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SINGLE-STAGE
EXPERIMENTAL EVALUATION OF
TANDEM-AIRFOIL ROTOR AND STATOR
BLADING FOR COMPRESSORS

PART VII - DATA AND PERFORMANCE FOR STAGE E

by J. G. Cheatham

PRATT & WHITNEY AIRCRAFT
DIVISION OF UNITED AIRCRAFT CORPORATION
FLORIDA RESEARCH AND DEVELOPMENT CENTER

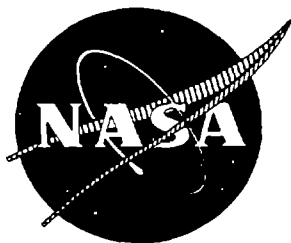| 1. Report No. NASA CR-134529	2. Government Accession No.	3. Recipient's Catalog No.
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16. Abstract

An axial flow compressor stage, having tandem airfoil blading, was designed for zero rotor prewhirl, constant rotor work across the span, and axial discharge flow. The stage was designed to produce a pressure ratio of 1.265 at a rotor tip velocity of 757 ft/sec. The rotor had an inlet hub/tip ratio of 0.8. The design procedure accounted for the rotor inlet boundary layer and included the effects of axial velocity ratio and secondary flow on blade row performance. The objectives of this experimental program were (1) to obtain performance with uniform and distorted inlet flow for comparison with the performance of a stage consisting of single-airfoil blading designed for the same vector diagrams and (2) to evaluate the effectiveness of accounting for the inlet boundary layer, axial velocity ratio, and secondary flows in the stage design. With uniform inlet flow, Rotor E achieved a maximum adiabatic efficiency of 90.0% at design equivalent rotor speed and a pressure ratio of 1.322. The stage maximum adiabatic efficiency at design equivalent rotor speed with uniform inlet flow was 83.7% at a pressure ratio of 1.275. Tip radial distortion of the inlet flow at design rotor speed caused a 7.0% reduction in surge pressure ratio whereas hub radial and circumferential distortion produced reductions of approximately 2.5 and 2.5%, respectively.

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FOREWORD

This report was prepared by the Pratt & Whitney Aircraft Division of United Aircraft Corporation, West Palm Beach, Florida, to present the data and performance for Stage E, which was tested under Contract NAS3-11158, Single-Stage Experimental Evaluation of Tandem-Airfoil Rotor and Stator Blading for Compressors. Mr. Everett E. Bailey, NASA-Lewis Research Center, Fluid System Components Division, was Project Manager.

The requirements of NASA Policy Directive NPD 2220.4 (September 14, 1970) regarding the use of SI Units have been waived in accordance with the provisions of paragraph 5d of that Directive by the Director of Lewis Research Center.

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SUMMARY

A single-stage axial flow compressor, having tandem-airfoil blading (i.e., blading composed of two airfoils positioned one behind the other so that there was an interblade passage whose width was approximately 10% of the individual airfoil chords) was designed and tested as part of an overall program to evaluate the effectiveness of tandem airfoils for increasing the design point loading capability and stable operating range of compressors. The stage was designed with zero rotor prewhirl, constant rotor work across the span, and axial discharge flow. The design procedure accounted for the rotor inlet boundary layer and included the effects of axial velocity ratio and secondary flow on blade row performance. The resulting blading had large variations in twist (i.e., end-bends) in the endwall regions. The rotor had an inlet hub/tip ratio of 0.8 and a design tip velocity of 757 ft/sec. The specific flow and resulting rotor inlet Mach number were generally consistent with design practice for compressor middle stages; however, the blade loading was appreciably higher. The stage was tested with uniform inlet flow and with hub radial, tip radial, and 90-deg one-per-revolution circumferential distortion of the inlet flow.

Overall and blade element performance data for uniform inlet flow were obtained at 50, 70, 90, 100, and 110% of design equivalent rotor speed and are presented herein. At design equivalent rotor speed and flow, the rotor achieved an adiabatic efficiency of 89.7% at a pressure ratio of 1.291, compared with respective design values of 89.9% and 1.28. At the same flow and rotor speed, the stage achieved an adiabatic efficiency of 83.7% at a pressure ratio of 1.275 relative to respective design values of 84.8 and 1.260. At design equivalent rotor speed, maximum rotor and stage adiabatic efficiencies of 90.0 and 83.7% were reached at approximately 98 and 100% of design equivalent flow, respectively.

For both hub radial and tip radial distortion of the inlet flow, overall performance, blade element performance, and flow distribution data were obtained at 70, 90, and 100% of design equivalent rotor speed and are also presented herein. For circumferential distortion of the inlet flow, overall performance data were obtained at 70, 90, and 100% of design equivalent rotor speed. Flow distribution data were also obtained with circumferential distortion of the inlet flow for two operating points (defined as a combination of flow and speed) at design equivalent rotor speed and one operating point at 90% design equivalent rotor speed.

Hub radial and circumferential distortion of the inlet flow produced moderate changes in surge pressure ratio for the stage, whereas tip radial distortion caused a substantial decrease in surge pressure ratio. At design equivalent rotor speed with hub radial, tip radial, and circumferential distortion, the surge pressure ratio decreased 2.5, 7.0, and 2.5%, respectively, when compared with the uniform inlet flow value. At design equivalent rotor speed and flow, hub, tip, and circumferential distortion reduced stage adiabatic efficiency by 4.3, 4.3, and 5.9%, respectively, when compared to the uniform inlet value. Similarly, stage pressure ratio was reduced by 2.4, 2.4, and 1.6%. Comparable reductions in stage efficiency and pressure ratio occurred for all speedlines and at no combination of speed and flow was the performance of Stage E with inlet flow distortion improved over that obtained with uniform inlet flow. With the exception of small increases in stall point efficiency occurring with hub and circumferential distortion of the inlet flow at 90 and 100% design equivalent rotor speed, the rotor also exhibited a similar trend towards reduced efficiency and pressure ratio with the addition of inlet flow distortion.

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INTRODUCTION

The effectiveness of tandem airfoils as a means for increasing the loading limit and stable operating range of highly loaded compressor blade rows was investigated for the National Aeronautics and Space Administration at the Florida Research and Development Center of Pratt & Whitney Aircraft under Task I of Contract NAS3-11158 (References 1 through 3). During this program, tandem rotors demonstrated higher pressure rise and efficiency than a single airfoil rotor with identical inlet and exit airfoil angles. The performance of the conventional stage was controlled to a large extent by three-dimensional flow effects associated with high losses near the walls. The three-dimensional flows resulted even though the blading was designed with increased work input near the walls to compensate for the high losses in these regions and, thereby, maintained a constant radial pressure distribution.

A second single-stage compressor investigation was initiated to evaluate the potential of tandem blading for improving the performance over that of a more moderately loaded stage, which was composed of single airfoil blade rows. A study was performed to select a radial work gradient for the rotor, which resulted in maximum rotor and stator loading levels consistent with good performance (Reference 4). Based on this study, a rotor design with uniform work input at all radii and an overall pressure ratio of 1.28 at a design rotor tip speed of 757 ft/sec was chosen for this investigation. This rotor has lower work input near the walls than the rotors of References 1 through 3. This lower work input near the walls should reduce the three-dimensional flows and high wall losses that are characteristic of highly loaded blade rows and provide a stage design that is not characterized by a highly three-dimensional flow and associated poor performance.

A single-airfoil rotor and stator, a dual-airfoil tandem rotor and a dual-airfoil tandem stator were designed and fabricated for this investigation. Because of the large inlet boundary layer noted during the testing described in References 1 through 3, a design procedure was used that accounted for the inlet total pressure gradient and the effects of axial velocity ratio and secondary flow on blade row performance. This report presents the data and performance obtained with Stage E, which was composed of tandem rotor and stator blading. A discussion of the aerodynamic and mechanical design of Stage E is presented in Reference 4. The overall and blade element performance for the single airfoil blading designed for the same vector diagrams are given in Reference 5.

DESIGN SUMMARY

Blading Design

The stage was designed with zero rotor prewhirl, constant rotor work across the span, and axial discharge flow. A rotor tip inlet Mach number of approximately 0.8 and a specific flow of 33 lb/sec-ft^2 were selected to be generally representative of current design practice for highly loaded compressor middle stages.

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To ensure a valid comparison between the conventional single-airfoil and the tandem-airfoil stages, the design velocity diagrams selected for the conventional stage were used in the design of the tandem stage. The design velocity diagrams were calculated by means of a computer program that solves the continuity, energy, and radial equilibrium equations for an axisymmetric flow field. The rotor inlet total pressure distortion from the data of the Reference 1 program was used for the velocity diagram calculations. Radial gradients of enthalpy and entropy were included in the calculation, and the influences of wall and streamline curvature on the radial distribution of static pressure were taken into account.

Simulated double-circular-arc airfoil sections (i.e., the mean camber line and the suction and pressure surface lines of each blade element are lines with a constant rate of angle change with path distance on a specified conical surface) were selected for the rotor and stator blading to be as consistent as possible with studies being conducted by NASA-Lewis Research Center (Reference 6). To ensure interchangeability with the conventional stage, radial distributions of overall axial chord for the tandem airfoils were maintained equal to the distributions selected for the conventional Stage D blading. To minimize the number of variables to be investigated in the selection of tandem Stage E metal geometry, the individual airfoil maximum thickness-to-chord ratio for each tandem airfoil was maintained equal to the corresponding values selected for the conventional Stage D airfoils. The individual airfoil chords of the tandem blades were arbitrarily set equal. The rotor and stator camber angles were selected to provide approximately an equal distribution of lift between the front and rear airfoils. The individual airfoils for both the rotor and stator were positioned so that:

1. The leading edge metal angle of the front airfoil and the trailing edge metal angle for the rear airfoil were equal to the leading and trailing edge metal angles, respectively, selected for Stage D.

2. There was zero axial overlap of the front and rear airfoils.

3. The passage width between the airfoils was approximately 10% of the front airfoil chord.

4. The passage between the airfoils would be slightly convergent (inlet-to-exit area ratio slightly greater than one).

Photographs of both the Rotor E and Stator E blading are shown in figure 1. The large variations in twist in the endwall regions resulted from using the actual inlet pressure gradient in the velocity diagram calculation and including the effects of axial velocity ratio and secondary flow on blade row performance. Details of the Stage E blading aerodynamic and mechanical design are presented in Reference 4.

Rotor and stator design velocity diagram data, blade element geometry data, and predicted performance are presented in tables I and II for the tandem rotor and stator, respectively. Symbols and performance variables are defined in Appendix C.

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Table I. Tandem Rotor E Blade Element Design

VELOCITY DIAGRAM DATA

Equivalent Rotor Speed = 4210 rpm Equivalent Weight Flow = 110 lb/sec

Percent Span From Tip		V'_{le} (ft/sec)	V_{zle} (ft/sec)	$V'_{\theta le}$ (ft/sec)	β'_{le} (deg)	U_{le} (ft/sec)	V'_{te} (ft/sec)	V_{zte} (ft/sec)	$V'_{\theta te}$ (ft/sec)	β'_{te} (deg)	U_{te} (ft/sec)	α (deg)
Leading Edge	Trailing Edge											
Hub 96.8	95.0	758.6	458.8	608.7	53.00	608.7	416.8	371.3	193.5	27.95	610.5	1.52
92.0	90.0	787.8	488.5	615.8	51.50	615.8	493.9	448.9	204.8	24.55	617.6	1.37
86.9	85.0	800.7	500.5	623.8	51.10	623.8	535.6	491.5	215.9	23.72	624.7	0.89
71.0	70.0	819.8	501.1	642.9	52.20	642.9	575.8	519.6	249.0	25.70	645.9	-1.17
49.5	50.0	844.3	499.9	680.6	53.60	680.6	603.1	525.8	293.7	29.35	674.3	-4.21
28.1	30.0	869.4	496.5	713.2	55.00	713.2	622.8	521.1	339.8	32.95	702.6	-7.16
12.0	15.0	877.9	473.4	737.8	57.10	737.8	596.0	464.2	370.0	38.35	723.9	-9.37
7.1	10.0	861.4	428.7	745.3	59.80	745.3	553.0	400.9	379.7	43.48	730.9	-9.64
Tip 3.0	5.0	837.2	375.1	751.5	64.10	751.5	483.5	270.0	388.9	53.00	738.0	-9.07

Note: $\beta_{le} = 0$ and is constant with radius.

DESIGN PERFORMANCE DATA

Rotor Pressure Ratio: 1.282 Adiabatic Efficiency: 89.9%

Percent Span From Tip		M'_{le}	i_m (deg)	D	$\bar{\omega}'$	Loss Parameter	δ° (deg)	P_{le} (psia)	T_{le} (°R)	P_{te} (psia)	T_{te} (°R)	r_{le} (in.)	r_{te} (in.)
Leading Edge	Trailing Edge												
Hub 96.8	95.0	0.697	0.57	0.604	0.236	0.0604	12.79	14.427	518.7	17.765	561.14	0.006	0.006
92.0	90.0	0.719	0.58	0.530	0.162	0.0432	10.38	14.659	518.7	18.361	561.14	0.006	0.006
86.9	85.0	0.732	0.52	0.484	0.106	0.0288	9.08	14.694	518.7	18.735	561.14	0.006	0.006
71.0	70.0	0.750	0.15	0.453	0.064	0.0177	7.05	14.694	518.7	19.000	561.34	0.006	0.006
49.5	50.0	0.774	-0.36	0.436	0.046	0.0129	6.16	14.693	518.7	19.063	561.34	0.006	0.006
28.1	30.0	0.796	-0.88	0.426	0.056	0.0158	5.44	14.701	518.7	19.010	561.07	0.006	0.006
12.0	15.0	0.801	-1.41	0.461	0.123	0.0335	6.82	14.602	518.7	18.465	561.28	0.006	0.006
7.1	10.0	0.783	-2.32	0.504	0.150	0.0382	10.45	14.308	518.7	17.915	561.14	0.006	0.006
Tip 3.0	5.0	0.757	-3.90	0.567	0.201	0.0428	17.12	13.820	518.7	17.130	561.38	0.006	0.006

GEOMETRY DATA

Airfoil: Simulated Double-Circular-Arc Number of Blades: 70 Overall Chord Length: 2.57 in.

Percent Span From Tip		Front Airfoil						Rear Airfoil						Each Airfoil	
Front Body Leading Edge	Rear Body Trailing Edge	κ_{le} (deg)	κ_{te} (deg)	ϕ (deg)	γ° (deg)	r_{le} (in.)	r_{te} (in.)	κ_{le} (deg)	κ_{te} (deg)	ϕ (deg)	γ° (deg)	r_{le} (in.)	r_{te} (in.)	σ	t/c
Hub 96.8	95.0	52.420	39.220	13.200	45.820	0.006	0.006	42.420	15.140	27.280	28.780	0.006	0.006	0.904	0.078
92.0	90.0	50.910	37.910	13.000	44.410	0.006	0.006	41.180	14.150	26.930	27.615	0.006	0.006	0.896	0.076
86.9	85.0	50.570	37.790	12.780	44.180	0.006	0.006	41.140	14.630	26.510	27.725	0.006	0.006	0.887	0.074
71.0	70.0	52.040	39.880	12.160	45.960	0.006	0.006	43.580	18.640	24.940	31.110	0.006	0.006	0.859	0.068
49.5	50.0	53.960	42.590	11.370	48.275	0.006	0.006	45.470	23.190	22.280	34.330	0.006	0.006	0.818	0.060
28.1	30.0	55.880	45.160	10.720	50.520	0.006	0.006	47.640	27.500	20.140	37.670	0.006	0.006	0.771	0.052
12.0	15.0	58.510	48.090	10.420	53.300	0.008	0.008	50.790	31.530	19.260	41.160	0.006	0.006	0.733	0.046
7.1	10.0	62.120	49.020	13.100	55.570	0.011	0.011	52.430	33.030	19.400	42.730	0.006	0.006	0.719	0.044
Tip 3.0	5.0	68.000	52.100	15.900	60.050	0.016	0.016	55.790	35.870	19.920	45.830	0.006	0.006	0.705	0.042

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Table II. Tandem Stator E Blade Element Design

VELOCITY DIAGRAM DATA

Equivalent Rotor Speed = 4210 rpm   Equivalent Weight Flow = 110 lb/sec

	Percent Span From Tip		V_{le} (ft/sec)	V_{zle} (ft/sec)	$V_{\theta le}$ (ft/sec)	β_{le} (deg)	V_{te} (ft/sec)	V_{zte} (ft/sec)	$V_{\theta te}$ (ft/sec)	β_{te} (deg)	α (deg)
	Leading Edge	Trailing Edge									
Hub	95.0	95.0	569.9	383.9	417.7	47.65	395.1	395.1	0.0	0.0	-0.29
	90.0	90.0	616.8	456.9	412.8	41.90	472.2	472.2	0.0	0.0	-0.57
	85.0	85.0	645.3	501.1	407.9	39.20	514.3	514.3	0.0	0.0	-0.86
	70.0	70.0	659.8	526.2	396.8	37.00	543.9	543.9	0.0	0.0	-1.72
	50.0	50.0	655.9	533.7	380.5	35.50	544.2	544.2	0.0	0.0	-2.86
	30.0	30.0	642.5	529.8	362.9	34.40	547.8	547.8	0.0	0.0	-4.00
	15.0	15.0	595.2	471.9	354.3	36.50	486.2	486.2	0.0	0.0	-4.86
	10.0	10.0	538.1	407.2	349.0	40.40	417.2	417.2	0.0	0.0	-5.14
Tip	5.0	5.0	450.2	284.3	349.1	52.50	298.4	298.4	0.0	0.0	-5.43

DESIGN PERFORMANCE DATA

Stage Pressure Ratio: 1.265   Stage Adiabatic Efficiency: 84.8%

	Percent Span From Tip		M_{le}	i_m (deg)	D	$\bar{\omega}$	Loss Parameter	$\delta°$ (deg)	P_{te} (psia)
	Leading Edge	Trailing Edge							
Hub	95.0	95.0	0.5024	-2.51	0.540	0.0972	0.02216	8.83	17.419
	90.0	90.0	0.5463	-1.48	0.462	0.0803	0.02027	11.31	18.117
	85.0	85.0	0.5751	-1.08	0.423	0.0712	0.01902	11.31	18.472
	70.0	70.0	0.5867	-1.02	0.389	0.0604	0.01714	10.97	18.748
	50.0	50.0	0.5832	-1.18	0.369	0.0534	0.01610	11.01	18.864
	30.0	30.0	0.5709	-1.43	0.364	0.0587	0.01866	11.66	18.762
	15.0	15.0	0.5262	-2.15	0.418	0.0995	0.03165	12.44	18.153
	10.0	10.0	0.4748	-3.11	0.488	0.1506	0.04575	12.68	17.534
Tip	5.0	5.0	0.3958	-6.64	0.630	0.1634	0.04282	4.85	16.738

GEOMETRY DATA

Airfoil: Simulated Double-Circular-Arc   Number of Vanes: 66   Overall Chord Length: 2.35 in.

	Percent Span From Tip		Front Airfoil						Rear Airfoil						Each Airfoil	
	Front Body Leading Edge	Rear Body Leading Edge	κ_{le} (deg)	κ_{te} (deg)	ϕ (deg)	$\gamma°$ (deg)	r_{le} (in.)	r_{te} (in.)	κ_{le} (deg)	κ_{te} (deg)	ϕ (deg)	$\gamma°$ (deg)	r_{le} (in.)	r_{te} (in.)	σ	t/c
Hub	95.0	95.0	50.160	25.160	25.00	37.660	0.008	0.006	28.170	-8.830	37.00	9.670	0.006	0.008	0.775	0.09
	90.0	90.0	43.380	19.780	23.60	31.580	0.007	0.006	22.940	-11.310	34.25	5.815	0.006	0.007	0.738	0.09
	85.0	85.0	40.280	17.630	22.65	28.955	0.006	0.006	20.990	-11.310	32.30	4.840	0.006	0.006	0.713	0.09
	70.0	70.0	38.020	16.880	21.14	27.450	0.006	0.006	18.890	-10.970	29.86	3.960	0.006	0.006	0.678	0.09
	50.0	50.0	36.680	16.680	20.00	26.680	0.006	0.006	18.490	-11.010	29.50	3.740	0.006	0.006	0.656	0.09
	30.0	30.0	35.830	16.470	19.36	26.150	0.006	0.006	18.320	-11.660	29.98	3.330	0.006	0.006	0.614	0.09
	15.0	15.0	38.650	17.000	21.65	27.825	0.008	0.006	19.600	-12.410	32.04	3.580	0.006	0.006	0.643	0.09
	10.0	10.0	43.110	19.360	23.75	31.235	0.013	0.006	20.930	-12.680	33.61	4.125	0.006	0.006	0.645	0.09
Tip	5.0	5.0	59.140	27.140	32.00	43.140	0.035	0.006	31.650	-4.850	36.50	13.400	0.006	0.010	0.619	0.09

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TEST EQUIPMENT

Compressor Test Facility

A schematic of the compressor test facility is shown in figure 2. The compressor is driven by a single-stage turbine, powered by exhaust gases from a J75 slave engine, with compressor speed controlled by means of the engine throttle. Air enters the compressor through a 103-ft combined inlet duct, plenum, and bellmouth inlet, and is exhausted through an exit diffuser to the atmosphere. The inlet duct contains a flow measuring orifice designed and installed in accordance with ASME standards. The area contraction ratio from plenum to compressor inlet is approximately 10 to 1.

Compressor Test Rig

A schematic of the compressor test rig is shown in figure 3. The flowpath dimensions are shown in figure 4. The hub/tip ratio at the rotor inlet is 0.798. The test section has a constant hub diameter of 32.85 in., and the outer wall converges from a diameter of 41.15 in. at the rotor leading edge to 39.99 in. at the stator trailing edge. Rotor bearing loads are transmitted to the rig support through struts located in the inlet and exhaust case assemblies. The inlet struts are sufficiently far upstream so that their wakes are dissipated ahead of the rotor. The stage design specifications of zero rotor prewhirl and axial discharge flow eliminated the need for inlet and exit guide vanes. Flowrate and/or backpressure were varied with a set of motor-driven throttle vanes located in the exhaust case.

Distortion Screens

Twenty-mesh, 0.020-in. diameter wire was used for the distortion screens (i.e., tip radial, hub radial, and circumferential). The tip and hub radial distortion screens covered 35 and 40% of the inlet annulus area, respectively, and the circumferential screen covered a 90-deg sector of the inlet annulus area. The distortion screens were mounted on a 1.0-in. mesh 0.125-in. diameter wire support screen located approximately one rotor radius upstream of the rotor leading edge. The support screen, which spanned the entire annulus, was installed for all the Stage E tests.

Instrumentation

Instrumentation was provided to obtain overall and blade element performance data for each blade or vane row. The locations of axial instrumentation stations are indicated in figure 4. Axial and circumferential locations of the instrumentation are shown in figure 5. Except for the omission of one rotor inlet total pressure probe during uniform inlet and radial distortion tests, dual instrumentation was provided at each axial station. The dual instrumentation provided: (1) a redundant set of measurements during uniform and radially distorted inlet flow testing, and (2) measurements within and outside of the distorted region during the circumferential distortion testing.

Airflow was measured with an ASME standard thin-plate orifice located in the compressor facility inlet duct. Compressor rotor speed was measured with an electromagentic sensor mounted adjacent to a 60-tooth gear on the rotor shaft. Gear tooth passing frequency was displayed as rpm on a digital counter. Rotor rpm was also recorded on magnetic tape. Inlet total temperature was measured in the inlet plenum by means of six half-shielded total temperature probes; inlet total pressure was measured in the plenum by means of five Kiel total pressure probes. Six equally spaced static pressure orifices were located on both the inner and outer walls at instrumentation Station 0.

Radial distributions of static pressure at the rotor inlet and exit and at the stator exit were measured by means of 8-deg wedge probes (figure 6). Four inner and four outer wall static pressure orifices, approximately equally spaced, were located at each of these stations. The rotor exit (i.e., stator inlet) instrumentation station also had two inner and three outer wall orifices installed across a vane gap to measure the static pressure variation across the gap. Likewise, the stator exit instrumentation station had four inner and four outer wall orifices installed across a vane gap to measure the gap-wise static pressure gradient on each wall. Eleven static pressure orifices were located over the rotor blade tips on the outer wall, between -26 and 107% rotor axial chord, to measure the rotor tip static pressures. Stator surface static pressure distributions at 10 and 90% span were measured with eight suction surface and three pressure surface orifices equally spaced from approximately 15 to 85% chord at both span locations for the front and rear airfoils of the tandem stator. The three pressure surface orifices at each percent span were installed on the same airfoil, i.e., one front and one rear airfoil; a different stator vane was used for each group of eight suction surface pressure orifices at a given percent span, i.e., two front airfoils and two rear airfoils for a total of six instrumented stators. The six stators were positioned in the stator assembly so that at least one uninstrumented vane separated those with static pressure orifices. The circumferential location of each instrumented airfoil and the location of the pressure orifices in terms of percent chord are shown in figure 7.

Twenty-deg wedge probes (figure 8) were used to measure the radial distributions of total pressure and flow angle at the rotor inlet and exit, and flow angle at the stator exit. Stator exit total pressure and temperature across a stator gap were measured at each of two circumferential locations by means of circumferentially traversed radial rakes with elements at nine radial positions (figure 9). The elements of each radial rake were designed to measure both total pressure and temperature. A fixed radial rake with five Kiel-type total pressure sensors was also installed downstream of the stator for use with the wall static measurements to calculate the freestream Mach number. This Mach number was used to correct the total temperature and the 8-deg wedge static pressure measurements.

As previously stated, dual instrumentation was provided at each axial measuring station to provide measurements within and outside of the distorted regions during the circumferential distortion testing. The dual instrumentation also reduced the number of circumferential distortion screen locations required to obtain a uniform spacing of flow distribution data relative to a reference screen location. Six screen locations resulted in the cirfumerential distributions (relative to a reference screen location) of data shown in figures 10a through 10c for Stations 1, 2, and 2A, respectively.

Steady-state pressure data were measured with a multichannel pressure transducer scanning system that includes automatic data recording on computer cards. Steady-state temperature measurements were also automatically recorded on computer cards by a multichannel scanning system in conjunction with a temperature reference oven and a digital voltmeter. Traverse pressure and temperature data and transient pressure data were recorded on magnetic tape at up to 600 samples per minute per channel.

One static pressure orifice located in the plenum, two of the outer wall static pressure orifices at Station 0, and a total pressure probe with sensors at 10, 50, and 90% spans at the rotor exit were close-coupled to transducers with 9-in. lengths of 0.040-in. inner diameter tubing for transient recording during operation into and out of surge. High-response pressure transducers mounted as total pressure probes at 10, 50, and 90% span from the tip behind the rotor (figure 11) were used to measure high-frequency total pressure oscillations and to indicate the initiation of rotating stall and/or surge. The high-response transducer output was recorded on magnetic tape and correlated in time with the transient recording of the plenum and Station 0 static and the stage exit total pressures.

Five rotor blades were instrumented with strain gages to provide vibratory stress data. Gage locations were determined by bench vibration tests with the aid of stress-coat, and the selected locations were verified by a fatigue test. The gage outputs were displayed on oscilloscopes and visually monitored during tests.

PROCEDURES

Test Procedures

Shakedown Tests

A shakedown test was performed to check out the rig and blade vibration levels, blade stress levels, instrumentation, and data reduction programs. Overall and blade element performance data were obtained for five operating points with uniform inlet flow at design equivalent rotor speed. One stall transient was performed during this test.

Performance Tests

Overall performance, blade element performance, flow distribution, and surge transient data were obtained during the uniform inlet flow tests at 50, 70, 90, 100, and 110% of design equivalent rotor speed. Five data points (defined as a combination of flow and speed) were recorded at each rotor speed to define stage performance between maximum obtainable flow and near surge. The near-surge point was determined on the basis of flow and rotor exit pressure. Overall performance, blade element performance and flow distribution data were obtained at three flow conditions, including maximum and near-surge flow, at 70, 90, and 100% of design equivalent rotor speed for the hub and tip radial inlet flow distortion tests. For circumferential distortion of the inlet flow, overall performance data were recorded for three data points at each of 70, 90, and 100% of design equivalent rotor speed. At each overall performance data point, data were recorded for two locations of the circumferential distortion

screen to assure a sampling of the rotor and stage performance in both the undistorted and distorted zones of the flow field. Flow distribution data were also obtained with circumferential distortion of the inlet flow for two of the data points at design equivalent rotor speed and one data point at 90% design equivalent rotor speed. To obtain an approximately uniform spacing of flow distribution data around the circumference of the compressor, data were recorded for six screen locations for each of these three data points. The resulting circumferential locations of the instrumentation relative to a reference screen location are shown in figure 10.

At each data point, traverse surveys were followed by the recording of fixed pressure and temperature instrumentation data. Blade stresses were monitored during steady-state and surge transient operation at all rotor speeds.

Transient measurements of bellmouth static pressure, rotor speed, and rotor exit total pressure were recorded 10 times per second to define surge characteristics as the stage was operated into and out of surge. The output from a high-response total pressure probe (10, 50, and 90% spans) at the rotor exit was also recorded as the stage was operated into and out of surge. These high-response total pressure probe data were correlated in time with the other transient measurements.

<center>Data Reduction Procedures</center>

Data reduction was accomplished in two steps. The first step involved the use of two computer programs (1) to convert millivolt readings to appropriate engineering units, and (2) to provide a tabulated and plotted array of pressures, temperature, and air angle data at each station. Conversion of data to absolute values, appropriate Mach number corrections, and adjustment of pressures and temperature to equivalent NASA standard day conditions were performed in the second computer program.

The second step in the data reduction procedure involved a third computer program to calculate overall and blade element performance variables for the rotor and stator. The array of data provided in step one, above, was analyzed for the selection of radial distributions of pressures, temperature, and air angle at each axial station for input into this computer program.

Overall Performance

Total pressure ratios and adiabatic efficiencies were calculated for the rotor and the rotor-stator (stage). The rotor and stator exit total pressures and total temperatures were weighted according to local mass flow to obtain average values. The mass-averaged stator exit total temperatures were used for both the rotor and stage efficiency calculations.

The stator wake total pressures and total temperatures at each radial measuring station were mass-averaged using the local total pressure in the wake, the local total temperature in the wake, and the 8-deg wedge probe static pressure. Mach number was determined from the local total and static pressure measurements. The local mass flow was then obtained from the relationship

$$\bar{m} = \frac{W\sqrt{T}}{PA} = \sqrt{\frac{\gamma g_c}{R}} \; M \left[1 + \frac{\gamma -1}{2} M^2 \right]^{\frac{1+\gamma}{2(1-\gamma)}}$$

where A is the flow area associated with each radial measurement increment.

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For circumferential distortion, the mass flow averaged values of total pressure and total temperature measured at one circumferential location within and one circumferential location outside of the undistorted flow region, were weighed according to the circumferential extent of the distorted and undistorted flow to obtain the values used to calculate the pressure ratio and efficiency (i.e., the values from the undistorted region were multiplied by 3/4 and the values from the distorted region were multiplied by 1/4 and the resultant answers added to obtain the final average performance). It was necessary to record data for two screen positions to ensure that measurements were obtained both within and outside of the distorted region at all instrumentation stations. It was assumed that the relative extent of distorted and undistorted flow remained the same through each blade row.

Blade Element Performance and Flow Distribution Data

Blade element performance and flow distribution data are presented for each blade row for uniform and radially distorted inlet flow. Performance calculations were made along design streamlines that pass through 5, 10, 15, 30, 50, 70, 85, 90, and 95% span at instrumentation Station 2. The calculations were performed at the instrumentation stations and at the rotor and stator leading and trailing edges. The pressures, temperatures, and air angles at the blade row leading and trailing edges were obtained by translating the measured values from the instrumentation stations assuming conservation of angular momentum, conservation of energy, continuity, and flow along design streamlines. A description of the translation method is presented in Reference 3. For circumferentially distorted inlet flow, flow distribution data (i.e., total pressure, total temperature, flow angle, velocity, Mach number, and turning) are presented for the three data points with six screen positions. These flow distribution data are at the instrumentation stations and not translated to the blade row leading and trailing edges.

Surge Transient Data

Bellmouth static pressure at incipient surge was determined from plots similar to the one shown in figure 12 and the corresponding weight flow was determined from the correlation of bellmouth static pressure and orifice weight flow shown in figure 13. The steady-state pressure ratio data were extrapolated to the surge flow using the shape of the transient data curve as a guide line. Incipient surge points were determined in this manner for each rotor speed.

PRESENTATION OF DATA

Uniform Inlet

Overall Performance

Overall performance data are presented in terms of total pressure ratio and adiabatic efficiency as functions of equivalent weight flow ($W\sqrt{\theta}/\delta$) and equivalent rotor speed ($N/\sqrt{\theta}$) for the rotor in figure 14 and the rotor-stator (stage) in figure 15. The design total pressure ratio and adiabatic efficiency for the rotor were 1.28 and 89.9%, respectively, at design flow. The corresponding design values for the stage were 1.26 and 84.8%. The design point is shown on each figure for comparison with the performance results. The solid

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symbol on the stall line in figures 14 and 15 is the surge point determined from the transient data. Pressure ratio, adiabatic efficiency, and polytropic efficiency for the rotor and stage are also tabulated for the steady-state data points in table A-1 of Appendix A.

Based on a curve faired through the data points, the rotor achieved an adiabatic efficiency of 89.7% and a total pressure ratio of 1.291 at design equivalent rotor speed and flow. At the same flow and rotor speed the stage achieved an adiabatic efficiency of 83.7% and a total pressure ratio of 1.275. At design equivalent rotor speed, maximum rotor and stage adiabatic efficiencies of 89.9 and 83.9%, respectively, were reached at approximately 98 and 100% design equivalent flow.

Blade Element Performance and Flow Distribution Data

As discussed on page 10, the blade element performance and flow distribution data were calculated for the instrumentation stations and for the rotor and stator leading and trailing edges. Table A-2 of Appendix A presents the data at the instrumentation stations at the near design point operating condition and is included only to illustrate the small differences at the near design point between values calculated from the data at the instrumentation stations and the values calculated from the data that have been translated to the rotor and stator leading and trailing edges. Because of the small differences between translated and untranslated values, only the translated values are given in table A-3 of Appendix A for the remaining compressor test points. The plotted results discussed for the rotor and stator in the following paragraphs are based on the translated data.

Rotor Blade Element Performance – Rotor diffusion factor, deviation angle, and loss coefficient are shown as functions of incidence angle in figures 16a through 16i. At the design incidence angle and rotor speed, total pressure losses were less than or equal to the design value from 15 to 95% span from the tip and greater than the design value only at 5 and 10% span. Deviation angles were essentially equal to the design value between 10 and 70% span from the tip, greater than the design value at 5, 85, and 90% span and less at 95% span. The diffusion factor at design incidence angle and rotor speed was greater than the design value at 5, 10, 15, 85, and 90% span from the tip, approximately equal to the design value at 30, 50, and 70% span, and slightly less than the design value at 95% span.

Loss parameter versus diffusion factor is presented in figures 17a through 17e for 10, 30, 50, 70, and 95% span, respectively. The design curve representing a correlation of the minimum loss data from Reference 3, References 8 through 14, and unpublished Pratt & Whitney Aircraft in-house data are shown in these figures for comparison with the performance data. Although the data from References 8 through 14 are for Series 65 blade sections, the data presented in Reference 7 indicate that a single correlation of loss parameter vs diffusion factor can be used for Series 65 and double-circular-arc blade sections. The range of data in the Reference 7 correlation and the two-dimensional cascade data from figure 149 of Reference 7 are also shown at 10, 50, and 90% span in figures 17a, 17c, and 17e, respectively, for comparison with the selected design loss curves. At design equivalent rotor speed, the loss parameter value

that corresponds to the minimum loss coefficient at 10, 30, 50, 70, and 90% span (figures 16b, 16d, 16e, 16f, and 16h, respectively) are above the design curve at 10 and 90% span and on or slightly below the design curve at 30, 50, and 70% span.

Axial gradients of rotor tip static pressure ratio (p_L/p at -7.0% axial chord) are shown in figure 18 for each flowrate at design equivalent rotor speed. This figure indicates (1) that the rotor tip loading shifted toward the leading edge of the blade as the compressor was throttled toward surge flow; and (2) that approximately an equal static pressure rise occurred across both front and rear airfoils at design equivalent flow.

Stator Blade Element Performance – Stator diffusion factor, deviation angle, and loss coefficient are presented as functions of incidence angle in figures 19a through 19i. For design incidence angle and rotor speed, the stator losses were less than design at 30, 50, 70, and 95% span from the tip and greater than design at 5, 10, 15, 85, and 90% span. Deviation angles, at design incidence, were from 1 to 3 deg greater than the design values from 5 to 90% span and approximately 1 deg less than design at 95% span. Diffusion factors, at design incidence angle and rotor speed, were less than the design value at 5, 10, 15, 30, and 95% span from the tip, approximately equal to the design value at 50 and 70% span, and greater than the design value at 85 and 90% span.

Loss parameter versus diffusion factor is shown in figures 20a through 20e for 10, 30, 50, 70, and 90% span, respectively. The design curve, representing a correlation of the minimum loss data derived from the same references discussed in the rotor blade element performance section, is shown on each figure. The design point, the range of stator data from Reference 7, and the two-dimensional cascade data from Reference 7 are also included in the figures for comparison with Stator E performance data. For design equivalent rotor speed, the loss parameter values corresponding to the minimum measured loss coefficients were below the design curve at 10, 30, 50, and 70% span from the tip and above the design curve value at 90% span.

The stator static pressure coefficient distributions at 10 and 90% span from the tip are shown in figures 21a through 21h for design equivalent rotor speed. Static pressure coefficient distributions for all uniform inlet data points are tabulated in Appendix B. Vane suction surface instrumentation at 10% span and 30 and 45% chord on the front airfoil (i.e., 11.6 and 16.5% overall axial chord); and pressure surface instrumentation at 10% span and 15% chord on the rear airfoil (i.e., 56.5% overall axial chord) was inoperative and prevented the calculation of static pressure coefficients at these locations. As shown on figure 21, the rear airfoil loading, represented by the area between the suction surface and the pressure surface static pressure coefficients, decreased, while the front airfoil loading increased, as the compressor was throttled toward surge flow. The ability of the tandem-airfoil configuration to control the stator rear airfoil incidence is suggested by the variations in the shape of the static pressure coefficient distribution for each airfoil. Operating between the maximum and minimum flowrates at design equivalent rotor speed, the stator front airfoil experienced large variations in the shape of its static pressure coefficient distribution, while the shape of the corresponding distribution for the rear airfoil exhibited only slight variations.

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Wall Static Pressure – The wall static pressure data were examined to determine if circumferential gradients with respect to the stator vanes were significant. In general, the variations of static pressure at different circumferential locations (solid symbols in figure 22), at approximately the same location relative to the stator vane, are as large as any variations that may be noted within one stator vane pitch. It was, therefore, concluded that no significant pitch variation was present in these data. Representative curves for two flow conditions at design equivalent rotor speed are presented as figures 22a and 22b.

Hub and Tip Radial Inlet Flow Distortion

Overall performance, blade element performance, and flow distribution data were obtained with hub radial and tip radial distortion of the inlet flow. The screens used to produce the distortion are described on page 6. At flows of approximately 115 lb/sec (i.e., 105% design equivalent flow), the hub and tip radial distortion screens produced 14.6 and 14.0% total pressure distortion, i.e., $(P_{1max} - P_{1min})/P_{1max}$. Rotor inlet total pressure profiles are presented in figure 23.

Overall Performance

Overall performance data obtained with hub radial distortion of the inlet flow are presented in terms of pressure ratio and adiabatic efficiency as functions of equivalent weight flow and equivalent rotor speed for the rotor in figure 24 and the stage in figure 25. Similarly presented in figures 26 and 27 is the overall performance obtained with a tip radial distortion of the inlet flow. Uniform inlet flow data and the rotor and stage design points are presented in these figures for comparison with the radially distorted inlet flow data. The surge line shown was determined from surge transient data. Pressure ratio, adiabatic efficiency, and polytropic efficiency for the rotor and stage are also tabulated for the steady-state data points with radial distortion in table A-4 of Appendix A.

With hub radial distortion of the inlet flow, rotor pressure ratio, and efficiency at design equivalent flow and rotor speed were 1.265 and 86.7%, compared with 1.291 and 89.7% for uniform inlet flow. Similarly, stage pressure ratio and efficiency were 1.245 and 79.4% as compared with 1.275 and 83.7% with uniform inlet flow. With the addition of hub radial distortion at 70, 90, and 100% design equivalent rotor speed, there were 0.9, 3.4, and 2.5% reductions, respectively, in stage surge pressure ratio. Therefore, Stage E was moderately affected by hub radial distortion.

With tip radial distortion of the inlet flow, rotor pressure ratio at design equivalent flow and rotor speed was 1.266 as compared with 1.291 for the uniform inlet flow. Rotor efficiency under the same conditions was 86.5%, compared with 89.7% for uniform inlet flow. The corresponding stage pressure ratio and efficiency were 1.245 and 79.4% as compared with 1.275 and 83.7% for the uniform inlet. Stage surge pressure ratio decreased by 3.6, 7.8, and 7.0% at 70, 90, and 100% design equivalent rotor speed, respectively, when compared to the uniform inlet test results. Consequently, Stage E was substantially affected by tip radial distortion.

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Blade Element Performance and Flow Distribution Data

Blade element performance and flow distribution data with radial distortion were calculated for each of the nine design streamline locations, and the results, based on data translated to the blade row leading and trailing edges, are presented in tables A-5 and A-6 of Appendix A.

Rotor and Stator Blade Element Performance – Diffusion factor, deviation angle, and loss coefficient with hub radial and tip radial distortion of the inlet flow are presented as functions of incidence angle in figures 28a through 28i for the rotor and in figures 29a through 29i for the stator. Comparison of the data shown in figures 28 and 29 with the uniform inlet flow data shown in figures 16 and 19 indicates that the rotor and stator deviation angle, loss coefficient, and diffusion factor distributions with radial distortion are generally equivalent to or are a normal extension of the values obtained with uniform inlet flow.

Flow Distribution Data – Radial distributions of total and static pressure, total temperature, air angle, and axial velocity for the rotor inlet, stator inlet and stator exit are presented for hub and tip radial distortion of the inlet flow in figures 30a through 32c and 33a through 35c, respectively. The values for the nine design streamline locations are also tabulated in tables A-5 and A-6 of Appendix A.

The similarity of the stage inlet and exit total pressure and axial velocity profiles shown in figures 30a and 33a for hub and tip distortion, respectively, at design rotor speed and approximately 115 lb/sec (i.e., 105% design flow) indicates very little attenuation of either distortion pattern. Generally, this result is typical of the results obtained at other rotor speeds and flows.

Circumferential Distortion

Rotor and stage overall performance were obtained with circumferential distortion of the inlet flow. The screen used to produce the distortion is described on page 6. At a flow of approximately 117 lb/sec (i.e., 106% design equivalent flow), the screen produced 13.5% total pressure distortion, i.e., $(P_{1max} - P_{1min})/P_{1max}$. A typical rotor inlet total pressure distribution at 94.0% design equivalent flow is presented in figure 36. The profile at approximately 106% design equivalent flow is not shown because at that flow, pressure data were recorded at only two circumferential locations.

Overall Performance

The rotor and stage overall performance achieved with circumferential distortion of the inlet flow are compared with uniform inlet performance in figures 37 and 38, respectively. The half-solid symbols of figures 37 and 38 indicate the data points for which both overall performance and flow distribution data were recorded, while the solid symbols are the surge points determined from the transient data. The surge line was extrapolated above 80 lb/sec flow because the surge flow obtained from the transient data at design rotor speed was greater than

the measured near-surge steady-state flow. The abrupt surge characteristics of Stage E preclude the possibility of a data point being taken in surge. Pressure ratio, adiabatic efficiency, and polytropic efficiency for the rotor and stage are also tabulated for the steady-state data points with the circumferential distortion in table A-7 of Appendix A.

With circumferential distortion of the inlet flow, rotor pressure ratio, and efficiency at design equivalent rotor speed and flow were 1.273 and 84.3% compared with 1.291 and 89.7% for uniform inlet flow. Similarly, stage pressure ratio and efficiency were 1.255 and 77.8%, compared to 1.275 and 83.7% with uniform inlet flow. Surge pressure ratio for the stage decreased by 2.6, 2.7, and 2.5% with circumferentially distorted inlet flow when compared with uniform inlet flow results at 70, 90, and 100% design equivalent rotor speed, respectively. Consequently, the Stage E surge margin was only moderately affected by circumferential distortion.

The peak rotor efficiency (figure 37) at 70, 90, and 100% design equivalent rotor speed with circumferential distortion was 6.3, 3.9, and 4.2 percentage points lower than the comparable values from the uniform inlet flow tests. Stage efficiencies (figure 38) were 3.8, 3.6, and 5.3 percentage points lower than the uniform inlet results. Peak efficiency for the rotor and the stage occurred at 100 and 90% design equivalent rotor speed, respectively.

As discussed on page 10, the overall performance shown in figures 37 and 38 was calculated from pressures and temperatures measured at one circumferential location within and one circumferential location outside the distorted region. In an effort to verify these pressure ratios and efficiencies, the overall performance was recalculated for the three data points of figures 37 and 38 for which data were recorded at six screen locations using a larger sample of the data within and outside of the distorted area. Average pressures and temperatures were obtained by area weighing the spanwise mass-average values from each of 12 circumferential locations around the flow field, thus providing a better average of the rotor and stage exit pressures and temperature than was used to calculate the pressure ratios and efficiencies shown in figures 37 and 38 and in table A-7. The overall performance calculated from the data at 12 circumferential locations is compared with the performance calculated from 2 circumferential locations in figures 39 and 40 for the rotor and stage, respectively. As shown in figure 39, the larger data sample resulted in 0.006 and 0.012 losses in design speed rotor pressure ratio at near stall and midpoint flowrates. Corresponding efficiency losses were 1.37 and 1.68 percentage points. There was no change in the 90% design speed near stall rotor pressure ratio, but a 1.0% efficiency loss was calculated. The values calculated for stage pressure ratio at design speed using the larger data sample (figure 40) were essentially unchanged, but efficiency increases of 0.86 and 1.60% were obtained for the near stall and midpoint flowrates, respectively. The 90% design speed near stall pressure ratio and efficiency remained essentially unchanged. This comparison of the two calculation procedures indicates fair agreement; however, additional data samples should be obtained in future test programs if a more accurate assessment of rotor and stator performance with circumferential distortion of the inlet flow is desired.

Flow Distribution Data

Table A-8 of Appendix A presents flow distribution data at the instrumentation stations for circumferential increments of 30 deg around the compressor annulus. Circumferential distributions of total pressure, static pressure, total temperature, air angle, and axial velocity for each instrumentation station at the nine design streamline locations are shown in figures 41 through 43. Figures 41 and 42 present the values for the two data points at design equivalent rotor speed, and figure 43 presents the data for the one point at 90% design equivalent rotor speed. The measured variables (pressure, temperature, and air angle) are plotted at the circumferential locations of the measuring instrument relative to the distortion screen, and the axial velocity is plotted at circumferential locations corresponding to the locations of the 20-deg wedge probes relative to the distortion screen. A comparison of the circumferential distributions of total pressure and axial velocity at the rotor inlet with the corresponding values at the stage exit indicates very little attenuation of the inlet distortion by either the hub or the tip sections of the compressor. This result is consistent with the results obtained with radial distortion of the inlet flow.

Summary Remarks

Stage E, composed of Rotor E and Stator E, was tested with uniform inlet flow and with hub radial, tip radial, and 90-deg one-per-revolution circumferential distortion of the inlet flow. The results of these tests provide performance data for: (1) evaluating the potential of tandem blading for extending the loading limit and stable operating range of compressor, (2) evaluating the effectiveness of accounting for the inlet boundary layer, axial velocity ratio and secondary flows in compressor design, and (3) evaluating the effects of inlet flow distortion on the stage performance.

With uniform inlet flow at design equivalent rotor speed and flow, the rotor achieved an adiabatic efficiency of 89.7% at a pressure ratio of 1.291 compared with respective design values of 89.9% and 1.28. At the same flow and rotor speed, the stage achieved an adiabatic efficiency of 83.9% at a pressure ratio of 1.275. At design equivalent rotor speed, maximum rotor and stage adiabatic efficiencies of 89.9 and 83.9%, respectively, were reached at approximately 98 and 100% design equivalent flow.

With tip radial distortion of the inlet flow, significant decreases in stage surge pressure ratio occurred, i.e., at design equivalent rotor speed, the surge pressure ratio decreased by 7.0%. The surge pressure ratio at design speed with hub radial and circumferential distortion of the inlet flow showed only a small change from the uniform inlet test results, i.e., respective stage surge pressure ratio decreases of 2.5 and 2.5% occurred at design equivalent rotor speed. Peak adiabatic efficiency for the stage with inlet flow distortion was affected as follows: hub radial distortion - respective decreases of 5.8, 4.2, and 3.5% from uniform inlet flow results at 70, 90, and 100% design equivalent rotor speed; tip radial distortion - decrease of approximately 3.8% at all three design rotor speed conditions; circumferential distortion - decreases of 3.8, 3.6, and 5.3%, at 70, 90, and 100% design rotor speed. For both radial and circumferential distortion of the inlet flow, the hub and tip regions of the compressor produced very little attenuation of the inlet distortion.
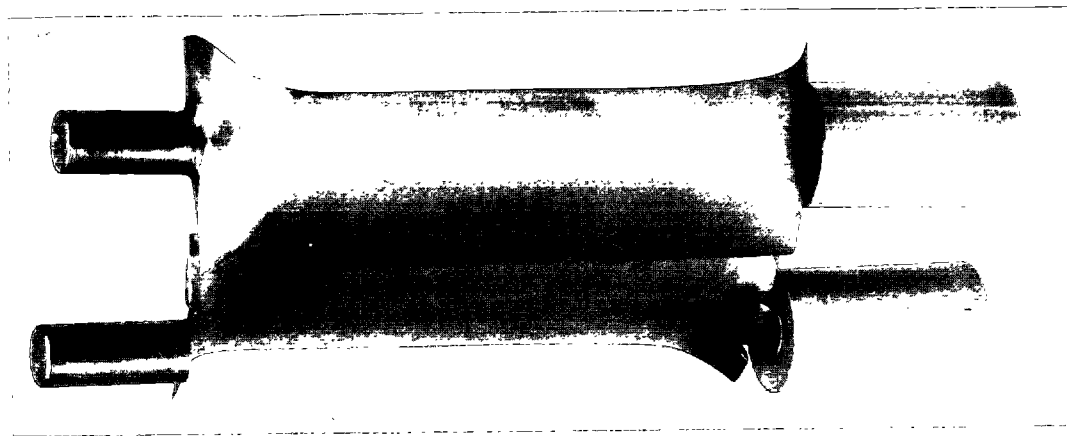
FD 77156

TANDEM ROTOR E

TANDEM STATOR E
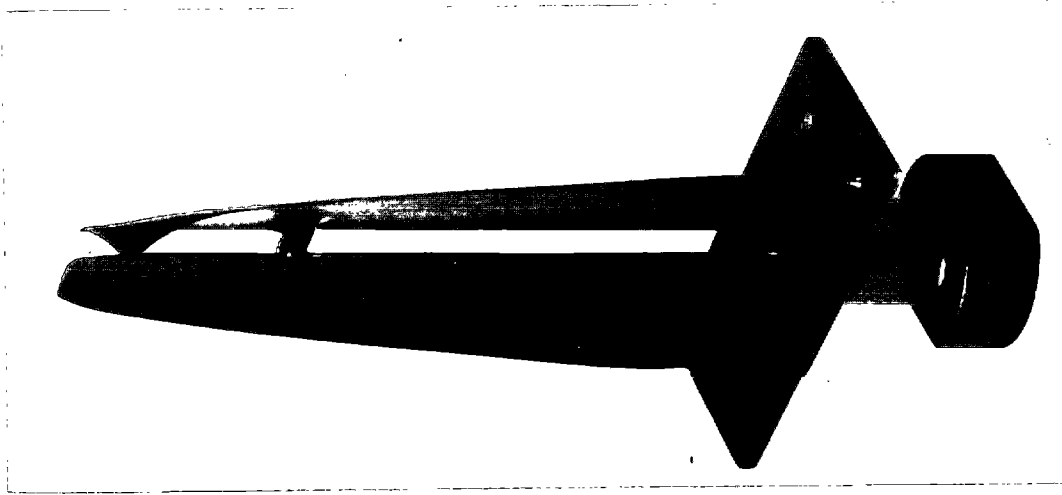
Figure 1. Stage E Airfoils

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TEST RIG EXHAUST
DUCTING TO EJECTOR

TURBINE EXHAUST DEFLECTOR

ATMOSHERIC EXHAUST VALVE

ORIFICE FLOW MEASUREMENT SYSTEM

INLET DUCTING

PLENUM CHAMBER

TEST RIG

EXHAUST COLLECTOR

TURBINE INLET COLLECTOR

DRIVE TURBINE

GAS SUPPLY
DUCTING
TO TURBINE

GAS EXHAUST FROM
SLAVE ENGINE

25 ft PLENUM LENGTH

103 ft INLET DUCTING LENGTH OVERALL
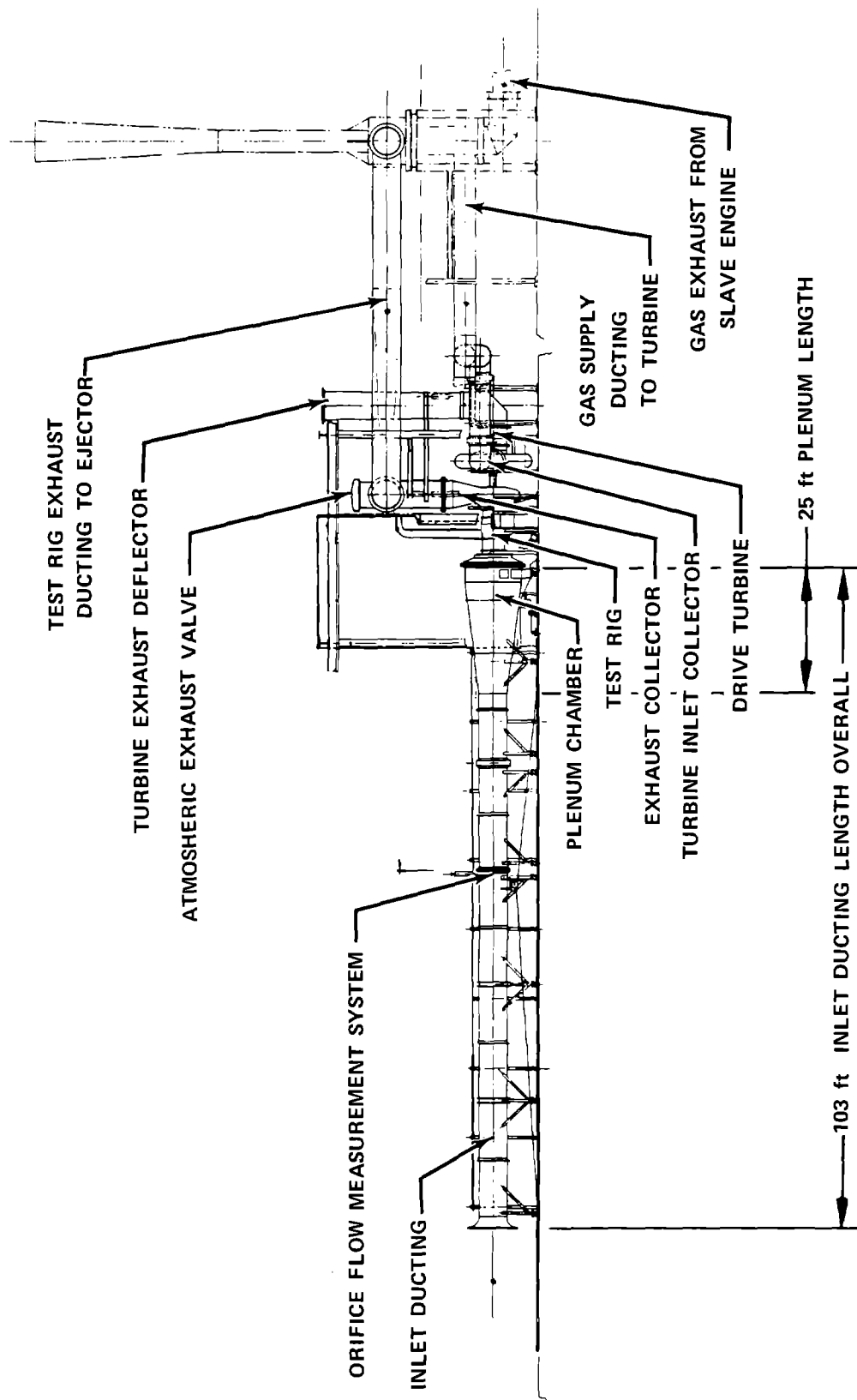
FD 75491A

Figure 2. Compressor Research Facility

Figure 3.   Single–Stage Compressor Rig

FD 75492

SCREEN SUPPORT STRUTS (6)   BLADES (70)   VANES (66)

FLOWPATH LOCATION	LOCATION DESCRIPTION	INNER DIAMETER, in.	OUTER DIAMETER, in.	AXIAL DISTANCE FROM REFERENCE PLANE, in.
A	REFERENCE PLANE	32.850	41.790	0.0
B	DISTORTION SCREEN	32.850	41.790	1.500
C	SUPPORT STRUT LEADING EDGE	32.850	41.744	2.440
D	SUPPORT STRUT TRAILING EDGE	32.850	41.444	6.265
E	INSTRUMENTATION STATION 0	32.850	41.340	10.248
F	INSTRUMENTATION STATION 1	32.850	41.226	17.188
G	ROTOR INLET STATION	32.850	41.145	18.061
H	ROTOR F STACKING LINE	32.850	40.860	19.188
I	ROTOR EXIT STATION	32.850	40.562	20.315
J	INSTRUMENTATION STATION 2	32.850	40.520	21.368
K	STATOR INLET STATION	32.850	40.450	22.163
L	STATOR E STACKING LINE AND FRONT AIRFOIL TRAILING EDGE	32.850	40.228	23.276
M	STATOR EXIT STATION	32.850	39.990	24.468
N	INSTRUMENTATION STATION 2A	32.850	39.990	25.418

NOTE: ALL DIMENSIONS ARE IN INCHES.

Figure 4. Flowpath Dimensions

FD 64415B

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STATION NUMBER

	0	1	2	2A	
180.0					BOTTOM CENTER

⊙● 207.0

⦿ 219.5

● 240.0

▲ 255.5

● 193.5

188.0
◇ 207.3
⊙● 231.8
△ 248.2

225.0 ——

▲ 225.7

270.0 ——
⊙● 264.0
⦿ 258.4
● 280.7

△ 284.5

315.0 ——
⊙● 333.0
⦿ 327.5

323.5
340.3
344.0
345.3
346.5
347.8

◇ 305.5
327.3
336.9
338.2
339.3
340.7
345.8

0-360.0 ——
● 356.5
—— TOP CENTER

24.0

△ 7.5

DIRECTION
OF ROTOR
ROTATION

⊙● 27.0

△ 32.5

45.0 ——
▲ 46.5
54.0
60.9
⊙● 35.5
△ 51.8

● 73.6

△ 75.5*

90.0 ——
⊙● 84.0
⦿● 83.9
▲ 100.8

● 119.0
⦿ 118.5

135.0 ——
⦿ 133.0

⦿ 147.5
⊙● 153.0
△ 154.8
⦿● 150.0

180.0					BOTTOM CENTER
	0	1	2	2A	
		ROTOR INLET	ROTOR EXIT	STATOR EXIT	

SYMBOLS

⊙ OD WALL STATIC PRESSURE ORIFICE
● ID WALL STATIC PRESSURE ORIFICE
△ 20 deg WEDGE TRAVERSE PROBE
▲ 8 deg WEDGE TRAVERSE PROBE
◯ TOTAL PRESSURE PROBE (10, 50 AND 90% SPANS)
⌂ HIGH-RESPONSE PROBE (10, 50 AND 90% SPANS)
◇ TOTAL TEMPERATURE/PRESSURE PROBE, CIRCUMFERENTIAL
     TRAVERSE (5, 10, 15, 30, 50, 70, 85 AND 95% SPANS)
⬢ TOTAL PRESSURE PROBE (10, 30, 50, 70, AND 90% SPANS)
⊕ ROTOR TIP STATIC PRESSURE ORIFICE (-26,-7.3, 8.6, 18,
     28.6, 38.7, 48.6, 64.6, 80, 94, AND 107% AXIAL CHORD;
     EQUALLY SPACED 3 deg CIRCUMFERENTIALLY)
*PROBE DELETED DURING UNIFORM INLET AND RADIAL DISTORTION TESTS
NOTE: ALL DIMENSIONS ARE IN DEGREES

Figure 5. Instrumentation Layout   FD 58981A

21

0.375 DIA

0.375 DIA

2.000

0.375

0.125

0.125 DIA

0.020 DIA

0.375

0.050

NOTE: ALL DIMENSIONS ARE IN INCHES

FD 58983

FD 47069

Figure 6. Eight–Degree Wedge Traverse Probe

22

STATIC PRESSURE
ORIFICE LOCATION

STATOR E
REAR AIRFOIL

STATOR E
FRONT AIRFOIL

OVERALL CHORD

COMPRESSOR CENTERLINE

STATOR GEOMETRY IS NOT TO SCALE

PERCENT OVERALL CHORD LOCATION

FRONT BODY 90% SPAN FROM TIP		REAR BODY 90% SPAN FROM TIP	
SUCTION SURFACE (16° 24')	PRESSURE SURFACE (32° 42')	SUCTION SURFACE (5° 24')	PRESSURE SURFACE (332° 30')
6.7	7.5	56.5	56.1
11.4	24.9	61.9	74.4
16.2	42.6	67.3	92.2
21.0		72.6	
26.1		77.7	
31.2		82.8	
36.5		87.8	
41.8		92.7	

10% SPAN FROM TIP		10% SPAN FROM TIP	
SUCTION SURFACE (343°30')	PRESSURE SURFACE (32°42')	SUCTION SURFACE (354°30')	PRESSURE SURFACE (332°30')
6.9	7.6	57.0	* 56.5
* 11.6	25.2	62.3	74.5
* 16.5	42.8	67.5	92.4
21.4		72.7	
26.5		77.8	
31.6		82.9	
36.9		87.4	
42.1		92.8	

NOTES: 1. NUMBERS IN PARENTHESIS INDICATE THE CIRCUMFERENTIAL POSITION OF THE INSTRUMENTATED AIRFOIL IN THE STATOR ASSEMBLY. ZERO DEGREES IS TOP CENTER; THE ANGLE INCREASES CLOCKWISE LOOKING AFT.
2. ASTERISK INDICATES ORIFICE WHICH WAS INOPERATIVE DURING TEST.

Figure 7. Stator E Static Pressure Orifice   FD 77157
Locations

0.103

0.058

0.375 DIA

0.562

0.350

0.031 HYPO
TUBE

0.074

0.060

0.045

0.050

TOTAL PRESSURE
ORIFICE

THERMOCOUPLE

STATIC
PRESSURE ORIFICE
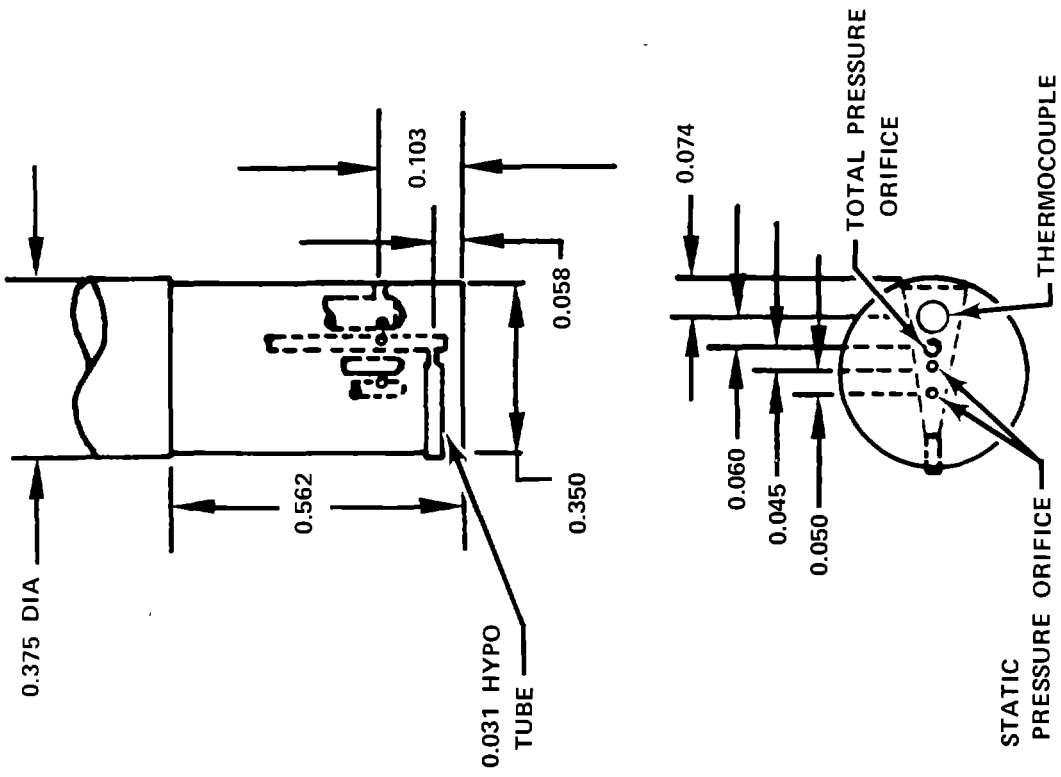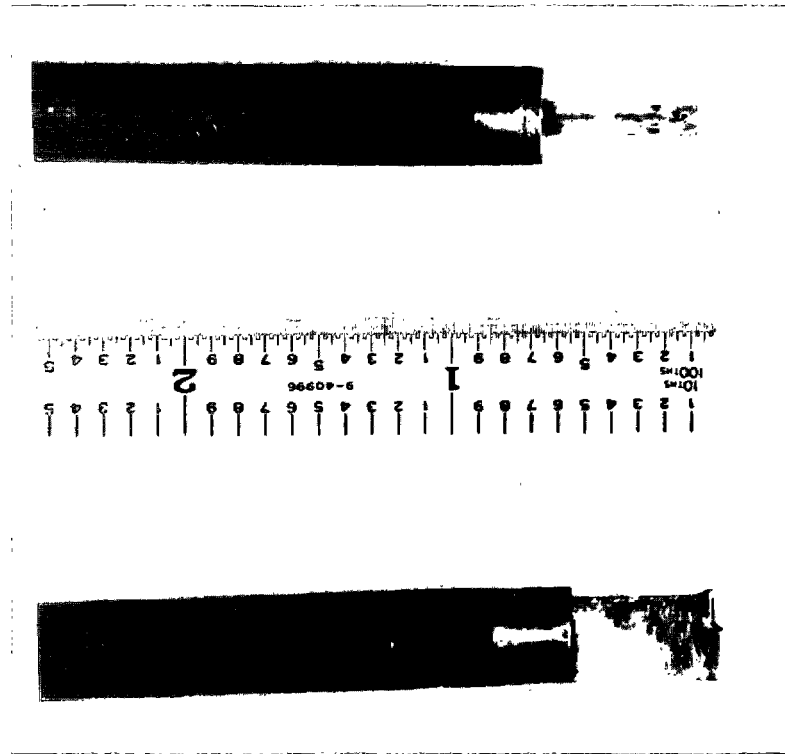
NOTE: ALL DIMENSIONS ARE IN INCHES

FD 47069

FD 58982

Figure 8.   Twenty–Degree Wedge Traverse Probe

FE 97405
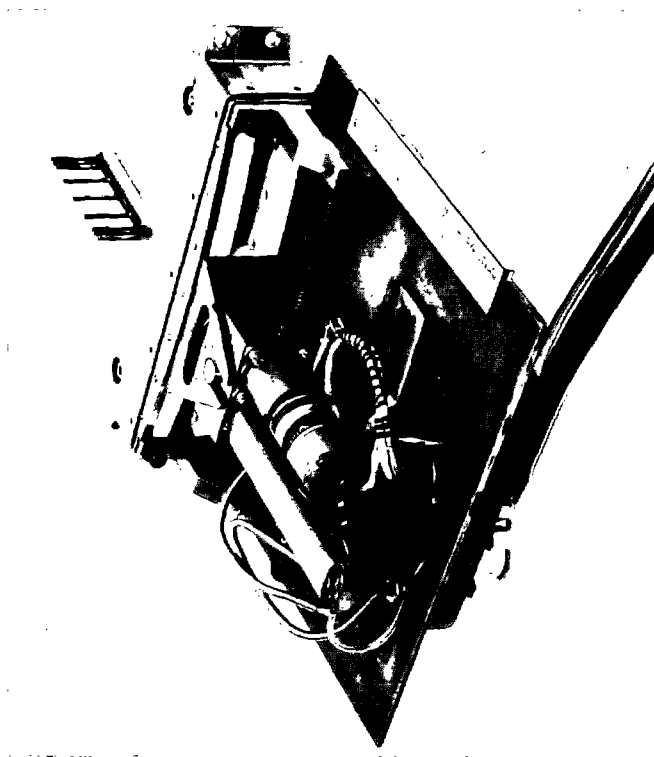
REAR VIEW

FE 97404

FRONT VIEW WITH COVER REMOVED
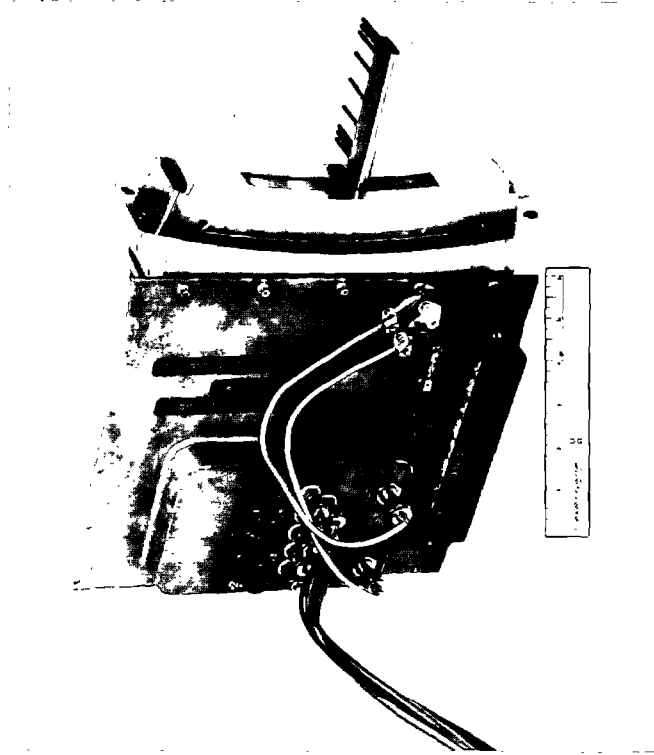
Figure 9. Total Pressure/Total Temperature Circumferential Traverse Unit

FD 47068

25
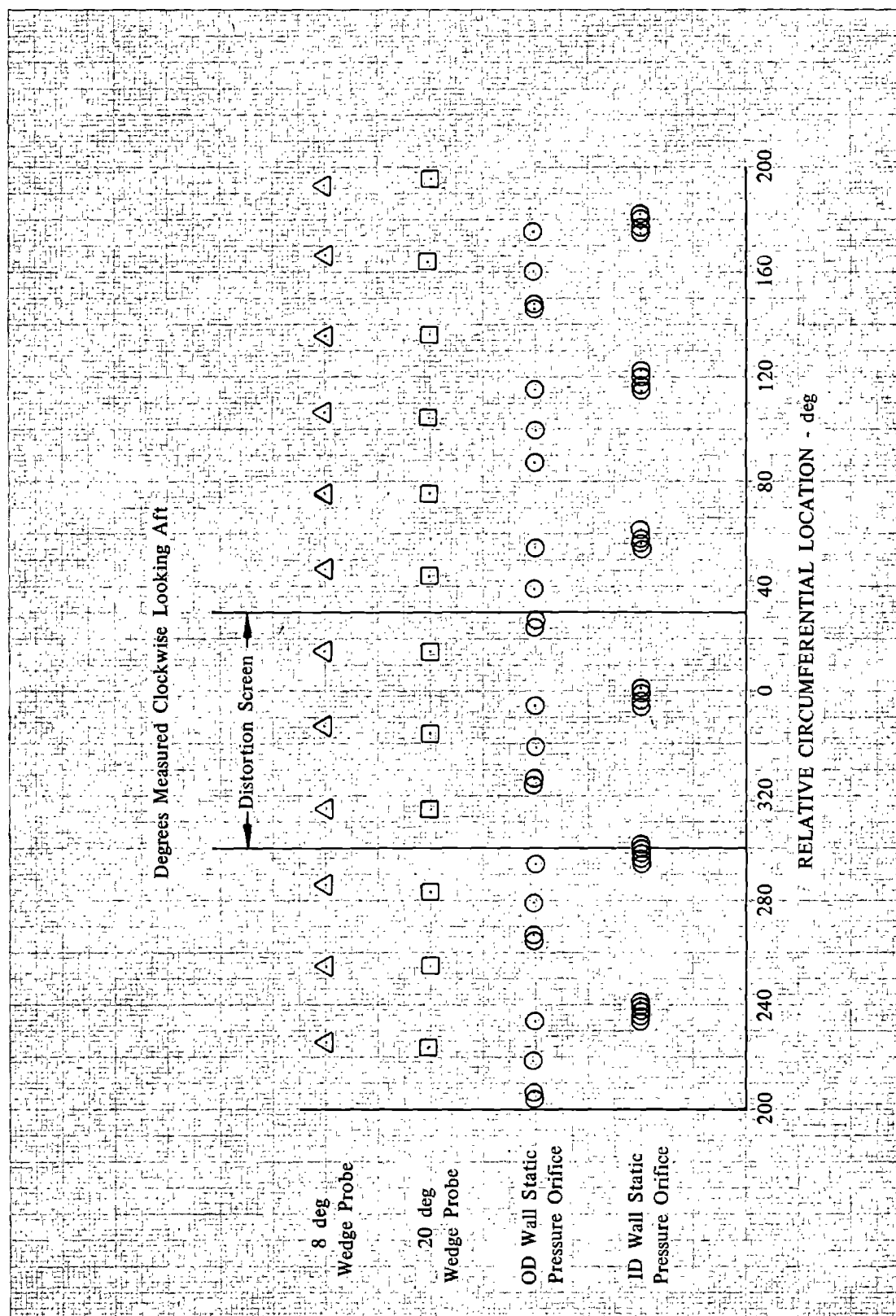
Figure 10a.   Composition of Station 1 Instrumentation Relative to the Circumferential Distortion
Screen for Six Screen Positions

DF 98072

26
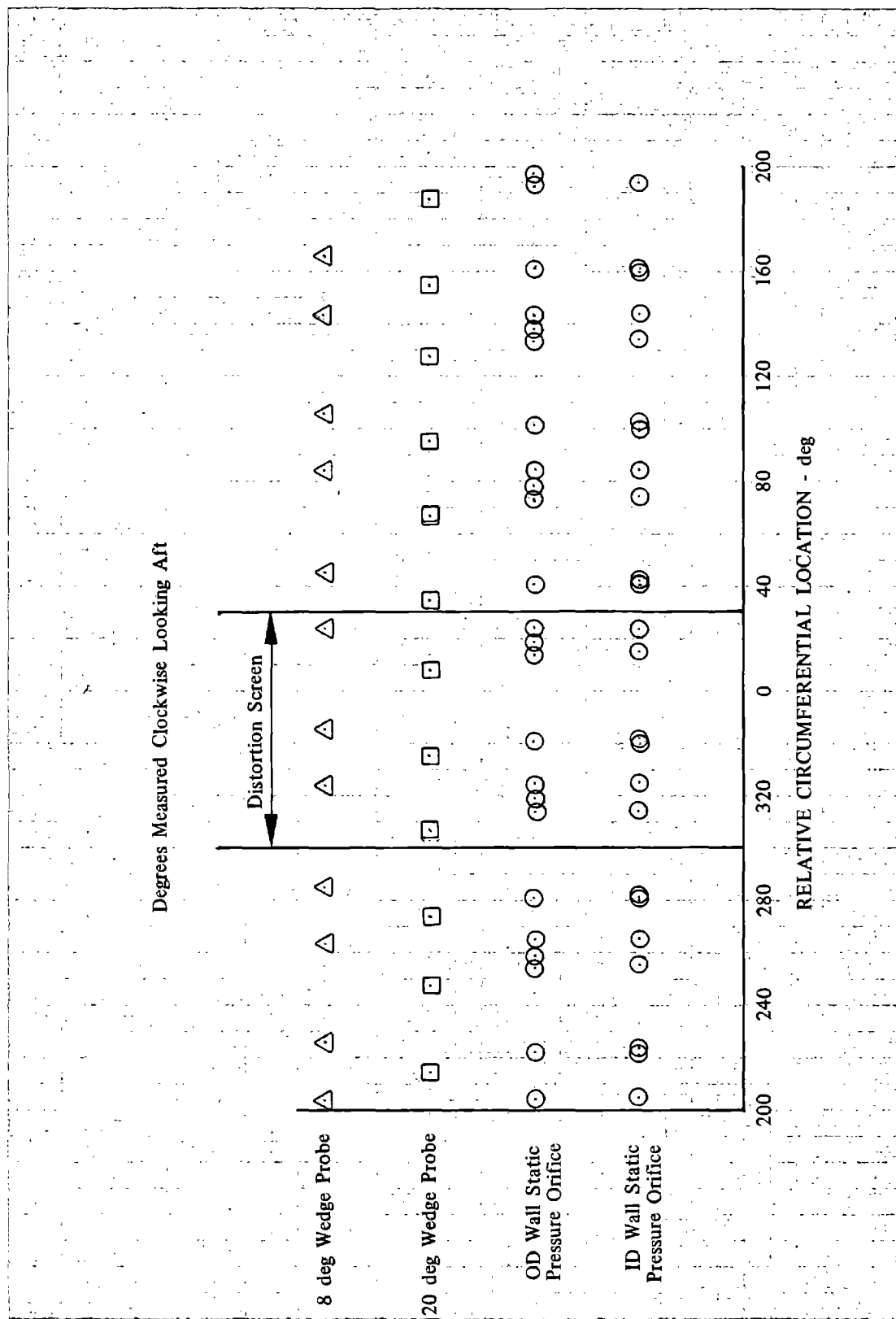
Figure 10b. Composition of Station 2 Instrumentation Relative to the Circumferential Distortion Screen for Six Screen Positions

DF 98073

27
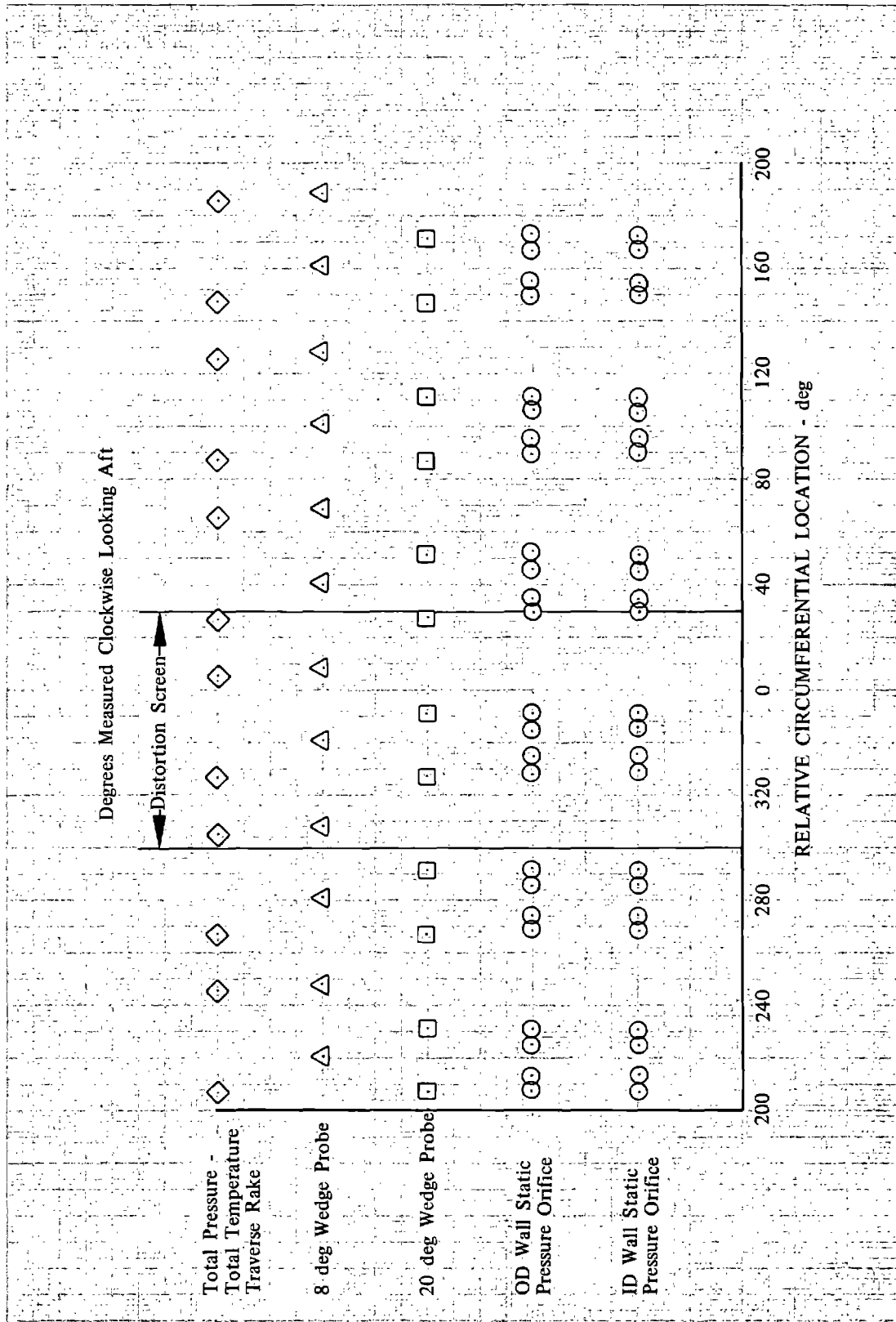
Figure 10c. Composition of Station 2A Instrumentation Relative to the Circumferential Distortion Screen for Six Screen Positions

DF 98074

28

SETSCREW

SEAL

FLOW

CAP

SPACER

BOSS

PRESSURE PORT (3)

CABLE ASSEMBLY (3)

HIGH-RESPONSE
TRANSDUCER (3)

SPACER

FLOW

FLOW

1.535

1.535

0.384
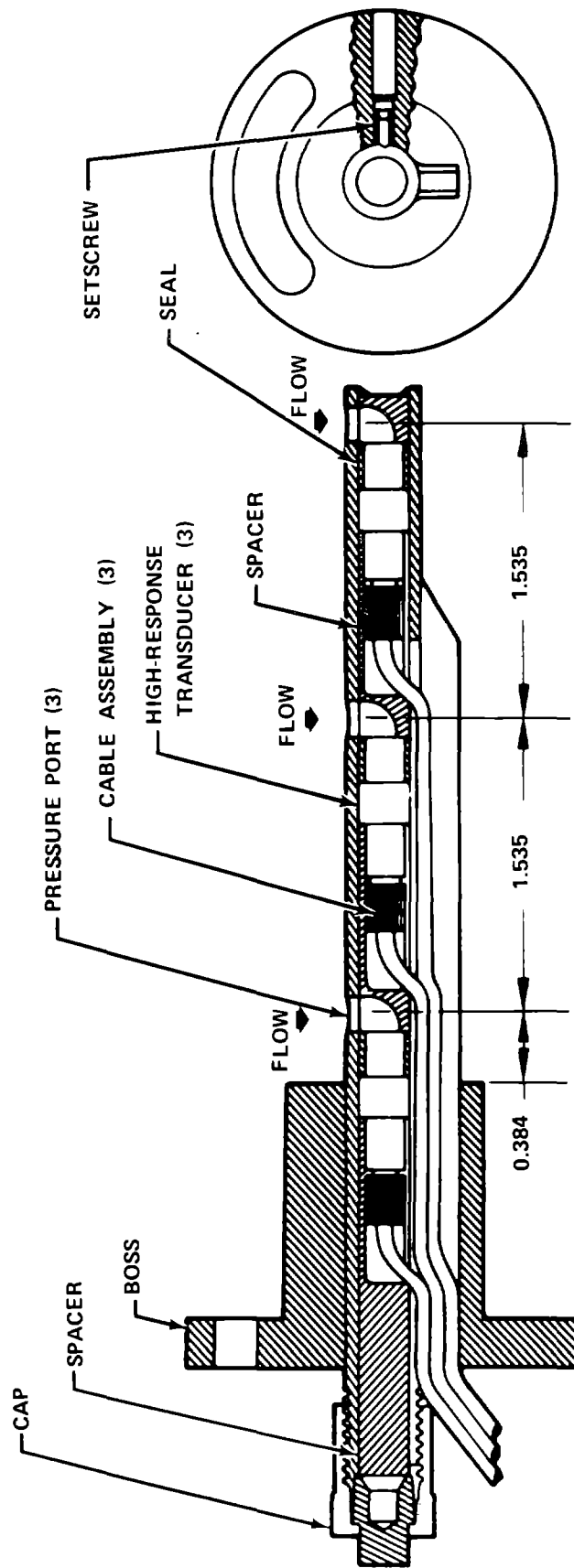
NOTE: ALL DIMENSIONS ARE IN INCHES

FD 58984B

Figure 11. High–Response Probe

ROTOR EXIT PRESSURE

BELLMOUTH PRESSURE

PLENUM PRESSURE

INITIATION OF SURGE

ROTOR SPEED

670.0   TIME - sec   701.2

0.1 sec

HIGH-RESPONSE PRESSURE TRANSDUCER DATA
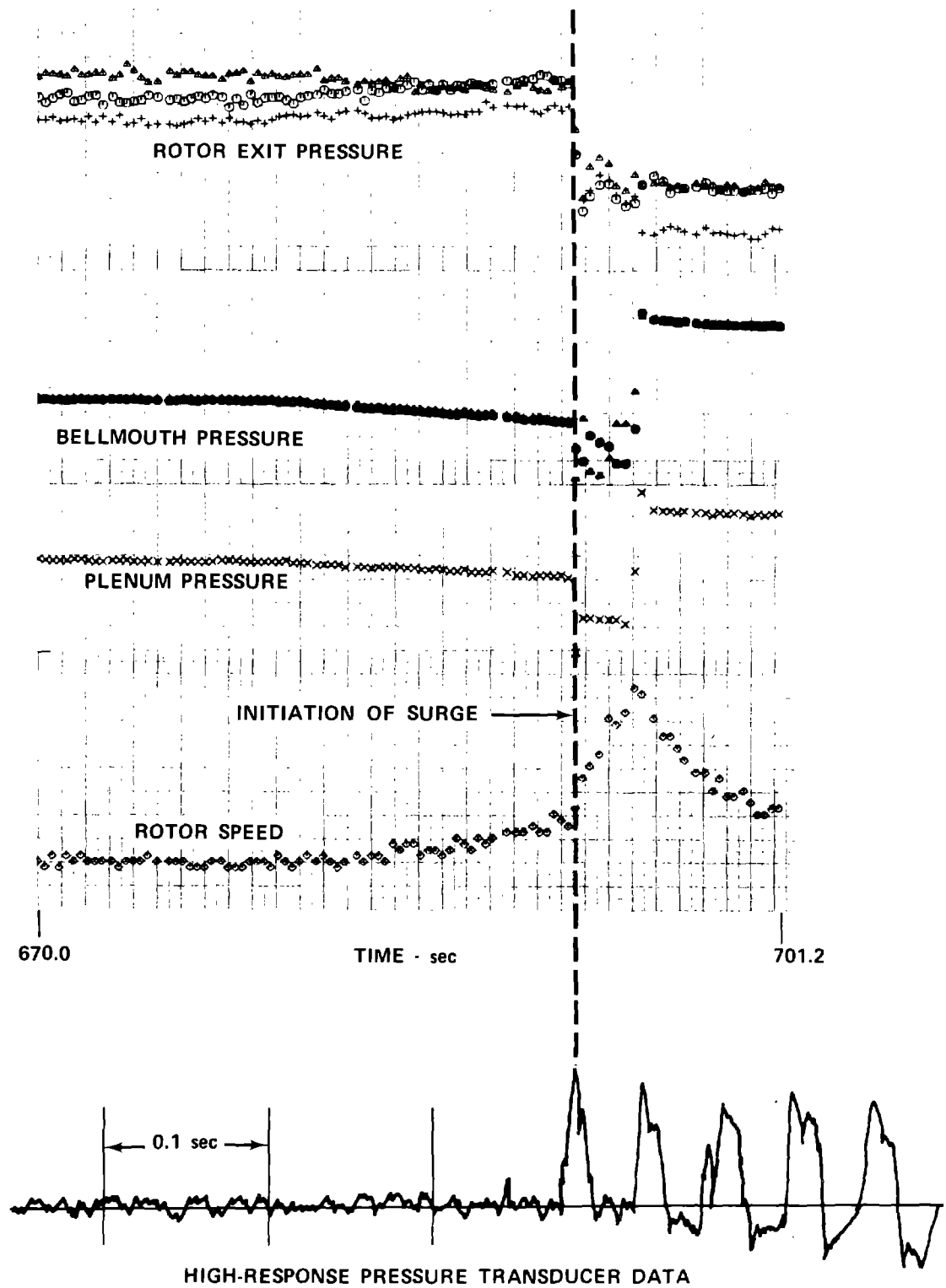
Figure 12. Typical Plot of Transient Data   FD 75494

30
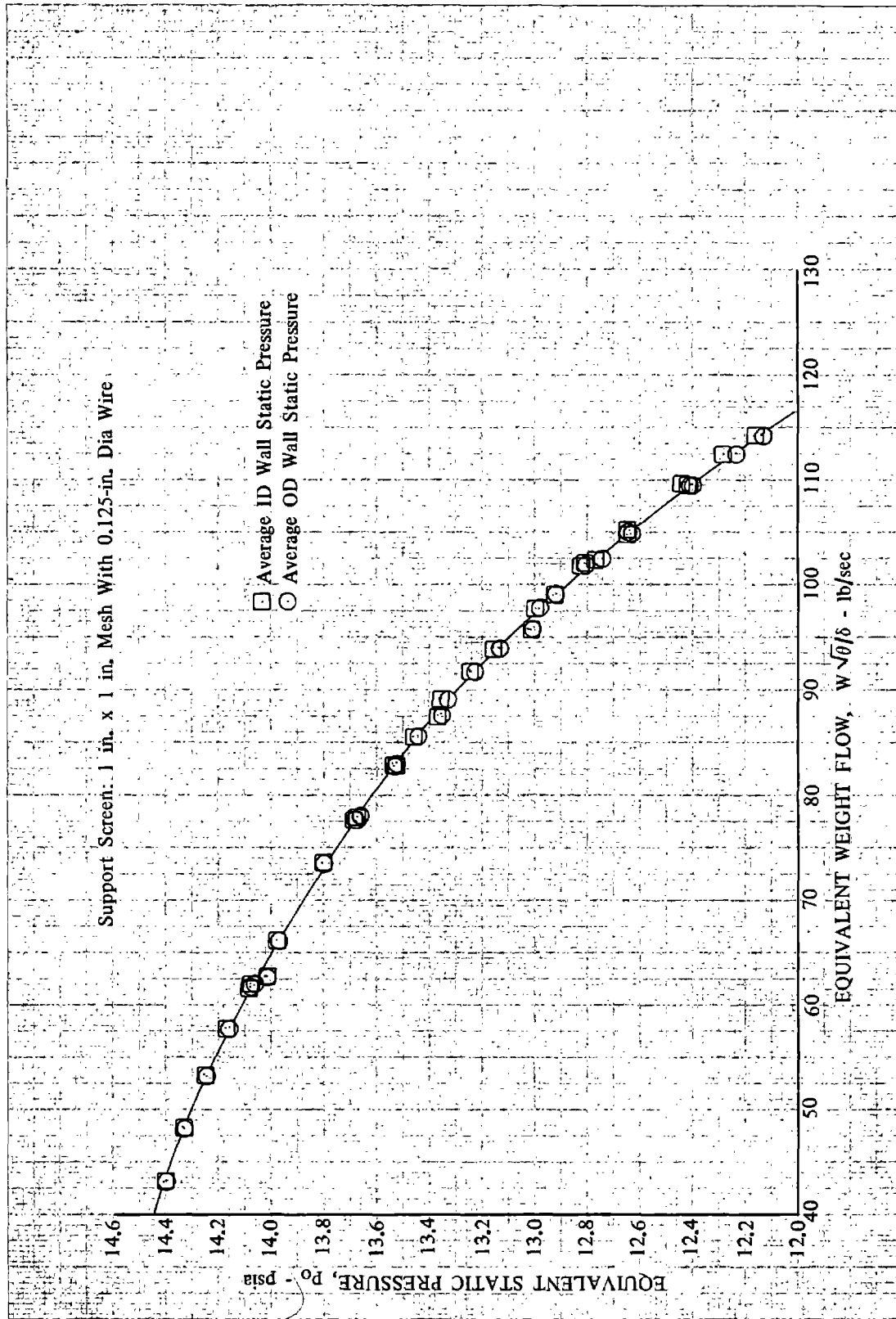
Figure 13. Station 0 Equivalent Static Pressure vs Equivalent Weight Flow for Stage E
Flowpath with Support Screen
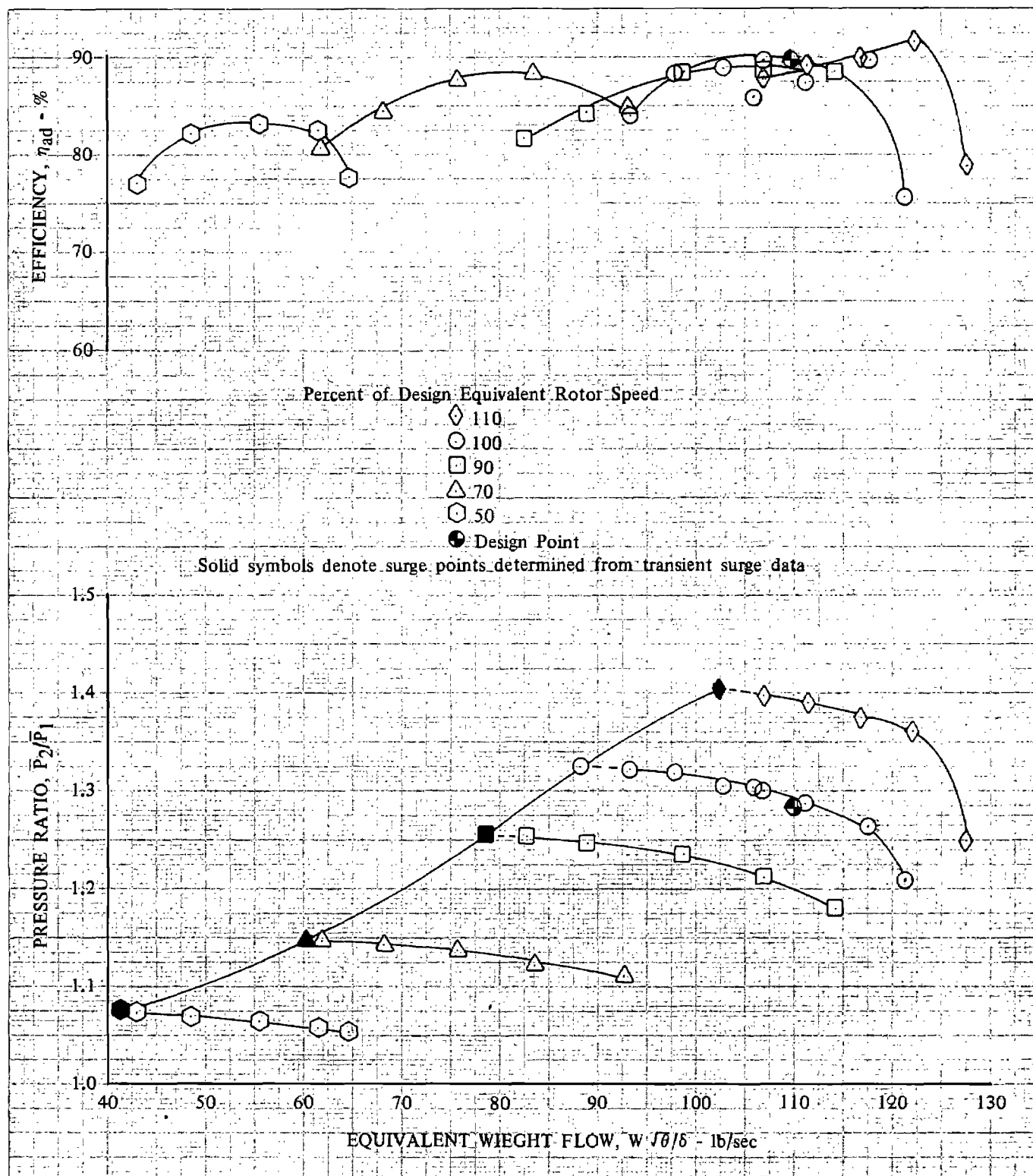
Figure 14. Overall Performance of Rotor E; Uniform   DF 98209
Inlet Flow
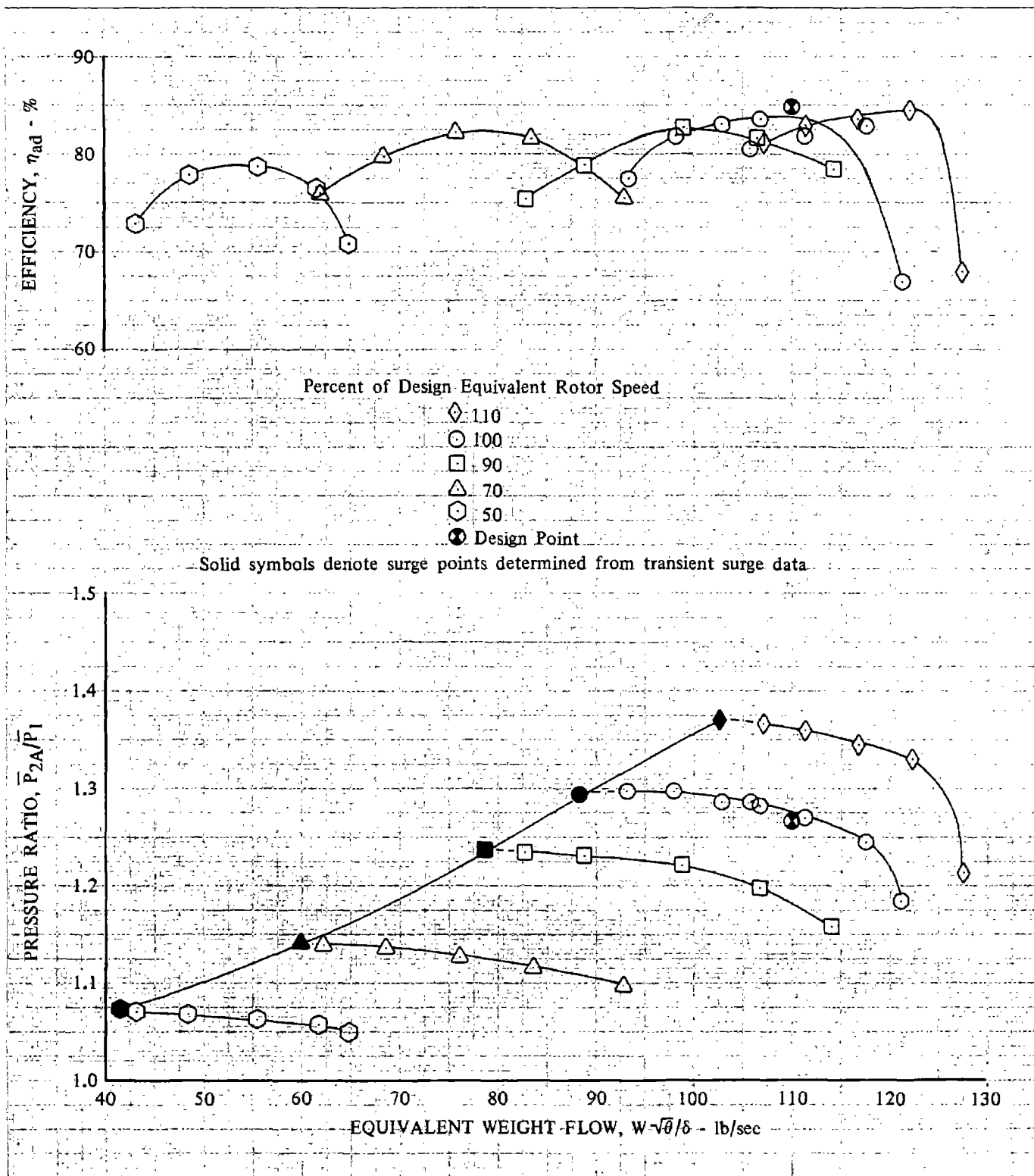
Figure 15. Overall Performance of Stage E; Uniform   DF 98210
Inlet Flow
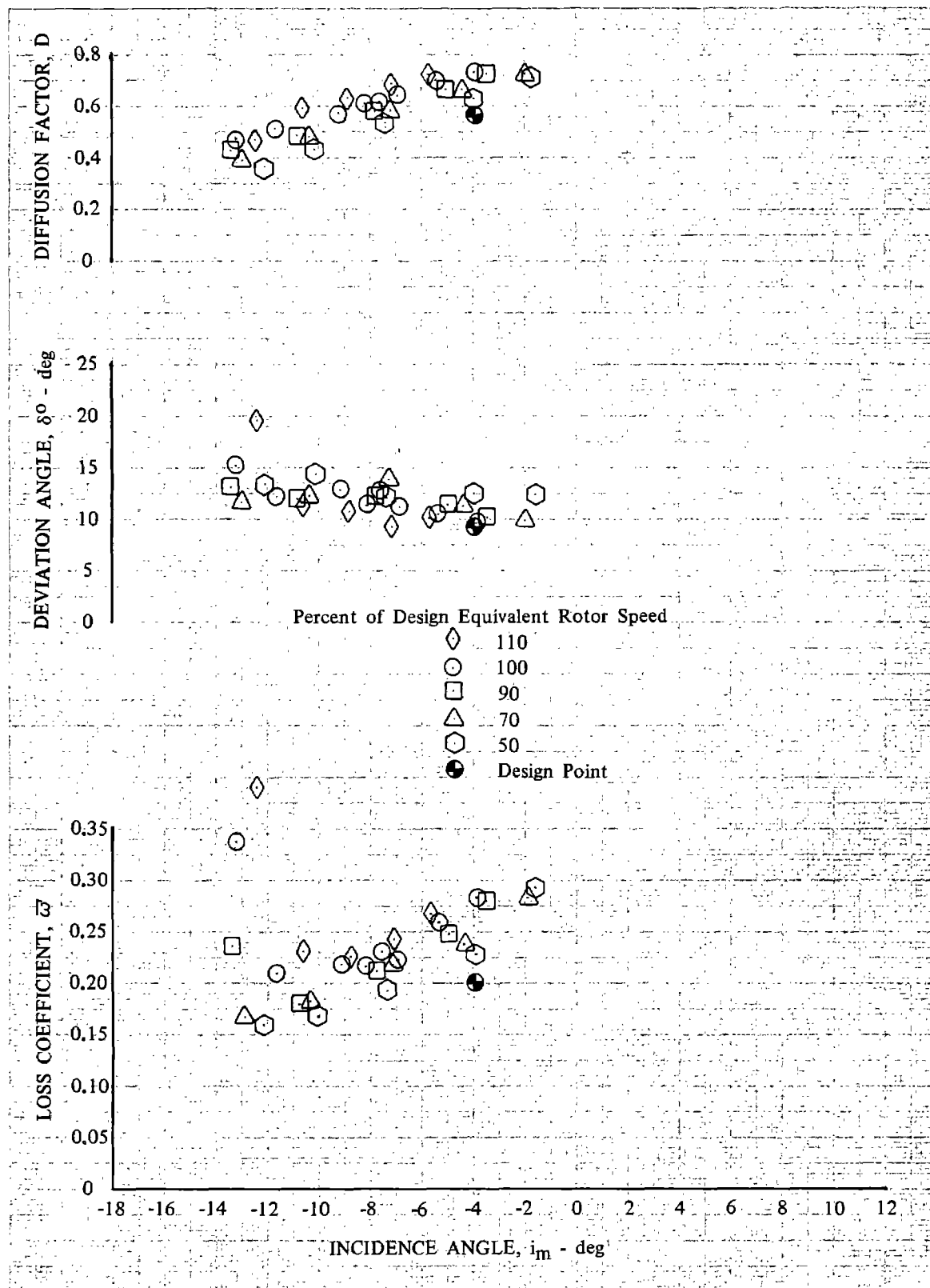
Figure 16a. Rotor E Blade Element Performance;   DF 98075
            5% Span from Tip; Uniform Inlet Flow

34

DIFFUSION FACTOR, D

0.8
0.6
0.4
0.2
0

DEVIATION ANGLE, δ^o - deg

25
20
15
10
5
0

Percent of Deisgn Equivalent Rotor Speed

◇ 110
⊙ 100
▢ 90
△ 70
⬠ 50
⬤ Design Point

LOSS COEFFICIENT, $\bar{\omega}'$

0.35
0.30
0.25
0.20
0.15
0.10
0.05
0

-18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12

INCIDENCE ANGLE, i_m - deg
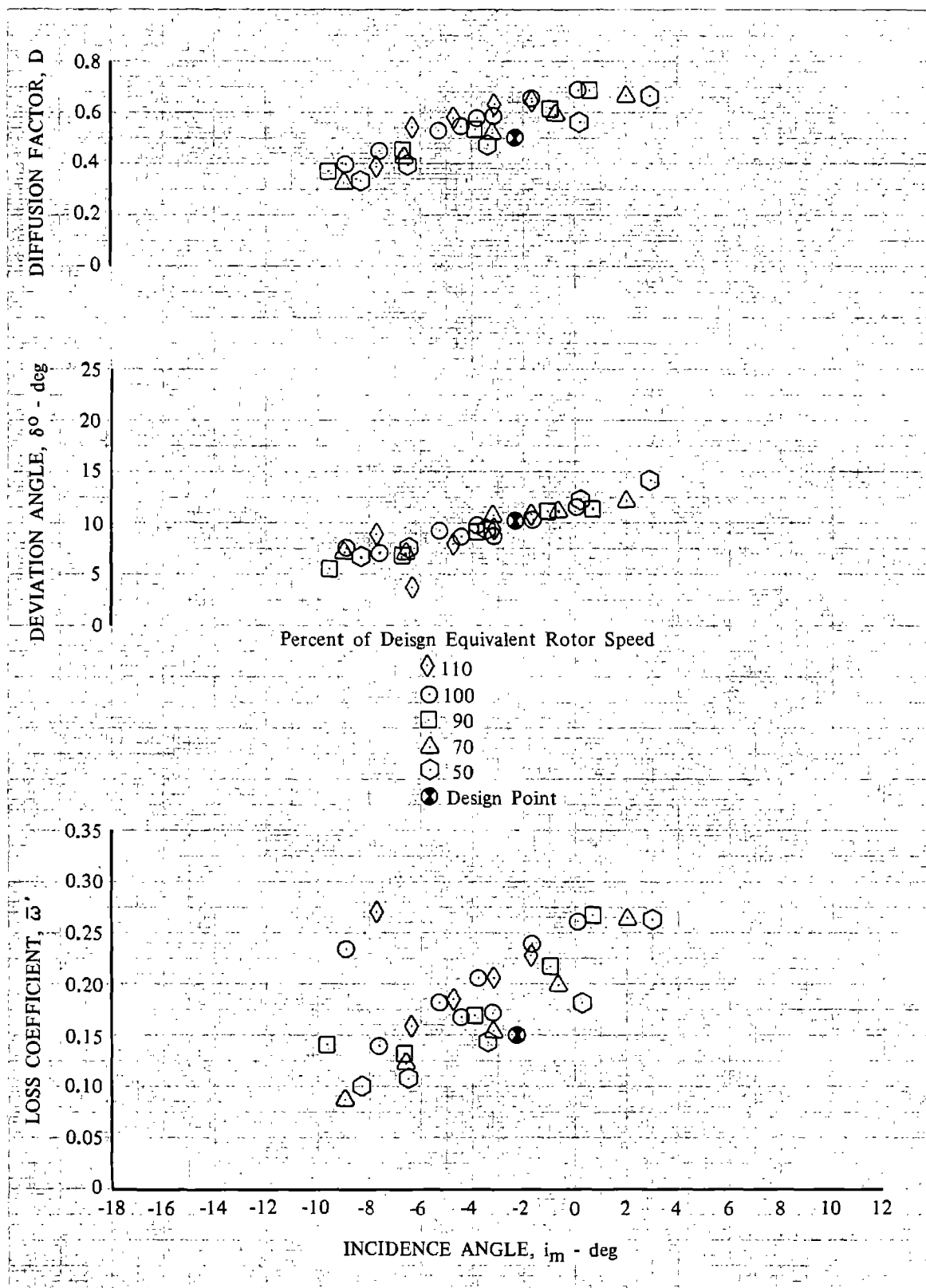
Figure 16b.   Rotor E Blade Element Performance;   DF 98076
10% Span from Tip; Uniform Inlet Flow
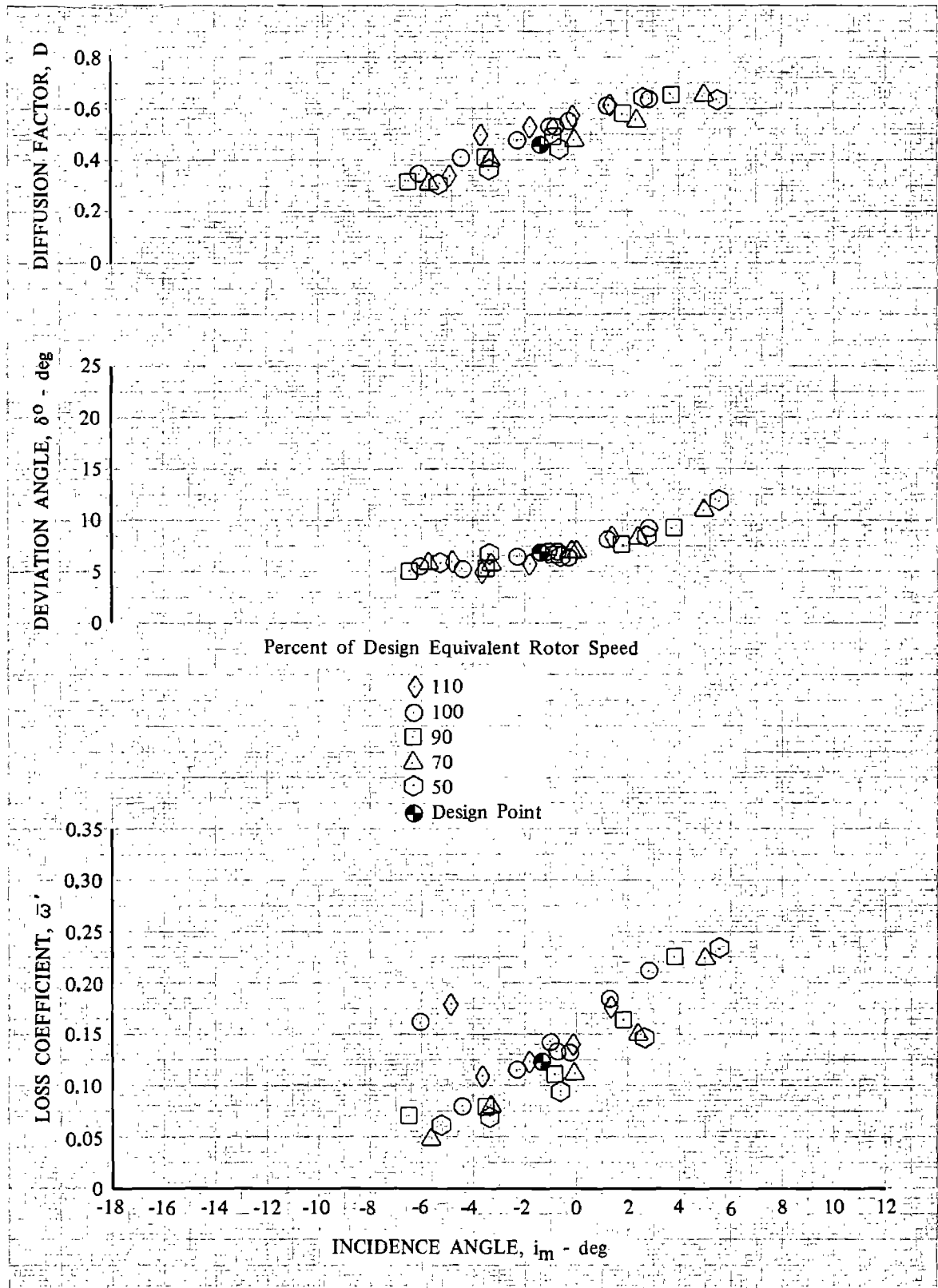
Figure 16c. Rotor E Blade Element Performance; DF 98077
15% Span From Tip; Uniform Inlet Flow
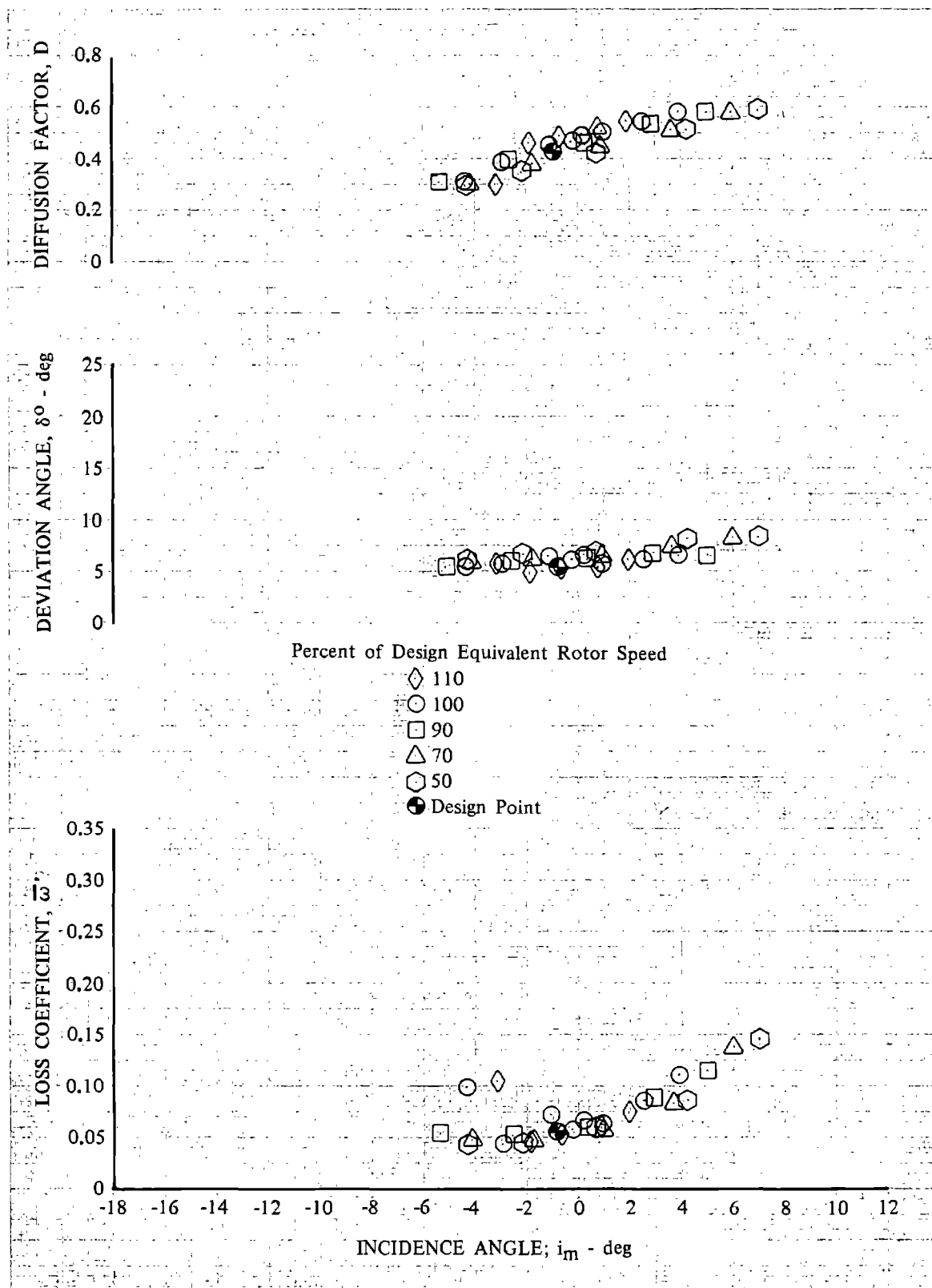
Figure 16d.   Rotor E Blade Element Performance;   DF 98078
30% Span From Tip; Uniform Inlet Flow
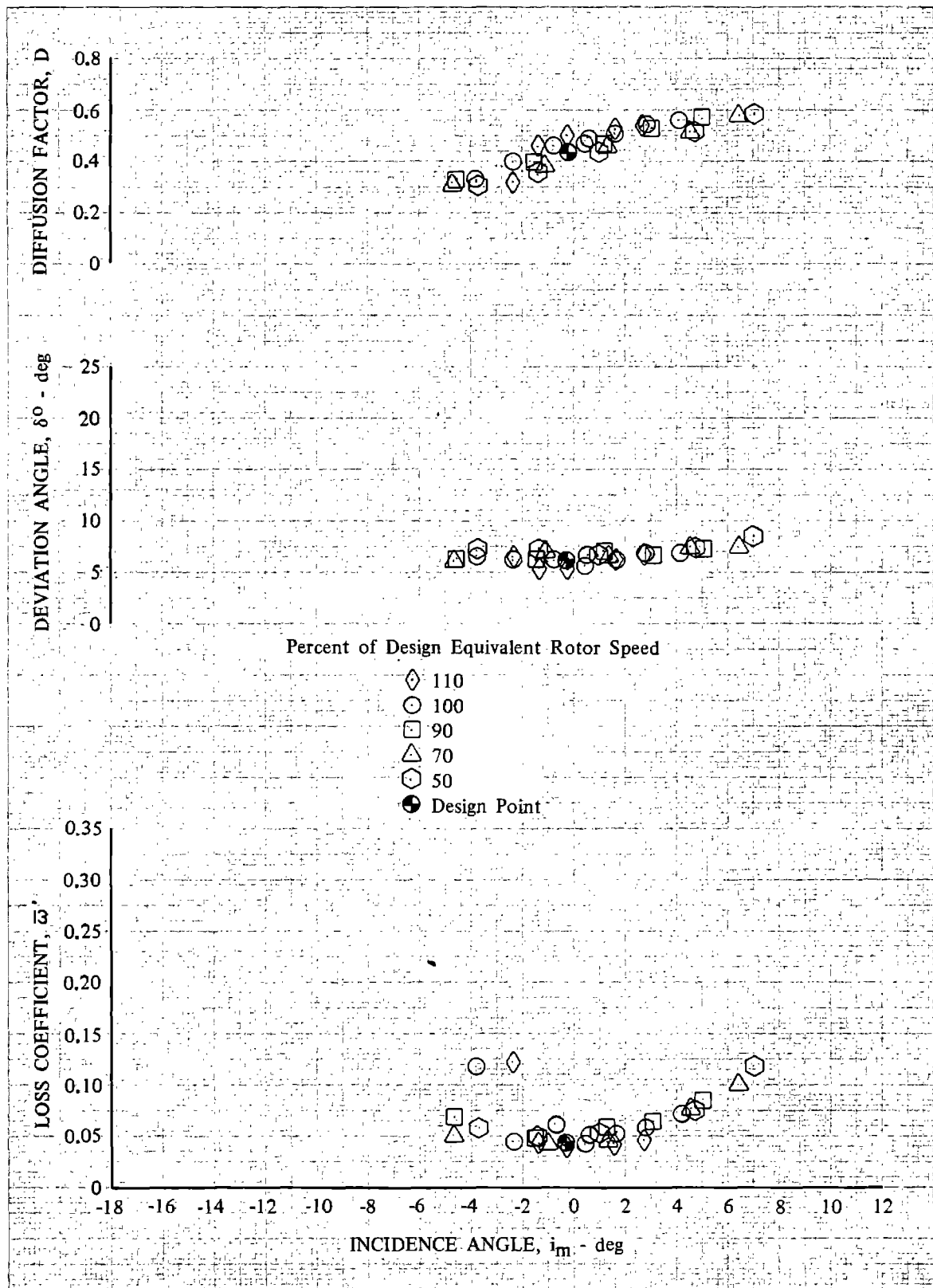
Figure 16e. Rotor E Blade Element Performance;   DF 98079
50% Span; Uniform Inlet Flow
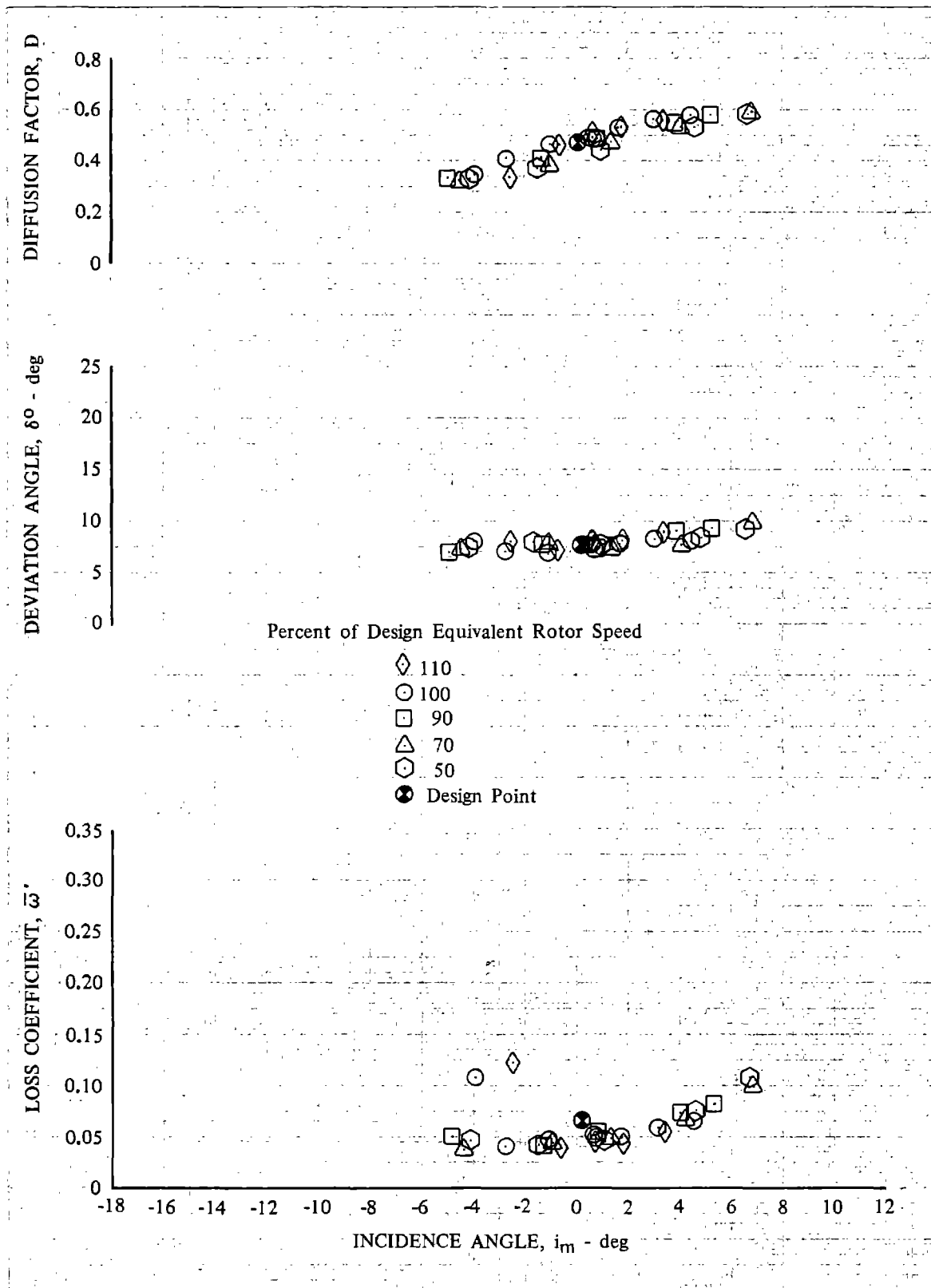
Figure 16f.   Rotor E Blade Element Performance;   DF 98080
               70% Span From Tip; Uniform Inlet Flow

39
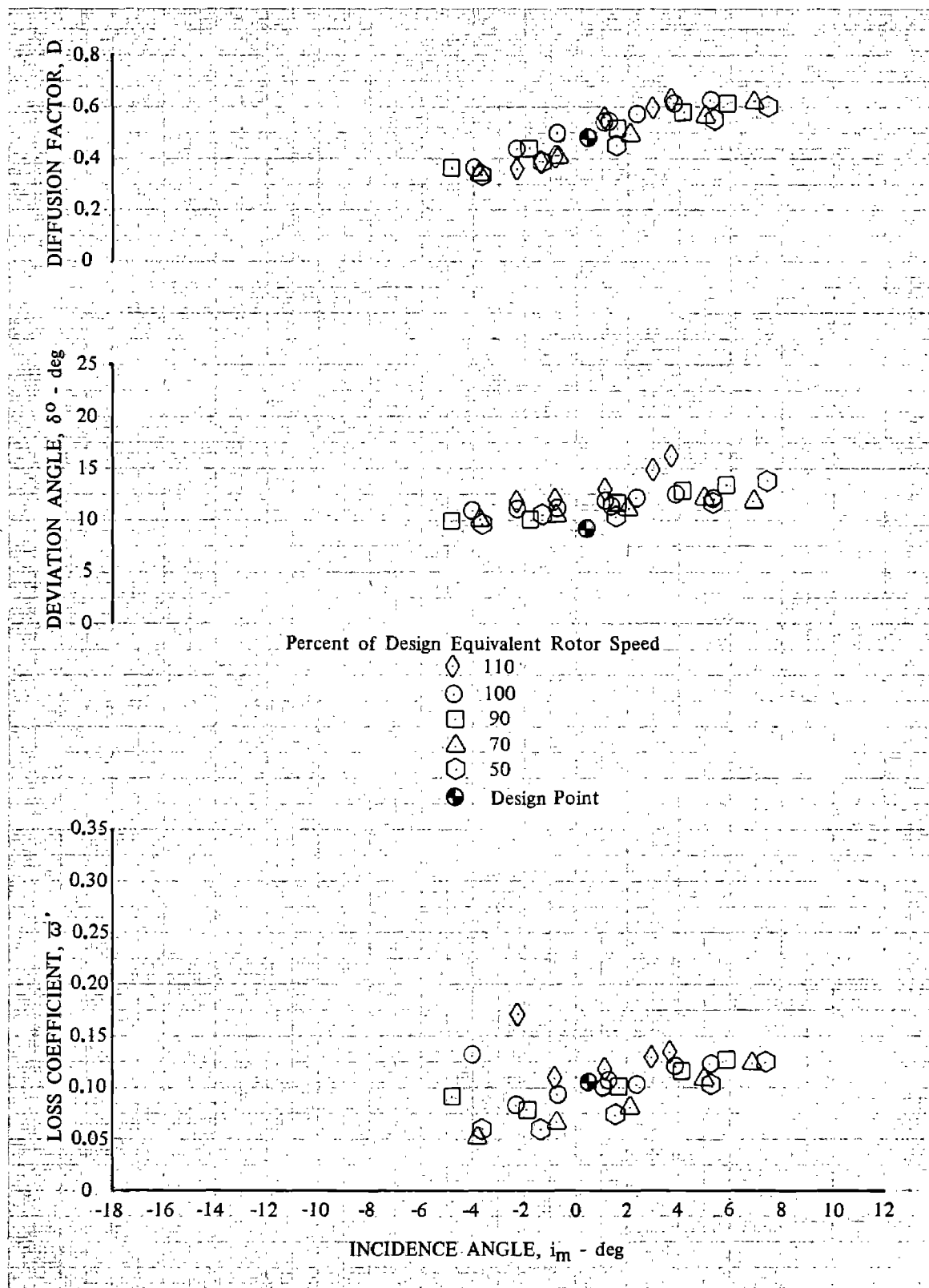
Figure 16g.   Rotor E Blade Element Performance;   DF 98081
85% Span From Tip; Uniform Inlet Flow

40
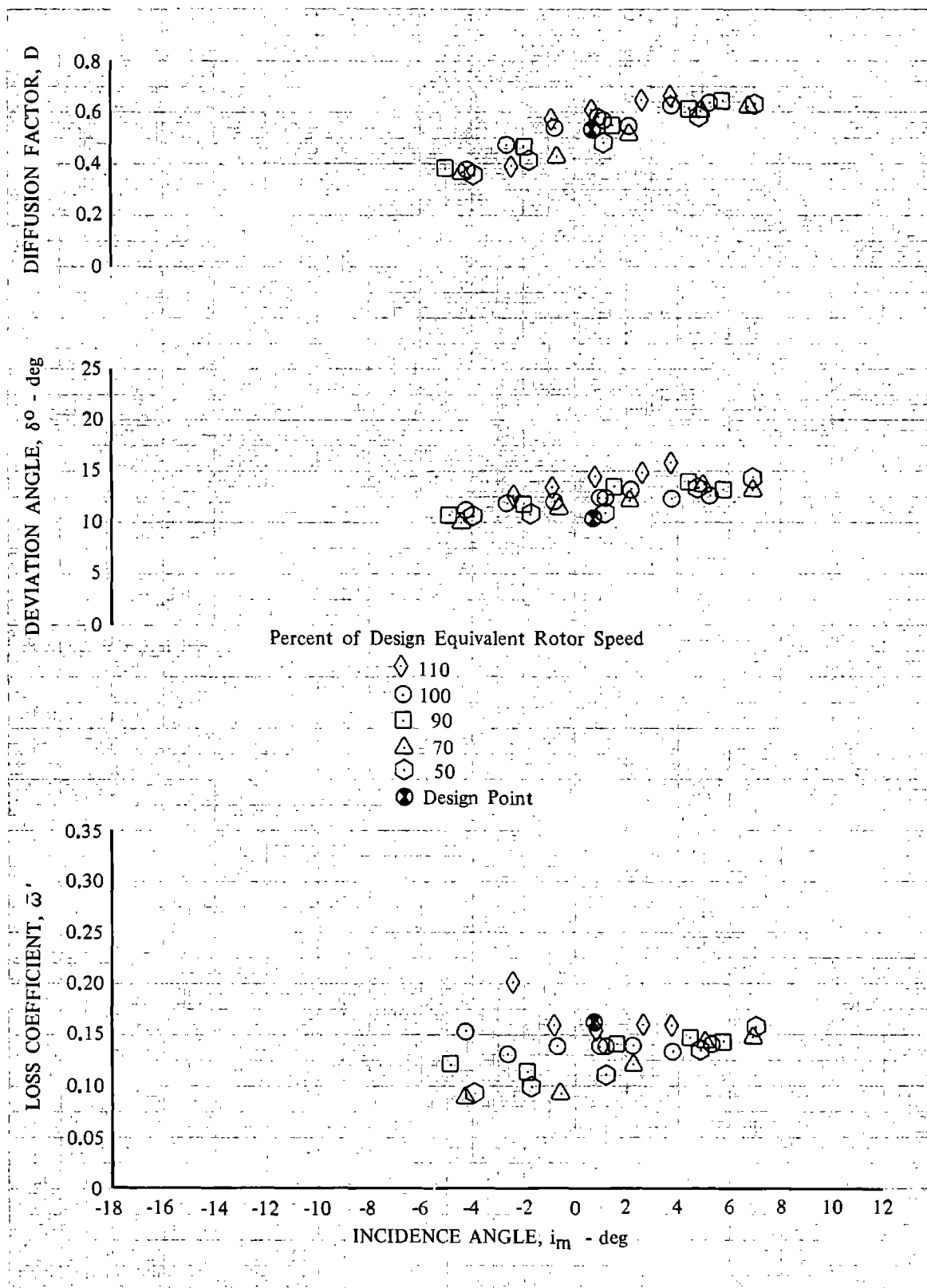
Figure 16h.   Rotor E Blade Element Performance;   DF 98082
              90% Span From Tip; Uniform Inlet Flow
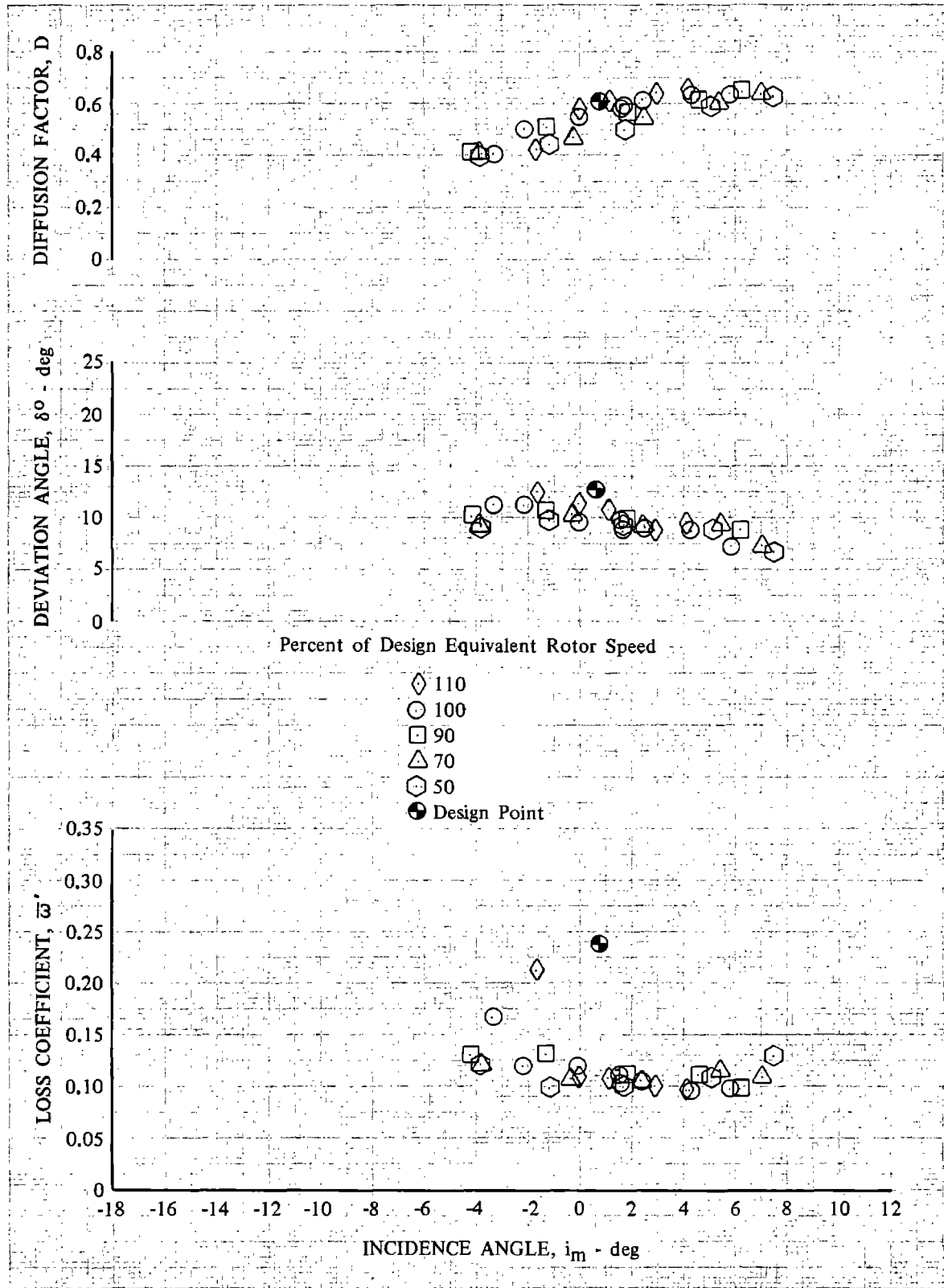
Figure 16i.   Rotor E Blade Element Performance;   DF 98083
95% Span From Tip; Uniform Inlet Flow
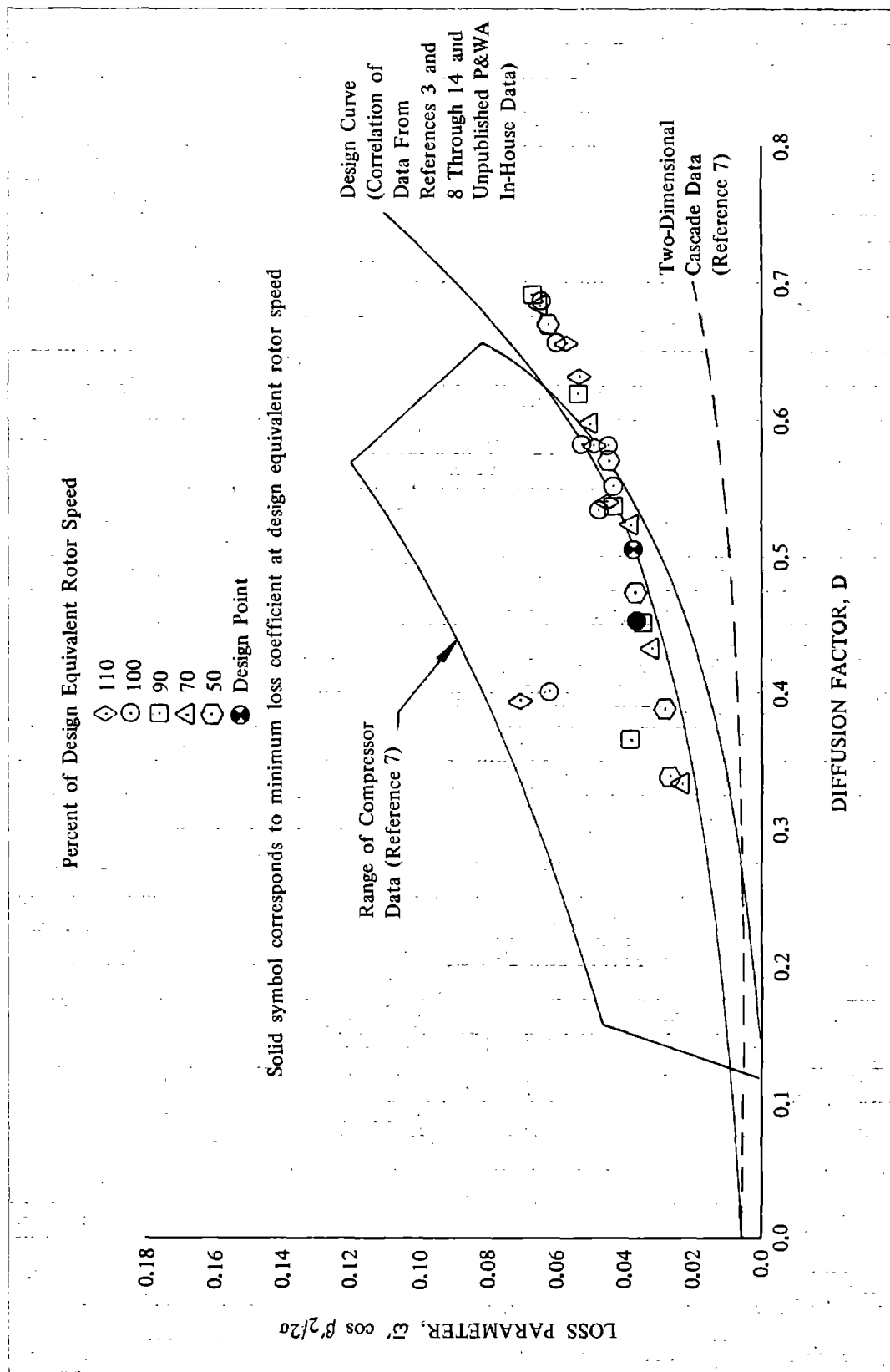
Figure 17a.   Rotor E Loss Parameter vs Diffusion Factor; 10% Span From Tip; Uniform Inlet Flow

DF 98084

43
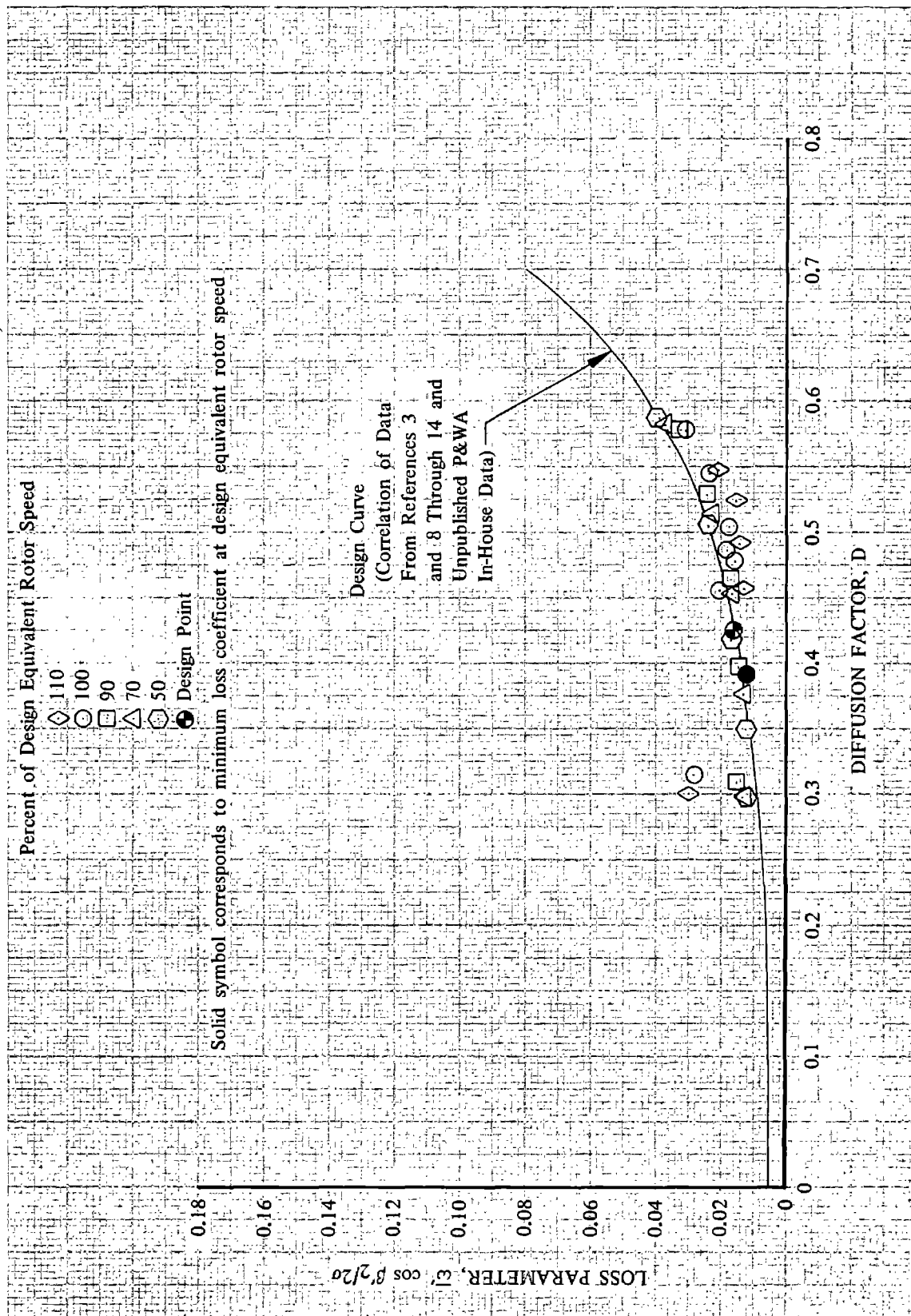
Figure 17b. Rotor E Loss Parameter vs Diffusion Factor; 30% Span From Tip; Uniform Inlet Flow

DF 98085

44
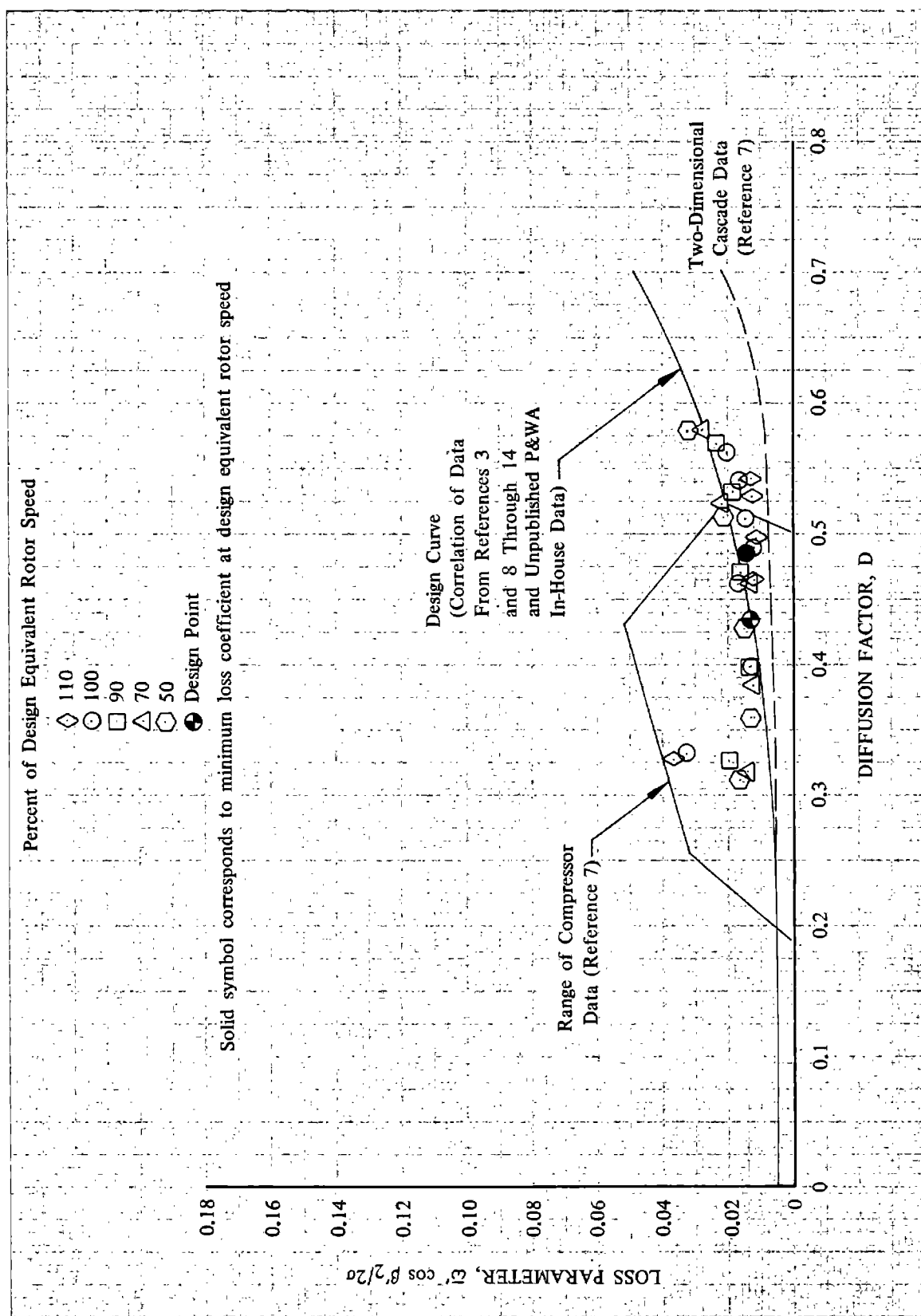
Figure 17c. Rotor E Loss Parameter vs Diffusion Factor; 50% Span; Uniform Inlet Flow

DF 98086

45
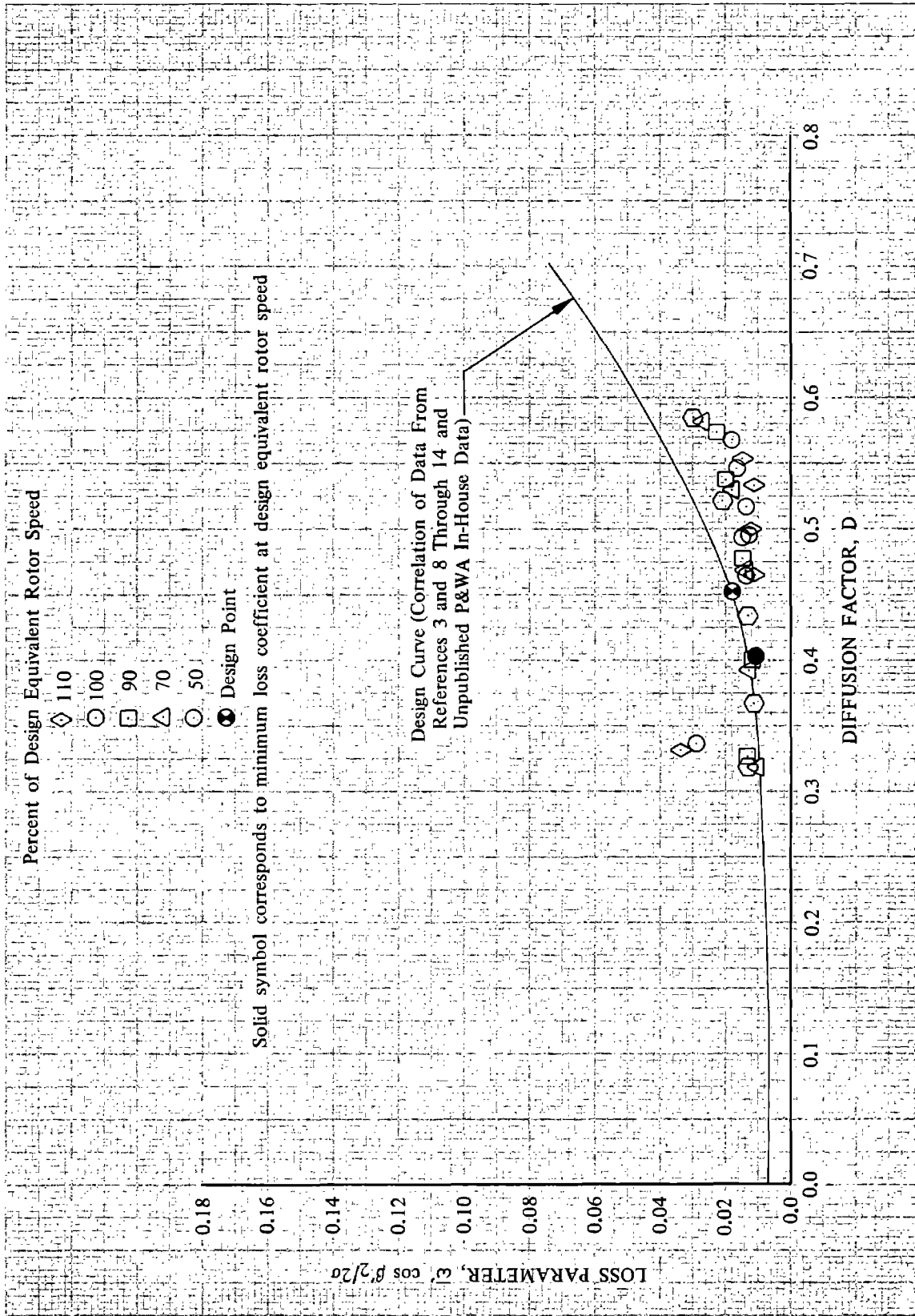
Figure 17d. Rotor E Loss Parameter vs Diffusion Factor; 70% Span From Tip; Uniform Inlet Flow

DF 98087

46
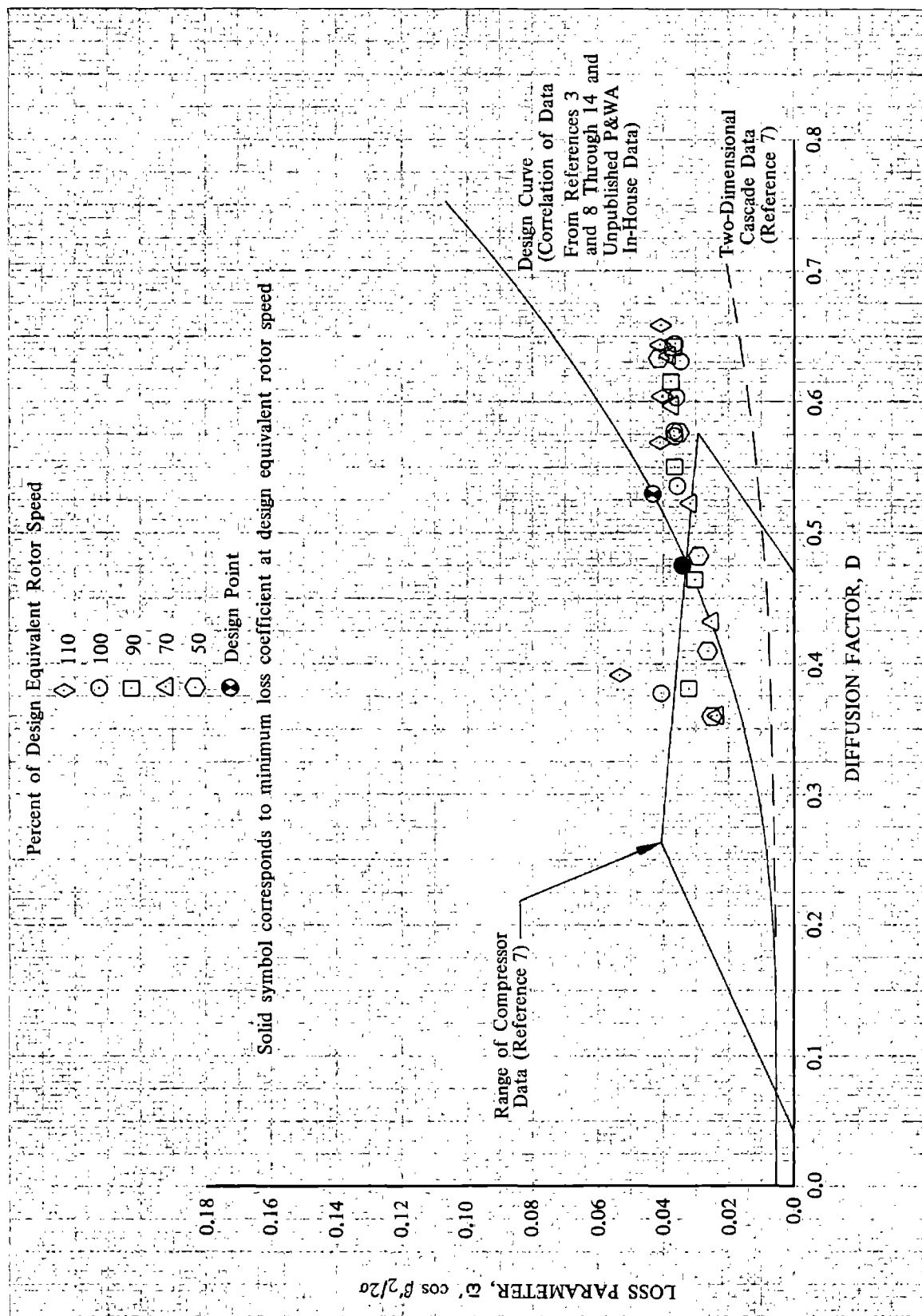
Figure 17e. Rotor E Loss Parameter vs Diffusion Factor; 90% Span From Tip; Uniform Inlet Flow

DF 98088

47
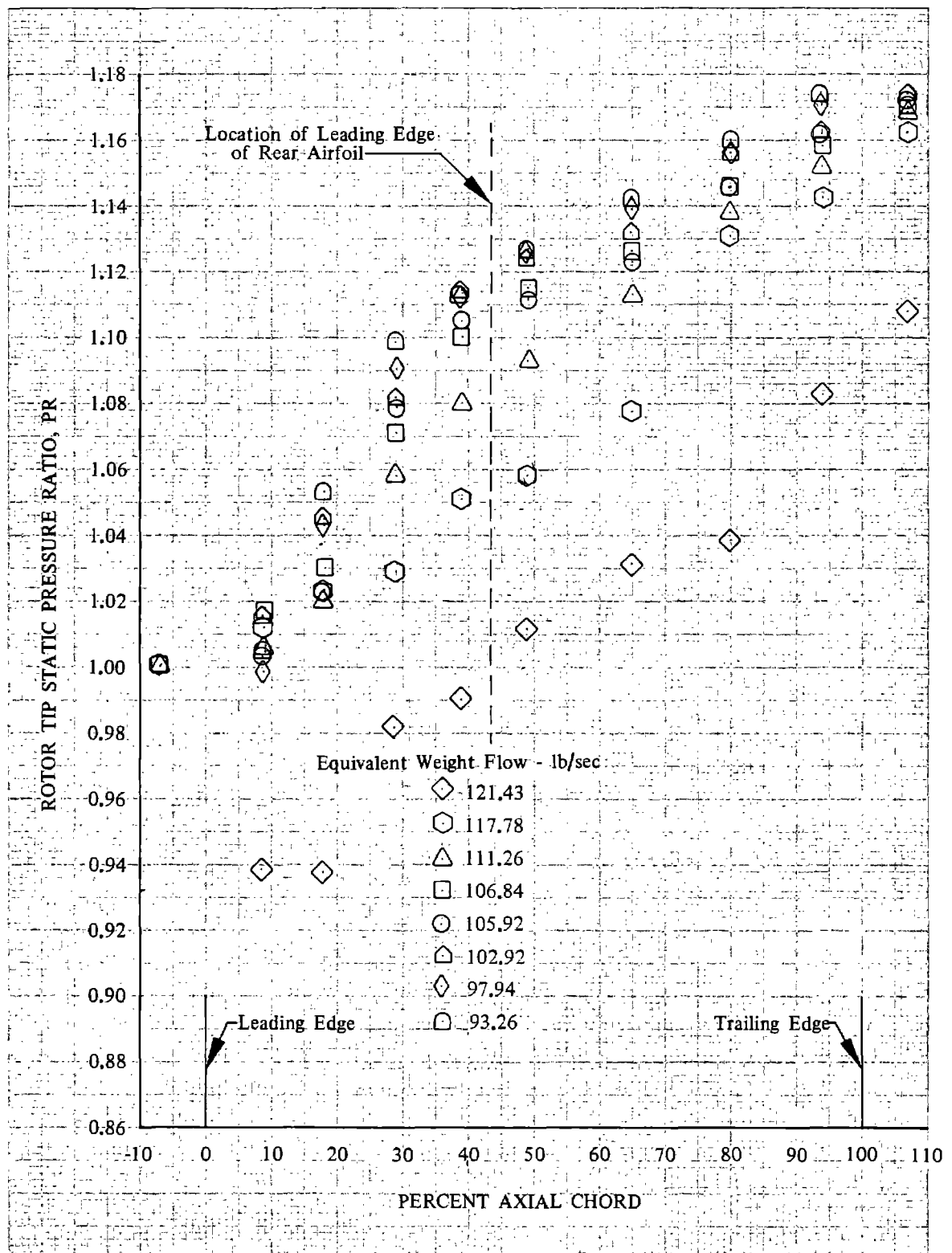
Figure 18.   Rotor E Tip Static Pressure Ratio vs   DF 98089
            Percent Axial Chord; 100% Design Equivalent
            Rotor Speed; Uniform Inlet Flow

48
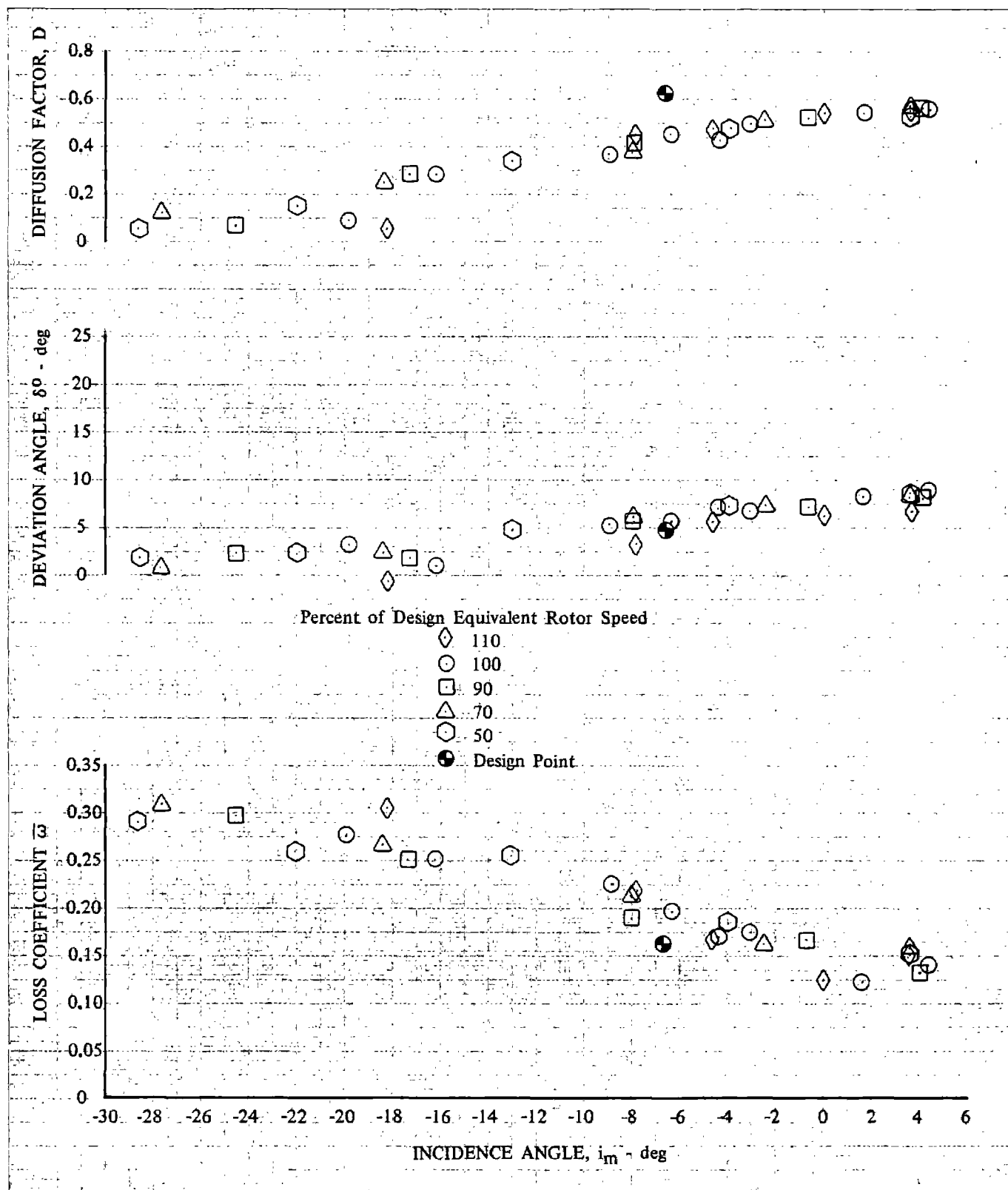
Figure 19a.   Stator E Blade Element Performance;   DF 98090
5% Span From Tip; Uniform Inlet Flow
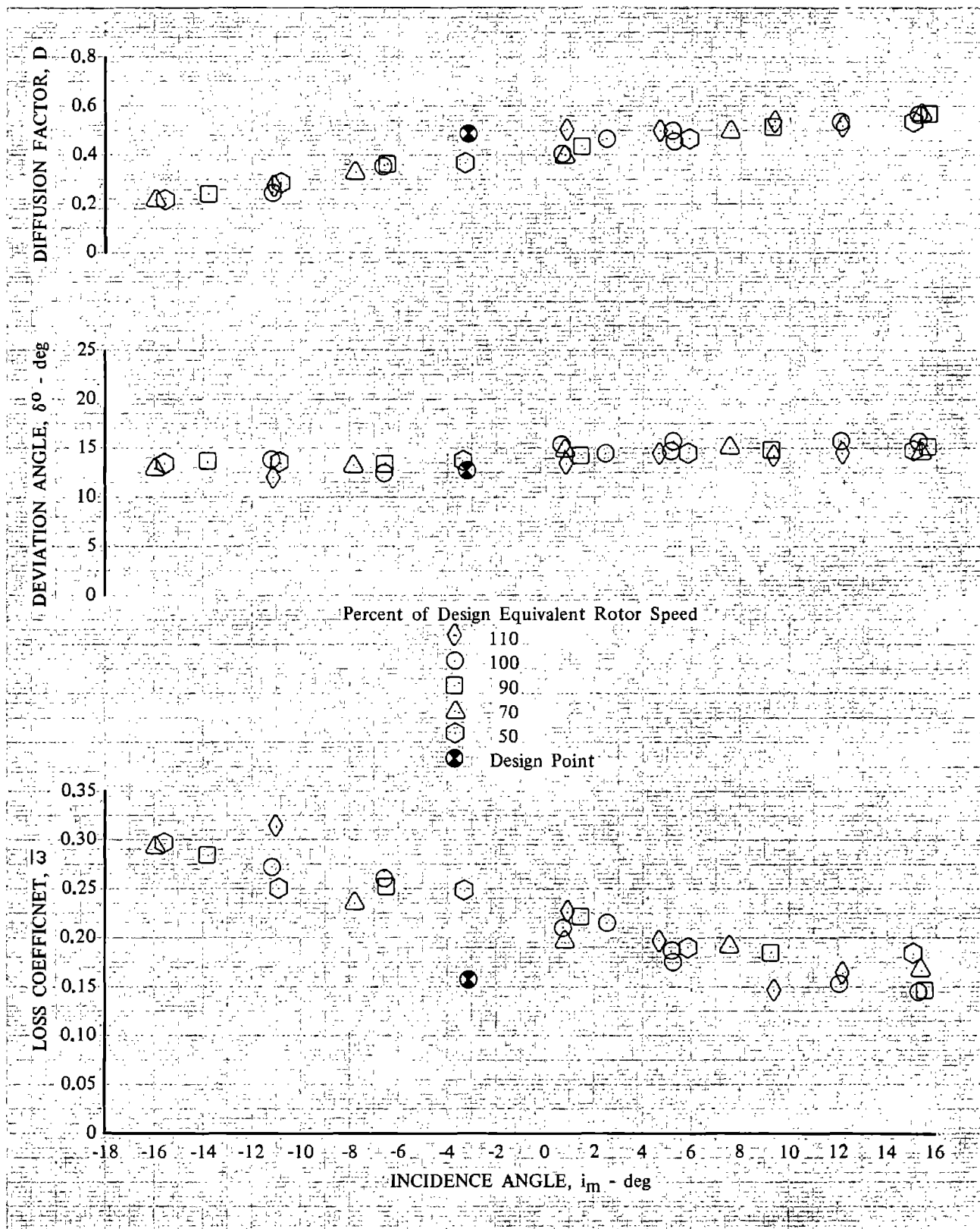
Figure 19b.   Stator E Blade Element Performance;   DF 98091
10% Span From Tip; Uniform Inlet Flow
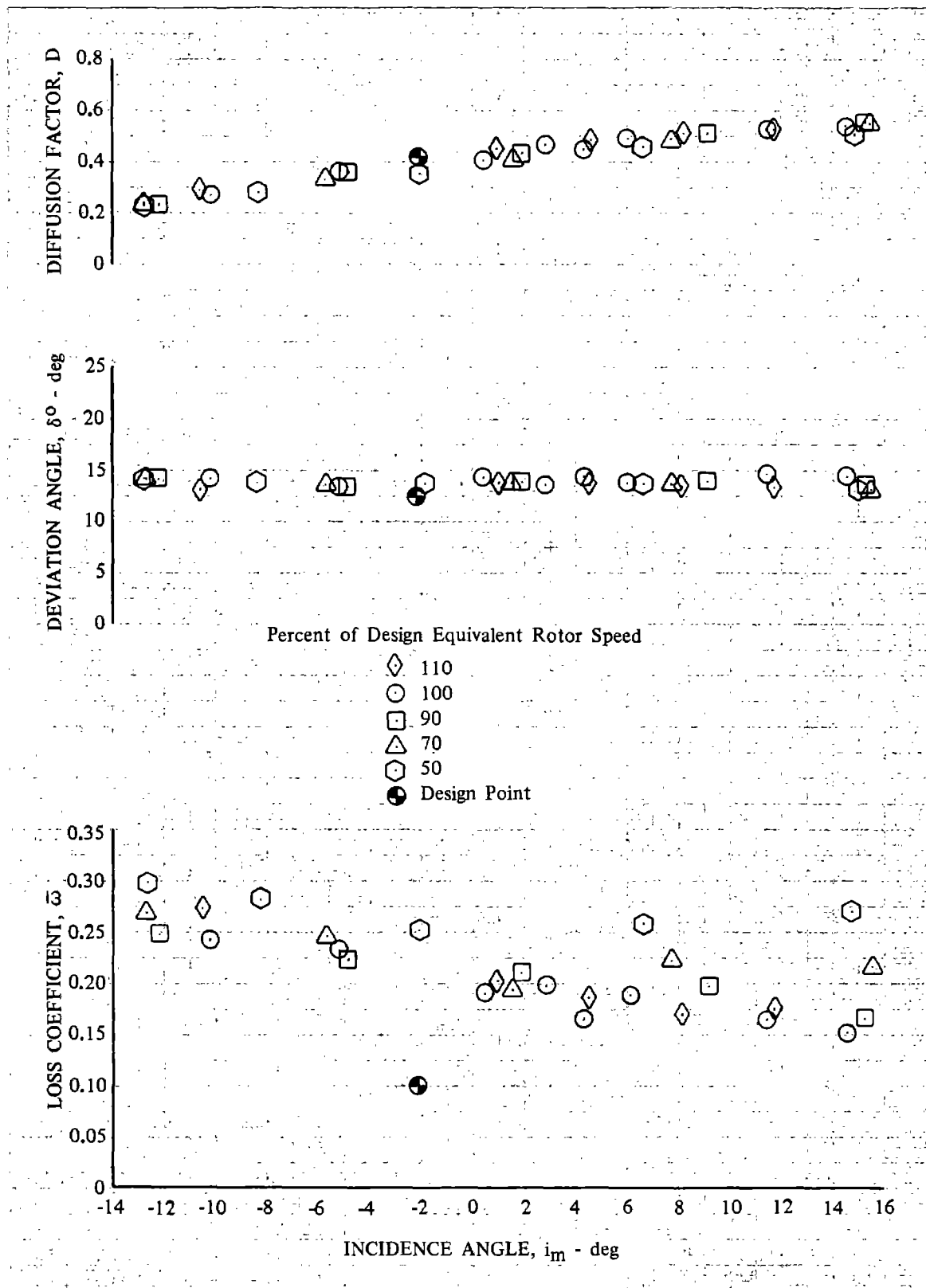
Figure 19c. Stator E Blade Element Performance;   DF 98092
15% Span From Tip; Uniform Inlet Flow
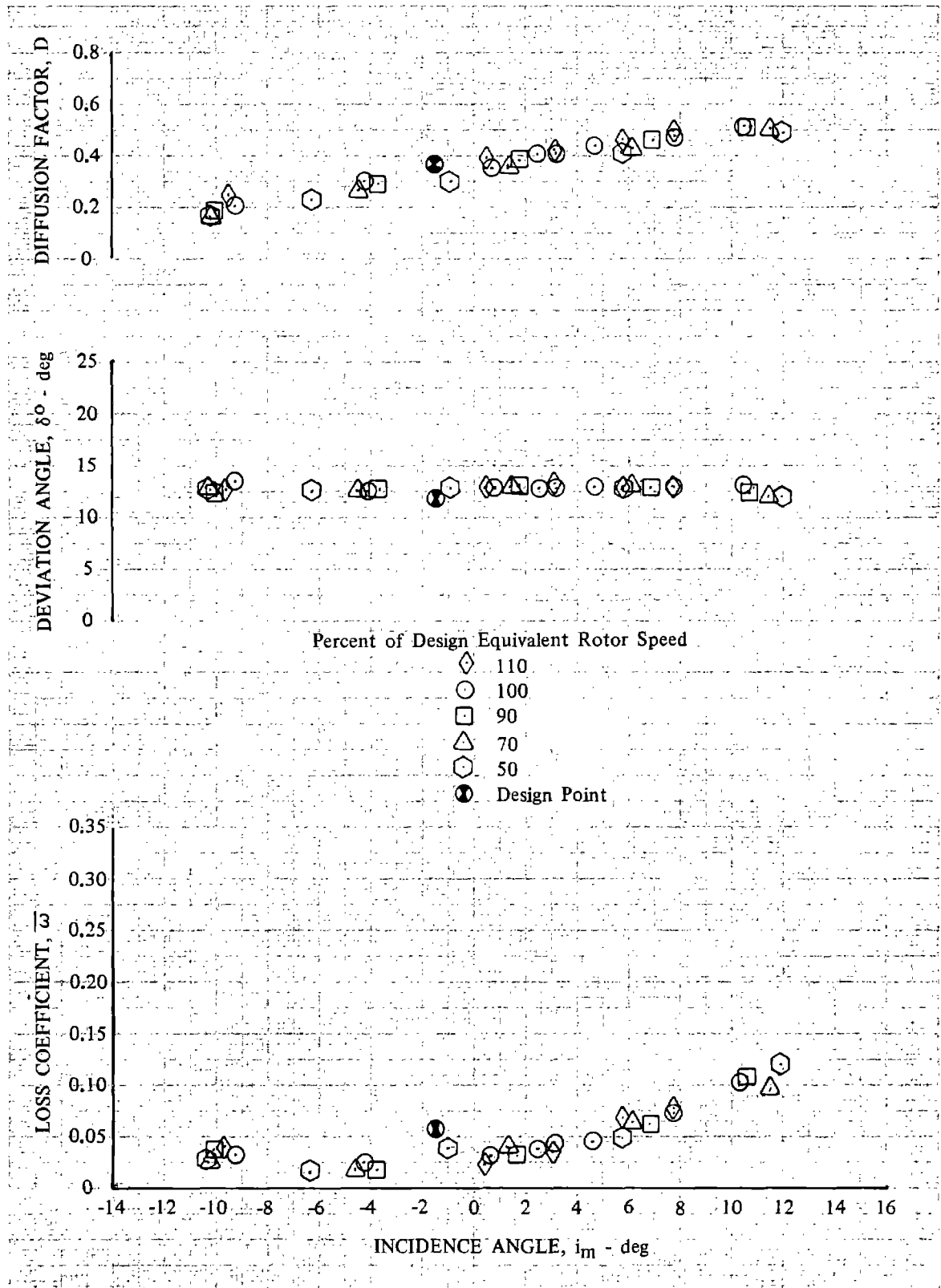
Figure 19d.   Stator E Blade Element Performance;   DF 98093
30% Span From Tip; Uniform Inlet Flow
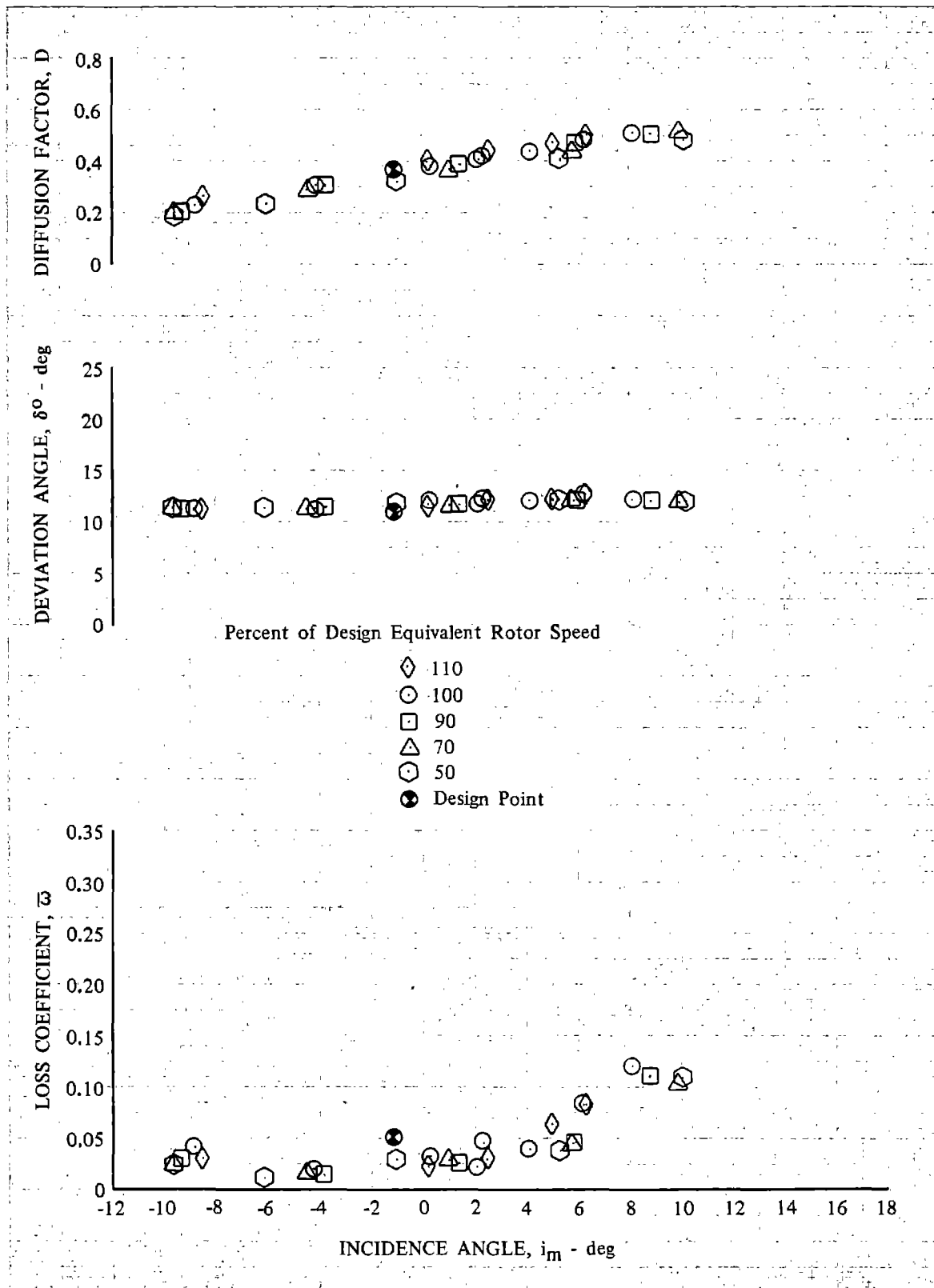
Figure 19e. Stator E Blade Element Performance;   DF 98094
            50% Span; Uniform Inlet Flow
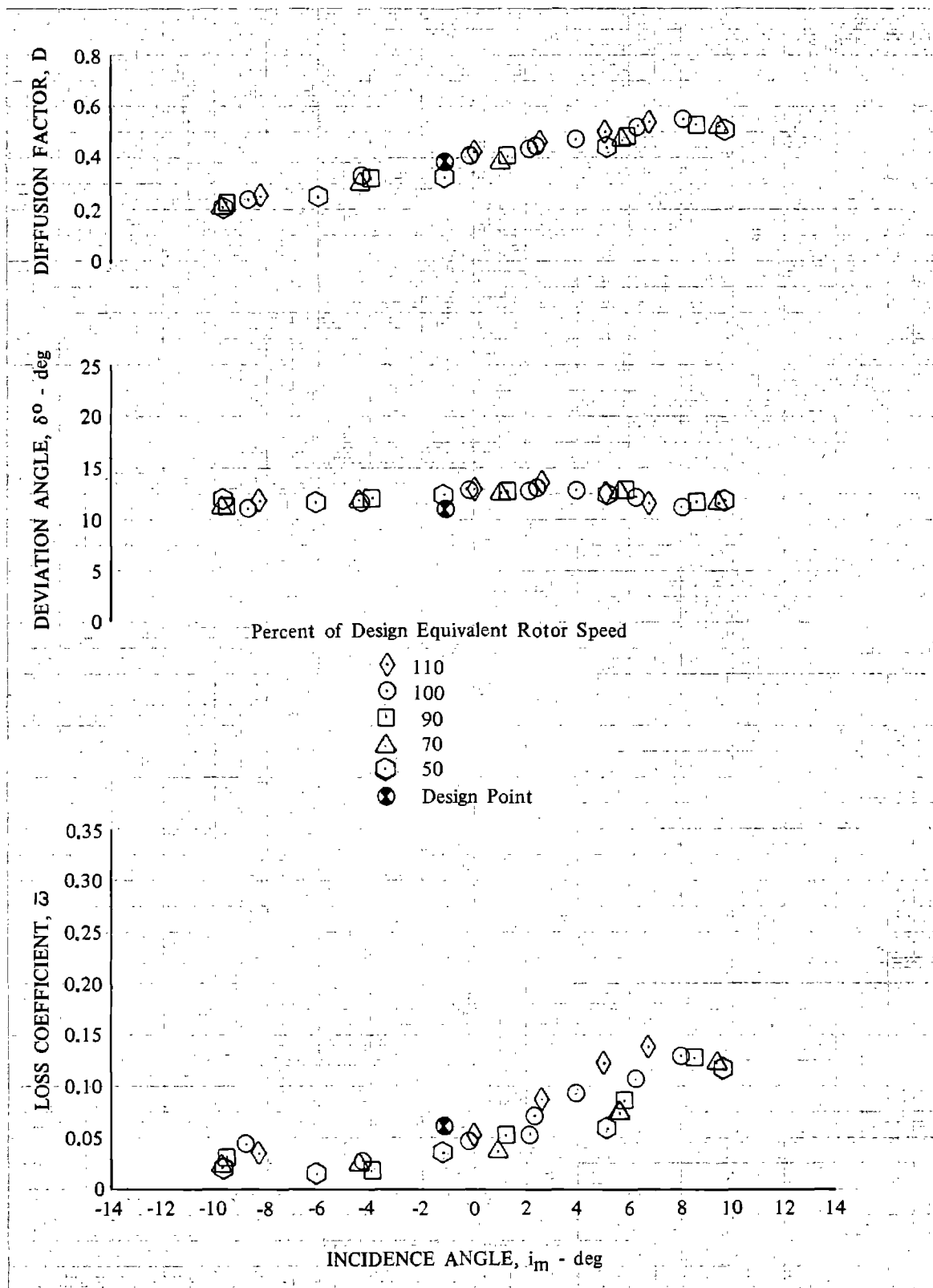
Figure 19f.   Stator E Blade Element Performance;   DF 98095
70% Span From Tip; Uniform Inlet Flow
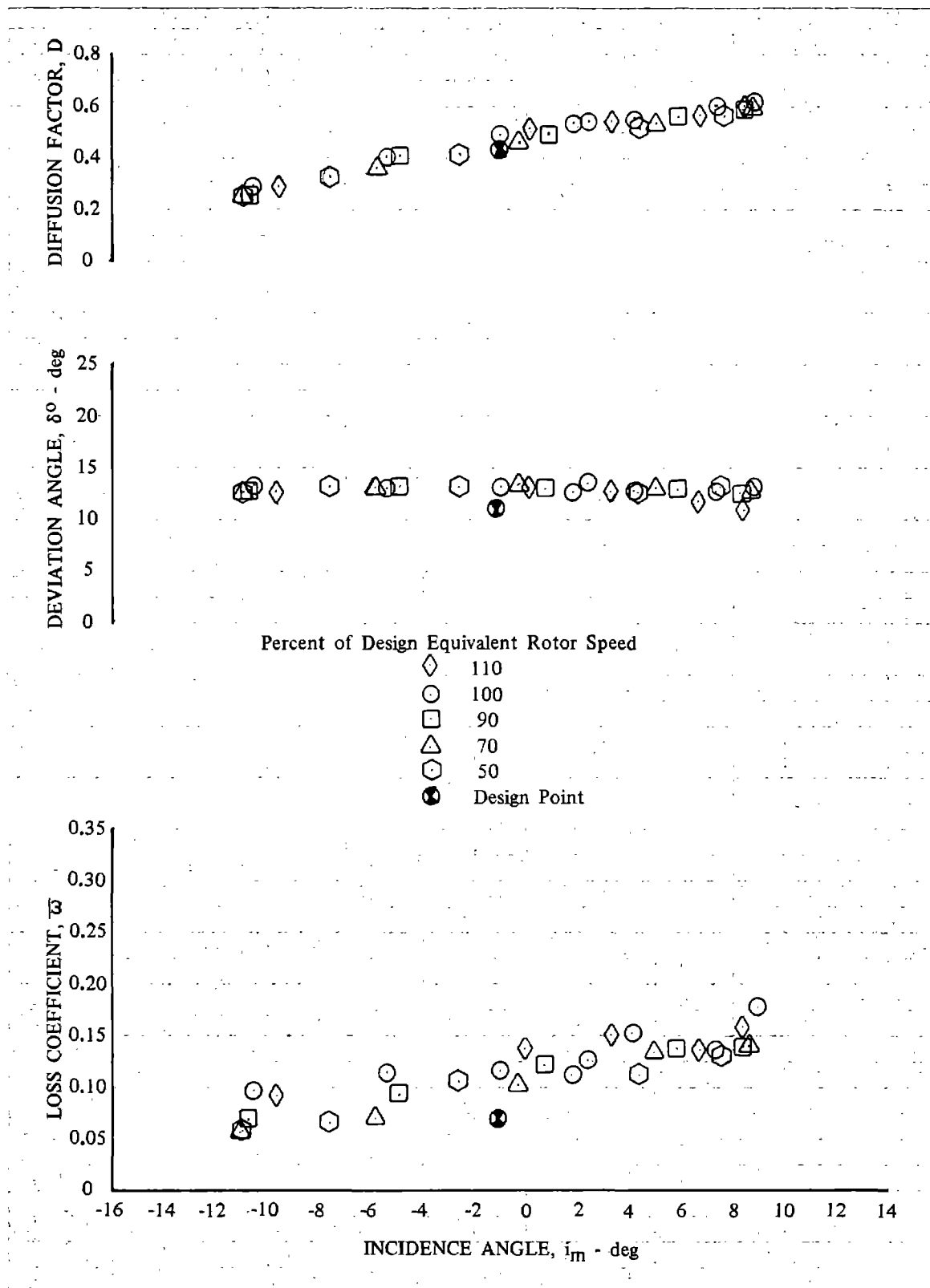
Figure 19g. Stator E Blade Element Performance;   DF 98096
85% Span From Tip; Uniform Inlet Flow
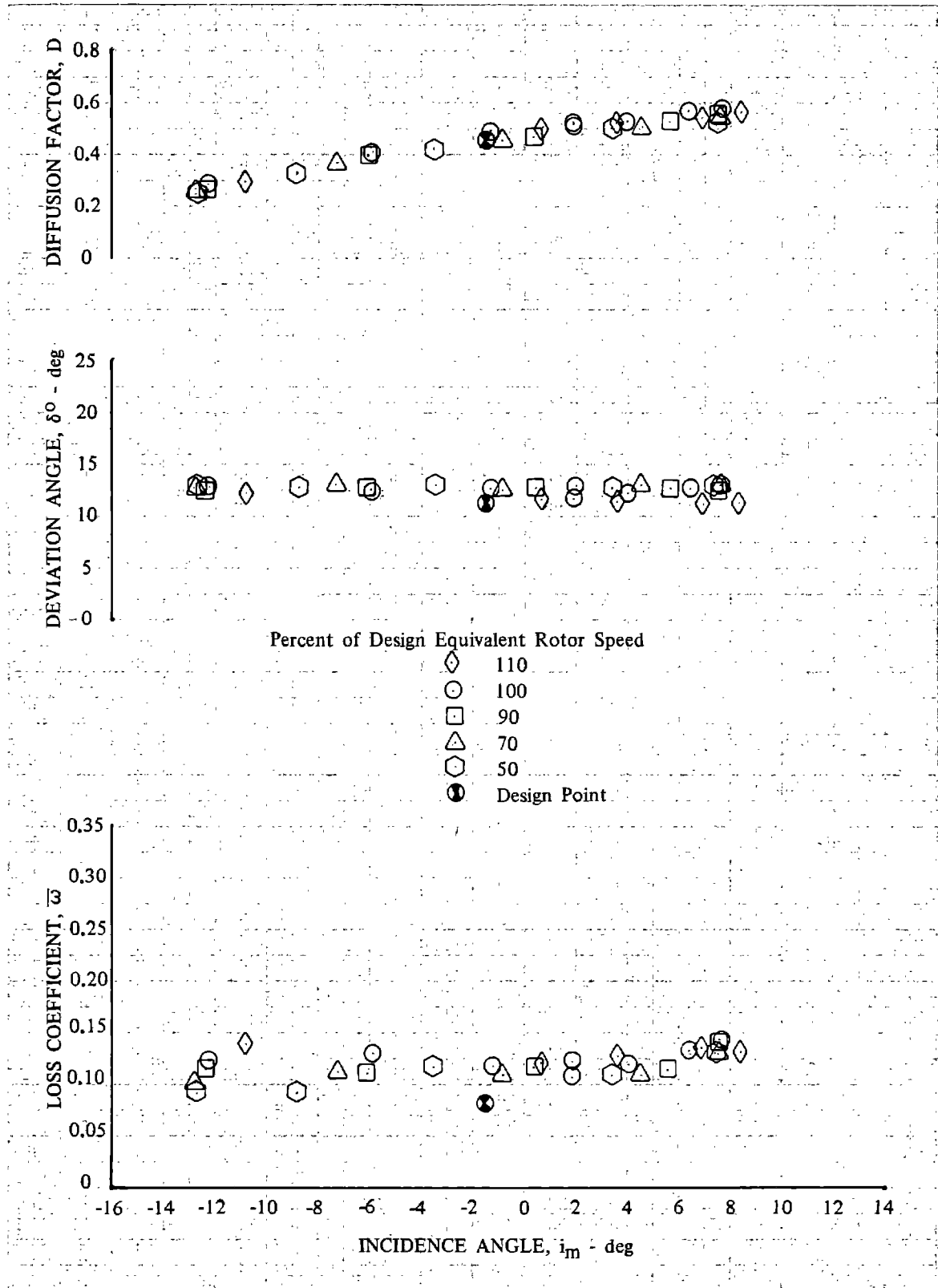
Figure 19h.   Stator E Blade Element Performance;   DF 98097
              90% Span From Tip; Uniform Inlet Flow
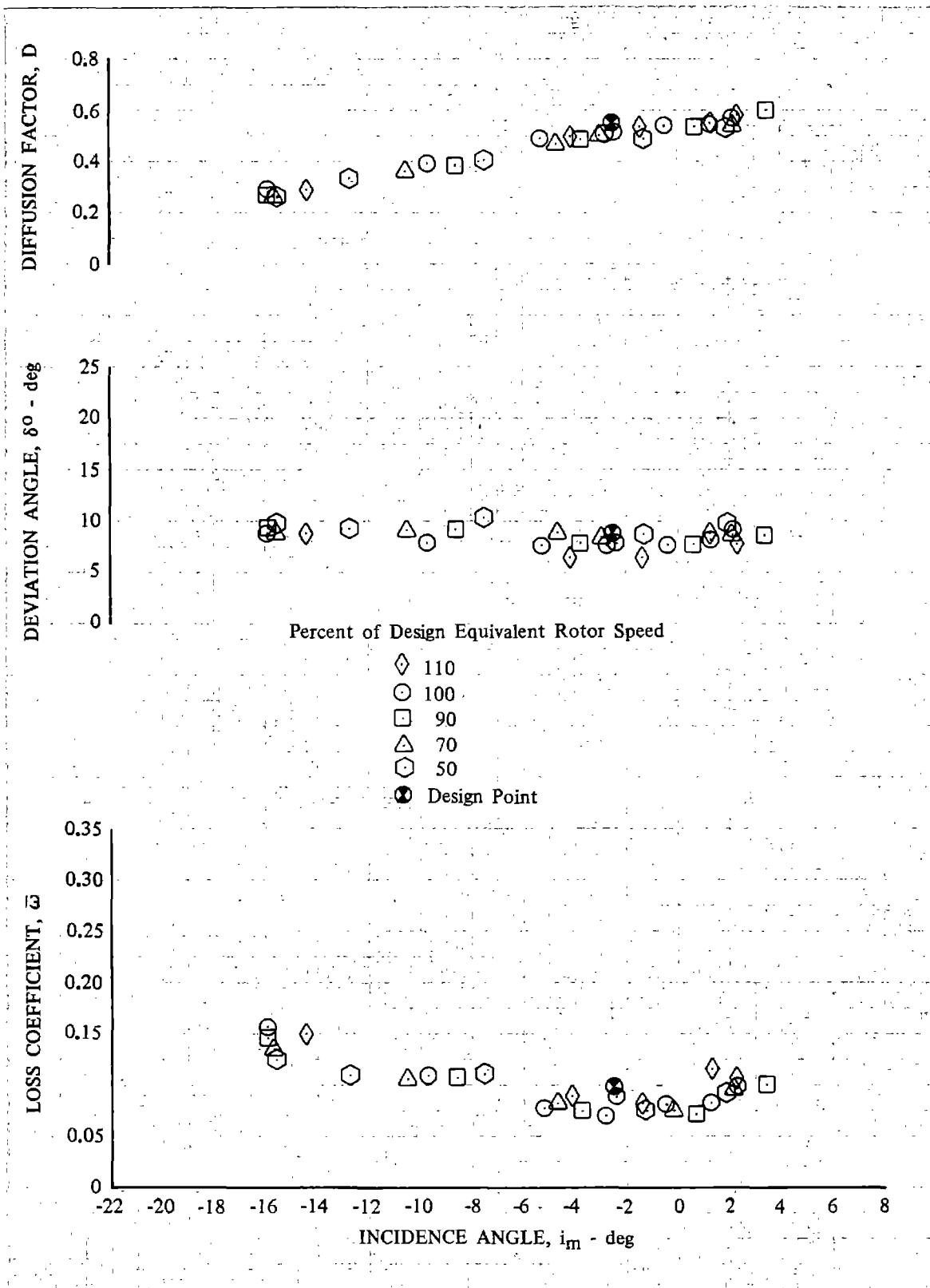
Figure 19i.   Stator E Blade Element Performance;   DF 98098
              95% Span From Tip; Uniform Inlet Flow
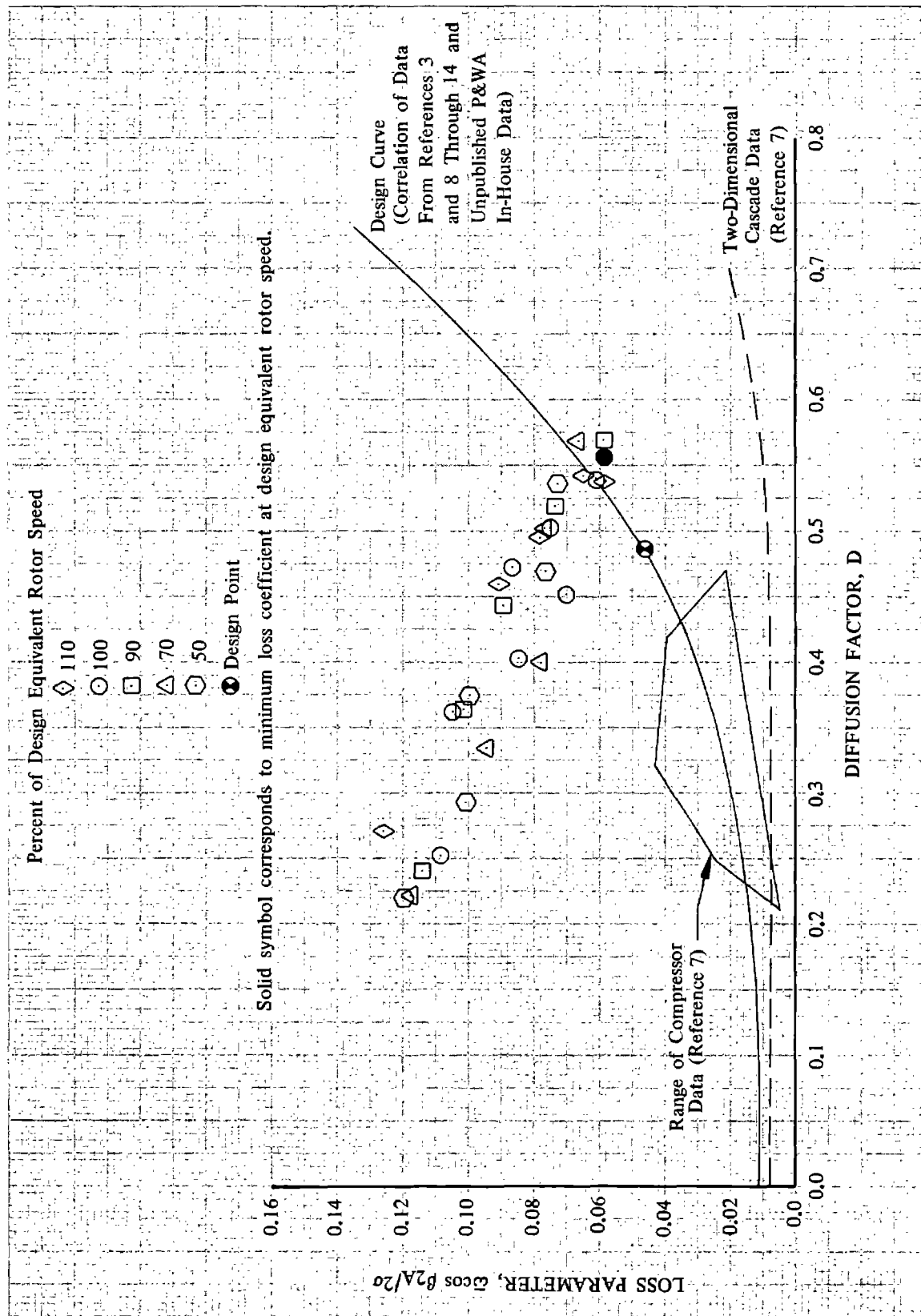
Figure 20a. Stator E Loss Parameter vs Diffusion Factor; 10% Span From Tip; Uniform Inlet Flow

DF 98099

58
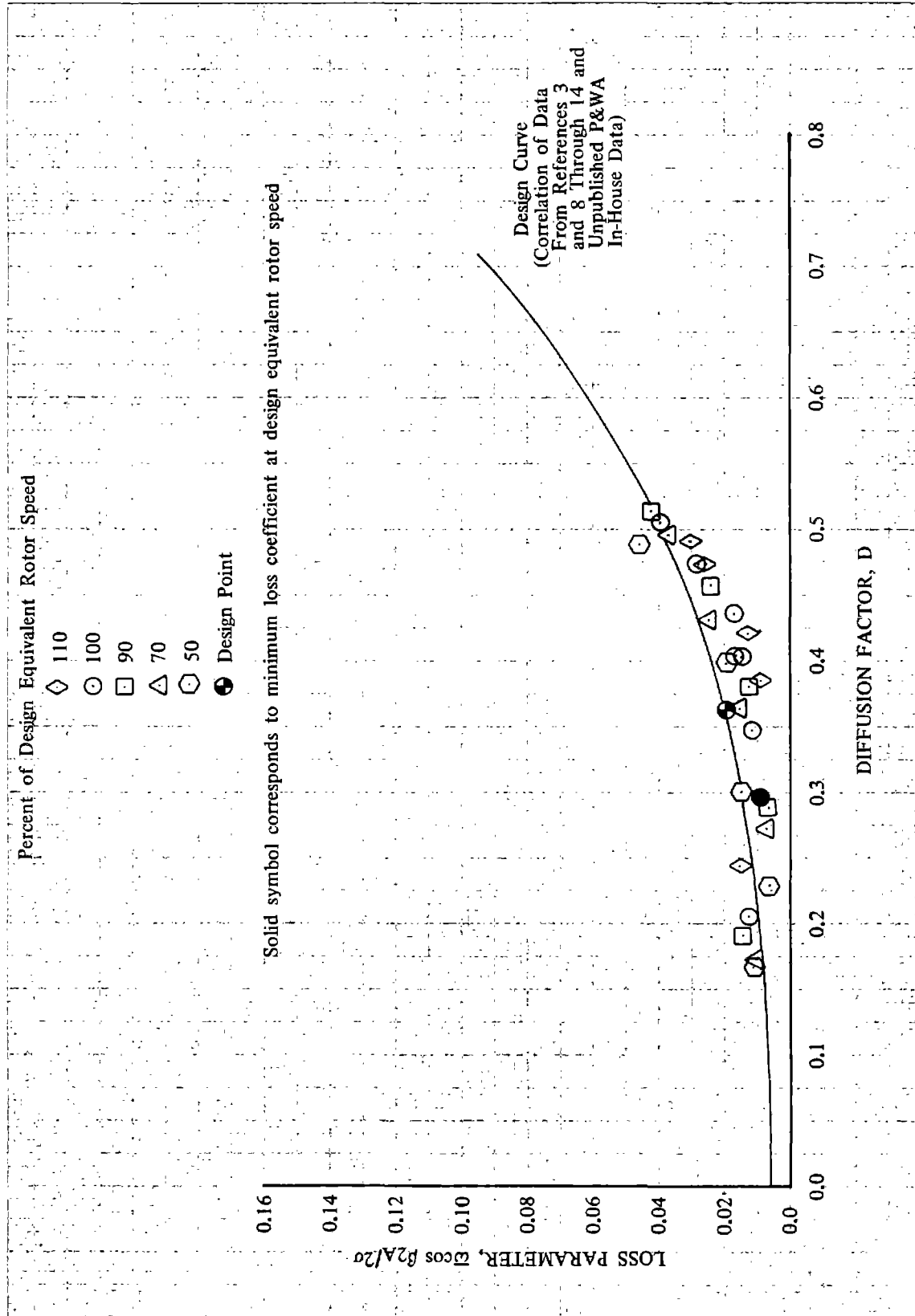
Figure 20b. Stator E Loss Parameter vs Diffusion Factor; 30% Span From Tip; Uniform Inlet Flow

DF 98100
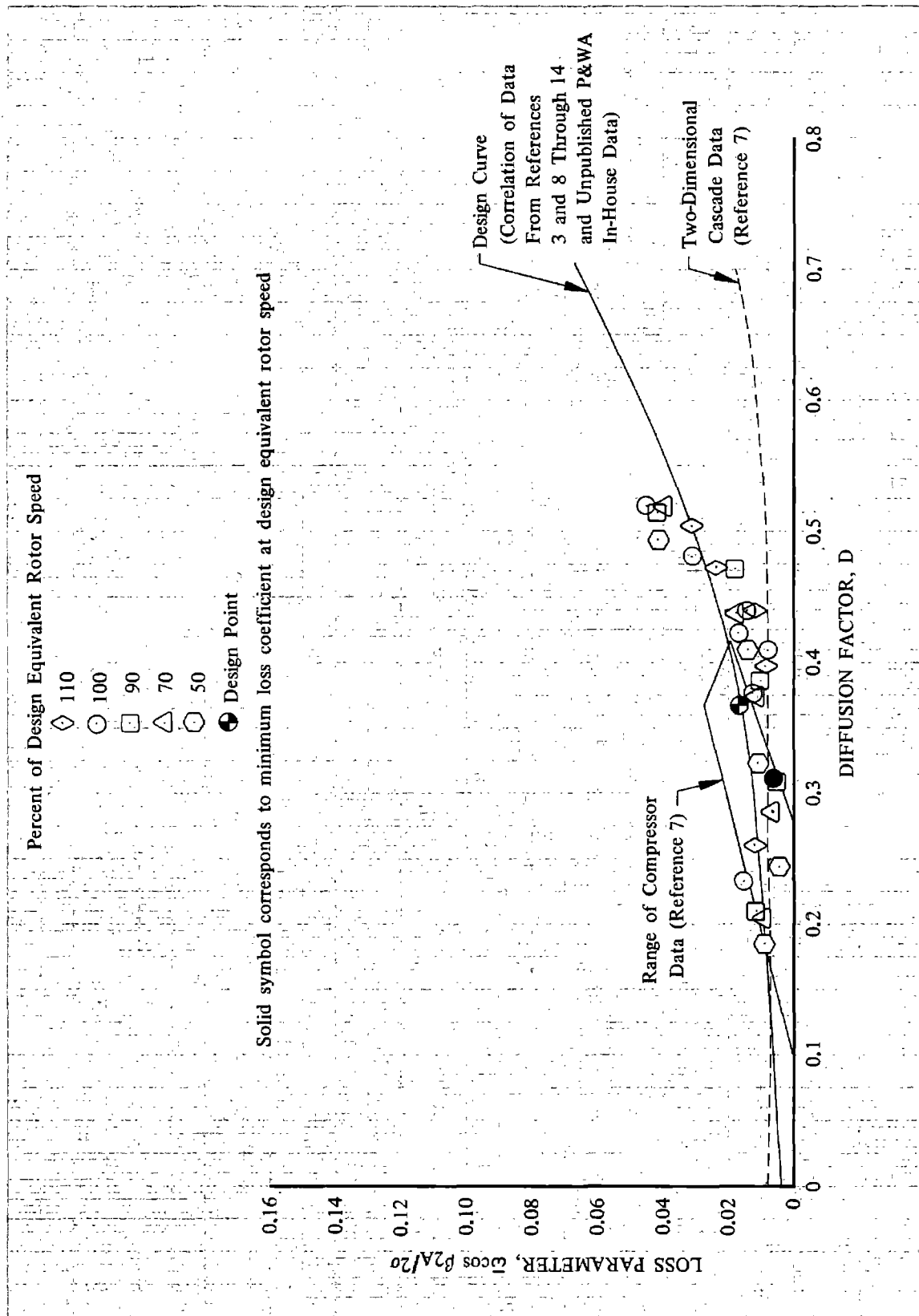
Figure 20c. Stator E Loss Parameter vs Diffusion Factor; 50% Span; Uniform Inlet Flow

DF 98101

60
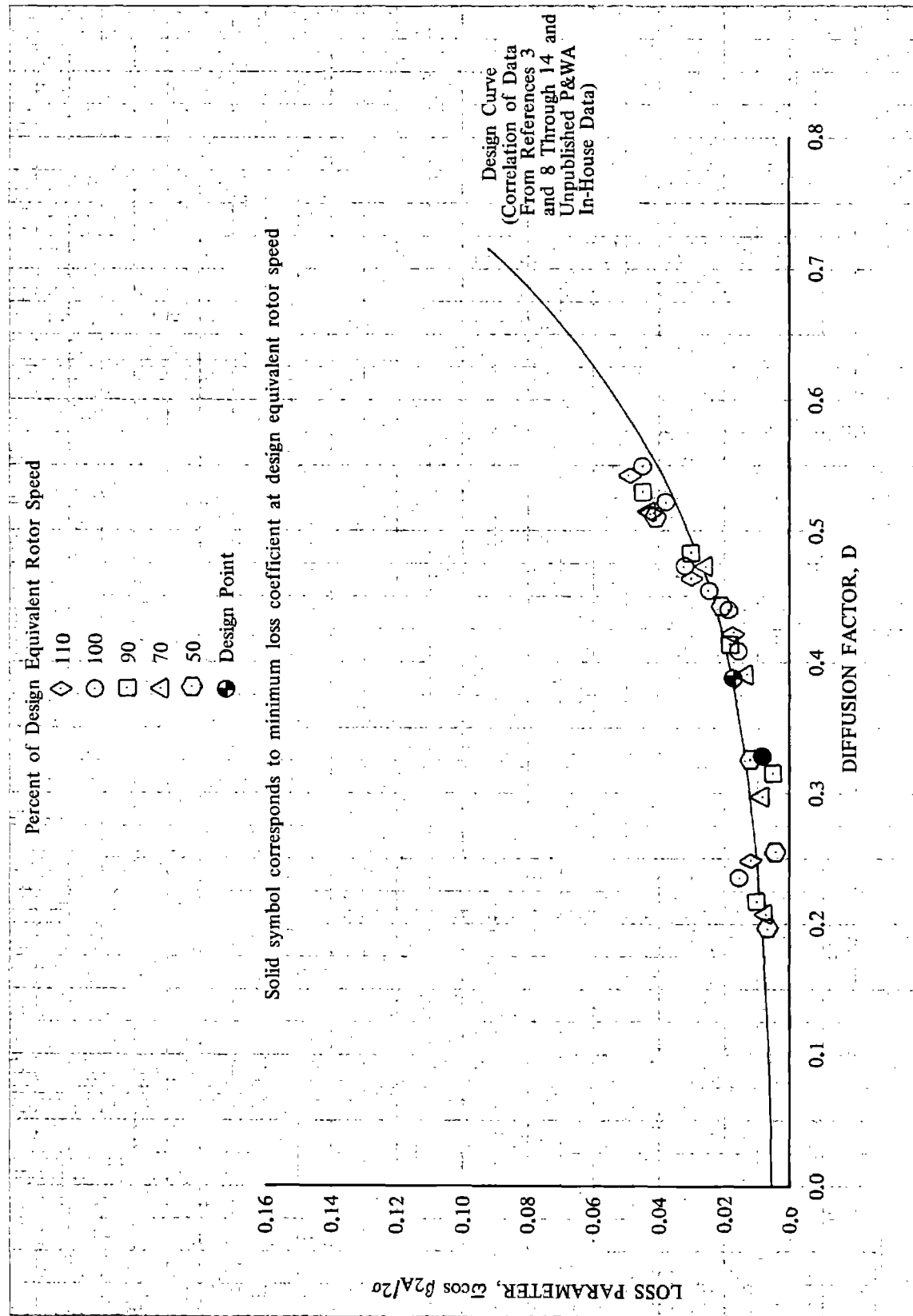
Figure 20d. Stator E Loss Parameter vs Diffusion Factor; 70% Span From Tip; Uniform Inlet Flow

DF 98102
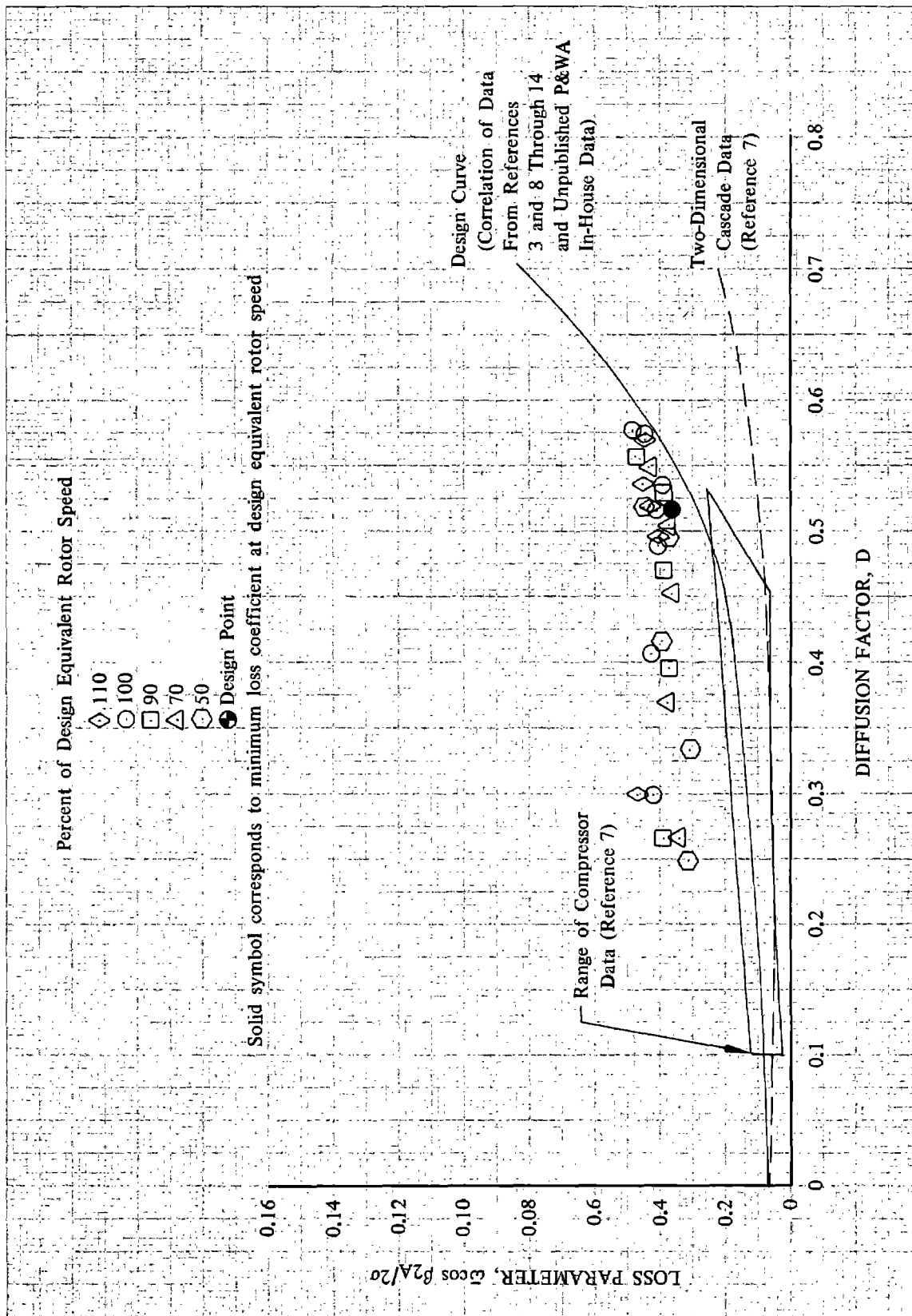
Figure 20e. Stator E Loss Parameter vs Diffusion Factor; 90% Span From Tip; Uniform Inlet Flow

DF 98103
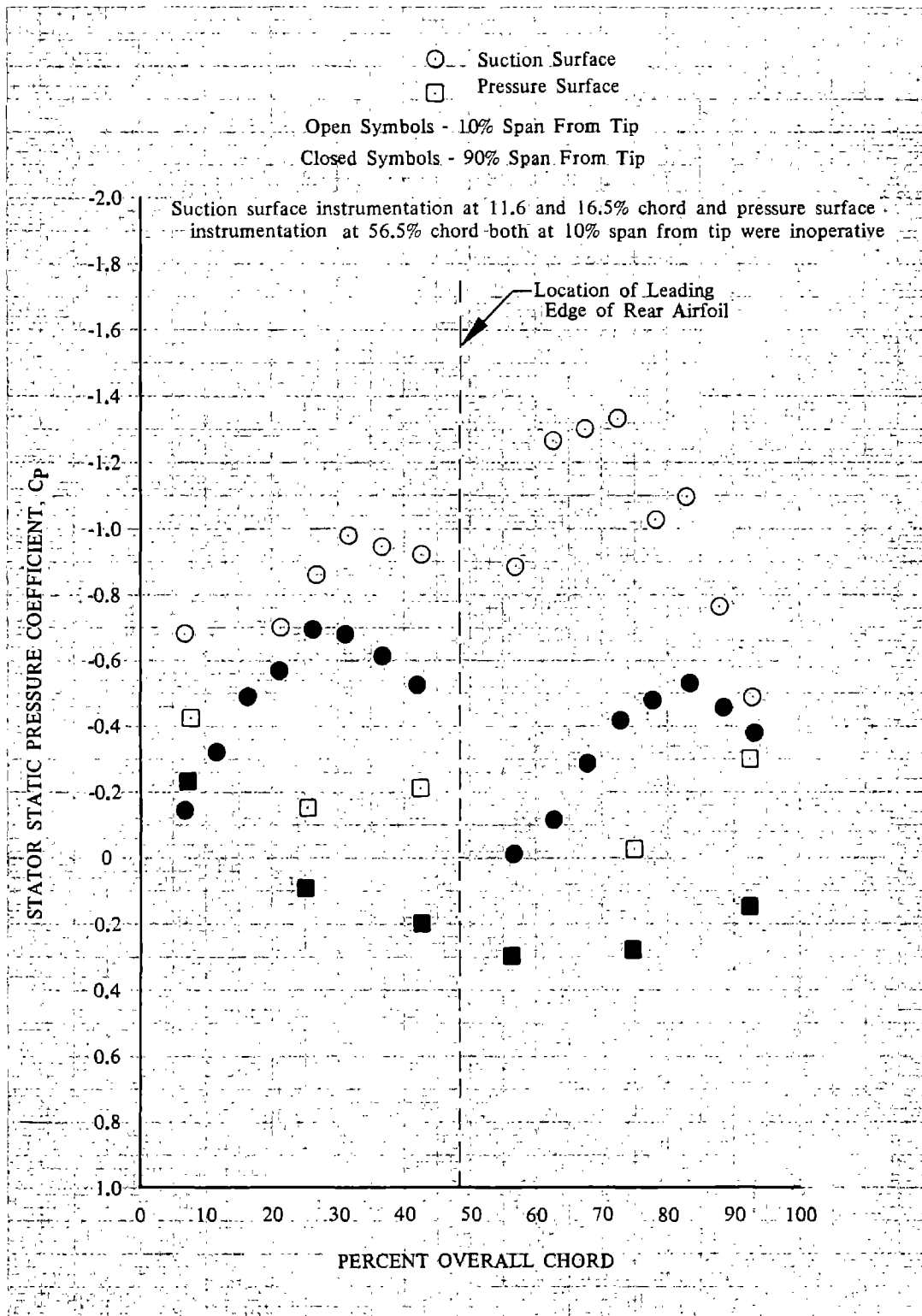
Figure 21a. Stator E Static Pressure Coefficient   DF 98211
vs Percent Overall Chord; 100% Design
Equivalent Rotor Speed; Equivalent Weight
Flow = 121.43 lb/sec; Uniform Inlet Flow
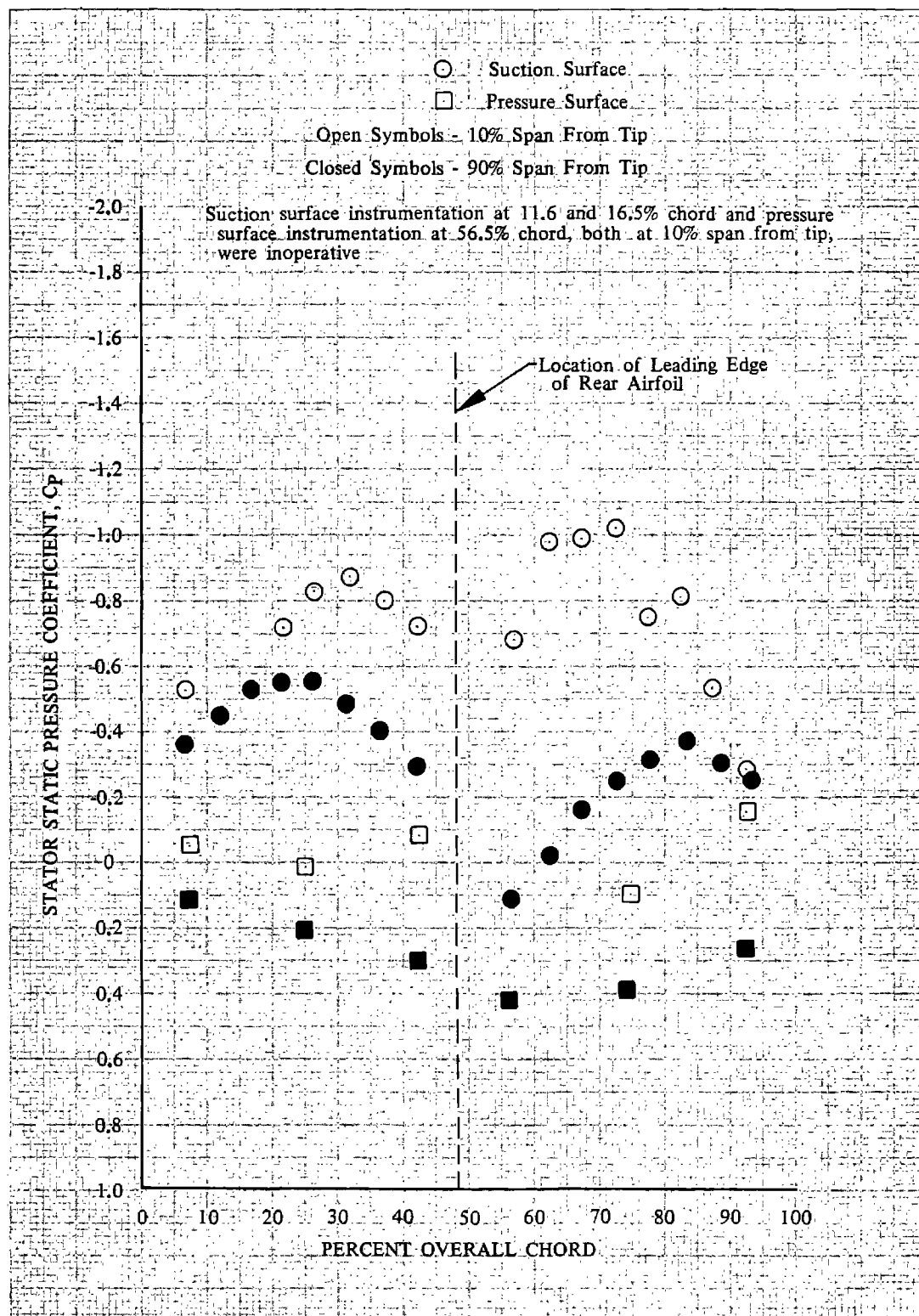
Figure 21b. Stator E Static Pressure Coefficient   DF 98212
vs Percent Overall Chord; 100% Design
Equivalent Rotor Speed; Equivalent Weight
Flow = 117.78 lb/sec; Uniform Inlet Flow
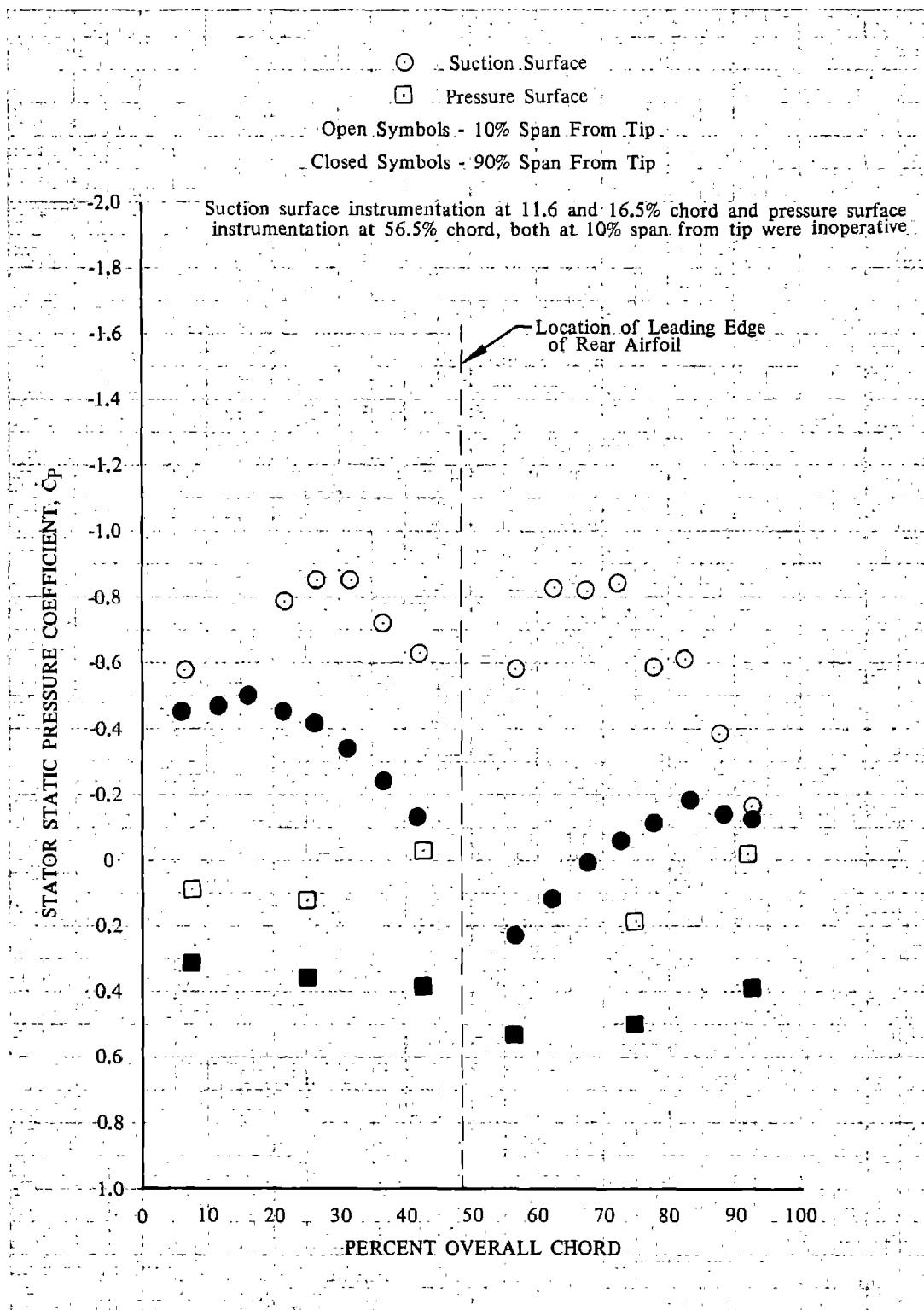
Figure 21c.   Stator E Static Pressure Coefficient   DF 98213
              vs Percent Overall Chord; 100% Design
              Equivalent Rotor Speed; Equivalent Weight
              Flow = 111.27 lb/sec; Uniform Inlet Flow

⊙ Suction Surface

□ Pressure Surface

Open Symbols - 10% Span From Tip

Closed Symbols - 90% Span From Tip

Suction surface instrumentation at 11.6 and 16.5% chord and pressure surface
instrumentation at 56.5% chord, both at 10% span from tip, were inoperative

Location of Leading Edge
of Rear Airfoil

STATOR STATIC PRESSURE COEFFICIENT, C_P

-2.0
-1.8
-1.6
-1.4
-1.2
-1.0
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1.0

0   10   20   30   40   50   60   70   80   90   100

PERCENT OVERALL CHORD
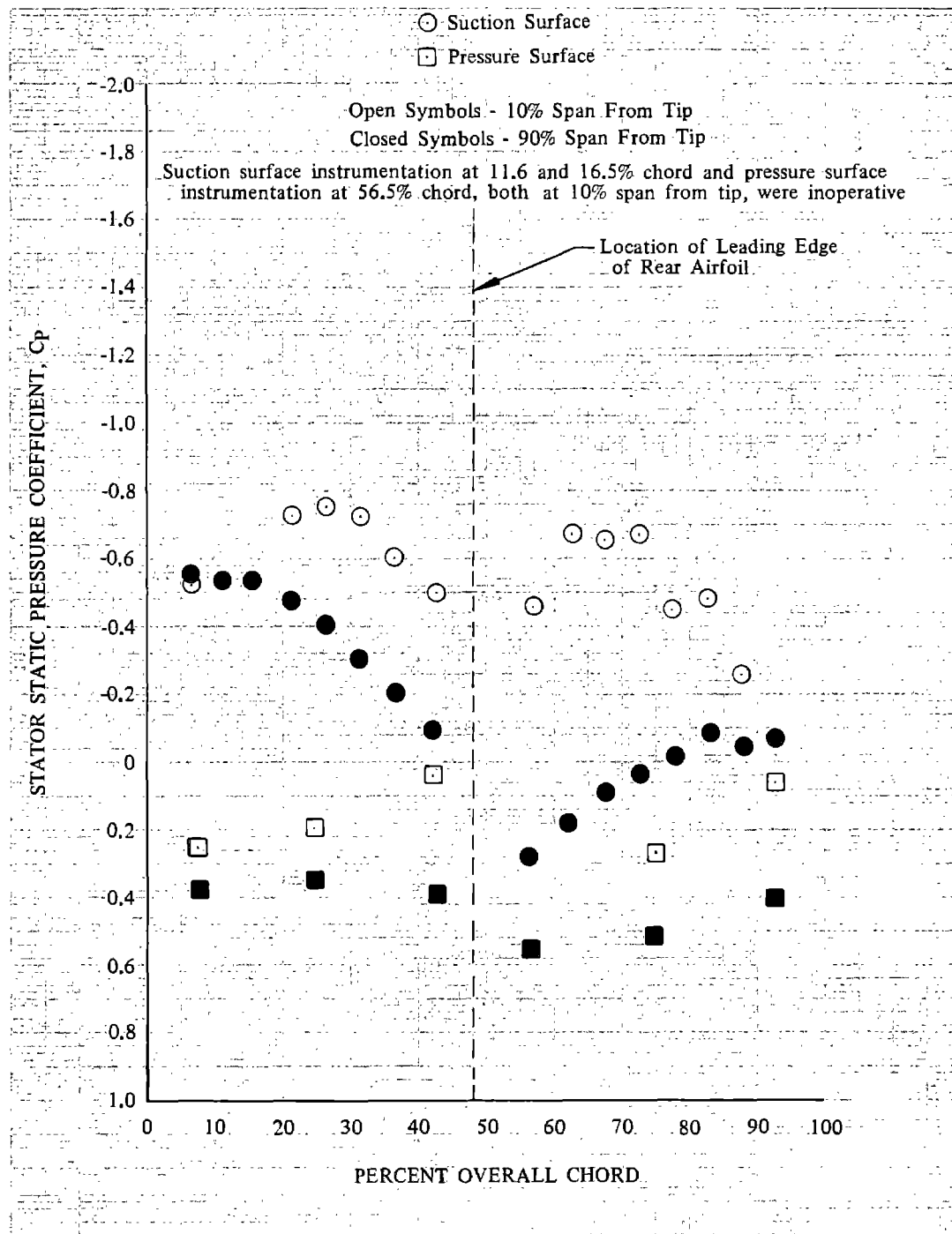
Figure 21d.   Stator E Static Pressure Coefficient   DF 98214
vs Percent Overall Chord; 100% Design
Equivalent Rotor Speed; Equivalent Weight
Flow = 106.84 lb/sec; Uniform Inlet Flow
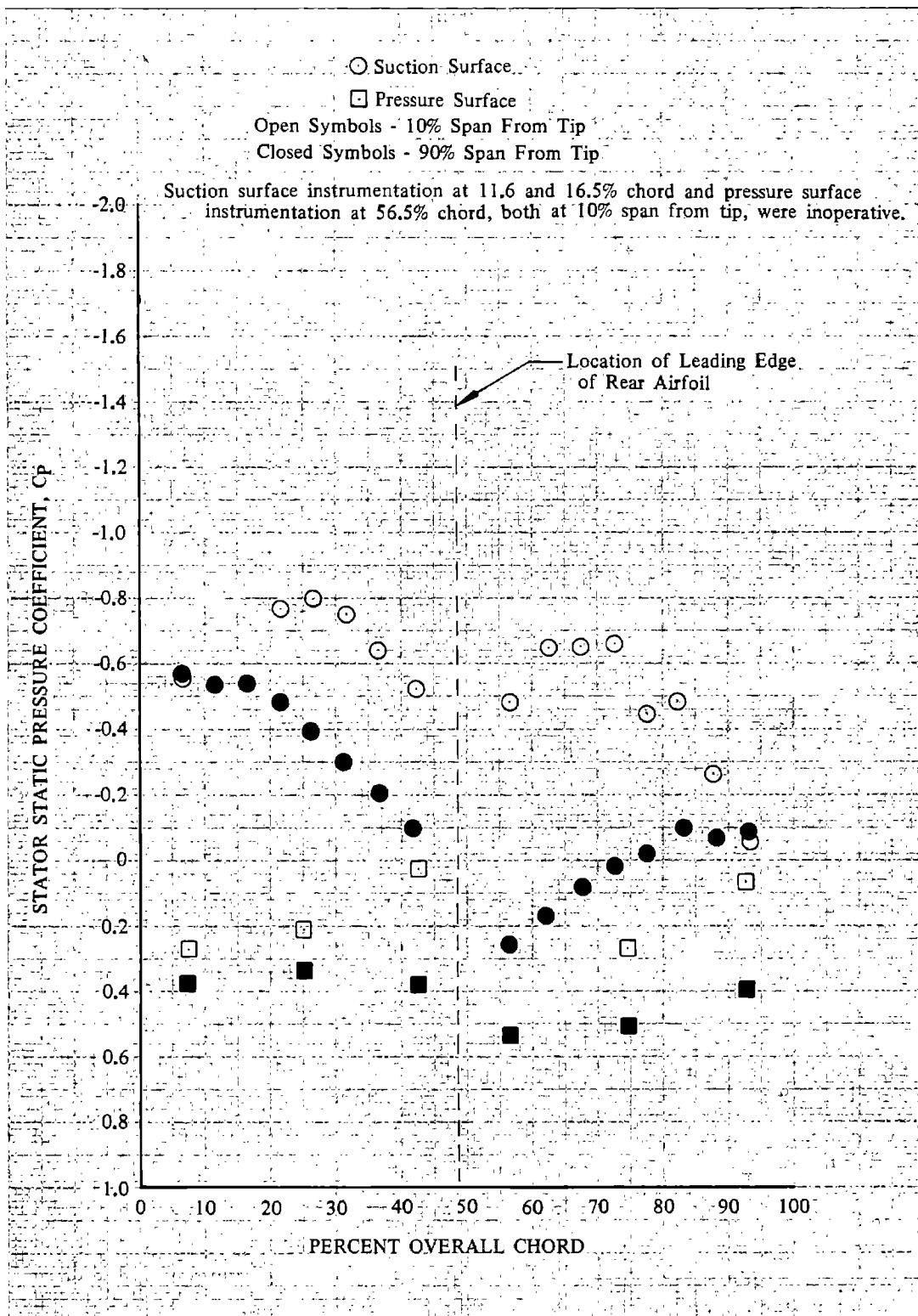
Figure 21e. Stator E Static Pressure Coefficient   DF 98215
vs Percent Overall Chord; 100% Design
Equivalent Rotor Speed; Equivalent Weight
Flow = 105.92 lb/sec; Uniform Inlet Flow
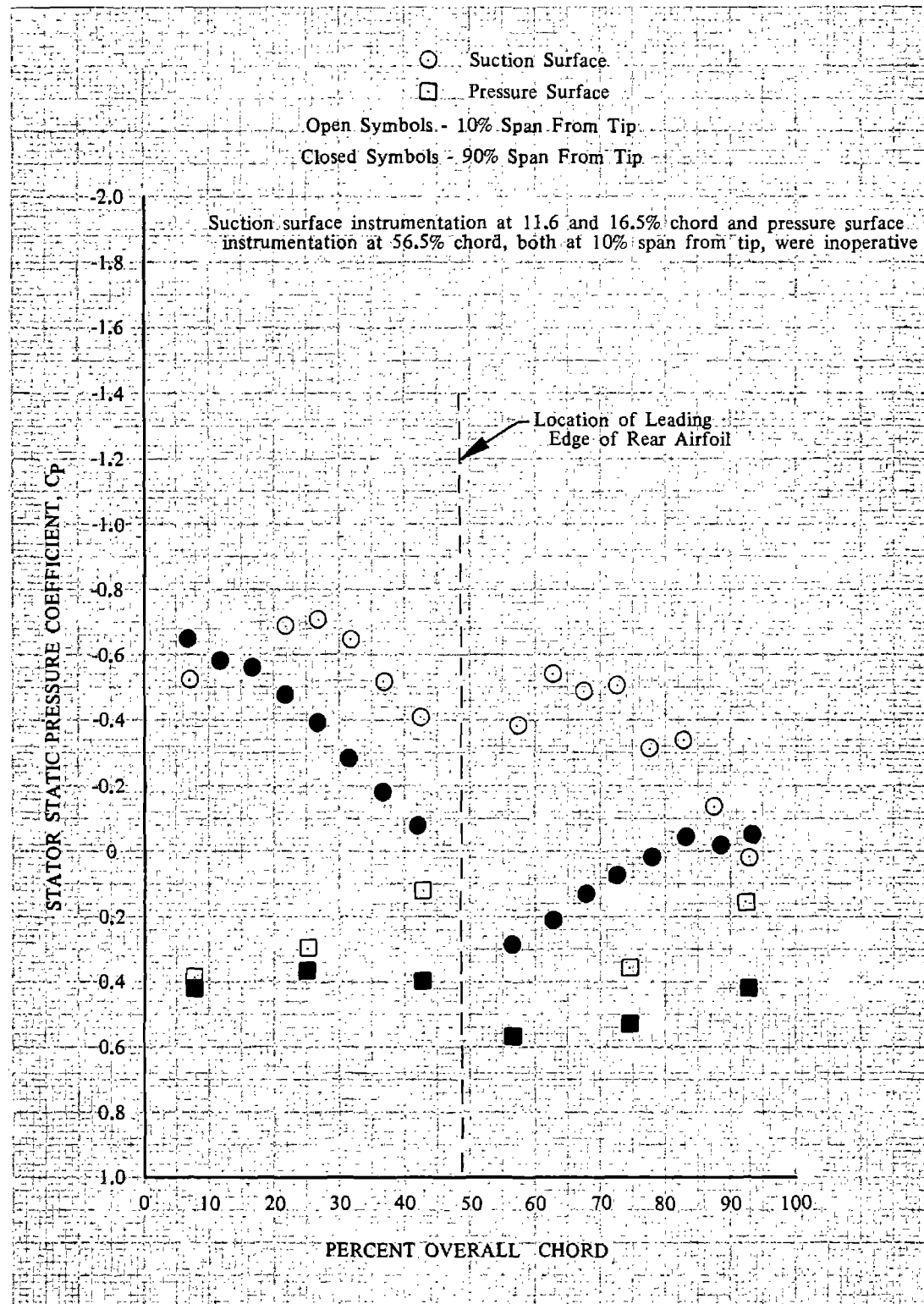
Figure 21f. Stator E Static Pressure Coefficient   DF 98216
vs Percent Overall Chord; 100% Design
Equivalent Rotor Speed; Equivalent Weight
Flow = 102.92 lb/sec; Uniform Inlet Flow
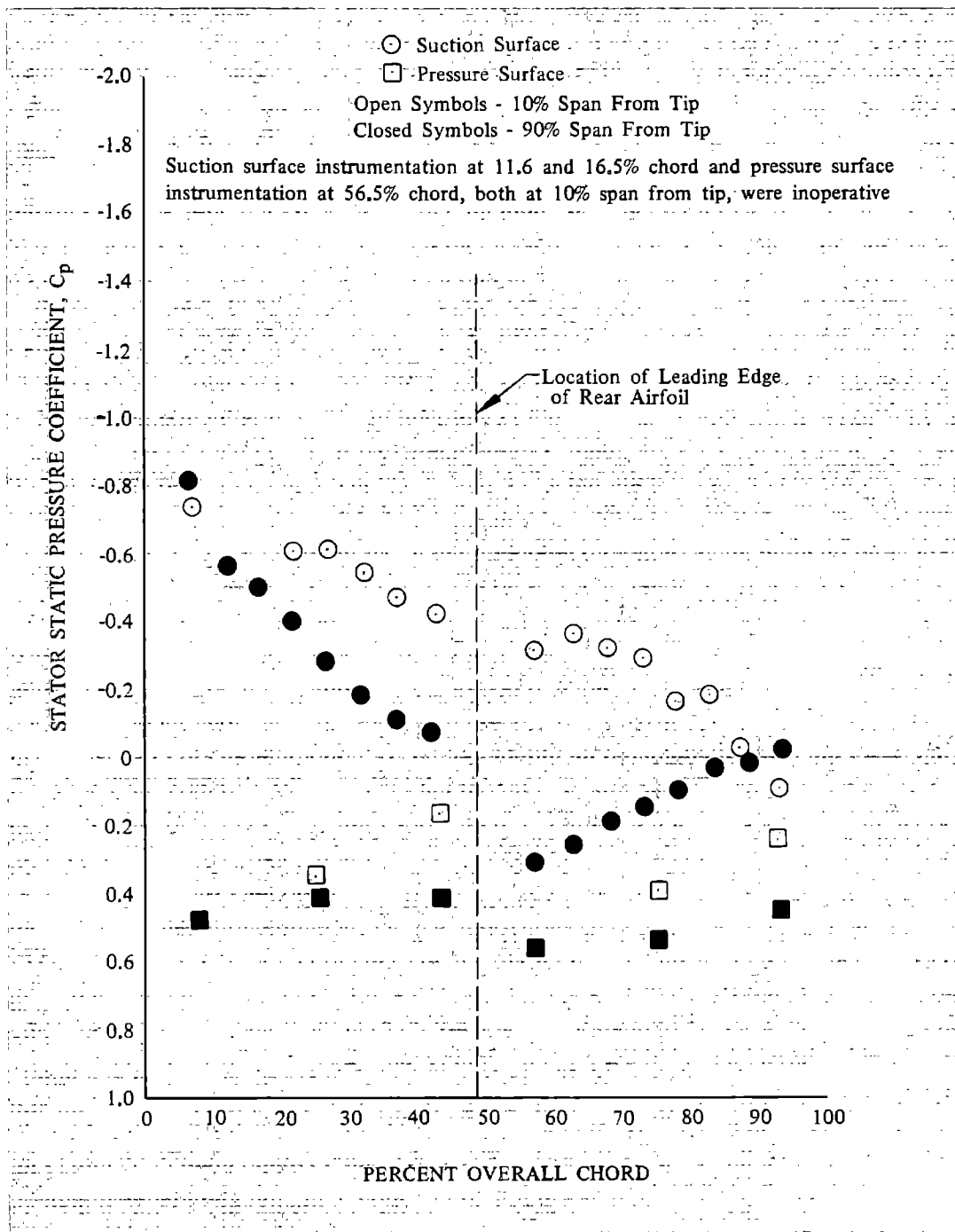
Figure 21g. Stator E Static Pressure Coefficient DF 98217
vs Percent Overall Chord; 100% Design
Equivalent Rotor Speed; Equivalent Weight
Flow = 97.95 lb/sec; Uniform Inlet Flow
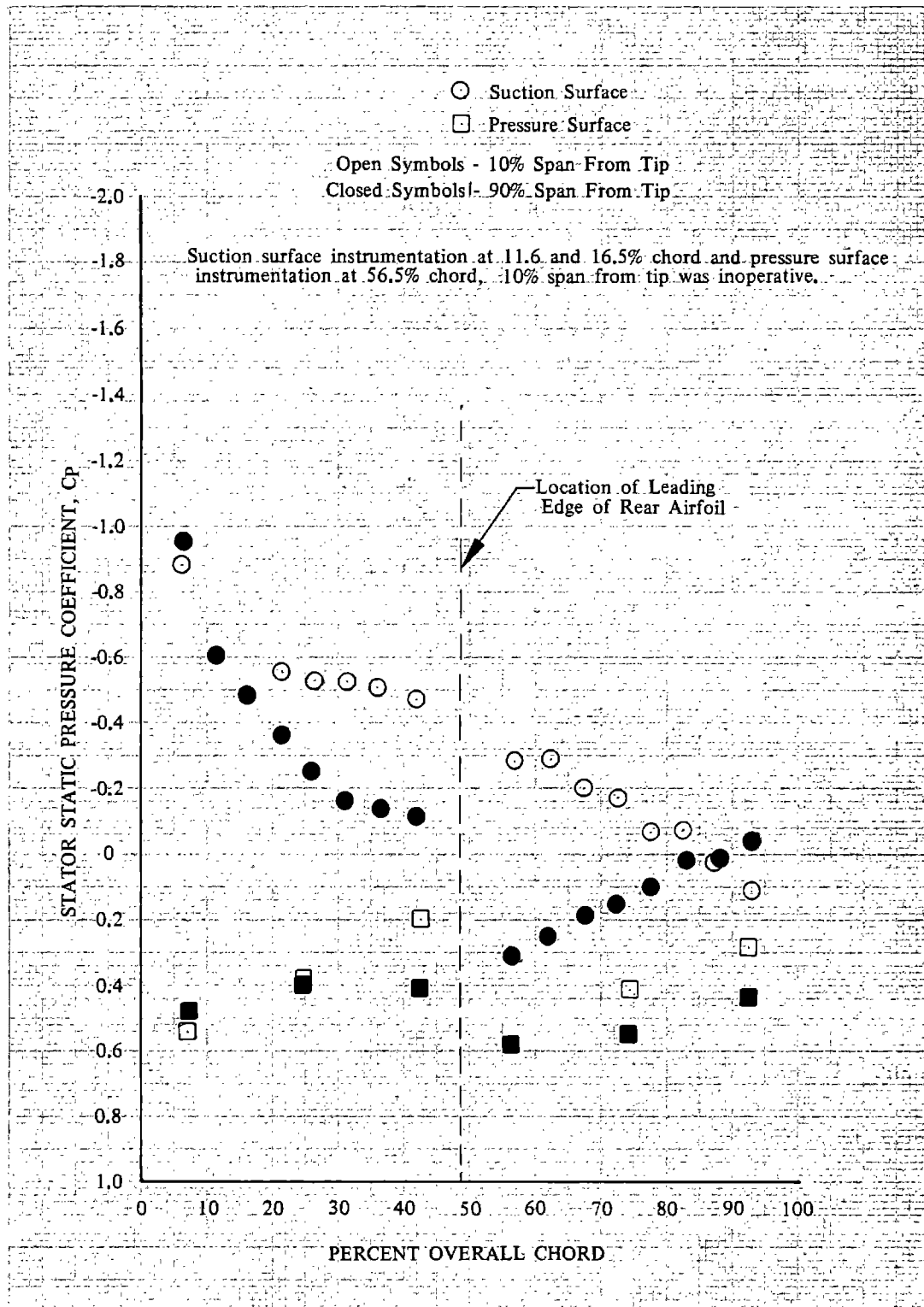
Figure 21h. Stator E Static Pressure Coefficient   DF 98218
vs Percent Overall Chord; 100% Design
Equivalent Rotor Speed, Equivalent Weight
Flow = 93. 27 lb/sec; Uniform Inlet Flow

70
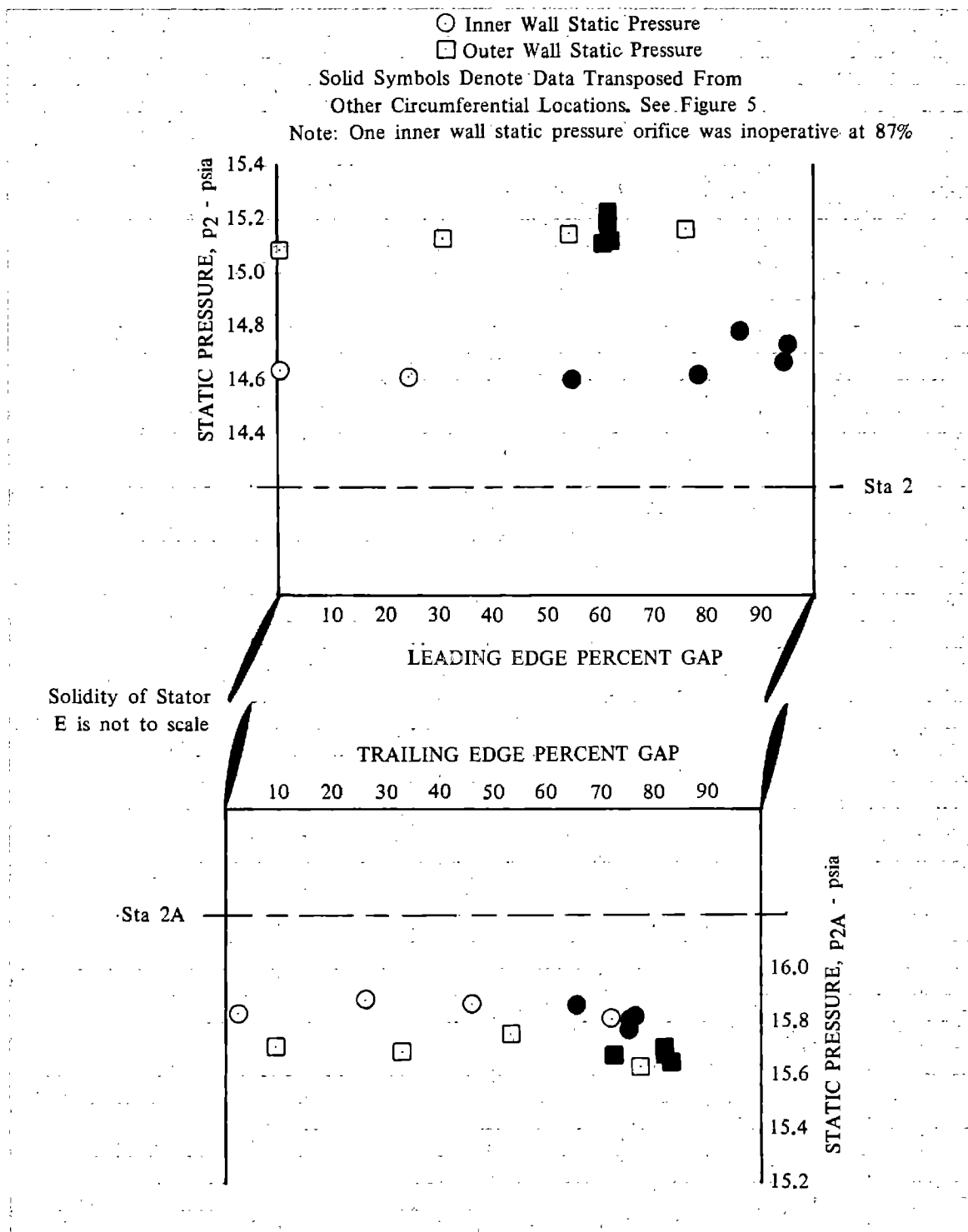
Figure 22a. Wall Static Pressure Distributions Up-   DF 98219
stream and Downstream of Stator E; 100%
Design Equivalent Rotor Speed; Equivalent
Weight Flow = 111.27 lb/sec; Uniform Inlet
Flow
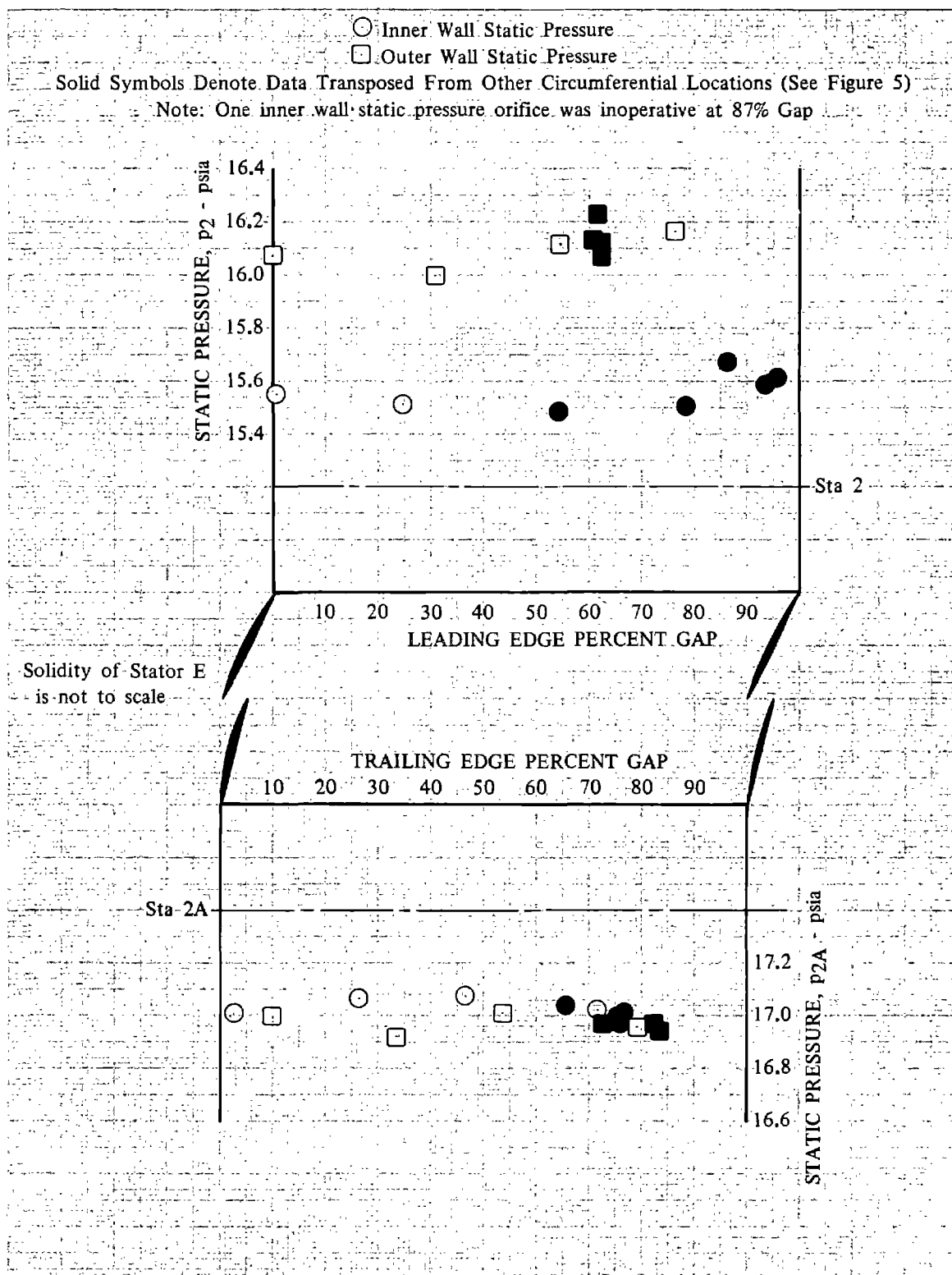
Figure 22b. Wall Static Pressure Distributions Up-   DF 98220
            stream and Downstream of Stator E; 100%
            Design Equivalent Rotor Speed; Equivalent
            Weight Flow = 93.27 lb/sec; Uniform Inlet
            Flow
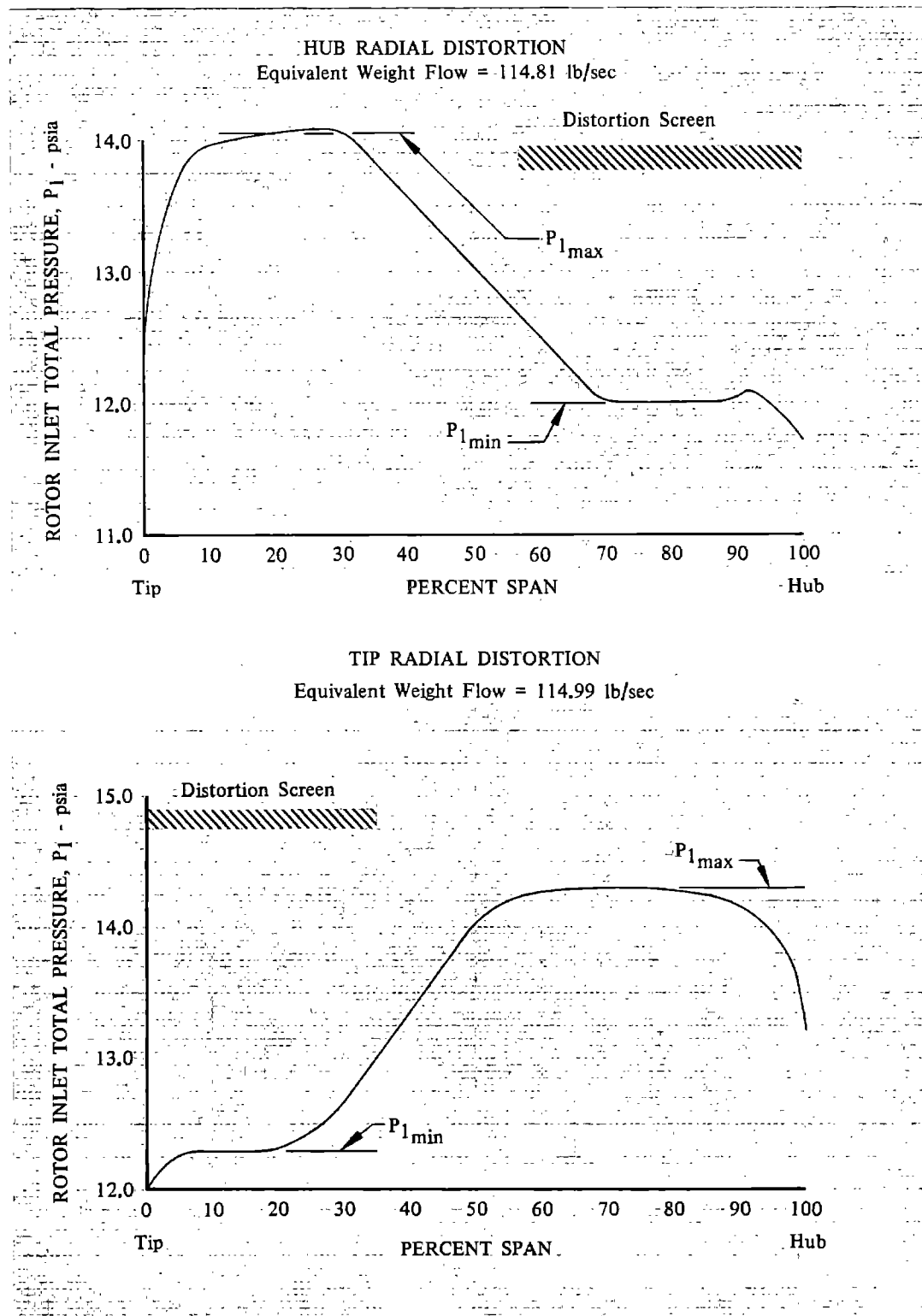
Figure 23. Typical Rotor Inlet Total Pressure Profiles   DF 98221
With Hub and Tip Radial Distortion; 100%
Design Equivalent Rotor Speed
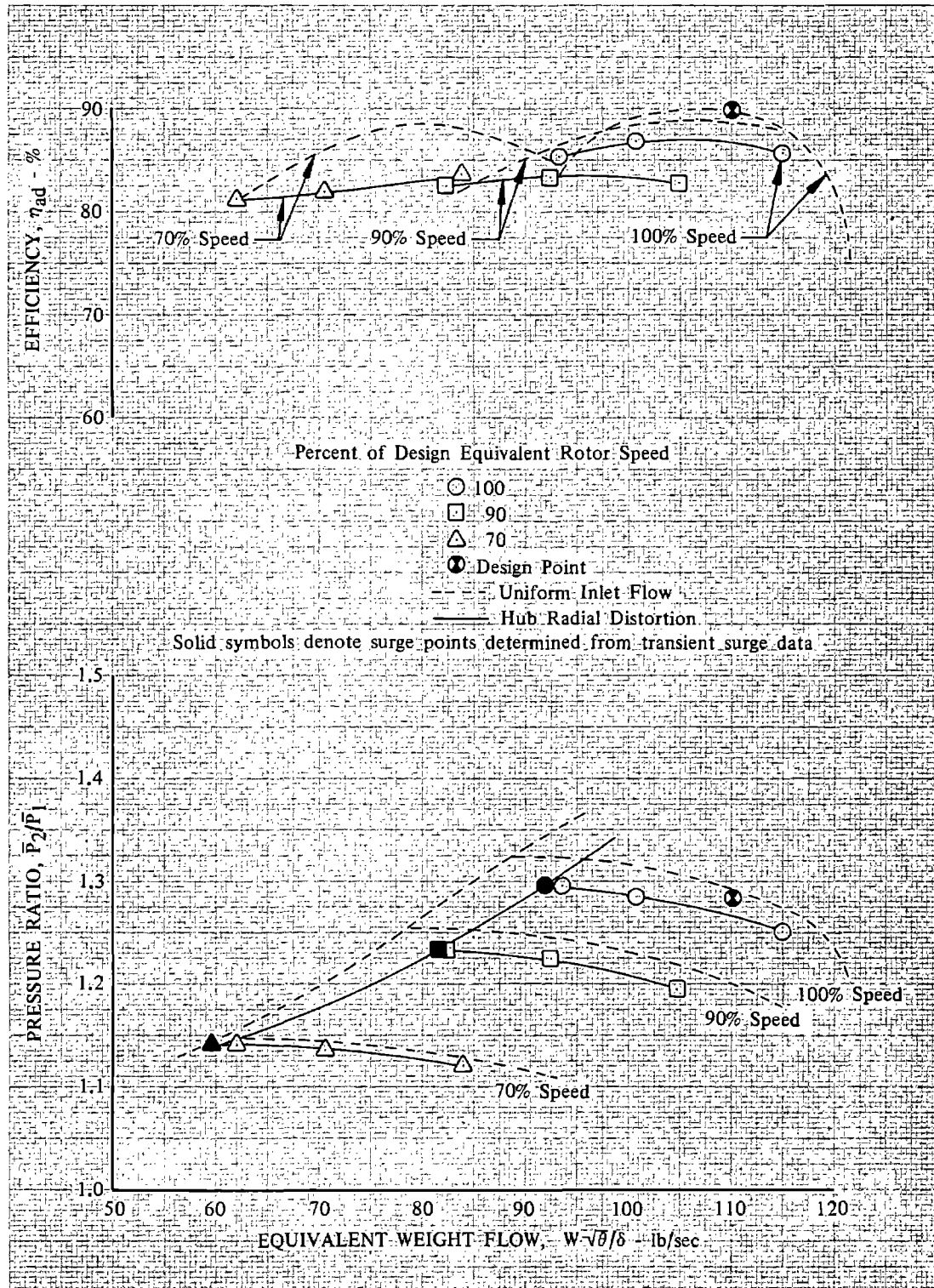
Figure 24. Overall Performance of Rotor E; Hub Radial DF 98222
Distortion Compared With Uniform Inlet Flow
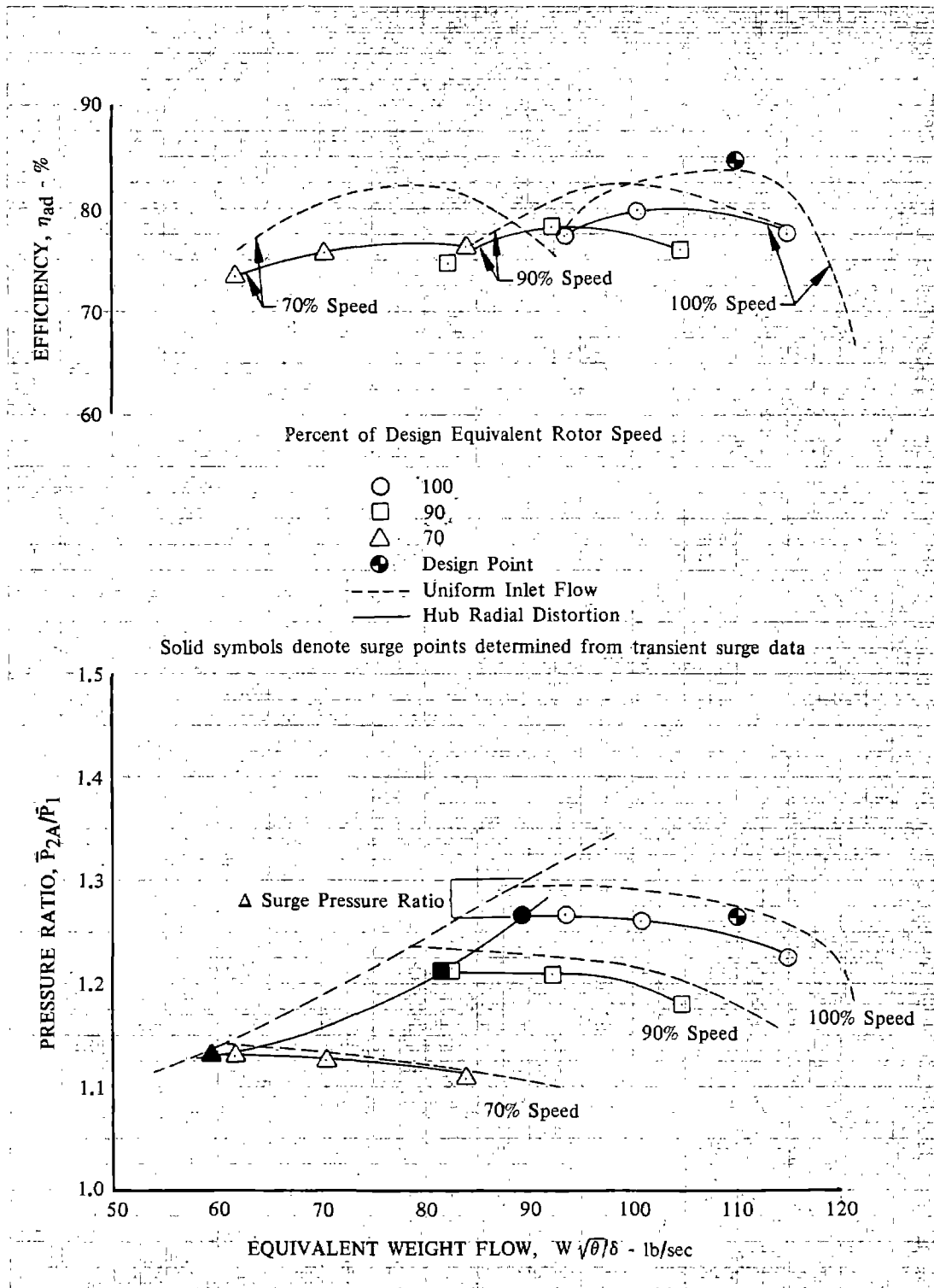
Figure 25. Overall Performance of Stage E; Hub   DF 98223
Radial Distortion Compared with Uniform
Inlet Flow
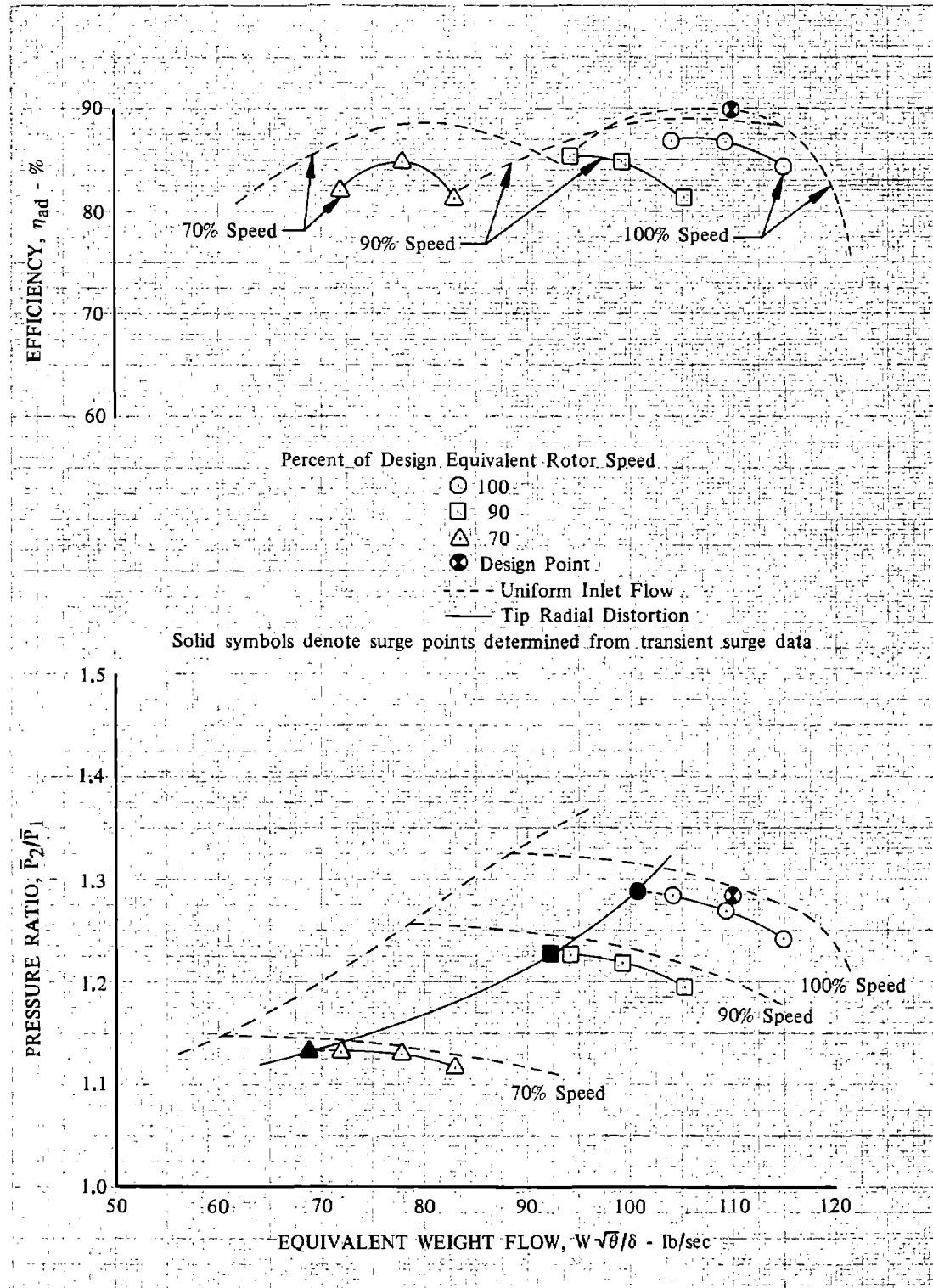
Figure 26. Overall Performance of Rotor E; Tip   DF 98224
         Radial Distortion Compared With Uniform
         Inlet Flow
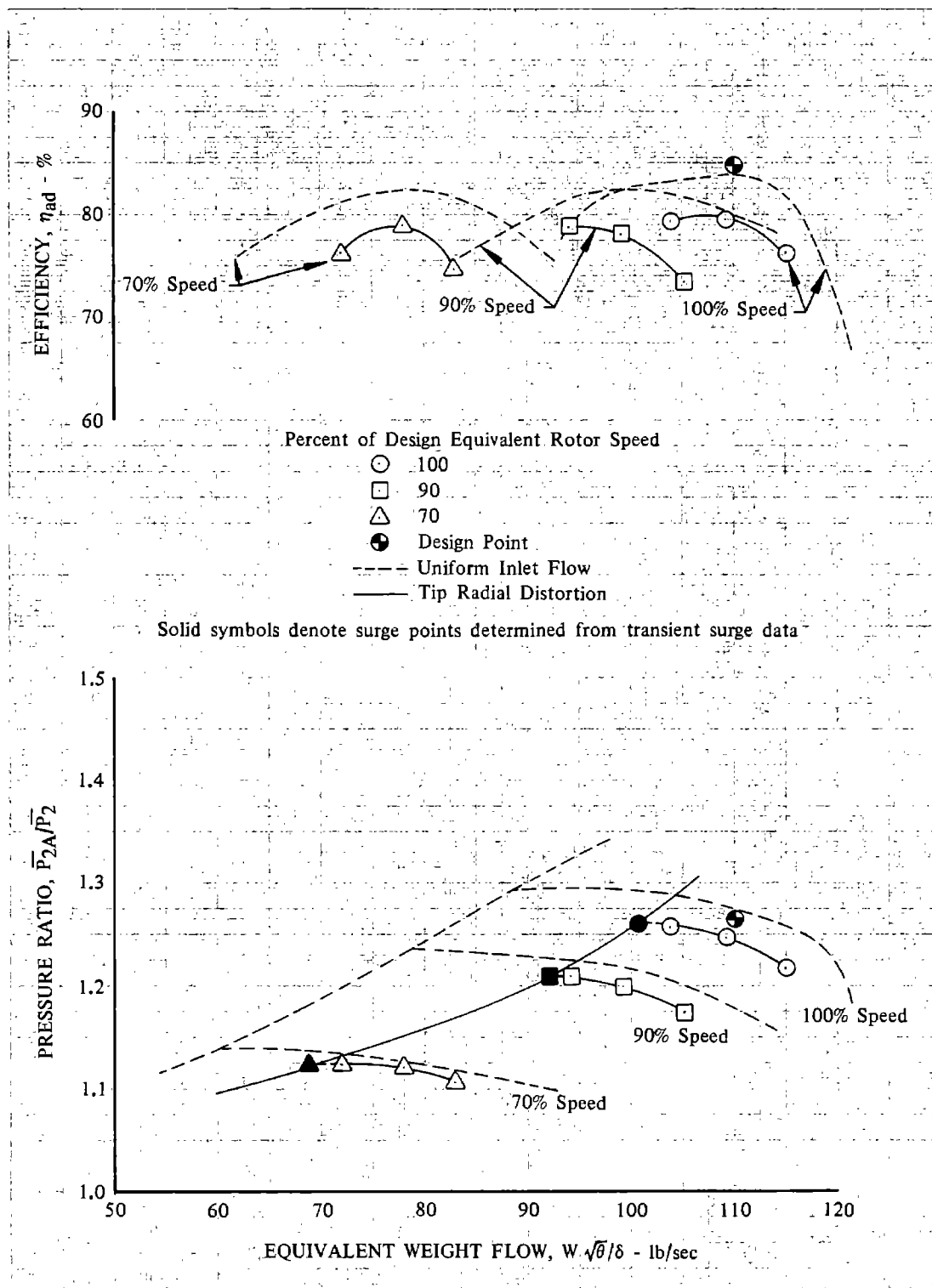
Figure 27. Overall Performance of Stage E; Tip   DF 98225
Radial Distortion Compared With Uniform
Inlet Flow
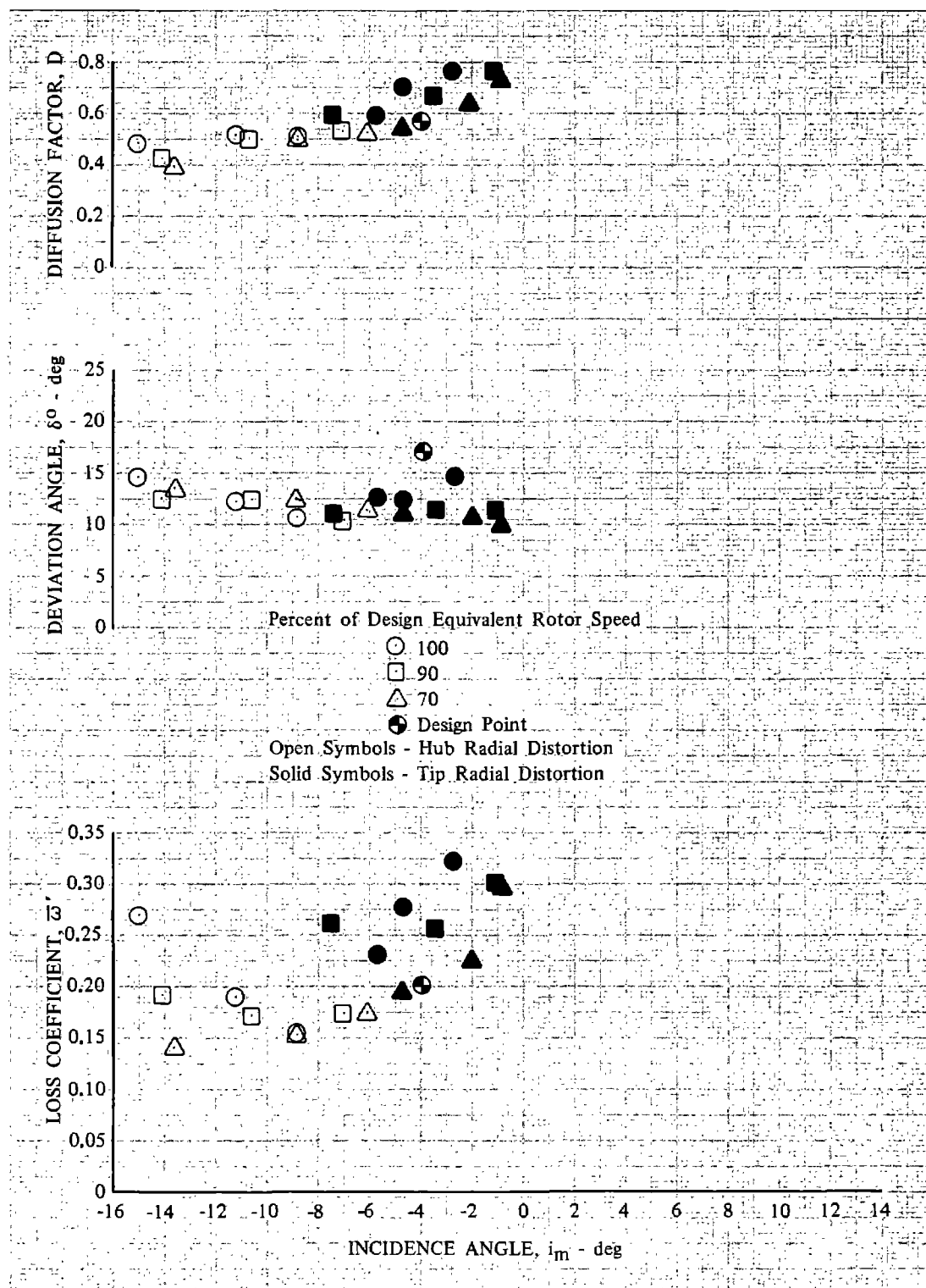
Figure 28a. Rotor E Blade Element Performance;   DF 98104
5% Span From Tip; Hub and Tip Radial
Distortion
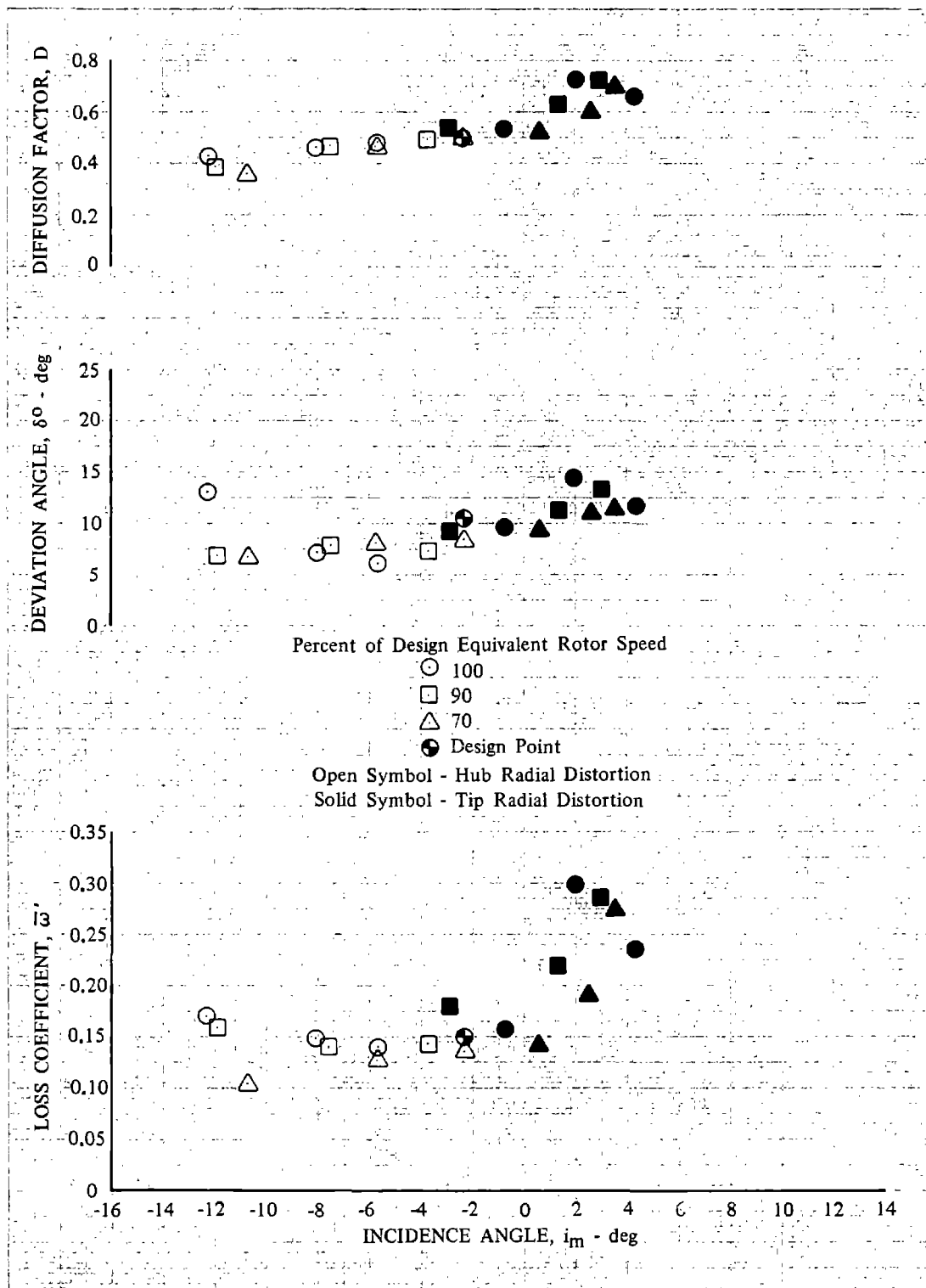
Figure 28b. Rotor E Blade Element Performance;   DF 98105
10% Span From Tip; Hub and Tip Radial
Distortion
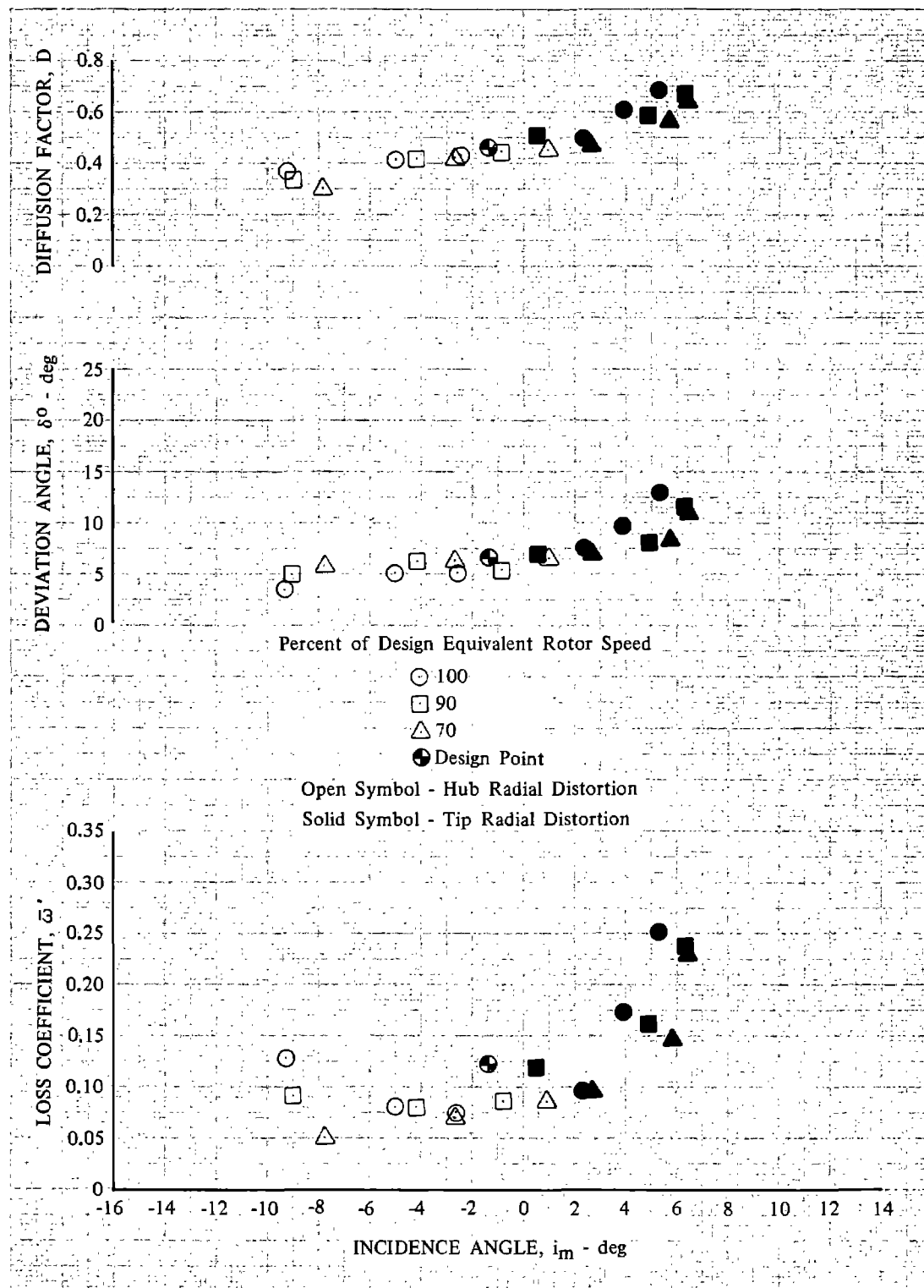
Figure 28c. Rotor E Blade Element Performance;   DF 98106
15% Span From Tip; Hub and Tip Radial
Distortion
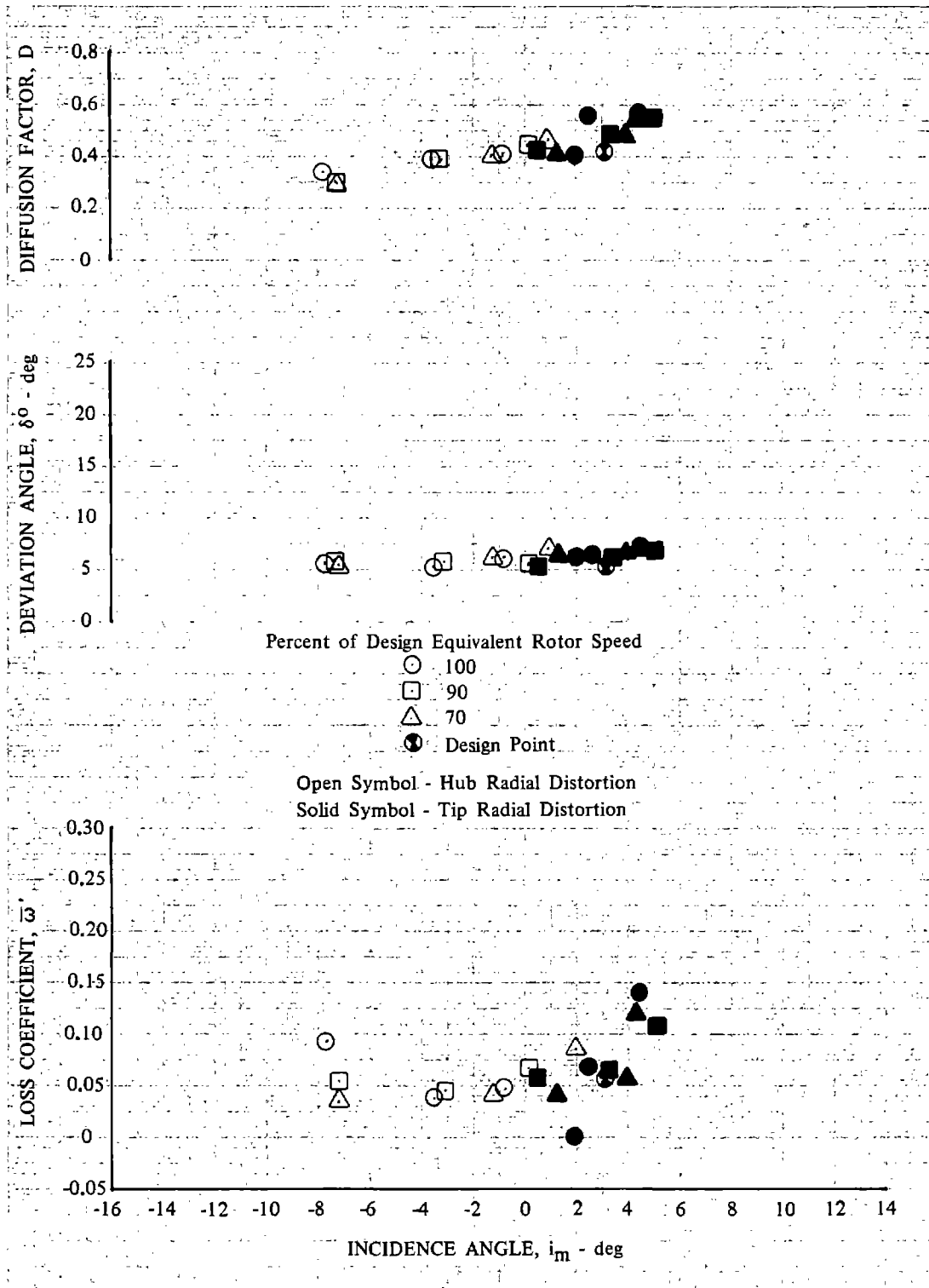
Figure 28d. Rotor E Blade Element Performance;   DF 98107
30% Span From Tip; Hub and Tip Radial
Distortion
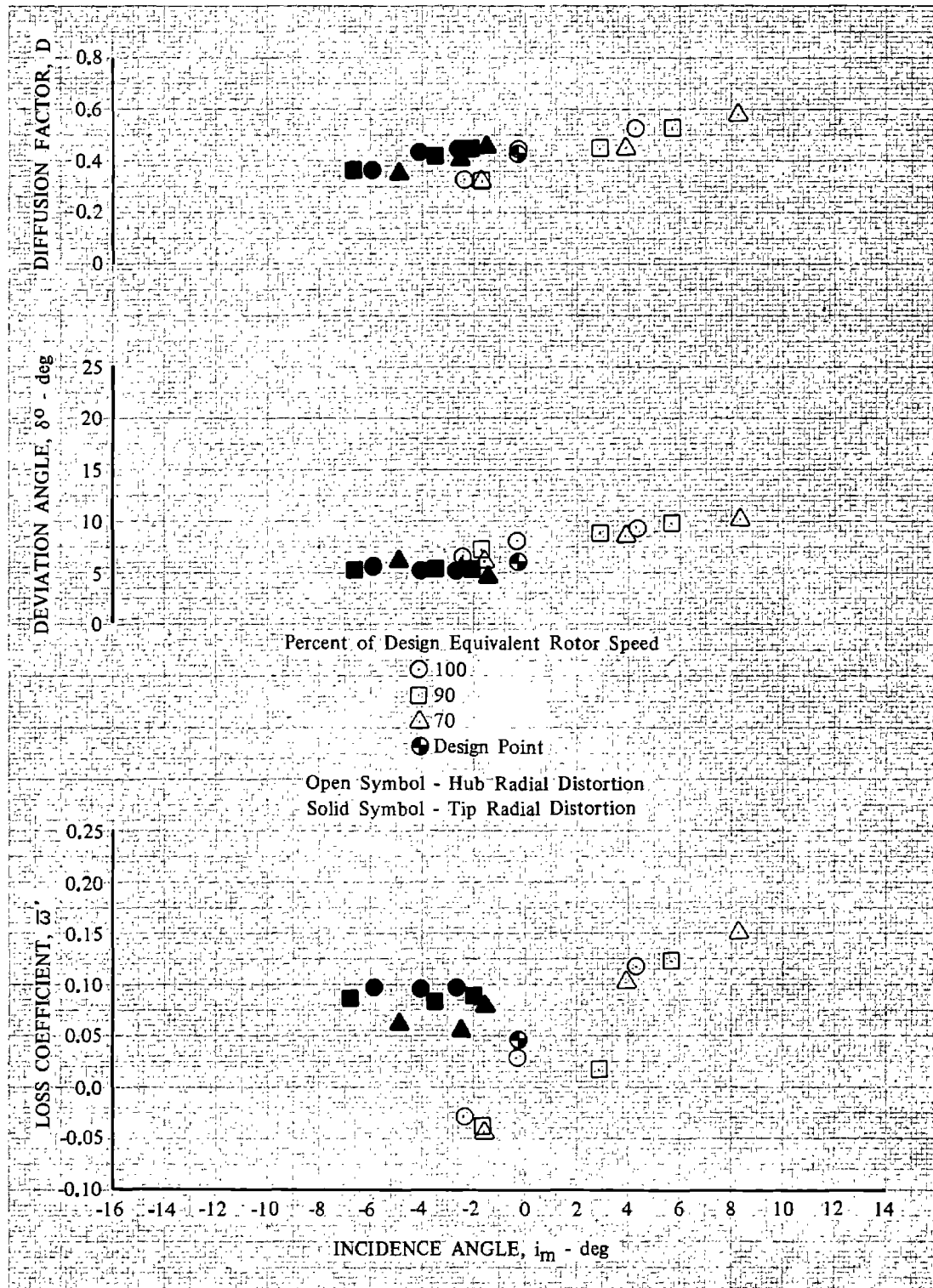
Figure 28e. Rotor E Blade Element Performance;   DF 98108
50% Span; Hub and Tip Radial Distortion

82
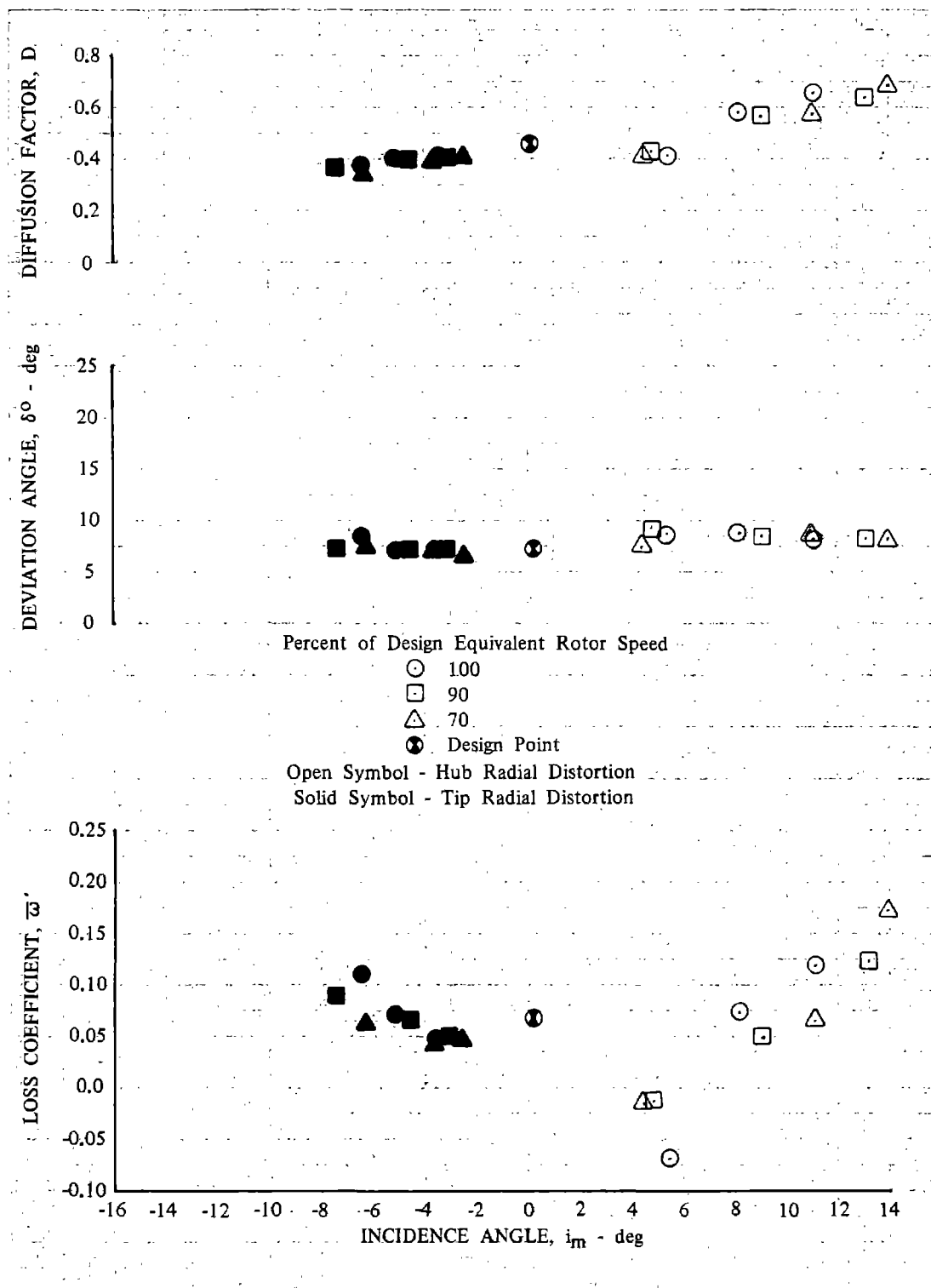
Figure 28f. Rotor E Blade Element Performance; DF 98109
70% Span From Tip; Hub and Tip Radial
Distortion
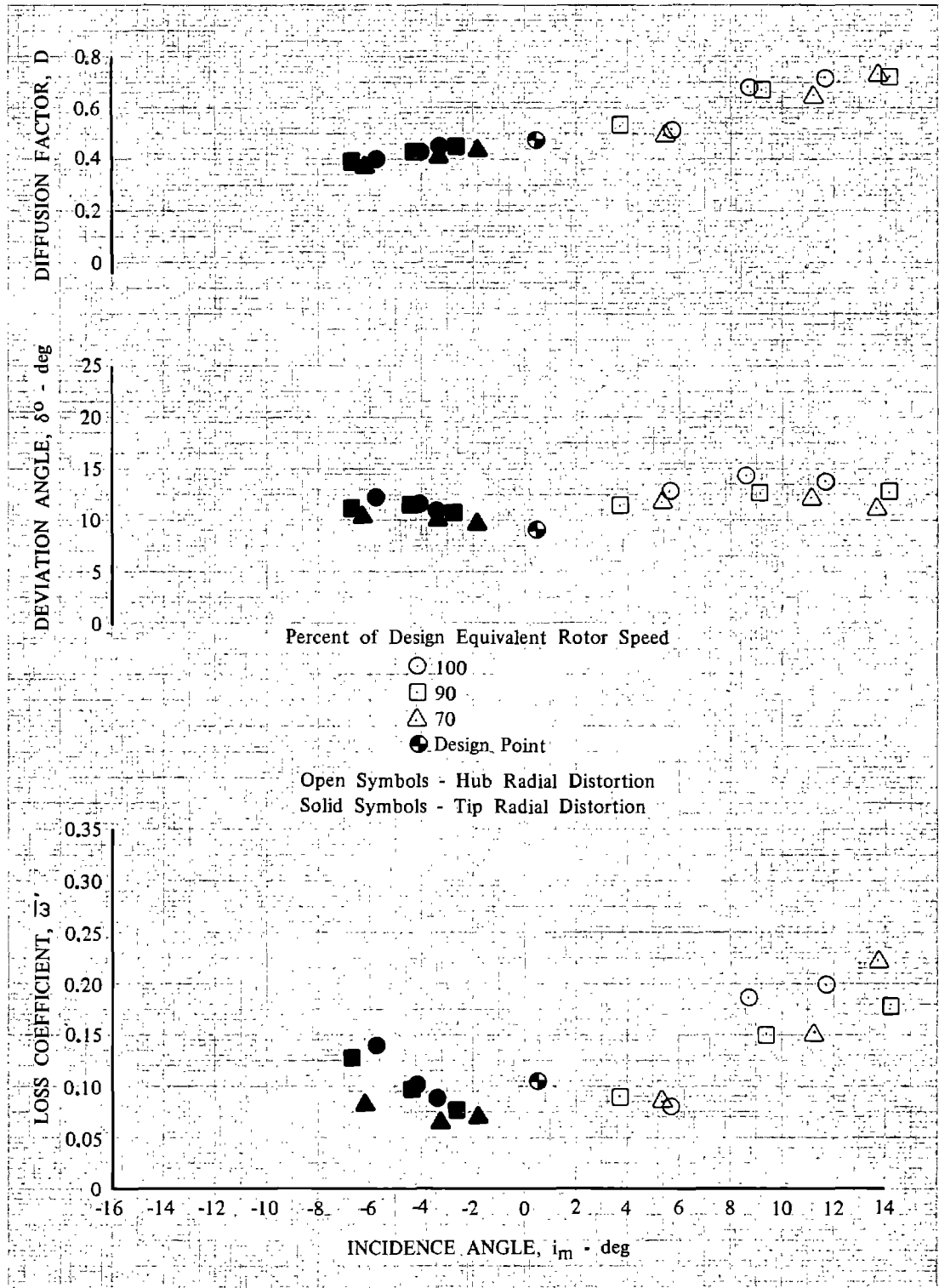
Figure 28g. Rotor E Blade Element Performance;   DF 98110
85% Span From Tip; Hub and Tip Radial
Distortion
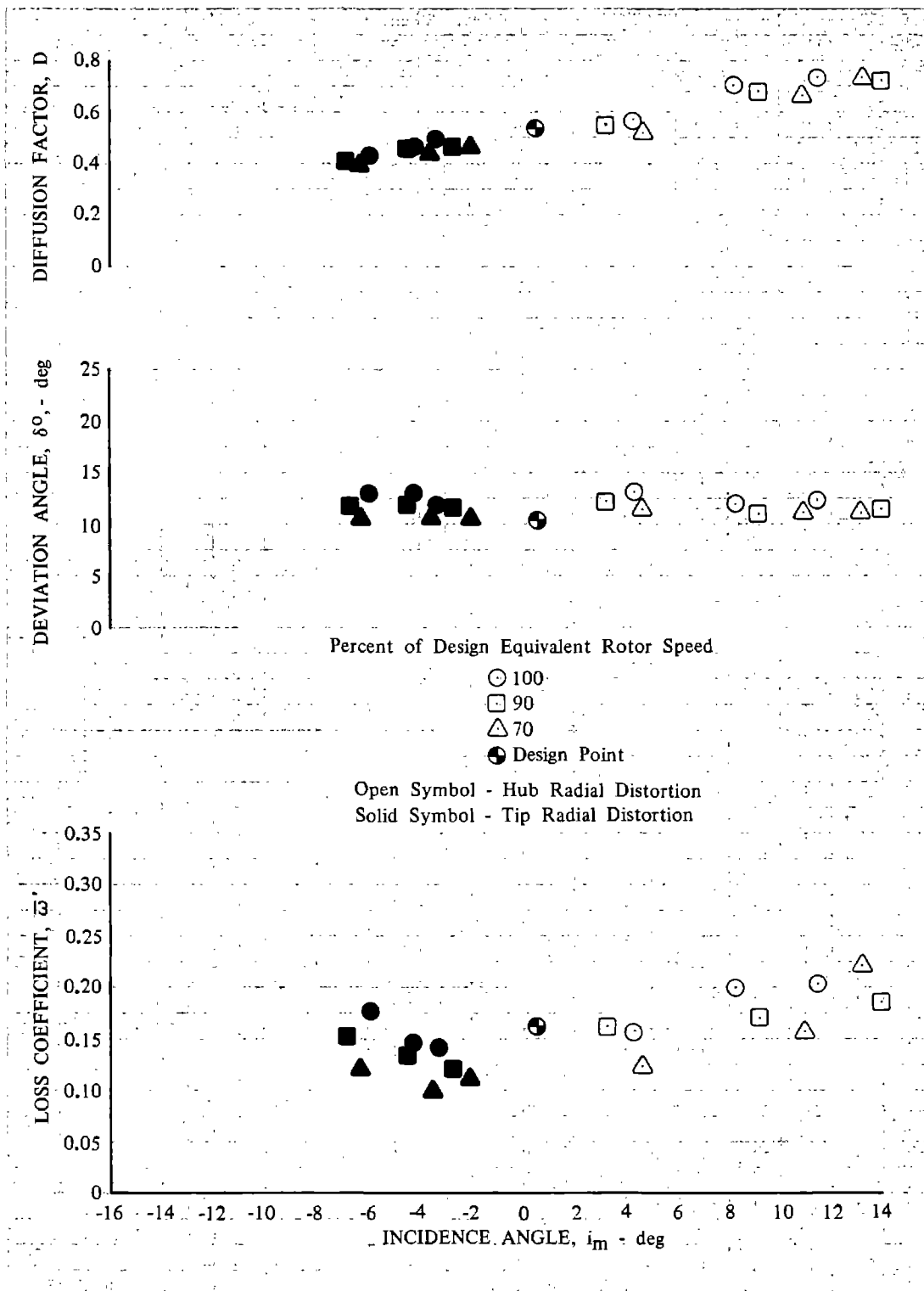
Figure 28h. Rotor E Blade Element Performance; DF 98111
90% Span From Tip; Hub and Tip Radial
Distortion
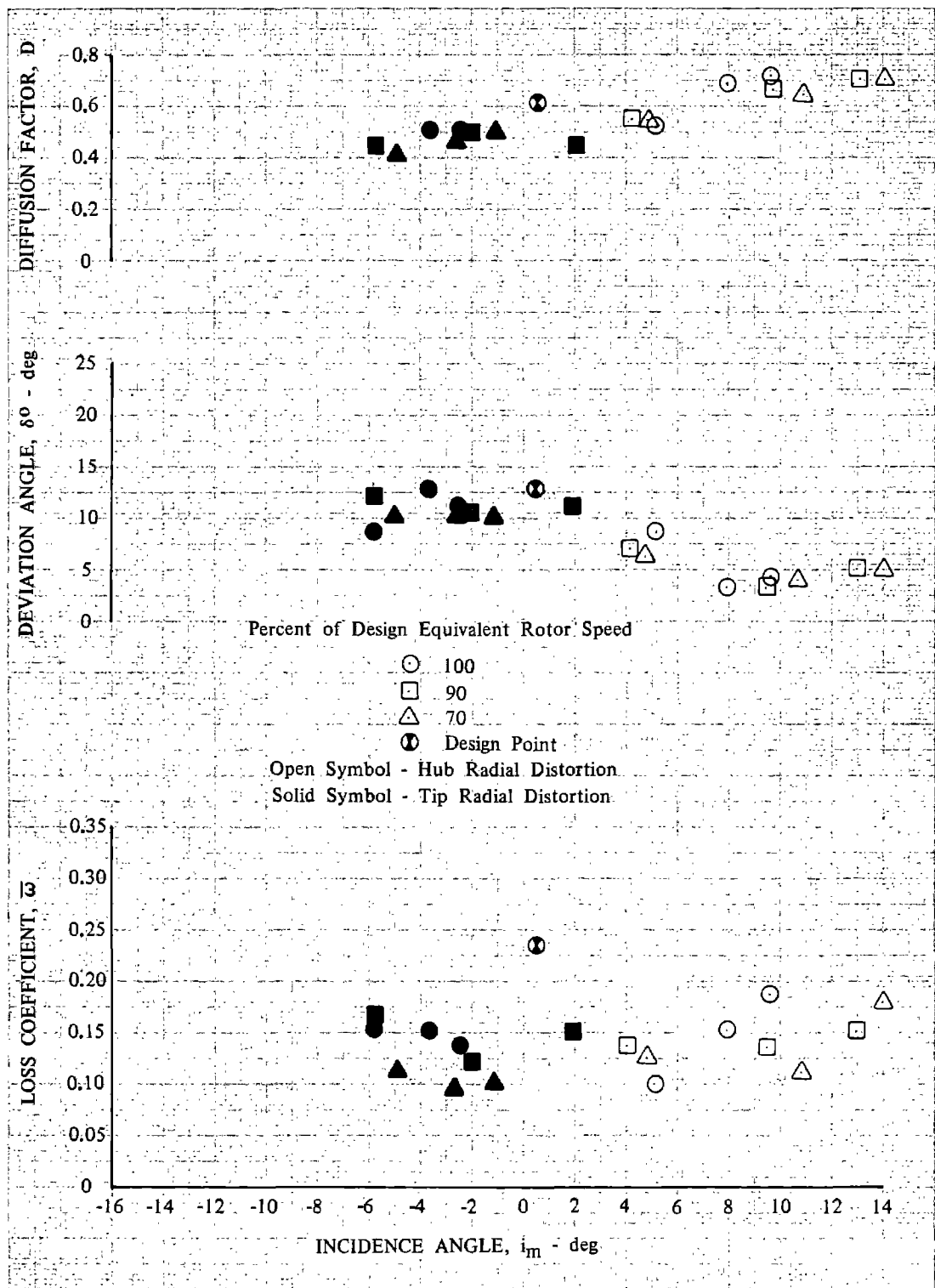
Figure 28i. Rotor E Blade Element Performance;   DF 98112
95% Span From Tip; Hub and Tip Radial
Distortion

Figure 29a.   Stator E Blade Element Performance;   DF 98113
5% Span From Tip; Hub and Tip Radial
Distortion
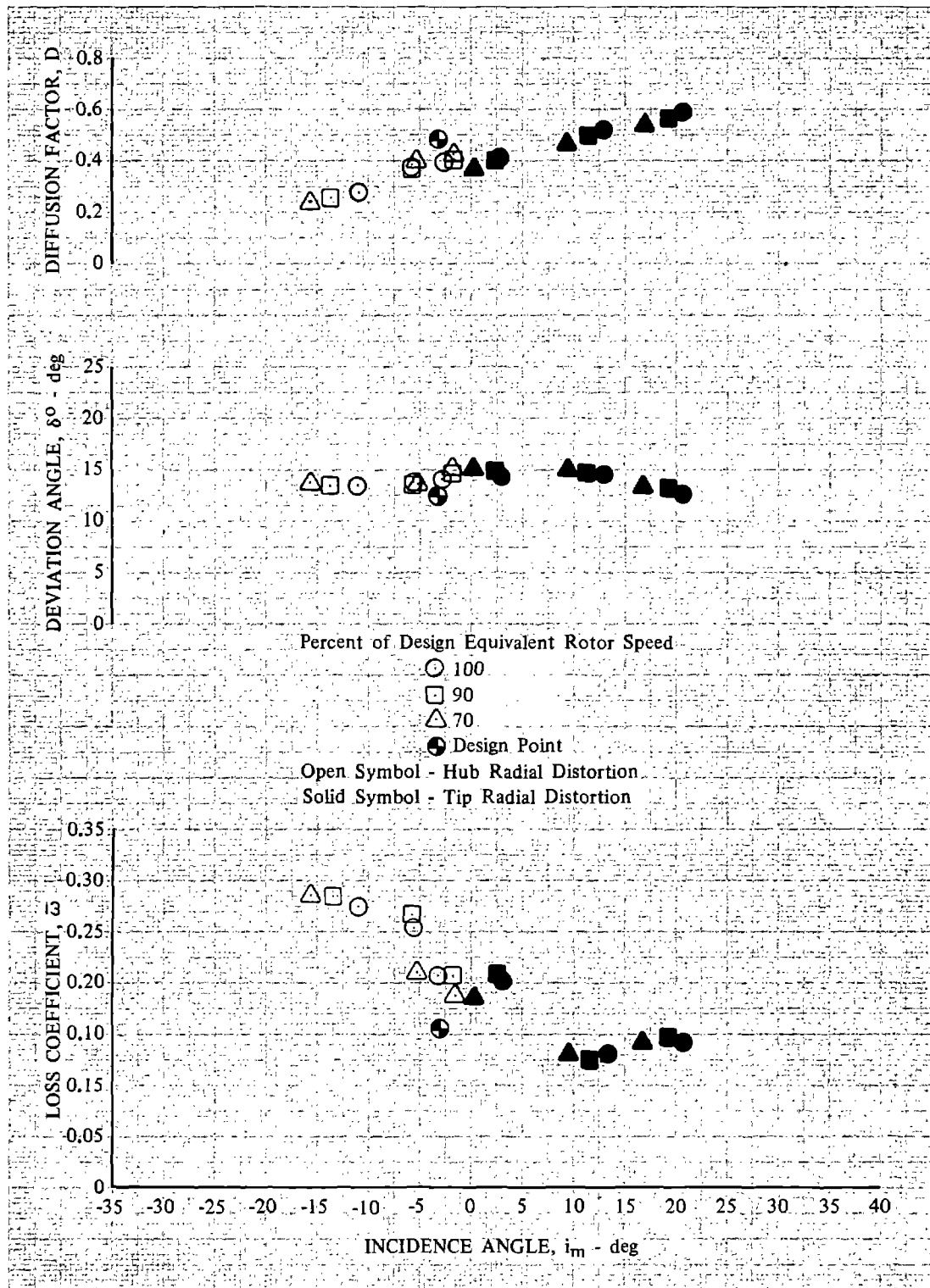
Figure 29b. Stator E Blade Element Performance;   DF 98114
10% Span From Tip; Hub and Tip Radial
Distortion
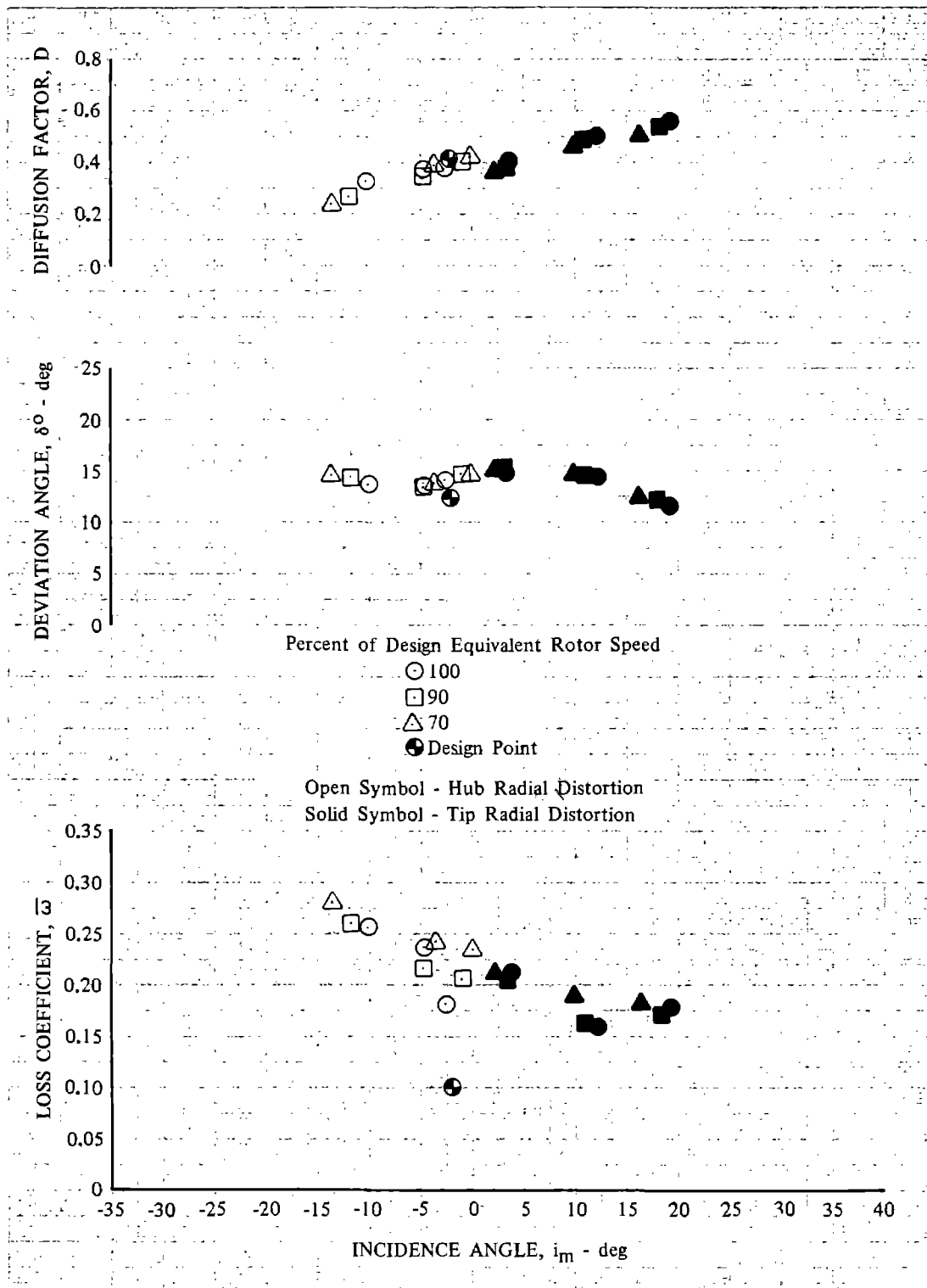
Figure 29c. Stator E Blade Element Performance;   DF 98115
15% Span From Tip; Hub and Tip Radial
Distortion
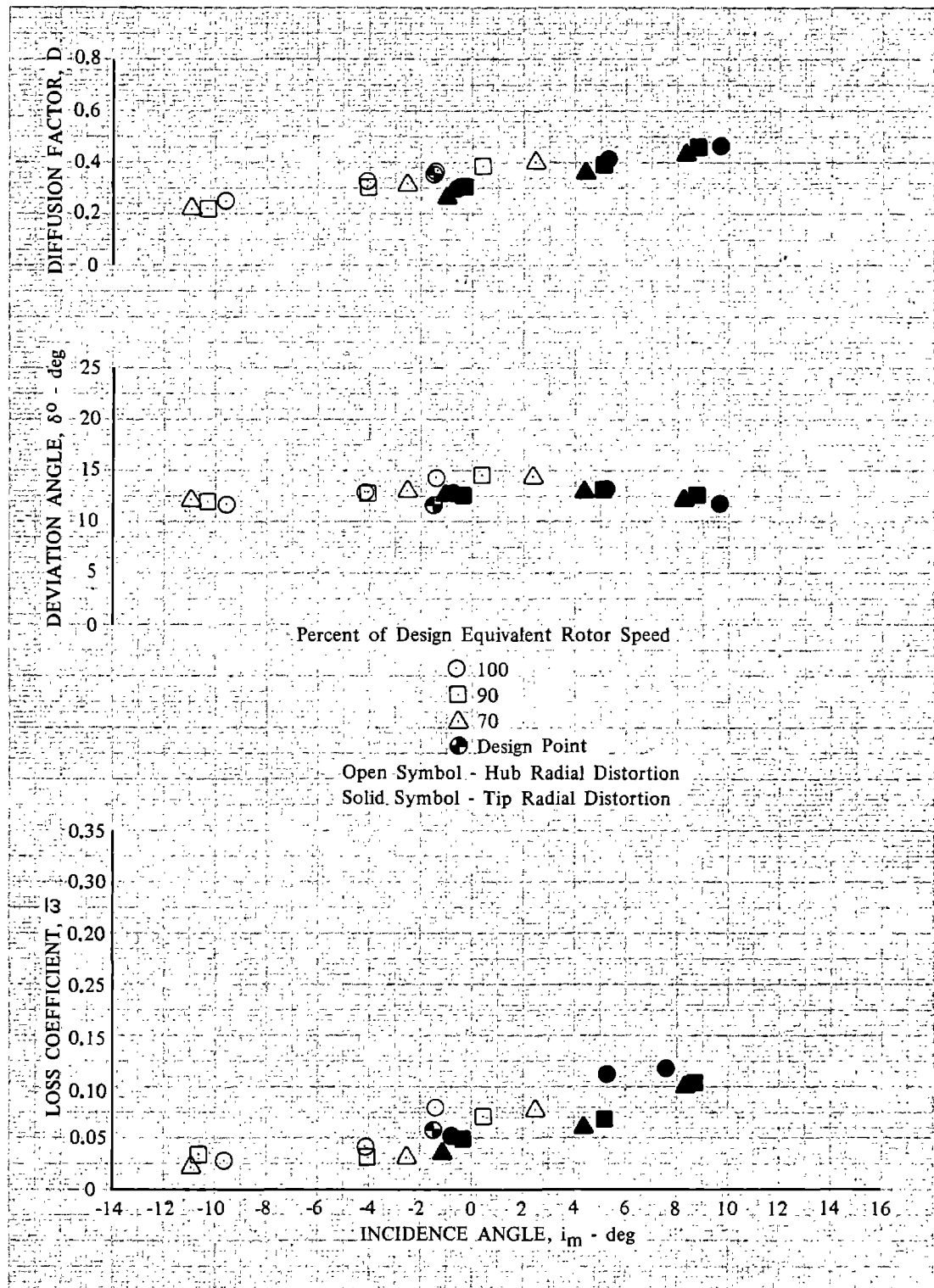
Figure 29d. Stator E Blade Element Performance;   DF 98116
30% Span From Tip; Hub and Tip Radial
Distortion
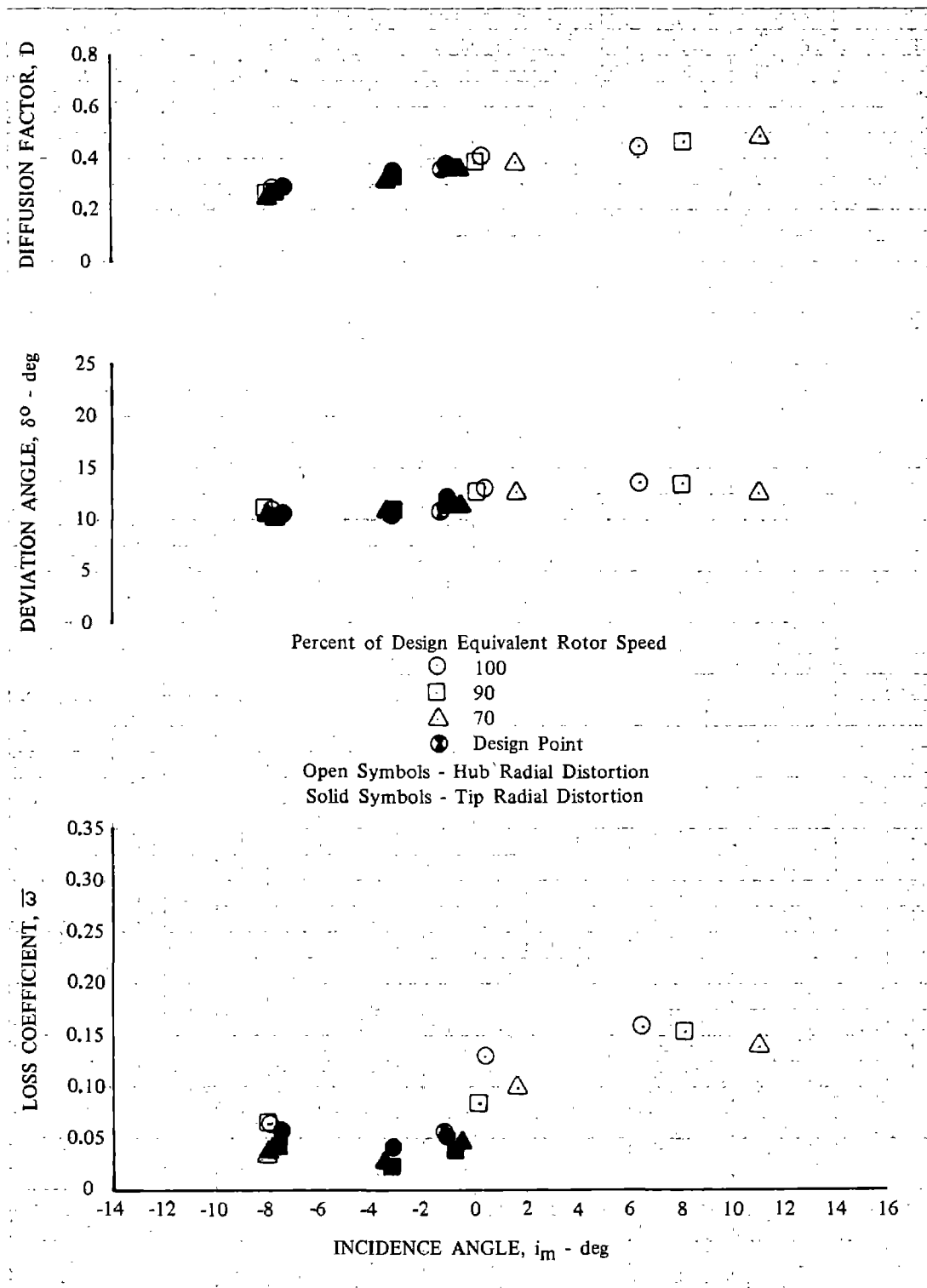
Figure 29e. Stator E Blade Element Performance;   DF 98117
50% Span; Hub and Tip Radial Distortion
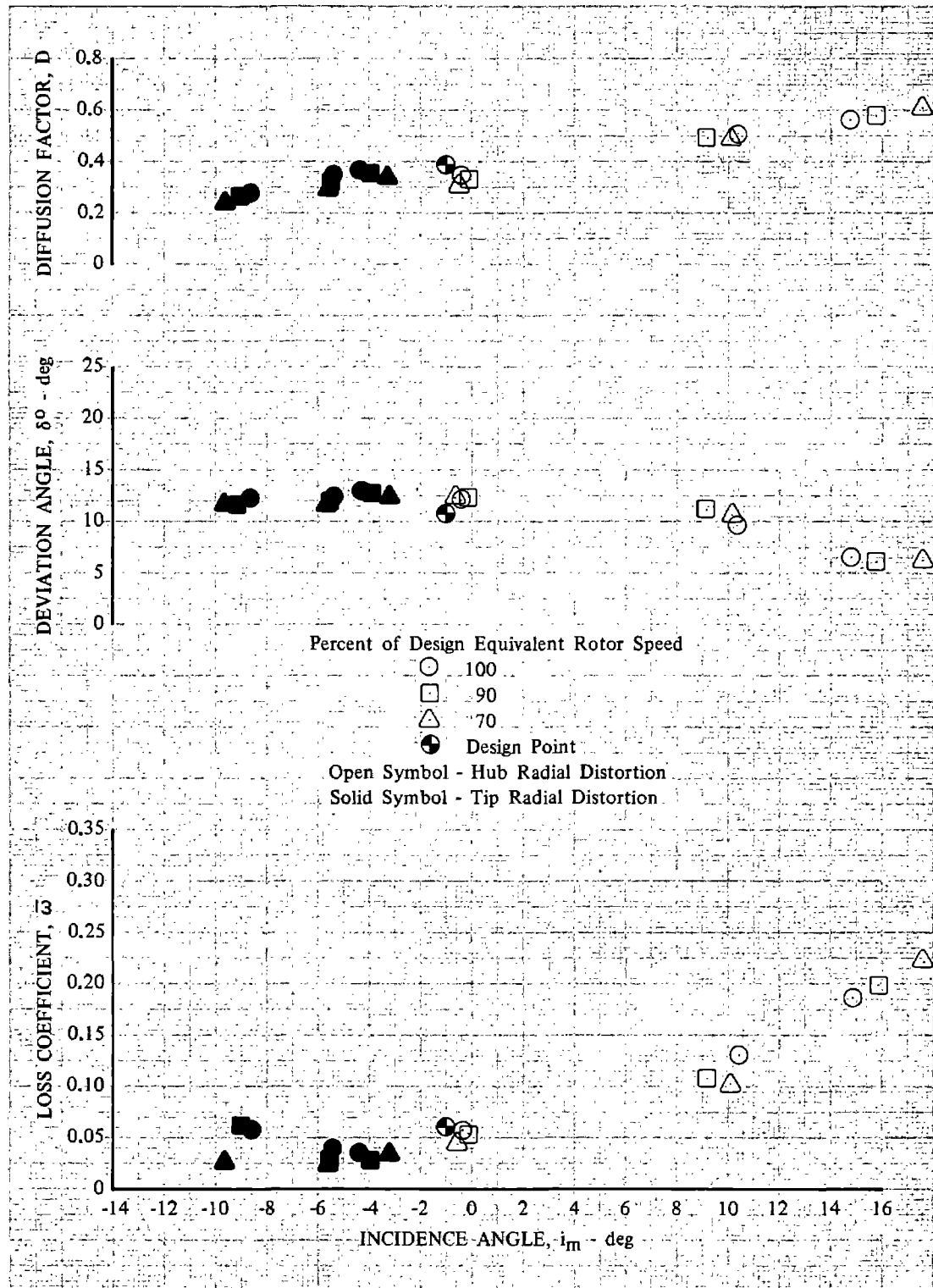
Figure 29f. Stator E Blade Element Performance; DF 98118
70% Span From Tip; Hub and Tip Radial
Distortion
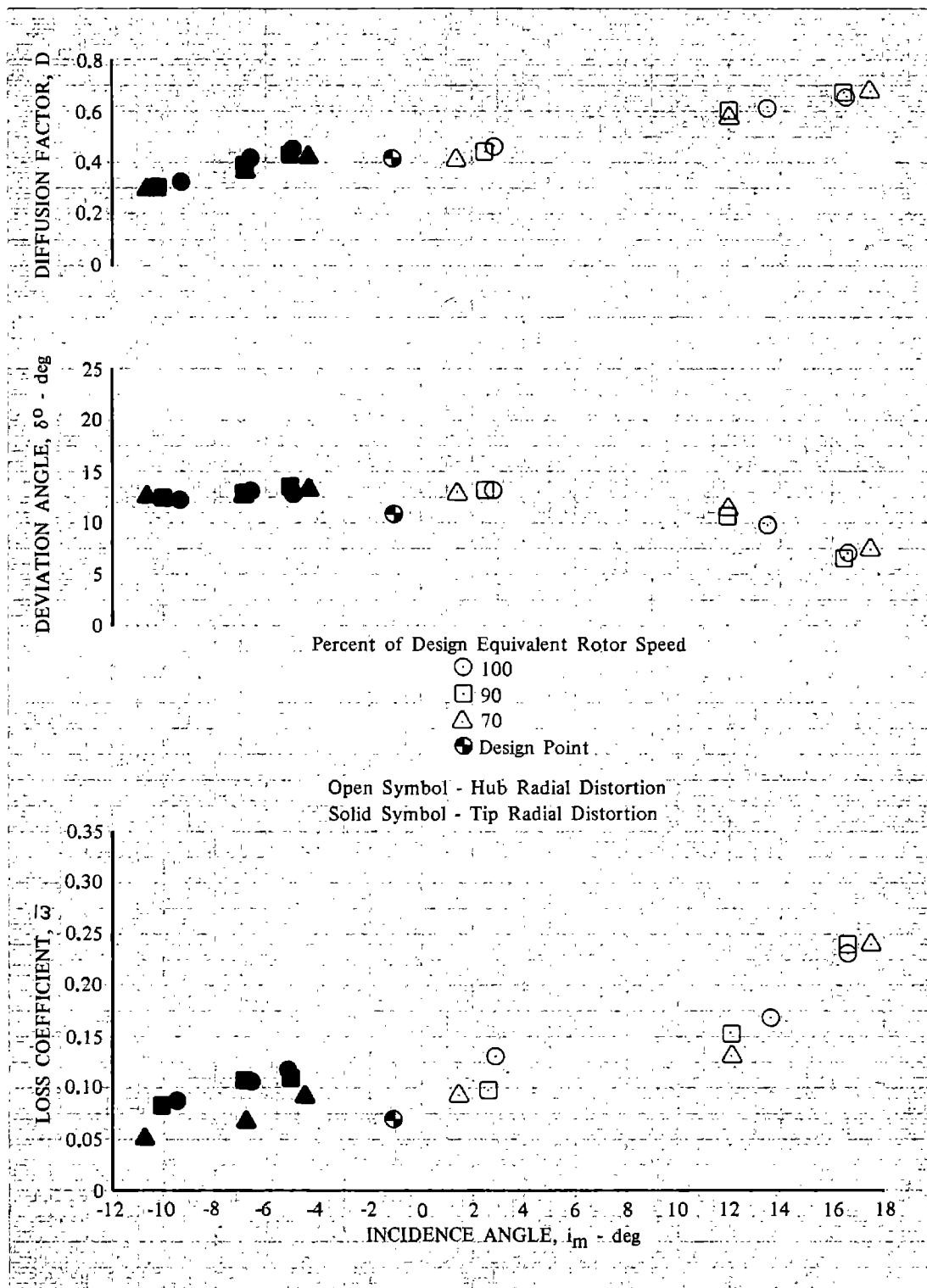
Figure 29g. Stator E Blade Element Performance;   DF 98119
              85% Span From Tip; Hub and Tip Radial
              Distortion
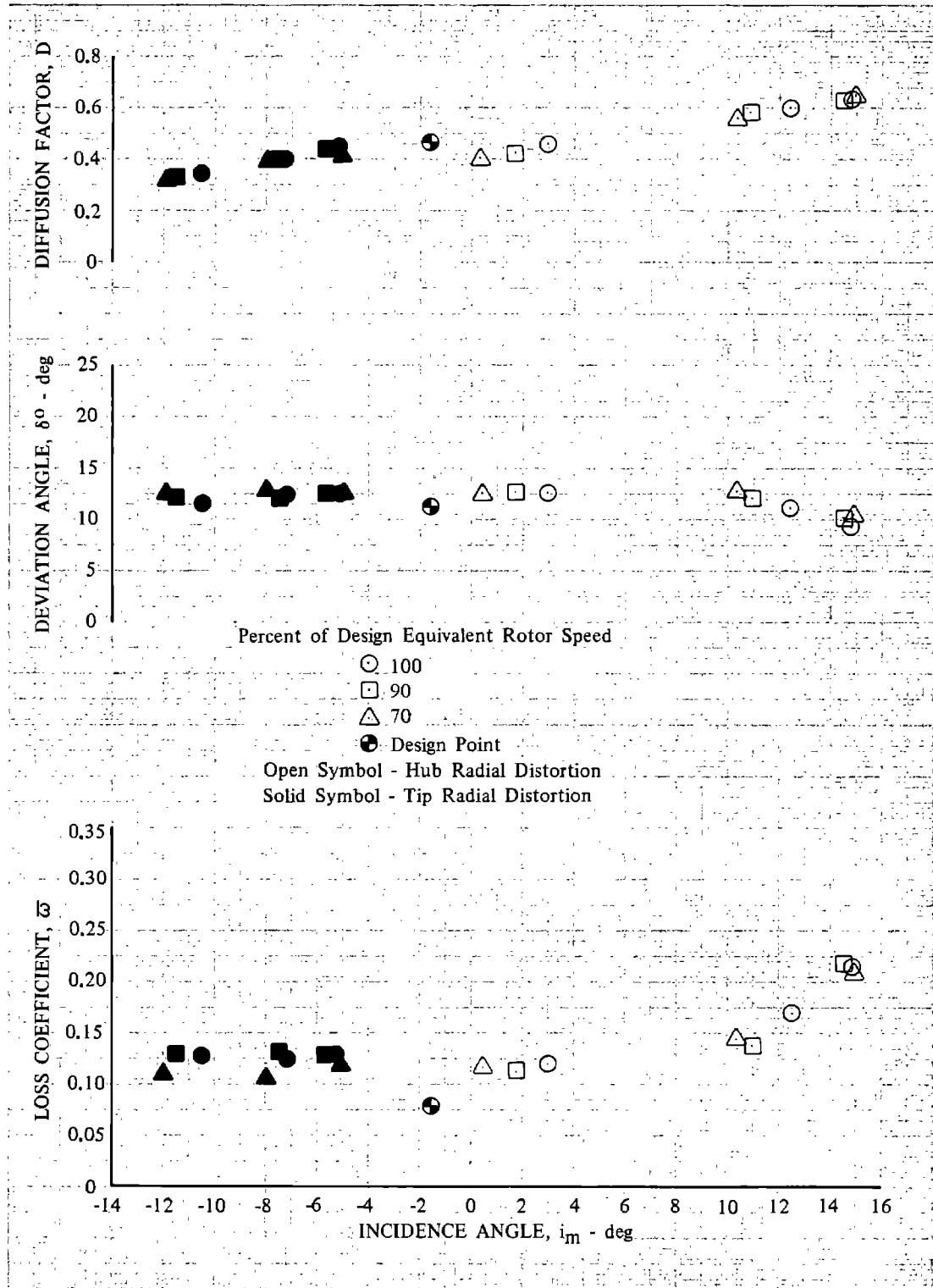
Figure 29h. Stator E Blade Element Performance; DF 98120
90% Span From Tip; Hub and Tip Radial
Distortion

DIFFUSION FACTOR, D

0.8
0.6
0.4
0.2
0

DEVIATION ANGLE, δ^o - deg

25
20
15
10
5
0

Percent of Design Equivalent Rotor Speed

○ 110
□ 90
△ 70
◉ Design Point

Open Symbols - Hub Radial Distortion
Solid Symbols - Tip Radial Distortion

LOSS COEFFICIENT, $\bar{\omega}$

0.35
0.30
0.25
0.20
0.15
0.10
0.05
0

-16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14

INCIDENCE ANGLE, i_m - deg
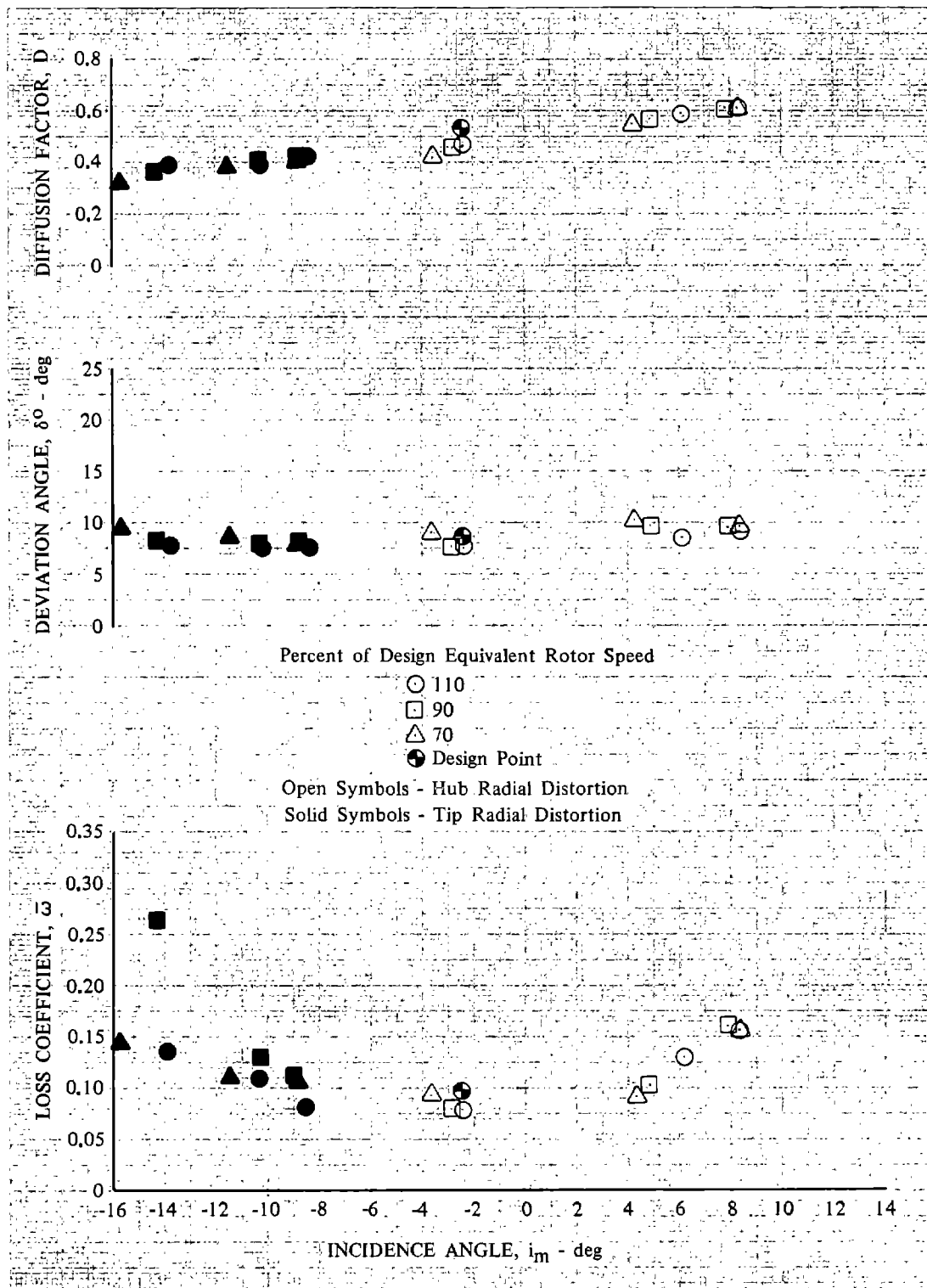
Figure 29i. Stator E Blade Element Performance;
95% Span From Tip; Hub and Tip Radial
Distortion

DF 98121
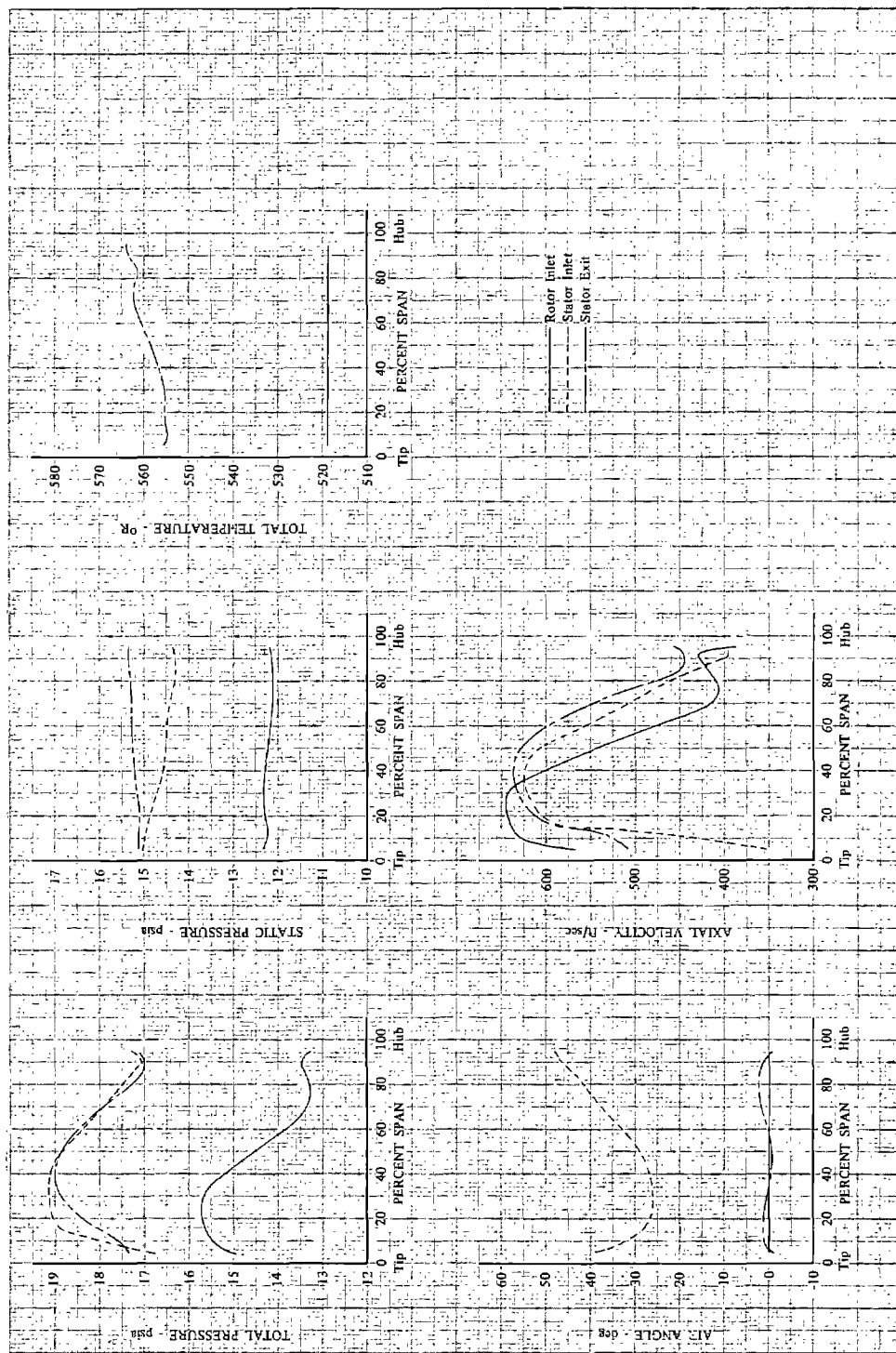
Figure 30a. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 114.81 lb/sec; Hub Radial Distortion
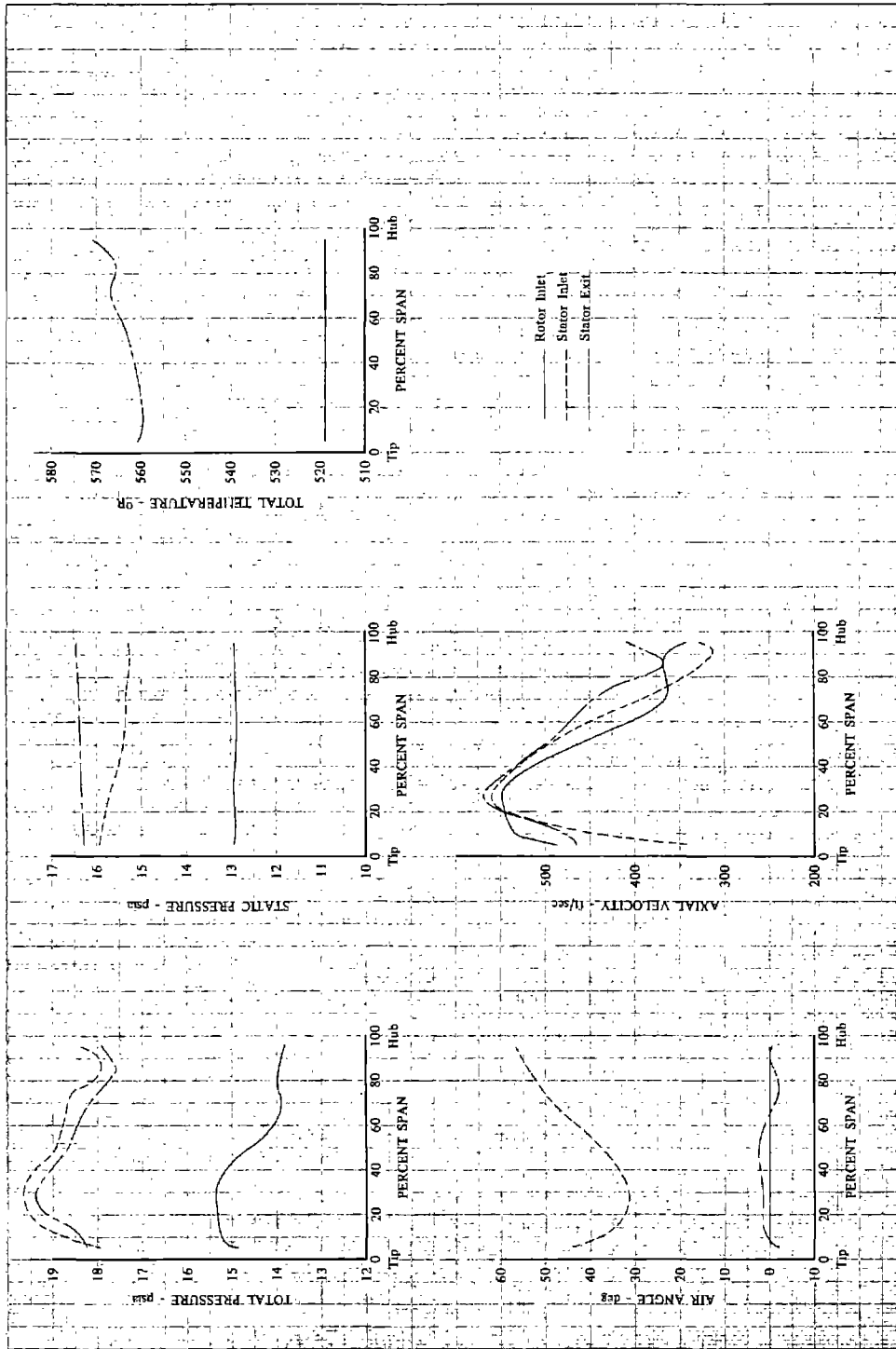
Figure 30b. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 100.63 lb/sec; Hub Radial Distortion
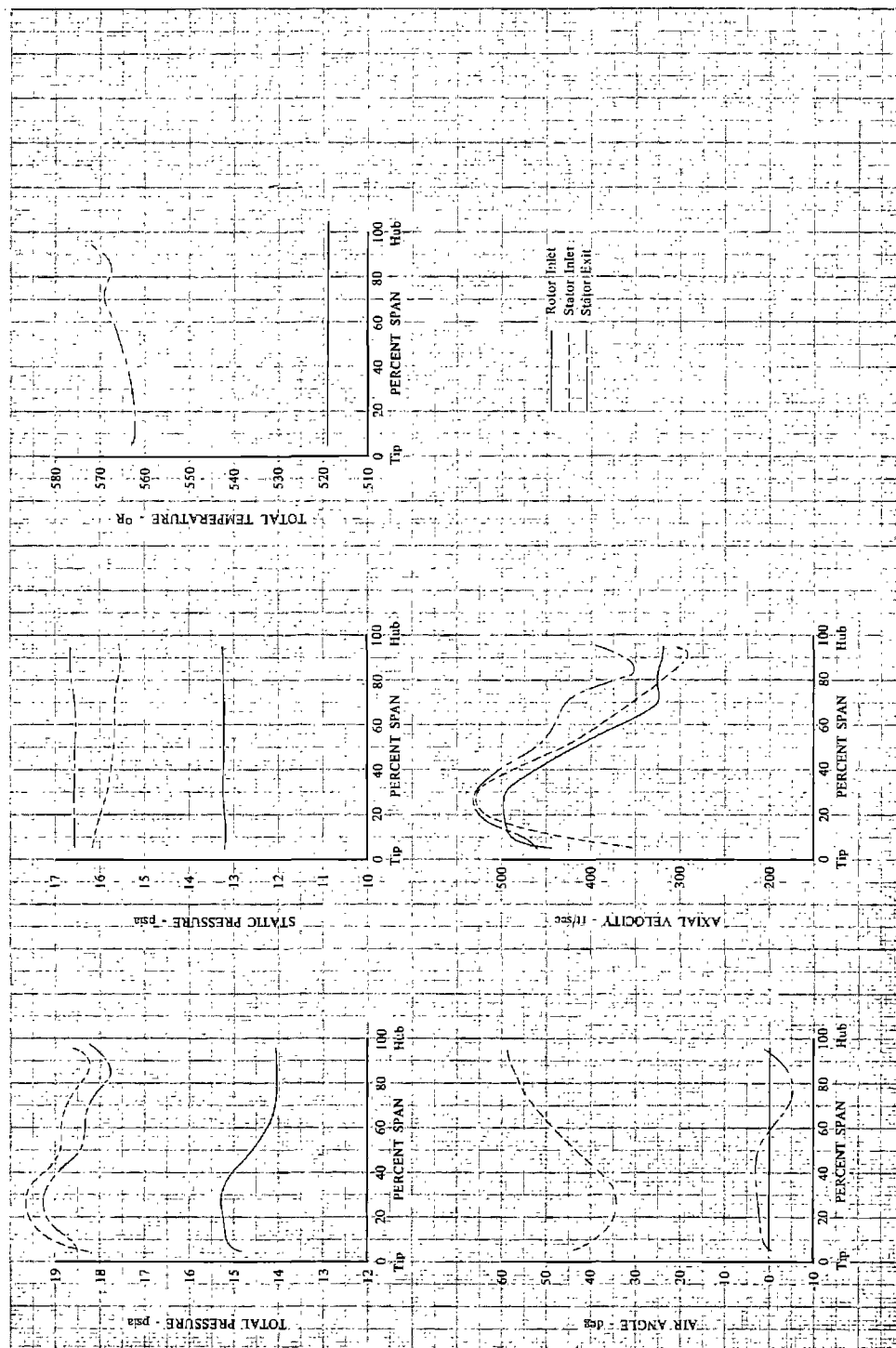
Figure 30c. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 93.49 lb/sec; Hub Radial Distortion

DF 98124

98
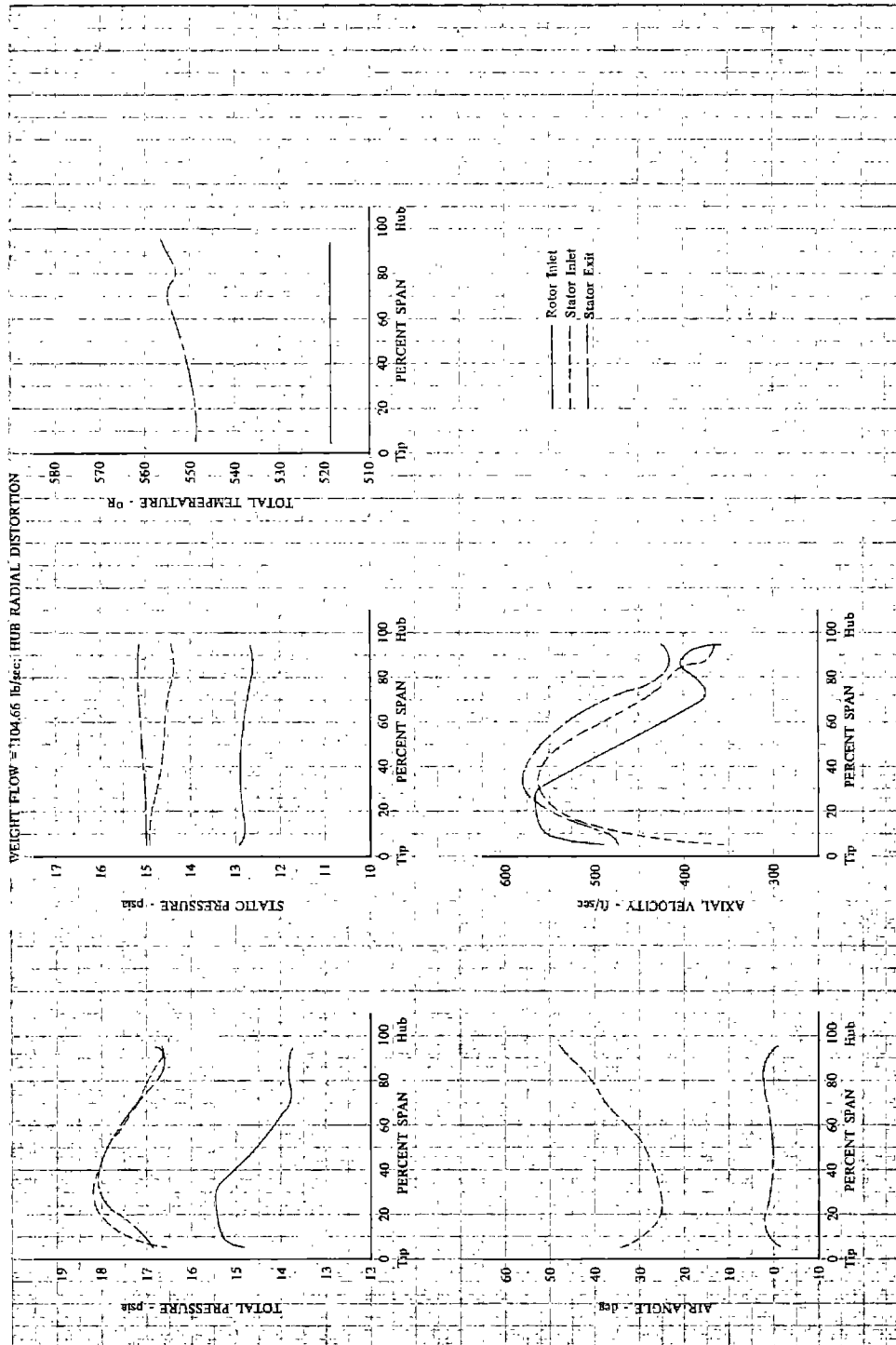
Figure 31a. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 104.66 lb/sec; Hub Radial Distortion

DF 98125

99
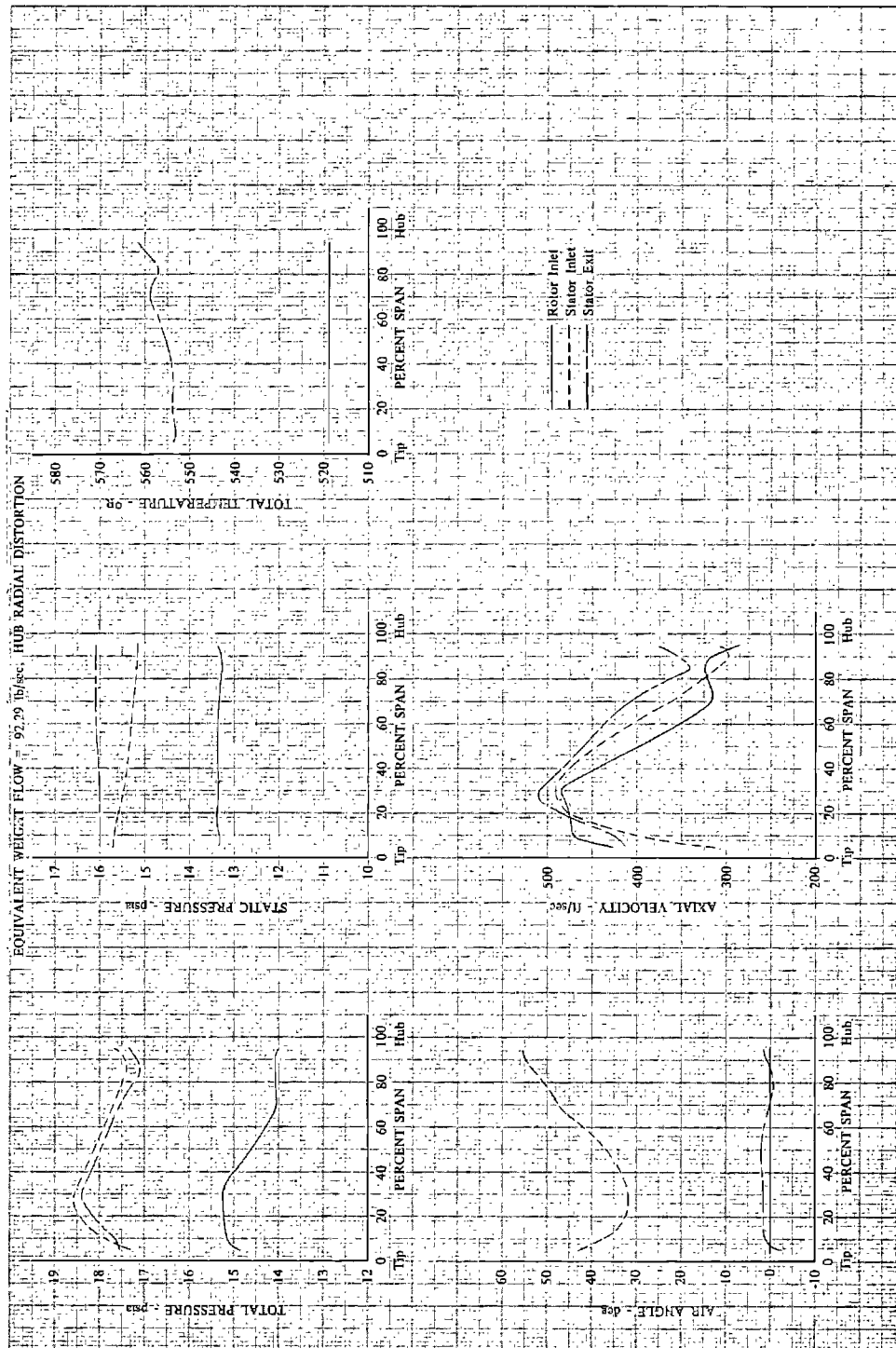
Figure 31b. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.29 lb/sec; Hub Radial Distortion

100
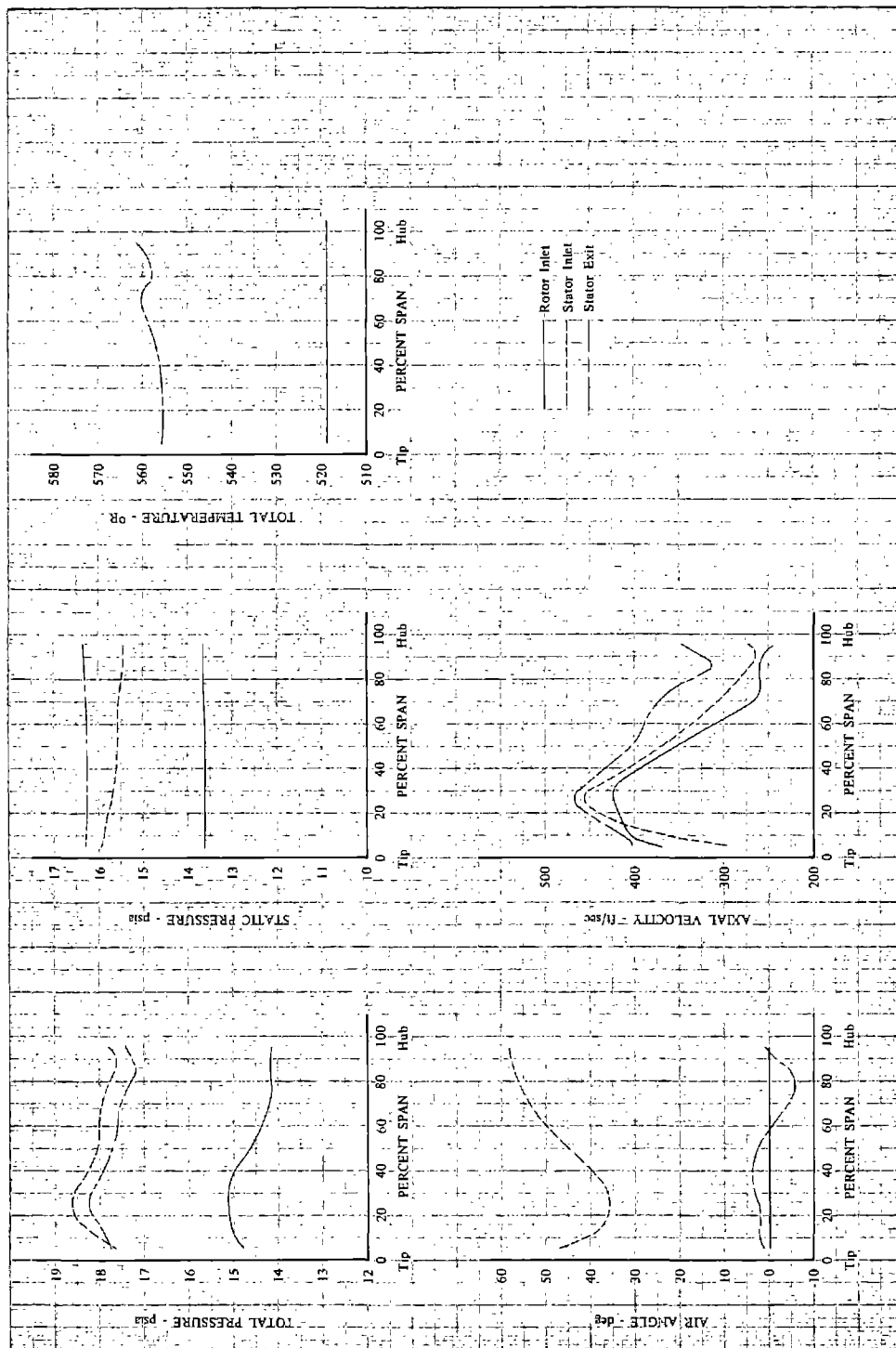
Figure 31c. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 82.24 lb/sec; Hub Radial Distortion

DF 98127

101
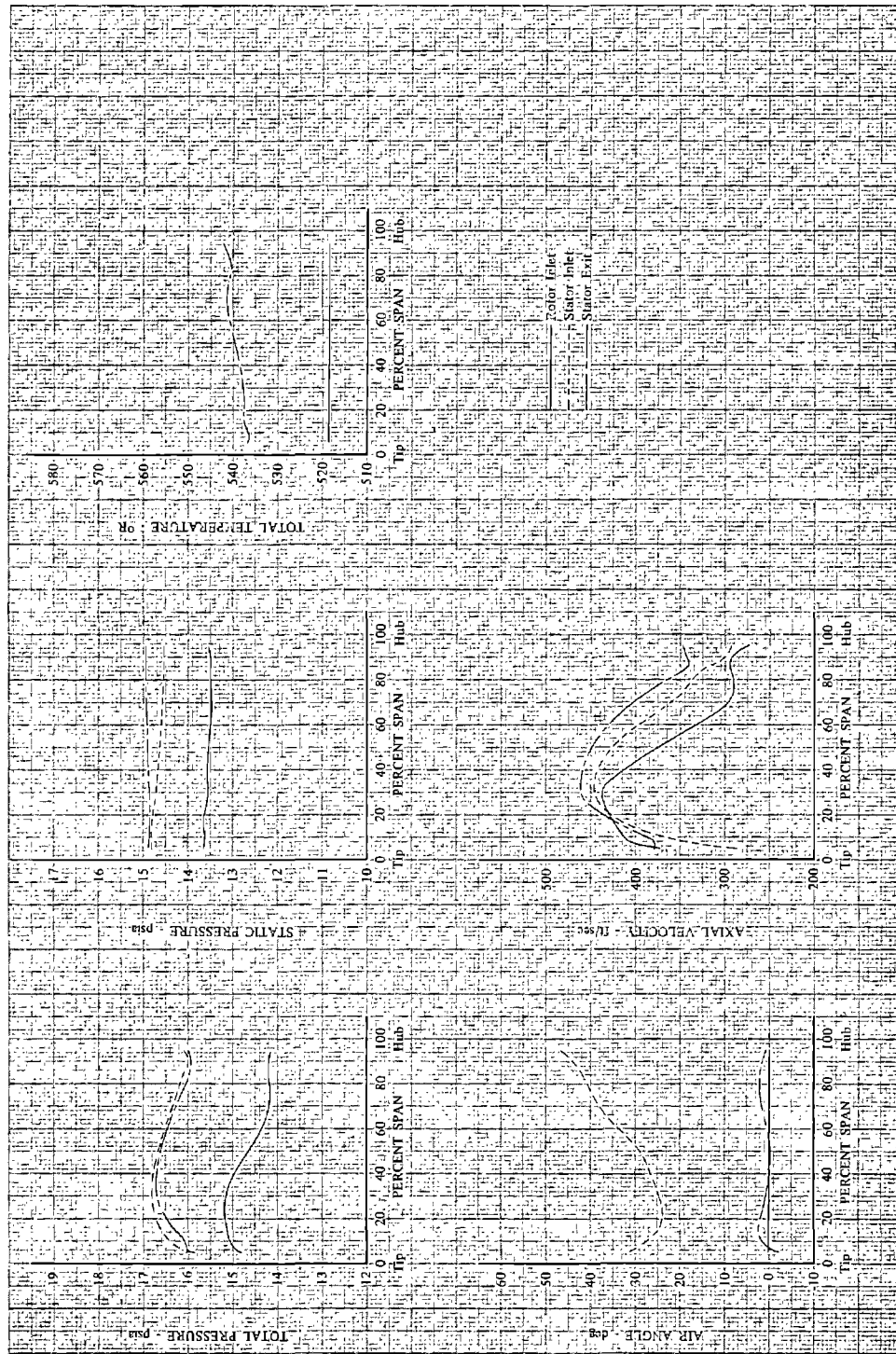
Figure 32a.   Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity
vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 70% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 83.81 lb/sec; Hub Radial Distortion

DF 98128

102
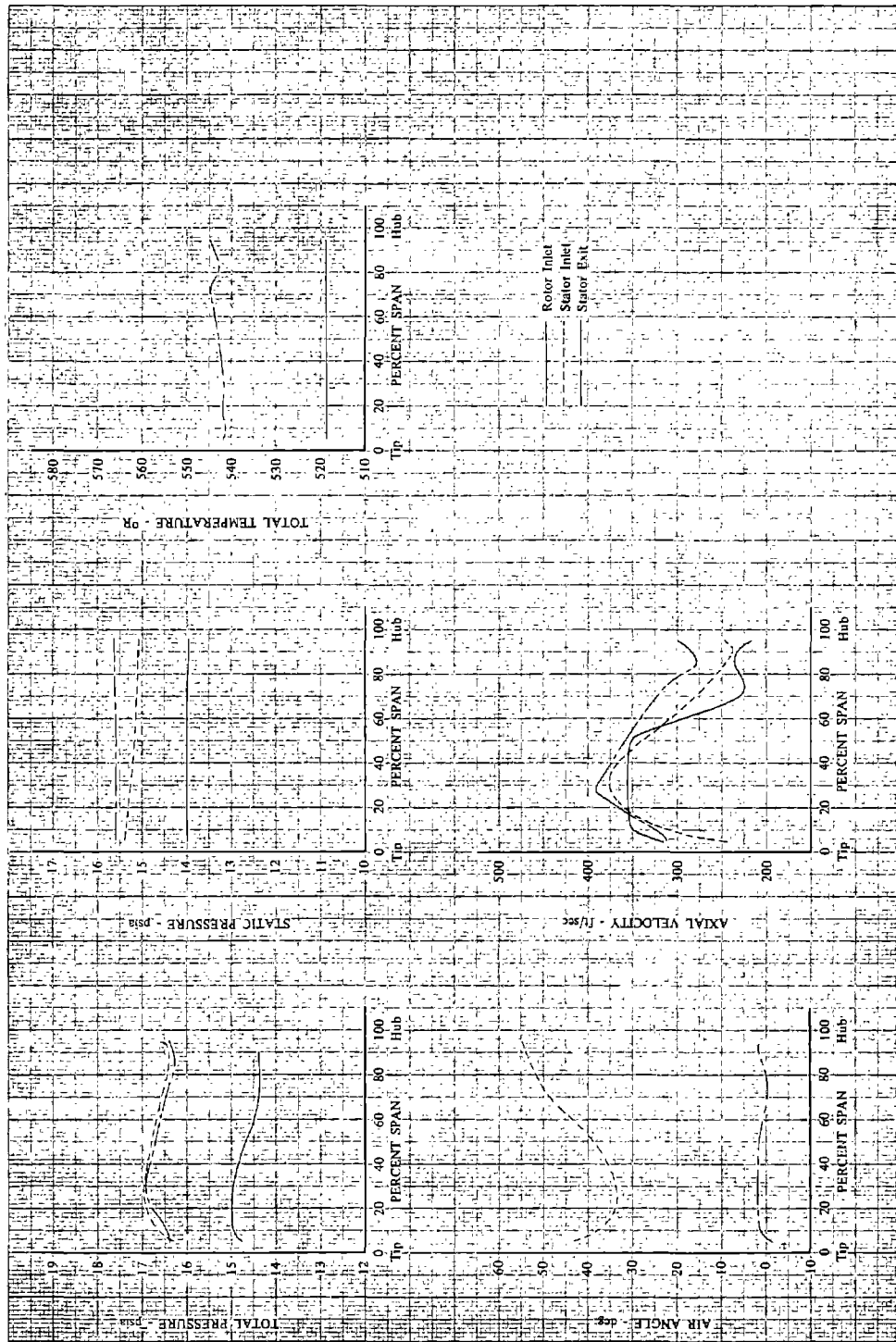
Figure 32b. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 70% Design Equivalent Rotor Speed; Equivalent Weight Flow = 70.40 lb/sec; Hub Radial Distortion

DF 98129

103
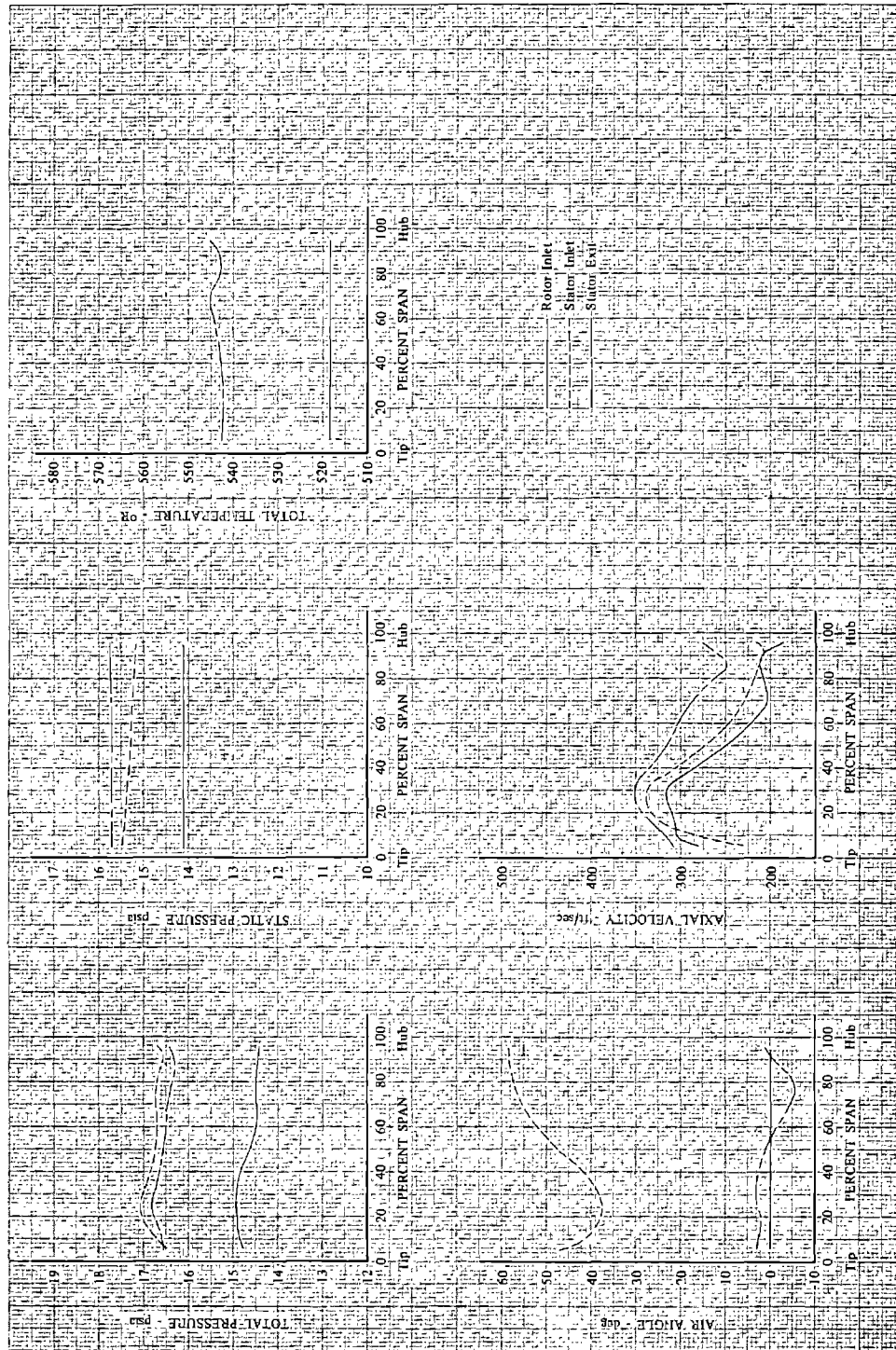
Figure 32c. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 70% Design Equivalent Rotor Speed; Equivalent Weight Flow = 61.83 lb/sec; Hub Radial Distortion

DF 98130

104
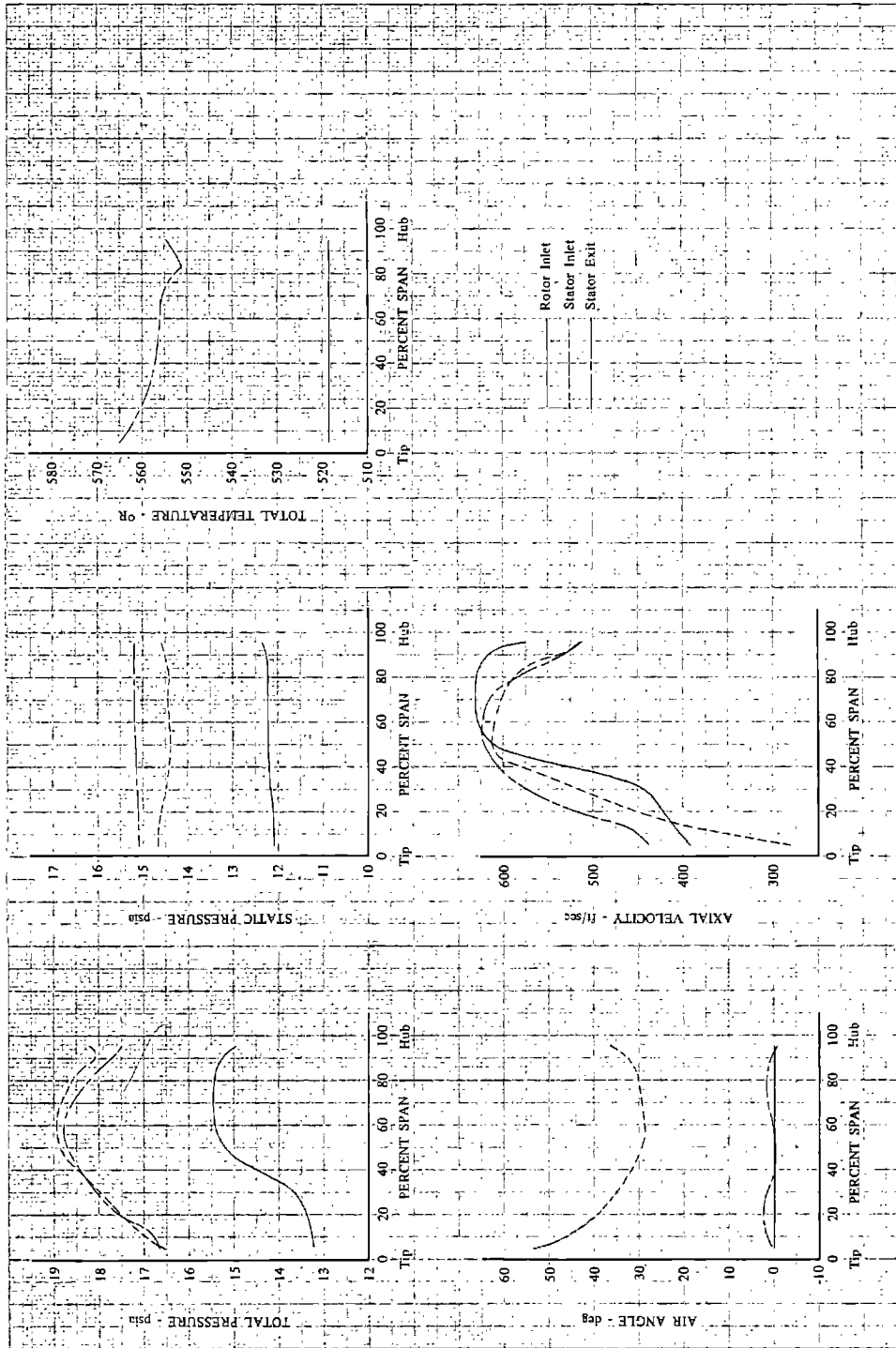
Figure 33a. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 114.99 lb/sec; Tip Radial Distortion

DF 98131
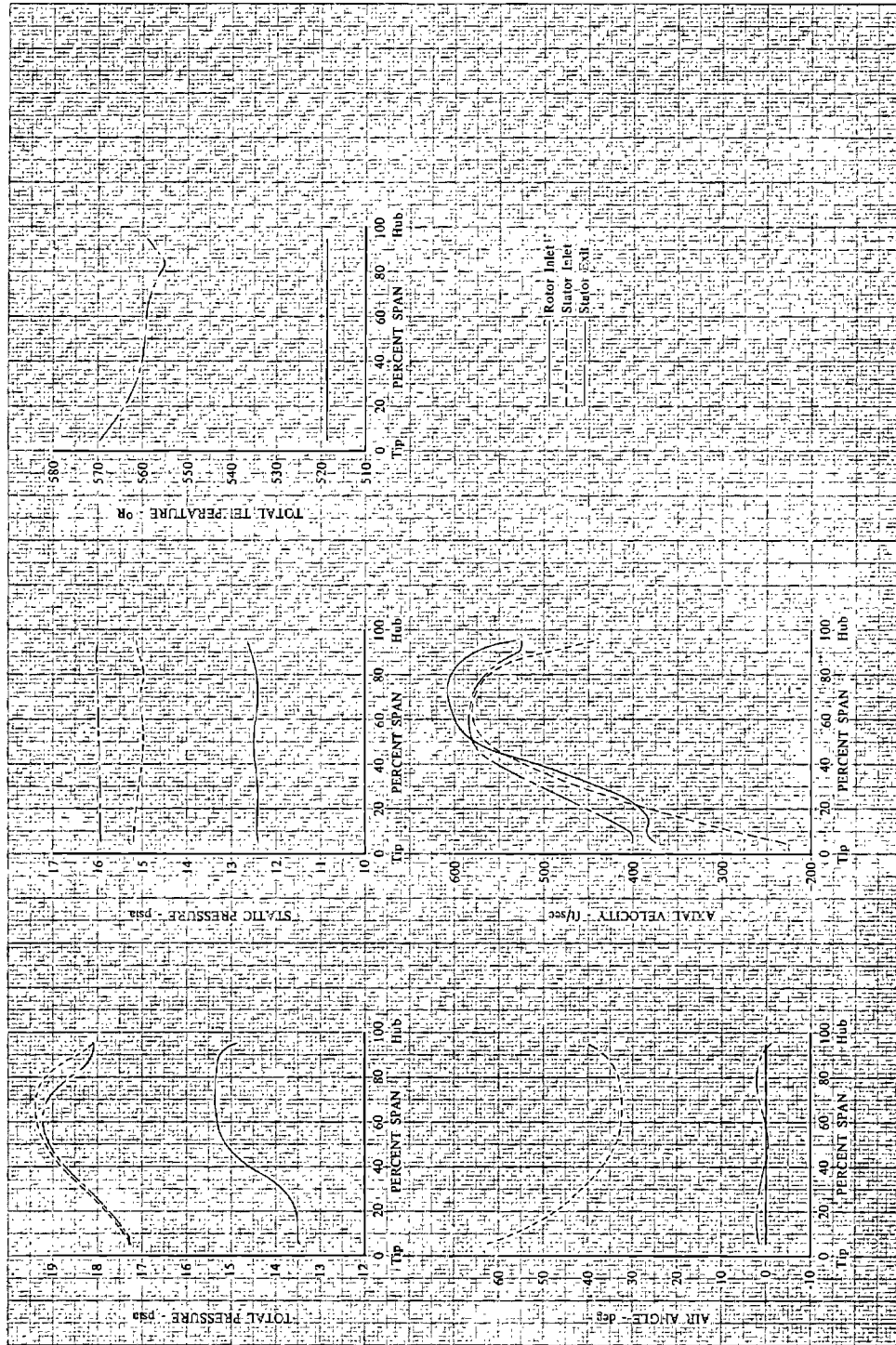
Figure 33b. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 109.16 lb/sec; Tip Radial Distortion

DF 98132

106
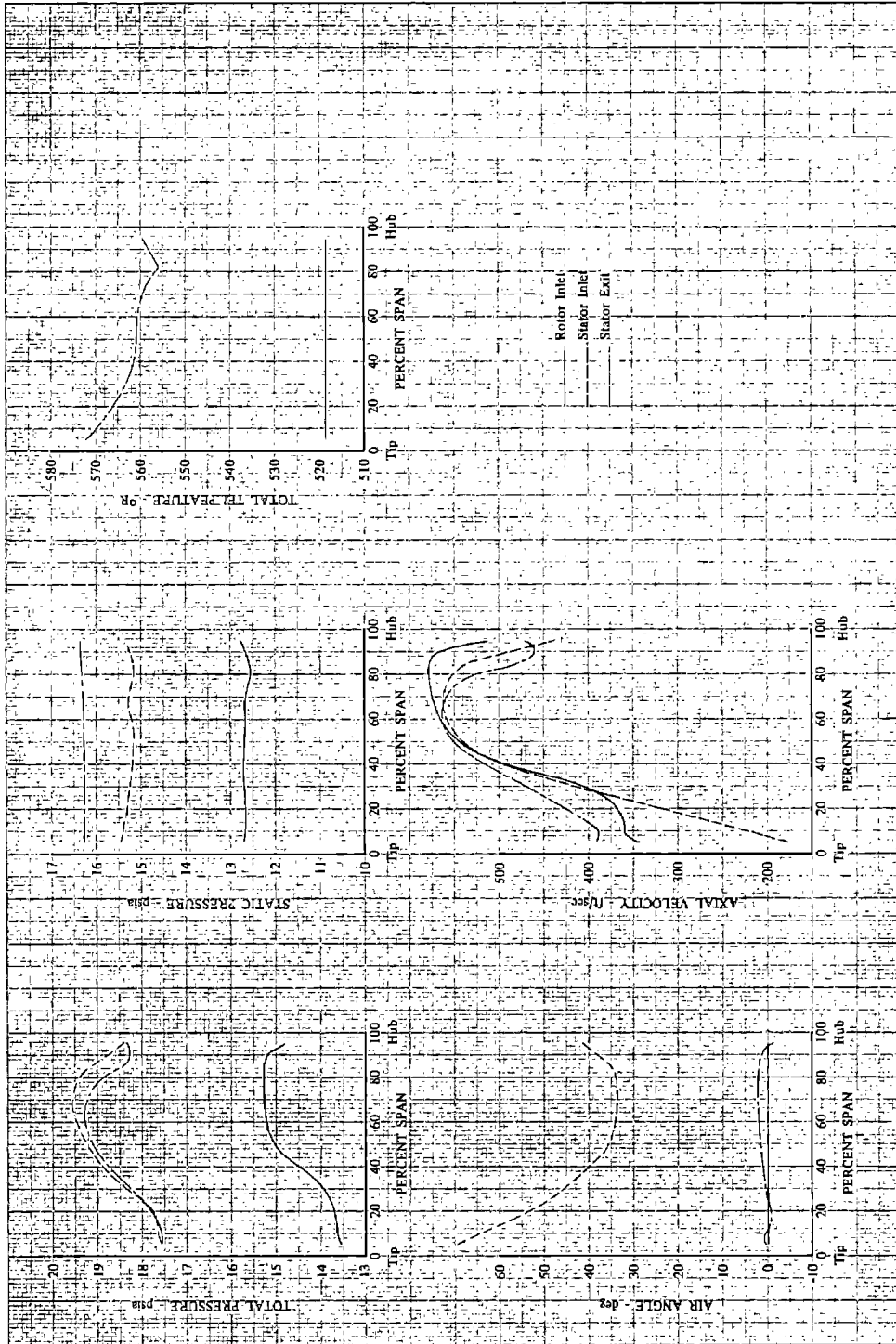
Figure 33c. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 103.95 lb/sec; Tip Radial Distortion

DF 98133

107
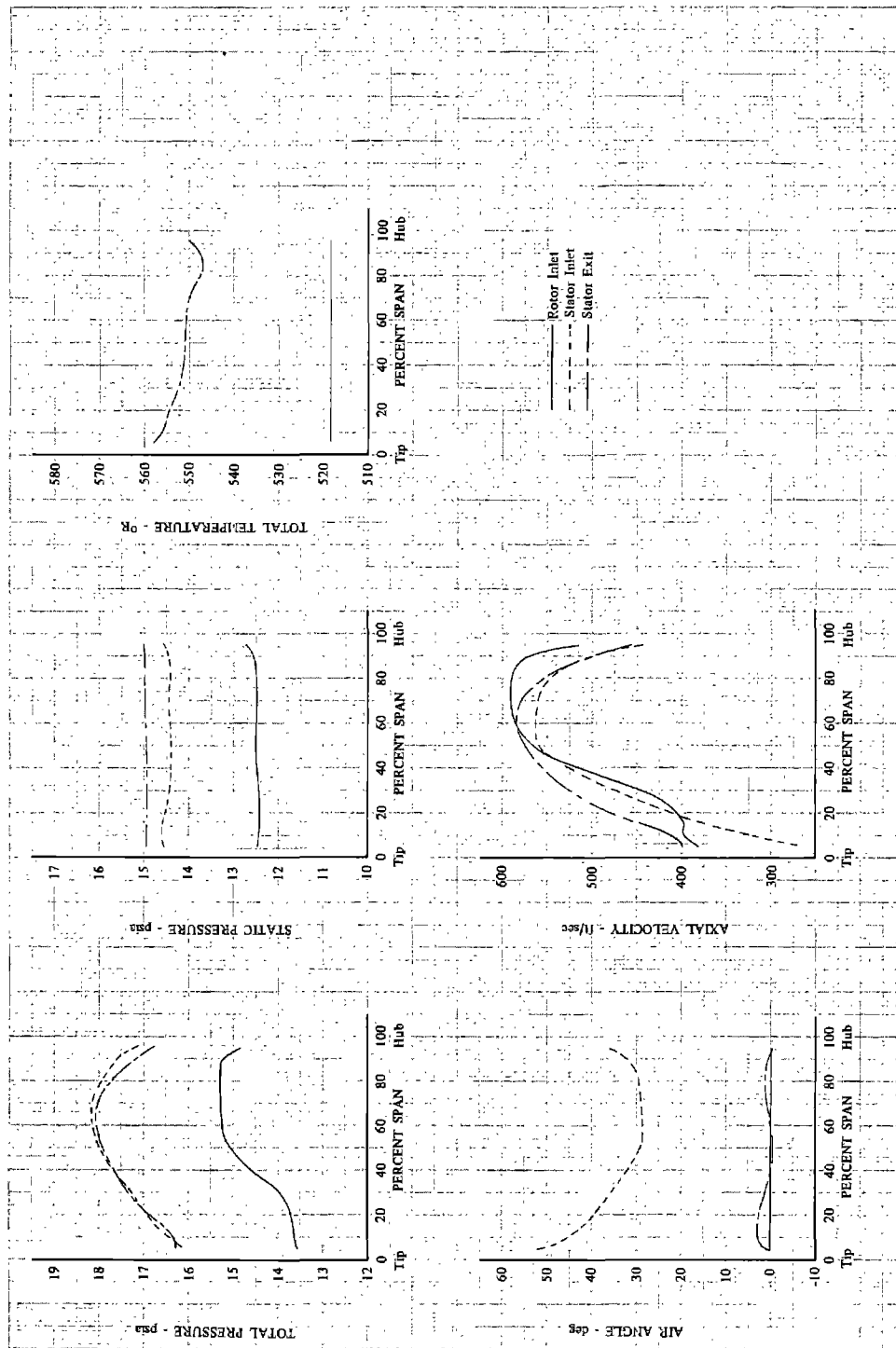
Figure 34a.   Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity
vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 90% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 105. 22 lb/sec; Tip Radial Distortion
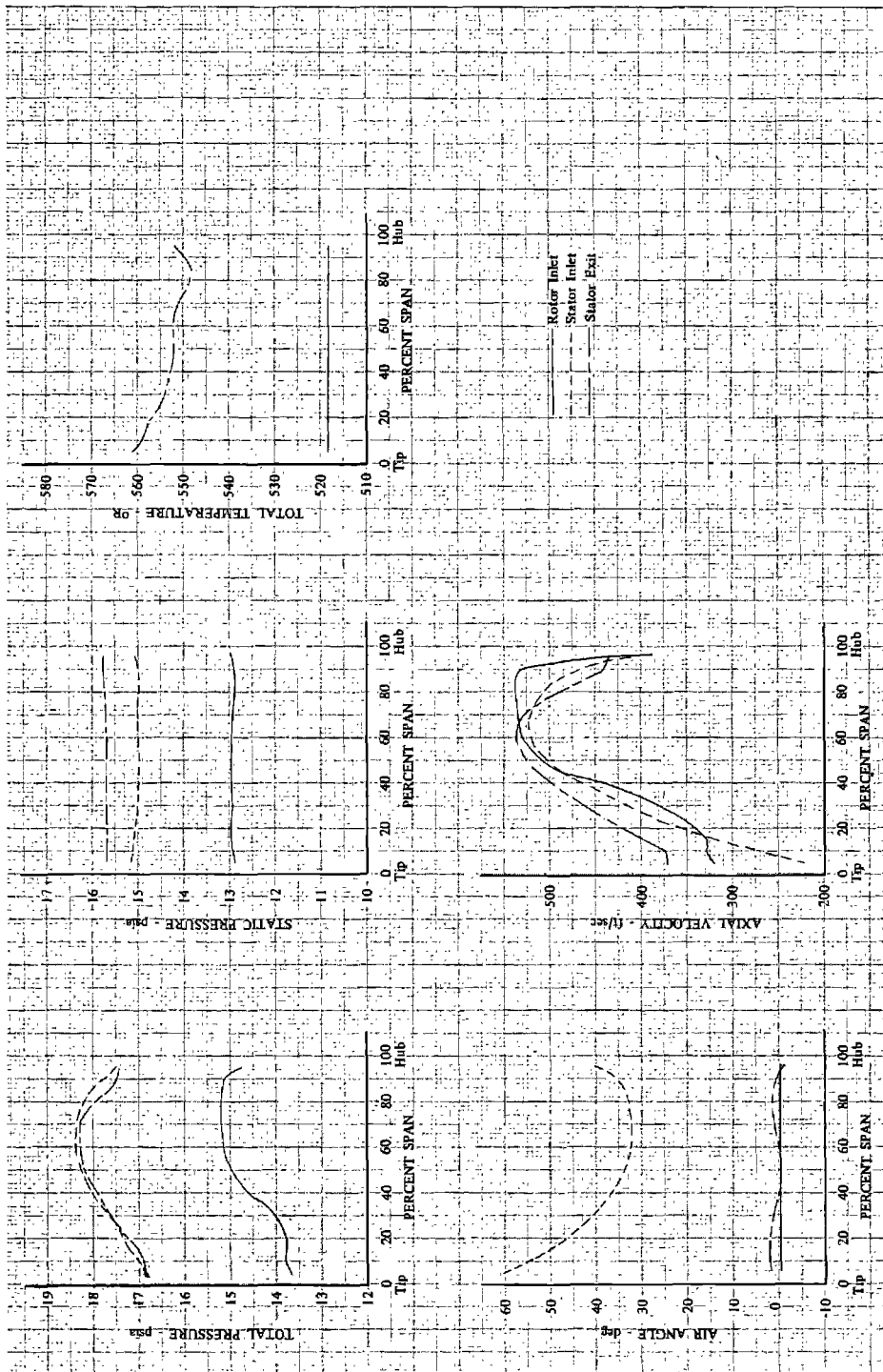
Figure 34b. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 99.16 lb/sec; Tip Radial Distortion

DF 98135

109
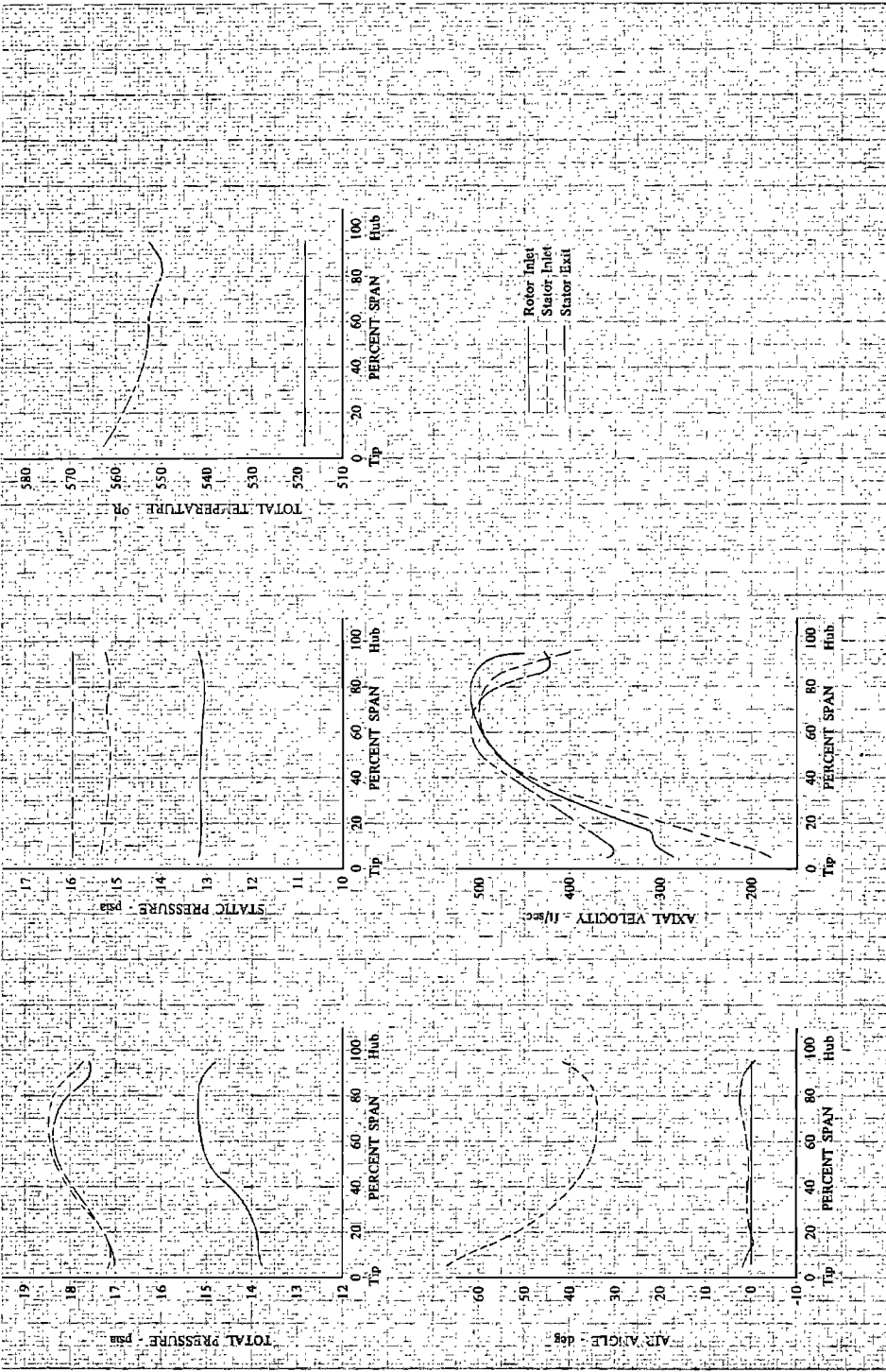
Figure 34c. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 94.04 lb/sec; Tip Radial Distortion

DF 98136

110
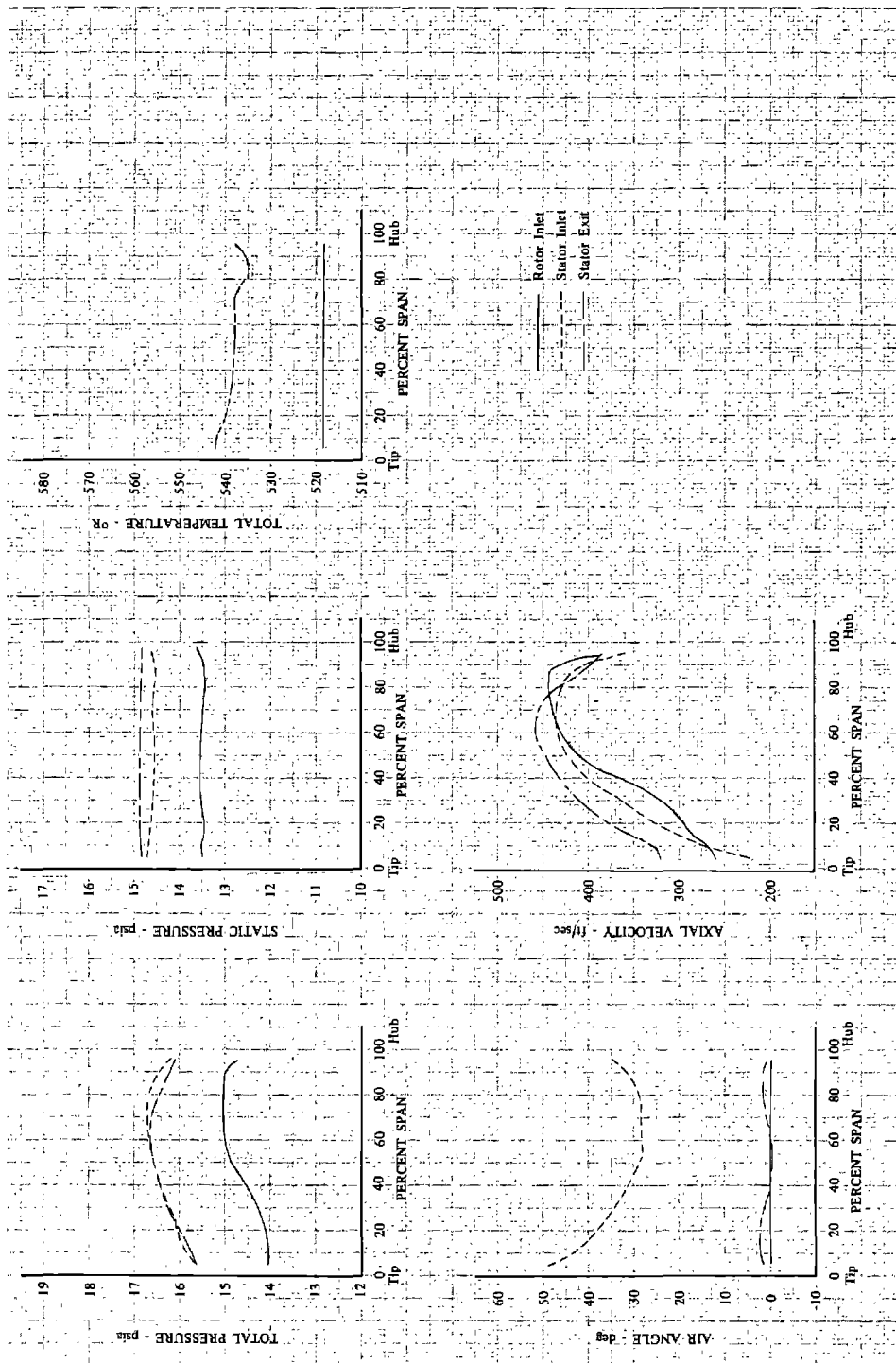
Figure 35a. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 70% Design Equivalent Rotor Speed; Equivalent Weight Flow = 82.97 lb/sec; Tip Radial Distortion

DF 98137

111
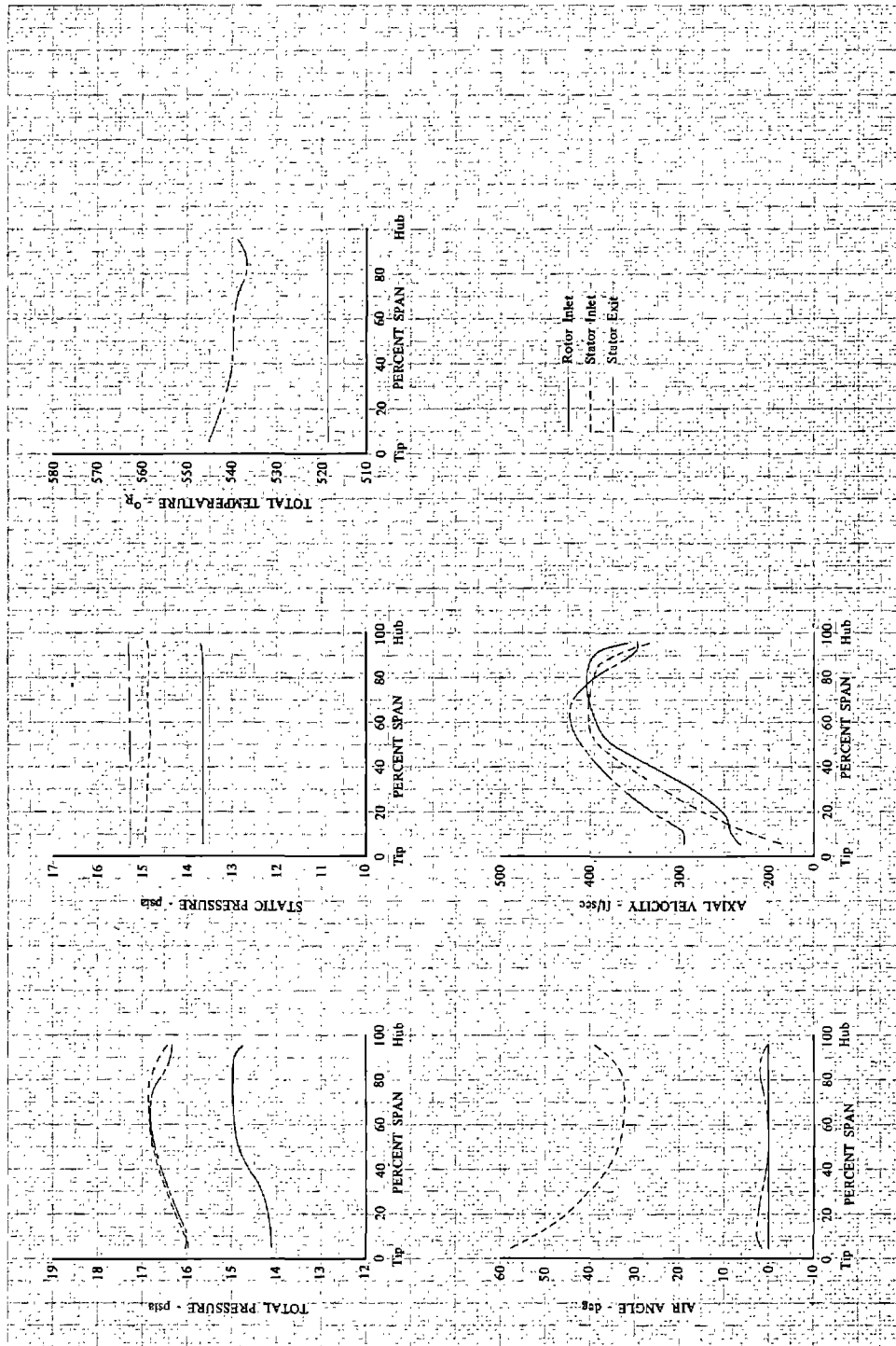
Figure 35b. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 70% Design Equivalent Rotor Speed; Equivalent Weight Flow = 77.98 lb/sec; Tip Radial Distortion

DF 98138

112
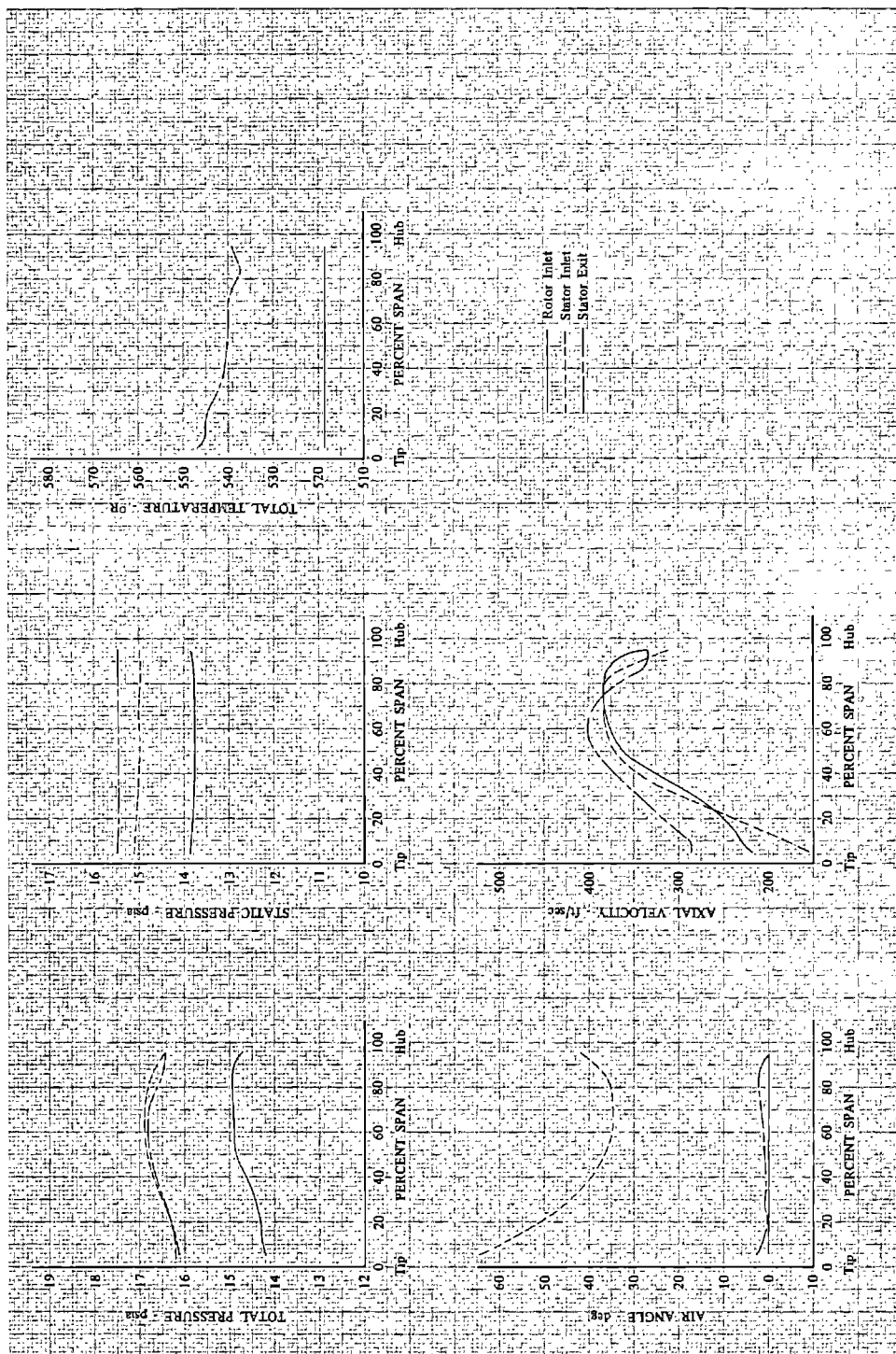
Figure 35c. Total and Static Pressure, Total Temperature, Air Angle and Axial Velocity vs Span at Rotor Inlet, Stator Inlet and Stator Exit; 70% Design Equivalent Rotor Speed; Equivalent Weight Flow = 71.91 lb/sec; Tip Radial Distortion

DF 98139

113
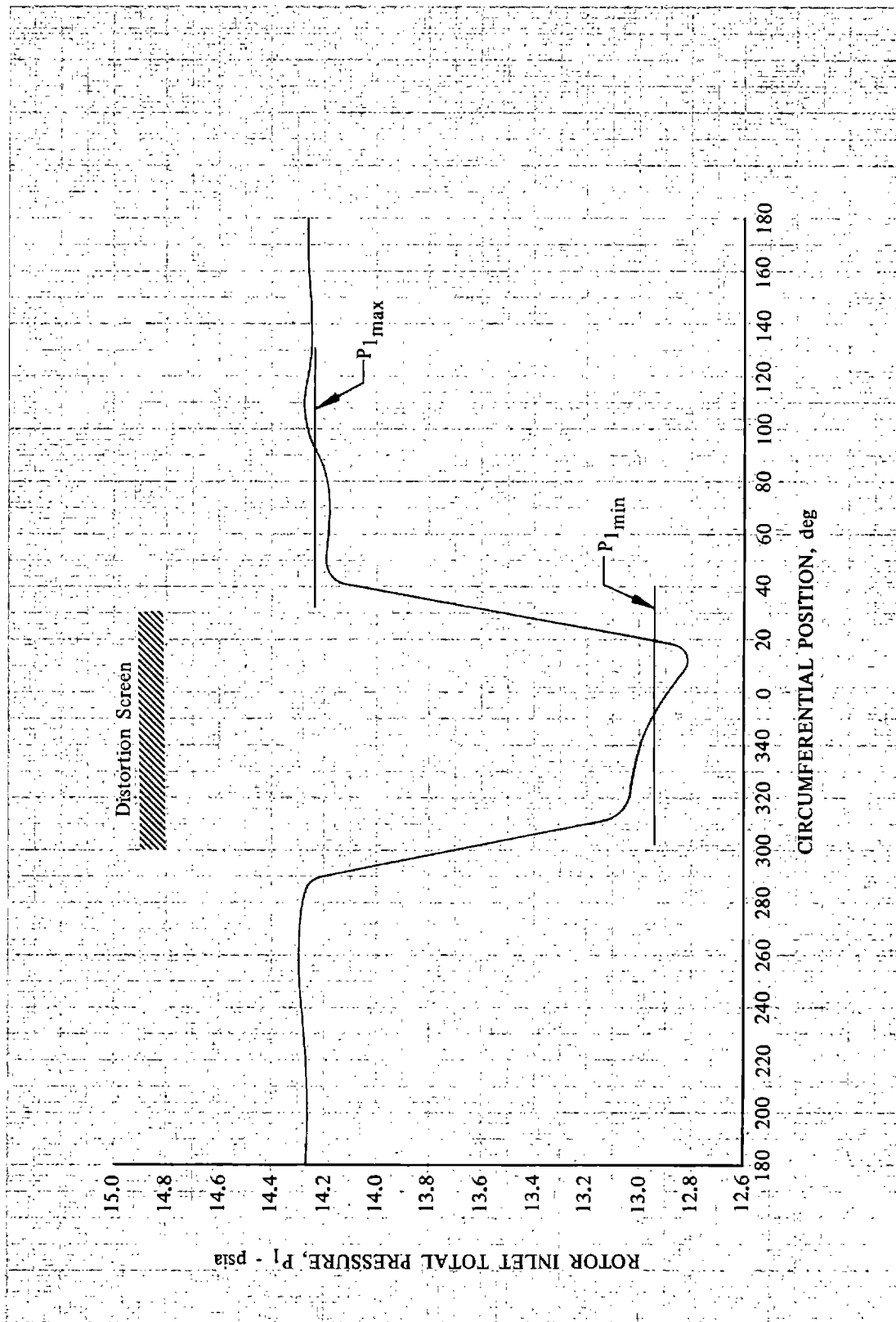
Figure 36. Typical Rotor Inlet Total Pressure Distribution with Circumferential Distortion;
100% Design Equivalent Rotor Speed; 94.0% Design Equivalent Flow (103.40 lb/sec);
50% Span
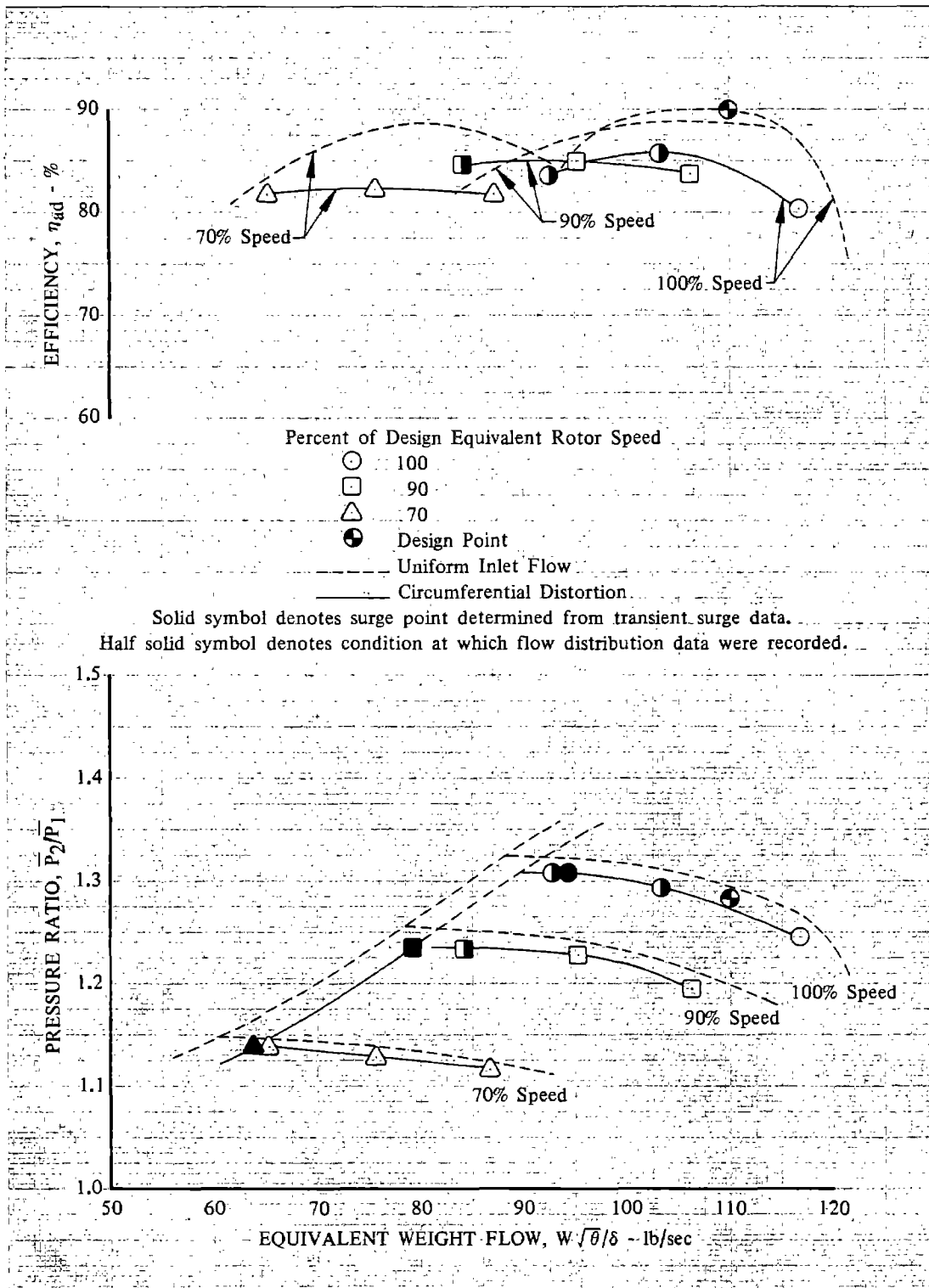
Figure 37. Overall Performance of Rotor E; Circum-   DF 98227
ferential Distortion Compared With Uniform
Inlet Flow
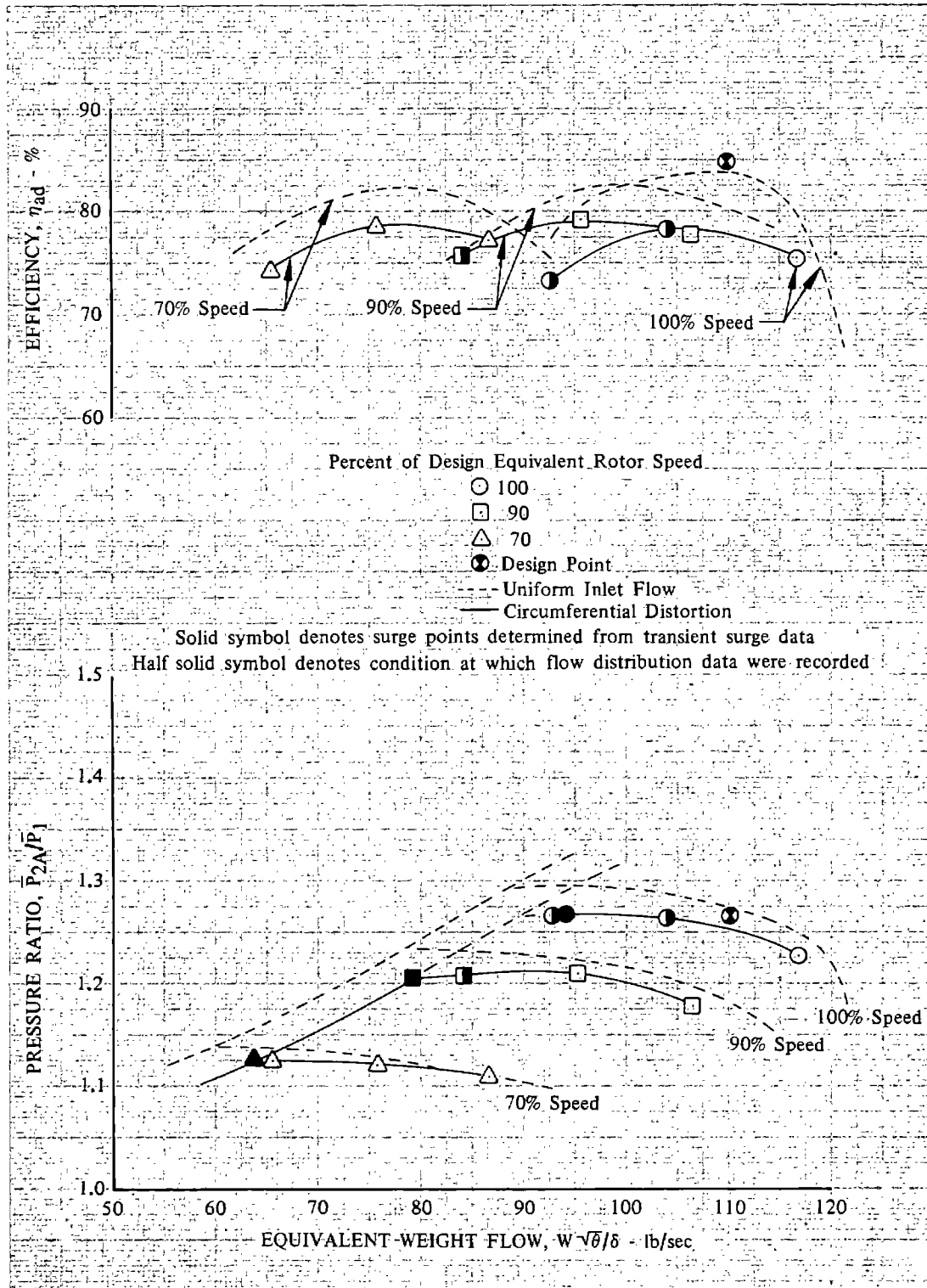
Figure 38. Overall Performance of Stage E; Circum-
ferential Distortion Compared With Uniform
Inlet Flow

DF 98228

116
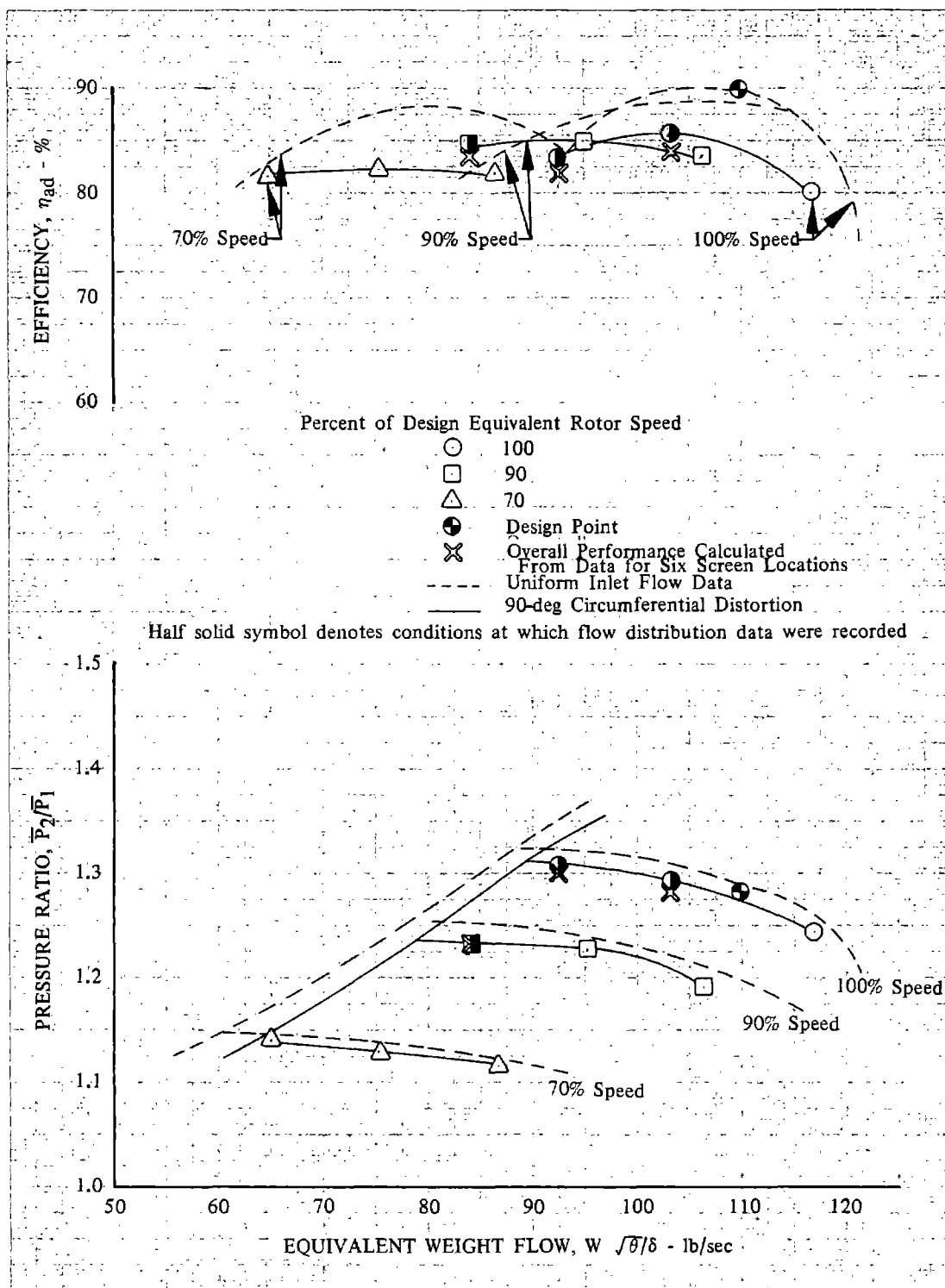
Figure 39.   Overall Performance of Rotor E With Circum-   DF 98229
ferential Distortion
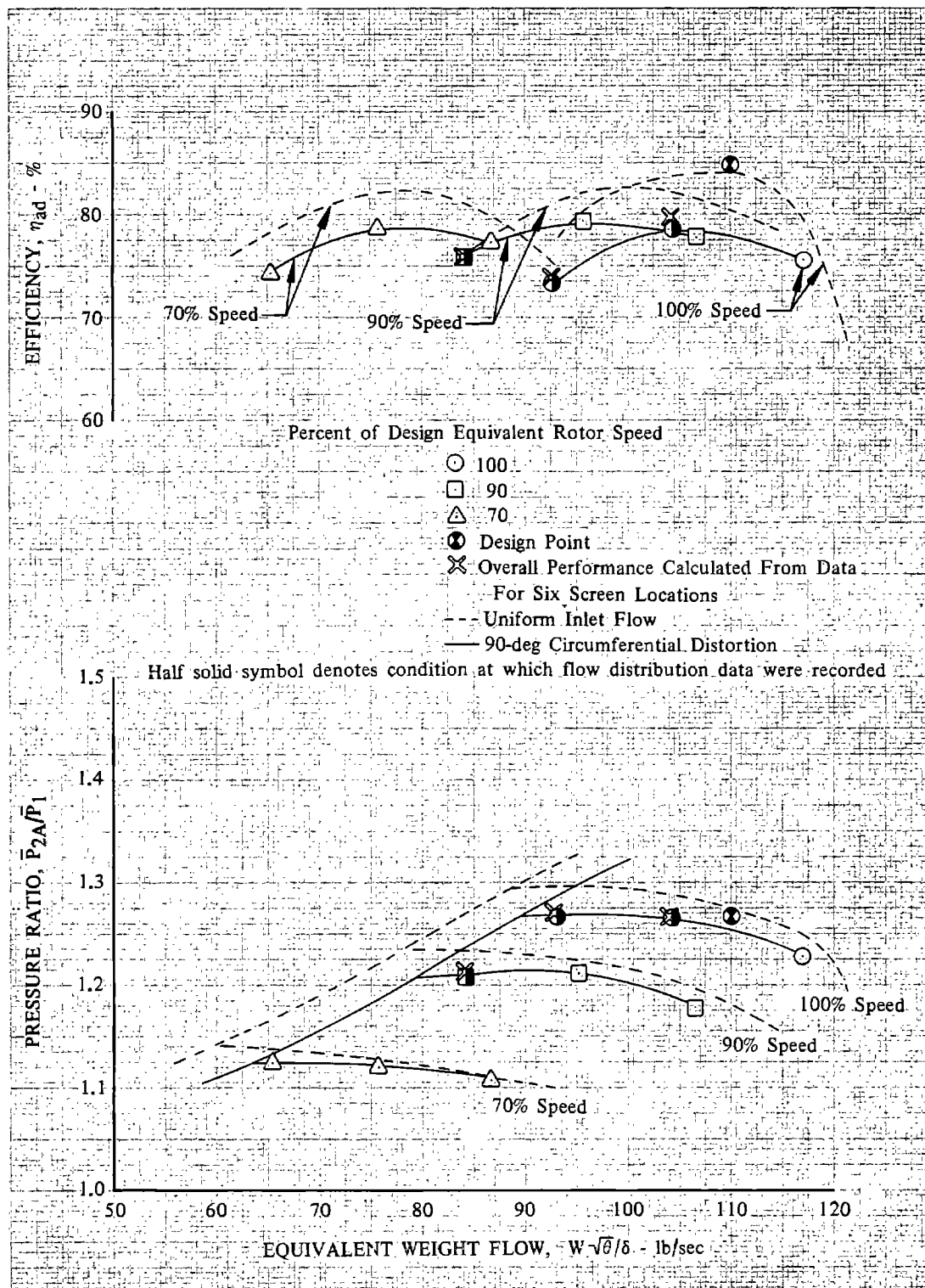
Figure 40. Overall Performance of Stage E With Circum- DF 98230
ferential Distortion

118
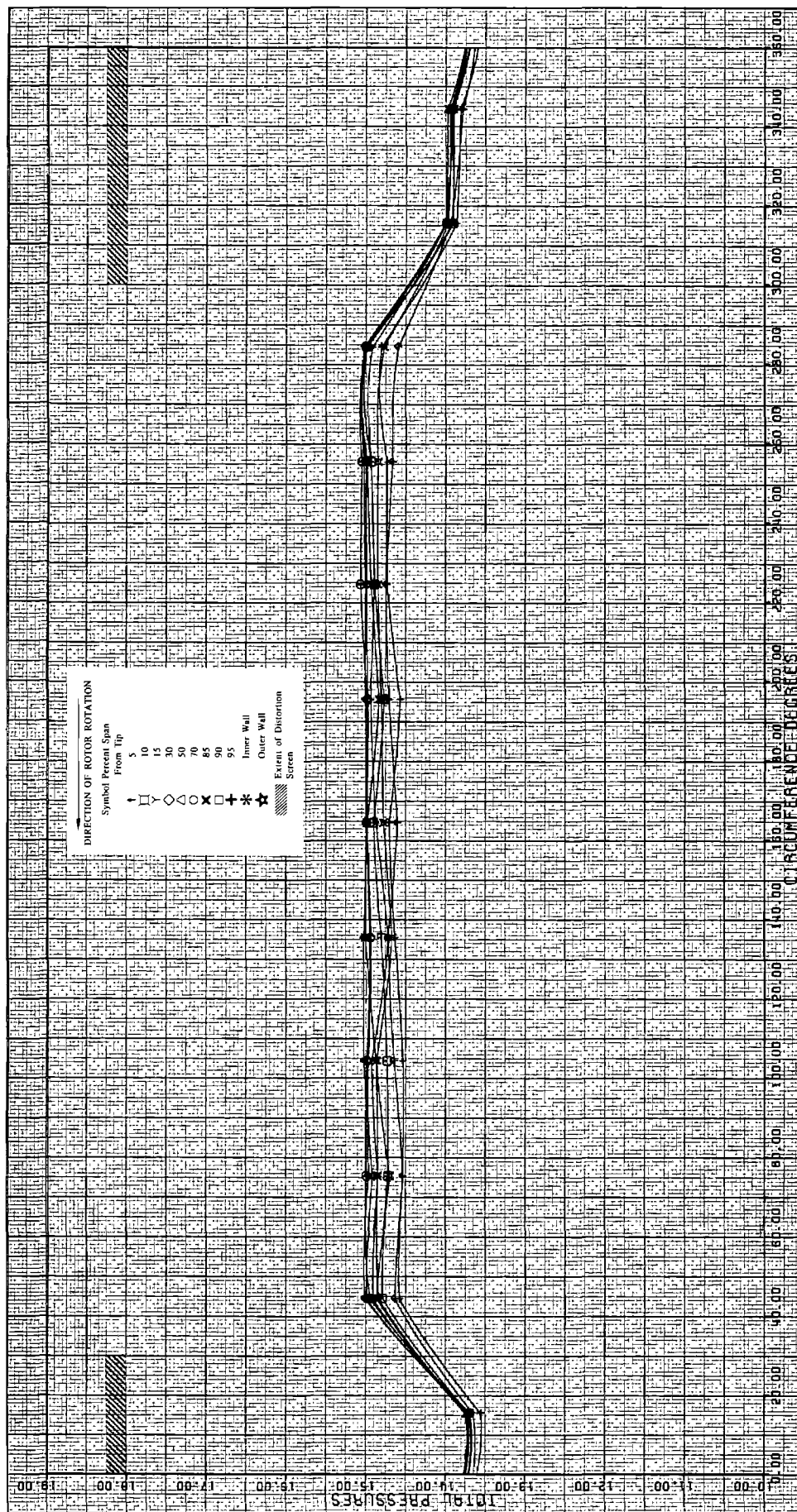
Figure 41a. Rotor Inlet Total Pressure vs Circumferential Location; 100% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98153

119
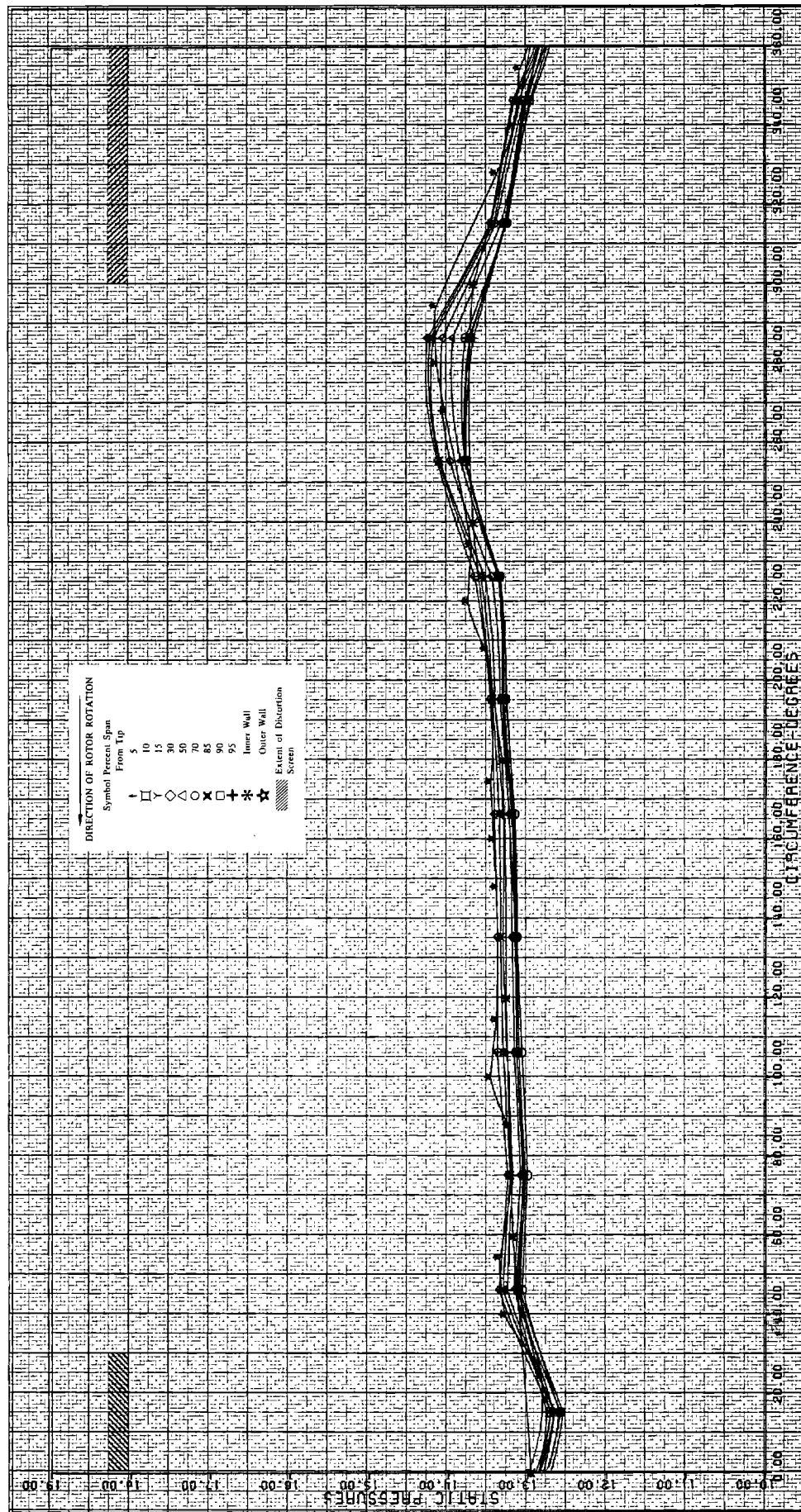
Figure 41b. Rotor Inlet Static Pressure vs Circumferential Location; 100% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98154

120
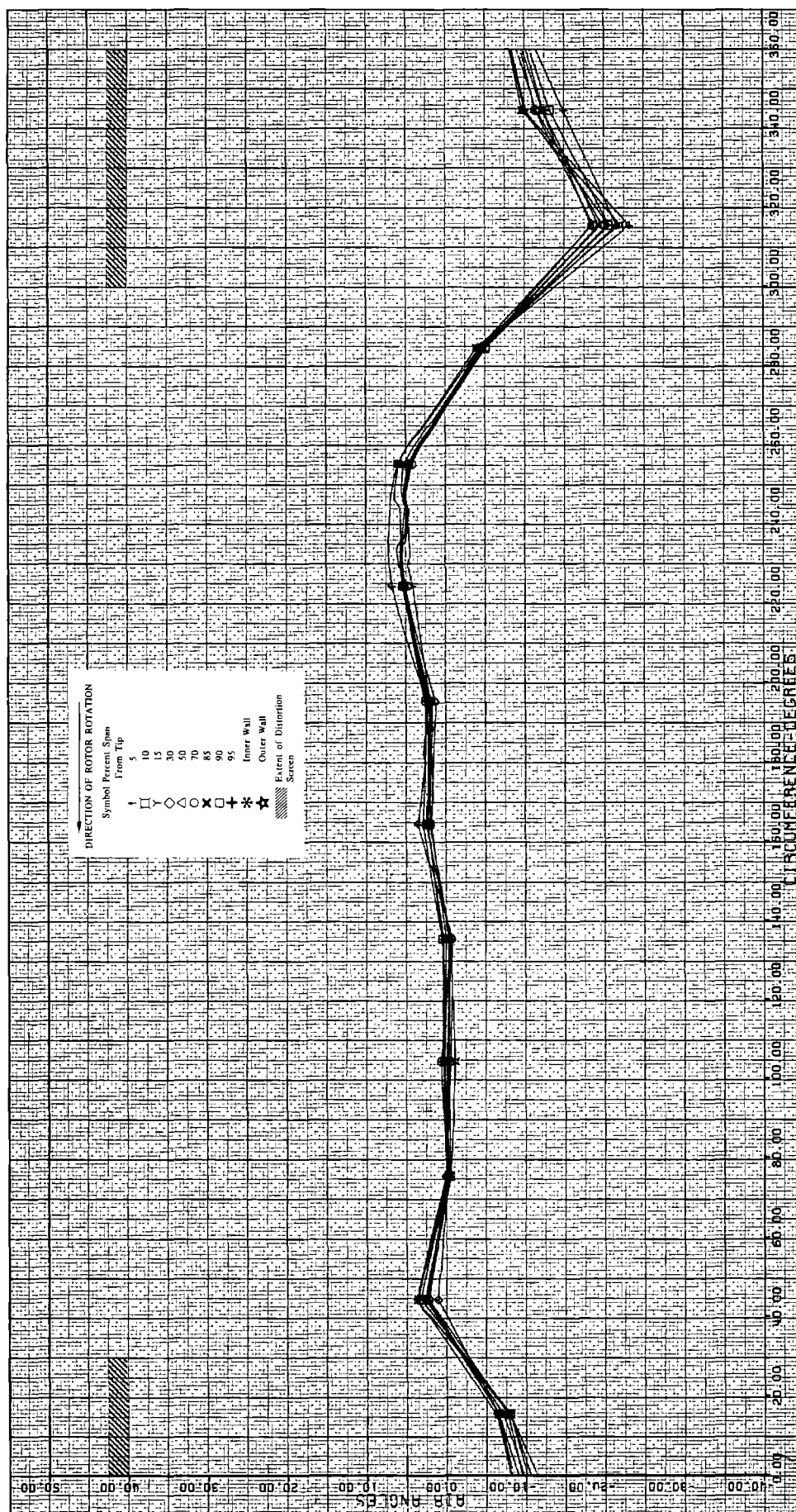
Figure 41c.   Rotor Inlet Air Angle vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98155

121
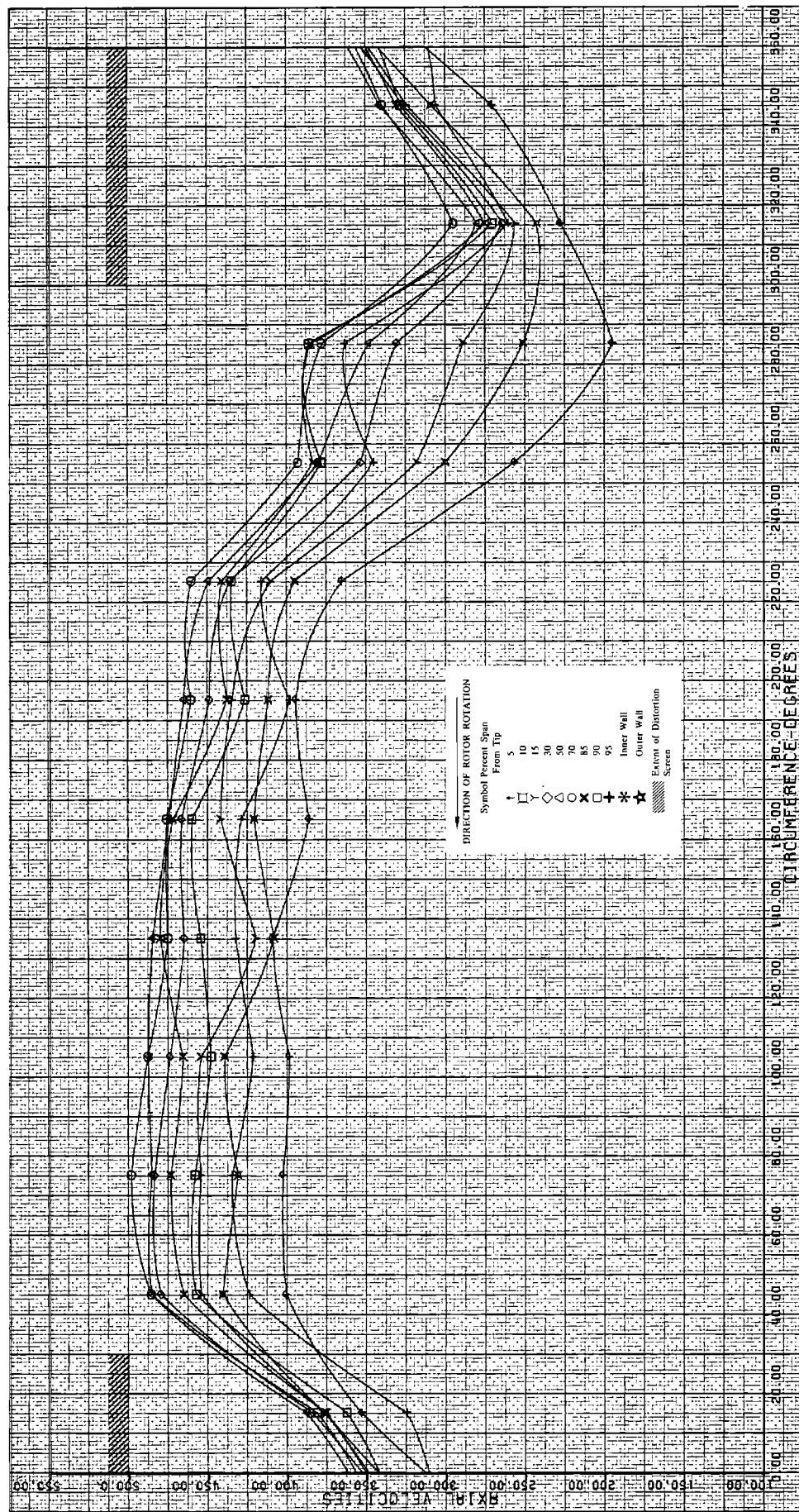
Figure 41d. Rotor Inlet Axial Velocity vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98156

122
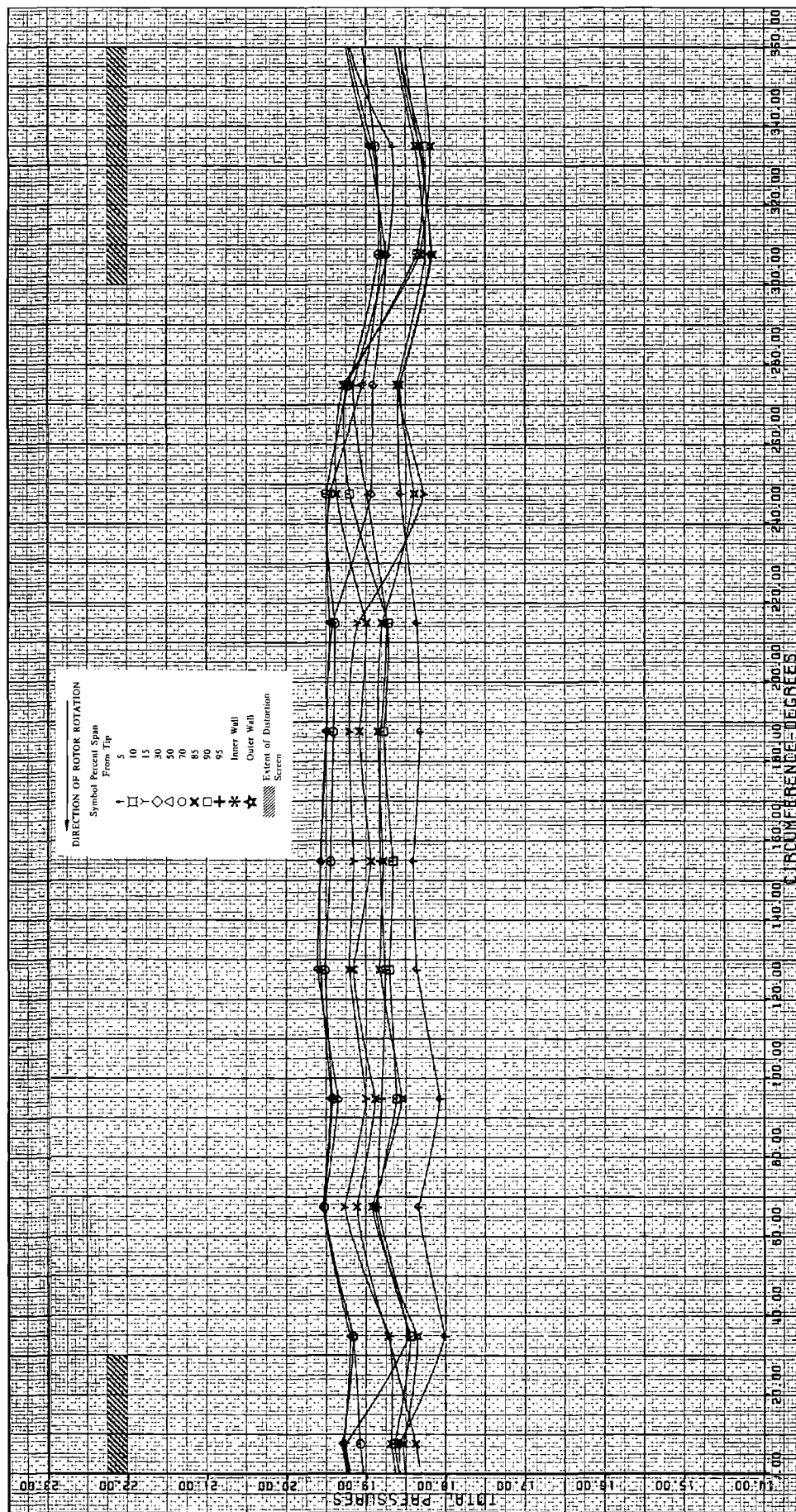
Figure 41e. Stator Inlet Total Pressure vs Circumferential Location; 100% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98157

123
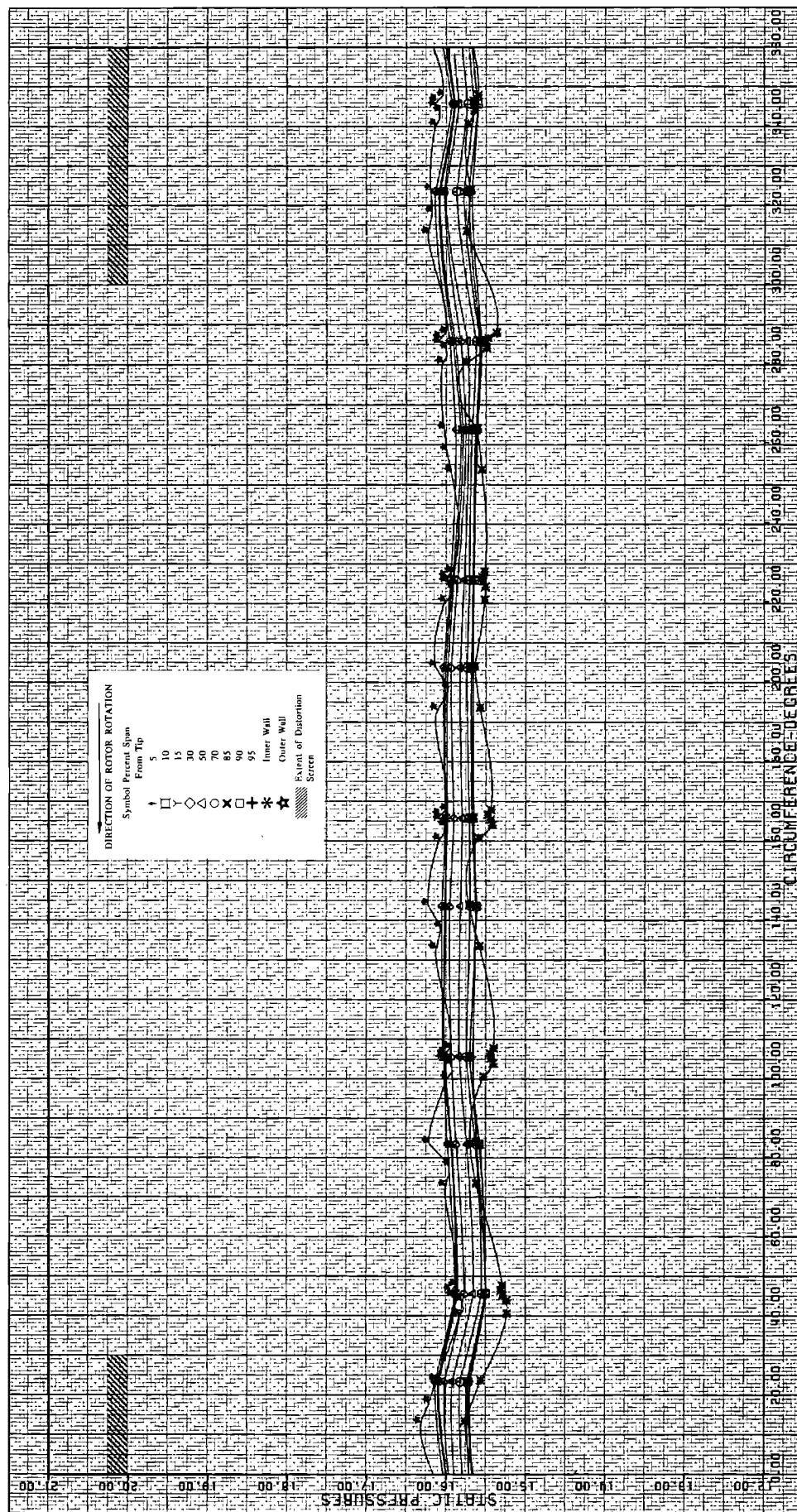
Figure 41f. Stator Inlet Static Pressure vs Circumferential Location; 100% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98158

124
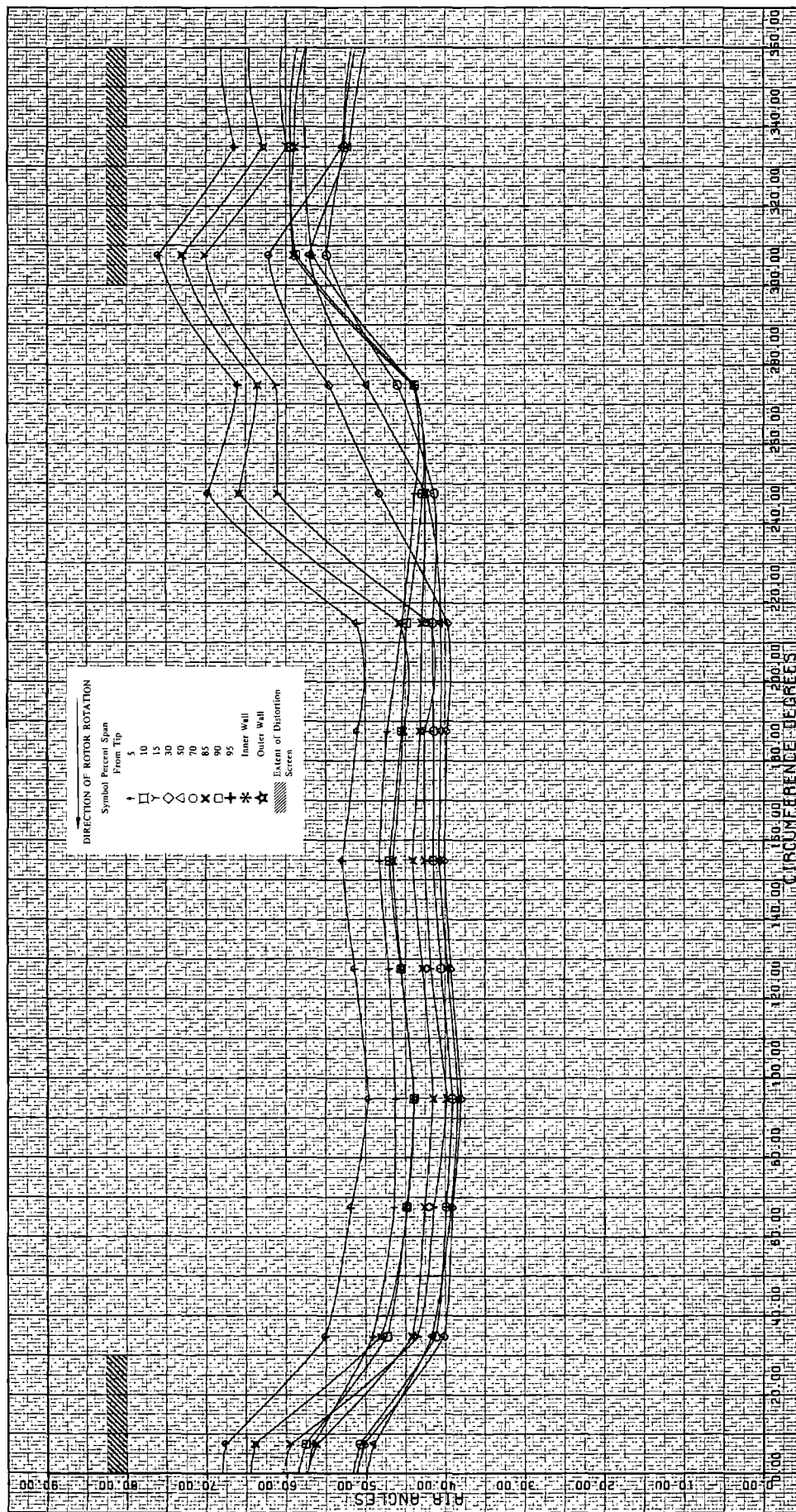
Figure 41g. Stator Inlet Air Angle vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98159

125
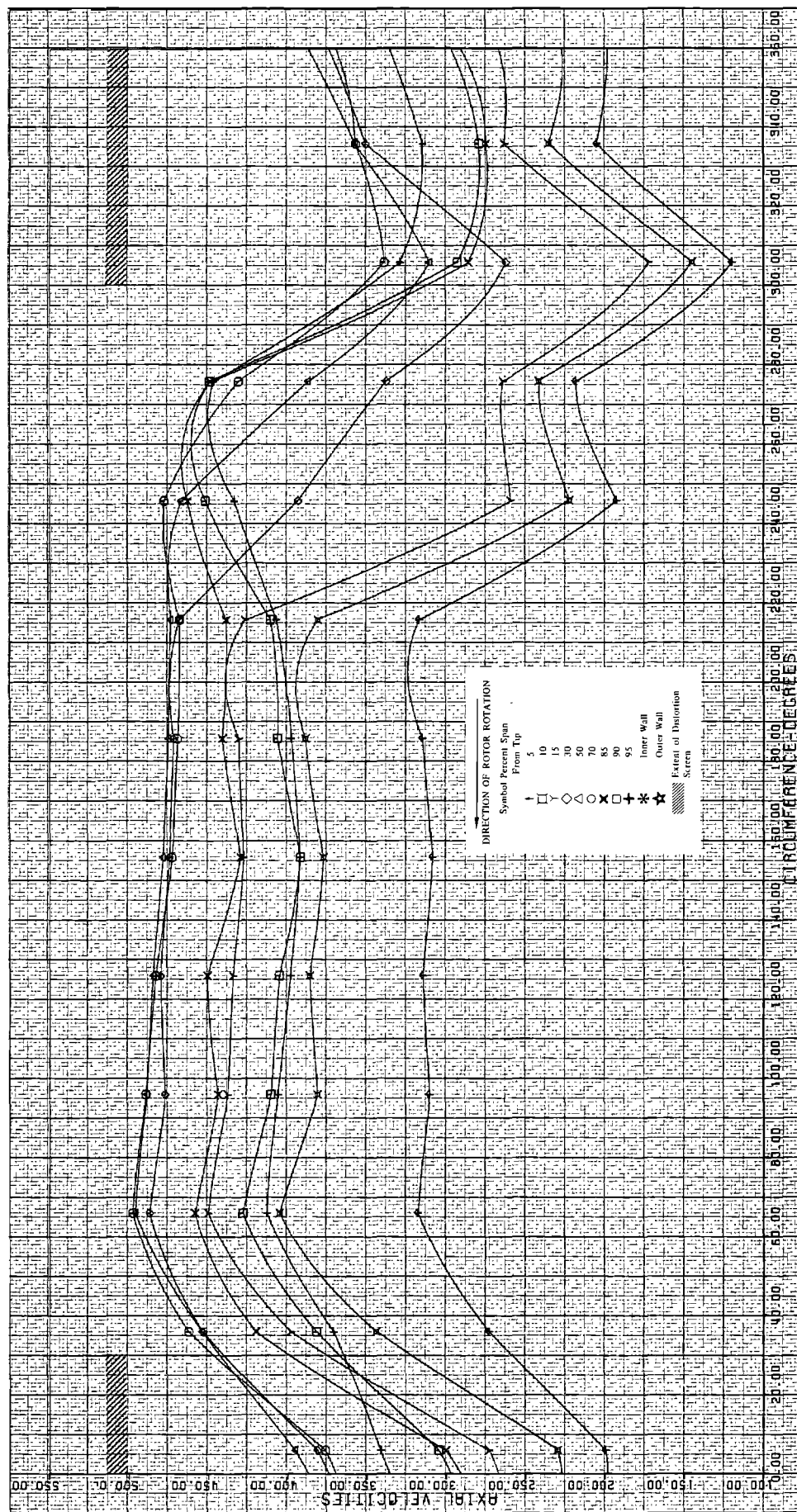
Figure 41h. Stator Inlet Axial Velocity vs Circumferential Location; 100% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98160

126
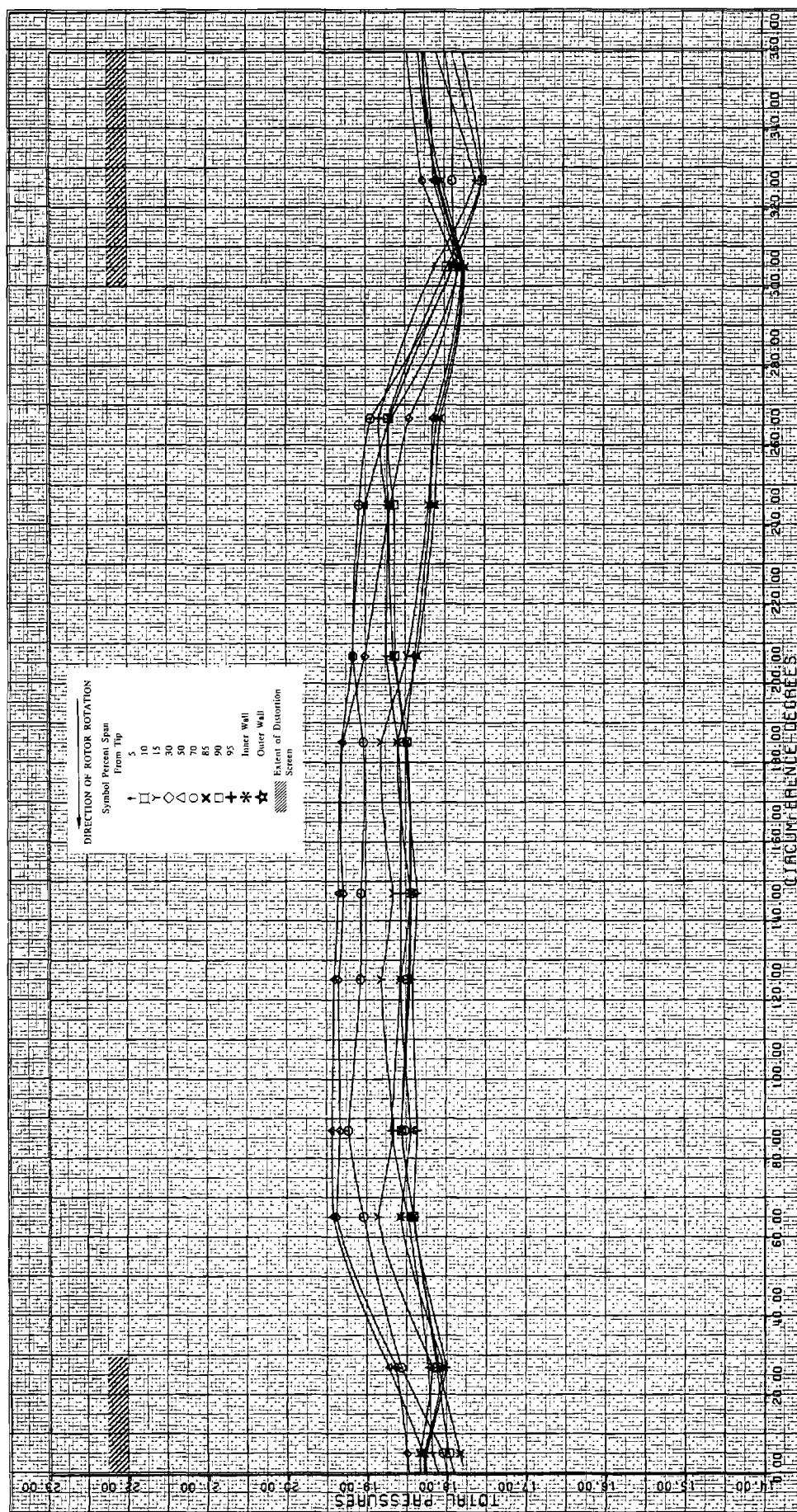
Figure 41i. Stator Exit Total Pressure vs Circumferential Location; 100% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98161

127
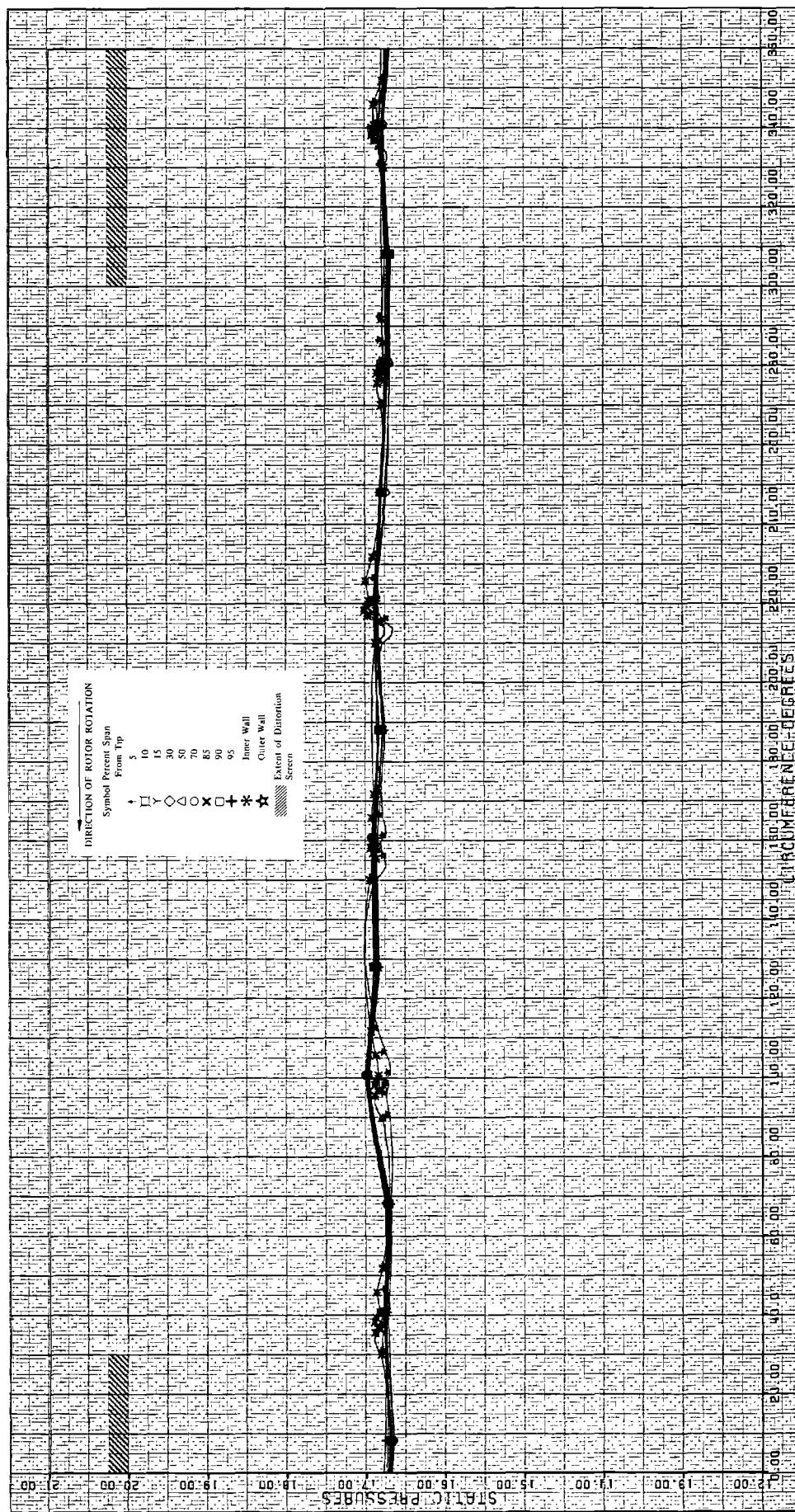
Figure 41j. Stator Exit Static Pressure vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98162

128
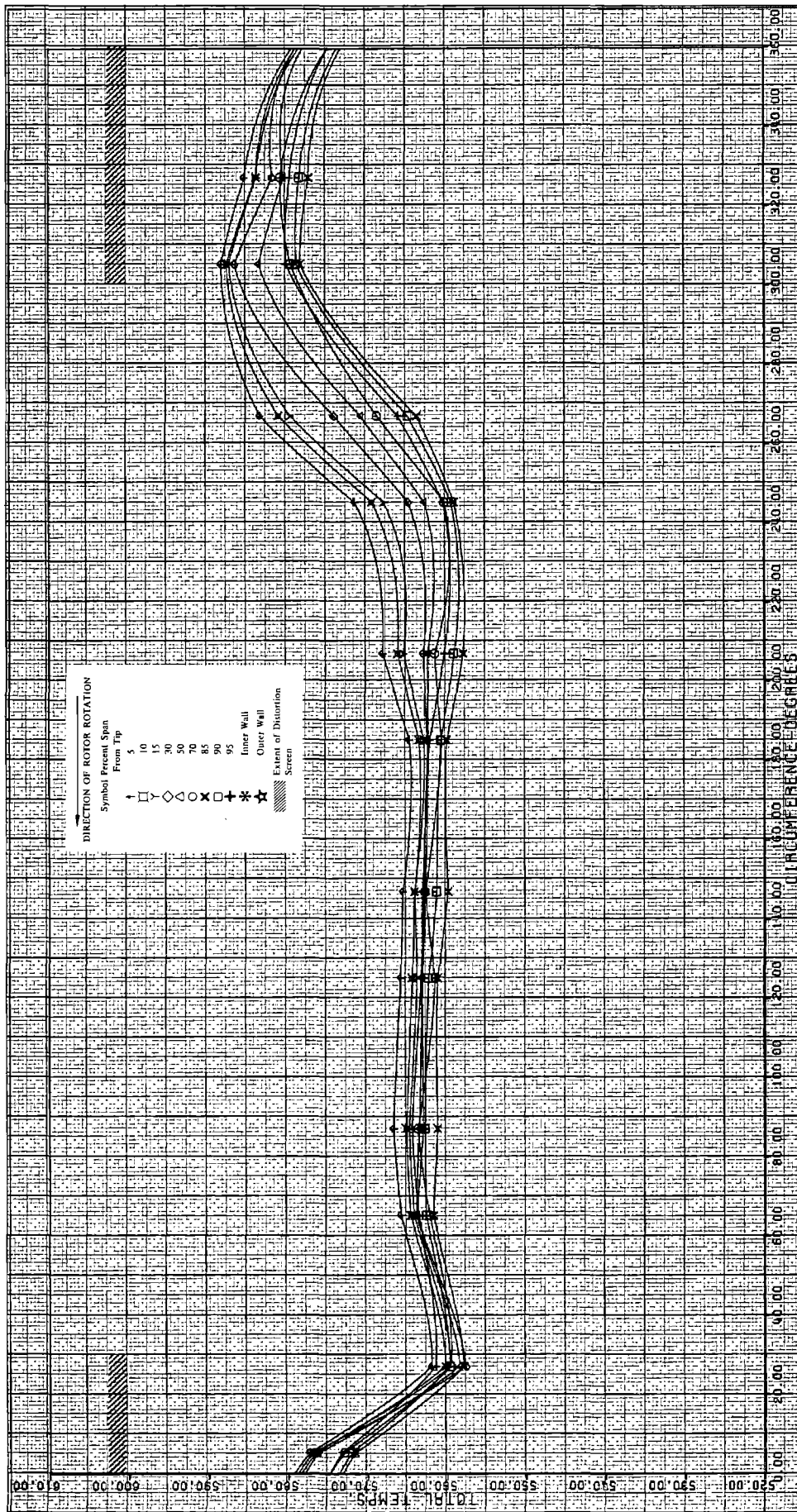
Figure 41k. Stator Exit Total Temperature vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98163

129
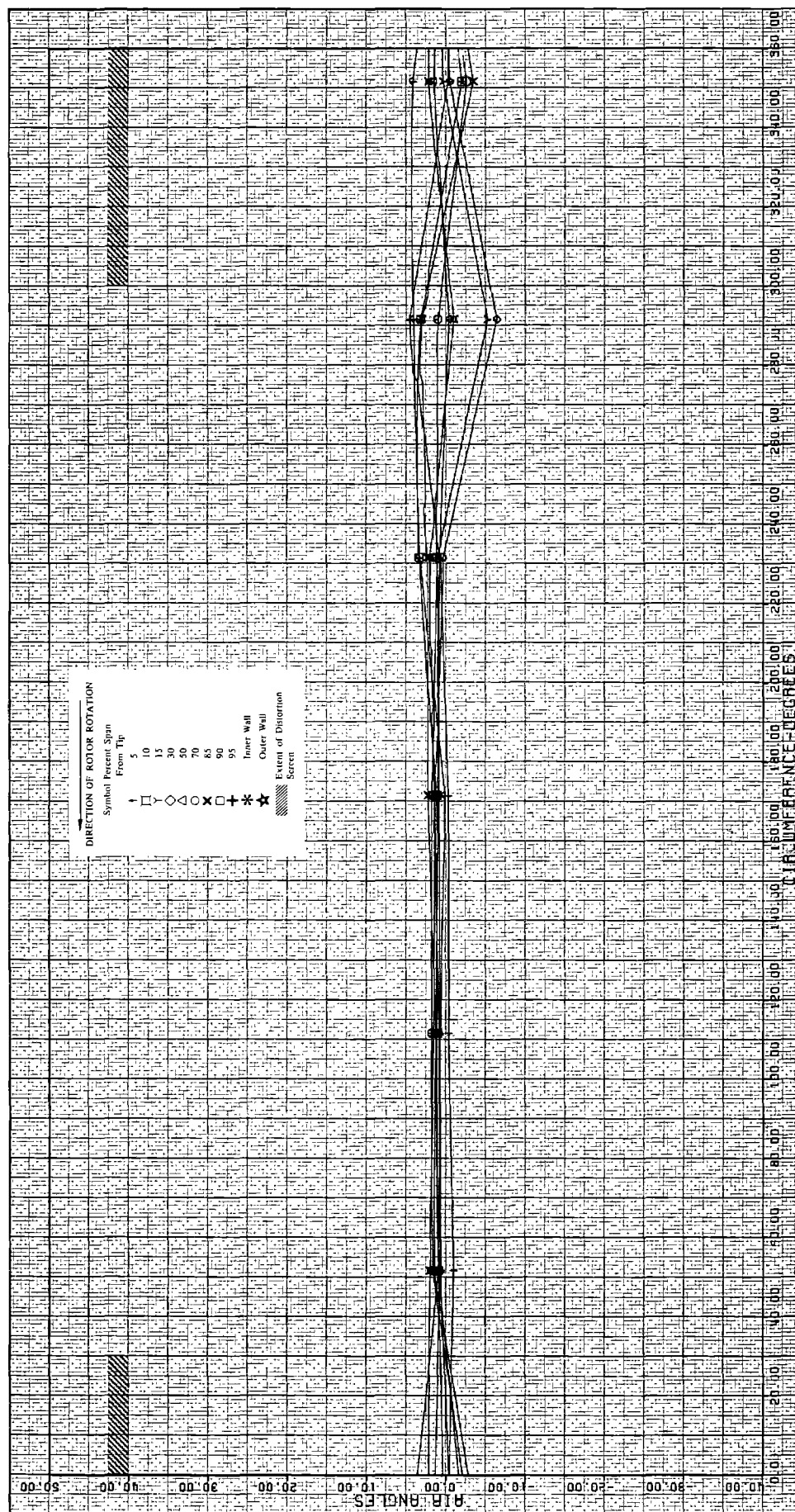
Figure 411. Stator Exit Air Angle vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98164

130
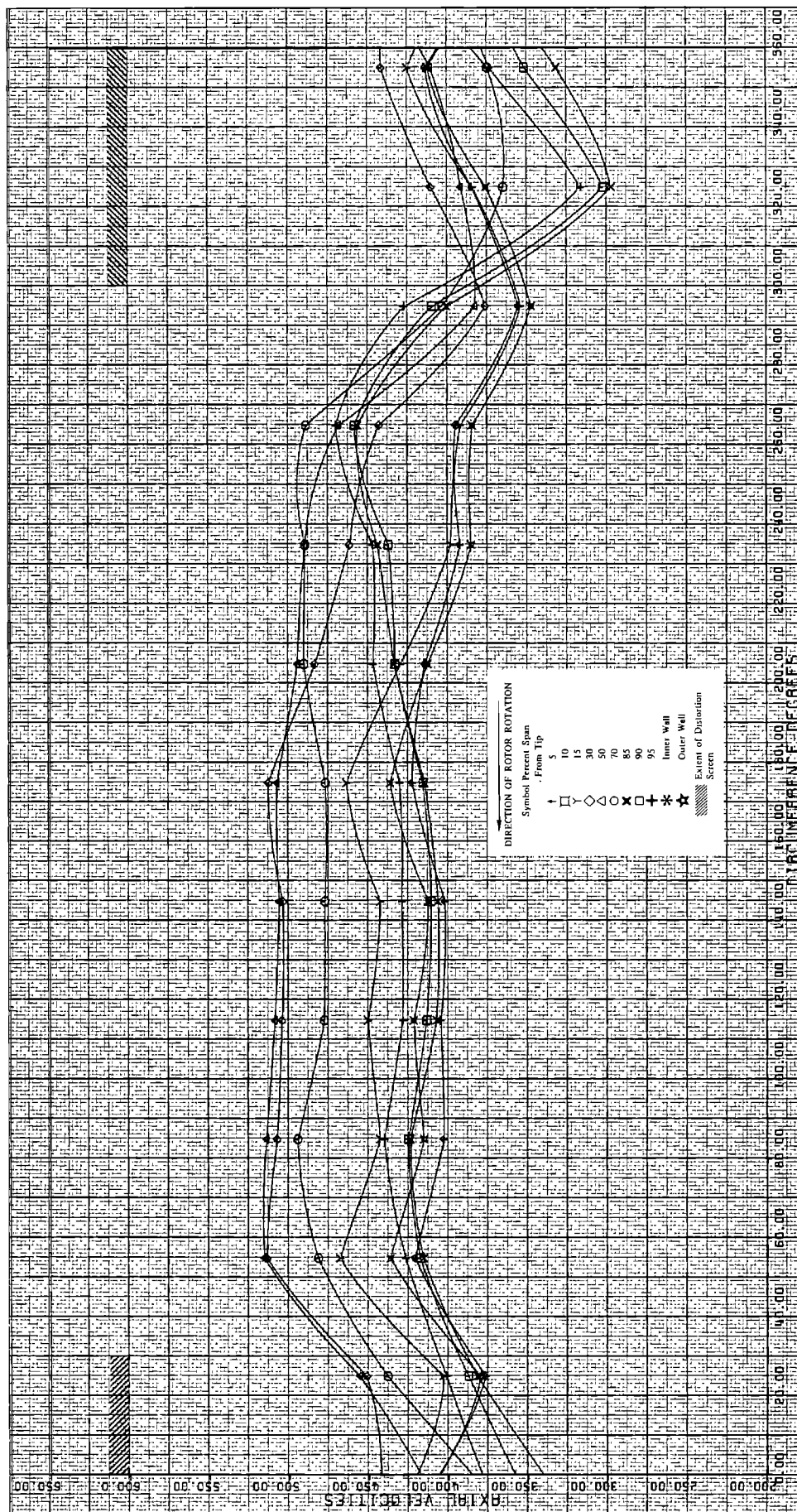
Figure 41m. Stator Exit Axial Velocity vs Circumferential Location; 100% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 103.40 lb/sec; Circumferential Distortion

DF 98165

131
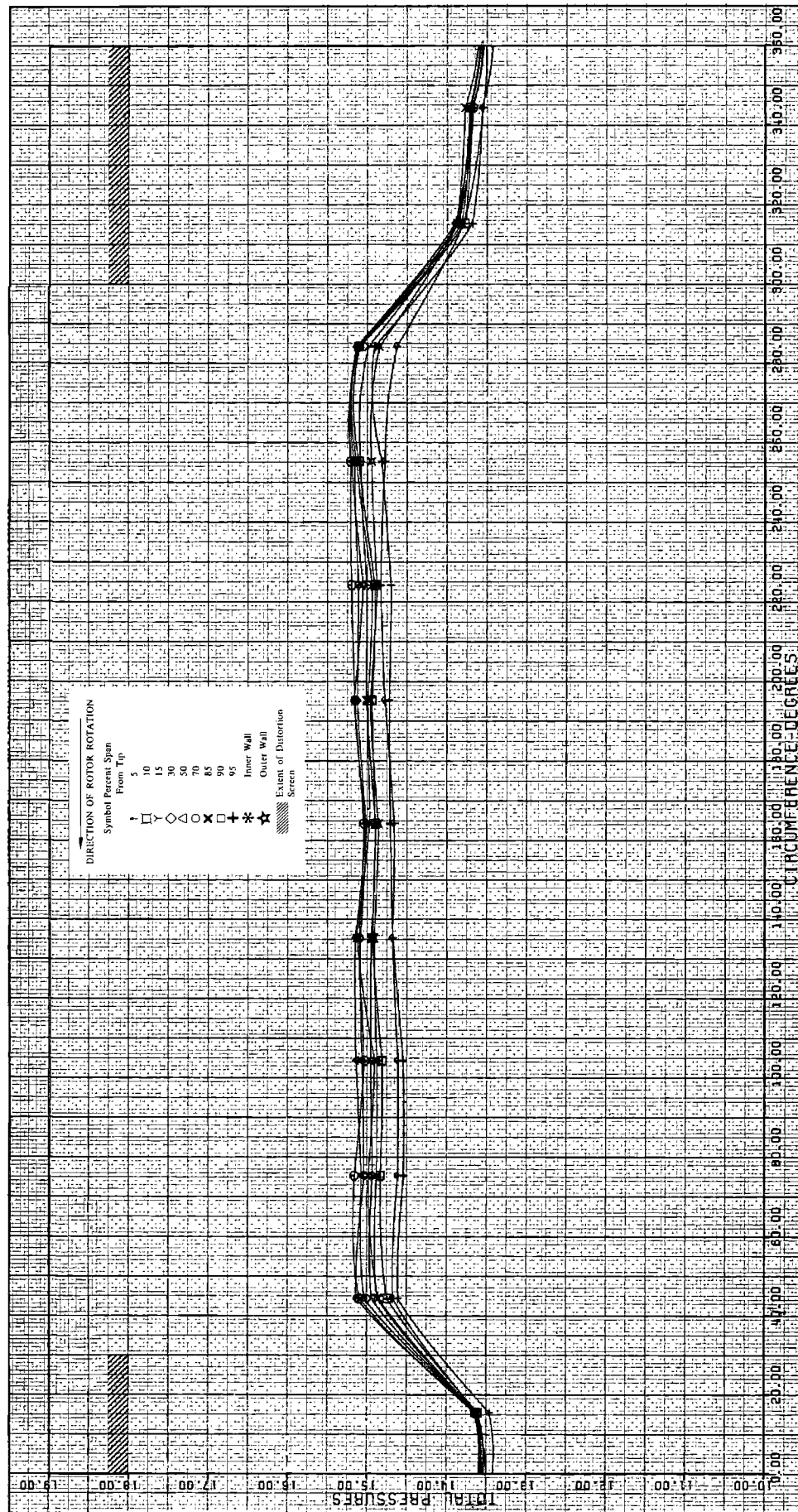
Figure 42a. Rotor Inlet Total Pressure vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98140

132
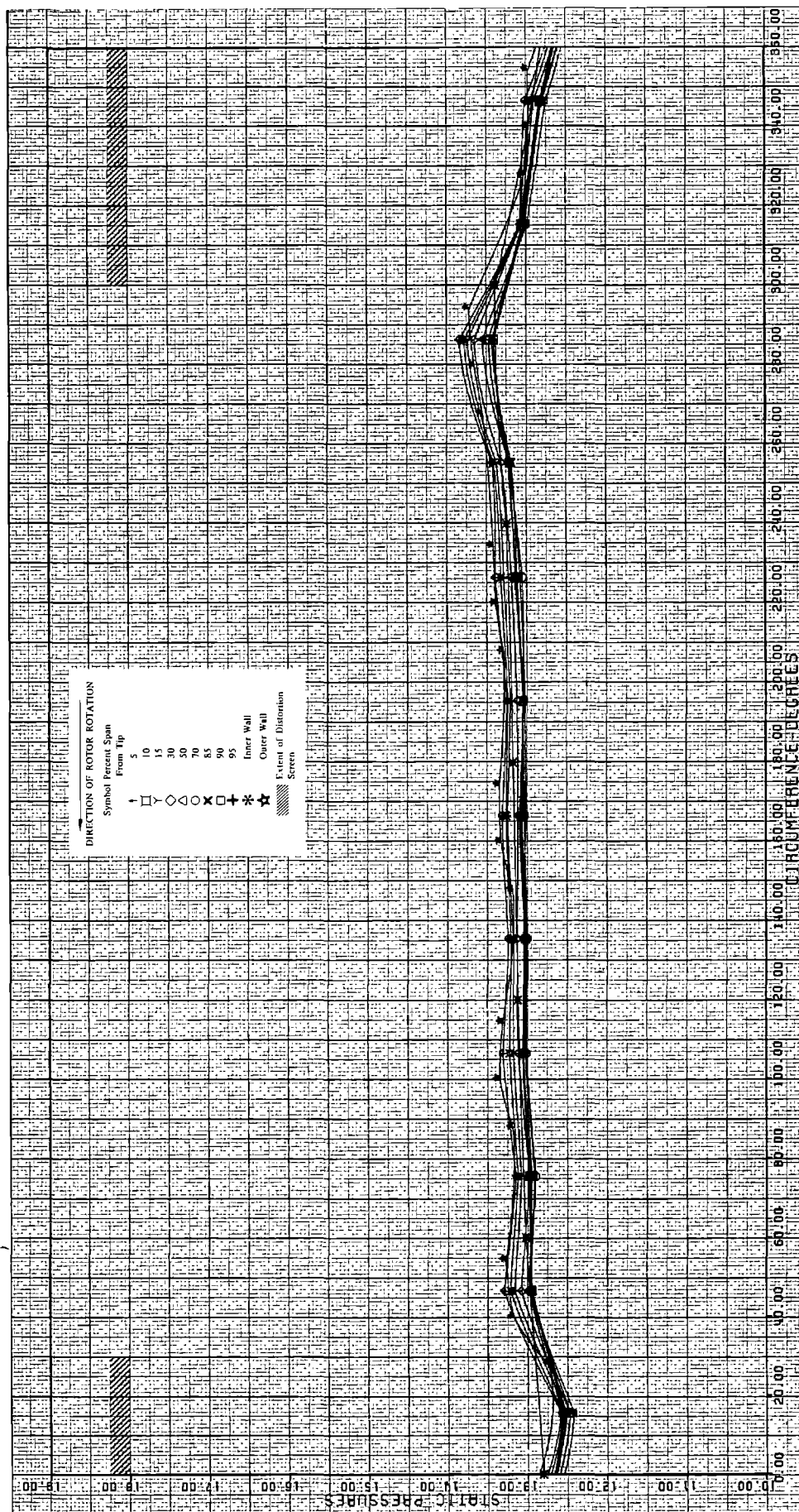
Figure 42b. Rotor Inlet Static Pressure vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98141

133
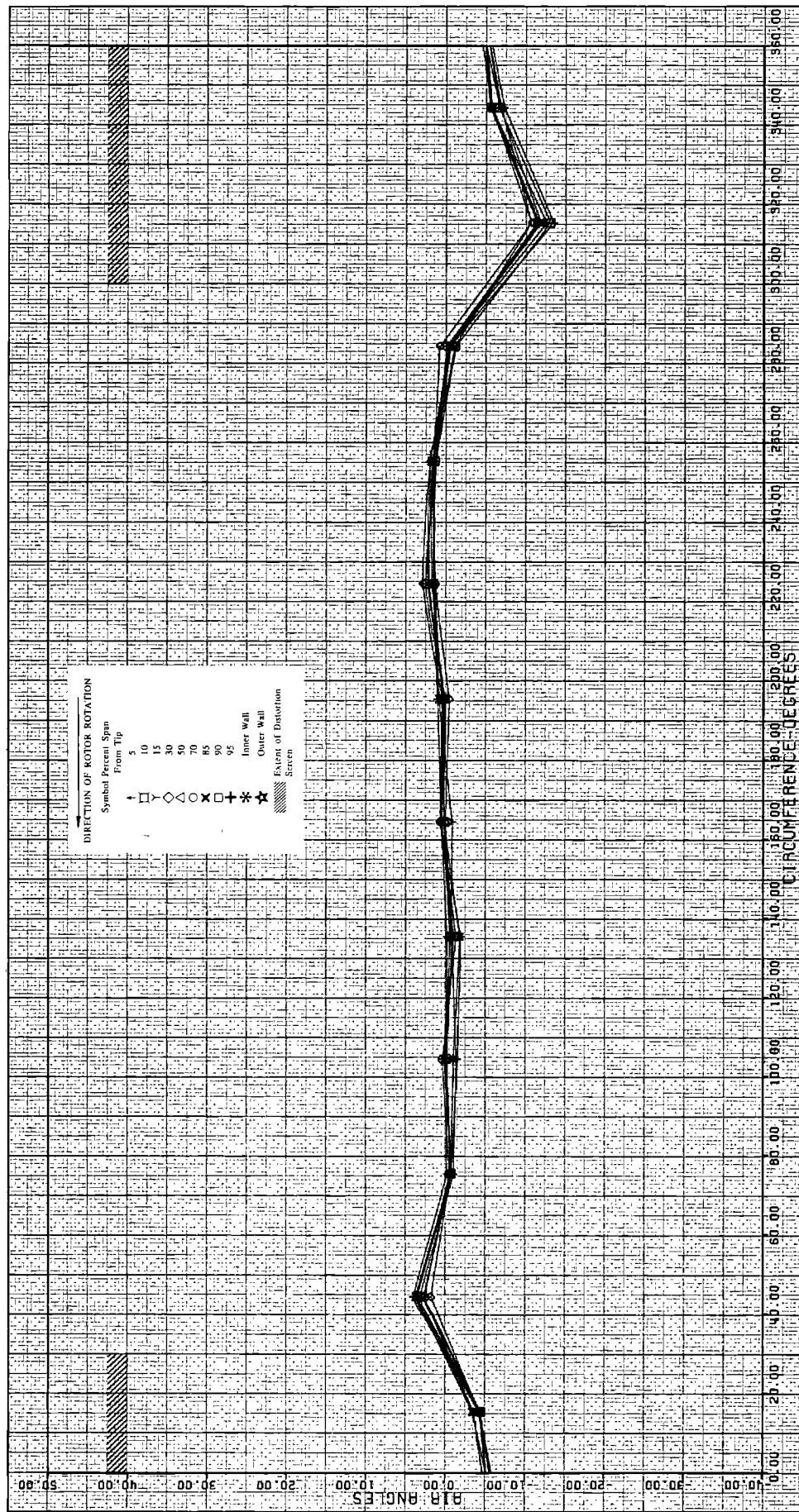
Figure 42c. Rotor Inlet Air Angle vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98142

134
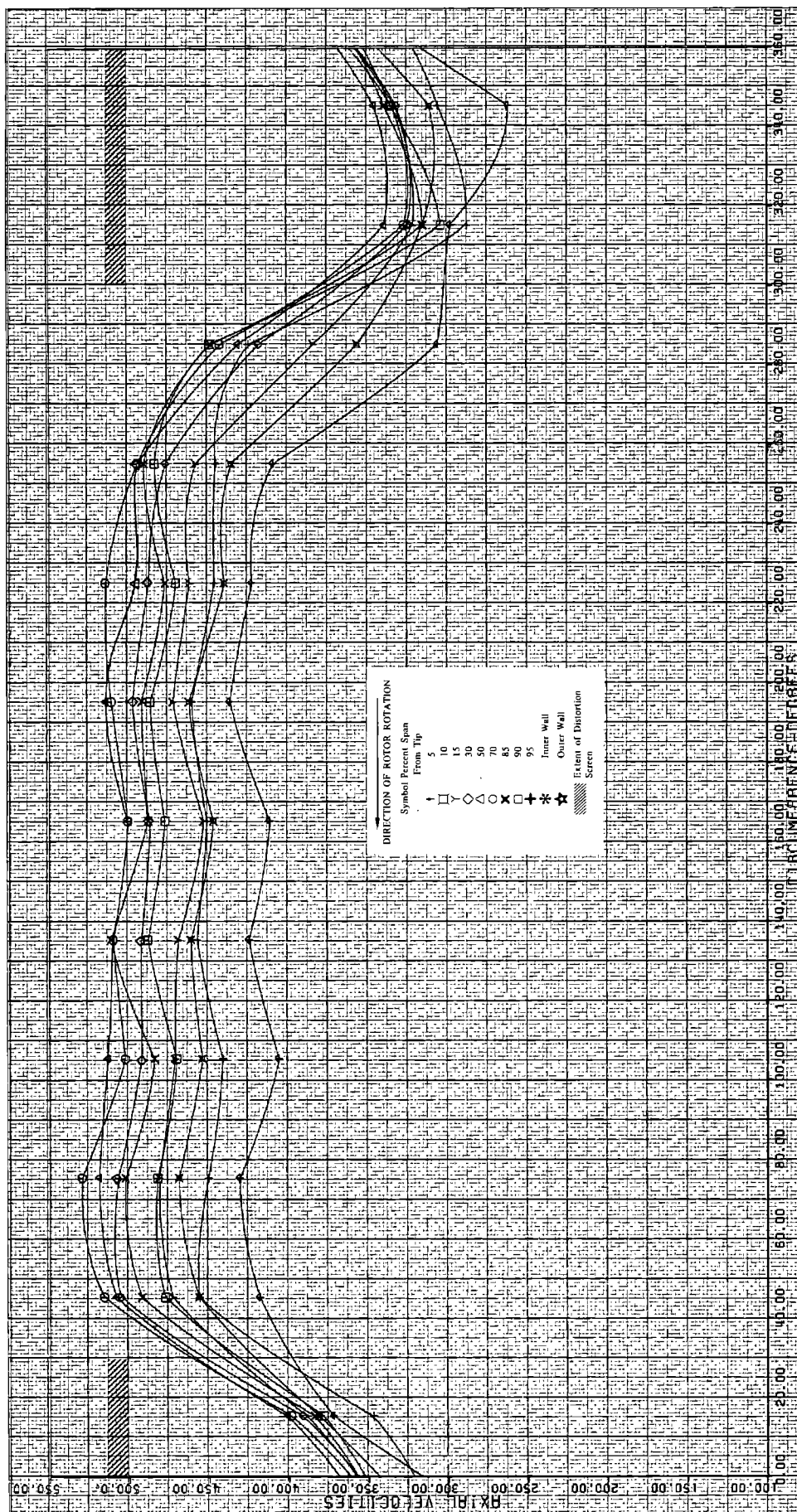
Figure 42d. Rotor Inlet Axial Velocity vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92. 60 lb/sec; Circumferential Distortion

DF 98143

135
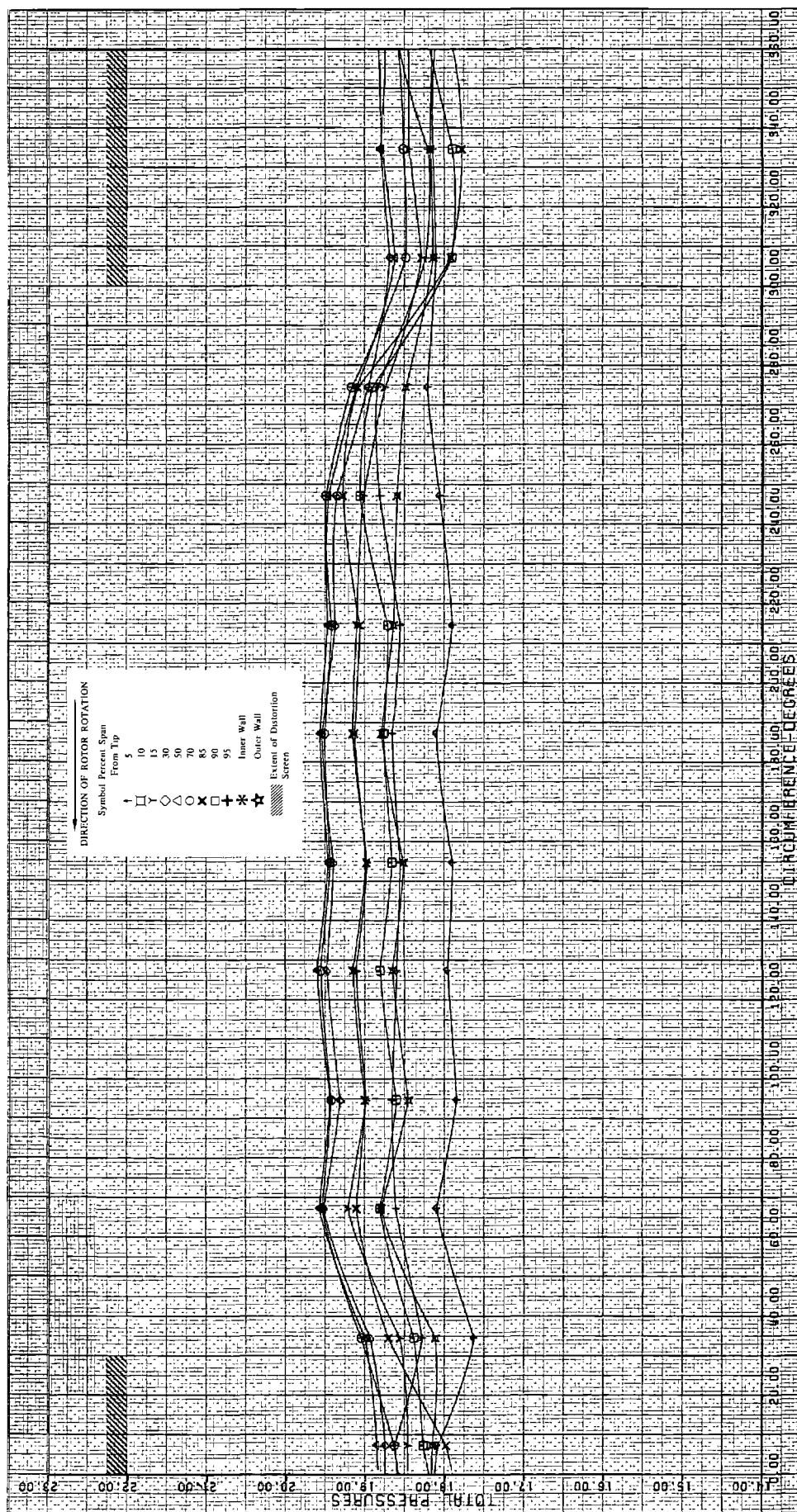
Figure 42e. Stator Inlet Total Pressure vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98144

136
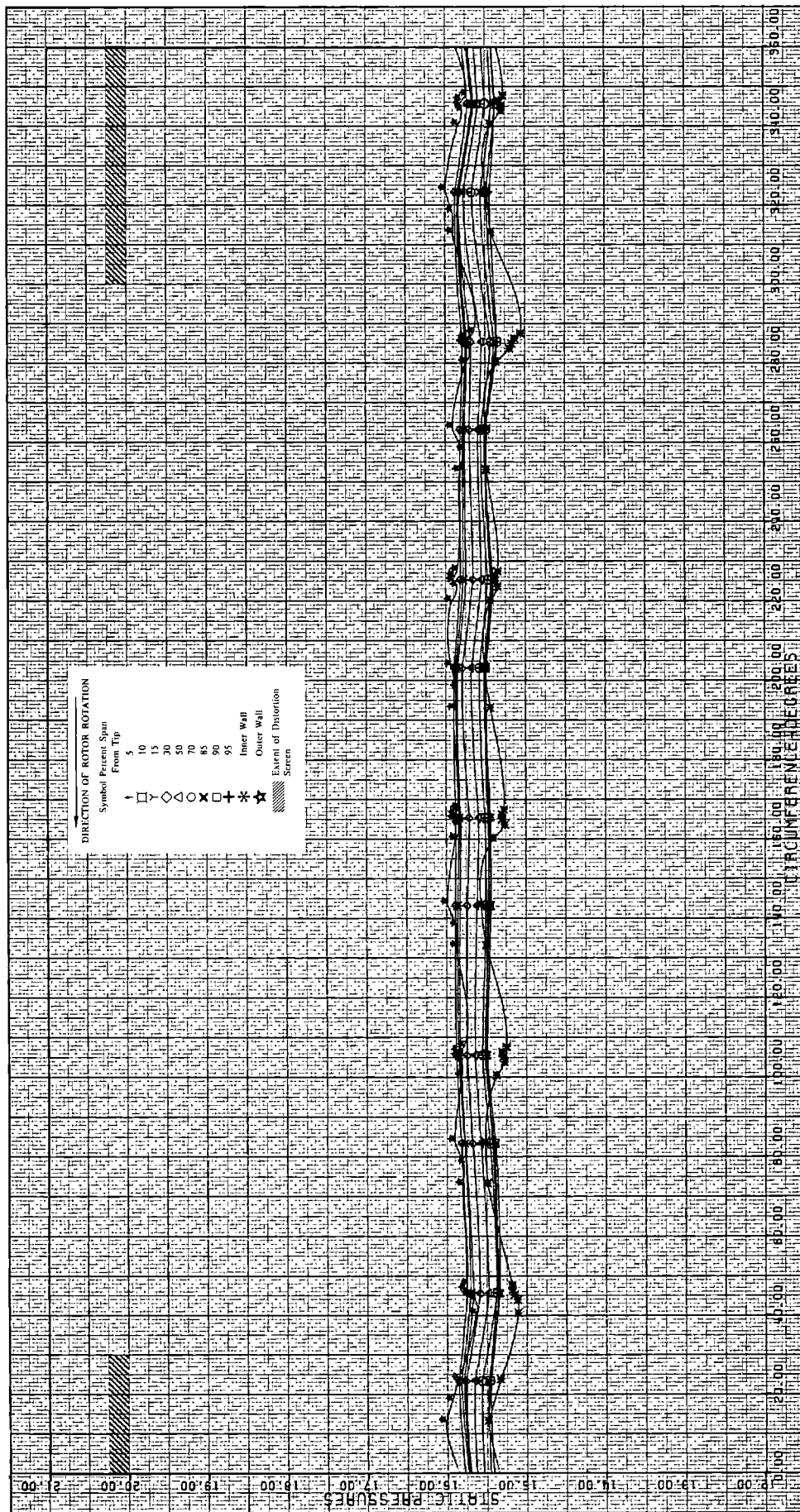
Figure 42f. Stator Inlet Static Pressure vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98145

137
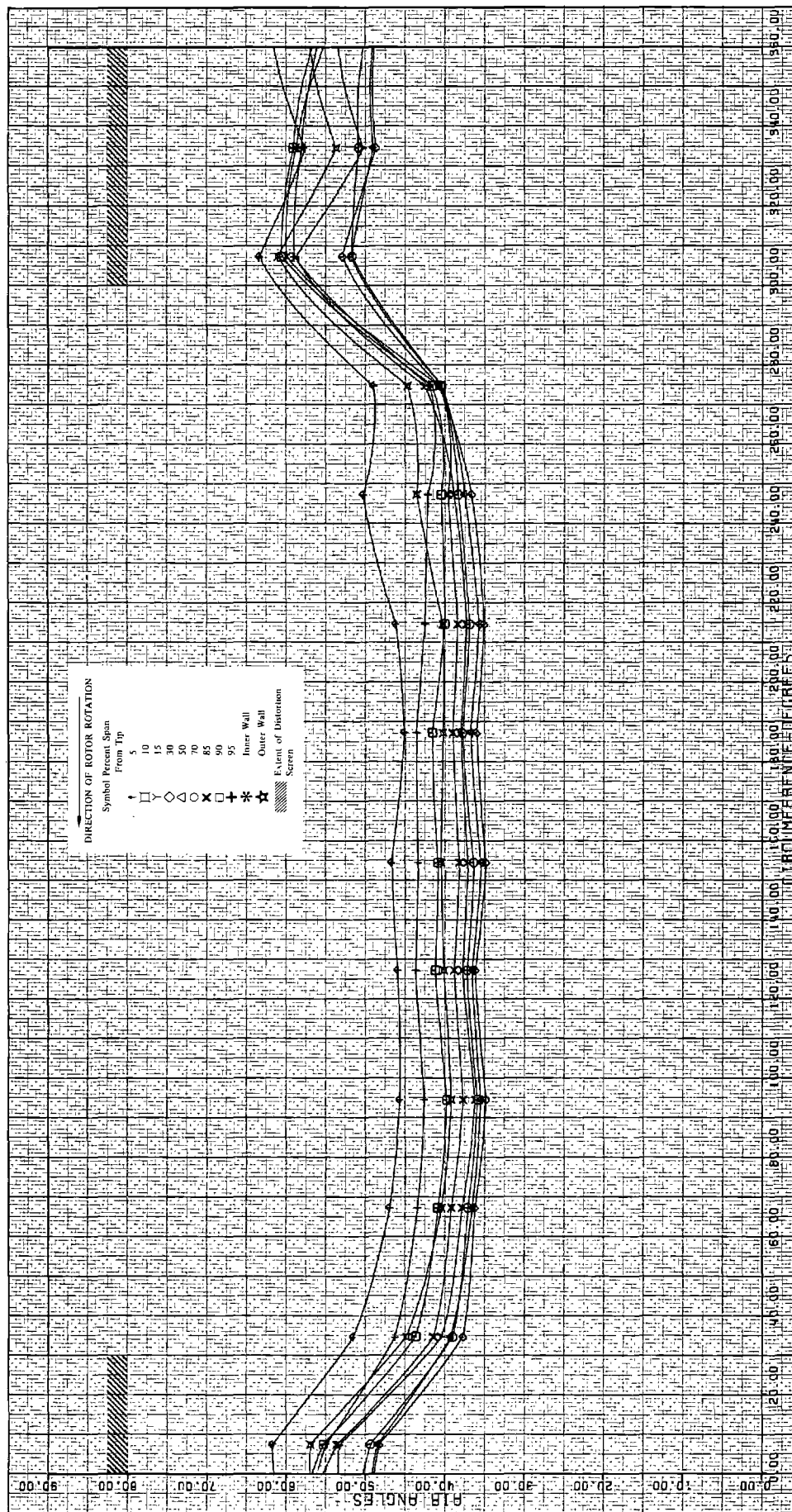
Figure 42g. Stator Inlet Air Angle vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98146

138
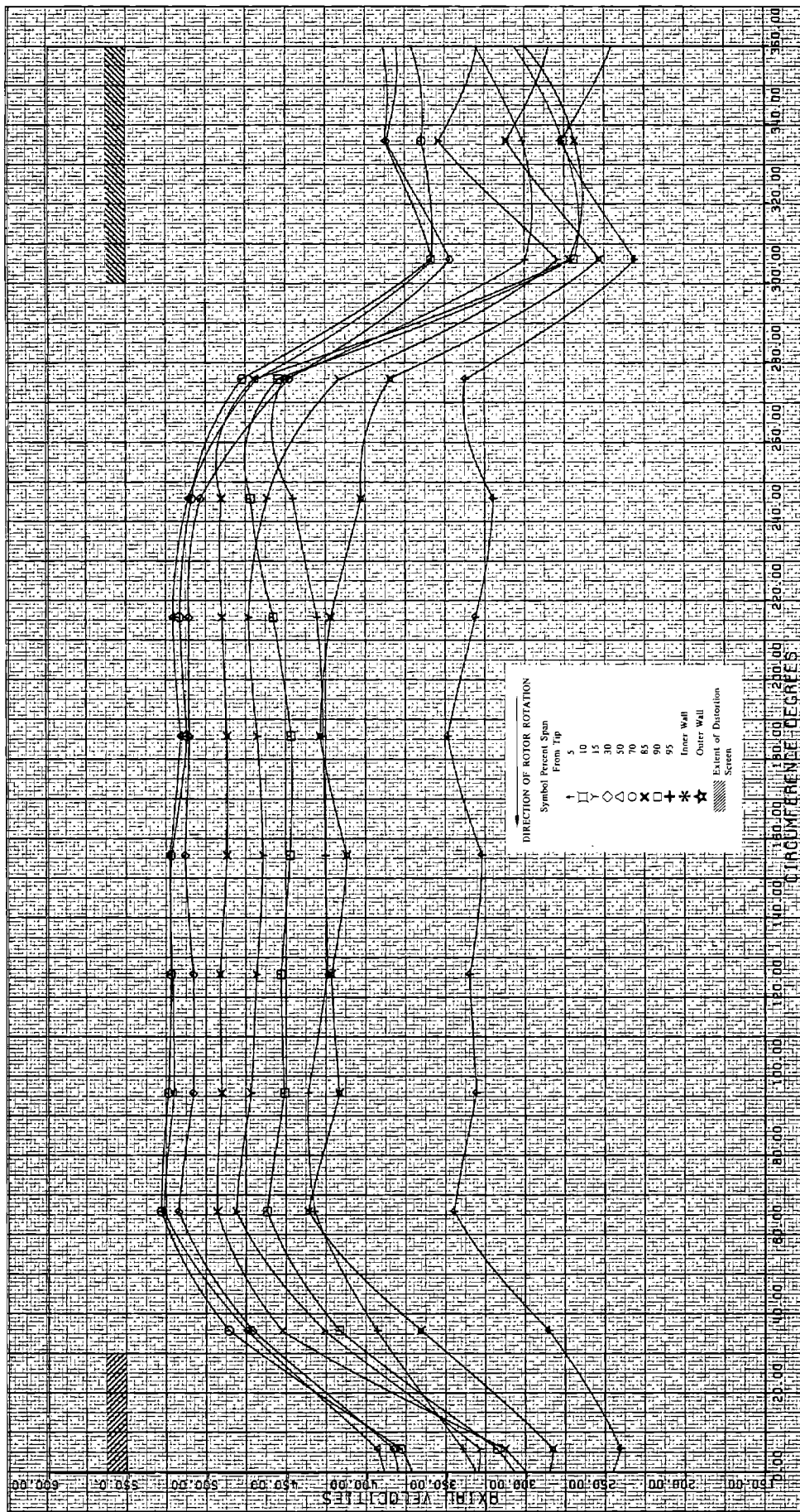
Figure 42h. Stator Inlet Axial Velocity vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98147

139
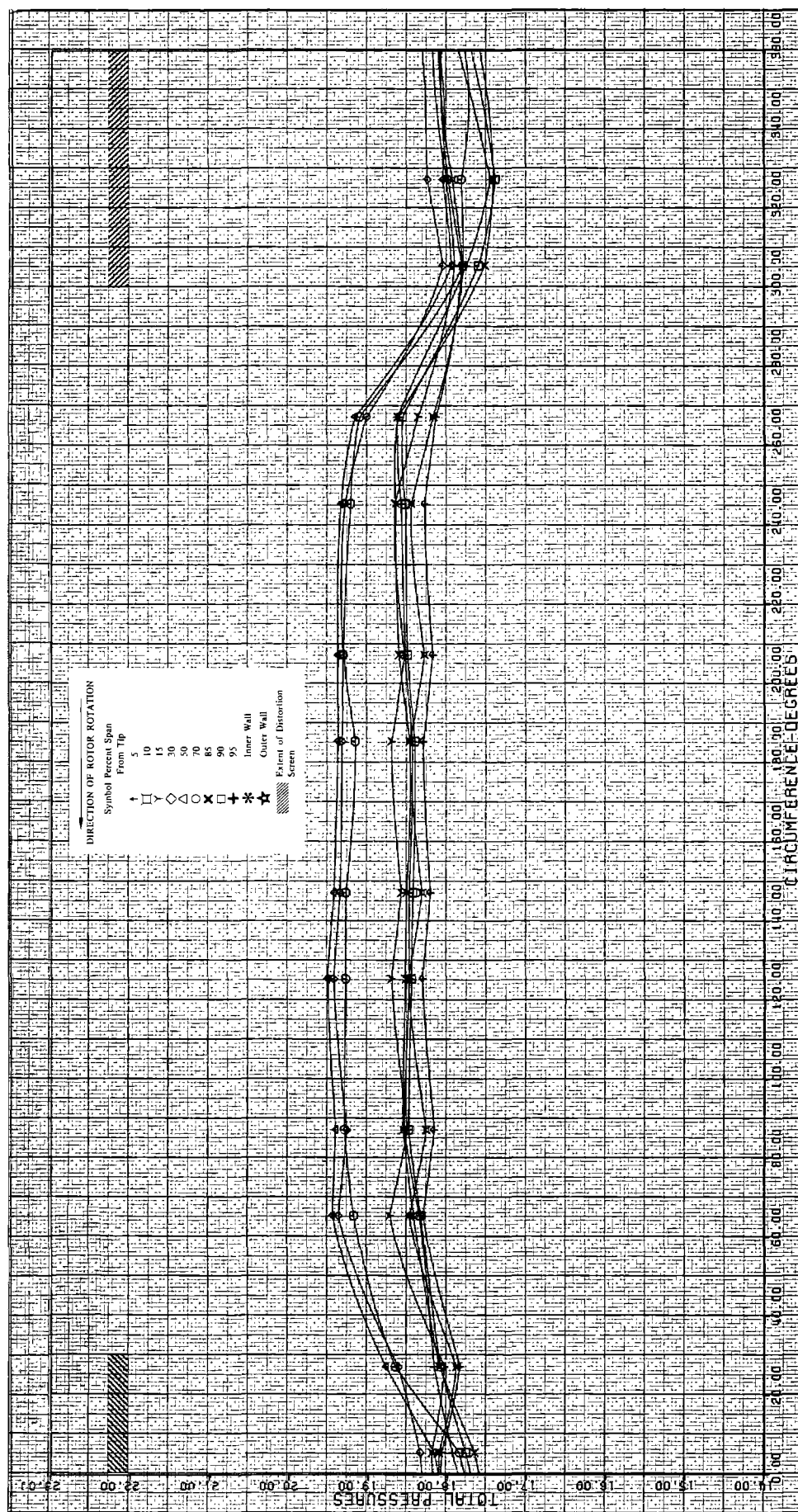
Figure 42i. Stator Exit Total Pressure vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98148

140
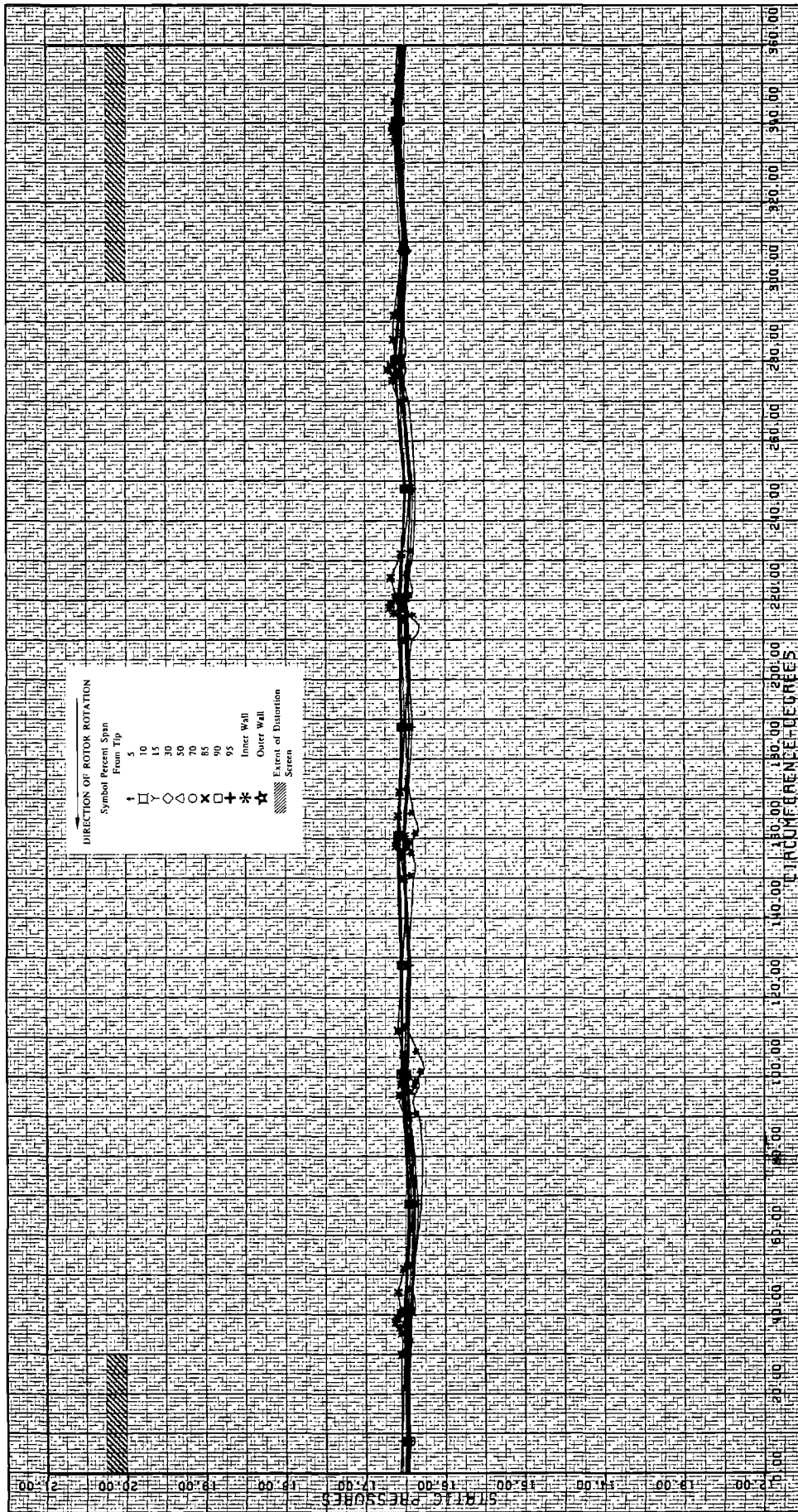
Figure 42j. Stator Exit Static Pressure vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92. 60 lb/sec; Circumferential Distortion

DF 98149

141
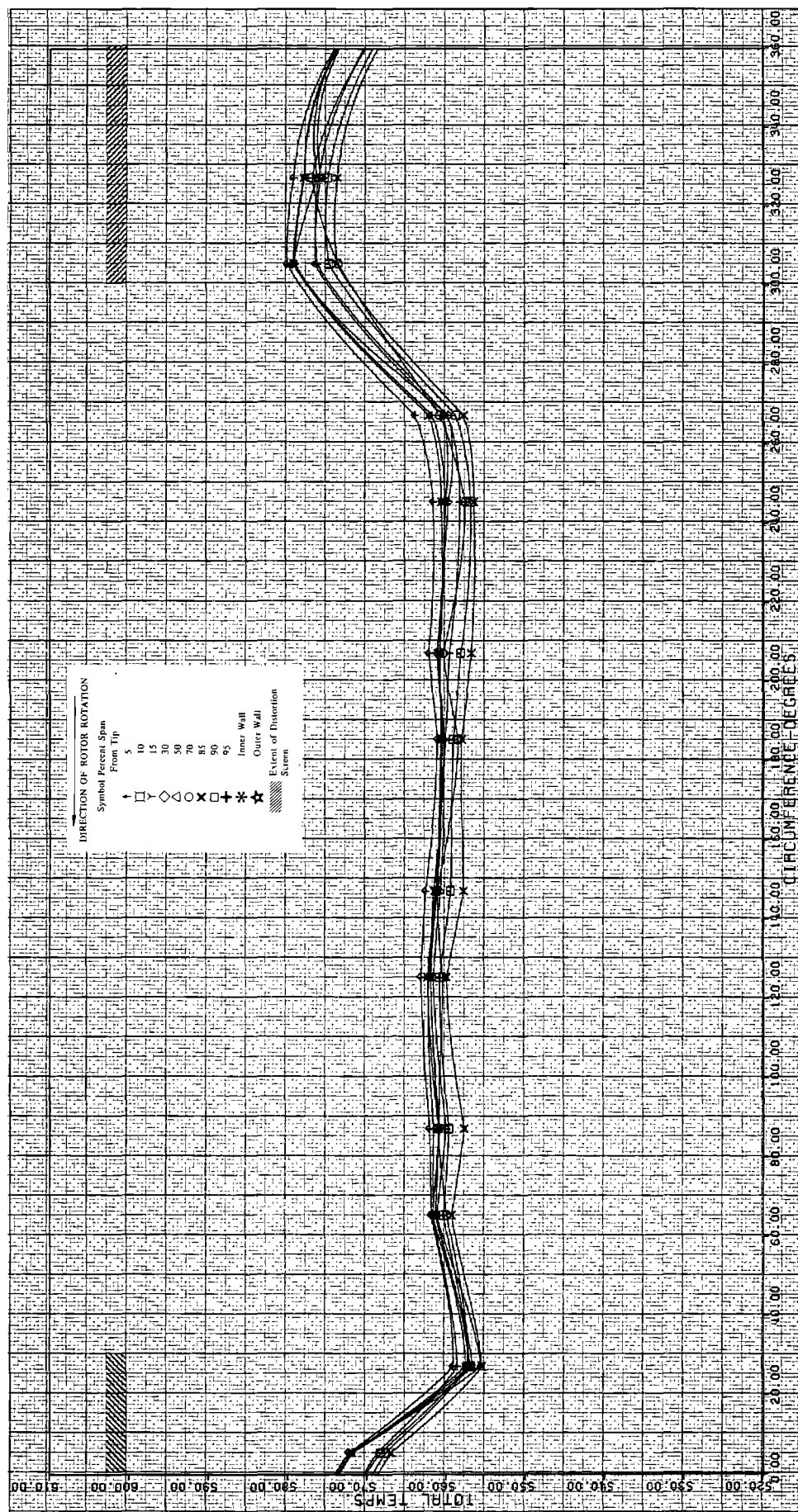
Figure 42k. Stator Exit Total Temperature vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98150

142
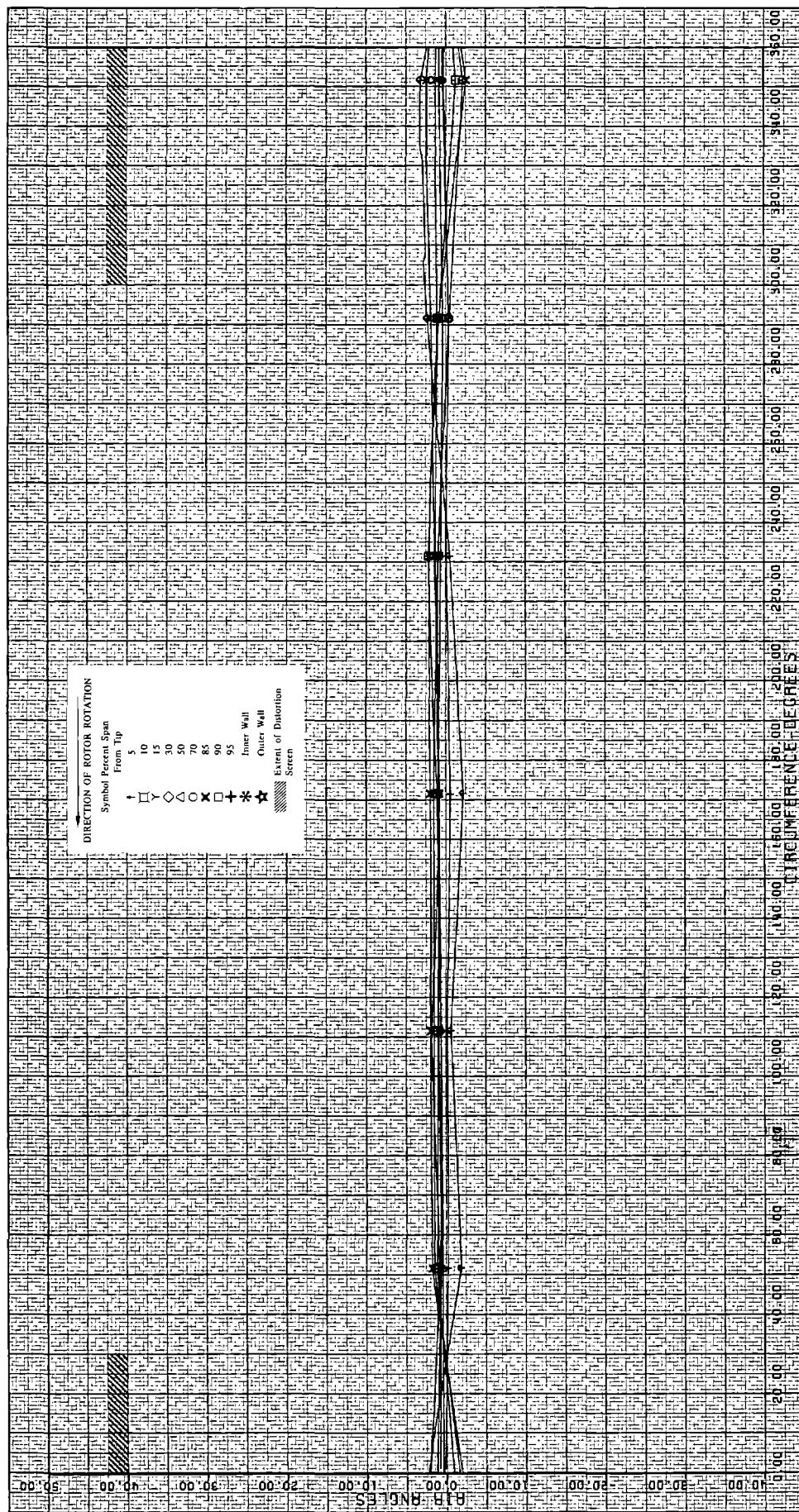
Figure 42l. Stator Exit Air Angle vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92. 60 lb/sec; Circumferential Distortion

DF 98151

143
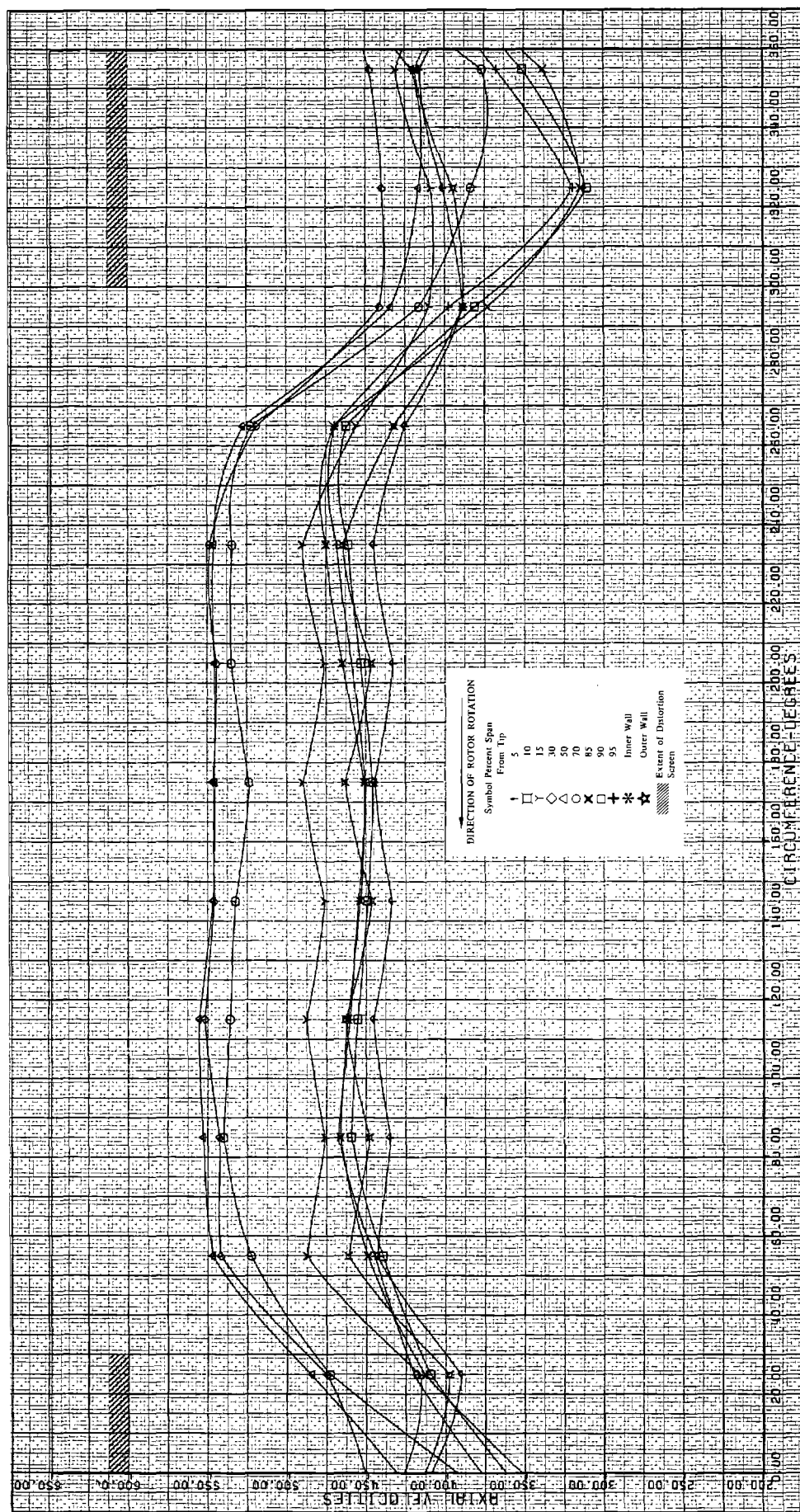
Figure 42m. Stator Exit Axial Velocity vs Circumferential Location; 100% Design Equivalent Rotor Speed; Equivalent Weight Flow = 92.60 lb/sec; Circumferential Distortion

DF 98152

144
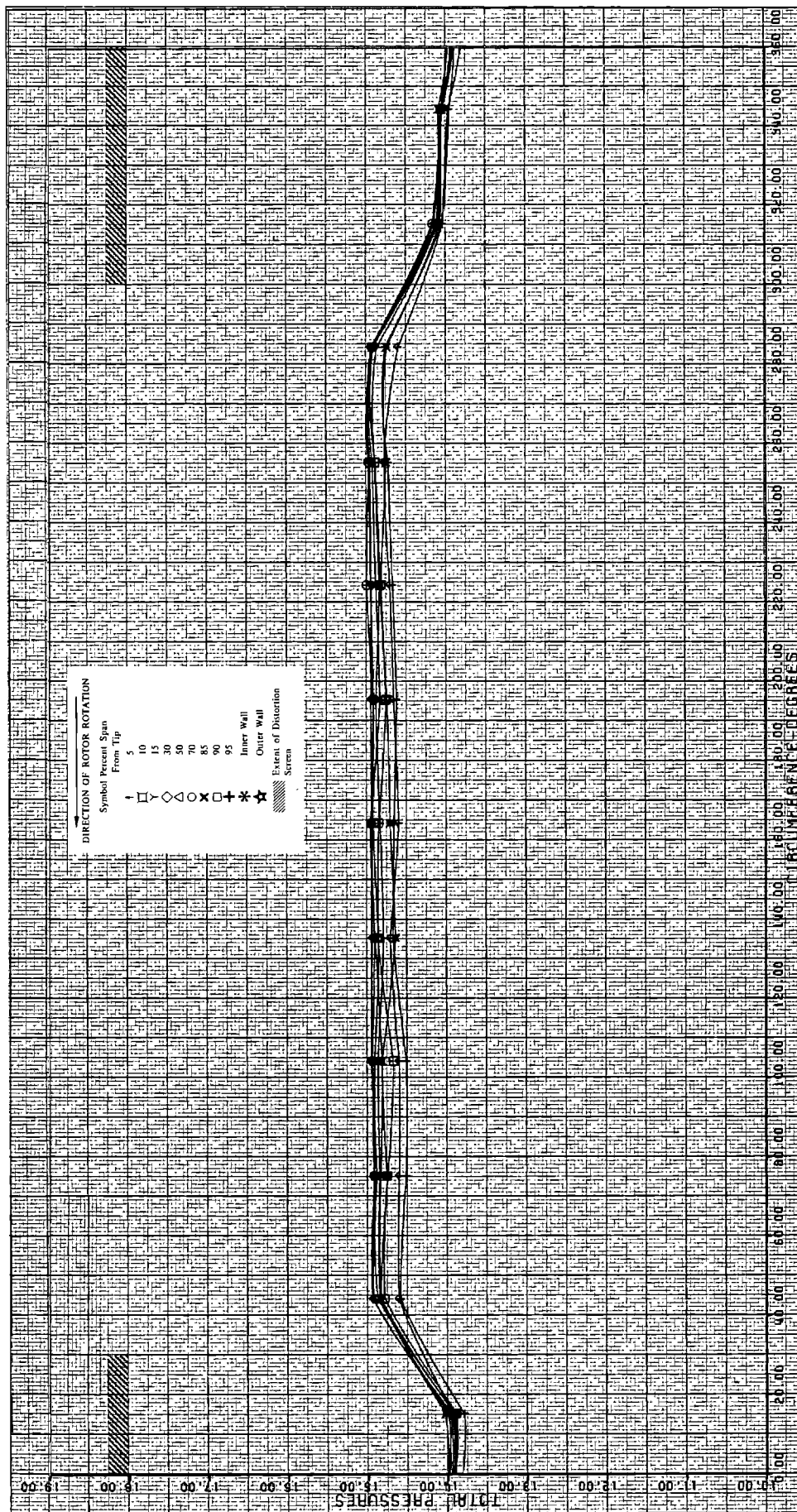
Figure 43a. Rotor Inlet Total Pressure vs Circumferential Location; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98166

145
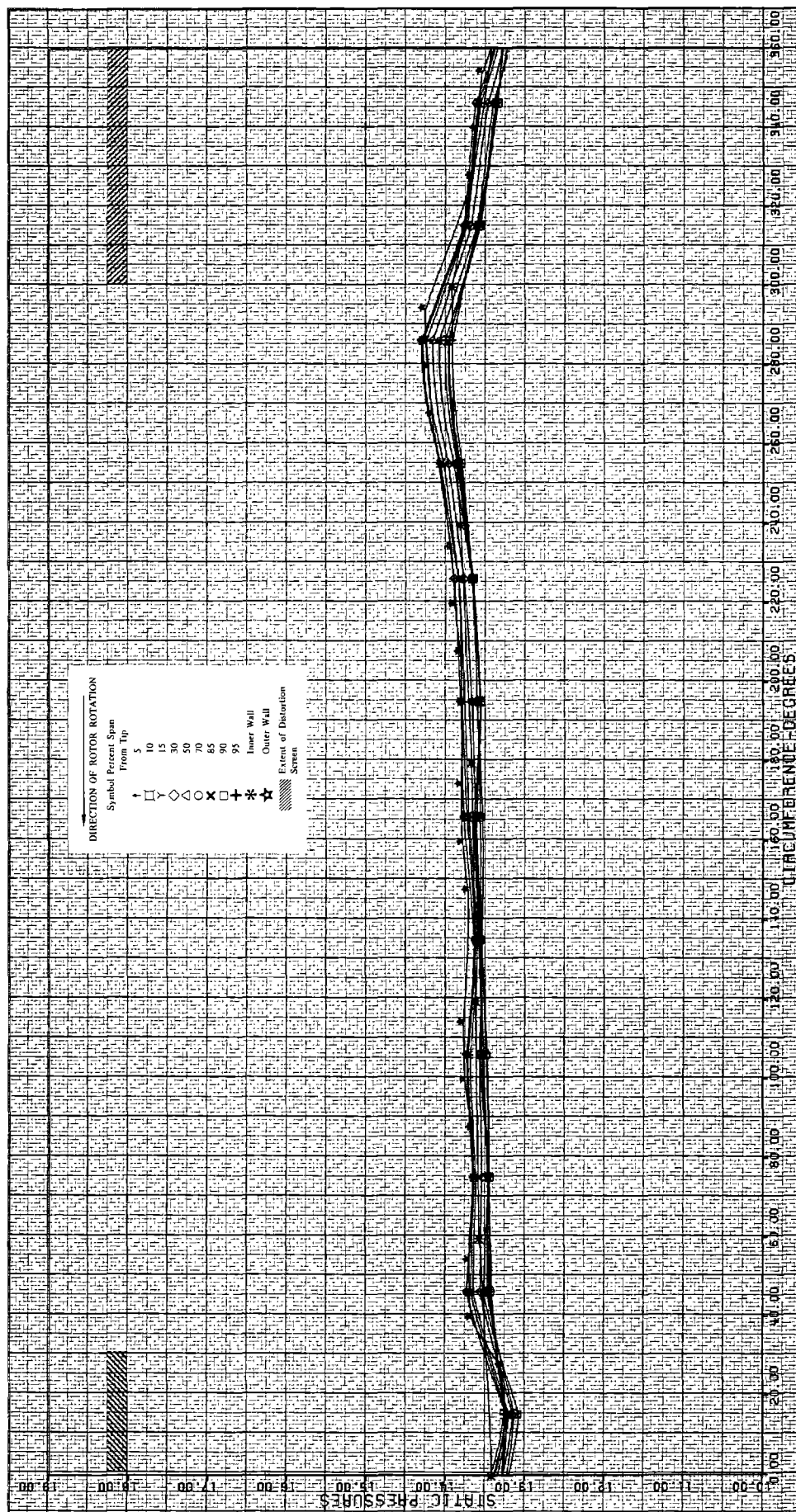
Figure 43b. Rotor Inlet Static Pressure vs Circumferential Location; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98167
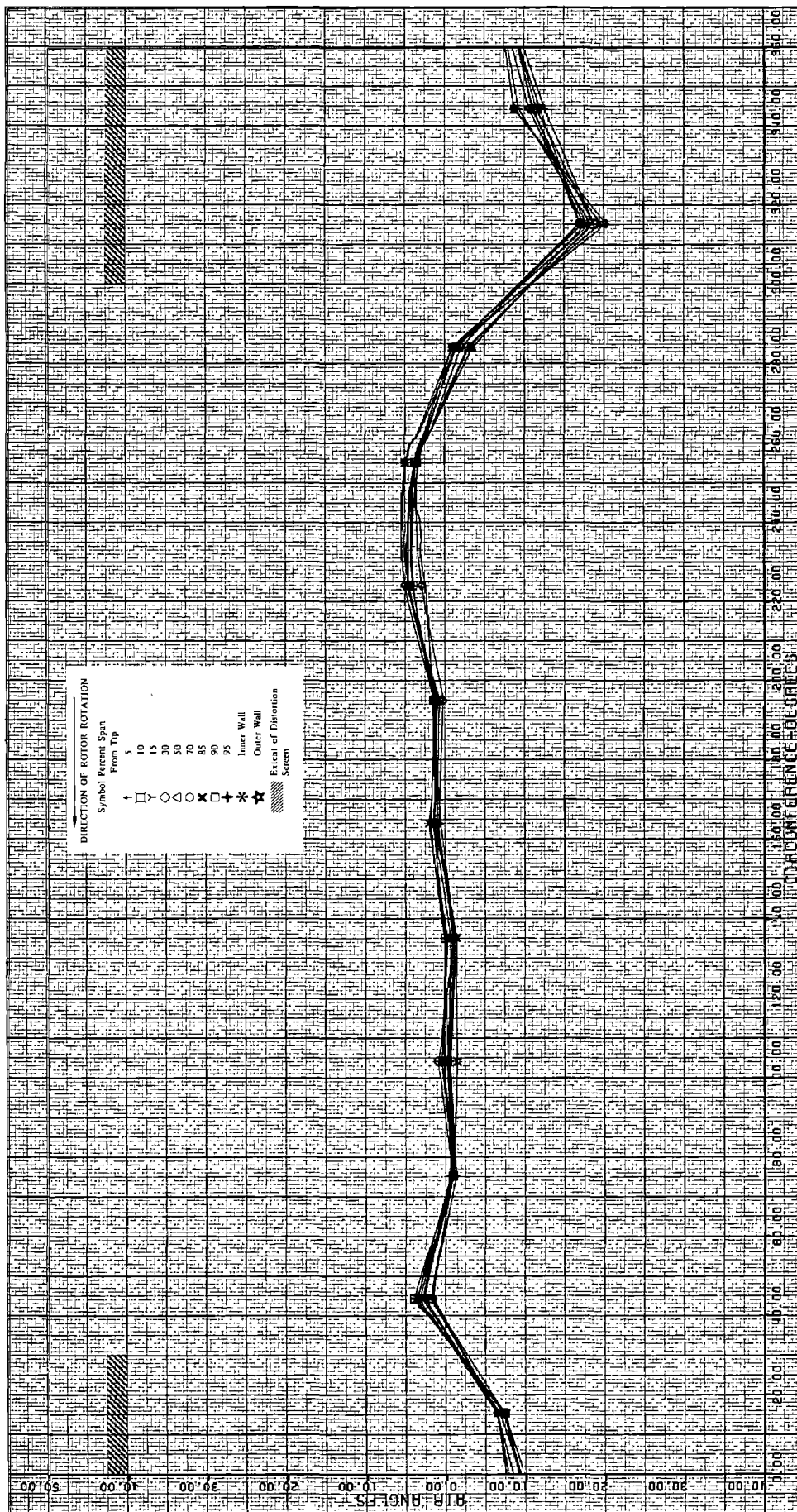
Figure 43c.   Rotor Inlet Air Angle vs Circumferential Location; 90% Design Equivalent Rotor
Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98168

147
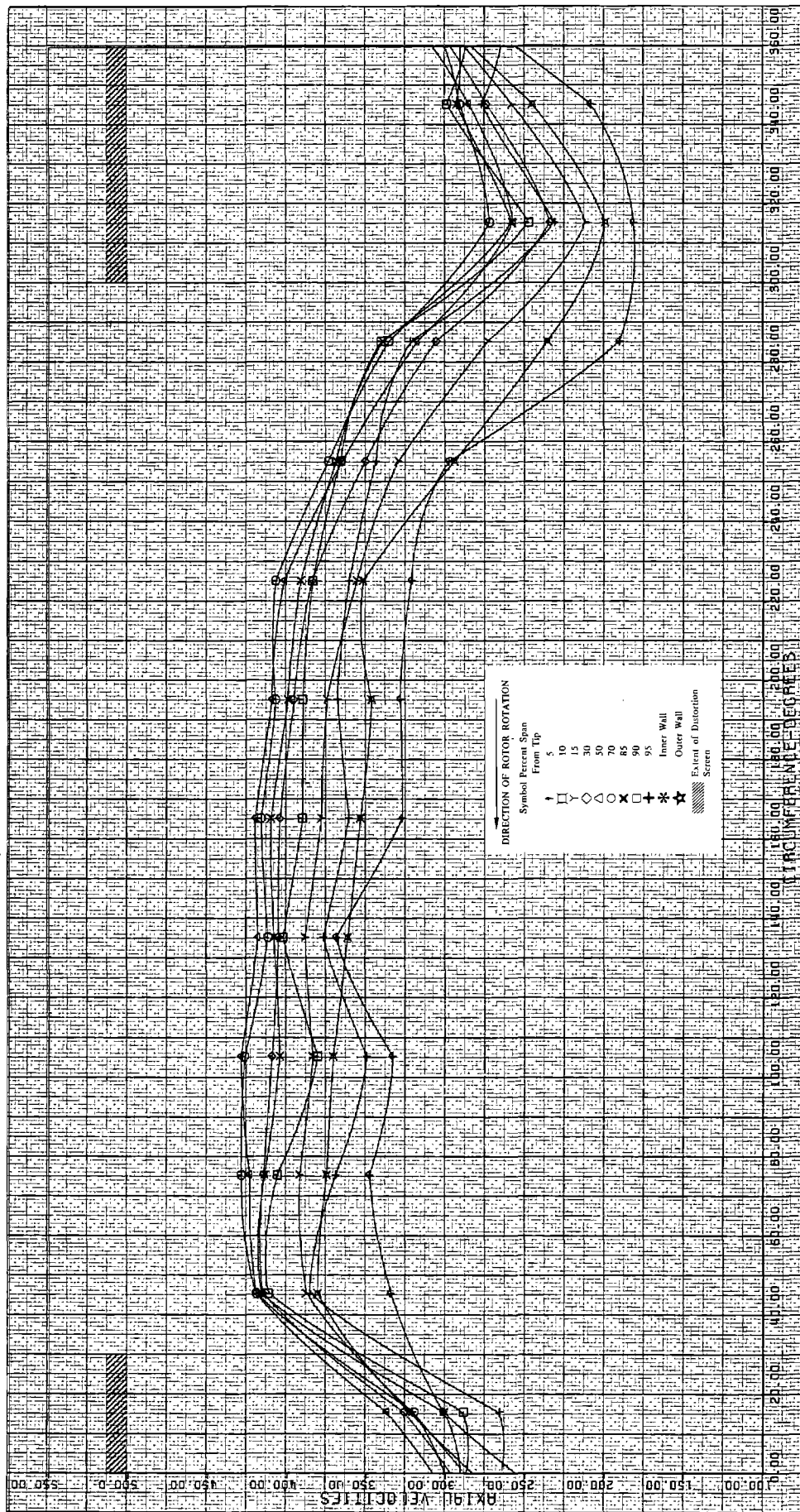
Figure 43d. Rotor Inlet Axial Velocity vs Circumferential Location; 90% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98169

148
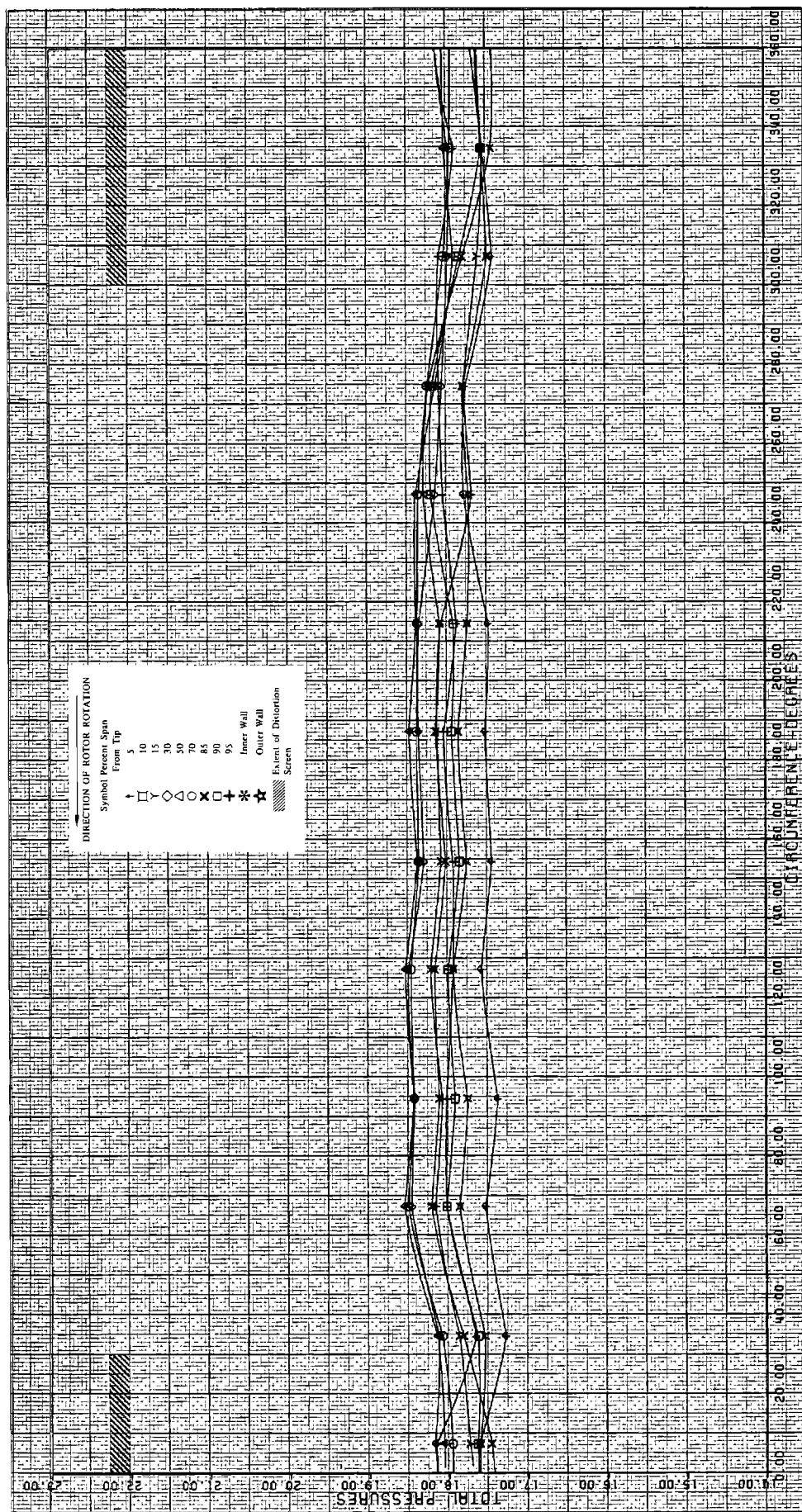
Figure 43e. Stator Inlet Total Pressure vs Circumferential Location; 90% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98170

149
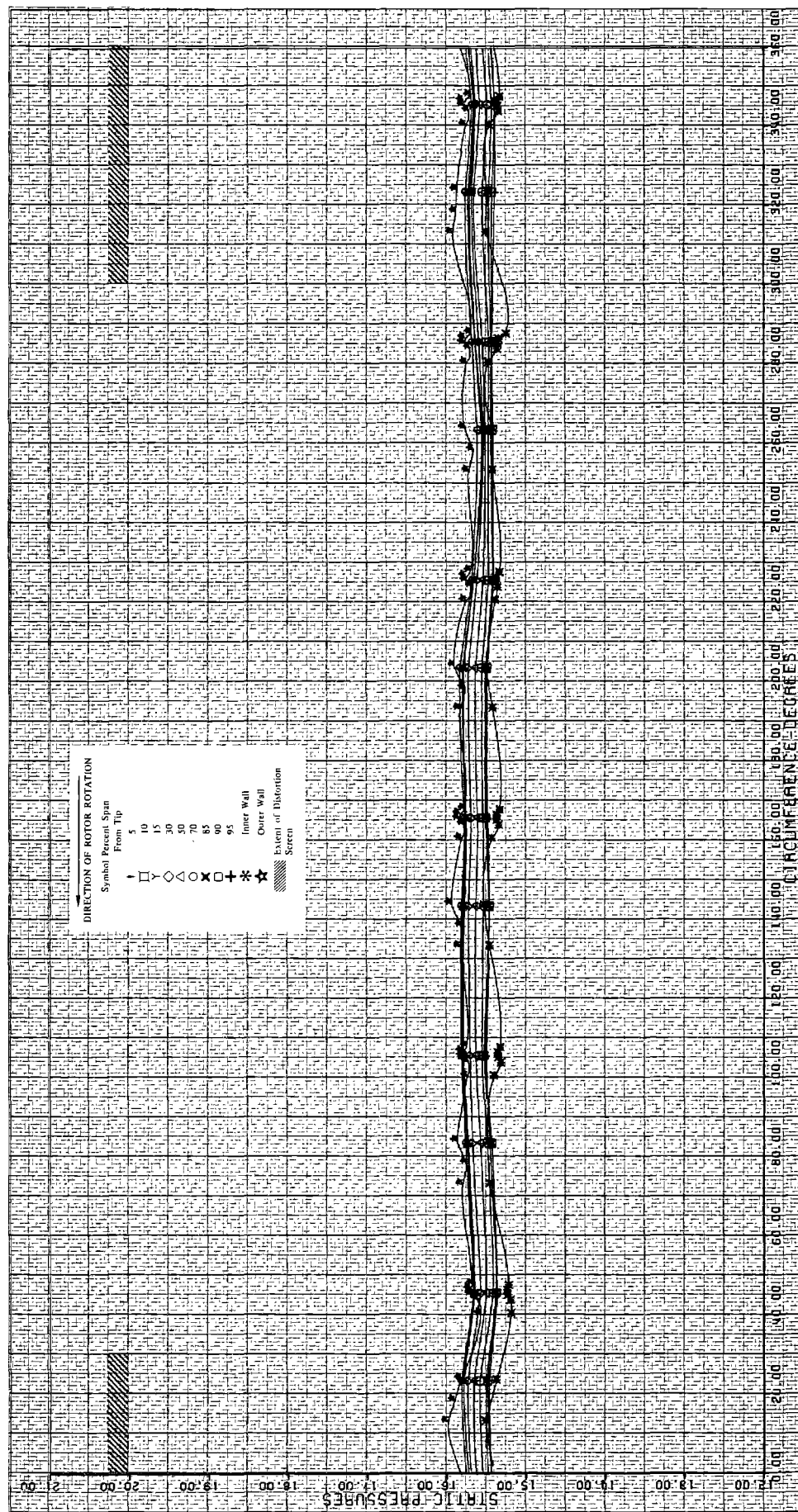
Figure 43f. Stator Inlet Static Pressure vs Circumferential Location; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98171

150
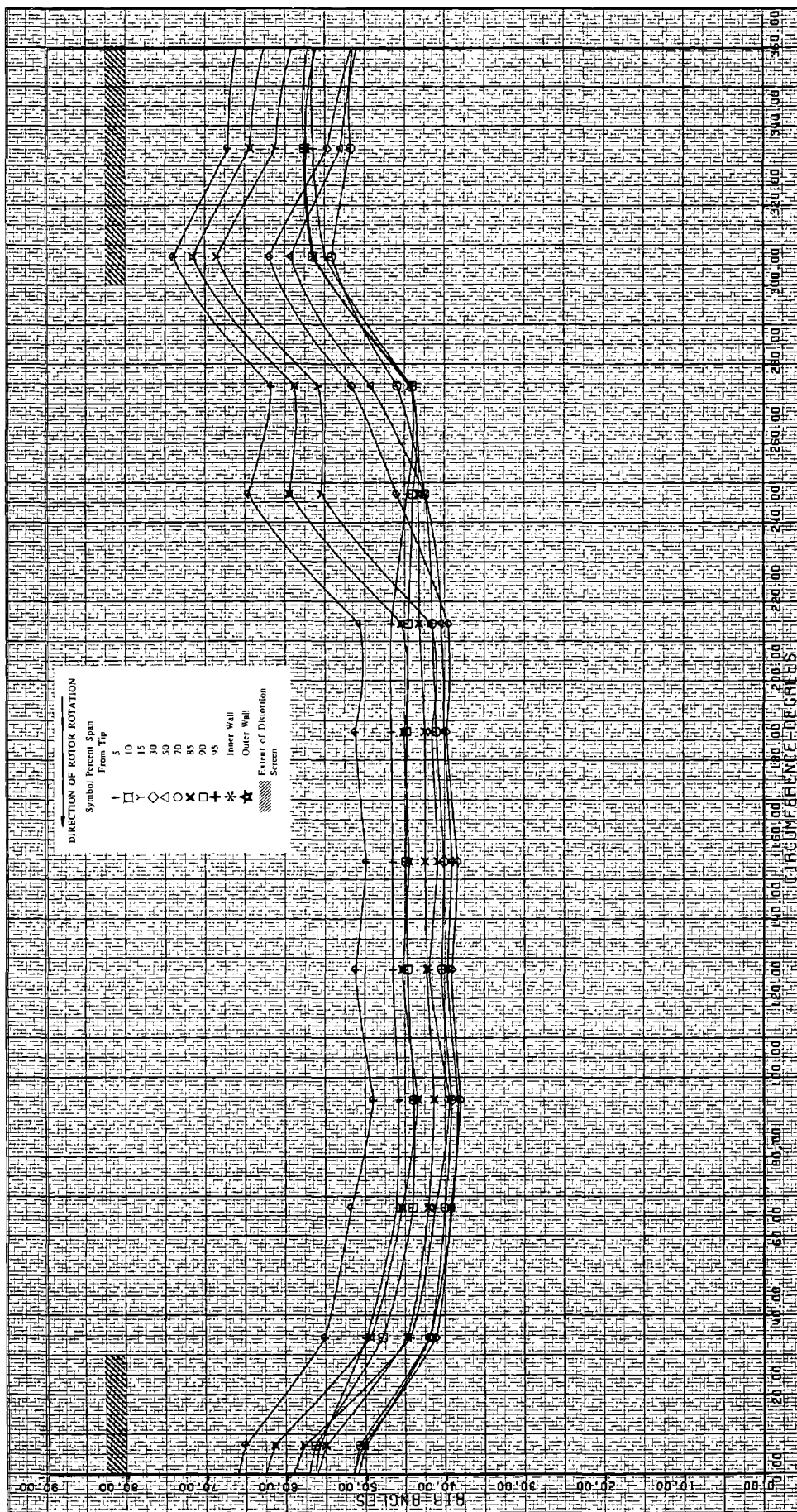
Figure 43g.   Stator Inlet Air Angle vs Circumferential Location; 90% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98172

151
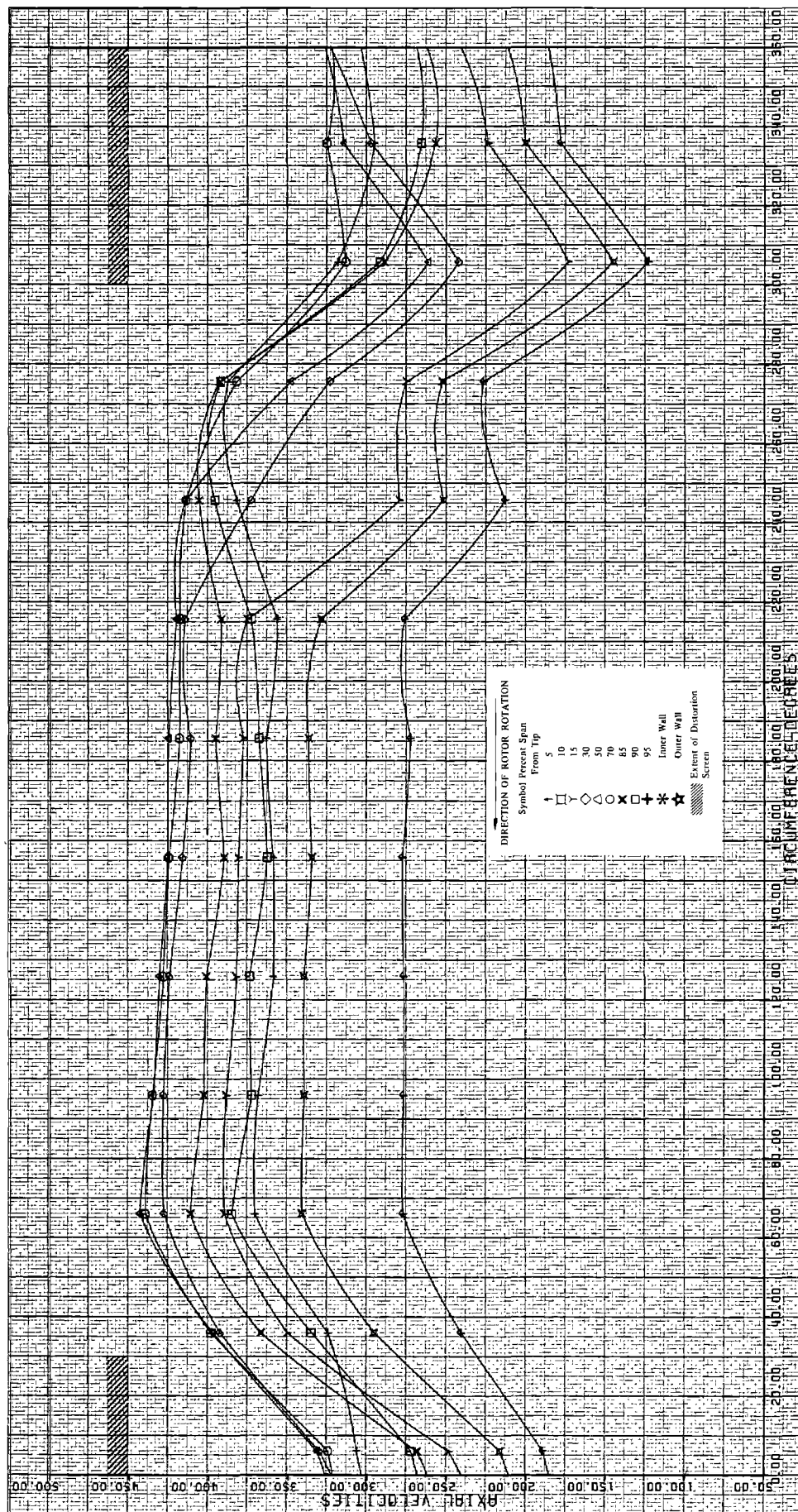
Figure 43h. Stator Inlet Axial Velocity vs Circumferential Location; 90% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98173

152
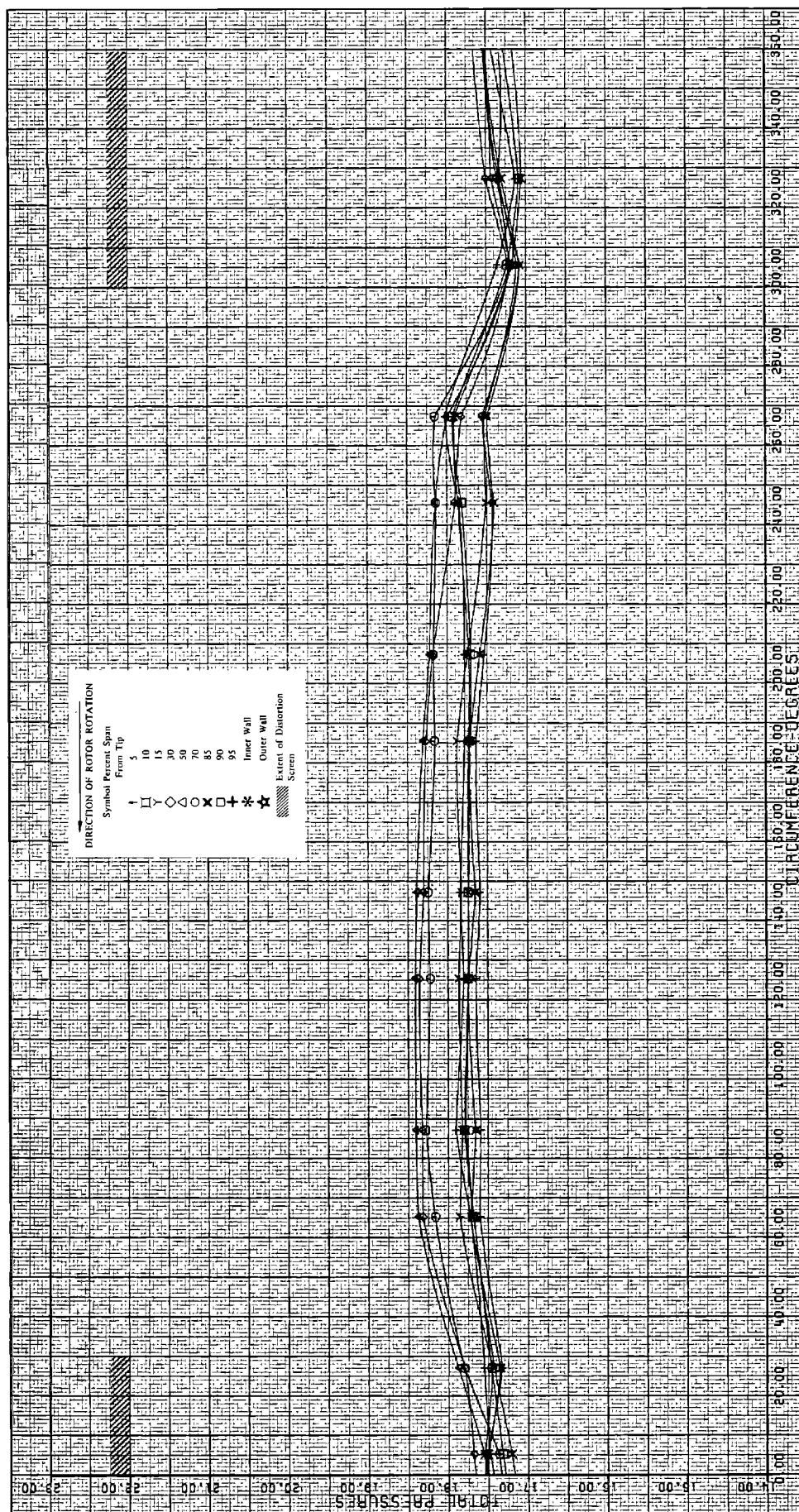
Figure 43i. Stator Exit Total Pressure vs Circumferential Location; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98174

153
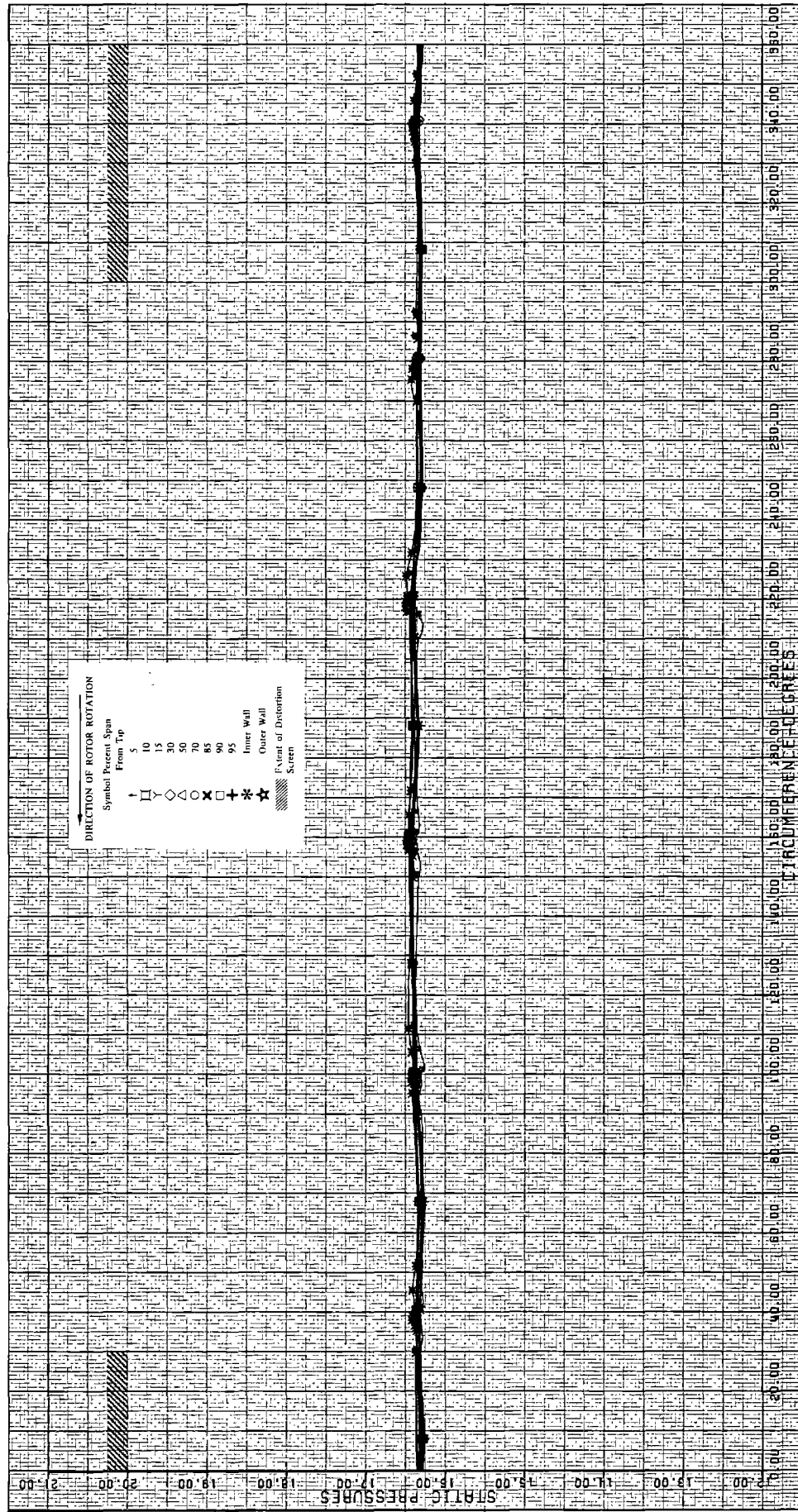
Figure 43j. Stator Exit Static Pressure vs Circumferential Location; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98175

154
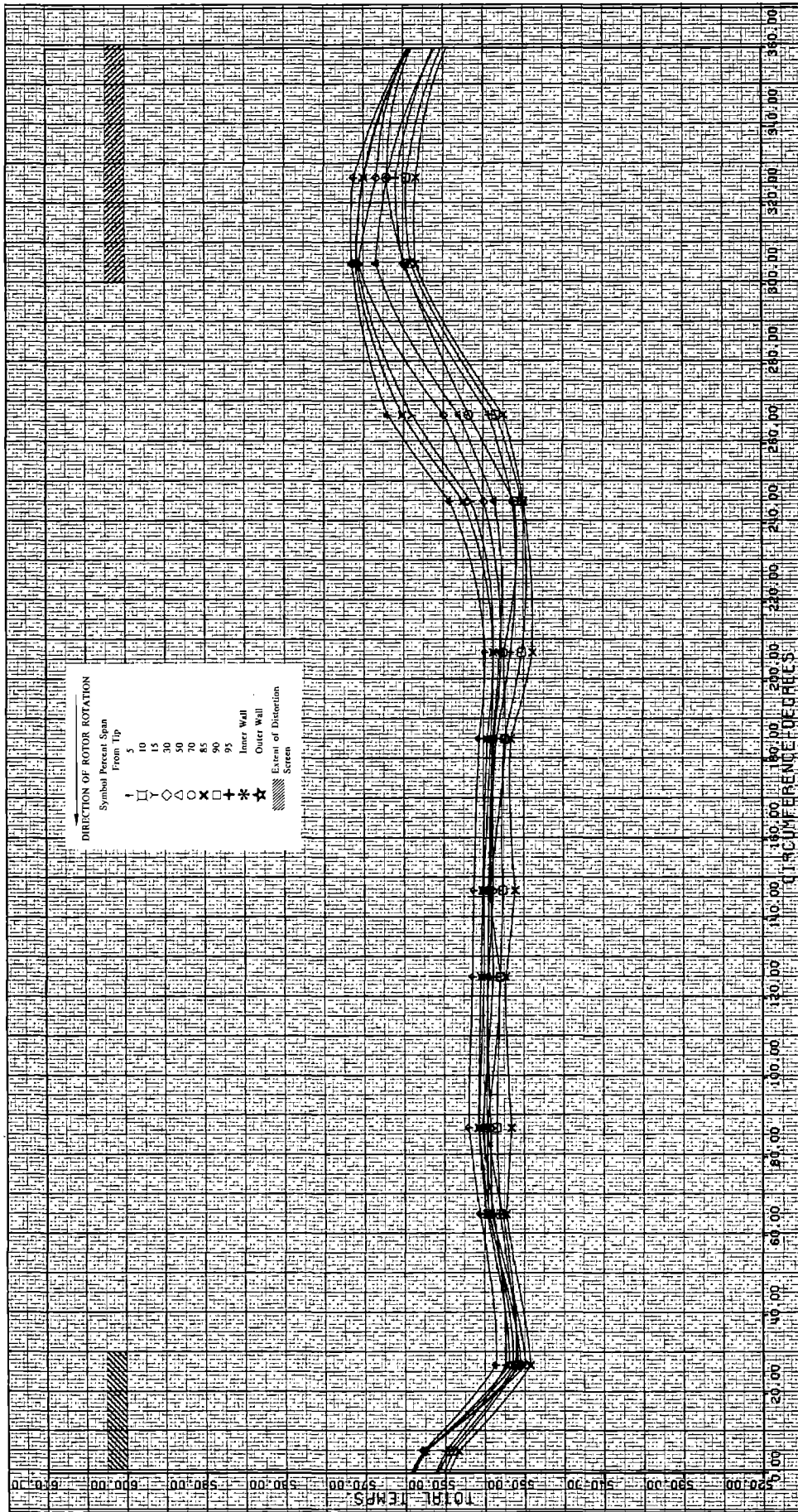
Figure 43k. Stator Exit Total Temperature vs Circumferential Location; 90% Design Equivalent
Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98176

155
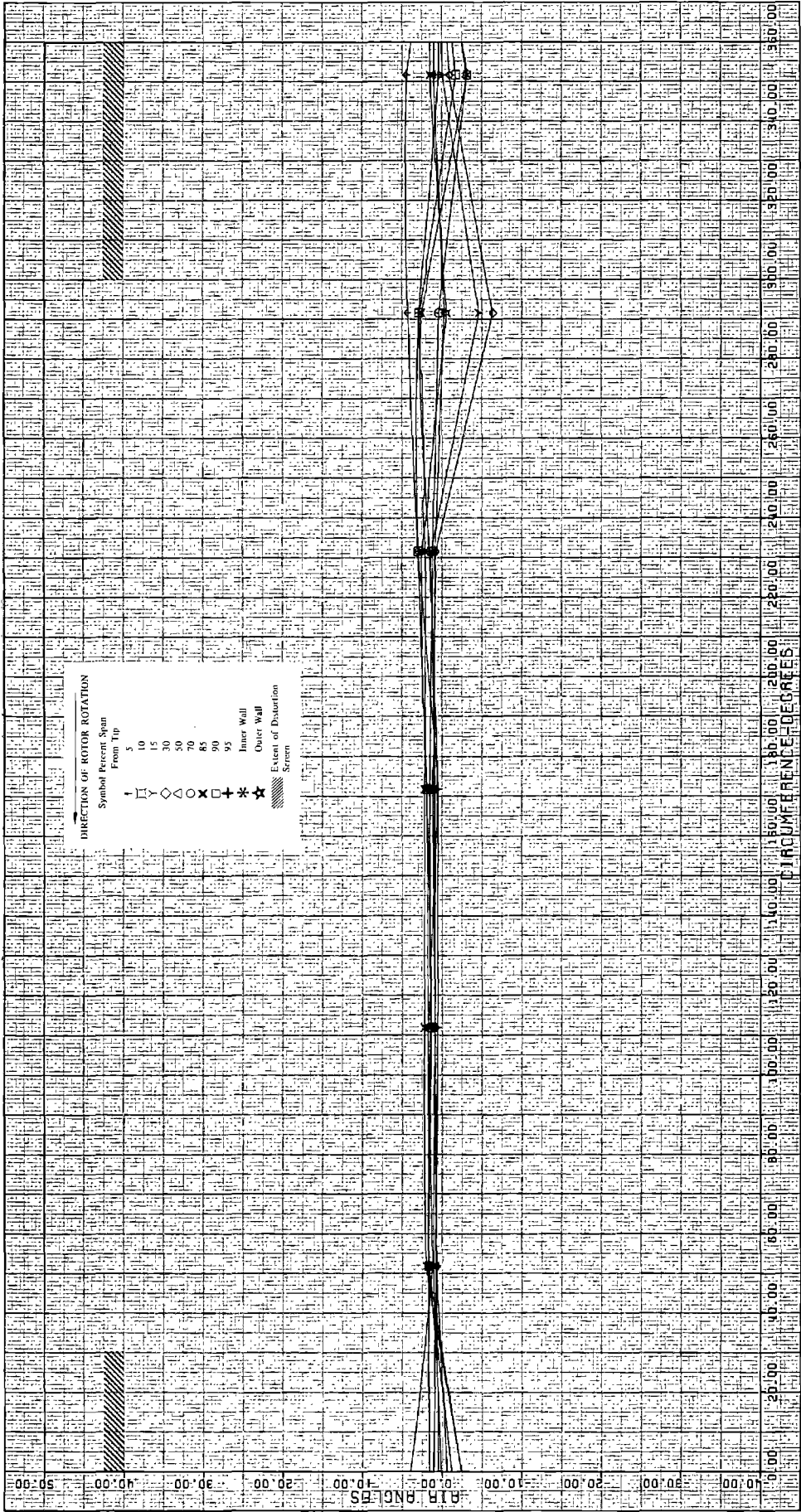
Figure 431.   Stator Exit Air Angle vs Circumferential Location; 90% Design Equivalent Rotor
Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98177

156
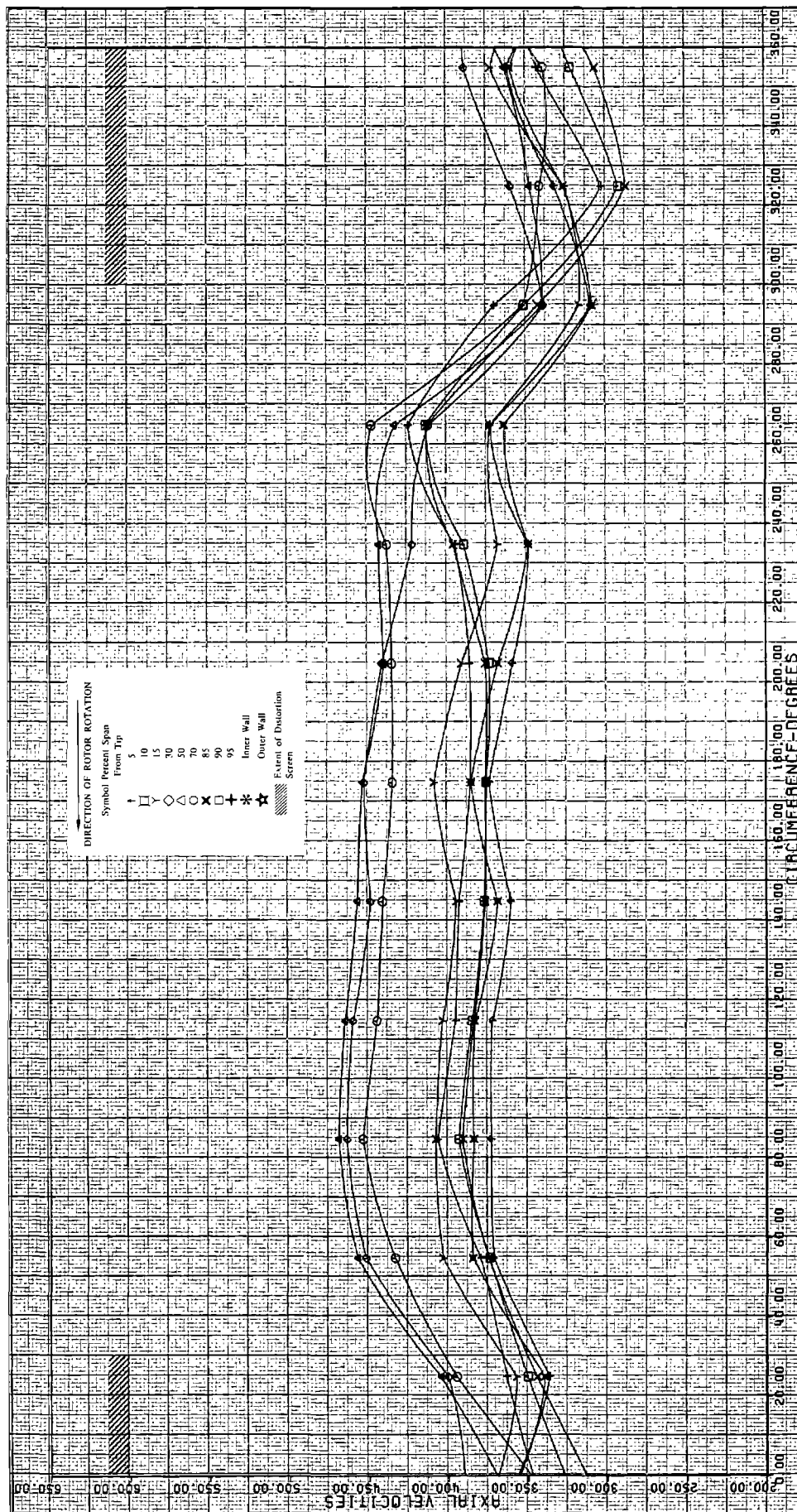
Figure 43m. Stator Exit Axial Velocity vs Circumferential Location; 90% Design Equivalent Rotor Speed; Equivalent Weight Flow = 84.27 lb/sec; Circumferential Distortion

DF 98178

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APPENDIX A
TABULATED OVERALL AND BLADE ELEMENT PERFORMANCE
AND FLOW DISTRIBUTION DATA

Rotor E and Stage E overall performance with a uniform inlet, hub radial distortion, tip radial distortion, and circumferential distortion of the inlet flow is tabulated in tables A-1, A-4, and A-7, respectively. Rotor E and Stator E blade element performance and flow distribution data for uniform inlet, hub radial distortion of the inlet flow, and tip radial distortion of the inlet flow are presented in tables A-3, A-5, and A-6, respectively. The flow distribution data with circumferential distortion of the inlet flow are given in table A-8 for circumferential increments of 30 deg around the compressor annulus. Table A-2 is presented to illustrate the small differences at the near design point between values calculated from the data at the instrumentation stations, and the values calculated from the data that have been translated to the blade row leading and trailing edges.

The blade element performance and flow distribution data with uniform inlet flow and radial distortion of the inlet flow are arranged in order of decreasing rotor speed and decreasing flow at each rotor speed. The flow distribution data with circumferential distortion of the inlet flow are given at the instrumentation station planes and are arranged for a given equivalent rotor speed and flow combination in order of increasing circumferential position. The circumferential positions of the data at each instrumentation station are noted at the top of each data sheet. These positions were selected so that they would correspond as close as possible to the locations of the 20-deg wedge probes relative to the distortion screen and provide data at increments of 30 deg around the compressor annulus.

NOMENCLATURE USED FOR OVERALL PERFORMANCE TABULATION

Mass-Averaged Rotor Inlet Total Pressure	$\bar{P}_1$
Mass-Averaged Stator Inlet Total Pressure	$\bar{P}_2$
Mass-Averaged Stator Exit Total Pressure	$\bar{P}_{2A}$
Adiabatic Efficiency*	η_{ad}
Polytropic Efficiency*	η_p

NOMENCLATURE USED FOR BLADE ELEMENT AND DISTORTION DATA TABULATION

Exit Percent Span from Tip	PCT SPAN
Exit Diameter	DIA
Absolute Flow Angle	BETA
Relative Flow Angle	BETA (PR)
Absolute Velocity	V
Axial Velocity	VZ
Absolute Tangential Velocity	V-THETA
Relative Tangential Velocity	V-THETA PR
Rotor Speed	U
Absolute Mach Number	M
Relative Mach Number	M (PR)
Relative Turning Angle	TURN (PR)
Loss Coefficient ($\bar{\omega}$)**	UUBAR
Loss Parameter**	LOSS PARA
Diffusion Factor**	DFAC
Polytropic Efficiency**	EFFP
Adiabatic Efficiency**	EFF
Incidence**	INCID
Deviation**	DEVM
Total Pressure	P
Total Temperature	T
Stator Exit Average Freestream Total Pressure from Wake Rakes	P2 FS
Loss Coefficient Based on P2FS ($\bar{\omega}_{fs}$)	UUBAR FS
Loss Parameter Based on UUBAR FS	LOSS PARA FS

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*Efficiencies calculated from mass-averaged values of total pressure and total temperature.

**Denotes variables excluded from circumferential distortion data.

Where applicable the appropriate instrumentation station is noted.

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Table A-1. Overall Performance – Stage E
Uniform Inlet

Equivalent Weight Flow, lb/sec	Rotor			Stage		
	$\bar{P}_2/\bar{P}_1$	η_{ad}	η_p	$\tilde{P}_{2A}/\bar{P}_1$	η_{ad}	η_p
110% Design Equivalent Rotor Speed						
127.64	1.2478	0.7886	0.7951	1.2106	0.6771	0.6858
122.36	1.3607	0.9148	0.9184	1.3302	0.8437	0.8499
116.81	1.3736	0.8995	0.9039	1.3440	0.8343	0.8411
111.46	1.3882	0.8895	0.8945	1.3593	0.8291	0.8364
107.01	1.3973	0.8763	0.8820	1.3645	0.8104	0.8185
100% Design Equivalent Rotor Speed						
121.43	1.2064	0.7558	0.7622	1.1811	0.6676	0.6754
117.78	1.2638	0.8984	0.9018	1.2420	0.8288	0.8339
111.27	1.2862	0.8717	0.8762	1.2666	0.8159	0.8219
106.84	1.2993	0.8953	0.8992	1.2774	0.8343	0.8399
105.92	1.3028	0.8556	0.8609	1.2823	0.8018	0.8086
102.92	1.3054	0.8884	0.8926	1.2827	0.8270	0.8330
97.95	1.3183	0.8799	0.8845	1.2939	0.8175	0.8240
93.27	1.3217	0.8389	0.8452	1.2948	0.7741	0.7822
90% Design Equivalent Rotor Speed						
114.30	1.1779	0.8849	0.8875	1.1564	0.7824	0.7868
106.88	1.2126	0.8834	0.8866	1.1945	0.8121	0.8168
98.57	1.2348	0.8844	0.8878	1.2185	0.8262	0.8310
88.91	1.2464	0.8445	0.8493	1.2289	0.7878	0.7939
82.57	1.2546	0.8179	0.8237	1.2332	0.7534	0.7606
70% Design Equivalent Rotor Speed						
92.73	1.1102	0.8467	0.8490	1.0976	0.7525	0.7558
83.59	1.1229	0.8828	0.8847	1.1133	0.8153	0.8181
75.87	1.1368	0.8781	0.8803	1.1275	0.8200	0.8230
68.30	1.1434	0.8448	0.8478	1.1348	0.7955	0.7991
61.93	1.1469	0.8091	0.8128	1.1372	0.7573	0.7617
50% Design Equivalent Rotor Speed						
64.65	1.0530	0.7769	0.7785	1.0481	0.7055	0.7075
61.51	1.0587	0.8226	0.8240	1.0543	0.7617	0.7635
55.53	1.0637	0.8323	0.8338	1.0601	0.7852	0.7870
48.51	1.0684	0.8228	0.8244	1.0646	0.7773	0.7793
42.99	1.0720	0.7720	0.7742	1.0677	0.7264	0.7290

Table A-2. Blade Element Performance
Stage E, Rotor E - Stator E
Calculations Using Untranslated Values
Percent Equivalent Rotor Speed = 100.28 Equivalent Rotor Speed = 4221.89 Equivalent Weight Flow = 111.27
Uniform Inlet

INLET (STATION G / STATION 1)

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.118	33.520	33.947	35.279	37.080	38.872	40.221	40.631	40.975	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	443.00	443.00	443.00	443.00	443.00	443.00	443.00	443.00	443.00	V 0
V 1	462.57	505.23	514.73	517.90	510.22	495.72	467.87	456.43	421.37	V 1
VZ 0	443.00	443.00	443.00	442.99	442.97	442.93	442.90	442.88	442.88	VZ 0
VZ 1	462.56	505.22	514.73	517.89	510.19	495.66	467.79	456.35	421.33	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	M 0
M 1	0.4216	0.4621	0.4712	0.4742	0.4668	0.4530	0.4266	0.4158	0.3829	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4811	0.3148	0.2852	0.2827	0.2839	0.2878	0.3520	0.3861	0.5390	UUBAR
DFAC	-0.044	-0.140	-0.162	-0.169	-0.152	-0.119	-0.056	-0.030	0.049	DFAC
EFFP	0.1643	0.5034	0.5663	0.5800	0.5501	0.4820	0.2572	0.1437	-0.2257	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.216	15.216	15.216	15.216	15.216	15.216	15.216	15.216	15.216	P 0
P 1	14.441	14.709	14.756	14.761	14.759	14.752	14.649	14.594	14.347	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (STATION 1 / STATION 2)

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98	PCT SPAN
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	44.500	42.250	39.800	37.900	37.400	36.860	38.800	43.200	49.000	BETA 2
BETA(PR) 1	52.831	50.710	50.542	51.449	53.246	55.310	57.734	58.629	60.830	BETA(PR) 1
BETA(PR) 2	24.552	25.889	25.400	25.516	29.054	34.060	38.436	42.959	49.986	BETA(PR) 2
V 1	462.57	505.23	514.73	517.90	510.22	495.72	467.87	456.43	421.37	V 1
V 2	596.28	600.30	623.29	653.49	644.69	618.24	583.72	538.25	482.14	V 2
VZ 1	462.56	505.22	514.73	517.89	510.19	495.66	467.79	456.35	421.33	VZ 1
VZ 2	425.29	444.35	478.86	515.63	511.92	494.38	453.96	391.57	315.78	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	417.93	403.61	398.97	401.41	391.39	369.84	365.00	367.70	363.26	V-THETA 2
V(PR) 1	765.6	797.8	809.9	831.0	852.6	870.9	876.3	876.7	866.5	V(PR) 1
V(PR) 2	467.6	493.9	530.1	571.4	585.9	597.6	580.8	536.1	491.9	V(PR) 2
VTHETA PR1	-610.1	-617.5	-625.4	-649.9	-683.1	-716.1	-740.9	-748.5	-754.8	VTHETA PR1
VTHETA PR2	-194.3	-215.7	-227.4	-246.1	-284.4	-334.2	-360.3	-364.6	-376.1	VTHETA PR2
U 1	610.08	617.49	625.35	649.89	683.07	716.08	740.93	748.48	754.82	U 1
U 2	612.22	619.27	626.35	647.53	675.79	704.05	725.27	732.33	739.40	U 2
M 1	0.4216	0.4621	0.4712	0.4742	0.4668	0.4530	0.4266	0.4158	0.3829	M 1
M 2	0.5265	0.5308	0.5529	0.5805	0.5720	0.5475	0.5151	0.4730	0.4214	M 2
M(PR) 1	0.6978	0.7297	0.7414	0.7609	0.7801	0.7959	0.7990	0.7987	0.7856	M(PR) 1
M(PR) 2	0.4129	0.4368	0.4702	0.5076	0.5199	0.5292	0.5125	0.4711	0.4299	M(PR) 2
TURN(PR)	28.279	24.821	25.142	25.934	24.205	21.303	19.389	15.775	10.953	TURN(PR)
UUBAR	0.1170	0.1378	0.0938	0.0492	0.0609	0.0748	0.1159	0.1889	0.2258	UUBAR
LOSS PARA	0.0308	0.0364	0.0252	0.0137	0.0171	0.0208	0.0315	0.0485	0.0514	LOSS PARA
DFAC	0.5477	0.5295	0.4919	0.4608	0.4598	0.4554	0.4803	0.5339	0.5783	DFAC
EFFP	0.8415	0.8095	0.8734	0.9238	0.9192	0.8976	0.8575	0.7750	0.7144	EFFP
EFF	0.8359	0.8033	0.8690	0.9209	0.9161	0.8939	0.8525	0.7678	0.7040	EFF
INCID	0.404	-0.200	-0.033	-0.592	-0.727	-0.591	-0.790	-3.504	-7.172	INCID
DEVM	9.404	11.731	10.767	6.875	5.841	6.495	6.807	9.814	14.000	DEVM
P 1	14.441	14.709	14.756	14.761	14.759	14.752	14.649	14.594	14.367	P 1
P 2	18.412	18.474	18.774	19.230	19.230	19.033	18.702	18.226	17.697	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	563.303	562.149	561.214	562.916	563.172	562.518	562.681	562.985	564.095	T 2

STATOR E (STATION 2 / STATION 2A)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	44.500	42.250	39.800	37.900	37.400	36.800	38.800	43.200	49.000	BETA 2
BETA 2A	-1.350	1.250	1.950	1.950	1.150	0.880	1.940	2.500	0.500	BETA 2A
V 2	596.28	600.30	623.29	653.49	644.69	618.24	583.72	538.25	482.14	V 2
V 2A	450.79	442.36	448.28	522.95	548.41	545.42	483.63	458.05	442.41	V 2A
VZ 2	425.29	444.35	478.86	515.63	511.92	494.38	453.96	391.57	315.78	VZ 2
VZ 2A	450.66	442.24	448.01	522.59	548.17	545.15	483.11	457.35	442.07	VZ 2A
V-THETA 2	417.93	403.61	398.97	401.41	391.39	369.84	365.00	367.70	363.26	V-THETA 2
V-THETA 2A	-10.62	9.65	15.25	17.79	11.00	8.37	16.36	19.97	3.86	V-THETA 2A
M 2	0.5265	0.5308	0.5529	0.5805	0.5720	0.5475	0.5151	0.4730	0.4214	M 2
M 2A	0.3934	0.3862	0.3919	0.4590	0.4822	0.4798	0.4233	0.4001	0.3856	M 2A
TURN(PR)	45.849	40.999	37.850	35.948	36.230	35.862	36.764	40.592	48.389	TURN(PR)
UUBAR	0.0657	0.1030	0.1629	0.0821	0.0217	-0.0100	0.1007	0.0256	-0.1522	UUBAR
LOSS PARA	0.0221	0.0351	0.0561	0.0291	0.0080	-0.0039	0.0399	0.0102	-0.0614	LOSS PARA
DFAC	0.4862	0.4867	0.4930	0.4089	0.3687	0.3442	0.4097	0.4092	0.3851	DFAC
EFFP	0.8617	0.7960	0.6951	0.7985	0.9313	1.0400	0.7090	0.9152	1.8853	EFFP
INCID	-5.668	-1.138	-0.489	-0.126	0.693	0.909	0.045	-0.028	-10.256	INCID
DEVM	7.482	12.562	13.260	12.925	12.162	12.546	14.380	15.179	5.354	DEVM
P 2	18.412	18.474	18.774	19.230	19.230	19.033	18.702	18.226	17.697	P 2
P 2A	18.204	18.142	18.201	18.908	19.147	19.068	18.390	18.159	18.007	P 2A
T 2	563.303	562.149	561.214	562.916	563.172	562.518	562.681	562.985	564.095	T 2
T 2A	563.303	562.149	561.214	562.916	563.172	562.518	562.681	562.985	564.095	T 2A
UUBAR FS	-.800	0.1220	0.1236	0.0489	0.0375	0.0337	0.1884	0.2086	0.2227	UUBAR FS
P2 FS	18.461	18.544	18.616	19.093	19.292	19.191	19.036	18.824	18.679	P2 FS
LOSS PARA FS	0.269	0.0416	0.0425	0.0173	0.0138	0.0131	0.0749	0.0831	0.0898	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 110.70   Equivalent Rotor Speed = 4660.48   Equivalent Weight Flow 127.64
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	511.45	511.45	511.45	511.45	511.45	511.45	511.45	511.45	511.45	V 0
V 1	549.50	565.86	561.15	556.48	550.87	552.86	549.24	536.03	516.95	V 1
VZ 0	511.45	511.45	511.45	511.44	511.41	511.36	511.32	511.31	511.31	VZ 0
VZ 1	549.50	565.86	561.15	556.48	550.83	552.77	549.10	535.88	516.82	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4680	0.4680	0.4680	0.4680	0.4680	0.4680	0.4680	0.4680	0.4680	M 0
M 1	0.5046	0.5204	0.5158	0.5113	0.5059	0.5078	0.5043	0.4916	0.4733	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.5714	0.3951	0.3624	0.3682	0.3609	0.3609	0.3902	0.4576	0.5411	UUBAR
DFAC	-.074	-0.106	-0.097	-0.088	-0.077	-0.081	-0.074	-0.048	-0.011	DFAC
EFFP	0.2225	0.3788	0.3772	0.3495	0.3231	0.3344	0.2966	0.1866	0.0406	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.546	15.546	15.546	15.546	15.546	15.546	15.546	15.546	15.546	P 0
P 1	14.309	14.690	14.761	14.749	14.765	14.765	14.701	14.555	14.374	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	35.499	32.769	31.411	29.787	28.707	26.509	27.491	31.031	39.256	BETA 2
BETA(PR) 1	50.716	48.414	48.238	49.503	51.572	52.842	53.778	54.659	55.796	BETA(PR) 1
BETA(PR) 2	27.523	26.623	26.337	26.217	30.164	33.297	37.537	41.989	55.362	BETA(PR) 2
V 1	550.98	604.91	616.28	612.28	598.32	600.63	602.00	589.01	568.98	V 1
V 2	672.58	710.20	732.84	773.77	754.25	753.32	702.73	630.50	466.88	V 2
VZ 1	550.87	604.77	616.21	612.25	597.58	598.20	598.04	584.82	565.27	VZ 1
VZ 2	547.55	597.14	625.42	671.52	661.24	673.07	621.79	538.84	360.74	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	390.54	384.37	381.93	384.38	362.12	335.71	323.55	324.17	294.80	V-THETA 2
V(PR) 1	870.1	911.2	925.2	942.8	961.9	991.8	1014.4	1013.5	1007.6	V(PR) 1
V(PR) 2	617.5	668.0	697.9	748.5	765.1	806.4	785.7	726.4	635.4	V(PR) 2
VTHETA PR1	-673.4	-681.5	-690.1	-716.9	-753.2	-789.3	-816.4	-824.7	-831.6	VTHETA PR1
VTHETA PR2	-285.3	-299.3	-309.6	-330.7	-384.3	-442.1	-477.8	-485.0	-522.2	VTHETA PR2
U 1	673.41	661.50	690.11	716.93	753.19	789.29	816.45	824.71	831.63	U 1
U 2	675.85	683.69	691.53	715.06	746.42	777.79	801.31	809.15	816.99	U 2
M 1	0.5060	0.5585	0.5696	0.5657	0.5520	0.5543	0.5556	0.5429	0.5234	M 1
M 2	0.5987	0.6356	0.6582	0.6960	0.6774	0.6782	0.6299	0.5611	0.4094	M 2
M(PR) 1	0.7990	0.8413	0.8552	0.8711	0.8874	0.9153	0.9362	0.9341	0.9269	M(PR) 1
M(PR) 2	0.5496	0.5979	0.6268	0.6733	0.6872	0.7259	0.7043	0.6464	0.5573	M(PR) 2
TURN(PR)	23.169	21.767	21.898	23.285	21.388	19.484	16.150	12.579	0.354	TURN(PR)
UUBAR	0.2135	0.2014	0.1705	0.1215	0.1304	0.1053	0.1785	0.2710	0.3909	UUBAR
LOSS PARA	0.0549	0.0528	0.0454	0.0335	0.0363	0.0296	0.0491	0.0706	0.0787	LOSS PARA
DFAC	0.4206	0.3908	0.3684	0.3313	0.3252	0.3000	0.3351	0.3943	0.4721	DFAC
EFFP	0.7290	0.7430	0.8035	0.8398	0.8230	0.8668	0.7549	0.6049	0.2892	EFFP
EFF	0.7219	0.7354	0.7973	0.8341	0.8169	0.8623	0.7479	0.5960	0.2815	EFF
INCID	-1.716	-2.502	-2.340	-2.540	-2.432	-3.157	-4.922	-7.663	-12.379	INCID
DEVM	12.373	12.463	11.703	7.576	6.954	5.738	5.914	8.850	19.392	DEVM
P 1	14.309	14.690	14.761	14.749	14.765	14.765	14.701	14.555	14.374	P 1
P 2	17.626	18.050	18.356	18.885	18.716	18.695	17.923	17.023	15.510	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	562.874	561.443	560.504	564.219	563.216	560.667	559.095	558.535	559.195	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	35.776	32.552	30.738	29.824	28.187	26.375	28.143	32.083	40.983	BETA 2
BETA 2A	-0.200	1.100	1.400	0.800	-0.100	0.800	0.650	-0.800	-5.002	BETA 2A
V 2	668.11	714.60	747.64	773.77	768.21	758.02	688.57	612.68	451.23	V 2
V 2A	610.92	627.80	653.77	715.09	703.19	698.97	615.26	580.88	562.12	V 2A
VZ 2	542.02	602.33	642.57	671.17	676.76	678.43	606.34	518.42	340.23	VZ 2
VZ 2A	610.91	627.66	653.54	714.92	702.95	698.49	614.72	580.31	559.39	VZ 2A
V-THETA 2	390.61	384.50	382.11	384.75	362.68	336.40	324.34	324.99	295.58	V-THETA 2
V-THETA 2A	-2.13	12.05	15.97	9.98	-1.23	9.76	6.98	-8.11	-48.96	V-THETA 2A
M 2	0.5944	0.6399	0.6727	0.6960	0.6911	0.6828	0.6162	0.5443	0.3953	M 2
M 2A	0.5404	0.5570	0.5821	0.6387	0.6278	0.6253	0.5464	0.5145	0.4967	M 2A
TURN(PR)	35.978	31.452	29.337	29.018	28.271	25.546	27.451	32.835	45.920	TURN(PR)
UUBAR	0.0768	0.1196	0.1073	0.0498	0.0550	0.0815	0.1954	0.0886	-0.6440	UUBAR
LOSS PARA	0.0259	0.0408	0.0369	0.0177	0.0204	0.0314	0.0774	0.0354	-0.2588	LOSS PARA
DFAC	0.2837	0.2991	0.2943	0.2483	0.2606	0.2446	0.2901	0.2705	0.0635	DFAC
EFFP	0.5916	0.5485	0.6141	0.7175	0.7184	0.5449	0.1507	0.2209	-0.0459	EFFP
INCID	-14.389	-10.835	-9.552	-8.206	-8.516	-9.487	-10.557	-11.084	-18.221	INCID
DEVM	8.632	12.412	12.710	11.775	10.912	12.466	13.091	11.880	-0.142	DEVM
P 2	17.626	18.050	18.356	18.885	18.716	18.695	17.923	17.023	15.510	P 2
P 2A	17.339	17.529	17.641	18.625	18.435	18.287	17.131	16.748	16.530	P 2A
T 2	562.874	561.443	560.504	564.219	563.216	560.667	559.095	558.535	559.195	T 2
T 2A	562.874	561.443	560.504	564.219	563.216	560.667	559.095	558.535	559.195	T 2A
UUBAR FS	0.1487	0.1386	0.0923	0.0346	0.0308	0.0408	0.2732	0.3140	0.3062	UUBAR FS
P2 FS	17.943	18.144	18.276	18.803	18.589	18.483	18.356	18.044	17.679	P2 FS
LOSS PARA FS	0.0561	0.0472	0.0317	0.0123	0.0114	0.0157	0.1082	0.1254	0.1230	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 109.62 Equivalent Rotor Speed = 4614.80 Equivalent Weight Flow : 122.36
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	490.72	490.72	490.72	490.72	490.72	490.72	490.72	490.72	490.72	V 0
V 1	512.41	531.49	528.61	517.35	526.49	524.08	522.57	507.29	480.19	V 1
VZ 0	490.72	490.72	490.72	490.71	490.68	490.64	490.59	490.59	490.59	VZ 0
VZ 1	512.40	531.49	528.61	517.34	526.45	523.99	522.44	507.15	480.06	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4483	0.4483	0.4483	0.4483	0.4483	0.4483	0.4483	0.4483	0.4483	M 0
M 1	0.4689	0.4872	0.4845	0.4737	0.4824	0.4801	0.4787	0.4641	0.4383	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.5447	0.3603	0.3228	0.3212	0.3196	0.3254	0.3782	0.4332	0.5383	UUBAR
DFAC	-0.044	-0.083	-0.077	-0.054	-0.073	-0.068	-0.065	-0.034	0.021	DFAC
EFFP	0.1489	0.3395	0.3477	0.2711	0.3365	0.3165	0.2745	0.1441	-0.0906	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.406	15.406	15.406	15.406	15.406	15.406	15.406	15.406	15.406	P 0
P 1	14.325	14.691	14.766	14.769	14.772	14.760	14.656	14.547	14.338	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	45.600	44.290	41.155	37.984	37.533	36.578	38.721	42.461	48.728	BETA 2
BETA(PR) 1	52.394	50.003	49.780	51.425	52.635	54.130	54.956	55.973	57.592	BETA(PR) 1
BETA(PR) 2	26.414	27.458	26.525	25.795	28.623	32.376	36.646	40.717	47.035	BETA(PR) 2
V 1	513.72	566.32	577.96	566.23	570.19	567.43	570.77	555.38	526.20	V 1
V 2	630.18	632.58	662.32	710.64	709.58	697.81	659.27	612.81	555.02	V 2
VZ 1	513.62	566.19	577.89	566.20	569.49	565.13	567.01	551.43	522.77	VZ 1
VZ 2	440.90	452.79	498.67	560.10	562.49	559.67	513.35	451.21	365.55	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	450.23	441.70	435.86	437.35	432.13	415.32	411.58	412.89	416.50	V-THETA 2
V(PR) 1	841.7	881.0	895.0	908.1	938.8	965.8	989.6	987.6	977.2	V(PR) 1
V(PR) 2	492.3	510.3	557.4	622.1	641.1	663.6	641.1	596.5	537.2	V(PR) 2
VTHETA PR1	-666.8	-674.8	-683.3	-709.9	-745.8	-781.6	-808.4	-816.6	-823.5	VTHETA PR1
VTHETA PR2	-219.0	-235.3	-248.9	-270.7	-307.0	-354.8	-381.9	-388.3	-392.5	VTHETA PR2
U 1	666.81	674.82	683.34	709.90	745.40	781.55	808.44	816.63	823.48	U 1
U 2	669.23	676.99	684.76	708.05	739.11	770.16	793.45	801.22	808.98	U 2
M 1	0.4702	0.5208	0.5321	0.5207	0.5246	0.5219	0.5251	0.5102	0.4821	M 1
M 2	0.5544	0.5573	0.5859	0.6308	0.6296	0.6187	0.5793	0.5377	0.4838	M 2
M(PR) 1	0.7704	0.8102	0.8240	0.8351	0.8637	0.8883	0.9105	0.9073	0.8954	M(PR) 1
M(PR) 2	0.4331	0.4496	0.4930	0.5523	0.5688	0.5884	0.5639	0.5234	0.4683	M(PR) 2
TURN(PR)	25.976	22.540	23.252	25.629	23.992	21.694	18.221	15.166	10.488	TURN(PR)
UUBAR	0.1092	0.1565	0.1071	0.0381	0.0425	0.0461	0.1070	0.1694	0.2323	UUBAR
LOSS PARA	0.0283	0.0407	0.0285	0.0106	0.0120	0.0131	0.0298	0.0450	0.0561	LOSS PARA
DFAC	0.5703	0.5680	0.5220	0.4629	0.4647	0.4565	0.4952	0.5412	0.5999	DFAC
EFFP	0.8575	0.8102	0.8788	0.9604	0.9750	0.9815	0.8511	0.8187	0.7386	EFFP
EFF	0.8516	0.8030	0.8738	0.9585	0.9738	0.9806	0.8445	0.8114	0.7289	EFF
INCID	-0.037	-0.914	-0.799	-0.618	-1.368	-1.868	-3.741	-6.348	-10.578	INCID
DEVM	11.265	13.298	11.891	7.154	5.413	4.817	5.024	7.579	11.058	DEVM
P 1	14.325	14.691	14.766	14.769	14.772	14.760	14.656	14.547	14.338	P 1
P 2	19.082	19.135	19.554	20.288	20.445	20.393	19.837	19.240	18.579	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	570.701	569.359	568.299	570.086	570.534	569.876	574.189	571.864	573.387	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	45.972	44.011	40.332	38.033	36.892	36.417	39.663	44.037	51.383	BETA 2
BETA 2A	-2.400	0.300	1.550	2.000	0.850	1.108	1.201	0.750	-1.751	BETA 2A
V 2	626.29	635.96	673.79	710.64	721.26	701.61	647.07	596.06	534.91	V 2
V 2A	476.86	470.44	476.86	559.71	591.92	586.67	517.84	484.99	469.52	V 2A
VZ 2	435.27	457.38	513.62	559.66	576.60	564.14	497.60	428.08	333.57	VZ 2
VZ 2A	476.44	470.42	476.66	559.30	591.65	586.21	517.31	484.91	468.81	VZ 2A
V-THETA 2	450.30	441.85	436.07	437.76	432.79	416.17	412.58	413.94	417.60	V-THETA 2
V-THETA 2A	-19.97	2.46	12.90	19.53	8.78	11.26	10.84	6.34	-14.33	V-THETA 2A
M 2	0.5508	0.5605	0.5968	0.6308	0.6408	0.6223	0.5684	0.5221	0.4655	M 2
M 2A	0.4141	0.4088	0.4150	0.4895	0.5190	0.5144	0.4509	0.4210	0.4065	M 2A
TURN(PR)	48.372	43.710	38.780	36.026	36.023	35.283	38.414	43.236	53.074	TURN(PR)
UUBAR	0.0271	0.0579	0.1383	0.0921	0.0419	0.0530	0.1378	0.0813	-0.0900	UUBAR
LOSS PARA	0.0091	0.0197	0.0476	0.0327	0.0155	0.0204	0.0546	0.0325	-0.0363	LOSS PARA
DFAC	0.4916	0.4957	0.5087	0.4220	0.3977	0.3871	0.4471	0.4614	0.4497	DFAC
EFFP	0.9425	0.8861	0.7542	0.7899	0.8903	0.8479	0.8507	0.7828	1.3562	EFFP
INCID	-4.195	0.623	0.041	0.002	0.186	0.549	0.956	0.865	-7.820	INCID
DEVM	6.432	11.612	12.860	12.975	11.862	12.766	13.641	13.430	3.105	DEVM
P 2	19.082	19.135	19.554	20.288	20.445	20.393	19.837	19.240	18.579	P 2
P 2A	18.986	18.922	18.975	19.849	20.239	20.144	19.299	18.974	18.810	P 2A
T 2	570.701	569.359	568.299	570.086	570.534	569.876	574.189	571.864	573.387	T 2
T 2A	570.701	569.359	568.299	570.086	570.534	569.876	571.189	571.864	573.387	T 2A
UUBAR FS	0.0880	0.1186	0.1376	0.0505	0.0233	0.0229	0.2033	0.2260	0.2141	UUBAR FS
P2 FS	19.319	19.387	19.550	20.079	20.352	20.248	20.158	19.849	19.571	P2 FS
LOSS PARA FS	0.0295	0.0403	0.0473	0.0179	0.0086	0.0088	0.0805	0.0903	0.0863	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 109.38 Equivalent Rotor Speed = 4605.05 Equivalent Weight Flow = 116.81
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	467.18	467.18	467.18	467.18	467.18	467.18	467.18	467.18	467.18	V 0
V 1	490.01	502.32	494.31	494.46	505.92	501.72	486.57	477.52	449.15	V 1
VZ 0	467.18	467.18	467.18	467.17	467.15	467.10	467.06	467.05	467.06	VZ 0
VZ 1	490.01	502.31	494.31	494.45	505.88	501.64	486.45	477.39	449.03	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4260	0.4260	0.4260	0.4260	0.4260	0.4260	0.4260	0.4260	0.4260	M 0
M 1	0.4476	0.4593	0.4517	0.4518	0.4627	0.4587	0.4443	0.4353	0.4090	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.5054	0.3301	0.3005	0.3000	0.2988	0.3040	0.3632	0.4027	0.5332	UUBAR
DFAC	-0.049	-0.075	-0.058	-0.058	-0.083	-0.074	-0.042	-0.022	-0.039	DFAC
EFFP	0.1725	0.3348	0.2977	0.2992	0.3815	0.3497	0.1984	0.1051	-0.1747	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.300	15.300	15.300	15.300	15.300	15.300	15.300	15.300	15.300	P 0
P 1	14.394	14.708	14.761	14.762	14.764	14.755	14.649	14.578	14.344	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	48.399	47.294	44.476	40.582	39.839	39.170	42.166	46.062	51.586	BETA 2
BETA(PR) 1	53.568	51.593	51.714	52.698	53.734	55.308	56.901	57.588	59.330	BETA(PR) 1
BETA(PR) 2	25.978	28.530	27.674	26.471	28.737	32.855	37.212	41.342	46.857	BETA(PR) 2
V 1	491.23	533.99	538.33	539.73	546.69	542.06	529.37	521.10	490.53	V 1
V 2	623.39	612.19	635.76	686.85	694.95	679.53	642.71	601.93	558.85	V 2
VZ 1	491.14	533.87	538.27	539.70	546.02	539.86	525.88	517.39	487.33	VZ 1
VZ 2	413.88	415.20	453.63	521.64	533.43	526.21	475.53	416.94	346.76	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	466.14	449.85	445.41	446.81	445.05	428.70	430.67	432.69	437.28	V-THETA 2
V(PR) 1	827.1	859.4	868.8	890.6	923.4	949.8	964.9	967.3	957.0	V(PR) 1
V(PR) 2	460.4	472.6	512.2	582.7	608.6	627.3	598.3	556.5	507.9	V(PR) 2
VTHETA PR1	-665.4	-673.4	-681.9	-708.4	-744.2	-779.9	-806.7	-814.9	-821.7	VTHETA PR1
VTHETA PR2	-201.7	-225.7	-237.9	-259.7	-292.5	-339.8	-361.1	-366.8	-370.0	VTHETA PR2
U 1	665.40	673.40	681.90	708.40	744.23	779.90	806.74	814.90	821.74	U 1
U 2	667.81	675.56	683.31	706.55	737.54	768.53	791.78	799.53	807.27	U 2
M 1	0.4488	0.4896	0.4938	0.4951	0.5018	0.4974	0.4852	0.4773	0.4481	M 1
M 2	0.5466	0.5368	0.5595	0.6071	0.6145	0.6000	0.5645	0.5261	0.4857	M 2
M(PR) 1	0.7556	0.7880	0.7969	0.8170	0.8477	0.8715	0.8844	0.8859	0.8742	M(PR) 1
M(PR) 2	0.4037	0.4144	0.4508	0.5150	0.5382	0.5539	0.5255	0.4864	0.4415	M(PR) 2
TURN(PR)	27.586	23.058	24.037	26.226	24.977	22.395	19.605	16.162	12.410	TURN(PR)
UUBAR	0.1073	0.1561	0.1161	0.0641	0.0600	0.0511	0.1219	0.1854	0.2255	UUBAR
LOSS PARA	0.0279	0.0402	0.0305	0.0121	0.0113	0.0144	0.0337	0.0488	0.0546	LOSS PARA
DFAC	0.6069	0.6039	0.5628	0.4998	0.4954	0.4903	0.5334	0.5801	0.6297	DFAC
EFFP	0.8478	0.7877	0.8489	0.9605	0.9733	0.9656	0.8850	0.8067	0.7577	EFFP
EFF	0.8412	0.7794	0.8426	0.9378	0.9720	0.9640	0.8798	0.7986	0.7478	EFF
INCID	1.137	0.676	1.135	0.655	-0.269	-0.687	-1.791	-4.726	-8.835	INCID
DEVM	10.829	14.370	13.040	7.830	5.527	5.296	5.590	8.204	10.880	DEVM
P 1	14.394	14.708	14.761	14.762	14.764	14.755	14.649	14.578	14.344	P 1
P 2	19.399	19.295	19.638	20.367	20.648	20.555	20.034	19.493	19.014	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	573.585	572.369	571.017	571.978	572.375	572.159	573.871	574.919	576.867	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	48.805	46.994	43.598	40.634	39.166	39.003	43.204	47.835	54.556	BETA 2
BETA 2A	-2.300	0.150	1.250	2.580	1.170	1.310	1.240	1.701	1.000	BETA 2A
V 2	619.59	615.36	646.24	686.85	706.03	683.09	631.19	585.73	538.55	V 2
V 2A	460.05	448.61	448.08	519.12	557.11	556.22	493.06	464.51	453.62	V 2A
VZ 2	408.07	419.72	467.99	521.16	547.18	530.44	459.66	392.85	312.09	VZ 2
VZ 2A	459.68	448.60	447.95	518.52	556.80	555.74	492.54	463.90	453.07	VZ 2A
V-THETA 2	466.22	450.00	445.63	447.23	445.73	429.58	431.71	433.79	438.44	V-THETA 2
V-THETA 2A	-18.46	1.17	9.77	23.37	11.37	12.71	10.66	13.77	7.91	V-THETA 2A
M 2	0.5431	0.5398	0.5693	0.6071	0.6251	0.6034	0.5537	0.5112	0.4673	M 2
M 2A	0.3980	0.3882	0.3882	0.4517	0.4861	0.4854	0.4275	0.4015	0.3911	M 2A
TURN(PR)	51.105	46.843	42.346	38.048	37.977	37.658	41.915	46.083	53.500	TURN(PR)
UUBAR	0.0275	0.0312	0.1166	0.1060	0.0575	0.0564	0.1249	0.0648	-0.0599	UUBAR
LOSS PARA	0.0092	0.0106	0.0401	0.0376	0.0213	0.0217	0.0495	0.0259	-0.0242	LOSS PARA
DFAC	0.5211	0.5195	0.5390	0.4640	0.4395	0.4219	0.4846	0.4955	0.4820	DFAC
EFFP	0.9452	0.9403	0.7991	0.7829	0.8683	0.8540	0.7124	0.8418	1.1878	EFFP
INCID	-1.362	3.606	3.307	2.604	2.460	3.135	4.496	4.663	-4.646	INCID
DEVM	6.532	11.462	12.560	13.555	12.182	12.976	13.680	14.379	5.853	DEVM
P 2	19.399	19.295	19.638	20.367	20.648	20.555	20.034	19.493	19.014	P 2
P 2A	19.302	19.186	19.186	19.891	20.374	20.302	19.563	19.286	19.172	P 2A
T 2	573.585	572.369	571.017	571.978	572.375	572.159	573.871	574.919	576.867	T 2
T 2A	573.585	572.369	571.017	571.978	572.375	572.159	573.871	574.919	576.867	T 2A
UUBAR FS	0.0814	0.1269	0.1509	0.0859	0.0309	0.0339	0.1868	0.1952	0.1679	UUBAR FS
P2 FS	19.602	19.674	19.794	20.268	20.518	20.450	20.320	20.008	19.737	P2 FS
LOSS PARA FS	0.0269	0.0431	0.0519	0.0304	0.0114	0.0130	0.0740	0.0780	0.0678	LOSS PARA FS

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Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 109.36   Equivalent Rotor Speed = 4604.26   Equivalent Weight Flow = 111.46
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	444.45	444.45	444.45	444.45	444.45	444.45	444.45	444.45	444.45	V 0
V 1	459.31	469.24	463.49	474.75	473.64	475.51	458.92	451.89	419.52	V 1
VZ 0	444.45	444.45	444.45	444.44	444.42	444.38	444.34	444.34	444.34	VZ 0
VZ 1	459.31	469.24	463.49	474.74	473.61	475.43	458.80	451.77	419.41	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4046	0.4046	0.4046	0.4046	0.4046	0.4046	0.4046	0.4046	0.4046	M 0
M 1	0.4185	0.4279	0.4225	0.4331	0.4321	0.4338	0.4182	0.4116	0.3812	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4807	0.3141	0.2847	0.2828	0.2815	0.2873	0.3524	0.3881	0.5350	UUBAR
DFAC	-0.033	-0.056	-0.043	-0.068	-0.066	-0.070	-0.033	-0.017	0.056	DFAC
EFFP	0.1291	0.2786	0.2457	0.3459	0.3382	0.3481	0.1653	0.0838	-0.2696	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.215	15.215	15.215	15.215	15.215	15.215	15.215	15.215	15.215	P 0
P 1	14.435	14.706	14.753	14.756	14.758	14.749	14.643	14.585	14.347	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	50.999	50.603	47.895	43.080	42.445	41.859	45.698	50.516	55.712	BETA 2
BETA(PR) 1	55.319	53.537	53.574	53.870	55.590	56.796	58.483	59.064	61.074	BETA(PR) 1
BETA(PR) 2	23.839	28.884	29.394	26.470	29.518	33.077	38.403	42.423	45.103	BETA(PR) 2
V 1	460.42	497.64	503.19	517.08	510.33	512.42	497.89	491.83	457.01	V 1
V 2	632.78	601.54	610.21	674.92	675.09	667.52	624.67	591.74	580.67	V 2
VZ 1	460.33	497.52	503.13	517.05	509.70	510.34	494.61	488.33	454.03	VZ 1
VZ 2	398.22	381.78	409.13	492.96	498.00	496.62	435.60	375.72	326.75	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	491.75	464.83	452.72	460.97	455.46	444.95	446.35	456.04	479.21	V-THETA 2
V(PR) 1	809.1	837.2	847.4	876.9	902.3	933.1	947.9	951.7	940.1	V(PR) 1
V(PR) 2	435.4	436.0	469.6	550.7	572.5	593.5	557.0	510.0	463.8	V(PR) 2
VTHETA PR1	-665.3	-673.3	-681.8	-708.3	-744.1	-779.8	-806.6	-814.8	-821.6	VTHETA PR1
VTHETA PR2	-176.0	-210.6	-230.5	-245.5	-282.0	-323.5	-345.3	-343.4	-327.9	VTHETA PR2
U 1	665.28	673.28	681.78	708.28	744.11	779.77	806.60	814.76	821.60	U 1
U 2	667.70	675.45	683.19	706.43	737.42	768.40	791.64	799.39	807.14	U 2
M 1	0.4196	0.4549	0.4601	0.4734	0.4670	0.4690	0.4551	0.4493	0.4164	M 1
M 2	0.5531	0.5254	0.5346	0.5950	0.5950	0.5877	0.5464	0.5158	0.5042	M 2
M(PR) 1	0.7373	0.7653	0.7749	0.8029	0.8256	0.8539	0.8664	0.8695	0.8566	M(PR) 1
M(PR) 2	0.3806	0.3809	0.4114	0.4855	0.5046	0.5225	0.4872	0.4445	0.4026	M(PR) 2
TURN(PR)	31.477	24.649	24.178	27.399	26.054	23.664	20.002	16.562	15.915	TURN(PR)
UUBAR	0.0999	0.1599	0.1286	0.0413	0.0441	0.0560	0.1385	0.2068	0.2443	UUBAR
LOSS PARA	0.0265	0.0411	0.0333	0.0114	0.0124	0.0158	0.0377	0.0535	0.0611	LOSS PARA
DFAC	0.6382	0.6423	0.6046	0.5335	0.5273	0.5232	0.5743	0.6306	0.6857	DFAC
EFFP	0.8427	0.7763	0.8249	0.9505	0.9706	0.9694	0.8671	0.8133	0.7943	EFFP
EFF	0.8354	0.7672	0.8176	0.9482	0.9691	0.9679	0.8610	0.8052	0.7850	EFF
INCID	2.888	2.621	2.996	1.828	1.588	0.803	-0.205	-3.246	-7.085	INCID
DEVM	8.689	14.724	14.760	7.830	6.307	5.517	6.779	9.285	9.126	DEVM
P 1	14.435	14.706	14.753	14.756	14.758	14.749	14.643	14.585	14.347	P 1
P 2	19.860	19.508	19.674	20.595	20.782	20.782	20.171	19.736	19.581	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	577.955	575.553	573.074	573.373	573.684	573.858	576.425	576.837	580.092	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	51.450	50.272	46.945	43.137	41.738	41.683	46.852	52.590	59.297	BETA 2
BETA 2A	-2.350	-0.100	0.750	1.650	1.300	1.250	0.930	1.420	1.621	BETA 2A
V 2	628.89	604.61	619.89	674.92	685.45	670.94	613.77	575.99	559.12	V 2
V 2A	461.89	439.81	426.56	487.83	525.82	520.40	472.51	445.59	441.91	V 2A
VZ 2	391.92	386.43	423.18	492.64	531.29	500.73	419.41	349.68	285.32	VZ 2
VZ 2A	461.49	439.80	426.50	487.56	525.51	519.97	472.06	445.05	441.27	VZ 2A
V-THETA 2	491.83	464.99	452.94	461.41	456.16	445.87	447.43	457.19	480.48	V-THETA 2
V-THETA 2A	-18.94	-0.77	5.58	14.04	11.93	11.35	7.66	11.04	12.48	V-THETA 2A
M 2	0.5495	0.5282	0.5436	0.5950	0.6048	0.5910	0.5363	0.5014	0.4845	M 2
M 2A	0.3981	0.3793	0.3684	0.4230	0.4571	0.4521	0.4081	0.3840	0.3796	M 2A
TURN(PR)	53.800	50.371	46.194	41.480	40.420	40.396	45.872	51.119	57.626	TURN(PR)
UUBAR	0.0250	-0.0080	0.0763	0.1339	0.0756	0.0895	0.1002	0.0492	0.0078	UUBAR
LOSS PARA	0.0064	-0.0027	0.0263	0.0476	0.0280	0.0345	0.0397	0.0197	0.0032	LOSS PARA
DFAC	0.5392	0.5350	0.5606	0.5133	0.4737	0.4749	0.5156	0.5380	0.5493	DFAC
EFFP	0.9516	1.0152	0.8695	0.7515	0.8393	0.8021	0.7783	0.8886	0.9810	EFFP
INCID	1.283	6.884	6.655	5.106	5.033	5.814	8.144	9.419	0.100	INCID
DEVM	6.482	11.212	12.060	12.625	12.312	12.916	13.371	14.099	6.473	DEVM
P 2	19.860	19.508	19.674	20.595	20.782	20.782	20.171	19.736	19.581	P 2
P 2A	19.768	19.535	19.400	20.008	20.438	20.390	19.811	19.583	19.558	P 2A
T 2	577.955	575.553	573.074	573.373	573.684	573.858	576.425	576.837	580.092	T 2
T 2A	577.955	575.553	573.074	573.373	573.684	573.858	576.425	576.837	580.092	T 2A
UUBAR FS	0.1148	0.1344	0.1366	0.1227	0.0651	0.0688	0.1690	0.1460	0.1251	UUBAR FS
P2 FS	20.234	20.063	19.923	20.539	20.731	20.684	20.467	20.089	19.970	P2 FS
LOSS PARA FS	0.0385	0.0453	0.0471	0.0436	0.0241	0.0265	0.0669	0.0584	0.0513	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 110.30 Equivalent Rotor Speed = 4643.61 Equivalent Weight Flow = 107.01
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	425.36	425.36	425.36	425.36	425.36	425.36	425.36	425.36	425.36	V 0
V 1	442.78	455.17	455.81	453.22	458.24	460.46	436.95	430.03	399.49	V 1
VZ 0	425.35	425.36	425.36	425.35	425.32	425.29	425.25	425.24	425.24	VZ 0
VZ 1	442.78	455.17	455.81	453.22	458.21	460.38	436.84	429.91	399.38	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3866	0.3866	0.3866	0.3866	0.3866	0.3866	0.3866	0.3866	0.3866	M 0
M 1	0.4030	0.4146	0.4152	0.4128	0.4175	0.4196	0.3975	0.3910	0.3625	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4682	0.3049	0.2737	0.2709	0.2702	0.2695	0.3397	0.3758	0.5224	UUBAR
DFAC	-0.041	-0.070	-0.072	-0.066	-0.077	-0.083	-0.027	-0.011	0.061	DFAC
EFFP	0.1572	0.3340	0.3640	0.3453	0.3856	0.4026	0.1460	0.0580	-0.3063	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.153	15.153	15.153	15.153	15.153	15.153	15.153	15.153	15.153	P 0
P 1	14.458	14.700	14.747	14.751	14.752	14.753	14.649	14.595	14.378	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	51.999	52.107	49.709	44.778	43.751	43.850	49.121	53.120	58.783	BETA 2
BETA(PR) 1	56.521	54.623	54.282	55.410	56.726	57.888	59.978	60.556	62.480	BETA(PR) 1
BETA(PR) 2	24.362	29.911	30.854	27.340	29.894	33.570	39.966	44.092	45.977	BETA(PR) 2
V 1	443.84	482.26	494.49	492.64	493.08	495.56	473.20	467.18	434.55	V 1
V 2	631.26	596.27	599.65	665.02	672.17	662.27	612.85	584.43	585.58	V 2
VZ 1	443.75	482.15	494.43	492.61	492.47	493.56	470.08	463.86	431.72	VZ 1
VZ 2	388.64	366.21	387.77	472.05	485.40	477.11	400.53	350.28	303.20	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	497.42	470.54	457.39	468.41	464.68	458.34	462.73	466.88	500.31	V-THETA 2
V(PR) 1	804.5	832.9	847.0	867.7	898.0	929.5	941.1	945.2	935.7	V(PR) 1
V(PR) 2	426.7	422.5	451.7	531.4	560.1	573.4	523.6	488.6	437.1	V(PR) 2
VTHETA PR1	-671.0	-679.0	-687.6	-714.3	-750.5	-786.4	-813.5	-821.7	-828.6	VTHETA PR1
VTHETA PR2	-176.0	-210.7	-231.6	-244.1	-279.0	-316.6	-335.7	-339.3	-313.7	VTHETA PR2
U 1	670.97	679.04	687.61	714.33	750.47	786.43	813.49	821.73	828.62	U 1
U 2	673.41	681.22	689.03	712.47	743.72	774.97	798.41	806.22	814.03	U 2
M 1	0.4040	0.4403	0.4519	0.4501	0.4505	0.4529	0.4317	0.4260	0.3953	M 1
M 2	0.5513	0.5202	0.5243	0.5844	0.5909	0.5814	0.5341	0.5076	0.5078	M 2
M(PR) 1	0.7322	0.7603	0.7739	0.7928	0.8205	0.8495	0.8585	0.8619	0.8510	M(PR) 1
M(PR) 2	0.3726	0.3686	0.3949	0.4670	0.4924	0.5034	0.4563	0.4244	0.3790	M(PR) 2
TURN(PR)	32.156	24.708	23.426	28.069	26.815	24.265	19.940	16.391	16.451	TURN(PR)
UUBAR	0.0960	0.1580	0.1338	0.0531	0.0460	0.0740	0.1768	0.2275	0.2679	UUBAR
LOSS PARA	0.0253	0.0402	0.0341	0.0145	0.0126	0.0207	0.0470	0.0573	0.0660	LOSS PARA
DFAC	0.6491	0.6587	0.6272	0.5534	0.5421	0.5478	0.6127	0.6546	0.7206	DFAC
EFFP	0.8542	0.7871	0.8187	0.9267	0.9581	0.9458	0.8339	0.7838	0.8009	EFFP
EFF	0.8473	0.7762	0.8111	0.9231	0.9559	0.9430	0.8262	0.7742	0.7916	EFF
INCID	4.090	3.707	3.703	3.367	2.725	1.896	1.295	-1.749	-5.674	INCID
DEVM	9.212	15.751	16.219	8.699	6.683	6.010	8.341	10.953	10.000	DEVM
P 1	14.458	14.700	14.747	14.751	14.752	14.753	14.649	14.595	14.378	P 1
P 2	20.058	19.656	19.748	20.677	20.965	20.924	20.202	19.831	19.852	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	578.721	576.383	574.353	575.615	576.021	576.451	579.085	580.026	581.967	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	52.465	51.761	48.714	44.839	43.017	43.666	50.410	55.384	62.900	BETA 2
BETA 2A	-1.160	0.050	-0.100	0.600	1.480	1.070	0.840	1.500	1.881	BETA 2A
V 2	627.39	599.29	609.01	665.02	682.41	665.63	602.34	569.08	563.75	V 2
V 2A	443.05	419.05	405.08	469.57	506.69	513.22	464.63	444.09	440.54	V 2A
VZ 2	382.23	370.92	401.83	471.51	498.76	481.18	383.59	323.08	256.70	VZ 2
VZ 2A	442.96	419.04	405.06	469.47	506.35	512.82	464.20	443.54	439.84	VZ 2A
V-THETA 2	497.51	470.70	457.61	468.86	465.39	459.28	463.85	468.06	501.64	V-THETA 2
V-THETA 2A	-8.97	0.37	-0.71	4.92	13.09	9.58	6.81	11.62	14.44	V-THETA 2A
M 2	0.5477	0.5230	0.5329	0.5844	0.6006	0.5845	0.5245	0.4936	0.4879	M 2
M 2A	0.3811	0.3607	0.3490	0.4058	0.4389	0.4446	0.4001	0.3816	0.3778	M 2A
TURN(PR)	53.625	51.710	48.812	44.232	41.518	42.560	49.521	53.835	60.973	TURN(PR)
UUBAR	0.0602	0.0164	0.0802	0.1563	0.1207	0.1036	0.0714	0.0210	0.0360	UUBAR
LOSS PARA	0.0203	0.0056	0.0276	0.0555	0.0447	0.0399	0.0283	0.0084	0.0145	LOSS PARA
DFAC	0.5658	0.5681	0.5942	0.5423	0.5038	0.4904	0.5309	0.5423	0.5692	DFAC
EFFP	0.8923	0.9711	0.8699	0.7217	0.7626	0.7740	0.8408	0.9512	0.9158	EFFP
INCID	2.296	8.373	8.423	6.808	6.311	7.797	11.703	12.215	3.707	INCID
DEVM	7.672	11.362	11.210	11.575	12.492	12.736	13.281	14.179	6.733	DEVM
P 2	20.058	19.656	19.748	20.677	20.965	20.924	20.202	19.831	19.852	P 2
P 2A	19.835	19.601	19.470	20.009	20.418	20.477	19.956	19.767	19.744	P 2A
T 2	578.721	576.383	574.353	575.615	576.021	576.451	579.085	580.026	581.967	T 2
T 2A	578.721	576.383	574.353	575.615	576.021	576.451	579.085	580.026	581.967	T 2A
UUBAR FS	0.1039	0.1304	0.1578	0.1403	0.0842	0.0781	0.1753	0.1629	0.1519	UUBAR FS
P2 FS	20.238	20.094	20.068	20.596	20.784	20.805	20.638	20.346	20.259	P2 FS
LOSS PARA FS	0.0350	0.0445	0.0543	0.0498	0.0311	0.0301	0.0695	0.0651	0.0612	LOSS PARA FS

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Table A-3. Blade Element Performance
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 100.54 Equivalent Rotor Speed = 4232.66 Equivalent Weight Flow = 121.43
Uniform Inlet

INLET.

PCT SPAN	96.60	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	486.04	486.04	486.04	486.04	486.04	486.04	486.04	486.04	486.04	V 0
V 1	529.16	548.99	542.37	531.35	526.94	527.29	522.34	510.97	486.50	V 1
VZ 0	486.04	486.04	486.04	486.03	486.00	485.96	485.91	485.91	485.91	VZ 0
VZ 1	529.16	548.99	542.37	531.34	526.90	527.20	522.21	510.83	486.37	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4438	0.4438	0.4438	0.4438	0.4438	0.4438	0.4438	0.4438	0.4438	M 0
M 1	0.4850	0.5041	0.4977	0.4871	0.4829	0.4832	0.4784	0.4676	0.4443	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.5418	0.3535	0.3212	0.3239	0.3164	0.3266	0.3788	0.4347	0.5402	UUBAR
DFAC	-0.069	-0.130	-0.116	-0.093	-0.084	-0.085	-0.075	-0.051	-0.001	DFAC
EFFP	0.2654	0.4553	0.4503	0.3924	0.3727	0.3672	0.3039	0.2045	0.0037	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.392	15.392	15.392	15.392	15.392	15.392	15.392	15.392	15.392	P 0
P 1	14.337	14.704	14.767	14.762	14.776	14.756	14.655	14.546	14.341	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.766	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	34.001	31.359	30.381	29.238	28.341	26.717	27.924	30.960	37.700	BETA 2
BETA(PR) 1	49.065	46.577	46.540	48.183	50.196	51.569	52.609	53.429	54.942	BETA(PR) 1
BETA(PR) 2	26.394	25.514	25.545	26.495	29.925	33.081	37.116	40.773	51.041	BETA(PR) 2
V 1	530.54	585.90	594.00	582.55	570.71	571.11	570.50	559.66	533.47	V 1
V 2	632.41	669.17	684.13	703.30	691.11	685.91	641.74	587.61	467.70	V 2
VZ 1	530.44	585.77	593.93	582.52	570.00	568.80	566.74	555.67	529.99	VZ 1
VZ 2	524.25	571.39	590.17	613.68	608.00	611.73	565.58	502.56	369.23	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	353.63	348.22	345.99	343.51	327.93	307.90	299.76	301.49	285.37	V-THETA 2
V(PR) 1	809.6	852.3	863.5	873.7	890.9	916.5	935.6	935.0	924.7	V(PR) 1
V(PR) 2	585.3	633.2	654.1	685.7	701.8	731.1	710.7	665.0	588.1	V(PR) 2
VTHETA PR1	-611.6	-618.9	-626.8	-651.1	-684.1	-716.8	-741.5	-749.0	-755.3	VTHETA PR1
VTHETA PR2	-260.2	-272.7	-282.1	-305.9	-350.0	-398.5	-428.0	-433.4	-456.6	VTHETA PR2
U 1	611.59	618.94	626.76	651.11	684.05	716.84	741.50	749.01	755.29	U 1
U 2	613.81	620.93	628.05	649.42	677.90	706.39	727.75	734.87	741.99	U 2
M 1	0.4863	0.5399	0.5478	0.5366	0.5251	0.5255	0.5249	0.5144	0.4891	M 1
M 2	0.5630	0.5989	0.6141	0.6313	0.6197	0.6156	0.5739	0.5228	0.4118	M 2
M(PR) 1	0.7421	0.7853	0.7963	0.8048	0.8196	0.8433	0.8608	0.8593	0.8478	M(PR) 1
M(PR) 2	0.5211	0.5667	0.5872	0.6155	0.6293	0.6561	0.6357	0.5917	0.5178	M(PR) 2
TURN(PR)	22.666	21.059	20.993	21.686	20.251	18.426	15.400	12.562	3.825	TURN(PR)
UUBAR	0.1664	0.1519	0.1310	0.1057	0.1172	0.1001	0.1598	0.2340	0.3360	UUBAR
LOSS PARA	0.0432	0.0402	0.0351	0.0291	0.0327	0.0282	0.0442	0.0621	0.0748	LOSS PARA
DFAC	0.4038	0.3771	0.3616	0.3360	0.3302	0.3145	0.3505	0.4008	0.4724	DFAC
EFFP	0.7121	0.7363	0.7941	0.8059	0.7877	0.8185	0.7397	0.6246	0.3974	EFFP
EFF	0.7045	0.7293	0.7884	0.8002	0.7816	0.8133	0.7332	0.6168	0.3893	EFF
INCID	-3.367	-4.339	-4.038	-3.860	-3.807	-4.432	-6.093	-8.896	-13.234	INCID
DEVM	11.245	11.354	10.911	7.855	6.715	5.522	5.493	7.635	15.066	DEVM
P 1	14.337	14.704	14.767	14.762	14.776	14.756	14.655	14.546	14.341	P 1
P 2	17.221	17.651	17.860	18.112	18.017	17.986	17.420	16.823	15.755	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	558.279	556.801	555.439	557.705	557.387	555.802	554.516	554.383	554.986	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	34.250	31.170	29.796	29.274	27.899	26.605	28.526	31.955	39.333	BETA 2
BETA 2A	-0.250	1.600	1.800	0.150	0.300	1.800	1.801	1.000	-1.701	BETA 2A
V 2	628.45	673.03	696.66	703.30	702.26	689.62	630.07	571.87	451.99	V 2
V 2A	566.94	585.36	608.60	659.41	659.63	659.63	576.98	546.61	531.27	V 2A
VZ 2	519.47	575.86	604.53	613.36	620.31	615.98	552.83	484.56	349.17	VZ 2
VZ 2A	566.93	585.12	608.27	659.32	659.40	658.91	576.23	546.04	530.68	VZ 2A
V-THETA 2	353.69	348.34	346.16	343.84	328.43	308.53	300.49	302.26	286.13	V-THETA 2
V-THETA 2A	-2.47	16.34	19.12	1.73	3.45	20.71	18.11	9.53	-15.75	V-THETA 2A
M 2	0.5593	0.6026	0.6262	0.6313	0.6304	0.6192	0.5628	0.5081	0.3975	M 2
M 2A	0.5016	0.5195	0.5420	0.5890	0.5894	0.5903	0.5128	0.4846	0.4701	M 2A
TURN(PR)	34.500	29.569	27.994	29.118	27.584	24.777	26.685	30.908	40.973	TURN(PR)
UUBAR	0.0912	0.1364	0.1118	0.0300	0.0163	0.0327	0.1744	0.1118	-0.3544	UUBAR
LOSS PARA	0.0307	0.0464	0.0387	0.0107	0.0061	0.0126	0.0691	0.0447	-0.1429	LOSS PARA
DFAC	0.2888	0.2983	0.2882	0.2356	0.2326	0.2050	0.2629	0.2501	0.0954	DFAC
EFFP	0.5655	0.5092	0.5894	0.7890	0.8820	0.6712	0.0364	-0.1698	0.1543	EFFP
INCID	-15.917	-12.218	-10.495	-8.756	-8.803	-9.256	-10.174	-11.212	-19.870	INCID
DEVM	8.582	12.912	13.110	11.125	11.312	13.465	14.240	13.679	3.155	DEVM
P 2	17.221	17.651	17.860	18.112	18.017	17.986	17.420	16.823	15.755	P 2
P 2A	16.921	17.127	17.394	17.984	17.948	17.852	16.833	16.519	16.331	P 2A
T 2	558.279	556.801	555.439	557.705	557.387	555.802	554.516	554.383	554.986	T 2
T 2A	558.279	556.801	555.439	557.705	557.387	555.802	554.516	554.383	554.986	T 2A
UUBAR FS	0.1561	0.1250	0.0970	0.0458	0.0419	0.0333	0.2423	0.2724	0.2775	UUBAR FS
P2 FS	17.475	17.601	17.789	18.182	18.130	17.988	17.721	17.422	17.176	P2 FS
LOSS PARA FS	0.0525	0.0425	0.0334	0.0163	0.0157	0.0128	0.0960	0.1089	0.1119	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 99.65   Equivalent Rotor Speed = 4195.46   Equivalent Weight Flow = 117.78
Uniform Inlet

INLET

PCT SPAN	96.60	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	471.36	471.38	471.38	471.38	471.38	471.38	471.38	471.38	471.38	V 0
V 1	503.49	515.60	508.54	506.86	498.93	497.93	490.41	483.56	456.53	V 1
VZ 0	471.37	471.38	471.38	471.37	471.34	471.30	471.26	471.25	471.25	VZ 0
VZ 1	503.48	515.60	508.54	506.85	498.90	497.85	490.28	483.43	456.41	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4299	0.4299	0.4299	0.4299	0.4299	0.4299	0.4299	0.4299	0.4299	M 0
M 1	0.4604	0.4720	0.4636	0.4636	0.4561	0.4551	0.4480	0.4415	0.4159	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.5128	0.3342	0.3029	0.3040	0.3029	0.3063	0.3679	0.4067	0.5350	UUBAR
DFAC	-0.068	-0.094	-0.079	-0.075	-0.058	-0.056	-0.040	-0.026	0.032	DFAC
EFFP	0.2245	0.3853	0.3662	0.3543	0.2977	0.2875	0.1921	0.1199	-0.1383	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.318	15.318	15.318	15.318	15.318	15.318	15.318	15.318	15.318	P 0
P 1	14.380	14.707	14.764	14.762	14.764	14.758	14.645	14.574	14.340	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR-L.E., ROTOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	40.146	37.720	35.508	33.735	33.001	31.803	32.758	35.371	41.079	BETA 2
BETA(PR) 1	50.223	48.200	48.243	49.358	51.560	52.994	54.193	54.771	56.491	BETA(PR) 1
BETA(PR) 2	26.137	25.912	25.604	25.581	29.458	33.257	36.902	40.166	47.989	BETA(PR) 2
V 1	504.76	548.66	554.68	554.03	538.84	537.71	533.74	528.04	498.95	V 1
V 2	596.60	617.92	641.20	675.14	660.12	646.63	616.62	576.30	493.30	V 2
VZ 1	504.67	548.54	554.61	554.00	538.18	535.54	536.23	524.28	495.70	VZ 1
VZ 2	456.01	488.76	521.95	561.44	553.39	548.77	517.37	468.60	371.10	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	384.66	378.02	372.41	374.94	359.39	340.29	332.88	332.80	323.49	V-THETA 2
V(PR) 1	788.8	823.1	832.6	850.6	866.0	891.1	906.3	911.1	899.7	V(PR) 1
V(PR) 2	508.0	543.4	576.8	622.5	635.8	657.2	648.3	614.7	555.4	V(PR) 2
VTHETA PR1	-606.2	-613.5	-621.2	-645.4	-678.0	-710.5	-735.0	-742.4	-748.6	VTHETA PR1
VTHETA PR2	-223.6	-237.5	-250.1	-268.8	-312.6	-359.9	-388.5	-395.6	-412.0	VTHETA PR2
U 1	606.21	613.50	621.25	645.39	678.04	710.54	734.98	742.42	748.65	U 1
U 2	608.42	615.47	622.53	643.71	671.94	700.18	721.35	728.42	735.47	U 2
M 1	0.4616	0.5037	0.5096	0.5089	0.4945	0.4932	0.4894	0.4839	0.4561	M 1
M 2	0.5205	0.5496	0.5723	0.6035	0.5891	0.5767	0.5483	0.5105	0.4336	M 2
M(PR) 1	0.7215	0.7557	0.7651	0.7813	0.7945	0.8173	0.8328	0.8349	0.8224	M(PR) 1
M(PR) 2	0.4500	0.4833	0.5166	0.5565	0.5675	0.5861	0.5765	0.5445	0.4881	M(PR) 2
TURN(PR)	24.062	22.284	22.636	23.776	22.082	19.677	17.201	14.519	8.431	TURN(PR)
UUBAR	0.1175	0.1297	0.0834	0.0387	0.0447	0.0429	0.0769	0.1369	0.2074	UUBAR
LOSS PARA	0.0306	0.0342	0.0223	0.0107	0.0125	0.0121	0.0213	0.0367	0.0492	LOSS PARA
DFAC	0.4975	0.4747	0.4379	0.4036	0.3989	0.3900	0.4123	0.4522	0.5090	DFAC
EFFP	0.8155	0.8256	0.9071	0.9556	0.9454	0.9468	0.9047	0.8213	0.6866	EFFP
EFF	0.8047	0.8204	0.9041	0.9540	0.9435	0.9470	0.9015	0.8159	0.6786	EFF
INCID	-2.206	-2.333	-2.685	-2.445	-3.004	-4.506	-7.551	-11.682		INCID
DEVM	10.957	11.752	10.971	6.941	6.247	5.698	5.280	7.023	12.012	DEVM
P 1	14.380	14.707	14.764	14.762	14.764	14.758	14.645	14.574	14.340	P 1
P 2	17.888	18.149	18.472	18.920	18.878	18.806	18.451	17.982	17.158	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	559.922	557.856	556.628	558.655	558.704	557.975	557.959	558.036	558.916	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.846	38.919	39.276	39.633	DIA
BETA 2	40.444	37.500	34.847	33.777	32.504	31.680	33.467	36.537	42.971	BETA 2
BETA 2A	-1.100	1.000	1.650	0.600	0.300	0.580	-0.900	-0.300	-3.901	BETA 2A
V 2	593.06	621.18	652.12	675.14	670.14	649.88	605.83	561.11	476.36	V 2
V 2A	495.78	495.35	513.89	584.75	592.07	566.91	521.45	493.15	480.78	V 2A
VZ 2	451.34	492.81	535.16	561.09	564.90	552.54	504.77	450.29	348.18	VZ 2
VZ 2A	495.68	495.26	513.65	564.63	591.86	586.53	520.96	492.70	479.16	VZ 2A
V-THETA 2	384.72	378.05	372.59	375.29	359.94	340.99	333.68	333.65	324.35	V-THETA 2
V-THETA 2A	-9.52	8.64	14.80	6.12	3.10	5.94	8.19	-2.58	-32.68	V-THETA 2A
M 2	0.5252	0.5527	0.5827	0.6035	0.5987	0.5798	0.5381	0.4963	0.4182	M 2
M 2A	0.4354	0.4359	0.4534	0.5160	0.5249	0.5204	0.4597	0.4338	0.4222	M 2A
TURN(PR)	41.544	36.500	33.195	33.171	32.187	31.068	32.522	36.786	46.809	TURN(PR)
UUBAR	0.0505	0.1011	0.1266	0.0439	0.0156	0.0308	0.1614	0.1182	-0.1811	UUBAR
LOSS PARA	0.0162	0.0344	0.0436	0.0156	0.0056	0.0118	0.0640	0.0473	-0.0729	LOSS PARA
DFAC	0.3680	0.4052	0.4010	0.3286	0.3143	0.2964	0.3533	0.3621	0.2945	DFAC
EFFP	0.9099	0.7514	0.7036	0.8474	0.9383	0.8543	0.4381	0.5262	-7.9547	EFFP
INCID	-9.723	-5.887	-5.444	-4.253	-4.200	-4.185	-5.237	-6.633	-16.233	INCID
DEVM	7.732	12.312	12.960	11.575	11.312	12.246	13.341	12.380	0.957	DEVM
P 2	17.888	18.149	18.472	18.920	18.878	18.806	18.451	17.982	17.158	P 2
P 2A	17.795	17.805	17.991	18.739	18.815	18.688	17.918	17.653	17.511	P 2A
T 2	559.922	557.856	556.628	558.655	558.704	557.975	557.959	558.036	558.916	T 2
T 2A	559.922	557.856	556.628	558.655	558.704	557.975	557.959	558.036	558.916	T 2A
UUBAR FS	0.1065	0.1272	0.1139	0.0260	0.0175	0.0233	0.2324	0.2600	0.2498	UUBAR FS
P2 FS	18.156	18.250	18.417	18.844	18.886	18.776	18.755	18.516	18.276	P2 FS
LOSS PARA FS	0.0365	0.0432	0.0392	0.0092	0.0065	0.0089	0.0921	0.1040	0.1005	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 100.28 Equivalent Rotor Speed = 4221.89 Equivalent Weight Flow = 111.27
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	443.01	443.01	443.01	443.01	443.01	443.01	443.01	443.01	443.01	V 0
V 1	469.16	466.59	483.72	481.42	473.54	469.35	455.75	449.43	419.05	V 1
VZ 0	443.01	443.01	443.01	443.01	442.98	442.94	442.90	442.89	442.90	VZ 0
VZ 1	469.15	486.59	483.72	481.42	473.50	469.27	455.64	449.30	418.94	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	0.4032	M 0
M 1	0.4278	0.4444	0.4416	0.4395	0.4320	0.4280	0.4152	0.4092	0.3807	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4811	0.3148	0.2852	0.2826	0.2839	0.2878	0.3520	0.3861	0.5389	UUBAR
DFAC	-0.059	-0.098	-0.092	-0.087	-0.069	-0.059	-0.029	-0.014	0.054	DFAC
EFFP	0.2093	0.4100	0.4169	0.4045	0.3474	0.3107	0.1488	0.0736	-0.2553	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.216	15.216	15.216	15.216	15.216	15.216	15.216	15.216	15.216	P 0
P 1	14.441	14.709	14.756	14.761	14.759	14.752	14.649	14.594	14.347	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	44.498	42.328	40.031	37.883	37.520	36.689	38.276	42.420	47.838	BETA 2
BETA(PR) 1	52.375	50.081	49.913	51.061	53.246	54.849	56.419	56.980	58.953	BETA(PR) 1
BETA(PR) 2	24.558	25.967	25.605	25.545	29.226	34.038	38.013	42.287	48.938	BETA(PR) 2
V 1	470.30	516.67	526.25	524.81	510.21	505.51	494.31	489.03	456.48	V 1
V 2	596.28	599.34	620.18	653.49	642.52	619.32	589.87	545.65	490.37	V 2
VZ 1	470.21	516.55	526.19	524.78	509.58	503.47	491.05	485.55	453.50	VZ 1
VZ 2	425.30	443.08	474.86	515.77	509.42	496.00	462.14	402.02	328.62	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	417.91	403.56	398.90	401.26	391.17	369.56	364.66	367.35	362.90	V-THETA 2
V(PR) 1	770.3	805.0	817.2	835.0	852.0	875.7	889.6	892.9	880.9	V(PR) 1
V(PR) 2	467.6	492.9	526.6	571.7	584.0	599.4	587.8	544.5	501.0	V(PR) 2
VTHETA PR1	-610.0	-617.4	-625.2	-649.5	-682.3	-715.0	-739.6	-747.1	-753.4	VTHETA PR1
VTHETA PR2	-194.3	-215.8	-227.6	-246.5	-285.0	-335.0	-361.2	-365.6	-377.2	VTHETA PR2
U 1	610.03	617.37	625.16	649.46	682.31	715.01	739.61	747.10	753.37	U 1
U 2	612.25	619.35	626.45	647.76	676.18	704.59	725.90	733.00	740.11	U 2
M 1	0.4289	0.4730	0.4822	0.4808	0.4668	0.4624	0.4517	0.4467	0.4159	M 1
M 2	0.5265	0.5299	0.5500	0.5805	0.5700	0.5485	0.5208	0.4798	0.4288	M 2
M(PR) 1	0.7025	0.7370	0.7488	0.7650	0.7796	0.8009	0.8129	0.8156	0.8025	M(PR) 1
M(PR) 2	0.4129	0.4358	0.4670	0.5078	0.5181	0.5308	0.519C	0.4788	0.4382	M(PR) 2
TURN(PR)	27.813	24.109	24.306	25.515	24.001	20.754	18.321	14.608	9.951	TURN(PR)
UUBAR	0.1157	0.1357	0.0923	0.0488	0.0610	0.0741	0.1131	0.1833	0.2189	UUBAR
LOSS PARA	0.0305	0.0358	0.0247	0.0135	0.0171	0.0207	0.0309	0.0476	0.0509	LOSS PARA
DFAC	0.5504	0.5350	0.5007	0.4630	0.4617	0.4564	0.4803	0.5331	0.5758	DFAC
EFFP	0.8415	0.8095	0.8734	0.9238	0.9192	0.8976	0.8575	0.7750	0.7146	EFFP
EFF	0.8359	0.8033	0.8690	0.9209	0.9161	0.8939	0.8525	0.7678	0.7060	EFF
INCID	-0.056	-0.835	-0.665	-0.982	-0.757	-1.147	-2.275	-5.337	-9.212	INCID
DFVM	9.409	11.807	10.971	6.904	6.016	6.478	6.390	9.149	12.962	DFVM
P 1	14.441	14.709	14.756	14.761	14.759	14.752	14.649	14.594	14.347	P 1
P 2	18.412	18.474	18.774	19.230	19.230	19.033	18.702	18.226	17.697	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	563.303	562.149	561.214	562.916	563.172	562.518	562.681	562.985	564.095	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	44.842	42.078	39.290	37.931	36.950	36.554	39.123	43.884	50.256	BETA 2
BETA 2A	-1.350	1.250	1.950	1.950	1.150	0.880	1.941	2.501	0.500	BETA 2A
V 2	592.75	602.42	630.26	653.49	652.01	622.28	579.93	531.80	473.62	V 2
V 2A	450.61	442.38	448.30	522.93	548.41	545.42	483.64	458.06	442.43	V 2A
VZ 2	420.29	447.13	487.77	515.36	520.84	499.47	449.43	382.92	302.56	VZ 2
VZ 2A	450.68	442.27	448.02	522.56	548.12	545.03	482.97	457.22	441.95	VZ 2A
V-THETA 2	417.98	403.70	399.09	401.26	391.17	370.32	365.55	368.29	363.86	V-THETA 2
V-THETA 2A	-10.62	9.65	15.25	17.79	11.00	8.37	16.36	19.97	3.86	V-THETA 2A
M 2	0.5232	0.5328	0.5594	0.5805	0.5789	0.5512	0.5116	0.4671	0.4137	M 2
M 2A	0.3934	0.3863	0.3919	0.4590	0.4823	0.4798	0.4233	0.4001	0.3856	M 2A
TURN(PR)	46.192	40.827	37.338	35.975	35.782	35.640	37.135	41.332	49.697	TURN(PR)
UUBAR	0.0664	0.1024	0.1596	0.0821	0.0212	-0.0099	0.1019	0.0262	-0.1574	UUBAR
LOSS PARA	0.0224	0.0348	0.0549	0.0291	0.0079	-0.0038	0.0404	0.0105	-0.0635	LOSS PARA
DFAC	0.4831	0.4885	0.4986	0.4090	0.3759	0.3486	0.4060	0.4022	0.3742	DFAC
EFFP	0.8577	0.7991	0.7089	0.7985	0.9365	1.0377	0.6964	0.9070	2.1390	EFFP
INCID	-5.325	-1.310	-1.001	-0.100	0.245	0.686	0.416	0.712	-8.948	INCID
DEVM	7.482	12.562	13.260	12.925	12.162	12.546	14.380	15.179	5.354	DEVM
P 2	18.412	18.474	18.774	19.230	19.230	19.033	18.702	18.226	17.697	P 2
P 2A	18.204	18.142	18.201	18.908	19.147	19.068	18.390	18.159	18.007	P 2A
T 2	563.303	562.149	561.214	562.916	563.172	562.518	562.681	562.985	564.095	T 2
T 2A	563.303	562.149	561.214	562.916	563.172	562.518	562.681	562.985	564.095	T 2A
UUBAR FS	0.1809	0.1213	0.1210	0.0489	0.0367	0.0334	0.1905	0.2125	0.2279	UUBAR FS
P2 FS	18.461	18.544	18.616	19.093	19.292	19.191	19.036	18.824	18.679	P2 FS
LOSS PARA FS	0.0772	0.0412	0.0416	0.0173	0.0136	0.0128	0.0755	0.0851	0.0919	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 99.97   Equivalent Rotor Speed = 4208.84   Equivalent Weight Flow   106.84
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	424.58	424.58	424.58	424.58	424.58	424.58	424.58	424.58	424.58	V 0
V 1	442.41	456.39	454.39	455.31	450.16	452.92	440.54	433.64	401.10	V 1
VZ 0	424.58	424.58	424.58	424.57	424.55	424.51	424.47	424.46	424.47	VZ 0
VZ 1	442.41	456.39	454.39	455.30	450.12	452.84	440.43	433.52	400.99	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3859	0.3859	0.3859	0.3859	0.3859	0.3859	0.3859	0.3859	0.3859	M 0
M 1	0.4026	0.4156	0.4139	0.4148	0.4099	0.4125	0.4009	0.3944	0.3640	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4070	0.3053	0.2747	0.2691	0.2705	0.2733	0.3388	0.3757	0.5284	UUBAR
DFAC	-0.042	-0.075	-0.070	-0.072	-0.060	-0.067	-0.038	-0.021	0.055	DFAC
EFFP	0.1607	0.3492	0.3583	0.3706	0.3263	0.3477	0.1920	0.1074	-0.2680	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.153	15.153	15.153	15.153	15.153	15.153	15.153	15.153	15.153	P 0
P 1	14.461	14.702	14.747	14.755	14.753	14.749	14.652	14.597	14.372	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	46.997	45.584	42.845	40.185	39.421	38.482	40.632	44.073	50.227	BETA 2
BETA(PR) 1	53.906	51.646	51.665	52.602	54.596	55.759	57.260	57.862	60.006	BETA(PR) 1
BETA(PR) 2	24.998	26.672	26.446	26.088	29.744	33.595	37.355	41.774	47.372	BETA(PR) 2
V 1	443.47	483.59	492.88	495.00	484.06	487.14	477.22	471.25	436.35	V 1
V 2	581.68	579.31	597.60	633.54	626.45	615.66	589.21	547.42	504.84	V 2
VZ 1	443.36	483.48	492.82	494.97	483.46	485.17	474.08	467.89	433.50	VZ 1
VZ 2	396.71	405.42	438.29	483.99	483.76	481.37	446.32	392.57	322.50	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	425.36	413.78	406.51	408.79	397.67	382.65	382.97	380.06	387.45	V-THETA 2
V(PR) 1	752.7	782.7	794.6	815.0	834.9	863.4	878.3	881.4	868.6	V(PR) 1
V(PR) 2	437.7	453.7	469.5	538.9	557.4	578.7	562.6	527.4	477.0	V(PR) 2
VTHETA PR1	-606.1	-615.5	-623.2	-647.5	-680.2	-712.8	-737.3	-744.8	-751.0	VTHETA PR1
VTHETA PR2	-185.0	-203.7	-218.0	-237.0	-276.4	-319.8	-340.7	-350.7	-350.4	VTHETA PR2
U 1	608.15	615.46	623.23	647.45	680.20	712.80	737.33	744.79	751.04	U 1
U 2	610.36	617.44	624.52	645.76	674.09	702.41	723.66	730.74	737.82	U 2
M 1	0.4636	0.4415	0.4503	0.4524	0.4420	0.4449	0.4355	0.4298	0.3969	M 1
M 2	0.5127	0.5110	0.5288	0.5618	0.5549	0.5449	0.5196	0.4806	0.4411	M 2
M(PR) 1	0.6651	0.7146	0.7260	0.7448	0.7622	0.7885	0.8015	0.8039	0.7902	M(PR) 1
M(PR) 2	0.3858	0.4002	0.4330	0.4778	0.4938	0.5122	0.4962	0.4630	0.4168	M(PR) 2
TURN(PR)	28.903	25.171	25.216	26.514	24.834	22.107	19.822	16.005	12.573	TURN(PR)
UUBAR	0.1044	0.1395	0.0986	0.0509	0.0526	0.0565	0.1057	0.1668	0.2163	UUBAR
LOSS PARA	0.0274	0.0366	0.0262	0.0141	0.0147	0.0158	0.0292	0.0436	0.0519	LOSS PARA
DFAC	0.5624	0.5756	0.5360	0.4929	0.4850	0.4777	0.5093	0.5513	0.6075	DFAC
EFFP	0.8813	0.8211	0.8790	0.9434	0.9478	0.9461	0.8896	0.7995	0.7506	EFFP
EFF	0.8562	0.8150	0.8747	0.9412	0.9457	0.9440	0.8855	0.7926	0.7423	EFF
INCID	1.474	0.932	1.086	0.560	0.594	-0.236	-1.431	-4.451	-8.156	INCID
DEVM	9.849	12.513	11.813	7.447	6.533	6.036	5.732	8.636	11.395	DEVM
P 1	14.461	14.702	14.747	14.755	14.753	14.749	14.652	14.597	14.372	P 1
P 2	18.594	18.568	18.831	19.305	19.362	19.326	19.016	18.532	18.099	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	563.002	562.816	561.599	562.690	562.997	562.811	564.001	564.874	566.285	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	47.366	45.312	42.054	40.237	38.835	38.340	41.555	45.631	52.898	BETA 2
BETA 2A	-1.300	0.250	1.300	1.850	0.800	0.900	1.200	1.550	1.050	BETA 2A
V 2	578.30	582.21	607.20	633.54	635.38	618.60	579.31	533.51	487.44	V 2
V 2A	453.29	421.72	424.64	495.08	520.11	514.67	457.62	430.00	418.72	V 2A
VZ 2	391.69	409.43	450.84	483.56	494.73	484.82	433.08	372.73	293.82	VZ 2
VZ 2A	453.17	421.71	424.51	494.75	519.89	514.30	457.15	429.46	418.20	VZ 2A
V-THETA 2	425.45	413.91	406.71	409.18	398.27	383.43	383.90	381.03	388.47	V-THETA 2
V-THETA 2A	-9.63	1.84	9.63	15.98	7.26	8.08	9.58	11.62	7.67	V-THETA 2A
M 2	0.5098	0.5137	0.5376	0.5618	0.5633	0.5476	0.5104	0.4678	0.4253	M 2
M 2A	0.3975	0.3675	0.3705	0.4337	0.4564	0.4515	0.3993	0.3742	0.3637	M 2A
TURN(PR)	46.666	45.061	40.753	38.380	38.017	37.405	40.306	44.028	51.792	TURN(PR)
UUBAR	0.0505	0.1365	0.0812	0.0275	0.0446	0.1392	0.0719	-0.0648		UUBAR
LOSS PARA	0.0170	0.0271	0.0470	0.0288	0.0102	0.0172	0.0552	0.0288	-0.0261	LOSS PARA
DFAC	0.5044	0.5168	0.5260	0.4396	0.4100	0.4028	0.4675	0.4726	0.4580	DFAC
EFFP	0.8955	0.8460	0.7578	0.8143	0.9264	0.8711	0.6623	0.8110	1.2286	EFFP
INCID	-2.001	1.924	1.763	2.206	2.130	2.472	2.847	2.458	-6.304	INCID
DEVM	7.532	11.562	12.610	12.825	11.812	12.566	13.640	14.229	5.903	DEVM
P 2	18.594	18.568	18.831	19.305	19.362	19.326	19.016	18.532	18.099	P 2
P 2A	18.441	18.345	18.372	19.003	19.259	19.167	18.585	18.346	18.236	P 2A
T 2	563.002	562.816	561.599	562.690	562.997	562.811	564.001	564.874	566.285	T 2
T 2A	563.002	562.816	561.599	562.690	562.997	562.811	564.001	564.874	566.285	T 2A
UUBAR FS	0.0681	0.1066	0.1120	0.0537	0.0221	0.0376	0.1981	0.2148	0.1958	UUBAR FS
P2 FS	18.650	18.681	18.738	19.197	19.341	19.300	19.243	19.001	18.784	P2 FS
LOSS PARA FS	0.0729	0.0363	0.0385	0.0190	0.0082	0.0145	0.0785	0.0860	0.0788	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 100.15 Equivalent Rotor Speed = 4216.49 Equivalent Weight Flow = 105.92
Uniform Inlet

INLET

	PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
	DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
	BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
	BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
	V 0	420.29	420.29	420.29	420.29	420.29	420.29	420.29	420.29	420.29	V 0
	V 1	440.85	454.32	451.33	453.65	454.18	447.29	430.83	423.39	392.66	V 1
	VZ 0	420.29	420.29	420.29	420.29	420.26	420.22	420.19	420.18	420.18	VZ 0
	VZ 1	440.85	454.32	451.33	453.64	454.15	447.22	430.72	423.27	392.56	VZ 1
	V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
	V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
	M 0	0.3819	0.3819	0.3819	0.3819	0.3819	0.3819	0.3819	0.3819	0.3819	M 0
	M 1	0.4012	0.4138	0.4110	0.4132	0.4137	0.4072	0.3918	0.3848	0.3561	M 1
	TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
	UUBAR	0.4649	0.3050	0.2715	0.2680	0.2694	0.2708	0.3369	0.3753	0.5324	UUBAR
	DFAC	-0.049	-0.081	-0.074	-0.079	-0.081	-0.064	-0.025	-0.007	0.066	DFAC
	EFFP	0.1837	0.3678	0.3729	0.3937	0.3965	0.3405	0.1365	0.0395	-0.3294	EFFP
	INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
	DEVM	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	DEVM
	P 0	15.144	15.144	15.144	15.144	15.144	15.144	15.144	15.144	15.144	P 0
	P 1	14.470	14.702	14.751	14.756	14.754	14.752	14.656	14.600	14.372	P 1
	T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
	T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

	PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
	DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
	BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
	BETA 2	47.397	45.584	43.451	40.385	39.625	39.179	42.013	46.802	52.043	BETA 2
	BETA(PR) 1	54.051	52.029	51.911	52.758	54.395	56.152	57.905	58.544	60.590	BETA(PR) 1
	BETA(PR) 2	24.095	26.526	26.074	25.906	29.005	33.544	38.479	43.045	48.782	BETA(PR) 2
	V 1	441.90	481.33	489.43	493.11	488.55	480.87	466.34	459.72	426.91	V 1
	V 2	588.65	581.59	599.89	635.58	634.44	614.93	576.48	535.91	496.55	V 2
	VZ 1	441.81	481.22	489.37	493.09	487.95	478.92	463.27	456.45	424.13	VZ 1
	VZ 2	398.45	407.01	435.49	484.12	488.50	476.12	427.55	366.22	305.00	VZ 2
	V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
	V-THETA 2	433.27	415.40	412.56	411.80	404.48	388.02	385.14	390.02	390.99	V-THETA 2
	V(PR) 1	752.6	782.2	793.3	814.8	838.5	860.9	873.6	876.4	865.1	V(PR) 1
	V(PR) 2	436.5	454.9	484.8	538.2	558.8	572.0	547.2	502.1	463.6	V(PR) 2
	VTHETA PR1	-609.3	-616.6	-624.4	-648.6	-681.4	-714.1	-738.7	-746.1	-752.4	VTHETA PR1
	VTHETA PR2	-170.2	-203.2	-213.1	-235.1	-270.8	-315.7	-339.8	-342.0	-348.2	VTHETA PR2
	U 1	609.25	616.58	624.36	648.63	681.44	714.10	738.67	746.15	752.40	U 1
	U 2	611.47	618.56	625.65	646.94	675.31	703.69	724.97	732.07	739.16	U 2
	M 1	0.4022	0.4394	0.4471	0.4506	0.4462	0.4389	0.4252	0.4189	0.3881	M 1
	M 2	0.5177	0.5117	0.5292	0.5622	0.5609	0.5429	0.5068	0.4692	0.4328	M 2
	M(PR) 1	0.6849	0.7140	0.7246	0.7445	0.7658	0.7858	0.7965	0.7986	0.7864	M(PR) 1
	M(PR) 2	0.3839	0.4003	0.4277	0.4760	0.4941	0.5051	0.4811	0.4396	0.4041	M(PR) 2
	TURN(PR)	29.952	25.498	25.835	26.851	25.371	22.551	19.347	15.419	11.749	TURN(PR)
	UUBAR	0.1115	0.1374	0.1045	0.0465	0.0430	0.0662	0.1329	0.2056	0.2314	UUBAR
	LOSS PARA	0.0295	0.0361	0.0279	0.0129	0.0121	0.0185	0.0361	0.0527	0.0540	LOSS PARA
	DFAC	0.5671	0.5744	0.5434	0.4947	0.4882	0.4860	0.5252	0.5817	0.6228	DFAC
	EFFP	0.8197	0.7792	0.8303	0.8998	0.9198	0.9018	0.8284	0.7510	0.7174	EFFP
	EFF	0.8131	0.7717	0.8242	0.8958	0.9165	0.8979	0.8221	0.7427	0.7081	EFF
	INCID	1.620	1.113	1.333	0.715	0.393	0.157	-0.784	-3.767	-7.570	INCID
	DEVM	8.946	12.366	11.440	7.265	5.795	5.985	6.855	9.906	12.805	DEVM
	P 1	14.470	14.702	14.751	14.756	14.754	14.752	14.656	14.600	14.372	P 1
	P 2	18.665	18.624	18.882	19.376	19.521	19.350	18.882	18.428	18.067	P 2
	T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
	T 2	566.824	565.679	564.696	565.567	565.830	565.269	566.061	566.743	568.187	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

	PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
	DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
	BETA 2	47.774	45.312	42.643	40.437	39.028	39.034	42.965	48.505	54.893	BETA 2
	BETA 2A	-1.000	1.500	2.350	2.050	1.460	0.880	1.951	2.751	2.251	BETA 2A
	V 2	585.21	584.50	609.33	635.58	643.57	617.85	567.00	522.46	479.53	V 2
	V 2A	433.77	420.83	419.08	487.09	517.13	515.83	460.58	435.43	424.10	V 2A
	VZ 2	393.29	411.04	448.20	483.69	499.75	479.56	414.53	345.88	275.59	VZ 2
	VZ 2A	433.70	420.68	418.71	486.71	516.79	515.47	459.94	434.54	423.32	VZ 2A
	V-THETA 2	433.34	415.54	412.76	412.19	405.10	388.02	386.07	391.01	392.02	V-THETA 2
	V-THETA 2A	-7.57	11.01	17.18	17.42	13.17	7.92	15.66	20.88	16.64	V-THETA 2A
	M 2	0.5145	0.5144	0.5380	0.5622	0.5695	0.5457	0.4981	0.4569	0.4175	M 2
	M 2A	0.3769	0.3657	0.3645	0.4253	0.4525	0.4515	0.4012	0.3784	0.3678	M 2A
	TURN(PR)	48.774	43.811	40.291	38.381	37.550	38.119	40.966	45.703	52.589	TURN(PR)
	UUBAR	0.0438	0.0667	0.1417	0.0984	0.0511	0.0224	0.0700	-0.0117	-0.1383	UUBAR
	LOSS PARA	0.0147	0.0227	0.0487	0.0349	0.0189	0.0086	0.0277	-0.0047	-0.0558	LOSS PARA
	DFAC	0.5126	0.5158	0.5359	0.4548	0.4227	0.4036	0.4480	0.4517	0.4333	DFAC
	EFFP	0.9120	0.8743	0.7561	0.7873	0.8726	0.9344	0.8126	1.0353	1.5859	EFFP
	INCID	-2.393	1.924	2.352	2.406	2.323	3.166	4.257	5.332	-4.308	INCID
	DEVM	7.832	12.812	13.660	13.025	12.472	12.546	14.390	15.428	7.102	DEVM
	P 2	18.665	18.624	18.882	19.376	19.521	19.350	18.882	18.428	18.067	P 2
	P 2A	18.535	18.419	18.403	19.008	19.324	19.271	18.675	18.457	18.350	P 2A
	T 2	566.824	565.679	564.696	565.567	565.830	565.269	566.061	566.743	568.187	T 2
	T 2A	566.824	565.679	564.696	565.567	565.830	565.269	566.061	566.743	568.187	T 2A
	UUBAR FS	0.1099	0.1228	0.1287	0.0732	0.0494	0.0463	0.1641	0.1767	0.1714	UUBAR FS
	P2 FS	18.920	18.920	18.831	19.274	19.514	19.439	19.212	18.991	18.831	P2 FS
	LOSS PARA FS	0.0371	0.0417	0.0442	0.0259	0.0182	0.0177	0.0649	0.0710	0.0691	LOSS PARA FS

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INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
V 0	407.80	407.80	407.80	407.80	407.80	407.80	407.80	407.80	407.80
V 1	421.71	434.89	430.37	433.53	431.43	431.00	418.89	409.96	379.18
VZ 0	407.79	407.79	407.79	407.79	407.77	407.73	407.69	407.69	407.69
VZ 1	421.71	434.89	430.37	433.52	431.40	430.92	418.79	409.85	379.08
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
M 0	0.3702	0.3702	0.3702	0.3702	0.3702	0.3702	0.3702	0.3702	0.3702
M 1	0.3832	0.3956	0.3913	0.3943	0.3923	0.3919	0.3806	0.3722	0.3436
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UUBAR	0.4597	0.2992	0.2683	0.2630	0.2645	0.2675	0.3293	0.3670	0.5207
DFAC	-0.034	-0.066	-0.055	-0.063	-0.058	-0.057	-0.027	-0.005	0.070
EFFP	0.1359	0.3252	0.3083	0.3424	0.3216	0.3150	0.2492	0.0293	-0.3684
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P 0	15.106	15.106	15.106	15.106	15.106	15.106	15.106	15.106	15.106
P 1	14.479	14.698	14.740	14.747	14.745	14.741	14.657	14.606	14.396
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
BETA 2	49.297	47.689	45.260	41.982	41.377	40.673	43.727	46.700	53.178
BETA(PR) 1	55.005	53.011	53.018	53.796	55.574	56.915	58.414	59.155	61.238
BETA(PR) 2	24.001	27.278	26.865	26.306	29.407	33.292	37.743	41.805	47.049
V 1	422.70	460.29	465.93	470.46	463.34	462.86	453.00	444.67	411.89
V 2	577.87	564.05	581.07	618.52	616.72	607.08	575.35	541.79	507.73
VZ 1	422.62	460.19	465.88	470.43	462.76	460.98	450.02	441.51	409.26
VZ 2	376.84	379.69	409.00	459.77	462.62	459.92	415.06	370.94	303.91
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
V-THETA 2	438.07	417.10	412.73	413.71	407.52	395.21	397.02	393.63	405.92
V(PR) 1	736.9	764.9	774.5	796.5	818.9	845.5	860.7	862.7	851.7
V(PR) 2	412.5	427.2	458.5	512.9	531.7	551.0	526.0	498.6	446.8
VTHETA PR1	-603.7	-610.9	-618.6	-642.7	-675.2	-707.5	-731.9	-739.3	-745.5
VTHETA PR2	-167.8	-195.8	-207.2	-227.3	-261.6	-302.0	-321.3	-331.7	-326.5
U 1	603.66	610.92	618.63	642.68	675.19	707.55	731.89	739.30	745.50
U 2	605.86	612.88	619.91	641.00	669.12	697.23	718.32	725.35	732.38
M 1	0.3842	0.4195	0.4248	0.4291	0.4223	0.4219	0.4126	0.4048	0.3741
M 2	0.5066	0.4963	0.5127	0.5472	0.5453	0.5364	0.5060	0.4749	0.4431
M(PR) 1	0.6697	0.6971	0.7061	0.7264	0.7464	0.7707	0.7840	0.7853	0.7735
M(PR) 2	0.3631	0.3759	0.4045	0.4537	0.4701	0.4868	0.4626	0.4370	0.3899
TURN(PR)	31.000	25.728	26.151	27.490	26.068	23.568	20.591	17.271	14.132
UUBAR	0.1654	0.1369	0.1021	0.0486	0.0516	0.0628	0.1289	0.1731	0.2216
LOSS PARA	0.0279	0.0357	0.0271	0.0134	0.0145	0.0176	0.0354	0.0452	0.0535
DFAC	0.6127	0.6017	0.5664	0.5157	0.5102	0.5044	0.5476	0.5805	0.6428
EFFP	0.8613	0.8092	0.8668	0.9334	0.9490	0.9459	0.8666	0.8055	0.7683
EFF	0.8561	0.8027	0.8621	0.9308	0.9470	0.9437	0.8615	0.7986	0.7602
INCID	2.573	2.094	2.439	1.754	1.572	0.921	-0.274	-3.155	-6.921
DEVM	8.851	13.118	12.231	7.665	6.276	5.733	6.120	8.667	11.072
P 1	14.479	14.698	14.740	14.747	14.745	14.741	14.657	14.606	14.396
P 2	18.741	18.628	18.865	19.343	19.461	19.424	19.050	18.690	18.356
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700
T 2	565.053	563.967	562.644	563.605	563.895	563.775	565.525	566.110	567.761

STATOR E
STATOR -L.E.
STATOR -T.E.

PCT SPAN	.95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	49.695	47.399	44.421	42.037	40.759	40.524	44.739	48.406	56.183
BETA 2A	-1.250	0.800	1.600	1.900	1.100	1.100	1.400	1.951	1.701
V 2	574.53	566.85	590.00	618.52	625.38	609.93	565.92	528.11	490.19
V 2A	417.75	404.11	404.68	468.27	498.42	493.39	437.73	415.59	405.48
VZ 2	371.64	383.69	421.38	459.32	473.52	463.30	401.63	350.30	272.64
VZ 2A	417.65	404.06	404.50	467.95	498.17	493.01	437.25	414.98	404.87
V-THETA 2	438.14	417.24	412.94	414.11	408.14	396.02	397.98	394.63	407.00
V-THETA 2A	-9.11	5.64	11.30	15.52	9.57	9.47	10.69	14.13	12.02
M 2	0.5055	0.4989	0.5210	0.5472	0.5534	0.5390	0.4973	0.4624	0.4273
M 2A	0.3632	0.3514	0.3523	0.4090	0.4362	0.4317	0.3809	0.3609	0.3514
TURN(PR)	50.945	46.598	42.819	40.130	39.640	39.388	43.289	46.403	54.429
UUBAR	0.0552	0.0597	0.1303	0.0990	0.0481	0.0578	0.1239	0.0751	-0.0275
LOSS PARA	0.0186	0.0203	0.0448	0.0352	0.0178	0.0223	0.0491	0.0300	-0.0111
DFAC	0.5352	0.5345	0.5487	0.4724	0.4398	0.4363	0.4992	0.5029	0.4998
EFFP	0.8935	0.8893	0.7756	0.7917	0.8827	0.8502	0.7175	0.8180	1.0808
INCID	-0.472	4.011	4.130	4.006	4.053	4.655	6.031	5.233	-3.017
DEVM	7.582	12.112	12.910	12.875	12.112	12.766	13.840	14.629	6.553
P 2	18.741	18.628	18.665	19.343	19.461	19.424	19.050	18.690	18.356
P 2A	18.576	18.455	18.450	18.990	19.285	19.223	18.683	18.499	18.416
T 2	565.053	563.967	562.644	563.605	563.895	563.775	565.525	566.110	567.761
T 2A	565.053	563.967	562.644	563.605	563.895	563.775	565.525	566.110	567.761
UUBAR FS	0.0785	0.1168	0.1517	0.0909	0.0397	0.0450	0.1896	0.1862	0.1738
P2 FS	18.817	18.817	18.946	19.310	19.429	19.377	19.290	19.038	18.884
LOSS PARA FS	0.0264	0.0397	0.0521	0.0323	0.0147	0.0173	0.0751	0.0744	0.0701

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 100.28 Equivalent Rotor Speed = 4221.92 Equivalent Weight Flow = 97.95
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	386.41	386.41	386.41	386.41	386.41	386.41	386.41	386.41	386.41	V 0
V 1	401.21	414.24	413.50	417.49	416.42	409.65	400.37	390.90	360.16	V 1
VZ 0	386.41	386.41	386.41	386.40	386.38	386.34	386.31	386.30	386.31	VZ 0
VZ 1	401.21	414.24	413.50	417.49	416.38	409.58	400.27	390.80	360.06	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3503	0.3503	0.3503	0.3503	0.3503	0.3503	0.3503	0.3503	0.3503	M 0
M 1	0.3641	0.3762	0.3756	0.3793	0.3783	0.3720	0.3633	0.3545	0.3260	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4533	0.2936	0.2618	0.2517	0.2568	0.2794	0.3220	0.3622	0.5094	UUBAR
DFAC	-0.038	-0.072	-0.070	-0.080	-0.078	-0.060	-0.036	-0.012	0.068	DFAC
EFFP	0.1516	0.3469	0.3671	0.4104	0.3967	0.3167	0.1924	0.0629	-0.3623	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.060	15.060	15.060	15.060	15.060	15.060	15.060	15.060	15.060	P 0
P 1	14.505	14.701	14.740	14.752	14.746	14.718	14.666	14.617	14.436	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	50.997	50.104	48.589	44.279	43.585	43.859	48.868	53.076	57.301	BETA 2
BETA(PR) 1	56.612	54.655	54.433	55.136	56.817	58.537	59.850	60.629	62.741	BETA(PR) 1
BETA(PR) 2	23.815	26.306	27.152	26.846	30.153	33.788	39.680	43.495	46.394	BETA(PR) 2
V 1	402.14	437.95	447.09	452.48	446.76	439.30	432.45	423.48	390.71	V 1
V 2	580.41	571.23	575.15	610.81	609.24	600.08	559.64	535.96	525.93	V 2
VZ 1	402.06	437.85	447.04	452.46	446.21	437.53	429.61	420.47	388.16	VZ 1
VZ 2	365.28	366.37	380.43	437.30	441.17	432.25	367.61	321.56	283.83	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	451.03	438.24	431.35	426.43	419.90	415.36	420.93	427.91	442.12	V-THETA 2
V(PR) 1	730.7	756.9	768.6	791.5	815.6	839.2	856.8	858.8	848.7	V(PR) 1
V(PR) 2	399.3	408.7	427.6	490.1	510.4	520.8	478.6	444.1	412.2	V(PR) 2
VTHETA PR1	-610.0	-617.4	-625.2	-649.5	-682.3	-715.0	-739.6	-747.1	-753.4	VTHETA PR1
VTHETA PR2	-161.2	-181.1	-195.1	-221.3	-256.3	-289.2	-305.0	-305.1	-298.0	VTHETA PR2
U 1	610.04	617.37	625.17	649.46	682.32	715.02	739.62	747.11	753.37	U 1
U 2	612.25	619.36	626.46	647.77	676.18	704.59	725.90	733.01	740.11	U 2
M 1	0.3631	0.3984	0.4070	0.4121	0.4067	0.3997	0.3933	0.3849	0.3543	M 1
M 2	0.5498	0.5018	0.5061	0.5387	0.5373	0.5288	0.4906	0.4685	0.4587	M 2
M(PR) 1	0.6631	0.6887	0.6997	0.7209	0.7425	0.7636	0.7792	0.7805	0.7696	M(PR) 1
M(PR) 2	0.3507	0.3590	0.3762	0.4323	0.4502	0.4589	0.4195	0.3882	0.3596	M(PR) 2
TURN(PR)	32.794	28.345	27.279	28.290	26.646	24.697	20.097	17.062	16.296	TURN(PR)
UUBAR	0.0949	0.1315	0.1187	0.0586	0.0602	0.0856	0.1832	0.2370	0.2618	UUBAR
LOSS PARA	0.0251	0.0346	0.0314	0.0161	0.0168	0.0239	0.0489	0.0603	0.0640	LOSS PARA
DFAC	0.6326	0.6301	0.6105	0.5463	0.5392	0.5447	0.6104	0.6559	0.6972	DFAC
EFFP	0.6675	0.8300	0.8603	0.9157	0.9412	0.9392	0.8390	0.7890	0.7886	EFFP
EFF	0.8623	0.8238	0.8552	0.9123	0.9388	0.9367	0.8329	0.7813	0.7866	EFF
INCID	4.181	3.739	3.854	3.094	2.816	2.547	1.166	-1.675	-5.412	INCID
DEVM	8.665	12.146	12.518	8.205	6.943	6.228	8.056	10.356	10.417	DEVM
P 1	14.505	14.701	14.740	14.752	14.746	14.718	14.666	14.617	14.436	P 1
P 2	19.043	18.982	19.064	19.515	19.638	19.597	19.105	18.828	18.726	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	567.356	566.402	564.962	566.020	565.831	565.901	567.573	568.505	569.969	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	51.420	49.783	47.656	44.339	42.926	43.697	50.078	55.237	60.942	BETA 2
BETA 2A	-0.400	1.350	1.600	1.500	1.720	1.250	2.101	3.001	3.251	BETA 2A
V 2	577.06	574.10	583.91	610.81	617.70	602.87	550.58	522.52	507.38	V 2
V 2A	411.00	390.74	380.12	440.54	472.02	474.39	420.42	405.58	401.75	V 2A
VZ 2	359.85	370.68	393.29	436.81	452.14	435.59	353.08	297.75	246.31	VZ 2
VZ 2A	410.99	390.62	379.95	440.33	471.65	474.00	419.80	404.66	400.68	VZ 2A
V-THETA 2	451.11	438.38	431.56	426.84	420.54	416.22	421.94	429.00	443.29	V-THETA 2
V-THETA 2A	-2.67	9.21	10.61	11.53	14.16	10.34	15.40	21.21	22.76	V-THETA 2A
M 2	0.5067	0.5045	0.5142	0.5387	0.5452	0.5314	0.4823	0.4563	0.4419	M 2
M 2A	0.3564	0.3387	0.3298	0.3832	0.4116	0.4137	0.3647	0.3512	0.3474	M 2A
TURN(PR)	51.820	48.432	46.055	42.832	41.188	42.412	47.929	52.188	57.644	TURN(PR)
UUBAR	0.0680	0.1012	0.1486	0.1266	0.0804	0.0691	0.0864	0.0360	0.0118	UUBAR
LOSS PARA	0.0229	0.0345	0.0511	0.0450	0.0298	0.0266	0.0342	0.0144	0.0047	LOSS PARA
DFAC	0.5528	0.5741	0.5974	0.5209	0.4803	0.4736	0.5306	0.5379	0.5446	DFAC
EFFP	0.8744	0.8275	0.7637	0.7613	0.8266	0.8368	0.8097	0.9164	0.9708	EFFP
INCID	1.253	6.395	7.366	6.308	6.220	7.828	11.370	12.068	1.746	INCID
DEVM	8.432	12.662	12.910	12.475	12.732	12.916	14.540	15.678	8.102	DEVM
P 2	19.043	18.982	19.064	19.515	19.638	19.597	19.105	18.828	18.726	P 2
P 2A	18.835	18.675	18.596	19.072	19.349	19.360	18.862	18.738	18.698	P 2A
T 2	567.356	566.402	564.962	566.020	565.831	565.901	567.573	568.505	569.969	T 2
T 2A	567.356	566.402	564.962	566.020	565.831	565.901	567.573	568.505	569.969	T 2A
UUBAR FS	0.1437	0.1353	0.1392	0.1113	0.0871	0.0763	0.1644	0.1540	0.1264	UUBAR FS
P2 FS	19.095	19.120	19.029	19.454	19.664	19.623	19.367	19.177	19.034	P2 FS
LOSS PARA FS	0.0481	0.0461	0.0478	0.0395	0.0323	0.0293	0.0650	0.0616	0.0503	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 99.98   Equivalent Rotor Speed = 4209.37   Equivalent Weight Flow = 93.27

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	366.74	366.74	366.74	366.74	366.74	366.74	366.74	366.74	366.74	V 0
V 1	375.68	391.11	390.79	395.48	393.67	387.02	374.42	362.97	336.72	V 1
VZ 0	366.74	366.74	366.74	366.74	366.72	366.68	366.65	366.64	366.65	VZ 0
VZ 1	375.67	391.11	390.79	395.47	393.64	386.96	374.33	362.87	336.64	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3321	0.3321	0.3321	0.3321	0.3321	0.3321	0.3321	0.3321	0.3321	M 0
M 1	0.3404	0.3547	0.3544	0.3588	0.3571	0.3509	0.3392	0.3286	0.3044	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4508	0.2907	0.2555	0.2518	0.2536	0.2555	0.3166	0.3601	0.4989	UUBAR
DFAC	-0.024	-0.066	-0.066	-0.078	-0.073	-0.055	-0.021	0.010	0.082	DFAC
EFFP	0.1015	0.3295	0.3556	0.4026	0.3846	0.3165	0.1217	-0.0627	-0.4789	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.016	15.016	15.016	15.016	15.016	15.016	15.016	15.016	15.016	P 0
P 1	14.518	14.695	14.734	14.738	14.736	14.734	14.666	14.618	14.465	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	51.896	51.350	50.104	46.078	45.492	46.447	51.847	56.055	59.615	BETA 2
BETA(PK) 1	58.245	56.139	55.908	56.538	58.231	59.923	61.456	62.382	64.243	BETA(PR) 1
BETA(PR) 2	22.517	26.656	26.612	26.812	30.100	34.036	40.892	44.695	45.619	BETA(PR) 2
V 1	376.52	413.11	421.93	428.00	421.81	414.54	403.78	392.51	364.79	V 1
V 2	565.45	564.22	573.79	603.11	602.38	590.83	548.42	529.40	535.40	V 2
VZ 1	376.45	413.02	421.88	427.97	421.29	412.86	401.13	389.71	362.41	VZ 1
VZ 2	361.26	352.38	368.02	418.36	422.16	406.72	338.37	295.28	270.56	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	460.67	440.63	440.21	434.40	429.46	427.80	430.72	438.68	461.44	V-THETA 2
V(PR) 1	715.3	741.3	752.7	776.2	800.4	824.7	840.7	842.0	835.0	V(PR) 1
V(PR) 2	391.1	394.3	411.6	468.4	488.2	491.5	448.4	416.1	387.5	V(PR) 2
VTHETA PR1	-608.2	-615.5	-623.3	-647.5	-680.3	-712.9	-737.4	-744.9	-751.1	VTHETA PR1
VTHETA PR2	-149.8	-176.9	-184.4	-211.4	-244.7	-274.7	-293.0	-292.2	-276.5	VTHETA PR2
U 1	608.22	615.54	623.31	647.53	680.29	712.89	737.42	744.89	751.13	U 1
U 2	610.43	617.51	624.60	645.84	674.17	702.50	723.75	730.83	737.91	U 2
M 1	0.3412	0.3752	0.3834	0.3891	0.3833	0.3765	0.3665	0.3560	0.3303	M 1
M 2	0.5130	0.4945	0.5040	0.5307	0.5299	0.5189	0.4787	0.4610	0.4658	M 2
M(PR) 1	0.6461	0.6733	0.6840	0.7057	0.7274	0.7490	0.7631	0.7636	0.7560	M(PR) 1
M(PR) 2	0.3427	0.3456	0.3616	0.4125	0.4294	0.4316	0.3915	0.3624	0.3372	M(PR) 2
TURN(PR)	35.725	29.479	29.293	29.725	28.114	25.839	20.497	17.622	18.580	TURN(PR)
UUBAR	0.0969	0.1396	0.1224	0.0643	0.0728	0.1124	0.2110	0.2595	0.2828	UUBAR
LOSS PARA	0.0265	0.0366	0.0325	0.0177	0.0203	0.0313	0.0554	0.0647	0.0701	LOSS PARA
DFAC	0.6401	0.6427	0.6269	0.5680	0.5621	0.5773	0.6428	0.6867	0.7299	DFAC
EFFP	0.8322	0.8009	0.8451	0.8941	0.9100	0.8921	0.7800	0.7639	0.7639	EFFP
EFF	0.8255	0.7936	0.8392	0.8897	0.9063	0.8876	0.7716	0.7337	0.7548	EFF
INCID	5.614	5.223	5.330	4.496	4.230	3.936	2.778	0.085	-3.904	INCID
DEVM	7.367	12.496	11.978	8.172	6.889	6.476	9.267	11.556	9.642	DEVM
P 1	14.518	14.695	14.734	14.738	14.736	14.734	14.666	14.618	14.465	P 1
P 2	19.150	18.966	19.150	19.559	19.671	19.620	19.079	18.864	18.926	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	570.435	568.131	566.778	567.802	567.947	568.536	571.163	572.129	573.554	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	52.336	51.017	49.124	46.141	44.797	46.276	53.184	58.471	63.684	BETA 2
BETA 2A	0.300	1.900	1.850	0.250	1.220	1.300	2.151	3.061	4.151	BETA 2A
V 2	582.04	567.04	582.49	603.11	610.65	593.53	539.66	516.23	516.37	V 2
V 2A	409.33	385.79	370.66	425.83	450.05	455.72	413.79	397.78	397.95	V 2A
VZ 2	355.64	356.72	381.19	417.84	433.18	409.99	323.19	269.81	228.82	VZ 2
VZ 2A	409.32	385.57	370.45	425.77	449.80	455.33	413.16	396.86	396.49	VZ 2A
V-THETA 2	460.75	440.77	440.43	434.82	430.12	428.68	431.76	439.79	462.67	V-THETA 2
V-THETA 2A	2.14	12.79	11.96	1.86	9.58	10.33	15.52	21.22	28.78	V-THETA 2A
M 2	0.5099	0.4971	0.5120	0.5307	0.5376	0.5214	0.4707	0.4491	0.4486	M 2
M 2A	0.3540	0.3338	0.3209	0.3695	0.3911	0.3959	0.3577	0.3432	0.3429	M 2A
TURN(PR)	52.036	49.116	47.272	45.884	43.558	44.941	50.987	55.365	59.490	TURN(PR)
UUBAR	0.0752	0.0798	0.1662	0.1458	0.1149	0.1004	0.0586	0.0256	0.0494	UUBAR
LOSS PARA	0.0253	0.0271	0.0572	0.0518	0.0425	0.0387	0.0232	0.0102	0.0199	LOSS PARA
DFAC	0.5622	0.5768	0.6171	0.5496	0.5188	0.5049	0.5406	0.5557	0.5704	DFAC
EFFP	0.8646	0.8640	0.7434	0.7356	0.7727	0.7783	0.8693	0.9418	0.8874	EFFP
INCID	2.169	7.629	8.833	8.110	8.091	10.407	14.478	15.304	4.492	INCID
DEVM	9.132	13.212	13.160	11.225	12.232	12.966	14.590	15.738	9.001	DEVM
P 2	19.150	18.966	19.150	19.559	19.671	19.620	19.079	18.864	18.926	P 2
P 2A	18.916	18.731	18.629	19.061	19.268	19.287	18.921	18.802	18.805	P 2A
T 2	570.435	568.131	566.778	567.802	567.947	568.536	571.163	572.129	573.554	T 2
T 2A	570.435	568.131	566.778	567.802	567.947	568.536	571.163	572.129	573.554	T 2A
UUBAR FS	0.1465	0.1478	0.1774	0.1294	0.1217	0.1023	0.1513	0.1460	0.1416	UUBAR FS
P2 FS	19.223	19.192	19.193	19.494	19.699	19.627	19.372	19.208	19.188	P2 FS
LOSS PARA FS	0.0324	0.0495	0.0610	0.0463	0.0453	0.0394	0.0599	0.0581	0.0570	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 89.61 Equivalent Rotor Speed = 3772.62 Equivalent Weight Flow = 114.30
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.0C0	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.800	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	456.03	456.03	456.03	456.03	456.03	456.03	456.03	456.03	456.03	V 0
V 1	486.28	502.22	499.11	494.07	485.10	487.69	475.55	468.85	437.59	V 1
VZ 0	456.03	456.03	456.03	456.02	456.00	455.96	455.92	455.91	455.91	VZ 0
VZ 1	486.28	502.22	499.11	494.06	485.06	487.61	475.43	468.72	437.47	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.4155	0.4155	0.4155	0.4155	0.4155	0.4155	0.4155	0.4155	0.4155	M 0
M 1	0.4441	0.4592	0.4563	0.4515	0.4429	0.4454	0.4339	0.4275	0.3981	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4910	0.3214	0.2935	0.2929	0.2923	0.2971	0.3591	0.3913	0.5341	UUBAR
DFAC	-0.066	-0.101	-0.094	-0.083	-0.064	-0.069	-0.043	-0.028	0.040	DFAC
EFFP	0.2268	0.4131	0.4178	0.3870	0.3236	0.3395	0.2048	0.1332	-0.1835	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.261	15.261	15.261	15.261	15.261	15.261	15.261	15.261	15.261	P 0
P 1	14.422	14.712	14.760	14.761	14.762	14.753	14.647	14.592	14.348	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	33.998	31.254	30.165	28.488	27.779	25.927	25.974	28.526	33.331	BETA 2
BETA(PR) 1	48.200	45.945	45.772	47.102	49.398	50.642	52.165	52.759	54.833	BETA(PR) 1
BETA(PR) 2	25.308	24.908	24.556	25.529	29.549	33.106	36.754	38.770	49.063	BETA(PR) 2
V 1	487.49	533.89	543.86	539.29	523.26	526.17	516.69	511.14	477.43	V 1
V 2	575.19	604.37	623.73	645.50	624.73	616.05	586.24	555.12	438.27	V 2
VZ 1	487.40	533.77	543.79	539.26	522.61	524.04	513.29	507.50	474.31	VZ 1
VZ 2	476.84	516.63	539.25	567.33	552.47	553.18	525.65	486.37	365.27	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	321.62	313.55	313.41	307.88	291.03	268.92	256.08	264.36	240.22	V-THETA 2
V(PR) 1	731.3	767.7	779.6	792.2	803.5	827.7	838.9	840.8	825.3	V(PR) 1
V(PR) 2	527.5	569.6	592.9	628.7	635.4	661.3	657.4	625.2	558.3	V(PR) 2
VTHETA PR1	-545.1	-551.7	-558.6	-580.3	-609.7	-638.9	-660.9	-667.6	-673.2	VTHETA PR1
VTHETA PR2	-225.5	-230.9	-246.4	-271.0	-313.2	-360.7	-392.6	-390.6	-421.1	VTHETA PR2
U 1	545.12	551.67	558.64	580.35	609.70	638.93	660.91	667.60	673.20	U 1
U 2	547.10	553.44	559.79	578.83	604.22	629.61	648.65	655.00	661.35	U 2
M 1	0.4452	0.4895	0.4991	0.4947	0.4793	0.4821	0.4730	0.4677	0.4357	M 1
M 2	0.5147	0.5430	0.5621	0.5811	0.5615	0.5538	0.5259	0.4967	0.3884	M 2
M(PR) 1	0.6679	0.7039	0.7155	0.7268	0.7360	0.7584	0.7686	0.7694	0.7531	M(PR) 1
M(PR) 2	0.4720	0.5118	0.5343	0.5660	0.5710	0.5945	0.5898	0.5594	0.4947	M(PR) 2
TURN(PR)	22.888	21.033	21.213	21.571	19.829	17.473	15.317	13.891	5.694	TURN(PR)
UUBAR	0.1312	0.1214	0.0877	0.0480	0.0696	0.0540	0.0713	0.1396	0.2353	UUBAR
LOSS PARA	0.0344	0.0323	0.0237	0.0133	0.0195		0.0198	0.0382	0.0546	LOSS PARA
DFAC	0.4063	0.3760	0.3590	0.3258	0.3253	0.3095	0.3213	0.3656	0.4257	DFAC
EFFP	0.8424	0.8681	0.9695	0.9330	0.8986	0.9193	0.8910	0.8106	0.5402	EFFP
EFF	0.8380	0.8652	0.9687	0.9313	0.8962	0.9173	0.8885	0.8067	0.5338	EFF
INCID	-4.232	-4.971	-4.807	-4.941	-4.606	-5.359	-6.537	-9.568	-13.344	INCID
DEVM	10.156	10.748	9.922	6.889	6.339	5.547	5.132	5.634	13.087	DEVM
P 1	14.422	14.712	14.760	14.761	14.762	14.753	14.647	14.592	14.348	P 1
P 2	16.988	17.179	17.428	17.677	17.511	17.449	17.158	16.825	15.808	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	547.221	545.849	544.735	548.144	547.644	546.468	545.690	545.397	545.963	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	34.230	31.083	29.641	28.523	27.398	25.834	26.490	29.395	34.684	BETA 2
BETA 2A	0.150	1.350	1.650	0.300	0.110	0.450	1.701	0.800	-2.601	BETA 2A
V 2	571.84	607.53	634.06	645.50	633.73	619.02	576.30	540.74	423.86	V 2
V 2A	527.07	548.60	574.17	614.03	608.73	602.95	540.23	514.16	504.31	V 2A
VZ 2	472.79	520.29	551.06	567.05	562.35	556.59	515.07	470.45	348.05	VZ 2
VZ 2A	527.06	548.44	573.91	613.93	608.53	602.58	539.56	513.65	503.25	VZ 2A
V-THETA 2	321.67	313.65	313.56	308.17	291.47	269.48	256.70	265.04	240.86	V-THETA 2
V-THETA 2A	1.38	12.92	16.53	3.21	1.17	4.73	16.02	7.17	-22.86	V-THETA 2A
M 2	0.5115	0.5460	0.5720	0.5811	0.5701	0.5567	0.5165	0.4832	0.3752	M 2
M 2A	0.4697	0.4904	0.5150	0.5510	0.5462	0.5414	0.4826	0.4585	0.4491	M 2A
TURN(PR)	34.080	29.733	27.989	28.217	27.273	25.356	24.751	28.550	37.226	TURN(PR)
UUBAR	0.0918	0.1077	0.0952	0.0374	0.0129	0.0376	0.1943	0.1915	-0.2781	UUBAR
LOSS PARA	0.0309	0.0367	0.0328	0.0133	0.0048	0.0145	0.0770	0.0766	-0.1121	LOSS PARA
DFAC	0.2670	0.2657	0.2559	0.2170	0.2096	0.1914	0.2291	0.2410	0.0624	DFAC
EFFP	0.4493	0.4789	0.5331	0.6580	0.8545	0.3541	-0.4557	-0.8336	0.3827	EFFP
INCID	-15.937	-12.304	-10.650	-9.507	-9.304	-10.027	-12.207	-13.769	-24.517	INCID
DEVM	8.962	12.662	12.960	11.275	11.122	12.116	14.140	13.480	2.256	DEVM
P 2	16.888	17.179	17.428	17.677	17.511	17.449	17.158	16.825	15.808	P 2
P 2A	16.634	16.839	17.098	17.542	17.466	17.324	16.603	16.350	16.215	P 2A
T 2	547.221	545.849	544.735	548.144	547.644	546.468	545.690	545.397	545.963	T 2
T 2A	547.221	545.849	544.735	548.144	547.644	546.468	545.690	545.397	545.963	T 2A
UUBAR FS	0.1453	0.1139	0.0689	0.0294	0.0306	0.0368	0.2481	0.2644	0.2964	UUBAR FS
P2 FS	17.50	17.260	17.330	17.647	17.574	17.445	17.361	17.148	17.003	P2 FS
LOSS PARA FS	0.489	0.398	0.0237	0.0104	0.0114	0.0142	0.0983	0.1137	0.1194	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 89.99 Equivalent Rotor Speed = 3788.37 Equivalent Weight Flow = 106.88
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	424.78	424.78	424.78	424.78	424.78	424.78	424.78	424.78	424.78	V 0
V 1	440.45	455.72	453.77	439.00	437.91	445.38	428.97	425.71	400.14	V 1
VZ 0	424.77	424.78	424.78	424.77	424.74	424.71	424.67	424.66	424.66	VZ 0
VZ 1	440.45	455.72	453.77	439.00	437.88	445.31	428.87	425.60	400.03	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3861	0.3861	0.3861	0.3861	0.3861	0.3861	0.3861	0.3861	0.3861	M 0
M 1	0.4008	0.4152	0.4133	0.3994	0.3984	0.4054	0.3900	0.3870	0.3631	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4859	0.3058	0.2758	0.2702	0.2702	0.2695	0.3399	0.3754	0.5224	UUBAR
DFAC	-0.037	-0.073	-0.068	-0.033	-0.031	-0.049	-0.010	-0.002	0.058	DFAC
EFFP	0.1441	0.3423	0.3507	0.2100	0.1968	0.2800	0.0578	0.0121	-0.2886	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.151	15.151	15.151	15.151	15.151	15.151	15.151	15.151	15.151	P 0
P 1	14.461	14.698	14.743	14.751	14.751	14.752	14.648	14.595	14.378	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	41.242	37.459	35.991	34.135	33.371	32.307	33.179	35.602	40.140	BETA 2
BETA(PK) 1	51.118	48.930	48.740	50.724	52.492	53.378	55.203	55.599	57.393	BETA(PK) 1
BETA(PK) 2	25.054	25.836	24.574	26.232	29.488	33.540	36.876	40.011	47.950	BETA(PK) 2
V 1	441.50	482.86	492.19	476.62	470.51	478.80	464.26	462.33	435.27	V 1
V 2	538.43	559.95	587.00	599.86	593.74	578.34	555.56	521.33	445.99	V 2
VZ 1	441.41	482.75	492.13	476.59	469.93	476.86	461.21	459.04	432.44	VZ 1
VZ 2	404.85	44--0	474.93	496.50	495.65	488.13	463.92	422.87	340.23	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	354.94	340.55	344.95	336.60	326.46	308.67	303.34	302.77	286.91	V-THETA 2
V(PR) 1	703.2	734.9	746.3	752.9	772.2	800.6	809.9	814.4	804.0	V(PR) 1
V(PR) 2	449.1	493.9	522.3	553.5	569.7	586.4	581.2	553.3	508.8	V(PR) 2
VTHETA PR1	-547.4	-554.0	-561.0	-582.8	-612.2	-641.6	-663.7	-670.4	-676.0	VTHETA PR1
VTHETA PR2	-194.4	-215.2	-217.2	-244.6	-280.3	-323.6	-348.0	-355.0	-377.2	VTHETA PR2
U 1	547.39	553.98	560.97	582.77	612.25	641.59	663.67	670.39	676.01	U 1
U 2	549.36	555.75	562.13	581.25	606.75	632.24	651.36	657.74	664.11	U 2
M 1	0.4018	0.4408	0.4497	0.4349	0.4291	0.4370	0.4232	0.4214	0.3959	M 1
M 2	0.4778	0.4984	0.5245	0.5354	0.5297	0.5155	0.4943	0.4624	0.3931	M 2
M(PR) 1	0.6406	0.6709	0.6816	0.6870	0.7042	0.7306	0.7383	0.7422	0.7314	M(PR) 1
M(PR) 2	0.3966	0.4396	0.4667	0.4940	0.5082	0.5228	0.5170	0.4907	0.4484	M(PR) 2
TURN(PR)	25.460	23.089	24.164	24.491	22.984	19.779	18.239	15.498	9.375	TURN(PR)
UUBAR	0.1300	0.1143	0.0208	0.0424	0.0457	0.0519	0.0772	0.1310	0.1786	UUBAR
LOSS PARA	0.0039	0.0302	0.0208	0.0117	0.0128	0.0146	0.0214	0.0352	0.0424	LOSS PARA
DFAC	0.5078	0.4661	0.4376	0.4022	0.3978	0.3962	0.4113	0.4497	0.4925	DFAC
EFFP	0.8164	0.8258	0.9341	0.9164	0.9254	0.9167	0.8934	0.8146	0.6950	EFFP
EFF	0.8116	0.8214	0.9322	0.9140	0.9232	0.9143	0.8905	0.8099	0.6883	EFF
INCID	-1.314	-1.986	-1.838	-1.319	-1.511	-2.620	-3.493	-6.721	-10.777	INCID
DEVM	16.505	11.677	9.940	7.591	6.278	5.980	5.254	6.874	11.973	DEVM
P 1	14.461	14.698	14.743	14.751	14.751	14.752	14.648	14.595	14.378	P 1
P 2	17.323	17.529	17.838	18.044	18.065	17.962	17.735	17.395	16.745	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	552.531	551.286	549.838	552.335	552.194	551.526	551.413	551.627	552.243	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	41.534	37.264	35.374	34.178	32.920	32.199	33.853	36.715	41.898	BETA 2
BETA 2A	0.200	1.400	2.000	1.000	0.350	0.900	0.950	0.490	-3.001	BETA 2A
V 2	535.39	562.64	596.17	599.86	601.89	580.98	546.52	508.34	431.26	V 2
V 2A	450.43	452.48	468.99	527.08	534.59	529.44	470.11	443.41	432.86	V 2A
VZ 2	400.77	447.77	486.09	496.18	505.01	491.18	453.33	407.01	320.63	VZ 2
VZ 2A	450.43	452.33	468.69	526.93	534.40	529.06	469.66	443.00	431.81	VZ 2A
V-THETA 2	355.00	340.66	345.12	336.92	326.96	309.30	304.08	303.53	287.67	V-THETA 2
V-THETA 2A	1.57	11.05	16.37	9.20	3.26	8.31	7.79	3.79	-22.64	V-THETA 2A
M 2	0.4750	0.5009	0.5332	0.5354	0.5374	0.5180	0.4859	0.4504	0.3797	M 2
M 2A	0.3970	0.3993	0.4150	0.4674	0.4744	0.4699	0.4154	0.3910	0.3812	M 2A
TURN(PR)	41.334	35.863	33.373	33.171	32.553	31.267	32.857	36.173	44.837	TURN(PR)
UUBAR	0.0574	0.1005	0.1393	0.0364	0.0253	0.0258	0.1731	0.1432	-0.1430	UUBAR
LOSS PARA	0.0126	0.0342	0.0479	0.0129	0.0094	0.0099	0.0686	0.0573	-0.0576	LOSS PARA
DFAC	0.3811	0.3954	0.4034	0.3159	0.3116	0.2892	0.3558	0.3649	0.2879	DFAC
EFFP	0.8829	0.7407	0.6693	0.8574	0.8935	0.8639	0.3877	0.4440	-16.9031	EFFP
INCID	-8.633	-6.124	-4.916	-3.853	-3.784	-3.667	-4.852	-6.456	-17.306	INCID
DEVM	9.032	12.712	13.310	11.975	11.362	12.566	13.391	13.170	1.856	DEVM
P 2	17.323	17.529	17.838	18.044	18.065	17.962	17.735	17.395	16.745	P 2
P 2A	17.230	17.251	17.401	17.928	17.984	17.885	17.277	17.071	16.972	P 2A
T 2	552.531	551.286	549.838	552.335	552.194	551.526	551.413	551.627	552.243	T 2
T 2A	552.531	551.286	549.838	552.335	552.194	551.526	551.413	551.627	552.243	T 2A
UUBAR FS	0.1172	0.1100	0.0940	0.0167	0.0151	0.0182	0.2226	0.2518	0.2507	UUBAR FS
P2 FS	17.516	17.557	17.681	17.980	18.032	17.939	17.903	17.722	17.578	P2 FS
LOSS PARA FS	0.361	0.374	0.0323	0.0059	0.0056	0.0070	0.0882	0.1007	0.1009	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 90.61 Equivalent Rotor Speed = 3814.89 Equivalent Weight Flow = 98.57
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	389.23	389.23	389.23	389.23	389.23	389.23	389.23	389.23	389.23	V 0
V 1	396.32	406.50	404.36	411.03	400.95	403.72	393.03	386.53	359.38	V 1
VZ 0	389.23	389.23	389.23	389.23	389.20	389.17	389.14	389.13	389.13	VZ 0
VZ 1	396.32	406.50	404.36	411.03	400.92	403.65	392.93	386.43	359.28	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3529	0.3529	0.3529	0.3529	0.3529	0.3529	0.3529	0.3529	0.3529	M 0
M 1	0.3595	0.3690	0.3670	0.3733	0.3638	0.3664	0.3565	0.3504	0.3253	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4544	0.2928	0.2655	0.2565	0.2598	0.2606	0.3233	0.3628	0.5105	UUBAR
DFAC	-0.018	-0.044	-0.039	-0.056	-0.030	-0.037	-0.010	0.007	0.077	DFAC
EFFP	0.0773	0.2446	0.2378	0.3197	0.1973	0.2333	0.0594	-0.0413	-0.4253	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.063	15.063	15.063	15.063	15.063	15.063	15.063	15.063	15.063	P 0
P 1	14.498	14.699	14.733	14.744	14.740	14.739	14.661	14.612	14.428	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR F
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	45.998	44.076	41.822	39.282	38.610	37.788	39.733	43.235	48.832	BETA 2
BETA(PR) 1	54.228	52.406	52.283	52.812	55.153	56.291	57.759	58.379	60.363	BETA(PR) 1
BETA(PR) 2	25.069	27.564	26.229	26.284	30.279	33.716	38.251	42.225	48.396	BETA(PR) 2
V 1	397.23	429.61	436.93	445.27	429.79	432.78	424.32	418.63	389.84	V 1
V 2	529.79	522.75	547.47	576.45	565.81	559.11	527.65	492.96	448.30	V 2
VZ 1	397.15	429.51	436.87	445.24	429.26	431.03	421.53	415.65	387.30	VZ 1
VZ 2	368.03	375.54	407.98	446.18	441.97	441.31	405.00	358.46	294.64	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	381.07	363.62	365.06	364.96	352.94	342.17	336.64	337.03	336.95	V-THETA 2
V(PR) 1	679.4	704.1	714.2	736.7	751.6	777.6	791.6	794.3	784.5	V(PR) 1
V(PR) 2	406.3	423.6	454.8	497.6	512.0	531.3	516.8	485.0	444.4	V(PR) 2
VTHETA PR1	-551.2	-557.9	-564.9	-586.8	-616.5	-646.1	-668.3	-675.1	-680.7	VTHETA PR1
VTHETA PR2	-172.2	-196.0	-201.0	-220.4	-258.0	-294.5	-319.3	-325.3	-331.6	VTHETA PR2
U 1	551.23	557.85	564.90	586.85	616.53	646.08	668.31	675.08	680.74	U 1
U 2	553.23	559.64	566.06	585.32	610.99	636.67	655.92	662.34	668.76	U 2
M 1	0.3604	0.3906	0.3975	0.4053	0.3906	0.3936	0.3857	0.3803	0.3535	M 1
M 2	0.4695	0.4625	0.4860	0.5120	0.5020	0.4959	0.4663	0.4343	0.3933	M 2
M(PR) 1	0.6164	0.6402	0.6497	0.6706	0.6834	0.7072	0.7195	0.7217	0.7114	M(PR) 1
M(PR) 2	0.3601	0.3748	0.4037	0.4420	0.4543	0.4712	0.4567	0.4273	0.3899	M(PR) 2
TURN(PR)	29.155	24.838	26.051	26.528	24.855	22.519	19.428	16.074	11.907	TURN(PR)
UUBAR	0.1110	0.1407	0.0999	0.0526	0.0578	0.0604	0.1102	0.1684	0.2131	UUBAR
LOSS PARA	0.0291	0.0366	0.0266	0.0145	0.0161	0.0169	0.0301	0.0437	0.0561	LOSS PARA
DFAC	0.5647	0.5500	0.5151	0.4767	0.4693	0.4637	0.4935	0.5368	0.5842	DFAC
EFFP	0.9020	0.8040	0.8887	0.9191	0.9168	0.9246	0.8522	0.7785	0.7193	EFFP
EFF	0.8992	0.7987	0.8855	0.9165	0.9142	0.9222	0.8478	0.7724	0.7120	EFF
INCID	1.797	1.490	1.704	0.770	1.151	0.297	-0.931	-3.933	-7.799	INCID
DEVM	9.919	13.404	11.595	7.643	7.068	6.156	6.628	9.086	12.419	DEVM
P 1	14.498	14.699	14.733	14.744	14.740	14.739	14.661	14.612	14.428	P 1
P 2	17.775	17.718	17.990	18.339	18.339	18.349	18.026	17.688	17.288	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	553.287	554.302	553.108	555.105	555.245	555.036	555.911	556.380	557.332	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	46.335	43.834	41.104	39.332	38.083	37.660	40.573	44.671	51.259	BETA 2
BETA 2A	-1.000	1.250	1.880	1.750	0.800	1.200	1.310	1.501	1.050	BETA 2A
V 2	526.88	525.21	555.58	576.45	573.33	561.63	519.34	481.06	433.49	V 2
V 2A	404.63	398.90	403.55	463.03	480.88	476.68	425.37	399.45	386.42	V 2A
VZ 2	363.76	378.85	418.62	445.81	451.10	444.26	394.08	341.78	271.06	VZ 2
VZ 2A	404.56	398.80	403.32	462.75	480.67	476.29	424.91	398.95	385.94	VZ 2A
V-THETA 2	381.14	363.74	365.24	365.31	353.48	342.87	337.45	337.88	337.84	V-THETA 2
V-THETA 2A	-7.06	8.70	13.24	14.14	6.71	9.98	9.72	10.45	7.08	V-THETA 2A
M 2	0.4666	0.4648	0.4935	0.5120	0.5090	0.4982	0.4587	0.4234	0.3799	M 2
M 2A	0.3553	0.3498	0.3544	0.4075	0.4237	0.4200	0.3731	0.3497	0.3377	M 2A
TURN(PR)	47.335	42.583	39.222	37.576	37.264	36.426	39.215	43.119	50.152	TURN(PR)
UUBAR	0.0507	0.0500	0.1278	0.0696	0.0203	0.0444	0.1168	0.0669	-0.1001	UUBAR
LOSS PARA	0.0171	0.0170	0.0440	0.0247	0.0075	0.0171	0.0463	0.0268	-0.0404	LOSS PARA
DFAC	0.4803	0.4708	0.4920	0.4137	0.3860	0.3806	0.4324	0.4435	0.4182	DFAC
EFFP	0.8862	0.8911	0.7514	0.8222	0.9381	0.8560	0.6714	0.7989	1.4564	EFFP
INCID	-3.832	0.813	1.302	1.377	1.793	1.866	1.499	-7.944		INCID
DEVM	7.832	12.562	13.190	12.725	11.812	12.866	13.750	14.179	5.903	DEVM
P 2	17.775	17.718	17.990	18.339	18.339	18.349	18.026	17.688	17.288	P 2
P 2A	17.650	17.596	17.638	18.130	18.278	18.222	17.743	17.551	17.452	P 2A
T 2	553.287	554.302	553.108	555.105	555.245	555.036	555.911	556.380	557.332	T 2
T 2A	553.287	554.302	553.108	555.105	555.245	555.036	555.911	556.380	557.332	T 2A
UUBAR FS	0.0791	0.1148	0.1236	0.0515	0.0274	0.0317	0.2100	0.2216	0.1904	UUBAR FS
P2 FS	17.640	17.696	17.968	18.281	18.360	18.311	18.311	18.096	17.875	P2 FS
LOSS PARA FS	0.0253	0.0395	0.0415	0.0182	0.0101	0.0122	0.0932	0.0988	0.0768	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 90.25 Equivalent Rotor Speed = 3799.69 Equivalent Weight Flow = 88.91
Uniform Inlet

INLET

PCT SPAN	96.8C	92.00	86.90	71.00	49.5L	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-C.COC	-C.000	-0.000	-0.000	-C.000	-0.000	-0.000	-C.000	-0.000	BETA C
BETA 1	-0.00G	-C.00C	-0.000	-0.000	-0.000	-C.000	-0.000	-0.0CC	-0.000	BETA 1
V 0	348.78	348.78	348.78	348.78	348.78	348.78	348.78	348.78	348.78	V 0
V 1	354.91	365.24	368.38	365.01	371.90	364.61	351.73	342.68	319.60	V 1
VZ C	348.78	348.78	348.78	348.77	348.75	348.72	348.69	348.68	348.69	VZ 0
VZ 1	354.9J	365.24	368.36	365.01	371.87	364.55	351.64	342.59	319.52	VZ 1
V-THETA C	-0.3U	-0.C0	-3.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-C.C0	-C.00	-0.00	-L.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3155	0.3155	0.3155	0.3155	0.3155	0.3155	0.3155	0.3155	0.3155	M 0
M 1	0.3211	C.3307	0.3336	0.3305	0.3369	0.3301	0.3182	0.3099	0.2886	M 1
TURN	0.0	0.C	C.0	0.0	0.0	0.C	0.0	0.0	0.0	TURN
UUBAR	C.4431	0.2879	0.2481	0.2491	C.2491	0.2491	C.3114	0.3542	0.4870	UUBAR
DFAC	-C.018	-C.047	-0.056	-0.047	-0.066	-0.065	-0.008	0.017	0.084	DFAC
EFFP	0.0762	0.2580	0.3260	0.2840	0.3633	0.2789	0.0533	-0.1123	-0.5103	EFFP
INCID	-C.00C0	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.978	14.978	14.978	14.978	14.978	14.978	14.978	14.978	14.978	P 0
P 1	14.536	14.691	14.731	14.730	14.730	14.730	14.667	14.625	14.492	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (RUTOR -L.E., RCTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	50.378	49.223	46.979	43.918	43.241	42.870	46.757	50.623	55.400	BETA 2
BETA(PR) 1	57.067	55.265	54.785	56.002	57.085	58.883	60.521	61.341	63.121	BETA(PR) 1
BETA(PR) 2	23.867	27.968	27.396	27.578	29.946	34.281	39.208	44.193	47.389	BETA(PR) 2
V 1	355.70	385.33	397.18	394.24	397.58	390.04	378.78	370.14	345.93	V 1
V 2	523.58	504.89	519.79	544.93	551.03	537.99	508.25	475.37	462.96	V 2
VZ 1	355.63	385.24	397.13	394.22	397.49	388.46	376.29	367.50	343.67	VZ 1
VZ 2	333.89	329.74	354.63	392.52	401.29	393.88	347.67	301.14	262.59	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	403.29	382.32	380.02	377.97	377.37	365.63	369.67	366.92	380.64	V-THETA 2
V(PR) 1	654.2	676.2	688.7	705.0	731.8	752.5	765.9	767.5	761.2	V(PR) 1
V(PR) 2	365.1	373.4	399.4	442.8	463.3	477.3	449.6	420.8	388.5	V(PR) 2
VTHETA PR1	-549.0	-555.6	-562.6	-584.5	-614.1	-643.5	-665.6	-672.4	-678.0	VTHETA PR1
VTHETA PR2	-147.7	-175.1	-183.8	-205.0	-231.2	-268.5	-283.6	-292.8	-285.5	VTHETA PR2
U 1	549.03	555.63	562.64	584.51	614.08	643.51	665.65	672.39	678.03	U 1
U 2	551.02	557.41	563.81	582.99	608.56	634.13	653.31	659.70	666.09	U 2
M 1	0.3219	0.3493	0.3603	0.3576	0.3611	0.3537	0.3432	0.3352	0.3129	M 1
M 2	0.4618	0.4449	0.4593	0.4816	0.4871	0.4749	0.4470	0.4168	0.4050	M 2
M(PR) 1	C.5920	C.6130	0.6248	0.6395	0.6639	0.6824	0.6940	0.6952	0.6884	M(PR) 1
M(PR) 2	C.3220	0.3290	0.3529	0.3914	0.4096	0.4214	0.3953	0.3689	0.3399	M(PR) 2
TURN(PR)	33.196	27.292	27.386	28.424	27.121	24.551	21.241	17.078	15.682	TURN(PR)
UUBAR	0.1105	0.1454	0.1151	0.0724	0.0655	0.0870	0.1628	0.2139	0.2468	UUBAR
LOSS PARA	C.0293	0.0377	C.0304	0.0198	0.0183	C.0242	0.0438	0.0538	0.0592	LOSS PARA
DFAC	0.6207	0.6139	0.5840	0.5366	0.5322	0.5279	0.5790	0.6178	0.6652	DFAC
EFFP	C.8547	0.7928	0.8558	0.8774	0.9112	0.8879	0.8093	0.7434	0.7341	EFFP
EFF	0.8501	0.7869	0.8515	0.8735	0.9082	0.8843	0.8034	0.7360	0.7263	EFF
INCID	4.636	4.349	4.206	3.960	3.084	2.893	1.839	-0.961	-5.030	INCID
DEVM	8.718	13.808	12.762	8.937	6.736	6.721	7.584	11.054	11.412	DEVM
P 1	14.536	14.691	14.731	14.730	14.730	14.730	14.667	14.625	14.492	P 1
P 2	18.063	17.910	18.093	18.379	18.573	18.491	18.185	17.869	17.767	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	557.771	557.092	555.559	557.468	557.809	558.082	559.599	560.225	561.508	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	50.769	46.940	46.149	43.977	42.640	42.725	47.826	52.484	58.574	BETA 2
BETA 2A	-1.00C	1.400	1.800	1.950	1.280	1.250	1.561	2.201	2.451	BETA 2A
V 2	520.73	507.22	527.25	544.93	558.15	540.37	500.41	464.09	447.51	V 2
V 2A	381.27	366.06	359.43	411.77	431.91	431.53	384.53	365.29	359.80	V 2A
VZ 2	329.33	333.16	365.26	392.09	410.44	396.70	335.70	282.43	233.20	VZ 2
VZ 2A	381.21	365.94	359.23	411.48	431.66	431.17	384.08	364.70	359.09	VZ 2A
V-THETA 2	403.36	382.45	380.21	378.34	377.95	366.38	370.57	367.85	381.65	V-THETA 2
V-THETA 2A	-6.65	8.94	11.29	14.01	9.65	9.41	10.46	14.01	15.37	V-THETA 2A
M 2	0.4592	C.4471	0.4661	0.4816	0.4937	0.4771	0.4398	0.4065	0.3911	M 2
M 2A	C.3330	0.3196	0.3141	0.3604	0.3784	0.3779	0.3353	0.3180	0.3128	M 2A
TURN(PR)	51.769	47.539	44.347	42.020	41.341	41.439	46.217	50.233	56.073	TURN(PR)
UUBAR	0.057C	0.0417	0.1259	0.0858	0.0751	0.0672	0.119C	C.0419	0.0057	UUBAR
LOSS PARA	C.0192	0.0142	0.0433	0.0305	C.0278	0.0259	0.0471	0.0167	0.0023	LOSS PARA
DFAC	C.5331	C.5292	0.5594	0.4825	0.4713	0.4570	0.5183	C.5197	0.5282	DFAC
EFFP	0.8864	0.9192	0.7818	0.8163	0.8290	0.8298	0.7289	0.8967	0.9849	EFFP
INCID	0.602	5.552	5.858	5.946	5.934	6.856	9.118	9.313	-0.624	INCID
DEVM	7.832	12.712	13.110	12.925	12.292	12.916	14.000	14.879	7.302	DEVM
P 2	18.063	17.910	18.093	18.379	18.573	18.491	18.185	17.869	17.767	P 2
P 2A	17.924	17.814	17.776	18.147	18.359	18.312	17.916	17.789	17.757	P 2A
T 2	557.771	557.092	555.559	557.468	557.809	558.082	559.599	560.225	561.508	T 2
T 2A	557.771	557.092	555.559	557.468	557.809	558.082	559.599	560.225	561.508	T 2A
UUBAR FS	0.712	0.1141	0.1387	C.0855	0.0472	0.0630	0.1972	0.1840	0.1674	UUBAR FS
P2 FS	18.095	14.097	18.130	18.377	18.489	18.479	18.405	18.204	18.112	P2 FS
LOSS PARA FS	0.240	0.398	C.0477	0.0304	0.0174	C.0243	0.0780	0.0733	0.0675	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 90.27 Equivalent Rotor Speed = 3800.22 Equivalent Weight Flow = 82.57
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	322.57	322.57	322.57	322.57	322.57	322.57	322.57	322.57	322.57	V 0
V 1	334.18	346.85	346.14	347.26	345.57	336.27	325.92	320.34	297.25	V 1
VZ 0	322.56	322.56	322.57	322.56	322.54	322.51	322.48	322.48	322.48	VZ 0
VZ 1	334.18	346.85	346.14	347.26	345.54	336.21	325.84	320.25	297.17	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2914	0.2914	0.2914	0.2914	0.2914	0.2914	0.2914	0.2914	0.2914	M 0
M 1	0.3020	0.3137	0.3131	0.3141	0.3125	0.3040	0.2944	0.2893	0.2682	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4341	0.2819	0.2415	0.2415	0.2403	0.2474	0.3045	0.3378	0.4722	UUBAR
DFAC	-0.036	-0.075	-0.073	-0.077	-0.071	-0.042	-0.010	0.007	0.078	DFAC
EFFP	0.1477	0.3639	0.3933	0.4047	0.3884	0.2657	0.0661	-0.0437	-0.4853	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.932	14.932	14.932	14.932	14.932	14.932	14.932	14.932	14.932	P 0
P 1	14.561	14.691	14.725	14.725	14.726	14.720	14.672	14.643	14.528	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E

ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	53.148	51.301	49.623	46.605	46.131	46.703	52.612	56.388	59.510	BETA 2
BETA(PR) 1	58.625	56.660	56.484	57.344	59.011	60.930	62.388	62.966	64.784	BETA(PR) 1
BETA(PR) 2	16.024	27.455	28.024	27.715	30.488	34.040	40.798	44.552	46.111	BETA(PR) 2
V 1	334.91	365.67	372.74	374.69	369.32	359.23	350.53	345.60	321.43	V 1
V 2	566.73	504.40	509.58	536.13	539.28	532.97	496.11	479.41	480.00	V 2
VZ 1	334.85	365.59	372.69	374.67	368.87	357.78	348.22	343.14	319.33	VZ 1
VZ 2	339.89	315.36	330.10	368.33	373.62	365.16	300.88	265.09	243.32	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	453.48	393.64	388.19	389.56	388.67	387.54	393.70	398.81	413.24	V-THETA 2
V(PR) 1	643.2	665.2	675.0	694.4	716.7	737.1	752.4	756.1	750.4	V(PR) 1
V(PR) 2	353.6	355.4	374.0	416.1	433.8	441.3	398.2	372.7	351.6	V(PR) 2
VTHETA PR1	-549.1	-555.7	-562.7	-584.6	-614.2	-643.6	-665.7	-672.5	-678.1	VTHETA PR1
VTHETA PR2	-97.6	-163.9	-175.7	-193.5	-220.0	-246.7	-259.7	-261.0	-252.9	VTHETA PR2
U 1	549.11	555.71	562.72	584.59	614.16	643.60	665.74	672.48	678.12	U 1
U 2	551.10	557.49	563.89	583.07	608.64	634.22	653.40	659.79	666.19	U 2
M 1	0.3027	0.3311	0.3376	0.3395	0.3345	0.3251	0.3171	0.3126	0.2903	M 1
M 2	0.5006	0.4438	0.4492	0.4727	0.4754	0.4691	0.4345	0.4192	0.4192	M 2
M(PR) 1	0.5813	0.6023	0.6114	0.6291	0.6490	0.6671	0.6806	0.6838	0.6778	M(PR) 1
M(PR) 2	0.3124	0.3127	0.3297	0.3668	0.3824	0.3884	0.3488	0.3258	0.3071	M(PR) 2
TURN(PR)	42.597	29.200	28.457	29.628	28.506	26.844	21.526	18.351	18.631	TURN(PR)
UUBAR	0.0968	0.1424	0.1254	0.0810	0.0861	0.1168	0.2255	0.2672	0.2838	UUBAR
LOSS PARA	0.0270	0.0371	0.0329	0.0221	0.0239	0.0326	0.0593	0.0668	0.0697	LOSS PARA
DFAC	0.6548	0.6396	0.6169	0.5732	0.5686	0.5769	0.6507	0.6903	0.7248	DFAC
EFFP	0.9318	0.7930	0.8361	0.8606	0.8789	0.8598	0.7501	0.7190	0.7318	EFFP
EFF	0.9293	0.7869	0.8311	0.8561	0.8748	0.8551	0.7424	0.7106	0.7234	EFF
INCID	6.194	5.744	5.905	5.301	5.011	4.945	3.713	0.671	-3.361	INCID
DEVM	0.875	13.296	13.390	9.074	7.278	6.480	9.173	11.413	10.134	DEVM
P 1	14.561	14.691	14.725	14.725	14.726	14.720	14.672	14.643	14.528	P 1
P 2	18.698	18.057	18.149	18.474	18.616	18.616	18.190	18.037	18.057	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	560.036	558.730	557.109	559.261	559.768	560.793	562.952	563.495	564.661	T 2

STATOR E

STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	53.591	50.996	48.723	46.668	45.478	46.548	53.926	58.730	63.355	BETA 2
BETA 2A	-0.120	1.230	1.140	0.860	1.110	0.680	1.150	2.711	3.501	BETA 2A
V 2	563.57	506.72	516.80	536.13	546.14	535.26	488.58	468.01	463.77	V 2
V 2A	377.10	355.65	343.37	388.90	407.09	408.11	372.71	356.75	358.33	V 2A
VZ 2	334.51	318.91	340.92	367.86	382.81	367.91	287.51	242.81	207.89	VZ 2
VZ 2A	377.09	355.56	343.29	388.80	406.88	407.84	372.33	356.03	357.28	VZ 2A
V-THETA 2	453.56	393.77	388.38	389.94	389.26	388.34	394.66	399.83	414.34	V-THETA 2
V-THETA 2A	-0.79	7.63	6.83	5.84	7.88	4.84	7.48	16.86	21.86	V-THETA 2A
M 2	0.4977	0.4459	0.4558	0.4727	0.4817	0.4712	0.4277	0.4089	0.4046	M 2
M 2A	0.3285	0.3099	0.2994	0.3393	0.3554	0.3560	0.3238	0.3095	0.3106	M 2A
TURN(PR)	53.711	49.765	47.581	45.801	44.349	45.832	52.729	55.974	59.810	TURN(PR)
UUBAR	0.2098	0.0573	0.1248	0.1229	0.1149	0.1176	0.0799	0.0606	0.0681	UUBAR
LOSS PARA	0.0707	0.0195	0.0429	0.0437	0.0425	0.0453	0.0317	0.0242	0.0274	LOSS PARA
DFAC	0.6025	0.5578	0.5900	0.5297	0.5140	0.5147	0.5529	0.5670	0.5709	DFAC
EFFP	0.6685	0.8950	0.7919	0.7601	0.7619	0.7405	0.8215	0.8642	0.8412	EFFP
INCID	3.424	7.608	8.432	8.637	8.772	10.679	15.221	15.564	4.162	INCID
DEVM	8.712	12.542	12.450	11.835	12.122	12.346	13.590	15.388	8.351	DEVM
P 2	18.698	18.057	18.149	18.474	18.616	18.616	18.190	18.037	18.057	P 2
P 2A	18.087	17.925	17.848	18.152	18.302	18.307	18.018	17.918	17.926	P 2A
T 2	560.036	558.730	557.109	559.261	559.768	560.793	562.952	563.495	564.661	T 2
T 2A	560.038	558.730	557.109	559.261	559.768	560.793	562.952	563.495	564.661	T 2A
UUBAR FS	0.1986	0.1397	0.1358	0.1268	0.1123	0.1067	0.1671	0.1456	0.1342	UUBAR FS
P2 FS	18.338	18.277	18.190	18.486	18.608	18.589	18.414	18.232	18.204	P2 FS
LOSS PARA FS	0.332	0.0475	0.0480	0.0451	0.0415	0.0418	0.0663	0.0581	0.0540	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 70.56 Equivalent Rotor Speed = 2970.64 Equivalent Weight Flow = 92.73
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	364.35	364.35	364.35	364.35	364.35	364.35	364.35	364.35	364.35	V 0
V 1	377.38	390.26	381.98	385.70	385.46	371.16	366.46	364.08	342.68	V 1
VZ 0	364.35	364.35	364.35	364.35	364.33	364.29	364.26	364.25	364.26	VZ 0
VZ 1	377.38	390.26	381.98	385.69	385.44	371.10	366.37	363.98	342.59	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3299	0.3299	0.3299	0.3299	0.3299	0.3299	0.3299	0.3299	0.3299	M 0
M 1	0.3419	0.3539	0.3462	0.3497	0.3494	0.3362	0.3318	0.3296	0.3099	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4491	0.2897	0.2944	0.2522	0.2513	0.2541	0.3160	0.3563	0.4913	UUBAR
DFAC	-0.036	-0.071	-0.048	-0.059	-0.058	-0.019	-0.006	0.001	0.059	DFAC
EFFP	0.1633	0.3458	0.2591	0.3324	0.3307	0.1337	0.0367	-0.0045	-0.3192	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.014	15.014	15.014	15.014	15.014	15.014	15.014	15.014	15.014	P 0
P 1	14.524	14.698	14.693	14.739	14.740	14.737	14.669	14.625	14.478	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	34.298	30.725	29.708	28.289	27.384	25.783	25.517	26.412	30.432	BETA 2
BETA(PR) 1	46.620	46.509	46.864	47.610	49.343	51.823	52.985	53.364	55.162	BETA(PR) 1
BETA(PR) 2	24.350	24.400	24.422	25.659	29.270	33.446	37.318	40.415	47.624	BETA(PR) 2
V 1	378.23	412.19	412.21	417.15	412.84	397.18	394.98	393.73	371.36	V 1
V 2	459.60	483.78	495.30	508.18	497.07	482.21	457.77	428.38	359.70	V 2
VZ 1	378.16	412.10	412.16	417.13	412.33	395.57	392.38	390.93	368.94	VZ 1
VZ 2	379.67	415.85	430.18	447.47	441.16	433.52	412.03	382.56	309.33	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	258.97	247.15	245.45	240.83	228.52	209.41	196.68	190.00	181.71	V-THETA 2
V(PR) 1	572.1	598.8	602.8	618.7	633.2	641.0	653.3	656.8	647.2	V(PR) 1
V(PR) 2	416.8	456.7	472.5	496.4	506.0	520.3	519.2	503.5	459.7	V(PR) 2
VTHETA PR1	-429.2	-434.4	-439.9	-457.0	-480.1	-503.1	-520.4	-525.7	-530.1	VTHETA PR1
VTHETA PR2	-171.8	-186.6	-195.3	-215.0	-247.3	-286.4	-314.1	-325.8	-339.0	VTHETA PR2
U 1	429.24	434.40	439.88	456.98	480.09	503.10	520.41	525.68	530.09	U 1
U 2	430.80	435.79	440.79	455.79	475.78	495.77	510.76	515.76	520.76	U 2
M 1	0.3427	0.3743	0.3743	0.3790	0.3749	0.3603	0.3583	0.3571	0.3364	M 1
M 2	0.4109	0.4340	0.4452	0.4561	0.4459	0.4323	0.4100	0.3829	0.3201	M 2
M(PR) 1	0.5184	0.5438	0.5475	0.5621	0.5751	0.5815	0.5926	0.5957	0.5862	M(PR) 1
M(PR) 2	0.3726	0.4096	0.4247	0.4455	0.4539	0.4664	0.4650	0.4501	0.4090	M(PR) 2
TURN(PR)	24.266	22.104	22.439	21.951	20.052	18.315	15.574	12.854	7.464	TURN(PR)
UUBAR	0.1214	0.0887	0.0486	0.0359	0.0507	0.0472	0.0481	0.0887	0.1665	UUBAR
LOSS PARA	0.0320	0.0237	0.0131	0.0100	0.0142	0.0132	0.0133	0.0237	0.0397	LOSS PARA
DFAC	0.4029	0.3587	0.3373	0.3173	0.3166	0.2974	0.3089	0.3338	0.3883	DFAC
EFFP	0.7902	0.8626	0.9886	0.8871	0.8711	0.8564	0.8667	0.7716	0.5933	EFFP
EFF	0.7871	0.8606	0.9884	0.8852	0.8691	0.8542	0.8648	0.7687	0.5893	EFF
INCID	-3.811	-4.407	-3.715	-4.432	-4.661	-4.177	-5.716	-8.962	-13.014	INCID
DEVM	9.200	10.241	9.788	7.018	6.059	5.887	5.695	7.278	11.648	DEVM
P 1	14.524	14.698	14.693	14.739	14.740	14.737	14.669	14.625	14.478	P 1
P 2	16.093	16.287	16.409	16.522	16.450	16.368	16.225	15.990	15.520	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	538.292	536.638	535.531	538.133	537.718	537.195	536.230	536.124	536.357	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	34.506	30.581	29.271	28.324	27.070	25.711	25.962	27.116	31.576	BETA 2
BETA 2A	-0.100	1.450	1.500	0.350	0.250	0.800	1.650	0.150	-4.001	BETA 2A
V 2	457.23	485.98	502.29	508.18	503.19	484.20	450.99	418.54	348.47	V 2
V 2A	420.87	437.47	457.62	487.52	485.31	479.05	422.90	402.09	392.91	V 2A
VZ 2	376.79	418.37	438.13	447.26	447.82	435.82	404.91	371.98	296.43	VZ 2
VZ 2A	420.86	437.32	457.44	487.44	485.14	476.73	422.38	401.73	391.54	VZ 2A
V-THETA 2	259.02	247.24	245.57	241.06	228.87	209.84	197.15	190.48	182.20	V-THETA 2
V-THETA 2A	-0.73	11.07	11.98	2.98	2.12	6.69	12.17	1.05	-27.39	V-THETA 2A
M 2	0.4087	0.4360	0.4517	0.4561	0.4516	0.4341	0.4037	0.3739	0.3099	M 2
M 2A	0.3752	0.3911	0.4101	0.4368	0.4349	0.4293	0.3778	0.3588	0.3503	M 2A
TURN(PR)	34.605	29.130	27.769	27.968	26.805	24.883	24.274	26.923	35.520	TURN(PR)
UUBAR	0.0912	0.1138	0.0877	0.0284	0.0205	0.0195	0.2010	0.1806	-0.1278	UUBAR
LOSS PARA	0.0307	0.0387	0.0302	0.0101	0.0076	0.0075	0.0796	0.0723	-0.0514	LOSS PARA
DFAC	0.2709	0.2654	0.2492	0.2075	0.2029	0.1730	0.2258	0.2213	0.1161	DFAC
EFFP	0.4412	0.4423	0.5236	0.6737	0.7312	0.1482	-0.5703	-1.2248	0.5517	EFFP
INCID	-15.662	-12.807	-11.020	-9.706	-9.632	-10.151	-12.735	-16.046	-27.622	INCID
DEVM	8.732	12.762	12.810	11.325	11.262	12.466	14.090	12.830	0.857	DEVM
P 2	16.093	16.287	16.409	16.522	16.450	16.368	16.225	15.990	15.520	P 2
P 2A	15.933	16.060	16.221	16.459	16.406	16.330	15.879	15.725	15.648	P 2A
T 2	538.292	536.638	535.531	538.133	537.718	537.195	536.230	536.124	536.357	T 2
T 2A	536.292	536.638	535.531	538.133	537.718	537.195	536.230	536.124	536.357	T 2A
UUBAR FS	.1237	0.1005	0.0558	0.0212	0.0247	0.0262	0.2673	0.2927	0.3091	UUBAR FS
P2 FS	16.175	16.257	16.336	16.505	16.459	16.382	16.382	16.224	16.152	P2 FS
LOSS PARA FS	0.0459	0.0341	0.0192	0.0075	0.0091	0.0101	0.1060	0.1171	0.1243	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 70.10 Equivalent Rotor Speed = 2951.10 Equivalent Weight Flow = 83.59
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	326.56	326.56	326.56	326.56	326.56	326.56	326.56	326.56	326.56	V 0
V 1	331.50	340.96	341.69	340.47	337.46	338.69	335.07	331.80	309.39	V 1
VZ 0	326.55	326.55	326.55	326.55	326.53	326.50	326.47	326.47	326.47	VZ 0
VZ 1	331.50	340.96	341.69	340.47	337.44	338.63	334.99	331.72	309.31	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2950	0.2950	0.2950	0.2950	0.2950	0.2950	0.2950	0.2950	0.2950	M 0
M 1	0.2996	0.3083	0.3090	0.3078	0.3051	0.3062	0.3029	0.2999	0.2793	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4366	0.2810	0.2403	0.2427	0.2427	0.2427	0.3042	0.3437	0.4737	UUBAR
DFAC	-0.015	-0.044	-0.046	-0.043	-0.033	-0.037	-0.026	-0.016	0.053	DFAC
EFFP	0.0669	0.2488	0.2894	0.2703	0.2242	0.2435	0.1518	0.0885	-0.2843	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.938	14.938	14.938	14.938	14.938	14.938	14.938	14.938	14.938	P 0
P 1	14.556	14.692	14.728	14.726	14.726	14.726	14.672	14.637	14.524	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	39.395	36.251	34.958	33.635	32.612	31.466	32.431	34.426	39.218	BETA 2
BETA(PR) 1	52.083	50.219	49.913	51.031	52.948	54.206	55.286	55.745	57.727	BETA(PR) 1
BETA(PR) 2	25.406	25.424	25.169	26.394	30.154	33.663	37.590	40.471	48.118	BETA(PR) 2
V 1	332.23	359.38	367.85	367.23	360.53	361.85	360.54	358.18	334.74	V 1
V 2	427.25	444.20	457.06	468.21	459.84	452.46	428.80	404.71	346.49	V 2
VZ 1	332.16	359.30	367.81	367.21	360.08	360.39	358.16	355.63	332.55	VZ 1
VZ 2	330.16	358.20	374.58	389.82	387.18	385.38	361.09	333.01	267.87	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	271.15	262.66	261.88	259.33	247.73	235.85	229.43	228.24	218.61	V-THETA 2
V(PR) 1	540.6	561.6	571.2	583.9	597.9	617.0	630.3	633.3	624.0	V(PR) 1
V(PR) 2	365.5	396.6	413.9	435.2	448.0	463.7	456.6	438.7	401.9	V(PR) 2
VTHETA PR1	-426.4	-431.5	-437.0	-454.0	-476.9	-499.8	-517.0	-522.2	-526.6	VTHETA PR1
VTHETA PR2	-156.8	-170.3	-176.0	-193.5	-224.9	-256.7	-278.0	-284.1	-298.7	VTHETA PR2
U 1	426.41	431.54	436.99	453.97	476.94	499.79	516.99	522.22	526.60	U 1
U 2	427.96	432.93	437.89	452.79	472.65	492.51	507.40	512.37	517.33	U 2
M 1	0.3002	0.3253	0.3263	0.3325	0.3263	0.3276	0.3263	0.3242	0.3026	M 1
M 2	0.3810	0.3969	0.4092	0.4186	0.4109	0.4042	0.3825	0.3604	0.3074	M 2
M(PR) 1	0.4885	0.5083	0.5173	0.5288	0.5412	0.5586	0.5705	0.5731	0.5640	M(PR) 1
M(PR) 2	0.3259	0.3554	0.3706	0.3891	0.4003	0.4142	0.4073	0.3906	0.3566	M(PR) 2
TURN(PR)	26.673	24.790	24.742	24.636	22.775	20.484	17.608	15.185	9.542	TURN(PR)
UUBAR	0.1091	0.0920	0.0661	0.0443	0.0439	0.0458	0.0792	0.1216	0.1821	UUBAR
LOSS PARA	0.0286	0.0244	0.0178	0.0122	0.0122	0.0128	0.0218	0.0324	0.0431	LOSS PARA
DFAC	0.4693	0.4311	0.4117	0.3912	0.3836	0.3762	0.4007	0.4325	0.4790	DFAC
EFFP	0.8454	0.8836	0.9801	0.9120	0.9085	0.9103	0.8691	0.7985	0.6719	EFFP
EFF	0.8429	0.8818	0.9797	0.9104	0.9069	0.9088	0.8670	0.7955	0.6678	EFF
INCID	-0.349	-0.697	-0.665	-1.011	-1.056	-1.792	-3.410	-6.574	-10.442	INCID
DEVM	10.256	11.265	10.535	7.753	6.943	6.104	5.968	7.333	12.141	DEVM
P 1	14.556	14.692	14.728	14.726	14.726	14.726	14.672	14.637	14.524	P 1
P 2	16.271	16.408	16.530	16.632	16.622	16.591	16.419	16.246	15.870	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	538.599	537.563	536.456	538.863	538.838	538.486	538.238	538.414	538.621	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	39.639	36.081	34.445	33.676	32.242	31.381	33.016	35.393	40.812	BETA 2
BETA 2A	0.200	1.800	1.950	0.700	0.400	0.850	1.100	0.400	-2.501	BETA 2A
V 2	425.11	446.14	463.25	468.21	465.28	454.27	422.61	395.58	335.76	V 2
V 2A	363.68	366.90	381.41	419.40	423.38	419.60	373.63	354.44	345.50	V 2A
VZ 2	327.23	360.56	362.01	389.57	393.35	387.47	353.93	322.07	253.82	VZ 2
VZ 2A	363.67	366.71	381.17	419.31	423.23	419.30	373.25	354.12	344.81	VZ 2A
V-THETA 2	271.19	262.74	262.01	259.58	248.10	236.33	229.98	228.82	219.19	V-THETA 2
V-THETA 2A	1.27	11.52	12.98	5.12	2.95	6.22	7.17	2.47	-15.06	V-THETA 2A
M 2	0.3790	0.3987	0.4150	0.4186	0.4159	0.4059	0.3768	0.3521	0.2977	M 2
M 2A	0.3230	0.3262	0.3398	0.3737	0.3773	0.3740	0.3321	0.3147	0.3065	M 2A
TURN(PR)	39.438	34.281	32.493	32.970	31.825	30.499	31.870	34.942	43.251	TURN(PR)
UUBAR	0.0457	0.1081	0.1112	0.0247	0.0120	0.0303	0.1486	0.1371	-0.1428	UUBAR
LOSS PARA	0.0154	0.0368	0.0382	0.0088	0.0044	0.0117	0.0589	0.0549	-0.0576	LOSS PARA
DFAC	0.3564	0.3695	0.3619	0.2978	0.2858	0.2723	0.3260	0.3341	0.2538	DFAC
EFFP	0.8392	0.6853	0.6762	0.8834	0.9352	0.8074	0.3544	0.3362	-1.3230	EFFP
INCID	-10.529	-7.307	-5.846	-4.354	-4.462	-4.484	-5.688	-7.777	-18.392	INCID
DEVM	9.032	13.112	13.260	11.675	11.412	12.516	13.541	13.080	2.356	DEVM
P 2	16.271	16.408	16.530	16.632	16.622	16.591	16.419	16.246	15.870	P 2
P 2A	16.201	16.224	16.325	16.585	16.600	16.538	16.191	16.063	16.005	P 2A
T 2	538.599	537.563	536.456	538.863	538.838	538.486	538.238	538.414	538.621	T 2
T 2A	538.599	537.563	536.456	538.863	538.838	538.486	538.238	538.414	538.622	T 2A
UUBAR FS	0.1154	0.1114	0.0737	0.0240	0.0176	0.0178	0.2464	0.2350	0.2670	UUBAR FS
P2 FS	16.373	16.414	16.449	16.630	16.633	16.569	16.617	16.416	16.399	P2 FS
LOSS PARA FS	0.0355	0.0379	0.0242	0.0085	0.0064	0.0069	0.0976	0.0941	0.1077	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 70.20 Equivalent Rotor Speed = 2955.62 Equivalent Weight Flow = 75.87
Uniform Inlet

INLET

PCT SPAN	96.8C	92.00	86.90	71.C0	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-C.CuU	-3.000	-0.000	-0.00C	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-C.uCO	-C.000	-0.00C	-0.000	-C.C00	-0.000	-0.000	-0.000	-0.000	BETA 1
V C	295.26	295.26	295.26	295.26	295.26	295.26	295.26	295.26	295.26	V 0
V 1	300.85	309.00	310.33	313.59	309.75	306.66	296.61	292.32	272.70	V 1
VZ 0	295.26	295.26	295.26	295.26	295.24	295.22	295.19	295.18	295.19	VZ 0
VZ 1	300.65	309.00	310.33	313.59	309.73	306.61	296.54	292.24	272.63	VZ 1
V-THETA 0	-0.0C	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.C0	-C.C0	-0.00	-0.00	-0.00	-C.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	C.2663	0.2663	0.2663	0.2663	0.2663	0.2663	0.2663	0.2663	0.2663	M 0
M 1	0.2714	0.2789	0.2801	0.2831	0.2796	0.2768	0.2676	0.2636	0.2457	M 1
TURN	0.C	0.C	0.0	0.C	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	C.4258	0.2674	0.2320	0.2320	0.2362	0.2362	0.2985	0.3268	0.4640	UUBAR
DFAC	-0.019	-C.047	-0.051	-0.062	-0.049	-0.039	-0.005	0.010	0.076	DFAC
EFFP	0.0837	0.2673	0.3163	0.3617	0.3040	0.2547	0.0304	-0.0665	-0.4773	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.887	14.887	14.887	14.887	14.887	14.887	14.887	14.887	14.887	P 0
P 1	14.582	14.696	14.721	14.721	14.718	14.718	14.673	14.653	14.555	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-C.030	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	45.142	42.659	40.587	39.021	38.186	37.376	39.433	42.716	49.050	BETA 2
BETA(PR) 1	54.784	53.032	52.685	53.392	55.348	56.932	58.561	59.120	60.977	BETA(PR) 1
BETA(PR) 2	24.290	26.399	25.845	25.902	29.861	34.034	38.200	43.705	49.830	BETA(PR) 2
V 1	301.50	325.38	333.62	337.79	330.57	327.24	318.64	315.02	294.55	V 1
V 2	417.29	415.86	430.63	450.39	442.78	431.80	409.64	372.42	338.80	V 2
VZ 1	301.44	325.31	333.58	337.77	330.16	325.91	316.54	312.78	292.63	VZ 1
VZ 2	294.33	305.81	327.02	349.91	347.90	342.72	315.78	273.12	221.71	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	295.79	281.79	280.16	283.56	273.63	261.80	259.69	252.11	255.49	V-THETA 2
V(PR) 1	522.8	541.0	550.3	566.4	580.9	598.0	608.0	610.6	604.1	V(PR) 1
V(PR) 2	322.9	341.4	363.4	389.0	401.3	414.1	402.6	378.5	344.2	V(PR) 2
VTHETA PR1	-427.1	-432.2	-437.7	-454.7	-477.7	-500.6	-517.8	-523.0	-527.4	VTHETA PR1
VTHETA PR2	-132.8	-151.8	-158.4	-169.9	-199.7	-231.5	-248.5	-261.0	-262.6	VTHETA PR2
U 1	427.07	432.20	437.66	454.67	477.67	500.56	517.78	523.02	527.41	U 1
U 2	428.62	433.59	438.56	453.48	473.37	493.26	508.18	513.16	518.13	U 2
M 1	0.2720	0.2940	0.3015	0.3054	0.2987	0.2957	0.2878	0.2844	0.2657	M 1
M 2	0.3713	0.3702	0.3841	0.4015	0.3944	0.3843	0.3640	0.3300	0.2996	M 2
M(PR) 1	C.4717	0.4887	0.4974	0.5120	0.5249	0.5403	0.5490	0.5513	0.5449	M(PR) 1
M(PR) 2	0.2874	C.3040	0.3241	0.3467	0.3575	0.3686	0.3577	0.3354	0.3043	M(PR) 2
TURN(PR)	30.490	26.629	26.838	27.489	25.468	22.844	20.283	15.337	11.088	TURN(PR)
UUBAR	0.1063	0.1199	0.0798	0.0487	0.0467	0.0595	0.1109	0.1521	0.2155	UUBAR
LOSS PARA	0.0281	C.0315	0.0213	C.0135	C.0130	0.0166	0.0302	0.0386	0.0492	LOSS PARA
DFAC	C.5465	0.5219	0.4910	C.4671	0.4601	0.4537	0.4846	0.5235	0.5787	DFAC
EFFP	C.8816	0.8463	0.9338	0.9202	0.9204	0.8969	0.8400	0.7548	0.6886	EFFP
EFF	C.8795	0.8438	0.9326	0.9186	0.9188	0.8950	0.8372	0.7508	0.6839	EFF
INCID	2.353	2.116	2.107	1.349	1.346	0.939	-0.127	-3.190	-7.183	INCID
DEVM	9.140	12.239	11.211	7.261	6.651	6.474	6.576	10.566	13.854	DEVM
P 1	14.582	14.696	14.721	14.721	14.718	14.718	14.673	14.653	14.555	P 1
P 2	16.514	16.509	16.646	16.823	16.837	16.783	16.616	16.413	16.170	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	540.044	539.482	538.576	540.651	540.812	540.852	541.100	541.455	541.848	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	45.438	42.452	39.974	39.071	37.740	37.275	40.189	44.001	51.333	BETA 2
BETA 2A	-0.100	1.300	2.000	1.550	0.820	1.280	1.250	2.001	1.200	BETA 2A
V 2	415.21	417.64	436.32	450.39	447.93	433.50	403.81	364.20	328.36	V 2
V 2A	325.61	322.45	328.21	371.97	380.36	377.26	336.73	315.82	304.87	V 2A
VZ 2	291.35	308.15	334.35	349.62	354.08	344.67	308.17	261.73	204.99	VZ 2
VZ 2A	325.81	322.36	327.99	371.79	380.19	376.94	336.38	315.34	304.49	VZ 2A
V-THETA 2	295.84	281.89	280.30	283.83	274.05	262.34	260.32	252.75	256.17	V-THETA 2
V-THETA 2A	-0.57	7.31	11.45	10.06	5.44	8.42	7.34	11.02	6.38	V-THETA 2A
M 2	0.3694	0.3718	0.3893	0.4015	0.3991	0.3859	0.3587	0.3226	0.2902	M 2
M 2A	0.2884	C.2855	0.2909	C.3299	0.3374	0.3346	0.2979	0.2790	0.2691	M 2A
TURN(PR)	45.538	41.151	37.973	37.514	36.900	35.961	38.890	41.948	50.075	TURN(PR)
UUBAR	0.051	0.0667	0.1221	0.0567	0.0324	0.0278	0.1111	0.0630	-0.1258	UUBAR
LOSS PARA	0.0172	0.0227	0.0420	0.0202	0.0120	0.0107	0.0440	0.0252	-0.0507	LOSS PARA
DFAC	0.4558	0.4519	0.4601	0.3906	0.3736	0.3564	0.4157	0.3999	0.3802	DFAC
EFFP	C.8737	C.8433	0.7337	0.8324	0.8910	0.8920	0.6525	0.7563	1.8766	EFFP
INCID	-4.729	-0.936	-0.316	1.040	1.034	1.408	1.481	0.828	-7.870	INCID
DEVM	8.732	12.612	13.310	12.525	11.832	12.946	13.690	14.679	6.053	DEVM
P 2	16.514	16.509	16.646	16.823	16.837	16.783	16.616	16.413	16.170	P 2
P 2A	16.436	16.469	16.444	16.723	16.780	16.737	16.459	16.341	16.285	P 2A
T 2	540.044	539.482	538.576	540.651	540.812	540.852	541.100	541.455	541.848	T 2
T 2A	540.044	539.482	538.576	540.651	540.812	540.852	541.100	541.455	541.848	T 2A
UUBAR FS	0.1911	0.1073	0.1016	0.0374	0.0300	0.0398	0.1932	0.1937	0.2117	UUBAR FS
P2 FS	16.552	16.577	16.608	16.787	16.832	16.803	16.760	16.597	16.562	P2 FS
LCSS PARA FS	0.273	0.365	0.0349	0.0133	0.0111	0.0153	0.0765	0.0774	0.0853	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 70.39 Equivalent Rotor Speed = 2963.23 Equivalent Weight Flow = 68.30
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
V 0	264.81	264.81	264.81	264.81	264.81	264.81	264.81	264.81	264.81
V 1	266.75	279.72	280.58	284.15	275.69	277.39	270.17	265.10	243.12
VZ 0	264.80	264.80	264.81	264.80	264.79	264.76	264.74	264.73	264.74
VZ 1	268.74	279.72	280.58	284.15	275.67	277.34	270.10	265.03	243.06
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
M 0	0.2385	0.2385	0.2385	0.2385	0.2385	0.2385	0.2385	0.2385	0.2385
M 1	0.2421	0.2521	0.2529	0.2562	0.2484	0.2500	0.2434	0.2388	0.2188
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UUBAR	0.4207	0.2559	0.2261	0.2279	0.2279	0.2261	0.2945	0.3225	0.4662
DFAC	-0.015	-0.056	-0.060	-0.073	-0.041	-0.048	-0.020	-0.001	0.082
EFFP	0.0675	0.3157	0.3565	0.4043	0.2729	0.3051	0.1240	0.0066	-0.5205
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P 0	14.846	14.846	14.846	14.846	14.846	14.846	14.846	14.846	14.846
P 1	14.604	14.699	14.716	14.715	14.715	14.716	14.677	14.660	14.578
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700

ROTOR E (ROTOR –L.E., ROTOR –T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
BETA 2	49.546	48.176	46.025	43.626	43.029	42.176	45.431	49.137	54.018
BETA(PR) 1	57.835	55.824	55.531	56.154	58.500	59.597	60.979	61.618	63.764
BETA(PR) 2	24.468	27.678	26.916	26.284	30.636	35.121	40.015	44.276	47.124
V 1	269.32	294.26	301.26	305.70	293.83	295.67	289.91	285.35	262.31
V 2	406.87	397.02	410.11	434.07	425.66	415.09	392.07	369.58	360.69
VZ 1	269.26	294.22	301.22	305.68	293.47	294.47	288.00	283.32	260.60
VZ 2	263.99	264.74	284.75	314.20	311.07	307.29	274.70	241.43	211.65
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
V-THETA 2	309.59	295.85	295.13	299.48	290.37	278.40	278.86	279.08	291.51
V(PR) 1	505.6	523.8	532.2	548.9	561.9	582.5	594.6	597.0	590.3
V(PR) 2	290.1	299.0	319.4	350.4	361.7	376.2	359.4	337.8	311.6
VTHETA PR1	-428.2	-433.3	-438.8	-455.8	-478.9	-501.8	-519.1	-524.4	-528.8
VTHETA PR2	-120.1	-138.9	-144.6	-155.2	-184.2	-216.1	-230.6	-235.4	-228.0
U 1	428.17	433.32	438.78	455.84	478.90	501.85	519.11	524.37	528.77
U 2	429.72	434.71	439.69	454.65	474.59	494.53	509.49	514.48	519.46
M 1	0.2426	0.2654	0.2718	0.2759	0.2650	0.2667	0.2614	0.2573	0.2363
M 2	0.3612	0.3525	0.3647	0.3860	0.3782	0.3684	0.3472	0.3267	0.3184
M(PR) 1	0.4557	0.4725	0.4802	0.4953	0.5068	0.5254	0.5362	0.5382	0.5316
M(PR) 2	0.2575	0.2654	0.2840	0.3116	0.3213	0.3339	0.3182	0.2986	0.2751
TURN(PR)	33.303	28.142	28.612	29.870	27.847	24.427	20.895	17.274	16.594
UUBAR	0.1173	0.1428	0.1084	0.0650	0.0787	0.0836	0.1479	0.2003	0.2366
LOSS PARA	0.0309	0.0371	0.0287	0.0179	0.0218	0.0230	0.0393	0.0503	0.0570
DFAC	0.6042	0.5952	0.5648	0.5292	0.5219	0.5137	0.5569	0.5965	0.6455
EFFP	0.8582	0.8185	0.8943	0.9073	0.8903	0.8682	0.7897	0.7238	0.7224
EFF	0.8556	0.8154	0.8924	0.9054	0.8881	0.8656	0.7858	0.7190	0.7175
INCID	5.404	4.908	4.953	4.112	4.499	3.608	2.299	-0.683	-4.385
DEVM	9.319	13.518	12.282	7.643	7.425	7.560	8.390	11.137	11.147
P 1	14.604	14.699	14.716	14.715	14.715	14.716	14.677	14.660	14.578
P 2	16.641	16.590	16.706	16.919	16.903	16.873	16.701	16.545	16.494
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700
T 2	541.744	541.086	540.155	542.003	542.301	542.584	543.530	544.060	544.670

STATOR E (STATOR–L.E., STATOR–T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	49.890	47.928	45.292	43.684	42.509	42.063	46.364	50.773	56.820
BETA 2A	-0.300	1.650	2.000	1.880	1.260	1.140	1.200	2.301	2.351
V 2	404.87	398.69	415.48	434.07	430.54	416.70	386.57	361.45	349.44
V 2A	307.19	295.93	293.37	331.37	347.81	342.30	307.29	287.67	283.20
VZ 2	260.84	267.14	292.28	313.86	317.27	309.15	266.54	228.41	191.12
VZ 2A	307.18	295.80	293.18	331.14	347.61	342.03	306.98	287.18	282.66
V-THETA 2	309.64	295.94	295.27	299.76	290.81	278.97	279.54	279.78	292.28
V-THETA 2A	-1.61	8.52	10.24	10.87	7.65	6.81	6.43	11.54	11.60
M 2	0.3594	0.3540	0.3696	0.3860	0.3826	0.3699	0.3422	0.3193	0.3083
M 2A	0.2712	0.2613	0.2592	0.2928	0.3075	0.3025	0.2708	0.2532	0.2491
TURN(PR)	50.190	46.277	43.290	41.797	41.230	40.887	45.114	48.421	54.417
UUBAR	0.0235	0.0345	0.1149	0.0991	0.0392	0.0432	0.0863	0.0430	0.0135
LOSS PARA	0.0079	0.0117	0.0395	0.0352	0.0145	0.0166	0.0342	0.0172	0.0054
DFAC	0.5003	0.5034	0.5303	0.4736	0.4365	0.4312	0.4866	0.5027	0.5155
EFFP	0.9475	0.9269	0.7817	0.7752	0.8935	0.8742	0.7757	0.8874	0.9623
INCID	-0.277	4.540	5.001	5.653	5.803	6.194	7.656	7.601	-2.379
DEVM	6.532	12.962	13.310	12.855	12.272	12.806	13.641	14.979	7.202
P 2	16.641	16.590	16.706	16.919	16.903	16.873	16.701	16.545	16.494
P 2A	16.607	16.543	16.534	16.755	16.840	16.807	16.589	16.496	16.480
T 2	541.744	541.086	540.155	542.003	542.301	542.584	543.530	544.060	544.670
T 2A	541.744	541.086	540.155	542.003	542.301	542.584	543.530	544.060	544.670
UUBAR FS	0.0737	0.1088	0.1343	0.0731	0.0470	0.0630	0.2210	0.1903	0.1616
P2 FS	16.717	16.705	16.740	16.872	16.916	16.904	16.926	16.749	16.680
LOSS PARA FS	0.0248	0.0369	0.0461	0.0259	0.0173	0.0242	0.0876	0.0761	0.0646

Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 70.37 Equivalent Rotor Speed = 2962.57 Equivalent Weight Flow = 61.93
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	239.44	239.44	239.44	239.44	239.44	239.44	239.44	239.44	239.44	V 0
V 1	252.41	259.99	260.34	256.04	255.75	251.76	242.00	236.02	218.73	V 1
VZ 0	239.43	239.44	239.44	239.43	239.42	239.40	239.38	239.37	239.37	VZ 0
VZ 1	252.41	259.99	260.34	256.04	255.73	251.72	241.94	235.95	218.67	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2155	0.2155	0.2155	0.2155	0.2155	0.2155	0.2155	0.2155	0.2155	M 0
M 1	0.2272	0.2341	0.2345	0.2306	0.2303	0.2267	0.2178	0.2124	0.1967	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4149	0.2502	0.2288	0.2267	0.2246	0.2288	0.2866	0.3251	0.4683	UUBAR
DFAC	-0.054	-0.086	-0.087	-0.069	-0.068	-0.051	-0.011	0.014	0.086	DFAC
EFFP	0.2141	0.4213	0.4477	0.3921	0.3899	0.3196	0.0711	-0.0970	-0.5569	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.618	14.818	14.818	14.818	14.818	14.818	14.818	14.818	14.818	P 0
P 1	14.622	14.700	14.710	14.711	14.712	14.710	14.683	14.665	14.597	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	51.888	51.234	49.805	47.469	47.162	47.458	52.914	56.422	59.345	BETA 2
BETA(PR) 1	59.427	57.751	57.518	58.878	60.392	61.976	63.591	64.328	66.100	BETA(PR) 1
BETA(PR) 2	22.407	27.274	26.496	28.332	30.789	35.918	42.596	45.398	45.631	BETA(PR) 2
V 1	252.94	273.40	279.32	275.17	272.41	268.13	259.44	253.79	235.80	V 1
V 2	412.60	394.21	404.95	412.71	416.91	403.46	377.16	369.40	376.29	V 2
VZ 1	252.89	273.33	279.28	275.16	272.08	267.04	257.73	251.99	234.26	VZ 1
VZ 2	254.65	246.82	261.34	278.98	283.39	272.55	227.16	204.08	191.68	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	324.63	307.36	309.32	304.13	305.63	297.00	300.52	307.42	323.40	V-THETA 2
V(PR) 1	497.2	512.3	520.1	532.4	550.9	568.9	580.2	582.5	578.9	V(PR) 1
V(PR) 2	275.5	277.7	292.0	317.0	330.0	337.0	309.1	291.2	274.6	V(PR) 2
VTHETA PR1	-428.1	-433.2	-438.7	-455.7	-478.8	-501.7	-519.0	-524.3	-528.6	VTHETA PR1
VTHETA PR2	-105.0	-127.3	-130.3	-150.4	-168.9	-197.4	-208.9	-206.9	-195.9	VTHETA PR2
U 1	428.07	433.22	438.69	455.74	478.79	501.74	519.00	524.25	528.65	U 1
U 2	429.63	434.61	439.59	454.55	474.49	494.42	509.38	514.36	519.34	U 2
M 1	0.2277	0.2464	0.2518	0.2480	0.2455	0.2416	0.2336	0.2285	0.2122	M 1
M 2	0.3660	0.3660	0.3597	0.3660	0.3697	0.3572	0.3330	0.3259	0.3319	M 2
M(PR) 1	0.4477	0.4616	0.4688	0.4798	0.4964	0.5125	0.5225	0.5244	0.5208	M(PR) 1
M(PR) 2	0.2443	0.2462	0.2594	0.2811	0.2927	0.2983	0.2730	0.2569	0.2422	M(PR) 2
TURN(PR)	37.017	30.473	31.019	30.545	29.588	26.015	20.937	18.873	20.432	TURN(PR)
UUBAR	0.1103	0.1466	0.1222	0.0988	0.1001	0.1371	0.2231	0.2645	0.2821	UUBAR
LOSS PARA	0.0295	0.0382	0.0325	0.0268	0.0277	0.0373	0.0570	0.0651	0.0699	LOSS PARA
DFAC	0.6354	0.6341	0.6153	0.5802	0.5787	0.5820	0.6453	0.6834	0.7218	DFAC
EFFP	0.8637	0.8161	0.8935	0.8495	0.8722	0.8144	0.7304	0.7047	0.7333	EFFP
EFF	0.8610	0.8128	0.8914	0.8465	0.8695	0.8107	0.7254	0.6994	0.7282	EFF
INCID	6.996	6.835	6.940	6.835	6.393	5.993	4.921	2.039	-2.039	INCID
DEVM	7.257	13.114	11.862	9.691	7.578	8.357	10.970	12.259	9.654	DEVM
P 1	14.622	14.700	14.710	14.711	14.712	14.710	14.683	14.665	14.597	P 1
P 2	16.800	16.685	16.790	16.876	16.982	16.891	16.704	16.645	16.702	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	543.082	542.225	541.112	543.216	543.664	544.483	545.535	546.036	546.646	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	52.272	50.959	48.980	47.535	46.567	47.328	54.141	58.598	62.890	BETA 2
BETA 2A	-0.000	1.900	1.630	0.630	0.940	0.020	0.830	1.851	3.651	BETA 2A
V 2	410.52	395.86	410.19	412.71	421.65	405.01	371.92	361.28	364.44	V 2
V 2A	298.19	280.47	268.47	307.00	314.40	319.33	287.34	275.87	276.60	V 2A
VZ 2	251.20	249.34	269.21	278.61	289.80	274.36	217.74	188.14	166.01	VZ 2
VZ 2A	298.19	280.30	268.35	306.94	314.25	319.14	287.07	275.48	275.75	VZ 2A
V-THETA 2	324.69	307.46	309.47	304.42	306.09	297.61	301.25	308.21	324.26	V-THETA 2
V-THETA 2A	-0.00	9.30	7.64	3.38	5.16	0.11	4.16	8.90	17.60	V-THETA 2A
M 2	0.3641	0.3510	0.3645	0.3660	0.3740	0.3586	0.3283	0.3186	0.3212	M 2
M 2A	0.2628	0.2472	0.2368	0.2707	0.2772	0.2814	0.2526	0.2422	0.2428	M 2A
TURN(PR)	52.271	49.058	47.348	46.898	45.608	47.272	53.264	56.701	59.194	TURN(PR)
UUBAR	0.0604	0.0481	0.1459	0.0899	0.1135	0.0646	0.0545	0.0553	0.0971	UUBAR
LOSS PARA	0.0233	0.0164	0.0502	0.0319	0.0420	0.0249	0.0216	0.0221	0.0391	LOSS PARA
DFAC	0.5401	0.5481	0.5990	0.5159	0.5195	0.4957	0.5457	0.5697	0.5826	DFAC
EFFP	0.8784	0.9079	0.7559	0.8084	0.7569	0.8375	0.8702	0.8725	0.7794	EFFP
INCID	2.104	7.571	8.689	9.504	9.861	11.459	15.435	15.431	3.696	INCID
DEVM	8.832	13.212	12.940	11.605	11.952	11.686	13.271	14.529	8.502	DEVM
P 2	16.800	16.685	16.790	16.876	16.982	16.891	16.704	16.645	16.702	P 2
P 2A	16.712	16.620	16.576	16.742	16.804	16.798	16.638	16.583	16.590	P 2A
T 2	543.082	542.225	541.112	543.216	543.664	544.483	545.535	546.036	546.646	T 2
T 2A	543.082	542.225	541.112	543.216	543.664	544.483	545.535	546.036	546.646	T 2A
UUBAR FS	0.945	0.1279	0.1386	0.1227	0.1039	0.0967	0.2199	0.1663	0.1583	UUBAR FS
P2 FS	16.856	16.810	16.778	16.931	16.964	16.941	16.958	16.796	16.785	P2 FS
LOSS PARA FS	0.317	0.0436	0.0477	0.0435	0.0384	0.0373	0.0871	0.0664	0.0637	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 49.99 Equivalent Rotor Speed = 2104.67 Equivalent Weight Flow = 64.65
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	250.19	250.19	250.19	250.19	250.19	250.19	250.19	250.19	250.19	V 0
V 1	267.29	274.01	271.46	271.22	265.35	265.51	256.76	252.86	235.59	V 1
VZ 0	250.19	250.19	250.19	250.18	250.17	250.15	250.12	250.12	250.12	VZ 0
VZ 1	267.29	274.01	271.46	271.22	265.33	265.46	256.70	252.79	235.53	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2252	0.2252	0.2252	0.2252	0.2252	0.2252	0.2252	0.2252	0.2252	M 0
M 1	0.2408	0.2469	0.2446	0.2444	0.2390	0.2392	0.2312	0.2277	0.2120	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4176	0.2549	0.2294	0.2235	0.2255	0.2313	0.2902	0.3235	0.4686	UUBAR
DFAC	-0.068	-0.095	-0.085	-0.084	-0.061	-0.061	-0.026	-0.011	0.058	DFAC
EFFP	0.2556	0.4437	0.4405	0.4443	0.3607	0.3572	0.1572	0.0631	-0.3248	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.830	14.830	14.830	14.830	14.830	14.830	14.830	14.830	14.830	P 0
P 1	14.615	14.698	14.712	14.715	14.714	14.711	14.680	14.663	14.588	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E — ROTOR -L.E. / ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	34.375	30.788	29.718	28.387	27.331	25.636	25.538	26.942	29.532	BETA 2
BETA(PR) 1	48.633	46.883	46.930	47.989	50.302	51.676	53.425	54.048	56.090	BETA(PR) 1
BETA(PR) 2	24.117	24.806	24.354	26.035	30.204	33.706	37.463	39.812	49.335	BETA(PR) 2
V 1	267.85	288.24	291.37	291.65	282.72	282.89	275.39	272.06	254.12	V 1
V 2	326.76	339.71	351.36	356.76	345.45	340.22	323.22	306.37	245.70	V 2
VZ 1	267.80	288.17	291.33	291.63	282.37	281.74	273.58	270.12	252.47	VZ 1
VZ 2	269.68	291.82	305.14	313.86	306.74	306.24	290.87	272.34	213.20	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	184.49	173.88	174.18	169.61	158.53	146.96	138.98	138.42	120.78	V-THETA 2
V(PR) 1	405.3	421.7	426.6	435.8	442.3	455.1	460.2	461.2	453.5	V(PR) 1
V(PR) 2	295.5	321.5	335.0	349.3	355.1	368.6	367.2	355.3	327.7	V(PR) 2
VTHETA PR1	-304.1	-307.8	-311.7	-323.8	-340.1	-356.4	-368.7	-372.4	-375.6	VTHETA PR1
VTHETA PR2	-120.7	-134.9	-138.1	-153.3	-178.6	-204.3	-222.9	-227.0	-248.2	VTHETA PR2
U 1	304.11	307.77	311.65	323.76	340.14	356.06	368.71	372.44	375.56	U 1
U 2	305.21	308.76	312.30	322.92	337.08	351.25	361.87	365.41	368.95	U 2
M 1	0.2413	0.2599	0.2628	0.2630	0.2549	0.2550	0.2482	0.2451	0.2288	M 1
M 2	0.2923	0.3045	0.3154	0.3196	0.3093	0.3046	0.2892	0.2739	0.2191	M 2
M(PR) 1	0.3651	0.3802	0.3848	0.3930	0.3987	0.4102	0.4147	0.4156	0.4083	M(PR) 1
M(PR) 2	0.2643	0.2882	0.3007	0.3129	0.3180	0.3300	0.3286	0.3177	0.2922	M(PR) 2
TURN(PR)	24.512	22.072	22.574	21.954	20.078	17.908	15.870	14.142	6.682	TURN(PR)
UUBAR	0.1234	0.0928	0.0581	0.0458	0.0579	0.0438	0.0609	0.0995	0.1594	UUBAR
LOSS PARA	0.0326	0.0247	0.0157	0.0126	0.0161	0.0123	0.0168	0.0268	0.0368	LOSS PARA
DFAC	0.4029	0.3587	0.3362	0.3180	0.3121	0.2978	0.3059	0.3339	0.3709	DFAC
EFFP	0.7592	0.8722	1.0446	0.8100	0.7873	0.7843	0.7631	0.6978	0.4940	EFFP
EFF	0.7574	0.8713	1.0450	0.8085	0.7857	0.7827	0.7614	0.6959	0.4917	EFF
INCID	-3.799	-4.033	-3.648	-4.053	-3.702	-4.324	-5.275	-8.276	-12.084	INCID
DEVM	8.967	10.647	9.720	7.394	6.993	6.147	5.840	6.675	13.359	DEVM
P 1	14.615	14.698	14.712	14.715	14.714	14.711	14.680	14.663	14.588	P 1
P 2	15.391	15.466	15.542	15.567	15.522	15.507	15.421	15.340	15.068	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	528.900	527.427	526.551	529.111	528.866	528.757	528.350	528.378	528.491	T 2

STATOR E — STATOR-L.E. / STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	34.565	30.660	29.332	28.421	27.060	25.576	25.946	27.612	30.576	BETA 2
BETA 2A	0.750	1.700	1.310	0.740	0.400	0.800	1.601	0.750	-3.001	BETA 2A
V 2	325.23	341.09	355.75	356.76	349.19	341.47	318.86	299.04	238.44	V 2
V 2A	299.09	312.43	325.94	345.47	342.30	339.52	305.22	288.24	281.87	V 2A
VZ 2	267.62	293.40	310.13	313.70	310.80	307.70	286.32	265.30	204.97	VZ 2
VZ 2A	299.06	312.29	325.84	345.40	342.17	339.29	304.86	287.96	281.19	VZ 2A
V-THETA 2	184.52	173.93	174.26	169.77	158.77	147.27	139.31	138.77	121.10	V-THETA 2
V-THETA 2A	3.91	9.27	7.45	4.46	2.39	4.74	8.52	3.77	-14.74	V-THETA 2A
M 2	0.2909	0.3056	0.3195	0.3196	0.3128	0.3057	0.2853	0.2680	0.2125	M 2
M 2A	0.2672	0.2797	0.2922	0.3093	0.3065	0.3040	0.2729	0.2575	0.2517	M 2A
TURN(PR)	33.815	28.959	28.021	27.675	26.644	24.748	24.307	26.818	33.521	TURN(PR)
UUBAR	0.0770	0.0862	0.0647	0.0133	-0.0040	0.0125	0.1549	0.1770	-0.2183	UUBAR
LOSS PARA	0.0259	0.0294	0.0291	0.0047	-0.0005	0.0048	0.0614	0.0708	-0.0879	LOSS PARA
DFAC	0.2675	0.2485	0.2454	0.1966	0.1861	0.1672	0.2063	0.2198	0.0487	DFAC
EFFP	0.5179	0.4840	0.4939	0.7956	1.0981	-0.0506	-0.7920	-1.2693	0.4645	EFFP
INCID	-15.602	-12.728	-10.958	-9.609	-9.643	-10.285	-12.751	-15.551	-28.621	INCID
DEVM	9.582	13.012	12.620	11.715	11.412	12.466	14.040	13.430	1.856	DEVM
P 2	15.391	15.466	15.542	15.567	15.522	15.507	15.421	15.340	15.068	P 2
P 2A	15.323	15.383	15.452	15.553	15.526	15.495	15.290	15.208	15.170	P 2A
T 2	528.900	527.427	526.551	529.111	528.866	528.757	528.350	528.378	528.491	T 2
T 2A	528.900	527.427	526.551	529.111	528.866	528.757	528.350	528.378	528.491	T 2A
UUBAR FS	0.1240	0.0934	0.0585	0.0195	0.0240	0.0287	0.2979	0.2971	0.2900	UUBAR FS
P2 FS	15.437	15.474	15.512	15.573	15.551	15.523	15.594	15.467	15.402	P2 FS
LOSS PARA FS	0.0417	0.0318	0.0230	0.0069	0.0090	0.0110	0.1181	0.1188	0.1167	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 50.22   Equivalent Rotor Speed = 2114.26   Equivalent Weight Flow = 61.51
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	237.72	237.72	237.72	237.72	237.72	237.72	237.72	237.72	237.72	V 0
V 1	245.12	254.26	251.31	248.81	245.42	246.74	241.22	237.80	219.84	V 1
VZ 0	237.72	237.72	237.72	237.72	237.71	237.68	237.66	237.66	237.66	VZ 0
VZ 1	245.12	254.26	251.31	248.80	245.40	246.69	241.16	237.74	219.78	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2139	0.2139	0.2139	0.2139	0.2139	0.2139	0.2139	0.2139	0.2139	M 0
M 1	0.2206	0.2289	0.2262	0.2240	0.2209	0.2221	0.2171	0.2140	0.1977	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4164	0.2473	0.2299	0.2256	0.2212	0.2299	0.2819	0.3253	0.4685	UUBAR
DFAC	-0.031	-0.070	-0.057	-0.047	-0.032	-0.038	-0.015	-0.000	0.075	DFAC
EFFP	0.1332	0.3718	0.3420	0.3005	0.2321	0.2545	0.0964	0.0016	-0.4559	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.815	14.815	14.815	14.815	14.815	14.815	14.815	14.815	14.815	P 0
P 1	14.621	14.700	14.708	14.710	14.712	14.708	14.684	14.663	14.597	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	37.294	34.693	33.133	31.984	30.958	29.604	29.841	31.461	35.843	BETA 2
BETA(PR) 1	51.204	49.158	49.275	50.583	52.625	53.840	55.256	55.838	58.031	BETA(PR) 1
BETA(PR) 2	24.805	24.831	24.903	26.559	30.578	34.187	38.245	40.557	50.184	BETA(PR) 2
V 1	245.64	267.33	269.55	267.33	261.33	262.74	258.59	255.73	237.00	V 1
V 2	314.94	326.63	335.41	340.16	331.77	325.81	308.49	293.99	238.46	V 2
VZ 1	245.59	267.27	269.52	267.31	261.00	261.68	256.89	253.91	235.46	VZ 1
VZ 2	250.54	268.55	280.87	288.52	284.38	282.86	266.93	250.11	192.85	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	190.82	185.90	183.33	180.17	170.59	160.71	153.13	153.03	139.30	V-THETA 2
V(PR) 1	392.0	408.7	413.1	421.0	430.2	444.1	451.7	453.2	445.5	V(PR) 1
V(PR) 2	276.0	295.9	309.7	322.6	330.5	342.4	340.6	329.9	301.6	V(PR) 2
VTHETA PR1	-305.5	-309.2	-313.1	-325.2	-341.7	-358.1	-370.4	-374.1	-377.3	VTHETA PR1
VTHETA PR2	-115.8	-124.3	-130.4	-144.2	-168.0	-192.1	-210.4	-214.0	-231.3	VTHETA PR2
U 1	305.50	309.17	313.07	325.24	341.69	358.07	370.39	374.14	377.27	U 1
U 2	366.60	310.16	313.72	324.39	338.62	352.85	363.52	367.08	370.63	U 2
M 1	0.2211	0.2408	0.2429	0.2408	0.2354	0.2366	0.2329	0.2303	0.2132	M 1
M 2	0.2617	0.2926	0.3008	0.3043	0.2967	0.2913	0.2756	0.2625	0.2124	M 2
M(PR) 1	0.3528	0.3682	0.3722	0.3793	0.3874	0.4000	0.4068	0.4081	0.4009	M(PR) 1
M(PR) 2	0.2469	0.2651	0.2777	0.2886	0.2955	0.3061	0.3043	0.2945	0.2686	M(PR) 2
TURN(PR)	26.395	24.322	24.369	24.023	22.028	19.595	16.924	15.192	7.779	TURN(PR)
UUBAR	0.1000	0.0983	0.0583	0.0409	0.0482	0.0453	0.0690	0.1058	0.1664	UUBAR
LOSS PARA	0.0263	0.0262	0.0157	0.0113	0.0134	0.0126	0.0188	0.0282	0.0378	LOSS PARA
DFAC	-.4371	0.4096	0.3823	0.3653	0.3499	0.3627	0.3894	0.4328		DFAC
EFFP	0.8813	0.9422	1.0765	0.8509	0.8305	0.8110	0.7796	0.7226	0.5584	EFFP
EFF	0.8803	0.9418	1.0771	0.8495	0.8290	0.8084	0.7779	0.7206	0.5559	EFF
INCID	-1.228	-1.759	-1.303	-1.459	-1.376	-2.157	-3.441	-6.482	-10.137	INCID
DEVM	9.655	10.671	10.270	7.918	7.367	6.627	6.622	7.419	14.209	DEVM
P 1	14.621	14.730	14.768	14.710	14.712	14.708	14.684	14.663	14.597	P 1
P 2	15.476	15.537	15.597	15.637	15.614	15.592	15.506	15.431	15.192	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	526.345	527.482	526.845	529.461	529.432	529.479	529.167	529.266	529.409	T 2

STATOR E (STATOR -L.E., STATOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	37.509	34.546	32.698	32.023	30.646	29.536	30.331	32.267	37.179	BETA 2
BETA 2A	0.250	1.580	1.890	0.660	0.420	0.800	1.200	0.700	-2.551	BETA 2A
V 2	313.44	327.95	339.56	340.16	335.33	327.00	304.36	287.77	231.43	V 2
V 2A	273.43	279.34	292.26	316.66	315.98	312.83	280.19	263.95	258.60	V 2A
VZ 2	248.64	270.12	285.74	288.35	288.36	284.23	262.36	243.00	184.15	VZ 2
VZ 2A	273.42	279.23	292.08	316.59	315.87	312.62	279.90	263.70	258.07	VZ 2A
V-THETA 2	190.85	185.96	183.42	180.34	170.85	161.04	153.50	153.42	139.67	V-THETA 2
V-THETA 2A	1.19	7.70	9.64	3.65	2.32	4.37	5.86	3.22	-11.50	V-THETA 2A
M 2	0.2603	0.2938	0.3046	0.3043	0.3000	0.2924	0.2719	0.2568	0.2061	M 2
M 2A	0.2441	0.2497	0.2615	0.2830	0.2824	0.2795	0.2500	0.2353	0.2305	M 2A
TURN(PR)	37.258	32.965	30.804	31.357	30.210	28.705	29.088	31.519	39.670	TURN(PR)
UUBAR	0.0736	0.1027	0.0965	0.0145	0.0011	0.0157	0.1363	0.1501	-0.2390	UUBAR
LOSS PARA	0.0248	0.0349	0.0332	0.0052	0.0004	0.0061	0.0540	0.0600	-0.0963	LOSS PARA
DFAC	0.3315	0.3334	0.3157	0.2541	0.2444	0.2287	0.2727	0.2927	0.1474	DFAC
EFFP	0.7017	0.6381	0.6410	0.8956	0.9908	0.8214	0.1311	0.0776	0.0612	EFFP
INCID	-12.659	-8.842	-7.594	-6.007	-6.057	-6.328	-8.371	-10.901	-22.023	INCID
DEVM	9.082	12.892	13.200	11.635	11.432	12.466	13.641	13.380	2.306	DEVM
P 2	15.476	15.537	15.597	15.637	15.614	15.592	15.506	15.400	15.327	P 2
P 2A	15.416	15.444	15.503	15.623	15.613	15.578	15.400	15.327	15.298	P 2A
T 2	526.345	527.482	526.845	529.461	529.432	529.479	529.167	529.266	529.409	T 2
T 2A	526.345	527.482	526.845	529.461	529.432	529.479	529.167	529.266	529.409	T 2A
UUBAR FS	0.1178	0.0915	0.0669	0.0139	0.0115	0.0169	0.2819	0.2502	0.2594	UUBAR FS
P2 FS	15.538	15.525	15.566	15.636	15.623	15.593	15.663	15.523	15.490	P2 FS
LOSS PARA FS	0.0363	0.0311	0.0230	0.0050	0.0041	0.0065	0.1117	0.1000	0.1045	LOSS PARA FS

Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 49.65   Equivalent Rotor Speed = 2090.12   Equivalent Weight Flow = 55.53
Uniform Inlet

INLET

PCT SPAN	96.60	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	213.95	213.95	213.95	213.95	213.95	213.95	213.95	213.95	213.95	V 0
V 1	218.22	226.79	223.97	225.40	222.77	219.30	215.44	209.06	194.78	V 1
VZ 0	213.94	213.94	213.94	213.94	213.93	213.91	213.89	213.89	213.89	VZ 0
VZ 1	218.22	226.79	223.97	225.40	222.76	219.27	215.38	209.01	194.73	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.1923	0.1923	0.1923	0.1923	0.1923	0.1923	0.1923	0.1923	0.1923	M 0
M 1	0.1962	0.2040	0.2014	0.2027	0.2003	0.1972	0.1937	0.1879	0.1750	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4195	0.2432	0.2245	0.2218	0.2218	0.2271	0.2672	0.3286	0.4676	UUBAR
DFAC	-0.020	-0.060	-0.047	-0.054	-0.041	-0.025	-0.007	0.023	0.090	DFAC
EFFP	0.0684	0.3399	0.3021	0.3343	0.2778	0.1839	0.0501	-0.1617	-0.5866	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.791	14.791	14.791	14.791	14.791	14.791	14.791	14.791	14.791	P 0
P 1	14.633	14.700	14.707	14.708	14.708	14.706	14.690	14.667	14.615	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	42.398	40.055	38.257	36.879	36.068	35.061	35.963	38.779	44.408	BETA 2
BETA(PR) 1	54.099	52.063	52.209	53.033	54.971	56.712	57.948	58.910	60.797	BETA(PR) 1
BETA(PR) 2	24.573	25.012	25.078	26.304	30.006	34.277	38.035	42.335	48.098	BETA(PR) 2
V 1	218.67	238.31	240.03	242.01	237.07	233.36	230.78	224.63	209.84	V 1
V 2	299.53	306.44	314.34	322.13	317.26	308.46	295.09	272.11	245.39	V 2
VZ 1	218.63	238.25	240.00	241.99	236.78	232.41	229.26	223.03	208.47	VZ 1
VZ 2	221.19	234.55	246.83	257.67	256.35	252.15	238.34	211.66	174.98	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	201.96	197.19	194.63	193.32	186.71	176.96	172.93	170.05	171.40	V-THETA 2
V(PR) 1	372.9	387.6	391.7	402.4	412.7	424.0	432.8	432.7	427.9	V(PR) 1
V(PR) 2	243.2	258.8	272.5	287.4	296.2	305.6	303.2	286.9	262.4	V(PR) 2
VTHETA PR1	-302.0	-305.6	-309.5	-321.5	-337.8	-354.0	-366.2	-369.9	-373.0	VTHETA PR1
VTHETA PR2	-101.1	-109.4	-115.5	-127.4	-148.0	-171.9	-186.4	-192.8	-195.0	VTHETA PR2
U 1	302.01	305.46	309.50	321.53	337.79	353.98	366.16	369.87	372.97	U 1
U 2	303.10	306.62	310.14	320.69	334.75	348.82	359.37	362.89	366.40	U 2
M 1	0.1966	0.2144	0.2160	0.2178	0.2133	0.2099	0.2076	0.2020	0.1886	M 1
M 2	0.2676	0.2740	0.2814	0.2878	0.2833	0.2753	0.2632	0.2424	0.2184	M 2
M(PR) 1	0.3353	0.3487	0.3524	0.3622	0.3713	0.3814	0.3893	0.3892	0.3847	M(PR) 1
M(PR) 2	0.2173	0.2315	0.2440	0.2568	0.2645	0.2727	0.2705	0.2555	0.2335	M(PR) 2
TURN(PR)	29.522	27.046	27.128	26.728	24.946	22.380	19.834	16.496	12.641	TURN(PR)
UUBAR	0.0999	0.1089	0.0733	0.0469	0.0537	0.0603	0.0922	0.1426	0.1943	UUBAR
LOSS PARA	0.0263	0.0290	0.0197	0.0129	0.0150	0.0167	0.0252	0.0370	0.0460	LOSS PARA
DFAC	0.5048	0.4816	0.4519	0.4334	0.4274	0.4187	0.4368	0.4735	0.5274	DFAC
EFFP	0.9008	0.9218	1.0360	0.8589	0.8486	0.8173	0.7775	0.6902	0.6452	EFFP
EFF	0.8999	0.9212	1.0363	0.8576	0.8472	0.8156	0.7756	0.6878	0.6427	EFF
INCID	1.667	1.147	1.630	0.991	0.969	0.718	-0.741	-3.400	-7.363	INCID
DEVM	9.424	10.852	10.444	7.663	6.796	6.717	6.411	9.196	12.121	DEVM
P 1	14.633	14.700	14.707	14.708	14.708	14.706	14.690	14.667	14.615	P 1
P 2	15.547	15.584	15.634	15.693	15.689	15.660	15.597	15.487	15.376	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	528.765	528.183	527.519	530.012	530.105	530.227	530.246	530.504	530.490	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	42.648	39.879	37.736	36.926	35.694	34.980	36.585	39.840	46.250	BETA 2
BETA 2A	1.500	1.650	2.000	1.500	0.680	1.280	1.180	1.110	-0.100	BETA 2A
V 2	296.15	307.66	318.18	322.13	320.64	309.57	291.17	266.41	238.14	V 2
V 2A	246.07	244.75	251.61	281.60	284.95	282.46	257.55	233.42	226.75	V 2A
VZ 2	219.30	236.10	251.62	257.48	260.29	253.43	233.54	204.33	164.52	VZ 2
VZ 2A	245.99	244.65	251.45	281.47	284.84	282.22	257.29	233.17	226.51	VZ 2A
V-THETA 2	201.99	197.26	194.73	193.50	187.00	177.32	173.35	170.49	171.85	V-THETA 2
V-THETA 2A	6.44	7.05	8.78	7.37	3.38	6.31	5.30	4.52	-0.40	V-THETA 2A
M 2	0.2664	0.2751	0.2849	0.2878	0.2864	0.2763	0.2597	0.2373	0.2119	M 2
M 2A	0.2193	0.2183	0.2246	0.2511	0.2541	0.2518	0.2294	0.2076	0.2016	M 2A
TURN(PR)	41.148	38.228	35.734	35.420	34.996	33.666	35.357	38.678	46.290	TURN(PR)
UUBAR	0.0457	0.0958	0.1093	0.0252	0.0104	0.0075	0.0916	0.0778	-0.0808	UUBAR
LOSS PARA	0.0154	0.0326	0.0376	0.0090	0.0039	0.0029	0.0363	0.0311	-0.0326	LOSS PARA
DFAC	0.3967	0.4151	0.4106	0.3316	0.3241	0.3013	0.3454	0.3745	0.3412	DFAC
EFFP	0.8605	0.7464	0.7171	0.8968	0.9522	0.9567	0.5902	0.6730	1.8479	EFFP
INCID	-7.519	-3.509	-2.555	-1.104	-1.011	-0.887	-2.121	-3.332	-12.955	INCID
DEVM	10.332	12.962	13.310	12.475	11.692	12.946	13.621	13.789	4.754	DEVM
P 2	15.547	15.584	15.634	15.693	15.689	15.660	15.597	15.487	15.376	P 2
P 2A	15.513	15.508	15.540	15.671	15.680	15.654	15.532	15.440	15.414	P 2A
T 2	528.765	528.183	527.519	530.012	530.105	530.227	530.246	530.504	530.490	T 2
T 2A	528.765	528.183	527.519	530.012	530.105	530.227	530.246	530.504	530.490	T 2A
UUBAR FS	0.1179	0.1162	0.1067	0.0346	0.0301	0.0389	0.2521	0.2482	0.2541	UUBAR FS
P2 FS	15.599	15.602	15.631	15.701	15.706	15.686	15.750	15.621	15.588	P2 FS
LOSS PARA FS	0.0363	0.0395	0.0367	0.0123	0.0112	0.0150	0.0999	0.0992	0.1025	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 49.70 Equivalent Rotor Speed = 2092.57 Equivalent Weight Flow = 48.51
Uniform Inlet

INLET

PCT SPAN	96.6.	92.00	66.9C	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
OIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA C	-0.200	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V _	186.49	186.49	186.49	186.49	186.49	186.49	186.49	186.49	186.49	V 0
V 1	192.15	199.00	196.17	197.78	193.22	192.00	189.18	180.68	168.81	V 1
VZ C	186.49	186.49	186.49	186.48	186.47	186.46	186.44	186.44	186.44	VZ 0
VZ 1	192.15	199.00	196.17	197.78	193.20	191.97	189.14	180.63	168.77	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.1675	0.1675	0.1675	0.1675	0.1675	0.1675	0.1675	0.1675	0.1675	M 0
M 1	0.1726	0.1788	0.1763	0.1777	0.1736	0.1725	0.1699	0.1623	0.1515	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.4190	0.2366	0.2211	0.2176	0.2211	0.2281	0.2491	0.3298	0.4562	UUBAR
DFAC	-0.030	-0.067	-0.052	-0.061	-0.036	-0.030	-0.014	0.031	0.095	DFAC
EFFP	0.1303	0.3698	0.3270	0.3668	0.2512	0.2095	0.1054	-0.2314	-0.6642	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P C	14.765	14.765	14.765	14.765	14.765	14.765	14.765	14.765	14.765	P 0
P 1	14.647	14.697	14.702	14.703	14.702	14.700	14.694	14.671	14.635	P 1
T C	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	48.597	46.968	45.504	43.179	42.491	41.788	44.481	47.627	52.796	BETA 2
BETA(PR) 1	57.515	55.674	55.867	56.609	58.749	60.153	61.241	62.518	64.193	BETA(PR) 1
BETA(PR) 2	24.067	27.476	26.446	27.082	31.157	35.667	40.182	45.533	48.466	BETA(PR) 2
V 1	192.55	208.99	210.08	212.19	205.48	204.17	202.52	194.00	181.75	V 1
V 2	290.28	282.72	292.74	303.71	298.99	290.97	276.53	255.31	248.33	V 2
VZ 1	192.51	208.94	210.05	212.18	205.22	203.35	201.19	192.62	180.56	VZ 1
VZ 2	191.97	192.92	205.89	221.47	270.40	216.72	196.97	171.78	149.96	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	217.72	206.66	208.09	207.82	201.89	193.69	193.44	188.31	197.54	V-THETA 2
V(PR) 1	358.5	370.6	374.4	385.5	395.7	409.0	418.8	418.0	415.3	V(PR) 1
V(PR) 2	210.3	217.5	230.0	248.7	257.7	267.1	258.3	245.7	226.5	V(PR) 2
VTHETA PR1	-302.4	-306.0	-309.9	-321.9	-338.2	-354.4	-366.6	-370.3	-373.4	VTHETA PR1
VTHETA PR2	-85.7	-100.3	-102.4	-113.2	-133.3	-155.5	-166.4	-175.0	-169.3	VTHETA PR2
U 1	302.36	306.00	309.86	321.90	338.19	354.39	366.59	370.30	373.40	U 1
U 2	303.46	306.98	310.50	321.66	335.15	349.23	359.79	363.31	366.83	U 2
M 1	0.1730	0.1879	0.1888	0.1907	0.1847	0.1835	0.1820	0.1743	0.1632	M 1
M 2	0.2591	0.2524	0.2616	0.2709	0.2666	0.2593	0.2462	0.2270	0.2207	M 2
M(PR) 1	0.322C	0.3331	0.3365	0.3466	0.3556	0.3676	0.3764	0.3756	0.3730	M(PR) 1
M(PR) 2	0.1677	0.1941	0.2055	0.2219	0.2298	0.2380	0.2299	0.2184	0.2013	M(PR) 2
TURN(PR)	33.445	28.194	29.416	29.527	27.576	24.439	20.991	16.921	15.661	TURN(PR)
UUBAR	0.1074	0.1337	0.1022	0.0738	0.0780	0.0857	0.1465	0.1828	0.2256	UUBAR
LOSS PARA	0.0284	0.0348	0.0272	0.0202	0.0215	0.0234	0.0388	0.0449	0.0530	LOSS PARA
DFAC	0.5897	0.5770	0.5509	0.5205	0.5124	0.5051	0.5421	0.5688	0.6216	DFAC
EFFP	0.9221	0.8899	0.9955	0.8569	0.8561	0.8222	0.7416	0.6759	0.6692	EFFP
EFF	0.9214	0.8889	0.9955	0.8555	0.8547	0.8205	0.7393	0.6732	0.6664	EFF
INCID	5.064	4.758	5.289	4.567	4.749	4.166	2.562	0.221	-3.954	INCID
DEVM	4.917	13.316	11.812	8.441	7.946	8.106	8.558	12.394	12.490	DEVM
P 1	14.647	14.697	14.702	14.703	14.702	14.700	14.694	14.671	14.635	P 1
P 2	15.645	15.615	15.676	15.741	15.746	15.726	15.657	15.560	15.532	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	529.412	528.894	528.335	530.634	530.713	531.004	531.550	531.766	532.048	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	48.907	46.747	44.646	43.237	42.026	41.691	45.331	49.090	55.327	BETA 2
BETA 2A	-0.150	1.480	1.560	1.650	1.150	1.100	1.300	1.841	2.461	BETA 2A
V 2	288.94	283.83	296.27	303.71	302.15	292.02	272.89	250.00	240.99	V 2
V 2A	219.78	211.88	210.93	240.95	251.34	248.69	222.98	205.81	202.42	V 2A
VZ 2	189.91	194.49	210.78	221.24	224.37	217.91	191.68	163.59	137.01	VZ 2
VZ 2A	219.77	211.80	210.84	240.82	251.21	248.50	222.74	205.52	202.02	VZ 2A
V-THETA 2	217.76	206.72	208.19	208.02	202.20	194.09	193.91	188.78	198.06	V-THETA 2
V-THETA 2A	-0.58	5.47	5.74	6.94	5.04	4.77	5.06	6.60	8.68	V-THETA 2A
M 2	0.2579	0.2534	0.2648	0.2709	0.2695	0.2603	0.2429	0.2222	0.2141	M 2
M 2A	0.1956	0.1866	0.1879	0.2144	0.2237	0.2212	0.1981	0.1827	0.1796	M 2A
TURN(PR)	49.057	45.266	43.084	41.580	40.857	40.555	43.982	47.198	52.813	TURN(PR)
UUBAR	0.0483	0.0516	0.1307	0.0655	0.0246	0.0236	0.0862	0.0287	-0.0041	UUBAR
LOSS PARA	0.0163	0.0176	0.0450	0.0233	0.0091	0.0091	0.0341	0.0115	-0.0017	LOSS PARA
DFAC	0.4940	0.4951	0.5235	0.4424	0.4106	0.3992	0.4586	0.4699	0.4790	DFAC
EFFP	0.8882	0.8864	0.7414	0.8283	0.9224	0.9166	0.7466	0.9128	1.0139	EFFP
INCID	-1.260	3.360	4.355	5.206	5.320	5.822	6.623	5.918	-3.874	INCID
DEVM	8.682	12.792	12.870	12.625	12.162	12.766	13.740	14.519	7.312	DEVM
P 2	15.645	15.615	15.676	15.741	15.746	15.726	15.657	15.560	15.532	P 2
P 2A	15.611	15.580	15.578	15.690	15.727	15.709	15.603	15.545	15.534	P 2A
T 2	529.412	528.894	528.335	530.634	530.713	531.004	531.550	531.766	532.048	T 2
T 2A	529.412	528.894	528.335	530.634	530.713	531.004	531.550	531.766	532.048	T 2A
UUBAR FS	0.0748	0.1093	0.1128	0.0588	0.0386	0.0495	0.2598	0.1900	0.1864	UUBAR FS
P2 FS	15.665	15.659	15.660	15.735	15.757	15.745	15.805	15.664	15.646	P2 FS
LOSS PARA FS	0.0252	0.0372	0.0388	0.0209	0.0142	0.0191	0.1027	0.0751	0.0772	LOSS PARA FS

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Table A-3. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 50.51 Equivalent Rotor Speed = 2186.35 Equivalent Weight Flow = 42.99
Uniform Inlet

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	164.90	164.90	164.90	164.90	164.90	164.90	164.90	164.90	164.90	V 0
V 1	177.57	186.23	184.05	185.12	179.70	173.43	169.68	162.36	153.83	V 1
VZ 0	164.90	164.90	164.90	164.90	164.89	164.87	164.86	164.86	164.90	VZ 0
VZ 1	177.57	186.23	184.05	185.12	179.69	173.40	169.64	162.32	153.79	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.1480	0.1460	0.1480	0.1480	0.1480	0.1480	0.1480	0.1480	0.1480	M 0
M 1	0.1594	0.1673	0.1653	0.1663	0.1614	0.1557	0.1523	0.1457	0.1381	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.3943	0.2286	0.2062	0.2151	0.2151	0.2241	0.2330	0.3271	0.4212	UUBAR
DFAC	-0.077	-0.129	-0.116	-0.123	-0.090	-0.052	-0.029	0.015	0.067	DFAC
EFFP	0.2890	0.5483	0.5455	0.5498	0.4678	0.3227	0.2020	-0.1038	-0.4500	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	14.748	14.748	14.748	14.748	14.748	14.748	14.748	14.748	14.748	P 0
P 1	14.659	14.696	14.701	14.699	14.699	14.697	14.695	14.674	14.653	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.L.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	51.696	51.179	48.668	47.696	47.307	48.022	52.319	56.194	59.530	BETA 2
BETA(PR) 1	59.929	57.841	57.965	58.744	60.958	62.984	64.163	65.307	66.562	BETA(PR) 1
BETA(PR) 2	21.620	28.403	28.184	27.671	31.798	35.983	43.365	47.281	48.397	BETA(PR) 2
V 1	177.93	195.54	197.04	198.54	191.05	184.36	181.57	174.26	165.57	V 1
V 2	299.27	278.99	285.60	298.62	294.84	288.98	267.43	257.83	260.36	V 2
VZ 1	177.90	195.50	197.02	198.53	190.81	183.62	180.37	173.02	164.49	VZ 1
VZ 2	165.49	174.89	188.61	200.99	199.86	193.12	163.27	143.29	131.91	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	234.84	217.36	214.45	220.85	216.65	214.64	211.39	214.00	224.20	V-THETA 2
V(PR) 1	355.0	367.3	371.4	382.6	393.2	404.6	414.4	414.7	414.0	V(PR) 1
V(PR) 2	199.5	198.8	214.0	227.0	235.3	239.0	225.0	211.6	199.0	V(PR) 2
VTHETA PR1	-507.2	-310.9	-314.9	-327.1	-343.6	-360.1	-372.5	-376.3	-379.4	VTHETA PR1
VTHETA PR2	-73.5	-94.6	-101.1	-105.4	-123.9	-140.2	-154.2	-155.2	-148.6	VTHETA PR2
U 1	307.24	310.94	314.86	327.10	343.65	360.12	372.51	376.28	379.43	U 1
U 2	308.36	311.94	315.51	326.25	340.56	354.87	365.60	369.18	372.75	U 2
M 1	0.1598	0.1757	0.1770	0.1784	0.1716	0.1656	0.1631	0.1565	0.1486	M 1
M 2	0.2669	0.2487	0.2548	0.2660	0.2626	0.2571	0.2376	0.2289	0.2311	M 2
M(PR) 1	0.3188	0.3300	0.3337	0.3436	0.3532	0.3634	0.3722	0.3723	0.3716	M(PR) 1
M(PR) 2	0.1780	0.1773	0.1909	0.2022	0.2095	0.2126	0.1999	0.1878	0.1766	M(PR) 2
TURN(PR)	38.305	29.434	29.778	31.072	29.146	26.959	20.743	17.973	18.129	TURN(PR)
UUBAR	0.1292	0.1584	0.1237	0.1085	0.1182	0.1458	0.2319	0.2625	0.2920	UUBAR
LOSS PARA	0.0348	0.0469	0.0324	0.0296	0.0324	0.0397	0.0585	0.0624	0.0687	LOSS PARA
DFAC	0.6299	0.6325	0.5955	0.5842	0.5783	0.5865	0.6326	0.6690	0.7095	DFAC
EFFP	0.9002	0.8384	0.9182	0.8180	0.8130	0.7708	0.6644	0.6460	0.6555	EFFP
EFF	0.8992	0.8369	0.9174	0.8161	0.8111	0.7685	0.6613	0.6428	0.6523	EFF
INCID	7.498	6.925	7.386	6.702	6.959	7.003	5.495	3.022	-1.575	INCID
DEVM	6.471	14.243	13.550	9.030	8.586	8.422	11.739	14.142	12.420	DEVM
P 1	14.659	14.696	14.701	14.699	14.699	14.697	14.695	14.674	14.653	P 1
P 2	15.747	15.664	15.704	15.787	15.797	15.789	15.671	15.633	15.647	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	530.621	530.094	529.459	531.800	531.999	532.664	533.238	533.420	533.748	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	52.045	50.923	47.932	47.762	46.759	47.906	53.457	58.236	62.898	BETA 2
BETA 2A	0.940	1.700	2.000	0.960	1.050	0.300	0.770	2.021	4.001	BETA 2A
V 2	297.69	280.09	289.03	298.62	297.94	290.02	263.92	252.47	252.63	V 2
V 2A	218.25	206.71	199.42	223.72	229.88	230.83	214.04	200.82	201.44	V 2A
VZ 2	183.21	176.56	193.65	200.72	204.05	194.30	157.05	132.84	115.04	VZ 2
VZ 2A	218.22	206.61	199.29	223.65	229.77	230.69	213.85	200.52	200.74	VZ 2A
V-THETA 2	234.88	217.43	214.56	221.06	216.98	215.09	211.91	214.54	224.80	V-THETA 2
V-THETA 2A	3.58	6.13	6.96	3.75	4.21	1.21	2.87	7.07	14.04	V-THETA 2A
M 2	0.2657	0.2497	0.2579	0.2660	0.2654	0.2580	0.2344	0.2241	0.2242	M 2
M 2A	0.1940	0.1838	0.1773	0.1987	0.2042	0.2049	0.1898	0.1779	0.1784	M 2A
TURN(PR)	51.105	49.223	45.930	46.795	45.690	47.570	52.639	56.169	58.852	TURN(PR)
UUBAR	0.0745	0.0272	0.1089	0.0993	0.0811	0.0815	0.0222	0.0299	0.0466	UUBAR
LOSS PARA	0.0251	0.0093	0.0374	0.0353	0.0300	0.0314	0.0088	0.0119	0.0188	LOSS PARA
DFAC	0.5290	0.5190	0.5576	0.5100	0.4937	0.4894	0.5045	0.5352	0.5413	DFAC
EFFP	0.6433	0.9419	0.7972	0.7795	0.8048	0.7834	0.9367	0.9203	0.8746	EFFP
INCID	1.878	7.536	7.641	9.731	10.053	12.037	14.751	15.069	3.705	INCID
DEVM	9.772	13.012	13.310	11.935	12.062	11.966	13.211	14.699	8.851	DEVM
P 2	15.747	15.664	15.704	15.767	15.797	15.769	15.671	15.633	15.647	P 2
P 2A	15.691	15.646	15.627	15.712	15.736	15.731	15.658	15.617	15.622	P 2A
T 2	530.621	530.094	529.459	531.800	531.999	532.664	533.238	533.420	533.748	T 2
T 2A	530.621	530.094	529.459	531.800	531.999	532.664	533.238	533.420	533.748	T 2A
UUBAR FS	0.0932	0.1312	0.1312	0.1170	0.1114	0.1200	0.2700	0.1828	0.1542	UUBAR FS
P2 FS	15.762	15.743	15.722	15.802	15.823	15.820	15.870	15.733	15.715	P2 FS
LOSS PARA FS	0.0314	0.0448	0.0450	0.0415	0.0412	0.0462	0.1070	0.0727	0.0622	LOSS PARA FS

Table A-4. Overall Performance - Stage E,
Radial Distortion

Equivalent Weight Flow, lb/sec	ROTOR			STAGE		
	$\overline{P}_2/\overline{P}_1$	η_{ad}	η_p	$\overline{P}_{2A}/\overline{P}_1$	η_{ad}	η_p

Hub Radial Distortion

100% Design Equivalent Rotor Speed

114.81	1.2498	0.8559	0.8604	1.2249	0.7755	0.7819
100.63	1.2843	0.8670	0.8717	1.2599	0.7976	0.8041
93.49	1.2940	0.8509	0.8562	1.2654	0.7737	0.7811

90% Design Equivalent Rotor Speed

104.66	1.1949	0.8266	0.8309	1.1786	0.7605	0.7660
92.29	1.2244	0.8345	0.8392	1.2089	0.7800	0.7858
82.24	1.2326	0.8244	0.8295	1.2092	0.7462	0.7529

70% Design Equivalent Rotor Speed

83.81	1.1200	0.8356	0.8382	1.1093	0.7627	0.7662
70.40	1.1360	0.8191	0.8223	1.1252	0.7561	0.7601
61.83	1.1421	0.8108	0.8143	1.1282	0.7343	0.7388

Tip Radial Distortion

100% Design Equivalent Rotor Speed

114.99	1.2400	0.8442	0.8489	1.2155	0.7629	0.7693
109.16	1.2699	0.8665	0.8710	1.2463	0.7954	0.8017
103.95	1.2827	0.8684	0.8729	1.2564	0.7930	0.7996

90% Design Equivalent Rotor Speed

105.22	1.1940	0.8121	0.8168	1.1743	0.7334	0.7394
99.16	1.2170	0.8465	0.8502	1.1988	0.7791	0.7847
94.04	1.2257	0.8524	0.8566	1.2072	0.7861	0.7918

70% Design Equivalent Rotor Speed

82.97	1.1153	0.8141	0.8170	1.1053	0.7454	0.7490
77.98	1.1299	0.8486	0.8512	1.1203	0.7876	0.7910
71.91	1.1324	0.8196	0.8227	1.1228	0.7618	0.7657

Table A-5. Blade Element Performance
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 100.80   Equivalent Rotor Speed = 4243.76   Equivalent Weight Flow = 114.81
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	421.40	421.40	421.40	421.40	421.40	421.40	421.40	421.40	421.40	V 0
V 1	386.74	406.28	387.29	383.76	503.69	590.13	583.76	572.15	519.82	V 1
VZ 0	421.40	421.40	421.40	421.39	421.37	421.33	421.29	421.29	421.29	VZ 0
VZ 1	386.74	406.28	387.28	383.76	503.65	590.03	583.61	571.99	519.68	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3829	0.3829	0.3829	0.3829	0.3829	0.3829	0.3829	0.3829	0.3829	M 0
M 1	0.3506	0.3688	0.3511	0.3479	0.4606	0.5440	0.5378	0.5265	0.4760	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.9797	1.8488	1.8983	1.9089	1.1840	0.4413	0.4965	0.5899	0.9251	UUBAR
DFAC	0.082	0.036	0.081	0.089	-0.195	-0.400	-0.385	-0.358	-0.234	DFAC
EFFP	-0.0627	-0.0383	-0.0856	-0.0942	0.2680	0.6975	0.6614	0.6001	0.3466	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	16.387	16.387	16.387	16.387	16.387	16.387	16.387	16.387	16.387	P 0
P 1	13.266	13.472	13.394	13.377	14.520	15.691	15.604	15.457	14.928	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	47.347	46.687	43.951	37.587	29.393	26.318	27.807	31.159	37.210	BETA 2
BETA(PR) 1	57.707	55.327	56.368	57.557	51.602	48.227	49.313	50.106	53.102	BETA(PR) 1
BETA(PR) 2	24.108	27.647	27.644	27.396	29.910	33.097	35.417	41.147	50.641	BETA(PR) 2
V 1	387.62	429.37	418.06	415.00	544.24	644.61	643.40	632.28	572.26	V 1
V 2	592.53	572.78	587.90	637.97	685.47	690.30	667.76	583.92	473.19	V 2
VZ 1	367.55	429.27	418.01	414.98	543.56	642.00	639.17	627.78	568.53	VZ 1
VZ 2	401.46	392.91	423.24	505.53	596.96	617.78	589.15	498.37	376.00	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	435.77	416.75	408.02	389.13	336.27	305.57	310.72	301.33	285.51	V-THETA 2
V(PR) 1	725.4	754.6	754.8	773.6	875.5	965.4	983.2	981.7	949.2	V(PR) 1
V(PR) 2	439.8	443.6	477.8	569.4	689.0	738.4	724.5	663.2	593.8	V(PR) 2
VTHETA PR1	-613.2	-620.6	-628.4	-652.8	-685.8	-718.7	-743.4	-751.0	-757.3	VTHETA PR1
VTHETA PR2	-179.6	-205.8	-221.7	-262.0	-343.4	-402.7	-418.9	-435.5	-458.4	VTHETA PR2
U 1	613.19	620.57	628.40	652.82	685.84	718.72	743.44	750.97	757.27	U 1
U 2	615.42	622.56	629.70	651.12	679.68	708.24	729.66	736.80	743.94	U 2
M 1	0.3515	0.3904	0.3798	0.3770	0.4995	0.5976	0.5964	0.5854	0.5266	M 1
M 2	0.5227	0.5048	0.5195	0.5661	0.6135	0.6199	0.5984	0.5191	0.4165	M 2
M(PR) 1	0.6577	0.6861	0.6857	0.7027	0.8035	0.8951	0.9114	0.9089	0.8734	M(PR) 1
M(PR) 2	0.3880	0.3909	0.4222	0.5052	0.6167	0.6631	0.6492	0.5896	0.5226	M(PR) 2
TURN(PR)	33.595	27.676	28.722	30.161	21.672	15.066	13.797	8.859	2.381	TURN(PR)
UUBAR	0.0997	0.1576	0.0836	-0.0734	-0.0379	0.0905	0.1289	0.2211	0.2719	UUBAR
LOSS PARA	0.0264	0.0409	0.0220	-0.0200	-0.0106	0.0255	0.0365	0.0584	0.0611	LOSS PARA
DFAC	0.5680	0.5744	0.5276	0.4185	0.3362	0.3408	0.3718	0.4311	0.4801	DFAC
EFFP	0.8994	0.8217	0.9110	1.0369	1.0066	0.8192	0.7965	0.6078	0.4849	EFFP
EFF	0.8956	0.8156	0.9077	1.0385	1.0068	0.8140	0.7909	0.5998	0.4763	EFF
INCID	5.276	4.411	5.790	5.515	-2.402	-7.776	-9.393	-12.225	-15.078	INCID
DEVM	8.959	13.487	13.010	8.755	6.699	5.537	3.796	8.009	14.666	DEVM
P 1	13.266	13.472	13.394	13.377	14.520	15.691	15.604	15.457	14.928	P 1
P 2	17.264	17.063	17.275	17.947	18.847	19.115	18.870	17.844	16.784	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	563.973	563.121	561.790	562.451	558.559	555.665	555.287	554.916	555.774	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	47.726	46.407	43.141	37.635	28.939	26.207	28.432	32.157	38.821	BETA 2
BETA 2A	-0.800	1.440	2.150	1.380	-0.200	0.200	1.230	1.000	-1.000	BETA 2A
V 2	569.04	575.62	597.02	637.97	696.38	694.06	655.07	568.35	457.23	V 2
V 2A	457.11	445.31	450.55	546.18	629.62	632.07	561.04	524.54	508.21	V 2A
VZ 2	396.23	396.90	435.62	505.14	609.12	622.08	575.27	480.52	355.78	VZ 2
VZ 2A	457.07	445.16	450.21	545.95	629.41	631.70	560.46	524.00	507.59	VZ 2A
V-THETA 2	435.85	416.89	408.22	389.50	336.79	306.20	311.47	302.09	286.27	V-THETA 2
V-THETA 2A	-6.38	11.19	16.90	13.15	-2.20	2.21	12.04	9.15	-8.86	V-THETA 2A
M 2	0.5194	0.5074	0.5280	0.5661	0.6240	0.6235	0.5862	0.5046	0.4020	M 2
M 2A	0.3989	0.3885	0.3937	0.4805	0.5603	0.5641	0.4976	0.4639	0.4485	M 2A
TURN(PR)	48.526	44.966	40.989	36.248	29.123	25.978	27.161	31.109	39.762	TURN(PR)
UUBAR	0.0561	0.0191	0.0769	0.0134	-0.0028	0.0660	0.2460	0.1093	-0.3229	UUBAR
LOSS PARA	0.0189	0.0065	0.0265	0.0047	-0.0010	0.0254	0.0975	0.0437	-0.1303	LOSS PARA
DFAC	0.4769	0.4665	0.4712	0.3540	0.2767	0.2587	0.3257	0.2845	0.1502	DFAC
EFFP	0.8725	0.9570	0.8387	0.9560	1.0132	0.6674	0.1749	0.3315	-0.2515	EFFP
INCID	-2.441	3.019	2.850	-0.396	-7.764	-9.655	-10.268	-11.011	-20.382	INCID
DEVM	8.032	12.752	13.460	12.355	10.812	11.866	13.670	13.680	3.855	DEVM
P 2	17.264	17.063	17.275	17.947	18.847	19.115	18.870	17.844	16.784	P 2
P 2A	17.101	17.010	17.045	17.900	18.860	18.824	17.906	17.532	17.355	P 2A
T 2	563.973	563.121	561.790	562.451	558.559	555.665	555.287	554.916	555.774	T 2
T 2A	563.973	563.121	561.790	562.451	558.559	555.665	555.287	554.916	555.774	T 2A
UUBAR FS	0.0780	0.1198	0.1310	0.0566	0.0623	0.0282	0.2559	0.2735	0.2501	UUBAR FS
P2 FS	17.332	17.377	17.460	18.107	19.150	18.943	18.921	18.486	18.135	P2 FS
LOSS PARA FS	0.0262	0.0407	0.0451	0.0198	0.0222	0.0108	0.1014	0.1093	0.1009	LOSS PARA FS

Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 99.60 Equivalent Rotor Speed = 4193.36 Equivalent Weight Flow = 100.63
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	376.25	376.25	376.25	376.25	376.25	376.25	376.25	376.25	376.25	V 0
V 1	341.74	345.39	341.86	338.91	430.21	506.89	498.77	491.94	448.38	V 1
VZ 0	376.25	376.25	376.25	376.24	376.22	376.19	376.15	376.15	376.15	VZ 0
VZ 1	341.74	345.39	341.86	338.90	430.18	506.81	498.64	491.81	448.26	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3409	0.3409	0.3409	0.3409	0.3409	0.3409	0.3409	0.3409	0.3409	M 0
M 1	0.3090	0.3124	0.3091	0.3064	0.3912	0.4637	0.4559	0.4494	0.4082	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.6638	1.5802	1.5661	1.5846	1.0517	0.3911	0.4475	0.4985	0.8095	UUBAR
DFAC	0.092	0.082	0.091	0.099	-0.143	-0.347	-0.326	-0.307	-0.192	DFAC
EFFP	-0.1152	-0.1087	-0.1233	-0.1328	0.2285	0.6857	0.6385	0.5970	0.3472	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.838	15.838	15.838	15.838	15.838	15.838	15.838	15.838	15.838	P 0
P 1	13.802	13.905	13.922	13.899	14.551	15.360	15.291	15.228	14.848	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	55.846	56.268	55.000	48.376	37.710	31.802	33.054	36.351	41.855	BETA 2
BETA(PR) 1	60.527	59.304	59.347	60.464	55.751	52.465	53.693	54.269	56.972	BETA(PR) 1
BETA(PR) 2	18.590	26.198	29.094	27.349	31.424	32.808	36.991	40.234	48.076	BETA(PR) 2
V 1	342.49	364.11	368.04	365.52	461.99	547.85	543.33	537.66	489.65	V 1
V 2	598.34	556.79	546.62	589.69	613.55	652.01	614.06	572.73	492.13	V 2
VZ 1	342.43	364.03	368.00	365.50	461.42	545.64	539.76	533.83	486.46	VZ 1
VZ 2	335.91	309.18	313.52	391.69	485.21	553.34	513.50	460.20	365.83	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	495.13	463.04	447.76	440.79	375.15	343.12	334.17	338.69	327.73	V-THETA 2
V(PR) 1	696.0	713.2	721.8	741.4	820.2	896.9	913.7	916.4	.894.2	V(PR) 1
V(PR) 2	354.4	344.6	358.8	441.0	568.9	659.3	644.2	604.1	548.4	V(PR) 2
VTHETA PR1	-605.9	-613.2	-620.9	-645.1	-677.7	-710.2	-734.6	-742.1	-748.3	VTHETA PR1
VTHETA PR2	-113.0	-152.1	-174.5	-202.6	-296.5	-356.7	-386.8	-389.4	-407.4	VTHETA PR2
U 1	605.91	613.20	620.94	645.07	677.70	710.18	734.61	742.05	748.27	U 1
U 2	608.11	615.17	622.22	643.39	671.61	699.83	720.99	728.05	735.10	U 2
M 1	0.3097	0.3297	0.3333	0.3310	0.4211	0.5030	0.4986	0.4931	0.4473	M 1
M 2	0.5248	0.4878	0.4794	0.5189	0.5430	0.5807	0.5451	0.5065	0.4319	M 2
M(PR) 1	0.6294	0.6457	0.6537	0.6713	0.7475	0.8235	0.8385	0.8405	0.8168	M(PR) 1
M(PR) 2	0.3109	0.3019	0.3147	0.3881	0.5035	0.5871	0.5718	0.5342	0.4813	M(PR) 2
TURN(PR)	41.934	33.102	30.251	33.114	24.309	19.596	16.611	13.942	8.826	TURN(PR)
UUBAR	0.1541	0.2022	0.1882	0.0778	0.0291	0.0386	0.0817	0.1482	0.1908	UUBAR
LOSS PARA	0.0423	0.0532	0.0488	0.0213	0.0080	0.0109	0.0227	0.0397	0.0452	LOSS PARA
DFAC	0.6972	0.7075	0.6873	0.5879	0.4531	0.3927	0.4207	0.4691	0.5154	DFAC
EFFP	0.8550	0.8018	0.8253	0.9249	0.9258	0.9163	0.8657	0.7921	0.7005	EFFP
EFF	0.8490	0.7945	0.8190	0.9218	0.9230	0.9134	0.8613	0.7858	0.6923	EFF
INCID	8.097	8.388	8.769	8.422	1.749	-3.535	-5.006	-8.054	-11.199	INCID
DEVM	3.440	12.038	14.460	8.709	8.213	5.249	5.369	7.096	12.099	DEVM
P 1	13.802	13.905	13.922	13.899	14.551	15.360	15.291	15.228	14.848	P 1
P 2	18.367	17.947	17.903	18.469	18.927	19.639	19.240	18.777	17.952	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	570.668	568.079	565.894	566.311	562.546	560.010	559.558	559.410	560.465	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	56.364	55.684	53.872	48.443	37.170	31.679	33.769	37.556	43.799	BETA 2
BETA 2A	-0.150	-0.000	-1.330	-1.300	2.400	1.370	1.331	0.950	-1.901	BETA 2A
V 2	594.80	559.49	554.65	589.69	622.14	655.31	603.36	557.72	475.28	V 2
V 2A	408.05	380.73	366.20	446.84	498.10	565.89	504.39	477.83	465.94	V 2A
VZ 2	329.47	313.80	327.01	391.14	495.55	557.16	500.96	441.61	342.67	VZ 2
VZ 2A	408.05	380.72	366.09	446.67	497.50	565.40	503.84	477.34	465.19	VZ 2A
V-THETA 2	495.22	463.20	447.98	441.21	375.73	343.82	334.97	339.55	328.60	V-THETA 2
V-THETA 2A	-1.07	-0.00	-8.50	-10.14	20.85	13.52	11.70	7.92	-15.44	V-THETA 2A
M 2	0.5216	0.4902	0.4868	0.5189	0.5511	0.5838	0.5350	0.4926	0.4166	M 2
M 2A	0.3528	0.3294	0.3172	0.3888	0.4365	0.4999	0.4434	0.4193	0.4081	M 2A
TURN(PR)	56.514	55.683	55.201	49.736	34.752	30.277	32.394	36.554	45.638	TURN(PR)
UUBAR	0.1505	0.0876	0.1107	0.0950	0.0855	0.0690	0.1721	0.1371	-0.1496	UUBAR
LOSS PARA	0.0507	0.0298	0.0381	0.0337	0.0316	0.0266	0.0682	0.0549	-0.0602	LOSS PARA
DFAC	0.5951	0.6016	0.6233	0.5148	0.4113	0.3315	0.3775	0.3824	0.3131	DFAC
EFFP	0.7404	0.8502	0.8192	0.7976	0.7871	0.7620	0.4827	0.5282	4.5327	EFFP
INCID	6.197	12.496	13.582	10.412	0.464	-4.187	-4.935	-5.615	-15.406	INCID
DEVM	8.682	11.312	9.980	9.675	13.412	13.036	13.771	13.638	2.955	DEVM
P 2	18.367	17.947	17.903	18.469	18.927	19.639	19.240	18.777	17.952	P 2
P 2A	17.899	17.708	17.607	18.175	18.626	19.360	18.654	18.383	18.254	P 2A
T 2	570.668	568.079	565.894	566.311	562.546	560.010	559.558	559.410	560.465	T 2
T 2A	570.668	568.079	565.894	566.311	562.546	560.010	559.558	559.410	560.465	T 2A
UUBAR FS	0.1300	0.1691	0.1697	0.1304	0.1297	0.0413	0.2365	0.2528	0.2335	UUBAR FS
P2 FS	18.293	18.212	18.094	18.595	19.107	19.522	19.527	19.220	18.962	P2 FS
LOSS PARA FS	0.0437	0.0575	0.0584	0.0462	0.0479	0.0159	0.0937	0.1012	0.0941	LOSS PARA FS

Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 99.65 Equivalent Rotor Speed = 4195.38 Equivalent Weight Flow = 93.49
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	351.53	351.53	351.53	351.53	351.53	351.53	351.53	351.53	351.53	V 0
V 1	318.88	304.44	303.33	303.18	390.44	462.05	459.13	452.12	411.01	V 1
VZ 0	351.53	351.53	351.53	351.53	351.53	351.47	351.44	351.44	351.44	VZ 0
VZ 1	318.87	304.44	303.33	303.18	390.41	461.97	459.02	452.00	410.90	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3180	0.3180	0.3180	0.3180	0.3180	0.3180	0.3180	0.3180	0.3180	M 0
M 1	0.2880	0.2747	0.2737	0.2736	0.3541	0.4211	0.4184	0.4118	0.3732	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.5271	1.5301	1.5090	1.5271	0.9923	0.3760	0.4243	0.4836	0.7781	UUBAR
DFAC	0.093	0.134	0.137	0.138	-0.111	-0.314	-0.306	-0.286	-0.169	DFAC
EFFP	-0.1296	-0.1925	-0.2011	-0.1987	0.1925	0.6681	0.6333	0.5835	0.3292	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.636	15.636	15.636	15.636	15.636	15.636	15.636	15.636	15.636	P 0
P 1	14.019	14.016	14.039	14.019	14.585	15.238	15.187	15.124	14.812	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR-L.E., ROTOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	57.995	58.628	58.195	52.772	43.929	34.597	35.220	38.544	41.751	BETA 2
BETA(PR) 1	62.208	62.419	62.313	63.169	58.361	55.118	56.048	56.650	59.300	BETA(PR) 1
BETA(PR) 2	19.634	26.473	28.557	26.650	32.656	33.017	36.727	39.207	46.503	BETA(PR) 2
V 1	319.57	320.55	326.01	326.47	418.28	497.34	498.13	492.00	447.43	V 1
V 2	566.66	552.96	547.68	585.27	581.77	635.79	609.41	578.84	507.47	V 2
VZ 1	319.51	320.47	325.97	326.45	417.76	495.33	494.85	488.59	444.51	VZ 1
VZ 2	310.92	287.86	288.64	354.08	418.86	522.67	496.77	451.73	377.84	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	497.48	472.11	465.44	466.00	403.49	360.52	350.70	359.89	337.25	V-THETA 2
V(PR) 1	685.3	692.2	701.6	723.3	796.7	867.3	887.9	890.7	872.2	V(PR) 1
V(PR) 2	330.1	321.6	328.6	396.2	497.7	624.2	621.1	584.2	549.9	V(PR) 2
VTHETA PR1	-606.2	-613.5	-621.2	-645.4	-678.0	-710.5	-735.0	-742.4	-748.6	VTHETA PR1
VTHETA PR2	-110.9	-143.3	-157.1	-177.7	-268.4	-339.6	-370.6	-368.5	-398.2	VTHETA PR2
U 1	606.20	613.49	621.24	645.38	678.03	710.52	734.97	742.41	748.64	U 1
U 2	608.40	615.46	622.52	643.70	671.93	700.17	721.34	728.40	735.46	U 2
M 1	0.2886	0.2895	0.2945	0.2949	0.3800	0.4546	0.4553	0.4496	0.4074	M 1
M 2	0.5136	0.4840	0.4798	0.5136	0.5122	0.5639	0.5393	0.5109	0.4449	M 2
M(PR) 1	0.6189	0.6252	0.6338	0.6534	0.7238	0.7927	0.8116	0.8138	0.7940	M(PR) 1
M(PR) 2	0.2890	0.2815	0.2879	0.3476	0.4382	0.5536	0.5497	0.5157	0.4821	M(PR) 2
TURN(PR)	42.570	35.942	33.755	36.518	25.689	22.044	19.235	17.356	12.734	TURN(PR)
UUBAR	0.1893	0.2043	0.2001	0.1197	0.1166	0.0478	0.0759	0.1400	0.1538	UUBAR
LOSS PARA	0.0516	0.0536	0.0522	0.0329	0.0316	0.0135	0.0211	0.0380	0.0375	LOSS PARA
DFAC	0.7289	0.7358	0.7288	0.6502	0.5376	0.4191	0.4363	0.4844	0.5053	DFAC
EFFP	0.8221	0.8186	0.8407	0.9000	0.8565	0.8985	0.8718	0.8248	0.7475	EFFP
EFF	0.8149	0.8117	0.8346	0.8958	0.8512	0.8948	0.8672	0.8189	0.7398	EFF
INCID	9.777	11.503	11.735	11.126	4.360	-0.878	-2.647	-5.667	-8.865	INCID
DEVM	4.485	12.313	13.923	8.010	9.444	5.458	5.105	6.070	10.526	DEVM
P 1	14.019	14.016	14.039	14.019	14.585	15.238	15.187	15.124	14.812	P 1
P 2	18.547	18.238	18.254	18.760	18.856	19.686	19.420	19.063	18.345	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	571.689	568.633	567.122	568.949	565.089	562.711	562.226	562.008	562.889	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	56.550	58.210	56.926	52.849	43.290	34.466	35.992	39.860	43.708	BETA 2
BETA 2A	0.320	-2.000	-4.130	-4.550	2.700	2.851	1.791	1.821	-0.200	BETA 2A
V 2	583.25	555.63	555.72	585.27	589.35	638.91	598.88	563.57	489.90	V 2
V 2A	394.23	364.50	353.19	429.04	461.14	530.64	505.04	475.00	460.54	V 2A
VZ 2	304.32	292.70	303.27	353.42	428.97	526.30	484.00	432.13	353.75	VZ 2
VZ 2A	394.22	364.27	352.25	427.63	460.47	529.67	504.38	474.34	460.05	VZ 2A
V-THETA 2	497.57	472.27	465.66	466.44	404.10	361.26	351.55	360.80	338.15	V-THETA 2
V-THETA 2A	2.20	-12.72	-25.43	-34.03	21.72	26.37	15.77	15.08	-1.61	V-THETA 2A
M 2	0.5104	0.4864	0.4872	0.5136	0.5194	0.5668	0.5295	0.4968	0.4289	M 2
M 2A	0.3402	0.3149	0.3053	0.3720	0.4021	0.4661	0.4429	0.4157	0.4023	M 2A
TURN(PR)	58.229	60.209	61.054	57.392	40.572	31.584	34.156	37.988	43.849	TURN(PR)
UUBAR	0.1631	0.1433	0.1747	0.1629	0.1162	0.1181	0.1438	0.1443	-0.0733	UUBAR
LOSS PARA	0.0549	0.0488	0.0600	0.0577	0.0430	0.0454	0.0569	0.0577	-0.0296	LOSS PARA
DFAC	0.6102	0.6414	0.6689	0.5713	0.4588	0.3724	0.3801	0.4040	0.3412	DFAC
EFFP	0.7244	0.7675	0.7285	0.6777	0.7282	0.6612	0.5500	0.5443	1.5803	EFFP
INCID	8.382	14.822	16.635	14.819	6.584	-1.400	-2.713	-3.312	-15.496	INCID
DEVM	9.152	9.312	7.180	6.426	13.711	14.515	14.230	14.499	4.654	DEVM
P 2	18.547	18.238	18.254	18.760	18.856	19.686	19.420	19.063	18.345	P 2
P 2A	18.054	17.848	17.777	18.257	18.487	19.230	18.934	18.636	18.505	P 2A
T 2	571.689	568.633	567.122	568.949	565.089	562.711	562.226	562.008	562.889	T 2
T 2A	571.689	568.633	567.122	568.949	565.089	562.711	562.226	562.008	562.889	T 2A
UUBAR FS	0.1613	0.2148	0.2323	0.1861	0.1583	0.0810	0.1821	0.2080	0.2039	UUBAR FS
P2 FS	18.540	18.486	18.460	18.848	19.013	19.529	19.577	19.300	19.104	P2 FS
LOSS PARA FS	0.0543	0.0731	0.0797	0.0659	0.0586	0.0311	0.0720	0.0831	0.0823	LOSS PARA

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Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 89.63 Equivalent Rotor Speed = 3773.22 Equivalent Weight Flow = 104.66
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	389.75	389.75	389.75	389.75	389.75	389.75	389.75	389.75	389.75	V 0
V 1	357.97	376.40	371.70	349.99	436.31	520.74	516.95	508.64	450.96	V 1
VZ 0	389.75	389.75	389.75	389.74	389.72	389.68	389.65	389.64	389.65	VZ 0
VZ 1	357.97	376.40	371.70	349.98	436.27	520.65	516.82	508.50	450.84	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3534	0.3534	0.3534	0.3534	0.3534	0.3534	0.3534	0.3534	0.3534	M 0
M 1	0.3240	0.3410	0.3367	0.3166	0.3969	0.4769	0.4733	0.4653	0.4107	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.7060	1.6278	1.6402	1.6361	1.0767	0.4006	0.4540	0.5067	0.8653	UUBAR
DFAC	0.082	0.034	0.046	0.102	-0.119	-0.336	-0.326	-0.305	-0.157	DFAC
EFFP	-0.0985	-0.0424	-0.0573	-0.1314	0.1922	0.6729	0.6364	0.5915	0.2859	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.969	15.969	15.969	15.969	15.969	15.969	15.969	15.969	15.969	P 0
P 1	13.715	13.819	13.802	13.808	14.547	15.440	15.369	15.300	14.826	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	46.997	45.380	43.635	37.829	29.178	25.329	26.221	28.633	32.841	BETA 2
BETA(PR) 1	56.658	54.251	54.348	56.949	52.486	48.706	49.700	50.369	53.989	BETA(PR) 1
BETA(PR) 2	22.228	26.544	26.169	27.887	30.630	33.287	36.779	40.059	48.500	BETA(PR) 2
V 1	358.77	397.28	400.83	377.69	468.74	563.56	564.30	556.95	492.59	V 1
V 2	541.77	520.91	535.42	561.38	601.88	617.60	584.72	539.70	444.46	V 2
VZ 1	358.70	397.19	400.78	377.67	468.16	561.28	560.59	552.98	489.38	VZ 1
VZ 2	369.49	365.88	387.50	443.39	525.27	557.34	523.18	472.39	372.49	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	396.19	370.76	369.46	344.29	293.30	263.79	257.68	257.90	240.43	V-THETA 2
V(PR) 1	652.7	679.9	687.6	692.5	769.1	852.0	869.1	869.5	834.3	V(PR) 1
V(PR) 2	399.2	409.0	431.8	501.7	610.7	667.6	654.6	618.5	563.0	V(PR) 2
VTHETA PR1	-545.2	-551.8	-558.7	-580.4	-609.8	-639.0	-661.0	-667.7	-673.3	VTHETA PR1
VTHETA PR2	-151.0	-182.8	-190.4	-234.6	-311.0	-365.9	-391.1	-397.2	-421.0	VTHETA PR2
U 1	545.20	551.76	558.72	580.44	609.80	639.03	661.01	667.70	673.30	U 1
U 2	547.18	553.53	559.88	578.93	604.32	629.71	648.76	655.11	661.45	U 2
M 1	0.3247	0.3604	0.3637	0.3422	0.4274	0.5182	0.5189	0.5117	0.4501	M 1
M 2	0.4793	0.4604	0.4745	0.4980	0.5377	0.5538	0.5230	0.4810	0.3931	M 2
M(PR) 1	0.5907	0.6168	0.6240	0.6275	0.7014	0.7834	0.7991	0.7989	0.7622	M(PR) 1
M(PR) 2	0.3531	0.3615	0.3826	0.4450	0.5456	0.5986	0.5855	0.5512	0.4979	M(PR) 2
TURN(PR)	34.427	27.703	28.176	29.061	21.836	15.355	12.824	10.211	5.412	TURN(PR)
UUBAR	0.1391	0.1645	0.1152	-0.0106	-0.0427	0.0529	0.0940	0.1598	0.1939	UUBAR
LOSS PARA	0.0373	0.0432	0.0307	-0.0029	-0.0118	0.0149	0.0261	0.0429	0.0455	LOSS PARA
DFAC	0.5645	0.5586	0.5318	0.4283	0.3282	0.3198	0.3488	0.3917	0.4263	DFAC
EFFP	0.8431	0.7744	0.8636	0.9242	0.9544	0.8162	0.7648	0.6630	0.5627	EFFP
EFF	0.8385	0.7684	0.8597	0.9218	0.9530	0.8119	0.7598	0.6568	0.5558	EFF
INCID	4.227	3.335	3.769	4.907	-1.517	-7.296	-9.006	-11.961	-14.189	INCID
DEVM	7.078	12.384	11.536	9.247	7.419	5.727	5.156	6.921	12.524	DEVM
P 1	13.715	13.819	13.802	13.808	14.547	15.440	15.369	15.300	14.826	P 1
P 2	16.845	16.628	16.824	17.193	17.867	18.193	17.856	17.389	16.552	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	556.119	555.356	553.806	555.081	551.627	549.361	548.587	548.112	548.525	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	47.346	45.127	42.880	37.877	28.791	25.238	26.742	29.490	34.173	BETA 2
BETA 2A	-0.900	1.500	2.250	1.500	0.200	0.600	2.001	1.250	-1.701	BETA 2A
V 2	538.79	523.35	543.25	561.38	610.24	620.58	574.84	525.98	429.79	V 2
V 2A	424.58	417.40	417.86	489.86	560.71	579.91	517.01	487.32	472.79	V 2A
VZ 2	365.06	369.24	398.07	443.05	534.53	560.76	512.64	457.18	355.08	VZ 2
VZ 2A	424.52	417.25	417.52	489.62	560.52	579.54	516.28	486.78	472.08	VZ 2A
V-THETA 2	396.26	370.88	369.65	344.61	293.75	264.33	258.30	258.56	241.07	V-THETA 2
V-THETA 2A	-6.67	10.92	16.40	12.82	1.96	6.07	18.03	10.62	-14.02	V-THETA 2A
M 2	0.4765	0.4626	0.4817	0.4980	0.5456	0.5566	0.5137	0.4682	0.3797	M 2
M 2A	0.3723	0.3661	0.3671	0.4320	0.4990	0.5181	0.4597	0.4325	0.4190	M 2A
TURN(PR)	48.246	43.627	40.628	36.370	28.575	24.611	24.703	28.195	35.817	TURN(PR)
UUBAR	0.0766	0.0153	0.0911	0.0004	-0.0040	0.0485	0.1925	0.1560	-0.2045	UUBAR
LOSS PARA	0.0258	0.0052	0.0313	0.0001	-0.0015	0.0187	0.0762	0.0624	-0.0825	LOSS PARA
DFAC	0.4639	0.4368	0.4549	0.3379	0.2588	0.2265	0.2672	0.2632	0.1406	DFAC
EFFP	0.8143	0.9613	0.7951	0.9985	1.0226	0.6625	0.0823	-0.0152	0.0980	EFFP
INCID	-2.821	1.740	2.589	-0.154	-7.912	-10.622	-11.956	-13.674	-25.027	INCID
DEVM	7.932	12.812	13.560	12.475	11.212	12.266	14.440	13.929	3.155	DEVM
P 2	16.845	16.628	16.824	17.193	17.867	18.193	17.856	17.389	16.552	P 2
P 2A	16.659	16.593	16.599	17.192	17.880	18.026	17.290	17.010	16.872	P 2A
T 2	556.119	555.356	553.806	555.081	551.627	549.361	548.587	548.112	548.525	T 2
T 2A	556.119	555.356	553.806	555.081	551.627	549.361	548.587	548.112	548.525	T 2A
UUBAR FS	0.0800	0.1123	0.0980	0.0533	0.0623	0.0341	0.2602	0.2853	0.2882	UUBAR FS
P2 FS	16.853	16.875	16.843	17.343	18.098	18.142	18.125	17.826	17.636	P2 FS
LOSS PARA FS	0.0269	0.0381	0.0336	0.0133	0.0233	0.0131	0.1030	0.1141	0.1163	LOSS PARA F

Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 89.44   Equivalent Rotor Speed = 3765.60   Equivalent Weight Flow = 92.29
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	347.22	347.22	347.22	347.22	347.22	347.22	347.22	347.22	347.22	V 0
V 1	287.42	300.45	301.64	295.70	371.16	450.62	438.21	435.24	395.63	V 1
VZ 0	347.22	347.22	347.22	347.21	347.19	347.16	347.13	347.12	347.13	VZ 0
VZ 1	287.42	300.45	301.64	295.69	371.14	450.54	438.10	435.12	395.53	VZ 1
V-THETA 0	-0.00	-8.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3141	0.3141	0.3141	0.3141	0.3141	0.3141	0.3141	0.3141	0.3141	M 0
M 1	0.2592	0.2711	0.2722	0.2667	0.3362	0.4104	0.3987	0.3959	0.3589	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.5798	1.5201	1.5057	1.5181	0.9846	0.3749	0.4263	0.4830	0.7765	UUBAR
DFAC	0.172	0.135	0.131	0.148	-0.069	-0.298	-0.262	-0.254	-0.139	DFAC
EFFP	-0.2445	-0.1954	-0.1921	-0.2179	0.1279	0.6547	0.5914	0.5501	0.2816	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.609	15.609	15.609	15.609	15.609	15.609	15.609	15.609	15.609	P 0
P 1	13.979	14.041	14.056	14.043	14.593	15.222	15.171	15.111	14.808	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	54.594	54.713	53.323	47.177	37.397	31.909	33.088	36.102	41.115	BETA 2
BETA(PR) 1	62.109	60.131	59.830	61.213	56.902	52.883	54.446	54.822	57.539	BETA(PR) 1
BETA(PR) 2	18.675	25.248	27.275	27.091	31.860	33.450	38.013	41.117	48.446	BETA(PR) 2
V 1	288.03	316.31	324.17	318.31	397.18	484.57	474.60	473.05	430.23	V 1
V 2	540.21	507.42	503.39	534.40	547.95	577.70	540.41	506.24	438.78	V 2
VZ 1	287.98	316.23	324.13	318.29	396.69	482.61	471.48	469.69	427.43	VZ 1
VZ 2	312.98	293.12	300.68	363.24	435.15	489.71	451.74	408.07	329.90	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	440.30	414.18	403.72	391.95	332.66	304.92	294.35	297.59	287.94	V-THETA 2
V(PR) 1	615.6	635.0	645.0	661.0	726.7	800.9	812.7	817.2	797.9	V(PR) 1
V(PR) 2	330.4	324.1	338.3	408.0	512.6	587.7	574.5	542.8	490.1	V(PR) 2
VTHETA PR1	-544.1	-550.6	-557.6	-579.3	-608.6	-637.7	-659.7	-666.4	-671.9	VTHETA PR1
VTHETA PR2	-105.8	-138.2	-155.0	-185.8	-270.4	-323.5	-353.1	-356.2	-372.2	VTHETA PR2
U 1	544.10	550.65	557.60	579.27	608.57	637.76	659.68	666.36	671.94	U 1
U 2	546.08	552.41	558.75	577.76	603.10	628.64	647.45	653.78	660.12	U 2
M 1	0.2597	0.2856	0.2928	0.2875	0.3603	0.4424	0.4330	0.4315	0.3912	M 1
M 2	0.4756	0.4462	0.4432	0.4714	0.4854	0.5141	0.4793	0.4479	0.3861	M 2
M(PR) 1	0.5551	0.5734	0.5826	0.5969	0.6593	0.7313	0.7414	0.7455	0.7255	M(PR) 1
M(PR) 2	0.2909	0.2850	0.2979	0.3599	0.4540	0.5230	0.5096	0.4802	0.4383	M(PR) 2
TURN(PR)	43.431	34.880	32.553	34.121	25.025	19.373	16.345	13.613	9.025	TURN(PR)
UUBAR	0.1374	0.1704	0.1515	0.0466	0.0175	0.0420	0.0833	0.1396	0.1737	UUBAR
LOSS PARA	0.0377	0.0452	0.0400	0.0128	0.0048	0.0118	0.0228	0.0369	0.0408	LOSS PARA
DFAC	0.6709	0.6812	0.6615	0.5649	0.4414	0.3933	0.4176	0.4623	0.5024	DFAC
EFFP	0.8462	0.8013	0.8356	0.9057	0.8961	0.8678	0.8047	0.7476	0.6784	EFFP
EFF	0.8410	0.7952	0.8305	0.9025	0.8928	0.8640	0.7996	0.7416	0.6713	EFF
INCID	9.678	9.216	9.252	9.170	2.901	-3.116	-4.252	-7.500	-10.631	INCID
DEVM	3.525	11.088	12.642	8.450	8.649	5.890	6.389	7.979	12.469	DEVM
P 1	13.979	14.041	14.056	14.043	14.593	15.222	15.171	15.111	14.808	P 1
P 2	17.655	17.373	17.389	17.767	18.072	18.521	18.196	17.867	17.278	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	561.235	559.622	557.853	558.655	555.296	553.311	553.292	553.002	553.514	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	55.069	54.368	52.305	47.242	36.910	31.802	33.748	37.214	42.926	BETA 2
BETA 2A	1.000	0.800	-0.500	0.300	1.900	1.400	1.200	0.900	-2.651	BETA 2A
V 2	537.14	509.77	510.48	534.40	555.01	580.33	531.77	493.88	424.38	V 2
V 2A	376.72	353.28	340.46	407.82	458.60	510.07	456.67	426.39	414.80	V 2A
VZ 2	307.56	296.97	312.13	362.76	443.59	492.76	441.63	392.85	310.40	VZ 2
VZ 2A	376.66	353.24	340.44	407.75	458.19	509.62	456.20	425.96	413.92	VZ 2A
V-THETA 2	440.37	414.32	403.92	392.32	333.17	305.55	295.06	298.34	288.70	V-THETA 2
V-THETA 2A	6.57	4.93	-2.97	2.14	15.20	12.46	9.56	6.69	-19.16	V-THETA 2A
M 2	0.4727	0.4483	0.4497	0.4714	0.4919	0.5165	0.4713	0.4365	0.3731	M 2
M 2A	0.3279	0.3075	0.2966	0.3564	0.4034	0.4513	0.4024	0.3750	0.3644	M 2A
TURN(PR)	54.069	53.567	52.803	46.935	34.992	30.370	32.502	36.263	45.515	TURN(PR)
UUBAR	0.1314	0.0897	0.1311	0.0962	0.0547	0.0421	0.1257	0.1110	-0.1550	UUBAR
LOSS PARA	0.0443	0.0305	0.0451	0.0342	0.0203	0.0162	0.0498	0.0444	-0.0625	LOSS PARA
DFAC	0.5708	0.5806	0.6077	0.4969	0.3866	0.3165	0.3552	0.3742	0.3166	DFAC
EFFP	0.7605	0.8394	0.7797	0.7877	0.8428	0.8337	0.5588	0.5944	4.2472	EFFP
INCID	4.902	10.980	12.014	9.211	0.204	-4.063	-4.957	-5.957	-16.278	INCID
DEVM	9.832	12.112	10.810	11.275	12.912	13.066	13.640	13.579	2.206	DEVM
P 2	17.655	17.373	17.389	17.767	18.072	18.521	18.196	17.867	17.278	P 2
P 2A	17.325	17.172	17.094	17.526	17.921	18.392	17.874	17.624	17.523	P 2A
T 2	561.235	559.622	557.853	558.655	555.296	553.311	553.292	553.002	553.514	T 2
T 2A	561.235	559.622	557.853	558.655	555.296	553.311	553.292	553.002	553.514	T 2A
UUBAR FS	0.1034	0.1373	0.1533	0.1093	0.0824	0.0319	0.2179	0.2659	0.2520	UUBAR FS
P2 FS	17.576	17.496	17.448	17.804	18.154	18.489	18.500	18.330	18.138	P2 FS
LOSS PARA FS	0.0348	0.0467	0.0527	0.0388	0.0305	0.0122	0.0863	0.1063	0.1016	LOSS PARA FS

Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 89.02   Equivalent Rotor Speed = 3747.66   Equivalent Weight Flow = 82.24
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	310.84	310.84	310.84	310.84	310.84	310.84	310.84	310.84	310.84	V 0
V 1	245.30	245.30	244.55	247.59	330.99	397.38	385.14	376.81	342.14	V 1
VZ 0	310.84	310.84	310.84	310.84	310.82	310.79	310.77	310.76	310.76	VZ 0
VZ 1	245.29	245.30	244.55	247.59	330.97	397.32	385.04	376.70	342.05	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2806	0.2806	0.2806	0.2806	0.2806	0.2806	0.2806	0.2806	0.2806	M 0
M 1	0.2208	0.2208	0.2201	0.2229	0.2991	0.3605	0.3491	0.3414	0.3094	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.5269	1.4732	1.4630	1.4630	0.9450	0.3274	0.3964	0.4693	0.7532	UUBAR
DFAC	0.211	0.211	0.213	0.203	-0.065	-0.278	-0.239	-0.212	-0.101	DFAC
EFFP	-0.3238	-0.3403	-0.3483	-0.3336	0.1251	0.6665	0.5814	0.5066	0.2220	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.378	15.378	15.378	15.378	15.378	15.378	15.378	15.378	15.378	P 0
P 1	14.129	14.173	14.181	14.191	14.605	15.110	15.054	14.994	14.762	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	57.598	58.320	58.072	53.774	45.528	36.394	36.833	39.917	44.881	BETA 2
BETA(PR) 1	65.589	64.807	64.710	65.232	59.760	56.246	57.836	58.591	61.154	BETA(PR) 1
BETA(PR) 2	20.282	25.724	27.592	26.903	32.935	33.144	37.156	40.353	46.548	BETA(PR) 2
V 1	245.81	257.86	262.24	266.01	353.51	425.88	415.60	407.85	370.77	V 1
V 2	521.41	497.99	494.26	519.64	514.30	559.66	535.40	504.16	452.78	V 2
VZ 1	245.76	257.80	262.21	266.00	353.07	424.16	412.86	404.95	368.35	VZ 1
VZ 2	279.39	261.53	261.39	307.09	360.20	449.93	427.63	385.86	320.26	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	440.23	423.78	419.48	419.19	366.89	331.64	320.29	322.82	318.92	V-THETA 2
V(PR) 1	594.7	605.7	613.8	634.9	701.3	764.3	777.0	778.6	764.6	V(PR) 1
V(PR) 2	297.9	290.3	294.9	344.4	429.3	538.1	537.7	507.4	466.4	V(PR) 2
VTHETA PR1	-541.5	-548.0	-554.9	-576.5	-605.7	-634.7	-656.5	-663.2	-668.7	VTHETA PR1
VTHETA PR2	-103.3	-126.0	-136.6	-155.8	-233.3	-293.8	-324.1	-327.8	-338.0	VTHETA PR2
U 1	541.51	548.02	554.94	576.51	605.67	634.70	656.53	663.18	668.74	U 1
U 2	543.48	549.78	556.09	575.00	600.23	625.45	644.36	650.67	656.97	U 2
M 1	0.2212	0.2322	0.2362	0.2396	0.3199	0.3871	0.3775	0.3703	0.3358	M 1
M 2	0.4583	0.4376	0.4347	0.4570	0.4534	0.4961	0.4737	0.4450	0.3980	M 2
M(PR) 1	0.5353	0.5454	0.5528	0.5719	0.6345	0.6948	0.7058	0.7068	0.6926	M(PR) 1
M(PR) 2	0.2618	0.2551	0.2594	0.3029	0.3785	0.4770	0.4757	0.4479	0.4100	M(PR) 2
TURN(PR)	45.305	39.079	37.116	38.328	26.809	23.046	20.599	18.157	14.549	TURN(PR)
UUBAR	0.1554	0.1863	0.1784	0.1243	0.1219	0.0668	0.0864	0.1441	0.1762	UUBAR
LOSS PARA	0.0422	0.0492	0.0469	0.0341	0.0329	0.0188	0.0239	0.0385	0.0429	LOSS PARA
DFAC	0.7139	0.7262	0.7226	0.6605	0.5555	0.4409	0.4498	0.4923	0.5364	DFAC
EFFP	0.8332	0.8189	0.8506	0.8677	0.8297	0.8590	0.8319	0.7806	0.7367	EFFP
EFF	0.8276	0.8132	0.8459	0.8632	0.8246	0.8548	0.8270	0.7747	0.7300	EFF
INCID	13.159	13.892	14.132	13.189	5.760	0.252	-0.854	-3.720	-7.005	INCID
DEVM	5.133	11.565	12.958	8.262	9.724	5.585	5.533	7.215	10.571	DEVM
P 1	14.129	14.173	14.181	14.191	14.605	15.110	15.054	14.994	14.762	P 1
P 2	17.792	17.614	17.645	17.959	18.006	18.582	18.378	18.064	17.635	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	561.368	559.570	558.212	560.514	557.475	555.635	555.489	555.294	555.735	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	58.109	57.941	56.885	53.854	44.906	36.272	37.588	41.196	46.984	BETA 2
BETA 2A	0.930	-1.100	-4.450	-4.780	2.600	3.001	2.201	2.101	1.100	BETA 2A
V 2	518.58	500.21	501.09	519.64	520.68	562.18	526.93	491.90	437.77	V 2
V 2A	347.93	326.49	315.40	374.92	404.72	461.05	437.35	414.98	402.90	V 2A
VZ 2	273.97	265.50	273.75	306.48	368.66	452.87	417.09	369.74	298.36	VZ 2
VZ 2A	347.88	326.42	314.43	373.56	404.17	460.14	436.68	414.33	402.40	VZ 2A
V-THETA 2	440.35	423.92	419.69	419.59	367.45	332.32	321.07	323.64	319.77	V-THETA 2
V-THETA 2A	5.65	-6.27	-24.47	-31.24	18.35	24.12	16.78	15.20	7.73	V-THETA 2A
M 2	0.4557	0.4396	0.4410	0.4570	0.4592	0.4985	0.4659	0.4338	0.3844	M 2
M 2A	0.3023	0.2838	0.2744	0.3265	0.3540	0.4055	0.3841	0.3640	0.3530	M 2A
TURN(PR)	57.179	59.040	61.333	58.627	42.287	33.238	35.341	39.044	45.825	TURN(PR)
UUBAR	0.1658	0.1616	0.2059	0.1847	0.1200	0.1313	0.1488	0.1065	-0.0619	UUBAR
LOSS PARA	0.0558	0.0550	0.0707	0.0654	0.0444	0.0505	0.0589	0.0426	-0.0249	LOSS PARA
DFAC	0.6115	0.6403	0.6760	0.5873	0.4718	0.3921	0.4002	0.4087	0.3689	DFAC
EFFP	0.7185	0.7358	0.6790	0.6404	0.7189	0.6333	0.5576	0.4557	1.3789	EFFP
INCID	7.942	14.553	16.595	15.824	8.200	0.404	-1.118	-1.976	-12.220	INCID
DEVM	9.762	10.212	6.860	6.196	13.611	14.665	14.640	14.779	5.953	DEVM
P 2	17.792	17.614	17.645	17.959	18.006	18.582	18.378	18.064	17.635	P 2
P 2A	17.400	17.260	17.191	17.516	17.715	18.201	18.000	17.830	17.740	P 2A
T 2	561.368	559.570	558.212	560.514	557.475	555.635	555.489	555.294	555.735	T 2
T 2A	561.368	559.570	558.212	560.514	557.475	555.635	555.489	555.294	555.735	T 2A
UUBAR FS	0.1628	0.2183	0.2407	0.1996	0.1537	0.0717	0.2066	0.2078	0.2084	UUBAR FS
P2 FS	17.783	17.772	17.746	18.003	18.102	18.395	18.563	18.343	18.217	P2 FS
LOSS PARA FS	0.0548	0.0743	0.0826	0.0706	0.0569	0.0275	0.0818	0.0831	0.0838	LOSS PARA FS

Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed - 69.99   Equivalent Rotor Speed = 2946.55   Equivalent Weight Flow = 83.81
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	316.30	316.30	316.30	316.30	316.30	316.30	316.30	316.30	316.30	V 0
V 1	271.90	279.32	274.05	278.18	345.04	407.94	391.78	384.69	347.40	V 1
VZ 0	316.30	316.30	316.30	316.30	316.28	316.25	316.22	316.22	316.22	VZ 0
VZ 1	271.90	279.32	274.05	278.18	345.02	407.87	391.68	384.58	347.31	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2856	0.2856	0.2856	0.2856	0.2856	0.2856	0.2856	0.2856	0.2856	M 0
M 1	0.2450	0.2518	0.2470	0.2507	0.3120	0.3704	0.3553	0.3487	0.3142	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.5376	1.4756	1.4732	1.4596	0.9462	0.3535	0.4020	0.4684	0.7586	UUBAR
DFAC	0.140	0.117	0.134	0.121	-0.091	-0.290	-0.239	-0.216	-0.098	DFAC
EFFP	-0.2022	-0.1738	-0.2019	-0.1922	0.1690	0.6595	0.5772	0.5125	0.2169	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.425	15.425	15.425	15.425	15.425	15.425	15.425	15.425	15.425	P 0
P 1	14.119	14.171	14.173	14.185	14.623	15.124	15.082	15.027	14.780	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	46.193	44.062	42.398	37.432	29.064	24.939	24.530	26.605	29.947	BETA 2
BETA(PR) 1	57.307	55.712	56.014	56.572	52.201	48.879	50.856	51.577	56.566	BETA(PR) 1
BETA(PR) 2	21.853	25.751	25.335	26.268	29.680	32.844	37.473	39.865	48.993	BETA(PR) 2
V 1	272.48	293.86	294.17	299.21	368.75	437.43	422.94	416.58	376.58	V 1
V 2	427.62	414.83	427.02	452.23	479.04	489.12	456.80	428.86	344.27	V 2
VZ 1	272.42	293.80	294.14	299.19	368.30	435.66	420.16	413.62	374.13	VZ 1
VZ 2	296.00	298.00	315.34	359.10	419.23	442.80	414.27	381.68	299.23	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	308.59	288.68	287.92	274.87	233.00	205.90	189.05	192.84	172.39	V-THETA 2
V(PR) 1	505.5	521.5	526.2	543.1	602.3	663.6	667.3	667.4	646.7	V(PR) 1
V(PR) 2	318.9	331.0	348.9	400.5	482.7	527.8	523.1	498.3	456.7	V(PR) 2
VTHETA PR1	-425.8	-430.9	-436.3	-453.3	-476.2	-499.0	-516.2	-521.4	-525.8	VTHETA PR1
VTHETA PR2	-118.7	-143.8	-149.3	-177.2	-230.9	-289.8	-317.6	-318.7	-344.1	VTHETA PR2
U 1	425.76	430.68	436.31	453.27	476.20	499.02	516.19	521.42	525.79	U 1
U 2	427.30	432.26	437.22	452.09	471.92	491.75	506.62	511.58	516.54	U 2
M 1	0.2455	0.2651	0.2653	0.2699	0.3340	0.3980	0.3844	0.3784	0.3412	M 1
M 2	0.3800	0.3685	0.3801	0.4028	0.4292	0.4384	0.4085	0.3831	0.3077	M 2
M(PR) 1	0.4555	0.4704	0.4746	0.4900	0.5454	0.6037	0.6065	0.6063	0.5860	M(PR) 1
M(PR) 2	0.2834	0.2940	0.3106	0.3567	0.4318	0.4731	0.4650	0.4452	0.4059	M(PR) 2
TURN(PR)	35.530	29.957	30.677	30.304	22.582	15.970	13.288	11.613	5.497	TURN(PR)
UUBAR	0.1250	0.1240	0.0851	-0.0177	-0.0483	0.0342	0.0500	0.1039	0.1432	UUBAR
LOSS PARA	0.0336	0.0328	0.0228	-0.0049	-0.0135	0.0097	0.0138	0.0280	0.0333	LOSS PARA
DFAC	0.5462	0.5279	0.4996	0.4182	0.3225	0.3083	0.3136	0.3537	0.3874	DFAC
EFFP	0.8277	0.7840	0.8829	0.9279	0.9561	0.8236	0.7725	0.7210	0.5665	EFFP
EFF	0.8245	0.7803	0.8807	0.9264	0.9353	0.8210	0.7694	0.7175	0.5623	EFF
INCID	4.956	4.796	5.436	4.530	-1.722	-7.124	-7.848	-10.752	-13.611	INCID
DEVM	6.704	11.591	10.702	7.627	6.469	5.285	5.850	6.728	13.017	DEVM
P 1	14.119	14.171	14.173	14.185	14.623	15.124	15.082	15.027	14.780	P 1
P 2	16.050	15.971	16.082	16.307	16.656	16.790	16.586	16.376	15.830	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	542.174	541.808	540.344	541.458	539.279	537.847	537.250	536.674	536.964	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	46.503	43.844	41.748	37.479	28.736	24.868	24.954	27.522	31.059	BETA 2
BETA 2A	0.300	1.400	1.900	1.350	0.230	0.500	2.130	1.220	-2.401	BETA 2A
V 2	425.48	416.60	432.66	452.23	485.63	491.15	469.84	419.00	335.59	V 2
V 2A	347.12	343.07	364.70	403.05	448.88	461.35	418.20	389.18	379.28	V 2A
VZ 2	292.86	300.46	322.77	358.82	425.60	445.15	407.26	371.04	287.00	VZ 2
VZ 2A	347.11	342.96	364.49	402.88	448.73	461.06	410.58	388.75	378.55	VZ 2A
V-THETA 2	308.64	288.57	288.06	275.13	233.35	206.33	189.51	193.33	172.85	V-THETA 2
V-THETA 2A	1.82	8.38	11.43	9.49	1.80	4.02	15.27	8.28	-15.87	V-THETA 2A
M 2	0.3780	0.3701	0.3853	0.4028	0.4346	0.4403	0.4023	0.3741	0.2980	M 2
M 2A	0.3070	0.3034	0.3053	0.3578	0.4006	0.4127	0.3667	0.3468	0.3377	M 2A
TURN(PR)	46.203	42.443	39.846	36.123	28.489	24.340	22.787	26.259	33.405	TURN(PR)
UUBAR	0.0668	0.0364	0.0852	0.0128	0.0135	0.0456	0.1920	0.1852	-0.1998	UUBAR
LOSS PARA	0.0225	0.0124	0.0293	0.0045	0.0050	0.0176	0.0761	0.0741	-0.0805	LOSS PARA
DFAC	0.4271	0.4057	0.4236	0.3179	0.2528	0.2200	0.2403	0.2489	0.0976	DFAC
EFFP	0.8108	0.8929	0.7794	0.9420	0.9147	0.6419	-0.1015	-0.2814	0.3144	EFFP
INCID	-3.664	0.456	1.457	-0.551	-7.968	-10.993	-13.742	-15.641	-28.138	INCID
DEVM	9.132	12.712	13.210	12.325	11.242	12.166	14.570	13.899	2.456	DEVM
P 2	16.050	15.971	16.082	16.307	16.656	16.790	16.586	16.376	15.830	P 2
P 2A	15.949	15.919	15.948	16.285	16.629	16.695	16.250	16.096	16.019	P 2A
T 2	542.174	541.808	540.344	541.458	539.279	537.847	537.250	536.674	536.964	T 2
T 2A	542.174	541.808	540.344	541.458	539.279	537.847	537.250	536.674	536.964	T 2A
UUBAR FS	0.0949	0.1162	0.0939	0.0416	0.0319	0.0230	0.2819	0.2868	0.2887	UUBAR FS
P2 FS	16.096	16.101	16.096	16.359	16.694	16.742	16.805	16.590	16.479	P2 FS
LOSS PARA FS	0.0319	0.0395	0.0323	0.0146	0.0118	0.0089	0.1117	0.1147	0.1163	LOSS PARA FS

Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 70.19   Equivalent Rotor Speed = 2955.05   Equivalent Weight Flow = 70.10
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	267.00	267.00	267.00	267.00	267.00	267.00	267.00	267.00	267.00	V 0
V 1	214.32	219.64	218.48	214.13	281.17	332.68	327.62	322.36	291.11	V 1
VZ 0	267.00	267.00	267.00	267.00	266.98	266.96	266.93	266.93	266.93	VZ 0
VZ 1	214.32	219.64	218.48	214.13	281.15	332.63	327.54	322.27	291.04	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2405	0.2405	0.2405	0.2405	0.2405	0.2405	0.2405	0.2405	0.2405	M 0
M 1	0.1927	0.1975	0.1964	0.1925	0.2535	0.3007	0.2960	0.2912	0.2625	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.4986	1.4038	1.3951	1.3969	0.8726	0.3415	0.3880	0.4415	0.7105	UUBAR
DFAC	0.197	0.177	0.182	0.198	-0.053	-0.246	-0.227	-0.207	-0.090	DFAC
EFFP	-0.3085	-0.2975	-0.3086	-0.3410	0.1118	0.6233	0.5710	0.5139	0.2120	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.179	15.179	15.179	15.179	15.179	15.179	15.179	15.179	15.179	P 0
P 1	14.281	14.338	14.343	14.342	14.656	14.974	14.946	14.914	14.753	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	53.989	53.993	53.287	48.069	38.885	33.410	34.257	36.812	41.262	BETA 2
BETA(PR) 1	63.303	61.902	61.856	63.181	57.919	54.734	55.932	56.559	59.335	BETA(PR) 1
BETA(PR) 2	19.354	25.649	26.907	27.206	31.931	33.722	38.172	41.246	48.861	BETA(PR) 2
V 1	214.76	230.76	234.10	229.83	299.73	355.34	352.39	347.82	314.71	V 1
V 2	422.04	397.27	396.81	416.93	425.43	445.79	419.92	395.21	341.50	V 2
VZ 1	214.72	230.71	234.08	229.82	299.36	353.91	350.07	345.34	312.66	VZ 1
VZ 2	248.13	233.54	237.22	278.60	331.04	371.62	346.30	315.67	256.19	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	341.38	321.36	318.10	310.17	266.97	245.13	235.85	236.26	224.76	V-THETA 2
V(PR) 1	478.0	489.9	496.3	509.4	563.8	613.8	626.2	628.0	614.1	V(PR) 1
V(PR) 2	263.0	259.1	266.0	313.3		447.4	441.4	420.7	390.0	V(PR) 2
VTHETA PR1	-427.0	-432.1	-437.6	-454.6	-477.6	-500.5	-517.7	-522.9	-527.3	VTHETA PR1
VTHETA PR2	-87.2	-112.1	-120.4	-143.2	-206.3	-248.0	-272.2	-276.8	-293.3	VTHETA PR2
U 1	426.98	432.12	437.57	454.58	477.57	500.46	517.68	522.92	527.31	U 1
U 2	428.53	433.51	438.48	453.39	473.28	493.17	508.08	513.06	518.03	U 2
M 1	0.1931	0.2076	0.2106	0.2067	0.2704	0.3216	0.3188	0.3146	0.2841	M 1
M 2	0.3742	0.3519	0.3518	0.3696	0.3780	0.3970	0.3733	0.3509	0.3022	M 2
M(PR) 1	0.4297	0.4407	0.4465	0.4582	0.5087	0.5554	0.5666	0.5681	0.5545	M(PR) 1
M(PR) 2	0.2332	0.2295	0.2359	0.2777	0.3467	0.3984	0.3924	0.3735	0.3451	M(PR) 2
TURN(PR)	43.946	36.249	34.947	35.974	25.971	20.954	17.675	15.227	10.411	TURN(PR)
UUBAR	0.1144	0.1588	0.1508	0.0663	0.0376	0.0403	0.0784	0.1263	0.1555	UUBAR
LOSS PARA	0.0313	0.0420	0.0399	0.0181	0.0103	0.0121	0.0214	0.0333	0.0362	LOSS PARA
DFAC	0.6570	0.6638	0.6545	0.5721	0.4597	0.4044	0.4247	0.4608	0.4934	DFAC
EFFP	0.8749	0.8103	0.8534	0.8683	0.8557	0.8413	0.7878	0.7399	0.6654	EFFP
EFF	0.8723	0.8066	0.8506	0.8656	0.8529	0.8385	0.7842	0.7359	0.6607	EFF
INCID	10.873	10.987	11.278	11.138	3.918	-1.263	-2.762	-5.758	-8.830	INCID
DEVM	4.205	11.490	12.273	8.565	8.720	6.162	6.548	8.108	12.884	DEVM
P 1	14.281	14.338	14.343	14.342	14.656	14.974	14.946	14.914	14.753	P 1
P 2	16.538	16.376	16.396	16.587	16.740	16.968	16.794	16.621	16.282	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	544.160	543.588	542.453	544.121	542.240	541.192	541.102	540.859	541.131	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	54.397	53.689	52.360	48.136	38.435	33.320	34.880	37.864	42.976	BETA 2
BETA 2A	1.300	1.360	0.200	-0.300	1.800	1.600	1.430	1.060	-1.400	BETA 2A
V 2	419.94	398.94	401.91	416.93	430.31	447.56	413.90	386.35	330.96	V 2
V 2A	299.01	282.45	276.54	320.55	356.63	388.44	342.36	323.12	310.72	V 2A
VZ 2	244.47	236.24	245.44	278.22	336.93	373.66	339.14	304.66	241.87	VZ 2
VZ 2A	298.93	282.36	276.52	320.50	356.33	388.06	341.97	322.78	310.30	VZ 2A
V-THETA 2	341.44	321.47	318.25	310.47	267.38	245.63	236.42	236.86	225.36	V-THETA 2
V-THETA 2A	6.78	6.70	0.97	-1.68	11.20	10.84	8.54	5.97	-7.59	V-THETA 2A
M 2	0.3723	0.3534	0.3565	0.3696	0.3824	0.3986	0.3679	0.3428	0.2927	M 2
M 2A	0.2633	0.2487	0.2436	0.2826	0.3155	0.3446	0.3030	0.2857	0.2745	M 2A
TURN(PR)	53.097	52.328	52.158	48.429	36.617	31.687	33.404	36.752	44.315	TURN(PR)
UUBAR	0.1198	0.0801	0.1161	0.0886	0.0514	0.0575	0.1655	0.1377	-0.1066	UUBAR
LOSS PARA	0.0403	0.0273	0.0400	0.0315	0.0190	0.0221	0.0656	0.0551	-0.0430	LOSS PARA
DFAC	0.5565	0.5608	0.5840	0.4977	0.3924	0.3351	0.3922	0.4041	0.3466	DFAC
EFFP	0.7687	0.8467	0.7891	0.7941	0.8450	0.7811	0.5008	0.5612	1.8642	EFFP
INCID	4.230	10.301	12.069	10.105	1.730	-2.546	-3.824	-5.307	-16.229	INCID
DEVM	10.132	12.672	11.510	10.675	12.812	13.265	13.870	13.739	3.455	DEVM
P 2	16.538	16.376	16.396	16.587	16.740	16.968	16.794	16.621	16.282	P 2
P 2A	16.357	16.267	16.235	16.454	16.657	16.867	16.546	16.442	16.382	P 2A
T 2	544.160	543.588	542.453	544.121	542.240	541.192	541.102	540.859	541.131	T 2
T 2A	544.160	543.588	542.453	544.121	542.240	541.192	541.102	540.859	541.131	T 2A
UUBAR FS	0.0921	0.1438	0.1315	0.1032	0.0979	0.0312	0.2424	0.2101	0.2029	UUBAR FS
P2 FS	16.491	16.476	16.419	16.610	16.822	16.920	16.946	16.739	16.646	P2 FS
LOSS PARA FS	0.0310	0.0490	0.0453	0.0367	0.0362	0.0120	0.0961	0.0641	0.0818	LOSS PARA FS

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Table A-5. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 70.87   Equivalent Rotor Speed = 2983.57   Equivalent Weight Flow = 61.83
Hub Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	234.88	234.88	234.88	234.88	234.88	234.88	234.88	234.88	234.88	V 0
V 1	186.44	201.13	198.03	190.22	238.05	297.14	287.72	285.46	262.47	V 1
VZ 0	234.88	234.88	234.88	234.88	234.87	234.84	234.82	234.82	234.82	VZ 0
VZ 1	186.44	201.13	198.03	190.22	238.03	297.09	287.65	285.39	262.40	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2113	0.2113	0.2113	0.2113	0.2113	0.2113	0.2113	0.2113	0.2113	M 0
M 1	0.1675	0.1807	0.1779	0.1709	0.2142	0.2680	0.2594	0.2574	0.2364	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	1.4304	1.2971	1.2971	1.3304	0.9462	0.3309	0.3820	0.4175	0.6530	UUBAR
DFAC	0.206	0.144	0.157	0.190	-0.013	-0.265	-0.225	-0.215	-0.117	DFAC
EFFP	-0.3470	-0.2585	-0.2864	-0.3479	0.0279	0.6486	0.5710	0.5370	0.2780	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.062	15.062	15.062	15.062	15.062	15.062	15.062	15.062	15.062	P 0
P 1	14.402	14.464	14.464	14.448	14.626	14.910	14.886	14.870	14.761	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	58.065	58.681	58.955	55.618	48.472	38.442	37.852	40.357	45.135	BETA 2
BETA(PR) 1	66.574	64.170	64.360	66.033	62.304	58.005	59.579	59.959	62.129	BETA(PR) 1
BETA(PR) 2	20.317	25.385	26.082	26.963	33.321	34.565	38.179	41.571	47.709	BETA(PR) 2
V 1	186.83	211.24	212.08	204.04	253.43	316.96	308.95	307.51	283.39	V 1
V 2	414.25	397.57	399.13	411.46	403.53	429.27	416.38	392.24	353.00	V 2
VZ 1	186.79	211.19	212.06	204.03	253.11	315.68	306.91	305.32	281.54	VZ 1
VZ 2	219.12	206.65	205.83	232.35	267.47	335.82	328.11	298.27	248.58	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	351.54	339.63	341.95	339.57	302.02	266.56	254.99	253.46	249.75	V-THETA 2
V(PR) 1	469.8	484.7	490.1	502.3	544.7	596.5	607.2	611.0	603.1	V(PR) 1
V(PR) 2	233.7	228.8	229.2	260.7	320.2	408.3	418.2	399.5	370.0	V(PR) 2
VTHETA PR1	-431.1	-436.3	-441.8	-459.0	-482.2	-505.3	-522.7	-528.0	-532.4	VTHETA PR1
VTHETA PR2	-81.1	-98.1	-100.8	-118.2	-175.8	-231.4	-258.0	-264.5	-273.3	VTHETA PR2
U 1	431.11	436.29	441.80	458.97	482.18	505.29	522.68	527.97	532.40	U 1
U 2	432.67	437.69	442.71	457.77	477.85	497.93	512.99	518.01	523.03	U 2
M 1	0.1678	0.1899	0.1906	0.1834	0.2282	0.2862	0.2789	0.2775	0.2555	M 1
M 2	0.3668	0.3520	0.3538	0.3641	0.3576	0.3814	0.3696	0.3477	0.3122	M 2
M(PR) 1	0.4220	0.4357	0.4405	0.4514	0.4904	0.5386	0.5480	0.5515	0.5437	M(PR) 1
M(PR) 2	0.2069	0.2026	0.2031	0.2307	0.2838	0.3628	0.3713	0.3542	0.3272	M(PR) 2
TURN(PR)	46.255	38.782	38.276	39.069	28.969	23.388	21.324	18.313	14.367	TURN(PR)
UUBAR	0.1811	0.2236	0.2214	0.1794	0.1523	0.0851	0.0867	0.1368	0.1762	UUBAR
LOSS PARA	0.0492	0.0592	0.0590	0.0492	0.0413	0.0236	0.0237	0.0359	0.0420	LOSS PARA
DFAC	0.7198	0.7339	0.7397	0.6887	0.5899	0.4646	0.4556	0.4902	0.5319	DFAC
EFFP	0.8397	0.8150	0.8628	0.8273	0.8250	0.8306	0.8119	0.7614	0.7070	EFFP
EFF	0.8363	0.8114	0.8601	0.8237	0.8216	0.8274	0.8085	0.7573	0.7024	EFF
INCID	14.144	13.255	13.782	13.991	8.306	2.014	0.894	-2.347	-6.026	INCID
DEVM	5.167	11.226	11.448	8.323	10.109	7.005	6.556	8.433	11.733	DEVM
P 1	14.402	14.464	14.464	14.448	14.626	14.910	14.886	14.870	14.761	P 1
P 2	16.659	16.560	16.606	16.729	16.739	16.988	16.914	16.739	16.493	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	545.044	543.906	542.977	545.632	543.524	542.520	542.540	542.275	542.490	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	58.549	58.318	57.811	55.704	47.855	38.338	38.572	41.556	47.124	BETA 2
BETA 2A	1.050	-0.650	-3.350	-4.530	1.650	3.001	2.001	2.801	2.851	BETA 2A
V 2	412.15	399.24	404.27	411.46	408.08	430.95	410.39	383.47	342.04	V 2
V 2A	274.39	256.93	251.07	288.34	316.09	353.44	333.82	317.14	310.52	V 2A
VZ 2	215.05	209.68	215.35	231.83	273.74	337.76	320.51	286.65	232.50	VZ 2
VZ 2A	274.34	256.91	250.63	287.40	315.85	352.75	333.35	316.48	309.81	VZ 2A
V-THETA 2	351.60	339.74	342.12	339.89	302.48	267.11	255.60	254.10	250.42	V-THETA 2
V-THETA 2A	5.03	-2.91	-14.67	-22.77	9.10	18.49	11.64	15.48	15.43	V-THETA 2A
M 2	0.3649	0.3536	0.3584	0.3641	0.3617	0.3829	0.3642	0.3398	0.3023	M 2
M 2A	0.2411	0.2259	0.2209	0.2534	0.2787	0.3126	0.2949	0.2800	0.2740	M 2A
TURN(PR)	57.499	58.967	61.159	60.227	46.186	35.304	36.524	38.704	44.217	TURN(PR)
UUBAR	0.1694	0.1705	0.2230	0.1919	0.1190	0.1160	0.1558	0.1108	-0.0648	UUBAR
LOSS PARA	0.0571	0.0580	0.0766	0.0680	0.0441	0.0446	0.0617	0.0443	-0.0261	LOSS PARA
DFAC	0.6176	0.6489	0.6830	0.6130	0.4925	0.4032	0.4235	0.4234	0.3710	DFAC
EFFP	0.7088	0.7207	0.6510	0.6390	0.7163	0.6643	0.5609	0.6642	1.3535	EFFP
INCID	8.382	14.930	17.521	17.673	11.149	2.470	-0.135	-1.617	-12.080	INCID
DEVM	9.882	10.662	7.960	6.445	12.662	14.665	14.440	15.478	7.702	DEVM
P 2	16.659	16.560	16.606	16.729	16.739	16.988	16.914	16.739	16.493	P 2
P 2A	16.411	16.326	16.291	16.448	16.567	16.799	16.683	16.597	16.559	P 2A
T 2	545.044	543.906	542.977	545.632	543.524	542.520	542.540	542.275	542.490	T 2
T 2A	545.044	543.906	542.977	545.632	543.524	542.520	542.540	542.275	542.490	T 2A
UUBAR FS	0.1559	0.2084	0.2420	0.2213	0.1397	0.0788	0.2346	0.1877	0.1949	UUBAR FS
P2 FS	16.635	16.625	16.640	16.784	16.774	16.922	17.066	16.861	16.820	P2 FS
LOSS PARA FS	0.0575	0.0709	0.0831	0.0786	0.0517	0.0303	0.0929	0.0750	0.0785	LOSS PARA FS

Table A-6. Blade Element Performance
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 99.94   Equivalent Rotor Speed = 4207.34   Equivalent Weight Flow = 114.99
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	430.35	430.35	430.35	430.35	430.35	430.35	430.35	430.35	430.35	V 0
V 1	571.71	577.34	569.83	571.95	562.67	415.67	381.28	374.57	363.49	V 1
VZ 0	430.35	430.35	430.35	430.35	430.32	430.28	430.24	430.24	430.24	VZ 0
VZ 1	571.71	577.34	569.83	571.94	562.63	415.60	381.19	374.47	363.40	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3913	0.3913	0.3913	0.3913	0.3913	0.3913	0.3913	0.3913	0.3913	M 0
M 1	0.5261	0.5315	0.5242	0.5263	0.5173	0.3776	0.3456	0.3393	0.3291	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.7369	0.5087	0.4646	0.4211	0.5760	1.5513	1.7482	1.7652	1.8026	UUBAR
DFAC	-0.328	-0.342	-0.324	-0.329	-0.307	0.034	0.114	0.130	0.155	DFAC
EFFP	0.5196	0.6239	0.6315	0.6585	0.5640	-0.0444	-0.1355	-0.1534	-0.1814	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	16.118	16.118	16.118	16.118	16.118	16.118	16.118	16.118	16.118	P 0
P 1	14.928	15.297	15.368	15.438	15.188	13.613	13.295	13.268	13.207	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	36.004	33.063	31.379	29.388	29.797	35.294	41.335	44.664	50.519	BETA 2
BETA(PR) 1	46.666	44.882	44.832	45.731	48.044	58.065	60.995	61.604	62.439	BETA(PR) 1
BETA(PR) 2	24.016	27.185	26.852	27.096	28.808	33.705	39.275	42.857	48.831	BETA(PR) 2
V 1	573.29	617.92	626.75	630.94	612.06	445.93	411.35	405.38	394.41	V 1
V 2	643.44	632.43	655.16	689.31	692.04	626.51	568.64	536.96	492.77	V 2
VZ 1	573.18	617.78	626.68	630.91	611.30	444.13	408.64	402.49	391.84	VZ 1
VZ 2	520.50	530.00	559.32	600.59	600.28	510.69	426.19	381.21	312.86	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	378.22	345.01	341.13	338.25	343.74	361.51	374.87	376.77	379.79	V-THETA 2
V(PR) 1	835.6	872.0	883.7	903.9	914.9	840.6	844.1	847.7	848.1	V(PR) 1
V(PR) 2	569.9	595.9	626.9	674.7	685.4	614.7	551.6	521.0	476.0	V(PR) 2
VTHETA PR1	-607.7	-615.2	-623.0	-647.2	-680.0	-712.5	-737.1	-744.5	-750.8	VTHETA PR1
VTHETA PR2	-231.9	-272.2	-283.2	-307.3	-330.1	-340.7	-348.5	-353.7	-357.8	VTHETA PR2
U 1	607.93	615.24	623.01	647.22	679.96	712.55	737.06	744.53	750.77	U 1
U 2	610.14	617.22	624.30	645.53	673.85	702.16	723.40	730.48	737.56	U 2
M 1	0.5276	0.5712	0.5800	0.5841	0.5655	0.4059	0.3735	0.3680	0.3578	M 1
M 2	0.5754	0.5660	0.5884	0.6191	0.6210	0.5575	0.5016	0.4718	0.4307	M 2
M(PR) 1	0.7690	0.8061	0.8177	0.8368	0.8452	0.7652	0.7665	0.7695	0.7693	M(PR) 1
M(PR) 2	0.5096	0.5333	0.5631	0.6060	0.6150	0.5470	0.4866	0.4578	0.4160	M(PR) 2
TURN(PR)	22.666	17.692	17.977	18.635	19.215	24.307	21.651	18.678	13.556	TURN(PR)
UUBAR	0.1555	0.1794	0.1401	0.1063	0.0967	0.0007	0.0968	0.1587	0.2315	UUBAR
LOSS PARA	0.0411	0.0466	0.0371	0.0291	0.0273	0.0002	0.0260	0.0408	0.0540	LOSS PARA
DFAC	0.4494	0.4329	0.4053	0.3686	0.3713	0.4123	0.4492	0.5397	0.5959	DFAC
EFFP	0.8445	0.7483	0.8392	0.8244	0.8661	1.0640	0.9321	0.8455	0.7445	EFFP
EFF	0.8400	0.7423	0.8350	0.8194	0.8619	1.0666	0.9296	0.8401	0.7363	EFF
INCID	-5.746	-6.034	-5.747	-6.311	-5.961	2.074	2.316	-0.696	-5.715	INCID
DEVM	8.666	13.026	12.218	8.455	5.597	6.145	7.651	9.718	12.855	DEVM
P 1	14.928	15.297	15.438	15.438	15.188	13.613	13.295	13.268	13.207	P 1
P 2	18.209	18.078	18.407	18.802	18.813	17.902	17.244	16.915	16.498	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	554.763	552.855	551.561	555.367	556.643	558.285	561.743	563.066	564.931	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.237	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	36.277	32.873	30.800	29.424	29.327	35.162	42.257	46.241	53.200	BETA 2
BETA 2A	-0.700	0.400	1.100	1.200	-0.350	1.400	2.401	1.851	0.400	BETA 2A
V 2	639.34	635.86	666.56	689.31	703.23	629.55	559.36	523.45	475.91	V 2
V 2A	514.37	530.87	555.80	613.64	621.99	574.26	477.17	448.35	437.64	V 2A
VZ 2	515.41	534.03	572.52	600.29	612.79	514.24	413.60	361.70	284.87	VZ 2
VZ 2A	514.33	530.84	555.68	613.42	621.77	573.75	476.37	447.71	437.17	VZ 2A
V-THETA 2	376.29	345.12	341.30	338.57	344.26	362.25	375.78	377.73	380.79	V-THETA 2
V-THETA 2A	-6.28	3.71	10.67	12.85	-3.80	14.03	19.97	14.46	3.05	V-THETA 2A
M 2	0.5715	0.5693	0.5994	0.6191	0.6318	0.5603	0.4930	0.4594	0.4154	M 2
M 2A	0.4546	0.4707	0.4944	0.5468	0.5541	0.5084	0.4178	0.3913	0.3810	M 2A
TURN(PR)	36.977	32.472	29.699	28.218	29.661	33.729	39.808	44.339	52.743	TURN(PR)
UUBAR	0.1977	0.1138	0.1164	0.0492	0.0349	-0.0361	0.0848	0.0660	-0.0843	UUBAR
LOSS PARA	0.0666	0.0387	0.0400	0.0175	0.0129	-0.0139	0.0336	0.0264	-0.0340	LOSS PARA
DFAC	0.3981	0.3480	0.3371	0.2781	0.2994	0.3019	0.4005	0.4227	0.4024	DFAC
EFFP	0.4975	0.6664	0.6648	0.7961	0.8632	1.1879	0.7162	0.7719	1.5053	EFFP
INCID	-13.890	-10.515	-9.490	-8.606	-7.376	-0.704	3.549	3.069	-6.002	INCID
DEVM	8.132	11.712	12.410	12.175	10.662	13.066	14.840	14.529	5.254	DEVM
P 2	18.209	18.078	18.407	18.802	18.813	17.902	17.244	16.915	16.498	P 2
P 2A	17.494	17.672	17.945	18.591	18.658	18.026	17.020	16.765	16.654	P 2A
T 2	554.763	552.855	551.561	555.367	556.643	558.285	561.743	563.066	564.931	T 2
T 2A	554.763	552.855	551.561	555.367	556.643	558.285	561.743	563.066	564.931	T 2A
UUBAR FS	0.1363	0.1273	0.0875	0.0584	0.0560	0.0519	0.2127	0.2017	0.1763	UUBAR FS
P2 FS	17.952	18.133	18.281	18.843	18.912	18.221	17.672	17.302	17.083	P2 FS
LOSS PARA FS	0.0459	0.0433	0.0300	0.0207	0.0207	0.0200	0.0842	0.0806	0.0711	LOSS PARA FS

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Table A-6. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 100.05 Equivalent Rotor Speed = 4211.98 Equivalent Weight Flow = 109.16
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	412.31	412.31	412.31	412.31	412.31	412.31	412.31	412.31	412.31	V 0
V 1	530.91	545.24	542.60	551.90	529.75	407.53	357.23	357.79	348.31	V 1
VZ 0	412.30	412.30	412.31	412.30	412.28	412.24	412.20	412.19	412.20	VZ 0
VZ 1	530.91	545.24	542.60	551.89	529.71	407.46	357.14	357.69	348.22	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3744	0.3744	0.3744	0.3744	0.3744	0.3744	0.3744	0.3744	0.3744	M 0
M 1	0.4867	0.5004	0.4979	0.5069	0.4855	0.3700	0.3233	0.3238	0.3151	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.7038	0.4345	0.3865	0.3666	0.5341	1.3972	1.6207	1.6244	1.6701	UUBAR
DFAC	-0.288	-0.322	-0.316	-0.339	-0.285	0.012	0.134	0.132	0.155	DFAC
EFFP	0.4927	0.6448	0.6665	0.6955	0.5606	-0.0167	-0.1773	-0.1748	-0.2009	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.870	15.870	15.870	15.870	15.870	15.870	15.870	15.870	15.870	P 0
P 1	14.839	15.234	15.304	15.333	15.088	13.824	13.497	13.492	13.425	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR-L.E., ROTOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	39.598	36.366	34.300	32.586	34.107	41.370	49.653	54.338	58.542	BETA 2
BETA(PR) 1	48.831	46.643	46.387	46.878	49.899	58.612	62.612	62.741	63.476	BETA(PR) 1
BETA(PR) 2	28.205	27.304	26.316	25.700	28.609	33.825	41.405	45.037	48.535	BETA(PR) 2
V 1	532.30	581.71	594.28	606.83	573.93	436.98	384.82	386.78	377.59	V 1
V 2	581.40	612.64	642.95	684.55	666.63	604.68	544.02	524.40	511.97	V 2
VZ 1	532.20	581.58	594.21	606.80	573.22	435.21	382.29	384.03	375.13	VZ 1
VZ 2	447.97	493.30	531.12	576.77	551.74	453.29	351.73	305.35	266.92	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	370.57	363.24	362.31	368.67	373.66	399.20	414.05	425.53	436.29	V-THETA 2
V(PR) 1	808.5	847.2	861.5	887.7	890.4	836.5	832.2	839.7	841.1	V(PR) 1
V(PR) 2	508.4	555.2	592.5	640.1	628.8	546.4	469.8	432.9	403.7	V(PR) 2
VTHETA PR1	-608.6	-615.9	-623.7	-647.9	-680.7	-713.3	-737.9	-745.3	-751.6	VTHETA PR1
VTHETA PR2	-240.2	-254.7	-262.7	-277.6	-300.9	-303.7	-310.1	-305.8	-302.1	VTHETA PR2
U 1	608.60	615.92	623.69	647.93	680.71	713.33	737.88	745.35	751.60	U 1
U 2	610.81	617.90	624.98	646.24	674.59	702.94	724.20	731.28	738.37	U 2
M 1	0.4880	0.5358	0.5480	0.5603	0.5282	0.3975	0.3489	0.3507	0.3421	M 1
M 2	0.5151	0.5453	0.5748	0.6129	0.5951	0.5353	0.4771	0.4585	0.4463	M 2
M(PR) 1	0.7413	0.7803	0.7945	0.8197	0.8194	0.7610	0.7544	0.7613	0.7621	M(PR) 1
M(PR) 2	0.4503	0.4942	0.5298	0.5732	0.5613	0.4837	0.4120	0.3785	0.3519	M(PR) 2
TURN(PR)	20.623	19.334	20.069	21.177	21.270	24.736	21.144	17.639	14.892	TURN(PR)
UUBAR	0.1547	0.1499	0.1046	0.0683	0.0948	0.0681	0.1727	0.2377	0.2781	UUBAR
LOSS PARA	0.0395	0.0391	0.0278	0.0189	0.0268	0.0190	0.0450	0.0589	0.0652	LOSS PARA
DFAC	0.5043	0.4706	0.4372	0.4065	0.4284	0.5062	0.6066	0.6605	0.7021	DFAC
EFFP	0.7632	0.7822	0.8837	0.9114	0.9044	1.0091	0.8736	0.8089	0.7667	EFFP
EFF	0.7565	0.7762	0.8802	0.9084	0.9011	1.0094	0.8687	0.8019	0.7583	EFF
INCID	-3.600	-4.274	-4.192	-5.165	-4.104	2.622	3.938	0.445	-4.674	INCID
DEVM	13.055	13.145	11.682	7.059	5.399	6.265	9.780	11.898	12.559	DEVM
P 1	14.839	15.234	15.304	15.333	15.088	13.824	13.497	13.492	13.425	P 1
P 2	18.069	18.468	18.868	19.359	19.138	18.290	17.599	17.388	17.248	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	558.379	556.493	555.025	558.034	559.167	561.488	565.731	567.334	569.475	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	39.883	36.158	33.664	32.627	33.582	41.218	50.887	56.585	62.318	BETA 2
BETA 2A	-1.100	1.150	1.850	1.500	-0.100	1.621	1.951	1.901	1.401	BETA 2A
V 2	578.01	615.86	653.95	684.55	676.87	607.51	535.30	511.39	494.22	V 2
V 2A	475.21	477.78	497.12	577.54	578.34	505.21	426.41	402.66	400.67	V 2A
VZ 2	443.54	497.23	544.26	576.43	563.63	456.65	337.46	281.46	229.49	VZ 2
VZ 2A	475.12	477.67	496.84	577.26	578.14	504.72	425.81	402.08	400.13	VZ 2A
V-THETA 2	370.63	363.36	362.49	369.02	374.23	400.02	415.05	426.61	437.45	V-THETA 2
V-THETA 2A	-9.12	9.59	16.05	15.12	-1.01	14.28	14.50	13.34	9.78	V-THETA 2A
M 2	0.5119	0.5483	0.5853	0.6129	0.6049	0.5379	0.4691	0.4466	0.4302	M 2
M 2A	0.4173	0.4204	0.4387	0.5116	0.5118	0.4434	0.3707	0.3490	0.3466	M 2A
TURN(PR)	40.983	35.007	31.813	31.120	33.665	39.563	48.889	54.637	60.870	TURN(PR)
UUBAR	0.0139	0.1174	0.1570	0.0620	0.0160	0.0205	0.0386	0.0291	-0.0173	UUBAR
LOSS PARA	0.0047	0.0400	0.0540	0.0220	0.0059	0.0079	0.0153	0.0116	-0.0070	LOSS PARA
DFAC	0.3992	0.4199	0.4224	0.3404	0.3515	0.4141	0.5016	0.5377	0.5404	DFAC
EFFP	0.9614	0.7351	0.6688	0.8135	0.9489	0.9408	0.9030	0.9291	1.0468	EFFP
INCID	-10.284	-7.230	-6.626	-5.404	-3.122	5.349	12.180	13.417	3.124	INCID
DEVM	7.732	12.462	13.160	12.475	10.912	13.286	14.390	14.579	6.253	DEVM
P 2	18.069	18.468	18.868	19.359	19.138	18.290	17.599	17.388	17.248	P 2
P 2A	18.026	18.068	18.254	19.090	19.071	18.223	17.504	17.323	17.283	P 2A
T 2	558.379	556.493	555.025	558.034	559.167	561.488	565.731	567.334	569.475	T 2
T 2A	558.379	556.493	555.025	558.034	559.167	561.488	565.731	567.334	569.475	T 2A
UUBAR FS	0.1095	0.1241	0.1077	0.0405	0.0381	0.1127	0.1600	0.1305	0.1170	UUBAR FS
P2 FS	18.396	18.494	18.651	19.261	19.234	18.629	17.954	17.647	17.560	P2 FS
LOSS PARA FS	0.0370	0.0422	0.0370	0.0143	0.0140	0.0434	0.0634	0.0520	0.0473	LOSS PARA FS

Table A-6. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 100.29 Equivalent Rotor Speed = 4222.38 Equivalent Weight Flow = 103.95
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
V 0	394.21	394.21	394.21	394.21	394.21	394.21	394.21	394.21	394.21
V 1	510.50	530.28	528.12	524.32	505.17	378.94	337.82	335.08	319.04
VZ 0	394.21	394.21	394.21	394.21	394.18	394.15	394.11	394.11	394.11
VZ 1	510.50	530.28	528.12	524.31	505.13	378.88	337.74	334.99	318.96
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
M 0	0.3576	0.3576	0.3576	0.3576	0.3576	0.3576	0.3576	0.3576	0.3576
M 1	0.4671	0.4861	0.4840	0.4803	0.4620	0.3434	0.3054	0.3029	0.2881
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UUBAR	0.6927	0.4039	0.3460	0.3444	0.5238	1.3429	1.5601	1.5762	1.6246
DFAC	-0.295	-0.345	-0.340	-0.330	-0.281	0.039	0.143	0.150	0.191
EFFP	0.5031	0.6781	0.7076	0.7016	0.5612	-0.0597	-0.2011	-0.2091	-0.2626
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P 0	15.713	15.713	15.713	15.713	15.713	15.713	15.713	15.713	15.713
P 1	14.793	15.177	15.254	15.256	15.017	13.929	13.640	13.618	13.554
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
BETA 2	41.398	38.371	35.812	33.635	36.213	45.751	56.372	60.992	64.322
BETA(PR) 1	50.013	47.547	47.282	48.518	51.377	60.531	63.977	64.324	65.520
BETA(PR) 2	26.405	26.237	25.619	25.815	28.427	34.795	44.682	47.663	50.920
V 1	511.81	564.97	577.38	574.32	545.86	405.71	363.54	361.78	345.31
V 2	592.36	615.05	643.28	677.21	658.39	587.20	526.47	521.55	516.22
VZ 1	511.71	564.84	577.31	574.29	545.19	404.07	361.15	359.21	343.06
VZ 2	444.33	482.19	521.65	563.82	531.00	409.35	291.27	252.70	223.54
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
V-THETA 2	391.70	381.77	376.38	375.10	388.83	420.22	437.93	455.73	464.93
V(PR) 1	796.4	836.9	851.1	867.0	873.9	822.2	824.2	830.2	828.8
V(PR) 2	496.1	537.6	578.5	626.3	604.1	499.1	410.3	375.8	355.1
VTHETA PR1	-610.1	-617.4	-625.2	-649.5	-682.4	-715.1	-739.7	-747.2	-753.5
VTHETA PR2	-220.6	-237.6	-250.1	-272.7	-287.0	-284.5	-288.1	-277.4	-275.3
U 1	610.10	617.44	625.23	649.53	682.39	715.09	739.70	747.19	753.45
U 2	612.32	619.42	626.53	647.84	676.26	704.47	725.98	733.09	740.19
M 1	0.4684	0.5195	0.5316	0.5286	0.5010	0.3683	0.3291	0.3275	0.3123
M 2	0.5247	0.5468	0.5743	0.6051	0.5863	0.5181	0.4601	0.4549	0.4491
M(PR) 1	0.7288	0.7696	0.7835	0.7980	0.8021	0.7463	0.7462	0.7515	0.7496
M(PR) 2	0.4394	0.4779	0.5165	0.5596	0.5380	0.4404	0.3586	0.3278	0.3089
TURN(PR)	23.603	21.306	21.660	22.703	22.930	25.689	19.238	16.604	14.558
UUBAR	0.1370	0.1437	0.0905	0.0462	0.0979	0.1370	0.2514	0.3009	0.3264
LOSS PARA	0.0355	0.0378	0.0242	0.0128	0.0277	0.0378	0.0621	0.0711	0.0729
DFAC	0.5198	0.4916	0.4516	0.4105	0.4514	0.5636	0.6849	0.7380	0.7685
EFFP	0.8203	0.8144	0.9111	0.9322	0.9130	0.9535	0.8144	0.7833	0.7561
EFF	0.8147	0.8089	0.9082	0.9297	0.9098	0.9516	0.8074	0.7752	0.7470
INCID	-2.419	-3.369	-3.296	-3.524	-2.626	4.545	5.308	2.035	-2.622
DEVM	11.256	12.077	10.985	7.174	5.217	7.235	13.056	14.524	14.945
P 1	14.793	15.177	15.254	15.256	15.017	13.929	13.640	13.618	13.554
P 2	18.393	18.693	19.099	19.527	19.265	18.329	17.666	17.613	17.559
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700
T 2	559.589	558.039	556.590	559.466	560.751	563.178	567.971	569.718	572.007

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	41.706	38.147	35.140	33.677	35.657	45.584	57.941	63.969	69.361
BETA 2A	-1.100	1.230	2.000	2.200	1.530	0.290	-0.900	0.150	0.050
V 2	588.86	618.29	654.28	677.21	668.33	589.89	518.24	508.66	498.26
V 2A	476.57	461.09	476.20	558.56	550.59	470.87	404.71	388.23	392.14
VZ 2	439.62	486.23	535.01	563.46	542.80	412.59	274.94	223.15	175.58
VZ 2A	470.49	460.97	475.89	558.07	550.21	470.59	404.33	387.88	391.73
V-THETA 2	391.77	381.90	376.57	375.46	389.42	421.08	438.99	456.89	466.16
V-THETA 2A	-9.03	9.90	16.62	21.44	14.70	2.38	-6.35	1.02	0.34
M 2	0.5214	0.5498	0.5848	0.6051	0.5958	0.5206	0.4526	0.4432	0.4329
M 2A	0.4127	0.4046	0.4189	0.4933	0.4854	0.4116	0.3507	0.3355	0.3383
TURN(PR)	42.805	36.916	33.138	31.471	34.109	45.258	58.795	63.776	69.271
UUBAR	0.0196	0.1275	0.1769	0.0670	0.0348	0.0232	-0.0078	0.0231	-0.0050
LOSS PARA	0.0066	0.0434	0.0609	0.0238	0.0129	0.0089	-0.0031	0.0092	-0.0020
DFAC	0.4302	0.4592	0.4618	0.3614	0.3845	0.4763	0.5613	0.5972	0.5922
EFFP	0.9512	0.7414	0.6638	0.8174	0.9055	0.9425	1.0185	0.9488	1.0123
INCID	-8.462	-5.240	-5.151	-4.353	-1.048	9.715	19.238	20.807	10.177
DEVM	7.732	12.542	13.310	13.175	12.542	11.956	11.541	12.830	4.904
P 2	18.393	18.693	19.099	19.527	19.265	18.329	17.666	17.613	17.559
P 2A	18.332	18.250	18.401	19.240	19.121	18.257	17.684	17.561	17.570
T 2	559.589	558.039	556.590	559.466	560.751	563.178	567.971	569.718	572.007
T 2A	559.589	558.039	556.590	559.466	560.751	563.178	567.971	569.718	572.007
UUBAR FS	0.0824	0.1285	0.1179	0.0341	0.0506	0.1175	0.1778	0.1425	0.1360
P2 FS	18.605	18.696	18.835	19.380	19.332	18.659	18.189	17.921	17.905
LOSS PARA FS	0.0277	0.0437	0.0406	0.0121	0.0187	0.0451	0.0706	0.0567	0.0544

Table A-6. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 90.40 Equivalent Rotor Speed = 3805.68 Equivalent Weight Flow · 105.22
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	398.05	398.05	398.05	398.05	398.05	398.05	398.05	398.05	398.05	V 0
V 1	516.10	538.78	536.62	538.54	523.08	416.32	370.76	370.38	353.47	V 1
VZ 0	398.05	398.05	398.05	398.04	398.02	397.98	397.95	397.94	397.94	VZ 0
VZ 1	516.09	538.78	536.62	538.53	523.04	416.26	370.67	370.28	353.37	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3611	0.3611	0.3611	0.3611	0.3611	0.3611	0.3611	0.3611	0.3611	M 0
M 1	0.4725	0.4942	0.4922	0.4940	0.4792	0.3782	0.3358	0.3355	0.3198	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.6949	0.4106	0.3530	0.3498	0.5259	1.3550	1.5746	1.5840	1.6314	UUBAR
DFAC	-0.297	-0.354	-0.348	-0.353	-0.314	-0.046	0.069	0.070	0.112	DFAC
EFFP	0.5039	0.6807	0.7094	0.7146	0.5909	0.0647	-0.0902	-0.0909	-0.1456	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.766	15.766	15.766	15.766	15.766	15.766	15.766	15.766	15.766	P 0
P 1	14.822	15.208	15.286	15.290	15.051	13.925	13.626	13.613	13.549	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	35.598	32.054	30.662	28.988	29.587	35.695	41.260	44.309	49.592	BETA 2
BETA(PR) 1	46.750	44.097	43.819	44.730	47.399	55.387	59.223	59.427	60.719	BETA(PR) 1
BETA(PR) 2	27.255	26.195	25.951	25.863	28.435	33.040	38.788	42.528	47.075	BETA(PR) 2
V 1	517.39	574.46	587.32	591.01	566.29	446.66	399.71	400.70	383.30	V 1
V 2	551.38	589.16	608.13	642.62	632.15	572.06	518.78	488.58	458.13	V 2
VZ 1	517.29	574.33	587.25	590.97	565.59	444.85	397.08	397.85	380.80	VZ 1
VZ 2	448.32	499.32	523.09	562.10	549.48	463.99	389.26	348.98	296.53	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	326.96	312.66	310.13	311.42	311.98	333.35	341.50	340.66	348.32	V-THETA 2
V(PR) 1	755.0	799.8	813.9	831.9	836.0	784.2	777.3	783.6	779.8	V(PR) 1
V(PR) 2	504.3	556.5	581.8	624.7	625.1	554.3	500.4	474.5	436.1	V(PR) 2
VTHETA PR1	-549.9	-556.5	-563.5	-585.4	-615.0	-644.5	-666.7	-673.4	-679.1	VTHETA PR1
VTHETA PR2	-231.0	-245.6	-254.6	-272.5	-297.5	-301.8	-312.8	-320.1	-318.8	VTHETA PR2
U 1	549.89	556.51	563.53	585.43	615.05	644.52	666.70	673.45	679.10	U 1
U 2	551.89	558.29	564.70	583.91	609.52	635.13	654.34	660.74	667.14	U 2
M 1	0.4737	0.5287	0.5412	0.5448	0.5208	0.4066	0.3627	0.3636	0.3474	M 1
M 2	0.4909	0.5273	0.5461	0.5774	0.5668	0.5093	0.4585	0.4304	0.4020	M 2
M(PR) 1	0.6913	0.7361	0.7501	0.7669	0.7689	0.7139	0.7054	0.7111	0.7068	M(PR) 1
M(PR) 2	0.4490	0.4981	0.5224	0.5613	0.5606	0.4935	0.4423	0.4179	0.3827	M(PR) 2
TURN(PR)	19.491	17.898	17.866	18.866	18.942	22.290	20.359	16.823	13.585	TURN(PR)
UUBAR	0.1663	0.1549	0.1289	0.0855	0.0855	0.0561	0.1223	0.1808	0.2633	UUBAR
LOSS PARA	0.0426	0.0468	0.0344	0.0237	0.0242	0.0158	0.0331	0.0467	0.0635	LOSS PARA
DFAC	0.4554	0.4191	0.3985	0.3641	0.3719	0.4351	0.5074	0.5455	0.5975	DFAC
EFFP	0.7067	0.7349	0.8118	0.8383	0.8524	0.9743	0.8721	0.7790	0.6793	EFFP
EFF	0.7026	0.7295	0.8078	0.8343	0.8486	0.9735	0.8683	0.7729	0.6713	EFF
INCID	-5.681	-4.819	-6.759	-7.312	-6.606	-0.609	0.537	-2.881	-7.441	INCID
DEVM	12.106	12.035	11.317	7.222	5.225	5.480	7.164	9.389	11.098	DEVM
P 1	14.822	15.208	15.286	15.290	15.051	13.925	13.626	13.613	13.549	P 1
P 2	17.167	17.543	17.768	18.133	18.004	17.242	16.759	16.470	16.116	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	550.346	548.315	546.904	549.734	550.800	552.245	555.089	556.230	557.958	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	35.836	31.882	30.141	29.023	29.173	35.575	42.142	45.797	52.110	BETA 2
BETA 2A	-0.600	0.800	1.200	0.800	-0.700	1.150	2.601	2.251	-0.000	BETA 2A
V 2	548.27	592.17	617.95	642.62	641.34	574.65	510.68	476.83	442.88	V 2
V 2A	457.24	499.18	526.22	582.10	576.07	524.63	441.90	412.61	399.68	V 2A
VZ 2	444.47	502.83	534.38	561.82	559.70	467.00	378.30	332.15	271.79	VZ 2
VZ 2A	457.21	499.12	526.08	581.96	575.84	524.21	441.09	411.92	399.26	VZ 2A
V-THETA 2	320.99	312.76	310.28	311.71	312.46	334.04	342.33	341.52	349.24	V-THETA 2
V-THETA 2A	-4.79	6.97	11.02	8.13	-7.04	10.53	20.03	16.19	-0.00	V-THETA 2A
M 2	0.4880	0.5302	0.5554	0.5774	0.5756	0.5117	0.4511	0.4196	0.3882	M 2
M 2A	0.4040	0.4433	0.4690	0.5200	0.5138	0.4652	0.3883	0.3615	0.3494	M 2A
TURN(PR)	36.436	31.081	28.940	28.217	29.856	34.392	39.494	43.495	52.052	TURN(PR)
UUBAR	0.1431	0.1232	0.1016	0.0342	0.0234	-0.0259	0.0884	0.0628	-0.0938	UUBAR
LOSS PARA	0.0462	0.0419	0.0350	0.0122	0.0087	-0.0100	0.0350	0.0251	-0.0378	LOSS PARA
DFAC	0.3662	0.3330	0.3153	0.2624	0.2868	0.3049	0.3862	0.4092	0.4174	DFAC
EFFP	0.5687	0.6158	0.6705	0.8332	0.8940	1.1389	0.6744	0.7668	1.4718	EFFP
INCID	-14.331	-11.506	-10.149	-9.007	-7.531	-0.292	3.435	2.625	-7.093	INCID
DEVM	8.232	12.112	12.510	11.775	10.312	12.816	15.040	14.929	4.854	DEVM
P 2	17.167	17.543	17.768	18.133	18.004	17.242	16.759	16.470	16.116	P 2
P 2A	16.798	17.166	17.427	18.007	17.919	17.315	16.566	16.352	16.265	P 2A
T 2	550.348	548.315	546.904	549.734	550.800	552.245	555.089	556.230	557.958	T 2
T 2A	550.348	548.315	546.904	549.734	550.800	552.245	555.089	556.230	557.958	T 2A
UUBAR FS	0.2655	0.1280	0.0862	0.0619	0.0407	0.0486	0.2041	0.2078	0.1739	UUBAR FS
P2 FS	17.597	17.559	17.704	18.240	18.069	17.463	17.076	16.813	16.631	P2 FS
LOSS PARA FS	0.0894	0.0435	0.0290	0.0221	0.0151	0.0187	0.0808	0.0830	0.0701	LOSS PARA FS

Table A-6. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 90.09   Equivalent Rotor Speed = 3792.92   Equivalent Weight Flow = 99.16
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	376.75	376.75	376.75	376.75	376.75	376.75	376.75	376.75	376.75	V 0
V 1	474.96	496.76	493.35	490.76	471.16	356.30	309.20	309.46	297.71	V 1
VZ 0	376.75	376.75	376.75	376.75	376.75	376.69	376.66	376.65	376.65	VZ 0
VZ 1	474.96	496.76	493.35	490.75	471.13	356.24	309.13	309.38	297.63	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3414	0.3414	0.3414	0.3414	0.3414	0.3414	0.3414	0.3414	0.3414	M 0
M 1	0.4333	0.4540	0.4508	0.4483	0.4297	0.3224	0.2791	0.2793	0.2686	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.6800	0.3857	0.3294	0.3286	0.5131	1.3125	1.5198	1.5339	1.5971	UUBAR
DFAC	-0.261	-0.319	-0.309	-0.303	-0.281	-0.054	0.179	0.179	0.210	DFAC
EFFP	0.4721	0.6670	0.6945	0.6897	0.5331	-0.0873	-0.2686	-0.2642	-0.3003	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.596	15.596	15.596	15.596	15.596	15.596	15.596	15.596	15.596	P 0
P 1	14.774	15.130	15.198	15.199	14.976	14.010	13.760	13.743	13.666	P 1
T 0	516.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E (ROTOR -L.E., ROTOR -T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	39.598	36.060	33.976	32.487	34.095	41.176	48.522	52.746	56.815	BETA 2
BETA(PR) 1	49.022	46.423	46.276	47.457	50.410	59.430	63.579	63.725	64.707	BETA(PR) 1
BETA(PR) 2	26.247	26.494	26.223	25.977	28.533	33.943	39.996	44.415	47.649	BETA(PR) 2
V 1	476.13	527.88	537.23	535.49	507.54	380.98	332.33	333.73	321.93	V 1
V 2	540.70	561.18	581.84	613.82	601.23	543.96	500.48	474.70	463.09	V 2
VZ 1	476.04	527.76	537.17	535.46	506.92	379.44	330.15	331.36	319.83	VZ 1
VZ 2	416.61	453.63	482.49	517.75	497.68	408.98	331.01	286.98	253.20	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	344.62	330.31	325.15	329.68	336.89	357.73	374.43	377.34	387.15	V-THETA 2
V(PR) 1	726.0	765.7	777.2	792.0	795.8	746.8	742.9	749.6	749.5	V(PR) 1
V(PR) 2	464.5	506.9	537.9	576.0	566.7	493.7	432.9	402.5	376.5	V(PR) 2
VTHETA PR1	-548.1	-554.6	-561.6	-583.5	-613.0	-642.4	-664.5	-671.2	-676.8	VTHETA PR1
VTHETA PR2	-205.4	-226.1	-237.7	-252.3	-270.6	-275.3	-277.7	-281.2	-277.8	VTHETA PR2
U 1	548.05	554.64	561.64	583.47	612.98	642.36	664.46	671.19	676.82	U 1
U 2	550.04	556.42	562.80	581.95	607.47	633.00	652.14	658.53	664.91	U 2
M 1	0.4344	0.4838	0.4927	0.4911	0.4643	0.3453	0.3003	0.3016	0.2908	M 1
M 2	0.4803	0.5001	0.5202	0.5490	0.5366	0.4821	0.4404	0.4165	0.4052	M 2
M(PR) 1	0.6624	0.7017	0.7128	0.7262	0.7280	0.6769	0.6714	0.6775	0.6770	M(PR) 1
M(PR) 2	0.4126	0.4518	0.4808	0.5152	0.5058	0.4375	0.3810	0.3531	0.3294	M(PR) 2
TURN(PR)	22.772	19.924	20.051	21.479	21.857	25.437	23.523	19.250	17.015	TURN(PR)
UUBAR	0.1316	0.1354	0.0966	0.0631	0.0815	0.0657	0.1628	0.2205	0.2581	UUBAR
LOSS PARA	0.0342	0.0355	0.0257	0.0175	0.0231	0.0183	0.0433	0.0552	0.0616	LOSS PARA
DFAC	0.4979	0.4647	0.4323	0.4007	0.4236	0.4989	0.5906	0.6379	0.6791	DFAC
EFFP	0.7965	0.7872	0.8682	0.8866	0.8978	0.9772	0.8589	0.7862	0.7486	EFFP
EFF	0.7915	0.7823	0.8650	0.8835	0.8949	0.9764	0.8544	0.7798	0.7412	EFF
INCID	-3.409	-4.494	-4.302	-4.586	-3.593	3.441	4.909	1.433	-3.438	INCID
DEVM	11.097	12.334	11.589	7.337	5.323	6.383	8.372	11.276	11.672	DEVM
P 1	14.774	15.130	15.198	15.199	14.976	14.010	13.760	13.743	13.666	P 1
P 2	17.555	17.789	18.043	18.383	18.256	17.598	17.152	16.918	16.802	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	551.800	550.090	548.839	551.488	552.438	554.455	558.150	559.406	561.241	T 2

STATOR E (STATOR-L.E., STATOR-T.E.)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	39.865	35.868	33.407	32.527	33.626	41.041	49.647	54.764	60.183	BETA 2
BETA 2A	-0.900	1.000	1.900	1.100	-0.000	1.600	2.081	2.151	1.901	BETA 2A
V 2	537.74	563.94	590.87	613.82	609.56	546.33	492.89	463.45	447.63	V 2
V 2A	436.57	441.89	462.48	527.43	525.17	463.42	393.31	373.71	372.74	V 2A
VZ 2	412.75	456.99	493.23	517.44	507.33	411.77	318.91	267.21	222.46	VZ 2
VZ 2A	436.52	441.81	462.21	527.26	525.00	462.97	392.73	373.11	372.14	VZ 2A
V-THETA 2	344.68	330.42	325.31	329.90	337.40	358.46	375.34	378.30	388.17	V-THETA 2
V-THETA 2A	-6.86	7.71	15.33	10.12	-0.00	12.93	14.27	14.01	12.35	V-THETA 2A
M 2	0.4775	0.5027	0.5287	0.5490	0.5445	0.4843	0.4395	0.4063	0.3913	M 2
M 2A	0.3847	0.3901	0.4094	0.4681	0.4656	0.4081	0.3436	0.3243	0.3243	M 2A
TURN(PR)	46.705	34.867	31.505	31.421	33.609	39.406	47.518	52.565	58.233	TURN(PR)
UUBAR	0.0507	0.1201	0.1334	0.0452	0.0213	0.0130	0.0807	0.0356	-0.0151	UUBAR
LOSS PARA	0.0204	0.0409	0.0459	0.0161	0.0079	0.0050	0.0320	0.0142	-0.0061	LOSS PARA
DFAC	0.4084	0.4114	0.3981	0.3263	0.3441	0.3965	0.4939	0.5099	0.5080	DFAC
EFFP	0.8369	0.7159	0.6880	0.8466	0.9265	0.9578	0.7931	0.9046	1.0464	EFFP
INCID	-10.302	-7.520	-6.883	-5.503	-3.078	5.173	10.939	11.595	0.987	INCID
DEVM	7.932	12.312	13.210	12.075	11.012	13.265	14.520	14.829	6.753	DEVM
P 2	17.555	17.789	18.043	18.383	18.256	17.598	17.152	16.918	16.802	P 2
P 2A	17.401	17.450	17.626	18.229	18.185	17.564	16.984	16.854	16.827	P 2A
T 2	551.800	550.090	548.839	551.488	552.438	554.455	558.150	559.406	561.241	T 2
T 2A	551.800	550.090	548.839	551.488	552.438	554.455	558.150	559.406	561.241	T 2A
UUBAR FS	0.1296	0.1312	0.1089	0.0282	0.0208	0.0675	0.1617	0.1244	0.1155	UUBAR FS
P2 FS	17.755	17.824	17.957	18.323	18.254	17.750	17.352	17.103	17.050	P2 FS
LOSS PARA FS	0.0435	0.0447	0.0374	0.0100	0.0077	0.0259	0.0641	0.0496	0.0466	LOSS PARA FS

Table A-6. Blade Element Performance (Continued)
Stage E; Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 89.78   Equivalent Rotor Speed = 3779.77   Equivalent Weight Flow = 94.04
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	357.56	357.56	357.56	357.56	357.56	357.56	357.56	357.56	357.56	V 0
V 1	450.23	466.52	465.13	464.91	444.47	330.84	289.44	285.22	265.69	V 1
VZ 0	357.56	357.56	357.56	357.55	357.53	357.50	357.47	357.46	357.46	VZ 0
VZ 1	450.23	466.52	465.13	464.90	444.43	330.78	289.36	285.14	265.62	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.3236	0.3236	0.3236	0.3236	0.3236	0.3236	0.3236	0.3236	0.3236	M 0
M 1	0.4100	0.4254	0.4240	0.4238	0.4046	0.2990	0.2610	0.2571	0.2393	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.6263	0.3764	0.3216	0.3219	0.5087	1.2867	1.4968	1.5065	1.5795	UUBAR
DFAC	-0.259	-0.305	-0.301	-0.300	-0.243	0.075	0.191	0.202	0.257	DFAC
EFFP	0.4907	0.6602	0.6923	0.6911	0.5258	-0.1256	-0.2947	-0.3131	-0.3869	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.484	15.484	15.484	15.484	15.484	15.484	15.484	15.484	15.484	P 0
P 1	14.865	15.076	15.136	15.135	14.933	14.090	13.862	13.852	13.773	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	40.995	37.863	35.787	34.085	36.501	44.862	55.630	59.818	62.744	BETA 2
BETA(PR) 1	50.437	48.179	47.942	48.976	52.003	61.200	64.998	65.483	67.091	BETA(PR) 1
BETA(PR) 2	25.795	25.981	25.480	25.796	28.516	34.535	43.499	46.557	47.684	BETA(PR) 2
V 1	451.31	494.67	505.05	505.91	477.79	353.34	310.84	307.24	286.90	V 1
V 2	537.00	555.35	577.42	603.66	587.06	529.19	477.96	470.76	476.37	V 2
VZ 1	451.22	494.55	504.99	505.88	477.20	351.91	308.80	305.06	285.03	VZ 1
VZ 2	405.29	438.42	468.39	499.94	471.73	374.73	269.54	236.46	218.00	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	352.25	340.84	337.65	338.30	349.07	372.92	394.10	406.57	423.16	V-THETA 2
V(PR) 1	708.5	741.7	753.9	770.7	775.5	731.2	731.5	736.1	733.0	V(PR) 1
V(PR) 2	450.2	487.7	518.9	535.3	537.1	455.5	372.2	344.5	324.3	V(PR) 2
VTHETA PR1	-546.2	-552.7	-559.7	-581.4	-610.9	-640.1	-662.2	-668.9	-674.5	VTHETA PR1
VTHETA PR2	-195.9	-213.6	-223.2	-241.6	-256.3	-257.9	-255.8	-249.7	-239.4	VTHETA PR2
U 1	546.15	552.72	559.69	581.45	610.86	640.14	662.16	668.86	674.47	U 1
U 2	548.13	554.49	560.85	579.93	605.37	630.80	649.88	656.24	662.60	U 2
M 1	0.4110	0.4520	0.4619	0.4627	0.4360	0.3197	0.2806	0.2773	0.2587	M 1
M 2	0.4764	0.4943	0.5155	0.5390	0.5229	0.4679	0.4193	0.4123	0.4167	M 2
M(PR) 1	0.6452	0.6778	0.6895	0.7050	0.7077	0.6616	0.6603	0.6643	0.6609	M(PR) 1
M(PR) 2	0.3994	0.4341	0.4632	0.4958	0.4784	0.4028	0.3265	0.3017	0.2837	M(PR) 2
TURN(PR)	24.638	22.194	22.459	23.179	23.468	26.619	21.446	18.875	19.375	TURN(PR)
UUBAR	0.1248	0.1205	0.0788	0.0466	0.0905	0.1093	0.2380	0.2864	0.3093	UUBAR
LOSS PARA	0.0325	0.0318	0.0211	0.0129	0.0256	0.0303	0.0599	0.0691	0.0738	LOSS PARA
DFAC	0.5089	0.4774	0.4449	0.4144	0.4517	0.5473	0.6764	0.7239	0.7602	DFAC
EFFP	0.8084	0.8229	0.9065	0.9128	0.9031	0.9428	0.8015	0.7685	0.7683	EFFP
EFF	0.8034	0.8185	0.9040	0.9103	0.9003	0.9409	0.7954	0.7614	0.7610	EFF
INCID	-1.994	-2.738	-2.637	-3.067	-2.000	5.215	6.334	3.199	-1.043	INCID
DEVM	10.646	11.821	10.846	7.155	5.306	6.975	11.873	13.418	11.707	DEVM
P 1	14.865	15.076	15.136	15.135	14.933	14.090	13.862	13.852	13.773	P 1
P 2	17.714	17.935	18.209	18.493	18.304	17.671	17.166	17.102	17.150	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	552.046	550.933	549.813	552.279	553.201	555.555	559.769	560.993	562.776	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	41.286	37.660	35.183	34.128	36.000	44.715	57.090	62.515	67.228	BETA 2
BETA 2A	-0.600	1.250	2.200	2.000	0.750	1.000	-0.250	0.850	1.751	BETA 2A
V 2	533.95	558.07	586.32	603.66	595.04	531.46	470.81	459.65	460.30	V 2
V 2A	422.40	422.18	437.55	504.85	498.90	428.24	374.23	355.47	360.23	V 2A
VZ 2	401.22	441.78	479.19	499.61	481.18	377.42	255.67	212.05	178.11	VZ 2
VZ 2A	422.37	422.07	437.21	504.47	498.69	427.93	373.93	355.11	359.68	VZ 2A
V-THETA 2	352.31	340.96	337.82	338.62	349.61	373.69	395.06	407.60	424.29	V-THETA 2
V-THETA 2A	-4.42	9.21	16.79	17.62	6.53	7.47	-1.63	5.27	10.99	V-THETA 2A
M 2	0.4736	0.4968	0.5239	0.5390	0.5304	0.4700	0.4128	0.4022	0.4022	M 2
M 2A	0.3716	0.3720	0.3863	0.4469	0.4410	0.3758	0.3261	0.3091	0.3128	M 2A
TURN(PR)	41.886	36.409	32.981	32.121	35.232	43.680	57.295	61.621	65.436	TURN(PR)
UUBAR	0.0468	0.1223	0.1561	0.0508	0.0195	0.0352	-0.0033	0.0280	0.0449	UUBAR
LOSS PARA	0.0158	0.0416	0.0537	0.0180	0.0072	0.0136	-0.0013	0.0112	0.0181	LOSS PARA
DFAC	0.4340	0.4460	0.4424	0.3531	0.3758	0.4608	0.5407	0.5787	0.5817	DFAC
EFFP	0.8853	0.7380	0.6792	0.8489	0.9413	0.9078	1.0084	0.9345	0.8913	EFFP
INCID	-8.681	-5.728	-5.108	-3.902	-0.705	8.846	18.387	19.352	8.040	INCID
DEVM	8.232	12.562	13.510	12.975	11.762	12.666	12.191	13.530	6.603	DEVM
P 2	17.714	17.935	18.209	18.493	18.304	17.671	17.166	17.102	17.150	P 2
P 2A	17.596	17.594	17.724	18.325	18.241	17.584	17.172	17.052	17.069	P 2A
T 2	552.646	550.933	549.813	552.279	553.201	555.555	559.769	560.993	562.776	T 2
T 2A	552.646	550.933	549.813	552.279	553.201	555.555	559.769	560.993	562.776	T 2A
UUBAR FS	0.1121	0.1279	0.1097	0.0272	0.0368	0.1051	0.1728	0.1469	0.1348	UUBAR FS
P2 FS	17.899	17.952	18.047	18.413	18.360	17.865	17.570	17.354	17.338	P2 FS
LOSS PARA FS	0.0378	0.0435	0.0377	0.0096	0.0136	0.0406	0.0680	0.0587	0.0543	LOSS PARA FS

Table A-6. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 69.61 Equivalent Rotor Speed = 2930.53 Equivalent Weight Flow = 82.97
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA O	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA O
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V O	316.13	316.13	316.13	316.13	316.13	316.13	316.13	316.13	316.13	V O
V 1	387.74	411.18	410.69	405.10	384.12	299.47	263.62	248.29	243.84	V 1
VZ O	316.13	316.13	316.13	316.13	316.11	316.08	316.05	316.05	316.05	VZ O
VZ 1	387.74	411.18	410.69	405.09	384.10	299.42	263.55	248.22	243.78	VZ 1
V-THETA O	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA O
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M O	0.2855	0.2855	0.2855	0.2855	0.2855	0.2855	0.2855	0.2855	0.2855	M O
M 1	0.3516	0.3734	0.3729	0.3677	0.3482	0.2702	0.2375	0.2235	0.2195	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.6384	0.3526	0.3044	0.3056	0.4912	1.2112	1.4339	1.4463	1.5094	UUBAR
DFAC	-0.227	-0.301	-0.299	-0.281	-0.215	0.053	0.166	0.215	0.229	DFAC
EFFP	0.4469	0.6695	0.7002	0.6847	0.4989	-0.0927	-0.2674	-0.3565	-0.3618	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P O	15.287	15.287	15.287	15.287	15.287	15.287	15.287	15.287	15.287	P O
P 1	14.751	14.991	15.031	15.030	14.874	14.269	14.082	14.071	14.018	P 1
T O	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T O
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	34.247	31.545	29.935	28.391	29.115	34.905	40.025	42.317	46.780	BETA 2
BETA(PR) 1	47.461	44.600	44.349	45.785	49.058	57.336	61.310	62.915	63.443	BETA(PR) 1
BETA(PR) 2	25.343	24.824	24.757	26.135	29.452	33.905	38.735	42.558	47.337	BETA(PR) 2
V 1	388.62	434.66	443.97	438.65	411.37	319.48	282.81	267.10	263.09	V 1
V 2	445.37	468.65	483.90	495.68	479.21	435.92	401.49	377.02	349.63	V 2
VZ 1	388.55	434.56	443.91	438.62	410.86	318.19	280.95	265.20	261.38	VZ 1
VZ 2	366.13	399.37	419.33	436.05	418.48	357.03	306.86	278.23	239.03	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	250.63	245.17	241.46	235.68	233.06	249.11	257.72	253.33	254.36	V-THETA 2
V(PR) 1	574.7	610.4	620.8	629.0	627.3	590.2	586.1	583.3	585.4	V(PR) 1
V(PR) 2	407.4	440.1	461.8	485.7	480.8	430.8	394.2	378.5	353.3	V(PR) 2
VTHETA PR1	-423.4	-428.5	-433.9	-450.8	-473.6	-496.3	-513.4	-518.6	-522.9	VTHETA PR1
VTHETA PR2	-174.4	-184.7	-193.4	-214.0	-236.3	-240.0	-246.1	-255.5	-259.4	VTHETA PR2
U 1	423.44	428.53	433.94	450.81	473.61	496.31	513.39	518.58	522.93	U 1
U 2	424.98	429.91	434.84	449.63	469.35	489.08	503.87	508.80	513.73	U 2
M 1	0.3524	0.3954	0.4041	0.3991	0.3736	0.2885	0.2550	0.2406	0.2370	M 1
M 2	0.3977	0.4200	0.4348	0.4446	0.4291	0.3887	0.3566	0.3342	0.3091	M 2
M(PR) 1	0.5211	0.5552	0.5651	0.5723	0.5697	0.5331	0.5284	0.5255	0.5273	M(PR) 1
M(PR) 2	0.3636	0.3944	0.4149	0.4357	0.4305	0.3841	0.3501	0.3355	0.3124	M(PR) 2
TURN(PR)	22.114	19.771	19.590	19.649	19.586	23.377	22.506	20.294	16.057	TURN(PR)
UUBAR	0.1139	0.1204	0.0840	0.0527	0.0601	0.0398	0.0971	0.1438	0.1974	UUBAR
LOSS PARA	0.0298	0.0321	0.0226	0.0146	0.0169	0.0111	0.0263	0.0371	0.0474	LOSS PARA
DFAC	0.4178	0.3970	0.3718	0.3429	0.3527	0.4111	0.4787	0.5020	0.5490	DFAC
EFFP	0.7523	0.8005	0.9244	0.8501	0.8471	0.9429	0.8587	0.7749	0.6961	EFFP
EFF	0.7488	0.7978	0.9233	0.8478	0.8448	0.9419	0.8561	0.7711	0.6914	EFF
INCID	-4.971	-6.316	-6.229	-6.258	-4.946	1.343	2.632	0.620	-4.707	INCID
DEVM	10.193	10.664	10.123	7.494	6.241	6.346	7.111	9.419	11.361	DEVM
P 1	14.751	14.991	15.031	15.030	14.874	14.269	14.082	14.071	14.018	P 1
P 2	16.272	16.459	16.605	16.719	16.584	16.204	15.970	15.814	15.632	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	538.399	536.288	534.905	537.597	538.084	539.079	540.880	541.518	542.422	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	34.452	31.399	29.503	28.425	28.785	34.811	40.794	43.594	48.889	BETA 2
BETA 2A	0.700	1.300	1.500	0.900	-0.370	1.250	2.651	2.611	1.700	BETA 2A
V 2	443.10	470.75	490.58	495.68	484.99	437.64	395.81	368.68	338.79	V 2
V 2A	383.38	400.48	418.95	457.33	447.62	409.19	348.86	326.26	321.29	V 2A
VZ 2	365.38	401.80	426.94	435.84	424.84	359.01	299.36	266.75	222.56	VZ 2
VZ 2A	363.35	400.36	418.79	457.21	447.46	408.85	348.20	325.64	320.81	VZ 2A
V-THETA 2	250.67	245.25	241.58	235.91	233.41	249.62	258.34	253.97	255.03	V-THETA 2
V-THETA 2A	4.68	9.09	10.97	7.18	-2.89	8.92	16.12	14.85	9.52	V-THETA 2A
M 2	0.3956	0.4220	0.4410	0.4446	0.4345	0.3903	0.3514	0.3266	0.2994	M 2
M 2A	0.3409	0.3572	0.3747	0.4090	0.3999	0.3642	0.3089	0.2884	0.2837	M 2A
TURN(PR)	33.752	30.098	28.002	27.519	29.139	33.528	38.096	40.932	47.132	TURN(PR)
UUBAR	0.1032	0.1283	0.1188	0.0250	0.0046	-0.0283	0.0955	0.0914	-0.0320	UUBAR
LOSS PARA	0.0347	0.0437	0.0409	0.0089	0.0017	-0.0109	0.0378	0.0365	-0.0129	LOSS PARA
DFAC	0.3218	0.3202	0.3080	0.2417	0.2580	0.2778	0.3625	0.3761	0.3457	DFAC
EFFP	0.6135	0.5652	0.5920	0.8452	0.9711	1.2107	0.5922	0.5955	1.3058	EFFP
INCID	-15.715	-11.989	-10.787	-9.605	-7.918	-1.056	2.086	0.421	-10.314	INCID
DEVM	9.532	12.612	12.810	11.875	10.642	12.916	15.090	15.288	6.553	DEVM
P 2	16.272	16.459	16.605	16.719	16.584	16.204	15.970	15.814	15.632	P 2
P 2A	16.100	16.215	16.358	16.666	16.574	16.256	15.845	15.711	15.662	P 2A
T 2	538.399	536.288	534.905	537.597	538.084	539.079	540.880	541.518	542.422	T 2
T 2A	538.399	536.288	534.905	537.597	538.084	539.079	540.880	541.518	542.422	T 2A
UUBAR FS	0.1454	0.1085	0.0518	0.0245	0.0342	0.0361	0.2112	0.1849	0.1541	UUBAR FS
P2 FS	16.354	16.416	16.458	16.717	16.645	16.312	16.161	15.943	15.839	P2 FS
LOSS PARA FS	0.0489	0.0369	0.0178	0.0087	0.0126	0.0139	0.0836	0.0738	0.0621	LOSS PARA FS

Table A-6. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Calculations Using Translated Values
Percent Equivalent Rotor Speed = 69.77   Equivalent Rotor Speed = 2937.39   Equivalent Weight Flow 77.98
Tip Radial Distortion

INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	297.47	297.47	297.47	297.47	297.47	297.47	297.47	297.47	297.47	V 0
V 1	357.55	375.39	373.26	371.33	354.38	270.44	231.43	228.08	216.52	V 1
VZ 0	297.47	297.47	297.47	297.46	297.45	297.42	297.39	297.39	297.39	VZ 0
VZ 1	357.54	375.39	373.26	371.33	354.36	270.41	231.37	228.02	216.46	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2684	0.2684	0.2684	0.2684	0.2684	0.2684	0.2684	0.2684	0.2684	M 0
M 1	0.3236	0.3401	0.3381	0.3363	0.3207	0.2437	0.2082	0.2051	0.1947	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.6232	0.3402	0.2942	0.2942	0.4796	1.1767	1.3997	1.4207	1.4834	UUBAR
DFAC	-0.202	-0.262	-0.255	-0.248	-0.191	0.091	0.222	0.233	0.272	DFAC
EFFP	0.4213	0.6418	0.6679	0.6614	0.4722	-0.1731	-0.3895	-0.4049	-0.4582	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-8.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.199	15.199	15.199	15.199	15.199	15.199	15.199	15.199	15.199	P 0
P 1	14.737	14.947	14.981	14.981	14.844	14.326	14.161	14.145	14.099	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	38.395	35.551	33.853	32.386	33.656	40.384	47.588	50.883	54.543	BETA 2
BETA(PR) 1	49.832	47.318	47.220	48.399	51.439	60.015	64.414	64.904	66.136	BETA(PR) 1
BETA(PR) 2	25.349	25.003	24.999	25.857	28.741	34.077	40.101	44.502	46.951	BETA(PR) 2
V 1	358.34	396.20	402.55	401.22	378.90	288.21	248.03	245.20	233.40	V 1
V 2	429.26	448.49	461.58	476.99	465.67	421.93	387.20	365.88	359.13	V 2
VZ 1	358.27	396.11	402.50	401.20	378.43	287.04	246.39	243.45	231.88	VZ 1
VZ 2	336.42	364.87	383.32	402.79	387.46	321.03	260.77	230.50	208.08	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	266.60	260.75	257.12	255.47	257.97	273.06	285.45	283.46	292.18	V-THETA 2
V(PR) 1	555.5	584.4	592.6	604.3	607.4	574.9	571.2	574.7	573.8	V(PR) 1
V(PR) 2	372.3	402.6	423.0	447.6	442.1	388.1	341.6	323.8	305.3	V(PR) 2
VTHETA PR1	-424.4	-429.5	-435.0	-451.9	-474.7	-497.5	-514.6	-519.8	-524.2	VTHETA PR1
VTHETA PR2	-159.4	-170.2	-178.7	-195.2	-212.5	-217.2	-219.6	-226.5	-222.8	VTHETA PR2
U 1	424.43	429.54	434.96	451.86	474.72	497.47	514.59	519.80	524.16	U 1
U 2	425.97	430.92	435.86	450.68	470.45	490.22	505.05	509.99	514.93	U 2
M 1	0.3243	0.3594	0.3653	0.3641	0.3434	0.2599	0.2233	0.2207	0.2100	M 1
M 2	0.3828	0.4010	0.4135	0.4267	0.4160	0.3752	0.3429	0.3233	0.3170	M 2
M(PR) 1	0.5027	0.5301	0.5379	0.5484	0.5504	0.5184	0.5142	0.5173	0.5162	M(PR) 1
M(PR) 2	0.3320	0.3600	0.3789	0.4004	0.3949	0.3452	0.3024	0.2861	0.2695	M(PR) 2
TURN(PR)	24.478	22.310	22.218	22.541	22.678	25.890	24.257	20.348	19.148	TURN(PR)
UUBAR	0.0930	0.0999	0.0649	0.0416	0.0539	0.0562	0.1457	0.1922	0.2291	UUBAR
LOSS PARA	0.0243	0.0265	0.0175	0.0115	0.0152	0.0157	0.0387	0.0481	0.0554	LOSS PARA
DFAC	0.4691	0.4421	0.4153	0.3892	0.4083	0.4835	0.5739	0.6080	0.6466	DFAC
EFFP	0.8416	0.8659	0.9615	0.8909	0.8941	0.9374	0.8275	0.7564	0.7285	EFFP
EFF	0.8391	0.8638	0.9609	0.8890	0.8922	0.9362	0.8242	0.7520	0.7236	EFF
INCID	-2.600	-3.598	-3.359	-3.644	-2.564	4.027	5.748	2.617	-2.003	INCID
DEVM	10.200	10.844	10.365	7.216	5.531	6.517	8.477	11.363	10.974	DEVM
P 1	14.737	14.947	14.981	14.981	14.844	14.326	14.161	14.145	14.099	P 1
P 2	16.457	16.626	16.757	16.878	16.796	16.442	16.188	16.043	15.992	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	538.510	537.243	536.260	538.918	539.597	540.936	543.225	543.968	544.972	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	38.631	35.384	33.358	32.426	33.268	40.275	48.596	52.627	57.402	BETA 2
BETA 2A	0.200	1.800	2.020	0.890	-0.000	1.640	2.381	2.431	1.701	BETA 2A
V 2	427.11	450.46	467.86	476.99	471.21	423.57	381.78	357.84	347.94	V 2
V 2A	348.33	354.48	371.84	419.24	412.99	368.04	313.50	295.97	295.91	V 2A
VZ 2	333.65	367.25	390.76	402.55	393.80	322.92	252.31	217.06	187.34	VZ 2
VZ 2A	348.33	354.30	371.59	419.13	412.85	367.67	312.98	295.44	295.47	VZ 2A
V-THETA 2	266.64	260.83	257.25	255.72	258.36	273.62	286.14	284.18	292.95	V-THETA 2
V-THETA 2A	1.22	11.13	13.11	6.51	-0.00	10.53	13.01	12.54	8.77	V-THETA 2A
M 2	0.3809	0.4028	0.4193	0.4267	0.4211	0.3767	0.3379	0.3161	0.3069	M 2
M 2A	0.3091	0.3151	0.3311	0.3735	0.3675	0.3262	0.2765	0.2606	0.2603	M 2A
TURN(PR)	38.430	33.583	31.336	31.529	33.251	38.600	46.167	50.147	55.649	TURN(PR)
UUBAR	0.0706	0.1382	0.1360	0.0229	0.0139	0.0040	0.0715	0.0299	-0.0102	UUBAR
LOSS PARA	0.0238	0.0470	0.0468	0.0081	0.0052	0.0016	0.0283	0.0119	-0.0041	LOSS PARA
DFAC	0.3938	0.4019	0.3851	0.3071	0.3272	0.3715	0.4639	0.4784	0.4810	DFAC
EFFP	0.8006	0.6574	0.6533	0.9065	0.9441	0.9843	0.7901	0.9093	1.0355	EFFP
INCID	-11.536	-8.004	-6.933	-5.605	-3.436	4.407	9.888	9.457	-1.797	INCID
DEVM	9.032	13.112	13.330	11.865	11.012	13.305	14.820	15.109	6.553	DEVM
P 2	16.457	16.626	16.757	16.878	16.796	16.442	16.188	16.043	15.992	P 2
P 2A	16.346	16.383	16.497	16.833	16.770	16.435	16.100	16.011	16.002	P 2A
T 2	538.510	537.243	536.260	538.918	539.597	540.936	543.225	543.988	544.972	T 2
T 2A	538.510	537.243	536.260	538.918	539.597	540.936	543.225	543.968	544.972	T 2A
UUBAR FS	0.1085	0.1048	0.0675	-0.0211	0.0233	0.0606	0.1901	0.1318	0.1293	UUBAR FS
P2 FS	16.523	16.560	16.616	16.874	16.815	16.533	16.368	16.169	16.153	P2 FS
LOSS PARA FS	0.0365	0.0356	0.0232	0.0074	0.0087	0.0242	0.0752	0.0524	0.0519	LOSS PARA FS

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INLET

PCT SPAN	96.80	92.00	86.90	71.00	49.50	28.10	12.00	7.10	3.00	PCT SPAN
DIA	33.122	33.529	33.962	35.312	37.137	38.954	40.321	40.737	41.085	DIA
BETA 0	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 0
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
V 0	274.46	274.48	274.48	274.48	274.48	274.48	274.48	274.48	274.48	V 0
V 1	335.70	352.86	352.45	353.93	339.10	264.45	222.72	216.26	203.30	V 1
VZ 0	274.48	274.48	274.48	274.48	274.46	274.44	274.41	274.41	274.41	VZ 0
VZ 1	335.70	352.86	352.45	353.92	339.07	264.40	222.67	216.20	203.24	VZ 1
V-THETA 0	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 0
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
M 0	0.2474	0.2474	0.2474	0.2474	0.2474	0.2474	0.2474	0.2474	0.2474	M 0
M 1	0.3034	0.3193	0.3189	0.3202	0.3066	0.2382	0.2003	0.1944	0.1827	M 1
TURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	TURN
UUBAR	0.5863	0.3168	0.2760	0.2809	0.4524	1.1171	1.3457	1.3784	1.4437	UUBAR
DFAC	-0.223	-0.286	-0.284	-0.289	-0.223	0.037	0.189	0.212	0.259	DFAC
EFFP	0.4626	0.6786	0.7069	0.7076	0.5430	-0.0688	-0.3386	-0.3773	-0.4508	EFFP
INCID	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	INCID
DEVM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DEVM
P 0	15.105	15.105	15.105	15.105	15.105	15.105	15.105	15.105	15.105	P 0
P 1	14.736	14.906	14.932	14.929	14.821	14.402	14.258	14.238	14.197	P 1
T 0	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 0
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1

ROTOR E
ROTOR -L.E.
ROTOR -T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.236	33.621	34.007	35.164	36.706	38.248	39.405	39.791	40.176	DIA
BETA 1	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	BETA 1
BETA 2	41.093	38.505	36.365	34.764	36.683	44.366	53.694	57.810	60.657	BETA 2
BETA(PR) 1	51.406	48.906	48.687	49.590	52.489	60.401	65.112	65.913	67.308	BETA(PR) 1
BETA(PR) 2	25.239	24.775	24.559	25.269	28.197	33.455	42.108	44.802	45.983	BETA(PR) 2
V 1	336.44	372.09	379.66	382.03	362.30	281.75	238.63	232.40	219.07	V 1
V 2	417.76	434.98	450.42	467.17	454.90	415.90	374.40	368.59	371.15	V 2
VZ 1	336.37	372.01	379.61	382.00	361.85	280.61	237.06	230.75	217.64	VZ 1
VZ 2	314.83	340.38	362.69	383.77	364.67	297.02	221.43	196.16	181.72	VZ 2
V-THETA 1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	V-THETA 1
V-THETA 2	274.58	270.79	267.06	266.37	271.65	290.52	301.37	311.61	323.25	V-THETA 2
V(PR) 1	539.3	566.0	575.1	589.3	594.5	568.7	564.0	566.1	564.7	V(PR) 1
V(PR) 2	348.1	374.9	398.8	424.4	414.0	356.5	299.0	277.0	262.0	V(PR) 2
VTHETA PR1	-421.5	-426.5	-431.9	-448.7	-471.4	-494.0	-511.0	-516.2	-520.5	VTHETA PR1
VTHETA PR2	-148.4	-157.1	-165.7	-181.2	-195.5	-196.3	-200.1	-194.8	-188.1	VTHETA PR2
U 1	421.46	426.52	431.91	448.69	471.39	493.98	510.98	516.15	520.48	U 1
U 2	422.99	427.89	432.80	447.52	467.15	486.78	501.50	506.41	511.32	U 2
M 1	0.3041	0.3370	0.3441	0.3463	0.3280	0.2540	0.2147	0.2091	0.1970	M 1
M 2	0.3720	0.3882	0.4028	0.4173	0.4057	0.3693	0.3308	0.3253	0.3273	M 2
M(PR) 1	0.4875	0.5127	0.5211	0.5341	0.5382	0.5126	0.5075	0.5092	0.5078	M(PR) 1
M(PR) 2	0.3099	0.3346	0.3566	0.3791	0.3692	0.3165	0.2642	0.2445	0.2310	M(PR) 2
TURN(PR)	26.163	24.126	24.125	24.320	24.272	26.897	22.952	21.061	21.293	TURN(PR)
UUBAR	0.1095	0.1181	0.0718	0.0446	0.0792	0.1185	0.2300	0.2766	0.3002	UUBAR
LOSS PARA	0.0287	0.0315	0.0194	0.0124	0.0225	0.0333	0.0592	0.0688	0.0739	LOSS PARA
DFAC	0.5023	0.4782	0.4446	0.4187	0.4502	0.5437	0.6536	0.7019	0.7371	DFAC
EFFP	0.8148	0.8392	0.9330	0.8852	0.8704	0.8756	0.7461	0.7196	0.7124	EFFP
EFF	0.8119	0.8367	0.9319	0.8832	0.8681	0.8732	0.7415	0.7145	0.7070	EFF
INCID	-1.025	-2.011	-1.891	-2.453	-1.514	4.414	6.448	3.631	-0.826	INCID
DEVM	10.089	10.616	9.925	6.628	4.987	5.896	10.482	11.663	10.006	DEVM
P 1	14.736	14.906	14.932	14.929	14.821	14.402	14.258	14.238	14.197	P 1
P 2	16.474	16.609	16.756	16.890	16.800	16.494	16.201	16.161	16.183	P 2
T 1	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	518.700	T 1
T 2	539.371	538.165	537.340	539.784	540.495	542.171	544.705	545.465	546.667	T 2

STATOR E
STATOR-L.E.
STATOR-T.E.

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00	PCT SPAN
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633	DIA
BETA 2	41.350	36.322	35.828	34.807	36.255	44.245	54.956	60.115	64.409	BETA 2
BETA 2A	-0.200	1.540	2.200	1.530	0.640	0.830	0.340	1.120	2.711	BETA 2A
V 2	415.69	436.87	456.48	467.17	460.25	417.50	369.21	360.48	359.51	V 2
V 2A	334.85	335.00	346.20	395.68	390.31	342.39	301.69	285.42	286.51	V 2A
VZ 2	312.05	342.73	370.09	383.51	370.98	298.89	211.88	179.53	155.23	VZ 2
VZ 2A	334.84	334.87	345.93	395.49	390.16	342.15	301.44	285.12	285.88	VZ 2A
V-THETA 2	274.62	270.88	267.19	266.62	272.06	291.12	302.10	312.40	324.11	V-THETA 2
V-THETA 2A	-1.17	9.00	13.29	10.56	4.36	4.96	1.79	5.58	13.54	V-THETA 2A
M 2	0.3701	0.3900	0.4084	0.4173	0.4106	0.3708	0.3261	0.3180	0.3168	M 2
M 2A	0.2967	0.2972	0.3075	0.3517	0.3466	0.3027	0.2655	0.2509	0.2515	M 2A
TURN(PR)	41.550	36.781	33.627	33.271	35.597	43.380	54.569	58.949	61.655	TURN(PR)
UUBAR	0.0401	0.1169	0.1482	0.0377	0.0134	0.0330	-0.0027	0.0301	0.0416	UUBAR
LOSS PARA	0.0135	0.0398	0.0510	0.0134	0.0050	0.0127	-0.0011	0.0120	0.0168	LOSS PARA
DFAC	0.4180	0.4374	0.4333	0.3482	0.3680	0.4451	0.5069	0.5506	0.5537	DFAC
EFFP	0.8918	0.7315	0.6709	0.8754	0.9555	0.9045	1.0078	0.9226	0.8905	EFFP
INCID	-8.817	-5.066	-4.462	-3.223	-0.450	8.376	16.251	16.949	5.218	INCID
DEVM	8.632	12.852	13.510	12.505	11.652	12.496	12.781	13.799	7.562	DEVM
P 2	16.474	16.609	16.756	16.890	16.800	16.494	16.201	16.161	16.183	P 2
P 2A	16.414	16.416	16.487	16.818	16.776	16.445	16.204	16.128	16.137	P 2A
T 2	539.371	538.165	537.340	539.784	540.495	542.171	544.705	545.465	546.667	T 2
T 2A	539.371	538.165	537.340	539.784	540.495	542.171	544.705	545.465	546.667	T 2A
UUBAR FS	0.1051	0.1171	0.0916	0.0325	0.0437	0.1009	0.1842	0.1423	0.1473	UUBAR FS
P2 FS	16.581	16.609	16.643	16.879	16.859	16.607	16.464	16.304	16.316	P2 FS
LOSS PARA FS	0.0353	0.0398	0.0315	0.0115	0.0163	0.0388	0.0750	0.0567	0.0594	LOSS PARA FS

Table A-7. Overall Performance - Stage E
Circumferential Distortion

Equivalent Weight Flow, lb/sec	Rotor			Stage		
	$\bar{P}_2/\bar{P}_1$	η_{ad}	η_p	$\bar{P}_{2A}/\bar{P}_1$	η_{ad}	η_p
100% Design Equivalent Rotor Speed						
116.75	1.2430	0.8042	0.8084	1.2272	0.7555	0.7608
*103.40	1.2934	0.8568	0.8630	1.2657	0.7823	0.7904
* 92.60	1.3081	0.8352	0.8380	1.2668	0.7320	0.7379
90% Design Equivalent Rotor Speed						
106.41	1.1928	0.8377	0.8382	1.1778	0.7761	0.7781
95.23	1.2272	0.8492	0.8537	1.2105	0.7908	0.7965
* 84.27	1.2334	0.8452	0.8515	1.2072	0.7563	0.7643
70% Design Equivalent Rotor Speed						
86.61	1.1167	0.8187	0.8251	1.1098	0.7721	0.7788
75.67	1.1279	0.8229	0.8176	1.1219	0.7858	0.7814
65.42	1.1381	0.8166	0.8226	1.1249	0.7417	0.7485

*Data taken at multiple screen positions.

Table A-8. Blade Element Performance
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow - 103.40

Circumferential Distortion

Station 1 (16°) - Station 2 (6°) - Station 2A (355°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138
BETA 1	-4.249	-4.390	-4.420	-4.396	-4.285	-4.219	-3.489	-3.375	-3.557
BETA 2	55.318	55.672	54.023	49.624	48.708	48.453	53.433	57.036	61.828
BETA(PR) 1	61.187	59.483	59.441	59.454	60.466	62.089	62.885	63.514	64.277
BETA(PR) 2	18.863	24.960	31.189	27.523	29.481	34.732	39.952	45.619	49.711
V 1	348.43	379.73	385.39	400.16	402.52	393.15	389.74	382.33	373.66
V 2	598.02	565.13	534.01	584.99	597.68	579.26	553.81	521.96	510.95
VZ 1	347.47	378.61	384.24	398.99	401.38	392.04	388.95	381.61	372.30
VZ 2	346.28	318.69	313.71	376.95	393.89	383.83	329.53	283.68	241.02
V-THETA 1	-25.82	-29.07	-29.70	-30.67	-30.06	-28.92	-23.71	-22.50	-23.14
V-THETA 2	491.76	466.69	432.15	445.64	448.48	433.12	444.25	437.43	450.02
V(PR) 1	721.0	745.6	755.7	785.1	814.3	837.5	853.4	855.7	857.8
V(PR) 2	359.6	351.5	366.7	427.3	452.7	467.7	430.8	406.3	373.3
VTHETA PR1	-631.7	-642.3	-650.8	-676.1	-706.4	-740.1	-759.6	-765.9	-772.8
VTHETA PR2	-116.3	-148.0	-189.9	-197.5	-222.7	-266.0	-276.0	-289.9	-284.0
U 1	605.90	613.25	621.07	645.43	678.38	711.17	735.85	743.35	749.64
U 2	608.02	615.03	622.05	643.09	671.16	699.22	720.30	727.31	734.33
M 1	0.3152	0.3441	0.3494	0.3631	0.3653	0.3566	0.3534	0.3465	0.3379
M 2	0.5256	0.4957	0.4675	0.5138	0.5232	0.5067	0.4834	0.4545	0.4443
M(PR) 1	0.6522	0.6757	0.6851	0.7124	0.7390	0.7597	0.7739	0.7756	0.7771
M(PR) 2	0.3160	0.3084	0.3210	0.3753	0.3967	0.4091	0.3760	0.3538	0.3247
TURN(PR)	42.324	34.523	28.251	31.933	31.001	27.410	23.025	18.001	14.674
P 1	13.468	13.621	13.650	13.661	13.627	13.618	13.645	13.655	13.623
P 2	18.632	18.263	17.971	18.631	18.860	18.754	18.475	18.169	18.165
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	568.539	567.369	566.768	568.069	571.527	571.846	571.650	571.515	571.978

STATOR E — STATION 2, STATION 2A

PCT SPAN	95.00	90.00	85.00	76.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.426	37.848	38.919	39.276	39.633
BETA 2	55.318	55.672	54.023	49.624	48.708	48.453	53.433	57.036	61.828
BETA 2A	0.273	-1.136	-2.312	-1.972	0.864	0.372	1.294	2.305	2.880
V 2	598.02	565.13	534.01	584.99	597.08	579.26	553.81	521.96	510.95
V 2A	366.65	352.44	339.78	377.90	421.79	448.90	432.73	420.72	417.82
VZ 2	340.28	318.69	313.71	378.95	393.89	383.83	329.53	283.68	241.02
VZ 2A	366.64	352.36	339.50	377.64	421.65	448.72	432.46	420.14	416.99
V-THETA 2	491.76	466.69	432.15	445.64	448.48	433.12	444.25	437.43	450.02
V-THETA 2A	1.76	-6.99	-13.71	-13.00	6.36	2.91	9.77	16.91	20.98
M 2	0.5256	0.4957	0.4675	0.5136	0.5232	0.5667	0.4834	0.4545	0.4443
M 2A	0.3177	0.3638	0.2928	0.3258	0.3637	0.3875	0.3732	0.3626	0.3599
TURN(PR)	55.044	56.807	56.335	51.591	47.824	48.021	52.045	54.632	58.856
P 2	18.632	18.263	17.971	18.631	18.860	18.754	18.475	18.169	18.105
P 2A	17.798	17.644	17.551	17.751	16.677	16.300	18.180	18.103	18.089
T 2	568.539	567.369	566.768	568.009	571.527	571.846	571.650	571.515	571.978
T 2A	571.667	570.552	569.892	571.647	574.605	575.084	575.082	574.924	575.425

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Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.10
Circumferential Distortion
Station 1 (46°) - Station 2 (36°) - Station 2A (25°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.96	36.00	56.00	70.00	84.99	90.00	94.99
DIA	46.138	39.754	39.371	38.219	36.685	35.151	34.001	33.617	33.234
BETA 1	2.487	3.562	3.049	1.744	2.579	2.522	2.567	3.384	3.657
BETA 2	51.329	44.614	40.256	37.633	39.148	38.893	41.299	43.514	46.183
BETA(PR) 1	60.223	57.443	56.351	54.000	52.210	56.353	50.182	50.757	51.567
BETA(PR) 2	52.803	44.947	40.032	35.375	30.861	27.188	26.250	27.622	26.592
V 1	418.95	457.43	473.80	505.81	508.81	516.51	493.16	478.68	457.42
V 2	458.51	515.77	560.67	596.94	613.34	625.81	603.66	575.87	569.24
VZ 1	418.52	456.47	473.04	505.51	508.27	516.00	492.20	477.84	456.38
VZ 2	286.06	366.44	427.02	472.12	475.45	487.06	453.51	417.62	394.11
V-THETA 1	18.18	28.41	25.20	15.39	22.89	22.73	30.68	28.25	30.77
V-THETA 2	357.43	361.54	361.58	364.01	387.05	392.91	398.41	396.50	416.73
V(PR) 1	842.8	848.3	853.7	860.1	829.5	808.7	768.6	755.4	73..2
V(PR) 2	473.8	518.7	558.8	579.8	554.2	547.6	505.7	471.3	440.7
VTHETA PR1	-731.5	-714.9	-710.7	-695.8	-655.5	-622.7	-590.4	-585.0	-575.1
VTHETA PR2	-376.9	-365.8	-358.7	-335.2	-284.1	-250.2	-223.6	-218.5	-197.3
U 1	749.64	743.35	735.85	711.17	678.38	645.43	621.07	613.25	605.96
U 2	734.33	727.31	720.30	699.22	671.16	643.09	622.05	615.03	608.02
M 1	0.3807	0.4168	0.4322	0.4626	0.4655	0.4729	0.4506	0.4369	0.4168
M 2	0.4018	0.4545	0.4961	0.5306	0.5306	0.5573	0.5370	0.5103	0.5035
M(PR) 1	0.7657	0.7729	0.7768	0.7867	0.7589	0.7404	0.7023	0.6894	0.6690
M(PR) 2	0.4153	0.4572	0.4945	0.5153	0.4929	0.4876	0.4498	0.4177	0.3898
TURN(PR)	7.527	12.601	16.411	16.679	21.366	23.167	23.932	23.136	24.975
P 1	14.680	14.880	14.953	15.136	15.045	15.109	14.868	14.759	14.616
P 2	17.659	18.157	18.002	18.976	19.040	19.086	18.742	18.418	18.306
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	559.255	557.935	557.643	556.446	557.404	557.406	556.136	557.495	556.939

STATOR E — STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	51.329	44.614	40.256	37.633	39.148	38.893	41.299	43.514	46.183
BETA 2A	0.115	1.423	0.960	0.424	0.778	-0.044	-0.045	0.125	0.009
V 2	458.51	515.77	560.67	596.94	613.34	625.81	603.66	575.87	569.24
V 2A	391.29	399.18	417.05	476.28	485.87	473.99	414.00	410.60	420.92
VZ 2	286.06	366.44	427.02	472.12	475.45	487.06	453.51	417.62	394.11
VZ 2A	391.01	398.83	416.78	476.09	485.72	473.95	413.99	410.59	420.92
V-THETA 2	357.43	361.54	361.58	364.01	387.05	392.91	398.41	396.50	416.73
V-THETA 2A	0.78	9.91	6.98	3.52	6.60	-0.46	-0.33	0.90	-0.07
M 2	0.4018	0.4545	0.4961	0.5306	0.5455	0.5573	0.5370	0.5103	0.5035
M 2A	0.3411	0.3487	0.3648	0.4188	0.4272	0.4163	0.3627	0.3592	0.3679
TURN(PR)	51.104	43.082	39.199	37.151	38.350	38.935	41.344	43.388	46.173
P 2	17.861	17.902	18.602	18.976	19.049	19.086	18.742	18.418	18.306
P 2A	17.861	16.157	16.047	16.586	16.715	18.581	18.058	18.059	16.151
T 2	559.255	557.935	557.643	556.446	557.404	557.406	556.136	557.495	559.426
T 2A	560.244	558.736	558.433	556.996	557.957	558.207	556.451	557.917	559.426

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.40
Circumferential Distortion
Station 1 (76°) - Station 2 (66°) - Station 2A (55°)

ROTOR E
STATION 1
STATION 2

PCT SPAN	4.98	9.99	14.98	30.50	50.50	70.00	84.99	90.00	94.99
DIA	40.138	39.754	39.371	38.219	36.085	35.151	34.001	33.617	33.234
BETA 1	-0.728	-0.636	-1.004	-0.622	-0.704	-0.469	-0.798	-0.716	-0.175
BETA 2	47.116	40.604	37.921	36.297	36.661	37.176	39.269	40.976	43.560
BETA(PR) 1	60.289	57.927	57.108	54.725	52.843	50.807	51.341	52.080	53.430
BETA(PR) 2	46.361	38.883	35.537	31.548	27.819	24.535	23.788	24.709	24.365
V 1	430.99	469.16	481.52	507.05	519.01	529.82	502.49	482.48	450.52
V 2	508.63	577.10	612.76	644.26	658.07	664.41	638.52	613.11	597.69
VZ 1	430.91	469.06	481.36	506.96	518.95	529.80	502.44	482.44	450.51
VZ 2	345.50	437.18	482.34	518.54	527.65	529.37	494.33	462.88	433.11
V-THETA 1	-5.48	-5.16	-0.44	-5.50	-0.38	-4.34	-7.00	-6.03	-1.38
V-THETA 2	372.01	374.76	375.77	380.86	392.74	401.46	404.16	402.04	411.87
V(PR) 1	869.4	883.4	886.4	877.9	859.2	838.4	804.3	785.0	756.1
V(PR) 2	501.6	562.9	594.1	609.4	596.9	581.9	540.2	509.5	475.5
VTHETA PR1	-755.1	-748.5	-744.3	-716.7	-684.8	-649.8	-628.1	-619.3	-607.3
VTHETA PR2	-362.3	-352.5	-344.5	-318.4	-278.4	-241.6	-217.9	-213.0	-196.2
U 1	749.64	743.35	735.85	711.17	678.38	645.43	621.07	613.25	605.90
U 2	734.33	727.31	720.30	699.22	671.16	643.09	622.05	615.03	608.02
M 1	0.3919	0.4278	0.4396	0.4638	0.4753	0.4856	0.4595	0.4405	0.4103
M 2	0.4464	0.5096	0.5429	0.5727	0.5855	0.5925	0.5683	0.5438	0.5287
M(PR) 1	0.7906	0.8056	0.8092	0.8031	0.7868	0.7684	0.7355	0.7167	0.6886
M(PR) 2	0.4402	0.4971	0.5264	0.5417	0.5311	0.5190	0.4806	0.4519	0.4206
TURN(PR)	14.037	19.147	21.659	23.227	25.040	26.275	27.553	27.371	29.065
P 1	14.619	14.086	14.935	15.043	15.075	15.164	14.987	14.836	14.543
P 2	18.696	18.790	19.209	19.519	19.572	19.539	19.112	18.808	18.612
T 1	516.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	561.870	561.324	561.290	561.187	561.681	559.982	559.276	560.313	561.648

STATOR E
STATION 2
STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	47.116	40.604	37.921	36.297	36.661	37.176	39.269	40.976	43.560
BETA 2A	-1.794	0.906	0.741	0.473	0.693	1.489	1.816	1.136	-0.192
V 2	508.63	577.10	612.76	644.26	658.07	664.41	638.52	613.11	597.69
V 2A	444.90	463.01	489.20	543.70	548.65	524.59	450.60	440.86	445.97
VZ 2	345.50	437.18	482.34	518.54	527.65	529.37	494.33	462.88	433.11
VZ 2A	444.37	462.69	488.91	543.48	548.49	524.36	450.36	440.76	445.97
V-THETA 2	372.01	374.76	375.77	380.86	392.74	401.46	404.16	402.04	411.87
V-THETA 2A	-13.92	7.32	6.32	4.49	6.63	13.63	14.28	8.74	-1.49
M 2	0.4464	0.5096	0.5429	0.5727	0.5855	0.5925	0.5683	0.5438	0.5287
M 2A	0.3890	0.4056	0.4294	0.4795	0.4838	0.4622	0.3950	0.3859	0.3900
TURN(PR)	48.796	39.590	37.084	35.766	35.948	35.685	37.453	39.839	43.751
P 2	18.696	18.790	19.209	19.519	19.572	19.539	19.112	18.808	16.612
P 2A	18.216	18.368	18.598	19.230	19.325	19.078	18.355	18.274	18.297
T 2	561.870	561.324	561.290	561.187	561.661	559.982	559.278	560.313	561.648
T 2A	560.833	560.101	559.973	559.604	560.226	558.894	558.311	559.356	560.663

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Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.40

Circumferential Distortion

Station 1 (106°) - Station 2 (96°) - Station 2A (85°)

ROTOR E (STATION 1 / STATION 2)

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138
BETA 1	-0.206	-0.135	0.121	0.309	-0.015	-0.119	-1.369	-1.044	-1.572
BETA 2	42.653	39.809	37.746	35.961	35.546	34.858	36.249	39.214	45.669
BETA(PR) 1	54.000	52.567	52.026	51.988	52.897	55.350	57.764	58.852	61.900
BETA(PR) 2	25.155	27.798	26.191	26.542	29.836	34.686	38.324	42.807	49.989
V 1	441.37	470.29	483.98	502.38	513.24	492.29	471.37	454.41	406.43
V 2	594.39	588.44	621.38	648.61	640.71	621.41	587.52	540.04	475.37
VZ 1	441.56	470.28	483.98	502.36	513.22	492.22	471.14	454.26	406.23
VZ 2	437.15	452.02	491.34	524.97	521.07	521.19	472.75	417.46	331.43
V-THETA 1	-1.59	-1.11	1.02	2.71	-0.13	-1.02	-11.26	-8.28	-11.15
V-THETA 2	402.73	376.73	380.38	380.87	372.31	354.66	346.62	340.64	339.50
V(PR) 1	750.9	773.7	786.6	815.8	850.8	865.8	883.3	878.3	862.5
V(PR) 2	483.0	511.0	547.6	586.9	601.0	615.7	603.9	570.2	516.3
VTHETA PR1	-607.5	-614.4	-620.0	-642.7	-678.5	-712.2	-747.1	-751.6	-760.8
VTHETA PR2	-205.3	-238.3	-241.7	-262.2	-298.9	-344.6	-373.7	-386.7	-394.8
U 1	605.90	613.25	621.07	645.43	678.38	711.17	735.85	743.35	749.64
U 2	608.02	615.03	622.05	643.09	671.16	699.22	720.30	727.31	734.33
M 1	0.4017	0.4289	0.4419	0.4594	0.4697	0.4498	0.4299	0.4139	0.3690
M 2	0.5255	0.5208	0.5525	0.5770	0.5693	0.5515	0.5193	0.4753	0.4159
M(PR) 1	0.6833	0.7056	0.7181	0.7459	0.7787	0.7910	0.8057	0.8000	0.7830
M(PR) 2	0.4270	0.4522	0.4869	0.5220	0.5340	0.5464	0.5338	0.5019	0.4517
TURN(PR)	28.845	24.769	25.835	25.447	23.077	21.317	19.531	16.150	12.019
P 1	14.551	14.818	14.918	15.046	15.140	15.066	14.959	14.879	14.618
P 2	18.676	18.628	19.021	19.449	19.460	19.335	19.004	18.476	17.865
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	561.875	560.093	558.457	560.922	561.197	560.515	561.285	561.421	562.454

STATOR E (STATION 2 / STATION 2A)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.60
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	42.653	39.809	37.746	35.961	35.546	34.858	36.249	39.214	45.689
BETA 2A	-0.125	1.107	1.958	1.567	0.673	0.581	0.870	1.473	-1.092
V 2	594.39	588.44	621.38	648.61	640.71	621.41	587.52	540.04	475.37
V 2A	468.82	460.60	467.80	541.68	554.42	544.17	477.47	449.46	436.22
VZ 2	437.15	452.02	491.34	524.97	521.07	509.19	472.75	417.46	331.43
VZ 2A	468.82	460.50	467.51	541.42	554.26	543.94	477.17	449.05	435.82
V-THETA 2	402.73	376.73	380.38	380.87	372.31	354.66	346.62	340.64	339.50
V-THETA 2A	-1.02	8.90	15.98	14.81	6.51	5.52	7.25	11.55	-8.31
M 2	0.5255	0.5208	0.5525	0.5770	0.5693	0.5515	0.5193	0.4753	0.4159
M 2A	0.4103	0.4036	0.4108	0.4688	0.4797	0.4797	0.4184	0.3930	0.3807
TURN(PR)	42.777	38.701	35.786	34.392	34.854	34.220	35.285	37.634	46.668
P 2	18.676	18.628	19.021	19.449	19.460	19.335	19.004	18.476	17.865
P 2A	18.533	18.481	18.550	19.293	19.416	19.282	18.524	18.288	18.180
T 2	561.875	560.093	558.457	560.922	561.197	560.515	561.285	561.421	562.454
T 2A	561.614	559.733	557.874	560.999	560.942	560.154	561.627	560.998	562.086

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.10
Circumferential Distortion
Station 1 (136°) - Station 2 (126°) - Station 2A (115°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN DIA	94.99	90.00	85.00	70.00	50.00	36.00	14.98	9.99	4.98
DIA	33.017	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.136
BETA 1	-0.196	-0.517	-0.661	-1.283	-1.028	-0.840	-0.756	-1.800	-1.920
BETA 2	43.049	41.157	38.779	37.171	36.551	36.113	37.723	46.047	45.915
BETA(PR) 1	53.026	51.680	50.812	52.183	53.481	55.567	57.692	58.674	60.914
BETA(PR) 2	25.480	25.635	24.702	25.250	28.534	32.769	37.272	41.374	49.154
V 1	457.34	488.18	511.16	509.96	509.20	492.61	469.37	461.56	425.21
V 2	587.44	603.32	631.59	656.25	650.20	631.15	594.71	553.20	483.08
VZ 1	457.33	488.15	511.12	509.83	509.09	492.49	469.24	461.25	424.93
VZ 2	425.05	454.24	492.36	522.89	522.28	509.17	469.39	422.53	335.45
V-THETA 1	-1.56	-4.40	-5.90	-11.42	-9.14	-7.22	-6.19	-14.50	-14.25
V-THETA 2	405.47	397.05	395.57	396.48	367.19	371.47	363.09	355.14	346.34
V(PR) 1	760.47	787.05	808.9	831.5	855.5	871.0	878.0	887.2	874.1
V(PR) 2	470.9	503.8	542.0	578.2	594.8	606.4	591.1	564.3	513.8
VTHETA PR1	-607.5	-617.7	-627.0	-656.9	-687.5	-718.4	-742.0	-757.8	-763.9
VTHETA PR2	-202.6	-218.0	-226.5	-246.6	-284.0	-327.7	-357.2	-372.2	-388.0
U 1	605.96	613.25	621.07	645.43	678.38	711.17	735.85	743.35	749.64
U 2	608.02	615.03	622.05	643.09	671.16	699.22	720.30	727.31	734.33
M 1	0.4167	0.4459	0.4676	0.4666	0.4659	0.4501	0.4280	0.4207	0.3865
M 2	0.5188	0.5343	0.5614	0.5844	0.5781	0.5600	0.5257	0.4876	0.4226
M(PR) 1	0.6928	0.7190	0.7402	0.7608	0.7827	0.7958	0.8007	0.8086	0.7946
M(PR) 2	0.4159	0.4462	0.4817	0.5149	0.5287	0.5381	0.5226	0.4968	0.4494
TURN(PR)	27.546	26.045	26.110	26.934	24.963	22.850	20.511	17.405	11.869
P 1	14.678	14.933	15.103	15.146	15.088	15.088	14.946	14.914	14.679
P 2	18.621	18.819	19.164	19.573	19.618	19.493	19.125	18.663	17.970
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	562.227	560.861	559.944	560.522	561.983	561.691	561.994	562.385	563.180

STATOR E — STATION 2 / STATION 2A

PCT SPAN DIA	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	43.649	41.157	38.779	37.171	36.551	36.113	37.723	40.047	45.915
BETA 2A	-0.129	1.016	1.945	1.532	0.713	0.697	0.982	1.786	-0.675
V 2	587.44	603.32	631.59	656.25	650.45	631.15	594.71	553.20	483.08
V 2A	461.34	456.69	462.99	537.59	557.27	553.67	489.37	464.73	446.83
VZ 2	425.05	454.24	492.36	522.89	522.28	509.17	469.39	422.53	335.45
VZ 2A	461.34	456.61	462.71	537.34	557.10	553.43	489.05	464.24	446.48
V-THETA 2	405.47	397.05	395.57	396.48	387.19	371.47	363.09	355.14	346.34
V-THETA 2A	-1.04	8.10	15.71	14.37	6.93	6.73	8.38	14.48	-5.26
M 2	0.5188	0.5343	0.5614	0.5844	0.5781	0.5600	0.5257	0.4876	0.4226
M 2A	0.4033	0.3996	0.4057	0.4734	0.4910	0.4879	0.4288	0.4064	0.3899
TURN(PR)	43.777	46.140	36.834	35.637	35.818	35.359	36.646	38.154	46.477
P 2	18.621	18.819	19.164	19.573	19.618	19.493	19.125	18.663	17.970
P 2A	18.504	18.473	18.545	19.297	19.502	19.409	18.672	18.461	18.293
T 2	562.227	560.861	559.944	560.522	561.983	561.691	561.994	562.385	563.180
T 2A	562.240	560.772	559.765	560.583	561.818	561.415	561.820	562.201	563.028

Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.10

Circumferential Distortion

Station 1 (166°) – Station 2 (156°) – Station 2A (145°)

ROTOR E

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.138	39.754	39.371	38.219	36.685	35.151	34.001	33.617	33.234
BETA 1	0.685	0.219	-0.790	0.004	0.665	0.498	0.194	0.177	0.516
BETA 2	46.669	40.500	37.160	34.885	35.516	36.425	38.219	40.909	43.385
BETA(PR) 1	61.061	58.920	58.594	55.600	53.390	52.023	51.776	52.039	53.150
BETA(PR) 2	49.728	42.247	38.326	33.517	29.595	26.187	25.987	26.797	25.684
V 1	411.84	447.11	453.21	467.00	500.12	500.48	487.87	477.32	451.59
V 2	478.54	543.94	584.98	627.87	643.65	649.97	621.04	593.35	586.67
VZ 1	411.77	447.04	453.08	486.93	500.67	500.46	487.86	477.31	451.06
VZ 2	327.78	412.70	465.18	514.31	523.66	522.96	487.92	448.41	426.36
V-THETA 1	4.92	1.71	-6.25	0.03	5.28	4.35	1.65	1.47	4.06
V-THETA 2	347.45	352.48	352.58	358.59	373.74	385.91	384.22	388.55	402.97
V(PR) 1	851.0	866.0	869.5	861.9	838.5	813.3	788.5	776.0	752.1
V(PR) 2	507.9	558.7	594.2	617.8	602.5	582.8	542.8	502.4	473.1
VTHETA PR1	-744.7	-741.6	-742.1	-711.1	-673.1	-641.1	-619.4	-611.8	-601.8
VTHETA PR2	-386.9	-374.8	-367.7	-340.6	-297.4	-257.2	-237.8	-226.5	-205.0
U 1	749.64	743.35	735.85	711.17	678.38	645.43	621.07	613.25	605.90
U 2	734.33	727.31	720.30	699.22	671.16	643.09	622.05	615.03	608.02
M 1	0.3740	0.4071	0.4128	0.4447	0.4572	0.4576	0.4456	0.4356	0.4108
M 2	0.4189	0.4791	0.5171	0.5575	0.5722	0.5786	0.5525	0.5257	0.5188
M(PR) 1	0.7728	0.7884	0.7920	0.7871	0.7666	0.7436	0.7201	0.7081	0.6849
M(PR) 2	0.4446	0.4921	0.5252	0.5486	0.5357	0.5188	0.4829	0.4451	0.4183
TURN(PR)	11.442	16.778	20.360	22.135	23.811	25.837	25.789	25.242	27.465
P 1	14.665	14.865	14.897	15.019	15.027	15.046	14.968	14.900	14.712
P 2	17.926	18.545	18.995	19.422	19.464	19.484	19.006	18.680	18.580
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	562.091	561.671	561.133	560.565	561.027	560.347	557.919	559.428	560.873

STATOR E

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	46.669	40.500	37.160	34.885	35.516	36.425	38.219	40.909	43.385
BETA 2A	-1.592	1.233	0.966	0.820	0.883	1.598	1.986	1.017	-0.368
V 2	478.54	543.94	584.98	627.87	643.65	649.97	621.04	593.35	586.67
V 2A	435.32	447.80	477.68	547.73	548.29	534.36	455.25	450.27	456.04
VZ 2	327.78	412.70	465.18	514.31	523.66	522.96	487.92	448.41	426.36
VZ 2A	434.84	447.44	477.37	547.47	548.10	534.10	454.96	450.19	450.03
V-THETA 2	347.45	352.48	352.58	358.59	373.74	385.91	384.22	388.55	402.97
V-THETA 2A	-12.09	9.63	8.05	7.84	8.45	14.90	15.78	7.99	-2.93
M 2	0.4189	0.4791	0.5171	0.5575	0.5722	0.5786	0.5525	0.5257	0.5188
M 2A	0.3797	0.3914	0.4183	0.4626	0.4830	0.4702	0.3993	0.3943	0.3989
TURN(PR)	48.148	39.159	36.099	34.009	34.614	34.825	36.233	39.891	43.752
P 2	17.926	18.545	18.995	19.422	19.484	19.287	19.006	18.680	18.580
P 2A	18.226	18.336	16.593	19.366	19.442	19.287	18.518	18.443	18.488
T 2	562.091	561.071	561.133	560.565	561.027	560.347	557.919	559.428	560.373
T 2A	562.667	561.466	561.629	560.898	561.287	561.148	558.037	559.620	561.248

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Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.40

Circumferential Distortion

Station 1 (196°) - Station 2 (186°) - Station 2A (175°)

ROTOR E / STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.138	39.754	39.371	38.219	36.685	35.151	34.001	33.617	33.234
BETA 1	0.414	0.311	0.831	-0.410	0.269	0.133	0.075	0.409	1.002
BETA 2	45.170	40.254	37.960	35.957	36.762	37.765	38.998	41.574	43.574
BETA(PR) 1	59.680	58.032	57.055	55.146	52.756	51.590	51.590	51.409	52.395
BETA(PR) 2	47.642	40.256	37.109	32.678	28.868	25.617	24.960	25.990	25.226
V 1	436.62	462.44	472.56	497.82	514.35	510.80	491.91	486.64	460.57
V 2	496.33	564.01	595.78	632.86	645.54	648.66	627.68	598.11	596.03
VZ 1	436.57	462.36	472.42	497.75	514.32	510.80	491.91	486.62	460.49
VZ 2	349.23	429.49	468.73	511.56	516.93	512.76	487.81	447.44	427.46
V-THETA 1	3.15	2.51	6.85	-3.56	1.88	1.19	0.64	3.47	8.05
V-THETA 2	351.31	363.64	365.68	371.09	386.17	397.24	394.99	396.89	406.69
V(PR) 1	864.8	873.3	868.7	871.0	849.8	822.2	791.8	780.2	754.6
V(PR) 2	519.3	564.0	589.1	608.7	590.6	568.7	538.1	497.8	472.5
VTHETA PR1	-746.5	-740.8	-729.0	-714.7	-676.5	-644.2	-620.4	-609.8	-597.8
VTHETA PR2	-383.0	-363.7	-354.6	-328.1	-285.0	-245.9	-227.1	-218.1	-201.3
U 1	749.64	743.35	735.85	711.17	678.38	645.43	621.07	613.25	605.90
U 2	734.33	727.31	720.30	699.22	671.16	643.09	622.05	615.03	608.02
M 1	0.3972	0.4215	0.4311	0.4550	0.4708	0.4674	0.4494	0.4444	0.4197
M 2	0.4354	0.4979	0.5276	0.5624	0.5742	0.5783	0.5587	0.5303	0.5223
M(PR) 1	0.7867	0.7960	0.7924	0.7961	0.7779	0.7523	0.7234	0.7124	0.6877
M(PR) 2	0.4556	0.4979	0.5216	0.5409	0.5253	0.5070	0.4789	0.4414	0.4183
TURN(PR)	12.147	17.879	20.036	22.520	23.904	25.976	26.630	25.419	27.175
P 1	14.775	14.961	15.011	15.011	15.162	15.155	14.969	14.939	14.724
P 2	18.119	18.806	19.172	19.561	19.590	19.533	19.151	18.784	18.678
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	561.128	560.523	560.247	560.329	560.666	558.551	558.024	559.121	560.083

STATOR E / STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	45.170	40.254	37.960	35.957	36.762	37.765	38.998	41.574	43.574
BETA 2A	-2.091	0.869	1.008	0.943	0.971	1.573	2.042	1.212	-0.468
V 2	496.33	564.01	595.78	632.86	645.54	648.66	627.68	598.11	590.03
V 2A	446.45	464.83	491.46	548.23	547.10	525.51	452.46	447.05	451.59
VZ 2	349.23	429.49	468.73	511.56	516.93	512.76	487.81	447.44	427.46
VZ 2A	445.83	464.51	491.13	547.95	546.90	525.26	452.16	446.94	451.57
V-THETA 2	351.31	363.64	365.68	371.09	386.17	397.24	394.99	396.89	406.69
V-THETA 2A	-16.28	7.05	8.64	9.02	9.27	14.42	16.12	9.46	-3.69
M 2	0.4354	0.4215	0.5276	0.5624	0.5742	0.5783	0.5587	0.5303	0.5223
M 2A	0.3902	0.4071	0.4313	0.4834	0.4821	0.4631	0.3968	0.3915	0.3952
TURN(PR)	47.147	39.277	36.857	34.957	35.771	36.190	36.956	40.361	44.041
P 2	18.119	18.806	19.172	19.561	19.590	19.533	19.151	18.784	18.678
P 2A	18.301	18.463	18.697	19.341	19.395	19.178	18.472	18.413	18.446
T 2	561.128	560.523	560.247	560.329	560.666	558.551	558.024	559.121	560.303
T 2A	561.291	560.632	560.412	560.290	560.750	558.890	558.091	559.292	560.360

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Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59 Equivalent Rotor Speed = 4192.94 Equivalent Weight Flow = 103.40
Circumferential Distortion
Station 1 (226°) - Station 2 (216°) - Station 2A (205°)

ROTOR E (STATION 1, STATION 2)

PCT SPAN / DIA	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138
BETA 1	1.505	1.510	2.257	2.521	2.115	1.320	1.300	1.703	2.879
BETA 2	42.564	40.052	38.472	36.957	35.795	35.147	37.354	40.455	46.426
BETA(PR) 1	53.684	51.954	51.623	50.442	53.102	55.144	57.518	58.933	59.880
BETA(PR) 2	26.162	26.559	25.285	26.109	29.464	33.499	37.067	40.941	49.312
V 1	446.53	470.39	477.34	514.94	495.93	487.68	461.99	440.22	423.15
V 2	585.65	599.38	627.09	647.76	643.71	626.95	597.98	556.88	482.05
VZ 1	446.37	470.22	476.96	514.44	495.57	487.49	461.78	439.95	422.58
VZ 2	431.33	458.80	490.96	517.59	521.88	521.92	474.29	422.80	331.65
V-THETA 1	11.73	12.39	18.80	22.65	18.30	11.23	10.48	13.08	21.25
V-THETA 2	396.13	385.69	390.13	389.42	376.32	360.41	362.02	360.53	348.58
V(PR) 1	743.2	763.0	768.3	807.8	825.4	853.0	859.9	852.6	842.1
V(PR) 2	480.6	512.9	543.0	576.4	599.7	614.8	595.7	560.9	509.6
VTHETA PR1	-594.2	-600.9	-602.3	-622.8	-660.1	-699.9	-725.4	-730.3	-728.4
VTHETA PR2	-211.9	-229.3	-231.9	-253.7	-294.8	-338.8	-358.3	-366.8	-385.7
U 1	605.90	613.25	621.07	645.43	678.38	711.17	735.85	743.35	749.64
U 2	608.02	615.03	622.05	643.09	671.16	699.22	720.30	727.31	734.33
M 1	0.4065	0.4290	0.4356	0.4714	0.4532	0.4454	0.4211	0.4006	0.3846
M 2	0.5187	0.5322	0.5589	0.5769	0.5725	0.5565	0.5294	0.4912	0.4222
M(PR) 1	0.6766	0.6959	0.7011	0.7394	0.7544	0.7790	0.7838	0.7758	0.7654
M(PR) 2	0.4256	0.4555	0.4839	0.5134	0.5334	0.5457	0.5274	0.4948	0.4463
TURN(PR)	26.922	25.395	26.337	24.335	23.654	21.697	20.542	18.097	10.676
P 1	14.704	14.911	14.943	15.197	15.058	15.113	15.007	14.879	14.828
P 2	18.584	18.743	19.094	19.444	19.492	19.394	19.118	18.658	17.920
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	559.063	557.656	556.580	559.478	560.565	560.851	560.743	560.674	561.870

STATOR E (STATION 2, STATION 2A)

PCT SPAN / DIA	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	42.564	40.052	38.472	36.957	35.795	35.147	37.354	40.455	46.426
BETA 2A	-0.188	1.865	2.159	1.344	0.841	1.086	1.220	1.145	-1.350
V 2	585.65	599.38	627.09	647.76	643.71	626.95	597.98	556.88	482.05
V 2A	460.07	454.68	466.36	536.46	547.05	545.91	477.55	448.07	434.34
VZ 2	431.33	458.80	490.96	517.59	521.88	521.92	474.29	422.80	331.65
VZ 2A	460.06	454.43	466.01	536.26	546.67	545.61	477.20	447.72	433.91
V-THETA 2	396.13	385.69	390.13	389.42	376.32	360.41	362.02	360.53	348.58
V-THETA 2A	-1.51	14.80	17.57	12.58	8.03	10.34	10.16	8.95	-10.23
M 2	0.5187	0.5322	0.5589	0.5769	0.5725	0.5565	0.5294	0.4912	0.4222
M 2A	0.4031	0.3987	0.4098	0.4725	0.4821	0.4809	0.4184	0.3918	0.3791
TURN(PR)	42.751	38.186	36.313	35.611	34.935	34.004	36.039	39.202	47.663
P 2	18.584	18.743	19.094	19.444	19.492	19.394	19.118	18.658	17.920
P 2A	18.528	18.499	18.601	19.303	19.385	19.320	18.555	18.307	18.196
T 2	559.063	557.656	556.580	559.478	560.565	560.851	560.743	560.674	561.870
T 2A	559.610	558.286	556.936	560.268	560.755	561.095	561.006	560.831	562.070

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.40
Circumferential Distortion
Station 1 (256°) – Station 2 (246°) – Station 2A (235°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.138	39.754	39.371	38.219	36.685	35.151	34.061	33.617	33.234
BETA 1	1.906	1.647	1.474	1.596	1.578	1.283	1.814	1.334	1.212
BETA 2	50.225	43.460	38.831	36.563	37.477	38.268	39.641	40.484	42.208
BETA(PR) 1	60.921	59.191	57.692	55.657	53.376	52.056	51.004	51.220	53.258
BETA(PR) 2	47.508	40.525	36.967	32.796	28.563	25.257	23.634	24.084	24.480
V 1	409.59	436.06	458.12	477.08	494.35	494.75	490.53	483.81	445.39
V 2	501.39	557.03	594.90	628.95	645.35	649.79	638.04	621.75	602.56
VZ 1	409.32	435.80	457.88	476.83	494.14	494.62	490.28	483.67	445.28
VZ 2	320.26	403.51	462.46	504.49	511.92	510.14	491.33	472.89	446.32
V-THETA 1	13.62	12.53	11.78	13.29	13.61	11.08	15.53	11.26	9.42
V-THETA 2	384.73	382.38	372.24	374.16	392.48	402.42	407.05	403.65	404.81
V(PR) 1	842.2	850.9	856.7	845.3	828.3	804.4	779.1	772.2	744.4
V(PR) 2	475.0	532.0	580.1	601.0	583.2	564.1	536.3	518.0	490.4
VTHETA PR1	-736.0	-730.8	-724.1	-697.9	-664.8	-634.4	-605.5	-602.0	-596.5
VTHETA PR2	-349.6	-344.9	-348.1	-325.1	-278.7	-240.7	-215.0	-211.4	-203.2
U 1	749.64	743.35	735.85	711.17	678.38	645.43	621.07	613.25	605.90
U 2	734.33	727.31	720.30	699.22	671.16	643.09	622.05	615.03	608.02
M 1	0.3719	0.3967	0.4174	0.4353	0.4517	0.4521	0.4481	0.4417	0.4054
M 2	0.4398	0.4914	0.5268	0.5590	0.5743	0.5799	0.5693	0.5537	0.5349
M(PR) 1	0.7647	0.7741	0.7806	0.7713	0.7569	0.7351	0.7117	0.7050	0.6776
M(PR) 2	0.4167	0.4693	0.5136	0.5342	0.5190	0.5034	0.4786	0.4613	0.4353
TURN(PR)	13.522	18.771	20.815	22.913	24.829	26.801	27.370	27.136	28.778
P 1	14.775	14.946	15.082	15.167	15.199	15.208	15.136	15.106	14.817
P 2	18.070	18.619	19.045	19.390	19.486	19.515	19.293	19.071	18.825
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	561.677	560.629	560.193	559.757	560.070	557.650	556.524	556.942	558.279

STATOR E — STATION 2, STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	50.225	43.460	38.831	36.563	37.477	38.268	39.641	40.484	42.208
BETA 2A	-0.292	1.451	1.345	0.949	0.673	0.955	2.094	2.174	-0.025
V 2	501.39	557.03	594.90	628.95	645.35	649.79	638.04	621.75	602.56
V 2A	446.64	466.20	491.78	550.49	547.47	535.89	476.85	462.69	469.58
VZ 2	320.26	403.51	462.46	504.49	511.92	510.14	491.33	472.89	446.32
VZ 2A	446.31	465.78	491.39	550.21	547.31	535.76	476.51	462.35	469.58
V-THETA 2	384.73	382.38	372.24	374.16	392.48	402.42	407.05	403.65	404.81
V-THETA 2A	-2.27	11.80	11.54	9.11	6.43	8.93	17.42	17.55	-0.20
M 2	0.4398	0.4914	0.5268	0.5590	0.5743	0.5799	0.5693	0.5537	0.5349
M 2A	0.3903	0.4083	0.4317	0.4855	0.4827	0.4731	0.4196	0.4065	0.4122
TURN(PR)	50.406	41.900	37.390	35.556	36.784	37.311	37.547	38.309	42.232
P 2	18.070	18.619	19.045	19.390	19.486	19.515	19.293	19.071	18.825
P 2A	18.283	18.454	18.668	19.337	19.375	19.265	18.657	18.530	18.576
T 2	561.677	560.629	560.193	559.757	560.070	557.650	556.524	556.942	558.279
T 2A	561.528	560.502	560.229	560.138	560.212	557.899	556.404	556.960	558.365

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.40
Circumferential Distortion
Station 1 (286°) - Station 2 (276°) - Station 2A (265°)

PER.

ROTOR E (STATION 1, STATION 2)

PCT SPAN / DIA	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.23.	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138
BETA 1	-1.150	-1.723	-1.070	-0.587	-1.594	0.296	-0.911	-0.838	-0.966
BETA 2	42.621	42.453	41.457	40.964	40.885	41.339	43.305	45.506	49.644
BETA(PR) 1	55.349	54.360	54.520	55.738	58.001	59.448	62.622	64.522	67.930
BETA(PR) 2	22.990	23.530	23.618	25.564	29.432	34.159	38.055	41.024	44.890
V 1	424.76	449.60	448.73	442.77	431.57	418.57	384.36	356.79	306.10
V 2	614.58	617.35	628.49	632.79	621.07	598.35	574.74	550.75	522.74
VZ 1	424.67	449.39	448.65	442.74	431.38	418.51	384.24	356.69	306.03
VZ 2	452.23	455.49	471.02	478.25	469.35	448.72	417.48	385.26	337.93
V-THETA 1	-8.52	-13.52	-8.38	-4.54	-12.00	2.16	-6.11	-5.22	-5.16
V-THETA 2	416.15	416.70	416.09	414.33	406.35	394.75	393.48	392.12	397.69
V(PR) 1	746.9	771.2	773.0	786.4	814.1	823.3	835.6	829.2	814.5
V(PR) 2	491.3	496.8	514.1	530.2	539.2	543.1	531.3	511.8	477.9
VTHETA PR1	-614.4	-626.8	-629.4	-650.0	-690.4	-709.0	-742.0	-748.6	-754.8
VTHETA PR2	-191.9	-198.3	-206.0	-228.8	-264.8	-304.5	-326.8	-335.2	-336.6
U 1	605.90	613.25	621.07	645.43	678.38	711.17	735.85	743.35	749.64
U 2	608.02	615.03	622.05	643.09	671.16	699.22	720.30	727.31	734.33
M 1	0.3861	0.4094	0.4086	0.4030	0.3925	0.3803	0.3484	0.3229	0.2763
M 2	0.5432	0.5464	0.5574	0.5604	0.5490	0.5276	0.5051	0.4828	0.4566
M(PR) 1	0.6789	0.7023	0.7038	0.7158	0.7403	0.7480	0.7504	0.7504	0.7351
M(PR) 2	0.4342	0.4397	0.4559	0.4695	0.4767	0.4788	0.4669	0.4486	0.4174
TURN(PR)	32.359	30.830	30.902	30.176	28.586	25.342	24.658	23.603	23.151
P 1	14.861	15.049	15.066	15.066	15.067	15.086	14.942	14.813	14.595
P 2	18.035	18.861	19.062	19.155	19.101	16.961	18.741	18.489	18.225
T 1	518.699	516.699	518.699	518.699	518.699	516.699	518.699	518.699	518.699
T 2	564.683	562.948	561.942	565.920	564.596	565.013	566.343	566.734	568.217

STATOR E (STATION 2, STATION 2A)

PCT SPAN / DIA	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	42.621	42.453	41.457	40.904	40.885	41.339	43.305	45.506	49.644
BETA 2A	-0.239	1.600	1.637	0.260	0.465	0.145	1.226	1.667	1.199
V 2	614.58	617.35	628.49	632.79	621.07	598.35	574.74	550.75	522.74
V 2A	470.80	463.81	471.46	524.05	529.19	520.72	457.56	433.90	426.88
VZ 2	452.23	455.49	471.25	478.25	469.35	448.72	417.48	385.26	337.93
VZ 2A	470.79	463.62	471.02	523.99	529.05	520.52	457.22	433.47	426.48
V-THETA 2	416.15	416.70	416.09	414.33	406.35	394.75	393.48	392.12	397.69
V-THETA 2A	-1.96	12.95	13.47	2.38	4.29	1.32	9.79	12.62	8.93
M 2	0.5432	0.5464	0.5574	0.5604	0.5490	0.5276	0.5051	0.4828	0.4566
M 2A	0.4129	0.4070	0.4143	0.4611	0.4584	0.4584	0.4002	0.3787	0.3719
TURN(PR)	42.859	40.852	39.820	40.642	40.400	41.134	41.981	43.730	48.335
P 2	18.035	18.580	19.062	19.155	19.101	18.961	18.741	18.489	18.225
P 2A	18.643	18.643	18.645	19.139	19.198	19.659	18.404	18.213	18.162
T 2	564.683	562.948	561.942	563.920	564.596	565.013	566.343	566.734	568.217
T 2A	559.451	558.431	557.492	560.374	560.167	559.487	561.385	561.837	563.530

220

Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 99.59   Equivalent Rotor Speed = 4192.94   Equivalent Weight Flow = 103.40

Circumferential Distortion

Station 1 (316°) – Station 2 (306°) – Station 2A (295°)

ROTOR E

STATION 1, STATION 2

PCT SPAN	4.96	9.99	14.98	30.00	50.00	70.00	85.00	90.00	94.99
DIA	40.138	39.754	39.371	38.219	36.685	35.151	34.001	33.617	33.234
BETA 1	-12.613	-11.894	-11.498	-10.705	-10.705	-11.458	-11.713	-13.110	-13.456
BETA 2	63.054	60.659	58.428	52.652	51.496	51.371	59.340	60.009	58.449
BETA(PR) 1	69.928	68.701	68.132	67.158	65.426	65.298	65.316	66.034	66.910
BETA(PR) 2	50.359	47.412	43.433	35.047	31.584	28.237	30.735	28.702	21.569
V 1	305.71	322.72	328.23	331.29	345.60	334.08	322.20	312.22	295.94
V 2	510.93	518.20	534.99	573.35	576.10	576.03	534.68	539.66	574.14
VZ 1	298.30	315.74	321.59	325.49	339.57	327.42	315.49	304.08	287.76
VZ 2	231.34	253.69	279.84	347.55	358.55	359.59	272.66	269.73	300.42
V-THETA 1	-66.75	-66.50	-65.42	-61.53	-64.19	-66.36	-65.41	-70.82	-69.07
V-THETA 2	455.10	451.30	455.37	455.44	450.72	449.98	459.94	467.35	489.26
V(PR) 1	869.2	869.2	863.4	838.5	816.5	783.5	755.5	748.6	733.8
V(PR) 2	363.2	375.5	386.1	425.1	421.1	408.2	317.2	307.5	325.1
VTHETA PR1	-816.4	-809.9	-801.3	-772.7	-742.6	-711.4	-686.5	-684.1	-675.0
VTHETA PR2	-279.2	-276.0	-264.9	-243.8	-220.4	-193.1	-162.1	-147.7	-118.8
U 1	749.64	743.35	735.85	711.17	678.38	645.43	621.07	613.25	605.96
U 2	734.33	727.31	720.30	699.22	671.16	643.09	622.05	615.03	606.02
M 1	0.2759	0.2915	0.2966	0.2994	0.3126	0.3019	0.2910	0.2819	0.2670
M 2	0.4411	0.4479	0.4631	0.4978	0.5016	0.5028	0.4651	0.4691	0.4999
M(PR) 1	0.7844	0.7852	0.7801	0.7577	0.7385	0.7081	0.6624	0.6758	0.6619
M(PR) 2	0.3136	0.3246	0.3342	0.3691	0.3666	0.3563	0.2759	0.2673	0.2813
TURN(PR)	19.679	21.394	24.795	32.165	33.860	37.063	34.583	37.333	45.341
P 1	13.786	13.864	13.879	13.893	13.896	13.858	13.815	13.782	13.682
P 2	16.126	18.170	18.318	18.712	18.650	18.528	17.979	17.957	19.275
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	580.056	579.260	579.075	579.297	576.552	573.715	573.807	574.823	576.312

STATOR E

STATION 2, STATION 2A

PCT SPAN	5.00	10.00	15.00	36.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.267
BETA 2	63.054	60.659	58.428	52.652	51.498	51.371	59.340	60.009	58.449
BETA 2A	2.476	1.918	1.161	-0.353	0.397	-0.577	0.676	0.749	-0.308
V 2	510.93	518.20	534.99	573.35	576.10	576.03	534.68	539.60	574.14
V 2A	390.06	390.24	411.18	442.45	435.05	417.59	374.20	382.32	398.71
VZ 2	231.34	253.69	279.84	347.55	358.55	359.59	272.66	269.73	300.42
VZ 2A	389.42	389.80	410.89	442.28	434.94	417.52	374.16	382.28	398.70
V-THETA 2	455.10	451.30	455.37	455.44	450.72	449.98	459.94	467.35	489.26
V-THETA 2A	16.84	13.05	8.33	-2.73	3.01	-4.20	4.41	5.00	-2.14
M 2	0.4411	0.4479	0.4631	0.4978	0.5016	0.5028	0.4651	0.4691	0.4999
M 2A	0.3351	0.3355	0.3540	0.3817	0.3759	0.3613	0.3233	0.3298	0.3439
TURN(PR)	60.489	58.642	57.179	52.947	51.061	51.946	58.664	59.259	58.756
P 2	18.128	18.175	18.318	18.712	18.650	18.528	17.979	17.957	18.275
P 2A	17.869	17.867	17.992	18.246	18.206	18.092	17.792	17.855	17.998
T 2	580.056	579.260	579.075	579.297	576.552	573.715	573.807	574.823	576.312
T 2A	576.601	575.643	575.384	575.315	573.021	570.436	570.244	571.246	572.655

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E
Percent Equivalent Rotor Speed = 99.59 Equivalent Rotor Speed = 4192.94 Equivalent Weight Flow = 103.40
Circumferential Distortion
Station 1 (346°) - Station 2 (336°) - Station 2A (325°)

ROTOR E (STATION 1, STATION 2)

	PCT SPAN								
	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.138	39.754	39.371	38.219	36.685	35.151	34.001	33.617	33.234
BETA 1	-5.665	-6.761	-5.799	-6.936	-5.763	-5.609	-5.844	-6.695	-7.292
BETA 2	57.917	53.943	50.529	48.796	49.138	50.920	58.728	59.099	58.057
BETA(PR) 1	71.352	68.253	66.606	66.166	64.127	63.718	62.603	62.788	64.619
BETA(PR) 2	46.369	43.687	39.225	33.473	29.764	27.850	33.561	28.866	22.265
V 1	263.05	313.47	334.74	334.48	347.79	336.60	341.61	337.90	308.53
V 2	523.45	531.33	558.78	589.15	593.90	579.72	518.77	538.95	570.82
VZ 1	261.74	311.24	332.96	331.99	346.01	334.99	339.85	335.59	306.03
VZ 2	277.72	312.32	354.71	387.79	388.43	365.45	269.29	276.78	302.00
V-THETA 1	-25.96	-36.90	-33.82	-40.35	-35.04	-32.90	-34.66	-39.39	-39.16
V-THETA 2	443.01	428.98	430.74	442.81	449.02	450.00	443.40	462.45	484.38
V(PR) 1	818.6	840.1	838.6	821.6	792.9	756.5	738.6	733.9	714.0
V(PR) 2	403.2	432.8	458.8	465.6	447.7	413.3	323.2	316.1	326.3
VTHETA PR1	-775.6	-780.2	-769.7	-751.5	-713.4	-678.3	-655.7	-652.6	-645.1
VTHETA PR2	-291.3	-298.3	-289.6	-256.4	-222.1	-193.1	-178.7	-152.6	-123.6
U 1	749.64	743.35	735.85	711.17	678.38	645.43	621.07	613.25	605.90
U 2	734.33	727.31	720.30	699.22	671.16	643.09	622.05	615.03	608.02
M 1	0.2369	0.2830	0.3026	0.3023	0.3146	0.3043	0.3069	0.3055	0.2785
M 2	0.4529	0.4604	0.4853	0.5135	0.5181	0.5052	0.4510	0.4689	0.4974
M(PR) 1	0.7373	0.7584	0.7586	0.7426	0.7172	0.6839	0.6678	0.6634	0.6444
M(PR) 2	0.3489	0.3750	0.3985	0.4058	0.3905	0.3602	0.2809	0.2749	0.2844
TURN(PR)	25.094	24.672	27.474	32.746	34.379	35.870	29.042	33.922	42.355
P 1	13.536	13.695	13.753	13.816	13.661	13.656	13.699	13.699	13.539
P 2	18.163	18.192	18.461	18.616	18.808	18.531	17.792	17.922	18.237
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	578.651	577.660	577.687	576.672	576.214	575.878	573.070	574.051	575.192

STATOR E (STATION 2, STATION 2A)

	PCT SPAN								
	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	57.917	53.943	50.529	48.790	49.138	50.920	58.728	59.099	58.057
BETA 2A	3.223	2.294	1.269	0.025	0.672	-1.726	-1.434	-0.563	0.062
V 2	523.45	531.33	558.78	589.15	593.90	579.72	518.77	538.95	570.62
V 2A	403.25	396.42	410.17	440.94	417.85	385.08	315.57	311.64	320.41
VZ 2	277.72	312.32	354.71	387.79	388.43	365.45	269.29	276.78	302.00
VZ 2A	402.32	395.88	409.85	440.77	417.73	384.86	315.46	311.62	320.41
V-THETA 2	443.01	428.98	430.74	442.81	449.02	450.00	443.40	462.45	484.38
V-THETA 2A	22.66	15.86	9.22	0.19	4.90	-11.60	-7.90	-3.06	0.35
M 2	0.4529	0.4604	0.4853	0.5135	0.5181	0.5052	0.4510	0.4689	0.4974
M 2A	0.3458	0.3402	0.3523	0.3799	0.3597	0.3306	0.2707	0.2670	0.2743
TURN(PR)	54.595	51.546	49.143	48.705	48.446	52.644	60.162	59.661	57.994
P 2	18.163	18.192	18.461	18.816	18.808	18.531	17.792	17.922	18.237
P 2A	17.983	17.929	18.006	16.241	18.055	17.832	17.430	17.416	17.407
T 2	578.651	577.660	577.687	576.672	576.214	575.878	573.070	574.051	575.192
T 2A	579.456	578.198	578.105	576.684	576.617	576.793	573.876	575.064	576.290

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60
Circumferential Distortion
Station 1 (16°) – Station 2 (6°) – Station 2A (355°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.234	33.564	34.001	35.151	36.605	38.219	39.371	39.754	40.138
BETA 1	-7.047	-7.862	-7.879	-7.596	-7.055	-6.431	-6.474	-6.414	-6.156
BETA 2	56.941	57.674	56.590	51.051	49.343	56.502	59.853	64.189	67.960
BETA(PR) 1	63.586	61.453	60.957	61.394	62.600	63.101	64.316	64.486	65.945
BETA(PR) 2	14.355	23.684	29.616	25.818	26.612	32.257	43.017	48.126	51.093
V 1	328.47	366.75	379.63	385.69	391.73	387.69	379.49	380.01	356.15
V 2	626.34	573.46	545.84	598.71	606.95	600.83	544.55	528.84	531.34
VZ 1	325.38	303.29	376.24	362.51	388.76	385.40	377.00	377.57	354.66
VZ 2	341.68	304.49	300.49	376.35	395.22	381.83	273.25	230.11	199.79
V-THETA 1	-44.64	-50.17	-52.07	-50.98	-47.94	-43.43	-42.45	-42.81	-38.19
V-THETA 2	524.93	485.65	455.68	465.60	460.30	463.23	470.49	475.78	492.03
V(PR) 1	731.4	766.2	775.0	798.5	828.1	851.9	869.9	876.6	868.6
V(PR) 2	352.7	333.6	345.6	418.1	450.6	452.2	374.4	345.5	518.6
VTHETA PR1	-655.1	-667.6	-677.6	-701.0	-731.0	-759.7	-783.9	-791.1	-793.2
VTHETA PR2	-87.4	-133.8	-170.8	-102.1	-215.6	-241.0	-255.0	-256.7	-247.5
U 1	610.22	617.63	625.50	650.04	683.23	716.24	741.10	748.66	754.99
U 2	612.36	619.42	626.49	647.68	675.95	704.21	725.44	732.50	739.57
M 1	0.2968	0.3321	0.3442	0.3497	0.3553	0.3517	0.3439	0.3444	0.3223
M 2	0.5496	0.5014	0.4763	0.5242	0.5303	0.5243	0.4729	0.4589	0.4607
M(PR) 1	0.6609	0.6884	0.7024	0.7239	0.7510	0.7724	0.7883	0.7944	0.7661
M(PR) 2	0.3095	0.2912	0.3016	0.3661	0.3956	0.3946	0.3251	0.2996	0.2763
TURN(PR)	49.232	37.769	31.341	35.578	33.404	30.895	21.394	16.463	14.960
P 1	13.567	13.730	13.756	13.714	13.708	13.717	13.753	13.756	13.663
P 2	19.266	18.645	18.275	19.080	19.284	19.299	18.689	18.541	18.599
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	573.026	571.767	571.296	572.656	575.628	576.454	576.478	576.099	576.980

STATOR E — STATION 2, STATION 2A

PCT SPAN	95.00	90.00	85.00	76.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.924	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	56.440	57.674	56.598	51.051	49.343	56.502	59.853	64.189	67.960
BETA 2A	-6.969	-4.844	-3.223	-2.398	1.439	-0.387	0.406	2.210	3.965
V 2	626.34	573.66	545.84	598.71	606.95	600.83	544.55	528.89	531.34
V 2A	373.89	352.21	332.40	375.46	411.17	442.19	425.91	413.41	415.51
VZ 2	341.68	304.96	300.49	376.35	395.34	381.83	273.25	230.11	199.79
VZ 2A	373.88	352.67	331.86	376.09	410.95	442.02	425.66	412.87	414.22
V-THETA 2	524.93	485.65	455.68	465.60	460.30	465.23	470.49	475.78	492.03
V-THETA 2A	-2.41	-11.36	-18.69	-15.71	10.32	-2.99	3.02	15.93	28.71
M 2	0.5496	0.5014	0.4763	0.5242	0.5303	0.5243	0.4729	0.4589	0.4607
M 2A	0.3210	0.2674	0.2852	0.3223	0.3528	0.3799	0.3654	0.3546	0.3561
TURN(PR)	57.208	59.721	59.021	53.447	47.884	56.829	59.361	61.694	63.859
P 2A	19.266	18.643	18.375	19.080	19.284	19.299	18.689	16.541	18.599
P 2	18.647	17.856	17.735	17.966	16.238	16.464	16.526	16.284	18.283
T 2	573.026	571.767	571.296	572.656	575.628	576.454	576.478	576.099	576.980
T 2A	576.134	574.966	574.503	576.379	576.233	580.188	580.422	579.989	580.898

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Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (46°) - Station 2 (36°) - Station 2A (25°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	4.98	9.99	14.98	36.00	50.00	70.00	84.99	90.00	94.99
DIA	4C.138	39.754	39.371	38.219	36.685	35.151	34.C61	33.617	33.234
BETA 1	3.579	2.636	2.210	1.121	2.527	2.296	3.577	3.22C	3.676
BETA 2	55.021	47.996	43.45C	40.154	41.674	41.204	44.175	47.273	49.133
BETA(PR) 1	61.178	58.773	57.827	55.779	53.670	52.326	51.981	52.234	53.909
BETA(PR) 2	51.915	45.475	41.184	35.283	30.9C1	27.651	27.431	2:.285	26.284
V 1	402.44	442.11	455.58	480.91	487.13	487.26	467.16	459.29	425.82
V 2	477.49	515.47	549.37	594.67	608.14	615.15	586.00	563.27	567.33
VZ 1	401.62	441.57	455.16	480.75	486.64	486.87	466.24	458.56	424.93
VZ 2	273.38	344.35	398.10	453.95	454.07	462.80	420.29	382.18	371.20
V-THETA 1	25.12	20.33	17.57	9.41	21.48	19.52	29.15	25.72	27.30
V-THETA 2	390.73	382.38	377.13	383.CO	404.19	405.21	408.35	413.77	429.03
V(PR) 1	833.1	851.8	854.8	854.9	821.4	796.6	757.0	748.8	721.4
V(PR) 2	443.9	492.0	530.0	556.9	529.5	522.5	473.5	434.0	414.0
VTHETA PR1	-729.9	-728.3	-723.5	-706.8	-661.7	-630.5	-596.4	-591.9	-582.9
VTHETA PR2	-348.8	-350.1	-348.3	-321.2	-271.8	-242.6	-218.1	-205.7	-183.3
U 1	754.99	748.66	741.10	716.24	663.23	650.04	625.50	617.63	610.22
U 2	739.57	732.50	725.44	704.21	675.95	647.68	626.49	619.42	612.36
M 1	0.3652	0.4024	0.4150	0.4390	0.4449	0.4450	0.4260	0.4185	0.3871
M 2	0.4179	0.4531	0.4845	0.5274	0.5397	0.5461	0.5193	0.4974	0.5005
M(PR) 1	0.7561	0.7752	C.7788	0.7803	0.7502	0.7275	0.6902	0.6823	0.6557
M(PR) 2	0.3885	0.4325	0.4675	0.4939	0.4699	0.4638	0.4197	0.3833	0.3653
TURN(PR)	9.370	13.403	16.737	20.549	22.786	24.676	24.550	23.950	27.625
P 1	14.638	14.868	14.915	15.020	14.993	14.961	14.849	14.796	14.585
P 2	18.C33	16.392	18.738	19.188	19.224	19.191	16.757	18.472	18.490
T 1	518.699	518.699	518.699	518.699	518.699	516.699	518.699	518.699	516.699
T 2	562.246	560.658	560.048	558.566	559.163	559.576	558.395	559.943	561.463

STATOR E — STATION 2, STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	55.021	47.996	43.450	40.154	41.674	41.204	44.175	47.273	49.133
BETA 2A	2.311	2.224	0.816	0.359	1.162	-0.139	-0.662	-0.316	-0.792
V 2	477.49	515.47	549.37	594.67	608.14	615.15	566.00	563.27	567.33
V 2A	377.54	380.69	403.70	451.97	456.19	438.67	382.09	387.78	401.67
VZ 2	273.38	344.35	398.10	453.95	454.07	462.80	420.29	382.18	371.20
VZ 2A	376.97	380.19	4C3.45	451.79	456.00	438.62	382.05	387.77	4C1.63
V-THETA 2	390.73	382.38	377.13	383.60	404.19	405.21	408.35	413.77	429.03
V-THETA 2A	15.21	14.76	5.75	2.83	8.77	-1.06	-4.01	-2.14	-5.55
M 2	0.4179	0.4531	0.3519	0.5274	0.5397	0.5461	0.5193	0.4974	0.5005
M 2A	0.3280	0.3313	0.3519	0.3959	0.3995	0.3834	0.3333	0.3378	0.3497
TURN(PR)	52.606	45.664	42.536	39.735	40.552	41.341	44.777	47.588	49.924
P 2	18.033	18.392	18.738	19.188	19.224	19.191	16.757	18.472	18.490
P 2A	16.037	18.069	18.198	18.631	18.693	18.534	16.088	18.122	18.740
T 2	562.246	560.658	560.046	558.566	559.163	559.576	558.395	559.943	561.463
T 2A	563.276	561.630	561.111	559.333	559.966	560.716	559.097	560.760	562.498

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Table A–8. Blade Element Performance (Continued)

Stage E, Rotor E – Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (76°) – Station 2 (66°) – Station 2A (55°)

ROTOR E (STATION 1, STATION 2)

PCT SPAN	94.99	90.00	84.99	70.00	56.00	30.00	14.98	9.99	4.98
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	46.138
BETA 1	0.027	-0.195	-0.201	-0.006	-0.266	-0.216	-0.433	-0.488	0.145
BETA 2	46.597	45.010	42.728	46.032	39.422	39.221	41.569	44.958	52.056
BETA(PR) 1	54.451	53.432	52.892	52.470	54.640	55.987	58.548	60.134	61.837
BETA(PR) 2	23.021	24.025	23.866	24.757	28.404	32.183	35.888	38.963	46.214
V 1	435.92	459.33	474.47	499.38	486.46	484.65	455.51	432.10	403.69
V 2	601.25	605.88	624.30	650.11	642.33	629.64	603.22	573.88	517.91
VZ 1	435.91	459.32	474.46	499.38	486.43	484.59	455.41	432.02	403.65
VZ 2	413.13	428.34	458.60	497.75	495.98	487.17	450.29	405.31	317.99
V-THETA 1	0.21	-1.56	-1.66	-0.05	-2.26	-1.84	-3.44	-3.68	1.02
V-THETA 2	436.82	428.49	423.60	418.14	407.72	397.62	399.63	404.72	407.82
V(PR) 1	749.8	771.0	786.4	819.8	840.6	866.3	872.8	867.6	855.2
V(PR) 2	448.9	469.0	501.5	548.2	564.2	576.5	557.1	522.5	460.4
VTHETA PR1	-610.0	-619.2	-627.2	-650.1	-685.5	-718.1	-744.5	-752.3	-754.0
VTHETA PR2	-175.5	-190.9	-202.9	-229.5	-268.2	-306.6	-325.8	-327.8	-331.7
U 1	610.22	617.63	625.50	650.04	683.23	716.24	741.16	748.66	754.99
U 2	612.36	619.42	626.49	647.68	675.95	704.21	725.44	732.50	739.57
M 1	0.3965	0.4186	0.4329	0.4565	0.4442	0.4425	0.4150	0.3930	0.3664
M 2	0.5310	0.5358	0.5536	0.5776	0.5694	0.5575	0.5325	0.5051	0.4532
M(PR) 1	0.6820	0.7625	0.7175	0.7494	0.7676	0.7916	0.7951	0.7890	0.7763
M(PR) 2	0.3964	0.4147	0.4447	0.4871	0.5001	0.5104	0.4918	0.4598	0.4028
TURN(PR)	31.430	29.407	29.026	27.714	26.251	23.855	22.749	21.274	15.734
P 1	14.543	14.729	14.856	15.001	14.925	14.973	14.854	14.708	14.538
P 2	18.849	18.882	19.118	19.529	19.543	19.533	19.265	18.919	18.341
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	563.630	562.673	561.731	562.292	563.933	563.851	564.226	564.652	565.874

STATOR E (STATION 2, STATION 2A)

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	46.597	45.010	42.728	40.032	39.422	39.221	41.589	44.958	52.056
BETA 2A	-0.868	1.045	1.553	1.725	0.789	0.764	1.019	2.066	1.010
V 2	601.25	605.88	624.30	650.11	642.33	629.64	603.22	573.88	517.91
V 2A	427.23	418.14	416.34	482.34	516.01	514.73	468.84	437.39	421.65
VZ 2	413.13	428.34	458.60	497.75	495.98	487.17	450.29	405.31	317.99
VZ 2A	427.23	418.06	416.17	482.08	515.85	514.50	468.53	436.86	421.29
V-THETA 2	436.82	428.49	423.60	418.14	407.72	397.62	399.63	404.72	407.82
V-THETA 2A	-6.47	7.63	11.28	14.52	7.10	6.86	8.33	15.76	7.43
M 2	0.5310	0.5358	0.5536	0.5776	0.5694	0.5575	0.5325	0.5051	0.4532
M 2A	0.3725	0.3647	0.3634	0.4228	0.4529	0.4519	0.4099	0.3814	0.3669
TURN(PR)	47.464	43.964	41.175	38.305	38.613	38.398	40.472	42.783	50.937
P 2	18.849	18.882	19.118	19.529	19.543	19.533	19.265	18.919	18.341
P 2A	18.421	18.350	18.350	18.946	19.297	19.244	18.745	18.486	18.343
T 2	563.630	562.673	561.731	562.292	563.935	563.851	564.226	564.652	565.874
T 2A	562.683	561.624	560.554	561.087	562.241	562.025	562.611	563.116	564.420

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Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31 Equivalent Rotor Speed = 4222.87 Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (106°) – Station 2 (96°) – Station 2A (85°)

ROTOR E

STATION 1 / STATION 2 PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138
BETA 1	0.384	0.242	0.242	0.588	0.257	-0.111	-0.305	-1.105	-0.572
BETA 2	46.401	44.068	41.656	39.232	38.475	38.117	39.935	44.014	49.789
BETA(PR) 1	55.185	53.884	53.183	52.842	54.339	56.484	58.515	59.812	62.233
BETA(PR) 2	24.581	28.392	27.542	26.869	30.472	34.636	39.341	43.691	50.156
V 1	422.41	449.16	466.75	488.88	488.69	475.03	455.45	440.62	399.66
V 2	589.02	571.49	594.24	631.97	624.53	607.49	572.18	531.13	481.86
VZ 1	422.39	449.15	466.75	488.86	488.66	474.96	455.36	440.46	399.60
VZ 2	406.19	410.62	443.98	489.50	488.72	477.32	437.84	381.22	310.58
V-THETA 1	2.83	1.97	1.97	5.02	2.19	-0.92	-2.42	-8.50	-3.99
V-THETA 2	426.55	397.47	394.96	399.68	388.39	374.50	366.55	368.32	367.38
V(PR) 1	739.8	762.0	778.9	809.3	838.2	860.2	871.9	876.0	857.8
V(PR) 2	446.7	466.8	500.7	548.8	567.3	581.0	567.3	528.3	485.5
VTHETA PR1	-607.4	-615.6	-623.5	-645.0	-681.0	-717.2	-743.5	-757.2	-759.0
VTHETA PR2	-185.8	-221.9	-231.5	-248.0	-287.6	-329.7	-358.9	-364.2	-372.2
U 1	610.22	617.63	625.50	650.04	683.23	716.24	741.10	748.66	754.99
U 2	612.36	619.42	626.49	647.68	675.95	704.21	725.44	732.50	739.57
M 1	0.3839	0.4090	0.4256	0.4465	0.4464	0.4334	0.4149	0.4010	0.3627
M 2	0.5193	0.5037	0.5256	0.5601	0.5529	0.5371	0.5036	0.4656	0.4202
M(PR) 1	0.6724	0.6939	0.7102	0.7392	0.7656	0.7848	0.7943	0.7971	0.7783
M(PR) 2	0.3938	0.4114	0.4429	0.4863	0.5023	0.5137	0.4993	0.4631	0.4234
TURN(PR)	30.604	25.493	25.641	25.975	23.884	21.902	19.267	16.227	12.186
P 1	14.543	14.740	14.882	14.989	15.033	14.979	14.923	14.865	14.654
P 2	18.813	18.627	18.904	19.435	19.452	19.370	19.613	18.564	18.669
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	564.184	562.784	561.271	563.068	563.381	563.053	564.504	565.001	566.566

STATOR E

STATION 2 / STATION 2A PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	46.401	44.068	41.656	39.232	38.475	38.117	39.935	44.014	49.789
BETA 2A	-0.554	1.191	1.448	1.876	0.779	0.832	1.245	1.834	0.852
V 2	589.02	571.49	594.24	631.97	624.53	607.49	572.18	531.13	481.86
V 2A	440.57	425.54	424.24	495.30	514.76	508.27	443.46	416.03	403.28
VZ 2	406.19	410.62	443.98	489.50	488.72	477.32	437.84	381.22	310.58
VZ 2A	440.55	425.44	424.28	494.99	514.60	508.03	443.13	415.58	402.95
V-THETA 2	426.55	397.47	394.96	399.68	388.39	374.50	366.55	368.32	367.38
V-THETA 2A	-4.26	8.84	10.73	16.21	7.00	7.38	9.65	13.31	5.99
M 2	0.5193	0.5037	0.5256	0.5601	0.5529	0.5371	0.5036	0.4656	0.4202
M 2A	0.3838	0.3769	0.3705	0.4335	0.4513	0.4455	0.3863	0.3616	0.3498
TURN(PR)	46.954	42.876	40.208	37.354	37.676	37.227	38.593	42.071	48.827
P 2	18.613	18.627	18.904	19.435	19.452	19.370	19.013	18.564	18.689
P 2A	18.691	18.571	18.568	19.235	19.452	19.355	18.693	18.472	18.384
T 2	564.184	562.784	561.271	563.068	563.381	563.053	564.504	565.001	566.566
T 2A	564.383	562.812	561.248	563.583	563.557	563.112	564.750	565.116	566.682

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Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (136°) - Station 2 (126°) - Station 2A (115°)

ROTOR E

STATION 1
STATION 2

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138
BETA 1	0.516	0.518	0.336	-0.518	-0.026	-0.314	-0.442	-0.427	-0.714
BETA 2	47.118	45.578	42.846	40.533	39.729	39.302	41.610	45.525	51.376
BETA(PR) 1	54.442	53.415	52.321	53.958	54.581	57.045	60.543	61.432	61.652
BETA(PR) 2	24.727	26.894	24.789	25.851	29.378	32.918	37.764	41.288	47.631
V 1	433.43	455.41	480.91	476.16	485.75	466.07	420.49	409.37	410.17
V 2	585.36	579.34	615.03	636.18	630.75	621.59	584.24	552.30	505.40
VZ 1	433.41	455.38	486.89	476.14	485.73	466.00	420.40	409.29	410.10
VZ 2	398.33	405.49	450.93	483.49	484.89	480.39	434.63	386.21	314.99
V-THETA 1	3.90	4.12	2.82	-4.30	0.22	-2.55	-3.24	-3.05	-5.11
V-THETA 2	428.92	413.76	418.24	413.42	402.97	393.22	388.74	393.35	394.24
V(PR) 1	745.3	764.1	766.8	809.2	838.1	856.7	854.9	855.9	863.7
V(PR) 2	438.5	454.7	496.7	537.3	556.7	573.1	551.0	515.1	468.2
VTHETA PR1	-606.3	-613.5	-622.7	-654.3	-683.0	-718.8	-744.3	-751.7	-760.1
VTHETA PR2	-183.4	-205.7	-208.3	-234.3	-273.0	-311.0	-336.7	-339.1	-345.3
U 1	610.22	617.63	625.50	650.04	683.23	716.24	741.10	748.66	754.99
U 2	612.36	619.42	626.49	647.68	675.95	704.21	725.44	732.50	739.57
M 1	0.3942	0.4149	0.4390	0.4345	0.4436	0.4249	0.3821	0.3717	0.3724
M 2	0.5164	0.5112	0.5452	0.5649	0.5589	0.5503	0.5151	0.4853	0.4418
M(PR) 1	0.6779	0.6960	0.7181	0.7384	0.7653	0.7816	0.7768	0.7772	0.7843
M(PR) 2	0.3869	0.4403	0.4403	0.4771	0.4933	0.5074	0.4858	0.4526	0.4093
TURN(PR)	29.715	26.522	27.532	28.109	25.219	24.179	22.870	20.250	14.131
P 1	14.642	14.813	15.011	14.954	15.033	14.942	14.726	14.680	14.728
P 2	18.769	18.712	19.167	19.526	19.582	19.609	19.215	18.828	18.361
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	565.172	562.300	561.109	561.533	563.088	563.135	563.742	564.393	565.804

STATOR E

STATION 2
STATION 2A

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	47.118	45.578	42.846	40.533	39.729	39.302	41.810	45.525	51.376
BETA 2A	-0.309	1.178	1.368	1.861	0.802	0.938	1.333	1.622	0.685
V 2	585.36	579.34	615.03	636.18	630.75	621.59	584.24	552.30	505.46
V 2A	428.91	414.10	407.80	478.54	509.44	505.14	451.11	422.48	405.29
VZ 2	398.33	405.49	450.93	483.49	484.89	480.39	434.63	386.21	314.99
VZ 2A	428.90	414.00	407.67	478.24	509.28	504.89	450.76	422.07	404.97
V-THETA 2	428.92	413.76	418.24	413.42	402.97	393.22	388.74	393.35	394.24
V-THETA 2A	-2.31	8.51	9.74	15.54	7.13	8.27	10.49	11.95	4.84
M 2	0.5164	0.5112	0.5452	0.5649	0.5589	0.5503	0.5151	0.4853	0.4418
M 2A	0.3757	0.3608	0.3555	0.4190	0.4466	0.4427	0.3935	0.3676	0.3518
TURN(PR)	47.426	44.399	41.478	38.670	38.907	38.305	40.379	43.794	50.582
P 2	16.769	18.712	19.167	19.526	19.502	19.654	19.211	16.828	16.361
P 2A	16.626	16.521	16.501	16.501	19.436	19.369	16.606	18.573	18.432
T 2	563.172	562.300	561.109	561.533	563.088	563.135	563.742	564.393	565.804
T 2A	563.532	562.556	561.289	561.882	563.174	563.138	563.945	564.618	566.080

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Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (166°) - Station 2 (156°) - Station 2A (145°)

ROTOR E — STATION 1, STATION 2

	94.99	90.00	84.99	70.00	50.00	36.00	14.98	9.99	4.96
PCT SPAN									
DIA	33.234	33.617	34.001	35.151	36.685	38.219	39.371	39.754	40.138
BETA 1	2.673	2.244	2.274	2.445	1.828	1.687	2.427	2.011	3.427
BETA 2	48.344	47.032	44.151	41.580	40.838	40.171	42.645	46.613	52.924
BETA(PR) 1	53.057	52.445	52.066	52.846	54.575	56.285	58.497	60.110	62.138
BETA(PR) 2	23.568	26.840	25.936	25.704	28.707	32.568	37.743	41.408	46.965
V 1	430.47	461.34	473.27	477.56	475.55	467.98	443.19	422.14	367.59
V 2	590.47	575.34	599.20	632.70	633.02	622.23	582.91	550.71	513.66
VZ 1	429.93	460.98	472.90	477.12	475.29	467.67	442.71	421.81	386.66
VZ 2	392.46	392.14	429.93	473.25	478.72	474.88	427.97	377.61	308.87
V-THETA 1	21.58	16.06	16.78	20.37	15.17	15.41	18.76	14.81	23.17
V-THETA 2	441.17	420.99	417.37	419.88	413.78	400.89	394.16	399.49	408.75
V(PR) 1	726.9	756.3	769.0	790.0	819.9	842.6	847.3	846.5	827.8
V(PR) 2	428.2	439.5	478.1	525.3	546.1	564.3	542.4	504.6	453.4
VTHETA PR1	-588.6	-599.6	-606.7	-629.7	-668.1	-760.8	-722.3	-733.6	-731.8
VTHETA PR2	-171.2	-198.4	-209.1	-227.8	-262.2	-303.3	-331.3	-333.0	-330.8
U 1	610.22	617.63	625.50	650.04	683.23	716.24	741.10	748.66	754.99
U 2	612.36	619.42	626.49	647.68	675.95	704.21	725.44	732.50	739.57
M 1	0.3914	0.4205	0.4317	0.4358	0.4339	0.4267	0.4034	0.3836	0.3514
M 2	0.5214	0.5060	0.5309	0.5612	0.5612	0.5512	0.5140	0.4841	0.4491
M(PR) 1	0.6628	0.6893	0.7017	0.7209	0.7461	0.7683	0.7711	0.7693	0.7566
M(PR) 2	0.3781	0.3861	0.4236	0.4659	0.4841	0.4999	0.4782	0.4436	0.3969
TURN(PR)	30.296	25.605	26.128	27.145	25.879	23.768	20.845	18.807	15.283
P 1	14.711	14.908	14.969	14.999	14.999	14.994	14.887	14.788	14.619
P 2	18.831	18.672	18.951	19.451	19.580	19.578	19.165	18.794	18.409
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	562.756	561.281	560.008	562.151	562.845	562.611	563.514	563.678	564.973

STATOR E — STATION 2, STATION 2A

	95.00	90.00	85.00	70.00	50.00	36.00	15.00	10.00	5.00
PCT SPAN									
DIA	33.207	33.564	33.921	34.992	36.420	37.846	38.919	39.276	39.633
BETA 2	48.344	47.032	44.151	41.580	40.838	40.171	42.645	46.613	52.924
BETA 2A	-0.354	1.046	1.881	1.885	0.838	1.261	1.124	1.482	0.165
V 2	590.47	575.34	599.20	632.70	633.02	622.23	582.91	550.71	513.66
V 2A	429.44	411.04	406.97	478.01	506.62	504.45	443.24	413.07	402.68
VZ 2	392.46	392.14	429.93	473.25	478.72	474.88	427.97	377.61	308.87
VZ 2A	429.43	410.97	406.74	477.70	506.45	504.14	442.93	412.69	402.39
V-THETA 2	441.17	420.99	417.37	419.88	413.78	400.89	394.16	399.49	408.75
V-THETA 2A	-2.65	7.50	13.36	15.72	7.41	11.10	8.69	10.68	1.16
M 2	0.5214	0.5060	0.5309	0.5612	0.5612	0.5512	0.5140	0.4841	0.4491
M 2A	0.3744	0.3564	0.3552	0.4182	0.4440	0.4422	0.3864	0.3593	0.3496
TURN(PR)	48.697	45.985	42.270	39.693	39.980	38.851	41.423	45.022	52.651
P 2	18.831	18.672	18.951	19.451	19.580	19.578	19.163	18.807	18.409
P 2A	16.587	16.469	18.456	19.067	19.374	19.306	16.666	16.465	18.376
T 2	562.756	561.281	560.008	562.151	562.845	562.611	563.514	563.678	564.973
T 2A	562.837	561.421	559.967	562.646	563.046	562.796	564.034	564.125	565.550

Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31 Equivalent Rotor Speed = 4222.87 Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (196°) – Station 2 (186°) – Station 2A (175°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN	4.96	9.99	14.96	36.00	50.00	70.00	84.99	90.00	94.99
DIA	40.150	39.371	39.371	38.219	36.885	35.151	34.001	33.017	33.234
BETA 1	2.405	2.268	2.037	1.571	1.885	2.211	2.061	2.054	2.671
BETA 2	51.205	45.420	42.697	39.883	40.657	41.502	42.277	45.611	47.439
BETA(PR) 1	61.843	60.595	59.056	57.472	55.105	53.874	54.277	54.461	55.992
BETA(PR) 2	47.774	40.991	37.250	33.263	29.392	26.267	25.506	26.631	24.234
V 1	395.59	413.11	435.73	450.16	466.12	461.60	436.99	427.91	399.61
V 2	503.98	555.03	587.56	616.03	626.80	627.28	606.54	581.42	548.08
VZ 1	395.21	412.72	435.37	449.92	465.64	461.46	438.72	427.29	399.16
VZ 2	315.27	388.84	431.02	472.13	475.31	469.77	441.56	406.71	397.76
V-THETA 1	16.66	16.35	15.49	10.77	15.33	17.82	15.48	16.73	18.62
V-THETA 2	392.19	394.59	397.69	394.52	408.21	415.64	415.81	415.48	433.15
V(PR) 1	637.5	840.6	846.3	836.6	814.3	782.7	751.4	735.6	713.7
V(PR) 2	470.0	516.3	542.7	565.5	545.5	524.0	489.5	455.0	436.3
VTHETA PR1	-738.4	-732.3	-725.6	-705.5	-667.9	-632.2	-610.5	-596.9	-591.6
VTHETA PR2	-347.4	-337.9	-327.7	-309.7	-267.7	-232.0	-210.7	-203.9	-179.2
U 1	754.99	748.66	741.10	716.24	683.23	650.64	625.50	617.63	612.22
U 2	739.57	732.50	725.44	704.21	675.95	647.68	626.44	619.42	612.36
M 1	0.3589	0.3752	0.3964	0.4099	0.4250	0.4209	0.3994	0.3890	0.3626
M 2	0.4410	0.4882	0.5186	0.5454	0.5556	0.5569	0.5378	0.5140	0.5195
M(PR) 1	0.7598	0.7635	0.7696	0.7626	0.7424	0.7134	0.6837	0.6690	0.6476
M(PR) 2	0.4112	0.4541	0.4790	0.5007	0.4838	0.4652	0.4430	0.4022	0.3654
TURN(PR)	14.179	19.709	21.877	24.262	25.729	27.589	28.771	27.851	31.728
P 1	14.727	14.820	14.953	14.987	15.020	14.998	14.856	14.786	14.586
P 2	18.326	18.856	19.216	19.506	19.515	19.422	19.091	18.764	18.327
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	564.716	563.542	562.675	562.447	562.354	560.624	559.686	560.667	562.018

STATOR E — STATION 2 / STATION 2A

PCT SPAN	5.00	10.05	15.00	36.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	51.205	45.420	42.697	39.883	40.657	41.502	43.279	45.611	47.439
BETA 2A	0.282	1.525	1.040	1.411	0.871	1.792	2.286	1.299	-0.281
V 2	503.98	555.03	587.56	616.03	626.80	627.28	606.54	581.42	586.08
V 2A	423.21	437.13	464.46	513.66	507.67	477.27	415.55	416.17	430.74
VZ 2	315.27	388.84	431.02	472.13	475.31	469.77	441.56	406.71	416.06
VZ 2A	422.96	436.72	464.15	513.31	507.70	477.27	415.29	416.06	430.74
V-THETA 2	392.19	394.59	397.69	394.52	408.21	415.64	415.81	415.48	433.15
V-THETA 2A	2.68	11.63	8.43	12.64	7.72	14.93	16.57	16.57	-2.01
M 2	0.4410	0.4882	0.5186	0.5454	0.5556	0.5569	0.5378	0.5140	0.5195
M 2A	0.3683	0.3811	0.4559	0.4507	0.4454	0.4184	0.3629	0.3631	0.3757
TURN(PR)	50.813	43.786	41.559	38.413	39.766	39.708	40.993	44.311	47.719
P 2	18.326	18.856	19.216	19.506	19.515	19.422	19.091	18.764	18.569
P 2A	18.493	18.326	18.229	19.343	19.347	19.041	18.475	18.475	18.569
T 2	564.716	565.542	562.679	562.447	562.324	560.624	559.686	560.667	562.010
T 2A	564.424	563.286	562.796	562.433	562.479	561.000	561.025	562.029	562.429

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (226°) - Station 2 (216°) - Station 2A (205°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.136	39.754	39.371	38.219	36.805	35.151	34.001	33.579	33.234
BETA 1	6.894	5.498	4.320	3.263	5.256	5.479	5.544	5.279	5.254
BETA 2	51.591	46.647	42.705	40.009	40.666	41.624	42.964	44.814	45.424
BETA(PR) 1	62.753	60.878	59.922	57.113	54.934	52.716	52.805	52.912	53.654
BETA(PK) 2	46.438	40.797	37.808	33.576	29.576	26.283	26.361	27.176	26.631
V 1	368.70	397.74	412.48	439.00	452.40	463.35	444.20	437.62	418.99
V 2	516.00	556.08	582.18	612.41	624.90	626.77	599.99	579.49	580.39
VZ 1	366.00	395.85	411.23	437.10	450.48	461.23	442.14	435.89	417.15
VZ 2	317.27	381.05	427.02	468.49	473.61	468.50	439.50	411.08	407.34
V-THETA 1	44.25	38.10	31.06	41.46	41.46	44.24	42.91	41.04	39.13
V-THETA 2	405.96	403.61	394.11	393.24	407.05	416.31	408.92	408.42	413.41
V(PR) 1	799.5	813.4	820.6	805.0	784.1	761.4	731.4	722.8	707.2
V(PR) 2	461.3	504.5	541.7	563.1	545.1	522.6	490.0	462.1	453.3
VTHETA PR1	-710.7	-710.6	-710.0	-676.0	-641.8	-605.8	-592.6	-576.6	-571.1
VTHETA PR2	-333.6	-328.9	-331.3	-311.0	-268.9	-231.4	-217.6	-211.0	-198.9
U 1	754.99	748.66	741.10	716.24	683.23	650.04	625.50	617.63	610.22
U 2	739.57	732.50	725.44	704.21	675.95	647.68	626.45	619.42	612.36
M 1	0.3339	0.3609	0.3746	0.3994	0.4120	0.4224	0.4043	0.3983	0.3807
M 2	0.4506	0.4880	0.5126	0.5419	0.5541	0.5565	0.5328	0.5132	0.5135
M(PR) 1	0.7240	0.7380	0.7452	0.7325	0.7141	0.6940	0.6657	0.6576	0.6426
M(PR) 2	0.4027	0.4427	0.4769	0.4983	0.4833	0.4640	0.4351	0.4092	0.4011
TURN(PR)	16.426	20.185	22.205	23.590	25.374	26.435	26.445	25.742	27.623
P 1	14.757	14.665	14.909	15.010	15.022	15.083	14.949	14.907	14.751
P 2	18.374	18.785	19.073	19.409	19.463	19.402	19.016	18.746	16.746
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	567.975	566.051	565.070	562.627	561.780	560.482	557.685	558.599	559.722

STATOR E — STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	51.991	46.647	42.705	40.009	40.666	41.624	42.964	44.814	45.424
BETA 2A	1.945	2.019	1.408	1.200	0.904	1.437	2.310	2.499	0.085
V 2	516.60	556.08	582.18	612.41	624.90	626.77	599.99	579.49	580.39
V 2A	415.23	413.61	430.33	484.22	495.03	491.01	434.53	433.99	447.28
VZ 2	317.27	381.05	427.02	468.49	473.81	468.50	439.06	411.08	407.34
VZ 2A	414.69	413.12	429.98	483.94	494.86	490.81	434.16	433.56	447.27
V-THETA 2	405.96	403.61	394.11	393.24	407.05	416.31	408.92	408.92	413.41
V-THETA 2A	14.08	14.56	10.57	10.14	7.81	12.31	17.51	18.52	0.66
M 2	0.4566	0.4880	0.5126	0.5419	0.5541	0.5565	0.5328	0.5132	0.5135
M 2A	0.3661	0.3592	0.3744	0.4237	0.4338	0.4305	0.3806	0.3797	0.3913
TURN(PR)	49.938	44.520	41.199	38.750	39.742	40.165	40.654	42.314	45.338
P 2	18.374	18.785	19.073	19.409	19.463	19.402	19.016	18.746	18.746
P 2A	18.416	18.461	18.530	19.062	19.199	19.172	18.659	18.642	18.753
T 2	567.975	566.051	565.070	562.627	561.780	560.482	557.685	558.599	559.722
T 2A	567.695	565.914	565.153	562.913	562.405	561.473	556.073	559.235	560.437

Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (256°) - Station 2 (246°) - Station 2A (235°)

ROTOR E
STATION 1
STATION 2

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.96	9.99	4.98
DIA	33.207	33.617	34.101	35.151	36.685	38.219	39.371	39.754	40.136
BETA 1	4.611	4.566	4.267	4.267	4.532	4.671	5.273	5.986	6.072
BETA 2	43.951	42.985	42.610	41.363	42.284	47.979	66.459	65.329	69.509
BETA(PR) 1	59.277	57.154	57.154	57.154	59.834	62.735	65.886	76.244	76.540
BETA(PR) 2	24.122	23.367	25.379	25.379	28.254	34.206	45.848	47.648	45.917
V 1	347.02	380.16	385.35	394.97	381.47	355.44	319.96	302.50	258.57
V 2	602.48	616.10	629.65	636.97	631.75	588.42	526.94	536.35	545.94
VZ 1	345.86	378.96	384.14	393.87	380.36	354.22	318.57	300.80	257.10
VZ 2	433.74	452.15	463.41	476.05	467.20	393.52	259.59	223.73	192.80
V-THETA 1	28.26	30.40	30.46	29.39	28.61	26.94	29.40	31.54	27.35
V-THETA 2	416.14	421.42	426.27	420.91	424.88	436.72	458.05	487.07	510.48
V(PR) 1	677.0	698.9	708.3	735.1	756.9	773.2	779.6	777.7	771.7
V(PR) 2	475.3	493.6	504.8	529.1	530.7	476.5	373.3	332.7	299.9
VTHETA PR1	-582.0	-587.2	-595.0	-620.7	-654.4	-687.3	-711.7	-717.1	-727.6
VTHETA PR2	-194.2	-198.0	-200.2	-226.8	-251.1	-267.5	-267.4	-245.4	-229.1
U 1	610.22	617.63	625.50	650.04	663.23	716.24	741.10	748.66	754.99
U 2	612.36	619.42	622.49	647.68	675.95	704.21	725.44	732.50	739.57
M 1	0.3139	0.3445	0.3493	0.3583	0.3457	0.3216	0.2890	0.2730	0.2329
M 2	0.5337	0.5489	0.5600	0.5662	0.5599	0.5184	0.4604	0.4684	0.4762
M(PR) 1	0.6123	0.6334	0.6421	0.6668	0.6860	0.6997	0.7042	0.7017	0.6950
M(PR) 2	0.4216	0.4383	0.4490	0.4704	0.4704	0.4198	0.3262	0.2905	0.2616
TURN(PR)	35.155	33.516	33.787	32.224	31.596	28.582	20.133	19.701	26.732
P 1	14.753	14.952	15.004	15.068	15.638	15.616	14.946	14.865	14.682
P 2	18.983	18.965	19.365	19.510	19.476	18.957	18.295	18.411	18.504
T 1	516.699	518.699	518.699	518.699	518.699	516.699	518.699	518.699	516.699
T 2	560.509	559.495	559.166	560.438	562.923	565.013	568.162	569.646	571.757

STATOR E
STATION 2
STATION 2A

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	43.951	42.985	42.610	41.363	42.284	47.979	60.459	65.329	69.309
BETA 2A	1.646	3.450	2.493	1.192	0.717	-0.127	0.622	1.874	3.361
V 2	602.48	618.10	629.65	636.97	631.75	588.42	526.94	536.35	545.94
V 2A	447.49	438.25	444.67	490.12	490.06	462.26	398.55	385.85	393.38
VZ 2	433.74	452.15	463.41	476.05	467.20	393.52	259.59	223.73	192.80
VZ 2A	447.41	437.45	444.43	489.91	489.91	462.04	398.32	385.43	392.42
V-THETA 2	418.14	421.42	426.27	420.91	424.88	436.72	458.05	487.07	510.48
V-THETA 2A	8.12	26.37	19.35	10.19	6.13	-1.02	4.32	12.61	23.05
M 2	0.5337	0.5489	0.5600	0.5662	0.5599	0.5184	0.4604	0.4684	0.4762
M 2A	0.3917	0.3638	0.3699	0.4304	0.4295	0.4037	0.3456	0.3341	0.3402
TURN(PR)	42.916	39.534	40.117	40.169	41.547	48.046	59.752	63.373	65.876
P 2	18.963	19.194	19.365	19.520	19.476	18.957	18.295	18.411	18.564
P 2A	18.742	18.652	18.726	19.141	19.094	18.861	18.286	18.196	18.241
T 2	560.519	559.495	559.125	560.438	562.923	565.013	568.102	569.646	571.757
T 2A	559.641	556.612	558.166	559.552	561.722	563.301	565.954	567.331	569.375

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60
Circumferential Distortion
Station 1 (286°) – Station 2 (276°) – Station 2A (265°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.138	39.754	39.371	36.219	36.005	35.151	34.001	33.017	33.234
BETA 1	-.994	-4.688	-5.269	-5.086	-5.218	-4.840	-5.448	-5.766	-5.224
BETA 2	66.602	64.123	61.799	55.105	50.365	46.477	44.694	44.521	44.513
BETA(PR) 1	75.819	71.883	69.340	66.036	63.992	60.962	59.709	59.460	60.405
BETA(PR) 2	47.051	44.012	41.275	33.037	28.339	24.266	22.103	21.567	21.164
V 1	195.84	252.58	290.81	352.82	350.37	380.08	387.36	368.85	365.84
V 2	550.46	554.75	591.15	591.08	606.87	626.00	631.54	630.89	626.67
VZ 1	195.08	251.76	289.52	331.47	348.90	378.72	385.62	386.89	364.51
VZ 2	218.46	241.94	264.50	337.91	387.01	431.06	448.94	449.28	446.68
V-THETA 1	-17.05	-20.64	-26.76	-29.50	-31.86	-32.11	-36.78	-38.66	-33.31
V-THETA 2	504.88	498.76	493.28	464.47	467.23	453.90	444.17	441.83	439.35
V(PR) 1	796.3	809.4	820.6	816.1	795.7	780.2	766.4	761.8	739.5
V(PR) 2	321.2	337.1	352.6	403.7	439.5	472.7	484.6	483.1	479.2
VTHETA PR1	-772.0	-769.3	-767.8	-745.7	-715.1	-682.1	-662.3	-656.3	-643.5
VTHETA PR2	-234.7	-233.7	-232.2	-219.7	-208.7	-193.6	-182.3	-177.6	-173.0
U 1	754.99	748.66	741.10	716.24	683.23	650.04	625.50	617.63	610.22
U 2	739.57	732.50	725.44	704.21	675.95	647.68	626.49	619.42	612.36
M 1	0.1760	0.2274	0.2623	0.3008	0.3170	0.3445	0.3512	0.3526	0.3313
M 2	0.4744	0.4791	0.4845	0.5146	0.5368	0.5560	0.5572	0.5572	0.5515
M(PR) 1	0.7155	0.7287	0.7400	0.7376	0.7198	0.7071	0.6948	0.6906	0.6696
M(PR) 2	0.2769	0.2911	0.3055	0.3514	0.3848	0.4153	0.4275	0.4258	0.4218
TURN(PR)	28.879	27.978	28.166	33.052	35.669	36.757	37.686	37.913	39.321
P 1	14.583	14.756	14.897	14.992	14.961	14.972	14.967	14.961	14.782
P 2	18.572	18.564	18.601	18.967	19.041	19.207	19.253	19.216	19.150
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	585.391	583.590	582.362	578.122	574.658	571.756	567.780	568.746	569.939

STATOR E — STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	66.602	64.123	61.799	55.165	50.365	46.477	44.694	44.521	44.513
BETA 2A	3.827	0.082	-3.052	-4.058	-0.007	1.312	3.229	3.668	3.372
V 2	550.46	554.75	560.15	591.08	606.67	626.00	631.54	630.15	626.69
V 2A	396.48	385.06	393.00	444.69	468.75	489.66	457.65	459.85	471.46
VZ 2	218.46	241.94	264.50	337.91	387.01	431.06	448.94	448.94	446.80
VZ 2A	395.31	384.84	392.24	443.41	468.65	489.49	456.91	458.50	470.04
V-THETA 2	504.88	498.76	493.28	484.47	467.23	453.90	444.17	441.83	439.35
V-THETA 2A	26.44	0.55	-20.91	-31.46	-0.06	11.21	25.78	29.42	27.73
M 2	0.4744	0.4791	0.4845	0.5146	0.5308	0.5560	0.5572	0.5554	0.5515
M 2A	0.3390	0.3297	0.3371	0.3845	0.4071	0.4267	0.3996	0.4012	0.4113
TURN(PR)	62.696	63.955	64.767	59.105	50.352	45.161	41.465	40.852	41.140
P 2	18.572	18.564	18.601	18.967	19.041	19.207	19.253	19.216	19.155
P 2A	18.169	18.091	18.129	18.129	18.742	18.965	16.751	16.742	18.053
T 2	585.391	583.590	582.362	578.122	574.658	571.756	567.780	568.746	569.939
T 2A	562.276	579.996	578.454	575.141	569.883	567.866	563.266	564.252	565.396

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Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (316°) - Station 2 (306°) - Station 2A (295°)

ROTOR E / STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.138	39.754	39.371	38.219	36.685	35.151	34.001	33.617	33.234
BETA 1	-23.065	-21.850	-20.547	-19.622	-18.325	-18.513	-19.253	-20.468	-21.464
BETA 2	75.943	72.993	70.159	62.194	57.065	54.718	58.032	58.293	56.292
BETA(PR) 1	75.010	73.975	72.971	71.917	70.136	68.451	69.085	69.345	69.896
BETA(PR) 2	65.374	60.594	55.205	38.144	32.296	26.409	26.750	26.248	19.030
V 1	248.01	261.87	273.90	261.04	295.39	311.96	292.20	289.21	280.44
V 2	493.18	496.69	507.83	563.23	571.53	587.13	549.95	558.06	593.38
VZ 1	228.17	243.02	256.43	264.69	280.40	295.81	275.86	270.95	266.95
VZ 2	119.76	145.23	172.30	262.62	310.25	339.12	266.27	293.31	329.30
V-THETA 1	-97.16	-97.45	-96.12	-94.36	-92.87	-99.05	-96.35	-101.13	-102.71
V-THETA 2	478.30	474.82	477.50	497.97	479.69	479.27	469.57	474.76	493.61
V(PR) 1	882.2	880.3	875.6	852.7	825.2	805.4	772.8	768.1	759.2
V(PR) 2	287.6	296.1	302.3	334.4	367.5	378.7	326.5	327.0	350.1
VTHETA PR1	-652.2	-646.1	-837.2	-610.6	-776.1	-749.1	-721.8	-718.8	-712.9
VTHETA PR2	-261.3	-257.7	-247.9	-206.2	-196.3	-168.4	-156.9	-144.6	-118.8
U 1	754.99	748.66	741.10	716.24	663.23	650.04	625.50	617.63	616.22
U 2	739.57	732.50	725.44	704.21	675.95	647.68	626.49	619.42	612.36
M 1	0.2232	0.2359	0.2468	0.2533	0.2665	0.2816	0.2635	0.2608	0.2528
M 2	0.4222	0.4255	0.4355	0.4855	0.4943	0.5103	0.4770	0.4841	0.5158
M(PR) 1	0.7941	0.7929	0.7891	0.7687	0.7444	0.7271	0.6969	0.6927	0.6843
M(PR) 2	0.2462	0.2536	0.2592	0.2882	0.3179	0.3291	0.2831	0.2837	0.3043
TURN(PR)	9.720	13.472	17.856	33.829	37.857	42.044	40.355	43.698	50.066
P 1	13.949	13.989	14.013	14.016	14.012	14.013	13.937	13.927	13.883
P 2	18.197	18.183	18.268	18.757	18.819	18.858	18.364	18.399	18.750
T 1	518.699	516.699	518.699	518.699	516.699	518.699	518.699	518.699	518.699
T 2	588.194	587.508	587.232	586.479	585.479	579.608	578.338	576.670	580.117

STATOR E / STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	75.943	72.993	70.159	62.194	57.065	54.718	58.632	58.293	56.292
BETA 2A	4.129	-0.795	-4.965	-6.096	-0.256	0.785	2.669	2.890	4.338
V 2	493.18	496.69	507.83	563.23	571.53	587.13	549.95	558.08	593.38
V 2A	356.79	348.00	355.56	376.74	382.82	403.68	401.44	410.67	428.85
VZ 2	119.76	145.23	172.30	262.62	310.50	339.12	280.27	293.31	329.30
VZ 2A	355.61	347.77	354.05	376.47	382.74	403.60	400.99	416.14	427.62
V-THETA 2	478.30	474.82	477.50	497.97	479.69	479.27	469.57	474.78	493.61
V-THETA 2A	25.67	-4.83	-30.76	-40.17	-1.71	5.52	18.69	20.71	32.44
M 2	0.4222	0.4255	0.4355	0.4855	0.4943	0.5103	0.4770	0.4841	0.5158
M 2A	0.3029	0.2956	0.3023	0.3228	0.3274	0.3468	0.3455	0.3534	0.3691
TURN(PR)	71.764	73.726	75.056	68.232	57.322	53.933	55.963	55.402	51.953
P 2	18.197	18.183	18.266	18.757	18.819	18.856	18.364	18.399	18.750
P 2A	17.843	17.799	17.815	17.942	17.965	18.144	18.138	18.219	16.573
T 2	588.154	587.508	587.232	586.479	585.479	579.608	578.338	578.670	580.117
T 2A	587.863	586.923	566.334	504.634	581.290	577.237	575.348	575.949	577.189

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Table A-8, Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 100.31   Equivalent Rotor Speed = 4222.87   Equivalent Weight Flow = 92.60

Circumferential Distortion

Station 1 (346°) - Station 2 (336°) - Station 2A (325°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	4.98	9.99	14.96	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.136	39.754	39.371	38.219	36.685	35.151	34.001	33.617	33.234
BETA 1	-9.892	-4.584	-10.036	-11.351	-12.143	-11.271	-12.266	-15.061	-14.726
BETA 2	66.648	63.113	60.051	52.969	52.066	52.755	58.993	59.491	57.696
BETA(PR) 1	71.311	68.856	67.654	67.288	65.674	64.617	64.576	64.625	66.046
BETA(PR) 2	52.273	48.708	45.500	34.319	31.344	26.507	31.506	27.425	19.908
V 1	275.52	314.21	330.05	333.85	349.98	347.34	339.45	337.91	317.34
V 2	517.34	521.06	528.24	562.72	581.30	589.95	534.16	550.61	569.53
VZ 1	271.40	309.77	324.49	327.26	342.13	331.70	331.76	329.17	306.90
VZ 2	204.94	235.47	263.49	350.67	357.26	357.04	275.17	279.53	315.10
V-THETA 1	-47.33	-52.31	-57.51	-65.70	-73.62	-67.89	-72.12	-76.36	-80.63
V-THETA 2	474.67	464.39	457.31	464.83	458.56	469.62	457.63	474.37	498.25
V(PR) 1	847.0	858.8	862.2	847.7	836.0	794.6	772.5	768.1	756.0
V(PR) 2	335.4	357.4	376.6	425.2	418.5	399.0	322.7	314.9	335.1
VTHETA PR1	-802.3	-801.0	-798.6	-781.9	-756.8	-717.9	-697.6	-694.6	-690.9
VTHETA PR2	-264.9	-268.1	-266.1	-239.4	-217.6	-178.1	-166.7	-145.0	-114.1
U 1	754.99	748.66	741.10	716.24	663.23	650.04	625.50	617.63	610.22
U 2	739.57	732.56	725.44	704.21	675.95	647.68	626.49	619.42	612.56
M 1	0.2483	0.2837	0.2982	0.3017	0.3166	0.3142	0.3069	0.3055	0.2865
M 2	0.4451	0.4489	0.4553	0.5051	0.5044	0.5126	0.4633	0.4778	0.5127
M(PR) 1	0.7633	0.7754	0.7791	0.7662	0.7514	0.7187	0.6984	0.6944	0.6826
M(PR) 2	0.2686	0.3079	0.3245	0.3686	0.3632	0.3467	0.2799	0.2733	0.2915
TURN(PR)	19.146	20.253	22.455	33.023	34.348	38.112	33.063	37.260	46.140
P 1	13.778	13.933	13.964	13.911	13.962	13.903	13.696	13.920	13.799
P 2	16.337	16.343	18.399	16.962	18.930	18.930	18.869	18.295	18.705
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	584.530	583.284	583.463	582.092	580.806	580.066	576.699	577.962	577.053

STATOR E — STATION 2, STATION 2A

PCT SPAN	5.60	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	66.648	63.113	60.051	52.969	52.066	52.755	58.993	59.491	57.696
BETA 2A	4.332	0.863	-2.086	-3.086	0.747	-1.416	-1.121	-0.074	1.794
V 2	517.34	521.08	528.24	582.72	581.30	589.95	534.16	550.61	589.53
V 2A	386.17	376.29	384.97	411.46	391.97	365.26	297.38	302.42	316.58
VZ 2	204.94	235.47	263.49	350.67	357.26	357.04	275.17	279.53	315.10
VZ 2A	384.79	376.04	384.52	410.72	391.65	365.11	297.31	302.41	316.43
V-THETA 2	474.67	464.39	457.31	464.83	458.36	469.62	457.63	474.37	496.25
V-THETA 2A	29.15	5.66	-14.01	-22.14	5.11	-9.03	-5.82	-0.39	9.91
M 2	0.4451	0.4489	0.4553	0.5051	0.5044	0.5126	0.4633	0.4778	0.5127
M 2A	0.3290	0.3268	0.3284	0.3521	0.3355	0.3122	0.2541	0.2582	0.2702
TURN(PR)	62.237	62.162	62.056	55.996	51.299	54.169	60.114	59.564	55.895
P 2	18.337	18.343	18.399	18.256	18.930	18.889	18.192	18.295	18.705
P 2A	18.087	18.025	18.066	18.256	18.124	17.917	17.556	17.574	17.666
T 2	584.530	583.284	583.463	582.092	580.806	580.066	576.699	577.962	579.053
T 2A	585.646	584.271	584.212	582.295	580.719	580.802	577.431	578.567	579.759

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27
Circumferential Distortion
Station 1 (16°) - Station 2 (6°) - Station 2A (355°)

ROTOR E / STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	94.99
DIA	40.136	39.754	39.271	38.214	36.684	35.151	34.001	33.564	35.234
BETA 1	-6.275	-6.300	-6.304	-5.224	-6.613	-7.136	-7.363	-7.157	-7.109
BETA 2	65.565	61.859	58.257	50.820	50.428	51.143	55.441	56.742	56.174
BETA(PR) 1	66.732	65.188	65.101	64.002	62.300	62.523	63.661	63.657	65.004
BETA(PR) 2	51.385	48.269	43.892	33.347	30.658	27.560	31.399	25.687	15.343
V 1	303.50	324.84	323.00	328.58	339.63	322.60	303.45	291.21	268.42
V 2	458.66	460.08	473.83	523.90	521.17	516.21	474.09	467.41	551.19
VZ 1	301.65	322.87	320.99	326.60	337.33	320.16	300.99	288.94	266.36
VZ 2	189.66	216.81	249.05	330.76	331.91	325.15	268.93	272.78	306.43
V-THETA 1	-33.17	-35.04	-35.49	-35.76	-39.35	-40.07	-26.57	-36.28	-33.22
V-THETA 2	417.30	405.34	402.56	405.76	401.61	403.52	390.44	415.94	457.09
V(PR) 1	763.6	769.4	762.4	745.1	727.1	693.8	664.4	650.7	632.3
V(PR) 2	304.3	326.3	346.2	396.5	386.1	366.8	315.1	303.2	318.2
VTHETA PR1	-761.5	-698.4	-691.4	-669.7	-644.1	-615.5	-592.2	-583.0	-573.4
VTHETA PR2	-237.4	-243.1	-239.6	-217.6	-196.7	-109.8	-164.1	-132.4	-84.2
U 1	668.33	662.72	656.04	634.03	604.86	575.43	553.70	546.74	540.18
U 2	654.66	648.42	642.17	623.38	598.36	573.34	554.58	548.32	542.07
M 1	0.2739	0.2935	0.2918	0.3071	0.2914	0.2736	0.2736	0.2626	0.2418
M 2	0.4008	0.4021	0.4146	0.4601	0.4576	0.4562	0.4164	0.4574	0.4865
M(PR) 1	0.6891	0.6951	0.6887	0.6752	0.6574	0.6267	0.5995	0.5866	0.5696
M(PR) 2	0.2659	0.2852	0.3029	0.3482	0.3390	0.3229	0.2767	0.2666	0.2867
TURN(PR)	15.455	17.024	21.302	30.707	31.719	34.944	31.662	37.750	49.741
P 1	13.948	14.046	14.006	13.985	13.933	13.933	13.932	13.959	13.667
P 2	17.631	17.616	17.735	16.160	18.069	17.962	17.462	17.641	16.160
T 1	518.699	518.699	518.695	518.699	518.699	518.644	518.699	518.699	518.699
T 2	562.594	562.266	562.245	562.464	562.292	559.279	558.120	556.781	559.801

STATOR E / STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.426	34.952	33.921	33.564	33.207
BETA 2	65.565	61.859	58.257	50.820	50.428	51.143	55.441	56.742	56.174
BETA 2A	4.361	1.574	0.132	-0.727	1.122	-2.830	-2.859	-1.500	0.516
V 2	458.66	460.08	473.83	523.90	521.17	516.21	474.09	497.41	551.19
V 2A	363.32	360.61	372.83	389.20	363.75	339.86	307.30	322.25	343.19
VZ 2	189.60	216.81	249.05	330.76	331.91	325.10	268.93	272.78	306.53
VZ 2A	362.03	360.27	372.64	389.11	363.60	339.42	306.91	322.13	343.37
V-THETA 2	417.30	405.34	402.56	405.76	401.61	403.52	390.44	415.94	457.89
V-THETA 2A	27.23	9.90	-0.86	-0.94	7.12	-16.60	-15.33	-8.44	3.05
M 2	0.4008	0.4021	0.4146	0.4601	0.4576	0.4562	0.4164	0.4574	0.4863
M 2A	0.3147	0.3124	0.3231	0.3377	0.3153	0.2949	0.2666	0.2796	0.2980
TURN(PR)	61.182	60.194	58.036	51.487	49.286	53.946	58.300	58.241	55.667
P 2	17.655	17.616	17.735	16.160	18.069	17.962	17.462	17.641	16.169
P 2A	17.511	17.485	17.534	17.637	17.453	17.315	17.141	17.242	17.385
T 2	562.594	562.266	562.245	562.462	562.292	562.262	558.120	556.781	559.801
T 2A	565.745	565.436	565.507	565.514	564.989	562.262	560.565	561.254	562.262

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 81.27

Circumferential Distortion

Station 1 (46°) - Station 2 (36°) - Station 2A (25°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	95.00	90.00	85.00	70.00	50.00	50.00	14.98	9.99	4.98
DIA	33.2..	33.017	33.921	31.1.1	36.605	36.219	39.371	39.754	40.156
BETA 1	3.160	3.938	—	1.56	2.941	1.651	1.964	2.718	3.242
BETA 2	49.911	47.802	44.763	41.969	41.913	41.180	44.330	49.306	55.114
BETA(PR) 1	53.269	51.514	51.707	53.205	54.249	56.255	56.891	59.411	62.725
BETA(PR) 2	25.618	27.961	27.341	28.217	31.268	35.361	40.525	45.778	52.036
V 1	386.75	413.11	417.43	420.17	420.46	415.79	368.35	381.56	335.38
V 2	504.01	499.67	517.68	537.02	534.51	523.37	490.97	454.76	422.06
VZ 1	386.00	412.13	416.61	419.93	419.86	415.56	368.16	381.06	334.81
VZ 2	325.06	335.62	367.50	399.26	397.61	393.44	350.58	356.02	241.69
V-THETA 1	24.05	28.37	26.04	14.00	21.57	11.98	12.90	18.09	18.96
V-THETA 2	386.19	370.16	364.54	359.11	356.91	344.19	342.48	344.25	345.77
V(PR) 1	644.5	662.2	672.3	701.1	716.7	748.1	751.2	748.9	730.6
V(PR) 2	360.5	386.0	413.8	453.1	465.4	463.1	462.1	425.2	392.4
VTHETA PR1	-510.1	-518.4	-527.7	-561.4	-583.2	-622.1	-643.1	-644.6	-649.4
VTHETA PR2	-155.9	-178.2	-190.0	-214.2	-241.4	-279.2	-299.7	-304.2	-308.9
U 1	540.18	546.74	553.70	575.43	604.80	634.03	656.04	662.72	668.33
U 2	542.07	548.32	554.56	573.34	598.36	623.38	642.17	648.42	654.68
M 1	0.3566	0.3752	0.3792	0.3818	0.3821	0.3777	0.3522	0.3458	0.3031
M 2	0.4468	0.4427	0.4599	0.4772	0.4749	0.4648	0.4344	0.4011	0.3709
M(PR) 1	0.5843	0.6015	0.6108	0.6371	0.6530	0.6796	0.6811	0.6787	0.6604
M(PR) 2	0.3191	0.3366	0.3676	0.4027	0.4135	0.4291	0.4089	0.3751	0.3449
TURN(PR)	27.591	23.553	24.366	24.996	22.997	20.948	18.459	13.739	10.802
P 1	14.603	14.804	14.850	14.891	14.947	14.952	14.864	14.850	14.626
P 2	17.676	17.655	17.642	18.105	18.170	18.145	17.689	17.562	17.298
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	552.309	550.966	549.678	551.012	550.965	550.392	551.596	552.081	553.573

STATOR E — STATION 2, STATION 2A

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.422	37.846	38.919	39.276	39.633
BETA 2	49.911	47.802	44.763	41.969	41.913	41.180	44.336	49.308	55.114
BETA 2A	0.641	0.279	-0.166	-0.270	0.936	0.180	0.797	1.688	2.522
V 2	504.61	499.67	517.66	537.02	534.51	523.37	490.97	454.76	422.06
V 2A	363.71	350.42	344.58	395.26	454.68	400.47	357.32	339.94	337.24
VZ 2	325.08	335.62	367.56	399.26	397.61	393.44	350.58	296.02	241.09
VZ 2A	363.66	350.41	344.56	395.66	404.73	400.32	357.10	339.66	336.67
V-THETA 2	386.19	370.16	364.54	359.11	356.91	344.19	342.48	344.25	345.77
V-THETA 2A	4.07	1.71	-1.00	-1.66	6.61	1.26	4.97	10.01	14.83
M 2	0.4468	0.4427	0.4599	0.4772	0.4749	0.4648	0.4344	0.4011	0.3709
M 2A	0.3167	0.3075	0.3625	0.3472	0.3561	0.3523	0.3132	0.2975	0.2947
TURN(PR)	49.269	47.522	44.429	42.237	40.957	40.940	43.434	47.512	52.488
P 2	17.676	17.653	17.642	18.105	16.145	16.145	17.689	17.562	17.296
P 2A	17.647	17.443	17.465	17.757	17.638	17.775	17.456	17.353	17.338
T 2	552.509	550.936	549.678	551.012	550.965	550.392	551.596	552.081	553.575
T 2A	553.020	551.462	549.977	551.639	551.475	550.942	552.356	552.802	554.362

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Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27

Circumferential Distortion

Station 1 (76°) - Station 2 (66°) - Station 2A (55°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	50.00	70.00	84.99	90.00	95.00
DIA	4.136	39.754	39.571	38.219	36.685	25.151	24.001	53.017	53.204
BETA 1	-0.760	-0.801	-1.124	-0.590	-0.662	-0.709	-0.600	-5.692	-0.423
BETA 2	52.152	45.767	41.551	39.516	39.389	40.299	42.389	44.384	46.454
BETA(PR) 1	62.659	60.679	59.424	56.965	55.176	53.542	53.461	55.630	55.767
BETA(PR) 2	46.955	41.104	37.197	32.224	27.846	24.448	23.459	23.685	22.199
V 1	348.07	375.27	392.31	415.16	423.97	429.09	414.36	406.29	369.45
V 2	453.24	490.24	522.57	556.03	574.02	577.11	557.55	539.73	538.07
VZ 1	348.01	375.18	392.16	415.08	423.92	429.06	414.26	406.26	369.41
VZ 2	277.68	341.34	390.31	428.41	443.45	440.13	411.80	365.74	371.24
V-THETA 1	-4.74	-5.25	-7.69	-4.27	-0.45	-5.31	-5.82	-4.91	-2.73
V-THETA 2	557.37	350.61	345.94	353.35	364.11	373.24	375.88	377.50	390.58
V(PR) 1	757.7	766.1	771.0	761.0	742.2	722.0	696.2	685.1	656.7
V(PR) 2	407.6	454.0	491.1	507.2	501.6	483.5	448.9	421.9	401.0
VTHETA PR1	-673.1	-668.0	-663.7	-638.3	-609.3	-580.7	-559.5	-551.6	-542.9
VTHETA PR2	-297.3	-297.8	-296.2	-270.0	-234.3	-260.1	-178.7	-176.8	-151.5
U 1	668.33	662.72	656.04	634.03	604.86	575.43	553.70	546.74	540.18
U 2	654.68	648.42	642.17	623.38	598.36	573.34	554.58	548.32	542.07
M 1	0.3146	0.3400	0.3558	0.3771	0.3853	0.3901	0.3764	0.3688	0.3346
M 2	0.3984	0.4325	0.4623	0.4935	0.5101	0.5138	0.4957	0.4788	0.4776
M(PR) 1	0.6854	0.6941	0.6992	0.6992	0.6746	0.6565	0.6324	0.6219	0.5947
M(PR) 2	0.3583	0.4005	0.4344	0.4501	0.4459	0.4305	0.3991	0.3743	0.3554
TURN(PR)	15.814	19.680	22.317	24.792	27.340	29.096	30.022	29.745	33.568
P 1	14.618	14.770	14.862	14.930	14.902	14.935	14.851	14.767	14.535
P 2	17.531	17.856	18.164	18.164	16.552	16.552	16.212	16.017	18.019
T 1	516.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	510.699
T 2	555.568	554.702	554.414	554.083	554.463	552.754	552.245	553.018	553.880

STATOR E — STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.426	34.992	33.921	33.564	33.207
BETA 2	52.152	45.767	41.551	39.516	39.389	46.299	42.389	44.362	46.454
BETA 2A	1.263	1.718	1.128	0.730	0.778	1.723	2.099	1.715	0.789
V 2	453.24	490.24	522.57	556.03	574.02	577.11	557.55	539.73	538.87
V 2A	372.05	385.34	403.89	452.43	457.37	434.14	375.25	374.63	380.07
VZ 2	277.68	341.34	390.31	428.41	443.45	440.13	411.60	385.74	371.24
VZ 2A	371.69	384.95	403.61	452.23	457.22	433.90	375.88	374.46	385.74
V-THETA 2	557.37	350.61	345.94	353.35	364.11	373.24	375.88	377.50	390.58
V-THETA 2A	8.19	11.55	7.95	5.76	6.21	13.05	13.74	11.21	5.23
M 2	0.3984	0.4325	0.4623	0.4935	0.5101	0.5138	0.4957	0.4788	0.4776
M 2A	0.3257	0.3379	0.3547	0.3988	0.4031	0.3825	0.3295	0.3287	0.3333
TURN(PR)	50.781	43.940	40.325	38.727	38.591	38.574	40.290	42.666	45.664
P 2	17.531	17.856	18.164	18.465	18.501	18.501	16.212	16.017	16.019
P 2A	17.540	17.635	17.767	18.206	18.271	16.663	17.624	17.620	17.664
T 2	555.568	554.702	554.414	554.083	554.463	552.754	552.245	553.018	553.880
T 2A	554.656	553.617	553.252	552.741	553.198	551.870	551.393	552.223	553.124

Table A-9. Blade Element Performance (Continued)
Stage E, Rotor E – Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27
Circumferential Distortion

Station 1 (106°) – Station 2 (96°) – Station 2A (85°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.99	9.99	4.98
DIA	33.34	33.617	34.001	34.947	36.685	36.219	39.574	39.754	46.136
BETA 1	-0.195	0.318	0.577	0.947	-0.370	-0.157	-0.407	-1.366	-0.564
BETA 2	46.000	44.098	41.560	39.386	36.545	38.246	39.660	45.667	49.351
BETA(PR) 1	57.130	55.041	53.628	53.083	54.749	57.171	59.766	61.083	63.591
BETA(PR) 2	23.372	26.535	26.032	26.329	30.063	33.623	39.359	43.595	50.151
V 1	349.63	360.77	404.82	427.07	429.44	469.75	484.01	371.15	333.40
V 2	531.69	519.99	539.03	563.78	556.43	546.93	566.82	471.06	425.99
VZ 1	349.82	380.76	454.80	427.01	429.41	469.70	483.93	370.98	333.35
VZ 2	369.43	373.43	403.33	357.71	425.97	428.97	389.37	346.06	277.32
V-THETA 1	-1.19	2.11	4.08	7.06	-2.77	-0.98	-2.73	-6.85	-2.93
V-THETA 2	362.46	361.85	357.59	357.72	346.57	336.13	322.81	324.62	322.42
V(PR) 1	649.6	664.5	682.6	710.9	744.0	755.7	762.5	767.3	749.5
V(PR) 2	402.4	417.4	448.9	486.2	502.9	515.9	504.6	470.5	433.5
VTHETA PR1	-541.4	-544.0	-549.0	-568.4	-607.6	-635.0	-658.8	-671.6	-671.3
VTHETA PR2	-159.6	-166.5	-197.0	-215.6	-251.8	-285.3	-319.4	-323.8	-332.3
U 1	540.18	546.74	553.70	575.43	664.80	634.03	656.04	662.72	668.33
U 2	542.07	546.32	554.58	575.34	598.36	623.38	642.17	648.42	654.68
M 1	0.3165	0.3451	0.3675	0.3882	0.3905	0.3721	0.3461	0.3362	0.3013
M 2	0.4705	0.4604	0.4787	0.5006	0.4936	0.4849	0.4473	0.4146	0.3733
M(PR) 1	0.5831	0.6023	0.6196	0.6463	0.6765	0.6862	0.6912	0.6949	0.6774
M(PR) 2	0.3561	0.3696	0.3986	0.4317	0.4461	0.4574	0.4454	0.4161	0.3799
TURN(PR)	33.758	28.567	27.597	26.755	24.702	23.600	26.560	17.594	13.549
P 1	14.537	14.699	14.836	14.956	14.964	14.926	14.885	14.829	14.627
P 2	18.027	17.926	16.125	18.441	18.444	18.442	18.093	17.770	17.395
T 1	516.699	516.699	516.699	516.699	518.699	518.699	518.699	518.699	518.699
T 2	554.893	553.337	551.827	554.164	554.638	554.329	555.541	555.694	556.869

STATOR E — STATION 2, STATION 2A

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	46.000	44.098	41.560	39.386	38.545	38.246	39.660	43.667	49.301
BETA 2A	0.686	1.542	2.278	1.639	0.865	0.842	1.024	1.741	1.571
V 2	531.99	519.99	534.03	563.78	556.43	546.93	506.82	471.06	425.99
V 2A	406.78	393.69	391.47	454.09	469.22	464.23	408.31	384.69	373.49
VZ 2	369.34	373.54	391.14	403.86	435.00	428.97	389.37	340.08	277.32
VZ 2A	361.85	361.14	357.59	357.72	346.57	336.13	322.81	324.62	322.42
V-THETA 2	-4.87	10.59	15.56	12.99	7.54	6.62	7.29	11.66	10.23
V-THETA 2A	0.4604	0.3454	0.3440	0.3996	0.4133	0.4090	0.3579	0.3367	0.3263
M 2	0.4604	0.4555	0.4787	0.5006	0.4936	0.4849	0.4473	0.4146	0.3733
M 2A	0.3566	0.3454	0.3440	0.3996	0.4133	0.4090	0.3579	0.3367	0.3263
TURN(PR)	45.013	42.555	39.282	37.745	37.665	37.345	38.539	41.817	47.620
P 2	18.027	17.926	18.125	18.441	18.444	18.442	18.093	17.770	17.660
P 2A	17.089	17.766	18.165	16.273	16.406	16.224	18.693	17.823	17.591
T 2	553.337	553.573	551.827	554.144	554.658	554.329	555.541	555.694	555.869
T 2A	555.123	555.573	551.629	554.510	554.659	554.182	555.583	555.644	556.812

Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27

Circumferential Distortion

Station 1 (136°) – Station 2 (126°) – Station 2A (115°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN	4.98	9.99	14.98	30.00	55.00	70.00	84.59	90.00	95.00
DIA	40.136	39.754	39.371	38.215	36.645	35.151	34.001	33.564	33.234
BETA 1	-1.224	-1.209	-0.969	-0.731	-0.477	-0.907	-0.046	0.206	0.314
BETA 2	51.386	45.471	39.295	39.295	39.875	40.577	42.407	44.853	46.698
BETA(PR) 1	61.363	61.645	59.606	57.604	55.470	54.685	53.605	53.559	54.575
BETA(PR) 2	47.954	41.643	37.723	32.946	28.906	25.646	25.646	25.119	24.066
V 1	369.67	361.92	388.76	405.62	418.57	412.33	408.40	402.66	377.17
V 2	445.03	486.10	517.01	549.99	562.14	564.82	544.02	528.43	524.23
VZ 1	368.95	361.78	388.63	405.53	418.53	412.28	408.39	402.65	377.15
VZ 2	277.36	340.24	382.72	425.69	431.23	428.96	401.69	374.61	359.53
V-THETA 1	-7.88	-7.63	-6.57	-5.26	-3.48	-6.53	-0.33	1.41	2.04
V-THETA 2	347.20	345.88	346.13	347.87	360.25	367.38	366.88	372.69	381.50
V(PR) 1	770.3	761.6	768.2	757.6	738.0	713.2	688.6	677.9	657.1
V(PR) 2	414.8	456.3	484.9	507.3	492.9	475.9	443.4	413.7	393.8
VTHETA PR1	-676.2	-670.4	-662.6	-639.2	-608.3	-582.0	-554.0	-545.3	-538.1
VTHETA PR2	-307.5	-362.5	-296.0	-275.5	-238.1	-206.0	-187.7	-175.6	-160.6
U 1	668.53	662.72	656.04	634.03	604.80	575.43	553.70	546.74	546.18
U 2	654.68	648.42	642.17	623.38	598.36	573.34	554.58	548.32	542.07
M 1	0.3342	0.3276	0.3525	0.3682	0.3803	0.3745	0.3706	0.3654	0.3417
M 2	0.3967	0.4284	0.4569	0.4877	0.4989	0.5022	0.4831	0.4684	0.4641
M(PR) 1	0.6976	0.6896	0.6966	0.6672	0.6709	0.6477	0.6249	0.6152	0.5954
M(PR) 2	0.3641	0.4021	0.4286	0.4496	0.4375	0.4231	0.3938	0.3667	0.3486
TURN(PR)	13.538	20.107	21.976	24.713	26.580	29.040	28.559	28.441	30.910
P 1	14.727	14.662	14.811	14.873	14.958	14.918	14.918	14.685	14.693
P 2	17.564	17.941	18.227	18.509	18.547	18.476	18.175	18.007	17.946
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	556.414	555.359	554.955	554.483	554.528	552.937	552.240	552.963	553.026

STATOR E — STATION 2 / STATION 2A

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.426	34.992	33.921	33.564	33.207
BETA 2	51.386	45.471	42.126	39.295	39.875	40.577	42.407	44.853	46.698
BETA 2A	1.672	1.771	0.918	0.923	0.943	1.453	2.252	1.376	0.587
V 2	445.03	486.10	517.01	549.99	562.14	564.82	544.02	528.43	524.23
V 2A	372.70	383.92	403.94	460.36	465.10	445.20	384.02	365.27	395.45
VZ 2	277.30	340.24	382.72	425.69	431.23	428.96	401.69	374.61	359.53
VZ 2A	372.27	383.52	403.68	460.13	464.01	445.01	383.01	385.15	395.42
V-THETA 2	347.20	345.88	346.13	347.87	360.25	367.38	366.88	372.69	381.50
V-THETA 2A	10.67	11.86	6.47	7.41	7.65	11.25	15.09	9.27	4.05
M 2	0.3907	0.4284	0.4569	0.4877	0.4989	0.5022	0.4831	0.4684	0.4641
M 2A	0.3257	0.3360	0.3541	0.4053	0.4096	0.3920	0.3371	0.3380	0.3408
TURN(PR)	49.605	43.591	41.110	38.313	38.912	39.122	40.155	43.474	46.110
P 2	17.564	17.941	18.227	18.509	18.547	18.476	18.175	18.007	17.946
P 2A	17.642	17.738	17.866	18.361	18.414	18.237	17.751	17.763	17.625
T 2	556.414	555.359	554.955	554.483	554.529	552.937	552.240	552.963	553.026
T 2A	556.592	555.497	555.140	554.510	554.584	553.184	552.234	553.120	554.134

Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27

Circumferential Distortion

Station 1 (166°) – Station 2 (156°) – Station 2A (145°)

ROTOR E (STATION 1, STATION 2)

PCT SPAN	94.90	95.00	85.00	70.00	64.90	50.00	34.90	30.00	14.95	9.99	4.98
DIA	35.254	33.237	33.921	34.001		36.219		38.219	54.371	39.754	40.138
BETA 1	1.660	1.668	2.115	2.015		1.547		0.968	0.777	1.191	1.474
BETA 2	46.761	45.066	42.655	40.297		39.348		38.015	41.089	44.703	50.104
BETA(PR) 1	55.619	53.922	52.762	53.660		54.694		57.164	59.841	61.630	63.620
BETA(PR) 2	23.890	26.862	26.517	26.566		30.337		34.871	39.065	43.383	49.209
V 1	361.34	390.54	410.51	416.70		420.45		404.90	378.32	354.04	327.44
V 2	525.25	514.54	550.94	557.69		550.92		534.14	507.05	472.43	434.12
VZ 1	361.12	390.38	410.23	416.01		420.28		404.79	378.22	472.43	327.36
VZ 2	359.68	363.40	390.48	425.33		425.05		416.82	381.41	335.14	277.99
V-THETA 1	12.41	10.96	15.15	8.09		11.35		6.76	5.13	7.36	8.41
V-THETA 2	362.70	364.26	359.76	360.67		349.15		332.92	332.60	331.68	332.52
V(PR) 1	634.5	662.9	677.0	703.4		727.2		746.6	752.8	744.6	736.6
V(PR) 2	393.4	407.4	436.4	475.6		493.7		508.8	492.3	462.1	426.2
VTHETA PR1	-527.6	-535.8	-538.6	-566.7		-593.5		-627.2	-650.9	-655.4	-659.9
VTHETA PR2	-159.3	-184.1	-194.8	-242.7		-249.2		-296.5	-309.6	-316.7	-322.2
U 1	540.16	546.74	553.70	575.43		575.43		634.03	656.04	662.72	668.33
U 2	542.07	548.32	554.58	573.34		598.36		623.30	642.17	648.42	654.66
M 1	0.3271	0.3542	0.3728	0.3785		0.3821		0.3675	0.3428	0.3204	0.2958
M 2	0.4649	0.4556	0.4714	0.4952		0.4686		0.4733	0.4479	0.4161	0.3809
M(PR) 1	0.5789	0.6012	0.6146	0.6390		0.6600		0.6558	0.6822	0.6740	0.6656
M(PR) 2	0.3482	0.3607	0.3874	0.4222		0.4379		0.4508	0.4348	0.4069	0.3740
TURN(PR)	31.729	27.061	26.186	27.116		24.374		22.347	20.868	18.353	14.520
P 1	14.670	14.869	14.974	14.966		14.959		14.947	14.868	14.730	14.624
P 2	17.862	17.862	18.041	18.379		18.395		18.313	18.095	17.774	17.457
T 1	518.699	518.699	518.699	518.699		518.699		518.699	518.699	518.699	518.699
T 2	554.117	552.721	551.388	553.769		553.859		553.859	554.626	555.076	556.116

Percent Equivalent Rotor Speed = 88.79   Equivalent Weight Flow = 84.27

Station 1 (166°) – Station 2 (156°) – Station 2A (145°)

STATOR E (STATION 2, STATION 2A)

PCT SPAN	95.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.257	33.921	34.992	36.420	37.846	38.919	39.276	39.633
BETA 2	46.781	42.655	40.247	39.348	38.615	41.069	44.703	50.124
BETA 2A	0.532	2.256	1.543	0.974	1.076	0.931	1.819	0.862
V 2	525.25	536.94	557.69	550.92	534.14	507.05	472.43	434.12
V 2A	393.65	376.88	441.54	457.22	449.22	395.17	369.33	360.70
VZ 2	359.68	390.48	425.33	425.85	416.82	381.41	335.14	277.99
VZ 2A	393.00	376.57	441.33	457.05	446.97	394.91	368.92	360.40
V-THETA 2	362.70	359.76	360.67	349.15	332.92	332.60	331.68	332.52
V-THETA 2A	3.65	14.20	11.89	7.77	8.43	6.42	11.72	5.42
M 2	0.4649	0.4714	0.4952	0.4886	0.4733	0.4479	0.4161	0.3869
M 2A	0.3446	0.3310	0.3883	0.4025	0.3954	0.3462	0.3231	0.3151
TURN(PR)	46.245	40.405	38.752	38.354	37.460	40.066	42.775	49.132
P 2	17.940	18.041	18.379	18.395	18.315	18.095	17.661	17.457
P 2A	17.835	17.729	18.246	18.291	18.211	17.826	17.594	17.594
T 2	554.117	551.388	553.764	554.268	553.854	554.826	555.076	556.116
T 2A	554.121	552.645	554.180	554.303	553.900	555.053	555.200	556.268

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27
Circumferential Distortion
Station 1 (196°) - Station 2 (186°) - Station 2A (175°)

ROTOR E — STATION 1 / STATION 2

PCT SPAN	94.99	90.00	85.0	70.00	56.00	31.00	14.98	9.99	4.98
DIA	33.617	33.617	34.001	35.151	36.055	38.371	39.371	39.754	40.158
BETA 1	1.971	1.551	1.120	0.969	1.240	0.404	1.735	1.333	1.409
BETA 2	46.857	44.921	42.623	41.166	40.197	39.879	41.764	45.223	51.378
BETA(PR) 1	55.125	53.904	53.747	54.607	55.493	57.915	56.835	62.094	63.526
BETA(PK) 2	22.885	26.100	25.657	26.343	29.207	34.149	38.786	42.444	46.904
V 1	366.33	390.22	399.62	467.29	409.81	395.82	374.93	346.86	326.79
V 2	532.04	520.72	538.26	556.34	557.46	537.20	506.48	479.80	436.03
VZ 1	368.17	390.07	399.54	407.24	409.65	395.75	374.66	346.70	328.65
VZ 2	364.02	368.71	396.66	418.78	425.62	411.80	378.55	337.31	272.99
V-THETA 1	16.74	10.56	7.65	6.46	8.87	2.79	11.35	8.07	8.43
V-THETA 2	388.42	367.69	364.49	366.20	359.64	344.06	338.03	339.94	341.70
V(PK) 1	644.9	663.1	676.5	699.7	723.2	745.1	745.7	740.8	737.2
V(PK) 2	395.1	416.6	439.3	467.2	488.5	498.3	466.6	458.0	416.0
VTHETA PR1	-529.4	-536.2	-545.6	-569.5	-595.5	-631.2	-644.7	-654.7	-659.9
VTHETA PR2	-153.7	-186.6	-190.1	-207.1	-238.7	-279.3	-304.1	-308.5	-313.0
U 1	540.18	546.74	553.70	575.43	604.80	634.05	656.04	662.72	668.33
U 2	542.07	546.32	554.56	572.34	598.36	623.38	642.17	648.42	654.68
M 1	0.3356	0.3559	0.3626	0.3698	0.3721	0.3591	0.3397	0.3137	0.2971
M 2	0.4718	0.4615	0.4761	0.4947	0.4945	0.4762	0.4495	0.4236	0.3847
M(PR) 1	0.5846	0.6013	0.6138	0.6352	0.6567	0.6759	0.6756	0.6700	0.6661
M(PR) 2	0.3502	0.3639	0.3903	0.4154	0.4335	0.4417	0.4302	0.4038	0.3654
TURN(PK)	32.301	27.864	28.158	28.091	26.222	23.819	21.147	19.756	14.731
P 1	14.604	14.779	14.854	14.939	14.967	14.905	14.905	14.765	14.661
P 2	17.953	17.953	18.155	18.398	18.494	18.373	18.141	17.874	17.534
T 1	510.699	518.699	518.699	518.699	518.699	516.699	518.699	518.699	518.699
T 2	553.308	552.283	551.449	552.158	553.769	553.659	554.017	554.489	555.471

STATOR E — STATION 2 / STATION 2A

PCT SPAN	95.00	90.00	85.0	70.00	56.00	36.00	15.00	10.00	5.00
DIA	33.207	33.564	33.921	34.992	36.423	37.646	38.919	39.276	39.633
BETA 2	46.857	44.924	42.623	41.166	40.197	39.879	41.764	45.223	51.378
BETA 2A	0.646	1.962	2.221	1.565	0.994	1.217	1.082	1.995	0.624
V 2	532.34	520.72	538.26	556.34	557.46	537.28	509.48	479.86	438.03
V 2A	385.57	376.12	376.06	435.14	453.71	453.06	408.89	385.99	374.19
VZ 2	364.02	368.71	396.66	418.78	425.62	411.80	378.55	337.31	272.99
VZ 2A	385.55	375.09	376.36	434.93	453.54	452.86	408.61	385.54	373.90
V-THETA 2	388.42	367.69	364.49	366.20	359.64	344.06	338.03	339.94	341.70
V-THETA 2A	4.35	12.68	14.60	11.88	7.87	9.62	7.72	13.43	4.07
M 2	0.4718	0.4615	0.4761	0.4947	0.4945	0.4762	0.4495	0.4236	0.3847
M 2A	0.3386	0.3299	0.3367	0.3831	0.3989	0.3989	0.3588	0.3381	0.3272
TURN(PR)	46.210	42.958	40.402	39.601	39.183	38.663	46.584	43.119	50.645
P 2	18.054	17.953	18.155	18.395	18.494	18.373	18.141	17.874	17.534
P 2A	17.746	17.725	17.733	17.639	18.236	18.290	17.680	17.721	17.639
T 2	553.368	552.243	551.444	552.158	553.769	553.654	554.017	554.489	555.471
T 2A	553.751	552.643	551.710	552.630	554.009	553.815	554.295	554.750	555.752

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E – Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27
Circumferential Distortion

Station 1 (226°) – Station 2 (216°) – Station 2A (205°)

ROTOR E — STATION 1, STATION 2

PCT SPAN / DIA	4.98	9.59	14.98	35.00	50.00	70.00	85.00	90.00	95.00
DIA	46.136	39.754	39.371	38.219	38.420	38.451	33.921	35.017	33.207
BETA 1	5.314	4.661	2.734	3.181	4.551	4.754	4.911	4.911	4.244
BETA 2	51.461	46.181	42.447	39.940	40.646	41.753	43.393	44.748	46.823
BETA(PR) 1	65.262	60.924	60.903	57.910	55.037	53.065	53.046	53.460	54.916
BETA(PR) 2	48.052	42.894	33.594	33.594	29.454	25.590	25.100	25.542	24.349
V 1	322.77	353.19	356.12	364.82	402.81	408.55	392.70	384.90	361.63
V 2	444.40	475.98	509.93	542.15	554.34	560.37	534.78	525.53	521.78
VZ 1	321.35	351.86	355.65	384.18	401.64	407.14	391.25	363.81	360.63
VZ 2	276.46	328.96	375.57	415.16	420.43	418.03	392.24	373.23	357.05
V-THETA 1	29.89	29.92	16.98	21.35	30.42	33.86	33.62	28.80	26.76
V-THETA 2	347.07	342.60	343.51	347.62	360.94	373.15	370.83	369.96	360.50
V(PR) 1	714.8	724.1	731.4	723.2	700.9	677.5	650.6	644.7	627.4
V(PR) 2	414.3	449.9	480.5	499.1	483.1	463.5	423.1	413.7	391.9
VTHETA PR1	-638.4	-632.8	-639.1	-612.7	-574.4	-541.6	-520.1	-517.9	-513.4
VTHETA PR2	-307.6	-365.6	-298.7	-275.6	-237.4	-200.2	-183.8	-178.4	-161.6
U 1	668.33	662.72	656.04	634.03	604.80	575.43	553.70	546.74	542.18
U 2	654.68	646.42	642.17	623.38	598.36	573.34	554.56	548.32	542.07
M 1	0.2915	0.3196	0.3223	0.3489	0.3656	0.3709	0.3562	0.3489	0.3274
M 2	0.3966	0.4197	0.4509	0.4811	0.4925	0.4987	0.4608	0.4671	0.4630
M(PR) 1	0.6456	0.6551	0.6619	0.6556	0.6361	0.6152	0.5903	0.5644	0.5640
M(PR) 2	0.3641	0.3968	0.4252	0.4430	0.4292	0.4125	0.3858	0.3677	0.3677
TURN(PR)	15.340	18.136	22.502	24.369	25.599	27.477	27.944	27.919	30.567
P 1	14.733	14.845	14.861	14.966	14.988	15.022	14.908	14.845	14.699
P 2	17.499	17.751	18.576	16.361	16.397	16.386	18.109	17.540	17.694
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	555.141	553.978	553.766	552.793	552.670	551.622	548.747	549.783	551.158

STATOR E — STATION 2, STATION 2A

PCT SPAN / DIA	5.00	10.00	15.00	36.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.420	34.992	33.921	33.564	33.207
BETA 2	51.461	46.181	42.447	39.940	40.646	41.753	43.393	44.748	46.823
BETA 2A	1.913	2.510	1.615	1.419	1.016	1.395	2.136	2.560	1.136
V 2	444.40	475.98	509.93	542.15	554.34	560.37	539.78	525.53	521.78
V 2A	359.55	369.25	391.72	441.96	440.39	435.50	376.76	374.37	366.41
VZ 2	276.46	328.96	375.57	415.16	420.43	418.03	392.24	373.23	357.03
VZ 2A	359.09	368.68	391.36	441.66	440.22	435.33	376.50	373.99	386.33
V-THETA 2	347.07	342.80	343.51	347.62	366.94	373.15	370.83	369.96	7.62
V-THETA 2A	11.99	16.16	11.03	10.94	7.82	10.60	14.06	16.77	16.77
M 2	0.3906	0.4197	0.4509	0.4811	0.4925	0.4987	0.4808	0.4671	0.4630
M 2A	0.3145	0.3234	0.3436	0.3892	0.3877	0.3835	0.3316	0.3290	0.3394
TURN(PR)	49.440	43.563	40.734	38.462	39.608	41.356	41.255	42.179	45.692
P 2	17.499	17.751	16.076	18.361	18.397	18.366	18.109	17.940	17.406
P 2A	17.546	17.609	17.761	16.199	16.227	18.175	17.723	17.762	17.406
T 2	555.141	553.976	553.766	552.793	552.670	551.622	548.747	549.783	551.158
T 2A	554.763	553.773	553.745	552.801	553.018	552.461	549.034	550.384	551.739

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79 Equivalent Rotor Speed = 3738.16 Equivalent Weight Flow = 84.27

Circumferential Distortion

Station 1 (256°) – Station 2 (246°) – Station 2A (235°)

ROTOR E (STATION 1 – STATION 2)

PCT SPAN	4.98	9.99	14.96	30.00	50.00	70.00	84.99	94.99
DIA	39.936	39.754	39.371	39.211	—	—	34.001	33.224
BETA 1	5.144	5.107	3.976	3.641	3.641	3.985	3.970	3.706
BETA 2	64.352	59.146	55.142	45.399	42.427	42.509	43.491	44.964
BETA(PR) 1	65.081	65.161	62.486	60.177	57.926	55.764	55.066	56.307
BETA(PR) 2	44.526	41.858	40.644	32.482	27.636	24.997	22.575	22.684
V 1	299.27	299.61	330.63	351.42	365.85	374.77	369.77	344.7
V 2	493.64	492.49	490.31	537.41	562.37	562.45	560.27	540.78
VZ 1	298.03	294.59	329.78	350.67	365.17	373.86	368.68	343.95
VZ 2	213.51	252.32	329.78	373.61	414.94	414.60	406.46	382.62
V-THETA 1	26.83	26.33	22.92	22.31	22.10	26.64	25.60	22.76
V-THETA 2	444.68	422.36	401.88	385.53	379.25	380.65	385.60	382.14
V(PR) 1	707.4	701.3	713.9	705.1	687.7	664.5	644.2	621.3
V(PR) 2	300.1	339.5	369.6	443.6	469.5	457.5	446.2	414.7
VTHETA PR1	-641.5	-636.4	-633.1	-611.7	-582.7	-549.4	-526.1	-517.4
VTHETA PR2	-216.0	-226.1	-240.3	-237.9	-219.1	-193.3	-169.0	-159.9
U 1	668.33	662.72	656.04	634.03	604.80	575.43	553.76	546.18
U 2	654.68	648.42	642.17	623.36	598.36	573.34	554.58	542.07
M 1	0.2700	0.2668	0.2968	0.3179	0.3313	0.3595	0.3349	0.3117
M 2	0.4337	0.4333	0.4316	0.4758	0.4996	0.5008	0.4994	0.4865
M(PR) 1	0.6382	0.6326	0.6451	0.6379	0.6227	0.5834	0.5619	0.5619
M(PR) 2	0.2637	0.2987	0.3255	0.3927	0.4171	0.3923	0.3685	0.3685
TURN(PR)	20.666	23.408	21.935	27.746	30.105	32.491	32.491	33.763
P 1	14.799	14.776	14.918	14.975	14.994	14.996	14.950	14.754
P 2	17.789	17.732	17.705	18.166	18.407	18.371	18.301	18.055
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	516.699
T 2	559.361	557.673	556.666	555.007	553.672	551.224	549.565	551.339

STATOR E (STATION 2 – STATION 2A)

PCT SPAN	5.00	10.00	15.00	30.00	50.00	70.00	85.00	90.00	95.00
DIA	39.633	39.276	38.919	37.848	36.426	34.992	33.921	33.564	33.207
BETA 2	64.352	59.146	55.142	45.899	42.427	42.509	43.491	44.185	44.964
BETA 2A	3.147	2.378	1.064	0.352	0.837	1.186	2.234	3.062	1.747
V 2	453.64	492.49	490.31	537.41	562.37	562.45	560.27	552.95	540.78
V 2A	349.69	349.47	368.34	422.44	443.22	436.23	396.76	390.12	395.49
VZ 2	213.51	252.32	279.92	373.61	414.94	414.60	406.46	369.56	382.62
VZ 2A	348.92	348.97	368.10	422.27	443.08	438.09	396.38	365.38	395.31
V-THETA 2	444.68	422.36	401.88	385.53	279.25	380.65	385.60	365.38	382.14
V-THETA 2A	19.16	14.49	6.45	2.59	6.847	9.07	15.46	20.84	12.06
M 2	0.4337	0.4333	0.4316	0.4758	0.4996	0.5008	0.4994	0.4924	0.4805
M 2A	0.3050	0.3052	0.3223	0.3712	0.3712	0.3866	0.3495	0.3434	0.3479
TURN(PK)	61.119	56.673	54.046	45.487	41.570	41.321	41.257	41.122	43.216
P 2	17.789	17.732	17.705	18.166	18.407	18.407	18.301	18.261	18.055
P 2A	17.428	17.435	17.552	17.972	17.972	18.147	17.822	17.772	17.811
T 2	559.361	557.673	556.666	555.007	552.007	551.224	549.565	550.162	551.339
T 2A	557.225	555.711	554.977	553.780	553.780	550.736	549.288	549.666	550.940

Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27
Circumferential Distortion
Station 1 (286°) - Station 2 (276°) - Station 2A (265°)

ROTOR E
STATION 1
STATION 2

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.59	4.56
DIA	33.054	33.504	34.001	35.151	36.005	38.219	39.371	39.754	40.138
BETA 1	-3.569	-2.530	-3.511	-1.503	-2.444	-1.698	-1.444	-2.046	-1.604
BETA 2	44.769	44.742	44.984	46.505	49.926	52.341	56.623	59.580	62.492
BETA(PR) 1	60.055	59.048	59.512	60.226	62.802	64.552	67.590	70.635	74.240
BETA(PR) 2	22.035	22.389	22.373	23.993	27.950	32.215	39.192	40.759	44.003
V 1	322.67	341.17	340.46	335.77	318.13	306.20	273.51	236.08	190.21
V 2	546.68	552.66	555.67	555.70	540.80	530.22	500.81	499.75	491.54
VZ 1	322.11	340.51	339.67	335.58	317.62	306.03	273.37	235.89	190.12
VZ 2	388.11	392.54	393.03	382.47	348.09	323.69	275.23	252.79	226.84
V-THETA 1	-18.96	-21.05	-23.22	-11.15	-13.68	-9.67	-6.89	-8.44	-5.32
V-THETA 2	384.99	389.02	392.81	403.11	413.67	419.43	417.77	430.53	435.60
V(PR) 1	645.3	662.1	669.5	675.8	695.4	712.2	717.1	711.4	700.0
V(PR) 2	418.7	423.6	425.0	418.7	394.3	383.2	355.9	334.5	316.0
VTHETA PR1	-559.1	-567.8	-576.9	-586.6	-618.5	-643.1	-662.9	-671.2	-673.7
VTHETA PR2	-157.1	-159.3	-161.8	-170.2	-184.7	-204.0	-224.4	-217.9	-219.1
U 1	540.18	546.74	553.70	575.43	604.80	634.03	656.04	662.72	668.33
U 2	542.07	548.32	554.58	573.34	598.36	623.36	642.17	648.42	654.68
M 1	0.2915	0.3085	0.3078	0.3035	0.2873	0.2764	0.2465	0.2124	0.1709
M 2	0.4634	0.4893	0.4925	0.4909	0.4762	0.4656	0.4375	0.4362	0.4262
M(PR) 1	0.5829	0.5906	0.6053	0.6109	0.6280	0.6428	0.6462	0.6401	0.6288
M(PR) 2	0.3702	0.3751	0.3767	0.3699	0.3472	0.3364	0.3109	0.2916	0.2753
TURN(PR)	38.020	36.960	37.139	36.234	34.868	32.369	28.492	29.981	30.347
P 1	14.760	14.908	14.919	14.928	14.914	14.931	14.659	14.741	14.601
P 2	16.109	16.182	16.230	16.247	18.145	18.069	17.792	17.792	17.759
T 1	516.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	557.092	556.199	555.411	558.863	561.050	563.135	566.105	567.096	566.488

STATOR E
STATION 2
STATION 2A

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.504	33.921	34.992	36.426	37.848	38.919	39.276	39.633
BETA 2	44.769	44.742	44.984	46.505	44.920	52.341	56.623	59.580	62.492
BETA 2A	2.624	3.301	2.837	0.979	0.155	-3.778	-2.457	0.624	3.889
V 2	546.66	552.66	555.67	555.70	540.80	530.22	500.81	499.75	491.54
V 2A	425.25	414.38	413.28	448.01	433.27	412.81	373.52	364.60	374.08
VZ 2	388.11	392.54	393.03	382.47	348.09	323.69	275.23	252.79	226.84
VZ 2A	424.80	413.68	412.76	447.90	433.17	411.76	372.99	364.37	372.95
V-THETA 2	384.99	389.02	392.81	403.11	413.67	419.43	417.77	430.53	435.60
V-THETA 2A	19.47	23.66	20.45	7.65	1.17	-27.19	-15.87	3.97	25.35
M 2	0.4834	0.4893	0.4925	0.4909	0.4762	0.4656	0.4375	0.4362	0.4282
M 2A	0.3737	0.3642	0.3635	0.3935	0.3797	0.3606	0.3244	0.3162	0.3246
TURN(PR)	42.144	41.445	42.147	45.524	49.745	56.059	58.968	58.660	58.513
P 2	18.016	18.122	18.200	18.247	18.145	18.069	17.792	17.792	17.759
P 2A	17.092	17.911	16.290	16.163	15.016	17.031	17.536	17.490	17.546
T 2	557.092	556.199	555.411	556.883	561.050	563.135	566.105	567.096	568.488
T 2A	553.898	552.968	552.125	556.254	557.558	559.424	563.235	504.444	566.264

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Table A-8. Blade Element Performance (Continued)
Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27
Circumferential Distortion
Station 1 (316°) - Station 2 (306°) - Station 2A (295°)

ROTOR E (STATION 1, STATION 2)

	PCT SPAN								
DIA	94.99	90.00	84.99	70.00	50.00	36.00	14.98	9.99	4.98
	33.234	33.617	34.001	35.151	36.685	36.219	39.371	39.754	40.138
BETA 1	-18.489	-18.389	-17.543	-16.721	-16.769	-17.186	-18.065	-19.319	-20.002
BETA 2	54.748	56.241	56.090	54.054	54.235	61.920	68.428	71.408	73.888
BETA(PR) 1	69.462	68.503	67.885	67.498	69.327	71.656	73.734	74.772	76.118
BETA(PR) 2	15.947	20.864	23.269	24.145	31.281	34.575	49.573	56.133	61.673
V 1	243.96	261.11	270.76	284.27	266.44	245.21	222.55	211.37	195.17
V 2	552.27	525.63	516.35	534.49	511.50	515.80	471.87	455.89	443.82
VZ 1	231.36	247.78	258.16	272.25	257.49	234.24	211.55	199.44	181.50
VZ 2	318.75	292.09	289.20	313.75	261.54	242.68	173.41	145.29	123.13
V-THETA 1	-77.36	-82.37	-81.61	-81.79	-77.59	-72.42	-69.00	-69.92	-66.07
V-THETA 2	450.99	436.99	430.22	432.70	439.43	454.88	438.61	431.92	426.26
V(PR) 1	659.5	676.1	665.8	711.4	729.2	744.3	755.3	759.3	756.5
V(PR) 2	331.5	312.6	314.8	343.9	306.2	295.9	267.8	261.0	259.7
VTHETA PR1	-617.5	-629.1	-635.3	-657.2	-682.4	-706.5	-725.0	-732.6	-734.4
VTHETA PR2	-91.1	-111.3	-124.4	-140.6	-156.9	-168.5	-203.6	-216.5	-228.4
U 1	540.16	546.74	553.70	575.43	604.80	634.03	656.04	662.72	668.33
U 2	542.07	548.32	554.56	573.34	598.36	623.38	642.17	648.42	654.66
M 1	0.2196	0.2352	0.2440	0.2563	0.2423	0.2207	0.2001	0.1900	0.1735
M 2	0.4849	0.4610	0.4546	0.4687	0.4463	0.4493	0.4096	0.3952	0.3843
M(PR) 1	0.5935	0.6090	0.6179	0.6413	0.6571	0.6699	0.6792	0.6826	0.6796
M(PR) 2	0.2911	0.2741	0.2761	0.3015	0.2672	0.2577	0.2325	0.2263	0.2249
TURN(PR)	53.514	47.639	44.617	43.355	38.063	36.936	24.256	18.739	14.538
P 1	14.067	14.113	14.135	14.190	14.170	14.143	14.121	14.096	14.061
P 2	16.110	17.863	17.627	18.056	17.926	17.996	17.624	17.505	17.440
T 1	516.699	518.699	510.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	565.093	564.089	563.493	564.881	566.418	570.588	570.805	571.012	571.459

STATOR E (STATION 2, STATION 2A)

	PCT SPAN								
DIA	95.00	90.00	85.00	70.00	56.00	30.00	15.00	10.00	5.00
	33.207	33.564	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	54.748	56.241	56.090	54.054	59.235	61.926	68.428	71.408	73.888
BETA 2A	2.856	2.661	2.303	0.269	-0.141	-6.055	-4.346	-0.464	4.432
V 2	552.27	525.63	518.39	534.49	511.50	515.80	471.87	455.89	443.82
V 2A	370.70	351.77	343.04	351.85	339.69	341.14	317.63	308.68	310.36
VZ 2	318.75	292.09	289.20	313.75	261.54	242.68	173.41	145.29	123.13
VZ 2A	370.24	351.39	342.75	351.81	339.62	339.11	316.56	308.49	309.21
V-THETA 2	456.99	436.99	430.22	432.70	439.43	454.88	438.61	431.93	426.26
V-THETA 2A	18.47	16.33	13.78	1.26	-0.84	-35.97	-24.06	-2.18	23.97
M 2	0.4849	0.4610	0.4546	0.4687	0.4463	0.4493	0.4096	0.3952	0.3642
M 2A	0.3221	0.3056	0.2980	0.3053	0.2937	0.2943	0.2735	0.2656	0.2669
TURN(PR)	51.891	53.787	53.787	53.843	59.358	67.923	72.704	71.745	69.399
P 2A	18.110	17.863	17.627	18.056	17.928	17.996	17.624	17.505	17.440
P 4	17.539	17.411	17.349	17.390	17.332	17.309	17.177	17.144	17.152
T 2	565.093	564.089	563.493	564.881	566.418	570.568	570.805	571.012	571.459
T 2A	562.627	561.693	561.105	562.907	566.427	566.667	569.592	570.068	570.713

Table A-8. Blade Element Performance (Continued)

Stage E, Rotor E - Stator E

Percent Equivalent Rotor Speed = 88.79   Equivalent Rotor Speed = 3738.16   Equivalent Weight Flow = 84.27

Circumferential Distortion

Station 1 (346°) - Station 2 (336°) - Station 2A (325°)

ROTOR E — STATION 1, STATION 2

PCT SPAN	94.99	90.00	84.99	70.00	50.00	30.00	14.98	9.99	4.98
DIA	33.234	33.617	34.001	35.151	36.605	38.219	39.371	39.754	40.136
BETA 1	-12.261	-11.269	-10.791	-10.903	-11.699	-10.326	-9.067	-8.549	-8.500
BETA 2	56.712	57.820	57.615	51.965	53.147	54.742	61.337	64.548	67.303
BETA(PR) 1	65.227	63.732	64.327	65.252	66.751	68.152	69.678	76.663	73.407
BETA(PR) 2	17.388	25.264	30.176	25.813	29.581	34.252	46.056	48.627	52.052
V 1	263.65	305.15	296.27	296.46	291.26	278.76	261.54	246.32	210.77
V 2	537.89	499.51	479.82	528.12	524.72	515.71	467.36	466.53	462.17
VZ 1	277.14	299.26	293.00	291.10	285.20	274.24	258.22	245.52	208.44
VZ 2	295.22	266.03	256.99	325.39	314.63	297.49	224.00	200.35	178.23
V-THETA 1	-60.33	-59.63	-55.84	-56.07	-59.06	-49.94	-41.21	-36.91	-31.15
V-THETA 2	449.63	422.77	465.19	415.95	419.76	426.81	409.76	420.95	426.13
V(PR) 1	661.4	676.2	676.3	695.4	722.5	736.9	743.5	741.5	729.9
V(PR) 2	304.4	294.2	297.3	361.5	362.0	360.4	323.3	303.6	290.3
VTHETA PR1	-600.5	-606.4	-609.5	-631.5	-663.9	-684.0	-697.2	-699.6	-699.5
VTHETA PR2	-92.4	-125.5	-149.4	-157.4	-178.6	-202.6	-232.4	-227.5	-228.6
U 1	540.18	546.74	553.70	575.43	604.80	634.03	656.04	662.72	668.33
U 2	542.07	546.32	554.58	573.34	598.36	623.38	642.17	648.42	654.68
M 1	0.2557	0.2754	0.2691	0.2674	0.2627	0.2513	0.2356	0.2235	0.1895
M 2	0.4717	0.4572	0.4198	0.4624	0.4589	0.4503	0.4062	0.4055	0.4013
M(PR) 1	0.5963	0.6102	0.6101	0.6273	0.6516	0.6642	0.6697	0.6674	0.6561
M(PR) 2	0.2715	0.2575	0.2601	0.3165	0.3166	0.3147	0.2810	0.2639	0.2520
TURN(PR)	47.839	38.468	34.158	39.441	37.187	33.954	23.717	22.142	21.462
P 1	13.574	14.063	14.051	14.050	14.060	14.070	14.095	14.069	13.566
P 2	17.930	17.571	17.441	17.966	18.645	17.997	17.561	17.570	17.561
T 1	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699	518.699
T 2	565.140	563.967	562.904	566.003	566.890	568.011	569.059	568.969	569.660

STATOR E — STATION 2, STATION 2A

PCT SPAN	95.00	90.00	85.00	70.00	50.00	30.00	15.00	10.00	5.00
DIA	33.207	33.604	33.921	34.992	36.420	37.848	38.919	39.276	39.633
BETA 2	56.712	57.820	57.615	51.965	53.147	54.742	61.337	64.548	67.303
BETA 2A	1.519	-6.013	-1.088	-1.948	0.590	-3.299	-2.012	0.656	4.682
V 2	537.89	499.51	479.82	528.12	524.72	515.71	467.36	466.53	462.17
V 2A	302.62	292.07	287.42	341.84	348.15	360.98	326.45	326.89	333.72
VZ 2	295.22	266.03	256.99	325.39	314.63	297.49	224.00	200.35	178.23
VZ 2A	302.51	291.95	287.36	341.60	348.06	360.25	326.06	326.68	332.37
V-THETA 2	449.63	422.77	465.19	415.95	419.76	426.81	409.76	420.95	426.13
V-THETA 2A	8.02	-0.07	-5.46	-11.62	3.58	-20.77	-11.46	3.71	27.22
M 2	0.4717	0.4572	0.4198	0.4624	0.4589	0.4503	0.4062	0.4055	0.4013
M 2A	0.2613	0.2523	0.2485	0.2954	0.3009	0.3118	0.2811	0.2815	0.2872
TURN(PR)	55.192	57.832	58.703	53.911	52.537	57.985	63.265	63.813	62.544
P 2	17.930	17.571	17.441	17.966	18.645	17.997	17.561	17.570	17.561
P 2A	17.140	17.093	17.061	17.331	18.045	17.470	17.266	17.277	17.332
T 2	565.140	563.967	562.904	566.003	566.890	568.011	569.059	568.969	569.660
T 2A	565.945	564.666	563.457	567.000	567.172	568.647	570.170	570.141	571.299

APPENDIX B
STATOR E SUCTION SURFACE STATIC
PRESSURE COEFFICIENTS AT 10% SPAN FROM TIP

$$C_p = \frac{P_{surface} - P_{2_{fs}}}{(\rho v^2/2)_{2_{fs}}}$$

Percent Design Equivalent Rotor Speed	Equivalent Weight Flow (lb/sec)	Percent Overall Chord															
		Front Airfoil								Rear Airfoil							
		6.9	11.6	16.5	21.4	26.5	31.6	36.9	42.1	57.0	62.3	67.5	72.7	77.8	82.9	87.4	92.8
110	127.63	-0.77	*	*	-0.72	-0.88	-0.99	-0.91	-0.88	-0.80	-1.13	-1.18	-1.23	-0.95	-1.01	-0.75	-0.52
110	122.36	-0.67	*	*	-0.89	-0.93	-0.92	-0.81	-0.71	-0.69	-0.93	-0.93	-0.95	-0.71	-0.75	-0.51	-0.29
110	116.81	-0.50	*	*	-0.69	-0.71	-0.66	-0.54	-0.43	-0.42	-0.60	-0.60	-0.61	-0.38	-0.42	-0.21	-0.01
110	111.46	-0.58	*	*	-0.61	-0.61	-0.57	-0.45	-0.42	-0.33	-0.41	-0.36	-0.33	-0.18	-0.18	-0.04	0.09
110	107.00	-0.77	*	*	-0.59	-0.57	-0.55	-0.54	-0.52	-0.34	-0.34	-0.27	-0.22	-0.11	-0.10	-0.02	0.07
100	121.43	-0.68	*	*	-0.70	-0.86	-0.98	-0.95	-0.92	-0.89	-1.27	-1.30	-1.34	-1.03	-1.10	-0.77	-0.49
100	117.78	-0.53	*	*	-0.72	-0.83	-0.87	-0.80	-0.72	-0.68	-0.98	-0.99	-1.02	-0.75	-0.81	-0.53	-0.28
100	111.26	-0.58	*	*	-0.79	-0.85	-0.85	-0.72	-0.63	-0.58	-0.83	-0.82	-0.84	-0.59	-0.62	-0.39	-0.16
100	106.84	-0.52	*	*	-0.72	-0.75	-0.72	-0.60	-0.50	-0.46	-0.67	-0.65	-0.67	-0.45	-0.48	-0.26	-0.06
100	105.92	-0.57	*	*	-0.77	-0.80	-0.75	-0.64	-0.52	-0.48	-0.65	-0.65	-0.66	-0.44	-0.48	-0.26	-0.06
100	102.92	-0.52	*	*	-0.69	-0.71	-0.65	-0.52	-0.41	-0.38	-0.54	-0.49	-0.51	-0.31	-0.34	-0.14	0.02
100	97.94	-0.73	*	*	-0.60	-0.61	-0.54	-0.47	-0.42	-0.31	-0.36	-0.32	-0.29	-0.16	-0.18	-0.03	0.09
100	93.26	-0.88	*	*	-0.55	-0.52	-0.52	-0.50	-0.47	-0.28	-0.29	-0.20	-0.17	-0.07	-0.07	0.02	0.11
90	114.30	-0.60	*	*	-0.62	-0.80	-0.93	-0.90	-0.89	-0.79	-1.12	-1.17	-1.22	-0.97	-1.02	-0.74	-0.46
90	106.88	-0.51	*	*	-0.67	-0.77	-0.83	-0.76	-0.66	-0.63	-0.92	-0.94	-0.97	-0.72	-0.78	-0.51	-0.26
90	98.57	-0.55	*	*	-0.74	-0.78	-0.77	-0.67	-0.57	-0.52	-0.76	-0.76	-0.76	-0.54	-0.59	-0.35	-0.13
90	88.90	-0.63	*	*	-0.68	-0.70	-0.64	-0.52	-0.41	-0.38	-0.50	-0.47	-0.46	-0.29	-0.31	-0.14	0.02
90	82.57	-0.81	*	*	-0.56	-0.54	-0.48	-0.44	-0.42	-0.27	-0.29	-0.21	-0.17	-0.05	-0.06	0.02	0.11
70	92.73	-0.61	*	*	-0.66	-0.84	-0.97	-0.96	-0.92	-0.86	-1.27	-1.29	-1.31	-1.06	-1.15	-0.84	-0.54
70	83.58	-0.51	*	*	-0.63	-0.75	-0.81	-0.75	-0.68	-0.66	-0.97	-0.98	-1.00	-0.77	-0.82	-0.54	-0.27
70	75.87	-0.62	*	*	-0.77	-0.82	-0.84	-0.73	-0.63	-0.60	-0.85	-0.85	-0.86	-0.64	-0.68	-0.43	-0.17
70	68.29	-0.61	*	*	-0.71	-0.73	-0.68	-0.57	-0.45	-0.42	-0.57	-0.54	-0.54	-0.37	-0.39	-0.22	-0.02
70	61.93	-0.82	*	*	-0.58	-0.55	-0.54	-0.54	-0.50	-0.32	-0.31	-0.26	-0.20	-0.07	-0.07	0.00	0.08
50	64.65	-0.62	*	*	-0.66	-0.81	-0.93	-0.93	-0.89	-0.87	-1.22	-1.28	-1.31	-1.07	-1.14	-0.84	-0.56
50	61.51	-0.56	*	*	-0.67	-0.80	-0.87	-0.83	-0.79	-0.77	-1.08	-1.07	-1.07	-0.87	-0.94	-0.66	-0.37
50	55.53	-0.64	*	*	-0.78	-0.85	-0.88	-0.80	-0.71	-0.68	-0.93	-0.95	-0.94	-0.73	-0.77	-0.52	-0.28
50	48.51	-0.62	*	*	-0.77	-0.77	-0.72	-0.62	-0.51	-0.49	-0.66	-0.65	-0.65	-0.45	-0.47	-0.27	-0.07
50	42.99	-0.88	*	*	-0.63	-0.62	-0.60	-0.60	-0.56	-0.37	-0.38	-0.32	-0.29	-0.19	-0.14	-0.06	0.04

*Asterisk indicates orifice which was inoperative during test.

APPENDIX B
STATOR E SUCTION SURFACE STATIC PRESSURE COEFFICIENTS AT 90% SPAN FROM TIP

$$C_p = \frac{p_{surface} - p_{2_{fs}}}{(\rho v^2/2)_{2_{fs}}}$$

Percent Design Equivalent Rotor Speed	Equivalent Weight Flow (lb/sec)	Front Airfoil									Rear Airfoil						
		6.7	11.4	16.2	21.0	26.1	31.2	36.5	41.8	56.5	61.9	67.3	72.6	77.7	82.8	87.8	92.7
110	127.63	-0.22	-0.41	-0.61	-0.71	-0.81	-0.78	-0.72	-0.60	-0.05	-0.18	-0.33	-0.46	-0.52	-0.58	-0.49	-0.39
110	122.36	-0.55	-0.55	-0.59	-0.54	-0.47	-0.37	-0.27	-0.16	0.23	0.14	0.05	-0.01	-0.06	-0.13	-0.10	-0.11
110	116.81	-0.71	-0.64	-0.63	-0.56	-0.45	-0.35	-0.24	-0.14	0.25	0.17	0.10	0.05	0.00	-0.07	-0.05	-0.08
110	111.46	-0.95	-0.72	-0.65	-0.54	-0.41	-0.30	-0.22	-0.17	0.24	0.18	0.13	0.08	0.03	-0.04	-0.03	-0.09
110	107.00	-1.11	-0.76	-0.61	-0.47	-0.33	-0.24	-0.21	-0.19	0.28	0.23	0.17	0.12	0.07	0.00	-0.01	-0.08
100	121.43	-0.14	-0.32	-0.49	-0.57	-0.69	-0.68	-0.61	-0.53	-0.01	-0.12	-0.29	-0.42	-0.48	-0.53	-0.46	-0.38
100	117.78	-0.36	-0.45	-0.54	-0.55	-0.55	-0.48	-0.40	-0.29	0.11	-0.02	-0.16	-0.25	-0.31	-0.37	-0.30	-0.25
100	111.26	-0.45	-0.47	-0.50	-0.45	-0.42	-0.34	-0.24	-0.13	-0.23	-0.12	0.01	-0.06	-0.11	-0.18	-0.14	-0.13
100	106.84	-0.55	-0.53	-0.53	-0.47	-0.40	-0.30	-0.20	-0.09	0.28	0.18	0.09	0.03	-0.01	-0.09	-0.05	-0.07
100	105.92	-0.57	-0.54	-0.54	-0.48	-0.40	-0.30	-0.20	-0.10	0.26	0.17	0.08	0.02	-0.02	-0.10	-0.07	-0.09
100	102.92	-0.65	-0.58	-0.56	-0.48	-0.39	-0.28	-0.18	-0.08	0.29	0.21	0.13	0.07	0.02	-0.04	-0.02	-0.05
100	97.94	-0.81	-0.56	-0.50	-0.40	-0.28	-0.18	-0.11	-0.07	0.31	0.26	0.19	0.15	0.10	0.03	0.02	-0.02
100	93.26	-0.95	-0.60	-0.48	-0.36	-0.25	-0.16	-0.14	-0.11	0.31	0.25	0.19	0.15	0.10	0.02	0.01	-0.04
90	114.30	-0.18	-0.36	-0.58	-0.65	-0.72	-0.71	-0.67	-0.58	-0.05	-0.18	-0.37	-0.49	-0.55	-0.60	-0.50	-0.41
90	106.88	-0.35	-0.44	-0.57	-0.55	-0.54	-0.48	-0.41	-0.29	0.12	-0.02	-0.16	-0.26	-0.31	-0.38	-0.30	-0.23
90	98.57	-0.58	-0.57	-0.61	-0.55	-0.48	-0.39	-0.30	-0.18	0.21	0.10	0.00	-0.08	-0.13	-0.20	-0.16	-0.15
90	88.90	-0.74	-0.61	-0.59	-0.49	-0.38	-0.27	-0.17	-0.08	0.27	0.19	0.11	0.06	0.01	-0.05	-0.04	-0.06
90	82.57	-0.89	-0.62	-0.53	-0.41	-0.28	-0.07	-0.15	-0.14	0.27	0.20	0.13	0.08	0.03	-0.05	-0.05	-0.08
70	92.73	-0.17	-0.35	-0.53	-0.59	-0.58	-0.62	-0.62	-0.52	-0.04	-0.20	-0.37	-0.48	-0.54	-0.60	-0.50	-0.37
70	83.58	-0.34	-0.42	-0.53	-0.54	-0.53	-0.49	-0.42	-0.32	0.08	-0.06	-0.20	-0.29	-0.36	-0.40	-0.33	-0.26
70	75.87	-0.51	-0.53	-0.58	-0.54	-0.49	-0.40	-0.31	-0.20	0.19	0.06	-0.03	-0.11	-0.17	-0.24	-0.19	-0.16
70	68.29	-0.67	-0.61	-0.61	-0.53	-0.43	-0.32	-0.22	-0.12	0.24	0.14	0.05	0.00	-0.04	-0.12	-0.10	-0.09
70	61.93	-0.87	-0.61	-0.55	-0.43	-0.30	-0.21	-0.15	-0.12	0.27	0.19	0.11	0.06	0.02	-0.06	-0.06	-0.08
50	64.65	-0.21	-0.38	-0.53	-0.60	-0.66	-0.65	-0.61	-0.54	-0.07	-0.23	-0.39	-0.49	-0.54	-0.59	-0.51	-0.43
50	61.51	-0.28	-0.41	-0.52	-0.55	-0.57	-0.54	-0.48	-0.39	0.02	-0.13	-0.26	-0.35	-0.41	-0.46	-0.39	-0.32
50	55.53	-0.42	-0.48	-0.55	-0.53	-0.50	-0.43	-0.36	-0.26	0.12	0.00	-0.12	-0.20	-0.25	-0.31	-0.26	-0.20
50	48.51	-0.62	-0.58	-0.58	-0.52	-0.44	-0.34	-0.24	-0.13	0.23	0.12	0.04	-0.03	-0.07	-0.14	-0.11	-0.10
50	42.99	-0.84	-0.63	-0.57	-0.48	-0.35	-0.26	-0.17	-0.12	0.22	0.15	0.08	0.01	-0.02	-0.10	-0.09	-0.11

Percent Overall Chord

APPENDIX B
STATOR E PRESSURE SURFACE STATIC PRESSURE COEFFICIENTS

$$C_p = \frac{P_{surface} - P_{2_{fs}}}{(\rho v^2/2)_{2_{fs}}}$$

Percent Design Equivalent Rotor Speed	Equivalent Weight Flow, lb/sec	Front Airfoil — Percent Overall Chord						Rear Airfoil — Percent Overall Chord					
		10% Span From Tip			90% Span From Tip			10% Span From Tip			90% Span From Tip		
		7.6	25.2	42.8	7.5	24.9	42.6	56.5	74.5	92.4	56.1	74.4	92.2
110	127.63	-0.42	-0.21	-0.25	-0.34	0.02	0.16	*	-0.12	-0.34	0.26	0.24	0.12
110	122.36	-0.04	-0.03	-0.15	-0.29	0.30	0.36	*	-0.12	-0.34	0.51	0.47	0.37
110	116.81	0.31	0.26	0.12	0.35	0.31	0.35	*	0.33	0.13	0.52	0.48	0.38
110	111.46	0.49	0.37	0.20	0.37	0.32	0.34	*	0.42	0.24	0.51	0.47	0.36
110	107.00	0.48	0.34	0.17	0.45	0.37	0.38	*	0.40	0.22	0.55	0.52	0.42
100	121.43	-0.42	-0.15	-0.21	-0.23	0.09	0.20	*	-0.03	-0.30	0.30	0.28	0.15
100	117.78	-0.05	0.01	-0.08	0.12	0.21	0.30	*	0.10	-0.15	0.42	0.39	0.27
100	111.26	0.09	0.12	-0.03	0.31	0.35	0.38	*	0.19	-0.02	0.54	0.50	0.39
100	106.84	0.26	0.20	0.04	0.38	0.35	0.39	*	0.27	0.06	0.55	0.51	0.40
100	105.92	0.27	0.21	0.03	0.38	0.34	0.38	*	0.27	0.07	0.54	0.51	0.40
100	102.92	0.39	0.30	0.12	0.42	0.37	0.40	*	0.36	0.16	0.57	0.53	0.42
100	97.94	0.49	0.35	0.17	0.47	0.41	0.42	*	0.40	0.24	0.57	0.54	0.45
100	93.26	0.54	0.39	0.20	0.48	0.40	0.41	*	0.41	0.28	0.58	0.55	0.44
90	114.30	-0.36	-0.15	-0.20	-0.25	0.03	0.17	*	-0.03	-0.28	0.28	0.25	0.10
90	106.88	-0.02	0.05	-0.07	0.14	0.23	0.32	*	0.13	-0.11	0.44	0.41	0.29
90	98.57	0.19	0.15	-0.01	0.30	0.29	0.33	*	0.22	0.00	0.50	0.46	0.35
90	88.90	0.45	0.30	0.09	0.43	0.37	0.38	*	0.35	0.16	0.55	0.52	0.40
90	82.57	0.57	0.41	0.22	0.45	0.37	0.36	*	0.45	0.26	0.56	0.51	0.40
70	92.73	-0.38	-0.17	-0.22	-0.11	0.10	0.18	*	-0.07	-0.33	0.32	0.28	0.13
70	83.58	-0.01	0.05	-0.07	0.14	0.21	0.29	*	0.13	-0.10	0.42	0.38	0.26
70	75.87	0.21	0.15	-0.04	0.32	0.30	0.34	*	0.22	0.00	0.51	0.46	0.34
70	68.29	0.44	0.27	0.05	0.43	0.36	0.36	*	0.34	0.13	0.53	0.50	0.39
70	61.93	0.58	0.37	0.18	0.46	0.38	0.37	*	0.41	0.25	0.55	0.52	0.40
50	64.65	-0.33	-0.18	-0.27	-0.09	0.05	0.14	*	-0.08	-0.33	0.29	0.25	0.11
50	61.51	-0.13	-0.01	-0.15	0.08	0.17	0.24	*	0.03	-0.17	0.39	0.35	0.22
50	55.53	0.05	0.06	-0.12	0.26	0.27	0.31	*	0.13	-0.10	0.46	0.42	0.31
50	48.51	0.40	0.25	0.00	0.42	0.34	0.34	*	0.30	0.09	0.55	0.50	0.39
50	42.99	0.56	0.35	0.13	0.47	0.36	0.34	*	0.43	0.23	0.54	0.50	0.40

*Asterisk indicates orifice which was inoperative during test.

APPENDIX C
DEFINITIONS

Definitions of Symbols

a_0 — Inlet relative stagnation velocity of sound, ft/sec

c — Chord length, inches

C_p — Static pressure coefficient

d — Diameter, inches

D — Diffusion factor

g_c — Gravitational acceleration, 32.174 lb_m - ft/lb_f-sec^2

l_m — Incidence angle, degree from axial direction

M — Mach number

m — Mass flow, lb_m/sec

N — Rotor speed, rpm

P — Total pressure, psia

PR — Rotor tip static pressure ratio (ratio of local static pressure to static pressure at -7.0% axial chord)

p — Static pressure, psia

R — Gas constant for air, 53.34 ft-lb_f/lb_m -°R

r — Radius, inches

S — Blade passage gap (leading edge), inches

t — Blade maximum thickness, inches

T — Total temperature, °R

T_s — Static temperature, °R

U — Rotor speed, ft/sec

V — Velocity, ft/sec

W — Actual flowrate, lb_m/sec

α — Cone angle (angle of plane tangent to conic surface that approximates the design streamline of revolution), deg

β — Air angle, degrees from axial direction

Definitions of Symbols (Continued)

γ	Ratio of specific heats
γ°	Blade-chord angle, degree from axial direction
δ	Ratio of total pressure to NASA standard sea level pressure of 14.694 psia
δ°	Deviation angle, degree
η	Efficiency
θ	Ratio of total temperature to NASA standard sea level temperature of 518.7 °R
κ	Blade metal angle, degree from axial direction
ρ	Density, $\text{lb}_f/\text{sec}^2/\text{ft}^4$
σ	Solidity, chord divided by blade spacing (c/S)
ϕ	Blade camber angle, $\kappa_1 - \kappa_2$, degree
$\bar{\omega}$	Loss coefficient
$\bar{\omega} \cos \beta / 2\sigma$	Loss parameter

Subscripts

0	Compressor inlet (bellmouth)
1	Rotor inlet
2	Rotor exit/stator inlet
2A	Stator exit
ad	Adiabatic
f	Force
fs	Freestream value
id	Isentropic condition
L	Local
m	Mean or mass
max	Maximum
min	Minimum

Definition of Symbols (Continued)

Subscripts (Continued)

le   Leading edge

p   Polytropic

te   Trailing edge

s   Static condition

z   Axial component

θ Tangential component

Superscripts:

'   Related to rotor blade

–   Mass average value

Definitions of Overall Performance Variables

Pressure ratio:

$$\text{Rotor: } \frac{\overline{P}_2}{\overline{P}_1} \qquad\qquad \text{Stage: } \frac{\overline{P}_{2A}}{\overline{P}_1}$$

Equivalent flow:

$$\frac{W\sqrt{\theta}}{\delta}$$

Equivalent rotor speed:

$$N/\sqrt{\theta}$$

Adiabatic efficiency:

$$\text{Rotor: } \eta_{ad} = \frac{\left(\overline{P}_2/\overline{P}_1\right)^{\frac{\gamma-1}{\gamma}} - 1}{\overline{T}_{2A}/518.7 - 1} \qquad \text{Stage: } \eta_{ad} = \frac{\left(\overline{P}_{2A}/\overline{P}_1\right)^{\frac{\gamma-1}{\gamma}} - 1}{\overline{T}_{2A}/518.7 - 1}$$

Definitions of Overall Performance Variables (Concluded)

Polytropic efficiency:

$$\text{Rotor: } \eta_p = \frac{\frac{\gamma-1}{\gamma} \ln(\bar{P}_2/\bar{P}_1)}{\ln(\bar{T}_2/518.7)} \qquad \text{Stator: } \eta_p = \frac{\frac{\gamma-1}{\gamma} \ln(\bar{p}_{2A}/\bar{p}_2)}{\ln(\bar{T}_{s2A}/\bar{T}_{s2})}$$

Change in surge pressure ratio:

$$\Delta \text{ Surge Pressure Ratio} = \left[1.0 - \frac{(\bar{P}_{2A}/\bar{P}_1)_{\text{Distorted}}}{(\bar{P}_{2A}/\bar{P}_1)_{\text{Uniform Inlet}}}\right]_{N/\sqrt{\theta}\,=\,\text{constant}}$$

Values of pressure ratio for each condition are at constant value of flow, which corresponds to the flow at surge with distortion.

Average pressures and temperatures for circumferential distortion tests:

$$\bar{P}_1 = \frac{(3)\,(\bar{P}_1 \text{ Undistorted}) + (1)\,(\bar{P}_1 \text{ Distorted})}{4}$$

$$\bar{P}_2 = \frac{(3)\,(\bar{P}_2 \text{ Undistorted}) + (1)\,(\bar{P}_2 \text{ Distorted})}{4}$$

$$\bar{P}_{2A} = \frac{(3)\,(\bar{P}_{2A} \text{ Undistorted}) + (1)\,(\bar{P}_{2A} \text{ Distorted})}{4}$$

$T_1 = $ Plenum Conditions (corrected to standard day)

$\bar{T}_2 = $ Set equal to $\bar{T}_{2A}$

$$\bar{T}_{2A} = \frac{(3)\,(\bar{T}_{2A} \text{ Undistorted}) + (1)\,(\bar{T}_{2A} \text{ Distorted})}{4}$$

Definitions of Blade Element Performance Variables

Incidence angle:

$$\text{Rotor: } i_m = \beta'_1 - \kappa_{le} \qquad \text{Stator: } i_m = \beta_2 - \kappa_{le}$$

Diffusion factor:

$$\text{Rotor: } D = 1 - \frac{V'_2}{V'_1} + \frac{d_2 V_{\theta 2} - d_1 V_{\theta 1}}{(d_1 + d_2)\,V'_1\,\sigma}$$

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Definitions of Blade Element Performance Variables (Continued)

Diffusion factor:

$$\text{Stator:} \quad D = 1 - \frac{V_{2A}}{V_2} - \frac{d_2 V_{\theta 2} - d_{2A} V_{\theta 2A}}{(d_2 + d_{2A}) V_2 \sigma}$$

Deviation angle:

$$\text{Rotor:} \quad \delta° = \beta'_2 - \kappa_{te} \qquad \text{Stator:} \quad \delta° = \beta_{2A} - \kappa_{te}$$

Loss coefficient:

$$\text{Rotor:} \quad \bar{\omega}' = \frac{(\overline{P}'_2)_{id} - P'_2}{\overline{P}'_1 - p_1}$$

where:

$$(P'_2)_{id} = P'_1 \left\{ 1 + \frac{\gamma - 1}{2} \left(\frac{U_2^2}{a_{o_1}^2} \right) \left[1 - \left(\frac{d_1}{d_2} \right)^2 \right] \right\}^{\frac{\gamma}{\gamma - 1}}$$

$$\text{P' is found from } p/P' = \left[1 + \frac{\gamma - 1}{2} M'^2 \right]^{\frac{\gamma}{1 - \gamma}}$$

and M' is calculated using trigonometric functions and the measurements of U, β, P, and p.

$$\text{Stator:} \quad \bar{\omega} = \frac{P_2 - \overline{P}_{2A}}{P_2 - p_2} \qquad \bar{\omega}_{fs} = \frac{P_{2A_{fs}} - \overline{P}_{2A}}{P_{2A_{fs}} - p_2}$$

where:

$P_{2A_{fs}}$ = stator exit average freestream total pressure from wake rakes

P_2 = stator inlet total pressure from 20-deg wedge probes

Definitions of Blade Element Performance Variables (Concluded)

Rotor tip static pressure ratio:

$$PR = \frac{p_L}{p \text{ at } -7.0\% \text{ axial chord}}$$

Stator static pressure coefficient:

$$Cp = \frac{p_{surface} - p_{2fs}}{(\rho V^2/2)_{2fs}}$$

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