NASA CR - 120991
PWA-4463

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HIGH-LOADING, 1800 FT/SEC TIP SPEED TRANSONIC COMPRESSOR FAN STAGE
II. FINAL REPORT

by

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prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA Lewis Research Center
Contract NAS3-13493

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA CR-120991		

4. Title and Subtitle	5. Report Date
HIGH-LOADING, 1800 FT/SEC TIP SPEED, TRANSONIC COMPRESSOR FAN STAGE II. Final Report	December 1972
	6. Performing Organization Code
7. Author(s) A. L. Morris and D. H. Sulam	8. Performing Organization Report No. PWA-4463
	10. Work Unit No.
9. Performing Organization Name and Address Pratt & Whitney Aircraft Division United Aircraft Corporation East Hartford, Connecticut 06108	11. Contract or Grant No. NAS3-13493
	13. Type of Report and Period Covered Contractor Report
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	14. Sponsoring Agency Code

15. Supplementary Notes

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16. Abstract

Tests were conducted on a 0.5 hub/tip ratio, single-stage fan-compressor designed to produce a pressure ratio of 2.285 at an efficiency of 84 percent with a rotor tip speed of 1800 feet per second (548.6 m/sec). A peak efficiency of 82 percent was achieved by the stage at a stall margin of 6.5 percent. Tests showed that stall-limit line was slightly sensitive to tip-radial distortion, but stall-line improvements were noted when the stage was subjected to circumferential and hub-radial flow distortions. Rotor blade passage and trailing edge shock positions were inferred from static pressure contours over the rotor tips.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Transonic Compressor Stage Precompression blading Shocks-in-Rotor Distorted Inlet Flows	Unclassified – Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	223	$3.00

* For sale by the National Technical Information Service, Springfield, Virginia 22151

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HIGH-LOADING, 1800 FT/SEC TIP SPEED TRANSONIC COMPRESSOR FAN STAGE II. FINAL REPORT

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SUMMARY

A fan stage with a rotor tip speed of 1800 ft/sec (548.6 m/sec) was tested to evaluate the usefulness of shock-in-rotor blading for jet engine applications that require high performance and high aerodynamic stability. The tests were conducted with uniform inlet flow and with the inlet flow distorted hub-radially, tip-radially, and circumferentially. The rotor was designed using modified multiple-circular-arc blade sections from the hub to 32 percent span and precompression blade sections from 37 percent span to the blade tip, with a transition region in between. The stator was designed with multiple-circular-arc airfoils. The stage was designed to provide a pressure ratio of 2.285, an efficiency of 84 percent, and a flow rate of 173.8 lbm/sec (78.8 kg/sec).

Under conditions of uniform inlet flow, the stage produced a pressure ratio of 2.2 at a peak efficiency of 82 percent with 6.5 percent stall margin at an airflow of 174.8 lbm/sec (79.3 kg/sec). Rotor tip efficiency and rotor tip turning were slightly lower than predicted which resulted in less of a pressure rise than had been anticipated. The stage stall-line was insensitive to hub-radially and circumferentially distorted inlet-flows. There was a moderate lowering of the stall line when the stage was subjected to tip-radial flow distortion. Various settings of stator stagger angle were evaluated at design speed, and a setting of 2.5 degrees open (increased positive incidence) provided the highest stator recovery with the same stall margin as for the design stagger setting. Contour maps of static pressure measured over the rotor tips showed: 1) that the flow entering the blade channel was precompressed, 2) an oblique leading edge passage shock which was not always cancelled, and 3) trailing edge shocks whose locations and apparent strengths varied with back pressure.

No flow-starting problems were encountered at design speed.

INTRODUCTION

A high-loading, 1800 ft/sec (548.6 m/sec) tip speed, transonic fan-stage for jet engine applications requiring high performance and high aerodynamic stability was designed, fabricated, and tested. The purpose of the program was to extend the scope of design information available in the areas of precompression and shocks-in-rotor blading.

The 1800 ft/sec (548.6 m/sec) transonic fan-stage was designed to provide a high pressure ratio and a high level of efficiency. Precompression rotor airfoils were chosen during design [ref. 1] to reduce shock losses at high relative inlet Mach numbers. Multiple-circular-arc airfoils were selected for the rotor hub regions and for the stator; this airfoil selection was based on the technology generated under Contract NAS3-10482 [ref. 2].

In this report, experimental data obtained during the program are provided and compared with design values; design principles are discussed. Shock positions and shapes, inferred from static pressure contours, are noted and discussed with respect to the design model. A comparison is made of distorted and uniform inlet-flow performance.

Holograms of the rotor inlet flow field were made under Contract NAS3-15340. The results of the holographic study will be reported under that contract at a later date.

APPARATUS AND PROCEDURE

FAN STAGE

The test fan-stage (Figure 1) was a single-stage, axial-flow fan-compressor without inlet guide-vanes. A detailed description of the stage was provided in the Design Report [ref. 1]. The stage was designed to provide a pressure ratio of 2.285, an efficiency of 84 percent, and a specific flow rate of 38.7 lbm/sec/ft^2 (188.9 kg/sec/m^2). The stage flowpath was based upon the aerodynamic objectives presented in the Design Report [ref. 1]. The designs of the rotor and stator are summarized below.

Rotor

The rotor was designed to operate at a tip speed of 1800 ft/sec (548.6m/sec) with a constant spanwise pressure ratio of 2.34 and an overall adiabatic efficiency of 86.8 percent. There were 38 rotor blades with an aspect ratio of 2.87 (based on average blade-length and axial root chord), a tip solidity of 1.635, and a hub-to-tip ratio at the rotor inlet of 0.5. Running tip clearance was about 0.035 inch (.0009m) at 100 percent of design speed. Relative Mach numbers at the rotor inlet were supersonic to about ten percent span from the hub; the relative Mach number at the blade tip was 1.77. The rotor blades consisted of multiple-circular-arc sections from the hub to 32 percent span and precompression sections from 37 percent span to the tip, with a transition region in between. Two views of a rotor blade are shown in Figure 2, and the blade disk assembly is shown in Figure 3. A summary of the metal angles for the rotor blades is given in Table 1 for 11 streamlines passing through 5, 10, 15, 30, 50, 60, 65, 70, 85, 90, and 95 percent span of the rotor blade trailing-edge passage height from the hub.

Stator

The stators had multiple-circular-arc airfoil sections; the sections near the tip were nearly double-circular arcs. There were 60 stator vanes, resulting in a hub solidity of 2.2. Chord length tapered linearly from 2.48 inches (0.063m) at the hub to 2.6 inches (0.066m) at the tip, and the aspect ratio was 2.22, based on the average length and axially projected chord at the hub. The stator-blade leading edge was 0.5 inch (0.13m) behind the rotor trailing edge at the hub. A photograph of a stator blade is shown in Figure 4, and a photograph of the stator assembly is shown in Figure 5. Mach numbers at the stator inlet were subsonic with a maximum value of 0.89 occurring at the hub where the diffusion factor was about 0.54. Incidence to the stator suction surface was set at zero degrees in the near-sonic region at the hub, blending into minimum loss incidence angles for double-circular-arc sections near the tip. Stator exit flow was axial for the design stagger angle. A summary of the stator-blade metal-angles is provided in Table 2 for 11 streamlines passing through 5, 10, 15, 30, 50, 60, 65, 70, 85, 90, and 95 percent span of the rotor-blade trailing-edge passage height from the hub.

TABLE 1

ROTOR DESIGN PARAMETERS

STATIONS 13 AND 14

Span %	Dia. 13 inches (meters)	Dia. 14 inches (meters)	β^*_{13} deg	β^*_{14} deg	$\beta^*_{13\,SS}$ deg	Solidity
5 (hub)	17.73 (.450)	20.76 (.527)	58.3	14.0	62.51	2.392
10	18.81 (.478)	21.34 (.542)	58.2	19.5	61.85	2.257
15	19.84 (.504)	21.93 (.557)	58.2	25.0	61.32	2.137
30	22.65 (.575)	23.705 (.602)	58.55	34.5	61.02	2.105
50	26.03 (.661)	26.09 (.663)	60.07	46.0	62.1	1.698
60	27.66 (.703)	27.275 (.693)	61.45	50.5	63.25	1.629
65	28.425 (.722)	27.91 (.709)	62.21	52.0	64.0	1.605
70	29.17 (.741)	28.52 (.724)	63.2	53.5	64.75	1.572
85	31.3 (.795)	30.26 (.769)	66.15	56.7	67.6	1.575
90	32.01 (.813)	30.86 (.784)	67.1	60.0	68.6	1.587
95 (tip)	32.63 (.829)	31.45 (.799)	67.6	64.0	69.11	1.613

NOTE: Symbol definitions appear in Appendix 1.

TABLE 2

STATOR DESIGN PARAMETERS (STATOR AT NOMINAL STAGGER)

STATIONS 15 AND 16

Span %	Dia. 15 inches (meters)	Dia. 16 inches (meters)	β^*_{15} deg	β^*_{16} deg	$\beta^*_{15\,SS}$ deg	Solidity
5 (hub)	21.37 (.543)	22.53 (.572)	50.2	-13.7	53.3	2.16
10	21.88 (.556)	22.92 (.582)	48.9	-11.8	52.1	2.114
15	22.4 (.569)	23.31 (.592)	48.3	-10.8	51.7	2.083
30	24.0 (.610)	24.58 (.624)	48.7	-10.0	53.2	1.98
50	26.16 (.665)	26.33 (.669)	48.6	-10.0	54.0	1.852
60	27.23 (.692)	27.2 (.691)	48.1	-10.1	53.9	1.789
65	27.29 (.693)	27.65 (.702)	47.9	-10.1	53.9	1.761
70	28.33 (.720)	28.09 (.714)	47.8	-10.2	53.8	1.739
85	29.86 (.758)	29.32 (.745)	49.2	-12.7	55.0	1.667
90	30.38 (.772)	29.73 (.755)	51.5	-14.7	57.0	1.645
95 (tip)	30.87 (.784)	30.09 (.764)	57.5	-17.0	63.5	1.631

TEST FACILITY

The test program was carried out in a sea-level compressor test stand (Figure 6). The stand was equipped with a gas-turbine drive-engine with a 2.1:1 gearbox to provide speed-range capability. Airflow entered the rig through a calibrated nozzle. A 72-foot (21.9m) straight section of 42-inch (1.07m) diameter pipe ran from the nozzle to a 90-inch (2.29m) diameter inlet plenum. A wire-mesh screen and an "egg-crate" structure, located in the plenum, provided a uniform pressure profile to the compressor. The airflow was exhausted from the compressor into a toroidal collector and then into a 6-foot (1.83m) diameter discharge stack. The stack contained a 6-foot (1.83m) diameter valve to provide backpressure, or throttling, for the test compressor. Two smaller valves, a 24-inch (.61m) and a 12-inch (.305m), located in the by-pass lines provided fine adjustment of backpressure.

The desired inlet-distortion patterns were generated by means of screens of various porosities that attached to a 1 in. x 1 in. (.0254m x .0254m) mesh base screen. A rotatable case with 12 struts located 33 inches (.84m) upstream of the rotor leading edge was used to support the base screen. The hub-radial, tip-radial, and circumferential distortion screens are shown attached to the base screen in Figures 7, 8, and 9. The distortion-screen support was removed during uniform-inlet testing.

Strain-gage and static-pressure instrumentation leads were routed through the nonrotating nose fairing. Ten struts, 14 inches (.356m) upstream of the rotor leading edge, supported the forward bearing and the assembly for the strain-gage slip-ring. Eight struts located 11 inches (.28m) downstream of the stator trailing edge supported the rear bearing.

INSTRUMENTATION AND CALIBRATION

Airflow to the test compressor was measured by means of a calibrated nozzle (Figure 6) designed to ISO[1] standards. Airflow measurements were within one percent accuracy.

The compressor speed was measured by means of an impulse type pick-up. The pick-up was an electromagnetic device which counted the number of gearteeth that passed within an interval of time and converted the count to rpm. Between 4,000 and 15,000 rpm, accuracy was within 0.2 percent.

All temperatures were measured using chromel-alumel, type-K thermocouples and were recorded in millivolts by means of an automatic data-acquisition system. Temperature elements were calibrated for Mach number over their full operating range. Effects of total pressure level on temperature recovery were accounted for by using the corrections found in reference 3. The thermocouple leads were calibrated for each temperature element. Overall rms temperature accuracy was estimated to be ±1.0°F (±0.2°K).

Wedge probes were calibrated for Mach number as a function of indicated static-to-total pressure ratio, with pitch angle as a parameter. Total-pressure recovery and yaw-angle

[1] International Organization for Standardization

deviation were calibrated as functions of Mach number and pitch angle. The measurement accuracy of the air-angle probe was within 1.0 degree.

All pressures from probes, fixed rakes, and static taps were measured with transducers and recorded in millivolts by an automatic data-acquisition system. The accuracy of the pressure was ±0.1 percent of the full-scale value.

Ten high-frequency-response pressure-transducers were installed in the case over the rotor tips to measure instantaneous static-pressure fluctuations. Ten taps for measuring wall static-pressure were installed over the rotor blade tips in axial locations corresponding to the pressure transducers to measure the average static-pressure level. Figure 10 shows the rotor-blade tip-shock pressure instrumentation in relation to the blades.

Two proximity detectors, located over the rotor blade tips but apart from the pressure transducers, generated an electrical pulse for each blade passing. The signals from both the pressure transducers and the proximity detectors were recorded on the same time reference by a multichannel tape recorder.

Photographs of typical instrumentation are shown in Figure 11, and the axial and circumferential positions of the instrumentation are shown in Figures 12 and 13. The fixed radial rakes for measuring total pressure near the rotor leading edge (Station 11 in Figure 12) were in place only during the testing with inlet flow distortion.

Instrumentation for measuring overall and blade-element performance data is listed in Table 3.

TABLE 3

PERFORMANCE AND BLADE ELEMENT INSTRUMENTATION

All measurements were recorded by automatic data acquisition system unless noted otherwise.

Instrument Plane Location	Parameter	Type and Quantity
Station 0 Plenum Chamber	P	6 pressure taps on plenum wall
	T	5 bare-wire thermocouples
Station 0.1 Instrumentation Ring	p	4 O.D. wall static taps
Station 2.0 Inlet Duct 3.0 4.0 7.0 9.0	p	2 O.D. and 2 I.D. wall static taps, 180 degrees apart

TABLE 3 (Cont'd)

Instrument Plane Location	Parameter	Type and Quantity
Station 11 Rotor Inlet (within 1/2 chord)	P, p, β Radius	2 wedge traverse probes 11 radial positions
	p	4 O.D. and 4 I.D. wall static taps
	P	2 fixed rakes, 180 degrees apart, each with sensors at 5 radial positions
Stations 13 to 14 Rotor Shroud	p	10 high frequency response pressure transducers mounted in axial line over rotor blade tips. Recorded on magnetic tape.
	p,	10 O.D. wall static taps in axial line over rotor blade tips.
	Blade Passing	Two proximity detectors positioned apart from the pressure transducers and in a line at about the rotor-blade tip-chord angle. Recorded on magnetic tape.
Station 15 Stator Leading Edge	p	4 O.D. and 4 I.D. wall static taps equally spaced and located on extension of mid-channel lines.
	p	4 O.D. and 4 I.D. wall static taps spaced across one vane gap.
	P	2 sets of 11 kiel headed sensors located at 11 radial positions
Station 17 Stator Exit	P, radius	2 circumferential wake rakes (14 kiel headed elements) traversable to each of eleven radial locations. Each wake rake spans at least one vane gap at O.D.

TABLE 3 (Cont'd)

Instrument Plane Location	Parameter	Type and Quantity
Station 17 Stator Exit (Cont'd)	T	6 fixed radial rakes, each with temperature sensors at 11 radial positions spaced circumferentially to obtain readings evenly distributed across a vane gap. A 7th rake is a duplicate mid-gap rake spaced 168 degrees from the other mid-gap rake, and used for distortion tests.
	P, p, β, Radius	2 wedge traverse probes, 11 radial positions. Probes spaced 162 degrees apart.
	p	4 O.D. and 4 I. D. wall static taps equally spaced and located on the extension of a stator mid-channel streamline.
	p	4 O.D. and 4 I.D. wall static taps spaced across vane gap.
Station 22 Rig Exit	P	1 fixed five-element circumferential rake located at about 30% span.

The eleven radial positions of each axial station are defined by the intersection of the axial station and the design streamlines which pass through 5, 10, 15, 30, 50, 60, 65, 70, 85, 90, and 95 percent of the passage height at the rotor trailing edge. The five radial positions are on the streamlines which pass through 10, 30, 50, 70, and 90 percent of the passage height at the rotor trailing edge.

Table 4 shows the parameters that were recorded continually during excursions into stall to detect and evaluate rotating stall. A hot-film probe at the rotor inlet with sensors at 25, 50, and 85 percent of blade height from the hub was used to continuously record velocity fluctuations on a multichannel tape recorder when operating near or within the stall region.

Stationary and rotating critical parts were instrumented with strain gages to determine the levels of vibratory stress over the operating range of the compressor.

TABLE 4

STALL TRANSIENT INSTRUMENTATION

Instrument Plane Location	Parameter	Type and Quantity
Inlet Nozzle	p	1 static tap downstream and 1 static tap upstream of inlet nozzle.
	Δp	A Δp transducer sensing the differential pressure between the upstream and downstream nozzle static pressures.
	T	One nozzle temperature.
Station 0 Plenum	p	One plenum static tap
	T	One plenum temperature
Station 11 Rotor Inlet	Velocity	One probe with three hot film sensors at 25, 50, and 85 percent of the blade height from the hub.
Rotor Blades	Stress	Various strain gages
Stator Blades	Stress	Various strain gages
Stator Exit	p	One O.D. static tap
Gearbox	Speed	Impulse pick-up

TEST PROCEDURE

Shakedown and Stator Stagger Angle Optimization Tests

Shakedown tests were conducted to establish the mechanical integrity of the compressor and to locate stress boundaries that might limit the operating range over which tests could be conducted. These shakedown tests were conducted before the uniform and tip-radially, hub-radially, and circumferentially distorted inlet flow programs were conducted.

The compressor stage was accelerated to 50, 70, 90, 100, and 105[1] percent of design speed along wide-open, midthrottle, and near-stall operating lines with the stator stagger angle set at five degrees open, at design, and at five degrees closed. Rotor and stator vibratory stresses were recorded during these accelerations. Vibration levels on several critical compressor-components were also recorded along the wide-open operating line, and the clearance between the rotor blade tips and the rotor case was recorded at each speed. Blade and vane vibratory stresses and vibration levels were well within acceptance limits.

Four data-points for overall and blade-element performance were taken at design speed over a range of flows between wide-open throttle and stall with the stator set at five degrees open, design, and five degrees closed. These data points were taken to select a stagger angle that would produce the best stage-efficiency without sacrificing flow range. Based on these data, a stagger angle of 2.5 degrees open was used in all subsequent performance tests.

Initial test data indicated that there was a difference in the pressure ratios measured by the two wake rakes. To determine if the difference was caused by the wakes generated from the front bearing support struts, the inlet case was rotated after the vane stagger angle optimization tests in order to relocate the struts relative to the wake rake positions. The differences between these pressure measurements were the same as before the struts were relocated, indicating that the distortion was not a local effect due to the struts. All instrumentation was checked and all measurements were verified; therefore, the average of both pressure wake rake measurements was used in the calculation of the stage efficiency and pressure ratio.

Tip-radial, hub-radial, and circumferential distortion patterns were created at the rotor inlet and examined. This examination showed that the desired magnitude and extent of inlet flow distortion had been achieved. Brief surveys were made to define any stress boundaries that might limit steady-state operation; no limiting stresses were encountered.

Rotating stall surveys were conducted with uniform flow at 50, 70, 80, 95, 100, and 105[2] percent of design speed with the stator angle setting at 2.5 degrees open and at 100 percent design speed with the stator set at five degrees open, design, and five degrees closed. Surveys were also conducted with the inlet flow distorted tip-radially, hub-radially, and circumferentially at the 2.5 degree open setting at 70, 95, and 100 percent of design speed. A three-sensor, hot-film probe was used to detect rotating stall by measuring rotor inlet velocity fluctuations at 25, 50, and 85 percent of the rotor inlet passage height.

Readings from the hot-film probe and selected rotor and stator strain-gages (Table 4) were recorded along with a speed signal and stator exit O.D. static pressure. These readings were recorded simultaneously by a multichannel tape recorder. Continual readings of the other transient parameters, shown in Table 4, were recorded every three seconds as the fan stage was throttled into stall; approximately 100 scans were made by the automatic recording system from wide-open throttle to stall. Surge pulses were detected at all the conditions except at 70 percent of design speed with tip-radial distortion. At 70 percent speed with tip-radial distortion, surge was not detected even with the throttle nearly closed.

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[1] 105% speed corresponds to 13,500 rpm for a 90°F (283°K) inlet temperature.

[2] The rotor blade attachment design was stress limited to approximately 105 percent of design speed.

After the completion of the vane stagger angle optimization test, the roller bearing that supported the front shaft of the rotor assembly failed. Examination of the compressor stage hardware showed that the rotor blade tips had rubbed against the rotor case; however, the rubs were minor, and the blades did not require smoothing. The maximum material removed due to rubbing was estimated to be 0.015 inch (.0004m); no casing material was added to compensate for the increased rotor tip clearance. The examination also showed fatigue cracks in the bearing support housing resulting from the bearing failure, making it necessary to replace the housing.

The bearing was replaced, the inlet case was rotated as previously discussed, and design speed performance was repeated. At the design vane stagger angle setting, there was an unexplained 0.4 percent decrease in weight flow and 1.2 percent decrease in stage efficiency; rotor and stator stresses remained low. From 10,000 to 11,300 rpm, a bearing support housing resonance with one excitation per revolution (1E) was noted by strain gages that were added to the replaced housing. This resonance prohibited testing at 90 percent of design speed.

Uniform-Inlet-Flow Performance Test With Stator Stagger Angle Set 2.5 Degrees Open

Thirty overall and blade-element performance points were obtained at 50, 70, 80, 95, 100, and 105 percent of design speed. Five points were obtained at each speed except at 50 and 100 percent speed where four and six points, respectively, were obtained. Stall flow was measured at all speeds tested. Static pressure fluctuations over the rotor blade tip were recorded at three points at 70 percent speed, at four points at 90 percent speed, at five points at 100 percent speed, and at three points at 105 percent speed. These data were used to obtain a static-pressure-field relative to the rotor blade tips to indicate shock position and strength.

Distorted-Inlet-Flow Performance Tests With Stator Stagger Angle Set 2.5 Degrees Open

The rotatable distortion-screen support was added to the flowpath 33 inches (.838m) upstream of the rotor leading edge. Several layers of screens of different porosities were attached to the 1 x 1 inch (.0254m x .0254m) mesh base-screen to create the hub-radial, tip-radial, and circumferential distortion patterns at the rotor inlet. With the throttle set wide-open at design speed, the tip-radial pattern with a distortion parameter, $(P_{max} - P_{min})/P_{max}$, of 0.18 covered about 40 percent of the inlet area. The hub-radial pattern provided a distortion parameter of 0.21 and also covered about 40 percent of the inlet area. A 90-degree circumferential pattern, created by the 120-degree screen shown in Figure 9, provided a distortion parameter of 0.20 at 50 percent span at the rotor inlet.

Open-throttle, part-throttle, and near-stall performance data were taken at 70, 95, and 100 percent of design speed with the inlet flow distorted tip-radially, hub-radially, and circumferentially. Each circumferential distortion data point was taken with the screen in six different positions with respect to compressor instrumentation. Surge pulses were detected at all speeds except at the 70 percent speed with tip-radially distorted inlet flow.

At 95 and 100 percent speed with hub-radial distortion, vibration levels on the front bearing support housing increased as the compressor was throttled which prevented steady-state operation at near stall; however, transient stall-data were recorded. At part-throttle design speed with only the base screen, a performance point was taken to show the effect of the base screen on uniform inlet-flow performance.

DATA REDUCTION TECHNIQUES

All performance data were automatically recorded in millivolts on computer cards. These data were then converted to engineering units, corrected and averaged as described in the following sections.

Pressure Data From Fixed-Element Probes

Data obtained from total pressure probes located in supersonic flow were corrected for shock losses.

The circumferential total pressure distributions indicated by the two wake-rakes were mass-flow averaged at each radial position, using a constant circumferential static pressure determined by linearly interpolating the wall static pressure data. Peak values from the circumferential pressure distribution indicated by each wake-rake were chosen to represent the rotor exit pressures. Free-stream pressures and circumferentially mass-flow-averaged pressures from both rakes were each arithmetically averaged for each radial location.

Data From Wedge Probes

The wedge probes were used to measure total pressure, air angle, and static pressure at the selected radial locations. Mach number was determined from a calibration of measured total and static pressures. The resulting calibrated Mach number and corrected total pressure were then used in conjunction with standard air-property-tables to calculate static pressure. The measured total pressure and flow angle from these probes were corrected using Mach number recovery calibration curves for individual probes.

Stationary Temperature Probe Data

Thermocouple signals were converted to temperature measurements using wire calibrations for individual sensors. These temperature measurements were converted into total temperature using Mach number calibrations for individual sensors and the pressure-level correction given in reference 3. A circumferential mass-flow-average total temperature was calculated at each radial position using the circumferential total pressure given by the wake rakes and static pressures linearly interpolated between inner and outer wall static tap measurements.

Flowfield Analysis Computer Program

Overall and blade element performance was calculated for uniform-inlet and radial-inlet-distortion test points by means of a flowfield analysis computer program. All parameters were corrected to standard-day conditions. The following input was used:

Compressor Inlet (Station 0, Figure 12)	1) Corrected weight flow 2) Corrected rotor speed
Rotor Inlet Instrument Plane (Station 11)	1) Total pressure ratio versus radius 2) Constant radial blockage factor (to account for estimated wall boundary layers)
Stator Inlet (Station 15)	1) Total pressure ratio versus radius 2) Constant radial blockage factor
Stator Exit Instrument Plane (Station 17)	1) Total temperature ratio versus radius 2) Total pressure ratio versus radius 3) Constant radial blockage factor 4) Absolute air-angle versus radius

Total pressures and temperatures were ratioed to compressor inlet values. Compressor inlet total pressure was assumed equal to the inlet plenum pressure for uniform inlet flow test data. An arithmetic average of radially mass-flow averaged pressures from the two fixed rakes at the rotor inlet was used for tests with radially distorted flow. Temperatures were always ratioed to the inlet plenum temperature.

A flow blockage factor was used at each radial location to improve the accuracy of the static pressure and velocity calculations at blade-row stations. Axial distributions of flow blockage factors were selected so that the hub and tip static pressure obtained from the flowfield calculation matched the wall average static pressure for a representative midthrottle operating condition at design speed. Blockage factors selected in this manner matched, for example, the stage discharge wall static pressures within 20 psfa (957 n/m^2) (~±0.6% error). The flow blockage factors used in the data reduction flow field calculation are compared in Table 5 with those blockages used in design.

TABLE 5

FLOW FIELD BLOCKAGES
(constant radial distribution)

Station	Data Reduction Blockage (%)	Design Blockage (%)
Upstream to Rotor Leading Edge	2.6	2.6
Rotor Trailing Edge	3.3	4.2

TABLE 5 (Cont'd)

Station	Data Reduction Blockage (%)	Design Blockage (%)
Stator Leading Edge	3.3	4.2
Stator Trailing Edge and Downstream	4.0	4.6

All static-pressure distributions and air angles behind the rotor were calculated by assuming axisymmetric flow and considerations of mass-flow continuity, radial equilibrium, and energy equations. Curvature, enthalpy, and entropy gradient terms were used in the equilibrium calculations. Blade-element performance parameters at the blade edges were calculated by translating the measured data from the instrument plane along streamlines passing through the rotor trailing edge at 5, 10, 15, 30, 50, 60, 65, 70, 85, 90, and 95 percent of the passage height. Blade-element parameters were calculated at airfoil sections lying on conical surfaces defined by the intersections of these streamlines and the blade edges. The blade-edge stations that were used as input to the flowfield calculation were curved lines closely approximating the meridional profiles of the manufactured blade edges. During design, a straight leading-edge blade section had been used. As a result, the design blade-element performance presented in Appendix 2 differs slightly from the design parameters reported in reference 1. For example, the maximum discrepancy in inlet air angles is one degree for the rotor and two degrees for the stator endwall regions. A sketch of the design and manufactured stator blade edge locations is presented in Figure 14.

Performance Data Presentation

The output of the flowfield analysis program included overall performance of the stage and of the rotor alone and blade element performance of the rotor and stator at 5, 10, 15, 30, 50, 60, 65, 70, 85, 90, and 95 percent rotor trailing edge span. Blade element performance is tabulated for the rotor and for the stator in Appendixes 2, 3, and 4. Overall performance for the rotor is given at the bottom of the rotor blade-element data, and overall stage-performance is given at the bottom of the stator blade-element data.

Different averaging techniques were applied to temperatures and pressures for evaluating overall performance (Appendix 5) for the circumferential distortion tests where the flowfield program could not be used. Each of the six individual temperature rakes was radially mass-averaged for each of the six screen position, and the 36 resulting values (six probes from each of six screen positions) were arithmetically averaged. Total pressures were radially mass-averaged for each wake rake (14 elements mass-averaged gapwise at each radial location) for all six screen positions, and the twelve resulting values were circumferentially area-averaged since the rakes were not 180 degrees apart.

Rotor Blade Tip-Shock Data

Static pressure contours over the rotor blade tips were obtained by using continously-recorded pressure fluctuation data measured by high-frequency-response transducers. Ten transducers were distributed axially over the blade tip (Figure 10), and ten wall static pressure taps were located at the same axial positions to measure average static pressure. Two proximity detectors, one located over the blade tip just downstream of the leading edge and one at about midchord, were used to orient the blade in relation to the static pressure contours. A third proximity detector, sensing a target on the front shaft assembly, provided a pulse once per rotor revolution which was superimposed on the pressure transducer and proximity sensor signals to provide a time reference point. A typical blade-gap was selected and, for a given speed, pressure signals for the representative gap were analyzed in much the same manner as reported in reference 2.

RESULTS AND DISCUSSION

SHAKEDOWN AND ROTATING STALL

Shakedown test results include stress and rotating stall data for uniform and distorted inlet-flows. During this series of tests, the levels of vibratory stresses on the blades and vanes were well within acceptable limits over the entire fan operating range.

Figure 15 presents oscillograph traces for uniform inlet-flow at design speed; velocity patterns from the hot-film probes, located upstream of the rotor inlet, are shown for both five degrees open (Figure 15a) and five degrees closed (Figure 15b) stator stagger settings. The stall regions shown in Figure 15 appear to consist of periodic velocity fluctuations; there were no indications of rotating stall prior to the surge pulse. The duration of the stall region was 0.15 second for both stator settings. Surge cycle time varied with rotor speed, from 1.27 seconds at 100 percent of design speed (Figure 15) to 0.30 second at 70 percent of design speed (not shown). These traces do not clearly define whether the rotor or stator initiated the stall.

An oscillograph trace for hub-radial distortion is presented in Figure 16. As shown, an abrupt stall occurred at the tip section but not at the hub or midspan sections. A periodic velocity fluctuation, which may be identified as rotating stall, existed at the hub, midspan, and tip sections during that surge pulse. In general, the surge for hub-radial distortion appears to have been less severe than for uniform inlet flow.

The oscillograph trace for circumferential distortion is presented in Figure 17. The magnitudes of velocity fluctuations with circumferentially distorted inlet-flow were less than those of uniform and hub-radially distorted flows.

STATOR STAGGER ANGLE OPTIMIZATION TESTS

Stage overall performance from which the optimum stator stagger angle was chosen is presented in Figure 18. The compressor achieved a stage pressure ratio of 2.28 for both the design and the five degree open stator settings. The stator pressure recovery from the data points shown in Figure 18 was plotted as a function of stagger angle (Figure 19) and the optimum position, 2.5 degree open setting, was chosen for subsequent testing with the objective of increasing stage efficiency. The data in Figure 19 includes an operating point taken after the stator was opened 2.5 degrees; the stator recovery at this point is indeed highest.

A front bearing failure occurred following the optimization tests. While there was no noticeable damage to airfoils, the tips were worn, increasing tip clearance at design speed from 0.035 inch (0.89×10^{-3}m) to 0.050 inch (1.27×10^{-3}m). After this change, the peak stage-efficiency at design speed with the nominal stator angle was down from 82.6 percent measured before the bearing failure to 81.3 percent. The corresponding peak rotor-efficiency dropped from 85.7 to 84.4 percent. Tests with the stator in the nominal position showed that flow rate also decreased 0.4 percent. These significant changes in performance appear to be out of line with the small increase in tip clearance, but they could not be traced to any other cause. All performance data presented in remaining sections were taken after the bearing failure.

UNIFORM INLET FLOW

Overall Performance

Overall performance of the rotor and stage with the stator at 2.5 degrees open is shown in Figures 20 and 21. The stall-limit line was established by extrapolating the characteristic speedlines to the measured stall airflows. Tabulated results of overall performance are presented in Appendix 2.

The peak rotor efficiency at design speed was 84.8 percent, occurring at a pressure ratio of 2.257; the design goal for this rotor was an efficiency of 86.8 percent at a pressure ratio of 2.34. There was only one percentage point drop in rotor peak efficiency from design speed to 105 percent design speed where the tip relative Mach number was 1.875. Rotor peak efficiency remained essentially unchanged at part-speed operation although a slight increase in efficiency was noted at 50 percent design speed.

The maximum stage efficiency at design speed was 82.0 percent at a pressure ratio of 2.202 and corrected weight flow of 174.8 lbm/sec (79.3 kg/sec). The design point for this stage was at a total pressure ratio of 2.285 with an efficiency of 84 percent at a corrected weight flow of 173.8 lbm/sec (78.8 kg/sec). Although peak efficiency was obtained near stall, efficiency remained nearly constant for most of the design speedline. An efficiency of 81.8 percent (0.2 percent below peak) was measured at a stall margin of 13 percent (stage pressure ratio of 2.08). The stage peak efficiency was always greater than 80.5 percent for all speeds tested.

The stator in its 2.5 degree open stagger angle position achieved its design total pressure recovery of 0.976; thus, the rotor was two percentage points lower in efficiency than design.

There were two major considerations affecting flow capacity in the design of this rotor [ref. 1]: one concerned the relative flow starting requirements and the other concerned the possibility of midspan flow choking.

At design speed, the blade flow area was insufficient to pass the flow if a normal shock occurred at the upstream relative Mach number. Precompression of the inlet flowfield was considered sufficient to lower the relative inlet Mach number allowing the flow to start. Figure 22 shows the wide open throttle and near stall flows versus percent design speed. As seen in the figure, there was no significant drop in the slope of the flow-speed curve which is indicative of the stage passing its flow. In fact, the stage overflowed by 2.3 percent of its design weight flow at wide open throttle setting – 100 percent design speed. Therefore, the rotor passage, in starting, must have encountered a precompressed shock at a Mach number lower than the upstream relative Mach number. Furthermore, as pointed out in the "Rotor Blade Tip Static Pressure Contours" section, there is no evidence of the flow unstarting at the rotor tip.

The other flow consideration in this design was potential choking due to high inlet meridional Mach numbers in the rotor midspan region resulting from the large amount of flowpath convergence. The design level of this Mach number was limited to 0.675 in order to prevent midspan choking arising from bow wave losses and blade leading edge blockages. This restricted the design specific flow to 38.7 lbm/ft^2-sec (188.9 kg/m^2-sec). Figure 23 shows the spanwise inlet Mach number profile at 100 and 105 percent speed compared to the design prediction. The design speed, wide open-throttle point Mach number profile was close to the design prediction, with a maximum Mach number of 0.68 at 68 percent span; however, the wide-open throttle inlet Mach number reached a maximum of 0.71 at 105 percent design speed operating condition. The data in Figure 23 and the fact that rotor efficiency did not deteriorate at 105 percent speed (Figure 20) suggest that a higher specific weight flow could have been incorporated into the design without choking penalties.

Blade Element Data

Rotor and stage spanwise efficiencies at near-stall and at ten percent stall-margin are compared in Figure 24 with design predictions. The rotor hub efficiencies were higher than design estimates; however, outboard of the midspan region, rotor efficiency was lower than design. Spanwise distributions of rotor pressure ratio are presented in Figure 25 for operating points near stall and with ten percent stall-margin. In comparison to design, the rotor pressure ratio was lower across most of the span even when operating near stall. Figure 26 presents the rotor's spanwise suction surface leading edge incidence angle, deviation angle, diffusion factor, and loss coefficient for the operating points appearing in Figure 24. Rotor leading edge suction surface incidence angle from 50-95% span was matched at ten percent stall margin to within a 1/2 degree from design. The rotor tip deviation angle was approximately two degrees higher than design, resulting in the lower rotor tip pressure ratio shown in Figure 25. Rotor hub losses were less than predicted, and this resulted in hub diffusion factors that are lower than design. Rotor losses were slightly higher than predicted near the tip and considerably higher near the midspan region. These midspan losses, although somewhat diffused as indicated in Figure 26, are related to the partspan shroud. Shroud loss was not included in the design of the rotor; the design [ref. 1] only incorporated the effect of the shroud's flow-blockage. The partspan shroud's influence on the rotor midspan losses may be seen more clearly for lower pressure ratio data, plotted in Figure 27. Figure 27 shows the local loss increase due to the presence of the shroud. Since the data away from the shroud location closely match the design prediction, the loss coefficients at the shroud location are estimated to be approximately 65 percent higher than the blade element's design level of loss.

The rotor supersonic blade section design was predicated on the attainment of a single, strong shock whose strength would be reduced by precompressing the inlet channel flow. There is reason to suspect from the static pressure contours, described in the next section, that the shock system for these blades did not consist of a single oblique-shock but rather a system of passage and trailing edge shocks. If the assumed design shock model is not obtained, the rotor design deviation and efficiency also will not be obtained. Therefore, a blade design technique incorporating the influence of a trailing edge shock should be employed in subsequent designs to establish the important design goals of deviation and efficiency.

Figure 28 shows the stator incidence angle, deviation angle, diffusion factor, and loss coefficient versus span for the same operating points as for the rotor (Figure 26). The stator incidence angle at the ten percent stall margin condition was close to design prediction.

Except at the hub, the stator vane under-deviated from its design expectation. The general level of stator diffusion factors was about 0.4, indicating moderate loading; stator tip diffusion factors exceeded 0.5 at the near-stall end of the speedline. Figure 28 also shows that the stator vane tip produced a higher loss coefficient than design predictions, which was somewhat expected since, in the outer 15 percent span of the stator, the minimum aerodynamic throat area occurred at the channel exit due to the design's low ratio of specific flow, $(\rho V_z)_{15}/(\rho V_z)_{16}$. The minimum flow area chosen in this design was not considered optimum, but its effect on loss could not be estimated since this aerodynamic condition was outside the range of design experience. The high tip loss data of Figure 28 strongly indicate that minimum flow area location should not occur at the vane channel exit in future designs.

Blade element performance for the rotor and stator at eleven radial positions is tabulated in Appendix 2. Blade element performance in terms of incidence angle versus loss, diffusion factor, and deviation angle is presented in Figures 29 and 30 for both rotor and stator. These data in general agree with the design principles of reference 1.

Rotor Blade Tip Static Pressure Contours

Static pressures over rotor blade tips were measured by ten high-frequency-response pressure transducers. Data were obtained over a range of compressor operating conditions at 70, 95, 100, and 105 percent of design speed with uniform inlet flow. Figure 31 shows a sample oscilloscope trace of static pressure versus time. For reference, a sketch of the design shock patterns is shown in Figure 32. Contours of static pressure regions over the rotor blade tip are shown in Figures 33 through 47. Shock wave locations were deduced from these figures by noting the presence of significant gradients in the static pressure contours. Where possible, deduced shock waves are indicated on the static pressure contours by heavy, dashed lines. The figures also include the axial distribution of wall static pressure over the blade tip and a rotor performance characteristic with the specific operating point indicated.

At 100 percent design speed and the wide-open throttle setting, there was a strong leading-edge shock which can be observed in Figure 33. Following this shock there was an expansion region which accelerated the flow, giving rise to a downstream shock. This downstream shock appears to have positioned itself approximately at 60 percent chord along the pressure surface. A downstream shock of this form (i.e., as far as static pressure contours can be interpreted) is also noticeable in the wide-open "readings" of reference 4. Figures 34, 35, and 36 also show the leading edge passage shock and its partial reflection from the suction surface.

The contours for near-stall operation are shown in Figure 37. This rotor operating point, on an overall performance basis, was closest to the design goals. In the figure a suction surface flow expansion can be seen just before the precompression region. This flow expansion is evident in some degree in all the tip static contour figures. Holographic pictures[1] taken under Contract NAS3-15340 [ref. 5] confirm that there was a wave disturbance in this region. Following this expansion, there was a compression of flow in the vicinity of the precompression ramp. This compression was greater than the 1.3 – 1.4 static pressure rise expected in the design, but the gap-wise influence of the static pressure contours (i.e., the focusing of waves toward the leading edge of the adjacent blade) is not apparent in these figures. The leading edge shock seems to have been directed toward the maximum suction surface camber point, as expected in the design (see Figure 32), but this leading edge shock wave does not appear to have been cancelled as had been expected. Figure 37 also shows an expansion near the pressure surface at about a 40 percent chord location, and a trailing edge shock appears to have formed in order to match the downstream back pressure condition.

The static pressure contours of Figures 38, 39, and 40, which represent the 105 percent design speed operation, show essentially the same qualitative shock formations as discussed for the 100 percent design speed figures. The static pressure contours at 95 and 70 percent design speed are presented in Figures 41 to 47. Similar passage and trailing edge shocks are noticeable at these part-speeds as described for the design speed contours. Two trailing edge shocks at 95 percent design speed may be seen in Figure 43. A trailing edge shock is also apparent from the 70 percent design speed contours (Figures 45 and 46).

A superposition of wall static pressures, taken from the data of Figures 33-37, is shown in Figure 48 for wide-open to near-stall operating points at 100 percent design speed. The axial static pressure distributions in the vicinity of the blade leading edge remain essentially unchanged with back pressure; hence, it is not evident that the passage shock unstarted when the stage was throttled toward stall. Similar pressure plots (not shown in this report) at other speeds tested also show no indication of shock-unstarting. Furthermore, it is concluded in reference 5 (from the holographic study) that for 70 and 100 percent design speeds the rotor leading edge shock remained attached, therefore started at the tip over the entire compressor flow range.

The data of Figures 33 through 47 are considered to be qualitative rather than quantitative due to the difficulties in obtaining highly accurate quantitative measurements of pressure fluctuations in the presence of casing boundary layer and tip clearance effects. In view of

[1] Not presented in this report.

the inherent inaccuracies, no attempt was made to construct fields of relative Mach numbers or to calculate shock strengths. The data are useful, however, in indicating how the relative shock position changes with back pressure.

In summary, a number of conclusions concerning these static pressure contour data can be made:

a. In most instances, bow-wave shape cannot be inferred from these data. This lack of information is probably due to the inability of the data reduction procedure to sense the relatively small pressure fluctuations, usually associated with upstream waves, compared to the time-averaged pressure level.

b. Precompression effects are evident in these tests; however, the blade-to-blade extent of these waves are not readily perceivable in these data. There was a noticeable region of flow expansion just before the start of the precompression ramp.

c. The leading edge passage shock was oblique – this inclined shock is confirmed by flow visualization.

d. An interpretation of the wave patterns at 100 percent design speed is shown in Figure 49. At the wide-open throttle condition, (Figure 49a) a leading edge shock was formed which was followed by an expansion of flow and then a weak trailing edge shock which terminated, something akin to a Mach reflection, well downstream of the suction surface trailing edge. At increased back pressure (Figures 49b and 49c), the downstream trailing edge shock increased in strength. For high back pressure conditions (Figure 49d), a strong leading edge shock appears to be detaching from the leading edge. The wave pattern described in Figures 49a to 49d is different than the design wave pattern sketched in Figure 32 due mainly to the presence of the trailing edge shocks. The trailing edge shock wave was not modeled in the design of this rotor's supersonic airfoils; therefore, its absence from that design approach may have been the reason why the rotor tip sections had higher measured losses and air-angle deviations. For certain Mach number ranges, a two-shock blade design may be employed to reduce shock losses below that of a single shock design. Also the two shock scheme would spread the shock diffusion within the blade channel which should be beneficial to blade surface boundary layers.

Distortion Support Screen Effects

A part-throttle performance point was taken at 100 percent of design speed with the base screen and support but without distortion screens. The inlet total pressure, P_{11}, was measured downstream of the screen; therefore, overall performance changes due to the presence of the screen do not include the screen's total pressure loss. The base screen caused a 1.2 percent drop in weight flow and a one percentage point decrease in stage efficiency relative to the uniform inlet performance pressure ratio. This flow and efficiency change, due to the basescreen, is comparable to the midthrottle base-screen data point of reference 2. The base-screen performance is plotted, for reference, on distortion overall-performance maps.

TIP-RADIALLY DISTORTED INLET FLOW

A tip-radial distortion pattern that covered the outer 40 percent of the rotor inlet area provided a distortion parameter, $(P_{max}-P_{min})/P_{max}$, of 0.181 with the discharge throttle wide-open at 100 percent of design speed. Figure 50 shows the spanwise total pressure and meridional Mach number at the rotor leading edge for the wide-open and near-stall throttle conditions at 100 percent design speed. Also shown on the Mach number plot is the profile for maximum flow (wide-open throttle) with uniform inlet flow. The distorted Mach number and pressure profiles were approximately the same in shape and magnitude for both throttle settings (Figure 50).

Overall Performance

Overall performance with tip-radially distorted inlet flow was calculated relative to the rotor inlet. Rotor and stage overall performance with tip-radially distorted inlet flow is presented in Figures 51 and 52. In these figures the uniform inlet performance is represented by dashed lines; a 100 percent design speed performance point with the base screen is also included for reference. The flow capacity of this stage decreased with distortion. There was also a moderate lowering of the stall line.

A sensitivity parameter is often used to evaluate the stall-line susceptibility of a compressor to various magnitudes of inlet flow distortion. This parameter is basically a measure of stall-line pressure ratio change between the uniform and distorted inlet flows. The sensitivity of the stall-line, taken at the stalled distorted weight flow, is defined by:

$$\text{sensitivity} = \frac{\left(P_{16}/P_{11}\right)_{\substack{\text{UNIFORM}\\ \text{INLET}}} - \left(P_{16}/P_{11}\right)_{\substack{\text{DISTORTED}\\ \text{INLET}}}}{\left(P_{16}/P_{11}\right)_{\substack{\text{UNIFORM}\\ \text{INLET}}}} \left(\frac{P_{11\,MAX} - P_{11\,MIN}}{P_{11\,MAX}}\right)^{-1}$$

The sensitivity of this stage against tip-radial distortion was +0.194 at 100 percent design speed. By comparison, the stage of reference 2 was much more sensitive to tip distortion with a sensitivity parameter of +0.625.

Tip-radial distortion caused an approximate 15 lbm/sec (6.8 kg/sec) weight flow decrease near design speeds but no change in flow at 70 percent speed. At design speed, the measured stage peak-efficiency was 10 percentage points lower than the peak efficiency for uniform inlet flow if the effects of the base screen are discounted. At 95 and 70 percent design speed, the efficiency was 9 and 2 percentage points lower respectively than the uniform inlet flow efficiencies.

Blade Element Data

Rotor and stator blade element performance for tip-radially distorted inlet flow is shown in Figures 53 and 54. Rotor tip regions (70-90 percent spans) operated at high positive incidence angles due to the low axial velocity created by the distortion. The rotor hub airfoil sections had slightly more negative incidence angles than with uniform inlet flow. The stator vane also exhibited choking (negative) incidence angles at its hub regions and stalling (positive) incidence angles near its tip region due to the radial tip flow deficit. Rotor tip deviation angles were approximately 6 degrees above design. Rotor and stator diffusion factors were less than design values at all spans. The relation between diffusion factor and stall line changes for tip distortion is discussed in a latter section, "Loading Parameters". Except at 70 percent design speed, rotor hub losses were higher than uniform inlet flow design values. Stator vane losses, at all measured spans, were higher than those measured with uniform inlet flow. Additional blade element performance parameters are presented in Appendix 3.

An attenuation parameter, defined as $1 - \frac{\text{discharge distortion parameter}}{\text{inlet distortion parameter}}$ where the distortion parameter is $(P_{max} - P_{min})/P_{max}$, was calculated from the radial distributions of inlet and exit total pressures. At 100 percent speed, wide-open throttle the attenuation parameter was +21.6 percent which indicates that the inlet tip distortion was attenuated.

HUB-RADIALLY DISTORTED INLET FLOW

A hub-radial distortion pattern which covered the inner 40 percent of the rotor inlet area provided a distortion parameter of 0.214 with the discharge throttle wide-open at 100 percent of design speed. Figure 55 shows the spanwise total pressure and meridional Mach number at the rotor leading edge for hub-radially distorted inlet flow for wide-open and near-stall throttle conditions at 100 percent design speed; the spanwise Mach number distribution for the wide-open, uniform inlet flow is also shown in Figure 55.

Overall Performance

In the hub-radial distortion tests, overall performance was calculated relative to the rotor inlet. Overall rotor and stage performance with hub-radially distorted inlet flow is presented in Figures 56 and 57. Hub-radial distortion caused an approximate 11 lbm/sec (5.0 kg/sec) weight flow-decrease at high speeds and a 6 lbm/sec (2.7 kg/sec) flow decrease at 70 percent design speed. The stall-limit line for this distorted flow test increased relative to the uniform flow stall line. The stall-line sensitivity parameter was calculated to be -0.51 at 100 percent design speed; thus, this stage was very insensitive, on a stall-line basis, to hub-radial distorted flow. The measured peak stage-efficiency at design speed dropped approximately five percent with the addition of the hub-distortion screen.

Blade Element Data

Rotor and stator blade element performance for hub-radially distorted inlet flow is shown in Figures 58 and 59. Rotorhub airfoil incidence angles increased approximately six degrees compared to those with uniform inlet. Rotor hub diffusion factors were the highest seen in the testing of this stage (0.655 at 100 percent design speed at near-stall). Rotor tip diffusion factors were low compared to uniform inlet tip diffusion factors for 100 and 95 percent design speeds. The low rotor tip diffusion factors are indicative of the flow shift towards the tip due to the hub distortion blockage. Additional blade element performance parameters are presented in Appendix 4.

The attenuation parameter, calculated at 100 percent design speed and wide-open throttle, was +1.8 percent.

CIRCUMFERENTIALLY-DISTORTED INLET FLOW

A 120-degree full-span screen was used to generate the circumferential distribution of rotor inlet total pressure shown in Figure 60. A circumferential distortion parameter of 0.2, covering approximately a 90 degree segment, was achieved at the rotor inlet with the throttle wide open at design speed using a 120-degree full-span screen.

Overall Performance

In the circumferential distortion tests, overall performance was calculated relative to the rotor inlet. Overall stage performance with circumferentially distorted inlet flow is shown in Figure 61 and is tabulated in Appendix 5.

At 70 percent design speed, performance was hardly affected by circumferential distortion; in fact, a slight increase in stage efficiency was noted. There was only a 3 lbm/sec (1.35 kg/sec) drop in flow when this stage was subjected to circumferential distortion at 100 percent design speed. The stall-line sensitivity parameter was calculated to be -0.036 at 100 percent design speed. This stage was slightly less sensitive to circumferential distortion than the stage of reference 2, which had a sensitivity parameter of approximately +0.08 at 100 percent of its design speed. Using the measured peak stage-efficiency values, the efficiency changes between the circumferential distorted inlet flow tests and the uniform inlet flow tests were -4.5, -4.3, and +1.0 percentage points for 100, 95, and 70 percent design speeds, respectively.

Circumferential Distributions of Flow Field Parameters

Measurements from static pressure taps at five axial planes between the distortion screen and the rotor inlet on both the outer case and inner hub showed circumferential distributions typical of those shown in Figures 62 and 63 for 100 percent design speed. Figure 62 shows a static pressure drop behind the screen at all axial planes. Figure 63 shows an increase in static pressure at the hub in the vicinity of the screen; this pressure increase at the hub changes to a deficit at about eight inches (0.2 meters) before the rotor leading edge. This local pressure increase has not been observed in other programs that have conducted similar distortion tests [ref. 6].

Rotor inlet circumferential distributions of total pressure, static pressure, absolute Mach number, relative air-angle, absolute air-angle, and meridional velocity are shown in Figures 64, 65, and 66 at 10, 50, and 90 percent span for wide-open and near-stall 100 percent design speed operations. Stator discharge circumferential distributions of total pressure, static pressure, absolute Mach number, total temperature, absolute air-angle, and absolute velocity are shown in Figures 67, 68, and 69 for the same percent spans, throttle settings, and speed as those of Figures 64, 65, and 66. These plots were constructed using measurements from radially traversed wedge probes at the rotor inlet at twelve locations relative to the distortion screen. Stator discharge circumferential patterns were measured by wedge probes and temperature rakes located at stator-midgap positions.

It is interesting to compare the attenuation of distortion through the compressor at different operating conditions along a speedline. The attenuation parameters for the hub, midspan, and tips are plotted in Figure 70 as a function of flow at 100 percent design speed. Figure 70 shows that only the total pressure distortion at the hub remained amplified as the stage was throttled towards stall.

The circumferential static pressures (Figures 67, 68, and 69) at the wide-open throttle condition were different in distribution than the near-stall static pressures. These differences may be explained by noting that the mid-gap discharge Mach numbers were very close to unity, on the average, for the wide-open throttle setting; therefore, the ratio of static to total pressure was fixed by this choked condition. Since the ratio p_{17}/P_{17} was essentially constant at wide-open throttle, the total pressure deficit caused by the screen must have been accompanied by a corresponding decrease in static pressure to be compatible with the choked exit. For a nonchoked stator discharge, the static pressure adjusts locally to the total pressure and the Mach number (or velocity) deficit caused by the distortion screen. These circumferential exit static pressures were not uniform, and any attempt to use these pressures as boundary conditions of a parallel compressor model would, at best, be approximate.

Figures 67 and 68 show a very large region of low axial velocity occurring at the hub and midspan of the stator exit for near-stall throttle setting. The low flow area indicates that there was a severe hub stall locked-in behind the stator vane which accounts for the reduced flows at stall seen on Figure 61. This low flow region, formed near the hub of this stage by the imposed circumferential distortion, could cause matching problems (ref. 7, chapter XIII) in a multistage compressor (or a booster stage) since this hub stall zone would be transferred from this stage to the middle stages which are more susceptible to abrupt stall.

Additional circumferential distributions of total pressure, static pressure, absolute Mach number, meridional velocity, absolute air-angle, relative air-angle, and total temperatures are presented in Appendix 5.

STALL WEIGHT FLOWS

Table 6 summarizes the stall weight flows for uniform inlet, hub-radial distortion, tip-radial distortion, and circumferential distortion flows. Also included in Table 6 are the stall weight flows for the stator stagger angle optimization tests.

TABLE 6

STALL WEIGHT FLOWS, $W\sqrt{\theta_{11}}/\delta_{11}$ ~ LBM/SEC

% Design Speed	Uniform Inlet	DISTORTION Hub Radial	Tip Radial	Circumferential
105	181.0	–	–	–
100	170.5	151.2	160.8	158.7
95	160.5	143.1	154.1	148.7
80	128.0	–	–	–
70	107.7	94.0	Not Detected	104.3
50	69.0	–	–	–

	STATOR SETTING 5° Closed	Nominal	5° Open
100	171.0	173.0	173.1

The stall weight flow at 70 percent design speed for tip-radial distortion tests was not recorded because it was not possible to detect stall even with the throttling valves nearly closed. Weight flows were continually recorded with back pressure down to a weight flow of 80.6 lbm/sec (36.6 kg/sec) without stall detection. The inability to detect stall at low speeds may possibly be attributed to the baffle effect of the tip radial screen [ref. 8] which eliminated the rotating stall, thereby causing an improved stall-limit line.

LOADING PARAMETERS

Figure 71 presents hub and tip diffusion factors for the rotor and stator as a function of suction surface incidence angle. Operating points at 100 percent design speed are included for uniform and radially distorted inlet flows. These data have been extrapolated to stall by extending a plot (not shown) of incidence angle versus flow to the stall weight flows given in Table 6. For uniform inlet flow, the maximum rotor diffusion factors (occurring at stall) did not reach design levels. Except at the rotor hub for the hub-radially distorted inflow, the blade-row loadings did not increase when subjected to radial flow distortion. These endwall diffusion factors do not appear, for the most part, to be indicative of the stall limit-line changes, discussed in the "Tip Radially Distorted Inlet Flow" and the "Hub Radially Distorted Inlet Flow" sections. For example, in the hub-radial distortion tests, the rotor hub diffusion factor at 100 percent design speed increased even though the sensitivity parameter was negative (-0.51); also, the rotor and stator tip diffusion factors decreased in the tip-radial distortion tests which had a sensitivity of +0.19. Figure 71 also shows that the stator tip, more than the other end-wall sections, encounters significant incidence angle changes accompanied by large loading variations. For uniform inlet and hub radially distorted inlet flow, the stator tip diffusion factor has well exceeded its design value at stall. Figure 72 presents the spanwise stator diffusion factors from wide-open throttle (maximum flow) to stall at 100 percent design speed and uniform inlet flow. This figure shows that the stator tip loadings increase at a very fast rate. Thus, the high loadings of the stator tip appear to be the likely source of stall for this stage.

CONCLUSIONS

Conclusions based on tests of a highly-loaded, single-stage fan with a design tip-speed of 1800 feet per second (548.6 meters per second) and a pressure ratio of 2.285 are presented below.

Under conditions of uniform inlet flow, the stage produced a pressure ratio of 2.2 at a peak efficiency of 82 percent with 6.5 percent stall margin. The pressure ratio and efficiency of this stage were good, but this performance was slightly below design goals. The rotor hub, consisting of multiple-circular-arc blades, achieved its design pressure ratio and efficiency, but the precompression tip sections did not. The blade tip sections operated with two shocks that caused an increase in loss and deviation angle which resulted in a lower efficiency and pressure ratio. A blade design technique incorporating the influence of a trailing edge shock should be employed to reduce shock losses and favorably distribute the shocks' pressure rise within the blade channel so that the design efficiency and pressure ratio goals may be attained.

The rotor design did not satisfy the starting criteria for operation with a normal shock at the relative inlet Mach number, but the stage passed higher than design flow. Therefore the rotor passage, in starting, must have achieved some precompression of the inlet flow. Static pressure measurements and holographic pictures show that the rotor leading edge shock remains attached, therefore started, at the tip for 70, 95, 100, and 105 percent design speeds.

The stator achieved its design pressure recovery of 0.976 with its stagger angle set at 2.5 degrees open from nominal. High stator tip loadings appear to be the likely source of stall for this stage.

Inlet flow distortions reduced pressure ratio at stall but also reduced flow rate so that the stall line was relatively insensitive to distortion. With tip radial distortion, the rotor tip diffusion factor at stall was lower than that with uniform inlet flow. The incidence angle at the tip was 6 degrees higher than with uniform inlet flow. With hub radial distortion, the diffusion factor was high at the rotor hub and low at the rotor tip. The incidence angle at the hub was 10-14 degrees higher than for uniform inlet flow or tip radial distortion. The reasons for the moderately low rotor tip diffusion factors were not immediately obvious, but it is believed that the usual approach of using diffusion factor to indicate stalling may not be adequate when a blade passage consists of multiple shock waves. With circumferential distortion, there was a significant low-flow region at the stator exit from the hub to the mean radius. This stall zone could be very detrimental to the performance of succeeding compressor stages.

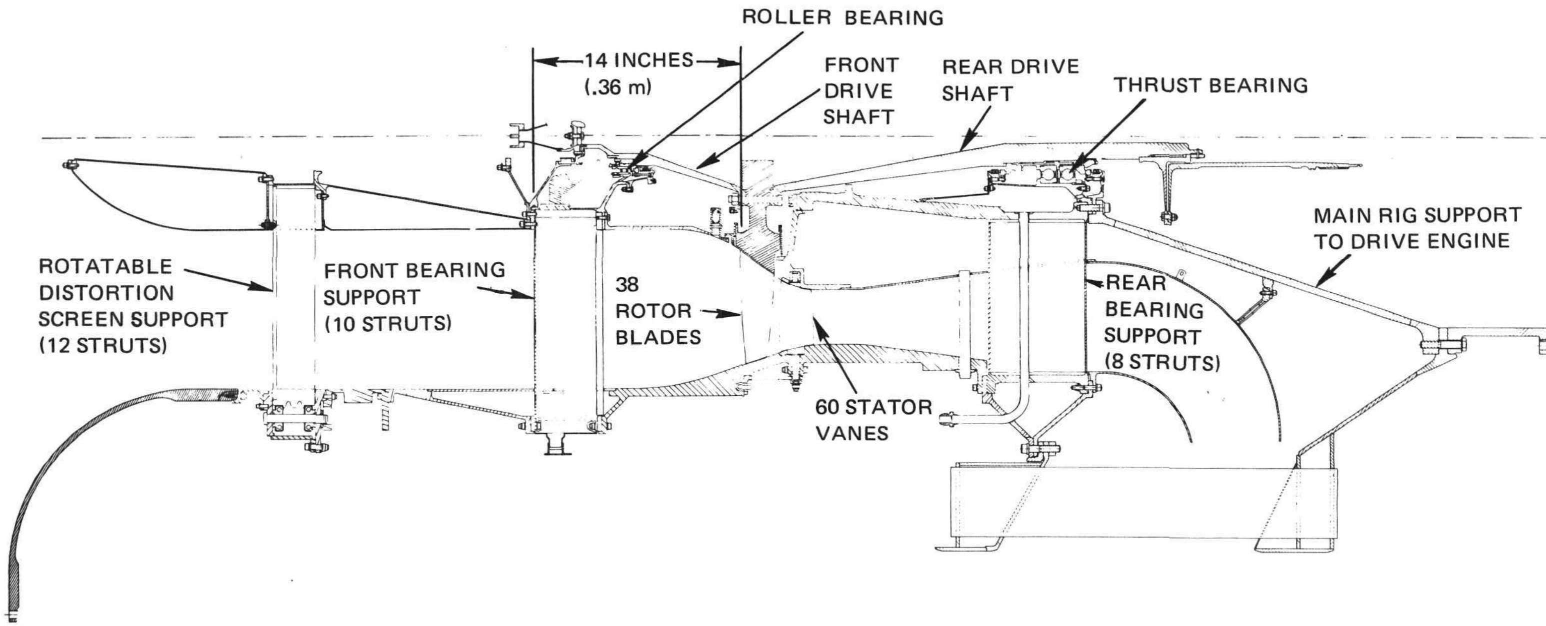
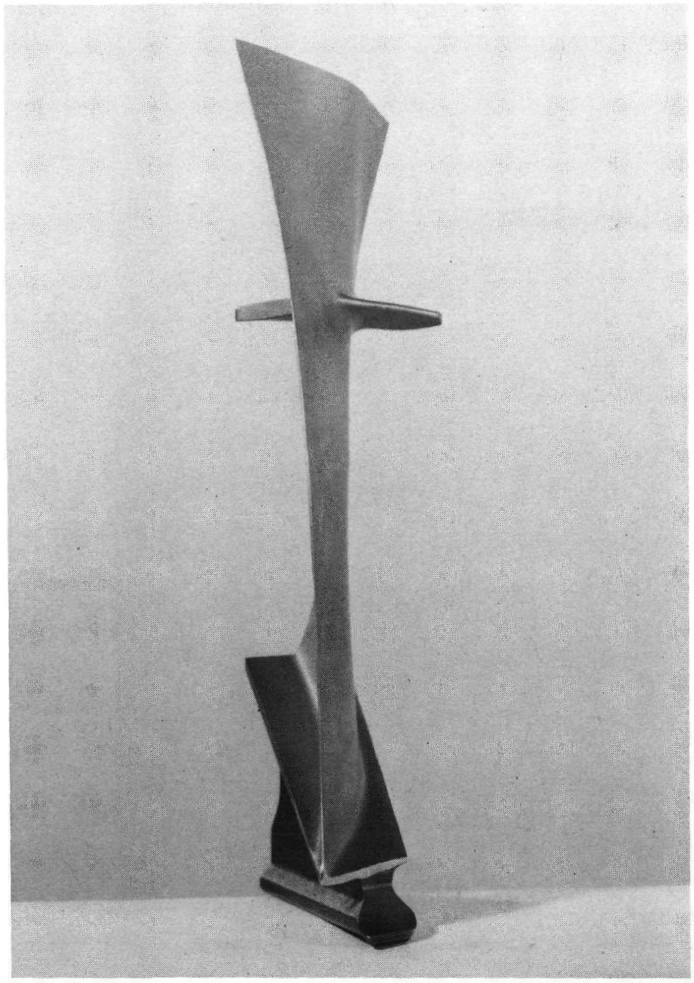


Figure 1 Cross-Section of Test Compressor



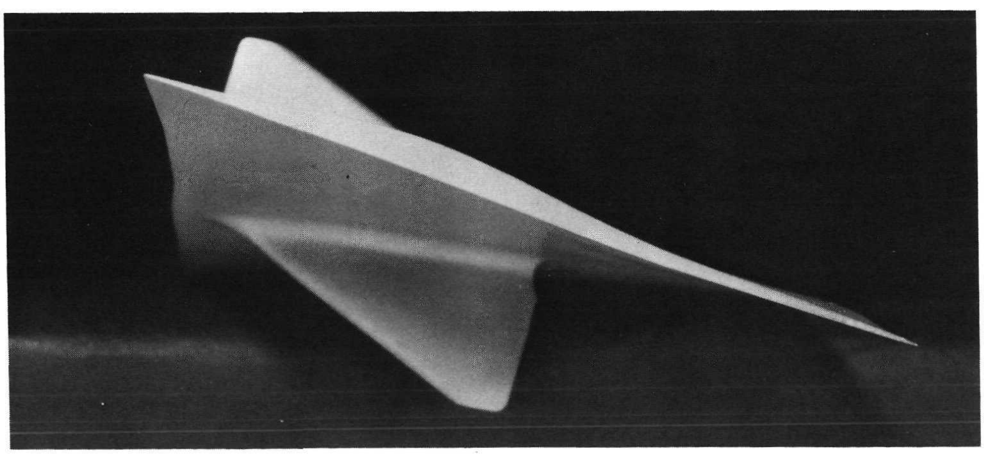


Figure 2 Rotor Blade

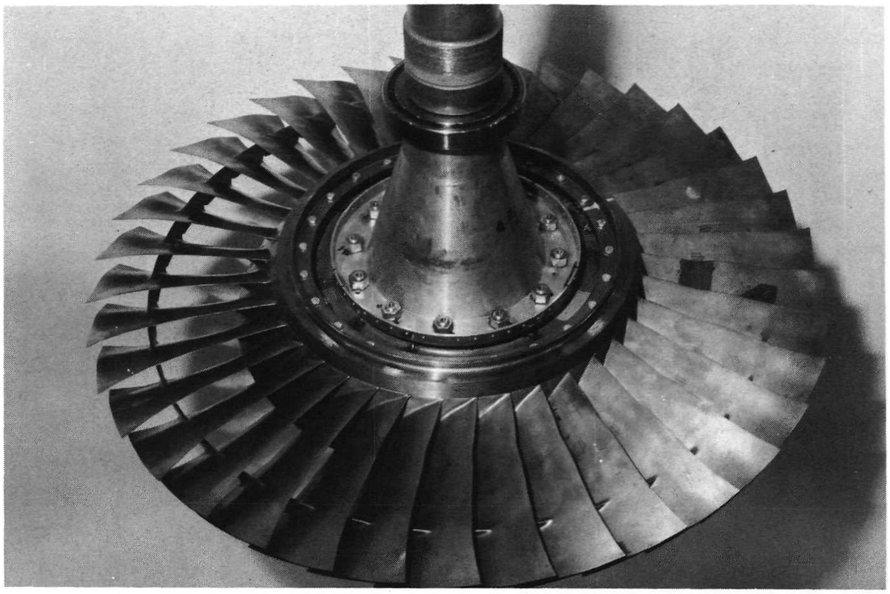


Figure 3 Rotor Blade-Disk Assembly

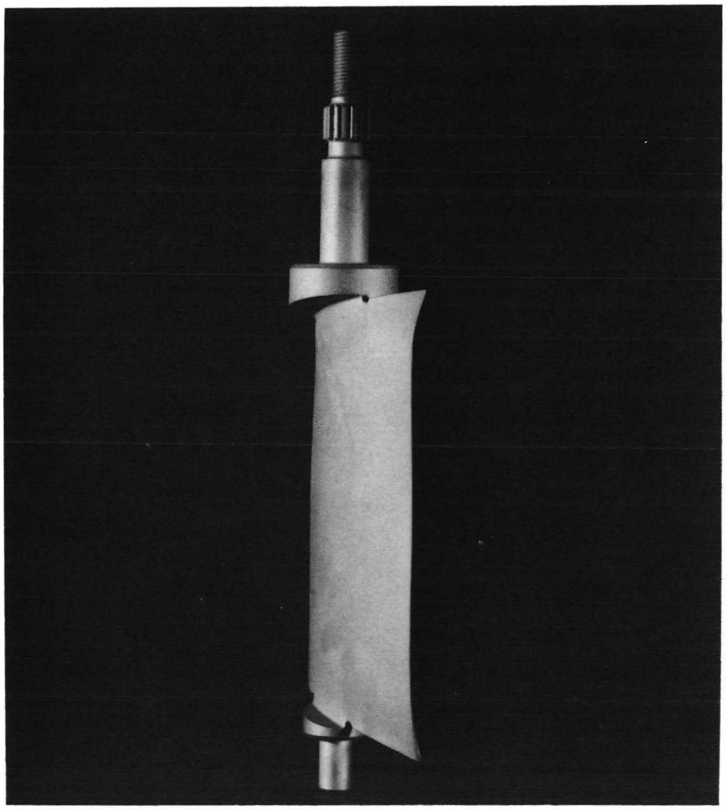


Figure 4 Stator Vane

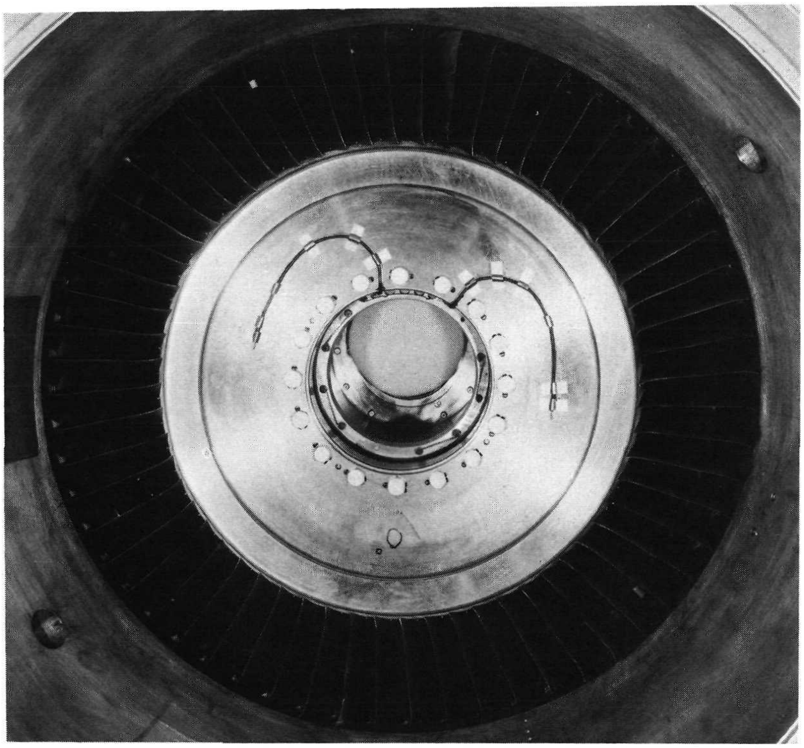


Figure 5 Stator Vane Assembly

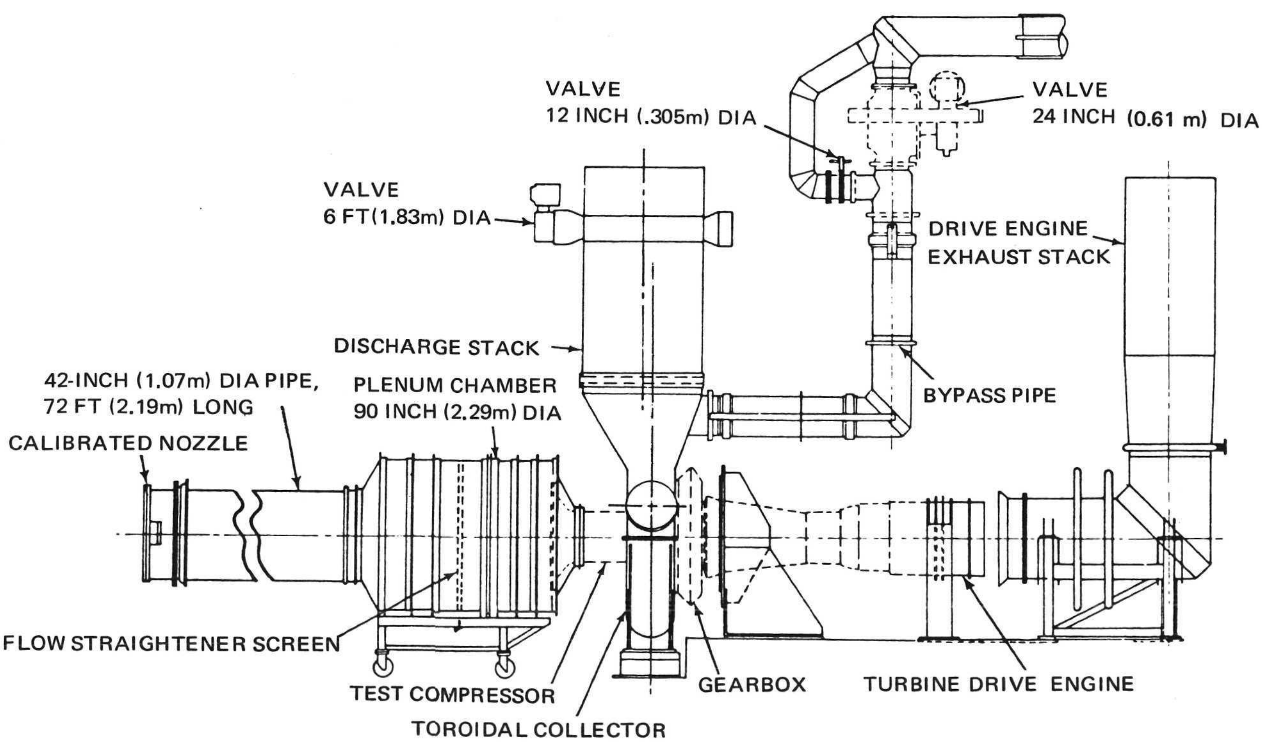


Figure 6 Schematic of Compressor Test Facility

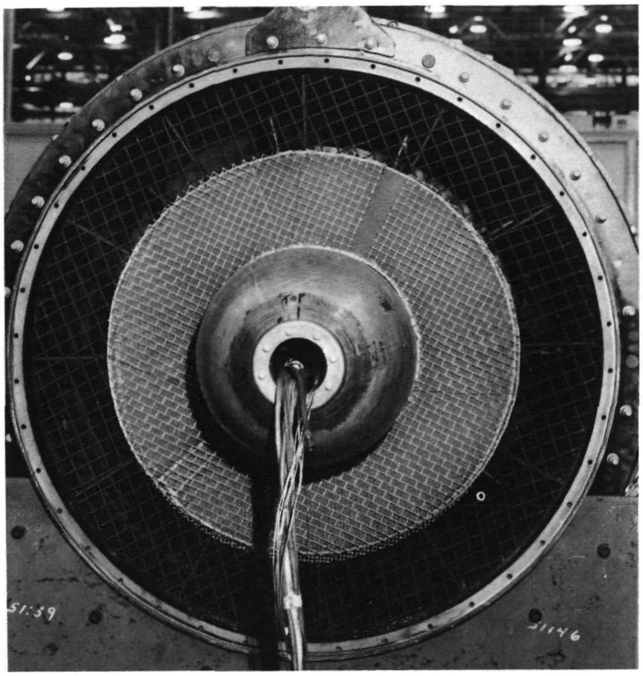


Figure 7 Hub-Radial Distortion Screen

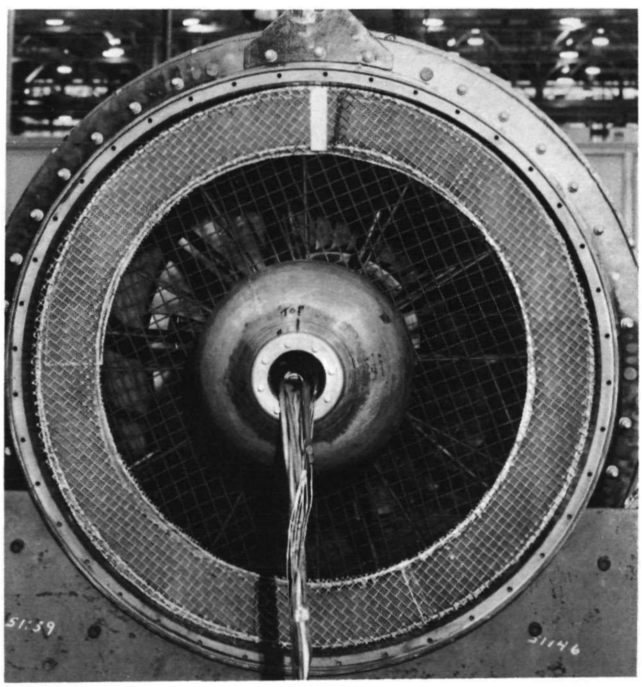


Figure 8 Tip-Radial Distortion Screen

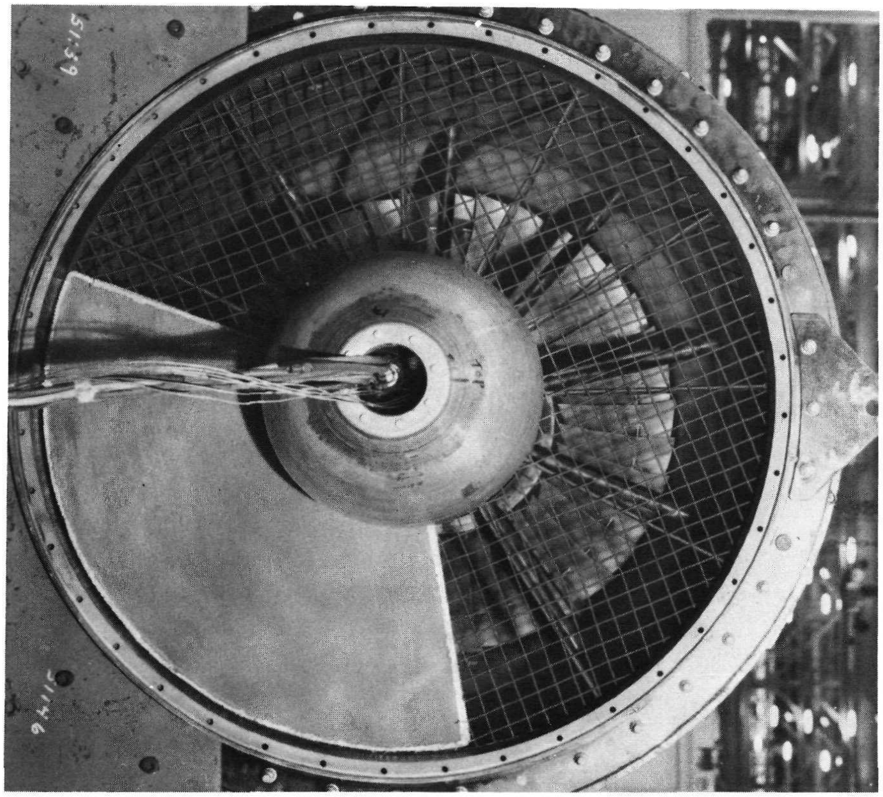


Figure 9 Circumferential Distortion Screen

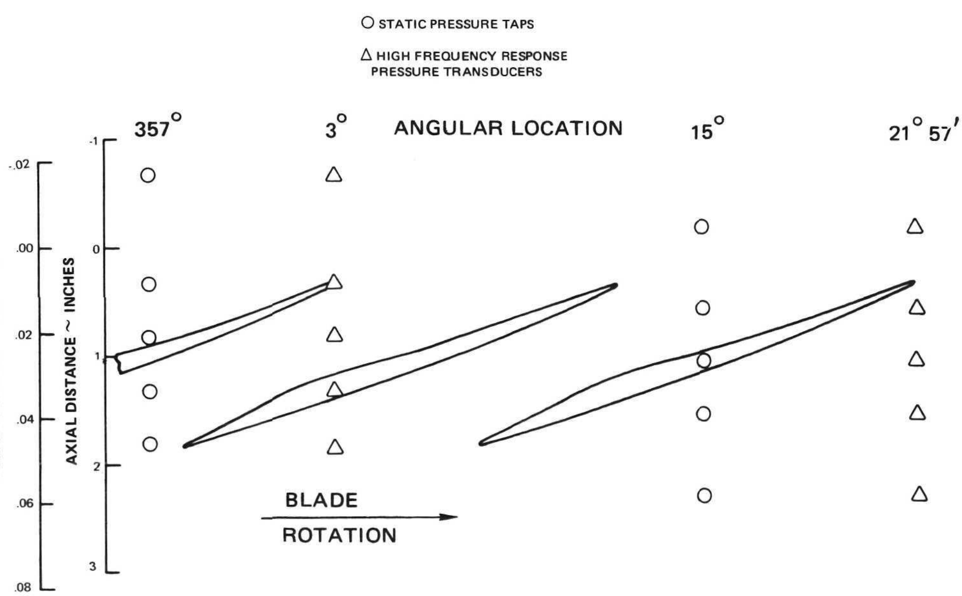
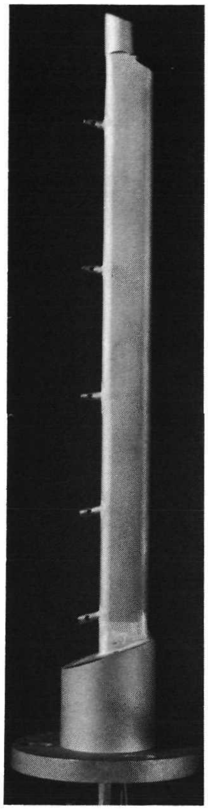
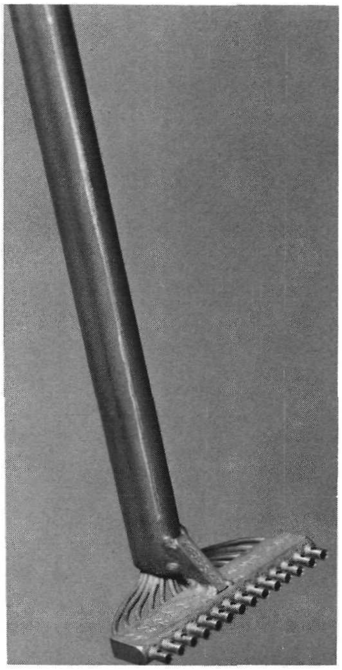


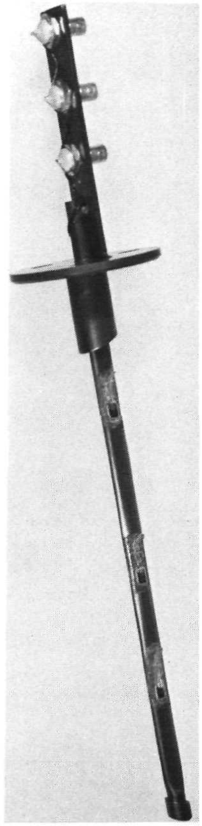
Figure 10 Casing Instrumentation Over Rotor Blade Tips



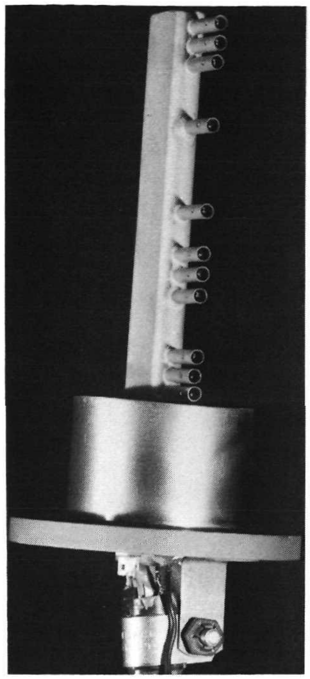
A Rotor Inlet
Total Pressure
Rake Probe



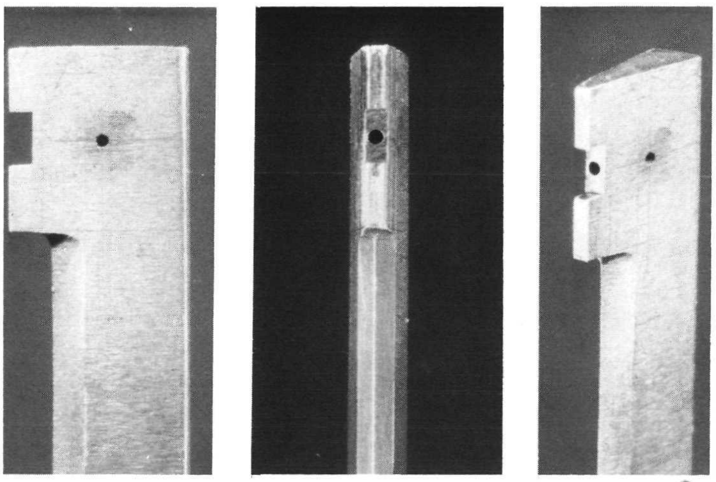
B Stator Exit Total
Pressure Wake Probe



C Rotor Inlet
Hot Film
Probe



D Stator Exit Total
Temperature Probe



E Rotor Inlet & Static Exit Traverse Wedge Probes

Figure 11 Typical Instrumentation

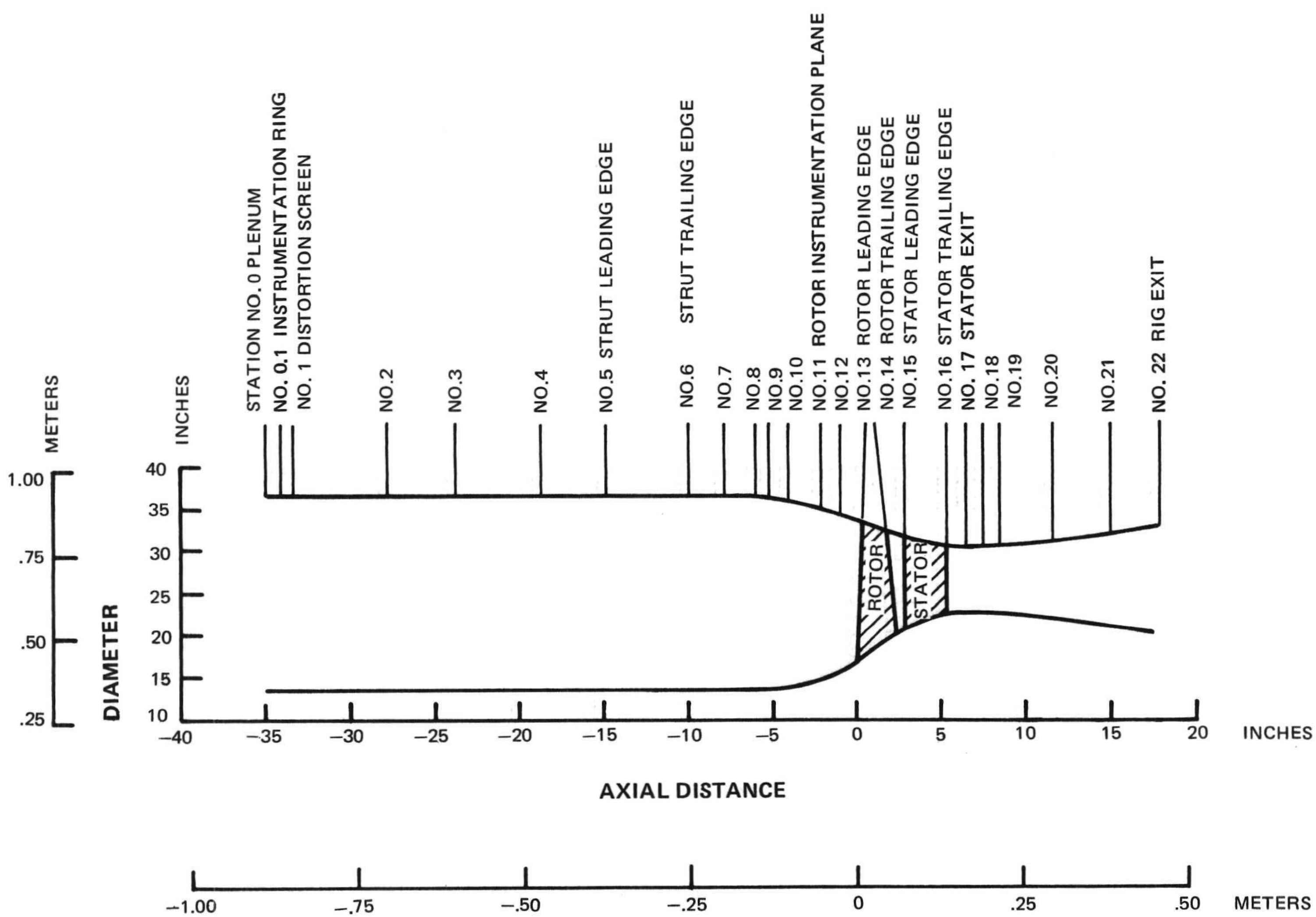


Figure 12 Axial Station Number Deisgnation Including Location of Instrumentation

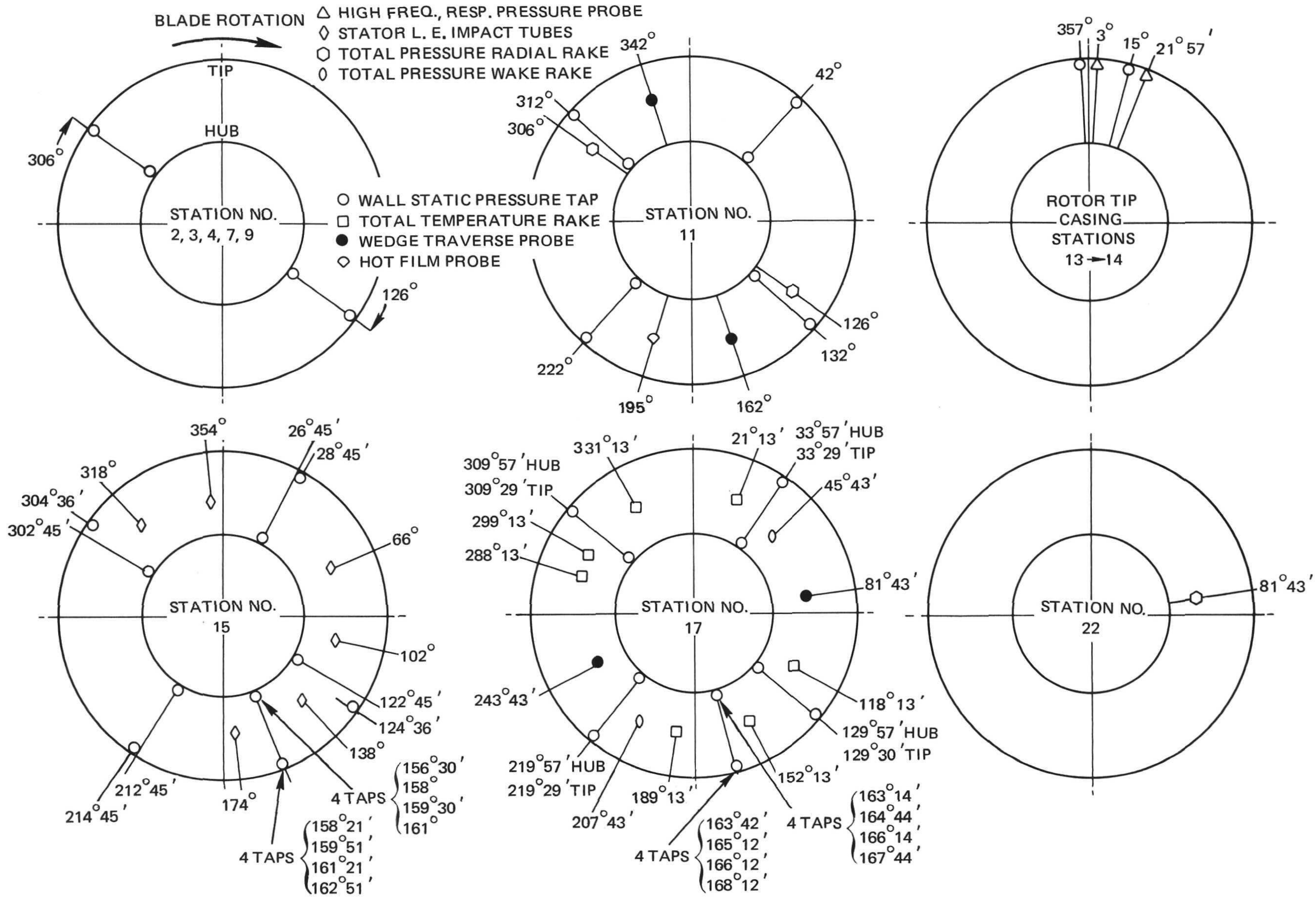


Figure 13 Circumferential Location of Instrumentation Viewed from Rear

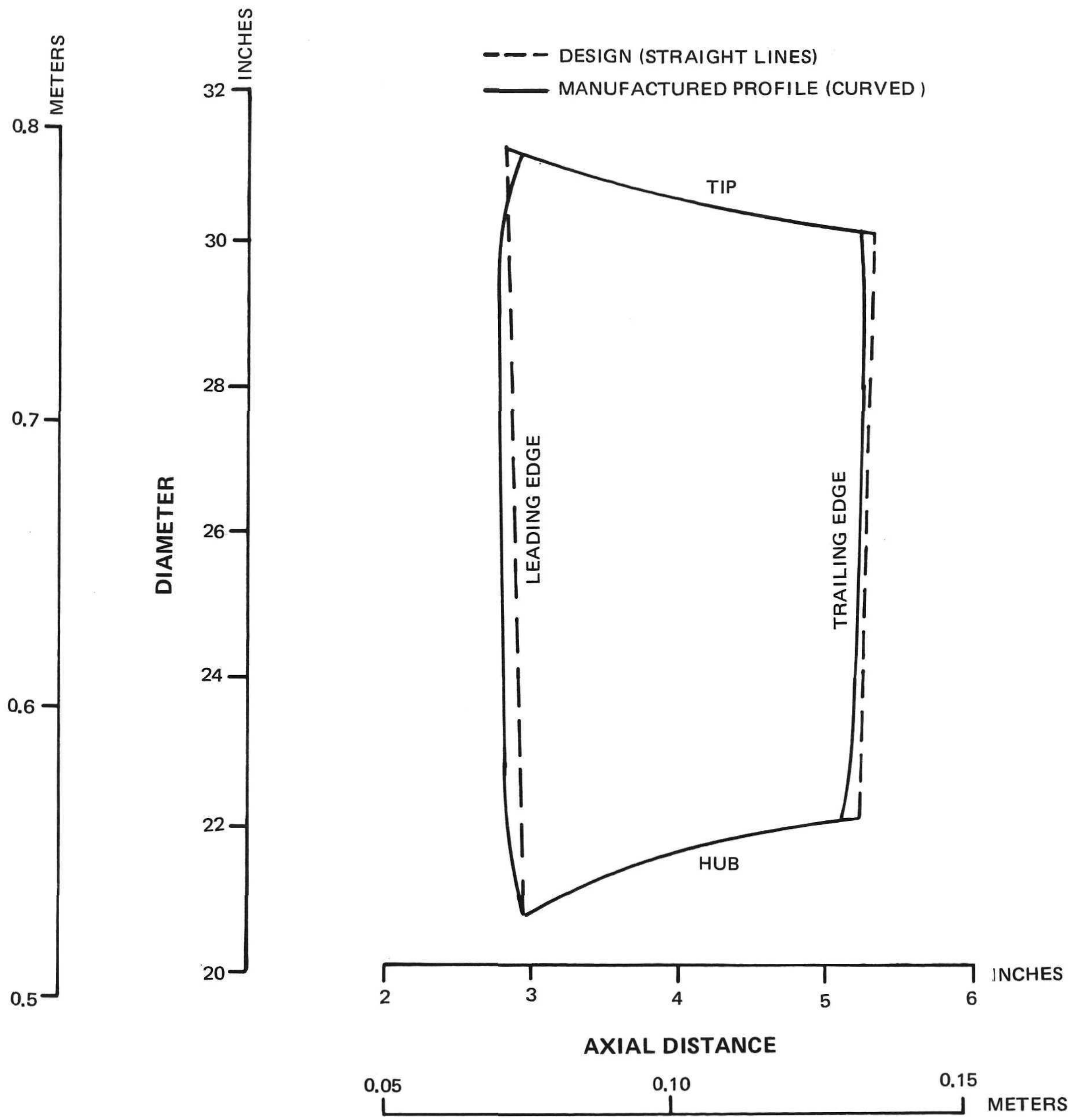


Figure 14 Design and Manufactured Stator Meridional Blade Row Edges

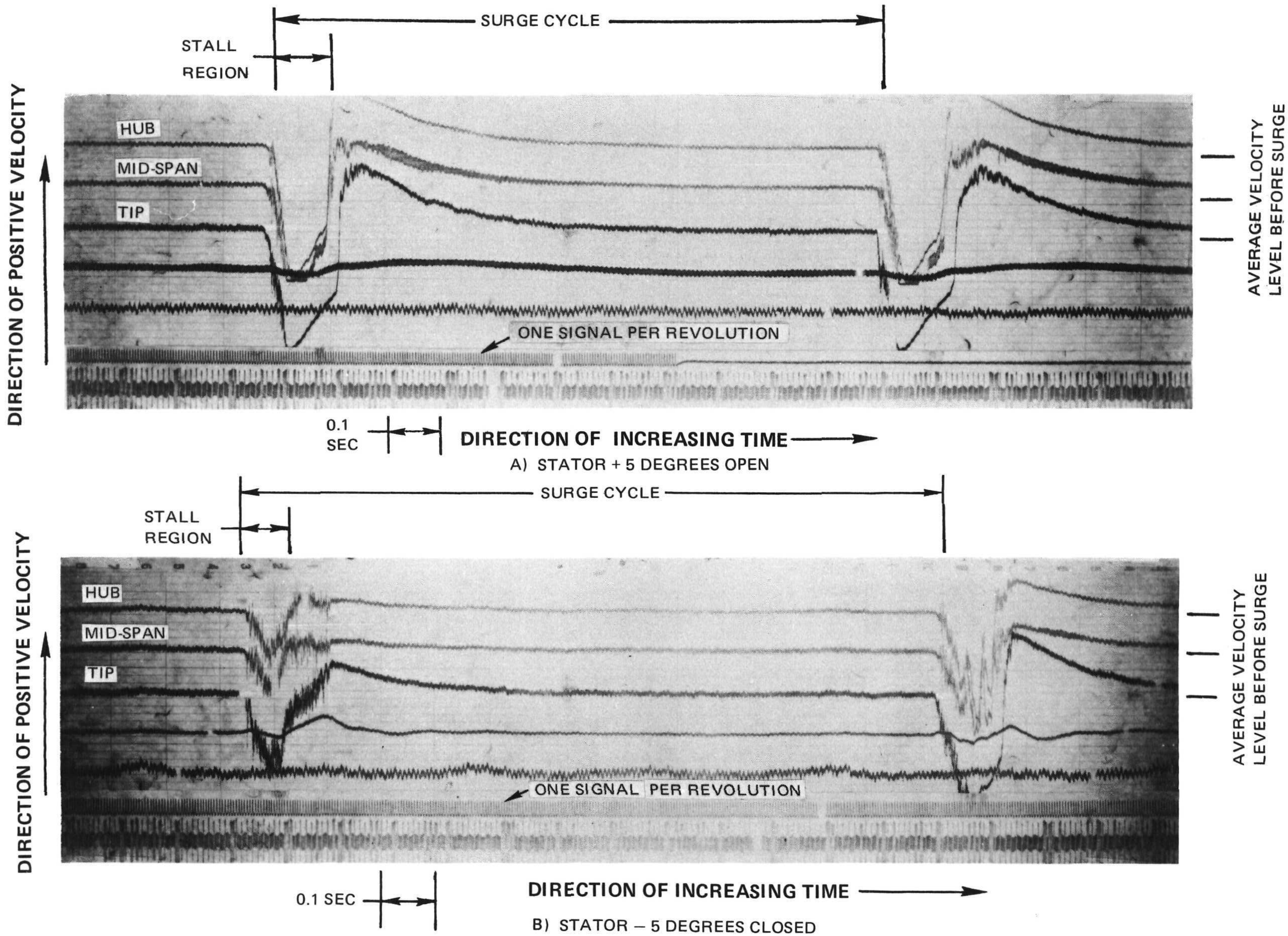


Figure 15 Oscillograph Traces of Surge Cycle for ± 5 degrees Stator Stagger Angle Tests, 100% Design Speed

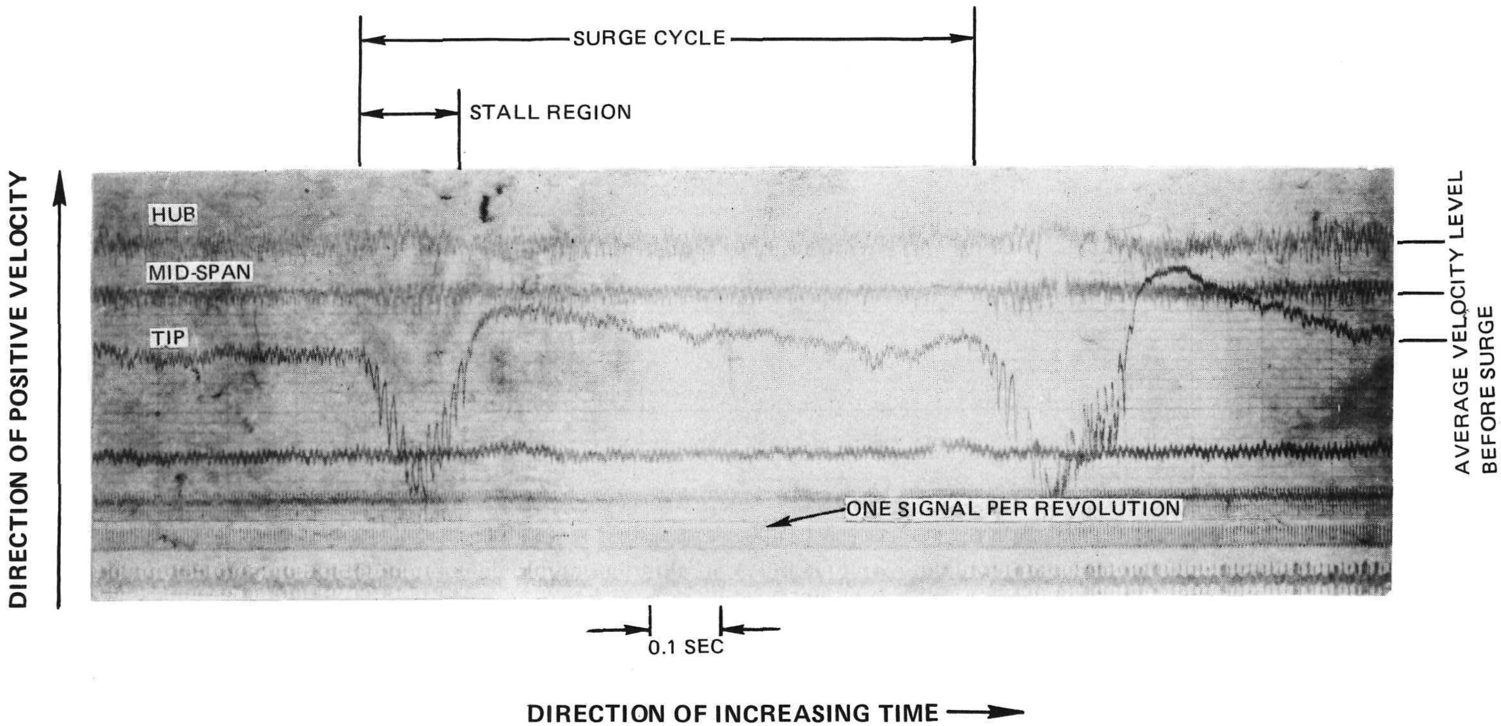


Figure 16 Oscillograph Trace of Surge Cycle for Hub-Radial Distortion Tests, 100% Design Speed

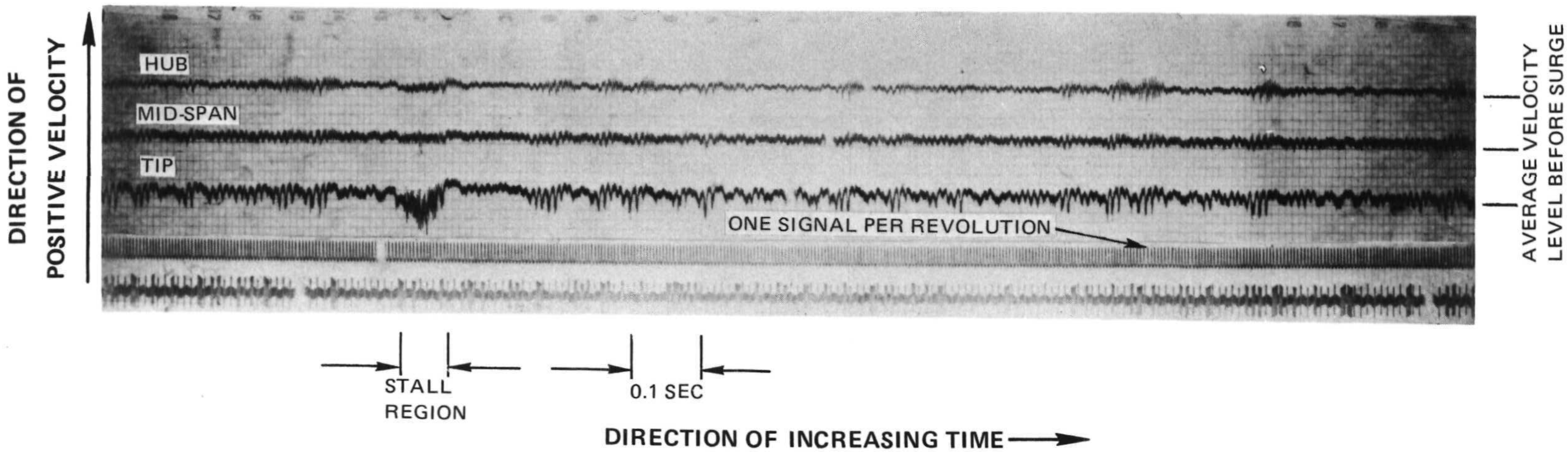


Figure 17 Oscillograph Trace During Surge for Circumferential Distortion Tests, 95% Design Speed

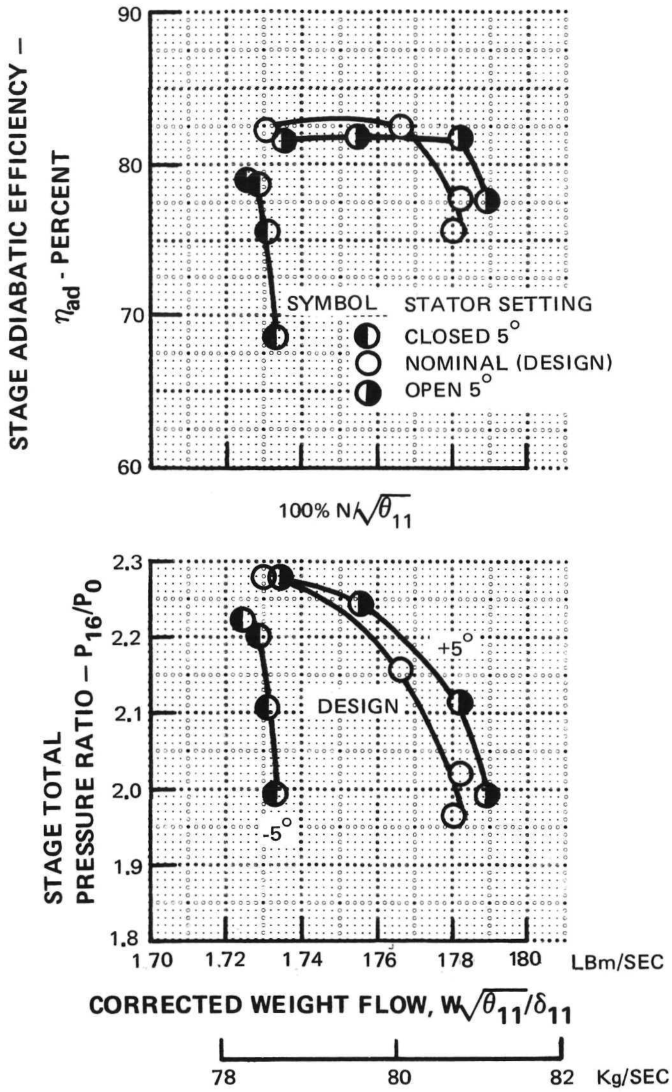


Figure 18 Stage Performance for Stator Stagger Angle Optimization Tests

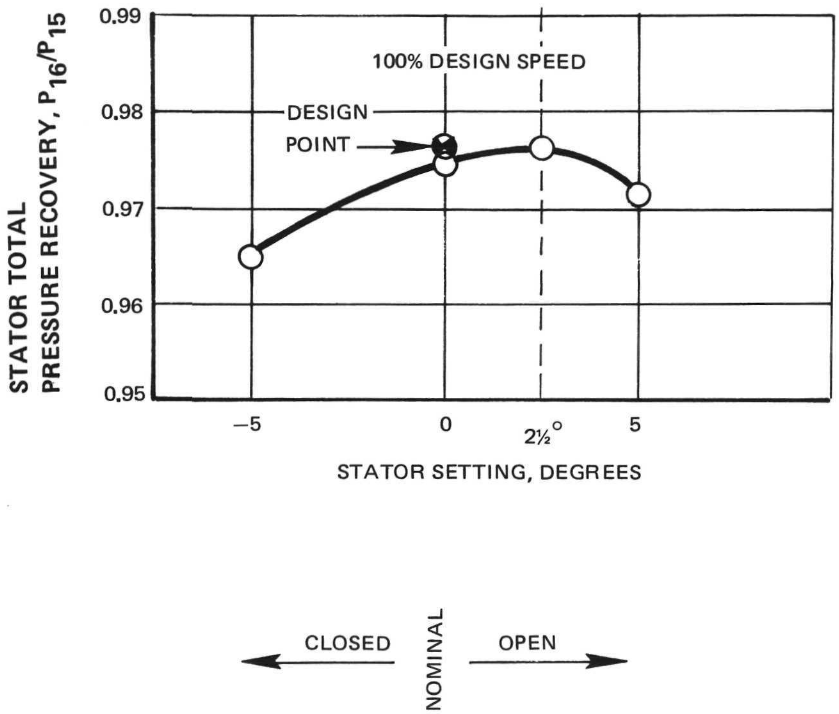


Figure 19 Stator Recovery Versus Stagger Setting for Stage Optimization Tests

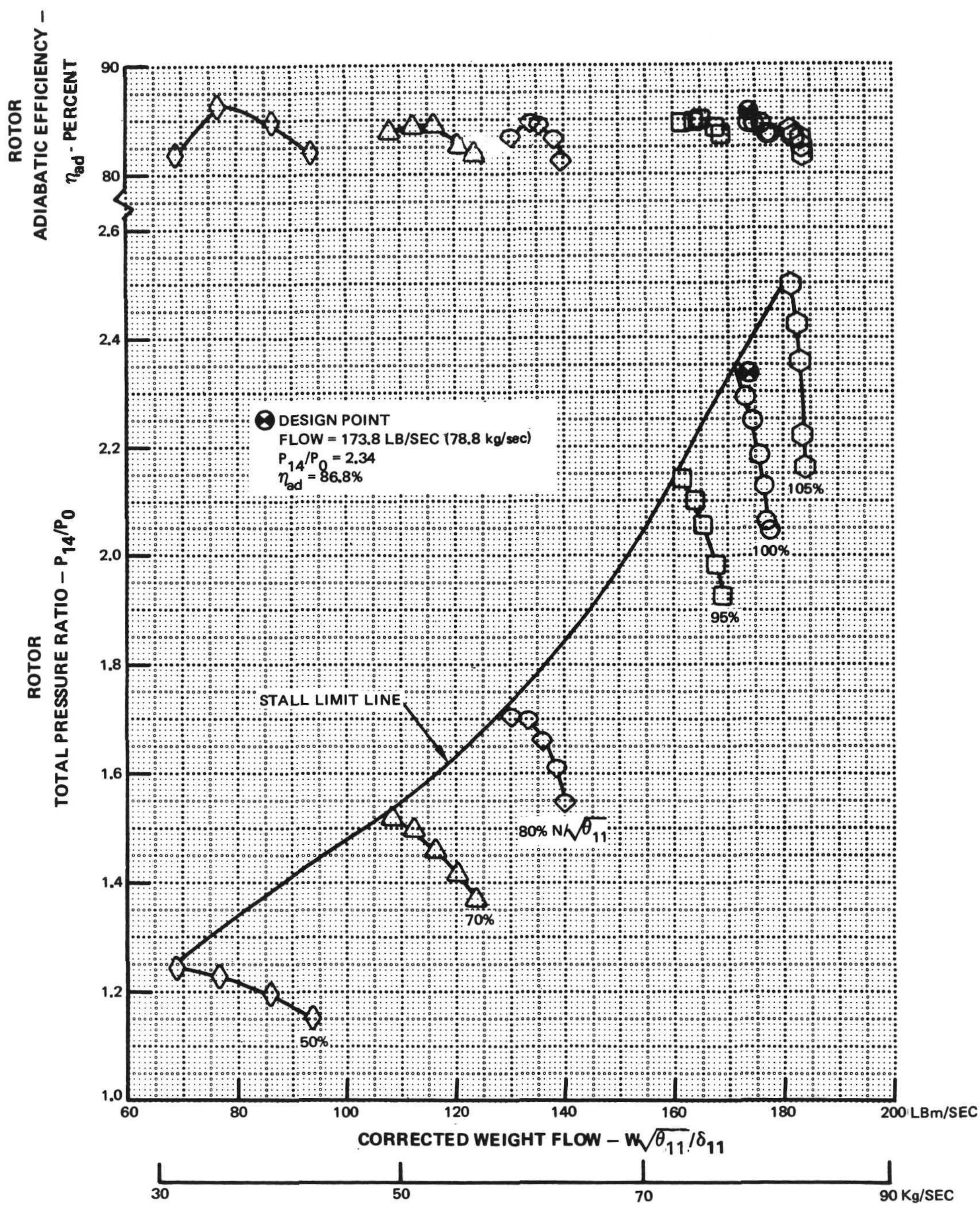


Figure 20 Rotor Overall Performance With Uniform Inlet Flow

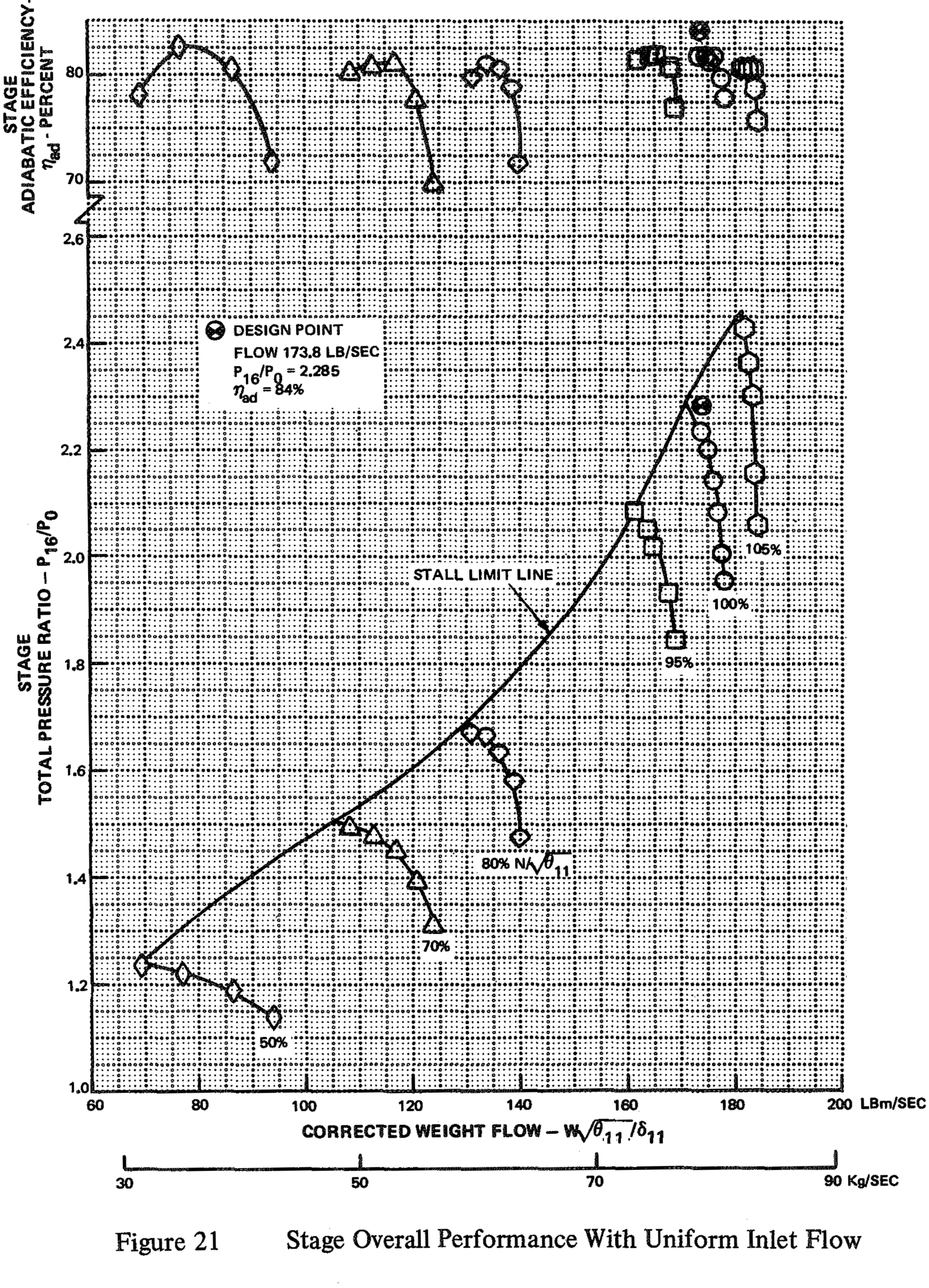


Figure 21 Stage Overall Performance With Uniform Inlet Flow

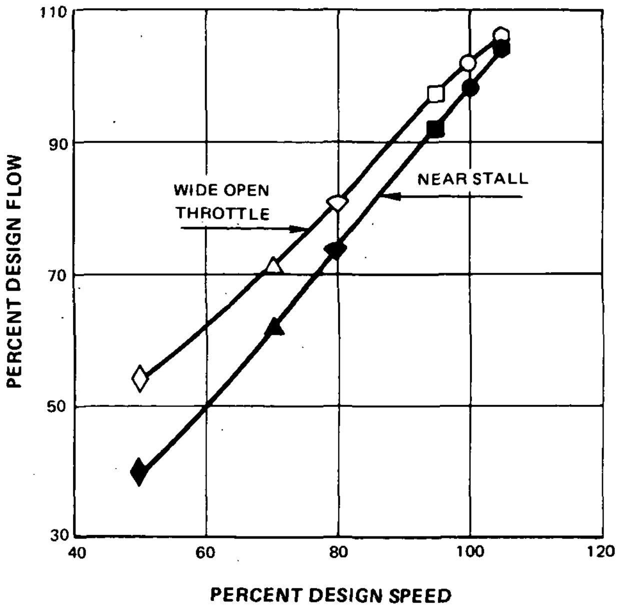


Figure 22 Wide Open Throttle and Surge Flows Versus Speed

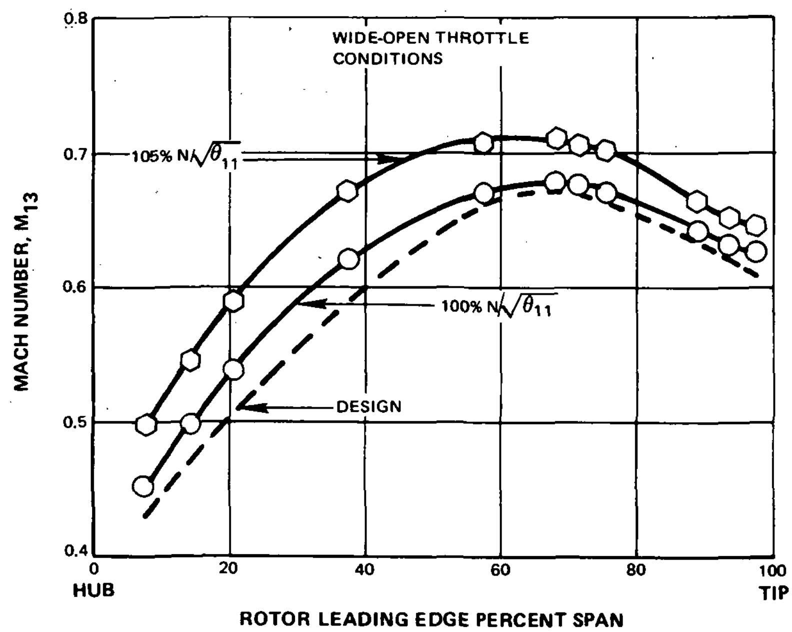


Figure 23 Rotor Inlet Mach Number Profile at 100% $N/\sqrt{\theta_{11}}$ and 105% $N/\sqrt{\theta_{11}}$ Compared With Design

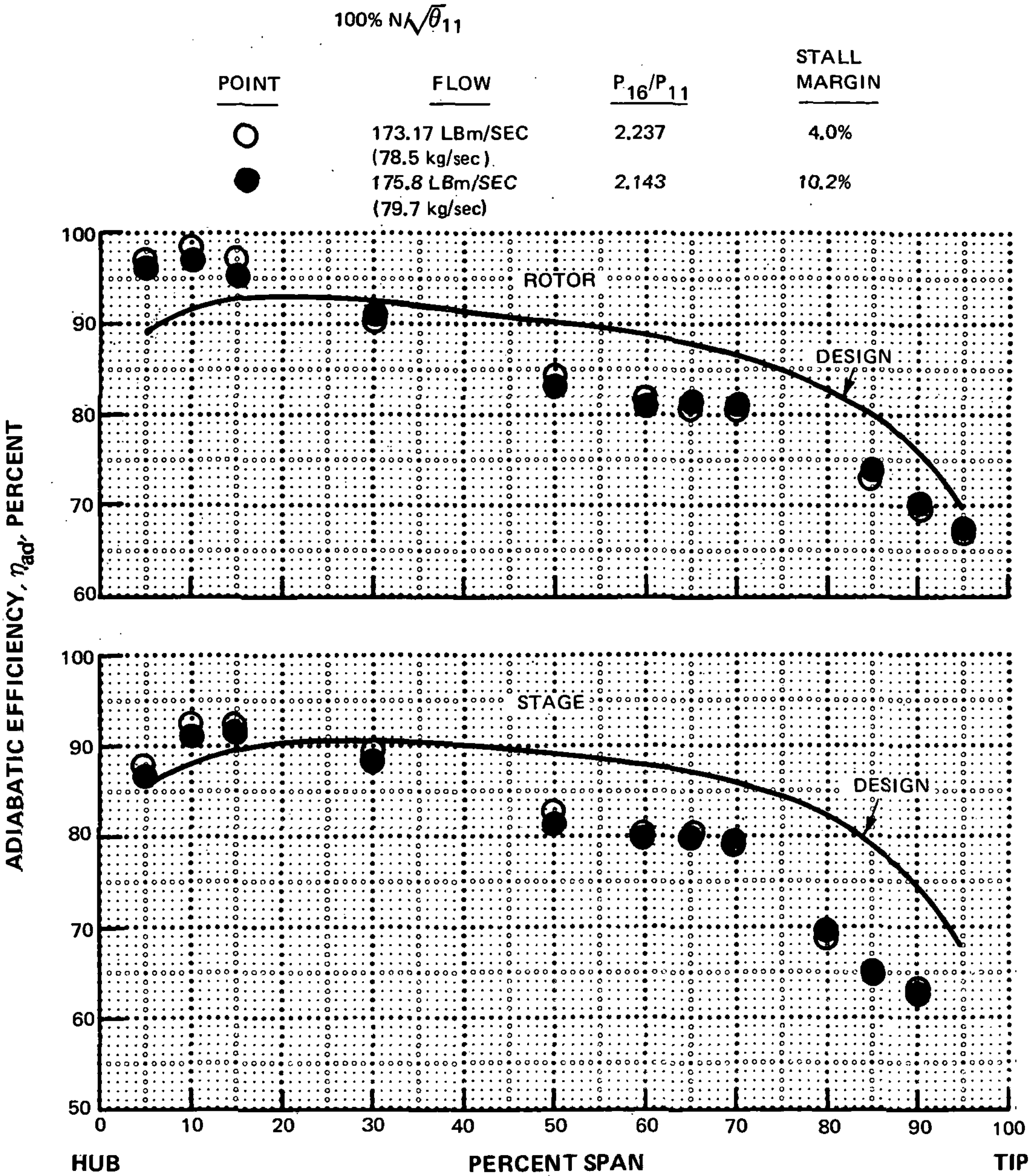


Figure 24 Rotor and Stage Spanwise Efficiencies for Near-Stall and Ten Percent Stall-Margin Operating Points Compared with Design

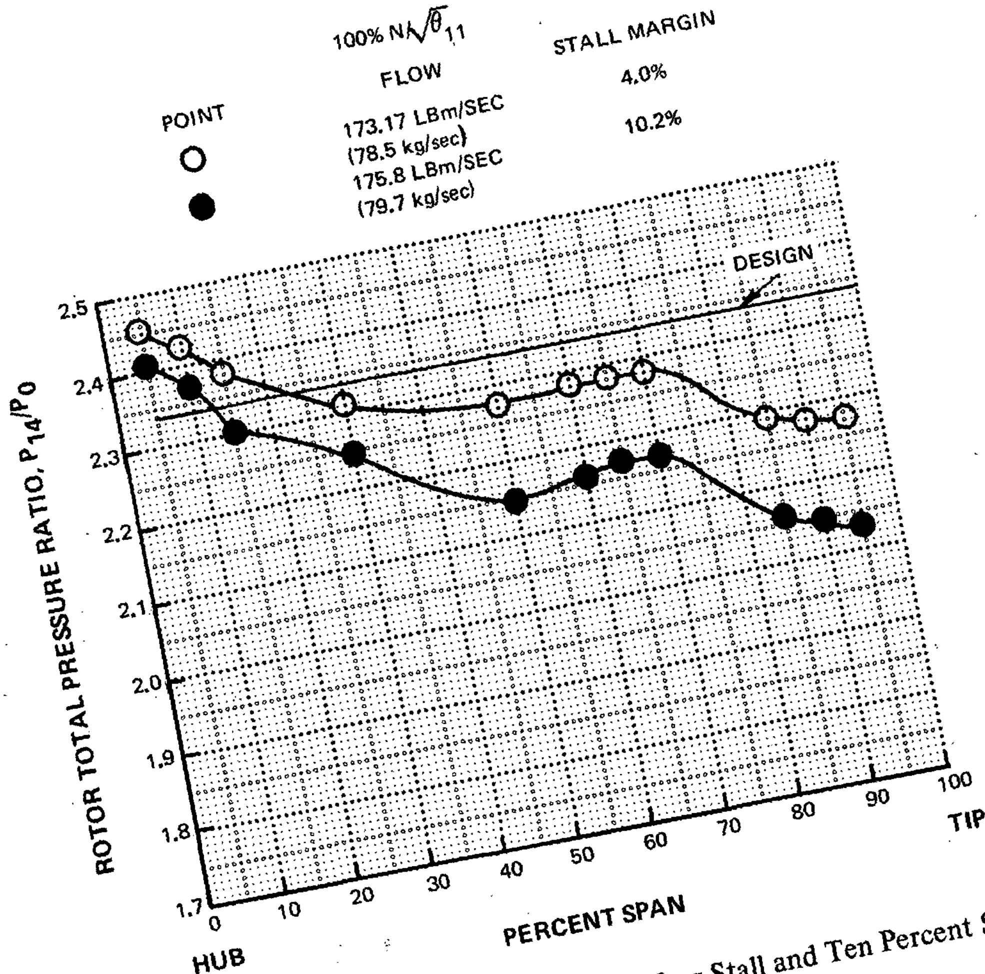


Figure 25 Rotor Spanwise Pressure Ratio for Near-Stall and Ten Percent Stall-Margin Operating Points Compared with Design

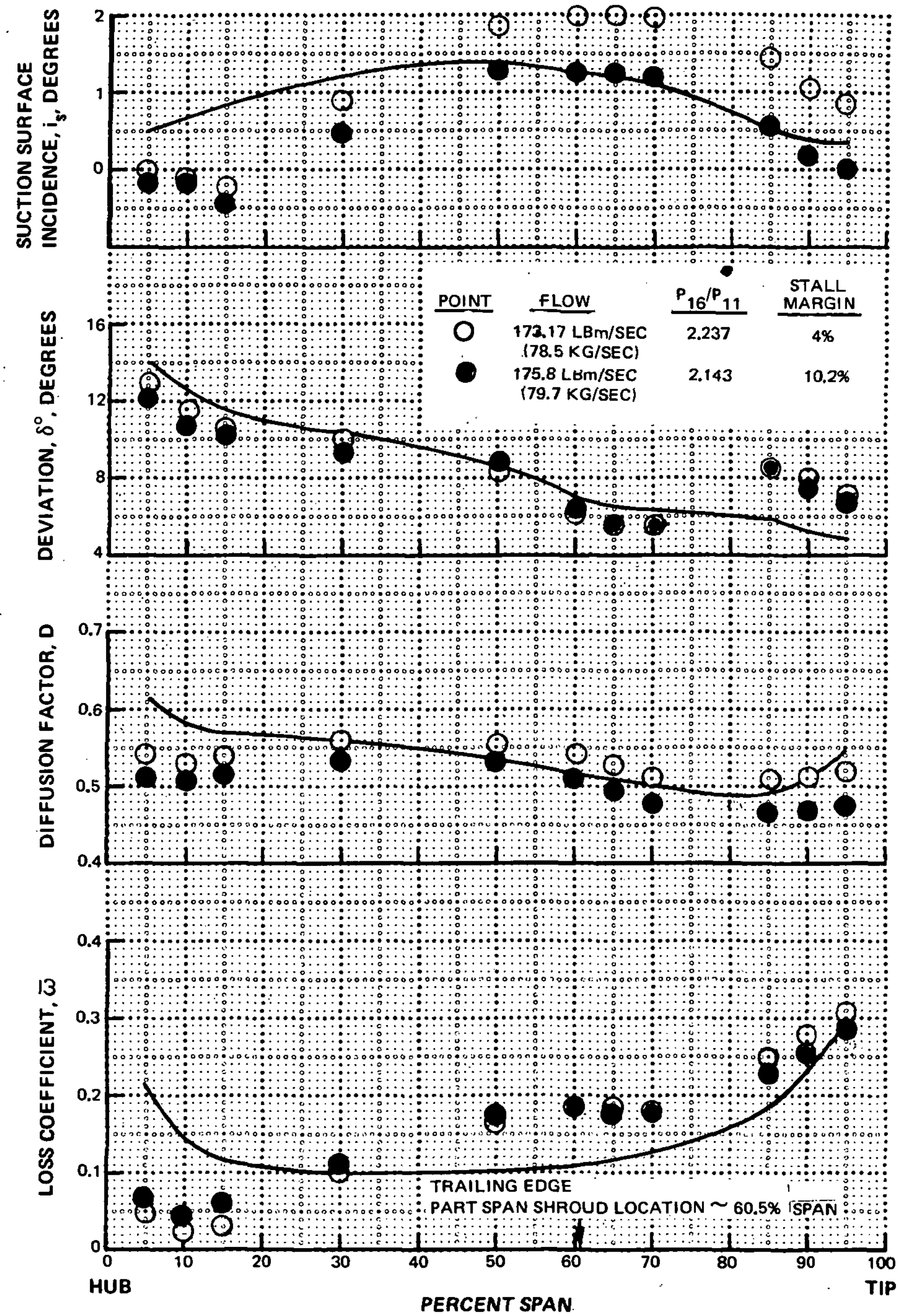


Figure 26 Spanwise Rotor Blade Element Performance for Near-Stall and Ten Percent Stall Margin Operating Points Compared with Design

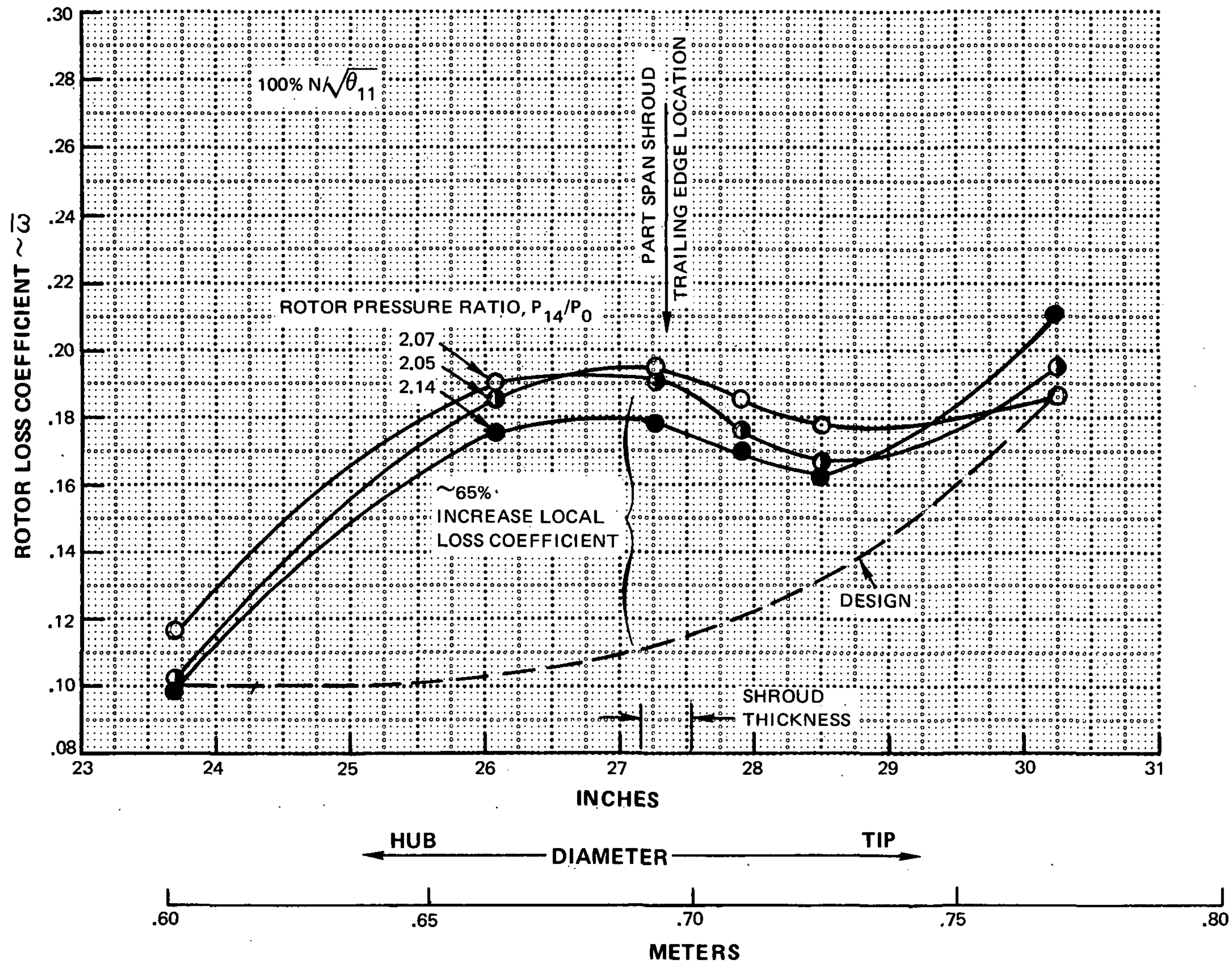


Figure 27 Rotor Loss Coefficients in Vicinity of Part Span Shroud

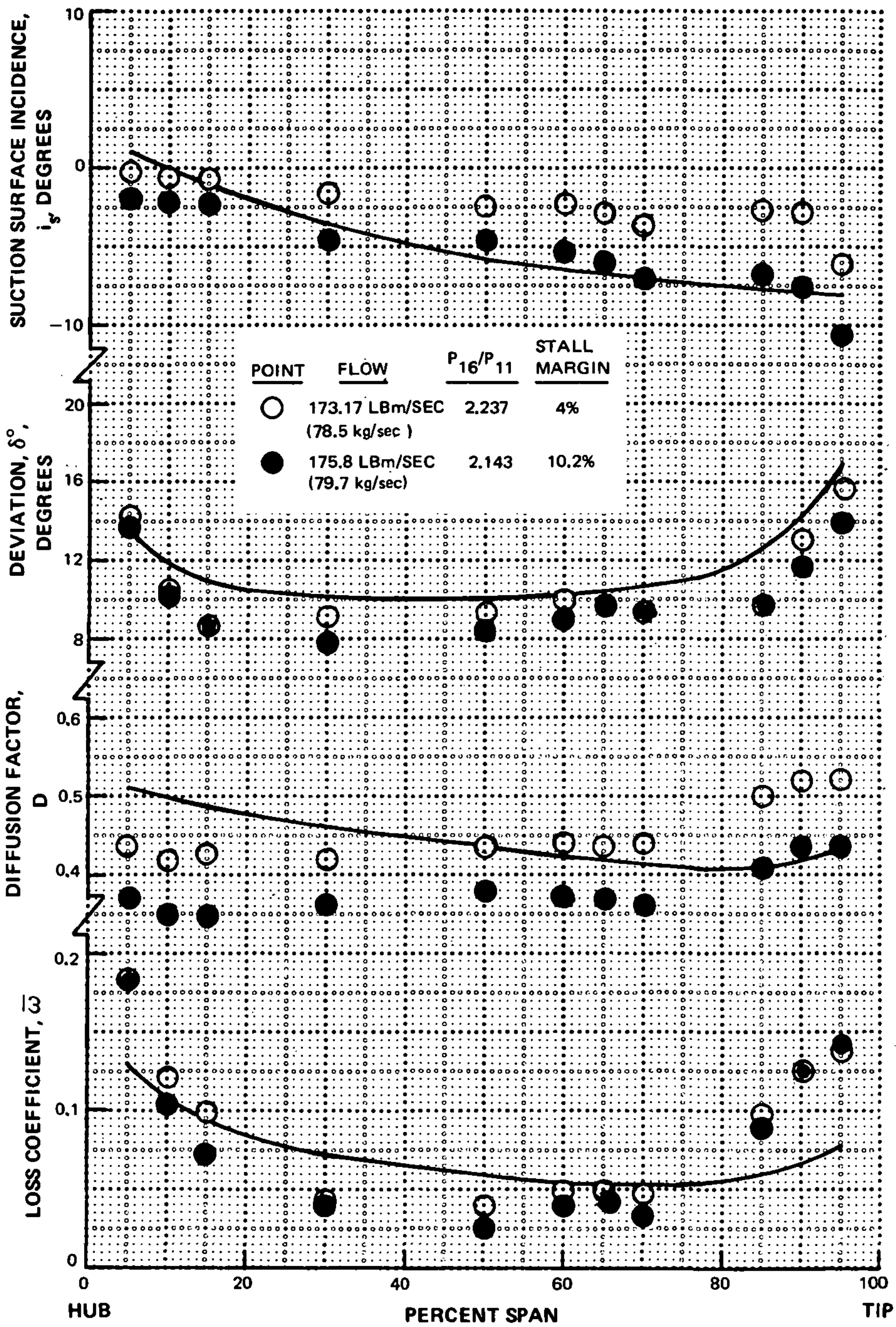


Figure 28 Spanwise Stator Vane Element Performance for Near-Stall and Ten Percent Stall-Margin Operating Points Compared with Design

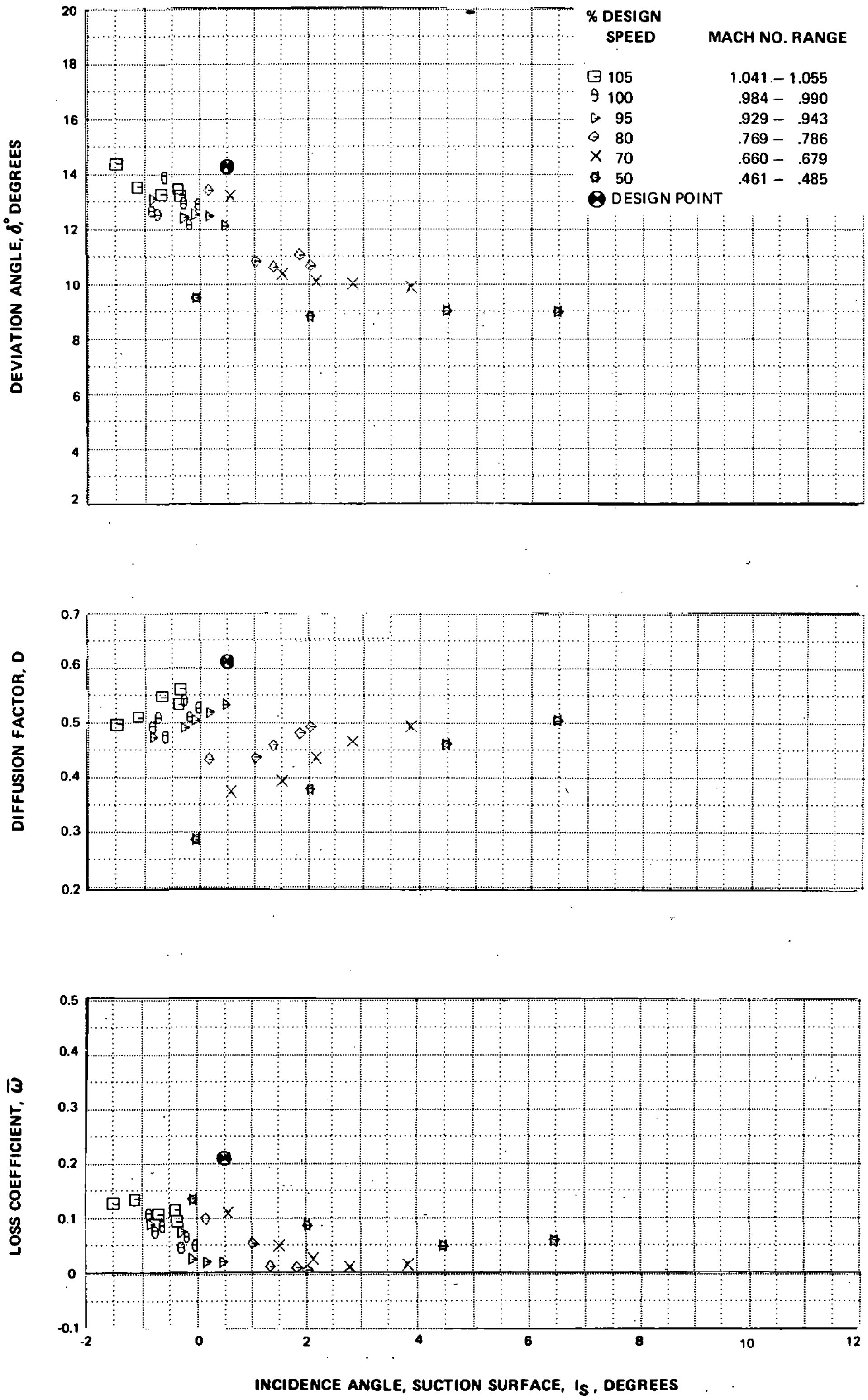


Figure 29a Rotor Blade Element Performance with Uniform Inlet Flow, 5% Span

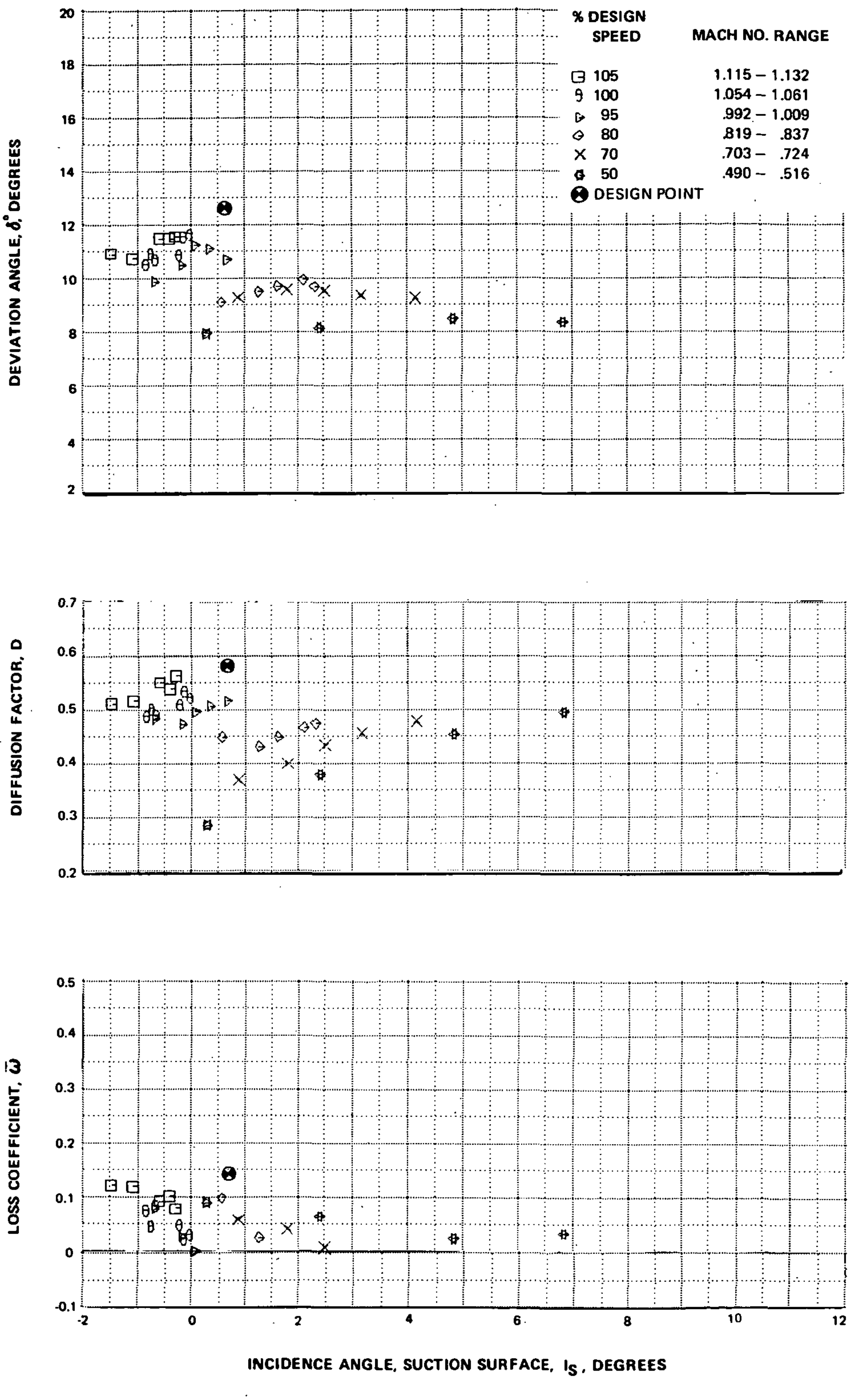


Figure 29b Rotor Blade Element Performance with Uniform Inlet Flow, 10% Span

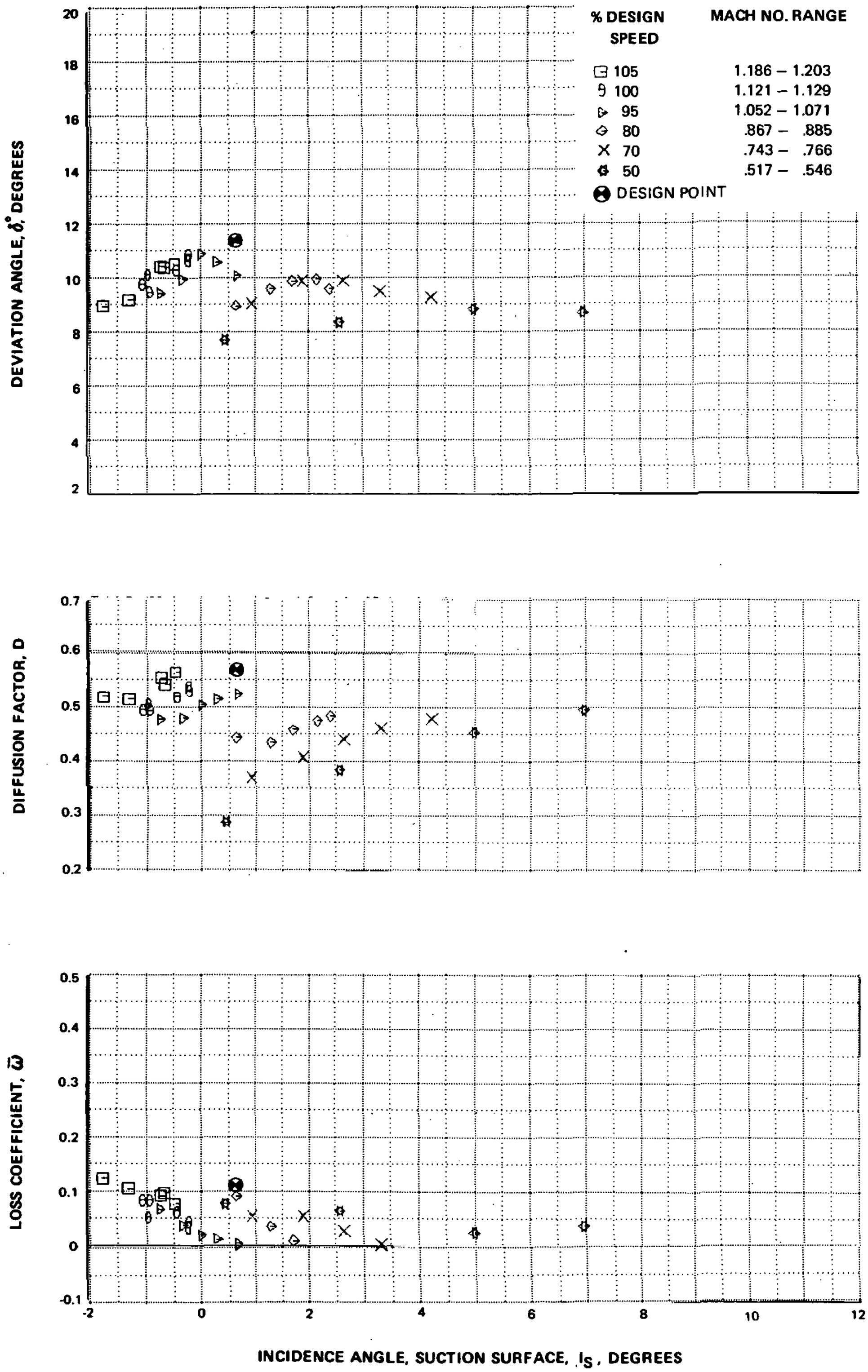


Figure 29c Rotor Blade Element Performance with Uniform Inlet Flow, 15% Span

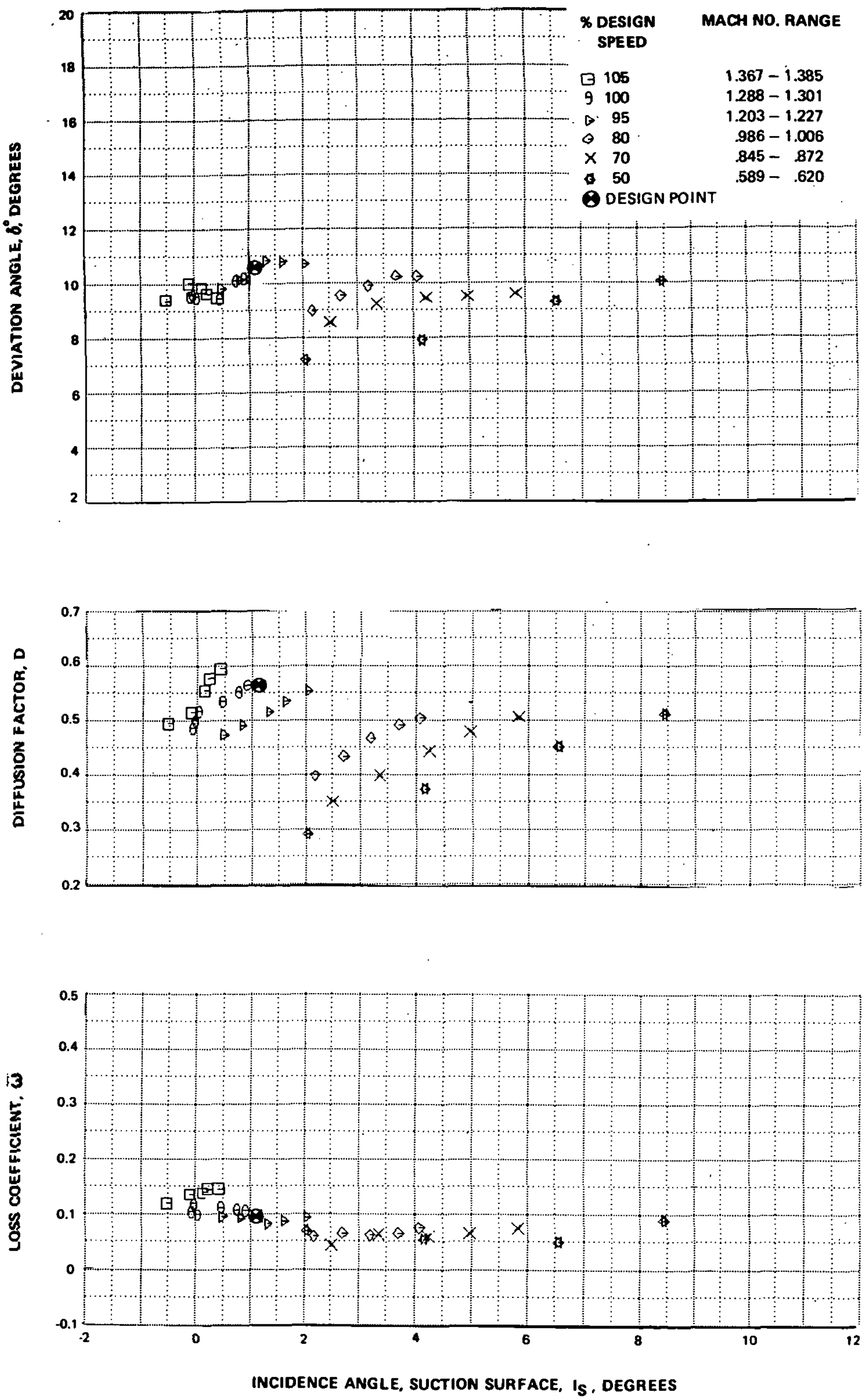


Figure 29d Rotor Blade Element Performance with Uniform Inlet Flow, 30% Span

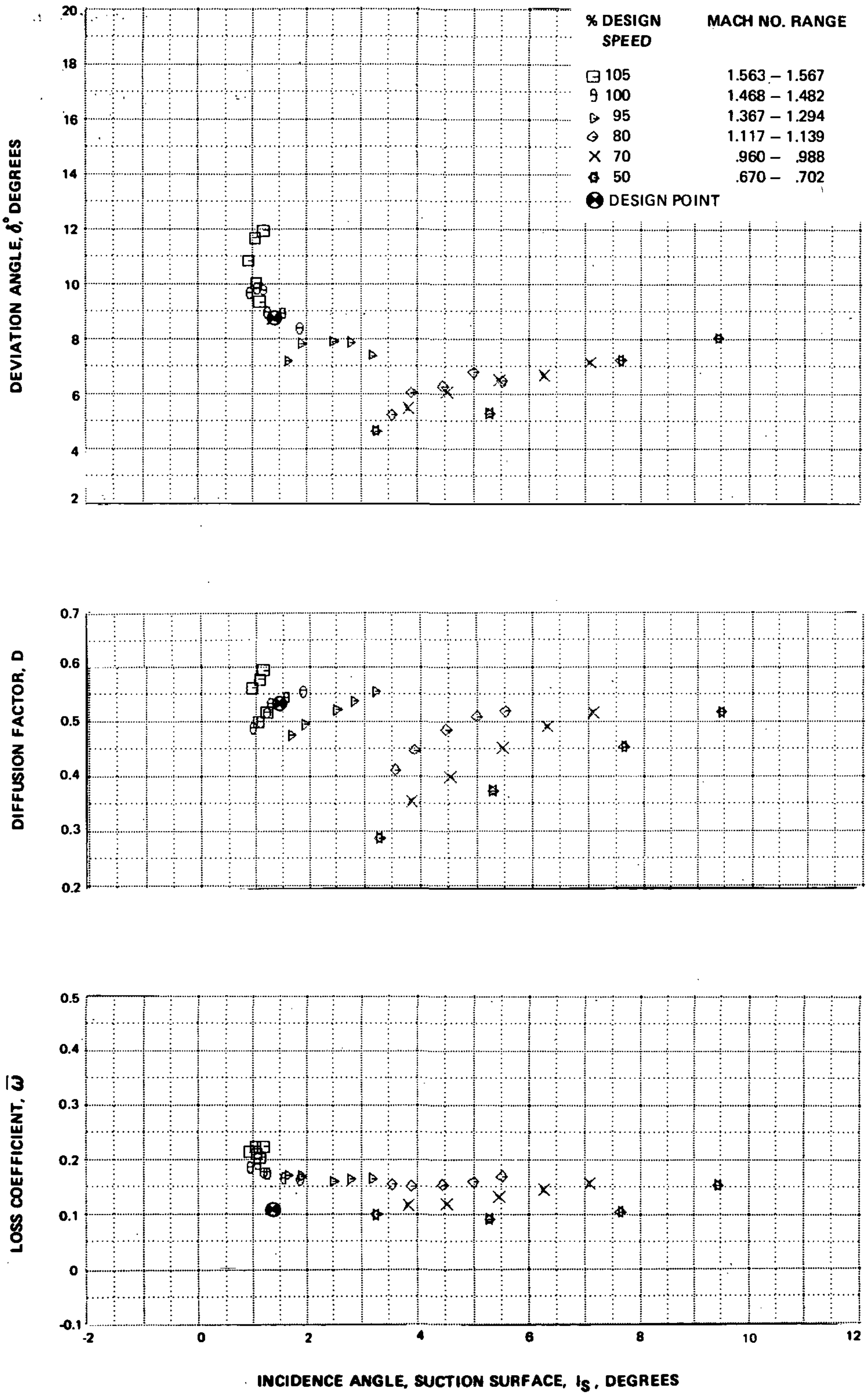


Figure 29e Rotor Blade Element Performance with Uniform Inlet Flow, 50% Span

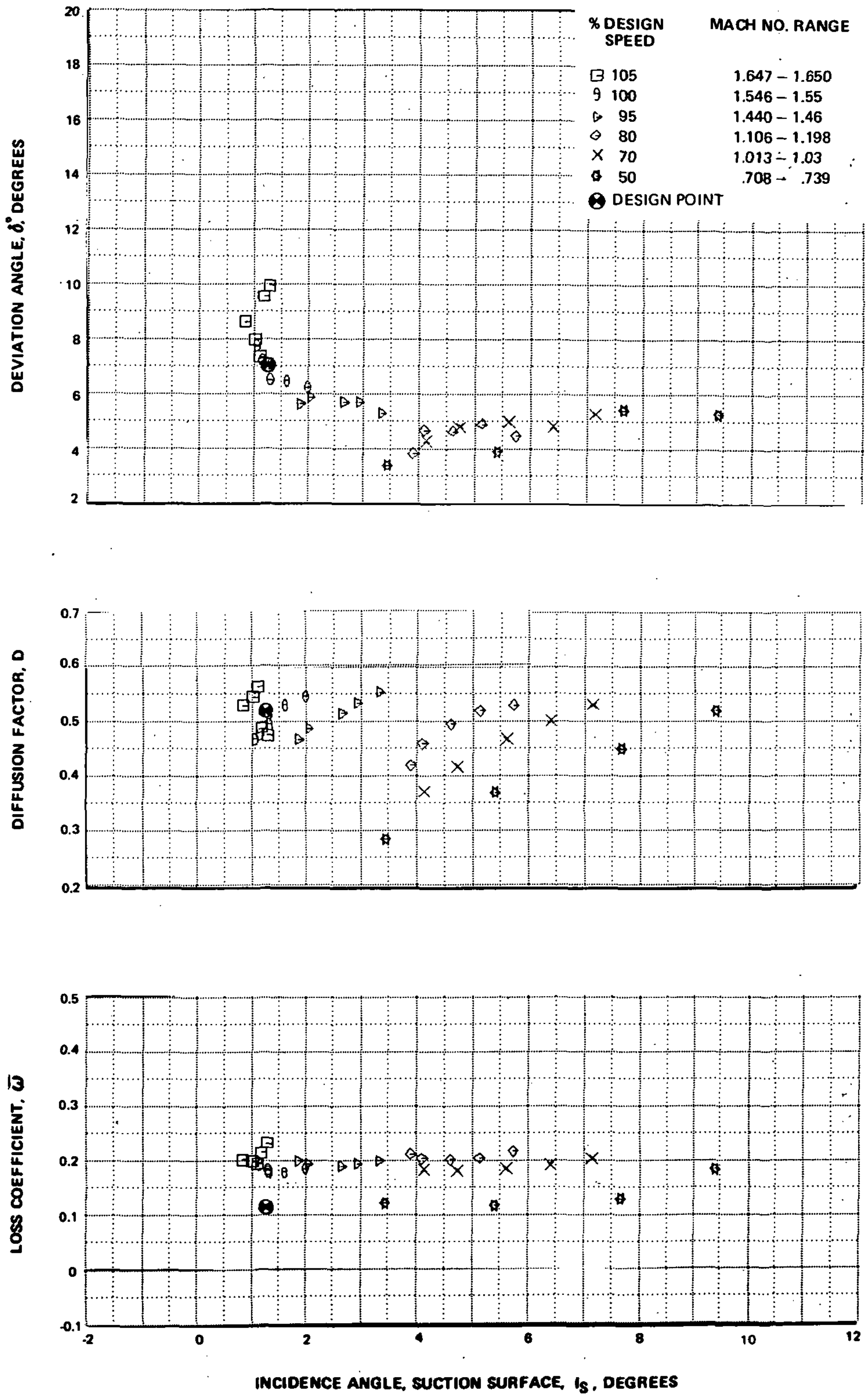


Figure 29f Rotor Blade Element Performance with Uniform Inlet Flow, 60% Span

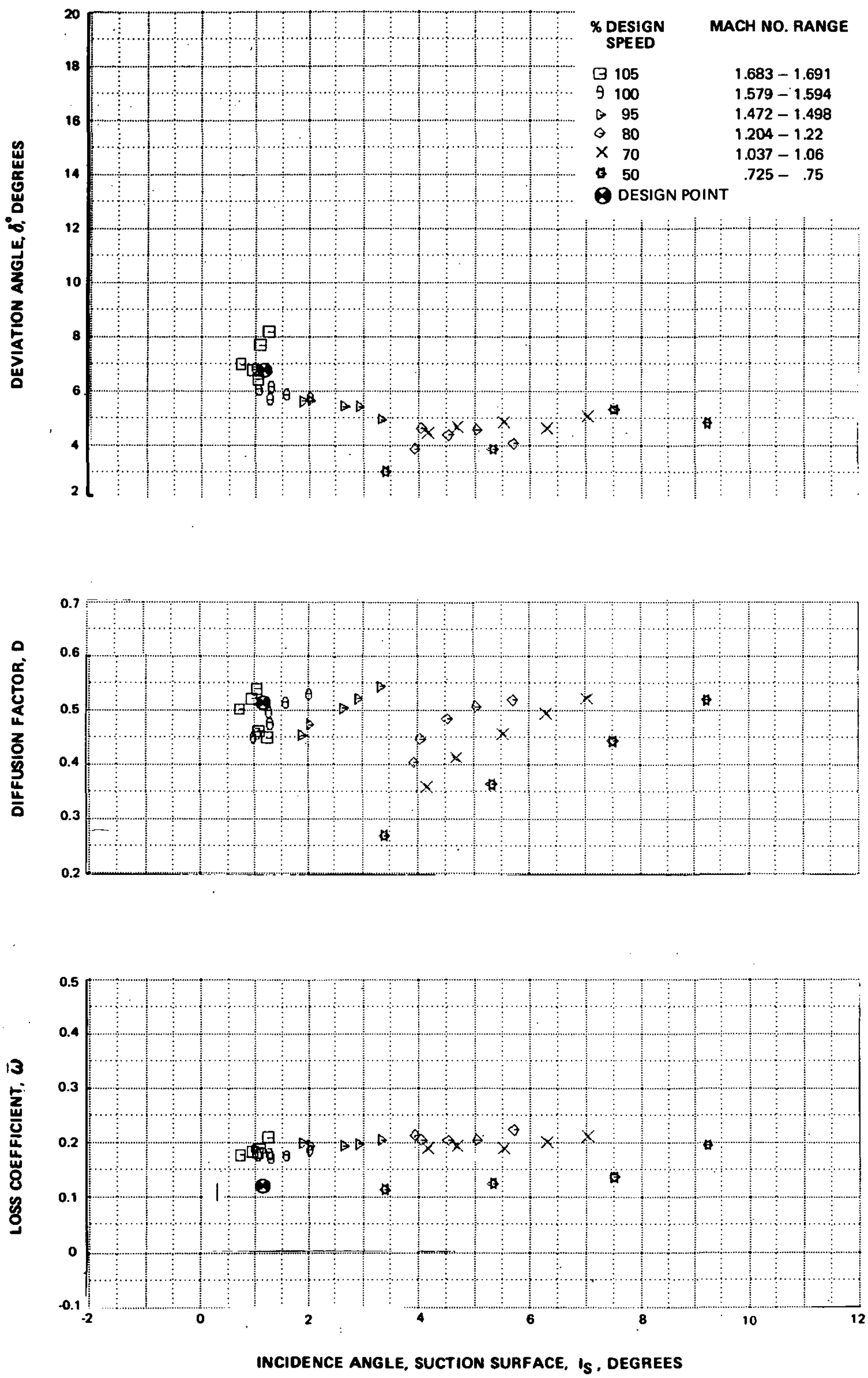


Figure 29g Rotor Blade Element Performance with Uniform Inlet Flow, 65% Span

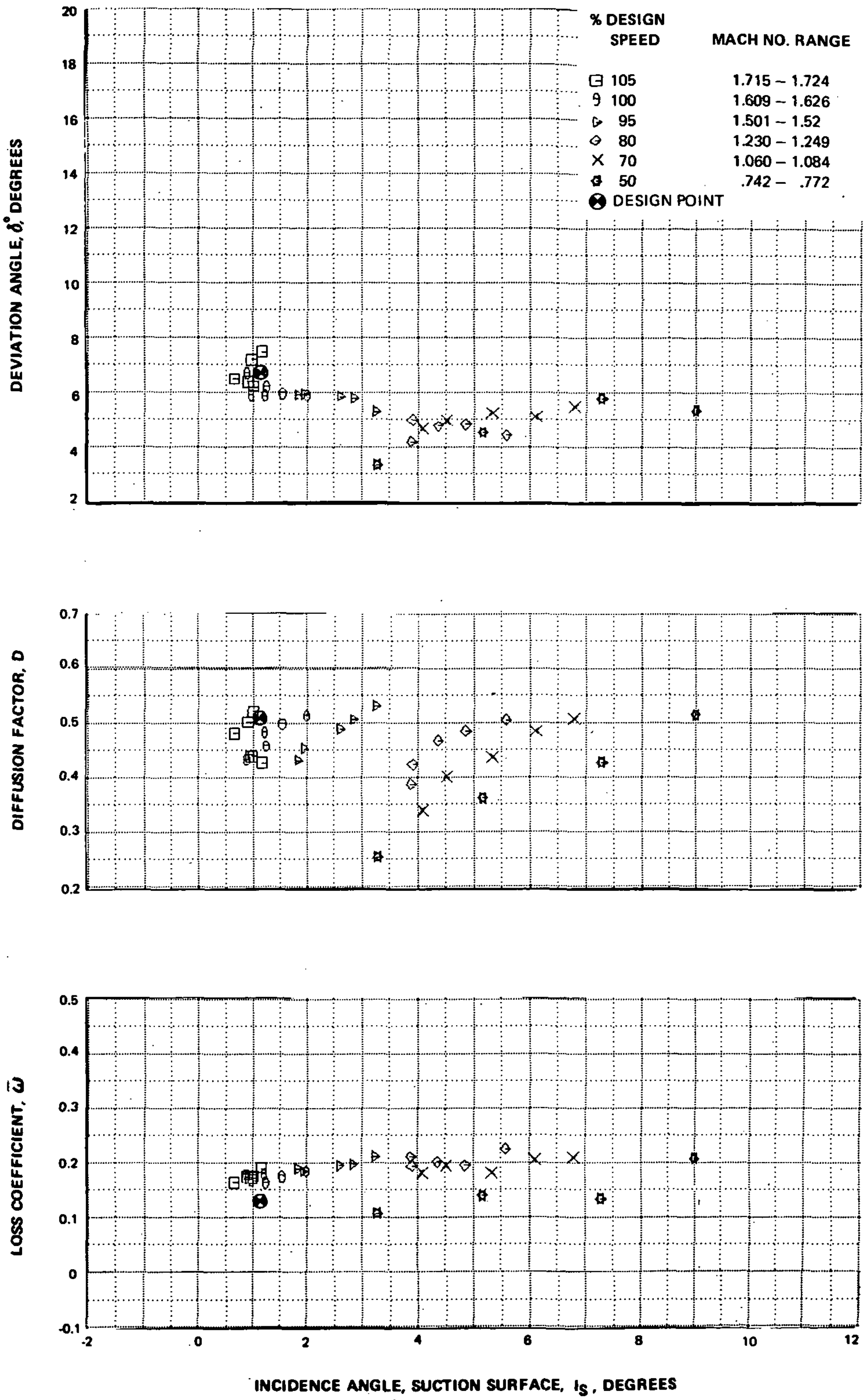


Figure 29h Rotor Blade Element Performance with Uniform Inlet Flow, 70% Span

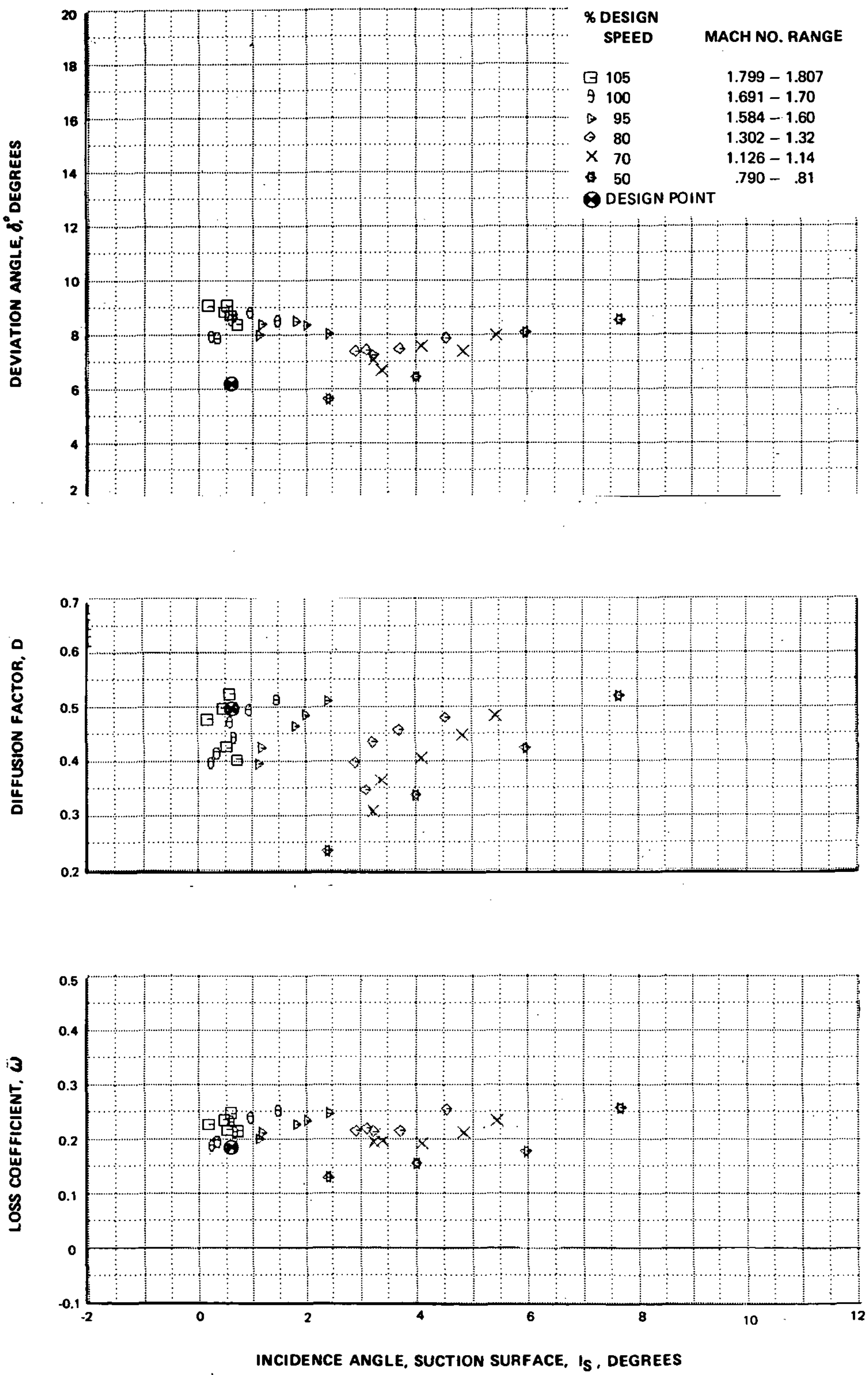


Figure 29i Rotor Blade Element Performance with Uniform Inlet Flow, 85% Span

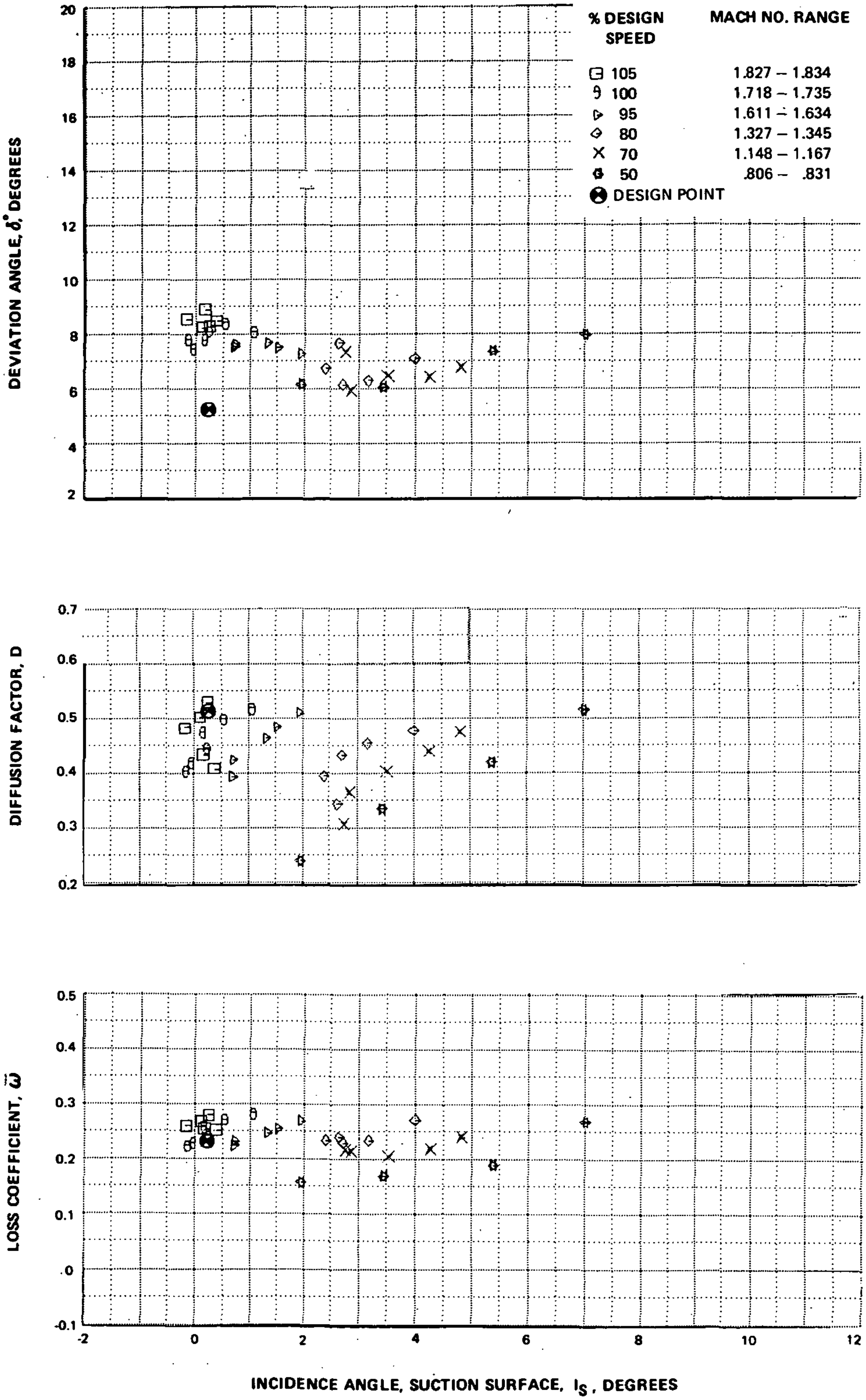


Figure 29 j Rotor Blade Element Performance with Uniform Inlet Flow, 90% Span

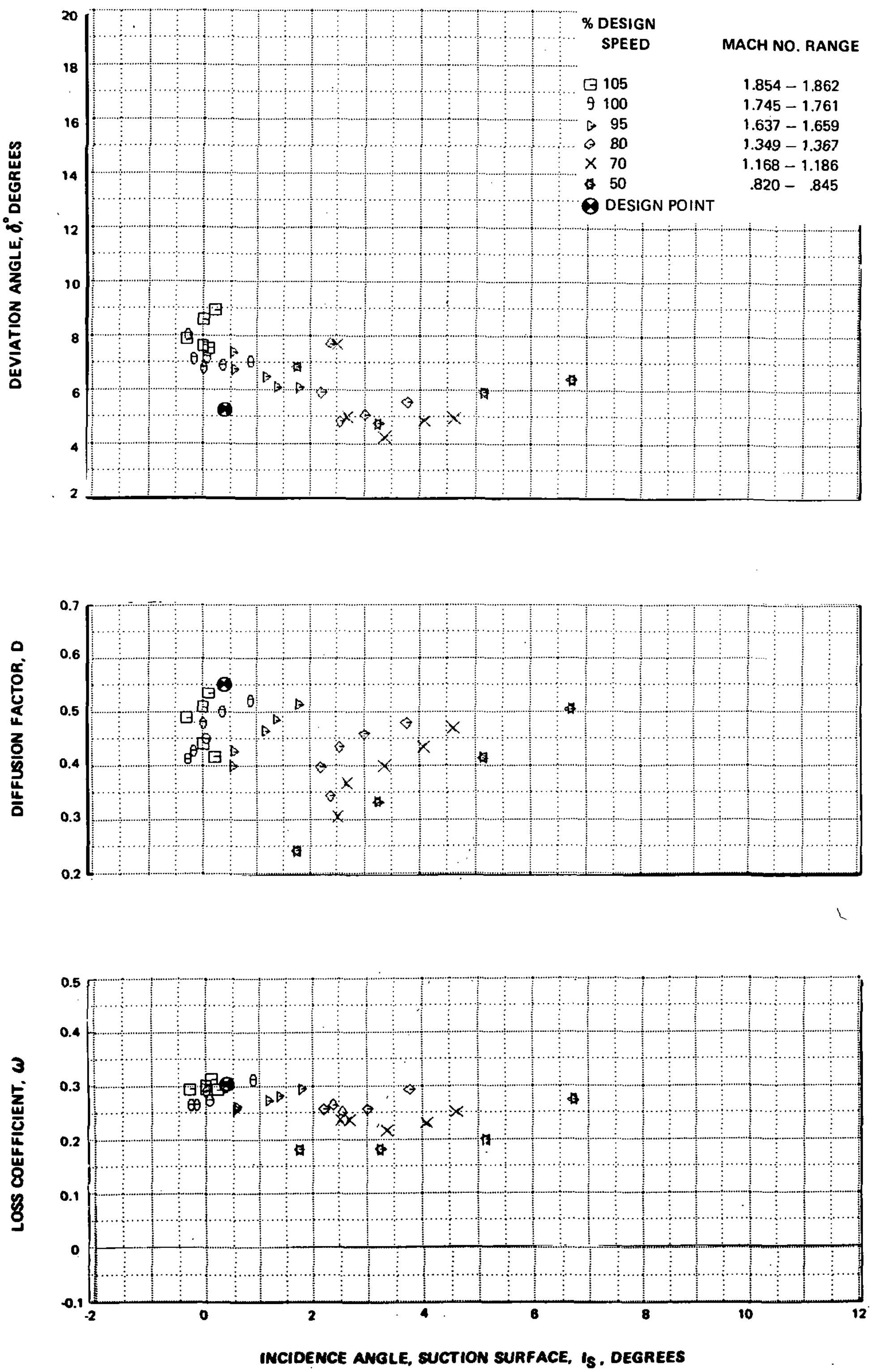


Figure 29k Rotor Blade Element Performance with Uniform Inlet Flow, 95% Span

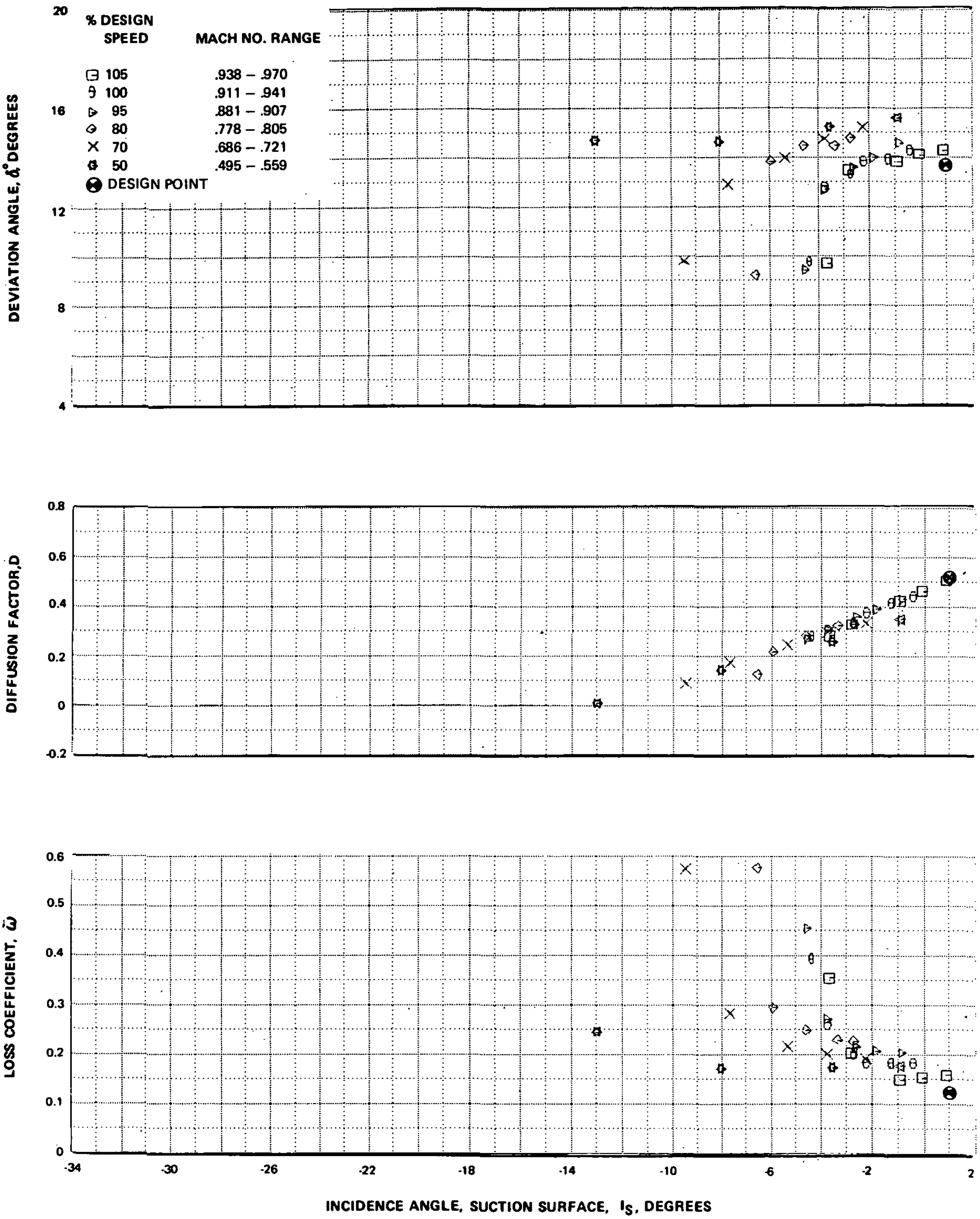


Figure 30a Stator Vane Element Performance with Uniform Inlet Flow, 5% Span

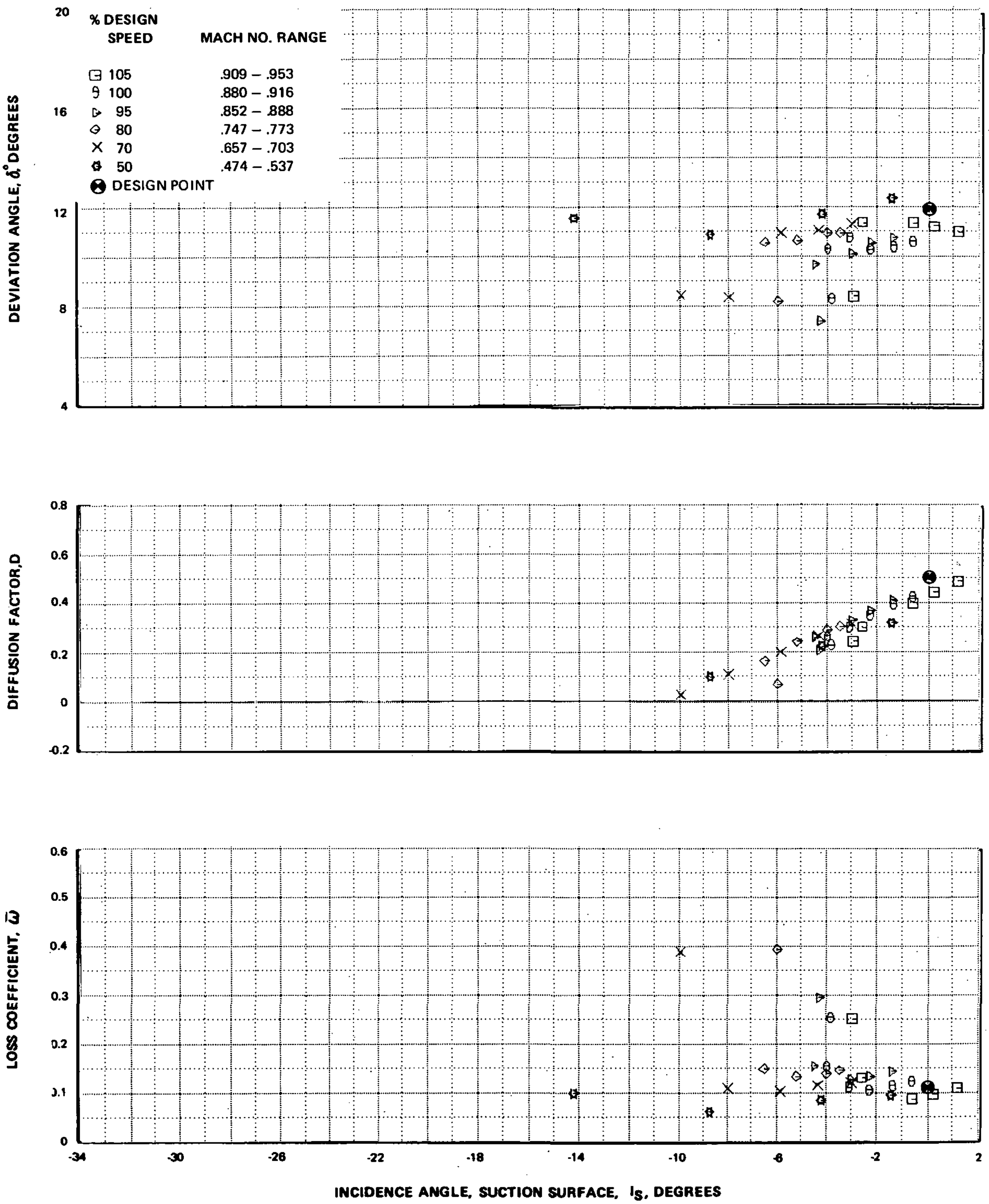


Figure 30b Stator Vane Element Performance with Uniform Inlet Flow, 10% Span

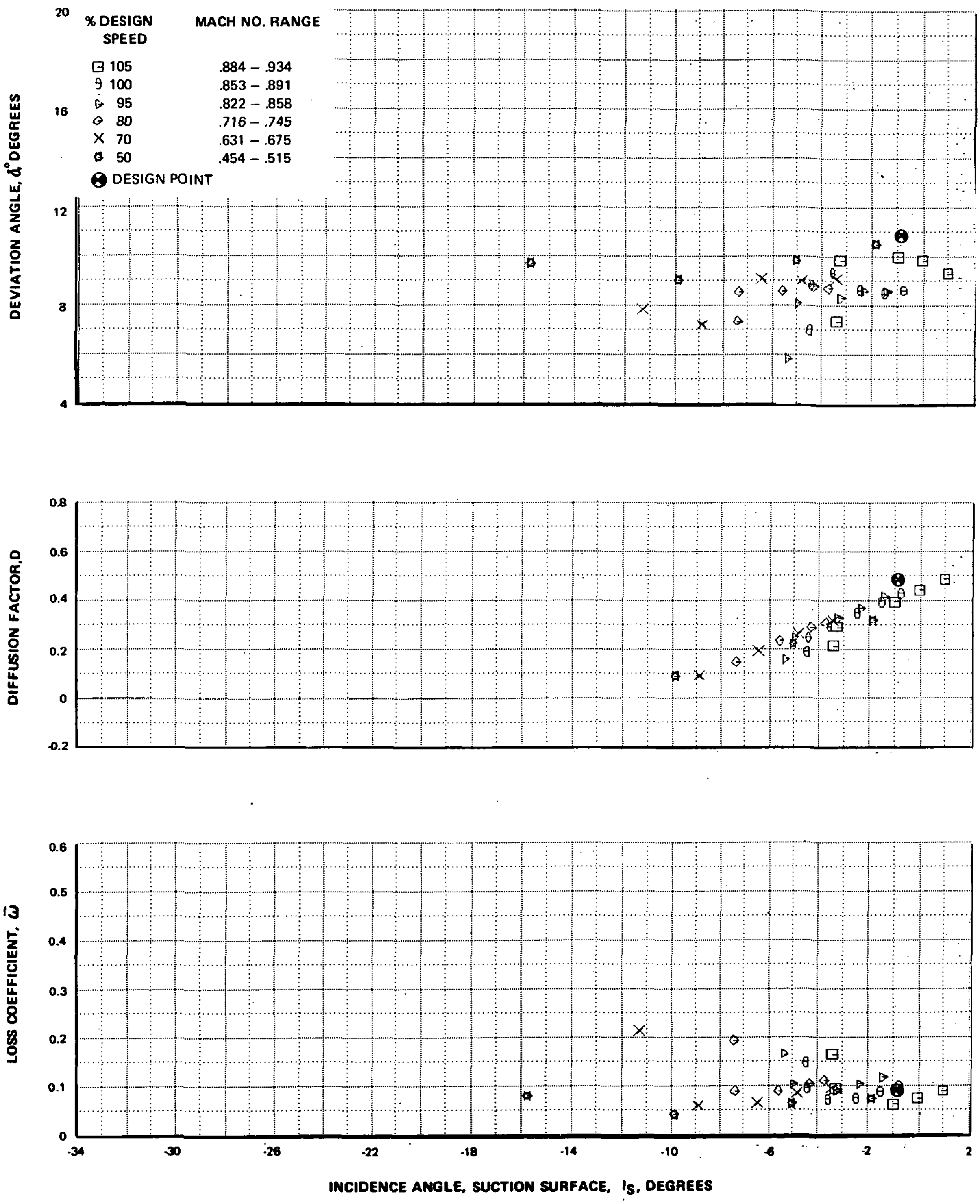


Figure 30c Stator Vane Element Performance with Uniform Inlet Flow, 15% Span

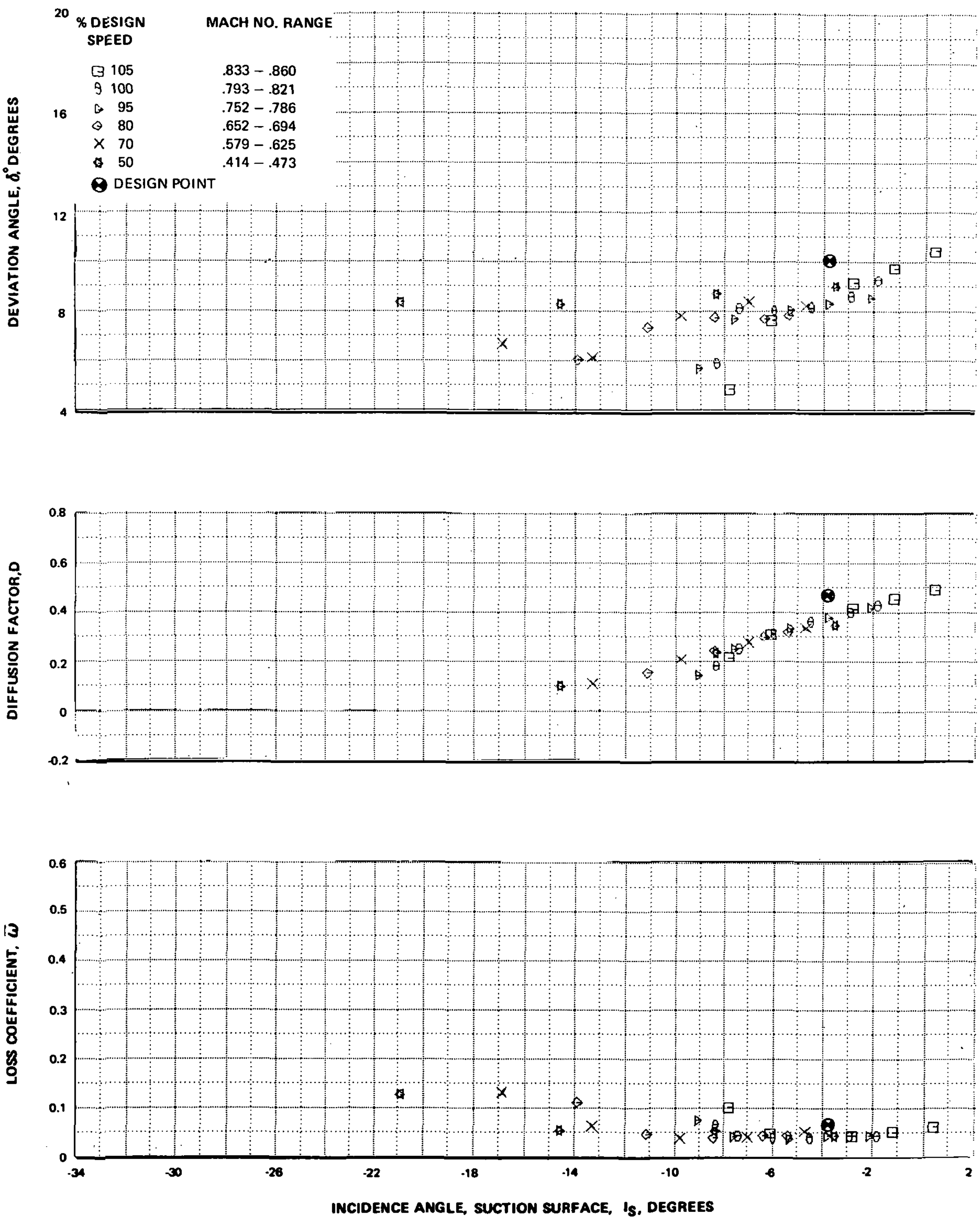


Figure 30d Stator Vane Element Performance with Uniform Inlet Flow, 30% Span

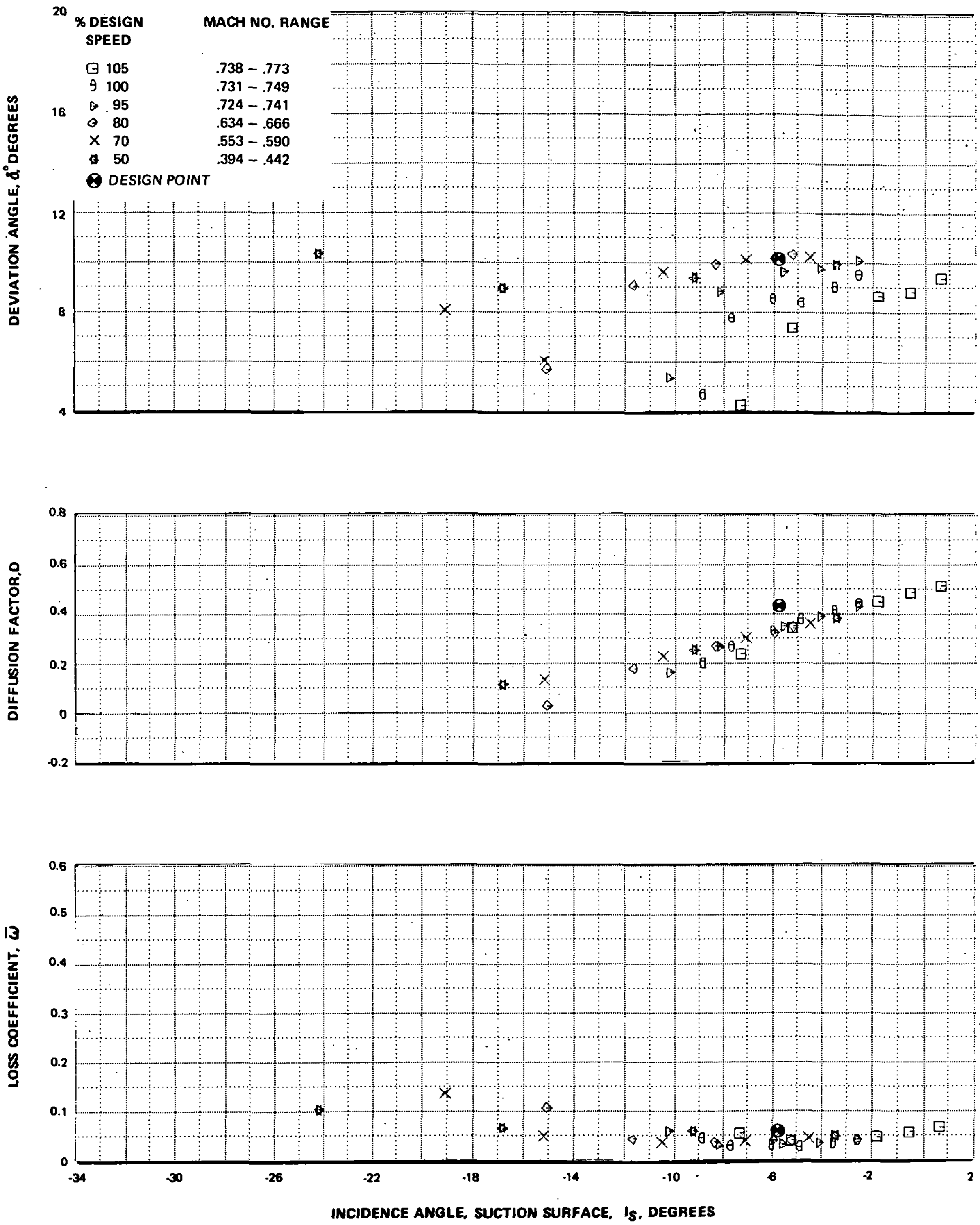


Figure 30e Stator Vane Element Performance with Uniform Inlet Flow, 50% Span

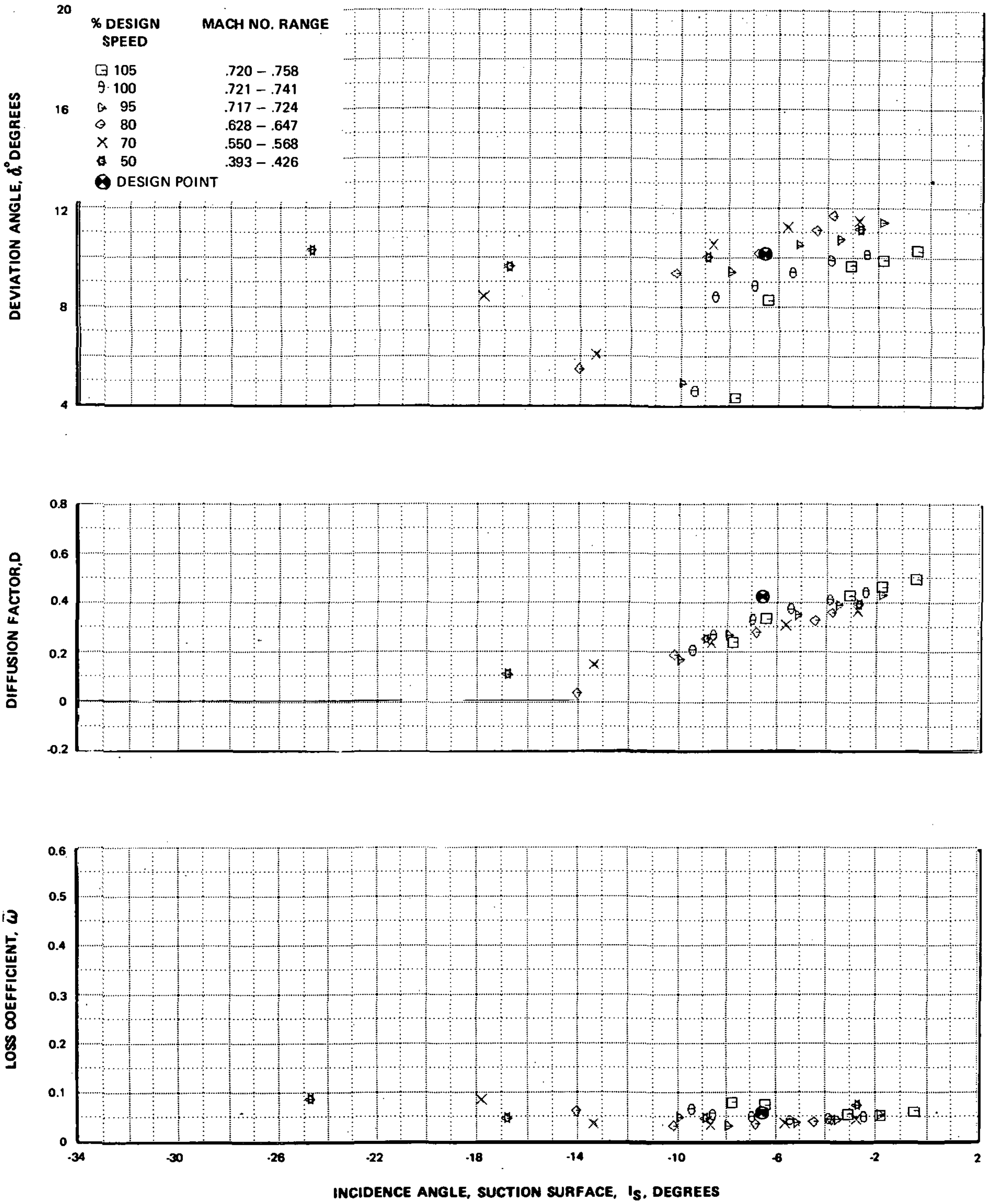


Figure 30f Stator Vane Element Performance with Uniform Inlet Flow, 60% Span

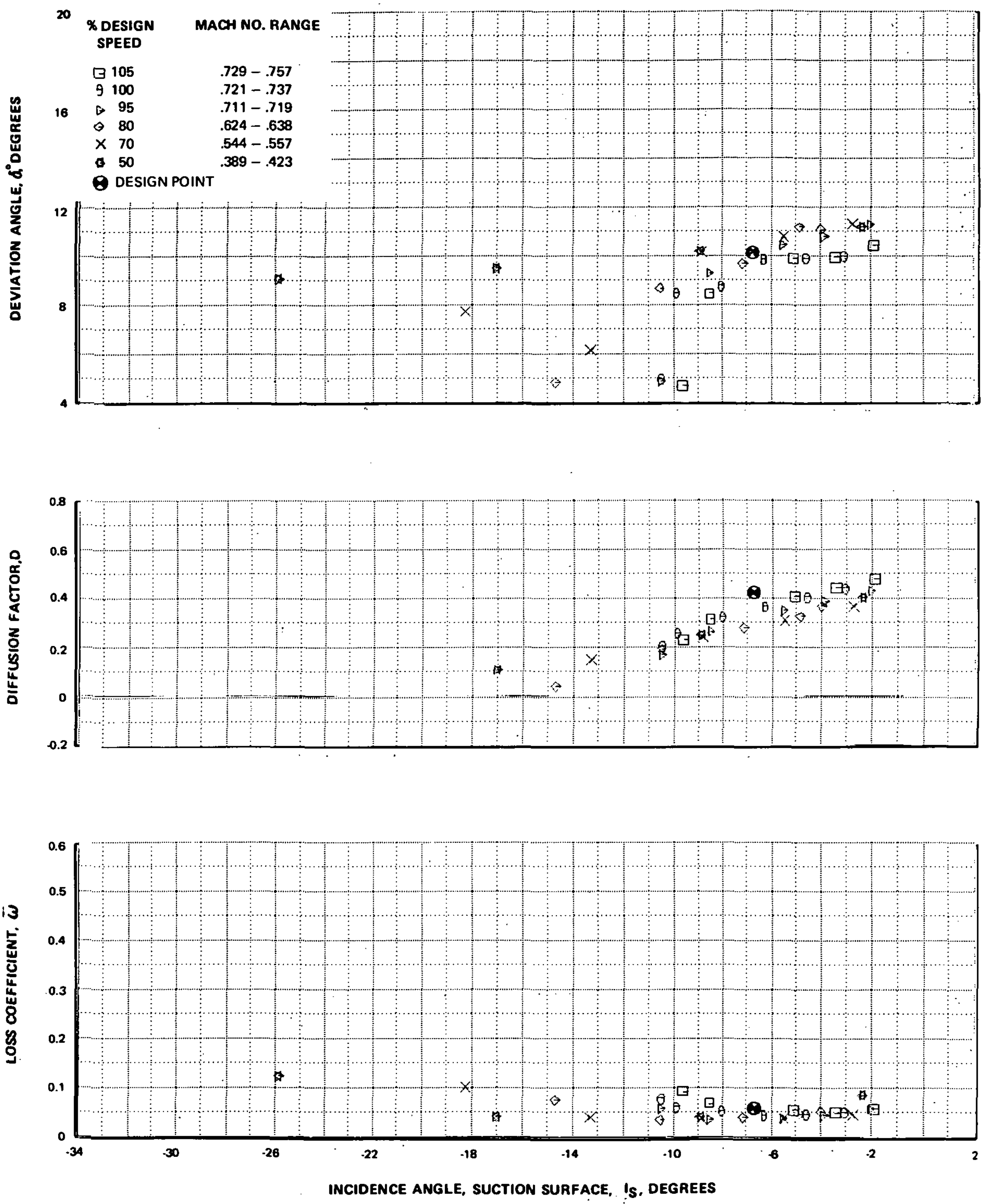


Figure 30g Stator Vane Element Performance with Uniform Inlet Flow, 65% Span

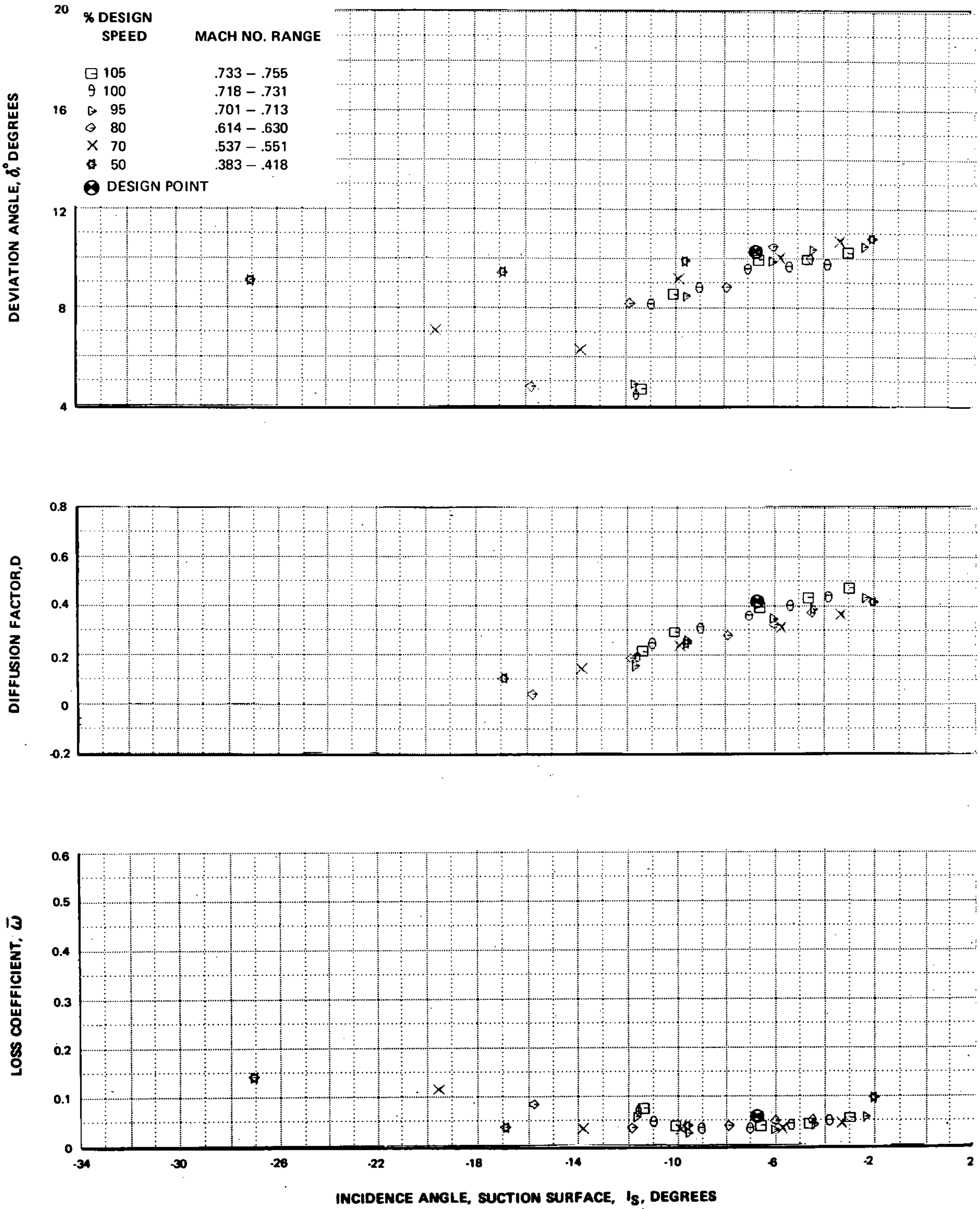


Figure 30h Stator Vane Element Performance with Uniform Inlet Flow, 70% Span

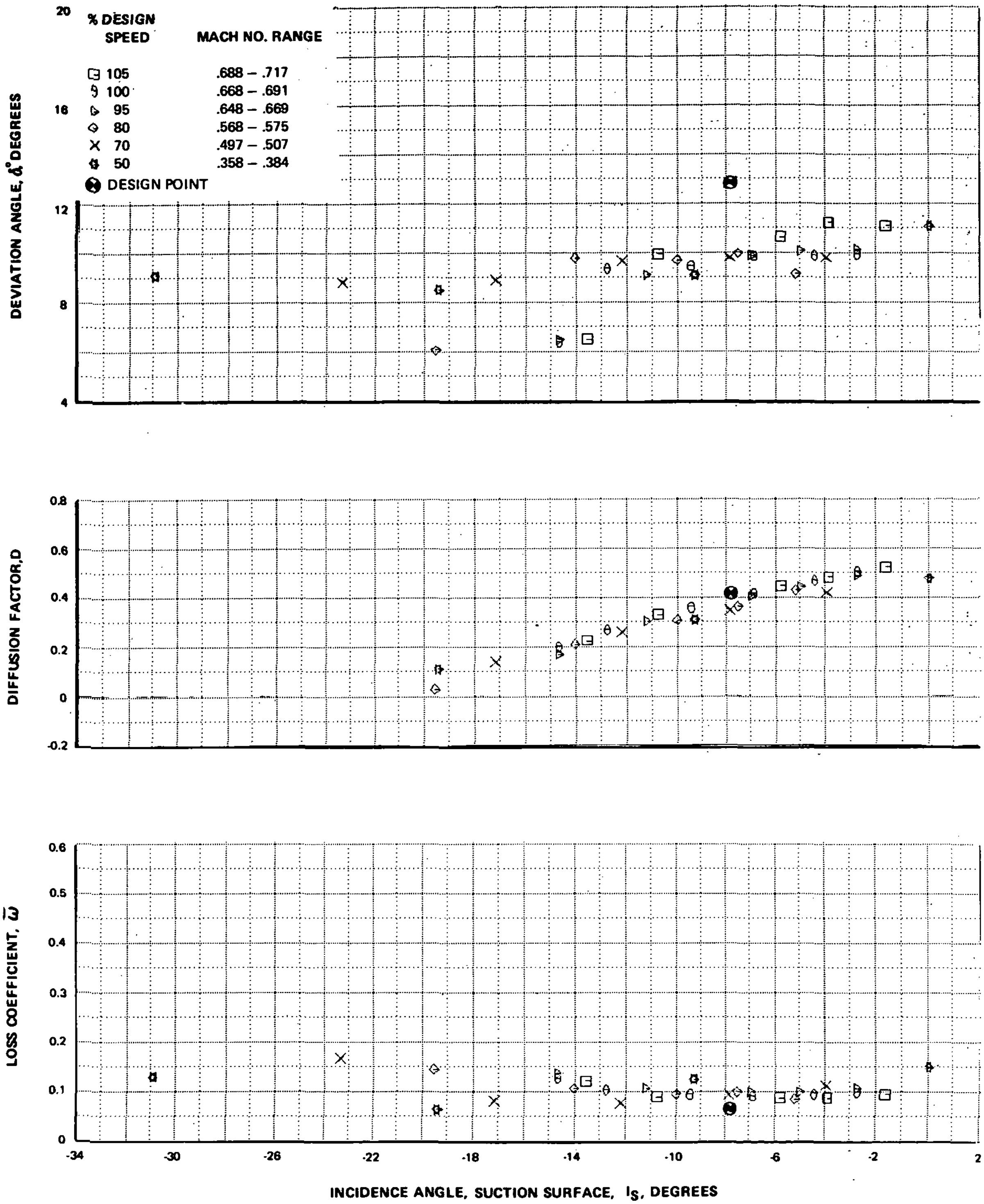


Figure 30i Stator Vane Element Performance with Uniform Inlet Flow, 85% Span

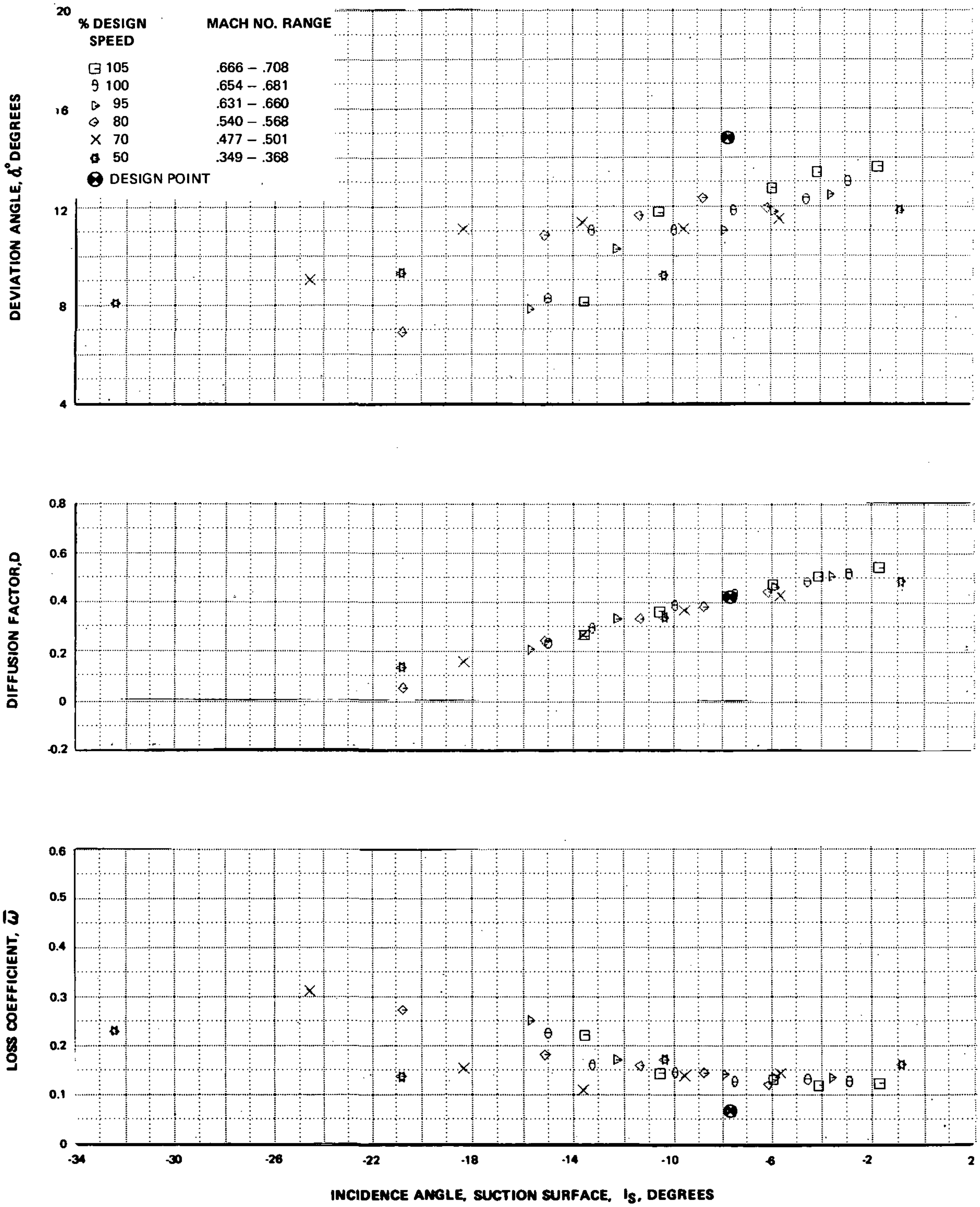


Figure 30j Stator Vane Element Performance with Uniform Inlet Flow, 90% Span

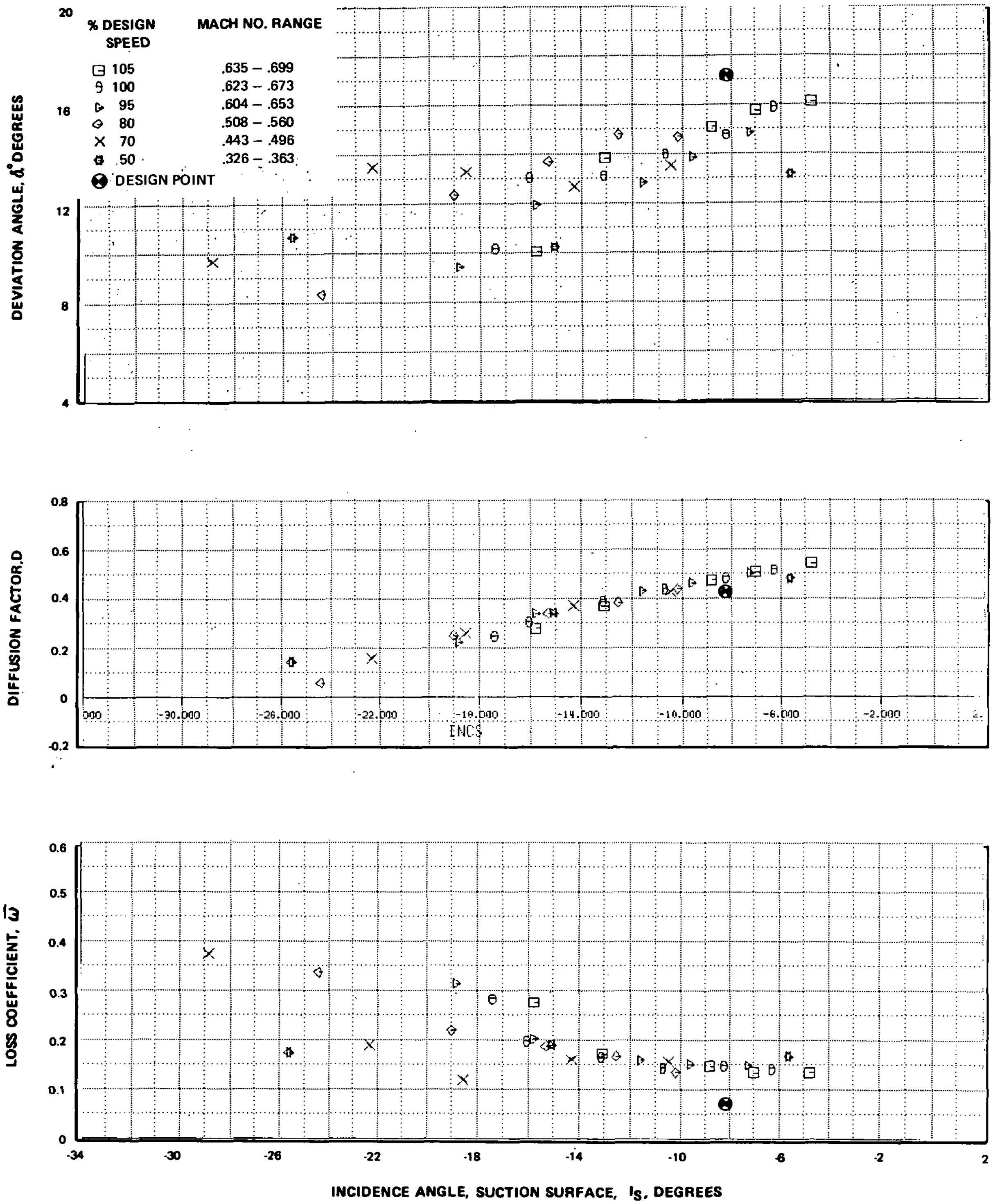


Figure 30k Stator Vane Element Performance with Uniform Inlet Flow, 95% Span

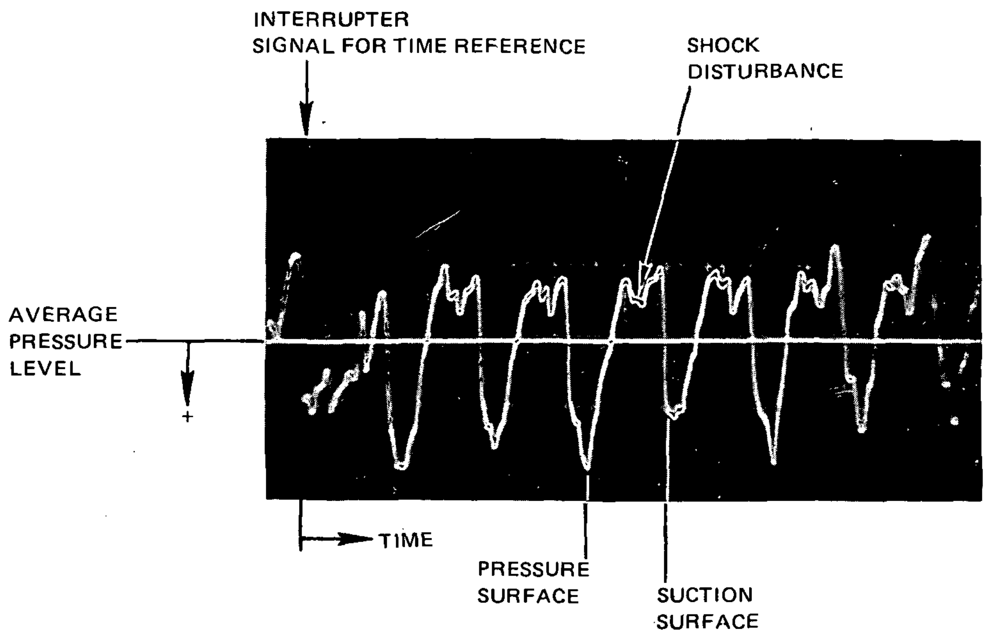


Figure 31 Sample High Response Signal Used in Determining Pressure Contours

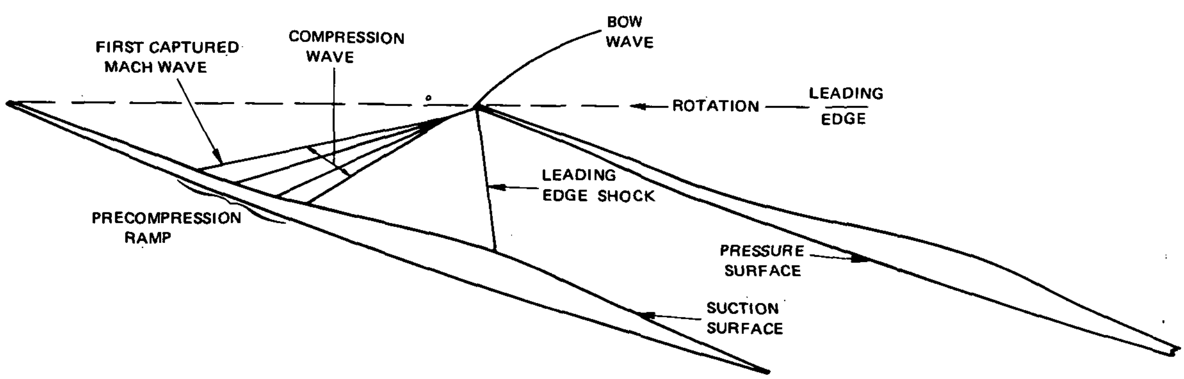


Figure 32 Design Shock Wave Pattern

STATIC PRESSURE CODE

SYMBOL	PSIA RANGE		
0	2.76	–	5.86
1	5.86	–	8.95
2	8.95	–	12.05
3	12.05	–	15.15
4	15.15	–	18.24
5	18.24	–	21.34
6	21.34	–	24.44
7	24.44	–	27.53
8	27.53	–	30.63
9	30.63	–	33.73

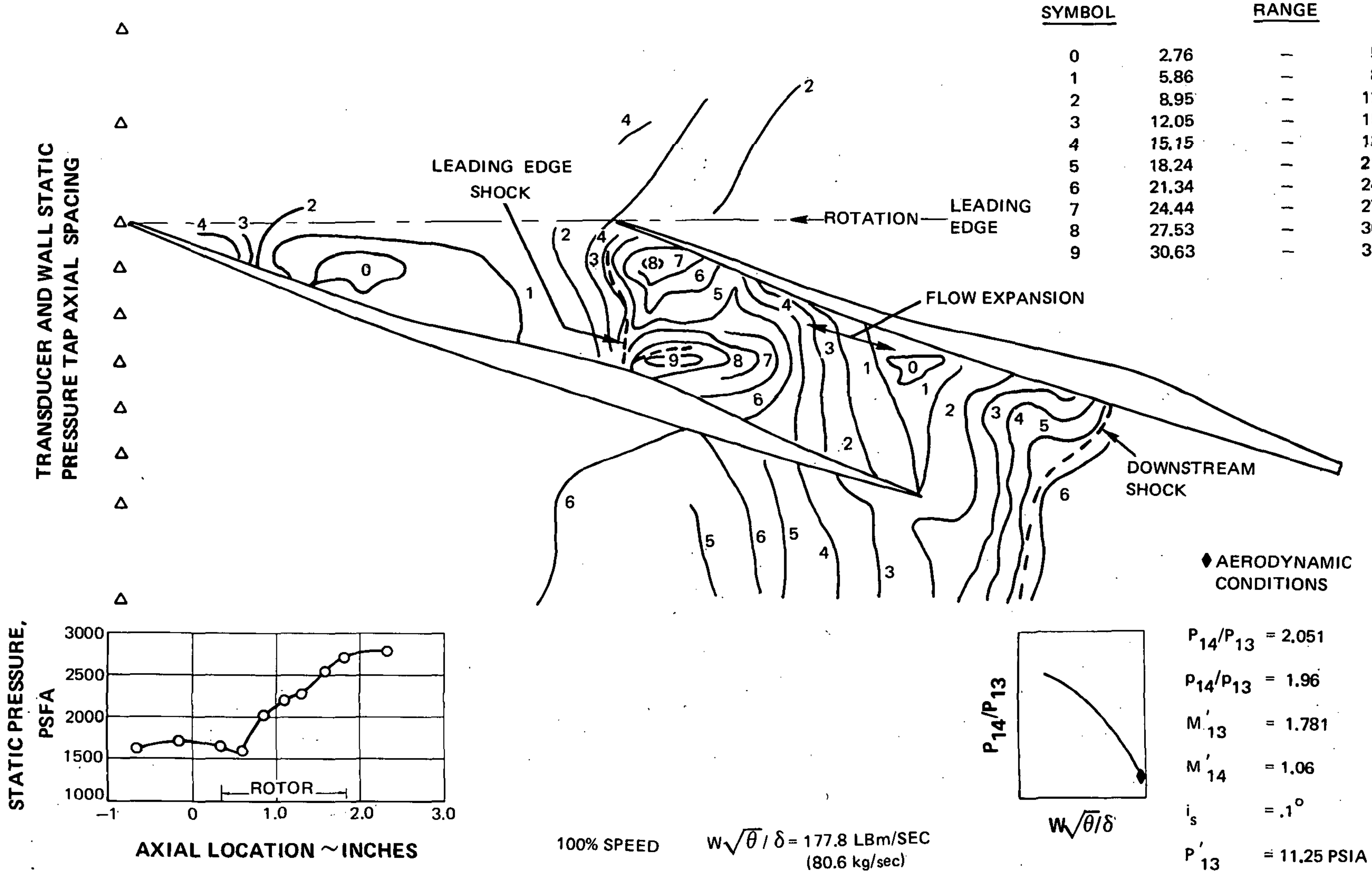


Figure 33 Rotor Blade Tip Static Pressure Contours, 100% Design Speed, $W\sqrt{\theta}/\delta$ = 177.8 lbm/sec

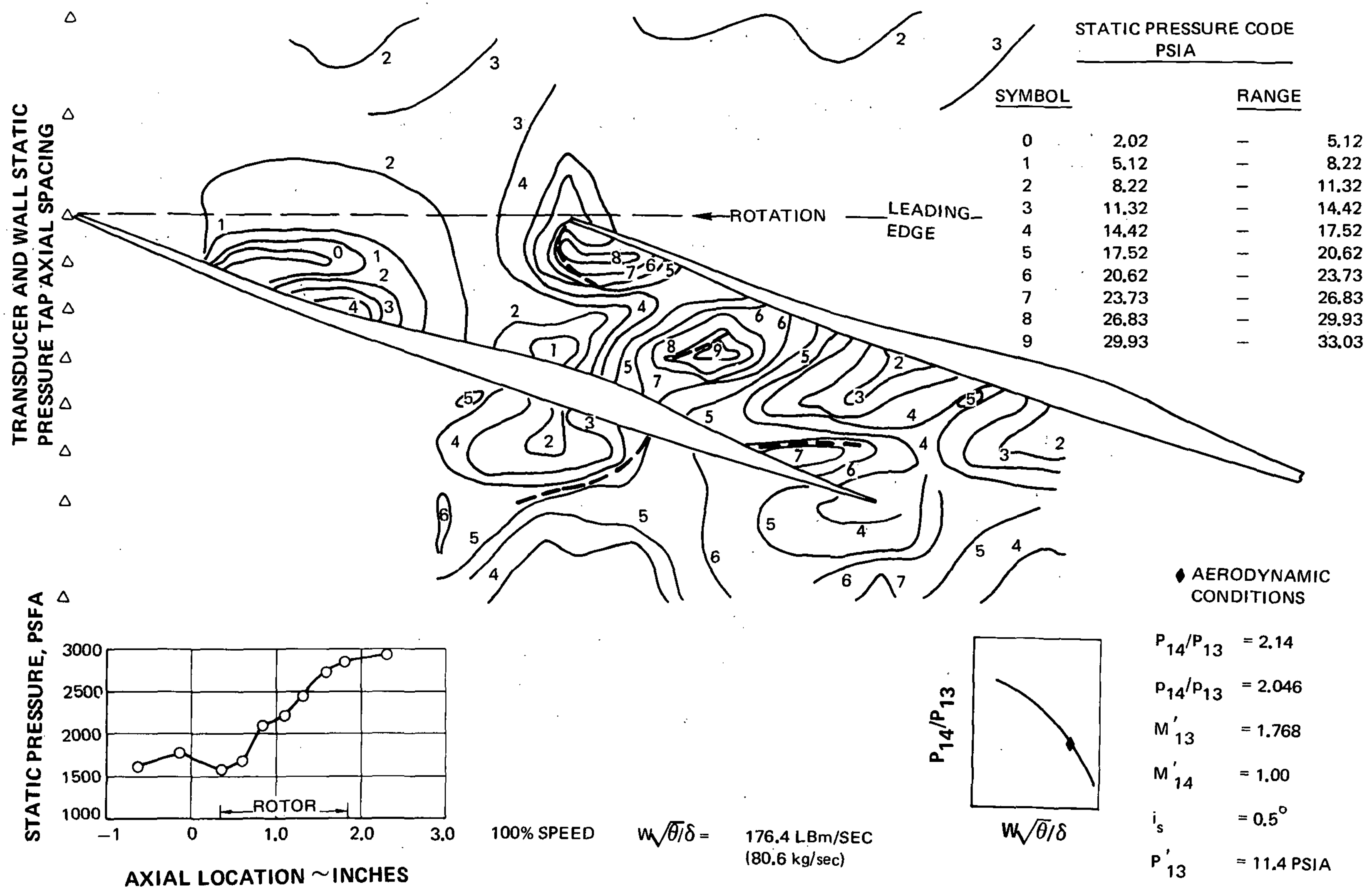


Figure 34 Rotor Blade Tip Static Pressure Contours, 100% Design Speed, $W\sqrt{\theta}/\delta = 176.4$ lbm/sec

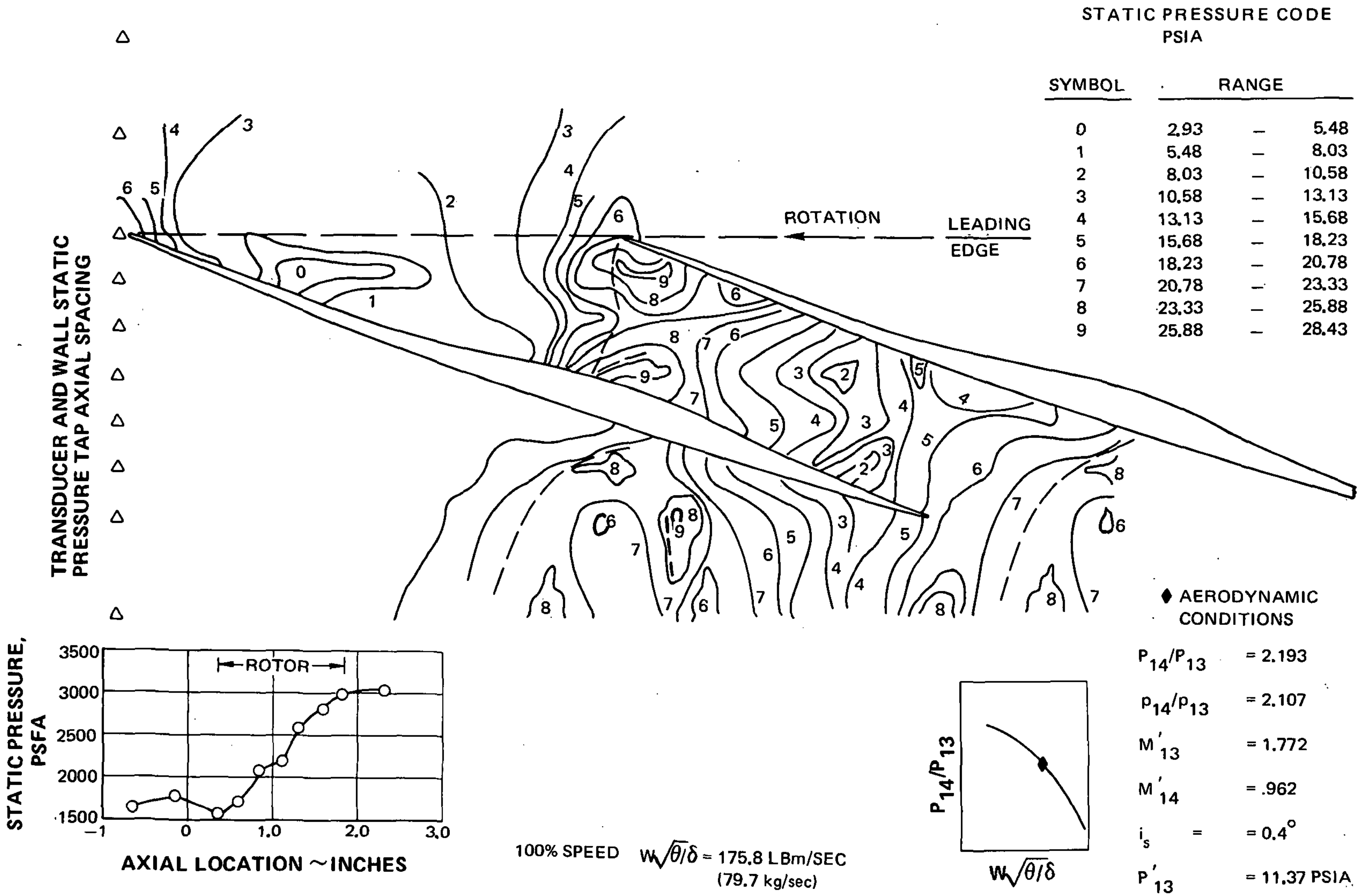


Figure 35 Rotor Blade Tip Static Pressure Contours, 100% Design Speed, $W\sqrt{\theta}/\delta$ = 175.8 lbm/sec

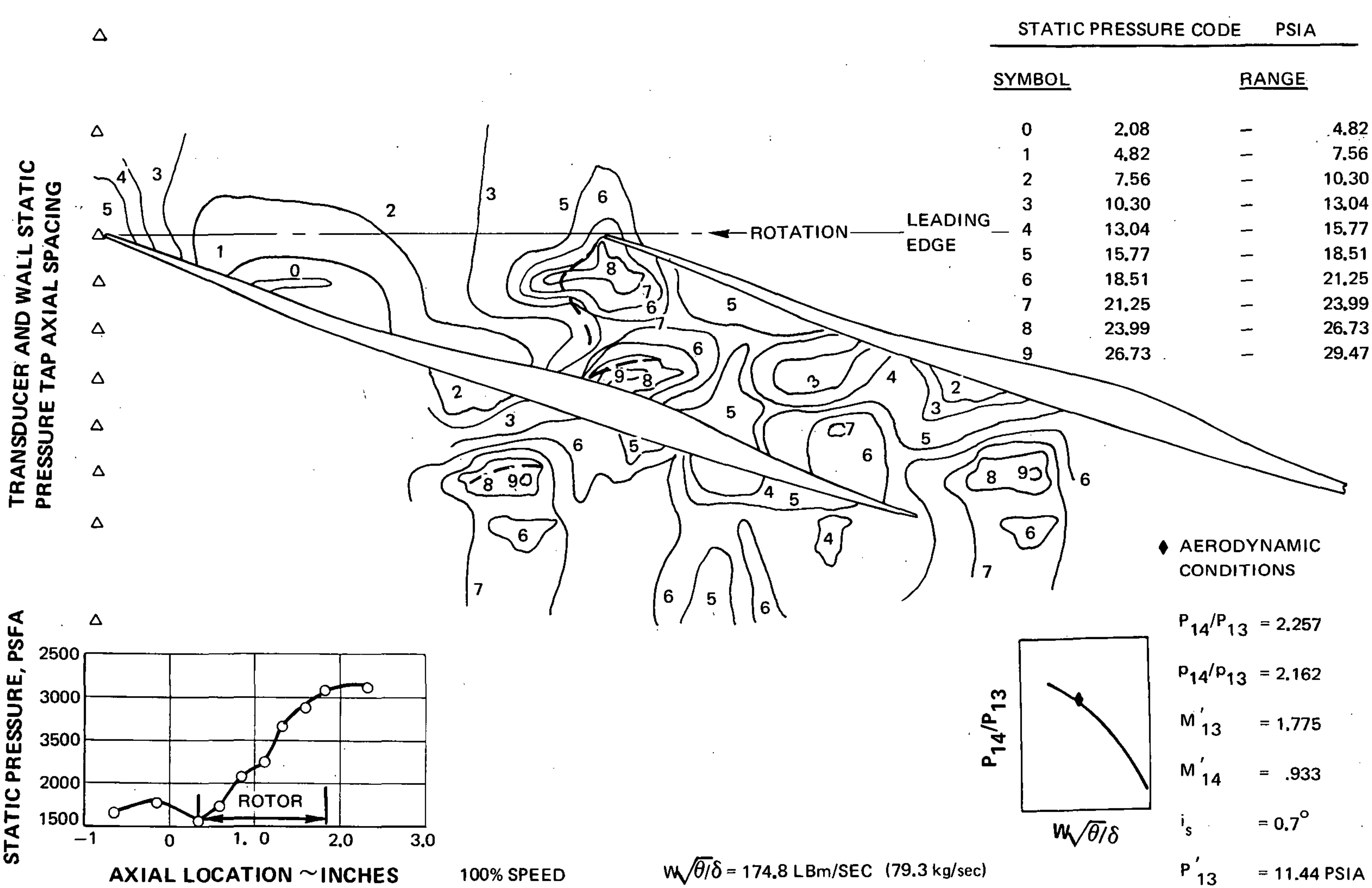


Figure 36 Rotor Blade Tip Static Pressure Contours, 100% Design Speed, $W\sqrt{\theta}/\delta$ = 174.8 lbm/sec

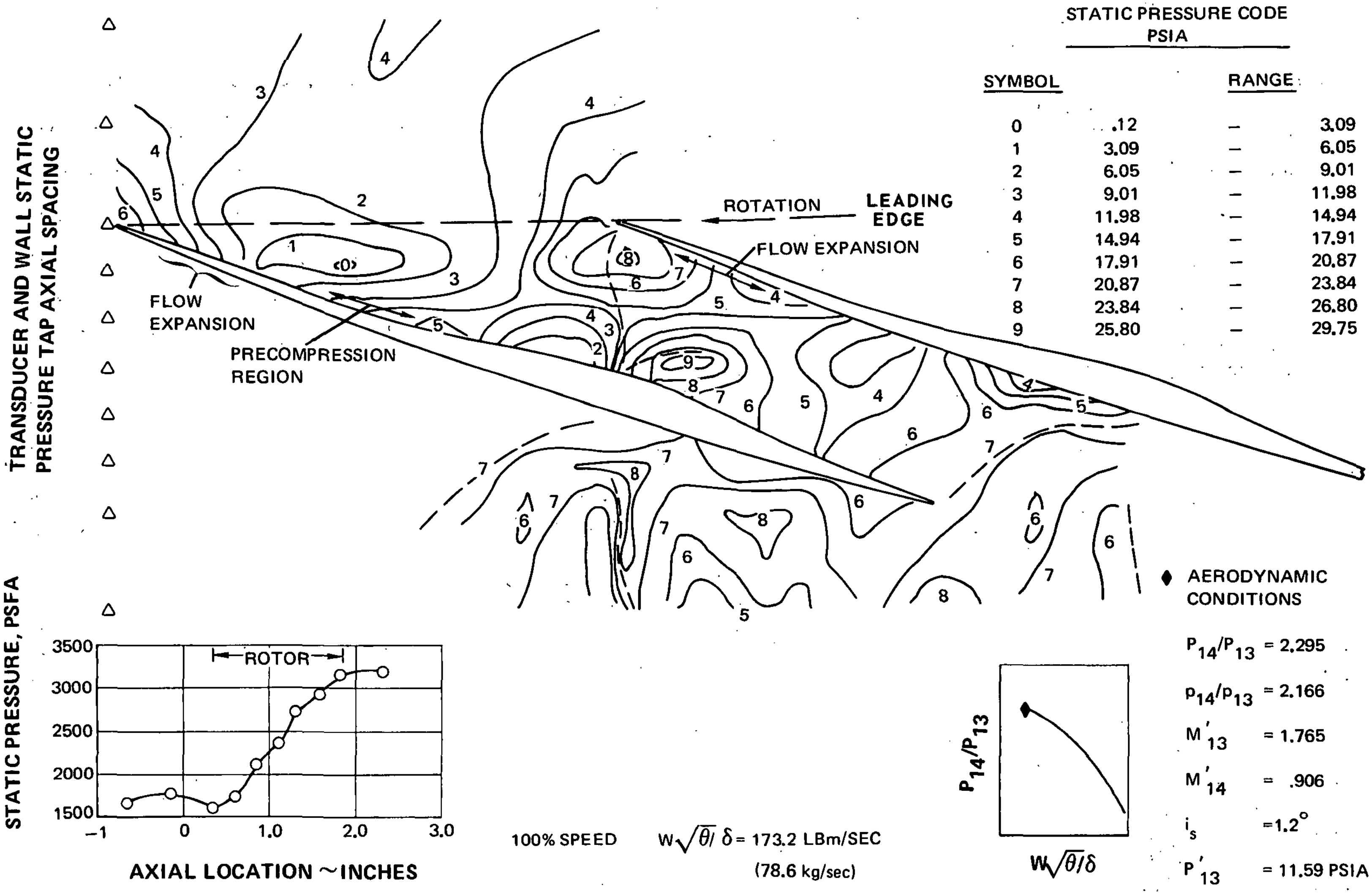
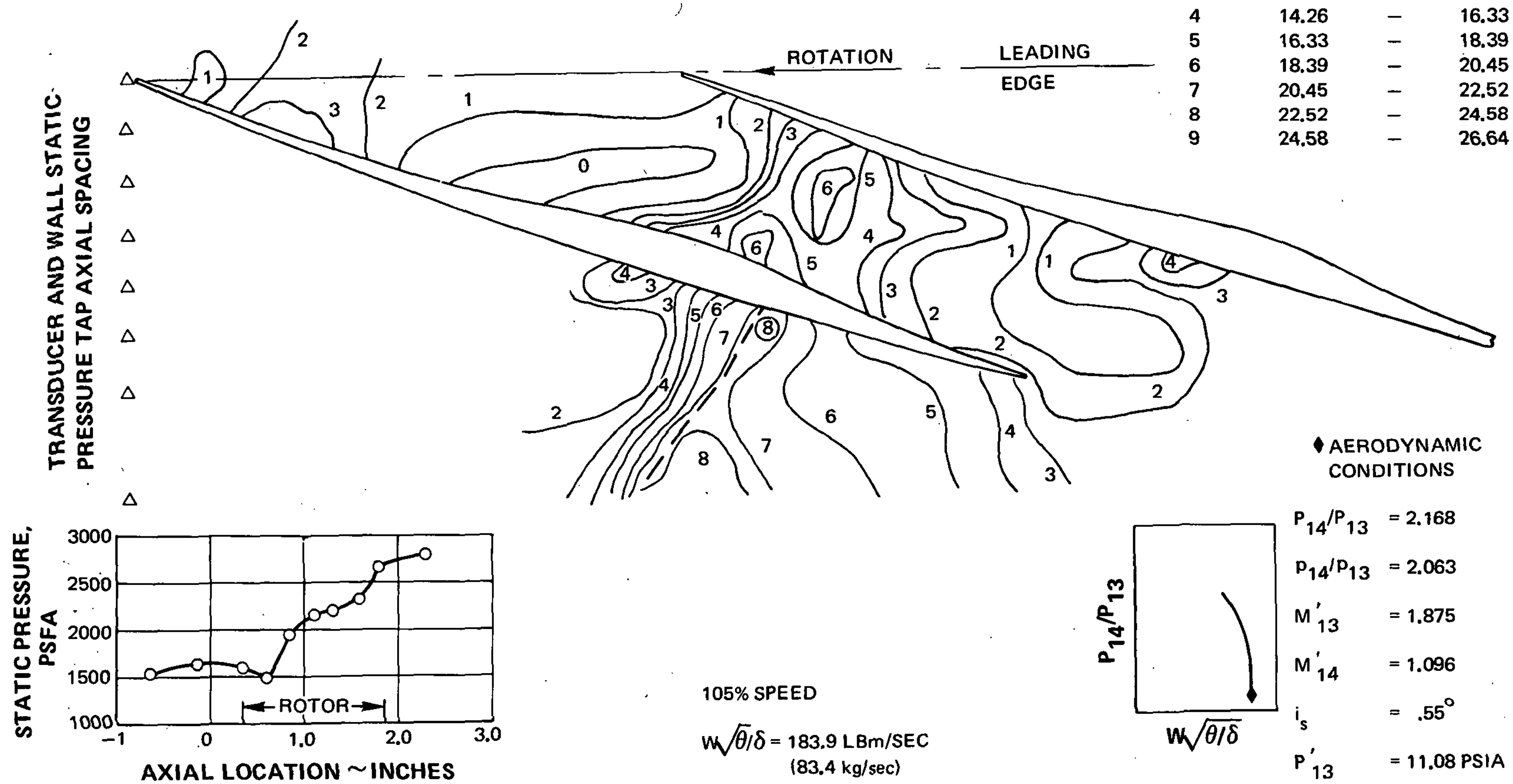


Figure 37 Rotor Blade Tip Static Pressure Contours, 100% Design Speed, $W\sqrt{\theta}/\delta$ = 173.2 lbm/sec



SYMBOL	RANGE		
0	6.01	–	8.07
1	8.07	–	10.14
2	10.14	–	12.20
3	12.20	–	14.26
4	14.26	–	16.33
5	16.33	–	18.39
6	18.39	–	20.45
7	20.45	–	22.52
8	22.52	–	24.58
9	24.58	–	26.64

Figure 38 Rotor Blade Tip Static Pressure Contours, 105% Design Speed, $W\sqrt{\theta}/\delta$ = 183.9 lbm/sec

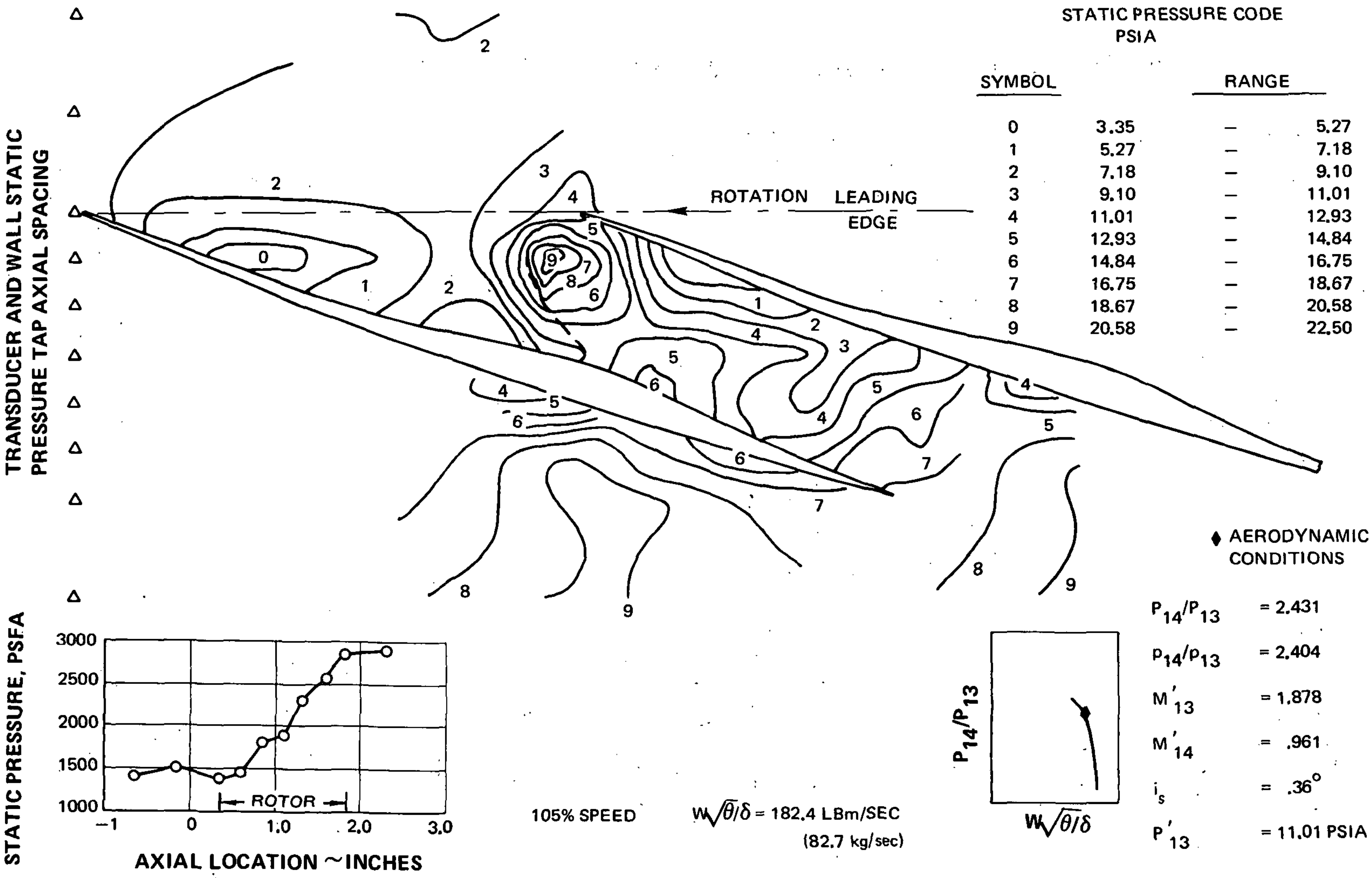


Figure 39 Rotor Blade Tip Static Pressure Contours, 105% Design Speed, $W\sqrt{\theta}/\delta$ = 182.4 lbm/sec

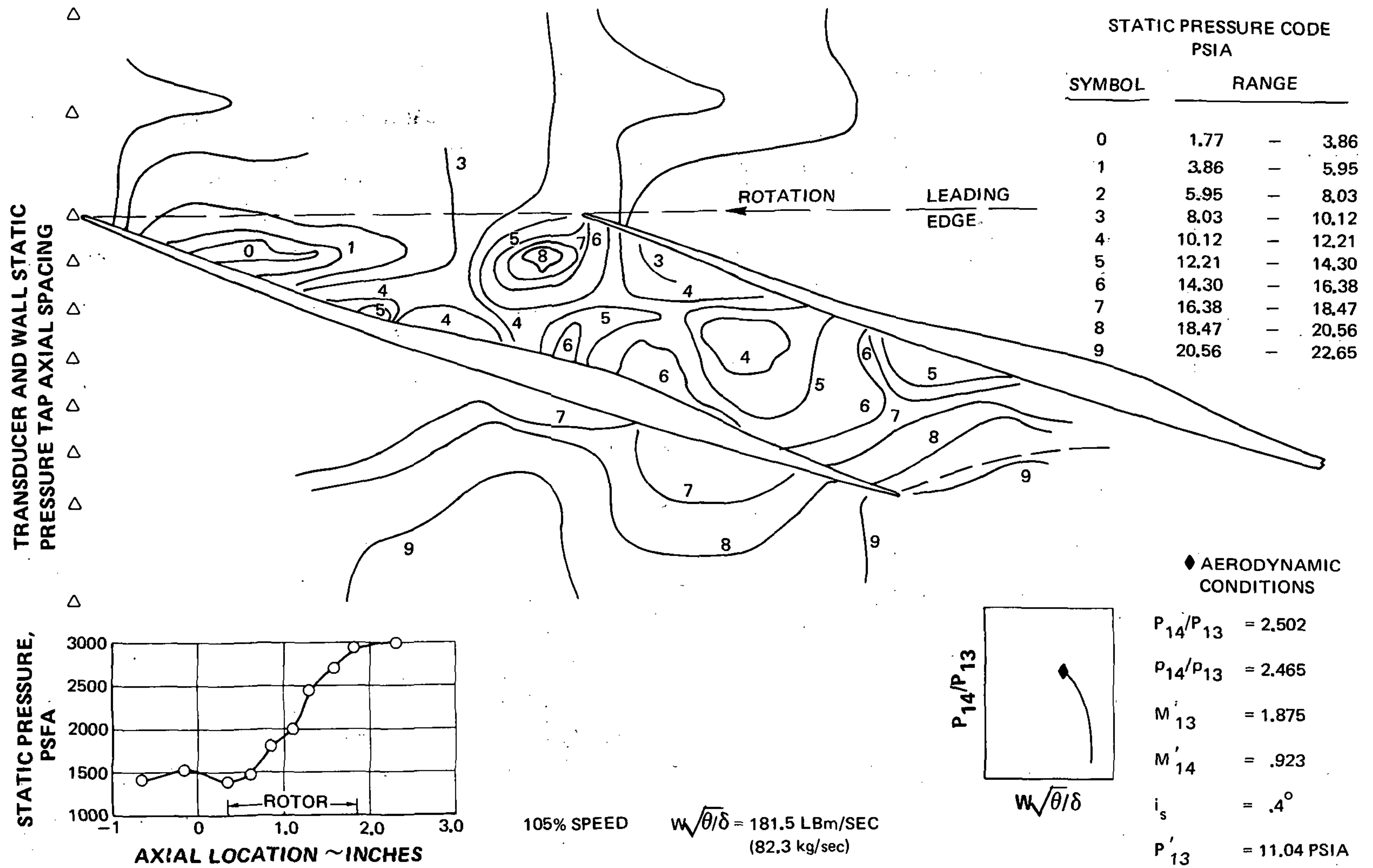


Figure 40 Rotor Blade Tip Static Pressure Contours, 105% Design Speed, $W\sqrt{\theta}/\delta$ = 181.5 lbm/sec

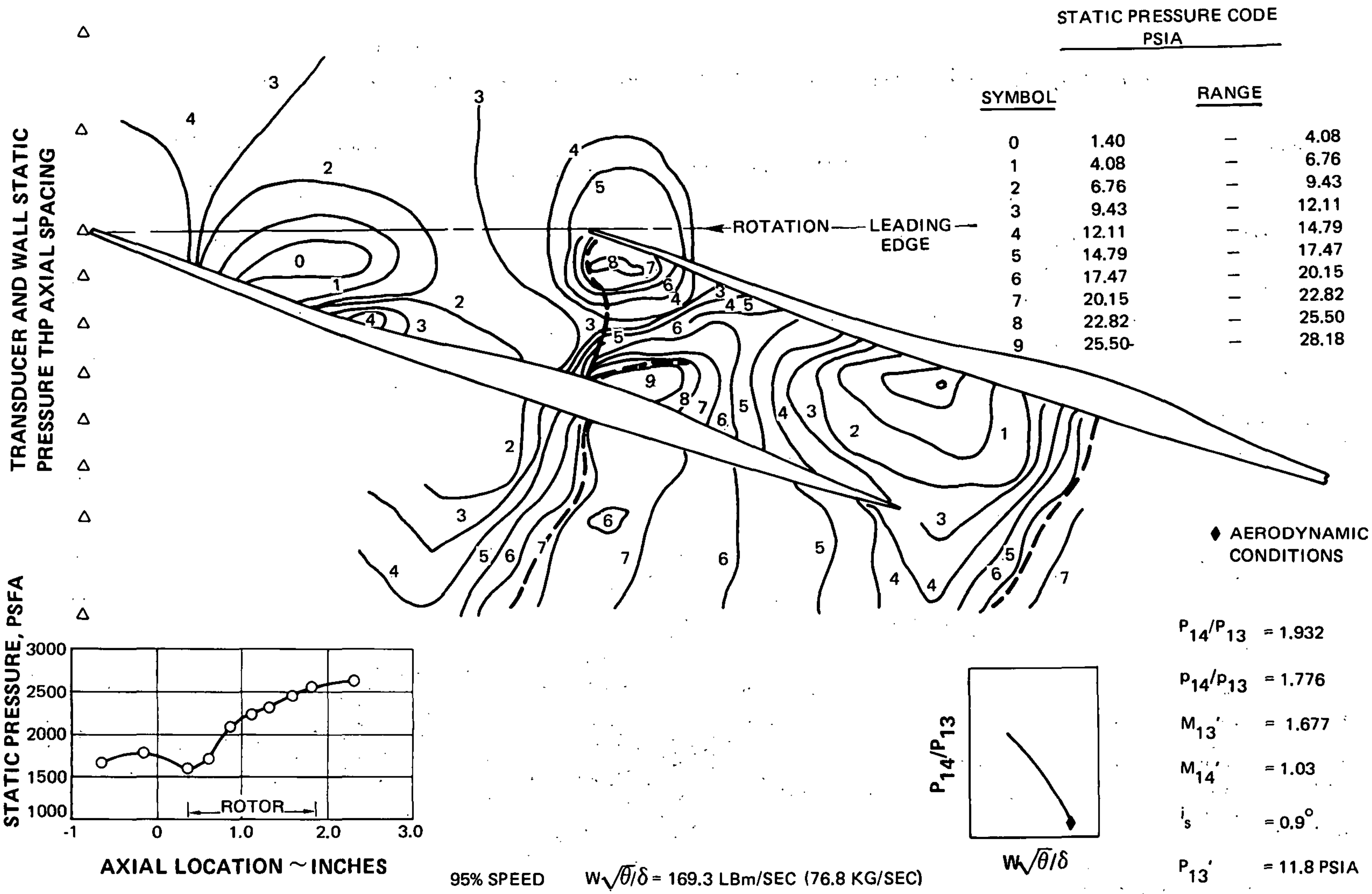


Figure 41 Rotor Blade Tip Static Pressure Contours, 95% Design Speed, $W\sqrt{\theta}/\delta$ = 169.3 lbm/sec

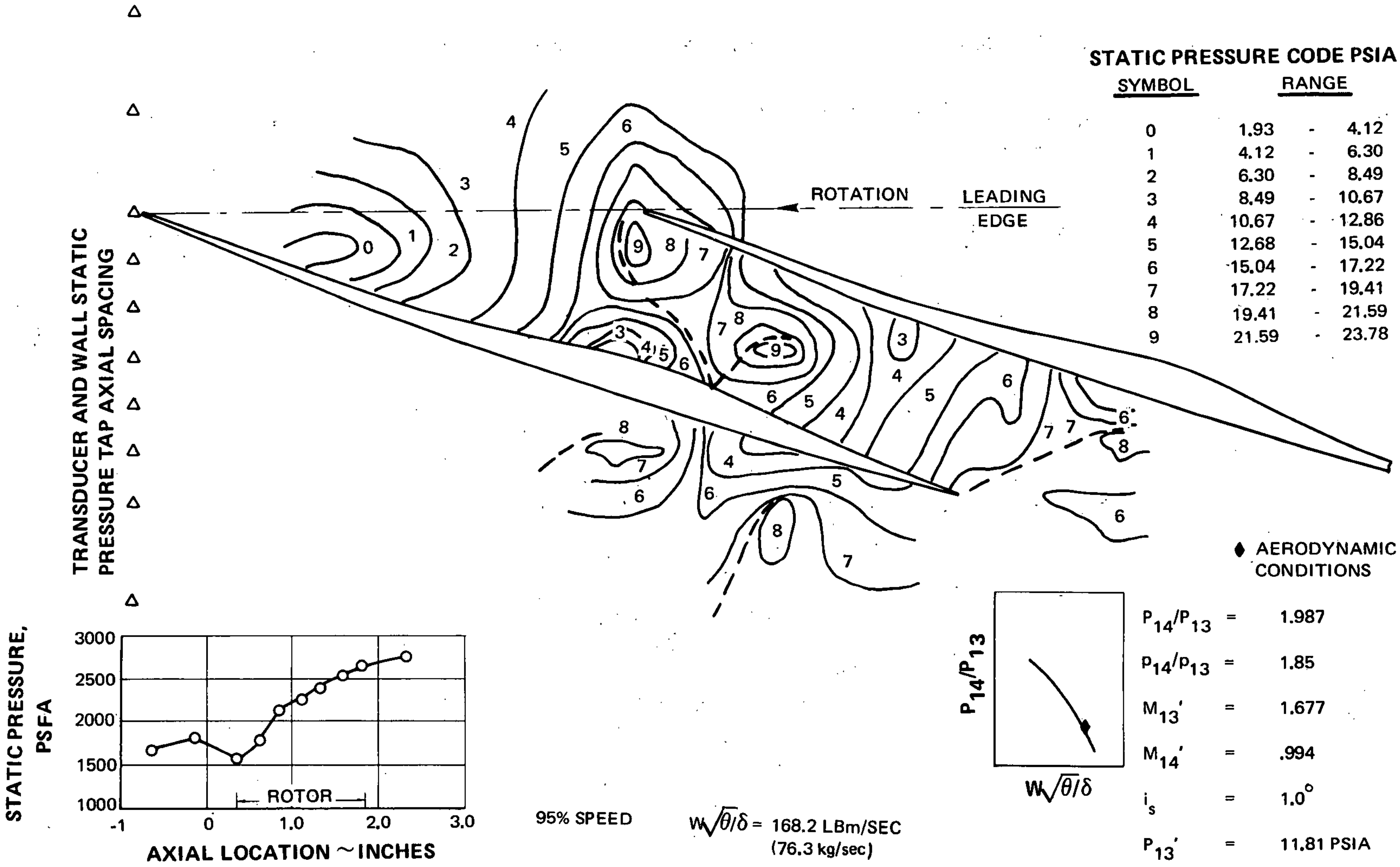


Figure 42 Rotor Blade Tip Static Pressure Contours, 95% Design Speed, $W\sqrt{\theta}/\delta$ = 168.2 lbm/sec

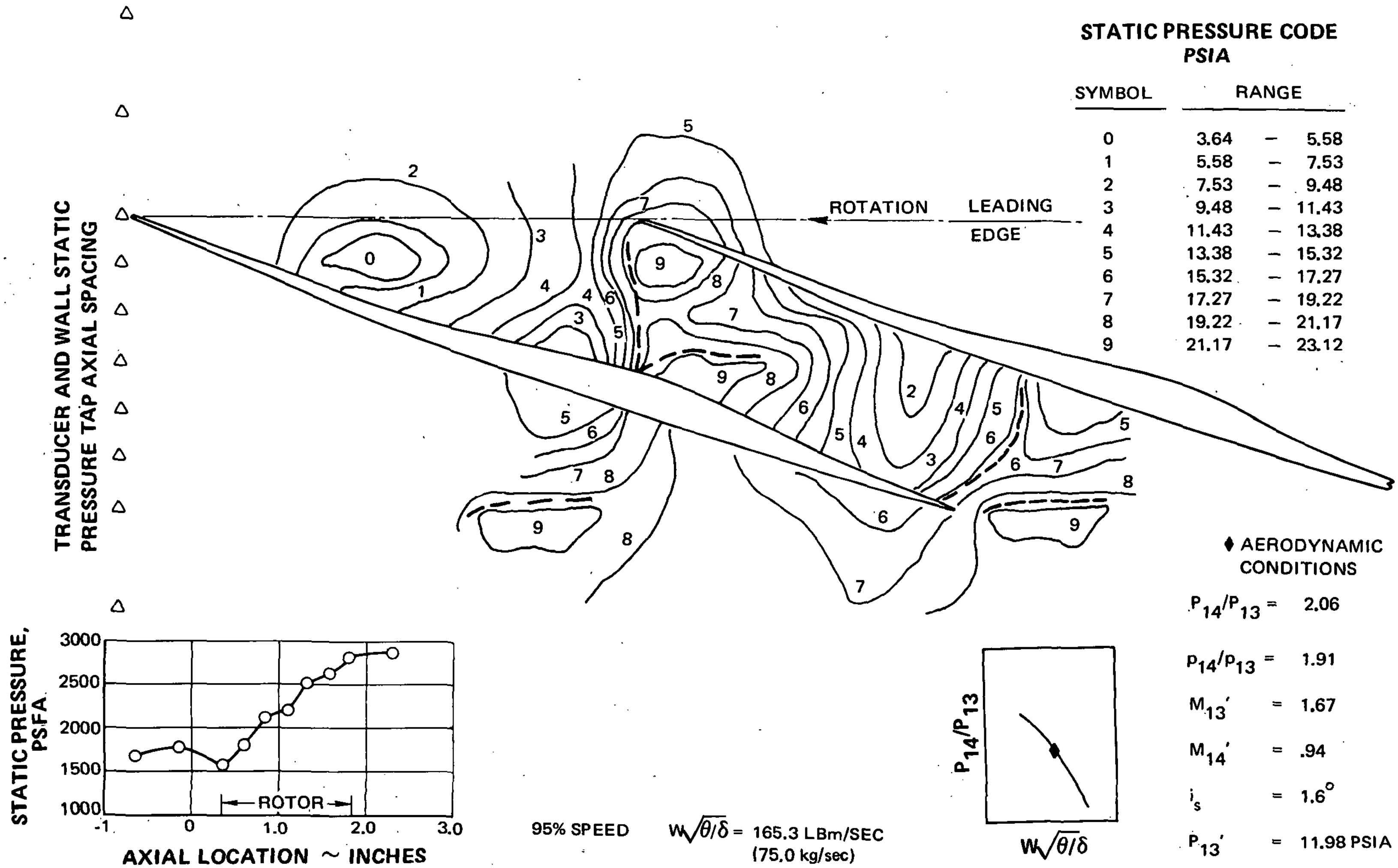


Figure 43 Rotor Blade Tip Static Pressure Contours, 95% Design Speed, $W\sqrt{\theta}/\delta = 165.3$ lbm/sec

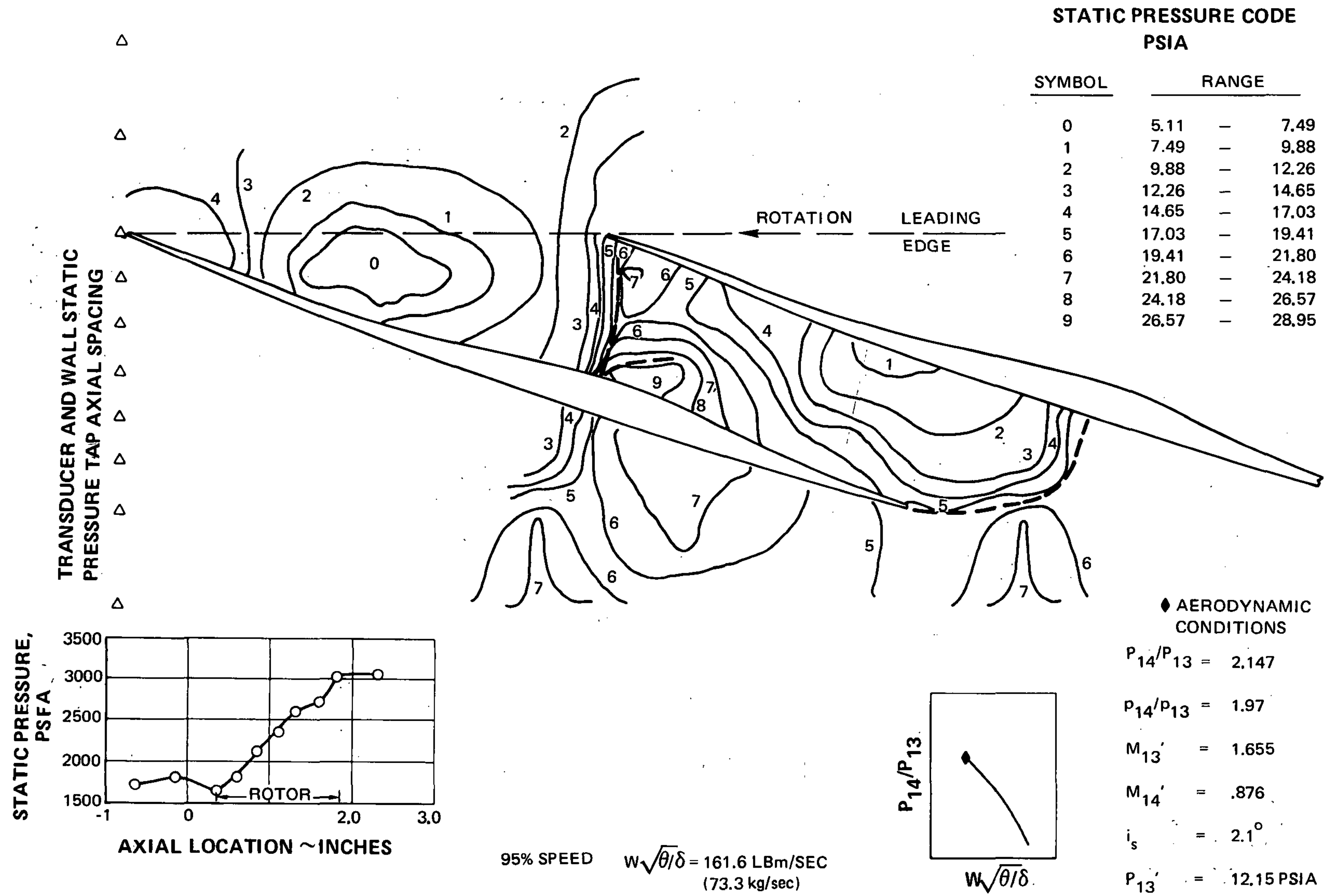


Figure 44 Rotor Blade Tip Static Pressure Contours, 95% Design Speed, $W\sqrt{\theta}/\delta$ = 161.6 lbm/sec

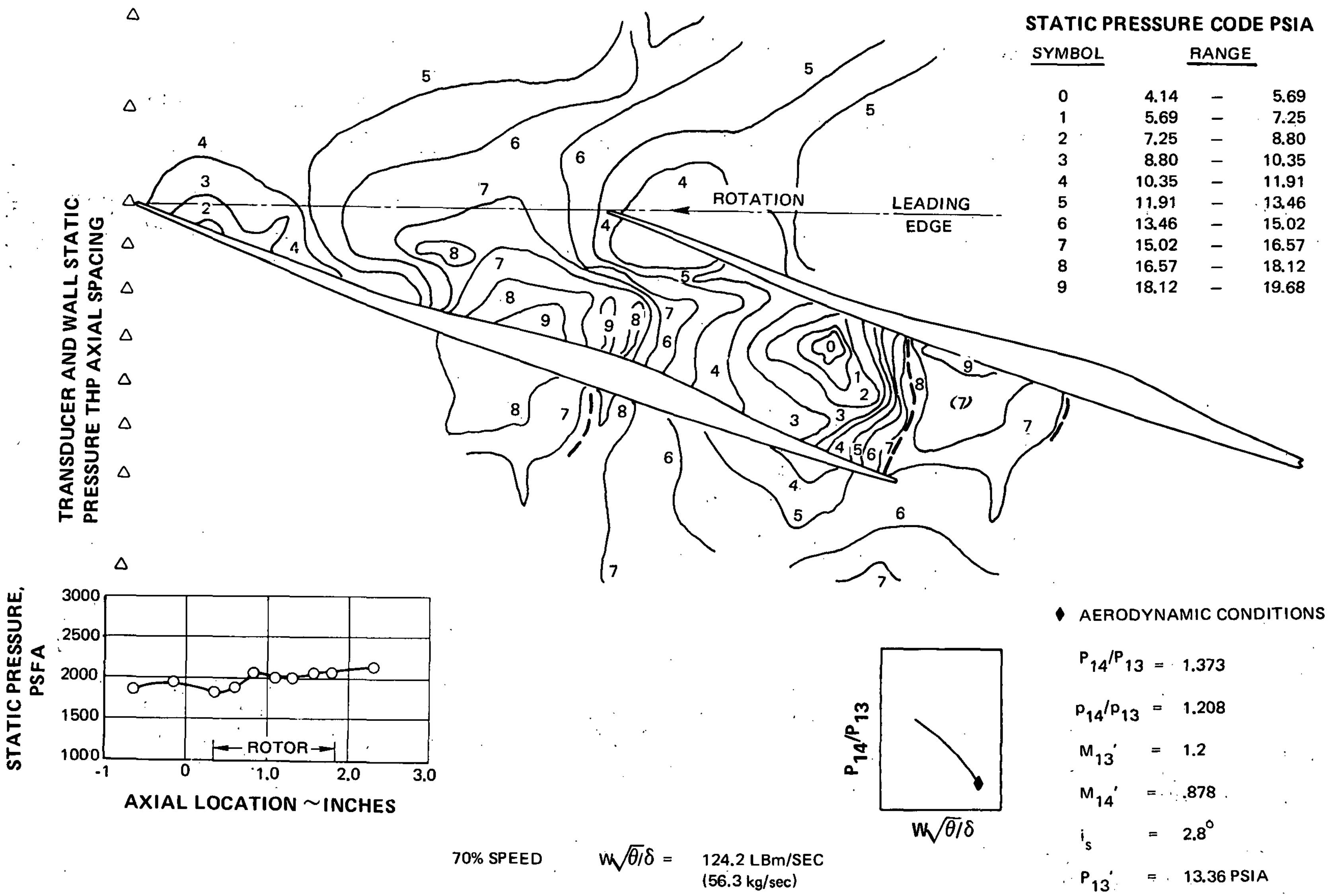


Figure 45 Rotor Blade Tip Static Pressure Contours, 70% Design Speed, $W\sqrt{\theta}/\delta = 124.2$ lbm/sec

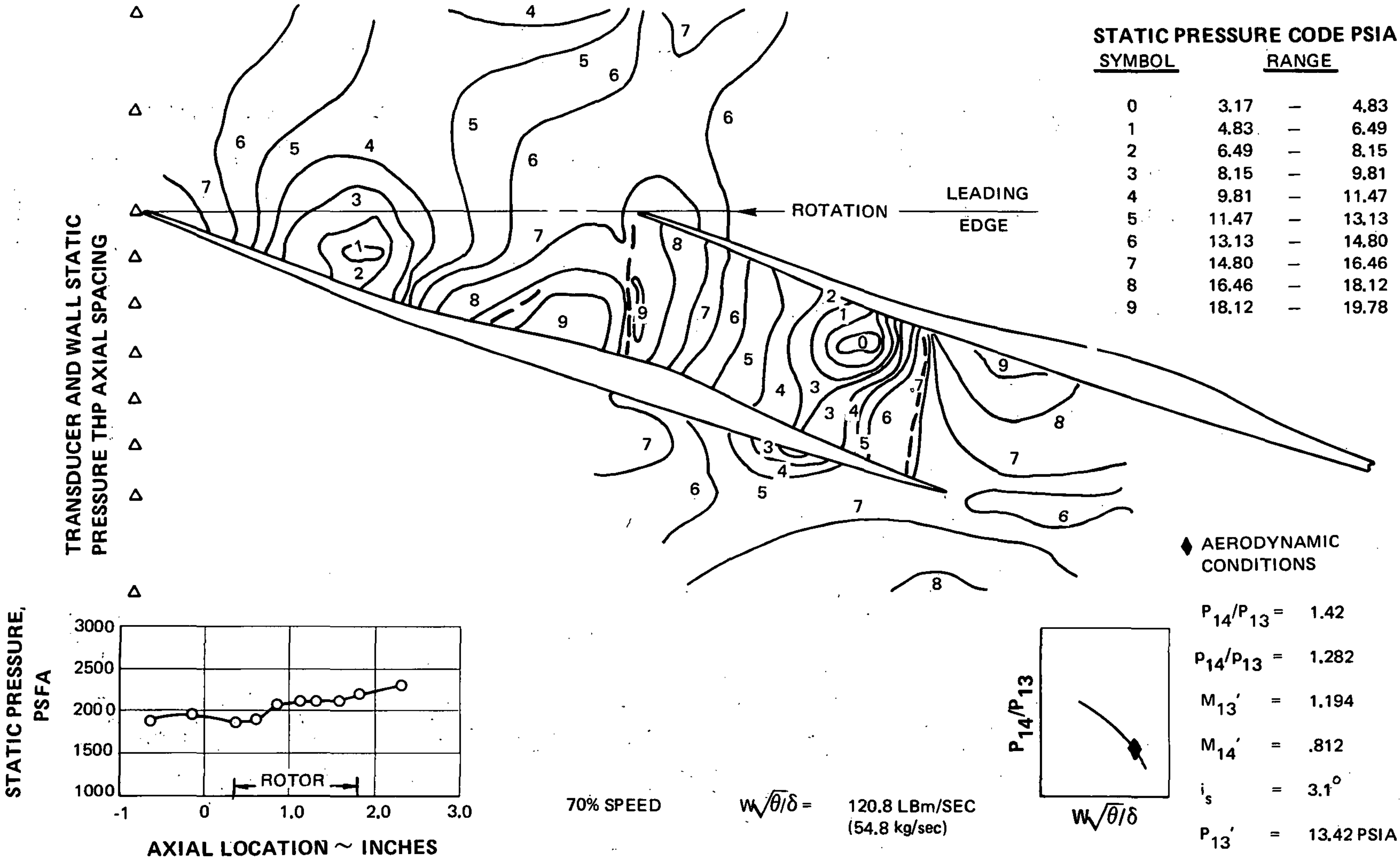


Figure 46 Rotor Blade Tip Static Pressure Contours, 70% Design Speed, $W\sqrt{\theta}/\delta$ = 120.8 lbm/sec

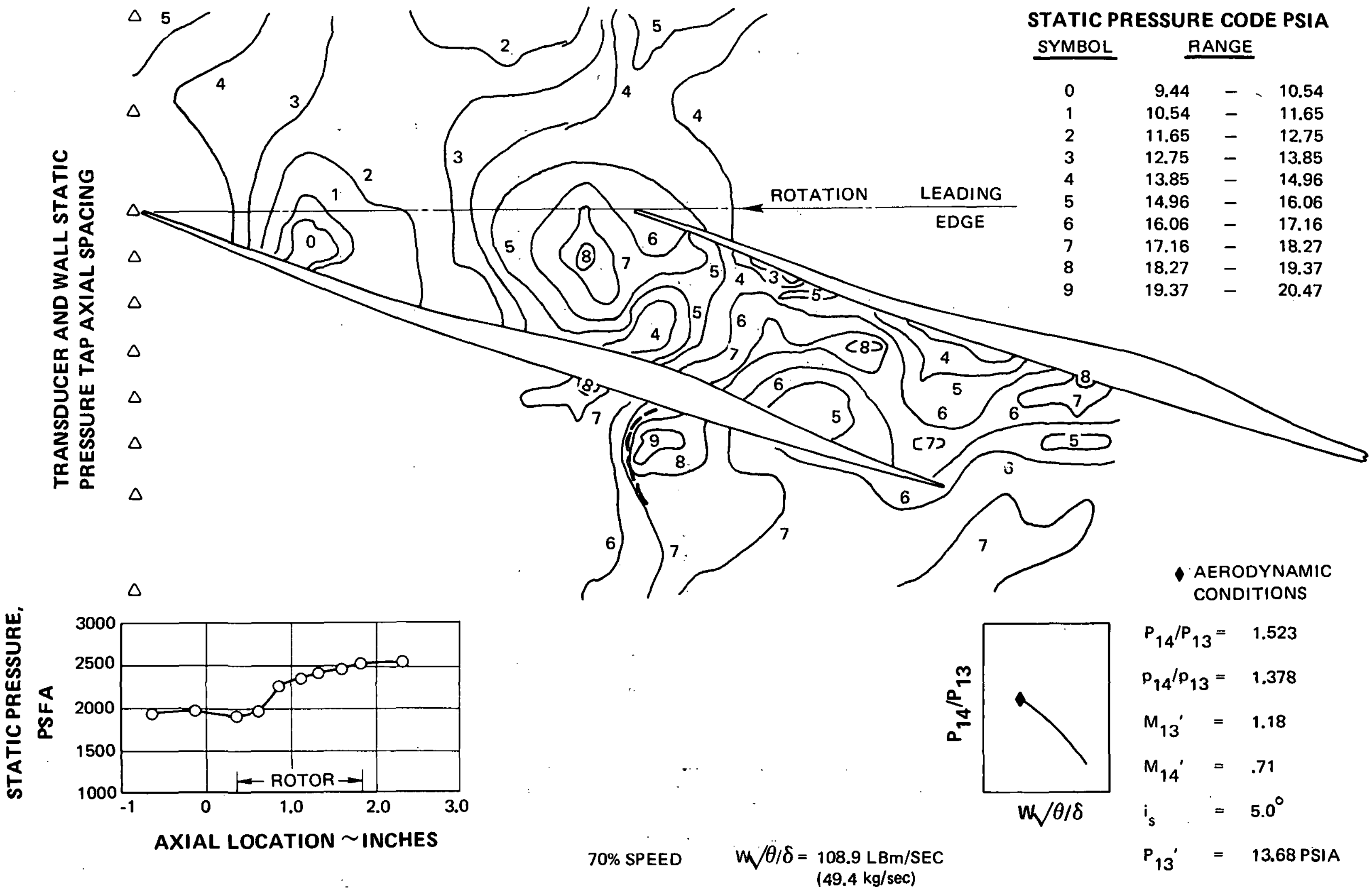


Figure 47 Rotor Blade Tip Static Pressure Contours, 70% Design Speed, $W\sqrt{\theta}/\delta$ = 108.9 lbm/sec

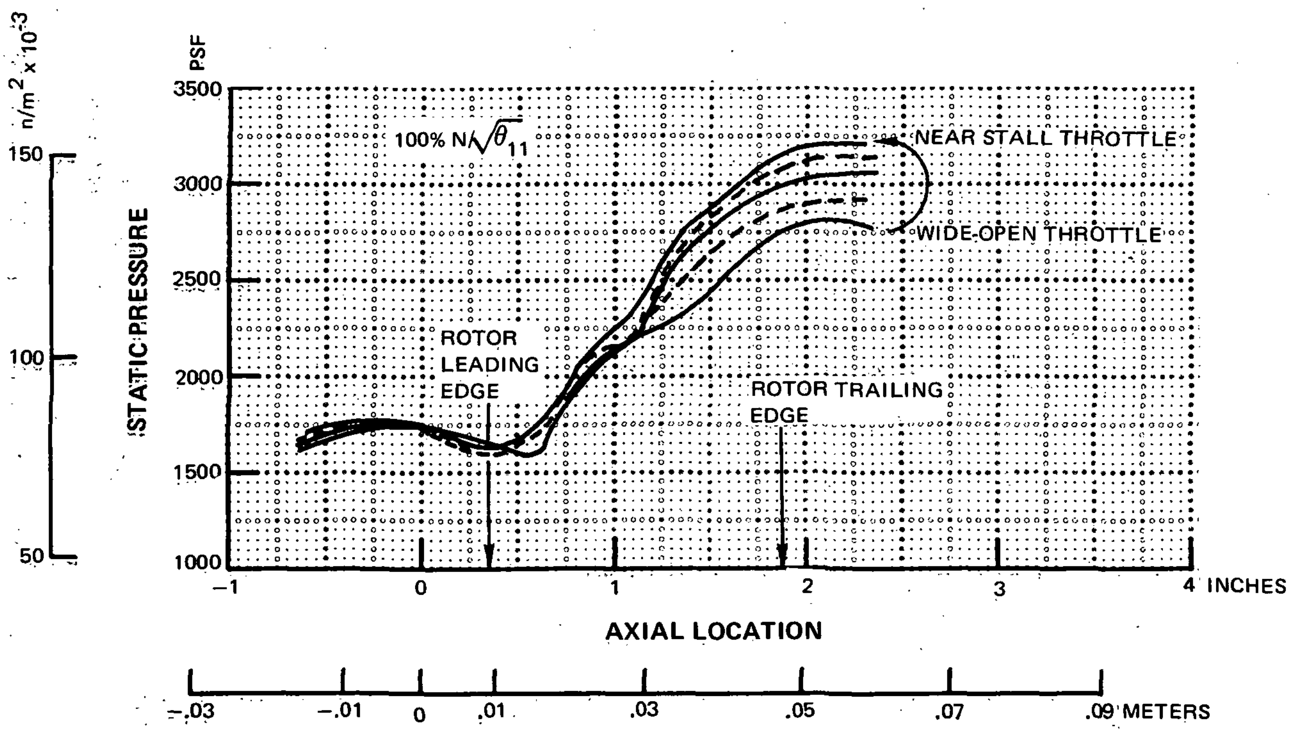


Figure 48 Axial Distribution of Rotor Tip Static Pressures Along 100% Design Speedline

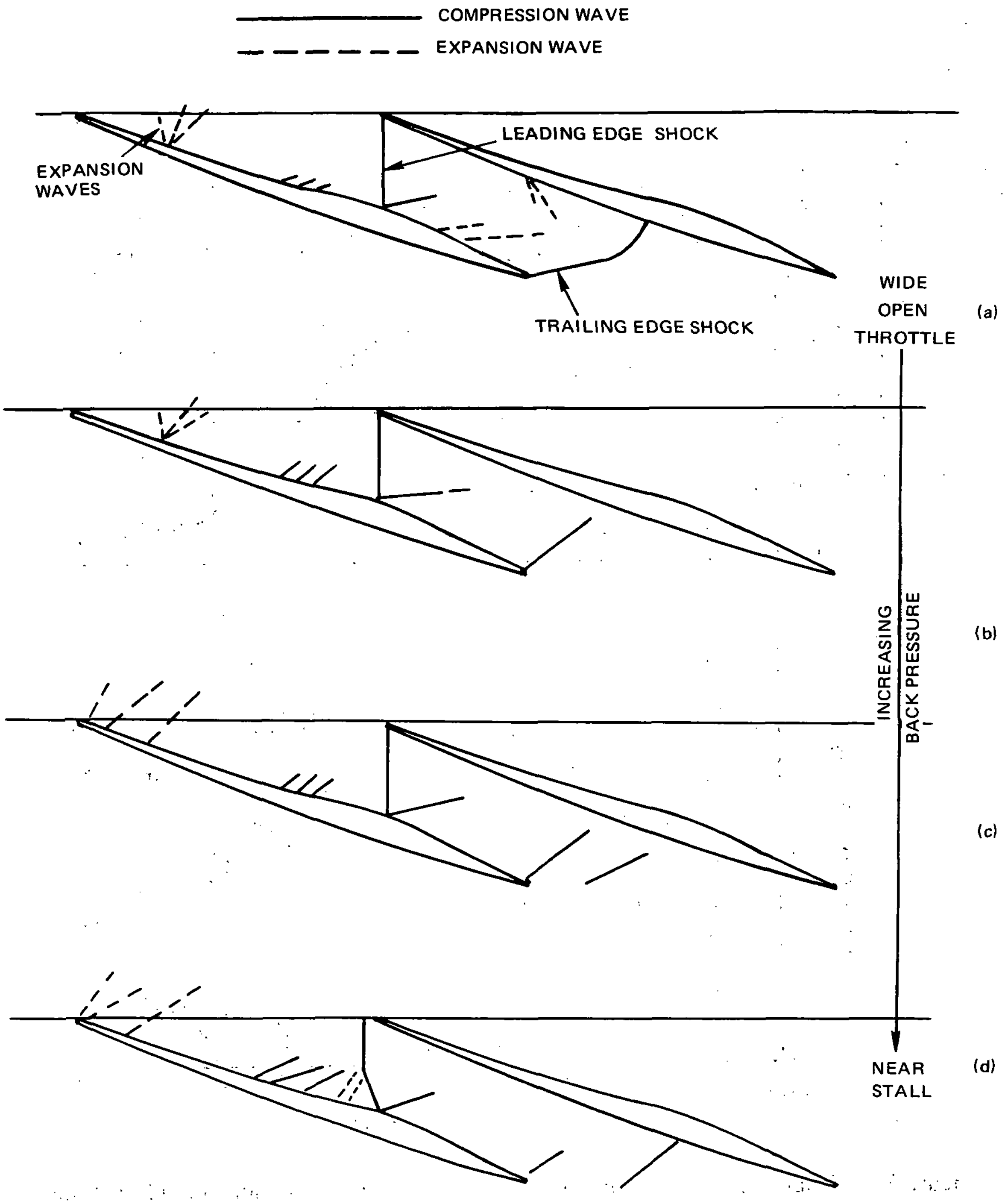


Figure 49 Sketch of Wave Patterns Along a Speedline

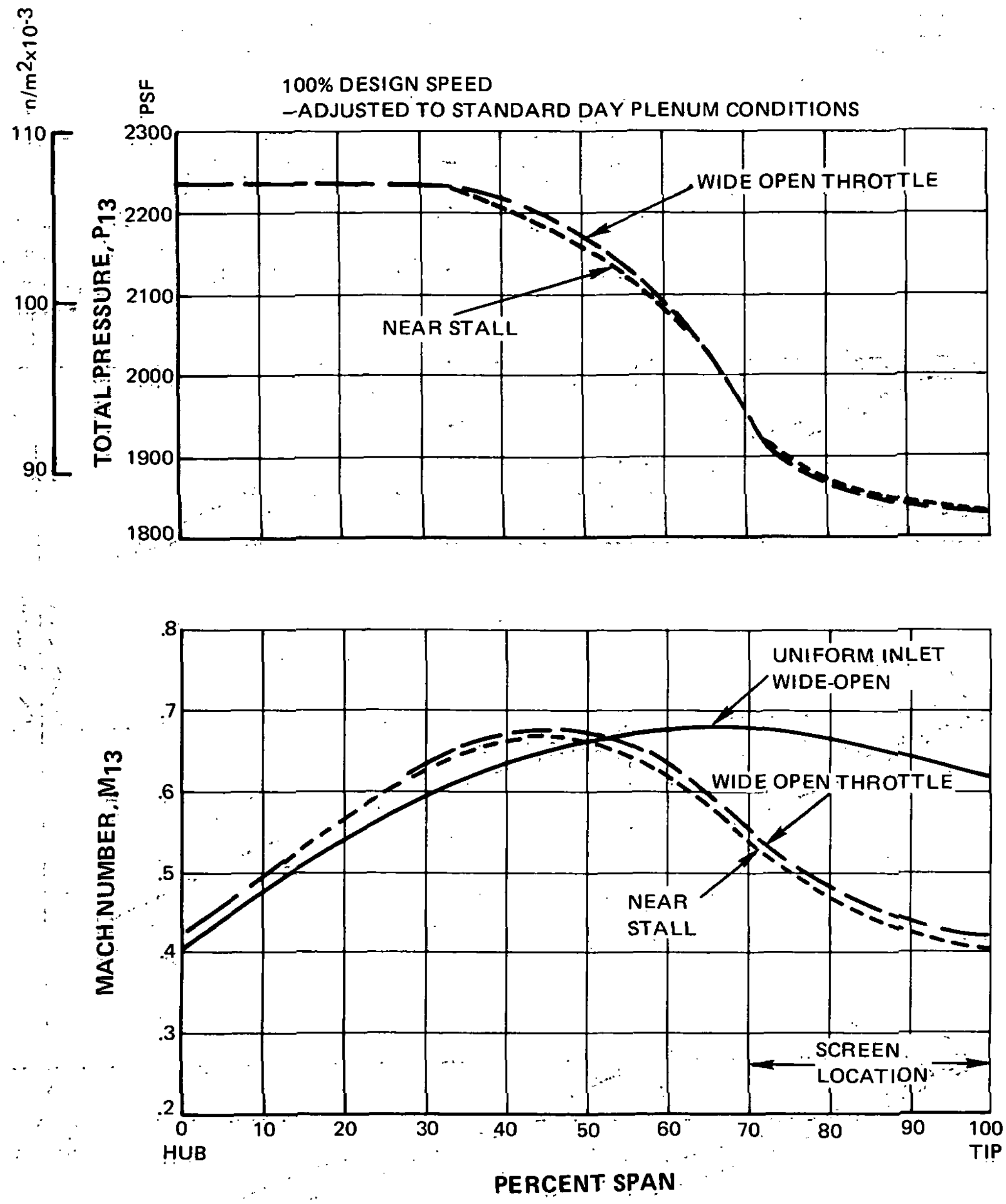


Figure 50 Spanwise Variation of Rotor Leading Edge Total Pressure and Mach Number With Tip Radial Distorted Inlet Flow

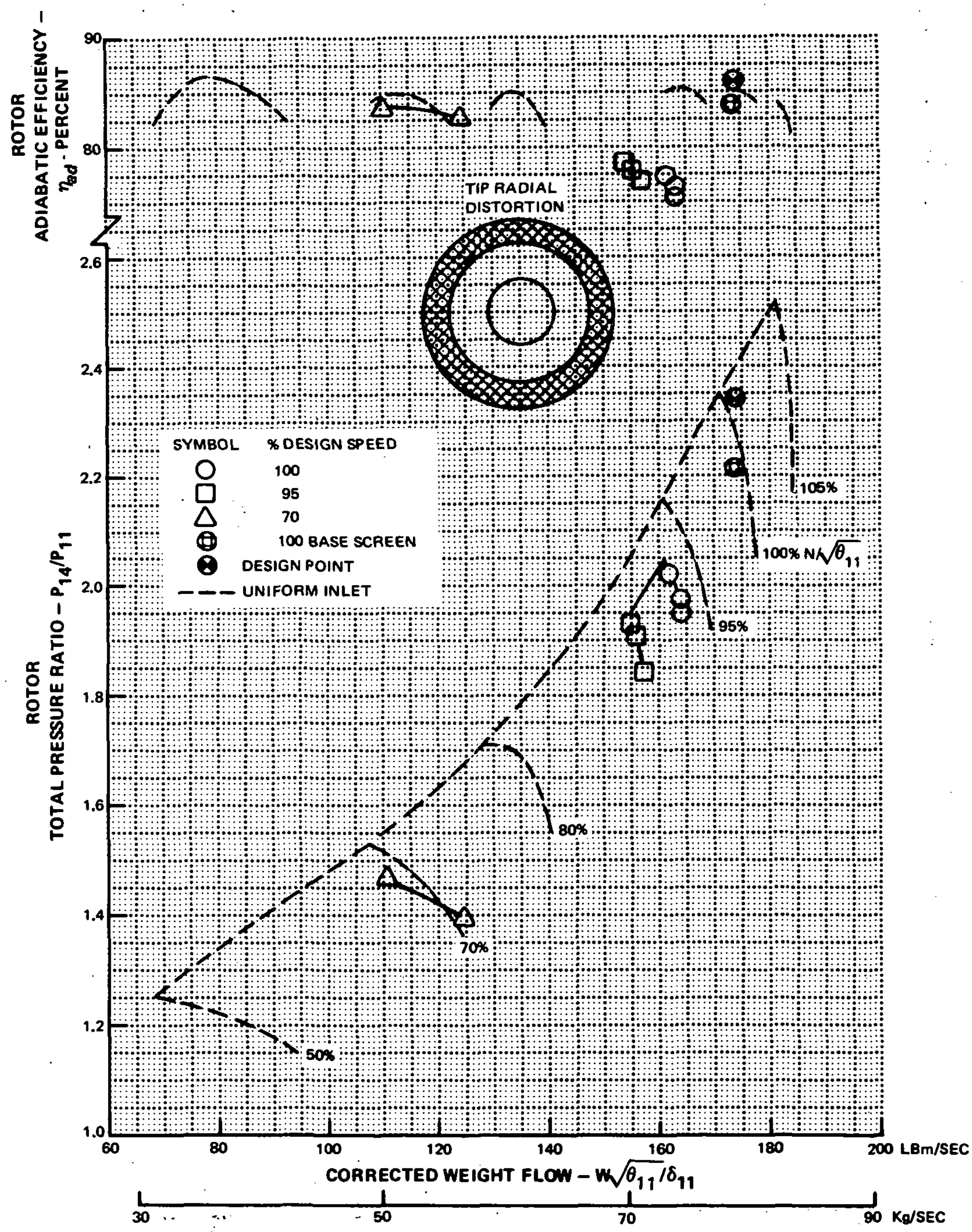


Figure 51 Comparison of Rotor Overall Performance With Tip-Radial Distorted Inlet Flow and Uniform Inlet Flow

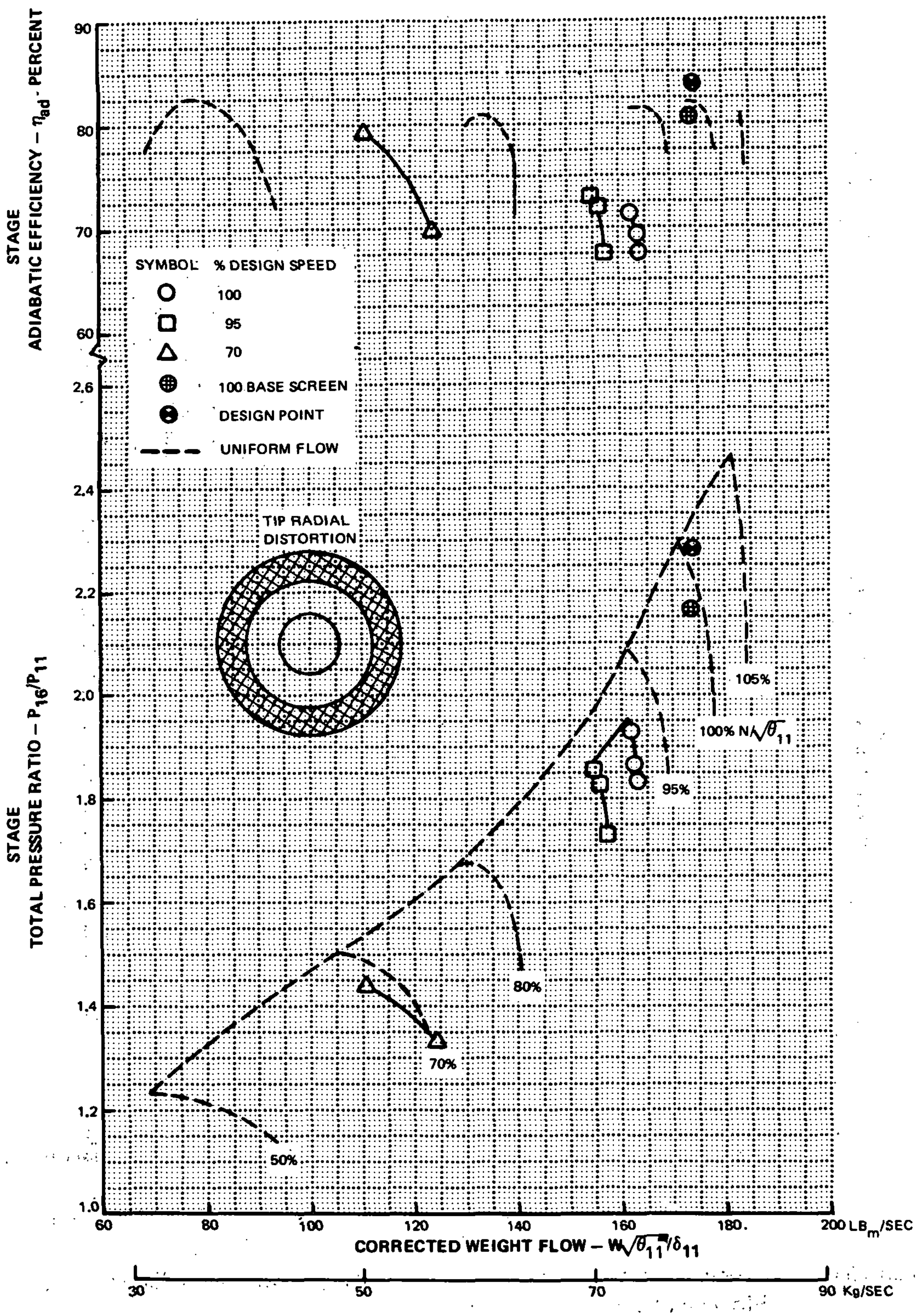


Figure 52 Comparison of Stage Overall Performance With Tip-Radial Distorted Inlet Flow and Uniform Inlet Flow

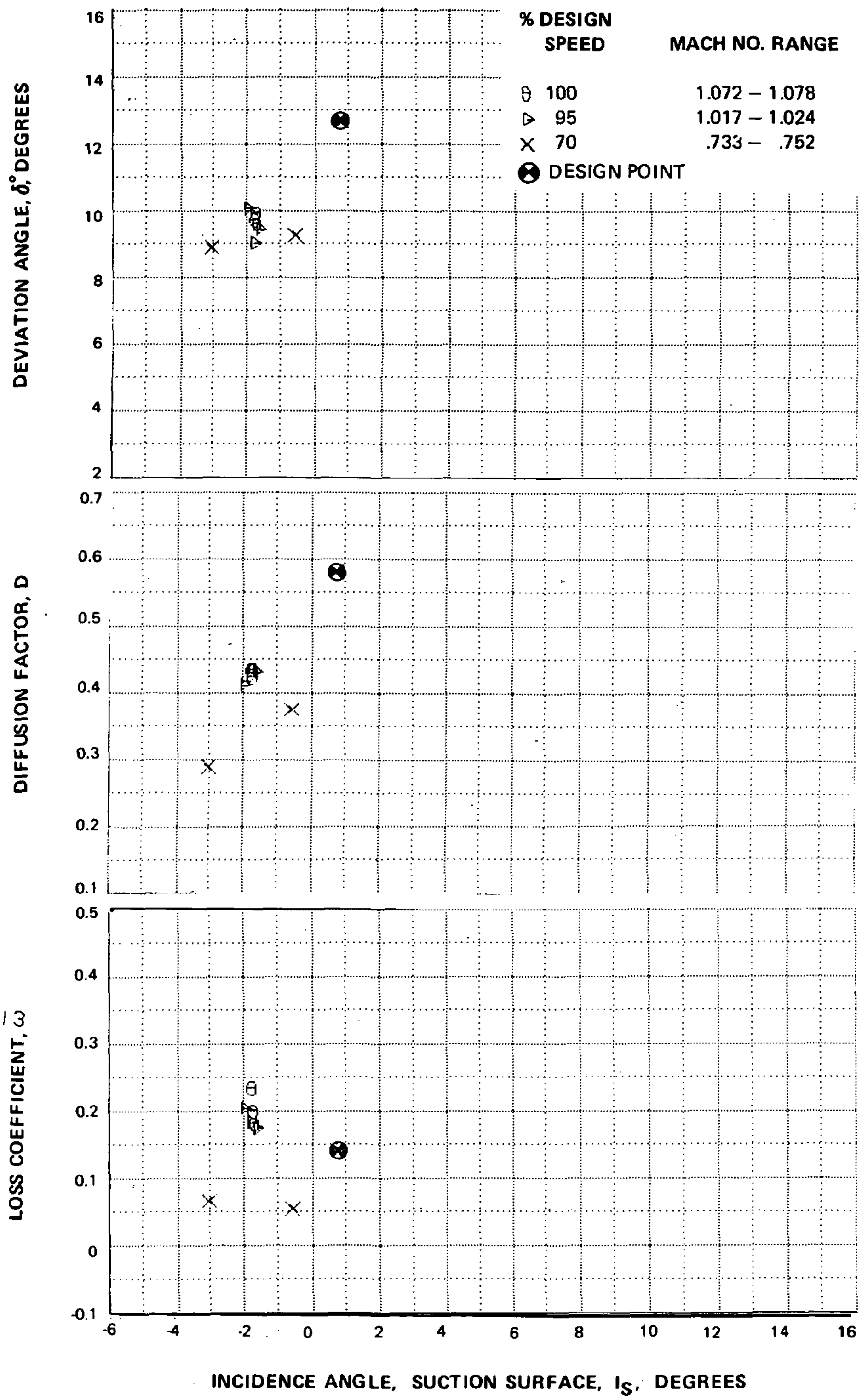


Figure 53a Rotor Blade Element Performance with Tip Radially Distorted Inlet Flow, 10% Span

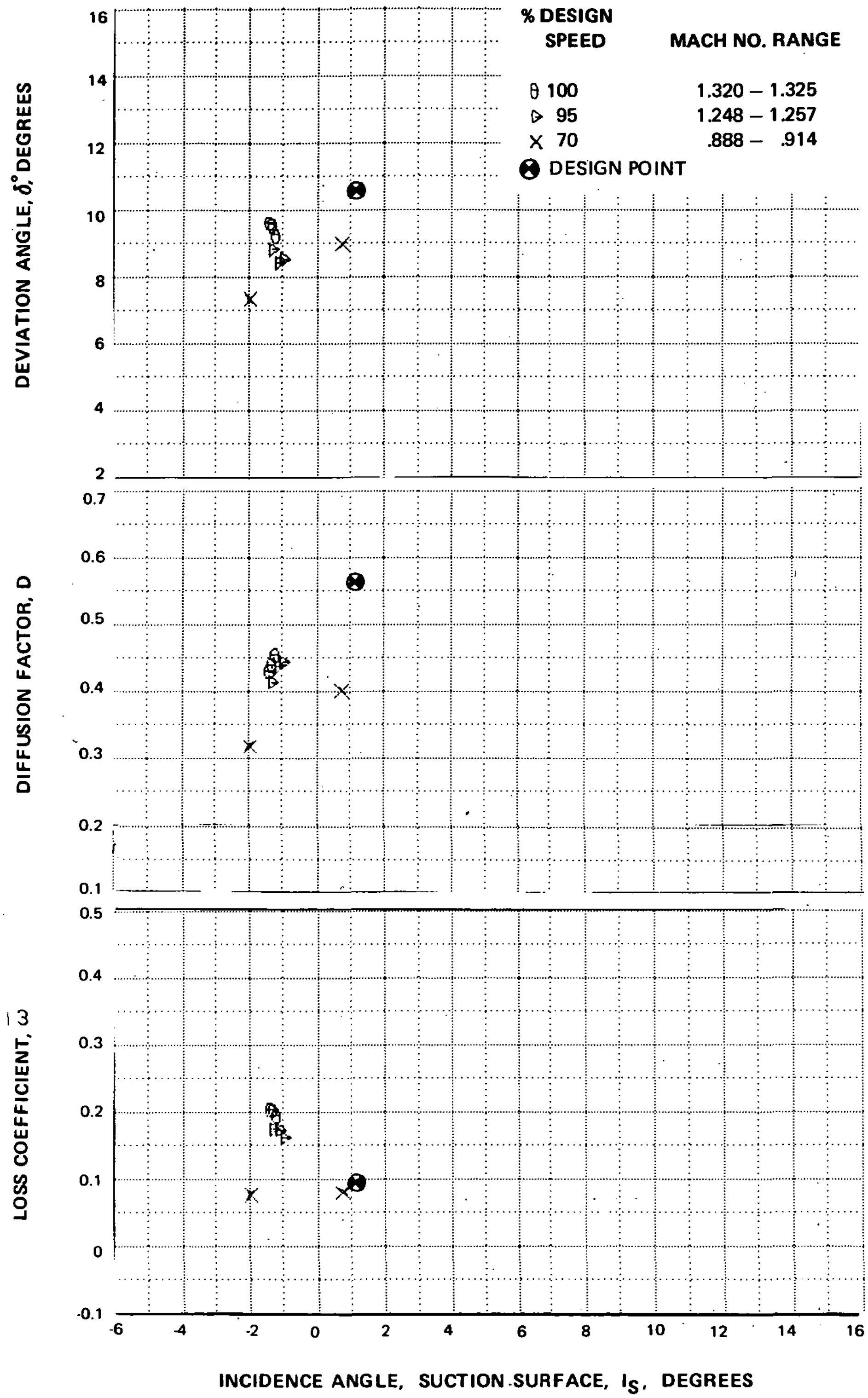


Figure 53b Rotor Blade Element Performance with Tip Radially Distorted Inlet Flow, 30% Span

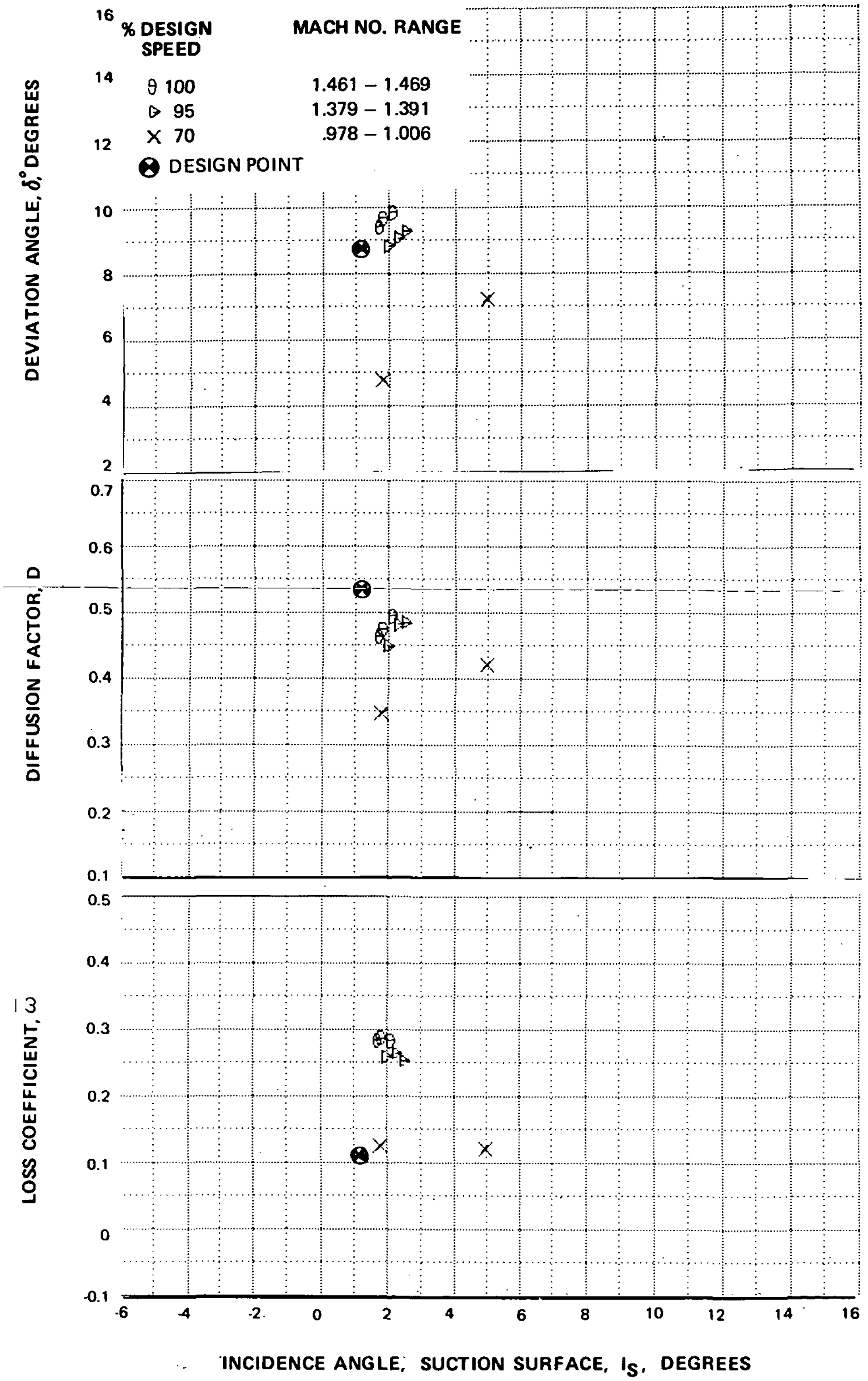


Figure 53c Rotor Blade Element Performance with Tip Radially Distorted Inlet Flow, 50% Span

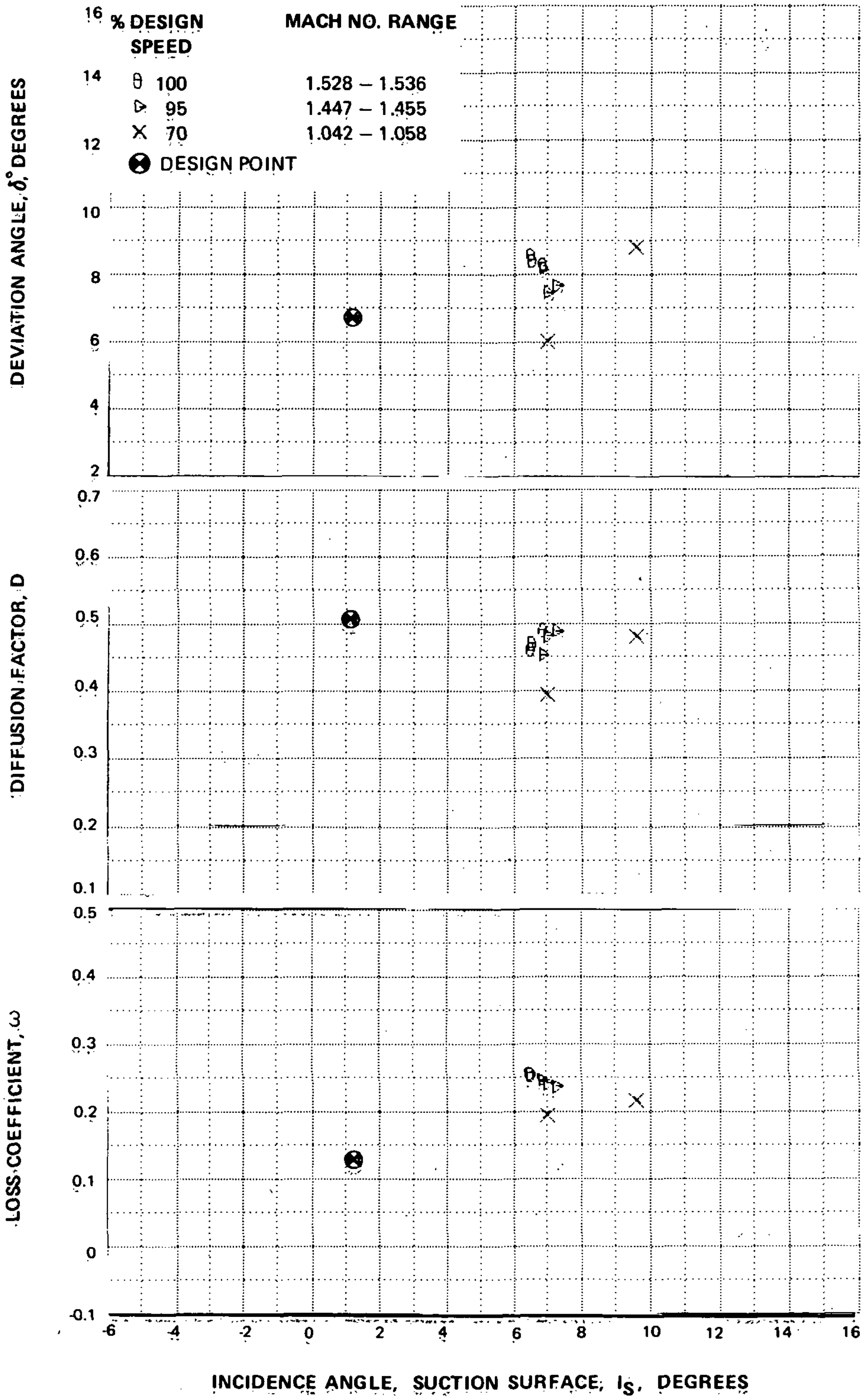


Figure 53d Rotor Blade Element Performance with Tip Radially Distorted Inlet Flow, 70% Span

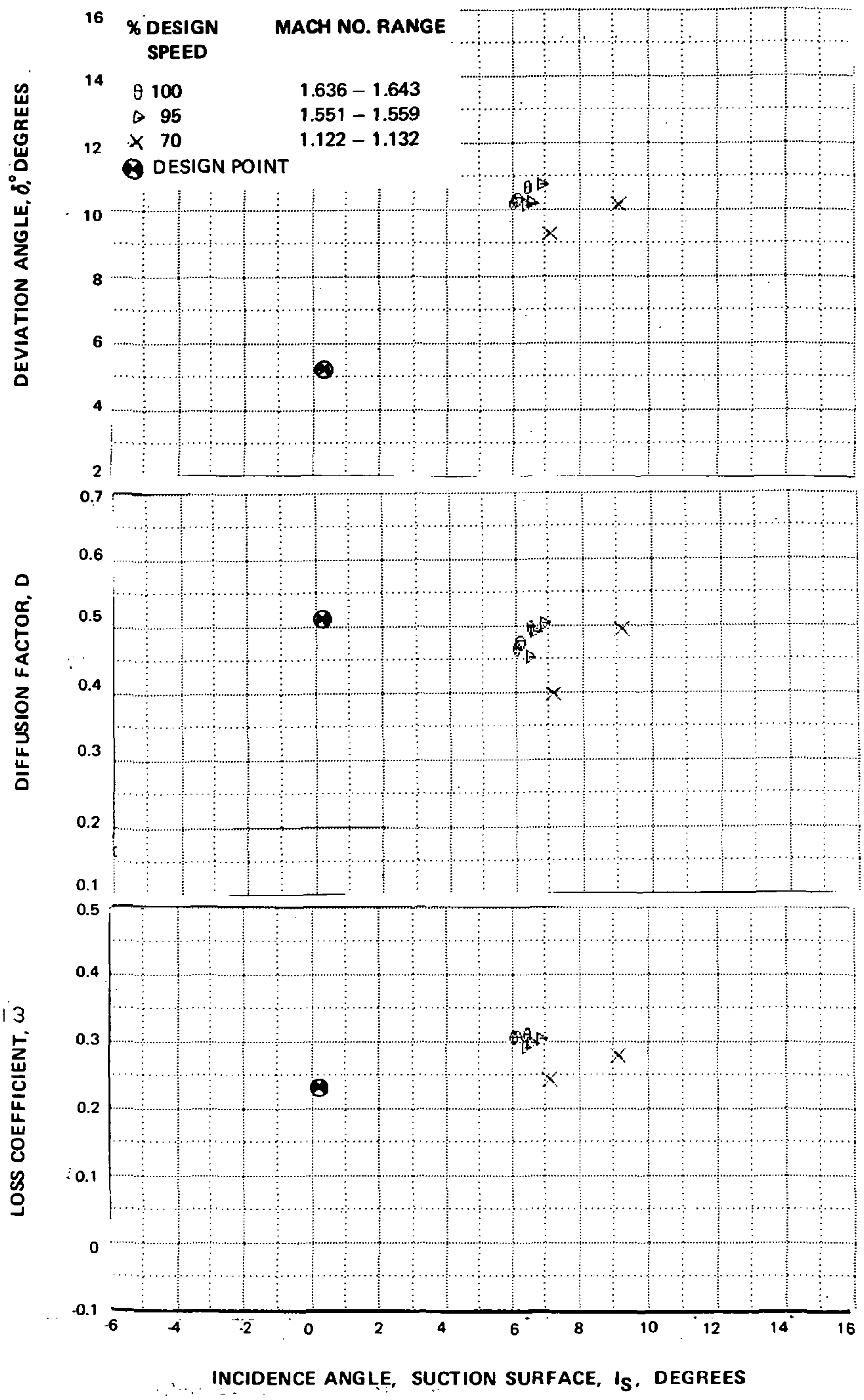


Figure 53e Rotor Blade Element Performance with Tip Radially Distorted Inlet Flow, 90% Span

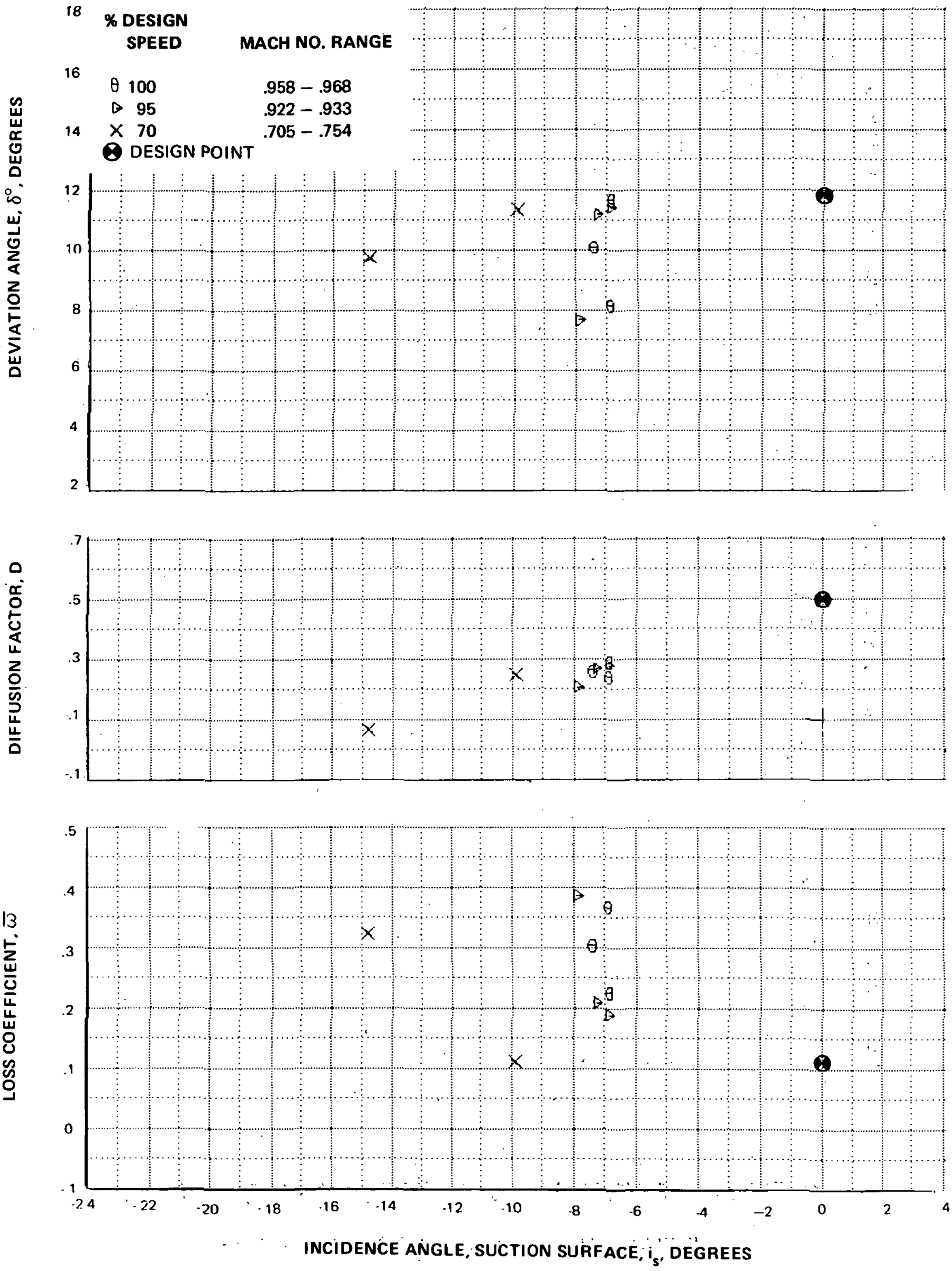


Figure 54a Stator Vane Element Performance with Tip Radially Distorted Inlet Flow, 10% Span

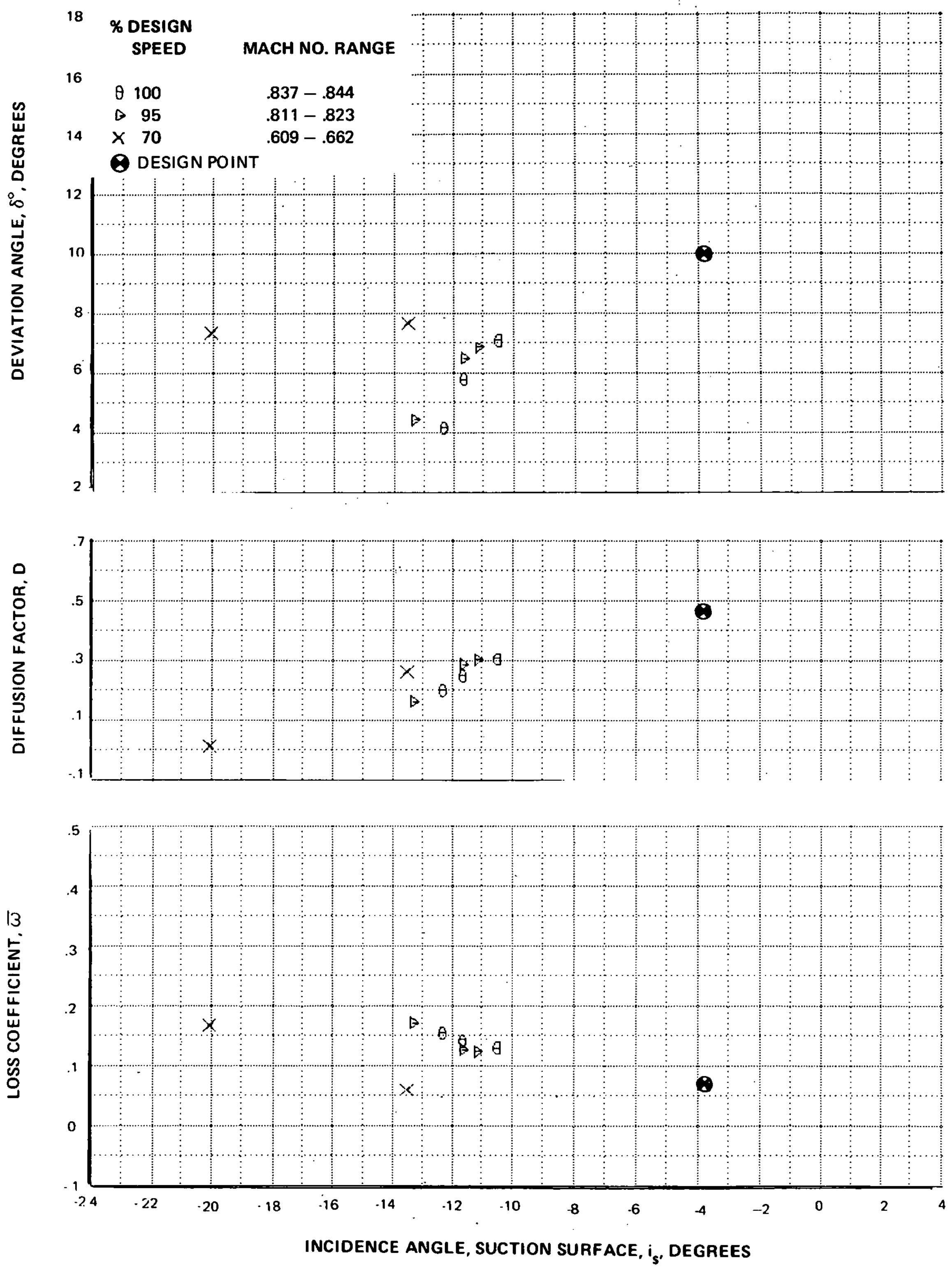


Figure 54b Stator Vane Element Performance with Tip Radially Distorted Inlet Flow, 30% Span

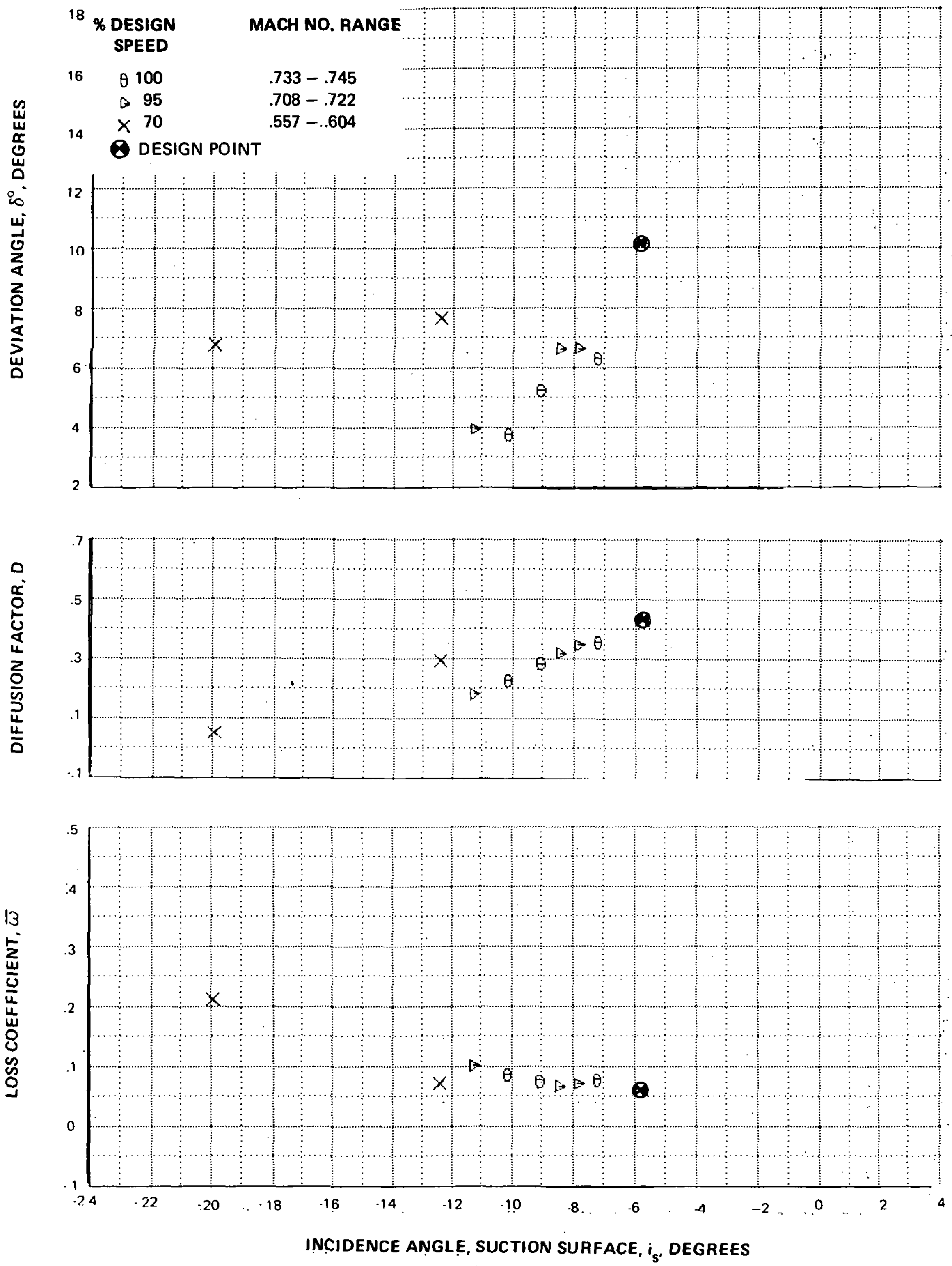


Figure 54c Stator Vane Element Performance with Tip Radially Distorted Inlet Flow, 50% Span

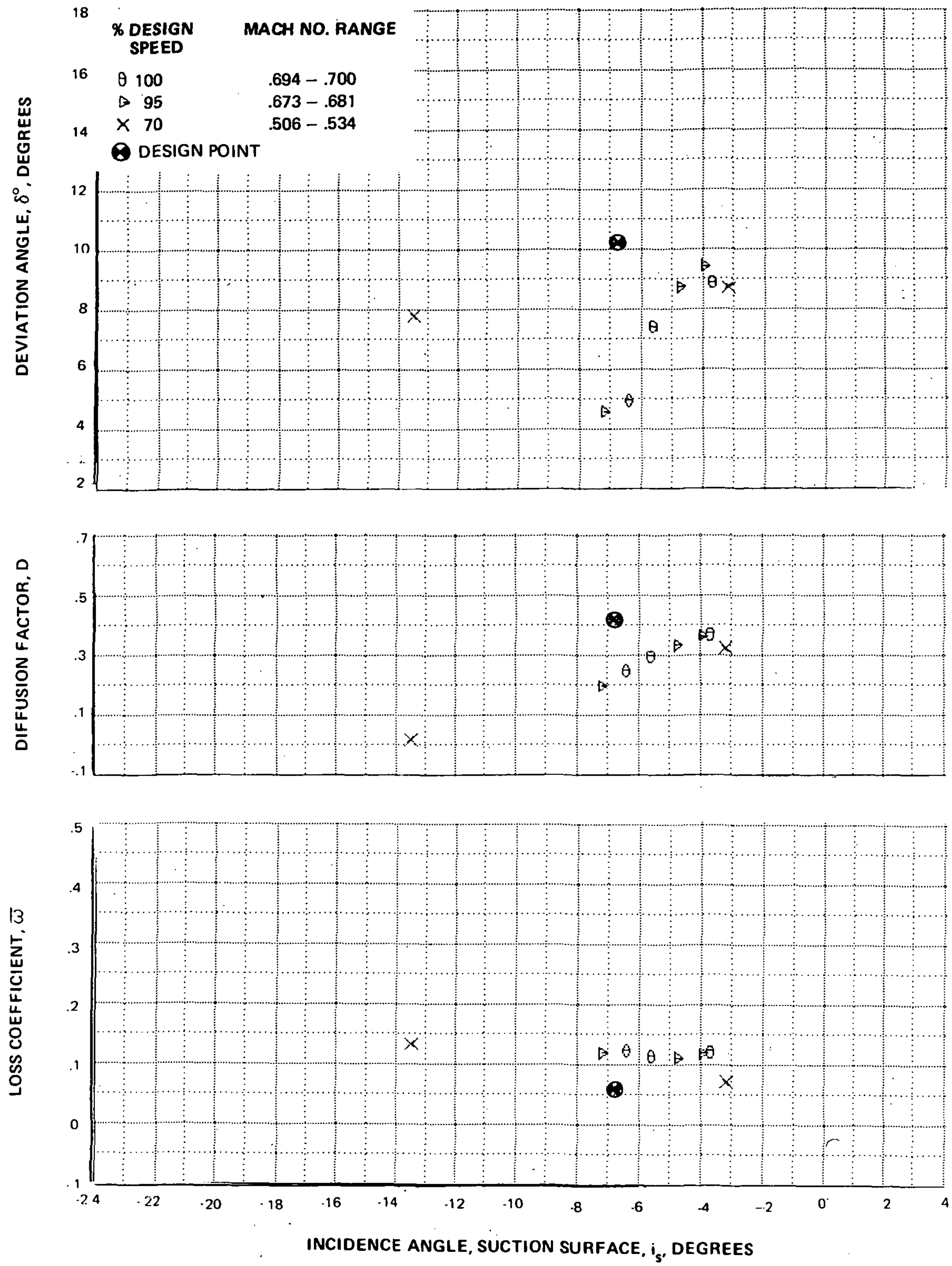


Figure 54d. Stator Vane Element Performance with Tip Radially Distorted Inlet Flow, 70% Span

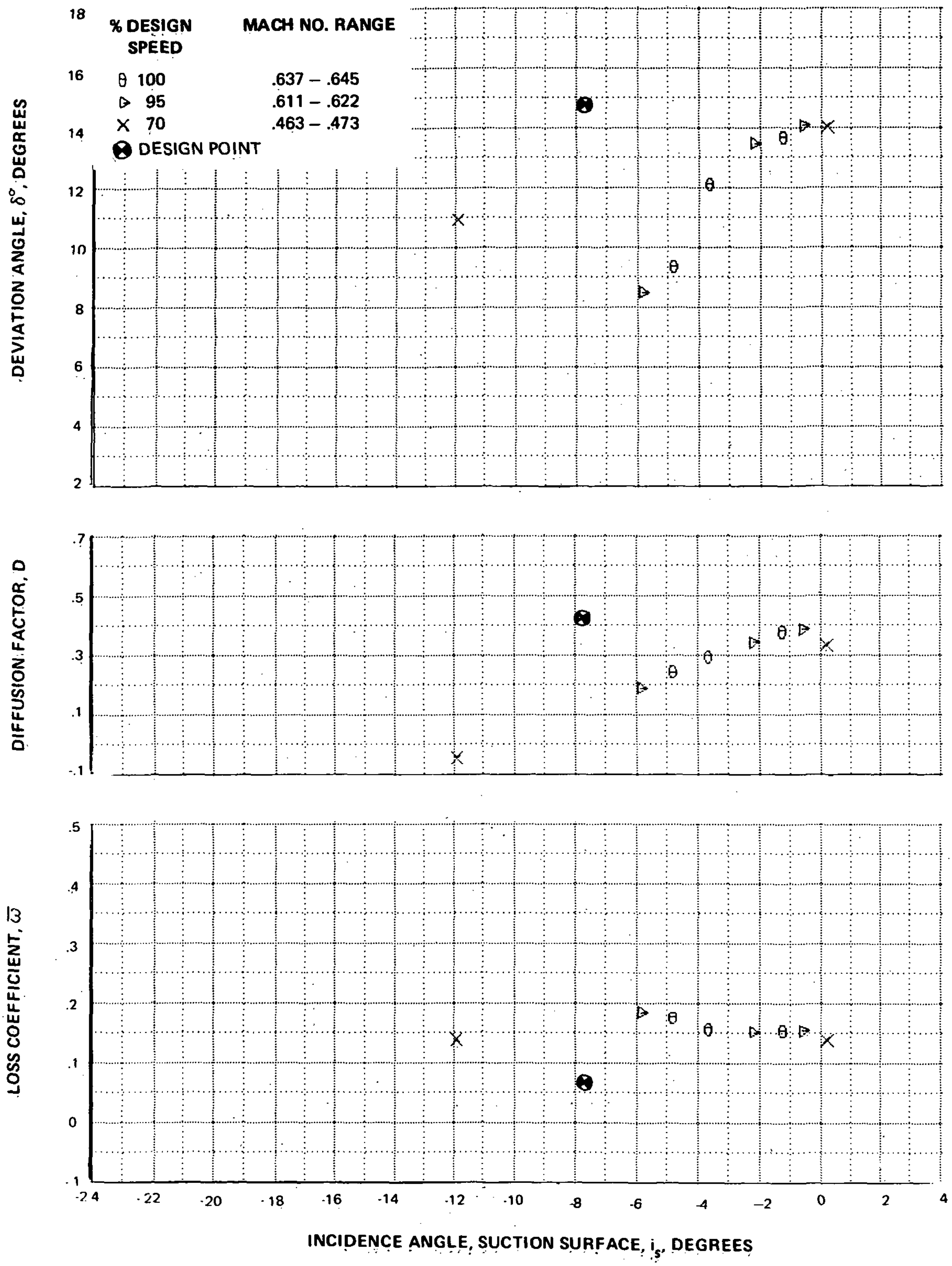


Figure 54e Stator Vane Element Performance with Tip Radially Distorted Inlet Flow, 90% Span

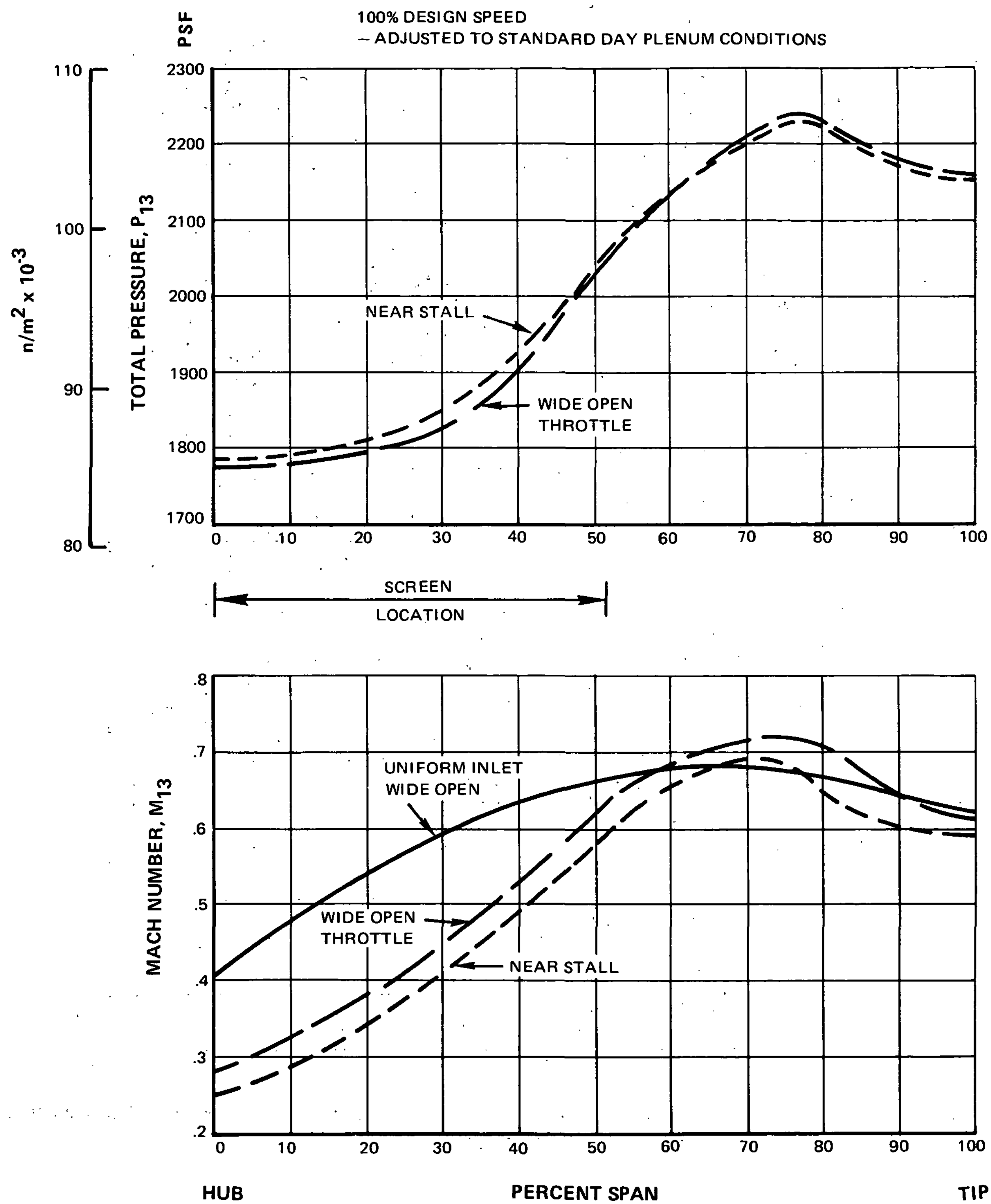


Figure 55 Spanwise Variation of Rotor Leading Edge Total Pressure and Mach Number With Hub-Radial Distorted Inlet Flow

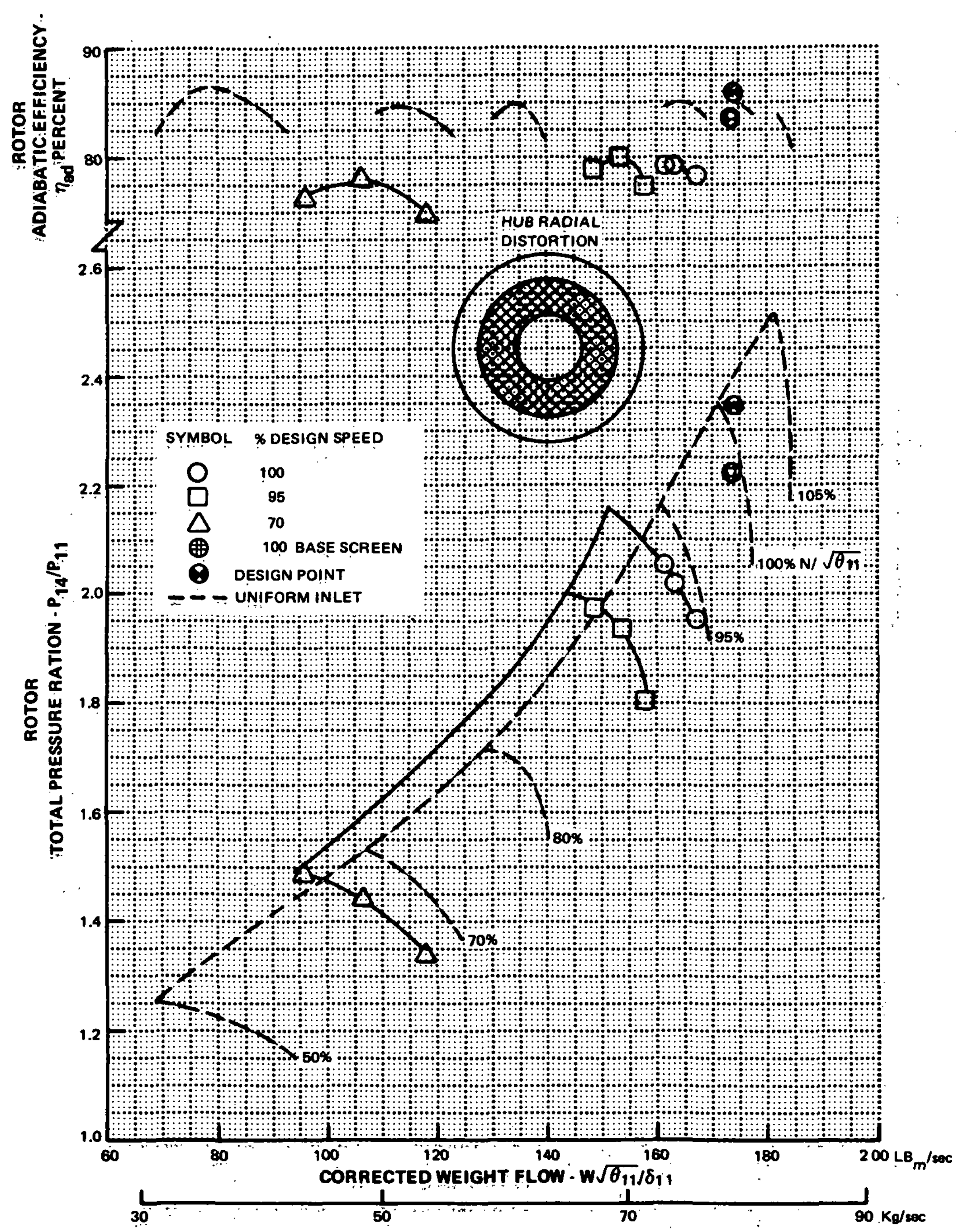


Figure 56 Comparison of Rotor Overall Performance With Hub Radial Distorted Inlet Flow and Uniform Inlet Flow

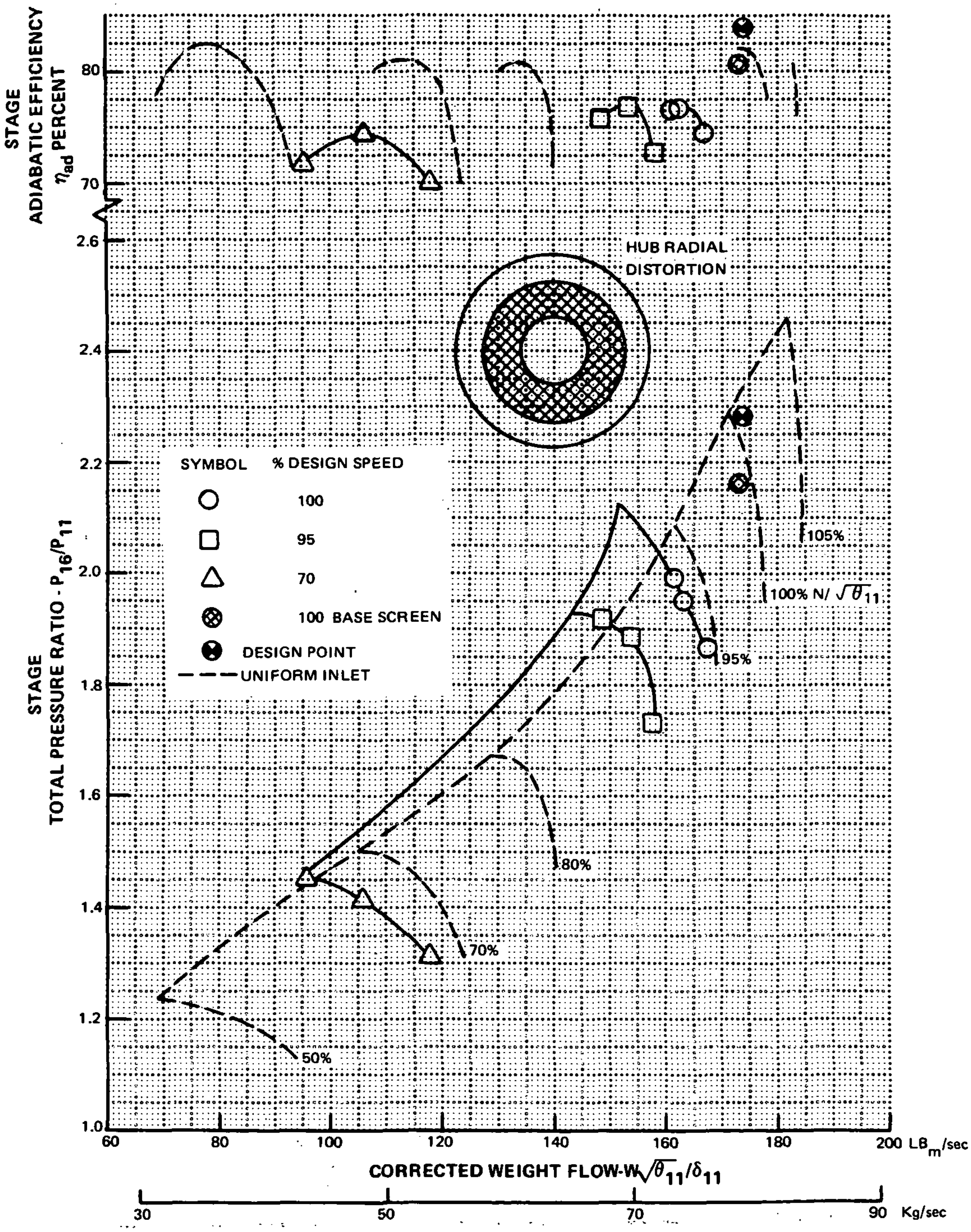


Figure 57 Comparison of Stage Overall Performance With Hub-Radial Distorted Inlet Flow and Uniform Inlet Flow

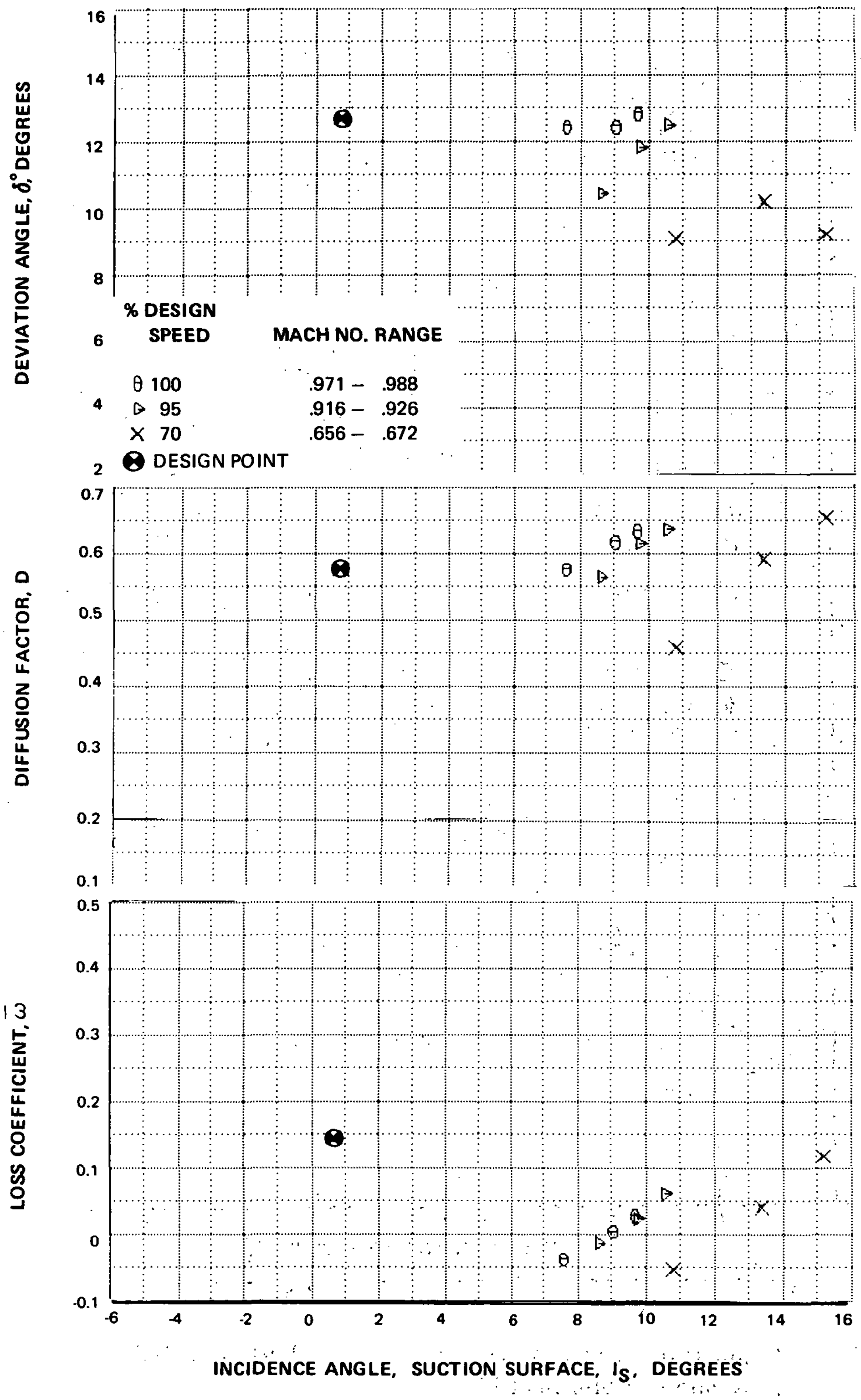


Figure 58a Rotor Blade Element Performance with Hub Radially Distorted Inlet Flow, 10% Span

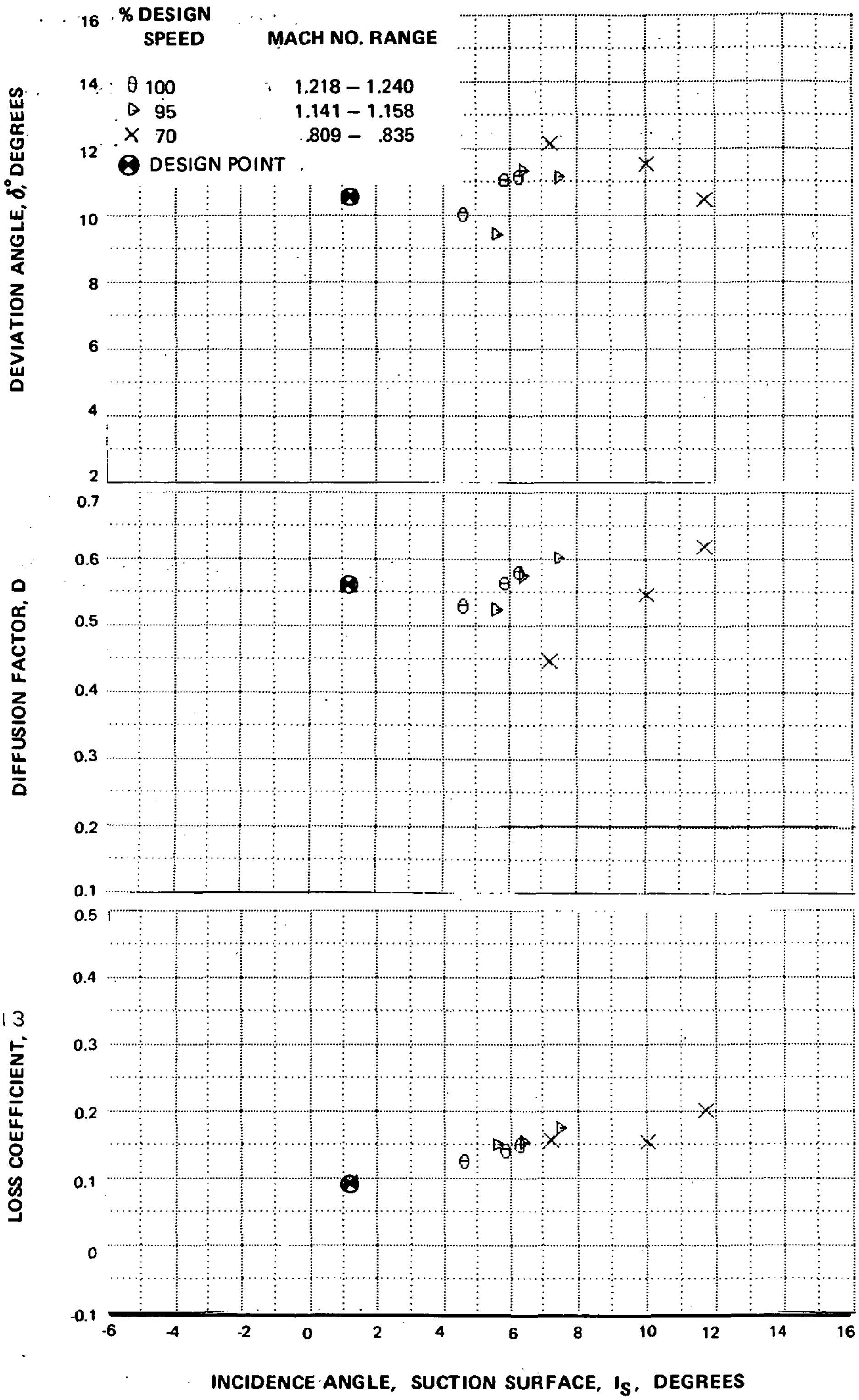


Figure 58b Rotor Blade Element Performance with Hub Radially Distorted Inlet Flow, 30% Span

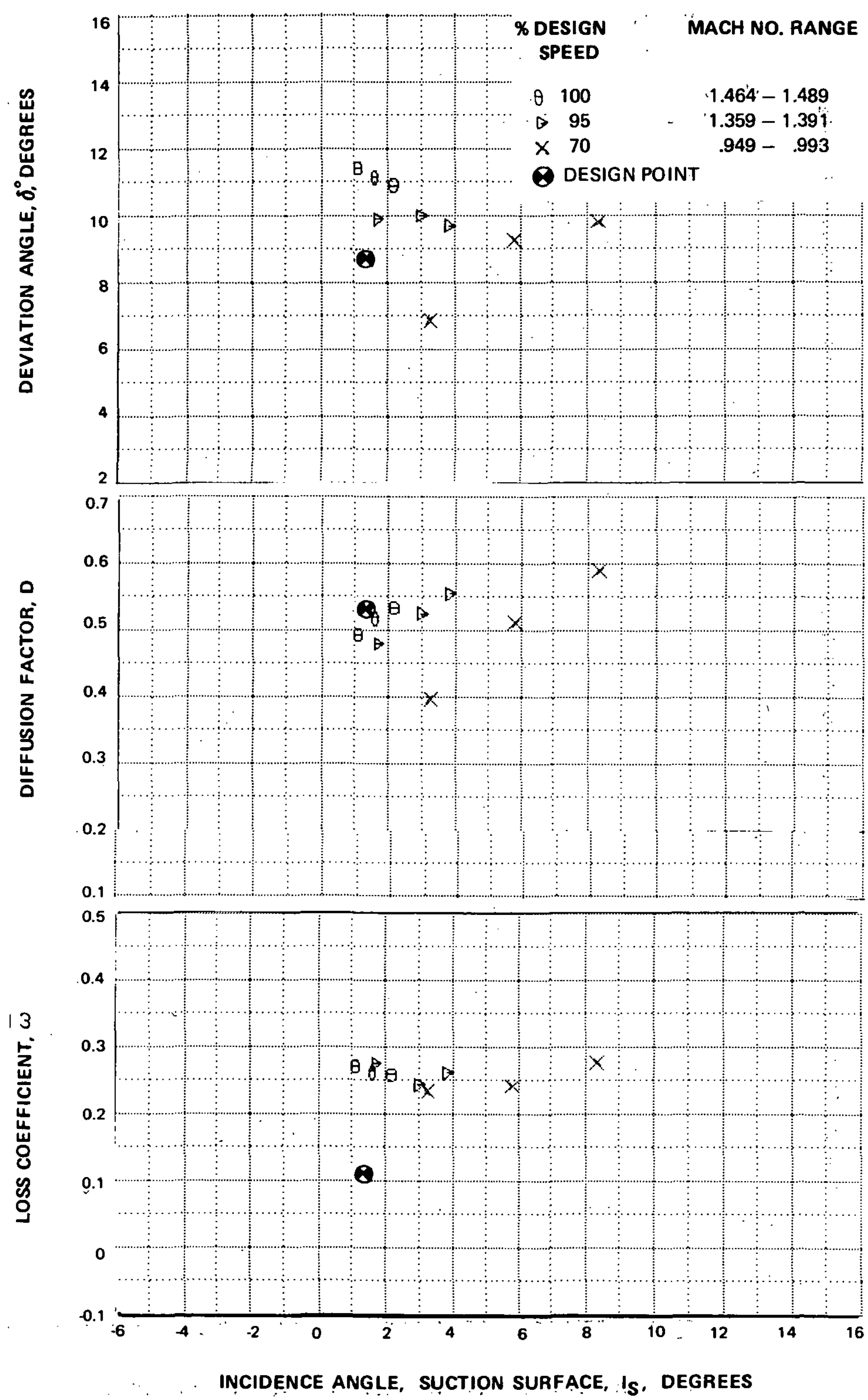


Figure 58c Rotor Blade Element Performance with Hub Radially Distorted Inlet Flow, 50% Span

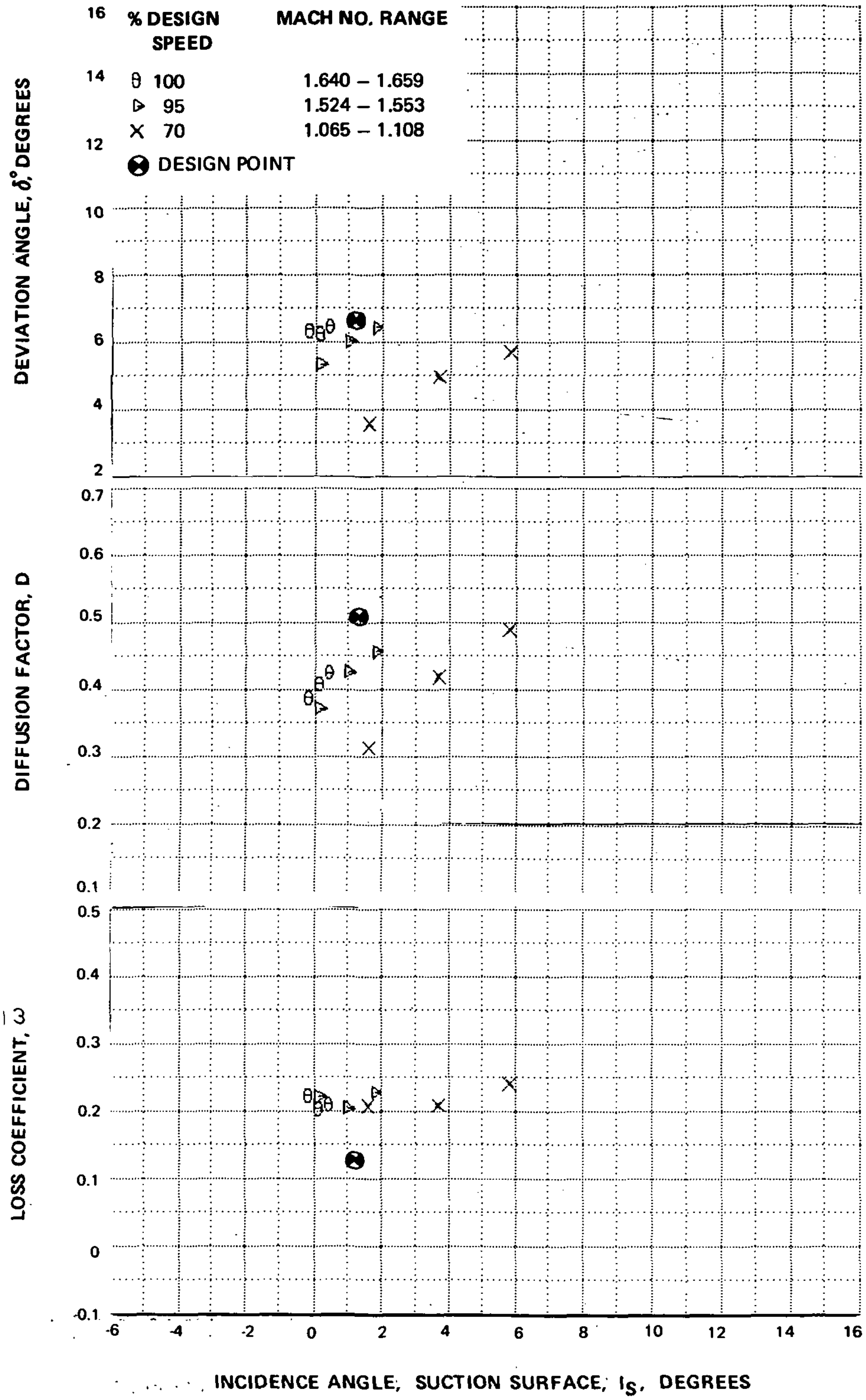


Figure 58d Rotor Blade Element Performance with Hub Radially Distorted Inlet Flow, 70% Span

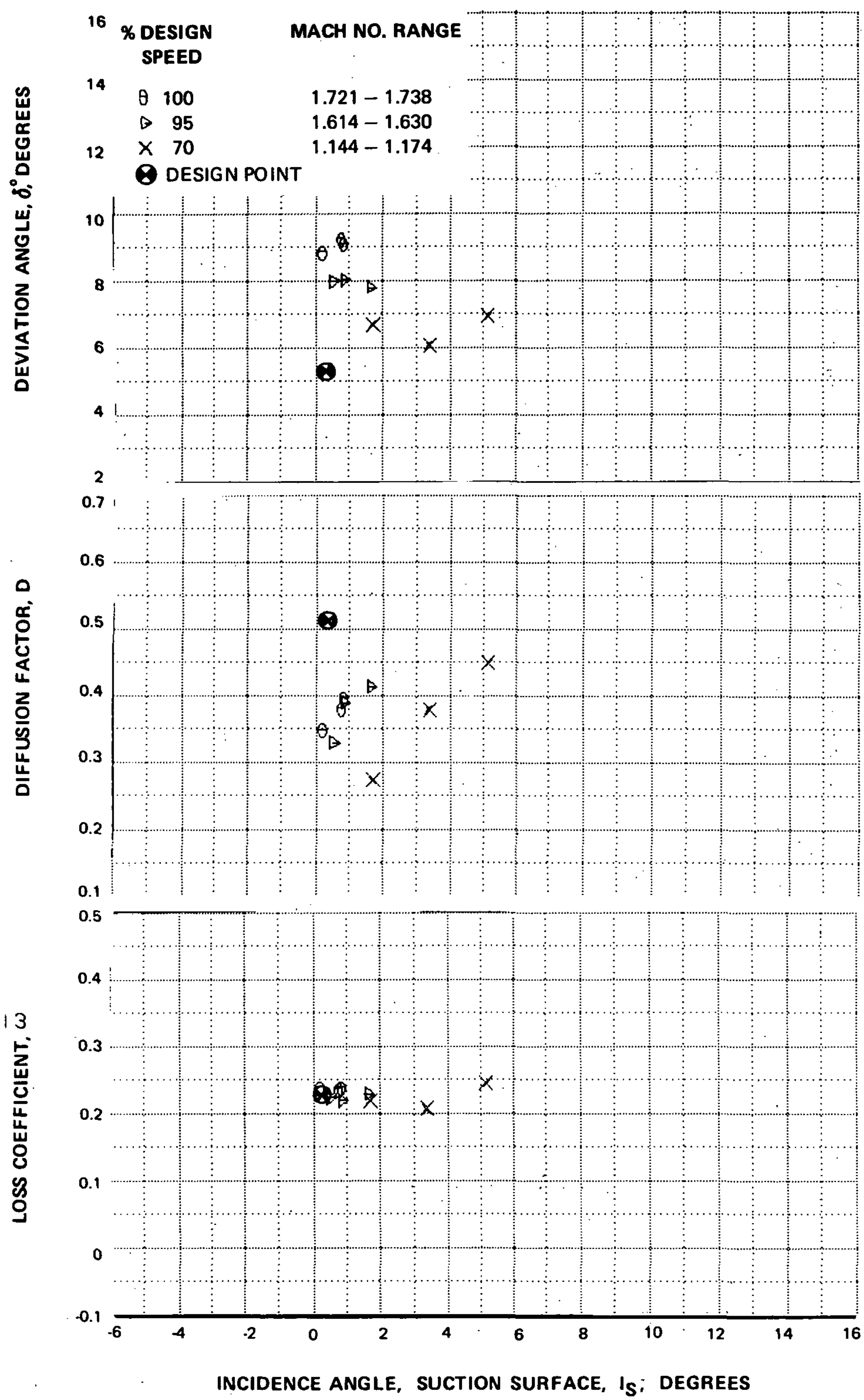


Figure 58e Rotor Blade Element Performance with Hub Radially Distorted Inlet Flow, 90% Span

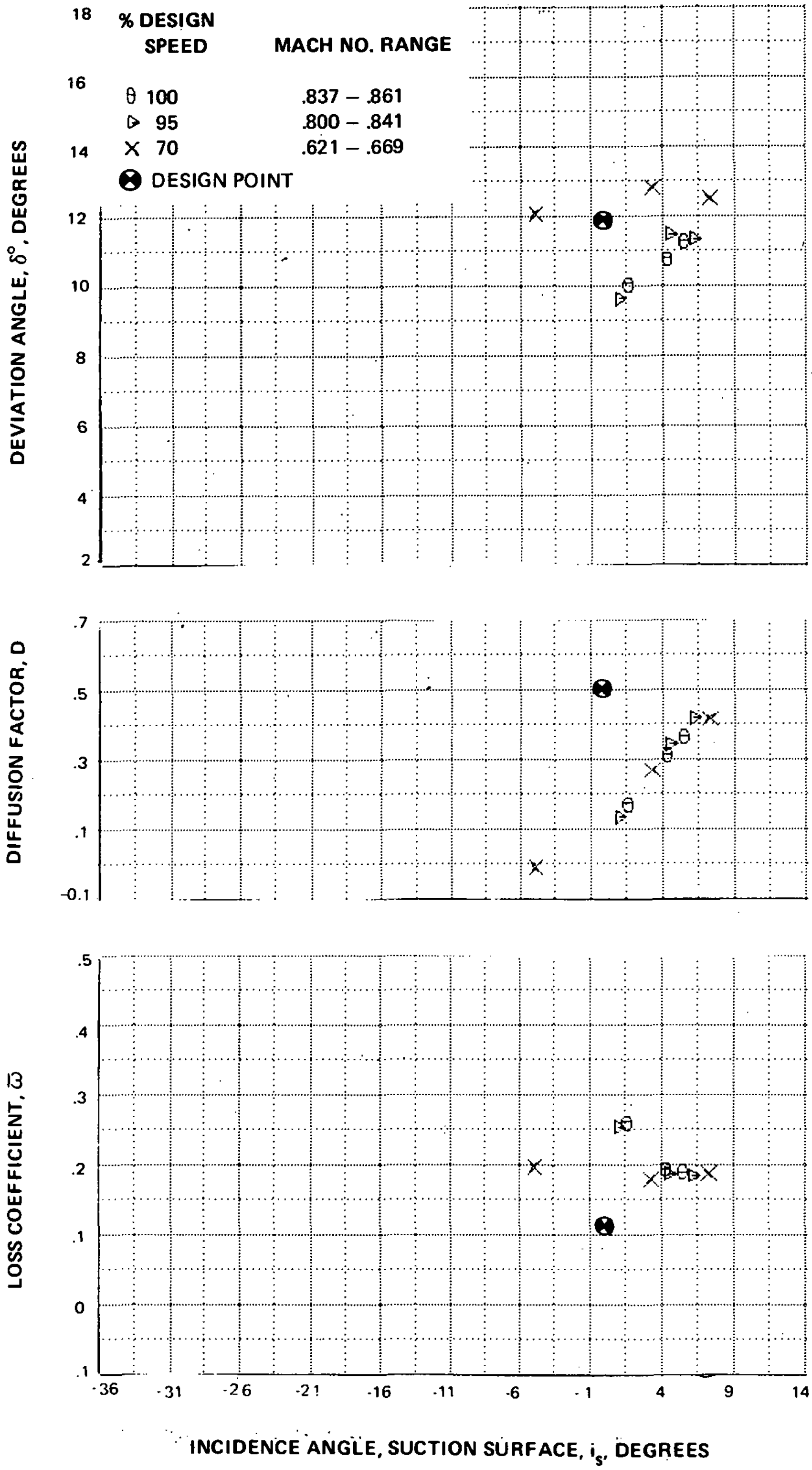


Figure 59a Stator Vane Element Performance with Hub Radially Distorted Inlet Flow, 10% Span

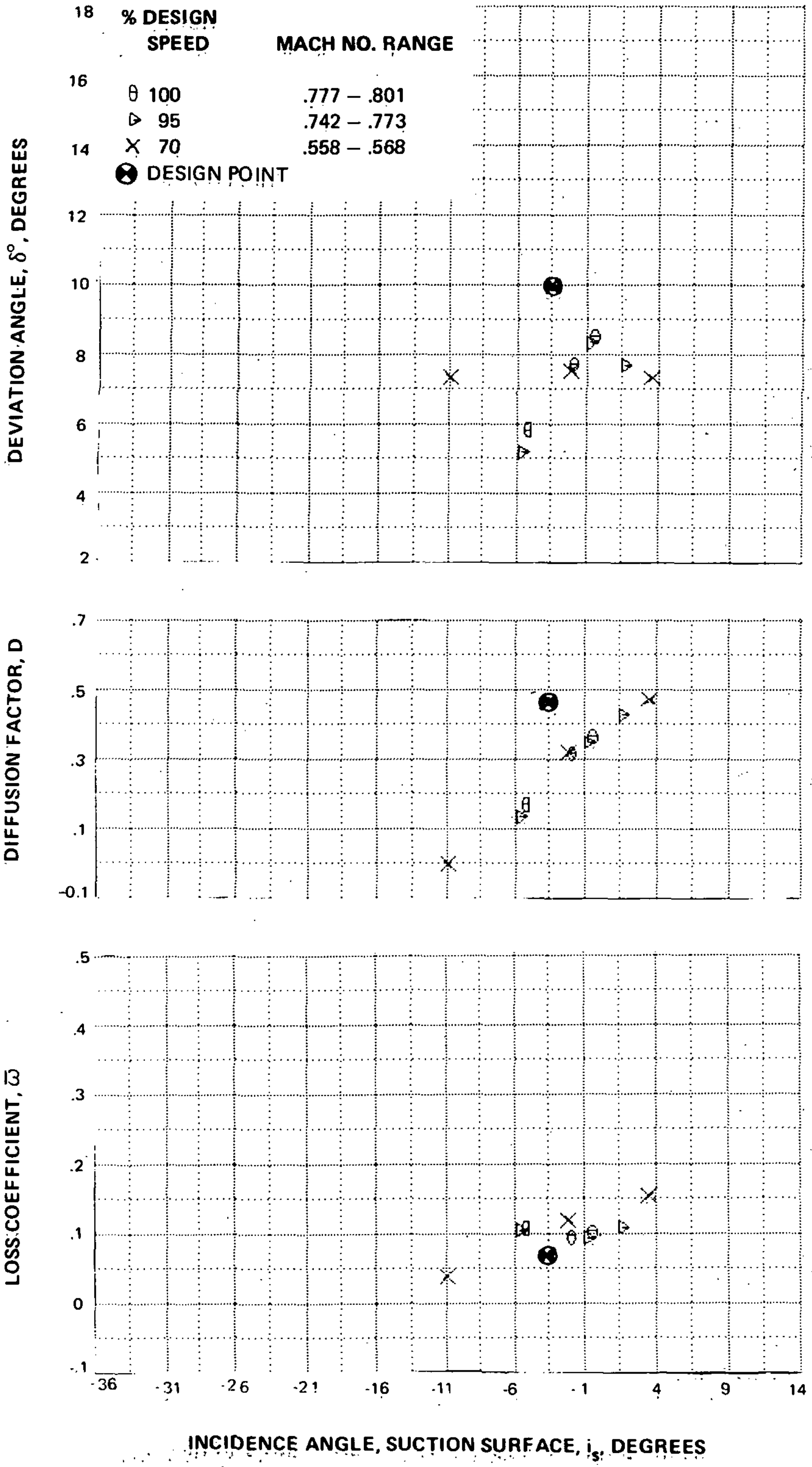


Figure 59b Stator Vane Element Performance with Hub Radially Distorted Inlet Flow, 30% Span

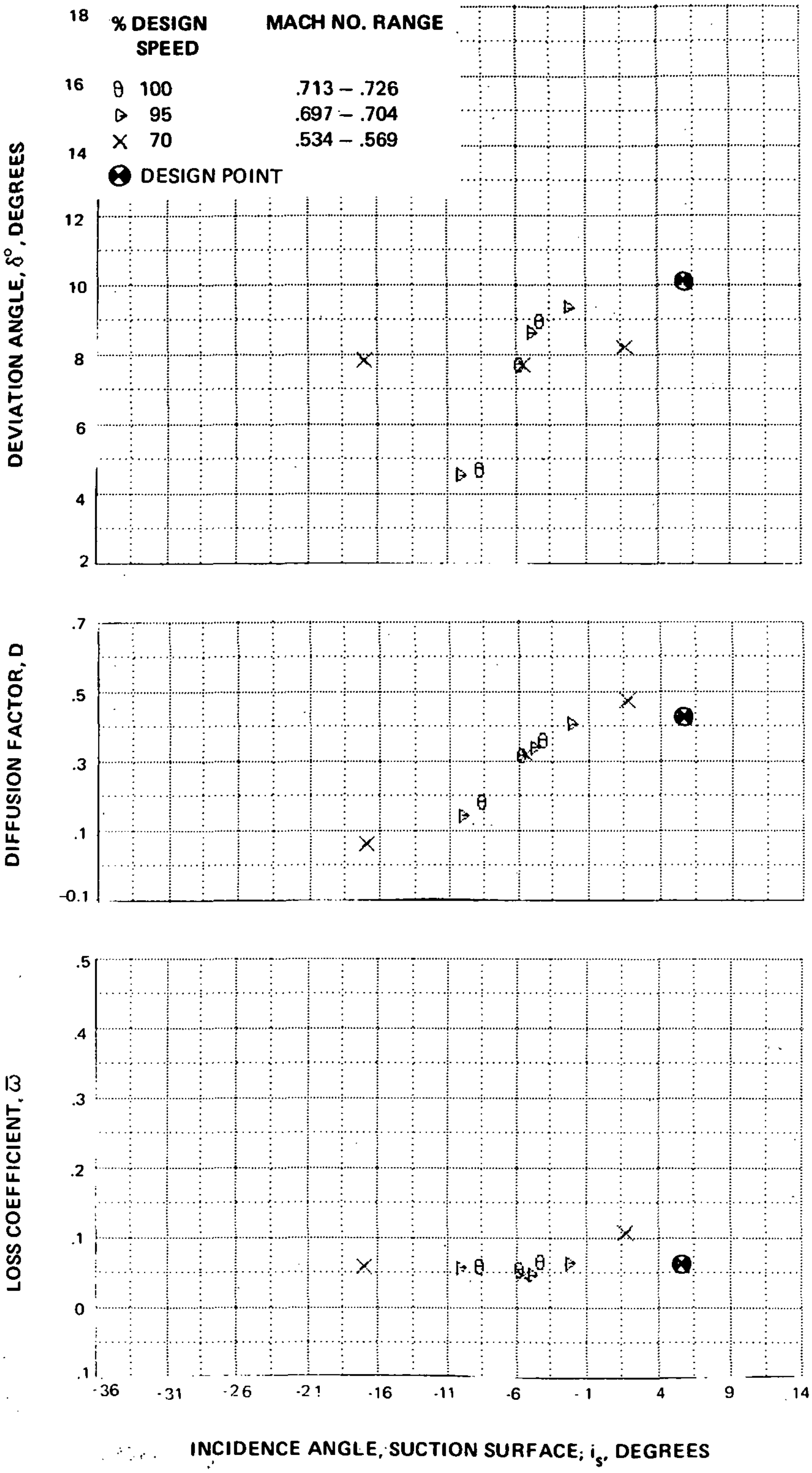


Figure 59c. Stator Vane Element Performance with Hub Radially Distorted Inlet Flow, 50% Span

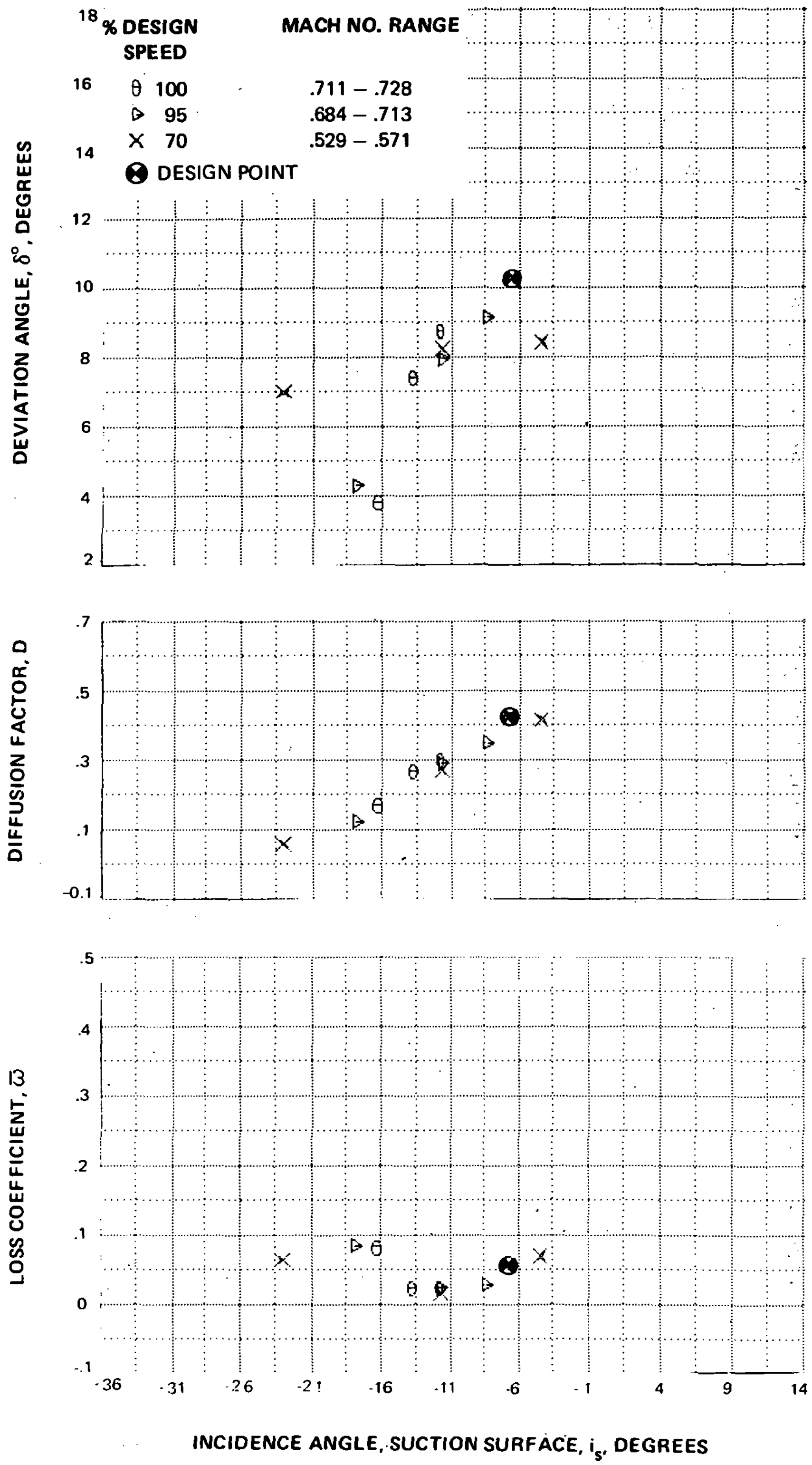


Figure 59d Stator Vane Element Performance with Hub Radially Distorted Inlet Flow, 70% Span

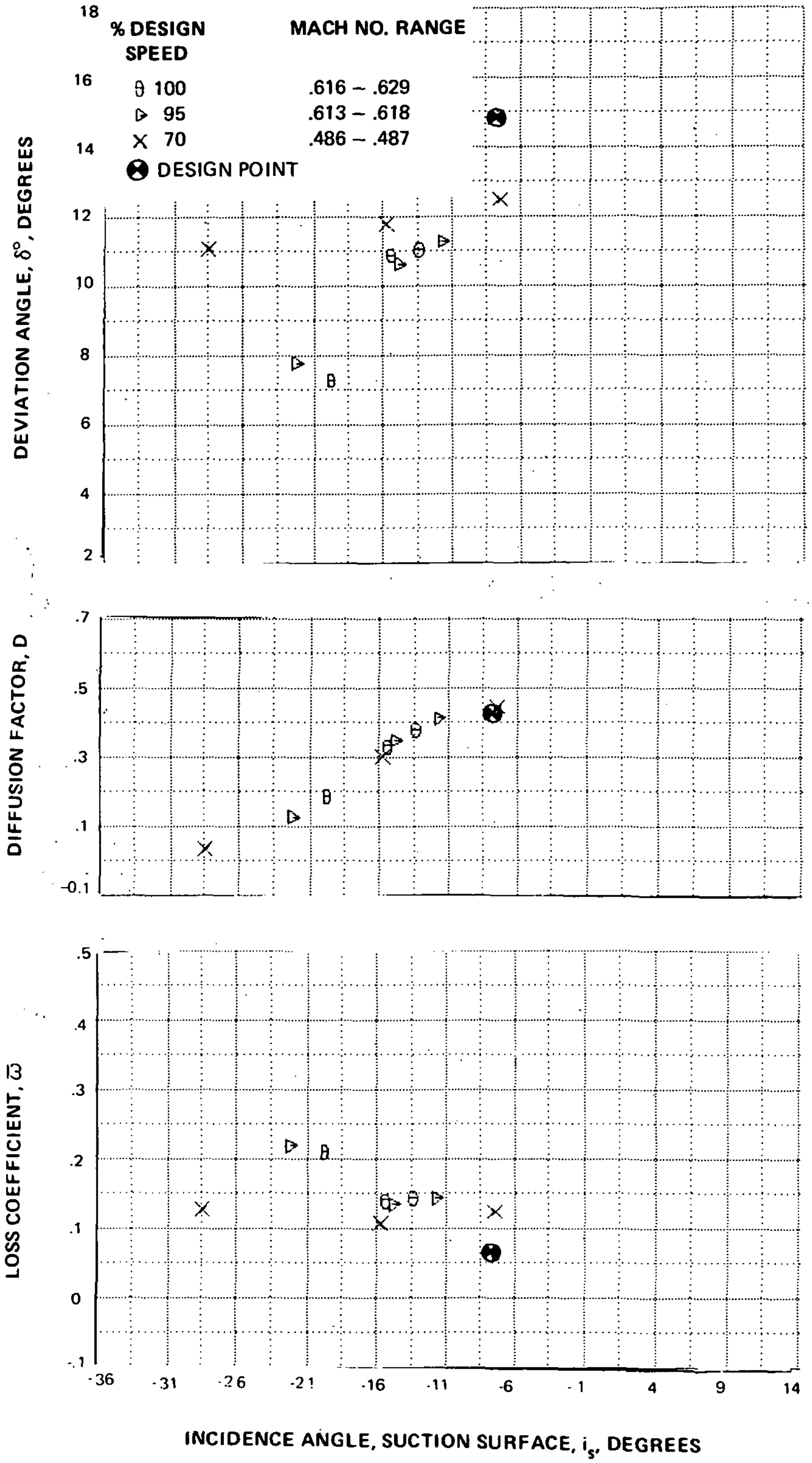


Figure 59e Stator Vane Element Performance with Hub Radially Distorted Inlet Flow, 90% Flow

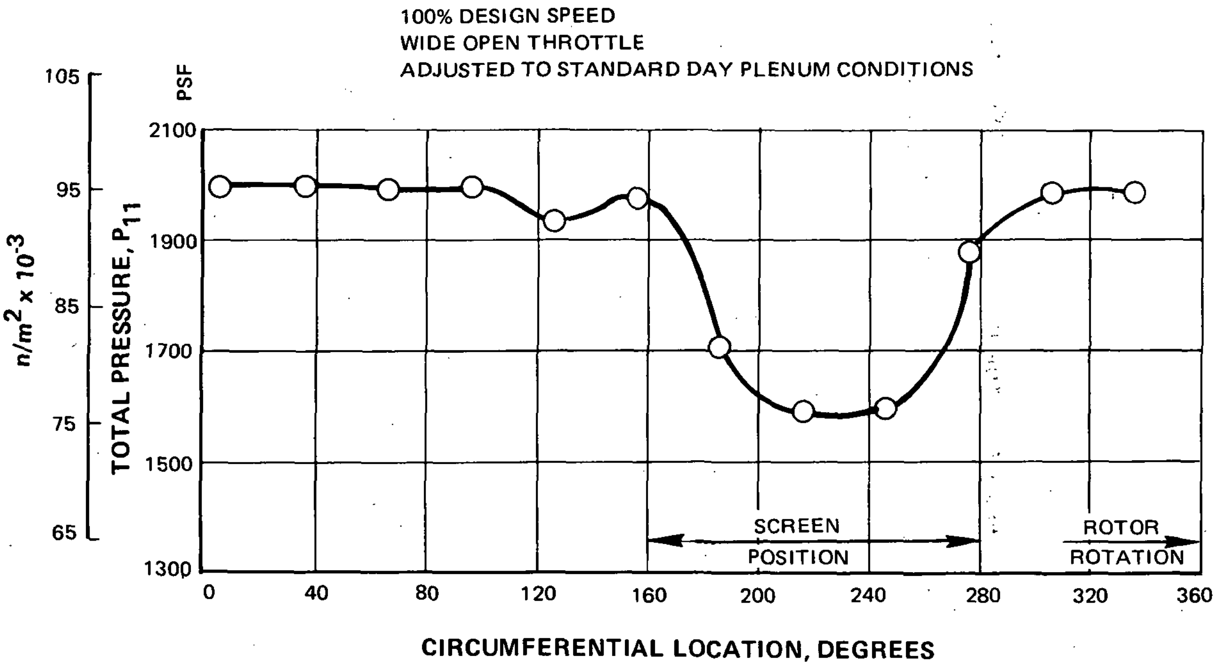


Figure 60 Midspan Circumferential Distribution of Rotor Inlet Total Pressure

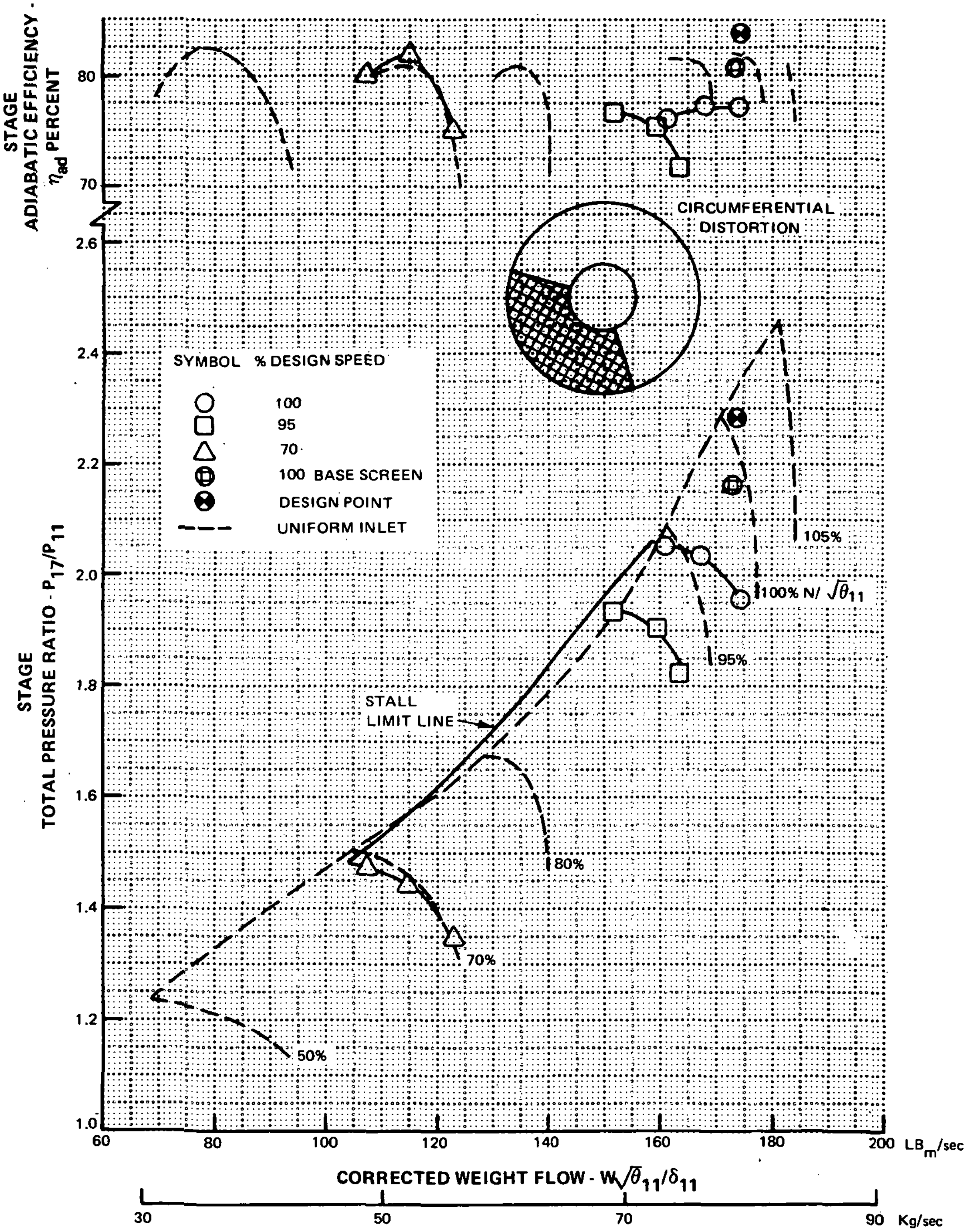


Figure 61 Comparison of Stage Overall Performance With Circumferentially Distorted Inlet Flow and Uniform Inlet Flow

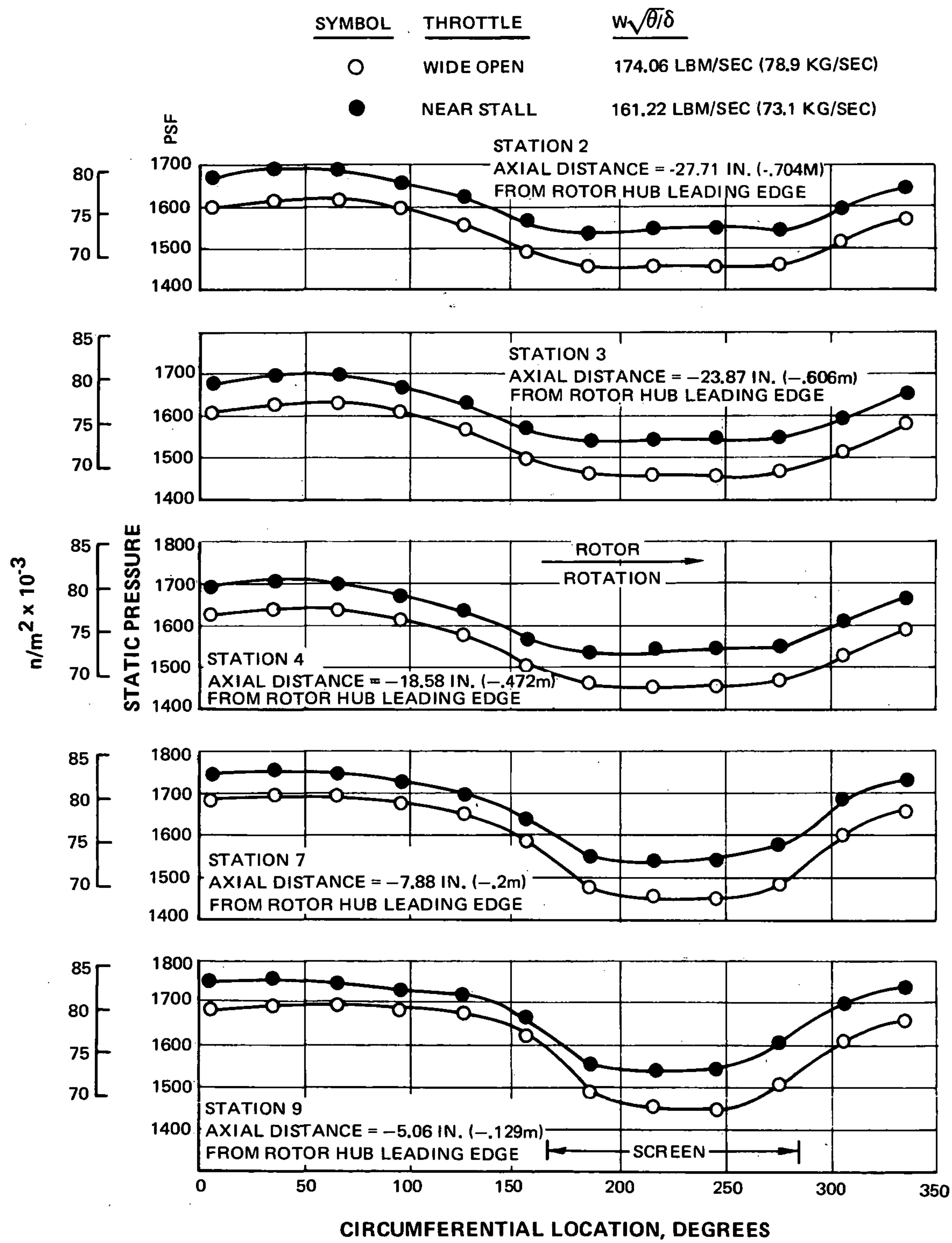


Figure 62 Circumferential Distributions of Rotor Inlet Static Pressure at the Tip for Design Speed Tests with Circumferential Inlet Distortion

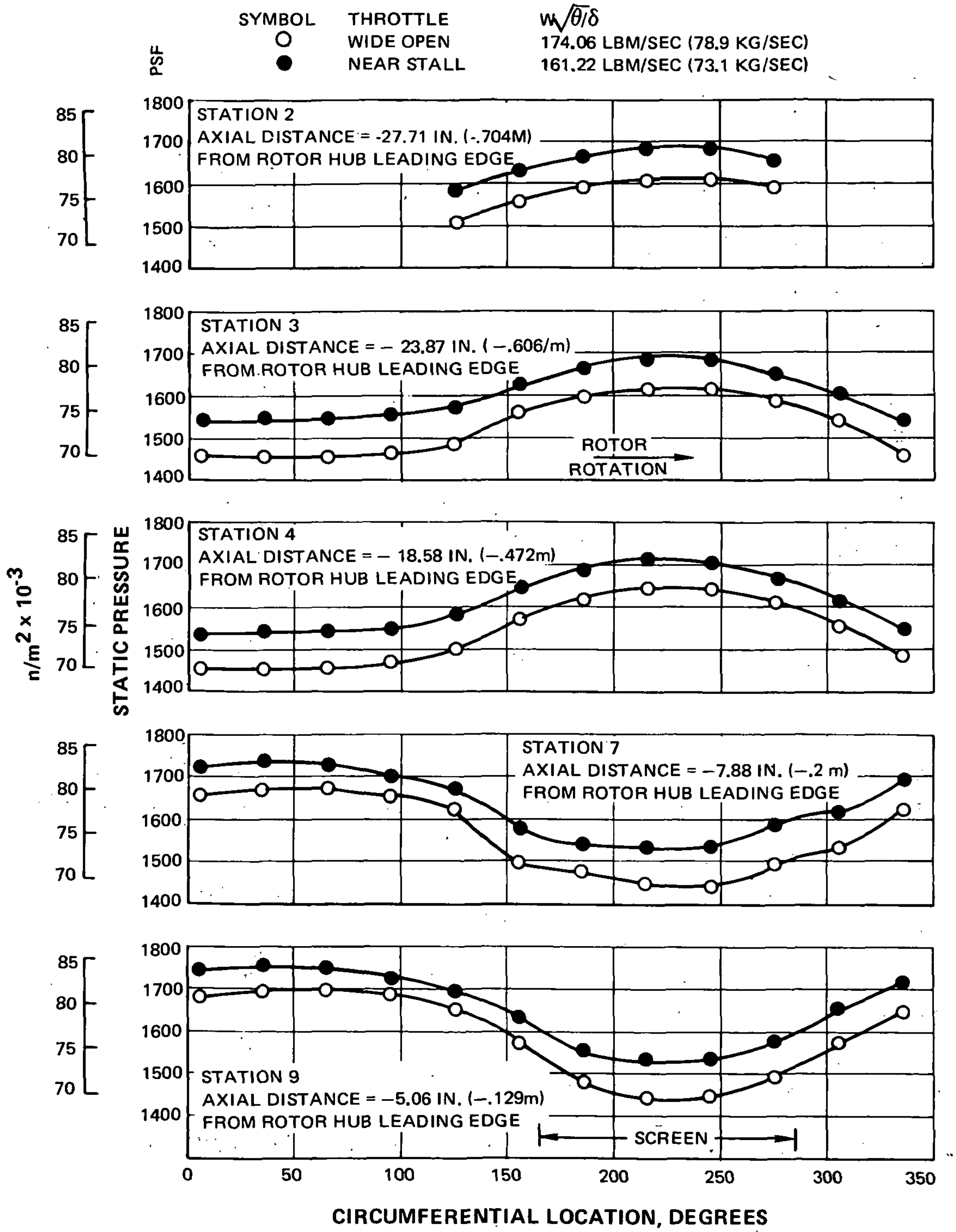


Figure 63 Circumferential Distributions of Rotor Inlet Static Pressure at the Hub for Design Speed Tests with Circumferential Inlet Distortion

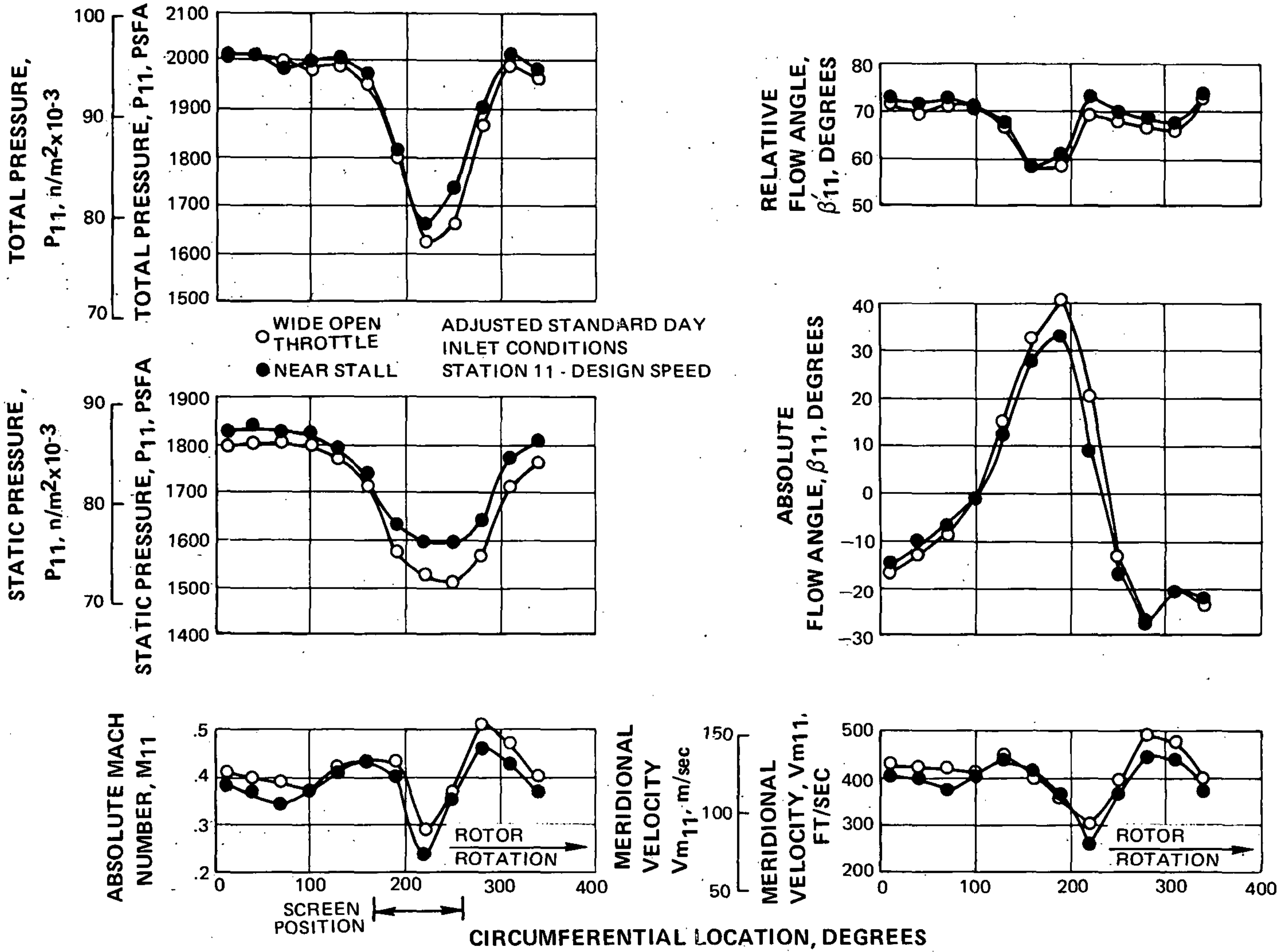


Figure 64 Circumferential Distributions of Rotor Inlet Total Pressure, Static Pressure, Absolute Mach Number, Relative Air Angle, Absolute Air Angle, and Meridional Velocity with Circumferential Inlet Distortion – 10% Span

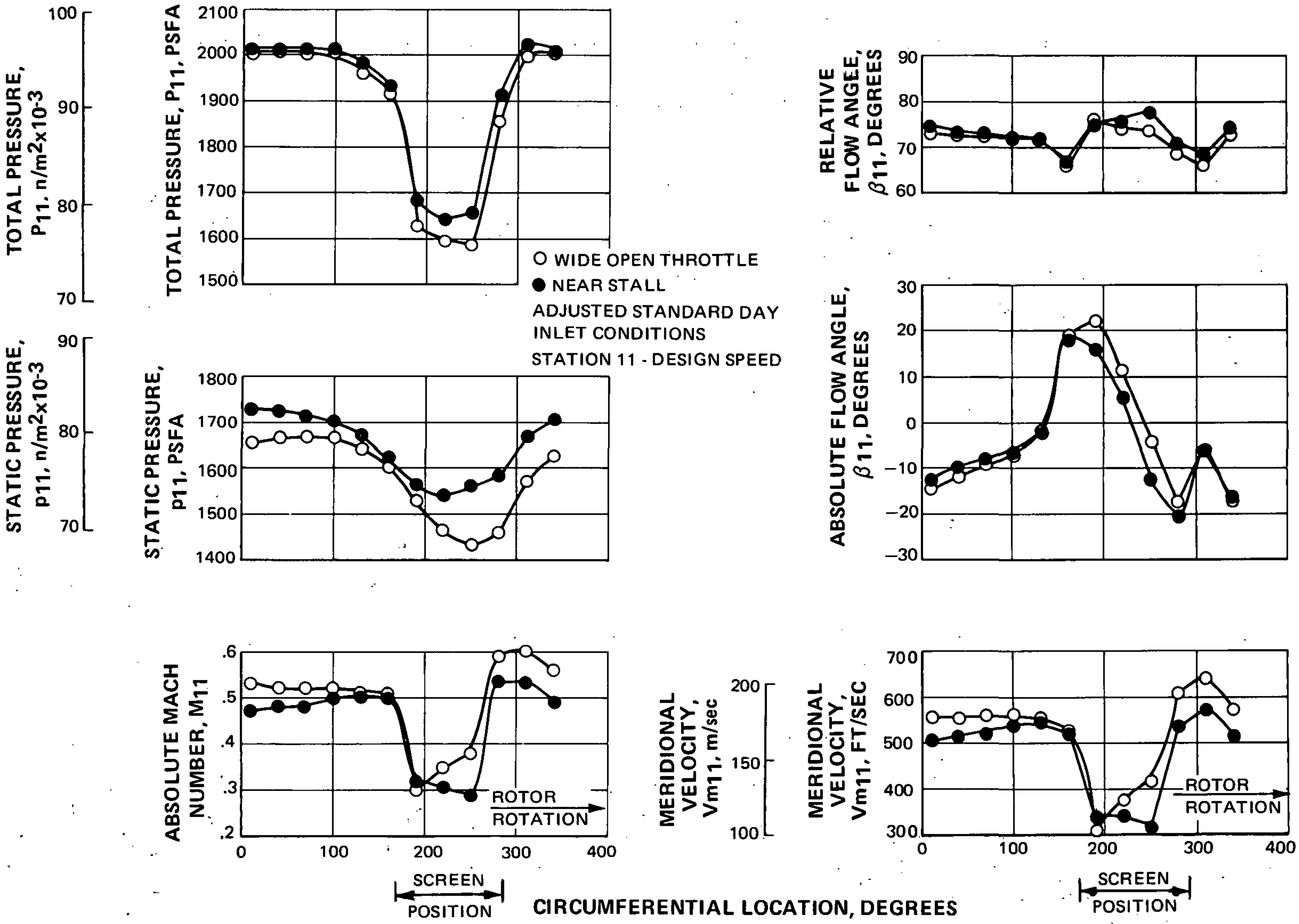


Figure 65 Circumferential Distributions of Rotor Inlet Total Pressure, Static Pressure, Absolute Mach Number, Relative Air Angle, Absolute Air Angle, and Meridional Velocity with Circumferential Inlet Distortion – 50% Span

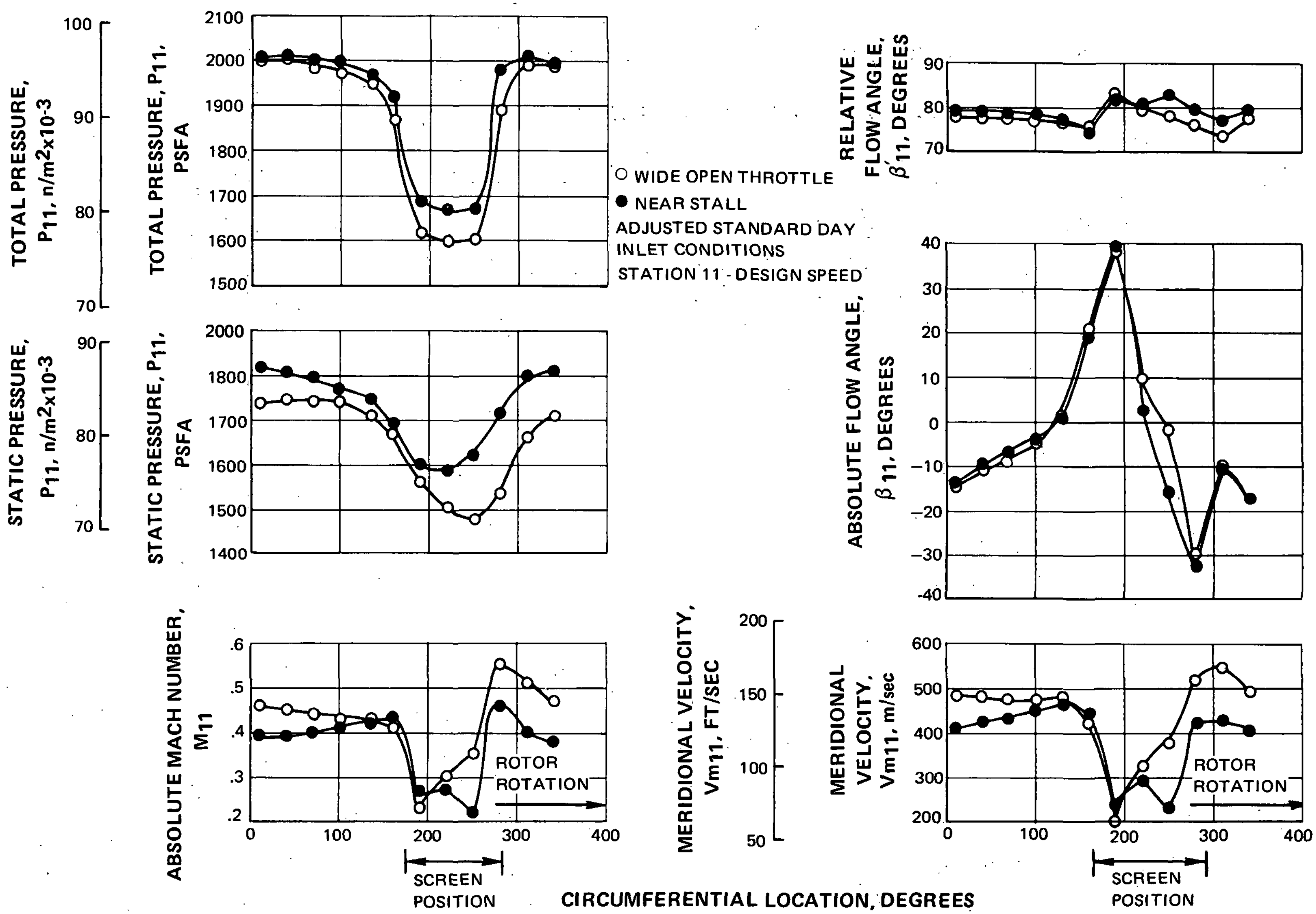


Figure 66 Circumferential Distributions of Rotor Inlet Total Pressure, Static Pressure, Absolute Mach Number, Relative Air Angle, Absolute Air Angle, and Meridional Velocity with Circumferential Inlet Distortion – 90% Span

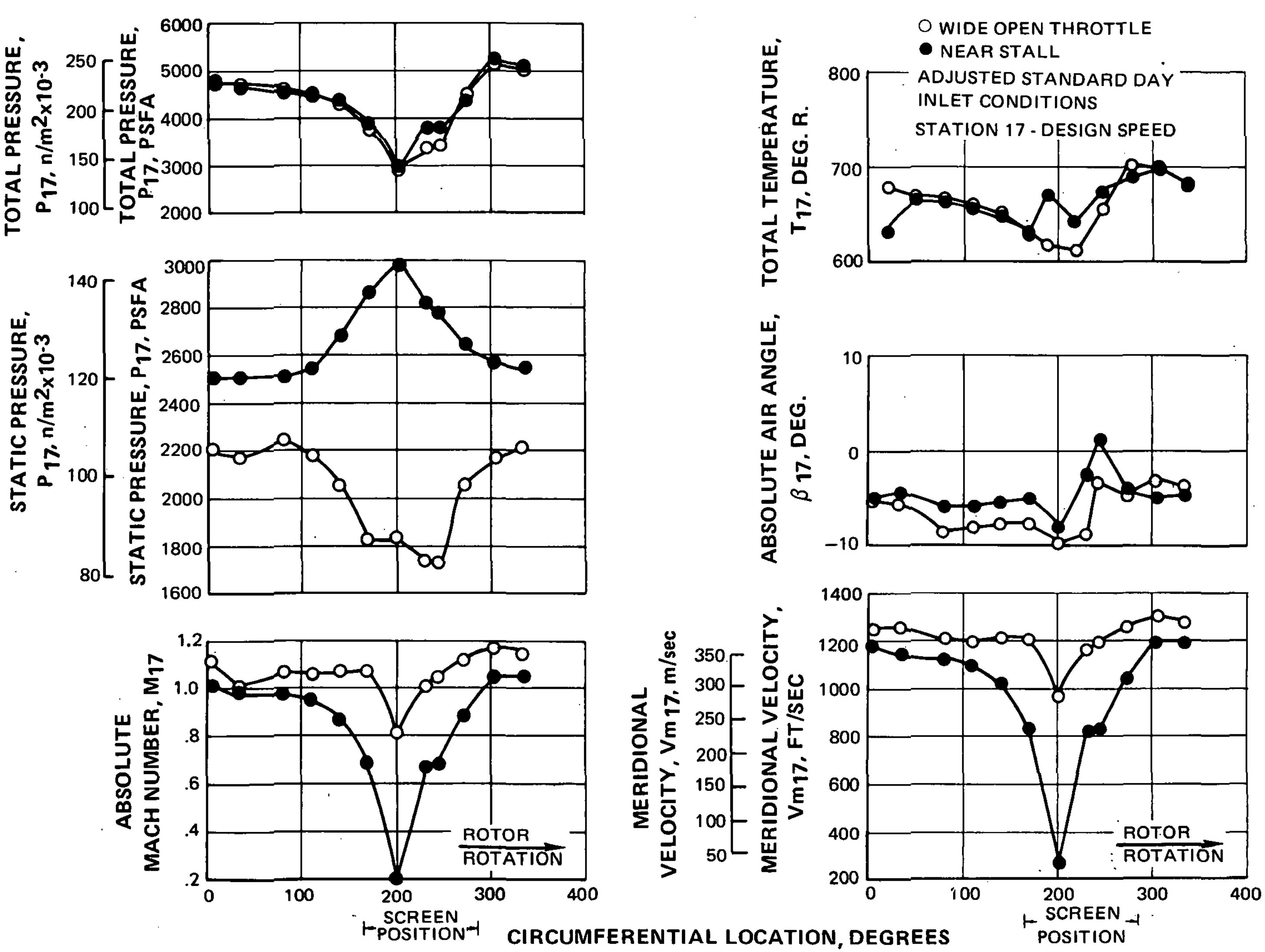


Figure 67 Circumferential Distributions of Stator Discharge Total Pressure, Static Pressure, Absolute Mach Number, Total Temperature, Absolute Air Angle, and Absolute Velocity with Circumferential Inlet Distortion – 10% Span

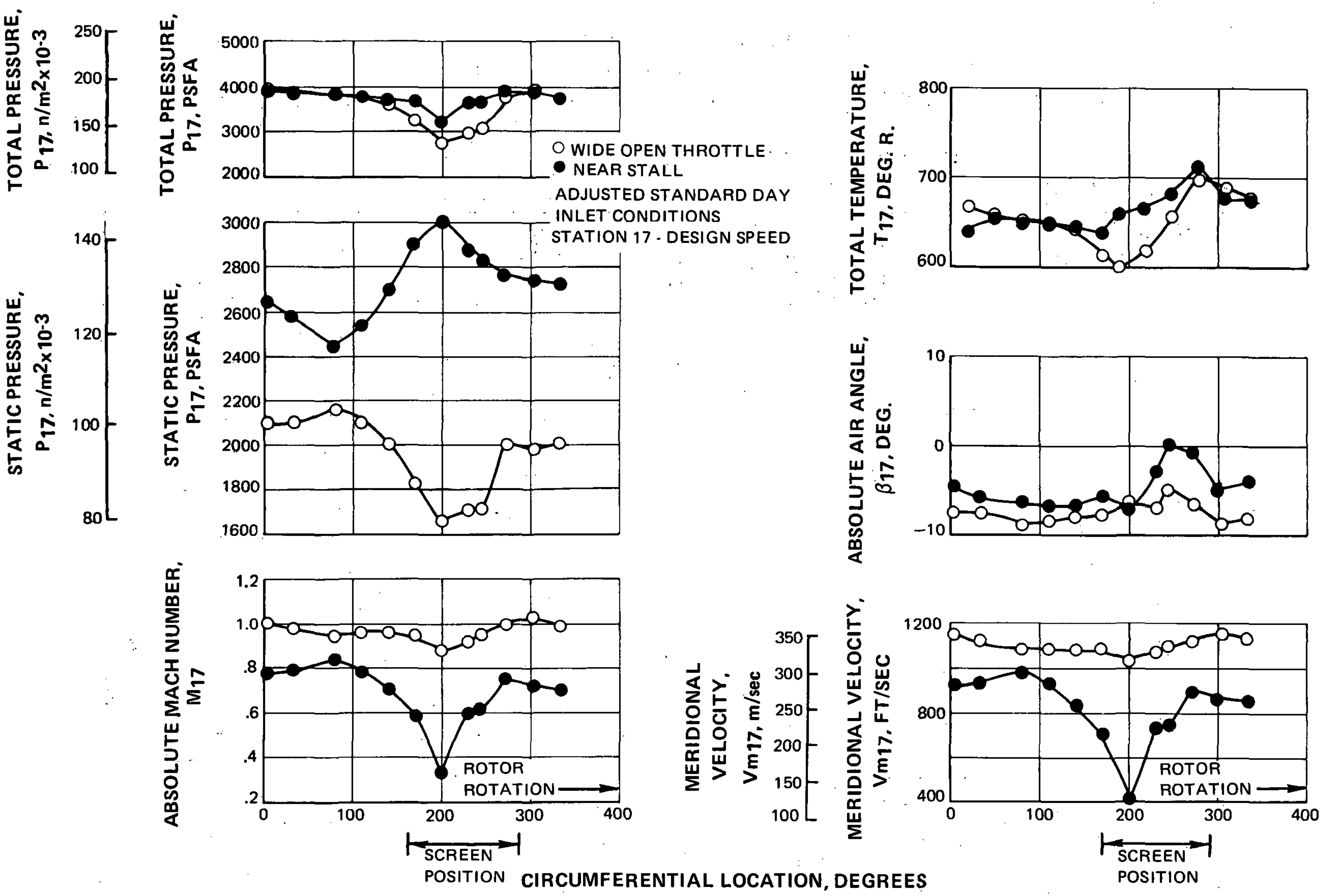


Figure 68 Circumferential Distributions of Stator Discharge Total Pressure, Absolute Mach Number, Total Temperature, Absolute Air Angle, and Absolute Velocity with Circumferential Inlet Distortion – 50% Span

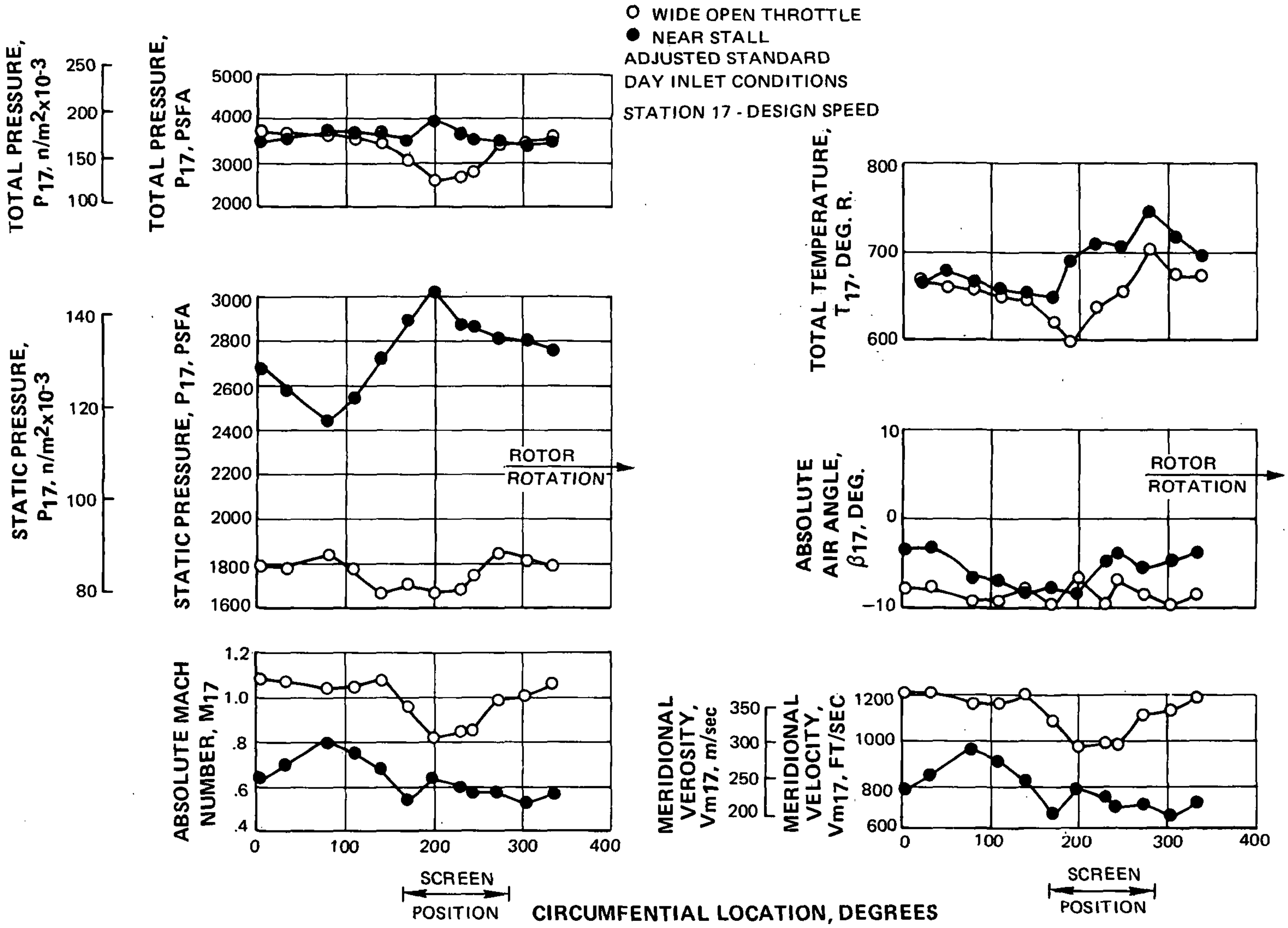


Figure 69 Circumferential Distributions of Stator Discharge Total Pressure, Statis Pressure, Absolute Mach Number, Total Temperature, Absolute Air Angle, and Absolute Velocity with Circumferential Inlet Distortion – 90% Span

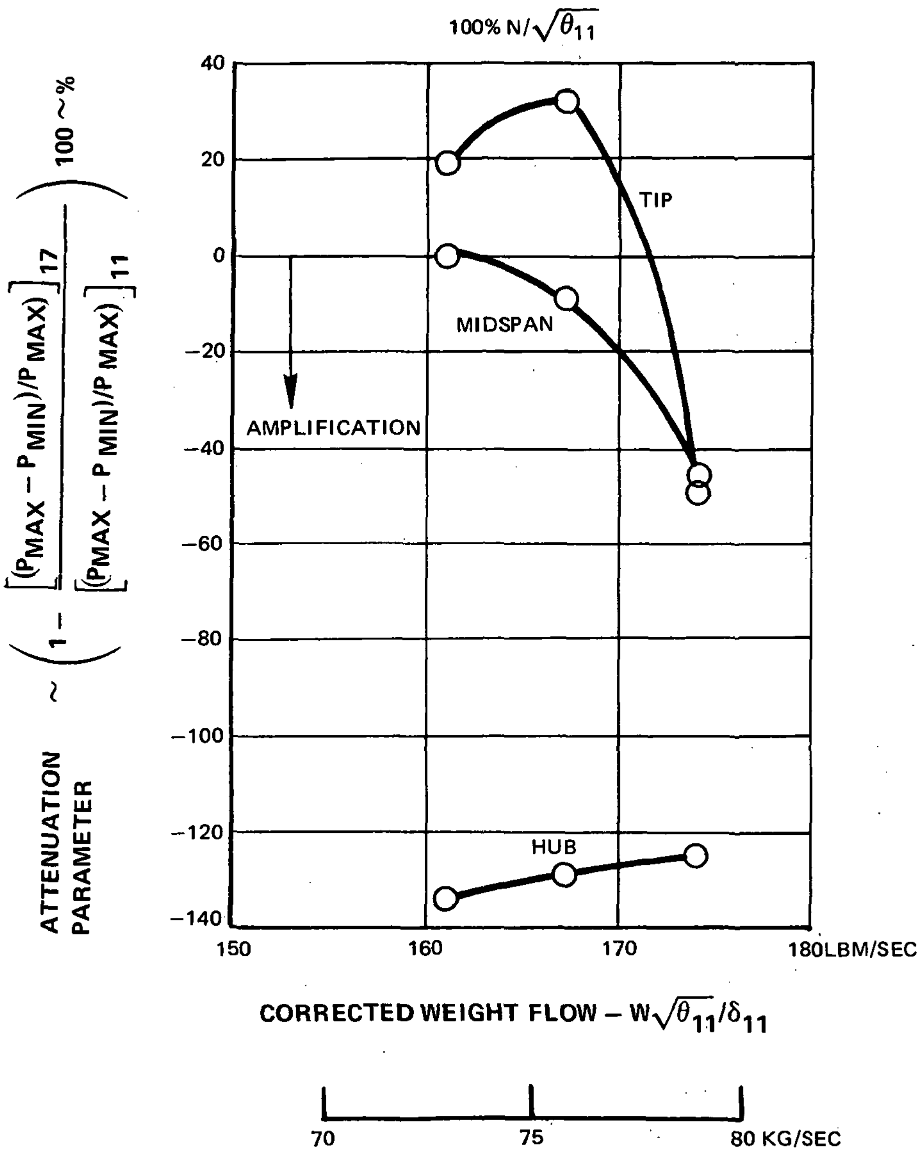


Figure 70 Hub, Midspan, and Tip Attenuation Parameters Versus Flow for Circumferentially-Distorted Inlet Tests at 100 Percent Design Speed

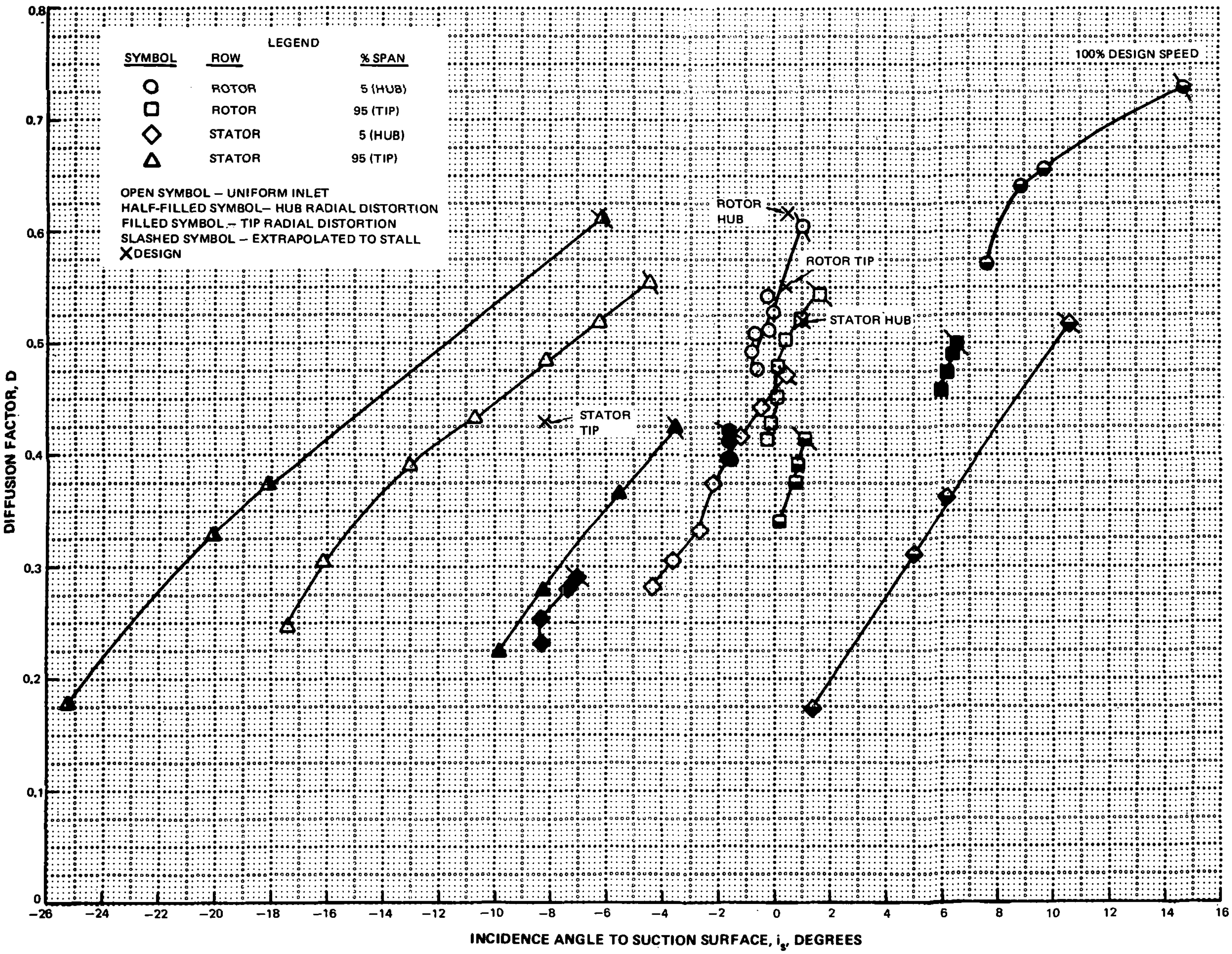


Figure 71 Hub and Tip Diffusion Factors Versus Incidence Angle for Uniform and Radially Distorted Inlet Flows – 100% Design Speed

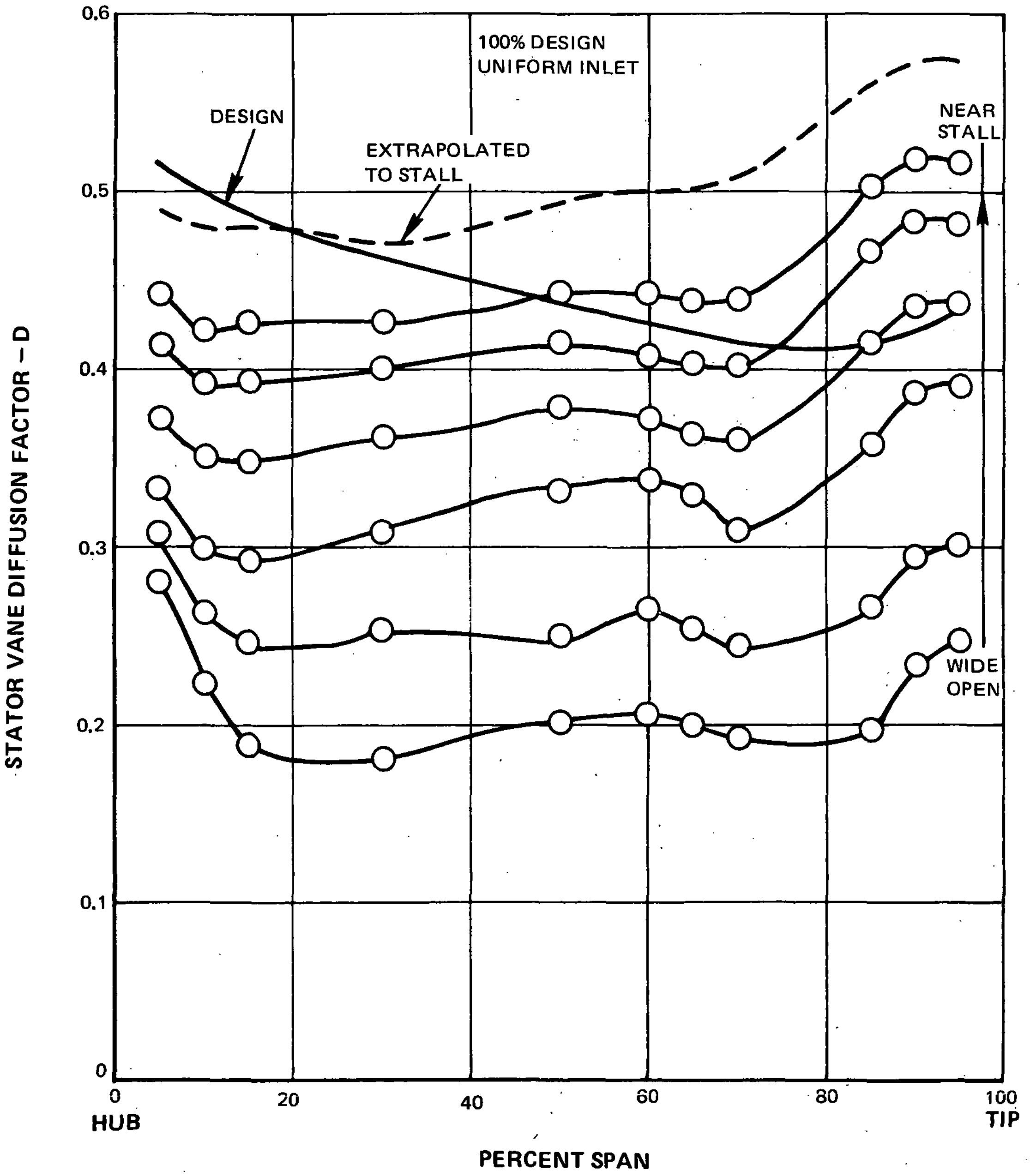


Figure 72 Spanwise Stator Vane Diffusion Factors - From Maximum to Stall Flows

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APPENDIX 1

SYMBOLS AND PERFORMANCE PARAMETER DEFINITIONS

APPENDIX 1-a

SYMBOLS

A	–	area, ft^2 or m^2
D	–	diffusion factor
g_c	–	conversion factor, 32.17 lb_m ft/lb sec^2
ID	–	inside diameter, inches or meters
i_m	–	incidence angle, angle between inlet air direction and line tangent to blade mean camber line at leading edge, degrees (labelled INCM, Table 7)
i_s	–	incidence angle, angle between inlet air direction and line tangent to blade suction surface at leading edge, degrees (labelled INCS, Table 7)
M	–	Mach number
MCA	–	multiple-circular-arc
MR	–	mass average in radial directions (Tables 13, 14, and 15)
N	–	rotor speed, rpm ($N/\sqrt{\theta}$ labelled NCORR, Table 7)
OD	–	outside diameter, inches or meters
P	–	total pressure, psfa or n/m^2
p	–	static pressure, psfa or n/m^2
r	–	radius, ft or meters
R	–	gas constant for air
SL	–	streamline number
SM	–	stall margin, %
T	–	total temperature, °R or °K
t	–	static temperature, °R or °K
U	–	rotor speed, ft/sec or m/sec

V	–	air velocity, ft/sec or m/sec
Vm	–	meridional velocity $(Vr^2 + Vz^2)^{1/2}$, ft/sec or m/sec (labelled VM, Table 7)
W	–	weight flow, lb_m/sec or kg/sec
β	–	absolute air angle, $\cot^{-1}$ $(Vm/V\theta)$, degrees (labelled B, Table 7)
β'	–	relative air angle, $\cot^{-1}$ $(Vm/V\theta')$, degrees (labelled B', Table 7)
γ	–	ratio of specific heats for air, 1.4
$\Delta\beta$	–	air turning angle, degrees (labelled TURN, Table 7)
δ	–	ratio of inlet total pressure to standard pressure of 2116.22 lbs/ft^2
δ°	–	deviation angle, angle between exit air direction and tangent to blade mean camber line at trailing edge, degrees (labelled DEV, Table 7)
ϵ	–	angle between tangent to streamline projected on meridional plane and axial direction, degrees (labelled EPSI, Table 7)
η	–	efficiency, %
θ	–	ratio of inlet total temperature to standard temperature of 518.6°R
ρ	–	mass density, lb_m/ft^3 or kg/m_3
σ	–	solidity, ratio of chord to spacing
$\bar{\omega}$	–	total pressure loss coefficient (labelled OMEGA - B, Table 7)
ω	–	angular velocity of rotor, radians/sec

Superscripts:

'	–	relative to moving blades or minutes of arc
*	–	designates blade metal angle
°	–	degrees of arc

Subscripts:

ad	–	adiabatic

p	–	polytropic or profile
r	–	radial direction
m	–	meridional direction (in z-r plane)
s	–	suction surface
z	–	axial direction
θ	–	tangential direction
0	–	plenum chamber
11	–	instrument plane upstream of rotor
13	–	station at rotor leading edge
14	–	station at rotor trailing edge
15	–	station at stator leading edge
16	–	station at stator trailing edge
17	–	instrument plane downstream stator

APPENDIX 1-b

PERFORMANCE PARAMETERS

a) Relative total temperature

$$T'_{13} = t_{13} \left[1 + \frac{\gamma - 1}{2} (M'_{13})^2\right] \qquad \text{(rotor in)}$$

$$T'_{14} = T'_{13} + \left[\frac{(\omega r_{14})^2 - (\omega r_{13})^2}{\frac{2\gamma}{\gamma - 1} R g_c}\right] \qquad \text{(rotor out)}$$

b) Incidence angle based on mean camber line

$$i_m = \beta'_{13} - \beta'^{*}_{13} \qquad \text{(rotor)}$$

$$i_m = \beta_{15} - \beta^{*}_{15} \qquad \text{(stator)}$$

c) Deviation

$$\delta^\circ = \beta'_{14} - \beta'^{*}_{14} \qquad \text{(rotor)}$$

$$\delta^\circ = \beta_{16} - \beta^{*}_{16} \qquad \text{(stator)}$$

d) Diffusion factor

$$D = 1 - \frac{V'_{14}}{V'_{13}} + \frac{r_{14} V_{\theta 14} - r_{13} V_{\theta 13}}{(r_{14} + r_{13})\, \sigma\, V'_{13}} \qquad \text{(rotor)}$$

$$D = 1 - \frac{V_{16}}{V_{15}} + \frac{r_{15} V_{\theta 15} - r_{16} V_{\theta 16}}{(r_{15} + r_{16})\, \sigma V_{15}} \qquad \text{(stator)}$$

e) Loss coefficient

$$\overline{\omega} = \frac{P'_{13} \left[\frac{T'_{14}}{T'_{13}}\right]^{\frac{\gamma}{\gamma - 1}} - P'_{14}}{P'_{13} - p_{13}} \qquad \text{(rotor)}$$

$$\overline{\omega} = \frac{P_{15} - P_{16}}{P_{15} - p_{15}} \qquad \text{(stator)}$$

f) Loss parameter

$$\frac{\overline{\omega}\ \cos\ \beta'_{14}}{2\sigma} \qquad \text{(rotor)}$$

$$\frac{\overline{\omega}\ \cos \beta_{16}}{2\sigma} \qquad \text{(stator)}$$

g) Polytropic efficiency

$$1)\ \eta_p = \frac{\frac{\gamma - 1}{\gamma} \ln \left[\frac{P_{14}}{P_{13}}\right]}{\ln \left[\frac{T_{14}}{T_0}\right]} \qquad \text{(rotor)}$$

$$2)\ \eta_p = \frac{\dfrac{\gamma - 1}{\gamma} \ln\left[\dfrac{p_{16}}{p_{15}}\right]}{\ln\left[\dfrac{t_{16}}{t_{15}}\right]} \qquad \text{(stator)}$$

h) Adiabatic efficiency

$$\eta_{ad} = \frac{\left[\dfrac{P_{14}}{P_{13}}\right]^{\frac{\gamma - 1}{\gamma}} - 1}{\left[\dfrac{T_{16}}{T_0}\right] - 1} \qquad \text{(rotor)}$$

$$\eta_{ad} = \frac{\left[\dfrac{P_{16}}{P_{11}}\right]^{\frac{\gamma - 1}{\gamma}} - 1}{\left[\dfrac{T_{16}}{T_0}\right] - 1} \qquad \text{(stage)}$$

i) Stall Margin

$$SM = \left[\left(\frac{P_{17}/P_{11}}{W\sqrt{\theta}_{11}/\delta_{11}}\right)_{\substack{\text{At}\\ \text{Stall}}} \left(\frac{W\sqrt{\theta}_{11}/\delta_{11}}{P_{17}/P_{11}}\right)_{\substack{\text{At}\\ \text{Reference}\\ \text{Point}}} - 1\right] 100 \qquad \text{(Stage)}$$

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APPENDIX 2

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET FLOW (TABULATIONS)

TABLE 7

IDENTIFICATION OF BLADE-ELEMENT OVERALL PERFORMANCE TABLE HEADINGS

ROTOR

SPEED CODE 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
2	ϵ_{13}	ϵ_{14}	V_{13}	V_{14}	Vm_{13}	Vm_{14}	$V_{\theta 13}$	$V_{\theta 14}$	β_{13}	β_{14}	M_{13}	M_{14}	U_{13}	U_{14}	M'_{13}	M'_{14}	V'_{13}	V'_{14}

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
2	i_{s13}	i_{m13}	$\delta^{\circ}{}_{14}$	$\Delta\beta$	$\rho_{13}V_{m13}$	$\rho_{14}V_{m14}$	D	$\overline{\omega}$	$\frac{\overline{\omega}\cos\beta'_{14}}{2\sigma}$	P_{14}/P_{13}	η_p	η_{ad}	β'_{13}	β'_{14}	$V'_{\theta 13}$	$V'_{\theta 14}$

TO/TC INLET	PO/PC INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
T_{14}/T_{11}	P_{14}/P_{11}	η_{ad}	η_p	$\frac{W\sqrt{\theta}}{\delta A_{13}}$

STATOR

SPEED CODE 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
2	ϵ_{15}	ϵ_{16}	V_{15}	V_{16}	V_{m15}	V_{m16}	$V_{\theta 15}$	$V_{\theta 16}$	β_{15}	β_{16}	M_{15}	M_{16}	P_{16}/P_{13}	T_{14}/T_{13}

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
2	i_{s15}	i_{m15}	$\delta^{\circ}{}_{16}$	$\Delta\beta$	$\rho_{15}V_{m15}$	$\rho_{16}V_{m16}$	D	$\overline{\omega}$	$\frac{\overline{\omega}\cos\beta_{16}}{2\sigma}$	P_{16}/P_{15}	η_{p5}	η_{ad}	η_p

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
$N\sqrt{\theta}$	$W\sqrt{\theta}/\delta$	T_{14}/T_{11}	P_{16}/P_{11}	η_{ad}	η_p

NOTES (TABLE 7 CONTINUED)

(1)

CODE	% DESIGN SPEED
50	50
70	70
80	80
95	95
10	100
15	105

(2)

SL	% SPAN OF DESIGN STREAM-LINES AT ROTOR TRAILING EDGE	ROTOR DIAMETERS (INCHES)		STATOR DIAMETERS (INCHES)	
		INLET	EXIT	INLET	EXIT
1	5 (HUB)	17.73	20.76	21.37	22.53
2	10	18.81	21.34	21.88	22.92
3	15	19.84	21.93	22.4	23.31
4	30	22.65	23.705	24.0	24.58
5	50	26.03	26.09	26.16	26.33
6	60	27.66	27.275	27.23	27.20
7	65	28.425	27.91	27.29	27.65
8	70	29.17	28.52	28.33	28.09
9	85	31.3	30.26	29.86	29.32
10	90	32.01	30.86	30.38	29.73
11	95 (TIP)	32.63	31.45	30.87	30.09

TABLE 8
BLADE ELEMENT AND OVERALL PERFORMANCE
DESIGN

Rotor

SPEED CODE 10

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.781	31.056	477.4	1004.7	477.4	538.0	.0	848.5	.0	57.3	.4355	.8413	964.2	1129.0	.9815	.5081	1075.9	606.7
2	25.826	27.188	517.8	981.8	517.8	565.4	.0	802.6	.0	54.6	.4739	.8226	1022.9	1160.5	1.0494	.5607	1146.5	669.2
3	21.921	23.327	555.7	961.8	555.7	573.0	.0	772.5	.0	53.2	.5104	.8048	1079.0	1192.6	1.1147	.5945	1213.7	710.5
4	11.310	12.627	639.3	912.0	639.3	562.1	.0	718.1	.0	51.9	.5922	.7577	1231.8	1289.1	1.2856	.6657	1387.8	801.3
5	-1.295	2.010	705.9	861.9	705.9	544.9	.0	667.8	.0	50.8	.6590	.7097	1415.6	1418.8	1.4767	.7640	1581.8	927.9
6	-7.063	-2.708	720.3	843.6	720.3	541.4	.0	646.9	.0	50.0	.6736	.6920	1504.2	1483.3	1.5597	.8173	1667.8	996.4
7	-9.106	-5.417	718.0	837.2	718.0	538.8	.0	640.7	.0	49.8	.6713	.6851	1545.8	1517.8	1.5935	.8423	1704.4	1029.4
8	-11.097	-7.422	710.8	832.7	710.8	537.2	.0	636.3	.0	49.6	.6640	.6798	1586.3	1551.0	1.6238	.8659	1738.3	1060.7
9	-17.421	-14.812	679.5	813.6	679.5	504.3	.0	649.9	.0	51.5	.6323	.6608	1702.2	1645.6	1.7056	.9046	1832.8	1120.6
10	-19.209	-17.341	664.9	814.7	664.9	463.1	.0	670.3	.0	54.8	.6177	.6521	1740.8	1678.3	1.7311	.8878	1863.4	1109.2
11	-19.913	-10.134	655.9	812.9	655.9	387.0	.0	714.9	.0	61.1	.6087	.6426	1774.5	1710.3	1.7557	.8442	1891.9	1068.0

SL	INCS DEGREE	INCH DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	.50	4.71	14.25	35.83	33.27	52.90	.6156	.2163	.0403	2.3400	90.55	89.37	63.06	27.23	-964.2	-280.5
2	.69	4.42	12.64	30.57	35.48	56.74	.5840	.1455	.0275	2.3400	92.80	91.91	62.64	32.06	-1022.9	-357.9
3	.57	4.11	11.36	26.30	37.43	58.38	.5732	.1151	.0219	2.3400	93.70	92.92	62.29	36.00	-1079.0	-420.1
4	1.24	3.74	10.53	17.02	41.27	59.11	.5640	.0990	.0184	2.3400	93.30	92.47	62.38	45.35	-1231.8	-571.0
5	1.41	3.41	8.74	9.45	43.84	58.84	.5388	.1065	.0184	2.3400	91.42	90.35	63.50	54.05	-1415.6	-751.0
6	1.27	3.10	6.97	7.49	44.33	58.96	.5207	.1119	.0187	2.3400	90.41	89.22	64.47	56.98	-1504.2	-836.4
7	1.22	2.94	6.66	6.85	44.26	58.74	.5133	.1209	.0198	2.3400	89.35	88.03	65.15	58.30	-1545.8	-877.1
8	1.15	2.76	6.56	6.54	44.01	58.55	.5049	.1319	.0212	2.3400	88.21	86.75	65.91	59.37	-1586.3	-914.7
9	.55	2.05	6.12	5.30	42.88	54.63	.4986	.1801	.0273	2.3400	82.82	80.70	68.15	62.85	-1702.2	-1000.8
10	.34	1.34	5.26	4.04	42.31	49.67	.5157	.2348	.0314	2.3400	78.77	76.15	68.91	64.87	-1740.8	-1007.9
11	.38	1.83	5.23	1.06	41.95	40.81	.5501	.3023	.0345	2.3400	73.32	70.03	69.47	68.41	-1774.5	-995.4

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	CI/AI LBM/SEC SQFT
1.3165	2.3400	86.8	89.13	38.95

Stator

SPEED CODE 10

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	26.650	4.863	1056.3	683.0	831.6	683.0	821.6	.0	54.6	.0	.8721	.5519	2.2195	1.3053
2	23.210	4.501	1011.7	685.2	642.8	685.2	781.2	.0	52.2	.0	.8514	.5555	2.2436	1.2976
3	19.778	4.202	991.2	686.5	640.9	686.5	756.1	.0	50.9	.0	.8327	.5572	2.2610	1.2952
4	10.785	3.084	941.8	680.7	619.1	680.7	709.6	.0	49.2	.0	.7853	.5518	2.2851	1.2970
5	2.318	1.223	895.8	680.7	599.0	680.7	666.1	.0	48.0	.0	.7406	.5502	2.2971	1.3040
6	-1.101	.289	880.7	686.3	596.7	686.3	647.8	.0	47.4	.0	.7256	.5541	2.3012	1.3081
7	-2.326	-.574	877.1	690.7	596.6	690.7	643.0	.0	47.2	.0	.7211	.5570	2.3028	1.3120
8	-3.773	-1.635	875.2	695.5	598.1	695.5	639.0	.0	46.9	.0	.7181	.5599	2.3033	1.3172
9	-10.037	-2.764	878.7	716.3	590.9	716.3	650.9	.0	48.0	.0	.7145	.5715	2.2979	1.3444
10	-12.407	-3.120	886.6	729.5	569.4	729.5	679.6	.0	50.5	.0	.7154	.5767	2.2930	1.3706
11	-15.261	-3.487	895.3	748.0	519.6	748.0	733.2	.0	55.5	.0	.7136	.5831	2.2877	1.4118

SL	INCS DEGREE	INCH DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	1.01	3.99	13.71	54.65	60.74	76.61	.5180	.1320	.0305	.9485	81.47	83.63	85.33
2	0.02	3.20	11.88	52.22	63.18	78.00	.4990	.1095	.0257	.9588	83.84	87.08	88.49
3	-.87	2.51	10.88	50.91	64.00	78.84	.4858	.0926	.0222	.9662	85.70	88.73	89.93
4	-3.77	0.47	10.00	49.20	63.88	79.12	.4645	.0704	.0178	.9765	87.84	89.47	90.61
5	-5.93	-.59	10.07	48.04	63.39	79.17	.4399	.0602	.0163	.9817	87.96	88.04	89.34
6	-6.46	-.73	10.10	47.36	63.59	79.56	.4259	.0562	.0157	.9834	87.84	87.07	88.48
7	-6.64	-.77	10.18	47.15	63.57	79.76	.4209	.0544	.0154	.9841	87.81	86.04	87.56
8	-6.68	-.86	10.29	46.92	63.66	79.89	.4171	.0541	.0156	.9843	87.48	84.68	86.34
9	-7.76	-1.54	12.76	48.01	61.97	79.94	.4141	.0623	.0187	.9820	84.35	77.77	80.17
10	-7.62	-1.38	14.84	53.45	58.74	79.46	.4217	.0695	.0211	.9799	81.93	72.11	75.10
11	-8.61	-2.03	17.11	55.53	51.83	78.64	.4340	.0778	.0239	.9777	78.57	64.55	68.33

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
12464.	173.80	1.3165	2.2846	84.0	85.64

TABLE 9.1
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

RUN NO908, SPEED CODE 60, POINT NO 1

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.196	30.829	292.9	580.2	292.9	439.6	.0	378.6	.0	40.3	.2185	.5159	481.9	563.6	.4851	.4291	639.2	477.0
2	24.907	26.432	261.0	562.5	261.0	443.4	.0	346.2	.0	37.6	.2351	.5004	510.7	579.4	.5164	.4480	573.5	501.0
3	20.694	22.783	276.9	538.3	276.9	436.1	.0	315.6	.0	35.5	.2495	.4788	538.7	595.4	.5457	.4609	605.7	518.1
4	9.796	11.921	307.1	495.8	307.1	420.8	.0	262.2	.0	31.8	.2771	.4408	614.9	643.6	.6202	.5049	687.3	567.9
5	-2.458	1.188	329.4	463.8	329.4	409.1	.0	227.6	.0	29.9	.2930	.4118	706.7	708.3	.7023	.5576	777.6	628.0
6	-7.889	-3.815	325.8	444.8	325.8	390.8	.0	213.2	.0	28.6	.2893	.3947	751.0	740.5	.7374	.5821	818.6	656.1
7	-10.284	-5.927	324.4	441.2	324.4	392.0	.0	202.5	.0	27.2	.2930	.3916	771.7	757.8	.7661	.6033	837.1	679.7
8	-12.627	-8.282	321.9	433.3	321.9	389.2	.0	190.3	.0	25.9	.2907	.3847	792.0	774.3	.7720	.6232	859.9	701.8
9	-18.624	-15.586	309.9	377.6	309.9	341.9	.0	160.2	.0	24.8	.2796	.3349	849.8	821.6	.8163	.6609	909.8	745.6
10	-19.681	-17.779	305.3	339.2	305.3	302.6	.0	153.2	.0	26.9	.2755	.3009	869.1	837.8	.8311	.6629	921.1	748.6
11	-19.419	-19.309	303.1	291.8	303.1	253.6	.0	149.3	.0	29.2	.2735	.2580	885.9	853.9	.8497	.6663	936.3	753.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.08	4.19	9.52	39.98	18.19	39.16	.2871	.1398	.0261	1.2361	91.49	91.22	62.49	22.51	-481.9	-185.0
2	.28	4.01	7.95	34.85	19.92	39.55	.2856	.0891	.0176	1.2255	93.13	92.98	62.23	27.38	-510.7	-233.2
3	.92	3.96	7.70	29.80	20.53	39.01	.2879	.0772	.0153	1.2100	92.97	92.83	62.19	32.39	-538.7	-277.8
4	2.03	4.52	7.19	21.15	22.60	32.89	.2903	.0694	.0136	1.1832	91.10	90.94	63.16	42.01	-614.9	-381.4
5	3.27	5.27	4.64	15.41	23.77	31.32	.2874	.0788	.0187	1.1590	83.52	83.23	65.36	49.95	-706.7	-480.7
6	3.44	5.27	3.39	13.24	23.87	30.11	.2832	.1206	.0220	1.1491	77.79	77.43	66.03	53.39	-751.0	-527.3
7	3.40	5.12	3.01	12.67	23.78	30.20	.2684	.1131	.0209	1.1398	77.79	77.44	67.33	54.62	-771.7	-555.2
8	3.28	4.88	3.39	11.88	23.61	29.94	.2537	.1068	.0188	1.1333	77.37	77.03	68.04	56.15	-792.0	-584.0
9	2.91	3.91	5.61	7.68	22.90	24.13	.2392	.1291	.0191	1.1011	66.49	66.08	70.01	62.33	-849.8	-661.4
10	1.95	3.95	6.15	4.75	22.89	23.09	.2387	.1563	.0202	1.0842	57.11	56.70	70.52	65.78	-869.1	-684.7
11	1.74	3.24	6.84	.80	22.84	19.25	.2408	.1805	.0191	1.0644	47.34	46.93	70.83	70.03	-885.9	-707.6

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.0518	1.1573	82.33	82.63	21.19

RUN NO908, SPEED CODE 60, POINT NO 1

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.276	4.890	625.7	705.9	507.7	705.6	365.7	-17.9	38.1	-1.5	.5589	.6360	1.1763	1.0679
2	23.865	4.388	601.1	719.1	499.5	713.2	334.3	-35.0	35.5	-2.8	.5360	.6456	1.1775	1.0632
3	20.702	3.901	578.4	694.0	487.9	692.5	307.6	-44.6	33.5	-3.6	.5195	.6270	1.1920	1.0578
4	11.789	2.912	530.1	630.5	462.7	628.8	258.7	-46.1	29.8	-4.2	.4726	.5674	1.1898	1.0538
5	3.368	.205	496.3	594.9	441.8	594.4	227.0	-23.2	27.2	-2.2	.4417	.5341	1.1909	1.0516
6	-.323	-.965	478.4	582.6	428.8	582.1	213.8	-23.9	26.5	-2.3	.4285	.5228	1.1306	1.0503
7	-2.173	-1.536	475.5	572.2	429.5	571.1	204.0	-36.1	25.4	-3.6	.4231	.5135	1.1216	1.0485
8	-3.927	-2.049	467.7	561.6	428.9	560.5	192.5	-36.1	24.2	-3.7	.4181	.5090	1.1121	1.0464
9	-10.039	-3.040	431.0	528.2	399.2	525.1	162.5	-56.0	22.3	-6.1	.3836	.4737	1.0807	1.0419
10	-13.905	-3.339	401.7	492.4	370.3	485.9	155.6	-79.0	23.1	-9.3	.3570	.4407	1.0553	1.0402
11	-16.398	-3.972	367.7	480.3	337.2	470.9	146.6	-97.2	24.1	-11.5	.3264	.4297	1.0430	1.0370

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-13.01	-10.03	19.68	39.66	38.59	48.92	.0082	.2960	.0868	.9526	144.11	70.20	70.81
2	-14.19	-11.01	11.56	38.33	38.18	50.38	-.0830	.0987	.0232	.9823	120.97	69.87	69.91
3	-15.75	-12.39	9.71	37.15	37.85	49.29	-.0441	.0799	.0191	.9871	115.49	66.08	66.37
4	-20.92	-16.68	8.33	33.72	35.59	48.26	-.0825	.1278	.0322	.9821	126.78	80.32	80.66
5	-24.22	-18.88	10.33	29.48	33.29	42.91	-.0738	.1037	.0280	.9871	120.69	74.29	74.70
6	-24.77	-19.05	10.30	28.84	32.41	41.95	-.0840	.0867	.0242	.9899	114.11	71.11	71.55
7	-25.87	-20.01	9.07	29.03	32.88	41.07	-.0465	.1235	.0347	.9858	124.76	68.92	69.36
8	-27.09	-21.10	9.11	27.91	32.58	40.24	-.0697	.1406	.0409	.9844	128.19	66.49	66.92
9	-30.92	-24.71	9.11	28.49	30.03	37.33	-.1082	.1289	.0389	.9883	120.13	53.80	59.02
10	-32.44	-26.20	8.08	32.40	27.69	34.25	-.1082	.2300	.0689	.9830	131.92	38.27	38.64
11	-37.12	-30.98	8.07	35.62	28.10	33.00	-.0998	.2963	.0892	.9780	140.66	31.82	31.85

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6222.	94.33	1.0518	1.1346	71.92	72.36

TABLE 9.2
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 80, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	27.143	30.839	222.0	566.0	222.0	376.3	.0	409.1	.0	45.1	.1996	.5015	482.6	565.0	.4776	.3790	531.2	427.8
2	24.823	26.620	238.4	592.1	238.9	394.5	.0	371.8	.0	42.4	.2195	.4802	512.0	580.8	.5081	.3985	569.8	446.9
3	20.638	22.733	252.7	516.1	252.7	384.5	.0	344.2	.0	41.4	.2275	.4569	540.0	576.9	.5366	.4074	576.2	460.2
4	9.871	11.765	279.9	478.2	279.9	375.0	.0	296.7	.0	38.2	.2524	.4230	616.5	695.2	.6101	.4530	677.1	512.0
5	-2.376	.992	295.5	481.1	295.5	360.3	.0	271.4	.0	37.0	.2665	.3982	708.5	710.1	.6923	.5011	767.6	567.7
6	-7.891	-3.756	296.8	434.7	296.9	349.3	.0	262.0	.0	36.8	.2673	.3850	752.8	792.4	.7297	.5238	809.1	593.9
7	-10.245	-6.185	294.8	429.6	294.8	344.7	.0	256.5	.0	36.5	.2658	.3786	773.7	789.7	.7466	.5375	827.9	609.9
8	-12.490	-8.487	292.3	418.6	292.8	334.4	.0	251.7	.0	36.8	.2634	.3685	793.9	776.3	.7829	.5477	846.0	622.0
9	-17.708	-15.477	283.6	374.1	283.8	297.4	.0	227.0	.0	36.9	.2547	.3290	851.9	823.6	.8090	.5862	897.6	666.7
10	-18.602	-17.641	279.2	353.0	279.2	274.2	.0	222.3	.0	38.5	.2516	.3100	871.2	839.9	.8299	.5935	919.9	675.8
11	-18.790	-19.103	277.1	335.0	277.1	253.9	.0	218.5	.0	40.2	.2497	.2937	888.1	856.0	.8383	.6020	930.9	686.1

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	EFF-P TOT-ST	EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VØ'-1 FT/SEC	VØ'-2 FT/SEC
1	2.02	6.23	8.81	42.79	16.85	31.60	.3781	.0875	.0170	1.2699	94.95	94.82	64.59	21.80	-482.6	-160.9
2	2.41	6.19	8.13	36.80	17.82	31.53	.3793	.0690	.0127	1.2512	95.62	95.42	64.36	27.59	-512.0	-209.0
3	2.58	4.12	8.33	31.34	18.83	30.78	.3833	.0692	.0127	1.2360	94.83	94.73	64.30	32.86	-540.0	-353.7
4	4.16	6.66	7.89	22.58	20.74	30.12	.3738	.0530	.0103	1.2171	94.16	94.05	65.30	42.72	-616.5	-398.6
5	5.28	7.29	5.30	16.77	21.83	28.84	.3723	.0918	.0171	1.2017	87.46	87.18	67.38	50.61	-708.6	-438.7
6	5.40	7.22	3.89	14.70	21.88	27.86	.3493	.1165	.0210	1.1919	82.89	82.47	68.59	53.89	-752.8	-480.9
7	5.33	7.05	3.84	13.78	21.77	27.44	.3437	.1259	.0221	1.1870	80.77	80.36	69.26	55.48	-773.7	-503.2
8	5.16	6.77	4.52	12.59	21.80	26.56	.3617	.1397	.0238	1.1802	77.81	77.34	69.92	57.39	-793.9	-524.5
9	4.00	5.50	4.44	8.43	20.93	23.56	.3370	.1548	.0222	1.1581	71.46	71.42	71.60	[illegible]	[illegible]	[illegible]
10	3.44	4.94	6.04	6.35	20.89	21.68	.3356	.1674	.0220	1.1494	68.39	67.77	72.01	65.65	-871.2	-617.6
11	3.25	4.75	4.75	4.41	20.55	20.06	.3320	.1803	.0210	1.1432	65.56	64.96	72.34	67.93	-888.1	-637.5

TO/TO INLET	PO/RO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.0631	1.2001	84.94	85.27	19.42

Stator

RUN NO908, SPEED CODE 80, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.278	4.814	599.2	603.7	459.5	603.6	370.9	-17.1	43.1	-1.6	.5326	.5369	1.2246	1.0727
2	23.812	4.379	570.0	601.5	442.3	600.3	359.7	-37.8	40.9	-3.5	.5064	.5360	1.2339	1.0683
3	20.571	3.909	544.9	582.8	429.2	581.1	335.9	-44.6	39.4	-4.3	.4837	.5191	1.2267	1.0655
4	11.488	2.443	509.5	534.9	410.7	533.4	292.9	-39.7	35.9	-4.2	.4472	.4754	1.2071	1.0619
5	3.108	.246	476.4	501.6	392.1	500.6	270.7	-31.7	34.6	-3.6	.4214	.4444	1.1903	1.0620
6	-.509	-.887	463.3	473.0	381.8	472.4	262.4	-25.5	34.5	-3.0	.4094	.4348	1.1845	1.0625
7	-2.382	-1.476	457.7	487.6	378.4	486.8	257.5	-27.0	34.3	-3.2	.4091	.4319	1.1796	1.0626
8	-4.236	-2.039	448.8	478.9	370.8	478.1	253.3	-28.3	34.4	-3.4	.3959	.4234	1.1724	1.0629
9	-11.111	-3.019	416.7	448.3	347.9	445.1	230.0	-52.9	33.8	-6.7	.3673	.3960	1.1468	1.0600
10	-14.035	-3.291	401.9	429.3	332.4	426.0	225.9	-60.4	34.8	-8.0	.3539	.3788	1.1328	1.0600
11	-17.020	-3.445	390.8	425.6	321.1	420.3	222.7	-67.1	35.6	-9.0	.3439	.3754	1.1270	1.0601

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-8.03	-5.09	14.63	44.69	35.66	45.80	.1423	.1708	.0394	.9697	-244.83	82.24	82.69
2	-8.76	-5.58	10.85	44.96	34.66	46.11	.0979	.0612	.0144	.9901	147.32	90.78	91.01
3	-9.89	-6.49	9.02	43.49	33.72	49.86	.0913	.0414	.0099	.9939	124.61	91.88	93.06
4	-14.62	-10.38	8.26	40.09	32.84	41.54	.0995	.0540	.0136	.9932	136.45	90.14	90.35
5	-16.83	-11.49	8.95	38.26	31.70	38.95	.1126	.0457	.0178	.9925	150.42	82.38	82.74
6	-16.81	-11.09	9.63	37.47	30.17	38.23	.1055	.0468	.0130	.9949	130.45	79.30	79.74
7	-17.04	-11.17	9.51	37.43	29.84	37.72	.1040	.0401	.0119	.9958	124.30	77.30	77.77
8	-16.70	-10.91	9.41	37.80	29.14	36.93	.1029	.0370	.0106	.9963	120.35	74.03	74.56
9	-19.43	-13.21	8.51	40.59	27.17	34.09	.1109	.0634	.0189	.9946	128.09	66.61	67.30
10	-20.81	-14.57	9.31	42.79	25.91	32.36	.1352	.1365	.0910	.9892	176.47	60.50	61.19
11	-25.62	-17.48	10.64	44.56	24.97	31.88	.1413	.1734	.0527	.9863	190.28	57.97	58.63

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/RO INLET	EFF-AD INLET %	EFF-P INLET %

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 50, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.036	30.798	197.7	548.1	197.7	352.6	.0	419.6	.0	49.5	.1776	.4842	482.0	564.3	.4680	.3368	520.9	381.2
2	24.640	26.570	212.5	526.7	212.5	354.3	.0	389.6	.0	47.3	.1910	.4652	511.3	580.1	.4977	.3569	553.7	402.3
3	20.379	22.679	225.3	502.6	225.3	346.4	.0	364.2	.0	46.0	.2026	.4437	537.3	596.1	.5256	.3680	584.5	416.8
4	9.923	11.718	249.1	461.0	249.1	328.6	.0	323.9	.0	44.3	.2242	.4063	615.7	649.4	.5977	.4098	664.2	459.9
5	-2.672	.941	261.7	434.8	261.7	309.1	.0	305.7	.0	44.7	.2357	.3820	707.6	709.2	.6793	.4466	754.4	508.3
6	-7.974	-3.792	262.5	426.9	262.5	302.3	.0	301.3	.0	44.8	.2366	.3746	751.9	741.4	.7171	.4605	796.9	534.1
7	-10.326	-6.210	261.2	421.5	261.2	299.0	.0	297.1	.0	44.7	.2352	.3695	772.7	758.7	.7344	.4821	815.7	550.0
8	-12.576	-8.593	259.2	412.6	259.2	296.5	.0	286.9	.0	43.9	.2333	.3614	792.9	775.3	.7511	.5007	834.3	571.3
9	-17.763	-15.572	250.4	375.9	250.4	252.9	.0	278.1	.0	47.3	.2254	.3285	850.8	822.6	.7983	.5295	886.9	600.3
10	-18.763	-17.482	247.8	362.2	247.9	235.0	.0	275.6	.0	49.0	.2226	.3161	870.1	838.9	.8141	.5326	904.6	610.3
11	-18.862	-19.117	245.6	349.4	245.6	218.7	.0	272.5	.0	50.8	.2210	.3096	887.0	854.9	.8282	.5424	920.9	622.1

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	4.96	8.67	9.02	45.01	14.88	28.69	.4607	.0489	.0075	1.2836	97.41	97.36	67.02	22.01	-482.0	-144.8
2	4.83	8.56	8.46	38.90	15.76	28.93	.4531	.0238	.0047	1.2730	98.47	98.46	66.78	27.88	-511.3	-190.5
3	4.79	8.53	8.81	33.27	16.88	28.33	.4523	.0253	.0050	1.2602	98.07	98.04	66.71	33.49	-537.3	-231.9
4	6.55	9.05	9.32	23.55	18.58	26.94	.4512	.0483	.0091	1.2408	95.22	95.12	67.64	44.19	-615.7	-321.0
5	7.63	9.63	7.23	17.18	19.57	25.28	.4528	.1045	.0187	1.2291	87.62	87.30	69.72	52.54	-707.6	-403.5
6	7.64	9.47	5.42	15.41	19.53	24.68	.4488	.1285	.0223	1.2254	83.87	83.45	70.83	55.42	-751.9	-440.2
7	7.50	9.22	5.32	14.47	19.44	24.37	.4429	.1367	.0232	1.2227	82.24	81.78	71.43	56.98	-772.7	-461.6
8	7.27	8.88	5.78	13.43	19.29	24.17	.4265	.1335	.0219	1.2183	81.79	81.33	72.03	58.60	-792.9	-488.3
9	5.97	7.47	8.05	8.80	18.68	20.52	.4221	.1768	.0240	1.2016	74.02	73.37	73.58	64.77	-850.8	-544.8
10	5.38	6.88	7.36	6.97	18.46	19.05	.4190	.1898	.0239	1.1965	71.60	70.92	73.94	66.97	-870.1	-563.2
11	5.19	6.69	8.90	5.15	18.33	17.72	.4126	.1984	.0220	1.1926	69.80	69.08	74.24	69.08	-887.0	-582.9

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0710	1.2817	86.49	86.84	17.35

Stator

RUN NO908, SPEED CODE 50, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.260	4.893	572.5	516.6	403.8	516.5	405.7	-9.3	47.6	-1.0	.5069	.4553	1.2965	1.0755
2	23.853	4.510	546.6	514.4	395.4	513.8	377.3	-24.6	45.5	-2.7	.4837	.4541	1.2532	1.0717
3	20.713	4.090	523.2	497.8	383.6	496.8	355.8	-31.0	44.2	-3.5	.4627	.4393	1.2476	1.0694
4	11.820	2.729	480.2	454.0	358.9	453.0	319.5	-30.2	42.1	-3.8	.4238	.3999	1.2321	1.0670
5	3.283	.472	453.9	426.2	336.3	425.6	304.9	-23.7	42.2	-3.2	.3993	.3742	1.2207	1.0701
6	-.464	-.726	447.1	423.4	330.8	423.0	301.6	-17.0	42.9	-2.6	.3927	.3712	1.2188	1.0722
7	-2.388	-1.353	442.9	421.0	327.8	420.6	298.3	-18.5	42.9	-2.5	.3886	.3690	1.2166	1.0724
8	-4.234	-1.931	435.7	413.9	325.7	413.3	289.5	-21.1	41.7	-2.9	.3825	.3629	1.2115	1.0707
9	-10.941	-2.971	408.5	375.8	295.8	373.7	281.7	-40.4	44.0	-6.1	.3576	.3283	1.1869	1.0739
10	-13.700	-3.279	397.1	363.5	289.8	359.8	280.1	-51.9	45.2	-8.2	.3491	.3172	1.1780	1.0796
11	-16.865	-3.952	391.2	362.7	275.4	357.7	277.8	-60.0	46.1	-9.4	.3419	.3165	1.1798	1.0799

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-3.58	-.57	15.21	48.59	32.97	41.36	.2584	.1723	.0378	.9721	14.27	86.22	86.59
2	-4.20	-1.02	11.69	48.20	31.97	41.53	.2231	.0859	.0201	.9873	26.17	93.02	93.20
3	-5.04	-1.63	9.82	47.75	31.10	40.31	.2202	.0432	.0151	.9913	36.17	94.06	94.19
4	-8.35	-4.11	8.71	45.91	29.18	36.97	.2339	.0822	.0132	.9940	50.22	91.77	91.96
5	-9.25	-3.91	9.39	45.41	27.82	34.65	.2547	.0595	.0161	.9938	50.49	83.83	84.23
6	-8.89	-3.17	10.03	44.99	26.75	34.35	.2521	.0474	.0132	.9953	59.40	80.60	81.09
7	-8.93	-3.06	10.16	44.88	26.50	34.12	.2481	.0400	.0113	.9961	55.99	79.63	80.15
8	-9.63	-3.64	9.88	44.59	26.86	33.52	.2459	.0393	.0113	.9963	52.74	79.78	80.28
9	-9.31	-3.09	9.11	50.11	23.77	29.93	.3109	.1292	.0373	.9897	10.14	67.79	68.51
10	-10.41	-4.16	9.19	53.32	22.80	28.70	.3366	.1703	.0512	.9866	-7.82	64.30	65.07
11	-15.08	-8.75	10.20	55.52	22.80	28.45	.3399	.1897	.0575	.9853	-30.92	62.75	63.79

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6230.	57.40	1.0710	1.2203	82.54	82.98

TABLE 9.4
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 80, POINT NO 9

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.065	30.735	178.5	540.3	178.5	329.8	.0	428.0	.0	51.9	.1602	.4767	481.0	563.2	.4606	.3145	513.1	356.9
2	29.602	26.540	191.9	521.1	191.9	333.5	.0	400.9	.0	49.8	.1723	.4597	510.3	579.0	.4897	.3337	545.2	378.3
3	20.166	22.719	203.6	499.1	203.6	325.7	.0	378.2	.0	48.9	.1829	.4400	538.3	595.0	.5170	.3449	575.5	391.3
4	8.716	11.806	225.4	455.6	225.9	297.8	.0	344.8	.0	49.0	.2027	.4005	614.5	643.1	.5885	.3706	654.5	421.5
5	-3.288	1.027	236.2	435.0	236.2	277.1	.0	335.3	.0	50.9	.2124	.3810	706.2	707.8	.6698	.4065	799.6	469.3
6	-8.583	-3.800	236.6	438.9	236.6	274.2	.0	340.5	.0	50.7	.2127	.3832	750.9	740.0	.7078	.4245	786.8	485.7
7	-11.010	-6.319	235.2	438.4	235.2	274.1	.0	342.2	.0	51.2	.2116	.3828	771.2	757.2	.7252	.4343	806.2	497.4
8	-13.341	-8.761	233.0	432.9	233.0	267.9	.0	340.1	.0	51.6	.2096	.3776	791.4	773.7	.7420	.4446	825.0	509.7
9	-18.632	-15.829	224.1	409.0	224.1	219.1	.0	339.4	.0	56.8	.2015	.3509	849.2	821.0	.7896	.4576	878.2	529.1
10	-19.233	-17.847	221.2	393.8	221.2	202.5	.0	337.7	.0	58.6	.1989	.3416	868.4	837.2	.8057	.4676	896.2	539.0
11	-19.101	-19.293	219.7	385.0	219.7	189.8	.0	335.0	.0	60.1	.1975	.3337	885.3	853.2	.8200	.4783	912.1	551.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VØ'-1 FT/SEC	VØ'-2 FT/SEC
1	6.46	10.67	8.98	47.05	13.58	26.97	.5048	.0584	.0113	1.2879	97.02	96.95	69.02	21.97	-481.0	-135.2
2	6.83	10.56	8.34	40.99	14.56	27.38	.4942	.0321	.0063	1.2792	98.09	98.01	68.78	27.78	-510.3	-178.5
3	6.97	10.51	8.65	35.40	15.81	28.78	.4943	.0371	.0073	1.2680	97.25	97.20	68.69	33.28	-538.3	-216.8
4	8.93	10.72	10.09	24.70	16.89	29.50	.5103	.0895	.0167	1.2471	91.78	91.56	69.57	44.87	-619.5	-298.3
5	9.44	11.95	8.09	18.18	17.66	22.72	.5160	.1537	.0270	1.2392	83.51	83.05	71.53	53.36	-706.2	-372.5
6	9.90	11.23	5.25	17.34	17.89	22.59	.5192	.1823	.0318	1.2425	79.79	79.20	72.60	55.26	-750.4	-399.5
7	9.24	10.77	4.81	16.72	17.59	22.38	.5189	.1960	.0337	1.2431	77.85	77.20	73.17	56.45	-771.2	-415.0
8	9.00	10.61	5.35	15.59	17.98	21.85	.5151	.2069	.0344	1.2407	76.00	75.30	73.76	58.17	-791.4	-433.6
9	7.65	9.15	8.53	10.00	16.79	17.78	.5176	.2571	.0342	1.2287	68.70	67.82	75.28	65.35	-849.2	-481.5
10	7.01	8.51	7.76	8.00	16.59	16.43	.5151	.2681	.0322	1.2256	66.91	65.98	75.58	67.57	-868.4	-499.5
11	6.73	8.23	6.39	4.25	16.40	15.39	.5058	.2739	.0297	1.2237	65.72	64.77	75.82	69.57	-885.3	-514.2

TO/TO INLET	PO/RO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0794	1.2467	82.17	82.67	15.69

Stator

RUN NO908, SPEED CODE 80, POINT NO 9

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.397	5.060	559.8	457.8	374.8	457.8	414.3	-5.0	50.2	-.6	.4948	.4015	1.2520	1.0771
2	29.203	9.771	536.4	457.2	370.1	456.9	388.2	-16.7	48.3	-2.0	.4739	.4033	1.2595	1.0739
3	21.260	9.424	514.7	442.9	358.0	442.3	369.9	-22.3	47.9	-2.8	.4544	.3887	1.2596	1.0722
4	12.740	3.286	470.3	398.4	329.0	397.7	340.8	-29.5	46.9	-3.5	.4139	.3487	1.2405	1.0719
5	9.243	1.130	449.8	374.1	301.2	373.7	334.1	-17.2	48.0	-2.6	.3944	.3263	1.2332	1.0767
6	.504	-.059	453.8	374.7	300.2	374.6	340.3	-9.6	48.6	-1.5	.3971	.3261	1.2337	1.0815
7	-1.363	-.685	454.8	372.6	298.8	372.5	342.9	-9.8	48.9	-1.5	.3976	.3237	1.2322	1.0834
8	-3.170	-1.277	451.2	365.0	279.5	364.8	341.9	-12.7	49.3	-2.0	.3940	.3170	1.2279	1.0847
9	-10.116	-2.574	430.1	335.6	258.2	334.7	343.6	-24.6	53.3	-4.2	.3742	.2903	1.2108	1.0900
10	-13.278	-3.031	423.1	331.2	247.5	330.1	343.2	-32.1	54.7	-5.5	.3677	.2867	1.2072	1.0913
11	-16.544	-3.409	417.8	334.4	240.7	332.3	341.4	-38.0	55.6	-6.5	.3628	.2890	1.2061	1.0919

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-.93	2.06	15.60	50.82	30.53	37.89	.3500	.1766	.0408	.9726	51.75	86.16	86.54
2	-1.42	1.76	12.34	50.32	30.25	38.00	.3163	.0953	.0224	.9863	67.06	92.34	92.54
3	-1.84	1.86	10.49	50.27	29.23	36.79	.3187	.0721	.0172	.9903	74.20	93.86	93.09
4	-3.82	.72	9.00	50.48	26.51	33.16	.3457	.0425	.0107	.9953	85.66	89.11	89.39
5	-3.44	1.70	9.94	50.66	24.67	31.05	.3806	.0476	.0134	.9949	84.88	80.63	81.15
6	-2.73	2.99	11.13	50.08	24.92	31.00	.3927	.0723	.0202	.9926	78.73	75.95	76.61
7	-2.37	3.50	11.17	50.93	24.27	30.75	.4023	.0850	.0241	.9912	75.55	73.62	74.35
8	-2.03	3.96	10.80	51.27	23.87	30.05	.4164	.0974	.0280	.9902	72.91	71.38	72.15
9	.02	4.24	11.07	57.47	20.88	27.27	.4762	.1487	.0444	.9865	62.94	62.80	63.46
10	-.88	5.37	11.84	60.20	19.89	26.61	.4857	.1618	.0489	.9857	59.02	60.59	61.58
11	-5.63	.81	13.14	62.02	19.85	26.73	.4809	.1666	.0609	.9856	55.25	59.89	60.90

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/RO INLET	EFF-AD INLET %	EFF-P INLET %

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 70, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.264	30.947	331.5	747.1	331.5	532.6	.0	524.0	.0	44.1	.2995	.6551	674.8	790.1	.6293	.5221	751.9	595.4
2	25.016	26.850	357.2	749.3	357.2	554.3	.0	504.2	.0	41.9	.3232	.6577	715.9	812.2	.7239	.5566	800.1	634.1
3	20.799	23.075	379.9	718.2	379.9	545.9	.0	466.6	.0	40.2	.3442	.6301	755.1	834.7	.7658	.5777	845.3	658.4
4	9.811	12.354	422.1	665.1	422.1	537.4	.0	391.8	.0	36.0	.3835	.5834	862.1	902.2	.8721	.6502	959.9	741.2
5	-3.009	1.444	444.1	629.7	444.1	516.3	.0	360.4	.0	34.9	.4041	.5501	990.7	993.0	.9880	.7133	1085.7	816.5
6	-8.738	-3.447	443.2	604.8	443.2	487.0	.0	358.7	.0	36.3	.4033	.5260	1052.8	1038.1	1.0393	.7270	1142.2	835.9
7	-11.112	-5.915	439.6	591.1	439.6	479.8	.0	345.3	.0	35.6	.3999	.5138	1081.9	1062.3	1.0623	.7499	1167.8	862.7
8	-13.322	-8.310	434.8	581.7	434.8	480.3	.0	328.2	.0	34.2	.3954	.5060	1110.2	1085.5	1.0843	.7801	1192.3	896.7
9	-18.998	-15.617	416.3	508.5	416.3	422.2	.0	283.4	.0	33.5	.3781	.4417	1191.3	1151.7	1.1461	.8387	1261.9	965.5
10	-19.933	-17.770	410.0	465.8	410.0	376.6	.0	274.1	.0	35.5	.3722	.4036	1218.3	1174.5	1.1669	.8458	1285.5	976.1
11	-19.580	-19.299	407.2	413.7	407.2	319.5	.0	262.8	.0	39.0	.3696	.3576	1241.9	1197.0	1.1862	.8535	1307.0	987.3

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VB'-1 FT/SEC	VB'-2 FT/SEC
1	.56	4.77	13.25	36.89	24.25	44.06	.3759	.1088	.0204	1.5057	93.71	93.36	63.12	26.24	-674.8	-266.2
2	.87	4.60	9.31	34.08	25.94	46.13	.3694	.0581	.0114	1.5153	96.13	95.93	62.81	28.74	-715.9	-308.0
3	.95	4.49	9.06	28.97	27.40	45.51	.3695	.0535	.0105	1.4851	95.91	95.70	62.67	33.70	-755.1	-368.1
4	2.47	4.97	8.58	20.21	30.03	44.82	.3509	.0426	.0082	1.4318	95.41	95.21	63.61	43.40	-862.1	-510.4
5	3.79	5.79	5.47	15.10	31.34	42.17	.3552	.1177	.0219	1.3793	84.55	83.88	65.88	50.78	-990.7	-632.6
6	4.11	5.93	4.27	13.03	31.29	39.08	.3703	.1830	.0327	1.3440	74.81	73.77	67.30	54.28	-1052.8	-679.4
7	4.14	5.86	4.45	11.98	31.07	38.31	.3590	.1892	.0329	1.3271	72.64	71.57	68.07	56.09	-1081.9	-717.0
8	4.06	5.66	4.65	11.36	30.79	38.26	.3398	.1814	.0307	1.3152	72.29	71.23	68.82	57.46	-1110.2	-757.3
9	3.22	4.72	7.03	7.06	29.67	33.30	.3076	.1955	.0275	1.2540	64.87	63.77	70.82	63.76	-1191.3	-868.3
10	2.74	4.24	7.32	4.38	29.29	29.55	.3069	.2173	.0268	1.2270	59.38	58.23	71.31	66.93	-1218.3	-900.5
11	2.50	4.00	7.64	.77	29.11	24.96	.3048	.2378	.0242	1.1981	53.68	52.52	71.59	70.83	-1241.9	-934.2

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1155	1.3732	82.19	82.93	27.84

Stator

RUN NO908, SPEED CODE 70, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.479	5.189	805.5	872.3	624.1	866.5	509.1	-100.0	41.7	-6.4	.7113	.7771	1.2581	1.1329
2	24.310	4.993	795.3	918.6	627.7	913.5	488.4	-97.0	39.8	-5.9	.7023	.8244	1.3467	1.1315
3	21.358	4.585	764.1	936.5	613.8	932.1	455.1	-91.3	38.0	-5.5	.6742	.8454	1.4010	1.1251
4	13.016	3.095	708.2	881.3	593.2	876.7	386.9	-90.0	33.6	-5.8	.6241	.7938	1.3874	1.1134
5	5.032	.869	672.2	817.7	568.3	815.2	359.0	-64.3	32.4	-4.5	.5898	.7295	1.3371	1.1153
6	1.364	-.335	650.8	798.9	542.8	796.7	359.0	-58.2	33.5	-4.2	.5684	.7094	1.3173	1.1197
7	-.696	-.985	638.7	782.7	535.7	779.8	347.8	-67.7	33.0	-5.0	.5576	.6945	1.2987	1.1171
8	-2.685	-1.579	630.9	771.1	536.6	767.2	331.9	-77.2	31.7	-5.7	.5512	.6845	1.2840	1.1134
9	-9.437	-2.826	580.2	713.8	503.9	709.2	287.5	-80.7	29.9	-6.5	.5069	.6322	1.2120	1.1044
10	-12.511	-3.217	548.4	664.3	472.4	657.2	278.5	-97.1	30.9	-8.3	.4782	.5860	1.1612	1.1020
11	-16.111	-3.452	510.2	651.0	434.6	641.0	267.3	-113.7	32.3	-9.9	.4440	.5738	1.1412	1.1002

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-9.46	-6.47	9.80	48.09	49.93	55.31	.0882	.5762	.1323	.8353	414.68	50.98	52.47
2	-9.92	-6.73	8.44	45.73	50.70	60.44	.0221	.3887	.0909	.8889	215.27	67.65	68.93
3	-11.26	-7.86	7.82	43.52	49.79	63.56	-.0515	.2141	.0510	.9431	136.31	80.90	81.76
4	-16.86	-12.62	6.67	39.44	48.33	62.09	-.0762	.1309	.0329	.9698	119.91	86.50	87.07
5	-19.11	-13.77	8.06	36.87	45.48	58.04	-.0493	.1365	.0368	.9714	123.91	75.17	76.13
6	-17.83	-12.10	8.42	37.67	42.68	56.41	-.0560	.0856	.0238	.9834	113.81	68.47	69.63
7	-18.30	-12.44	7.72	37.95	41.88	55.08	-.0480	.1007	.0284	.9810	116.70	66.26	67.44
8	-19.57	-13.58	7.05	37.48	41.82	54.09	-.0417	.1158	.0331	.9785	119.77	65.32	66.49
9	-23.37	-17.16	8.79	36.35	38.67	49.11	-.0632	.1672	.0498	.9742	125.54	54.11	55.29
10	-24.67	-18.43	9.00	39.24	35.94	44.83	-.0479	.3107	.0933	.9594	147.60	42.65	43.78
11	-28.92	-22.78	9.67	42.22	32.84	43.35	-.0439	.3727	.1128	.9526	155.46	38.43	39.53

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
8723.	124.24	1.1155	1.3118	69.88	70.97

TABLE 9.6
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 70, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.082	31.037	317.1	771.0	317.1	536.5	.0	553.7	.0	45.5	.2862	.6757	673.4	788.5	.6720	.5133	744.4	585.7
2	24.821	27.001	341.9	737.9	341.9	530.4	.0	513.0	.0	43.7	.3090	.6462	714.5	810.6	.7160	.5326	792.0	608.1
3	20.564	23.228	363.5	700.7	363.5	513.5	.0	476.8	.0	42.6	.3290	.6129	753.6	833.0	.7573	.5466	836.7	624.9
4	9.672	12.351	404.8	649.1	404.8	498.4	.0	415.9	.0	39.7	.3673	.5667	860.3	900.4	.8628	.6069	950.8	695.1
5	-2.776	1.335	427.9	618.6	427.9	481.2	.0	388.8	.0	38.9	.3889	.5377	988.7	991.0	.9792	.6699	1077.3	770.8
6	-8.248	-3.529	428.4	598.9	428.4	452.4	.0	392.5	.0	40.8	.3894	.5179	1050.6	1036.0	1.0313	.6802	1134.6	786.6
7	-10.487	-5.960	425.8	590.9	425.8	446.4	.0	387.2	.0	40.8	.3869	.5103	1079.7	1060.1	1.0547	.6974	1160.6	807.5
8	-12.572	-8.276	422.2	581.4	422.2	442.4	.0	377.2	.0	40.3	.3836	.5018	1108.0	1083.3	1.0773	.7192	1185.7	833.2
9	-17.712	-15.388	408.4	524.0	408.4	400.9	.0	337.4	.0	39.7	.3707	.4516	1188.9	1149.4	1.1410	.7803	1257.1	905.5
10	-18.671	-17.598	403.4	502.0	403.4	373.4	.0	335.6	.0	41.4	.3660	.4316	1215.8	1172.2	1.1624	.7875	1281.0	916.1
11	-18.813	-19.108	400.3	476.0	400.3	338.1	.0	335.0	.0	44.2	.3632	.4080	1239.4	1194.6	1.1816	.7917	1302.4	923.7

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	1.51	5.73	10.37	40.71	23.28	45.22	.3933	.0489	.0094	1.5635	97.35	97.20	64.08	23.36	-673.4	-234.8
2	1.80	5.53	9.58	34.74	24.94	44.85	.3999	.0417	.0081	1.5321	97.25	97.10	63.74	29.00	-714.5	-297.6
3	1.88	5.42	9.85	29.11	26.35	43.45	.4066	.0547	.0106	1.4960	95.88	95.67	63.60	34.49	-753.6	-356.2
4	3.36	5.86	9.24	20.44	28.96	42.25	.3990	.0630	.0120	1.4511	93.70	93.39	64.50	44.07	-860.3	-484.5
5	4.53	6.53	6.06	15.25	30.37	40.35	.3987	.1193	.0219	1.4181	85.66	84.97	66.62	51.38	-988.7	-602.2
6	4.73	6.55	4.80	13.12	30.40	37.46	.4169	.1807	.0319	1.3947	77.48	76.44	67.92	54.80	-1050.6	-643.5
7	4.68	6.40	4.68	12.29	30.25	36.82	.4119	.1923	.0332	1.3861	75.35	74.23	68.61	56.32	-1079.7	-672.9
8	4.52	6.13	4.96	11.51	30.03	36.43	.4005	.1943	.0327	1.3773	74.20	73.04	69.28	57.77	-1108.0	-706.1
9	3.39	4.89	5.65	7.61	29.19	32.96	.3642	.1961	.0280	1.3359	70.52	69.33	70.99	63.38	-1188.9	-812.0
10	2.86	4.36	5.92	5.89	28.87	30.60	.3651	.2154	.0281	1.3226	67.18	65.90	71.42	65.53	-1215.8	-836.5
11	2.68	4.18	4.99	3.59	28.69	27.63	.3674	.2374	.0274	1.3085	63.57	62.20	71.77	68.18	-1239.4	-859.5

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1270	1.4200	82.97	83.76	27.07

Stator

RUN NO908, SPEED CODE 70, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.725	4.897	818.0	807.8	618.1	806.4	535.8	-48.0	43.5	-3.3	.7212	.7113	1.4304	1.1396
2	24.552	4.486	777.6	826.9	598.0	822.1	497.1	-88.6	41.7	-6.0	.6845	.7323	1.4802	1.1325
3	21.468	4.009	742.0	804.3	577.7	799.5	465.7	-87.2	40.4	-6.1	.6522	.7122	1.4715	1.1271
4	12.562	2.574	687.6	735.0	551.5	730.4	410.8	-82.2	37.1	-6.4	.6027	.6476	1.4290	1.1202
5	4.117	.443	655.9	693.1	529.2	688.6	387.5	-78.9	36.3	-6.5	.5721	.6065	1.4004	1.1248
6	.315	-.717	638.4	675.6	503.5	671.2	392.6	-77.1	37.9	-6.6	.5541	.5882	1.3815	1.1315
7	-1.796	-1.334	631.9	669.5	498.0	665.2	388.9	-76.3	38.0	-6.5	.5477	.5825	1.3735	1.1317
8	-3.845	-1.907	624.9	663.9	496.0	659.6	380.1	-75.4	37.5	-6.5	.5414	.5775	1.3648	1.1308
9	-10.938	-2.923	584.9	622.6	474.7	618.7	341.7	-69.3	36.1	-6.4	.5066	.5408	1.3119	1.1254
10	-13.857	-3.231	571.5	598.8	458.5	595.2	341.2	-65.7	37.2	-6.3	.4940	.5185	1.2839	1.1277
11	-16.905	-3.431	555.3	594.0	437.7	590.5	341.8	-64.1	38.8	-6.1	.4788	.5138	1.2716	1.1288

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATIC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-7.66	-4.67	12.90	46.80	50.56	60.78	.1730	.2831	.0653	.9162	-91.87	77.22	78.28
2	-7.99	-4.81	0.36	47.73	49.27	63.70	.1095	.1086	.0254	.9702	182.62	89.59	90.12
3	-8.89	-5.48	7.20	46.51	47.74	62.68	.0915	.0598	.0142	.9851	128.36	91.82	92.22
4	-13.32	-9.08	6.12	43.53	45.83	58.26	.1080	.0625	.0157	.9865	135.91	89.37	89.86
5	-15.21	-9.87	6.04	42.79	43.60	54.90	.1324	.0490	.0132	.9903	133.29	81.05	81.89
6	-13.37	-7.65	6.05	44.50	40.95	53.02	.1440	.0362	.0100	.9933	123.84	73.58	74.72
7	-13.30	-7.44	6.14	44.53	40.34	52.39	.1462	.0400	.0113	.9927	126.70	72.07	73.26
8	-13.82	-7.83	6.28	44.01	40.08	51.81	.1403	.0339	.0097	.9940	120.25	71.09	72.29
9	-17.18	-10.97	8.90	42.44	38.07	47.85	.1385	.0813	.0242	.9873	145.42	64.34	65.64
10	-18.35	-12.11	11.09	43.47	36.53	45.46	.1578	.1534	.0463	.9774	209.11	58.01	59.42
11	-22.36	-16.22	13.49	44.96	34.67	44.73	.1577	.1891	.0578	.9725	221.04	55.19	56.65

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %

TABLE 9.7
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 70, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.175	31.013	308.1	762.7	308.1	508.4	.0	568.6	.0	47.8	.2780	.6666	673.1	788.2	.6680	.4841	740.3	553.8
2	24.825	26.954	331.1	730.9	331.1	507.7	.0	525.8	.0	45.6	.2991	.6387	714.2	810.2	.7112	.5085	787.2	582.0
3	20.560	23.159	351.2	694.4	351.2	489.9	.0	492.1	.0	44.8	.3177	.6058	753.3	832.6	.7517	.5205	831.1	596.6
4	9.676	12.199	389.0	643.5	389.0	468.2	.0	441.4	.0	43.2	.3527	.5596	859.9	900.0	.8556	.5700	943.8	655.4
5	-2.628	1.194	408.8	615.2	408.8	444.5	.0	425.3	.0	43.7	.3711	.5317	988.3	990.6	.9708	.6219	1069.5	719.1
6	-7.933	-3.613	409.1	603.3	409.1	421.8	.0	431.3	.0	45.5	.3713	.5188	1050.2	1035.5	1.0230	.6337	1127.0	736.9
7	-10.131	-6.018	406.8	596.0	406.8	418.7	.0	424.0	.0	45.2	.3692	.5120	1079.2	1059.6	1.0467	.6539	1153.3	761.2
8	-12.226	-8.320	403.6	584.3	403.6	418.3	.0	407.8	.0	44.1	.3662	.5020	1107.5	1082.8	1.0696	.6823	1178.7	794.1
9	-17.298	-15.348	391.0	523.1	391.0	368.4	.0	371.4	.0	44.8	.3545	.4482	1188.4	1148.9	1.1342	.7371	1251.0	860.3
10	-18.155	-17.514	386.4	508.5	386.4	348.8	.0	370.0	.0	46.1	.3503	.4348	1215.3	1171.7	1.1559	.7474	1275.3	874.2
11	-18.519	-18.982	383.4	500.9	383.4	336.2	.0	371.3	.0	47.3	.3474	.4274	1238.9	1194.1	1.1752	.7584	1296.8	888.8

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	2.14	6.36	10.10	41.62	22.68	43.71	.4364	.0254	.0049	1.5910	98.72	98.65	64.71	23.09	-673.1	-219.6
2	2.51	6.24	9.53	35.50	24.22	43.87	.4323	.0072	.0014	1.5629	99.50	99.49	64.46	28.96	-714.2	-284.4
3	2.65	6.19	9.89	29.85	25.55	42.37	.4403	.0264	.0051	1.5283	98.04	97.94	64.37	34.52	-753.3	-340.5
4	4.23	6.73	9.44	21.10	27.98	40.56	.4430	.0598	.0113	1.4866	94.40	94.11	65.37	44.26	-859.9	-458.6
5	5.45	7.46	6.51	15.73	29.21	38.16	.4515	.1318	.0239	1.4619	85.61	84.85	67.55	51.82	-988.3	-565.2
6	5.61	7.44	4.99	13.81	29.23	35.89	.4666	.1843	.0323	1.4501	79.25	78.16	68.80	54.99	-1050.2	-604.2
7	5.53	7.25	4.87	12.95	29.09	35.58	.4573	.1896	.0326	1.4447	78.00	76.87	69.46	56.51	-1079.2	-635.6
8	5.33	6.94	5.24	12.04	28.89	35.59	.4375	.1809	.0302	1.4364	78.04	76.92	70.09	58.05	-1107.5	-675.0
9	4.10	5.60	7.58	7.39	28.10	31.31	.4053	.1913	.0264	1.3946	74.03	72.81	71.70	64.31	-1188.4	-777.4
10	3.53	5.03	6.46	6.02	27.82	29.61	.4030	.2057	.0263	1.3874	71.79	70.49	72.09	66.07	-1215.3	-801.6
11	3.37	4.87	4.21	5.06	27.62	28.53	.3998	.2175	.0259	1.3864	70.15	68.78	72.46	67.40	-1238.9	-822.8

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1365	1.4668	84.75	85.53	26.14

Stator

RUN NO908, SPEED CODE 70, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.641	4.857	802.8	736.3	584.9	735.7	549.9	-29.3	45.8	-2.2	.7052	.6418	1.4903	1.1431
2	24.466	4.465	763.8	737.3	568.9	735.9	509.7	-45.2	43.8	-3.4	.6702	.6450	1.5131	1.1356
3	21.406	4.036	728.9	714.2	547.6	712.2	481.1	-53.6	42.8	-4.2	.6384	.6245	1.5022	1.1313
4	12.515	2.689	675.6	656.4	516.0	654.1	436.2	-54.1	40.7	-4.7	.5894	.5714	1.4725	1.1278
5	3.816	.489	647.2	620.2	489.0	619.4	424.0	-31.8	41.0	-2.9	.5610	.5359	1.4496	1.1366
6	-.455	-.723	637.4	610.8	469.0	610.4	431.6	-21.9	42.6	-2.1	.5498	.5253	1.4391	1.1445
7	-2.309	-1.355	631.7	606.3	466.3	605.7	426.2	-26.9	42.4	-2.5	.5445	.5214	1.4331	1.1437
8	-4.346	-1.927	622.8	598.5	467.5	597.3	411.5	-37.8	41.4	-3.6	.5369	.5152	1.4237	1.1403
9	-11.441	-2.891	577.1	556.1	437.6	553.5	376.3	-54.6	41.1	-5.6	.4966	.4775	1.3741	1.1382
10	-14.392	-3.188	570.5	552.7	428.6	549.6	376.5	-58.1	41.9	-6.0	.4901	.4737	1.3638	1.1412
11	-17.183	-3.426	570.0	559.5	425.5	556.0	379.4	-62.4	42.6	-6.3	.4889	.4794	1.3614	1.1430

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-5.36	-2.37	13.99	48.00	49.05	60.17	.2447	.2176	.0502	.9381	-20.21	84.50	85.31
2	-5.86	-2.68	10.94	47.28	48.10	61.40	.1998	.1037	.0243	.9727	-44.14	92.67	93.06
3	-6.46	-3.05	9.10	47.05	46.44	59.93	.1924	.0643	.0154	.9844	-44.20	93.94	94.25
4	-9.78	-5.54	7.80	45.38	43.97	55.76	.2082	.0397	.0100	.9917	30.23	91.50	91.92
5	-10.50	-5.16	9.63	43.91	41.35	52.54	.2312	.0371	.0100	.9929	57.25	82.04	82.92
6	-8.69	-2.97	10.55	44.68	39.29	51.32	.2392	.0335	.0093	.9938	60.52	75.86	77.03
7	-8.86	-2.99	10.14	44.98	39.00	50.85	.2397	.0368	.0104	.9933	54.02	75.39	76.58
8	-9.91	-3.92	9.18	45.02	39.12	50.11	.2363	.0314	.0090	.9945	50.10	75.73	76.88
9	-12.18	-5.96	9.65	46.70	36.40	45.71	.2582	.0773	.0230	.9882	-15.97	68.80	70.13
10	-13.63	-7.38	11.35	47.94	35.50	45.01	.2665	.1094	.0330	.9835	-67.38	65.66	67.09
11	-18.56	-12.42	13.28	48.97	35.12	45.26	.2591	.1187	.0363	.9821	-199.09	64.44	65.92

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
8702.	116.63	1.1365	1.4451	81.28	82.19

TABLE 9.8
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 70, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.191	30.959	299.2	757.2	299.2	489.0	.0	578.2	.0	49.4	.2699	.6606	673.7	788.8	.6649	.4645	737.1	532.4
2	24.813	26.885	321.3	728.5	321.3	492.5	.0	536.8	.0	47.1	.2901	.6355	714.7	810.8	.7076	.4917	783.6	563.6
3	20.475	23.106	340.6	696.2	340.6	478.8	.0	505.4	.0	46.2	.3079	.6065	753.8	833.2	.7477	.5055	827.2	580.2
4	9.404	12.192	375.9	642.9	375.9	446.5	.0	462.5	.0	45.9	.3405	.5574	860.6	900.7	.8506	.5424	939.1	625.5
5	-2.809	1.231	393.0	618.7	393.0	421.2	.0	453.1	.0	47.1	.3563	.5326	989.0	991.3	.9650	.5883	1064.2	683.4
6	-8.049	-3.594	392.9	613.1	392.9	405.7	.0	459.7	.0	48.5	.3563	.5254	1051.0	1036.3	1.0174	.6042	1122.0	705.0
7	-10.280	-6.022	390.5	608.3	390.5	402.1	.0	456.4	.0	48.5	.3541	.5205	1080.0	1050.5	1.0412	.6209	1148.5	725.7
8	-12.388	-8.325	387.3	598.1	387.3	396.3	.0	448.0	.0	48.3	.3510	.5112	1108.3	1083.6	1.0642	.6403	1174.0	749.1
9	-17.393	-15.325	374.9	542.7	374.9	353.5	.0	411.8	.0	49.9	.3396	.4626	1189.3	1149.7	1.1294	.6974	1247.0	818.3
10	-18.305	-17.510	370.5	526.0	370.5	334.6	.0	405.9	.0	49.9	.3355	.4476	1216.2	1172.5	1.1513	.7117	1271.4	836.5
11	-18.624	-19.005	367.6	511.2	367.6	314.2	.0	403.3	.0	51.6	.3328	.4341	1239.8	1195.0	1.1707	.7233	1293.1	851.8

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VB'-1 FT/SEC	VB'-2 FT/SEC
1	2.81	7.02	10.02	42.36	22.07	42.59	.4658	.0100	.0019	1.6096	99.54	99.53	65.37	23.01	-673.7	-210.6
2	3.19	6.92	9.35	36.35	23.57	43.15	.4565	-.0124	-.0024	1.5859	100.73	100.80	65.13	28.78	-714.7	-274.1
3	3.33	6.87	9.48	30.94	24.85	42.02	.4612	.0032	.0006	1.5564	99.64	99.65	65.05	34.11	-753.8	-327.8
4	4.97	7.46	9.50	21.79	27.14	39.16	.4781	.0658	.0124	1.5120	94.12	93.80	66.11	44.32	-860.6	-438.1
5	6.26	8.26	6.64	16.40	28.23	36.62	.4899	.1456	.0264	1.4931	85.09	84.25	68.35	51.95	-989.0	-538.2
6	6.39	8.22	4.78	14.80	28.22	35.03	.5002	.1903	.0336	1.4889	79.91	78.78	69.59	54.79	-1051.0	-576.6
7	6.30	8.03	4.59	14.00	28.07	34.67	.4945	.2003	.0347	1.4860	79.36	77.15	70.23	56.23	-1080.0	-604.0
8	6.10	7.71	5.09	12.96	27.87	34.15	.4840	.2045	.0342	1.4791	77.21	75.95	70.86	57.90	-1108.3	-635.7
9	4.82	6.32	7.33	8.37	27.08	30.49	.4473	.2107	.0293	1.4427	74.01	72.66	72.43	64.06	-1189.3	-737.9
10	4.25	5.75	6.39	6.81	26.80	28.86	.4399	.2189	.0281	1.4343	72.47	71.07	72.81	66.00	-1216.2	-766.6
11	4.07	5.57	4.80	5.17	26.61	27.09	.4345	.2299	.0267	1.4283	70.80	69.33	73.16	67.99	-1239.8	-791.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1955	1.5009	84.53	85.36	25.29

RUN NO908, SPEED CODE 70, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.600	4.891	793.2	689.6	562.4	689.4	559.3	-18.0	47.4	-1.4	.6951	.5914	1.5181	1.1456
2	24.468	4.537	757.9	685.8	550.9	684.6	520.5	-40.7	45.4	-3.3	.6636	.5958	1.5329	1.1387
3	21.499	4.149	726.3	663.4	532.0	661.4	494.5	-50.9	44.4	-4.3	.6348	.5760	1.5224	1.1351
4	12.811	2.897	670.8	609.9	490.9	608.3	457.2	-44.2	43.5	-4.1	.5832	.5271	1.4977	1.1341
5	4.065	.663	646.5	579.3	462.6	578.8	451.6	-24.7	44.4	-2.4	.5580	.4967	1.4814	1.1454
6	.071	-.582	642.6	576.5	448.8	576.3	459.9	-13.8	45.7	-1.4	.5522	.4922	1.4778	1.1541
7	-2.056	-1.246	639.4	574.9	446.1	574.6	458.1	-18.9	45.8	-1.9	.5487	.4904	1.4744	1.1558
8	-4.112	-1.871	631.9	568.2	442.6	567.5	451.0	-27.6	45.6	-2.8	.5417	.4845	1.4659	1.1557
9	-11.326	-2.941	590.1	522.4	417.3	520.3	417.3	-49.9	45.4	-5.5	.5049	.4445	1.4168	1.1524
10	-14.249	-3.241	580.2	507.9	407.8	504.8	412.6	-56.0	46.0	-6.3	.4958	.4313	1.3999	1.1540
11	-17.087	-3.441	572.2	507.6	397.6	503.8	411.4	-62.1	46.9	-6.9	.4881	.4309	1.3933	1.1551

Stator

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-3.76	-.77	14.76	48.83	47.92	58.80	.2937	.2006	.0483	.9443	30.60	87.07	87.77
2	-4.34	-1.16	11.04	48.70	47.36	59.37	.2642	.1161	.0273	.9701	45.06	93.64	93.99
3	-4.83	-1.42	9.00	48.77	45.89	57.77	.2633	.0847	.0202	.9796	56.05	94.48	94.77
4	-6.99	-2.74	8.37	47.61	42.45	53.67	.2767	.0415	.0105	.9915	78.43	91.26	91.71
5	-7.11	-1.77	10.12	46.81	39.71	50.75	.3035	.0391	.0106	.9926	82.18	81.80	82.75
6	-5.61	.11	11.23	47.07	38.24	50.14	.3094	.0378	.0105	.9930	82.52	76.61	77.84
7	-5.53	.34	10.79	47.65	37.93	49.85	.3113	.0380	.0108	.9930	81.77	75.30	76.59
8	-5.72	.27	10.02	48.36	37.58	49.09	.3128	.0352	.0101	.9937	82.06	74.16	75.48
9	-7.88	-1.67	9.80	50.85	35.31	44.38	.3478	.0931	.0277	.9855	58.14	68.70	70.17
10	-9.60	-3.36	11.06	52.26	34.41	42.74	.3682	.1397	.0421	.9788	42.47	65.52	67.08
11	-14.31	-8.18	12.67	53.83	33.46	42.43	.3691	.1602	.0489	.9760	30.34	64.09	65.69

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
8708.	112.83	1.1955	1.4772	81.04	82.03

TABLE 9.9

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 70, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.205	30.173	285.4	753.0	285.4	470.9	.0	587.7	.0	50.9	.2573	.6559	674.4	789.7	.6601	.4462	732.3	512.3
2	24.831	26.614	307.4	725.7	307.4	477.7	.0	546.3	.0	48.4	.2774	.6321	715.5	811.7	.7027	.4760	778.7	546.4
3	20.402	22.859	326.8	696.4	326.8	467.7	.0	515.9	.0	47.4	.2952	.6058	754.7	834.2	.7428	.4921	822.4	565.7
4	9.052	12.126	360.7	643.0	360.7	428.6	.0	479.4	.0	48.1	.3264	.5563	861.5	901.7	.8453	.5205	934.0	601.7
5	-3.086	1.283	377.1	618.3	377.1	400.4	.0	471.1	.0	49.6	.3416	.5308	990.1	992.4	.9598	.5643	1059.5	657.3
6	-8.213	-3.537	377.6	615.6	377.6	384.2	.0	481.0	.0	51.3	.3421	.5260	1052.1	1037.5	1.0126	.5777	1117.8	676.2
7	-10.380	-5.971	375.8	611.3	375.8	382.2	.0	477.0	.0	51.2	.3404	.5215	1081.2	1061.6	1.0368	.5959	1144.6	698.5
8	-12.472	-8.307	373.0	601.2	373.0	380.4	.0	465.6	.0	50.6	.3378	.5126	1109.5	1094.8	1.0601	.6196	1170.6	726.8
9	-17.426	-15.390	361.8	552.2	361.8	329.9	.0	442.9	.0	52.9	.3274	.4685	1190.6	1151.0	1.1261	.6628	1244.3	781.2
10	-18.206	-17.558	357.8	540.4	357.8	315.2	.0	439.0	.0	53.8	.3238	.4578	1217.6	1173.8	1.1483	.6773	1269.1	799.6
11	-18.898	-19.033	355.2	529.8	355.2	299.1	.0	437.2	.0	55.1	.3214	.4479	1241.2	1196.3	1.1679	.6897	1291.0	815.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	3.84	8.05	9.90	43.51	21.12	41.32	.4925	.0141	.0027	1.6207	99.35	99.33	66.40	22.89	-674.4	-202.0
2	4.16	7.89	9.26	37.42	22.63	42.20	.4786	-.0138	-.0027	1.5995	100.82	100.90	66.11	28.68	-715.5	-265.4
3	4.24	7.78	9.26	32.06	23.94	41.42	.4792	-.0043	-.0008	1.5739	100.11	100.14	65.96	33.90	-754.7	-318.2
4	5.83	8.33	9.60	22.54	26.17	37.90	.5059	.0753	.0142	1.5299	93.52	93.15	66.97	44.43	-861.5	-422.3
5	7.08	9.09	7.16	16.70	27.23	35.11	.5172	.1565	.0280	1.5123	84.59	83.70	69.17	52.48	-990.1	-521.3
6	7.15	8.98	5.28	15.06	27.26	33.47	.5299	.2032	.0354	1.5120	79.49	78.29	70.35	55.29	-1052.1	-556.4
7	7.02	8.74	5.06	14.25	27.14	33.27	.5221	.2106	.0360	1.5105	78.22	76.95	70.95	56.70	-1081.2	-584.6
8	6.78	8.39	5.47	13.26	26.96	33.14	.5063	.2087	.0346	1.5045	77.66	76.37	71.54	58.28	-1109.5	-619.3
9	5.42	6.92	7.97	8.33	26.24	28.69	.4838	.2330	.0317	1.4734	73.06	71.58	73.03	64.69	-1190.6	-708.1
10	4.81	6.31	6.76	7.00	25.98	27.43	.4760	.2408	.0304	1.4691	71.78	70.24	73.38	66.38	-1217.6	-734.8
11	4.61	6.11	4.94	5.57	25.81	26.04	.4695	.2501	.0289	1.4665	70.47	68.87	73.70	68.13	-1241.2	-759.0

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1520	1.5232	84.05	84.94	24.40

Stator

RUN NO908, SPEED CODE 70, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.404	4.974	784.8	651.7	541.1	651.6	568.4	-11.5	48.9	-1.0	.6863	.5618	1.5348	1.1481
2	24.267	4.656	751.7	645.9	533.5	644.9	529.5	-35.5	46.7	-3.1	.6569	.5582	1.5458	1.1412
3	21.402	4.291	722.7	624.0	517.0	622.3	505.0	-47.1	45.8	-4.3	.6306	.5390	1.5358	1.1381
4	13.022	3.099	667.5	572.1	470.2	570.4	473.8	-43.1	45.8	-4.3	.5788	.4916	1.5126	1.1391
5	4.368	.863	642.8	543.8	439.3	543.4	469.3	-22.4	47.0	-2.4	.5532	.4637	1.4995	1.1513
6	.312	-.417	641.8	544.6	424.8	544.5	481.0	-11.0	48.5	-1.2	.5497	.4623	1.4992	1.1615
7	-1.864	-1.105	639.1	543.8	423.2	543.7	478.9	-13.2	48.5	-1.4	.5466	.4613	1.4970	1.1627
8	-3.926	-1.741	631.6	537.1	423.0	536.7	469.0	-19.9	48.0	-2.1	.5399	.4556	1.4894	1.1616
9	-11.276	-2.835	595.0	493.8	390.7	491.5	448.7	-47.1	49.3	-5.5	.5066	.4170	1.4448	1.1646
10	-14.841	-3.156	589.2	487.4	384.6	484.9	446.4	-49.9	49.9	-5.8	.5010	.4110	1.4344	1.1670
11	-17.231	-3.397	584.5	490.6	377.5	487.7	446.3	-52.4	50.7	-6.1	.4962	.4134	1.4306	1.1685

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATIC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-2.25	.74	15.22	49.88	46.59	57.16	.3350	.1907	.0440	.9482	47.88	87.96	88.64
2	-2.98	.20	11.29	49.81	46.36	57.43	.3125	.1206	.0283	.9696	60.25	93.88	94.22
3	-3.43	-.02	9.07	50.10	45.09	55.75	.3164	.0959	.0229	.9772	67.36	94.43	94.73
4	-4.71	-.46	8.20	50.06	41.06	51.48	.3359	.0520	.0131	.9895	82.46	90.25	90.77
5	-4.52	.82	10.21	49.31	38.09	48.72	.3617	.0449	.0121	.9916	85.82	81.22	82.23
6	-2.77	2.96	11.45	49.70	36.58	48.41	.3670	.0456	.0127	.9916	85.31	75.95	77.25
7	-2.76	3.11	11.29	49.92	36.38	48.24	.3662	.0458	.0130	.9916	84.83	75.09	76.43
8	-3.32	2.67	10.68	50.10	36.37	47.54	.3671	.0449	.0129	.9920	84.70	74.57	75.93
9	-3.94	2.28	9.80	54.18	33.39	42.82	.4197	.1120	.0334	.9822	66.40	67.37	68.98
10	-5.68	.57	11.51	55.73	32.79	41.95	.4301	.1440	.0435	.9776	57.32	65.02	66.71
11	-10.51	-4.37	13.55	56.75	32.13	41.99	.4249	.1573	.0481	.9757	50.70	63.94	65.68

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
8718.	108.87	1.1520	1.4973	80.43	81.48

TABLE 9.10
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	31.187	30.456	393.6	839.8	393.4	672.8	.0	414.1	.0	46.9	.3869	.7289	772.2	904.2	.7859	.8573	866.7	692.0
2	26.908	26.377	420.9	841.1	420.9	682.0	.0	407.2	.0	45.7	.3823	.7292	817.2	929.4	.8367	.8747	921.0	665.2
3	22.470	22.477	445.7	808.7	445.7	677.2	.0	566.5	.0	44.1	.4056	.7009	864.1	955.1	.8848	.6030	972.3	695.8
4	10.480	18.434	490.4	748.9	490.8	580.1	.0	473.6	.0	39.1	.4478	.6479	986.8	1032.4	1.0061	.6786	1101.6	805.5
5	-2.891	1.747	513.6	722.3	513.6	559.3	.0	457.1	.0	39.3	.4700	.6217	1133.7	1136.3	1.1389	.7575	1244.6	879.9
6	-8.661	-3.166	512.3	701.3	512.8	534.0	.0	454.6	.0	40.3	.4697	.6005	1209.7	1187.9	1.1977	.7748	1307.1	907.3
7	-11.061	-5.686	507.9	689.2	507.9	531.5	.0	438.7	.0	39.4	.4646	.5900	1238.0	1215.6	1.2238	.8057	1338.1	941.3
8	-13.342	-8.198	502.1	676.4	502.1	529.6	.0	420.8	.0	38.3	.4570	.5792	1270.5	1252.1	1.2488	.8369	1366.1	977.3
9	-19.097	-15.627	479.4	582.4	479.9	457.6	.0	360.4	.0	37.8	.4375	.4979	1363.2	1317.9	1.3185	.9073	1446.1	1061.2
10	-19.430	-17.810	472.1	538.2	472.1	409.1	.0	349.8	.0	40.0	.4308	.4588	1379.1	1344.1	1.3422	.9168	1471.1	1078.2
11	-19.468	-19.385	467.1	489.7	467.1	349.9	.0	342.6	.0	43.9	.4276	.4159	1421.2	1369.8	1.3699	.9218	1496.6	1086.2

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	.16	4.37	13.43	36.30	28.27	49.69	.4332	.0987	.0185	1.7204	94.49	94.08	62.72	26.42	-772.2	-290.1
2	.56	4.29	9.12	33.96	29.75	50.60	.4495	.0981	.0192	1.7290	93.92	93.45	62.51	28.55	-817.2	-322.2
3	.63	4.18	8.96	28.77	31.43	50.28	.4426	.0901	.0176	1.6718	93.70	93.24	62.36	33.59	-864.1	-388.6
4	2.10	4.68	8.99	19.50	33.99	50.67	.3982	.0592	.0113	1.6179	94.28	93.91	63.32	43.82	-986.5	-558.9
5	3.56	5.56	5.23	15.11	35.36	47.49	.4109	.1851	.0290	1.5608	82.65	81.45	65.65	50.54	-1133.7	-679.3
6	3.90	5.72	3.83	13.25	35.19	49.51	.4189	.2118	.0382	1.5217	75.03	73.54	67.09	53.84	-1209.7	-733.4
7	3.94	5.66	3.85	12.38	34.78	44.10	.4039	.2134	.0376	1.5033	73.69	72.18	67.87	55.49	-1238.0	-776.9
8	3.88	6.49	4.20	11.63	34.83	43.80	.3865	.2102	.0361	1.4850	72.86	71.35	68.64	57.02	-1270.5	-821.9
9	3.11	4.61	7.42	6.56	33.88	37.48	.3461	.2174	.0304	1.3936	66.78	65.23	70.72	64.19	-1363.2	-957.8
10	2.84	4.14	7.66	3.93	32.97	33.33	.3434	.2400	.0292	1.3594	62.46	60.84	71.20	67.27	-1394.1	-994.3
11	2.30	3.88	7.72	.56	32.79	28.35	.3437	.2652	.0269	1.3270	57.60	55.92	71.47	70.90	-1421.2	-1027.2

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1695	1.5606	81.17	82.27	31.93

RUN NO908, SPEED CODE 80, POINT NO 1

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.779	5.183	894.7	744.1	668.8	736.6	598.6	-118.1	44.6	-7.0	.7820	.8312	1.3906	1.1781
2	24.687	4.989	885.9	794.7	661.6	788.7	589.2	-109.6	43.7	-6.2	.7729	.8811	1.5097	1.1814
3	21.759	4.632	859.6	1021.8	652.2	1016.1	552.5	-108.0	41.8	-6.0	.7452	.9123	1.5901	1.1790
4	13.593	2.725	795.9	757.0	693.9	750.8	467.9	-108.4	36.6	-6.5	.6940	.8529	1.5675	1.1570
5	5.568	.678	769.3	899.2	620.8	892.7	455.0	-107.7	36.4	-6.9	.6657	.7906	1.5145	1.1674
6	1.760	-.517	751.6	882.7	598.2	875.9	455.0	-104.6	37.3	-7.1	.6476	.7721	1.4934	1.1735
7	-.392	-1.143	741.1	867.5	594.9	859.3	441.9	-118.6	36.6	-7.9	.6377	.7585	1.4723	1.1702
8	-2.336	-1.715	731.1	853.6	594.9	845.2	425.1	-119.2	35.5	-8.0	.6295	.7462	1.4510	1.1667
9	-7.306	-2.888	662.2	775.3	552.8	765.2	365.8	-124.8	33.7	-9.2	.5702	.6761	1.3912	1.1515
10	-12.569	-3.229	628.8	724.9	518.8	712.8	355.3	-132.2	34.8	-10.4	.5402	.6288	1.2794	1.1507
11	-16.314	-3.416	593.5	709.5	480.1	695.5	348.9	-140.4	36.8	-11.3	.5092	.6195	1.2533	1.1504

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-6.56	-3.57	9.22	51.57	55.78	61.14	.1259	.5776	.1324	.8083	581.40	55.39	57.30
2	-5.99	-2.80	8.18	49.91	55.72	67.10	.0666	.3924	.0918	.8697	250.02	68.29	70.00
3	-7.43	-4.02	7.36	47.82	58.13	71.43	-.0072	.1932	.0460	.9397	134.97	81.49	82.64
4	-13.89	-9.65	6.03	43.04	54.80	70.14	-.0213	.1104	.0277	.9697	117.87	87.27	88.02
5	-15.10	-9.76	5.69	43.28	51.88	65.97	.0267	.1068	.0287	.9726	123.43	75.28	76.65
6	-14.04	-8.32	5.47	44.40	48.82	64.32	.0294	.0618	.0170	.9851	112.63	69.96	71.57
7	-14.70	-8.83	4.82	44.46	48.08	62.78	.0376	.0748	.0209	.9823	115.95	68.66	70.29
8	-15.77	-9.78	4.77	43.56	47.98	61.74	.0386	.0839	.0239	.9806	118.18	67.32	68.95
9	-17.84	-13.33	4.04	43.94	43.72	54.77	.0277	.1452	.0429	.9727	128.73	62.76	64.42
10	-20.76	-14.61	6.91	45.28	40.49	50.07	.0506	.2722	.0813	.9549	157.48	48.35	50.06
11	-24.44	-18.30	8.33	48.04	37.83	48.31	.0575	.3366	.1014	.9457	170.14	44.33	46.04

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
9782.	180.24	1.1645	1.4770	71.67	73.15

TABLE 9.11
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 80, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V8-1 FT/SEC	V8-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	27.268	31.032	372.2	867.0	372.2	583.0	.0	644.9	.0	47.5	.3371	.7540	773.0	905.1	.7769	.5591	857.9	638.6
2	24.780	27.018	402.1	841.3	402.1	588.7	.0	601.0	.0	45.2	.3648	.7300	820.0	930.3	.8286	.5884	913.3	674.6
3	20.655	23.272	428.5	803.2	428.5	573.8	.0	562.0	.0	44.1	.3895	.6960	864.9	956.1	.8774	.6032	965.3	696.1
4	9.577	12.543	478.5	737.0	478.5	548.5	.0	495.2	.0	42.0	.4366	.6380	987.4	1033.4	1.0011	.6635	1077.3	768.5
5	-2.815	1.542	506.3	712.2	506.3	523.1	.0	483.4	.0	42.7	.4630	.6077	1134.8	1137.4	1.1363	.7170	1242.6	837.5
6	-8.179	-3.341	507.5	694.7	507.5	497.0	.0	485.3	.0	44.2	.4641	.5913	1205.9	1189.1	1.1965	.7333	1308.3	861.6
7	-10.447	-5.801	509.6	684.3	509.6	494.2	.0	473.4	.0	43.6	.4614	.5820	1239.2	1216.8	1.2239	.7571	1338.0	892.6
8	-12.411	-8.179	500.4	670.5	500.5	495.5	.0	451.6	.0	42.2	.4573	.5706	1271.7	1243.4	1.2471	.7947	1366.6	933.9
9	-18.061	-15.930	482.3	598.7	482.3	433.3	.0	413.3	.0	43.2	.4402	.5074	1364.6	1319.2	1.3209	.8510	1447.3	1004.2
10	-18.949	-17.628	475.9	574.4	475.9	401.7	.0	410.5	.0	45.1	.4341	.4853	1395.5	1345.4	1.3447	.8597	1474.4	1017.6
11	-18.944	-19.150	472.4	546.1	472.4	361.3	.0	407.5	.0	48.1	.4308	.4598	1422.5	1371.1	1.3669	.8648	1498.9	1027.2

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	V8'-1 FT/SEC	V8'-2 FT/SEC
1	1.02	5.23	10.82	39.78	26.41	51.48	.4342	.0531	.0102	1.7945	97.33	97.12	63.58	23.81	-773.0	-260.6
2	1.26	4.99	9.51	34.27	28.80	52.33	.4306	.0258	.0050	1.7664	98.49	98.33	63.21	28.94	-820.0	-329.9
3	1.28	4.82	9.59	28.77	30.81	51.19	.4347	.0340	.0070	1.7212	97.45	97.32	63.00	34.23	-864.9	-394.1
4	2.70	5.17	9.53	19.48	33.33	48.67	.4330	.0654	.0123	1.6494	94.01	93.69	63.83	44.36	-987.4	-538.3
5	3.89	5.89	6.04	14.43	34.86	45.83	.4929	.1811	.0277	1.6126	84.08	82.97	65.98	51.35	-1134.8	-654.0
6	4.09	5.71	4.67	12.61	34.93	43.01	.4588	.2029	.0359	1.5880	77.74	76.27	67.28	54.67	-1205.9	-703.8
7	4.05	5.77	4.62	11.72	34.77	42.69	.4465	.2056	.0356	1.5768	76.47	75.16	67.78	56.26	-1239.2	-743.4
8	3.71	5.52	4.78	10.88	34.54	42.87	.4238	.1733	.0325	1.5635	77.01	75.55	68.67	57.79	-1271.7	-791.6
9	2.91	4.41	7.38	6.41	33.58	37.28	.3949	.2195	.0298	1.4988	71.48	70.06	70.52	64.11	-1364.6	-905.9
10	2.90	3.70	6.73	4.62	33.18	34.44	.3958	.2390	.0296	1.4809	68.72	66.98	70.97	66.35	-1395.5	-934.8
11	2.21	3.71	5.89	2.23	32.98	30.87	.3969	.2566	.0284	1.4621	65.48	63.62	71.31	69.07	-1422.5	-961.6

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1759	1.6180	83.29	84.36	31.13

Stator

RUN NO908, SPEED CODE 80, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V8-1 FT/SEC	V8-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.666	4.710	920.6	868.5	677.0	867.7	623.8	-36.7	45.2	-2.4	.8097	.7537	1.6086	1.1868
2	24.666	4.515	884.7	889.1	665.6	887.0	582.9	-60.5	43.2	-3.8	.7724	.7767	1.6733	1.1784
3	21.604	4.044	847.3	869.9	645.3	866.7	597.1	-73.7	41.9	-4.8	.7384	.7602	1.6708	1.1720
4	12.977	2.599	781.0	801.0	608.7	797.7	489.3	-72.4	39.3	-5.2	.6775	.6964	1.6265	1.1696
5	4.373	.347	763.4	759.8	577.4	758.4	481.6	-46.4	39.8	-3.5	.6479	.6533	1.5919	1.1780
6	.828	-.850	738.8	745.2	556.3	744.0	485.5	-42.1	41.1	-3.2	.6314	.6373	1.5714	1.1848
7	-1.725	-1.464	727.9	737.4	553.1	735.6	476.2	-51.7	40.7	-4.0	.6235	.6308	1.5599	1.1836
8	-3.737	-2.022	719.1	724.3	555.8	723.9	456.5	-58.3	39.4	-4.6	.6148	.6223	1.5441	1.1777
9	-10.644	-3.016	666.3	665.7	518.5	662.6	418.5	-63.6	39.2	-5.5	.5682	.5673	1.4587	1.1761
10	-13.634	-2.295	650.8	636.1	497.5	632.0	417.2	-72.7	40.4	-4.5	.5536	.5398	1.4204	1.1772
11	-16.807	-3.443	632.9	629.5	475.5	624.3	417.7	-80.7	42.2	-7.3	.5366	.5336	1.4093	1.1807

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-5.73	-2.94	13.84	47.58	57.20	68.70	.2186	.2945	.0680	.8972	-271.84	78.01	79.38
2	-6.49	-3.31	10.56	47.03	57.84	72.46	.1626	.1488	.0349	.9509	-263.88	88.85	89.60
3	-7.33	-3.93	8.58	46.72	58.83	71.87	.1467	.0898	.0214	.9728	335.83	91.80	92.38
4	-11.15	-6.91	7.38	44.47	52.93	67.59	.1528	.0470	.0118	.9876	171.14	90.96	91.16
5	-11.68	-6.34	9.07	43.30	49.48	63.86	.1791	.0422	.0114	.9897	243.22	79.88	81.12
6	-10.20	-4.48	9.36	44.36	47.10	62.00	.1869	.0310	.0086	.9928	186.41	73.93	75.51
7	-10.86	-4.70	8.66	44.75	46.70	61.22	.1889	.0358	.0101	.9918	194.58	73.77	75.33
8	-11.87	-5.88	8.19	44.04	46.94	60.29	.1842	.0355	.0102	.9921	170.97	74.36	75.85
9	-14.08	-7.83	9.79	48.69	43.39	53.77	.3104	.1041	.0314	.9797	411.83	64.66	66.48
10	-15.15	-8.70	10.83	46.78	41.39	50.52	.2920	.1811	.0546	.9673	-221.29	58.70	60.83
11	-17.04	-12.70	12.33	49.43	39.13	49.48	.2978	.2170	.0667	.9610	********	54.38	58.37

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/RO INLET	EFF-AD INLET %	EFF-P INLET %
9972.	188.92	1.1759	1.5788	78.73	80.02

TABLE 9.12
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.223	31.059	365.8	863.0	365.8	565.4	.0	652.0	.0	48.7	.3312	.7477	770.7	902.4	.7723	.5358	853.1	618.9
2	24.830	27.070	379.3	832.6	379.3	571.3	.0	605.7	.0	46.4	.3576	.7214	817.7	927.7	.8232	.5682	907.8	658.7
3	20.500	23.397	419.4	794.0	419.4	551.9	.0	570.8	.0	45.7	.3810	.6866	862.4	953.3	.8711	.5807	959.0	671.5
4	9.449	12.832	466.3	730.9	466.3	519.3	.0	514.9	.0	44.6	.4250	.6288	984.8	1030.5	.9930	.6298	1089.4	732.1
5	-2.696	1.823	491.6	711.3	491.6	493.6	.0	512.1	.0	46.1	.4490	.6062	1131.5	1134.1	1.1268	.6767	1233.7	779.1
6	-7.920	-3.239	493.0	700.7	493.8	472.3	.0	517.6	.0	47.5	.4503	.5937	1202.4	1185.7	1.1871	.6932	1299.5	818.1
7	-10.139	-5.789	490.6	694.6	490.6	472.3	.0	509.3	.0	47.0	.4480	.5878	1235.6	1213.3	1.2191	.7174	1329.5	847.8
8	-12.283	-8.134	486.8	682.4	486.8	470.4	.0	494.3	.0	46.2	.4494	.5772	1268.0	1239.8	1.2401	.7486	1358.3	881.5
9	-17.530	-15.306	470.8	614.8	470.8	415.1	.0	453.1	.0	47.1	.4273	.5177	1360.6	1318.4	1.3128	.8063	1439.8	957.0
10	-18.977	-17.529	469.9	599.1	469.9	392.7	.0	452.5	.0	48.5	.4237	.5033	1391.8	1391.5	1.3371	.8165	1467.1	971.9
11	-18.700	-19.098	461.2	581.7	461.2	361.4	.0	455.8	.0	51.1	.4202	.4869	1418.9	1367.1	1.3890	.8208	1471.5	980.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VØ'-1 FT/SEC	VØ'-2 FT/SEC
1	1.34	5.55	10.63	40.28	26.50	50.98	.4585	.0103	.0020	1.8273	99.55	99.53	63.90	23.62	-770.7	-250.9
2	1.62	5.35	9.70	34.94	28.31	51.89	.4489	-.0156	-.0030	1.7964	100.87	100.97	63.67	29.12	-817.7	-321.9
3	1.69	5.23	9.85	28.93	29.96	50.19	.4582	.0085	.0016	1.7505	99.32	99.28	63.91	34.97	-862.4	-383.8
4	3.20	5.70	9.90	19.62	32.83	47.21	.4663	.0611	.0115	1.6827	94.64	94.25	64.39	44.72	-984.6	-516.1
5	4.48	6.45	6.26	14.77	34.04	44.29	.4849	.1523	.0278	1.6617	84.92	83.83	66.54	51.57	-1131.5	-622.0
6	4.60	6.43	4.64	13.15	34.18	41.99	.4753	.2003	.0355	1.6496	79.81	78.05	67.79	54.64	-1202.4	-668.0
7	4.53	6.25	4.37	12.95	34.00	41.97	.4841	.2038	.0355	1.6481	78.58	77.06	68.46	56.01	-1235.6	-709.0
8	4.36	5.97	4.76	11.55	33.79	41.83	.4675	.2009	.0339	1.6348	78.17	76.64	69.12	57.55	-1268.0	-745.5
9	3.29	4.79	7.22	6.90	32.89	38.70	.4341	.2130	.0298	1.5776	74.39	72.73	70.89	63.99	-1360.6	-862.3
10	2.72	4.22	6.14	5.53	32.55	34.84	.4321	.2274	.0297	1.5603	72.21	70.43	71.28	65.78	-1391.5	-887.0
11	2.56	4.06	4.82	3.63	32.38	31.97	.4341	.2519	.0293	1.5586	69.52	67.59	71.65	68.01	-1418.4	-911.3

TO/TO INLET	PO/RO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1862	1.6476	84.47	85.82	30.51

Stator

RUN NO908, SPEED CODE 80, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.708	4.878	908.6	799.0	654.2	798.6	630.7	-25.1	46.5	-1.7	.7923	.6870	1.6706	1.1880
2	24.654	4.520	870.3	808.9	641.3	807.1	588.0	-54.0	44.5	-3.7	.7581	.6992	1.7139	1.1794
3	21.708	4.089	832.5	784.9	617.7	782.1	558.1	-66.1	43.7	-4.8	.7234	.6780	1.7016	1.1743
4	13.007	2.749	767.3	722.1	579.7	719.6	508.4	-60.2	42.0	-4.8	.6627	.6205	1.6648	1.1707
5	4.218	.492	747.1	692.7	545.8	692.0	510.2	-31.8	43.1	-2.6	.6391	.5888	1.6452	1.1880
6	.152	-.751	738.7	686.0	526.8	685.4	517.9	-29.2	44.5	-2.4	.6284	.5801	1.6348	1.1981
7	-2.013	-1.373	739.5	682.9	526.9	681.9	511.6	-36.1	44.2	-3.0	.6290	.5773	1.6285	1.1979
8	-4.050	-1.976	728.5	673.1	527.8	671.5	498.2	-46.7	43.4	-4.0	.6162	.5691	1.6190	1.1956
9	-11.138	-2.974	674.5	622.6	494.4	619.6	458.8	-60.5	43.2	-5.6	.5714	.5245	1.5932	1.1932
10	-14.062	-3.256	667.4	602.7	483.3	599.7	460.2	-60.5	44.2	-5.7	.5690	.5057	1.5196	1.1982
11	-17.017	-3.437	658.5	600.9	465.6	597.6	465.6	-62.7	45.9	-5.9	.5597	.5035	1.5030	1.2011

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-9.61	-1.62	14.46	48.28	57.18	68.52	.2831	.2987	.0574	.9152	10.49	84.04	85.11
2	-5.18	-2.00	10.63	48.28	56.72	71.02	.2903	.1328	.0312	.9576	21.38	92.68	93.20
3	-5.60	-2.19	8.58	48.42	54.80	69.84	.2341	.0885	.0211	.9736	35.39	94.02	94.43
4	-8.43	-4.19	7.74	46.79	51.19	65.01	.2936	.0383	.0097	.9902	70.73	91.88	92.39
5	-8.34	-3.00	9.94	45.77	48.05	61.78	.2687	.0370	.0100	.9912	76.90	81.39	82.58
6	-6.80	-1.08	10.16	46.95	45.93	60.78	.2779	.0348	.0097	.9919	77.62	76.06	77.63
7	-7.13	-1.26	9.65	47.20	45.88	60.39	.2791	.0390	.0110	.9910	74.09	75.60	77.09
8	-7.89	-1.70	8.82	47.39	45.92	59.26	.2799	.0393	.0113	.9913	71.75	74.91	76.51
9	-10.03	-3.82	9.70	48.79	42.26	53.61	.3074	.0946	.0282	.9815	40.76	68.31	70.15
10	-11.36	-5.11	11.62	49.94	41.56	51.17	.3339	.1889	.0480	.9698	18.18	63.55	65.57
11	-15.30	-7.16	13.69	51.82	39.79	50.54	.3366	.1864	.0570	.9649	-.60	61.37	63.48

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/RO INLET	EFF-AD INLET %	EFF-P INLET %
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 9.13

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 80, POINT NO 9

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.254	31.031	359.5	856.2	359.5	596.6	.0	659.0	.0	50.0	.3253	.7402	773.9	906.1	.7722	.5186	853.3	599.9
2	24.901	27.020	387.7	829.4	387.7	557.4	.0	614.2	.0	47.4	.3518	.7173	821.0	931.4	.8230	.5597	908.0	491.4
3	20.552	23.291	412.6	793.6	412.8	590.2	.0	581.3	.0	46.8	.3796	.6850	866.0	957.2	.8709	.5680	959.2	658.1
4	9.494	18.469	458.0	729.7	458.9	500.6	.0	531.0	.0	46.6	.4174	.6260	988.6	1039.7	.9925	.6071	1089.5	710.1
5	-2.605	1.808	480.7	711.7	480.7	472.5	.0	532.2	.0	48.4	.4386	.6043	1136.1	1138.8	1.1257	.6529	1233.6	768.9
6	-7.753	-3.310	481.7	706.3	481.7	454.9	.0	540.3	.0	49.8	.4397	.5763	1207.3	1190.5	1.1863	.6699	1299.9	793.5
7	-9.947	-5.792	479.5	700.9	479.5	456.8	.0	531.5	.0	49.2	.4378	.5910	1290.7	1218.2	1.2137	.6959	1330.1	824.8
8	-12.119	-8.079	476.0	689.6	476.0	460.3	.0	513.5	.0	47.9	.4392	.5815	1273.2	1294.8	1.2399	.7287	1359.3	869.1
9	-17.595	-15.309	460.4	624.2	460.9	401.4	.0	477.9	.0	49.5	.4194	.5237	1366.2	1320.8	1.3138	.7833	1441.7	933.5
10	-18.503	-17.531	459.5	611.7	459.5	380.6	.0	478.9	.0	51.0	.4139	.5118	1397.2	1397.0	1.3380	.7929	1469.2	947.8
11	-18.732	-19.060	450.9	596.4	450.9	348.4	.0	489.0	.0	53.8	.4106	.4969	1429.2	1372.7	1.3401	.7959	1493.7	954.6

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VØ'-1 FT/SEC	VØ'-2 FT/SEC
1	1.83	6.09	11.06	50.36	26.09	49.86	.4817	.0086	.0016	1.8436	99.65	99.64	64.37	25.08	-773.9	-247.2
2	2.11	5.84	9.93	39.70	27.90	51.28	.4667	-.0299	-.0047	1.8193	101.38	101.62	64.06	29.36	-821.0	-317.3
3	2.14	5.70	7.98	29.31	29.98	49.79	.4746	-.0023	-.0004	1.7783	100.01	100.03	63.80	34.58	-866.0	-376.9
4	3.70	6.20	10.24	19.77	32.18	46.09	.4903	.0656	.0122	1.7104	94.43	94.01	64.84	45.06	-988.6	-503.7
5	4.79	7.00	6.77	15.00	33.85	43.00	.5074	.1589	.0287	1.6953	84.68	83.74	67.09	52.09	-1136.1	-606.6
6	5.13	6.76	4.92	13.40	33.61	41.10	.5172	.2091	.0357	1.6720	80.03	78.83	68.32	54.92	-1207.3	-650.2
7	5.04	6.76	4.69	12.73	33.38	41.29	.5046	.2055	.0356	1.6899	79.35	77.81	68.97	56.29	-1290.7	-686.7
8	4.85	6.46	4.83	11.97	33.17	41.72	.4848	.1756	.0330	1.6821	79.58	78.07	69.51	57.69	-1273.2	-731.3
9	3.71	5.21	7.86	7.18	32.97	36.34	.4565	.2156	.0299	1.6270	75.36	73.46	71.31	64.9	-1366.2	-843.8
10	3.18	4.64	6.30	5.63	31.95	33.40	.4597	.2327	.0299	1.6206	73.27	71.44	71.74	65.91	-1397.2	-868.0
11	3.01	4.51	5.08	3.86	31.74	31.39	.4582	.2548	.0295	1.6125	70.59	68.59	72.10	68.28	-1424.2	-888.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1939	1.7090	84.77	85.85	29.98

Stator

RUN NO908, SPEED CODE 80, POINT NO 9

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.654	4.916	897.6	755.8	631.8	755.4	637.6	-23.7	47.8	-1.7	.7805	.6459	1.7013	1.1908
2	29.602	4.567	863.2	761.1	629.0	759.6	596.4	-46.6	48.7	-3.4	.7500	.6532	1.7391	1.1827
3	21.697	4.172	827.7	736.7	601.4	734.3	568.7	-59.6	48.0	-4.6	.7174	.6318	1.7212	1.1789
4	13.099	2.918	762.0	679.0	552.3	676.6	529.9	-57.4	44.1	-4.8	.6559	.5793	1.6909	1.1769
5	4.202	.636	744.0	655.5	521.9	654.9	530.2	-27.2	45.5	-2.4	.6339	.5532	1.6788	1.1960
6	.054	-.693	740.9	655.3	506.6	655.1	540.6	-17.1	46.9	-1.5	.6277	.5502	1.6759	1.2076
7	-2.138	-1.309	737.2	653.0	508.1	652.7	534.2	-17.4	46.4	-1.5	.6239	.5482	1.6709	1.2071
8	-4.186	-1.893	729.2	644.0	513.3	643.5	517.9	-26.5	45.3	-2.4	.6178	.5411	1.6882	1.2038
9	-11.062	-2.915	679.7	598.9	477.8	593.3	483.9	-55.2	45.0	-5.3	.5733	.4983	1.5920	1.2048
10	-13.975	-3.214	675.1	582.2	467.3	580.0	487.2	-51.0	46.8	-5.0	.5479	.4850	1.5499	1.2109
11	-16.958	-3.927	667.7	582.0	448.5	579.9	494.6	-47.5	48.7	-4.8	.5597	.4841	1.5602	1.2198

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-3.33	-.39	14.97	49.56	56.07	67.54	.3238	.2298	.0531	.9238	35.69	85.96	84.94
2	-3.98	-.80	10.74	49.16	56.09	69.40	.2899	.1394	.0327	.9563	48.86	93.18	93.67
3	-4.30	-.89	8.76	49.54	54.22	67.68	.2892	.1040	.0248	.9694	58.92	94.03	94.46
4	-6.38	-2.14	7.68	48.91	49.98	63.19	.2997	.0432	.0109	.9892	81.91	91.55	92.13
5	-5.96	-.62	10.19	47.89	46.80	60.60	.3222	.0400	.0108	.9905	84.47	81.42	82.70
6	-4.95	1.27	11.11	48.35	44.96	60.02	.3259	.0390	.0109	.9909	84.23	76.51	78.12
7	-4.85	1.02	11.16	47.97	45.08	59.72	.3243	.0471	.0139	.9892	80.69	76.23	77.88
8	-6.01	-.02	10.44	47.46	45.62	58.81	.3237	.0488	.0140	.9891	79.16	76.32	77.92
9	-7.51	-1.29	9.96	51.05	42.18	53.11	.3631	.0985	.0294	.9808	61.78	69.38	71.28
10	-8.78	-2.53	12.35	51.79	41.03	51.26	.3817	.1458	.0441	.9718	47.42	65.21	67.30
11	-12.52	-6.39	14.79	53.49	39.13	50.81	.3813	.1476	.0513	.9680	36.97	63.13	65.33

WCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
10009.	133.75	1.1939	1.6674	81.06	82.38

TABLE 9.14
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 80, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.328	30.937	355.6	855.8	355.6	540.0	.0	663.9	.0	50.5	.3217	.7395	771.8	903.7	.7688	.5106	849.8	590.9
2	25.027	26.887	383.4	828.3	383.4	551.7	.0	617.8	.0	47.9	.3474	.7160	818.9	929.0	.8193	.5475	909.1	633.4
3	20.644	23.191	407.8	794.3	407.5	536.1	.0	586.2	.0	47.3	.3698	.6854	863.7	954.7	.8668	.5613	955.0	650.5
4	9.629	12.288	449.3	728.4	449.3	491.3	.0	537.8	.0	47.4	.4091	.6242	986.0	1032.0	.9864	.5973	1083.6	696.8
5	-2.854	1.309	467.5	715.7	467.5	468.9	.0	540.7	.0	49.1	.4261	.6073	1133.2	1135.8	1.1174	.6429	1225.8	757.6
6	-8.319	-3.556	466.2	713.3	466.2	453.5	.0	550.6	.0	50.4	.4249	.6017	1204.1	1187.4	1.1769	.6599	1291.2	781.8
7	-10.682	-6.033	462.6	709.9	462.6	454.8	.0	545.0	.0	50.0	.4215	.5978	1237.4	1215.0	1.2038	.6820	1321.1	809.8
8	-12.910	-8.493	457.7	699.9	457.7	452.7	.0	533.8	.0	49.5	.4169	.5889	1269.9	1291.6	1.2276	.7068	1349.8	840.2
9	-18.332	-15.608	439.2	630.1	439.2	383.1	.0	500.3	.0	52.2	.3995	.5269	1362.6	1317.3	1.3023	.7547	1431.6	902.4
10	-19.063	-17.733	433.2	613.7	433.2	356.5	.0	499.5	.0	54.0	.3939	.5116	1393.5	1393.4	1.3269	.7637	1459.3	916.1
11	-18.995	-19.196	430.1	603.3	430.1	330.9	.0	504.4	.0	56.3	.3909	.5011	1420.5	1369.1	1.3492	.7691	1484.2	925.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	2.03	6.29	10.66	30.94	25.88	47.45	.4922	.0038	.0007	1.8512	99.90	99.70	64.59	23.65	-771.8	-239.8
2	2.33	6.06	9.68	35.16	27.62	50.95	.4755	-.0291	-.0057	1.8255	101.65	101.82	64.27	29.11	-818.9	-311.2
3	2.90	5.99	9.59	29.98	29.13	49.87	.4823	-.0069	-.0013	1.7862	100.26	100.31	65.12	34.23	-863.7	-368.5
4	4.07	6.56	10.21	20.18	31.65	45.25	.5027	.0750	.0190	1.7116	93.67	93.20	65.20	45.03	-986.0	-494.2
5	5.51	7.62	6.45	15.84	32.70	42.56	.5166	.1672	.0308	1.6977	84.06	82.86	67.60	51.77	-1133.2	-578.1
6	5.74	7.57	4.45	14.49	32.63	40.78	.5287	.2168	.0386	1.6939	79.03	77.45	68.94	54.45	-1204.1	-636.8
7	5.71	7.43	4.07	13.93	32.92	40.84	.5187	.2231	.0391	1.6917	77.91	76.25	69.64	55.71	-1237.4	-670.0
8	5.58	7.19	4.43	13.10	32.14	40.63	.5098	.2297	.0383	1.6826	77.05	75.34	70.34	57.29	-1269.9	-707.7
9	4.59	6.09	7.85	7.57	31.05	39.21	.4800	.2592	.0347	1.6191	71.73	69.79	72.15	64.67	-1362.6	-817.1
10	3.99	5.49	7.11	5.84	30.69	31.75	.4779	.2717	.0339	1.6082	69.57	67.51	72.55	66.72	-1373.5	-843.9
11	3.77	5.27	5.54	4.14	30.50	29.41	.4785	.2722	.0327	1.6043	67.43	65.24	72.86	68.73	-1420.5	-864.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.1979	1.7055	83.30	84.48	29.29

Stator

RUN NO908, SPEED CODE 80, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.663	4.943	895.1	747.3	623.6	747.1	642.2	-19.4	48.4	-1.4	.7777	.6378	1.7104	1.1916
2	24.684	4.619	860.3	748.4	616.6	747.0	600.0	-45.9	46.3	-3.4	.7470	.6412	1.7373	1.1839
3	21.865	4.291	826.1	724.2	594.7	721.7	573.4	-57.7	45.6	-4.7	.7156	.6200	1.7249	1.1794
4	13.468	3.055	758.8	663.0	541.5	660.8	531.5	-54.4	45.1	-4.7	.6525	.5643	1.6919	1.1785
5	4.772	.836	746.3	638.3	516.9	637.8	538.4	-25.0	46.3	-2.2	.6354	.5372	1.6812	1.1984
6	.783	-.423	746.0	635.0	503.5	635.0	550.5	-10.0	47.6	-.9	.6316	.5314	1.6765	1.2111
7	-1.308	-1.085	749.3	631.8	509.7	631.5	547.0	-17.9	47.3	-1.6	.6271	.5281	1.6711	1.2128
8	-3.281	-1.687	737.6	622.7	505.2	622.0	537.5	-30.6	46.8	-2.8	.6229	.5202	1.6590	1.2125
9	-10.275	-2.818	683.8	559.0	459.6	555.8	506.4	-59.8	48.1	-6.1	.5747	.4695	1.5860	1.2130
10	-13.432	-3.165	674.1	548.0	443.3	545.5	507.8	-51.9	49.4	-5.4	.5650	.4538	1.5687	1.2190
11	-16.677	-3.419	670.4	550.6	429.5	548.5	514.8	-47.7	51.0	-4.9	.5601	.4553	1.5626	1.2227

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-2.75	.24	14.77	49.84	56.63	67.43	.3314	.2276	.0526	.9247	38.58	86.51	87.96
2	-3.45	-.27	10.93	49.70	55.66	68.83	.3031	.1461	.0343	.9545	50.74	93.20	93.69
3	-3.71	-.30	8.68	50.22	53.84	67.06	.3087	.1118	.0267	.9671	60.25	93.88	94.31
4	-5.40	-1.16	7.82	49.74	49.03	62.16	.3192	.0438	.0110	.9891	83.94	90.80	91.43
5	-6.22	-.12	10.33	48.49	46.17	59.47	.3498	.0390	.0105	.9907	87.37	80.69	82.02
6	-3.76	1.96	11.69	48.46	44.53	58.59	.3597	.0424	.0118	.9900	86.65	75.32	77.01
7	-3.99	1.87	11.06	48.92	44.53	58.11	.3664	.0509	.0143	.9882	84.18	74.22	75.98
8	-4.82	1.47	9.78	49.61	44.51	57.05	.3738	.0513	.0147	.9883	83.69	73.18	74.99
9	-5.19	1.02	9.14	54.19	40.05	50.01	.4295	.0857	.0255	.9831	74.21	66.11	68.19
10	-6.16	.08	11.95	54.81	38.43	48.54	.4439	.1201	.0363	.9768	67.92	62.87	64.72
11	-10.21	-4.07	14.70	55.90	37.03	48.44	.4392	.1354	.0415	.9741	62.37	61.03	63.35

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
9777.	130.47	1.1979	1.6891	79.48	81.06

TABLE 9.15

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 95, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.375	31.141	478.8	992.8	478.8	649.0	.0	751.4	.0	48.8	.4368	.8480	916.3	1072.8	.9432	.6186	1033.8	724.2
2	25.175	27.212	518.6	982.4	518.6	657.5	.0	730.0	.0	47.7	.4747	.8380	972.1	1102.8	1.0085	.6448	1101.8	755.8
3	20.925	23.565	554.7	949.5	554.7	654.6	.0	687.8	.0	46.2	.5094	.8093	1025.3	1133.3	1.0706	.6749	1165.7	791.8
4	9.819	13.063	624.5	871.2	624.5	623.8	.0	608.2	.0	44.2	.5776	.7385	1170.5	1225.0	1.2210	.7437	1326.7	877.3
5	-2.510	2.114	664.9	827.1	664.9	589.8	.0	579.9	.0	44.5	.6176	.6938	1345.2	1348.3	1.3940	.8125	1500.5	968.7
6	-7.825	-2.819	668.0	807.1	668.0	573.2	.0	568.2	.0	44.6	.6208	.6736	1429.4	1409.5	1.4663	.8497	1577.8	1018.0
7	-10.141	-5.333	664.1	792.8	664.1	570.3	.0	550.7	.0	43.8	.6168	.6613	1469.0	1442.3	1.4975	.8828	1612.1	1058.4
8	-12.382	-7.752	657.7	777.1	657.7	570.0	.0	528.2	.0	42.6	.6105	.6485	1507.5	1473.9	1.5261	.9219	1644.7	1104.1
9	-18.123	-15.233	630.0	694.4	630.0	506.5	.0	475.0	.0	42.7	.5830	.5775	1617.5	1563.8	1.6064	.9986	1735.9	1200.8
10	-19.162	-17.542	620.2	661.8	620.2	464.5	.0	471.4	.0	44.9	.5733	.5480	1654.2	1594.6	1.6331	1.0067	1766.6	1215.7
11	-19.083	-19.161	615.3	618.7	615.3	400.2	.0	471.8	.0	49.2	.5685	.5093	1686.3	1625.3	1.6585	1.0051	1795.0	1220.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VB'-1 FT/SEC	VB'-2 FT/SEC
1	-.86	3.35	13.09	35.62	33.34	60.92	.4728	.0885	.0166	2.1615	95.65	95.17	61.70	26.08	-916.3	-321.5
2	-.69	3.04	9.88	31.95	35.52	62.14	.4822	.0779	.0151	2.1603	95.70	95.22	61.26	29.31	-972.1	-372.8
3	-.77	2.77	9.41	26.91	37.38	62.21	.4764	.0674	.0131	2.1142	95.72	95.26	60.95	34.05	-1025.3	-445.5
4	.47	2.97	9.81	16.97	40.64	59.37	.4723	.0953	.0179	1.9977	92.17	91.39	61.61	44.63	-1170.5	-616.9
5	1.63	3.63	7.20	11.21	42.31	55.22	.4743	.1702	.0304	1.9269	83.68	82.13	63.72	52.51	-1345.2	-768.4
6	1.85	3.68	5.62	9.42	42.43	53.21	.4678	.1997	.0345	1.8957	79.84	77.98	65.04	55.63	-1429.4	-841.3
7	1.87	3.59	5.61	8.55	42.28	52.91	.4524	.1990	.0335	1.8775	79.21	77.32	65.80	57.25	-1469.0	-891.6
8	1.81	3.42	5.92	7.84	42.03	52.98	.4320	.1898	.0311	1.8588	79.37	77.53	66.57	58.73	-1507.5	-945.7
9	1.11	2.61	7.98	4.00	40.88	46.98	.3948	.2000	.0272	1.7649	75.87	73.91	68.71	64.70	-1617.5	-1088.8
10	.69	2.19	7.53	2.12	40.45	42.86	.3940	.2237	.0274	1.7329	72.65	70.50	69.26	67.14	-1654.2	-1123.4
11	.53	2.03	7.37	-.94	40.24	36.65	.3986	.2574	.0266	1.6932	68.34	65.96	69.62	70.56	-1686.3	-1153.4

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2476	1.9321	83.52	84.95	37.94

Stator

RUN NO908, SPEED CODE 95, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.832	5.082	1052.6	962.0	757.7	954.8	730.6	-117.0	46.6	-6.8	.9070	.8180	1.7547	1.2584
2	24.835	4.797	1033.1	1018.8	751.3	1010.5	709.1	-126.5	45.4	-7.0	.8883	.8735	1.9017	1.2584
3	21.958	4.321	999.2	1034.9	739.2	1025.8	672.3	-137.1	43.9	-7.5	.8578	.8929	1.9800	1.2501
4	13.580	2.721	920.8	970.3	697.8	963.3	600.8	-116.2	41.3	-6.8	.7856	.8333	1.9455	1.2391
5	4.704	.343	878.1	920.2	661.1	912.9	577.8	-115.6	41.2	-7.2	.7411	.7804	1.8884	1.2517
6	.565	-.864	861.4	905.1	646.7	896.9	569.1	-120.9	41.3	-7.7	.7236	.7643	1.8601	1.2568
7	-1.582	-1.472	849.0	896.1	643.1	887.7	554.2	-122.0	40.8	-7.8	.7125	.7571	1.8420	1.2529
8	-3.584	-2.029	836.8	885.6	644.8	877.1	533.4	-122.1	39.6	-7.9	.7028	.7492	1.8197	1.2471
9	-10.363	-3.046	776.7	820.0	609.9	810.3	481.0	-125.8	38.6	-8.8	.6514	.6906	1.6906	1.2395
10	-13.316	-3.320	756.5	772.1	584.4	761.3	478.9	-128.8	39.9	-9.5	.6313	.6455	1.6120	1.2442
11	-16.653	-3.435	726.2	756.6	543.9	744.3	481.2	-135.7	42.3	-10.2	.6037	.6307	1.5765	1.2468

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-4.58	-1.60	9.41	53.36	68.04	74.31	.2690	.4545	.1043	.8118	-147.48	67.28	69.69
2	-4.29	-1.11	7.39	52.40	68.28	81.89	.2056	.2956	.0690	.8800	-166.12	77.94	79.80
3	-5.36	-1.95	5.83	51.41	67.70	85.83	.1595	.1660	.0394	.9359	306.67	86.05	87.31
4	-9.14	-4.90	5.66	48.17	64.30	83.55	.1407	.0750	.0188	.9749	151.38	87.48	88.57
5	-10.24	-4.90	5.36	48.45	60.06	79.02	.1632	.0584	.0157	.9823	143.89	79.06	80.82
6	-9.97	-4.24	4.92	49.02	58.22	77.01	.1664	.0494	.0137	.9857	132.60	75.43	77.45
7	-10.54	-4.67	4.85	48.58	57.81	76.09	.1641	.0570	.0160	.9838	136.12	75.29	77.29
8	-11.69	-5.70	4.88	47.54	58.02	75.02	.1555	.0563	.0160	.9845	131.28	75.39	77.34
9	-14.71	-8.50	6.47	47.34	54.31	67.29	.1688	.1375	.0407	.9670	181.92	67.90	69.76
10	-15.72	-9.48	7.81	49.38	51.49	61.71	.2071	.2512	.0752	.9442	355.08	59.81	62.35
11	-18.86	-12.72	9.40	52.55	47.37	59.44	.2215	.3130	.0947	.9317	422.21	56.22	58.88

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11844.	169.28	1.2476	1.8452	77.16	79.01

TABLE 9.16
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 95, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.368	31.026	459.2	990.7	459.2	612.4	.0	778.7	.0	51.5	.4183	.8423	917.5	1074.3	.9346	.5781	1026.0	680.0
2	25.094	27.042	497.3	961.7	497.3	623.4	.0	732.2	.0	49.3	.4544	.8176	973.4	1104.3	.9988	.6173	1093.1	726.0
3	20.729	23.378	531.4	928.7	531.4	607.8	.0	702.1	.0	48.9	.4870	.7874	1026.7	1134.8	1.0595	.6326	1156.1	746.1
4	9.611	12.752	595.4	860.5	595.4	559.4	.0	653.9	.0	49.4	.5490	.7227	1172.1	1226.7	1.2122	.6724	1314.7	800.6
5	-2.373	1.847	631.8	832.6	631.8	530.6	.0	641.6	.0	50.4	.5848	.6908	1347.0	1350.1	1.3771	.7344	1487.8	885.2
6	-7.597	-3.027	635.5	827.8	635.5	522.9	.0	641.8	.0	50.7	.5884	.6821	1431.4	1411.4	1.4501	.7674	1366.1	930.5
7	-9.954	-5.531	632.2	820.7	632.2	523.5	.0	632.2	.0	50.2	.5852	.6757	1470.9	1444.3	1.4820	.7955	1601.1	966.2
8	-12.263	-7.953	626.4	807.7	626.4	520.7	.0	617.4	.0	49.7	.5795	.6642	1509.5	1475.9	1.5118	.8257	1634.3	1004.0
9	-17.842	-15.333	601.3	738.8	601.3	447.4	.0	588.0	.0	52.3	.5548	.6025	1619.7	1565.9	1.5940	.8769	1727.7	1075.4
10	-18.705	-17.585	592.7	722.4	592.7	416.7	.0	590.2	.0	54.3	.5464	.5865	1656.5	1597.0	1.6217	.8846	1759.3	1089.6
11	-18.758	-19.121	588.0	709.3	588.0	382.5	.0	597.3	.0	56.9	.5417	.5729	1688.5	1627.5	1.6474	.8876	1788.0	1098.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	.15	4.36	12.48	37.25	32.23	60.51	.5182	.0192	.0036	2.2838	99.16	99.07	62.72	25.47	-917.5	-295.6
2	.33	4.06	11.11	31.74	34.37	62.29	.5065	-.0088	-.0017	2.2518	100.45	100.51	62.28	30.54	-973.4	-372.1
3	.27	3.81	10.58	26.77	36.19	60.93	.5197	.0120	.0023	2.2052	99.15	99.06	61.99	35.21	-1026.7	-432.7
4	1.61	4.11	10.77	17.16	39.33	56.13	.5345	.0873	.0161	2.1148	93.37	92.66	62.75	45.60	-1172.1	-572.8
5	2.80	4.80	7.87	11.71	40.95	52.92	.5372	.1628	.0287	2.0928	85.98	84.48	64.89	53.18	-1347.0	-708.5
6	2.94	4.77	5.70	10.43	41.11	51.96	.5333	.1934	.0334	2.0953	82.76	80.91	66.14	55.71	-1431.4	-769.7
7	2.92	4.64	5.42	9.79	40.97	52.06	.5212	.1974	.0334	2.0915	81.98	80.05	66.85	57.06	-1470.9	-812.1
8	2.83	4.44	5.77	9.01	40.72	51.86	.5061	.1975	.0324	2.0789	81.44	79.48	67.59	58.58	-1509.5	-858.4
9	1.99	3.49	8.36	4.51	39.61	44.37	.4845	.2338	.0313	2.0015	76.53	74.18	69.59	65.08	-1619.7	-977.9
10	1.51	3.01	7.51	2.95	39.21	41.20	.4839	.2557	.0313	1.9883	74.26	71.71	70.08	67.12	-1656.5	-1006.8
11	1.35	2.85	6.11	1.15	38.99	37.69	.4859	.2810	.0308	1.9811	71.88	69.11	70.45	69.30	-1688.5	-1030.1

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.2784	2.1050	84.97	86.43	36.76

Stator

RUN NO908, SPEED CODE 95, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.621	4.876	1035.0	807.7	709.2	807.0	753.9	-32.2	49.3	-2.2	.8861	.6713	2.0917	1.2671
2	24.593	4.502	999.5	810.8	701.1	808.9	712.4	-55.4	47.5	-3.8	.8546	.6767	2.1306	1.2585
3	21.733	4.082	966.0	789.1	678.7	786.2	687.4	-66.5	46.9	-4.8	.8232	.6578	2.1195	1.2554
4	13.203	2.744	896.6	733.5	621.5	731.5	646.2	-54.3	46.7	-4.2	.7563	.6072	2.0849	1.2580
5	4.189	.436	869.6	712.8	589.4	711.9	639.3	-34.9	47.4	-2.8	.7246	.5835	2.0719	1.2798
6	.111	-.795	867.2	713.8	582.7	713.4	642.2	-23.1	47.8	-1.9	.7186	.5815	2.0684	1.2919
7	-1.938	-1.420	862.3	713.2	583.4	712.8	634.9	-23.7	47.4	-1.9	.7133	.5808	2.0636	1.2926
8	-3.849	-1.997	852.7	704.9	583.5	704.2	621.8	-30.3	46.9	-2.5	.7047	.5738	2.0470	1.2916
9	-10.720	-2.960	801.6	643.6	537.1	640.9	595.1	-58.5	48.3	-5.2	.6580	.5196	1.9447	1.2986
10	-13.770	-3.226	793.9	632.3	519.6	629.2	600.2	-61.8	49.7	-5.6	.6490	.5080	1.9182	1.3081
11	-16.953	-3.404	789.1	635.1	500.1	631.8	610.4	-64.5	51.5	-5.8	.6421	.5093	1.9082	1.3137

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-1.86	1.13	13.99	51.50	67.80	82.09	.3903	.2070	.0478	.9170	58.76	87.78	88.96
2	-2.24	.94	10.54	51.30	68.03	84.12	.3652	.1333	.0313	.9493	69.42	93.20	93.87
3	-2.33	1.08	8.57	51.70	66.22	82.47	.3669	.1021	.0244	.9629	75.72	93.56	94.19
4	-3.79	.46	8.28	50.90	60.96	77.60	.3768	.0421	.0106	.9867	89.41	90.41	91.33
5	-4.09	1.25	9.76	50.19	57.53	74.76	.3906	.0347	.0094	.9898	91.01	82.60	84.26
6	-3.53	2.19	10.74	49.64	56.62	74.17	.3910	.0425	.0118	.9877	88.73	78.92	80.92
7	-3.87	2.00	10.78	49.33	56.67	73.92	.3876	.0437	.0124	.9875	88.07	78.45	80.49
8	-4.46	1.53	10.33	49.31	56.72	72.78	.3879	.0408	.0117	.9887	88.50	77.79	79.83
9	-5.00	1.21	10.07	53.46	51.61	64.35	.4430	.0997	.0297	.9752	75.28	69.97	72.59
10	-5.88	.36	11.78	55.26	49.56	62.22	.4614	.1354	.0409	.9670	67.36	66.30	69.18
11	-9.66	-3.52	13.85	57.29	47.34	61.85	.4606	.1514	.0463	.9635	62.19	64.51	67.52

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11860.	164.00	1.2784	2.0528	81.80	83.52

TABLE 9.17
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

RUN N0908, SPEED CODE 95, POINT NO 3

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.444	31.092	468.3	997.8	468.3	638.1	.0	767.1	.0	49.9	.4269	.8507	917.2	1074.0	.9388	.6036	1029.8	708.0
2	25.234	27.146	508.8	976.6	508.8	658.7	.0	721.0	.0	47.3	.4653	.8334	973.1	1104.0	1.0043	.6503	1098.1	761.9
3	20.915	23.492	545.5	942.0	545.5	646.0	.0	685.5	.0	46.5	.5006	.8022	1026.4	1134.5	1.0666	.6700	1162.3	786.7
4	9.771	12.883	616.0	866.4	616.0	603.9	.0	621.3	.0	45.7	.5692	.7323	1171.7	1226.3	1.2232	.7225	1323.8	854.8
5	-2.385	1.902	657.7	822.0	657.7	564.8	.0	597.3	.0	46.6	.6105	.6868	1346.6	1349.7	1.3910	.7860	1498.6	940.8
6	-7.591	-2.994	662.6	809.4	662.6	555.1	.0	589.0	.0	46.6	.6153	.6729	1430.5	1411.0	1.4645	.8247	1576.9	991.9
7	-9.920	-5.494	659.6	799.1	659.6	555.9	.0	574.1	.0	45.8	.6124	.6639	1470.5	1443.8	1.4963	.8575	1611.6	1032.3
8	-12.211	-7.910	654.0	784.1	654.0	555.9	.0	552.9	.0	44.6	.6068	.6515	1509.0	1478.4	1.5260	.8949	1644.6	1077.1
9	-17.915	-15.306	628.1	702.6	628.1	481.7	.0	511.6	.0	46.3	.5811	.5802	1619.2	1565.4	1.6068	.9568	1736.8	1158.7
10	-18.857	-17.572	618.9	678.0	618.9	447.0	.0	509.7	.0	48.2	.5720	.5516	1655.9	1596.5	1.6340	.9663	1767.8	1175.1
11	-18.869	-19.133	614.0	650.8	614.0	400.1	.0	513.2	.0	51.6	.5673	.5323	1688.0	1627.0	1.6594	.9681	1796.2	1183.4

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.30	3.92	12.41	36.86	32.75	60.82	.4901	.0744	.0141	2.2098	96.52	96.12	62.27	25.40	-917.2	-306.8
2	-.19	3.54	10.48	31.84	35.00	63.56	.4736	.0259	.0050	2.1930	98.56	98.40	61.75	29.91	-973.1	-383.0
3	-.34	3.20	9.95	26.79	36.92	62.55	.4792	.0371	.0072	2.1421	97.59	97.34	61.38	34.59	-1026.4	-449.0
4	.82	3.32	10.16	16.97	40.27	58.47	.4909	.0920	.0172	2.0327	92.61	91.85	61.96	44.99	-1171.7	-605.0
5	1.89	3.90	7.81	10.87	42.02	54.03	.4954	.1688	.0298	1.9724	84.31	82.77	63.99	53.12	-1346.6	-752.4
6	2.04	3.87	5.86	9.37	42.22	52.86	.4877	.1939	.0333	1.9584	81.17	79.34	65.23	55.87	-1430.9	-822.0
7	2.02	3.74	5.64	8.67	42.10	52.98	.4726	.1924	.0324	1.9484	80.75	78.89	65.95	57.28	-1470.5	-869.8
8	1.94	3.55	5.93	7.95	41.88	53.12	.4529	.1841	.0301	1.9325	80.89	79.07	66.70	58.74	-1509.0	-922.5
9	1.16	2.66	8.38	3.66	40.79	45.83	.4257	.2107	.0282	1.8402	76.14	74.05	66.77	65.10	-1619.2	-1053.9
10	.72	2.22	7.63	2.04	40.40	42.37	.4240	.2320	.0283	1.8173	73.51	71.24	69.28	67.25	-1655.9	-1086.7
11	.56	2.06	6.73	-.26	40.18	37.72	.4268	.2606	.0278	1.7938	70.28	67.79	69.65	69.92	-1688.0	-1113.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2568	1.9871	84.29	85.71	37.70

RUN N0908, SPEED CODE 95, POINT NO 3

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.639	4.856	1053.4	913.6	746.9	911.8	742.8	-57.6	47.4	-3.5	.9060	.7703	1.9614	1.2632
2	24.617	4.435	1024.0	938.9	746.5	935.6	700.9	-79.1	45.2	-4.7	.8804	.7974	2.0503	1.2543
3	21.751	3.946	988.7	923.3	726.5	919.3	670.6	-86.4	44.3	-5.3	.8476	.7844	2.0546	1.2491
4	13.253	2.429	912.0	854.4	674.5	851.3	613.9	-72.5	42.9	-4.8	.7753	.7209	2.0007	1.2449
5	4.173	.110	868.8	811.0	632.9	809.3	595.3	-53.0	43.3	-3.7	.7300	.6763	1.9521	1.2602
6	-.013	-1.082	858.8	803.8	624.3	802.5	589.7	-44.5	43.4	-3.2	.7181	.6676	1.9356	1.2672
7	-2.106	-1.675	850.5	799.4	624.6	798.0	577.3	-47.4	42.8	-3.4	.7106	.6646	1.9251	1.2640
8	-4.033	-2.217	839.1	791.3	626.9	789.0	557.8	-60.1	41.7	-4.4	.7014	.6586	1.9073	1.2591
9	-10.749	-3.113	778.6	718.6	581.3	714.4	517.9	-77.5	42.0	-6.2	.6479	.5937	1.7796	1.2590
10	-13.714	-3.337	763.9	690.0	561.3	684.7	518.2	-85.6	43.3	-7.1	.6335	.5670	1.7310	1.2655
11	-16.894	-3.433	747.6	685.3	533.2	679.0	524.0	-92.7	45.4	-7.7	.6170	.5619	1.7111	1.2693

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-3.75	-.76	12.70	50.90	68.31	81.75	.3042	.2714	.0626	.8877	15.05	80.54	82.25
2	-4.49	-1.31	9.64	49.95	69.41	86.70	.2585	.1556	.0365	.9380	25.84	89.43	90.42
3	-4.98	-1.57	8.05	49.58	67.95	86.50	.2463	.1021	.0243	.9613	39.02	91.56	92.36
4	-7.60	-3.36	7.67	47.70	63.42	81.71	.2495	.0413	.0104	.9865	71.65	89.36	90.33
5	-8.17	-2.83	8.82	47.05	58.91	77.03	.2670	.0300	.0081	.9911	80.14	80.85	82.54
6	-7.95	-2.23	9.43	46.54	57.79	75.72	.2668	.0310	.0086	.9911	77.66	77.59	79.54
7	-8.54	-2.67	9.28	46.15	57.82	75.22	.2632	.0355	.0100	.9899	72.66	77.84	79.75
8	-9.61	-3.62	8.44	46.05	58.14	74.24	.2577	.0250	.0072	.9931	76.20	78.07	79.94
9	-11.24	-5.02	9.09	48.20	53.27	65.13	.3020	.1078	.0321	.9742	29.94	69.05	71.40
10	-12.29	-6.04	10.27	50.36	50.98	61.28	.3332	.1708	.0515	.9608	9.05	63.87	66.49
11	-15.82	-9.68	11.93	53.06	47.97	60.06	.3396	.2008	.0612	.9546	-10.55	61.50	64.24

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11856.	168.21	1.2568	1.9326	80.55	82.23

TABLE 9.18
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 95, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.366	31.050	463.8	992.0	463.8	623.5	.0	771.5	.0	50.7	.4227	.8446	916.6	1073.3	.9362	.5897	1027.3	692.7
2	25.095	27.075	502.4	961.3	502.4	631.7	.0	724.6	.0	48.6	.4593	.8183	972.5	1103.3	1.0006	.6269	1094.6	736.5
3	20.749	23.405	537.0	925.4	537.0	614.9	.0	691.5	.0	48.1	.4924	.7857	1025.7	1133.8	1.0616	.6431	1157.8	757.4
4	9.652	12.762	602.4	857.5	602.4	573.9	.0	637.1	.0	47.9	.5559	.7220	1171.0	1225.5	1.2151	.6921	1316.9	821.9
5	-2.436	1.825	639.9	826.2	639.9	542.2	.0	623.4	.0	49.0	.5928	.6873	1345.7	1348.8	1.3804	.7535	1490.1	905.7
6	-7.690	-3.063	643.4	820.4	643.4	535.7	.0	621.3	.0	49.1	.5963	.6787	1430.0	1410.1	1.4532	.7889	1568.1	953.5
7	-10.068	-5.577	639.9	812.5	639.9	536.0	.0	610.7	.0	48.6	.5928	.6712	1469.6	1442.9	1.4848	.8178	1602.8	989.9
8	-12.388	-8.002	633.7	798.8	633.7	531.1	.0	596.7	.0	48.1	.5867	.6590	1508.1	1474.5	1.5144	.8464	1635.8	1026.0
9	-17.943	-15.359	607.6	723.1	607.6	456.5	.0	560.8	.0	50.4	.5610	.5922	1618.2	1564.4	1.5958	.9029	1728.5	1102.6
10	-18.808	-17.604	598.8	703.5	598.8	425.1	.0	560.6	.0	52.3	.5523	.5737	1654.9	1595.4	1.6233	.9124	1759.9	1118.8
11	-18.821	-19.141	594.1	685.6	594.1	386.5	.0	566.3	.0	55.2	.5477	.5563	1687.0	1625.9	1.6489	.9152	1788.5	1128.0

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	-.10	4.11	12.55	36.92	32.49	61.03	.5051	.0251	.0047	2.2613	98.87	98.74	62.46	25.54	-916.6	-301.8
2	.07	3.80	11.23	31.36	34.65	62.47	.4961	.0000	.0000	2.2250	99.97	99.98	62.01	30.65	-972.5	-378.7
3	-.00	3.54	10.86	26.23	36.48	61.00	.5037	.0196	.0038	2.1729	98.69	98.55	61.72	35.49	-1025.7	-442.2
4	1.32	3.82	10.81	16.82	39.66	57.03	.5159	.0812	.0150	2.0823	93.67	93.01	62.46	45.64	-1171.0	-588.4
5	2.49	4.50	7.92	11.35	41.30	53.43	.5208	.1600	.0282	2.0500	85.82	84.35	64.59	53.24	-1345.7	-725.5
6	2.66	4.49	5.71	10.14	41.44	52.57	.5155	.1888	.0326	2.0486	82.64	80.84	65.86	55.72	-1430.0	-788.8
7	2.66	4.38	5.44	9.51	41.30	52.62	.5031	.1923	.0325	2.0424	81.87	80.00	66.59	57.08	-1469.6	-832.3
8	2.59	4.20	5.84	8.70	41.03	52.15	.4894	.1943	.0319	2.0274	81.14	79.21	67.35	58.65	-1508.1	-877.8
9	1.79	3.29	8.49	4.18	39.89	44.65	.4692	.2262	.0302	1.9411	76.34	74.08	69.39	65.21	-1618.2	-1003.6
10	1.32	2.82	7.67	2.60	39.49	41.45	.4624	.2468	.0301	1.9239	74.05	71.60	69.88	67.28	-1654.9	-1034.9
11	1.16	2.66	6.45	.61	39.28	37.53	.4644	.2732	.0295	1.9107	71.40	68.74	70.25	69.63	-1687.0	-1059.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2697	2.0614	85.00	86.42	37.05

Stator

RUN NO908, SPEED CODE 95, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.652	4.841	1039.6	845.3	723.1	844.3	746.9	-39.7	48.5	-2.6	.8918	.7064	2.0615	1.2644
2	24.608	4.432	1002.1	850.9	712.5	848.5	704.6	-64.7	46.7	-4.3	.8583	.7144	2.1080	1.2593
3	21.712	3.982	966.2	828.7	689.6	825.4	676.8	-74.1	46.0	-5.0	.8249	.6952	2.0970	1.2512
4	13.125	2.579	896.9	768.3	638.7	765.9	629.6	-60.3	45.1	-4.5	.7589	.6402	2.0551	1.2513
5	4.143	.289	866.1	740.8	603.6	739.8	621.2	-38.0	45.9	-2.9	.7240	.6101	2.0310	1.2717
6	.077	-.918	862.5	740.0	597.8	739.5	621.8	-26.8	46.1	-2.1	.7172	.6068	2.0248	1.2822
7	-1.950	-1.529	856.7	738.2	598.1	737.7	613.4	-29.1	45.7	-2.3	.7113	.6052	2.0180	1.2822
8	-3.850	-2.098	846.5	730.0	596.4	729.1	600.8	-37.2	45.2	-2.9	.7021	.5981	2.0005	1.2818
9	-10.716	-3.038	789.4	658.6	548.5	655.6	567.7	-62.4	46.3	-5.4	.6508	.5355	1.9847	1.2840
10	-15.744	-3.281	778.5	640.9	530.3	636.9	570.0	-71.1	47.6	-6.3	.6395	.5186	1.8512	1.2922
11	-16.927	-3.418	769.6	641.4	507.7	636.8	578.4	-76.9	49.6	-6.8	.6293	.5180	1.8386	1.2971

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-2.66	.32	13.59	51.09	68.29	82.97	.3570	.2152	.0497	.9129	60.90	86.76	88.00
2	-3.01	.17	10.11	50.97	68.25	85.45	.3268	.1268	.0297	.9514	64.62	92.88	93.57
3	-3.23	.18	8.28	51.09	66.43	83.98	.3249	.0898	.0214	.9673	73.25	93.64	94.25
4	-5.33	-1.09	8.03	49.61	61.92	79.00	.3348	.0371	.0093	.9883	88.41	90.83	91.69
5	-5.59	-.25	9.63	48.82	58.11	75.51	.3510	.0313	.0084	.9908	90.13	82.49	84.12
6	-5.18	.54	10.52	48.21	57.26	74.77	.3511	.0365	.0102	.9895	88.14	78.98	80.93
7	-5.56	.30	10.42	47.99	57.26	74.40	.3484	.0371	.0105	.9895	87.52	78.57	80.54
8	-6.07	-.08	9.87	48.16	57.09	73.21	.3480	.0302	.0087	.9917	89.25	77.62	79.66
9	-6.95	-.73	9.85	51.75	51.90	64.01	.4041	.0990	.0296	.9160	70.91	69.79	72.31
10	-7.93	-1.69	11.02	53.97	49.79	61.21	.4290	.1416	.0427	.9666	60.61	65.75	68.53
11	-11.60	-5.46	12.81	56.40	47.29	60.57	.4309	.1598	.0488	.9627	53.90	63.86	66.76

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11849.	165.30	1.2697	2.0126	81.90	83.56

TABLE 9.19

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 95, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V8-1 FT/SEC	V8-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.257	31.223	452.1	989.3	452.1	599.6	.0	786.9	.0	52.4	.4116	.8402	915.0	1071.4	.9292	.5637	1020.6	663.7
2	24.913	27.323	488.5	963.2	488.5	615.3	.0	741.0	.0	50.0	.4461	.8182	970.8	1101.3	.9923	.6056	1086.8	713.0
3	20.558	23.637	521.2	932.6	521.2	601.8	.0	712.5	.0	49.6	.4772	.7901	1023.9	1131.8	1.0520	.6214	1149.0	733.5
4	9.516	12.815	583.2	861.4	583.2	542.4	.0	669.2	.0	50.9	.5371	.7218	1168.9	1223.4	1.2030	.6498	1306.3	779.4
5	-2.484	1.790	618.7	842.6	618.7	521.5	.0	661.8	.0	51.8	.5718	.6975	1343.4	1346.5	1.3670	.7125	1479.0	860.7
6	-7.782	-3.117	622.0	839.6	622.0	512.1	.0	665.3	.0	52.3	.5751	.6905	1427.5	1407.6	1.4397	.7417	1557.1	901.8
7	-10.155	-5.634	618.6	834.7	618.6	512.8	.0	658.7	.0	52.0	.5717	.6850	1467.0	1440.4	1.4715	.7672	1592.1	934.9
8	-12.460	-8.058	612.6	824.5	612.6	508.9	.0	648.7	.0	51.7	.5659	.6753	1505.4	1471.9	1.5013	.7926	1625.3	967.7
9	-18.060	-15.346	587.2	759.6	587.2	437.2	.0	621.2	.0	54.5	.5409	.6167	1615.4	1561.7	1.5835	.8420	1718.8	1037.1
10	-18.979	-17.568	578.3	744.4	578.3	405.8	.0	624.1	.0	56.5	.5324	.6016	1652.0	1592.6	1.6111	.8486	1750.3	1050.1
11	-19.009	-19.112	573.6	731.9	573.6	369.1	.0	632.0	.0	59.3	.5278	.5883	1684.0	1623.1	1.6368	.8501	1779.0	1057.6

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	V8'-1 FT/SEC	V8'-2 FT/SEC
1	.43	4.64	12.15	37.85	31.81	59.61	.5324	.0183	.0035	2.2980	99.22	99.13	62.99	25.14	-915.0	-284.5
2	.65	4.38	10.70	32.47	33.89	61.95	.5162	-.0163	-.0031	2.2744	100.65	100.96	62.60	30.12	-970.8	-360.3
3	.63	4.17	10.05	27.67	35.66	60.84	.5233	.0024	.0005	2.2339	99.71	99.68	62.35	34.68	-1023.9	-419.3
4	2.03	4.52	10.72	17.62	38.76	54.85	.5530	.0935	.0173	2.1392	93.09	92.33	63.16	45.54	-1168.9	-554.2
5	3.20	5.20	7.40	12.58	40.38	52.57	.5545	.1650	.0294	2.1373	86.25	84.74	65.29	52.71	-1343.4	-684.7
6	3.34	5.17	5.30	11.24	40.53	51.43	.5535	.1990	.0347	2.1439	82.85	80.95	66.54	55.30	-1427.5	-742.3
7	3.33	5.05	4.96	10.65	40.38	51.51	.5432	.2055	.0352	2.1438	81.91	79.90	67.26	56.60	-1467.0	-781.7
8	3.24	4.85	5.29	9.90	40.12	51.14	.5315	.2105	.0351	2.1350	81.01	78.92	68.00	58.10	-1505.4	-823.2
9	2.41	3.91	8.01	5.27	38.95	43.78	.5102	.2473	.0336	2.0622	76.24	73.76	70.01	64.74	-1615.4	-940.4
10	1.94	3.44	7.26	3.63	38.54	40.52	.5100	.2694	.0334	2.0503	74.04	71.35	70.60	66.87	-1652.0	-968.5
11	1.78	3.28	6.05	1.63	38.31	36.72	.5127	.2955	.0325	2.0434	71.69	68.77	70.87	69.24	-1684.0	-991.1

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2874	2.1468	84.70	86.23	36.21

Stator

RUN NO908, SPEED CODE 95, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V8-1 FT/SEC	V8-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.777	4.872	1030.3	764.1	693.5	763.8	762.0	-22.5	50.3	-1.6	.8806	.6316	2.1105	1.2694
2	24.788	4.538	998.0	768.1	689.8	766.5	721.3	-49.6	48.3	-3.6	.8521	.6374	2.1470	1.2611
3	21.910	4.175	965.9	747.0	668.1	744.4	697.7	-63.1	47.9	-4.8	.8220	.6192	2.1366	1.2586
4	13.282	2.994	893.4	696.4	600.6	694.7	661.4	-48.6	48.3	-4.0	.7516	.5733	2.1097	1.2630
5	4.245	.724	875.8	685.6	576.4	685.0	659.4	-29.6	48.9	-2.5	.7279	.5582	2.1122	1.2872
6	.257	-.513	875.4	687.5	568.5	687.3	665.7	-14.5	49.5	-1.2	.7231	.5566	2.1108	1.3014
7	-1.771	-1.152	872.6	689.0	569.6	688.8	661.0	-17.1	49.2	-1.4	.7193	.5571	2.1089	1.3047
8	-3.684	-1.750	865.9	682.5	569.0	682.0	652.7	-27.8	48.9	-2.3	.7126	.5512	2.0952	1.3064
9	-10.409	-2.864	818.2	623.7	523.8	621.2	628.6	-55.9	50.5	-5.1	.6685	.4996	2.0005	1.3141
10	-13.375	-3.191	811.1	613.8	505.4	611.6	634.4	-52.6	52.0	-4.9	.6599	.4894	1.9768	1.3243
11	-16.591	-3.431	806.4	617.2	483.7	615.0	645.2	-51.9	53.9	-4.8	.6528	.4910	1.9680	1.3304

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-.88	2.11	14.57	51.90	66.90	80.14	.4298	.2038	.0471	.9190	64.44	88.20	89.34
2	-1.37	1.81	10.75	51.95	67.64	82.08	.4085	.1432	.0336	.9458	72.29	93.28	93.95
3	-1.42	1.99	8.56	52.63	65.92	80.33	.4128	.1170	.0279	.9575	76.92	93.54	94.18
4	-2.14	2.10	8.52	52.31	59.54	75.68	.4193	.0433	.0109	.9865	90.81	90.29	91.23
5	-2.57	2.77	10.10	51.38	56.98	73.90	.4304	.0408	.0110	.9879	91.04	82.83	84.51
6	-1.81	3.91	11.40	50.71	55.93	73.36	.4320	.0526	.0147	.9846	88.31	78.78	80.85
7	-2.04	3.82	11.26	50.67	56.00	73.24	.4310	.0561	.0159	.9837	87.29	77.81	79.98
8	-2.36	3.63	10.46	51.28	55.91	72.17	.4356	.0574	.0165	.9837	86.81	76.64	78.90
9	-2.78	3.44	10.13	55.61	50.92	64.02	.4907	.1064	.0317	.9728	77.74	69.62	72.38
10	-3.60	2.64	12.46	56.86	48.77	62.11	.5054	.1354	.0410	.9660	72.12	66.16	69.18
11	-7.26	-1.12	14.84	58.71	46.34	61.85	.5029	.1481	.0453	.9633	68.54	64.43	67.58

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11828.	161.57	1.2874	2.0895	81.37	83.17

TABLE 9.20
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 10, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.411	31.175	497.9	1030.6	497.9	672.2	.0	781.2	.0	49.0	.4550	.8758	961.7	1126.0	.9895	.6421	1083.0	755.5
2	25.236	27.266	544.4	1018.3	544.4	676.4	.0	761.2	.0	48.1	.4995	.8636	1020.3	1157.5	1.0610	.6649	1156.4	783.9
3	20.996	23.629	587.0	993.8	587.0	674.0	.0	730.4	.0	47.1	.5407	.8415	1076.1	1189.5	1.1293	.6905	1225.8	815.5
4	9.772	13.153	670.5	918.7	670.5	649.6	.0	649.7	.0	45.0	.6233	.7736	1228.6	1285.8	1.3011	.7656	1399.6	909.2
5	-2.450	2.199	718.9	828.1	718.9	573.5	.0	597.3	.0	46.2	.6722	.6886	1411.9	1415.1	1.4815	.8307	1584.4	998.9
6	-7.266	-2.689	726.3	808.8	726.3	568.1	.0	575.8	.0	45.3	.6798	.6706	1500.3	1479.4	1.5601	.8849	1666.9	1067.4
7	-9.490	-5.166	724.6	807.7	724.6	580.8	.0	561.2	.0	43.9	.6780	.6697	1541.8	1513.9	1.5941	.9251	1703.6	1115.7
8	-11.777	-7.556	719.7	800.3	719.7	586.3	.0	544.7	.0	42.7	.6730	.6637	1582.2	1547.0	1.6255	.9630	1738.2	1161.2
9	-17.952	-15.118	691.1	729.0	691.1	532.8	.0	497.5	.0	42.6	.6440	.6022	1697.7	1641.3	1.7081	1.0424	1833.0	1261.8
10	-19.203	-17.500	679.7	692.6	679.7	479.4	.0	499.9	.0	45.6	.6325	.5687	1736.3	1673.9	1.7351	1.0411	1864.6	1268.1
11	-19.158	-19.160	674.3	645.3	674.3	401.1	.0	505.6	.0	51.1	.6270	.5258	1769.9	1705.9	1.7614	1.0311	1894.0	1265.6

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.64	3.58	13.90	35.04	34.41	64.70	.4750	.0853	.0159	2.3053	95.90	95.41	61.93	26.89	-961.7	-344.9
2	-.68	3.05	10.70	31.14	36.86	65.50	.4898	.0837	.0161	2.2992	95.46	94.91	61.27	30.13	-1020.3	-396.3
3	-.95	2.59	9.45	26.69	38.94	65.57	.4923	.0827	.0161	2.2662	94.95	94.36	60.77	34.08	-1076.1	-459.2
4	-.08	2.42	9.54	16.69	42.53	63.39	.4858	.1029	.0194	2.1470	91.84	90.94	61.06	44.36	-1228.6	-636.1
5	.94	2.95	9.66	8.06	44.29	54.96	.4866	.1858	.0313	1.9980	82.33	80.57	63.03	54.98	-1411.9	-817.8
6	1.04	2.86	7.73	6.49	44.54	54.36	.4674	.1951	.0319	1.9756	80.44	78.52	64.23	57.74	-1500.3	-903.6
7	.98	2.70	6.84	6.43	44.48	55.76	.4493	.1861	.0303	1.9799	80.88	79.00	64.91	58.48	-1541.8	-952.6
8	.88	2.49	6.66	6.17	44.31	56.45	.4319	.1780	.0285	1.9749	81.18	79.33	65.64	59.47	-1582.2	-1002.3
9	.22	1.72	7.94	3.15	43.31	51.33	.3972	.1869	.0255	1.8940	78.36	76.38	67.82	64.66	-1697.7	-1143.8
10	-.14	1.36	7.78	1.04	42.88	45.80	.4024	.2218	.0269	1.8538	74.11	71.81	68.43	67.39	-1736.3	-1174.0
11	-.28	1.22	8.03	-2.41	42.68	37.91	.4119	.2651	.0265	1.8048	69.00	66.37	68.81	71.22	-1769.9	-1200.3

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2715	2.0511	83.78	85.31	39.85

Stator

RUN NO908, SPEED CODE 10, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.876	4.972	1090.6	982.5	782.9	975.9	759.3	-113.5	46.7	-6.5	.9354	.8291	1.9141	1.2820
2	24.888	4.627	1071.0	1029.3	773.0	1023.2	741.4	-111.6	45.9	-6.1	.9158	.8744	2.0525	1.2823
3	22.023	4.120	1044.4	1045.3	762.1	1038.7	714.2	-117.4	44.8	-6.3	.8910	.8917	2.1298	1.2784
4	13.752	2.458	968.3	980.5	725.1	973.9	641.7	-113.9	42.1	-6.6	.8207	.8325	2.0898	1.2678
5	4.516	.059	881.4	894.1	649.7	885.7	595.6	-122.4	42.6	-7.9	.7376	.7493	1.9657	1.2714
6	-.085	-1.112	864.2	880.9	643.6	872.3	576.7	-122.7	41.9	-8.0	.7210	.7364	1.9397	1.2730
7	-2.264	-1.673	864.1	883.5	654.6	875.5	564.0	-118.8	40.8	-7.7	.7211	.7394	1.9376	1.2715
8	-4.188	-2.192	860.1	882.5	662.1	873.2	549.0	-128.0	39.7	-8.3	.7181	.7394	1.9274	1.2686
9	-10.445	-3.108	812.5	834.1	637.9	824.0	503.2	-129.5	38.6	-8.9	.6773	.6959	1.8130	1.2651
10	-13.198	-3.358	789.1	785.9	604.0	775.8	507.8	-125.2	40.6	-9.1	.6542	.6498	1.7267	1.2734
11	-16.537	-3.444	756.8	769.8	553.9	759.0	515.7	-128.0	43.8	-9.5	.6230	.6341	1.6870	1.2778

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-4.40	-1.42	9.76	53.19	71.94	80.70	.2809	.3924	.0901	.8303	-68.14	72.11	74.48
2	-3.82	-.64	8.28	51.98	71.84	87.72	.2249	.2536	.0593	.8930	-523.51	80.63	82.44
3	-4.49	-1.08	6.98	51.13	71.34	91.50	.1891	.1472	.0350	.9401	******	86.45	87.79
4	-8.34	-4.10	5.87	48.76	68.42	88.72	.1801	.0656	.0165	.9766	252.57	87.38	88.60
5	-8.89	-3.55	4.70	50.45	60.35	80.26	.2019	.0456	.0122	.9863	194.25	78.36	80.28
6	-9.45	-3.73	4.59	49.87	59.64	78.57	.2063	.0654	.0181	.9809	234.38	76.20	78.27
7	-10.53	-4.67	4.95	48.49	60.81	78.72	.2010	.0767	.0215	.9775	237.15	76.50	78.54
8	-11.60	-5.61	4.46	48.04	61.65	78.27	.1920	.0685	.0195	.9804	179.33	76.65	78.66
9	-14.70	-8.48	6.36	47.46	58.91	71.66	.1986	.1262	.0374	.9677	227.39	69.82	72.19
10	-15.02	-8.77	8.24	49.66	54.97	65.64	.2339	.2252	.0675	.9471	738.92	61.72	64.47
11	-17.43	-11.29	10.15	53.24	49.65	63.16	.2471	.2821	.0855	.9351	826.01	57.92	60.84

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
[illegible]	[illegible]	1.2715	1.9631	78.18	80.13

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

RUN NO908, SPEED CODE 10, POINT NO 2

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.442	31.166	501.1	1039.4	501.1	666.0	.0	798.0	.0	49.8	.4580	.8826	957.7	1121.3	.9879	.6286	1080.9	740.3
2	25.261	27.257	546.3	1017.4	546.3	678.6	.0	758.0	.0	47.9	.5013	.8637	1016.0	1152.7	1.0586	.6665	1153.6	785.1
3	21.000	23.611	587.4	985.2	587.4	667.2	.0	724.9	.0	47.2	.5412	.8343	1071.6	1184.5	1.1259	.6861	1222.1	810.2
4	9.883	13.059	666.4	913.9	666.4	634.2	.0	658.0	.0	46.0	.6192	.7683	1223.4	1280.4	1.2945	.7470	1393.1	888.6
5	-2.041	2.122	711.5	825.5	711.5	558.7	.0	607.7	.0	47.4	.6646	.6853	1406.0	1409.2	1.4720	.8111	1575.7	977.1
6	-6.787	-2.697	719.6	817.6	719.6	566.2	.0	589.7	.0	46.0	.6729	.6769	1494.0	1473.2	1.5507	.8688	1658.3	1049.4
7	-9.107	-5.161	718.3	821.4	718.3	586.3	.0	575.3	.0	44.3	.6716	.6805	1535.3	1507.5	1.5848	.9123	1695.0	1101.2
8	-11.534	-7.566	713.2	814.0	713.2	592.2	.0	558.5	.0	43.1	.6664	.6745	1575.6	1540.5	1.6160	.9501	1729.5	1146.7
9	-17.789	-15.119	683.9	736.4	683.9	520.8	.0	520.7	.0	44.5	.6368	.6060	1690.6	1634.5	1.6980	1.0117	1823.7	1229.5
10	-18.959	-17.486	672.7	706.9	672.7	474.6	.0	523.9	.0	47.3	.6255	.5783	1729.0	1666.9	1.7250	1.0125	1855.2	1237.6
11	-18.987	-19.116	667.0	670.7	667.0	410.3	.0	530.5	.0	51.8	.6198	.5448	1762.5	1698.7	1.7511	1.0058	1884.5	1238.2

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.88	3.33	12.64	36.05	34.58	63.80	.4911	.1074	.0203	2.3155	94.96	94.34	61.68	25.63	-957.7	-323.3
2	-.86	2.87	10.51	31.14	36.96	65.71	.4866	.0742	.0143	2.2948	95.95	95.46	61.08	29.94	-1016.0	-394.7
3	-1.08	2.47	9.74	26.27	38.96	64.84	.4936	.0824	.0160	2.2462	94.91	94.32	60.65	34.38	-1071.6	-459.6
4	-.03	2.47	9.59	16.70	42.37	61.86	.4990	.1169	.0220	2.1416	90.85	89.84	61.11	44.41	-1223.4	-622.4
5	1.08	3.08	9.82	8.04	44.03	53.92	.4985	.1905	.0320	2.0131	82.28	80.48	63.17	55.14	-1406.0	-801.5
6	1.13	2.95	7.23	7.08	44.31	54.82	.4770	.1918	.0318	2.0152	81.34	79.45	64.32	57.24	-1494.0	-883.5
7	1.06	2.78	6.04	7.31	44.27	57.09	.4569	.1771	.0295	2.0310	82.38	80.57	64.99	57.68	-1535.3	-932.2
8	.96	2.57	5.89	7.02	44.09	57.91	.4395	.1678	.0275	2.0283	82.80	81.05	65.73	58.70	-1575.6	-981.9
9	.32	1.82	7.85	3.35	43.04	50.78	.4156	.1957	.0267	1.9375	78.22	76.14	67.93	64.58	-1690.6	-1113.8
10	-.04	1.46	7.43	1.48	42.62	45.96	.4197	.2275	.0280	1.9056	74.53	72.17	68.52	67.04	-1729.0	-1143.0
11	-.17	1.33	7.14	-1.41	42.39	39.39	.4274	.2657	.0278	1.8689	70.28	67.62	68.92	70.33	-1762.5	-1168.2

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2762	2.0724	83.64	85.20	39.69

RUN NO908, SPEED CODE 10, POINT NO 2

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.722	4.774	1097.5	951.6	778.4	949.8	773.6	-58.5	47.4	-3.4	.9406	.7983	2.0506	1.2861
2	24.691	4.315	1067.9	973.7	772.3	971.1	737.6	-70.9	45.7	-4.1	.9138	.8217	2.1393	1.2792
3	21.787	3.794	1035.0	964.7	753.8	961.7	709.2	-77.1	44.8	-4.5	.8829	.8148	2.1569	1.2749
4	13.290	2.177	961.8	895.9	709.0	893.2	649.9	-69.1	43.1	-4.4	.8137	.7514	2.0988	1.2702
5	3.797	-.153	876.6	821.2	633.5	818.3	605.9	-68.8	43.8	-4.8	.7321	.6811	1.9958	1.2755
6	-.772	-1.279	870.1	823.2	639.1	821.0	590.5	-59.9	42.7	-4.2	.7248	.6820	1.9920	1.2786
7	-2.820	-1.814	874.8	832.2	656.5	829.9	578.2	-61.3	41.4	-4.2	.7292	.6906	1.9993	1.2768
8	-4.584	-2.314	871.1	831.2	665.0	828.5	562.7	-67.4	40.3	-4.7	.7265	.6904	1.9888	1.2747
9	-10.685	-3.141	816.8	777.0	624.2	772.8	526.8	-80.3	40.5	-5.9	.6779	.6410	1.8696	1.2766
10	-13.465	-3.357	799.1	745.4	595.9	740.8	532.4	-82.7	42.3	-6.3	.6598	.6106	1.8088	1.2856
11	-16.704	-3.439	775.8	736.4	555.4	731.4	541.7	-85.6	45.1	-6.6	.6364	.6014	1.7795	1.2907

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-3.75	-.76	12.78	50.82	71.28	85.77	.3039	.2617	.0604	.8860	19.83	79.46	81.38
2	-3.98	-.80	10.29	49.81	71.81	90.48	.2620	.1540	.0361	.9353	32.04	86.76	88.08
3	-4.42	-1.02	8.82	49.36	70.56	91.09	.2462	.0940	.0224	.9624	45.84	89.16	90.25
4	-7.39	-3.15	8.11	47.47	66.95	86.36	.2512	.0432	.0109	.9848	72.21	87.15	88.40
5	-7.70	-2.36	7.76	48.57	59.33	78.44	.2697	.0289	.0078	.9914	79.90	79.12	81.01
6	-8.58	-2.85	8.42	46.91	60.00	78.32	.2654	.0550	.0153	.9837	59.85	77.97	79.96
7	-9.90	-4.03	8.46	45.62	61.94	79.14	.2556	.0595	.0168	.9822	49.40	78.94	80.85
8	-11.01	-5.02	8.14	44.95	62.97	78.73	.2447	.0470	.0135	.9863	43.20	78.89	80.80
9	-12.78	-6.56	9.35	46.39	58.41	71.04	.2673	.1027	.0306	.9736	-15.72	70.69	73.11
10	-13.26	-7.01	11.02	48.64	55.04	66.57	.2946	.1607	.0485	.9610	-38.07	64.54	67.30
11	-16.07	-9.93	13.01	51.73	50.61	64.76	.3020	.1963	.0599	.9533	-73.22	61.48	64.41

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
12379.	177.11	1.2762	2.0109	79.84	81.69

TABLE 9.22
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 10, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.450	31.113	499.6	1038.3	499.6	651.9	.0	808.1	.0	50.8	.4565	.8799	959.2	1123.1	.9883	.6136	1081.5	724.0
2	25.273	27.157	544.9	1010.1	544.9	662.2	.0	762.8	.0	48.7	.4999	.8558	1017.6	1154.5	1.0591	.6518	1154.3	769.3
3	21.004	23.483	586.2	979.5	586.2	653.2	.0	729.9	.0	47.9	.5400	.8280	1073.3	1186.4	1.1266	.6737	1223.0	796.9
4	9.807	12.878	665.4	916.7	665.4	621.2	.0	674.1	.0	47.3	.6182	.7686	1225.4	1282.4	1.2954	.7289	1394.4	869.4
5	-2.278	1.938	709.3	832.9	709.3	547.7	.0	627.5	.0	48.9	.6624	.6892	1408.2	1411.5	1.4726	.7914	1576.8	956.4
6	-7.178	-2.900	715.8	827.2	715.8	558.4	.0	610.4	.0	47.4	.6690	.6827	1496.4	1475.6	1.5504	.8498	1658.8	1029.7
7	-9.564	-5.398	713.2	826.7	713.2	572.2	.0	596.7	.0	46.0	.6664	.6822	1537.8	1509.9	1.5839	.8893	1695.1	1077.7
8	-12.011	-7.847	706.9	816.1	706.9	575.1	.0	579.0	.0	45.0	.6600	.6733	1578.1	1542.9	1.6144	.9261	1729.2	1122.4
9	-18.115	-15.340	675.6	737.1	675.6	488.8	.0	551.7	.0	48.0	.6284	.6024	1693.3	1637.1	1.6958	.9728	1823.1	1190.4
10	-19.073	-17.611	664.8	713.8	664.8	448.5	.0	555.2	.0	50.5	.6176	.5802	1731.7	1669.5	1.7232	.9764	1855.0	1201.2
11	-18.990	-19.178	659.6	690.4	659.6	398.6	.0	563.7	.0	54.3	.6124	.5576	1765.3	1701.4	1.7496	.9737	1884.5	1205.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.77	3.44	12.53	36.28	34.50	63.93	.5084	.0756	.0143	2.3731	96.53	96.09	61.80	25.52	-959.2	-315.0
2	-.76	2.98	10.91	30.85	36.88	65.68	.5015	.0451	.0087	2.3412	97.57	97.27	61.19	30.34	-1017.6	-391.7
3	-.98	2.56	10.10	26.00	38.91	65.12	.5059	.0515	.0099	2.2973	96.83	96.45	60.74	34.74	-1073.3	-456.5
4	.04	2.54	9.51	16.85	42.33	62.18	.5164	.0982	.0185	2.2107	92.49	91.63	61.18	44.33	-1225.4	-608.3
5	1.19	3.19	9.76	8.21	43.96	54.33	.5161	.1762	.0296	2.0896	84.12	82.42	63.28	55.08	-1408.2	-784.0
6	1.30	3.13	7.06	7.44	44.18	55.57	.4935	.1787	.0297	2.0954	83.18	81.38	64.50	57.06	-1496.4	-865.2
7	1.28	3.00	6.15	7.42	44.09	57.17	.4754	.1703	.0283	2.1034	83.58	81.81	65.21	57.79	-1537.8	-913.2
8	1.23	2.84	6.18	6.99	43.87	57.63	.4578	.1637	.0266	2.0944	83.72	81.97	65.99	58.99	-1578.1	-963.9
9	.64	2.14	8.70	2.81	42.73	48.54	.4425	.2111	.0279	1.9949	77.48	75.24	68.24	65.43	-1693.3	-1085.4
10	.23	1.73	8.08	1.10	42.31	44.27	.4447	.2397	.0287	1.9704	74.37	71.86	68.79	67.69	-1731.7	-1114.3
11	.07	1.57	7.19	-1.22	42.10	39.07	.4502	.2733	.0285	1.9483	70.96	68.17	69.16	70.38	-1765.3	-1137.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2857	2.1399	84.82	86.33	39.54

Stator

RUN NO908, SPEED CODE 10, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.629	4.716	1091.2	913.3	760.3	912.1	782.8	-47.4	48.4	-2.9	.9327	.7612	2.1643	1.2896
2	24.530	4.229	1056.9	922.8	752.6	920.9	742.0	-59.6	46.6	-3.6	.9019	.7730	2.2255	1.2810
3	21.605	3.716	1025.7	908.1	736.0	905.8	714.5	-64.4	45.7	-4.0	.8729	.7604	2.2279	1.2775
4	13.124	2.140	960.1	841.9	691.7	839.3	665.9	-66.4	44.5	-4.5	.8096	.6993	2.1694	1.2776
5	3.812	-.148	878.8	769.8	617.2	767.9	625.6	-54.0	45.4	-4.0	.7311	.6323	2.0722	1.2851
6	-.576	-1.259	874.4	772.8	625.3	771.2	611.2	-50.3	44.4	-3.7	.7256	.6339	2.0707	1.2894
7	-2.538	-1.792	875.2	778.4	637.6	776.6	599.6	-53.4	43.3	-3.9	.7262	.6393	2.0736	1.2877
8	-4.276	-2.288	868.5	775.3	643.2	773.4	583.5	-53.9	42.3	-4.0	.7207	.6372	2.0617	1.2849
9	-10.516	-3.133	810.7	708.0	588.0	704.3	558.1	-72.0	43.8	-5.8	.6677	.5761	1.9348	1.2934
10	-13.462	-3.344	797.3	682.6	563.2	678.4	564.4	-75.6	45.6	-6.3	.6535	.5518	1.8872	1.3037
11	-16.750	-3.434	784.4	681.5	532.7	677.0	575.7	-78.0	48.1	-6.5	.6391	.5495	1.8703	1.3096

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-2.76	.23	13.32	51.27	71.54	88.97	.3335	.2011	.0464	.9134	49.33	85.08	86.58
2	-3.11	.07	10.76	50.22	71.94	92.27	.2994	.1103	.0259	.9547	64.91	91.23	92.14
3	-3.56	-.15	9.33	49.71	70.89	91.87	.2922	.0709	.0169	.9722	74.66	92.51	93.29
4	-6.00	-1.76	8.01	48.96	67.24	86.29	.3094	.0386	.0097	.9866	86.03	89.07	90.17
5	-6.04	-.70	8.55	49.45	59.59	78.12	.3322	.0294	.0079	.9913	89.28	81.04	82.85
6	-6.96	-1.24	8.87	48.08	60.52	78.07	.3287	.0487	.0136	.9856	81.70	79.72	81.65
7	-8.03	-2.16	8.75	47.19	61.91	78.58	.3207	.0508	.0144	.9850	79.65	80.38	82.25
8	-9.05	-3.06	8.81	46.25	62.61	78.07	.3098	.0341	.0098	.9902	84.52	80.45	82.30
9	-9.45	-3.23	9.44	49.63	56.26	68.61	.3583	.0930	.0277	.9765	64.72	70.63	73.17
10	-9.97	-3.73	11.03	51.92	53.28	64.77	.3882	.1453	.0438	.9647	50.53	65.43	68.32
11	-13.13	-6.99	13.12	54.56	49.84	63.86	.3903	.1651	.0504	.9604	41.17	63.14	66.17

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
[illegible]	[illegible]	1.2857	2.0886	81.83	83.58

TABLE 9.23

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 10, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.334	31.249	487.8	1043.8	487.8	651.8	.0	815.3	.0	51.1	.4453	.8842	960.5	1124.6	.9835	.6111	1077.3	721.4
2	25.080	27.363	532.9	1010.9	532.9	654.2	.0	770.6	.0	49.4	.4884	.8553	1019.0	1156.1	1.0539	.6425	1149.9	759.3
3	20.827	23.686	573.8	977.3	573.8	639.1	.0	739.4	.0	49.0	.5279	.8245	1074.8	1188.0	1.1210	.6588	1218.4	780.9
4	9.843	12.965	655.3	920.5	655.3	606.1	.0	692.7	.0	48.8	.6081	.7694	1227.0	1284.2	1.2909	.7079	1391.1	846.9
5	-2.193	1.973	707.9	851.6	707.9	548.9	.0	651.2	.0	49.9	.6610	.7029	1410.1	1413.4	1.4733	.7753	1577.9	939.3
6	-7.267	-2.890	717.2	844.7	717.2	553.8	.0	637.8	.0	48.9	.6704	.6946	1498.4	1477.6	1.5530	.8272	1661.2	1005.9
7	-9.685	-5.417	715.1	843.2	715.1	565.1	.0	625.8	.0	47.8	.6683	.6929	1539.9	1512.0	1.5868	.8637	1697.8	1051.0
8	-12.123	-7.884	709.0	832.1	709.0	564.3	.0	611.5	.0	47.1	.6622	.6830	1580.3	1545.0	1.6175	.8954	1732.0	1090.8
9	-18.089	-15.321	678.6	758.4	678.6	475.9	.0	590.5	.0	50.7	.6314	.6158	1695.6	1639.3	1.6994	.9352	1826.4	1151.8
10	-19.037	-17.578	668.0	740.2	668.0	439.8	.0	595.4	.0	53.0	.6208	.5979	1734.1	1671.8	1.7270	.9391	1858.3	1162.8
11	-19.004	-19.146	662.7	722.2	662.7	393.1	.0	605.9	.0	56.6	.6155	.5796	1767.7	1703.8	1.7533	.9358	1887.8	1166.2

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.20	4.02	12.16	37.22	33.85	64.36	.5102	.0656	.0124	2.4030	97.04	96.66	62.37	25.15	-960.5	-309.3
2	-.23	3.51	10.86	31.44	36.27	65.28	.5093	.0469	.0090	2.3606	97.50	97.20	61.72	30.28	-1019.0	-385.4
3	-.46	3.08	10.26	26.36	38.32	64.07	.5181	.0613	.0118	2.3110	96.31	95.86	61.26	34.90	-1074.8	-448.7
4	.45	2.94	9.42	17.34	41.93	61.15	.5339	.1105	.0209	2.2430	91.84	90.88	61.58	44.24	-1227.0	-591.4
5	1.26	3.27	8.94	9.10	43.91	55.24	.5310	.1747	.0300	2.1573	84.82	83.13	63.36	54.26	-1410.1	-762.2
6	1.29	3.12	6.49	8.00	44.23	55.89	.5134	.1836	.0310	2.1629	83.34	81.48	64.49	56.49	-1498.4	-839.8
7	1.26	2.98	5.69	7.85	44.16	57.22	.4971	.1787	.0300	2.1700	83.41	81.54	65.19	57.33	-1539.9	-886.2
8	1.20	2.81	5.85	7.29	43.95	57.24	.4826	.1780	.0292	2.1600	83.01	81.11	65.96	58.67	-1580.3	-933.5
9	.57	2.07	8.54	2.91	42.84	47.81	.4711	.2306	.0307	2.0663	76.61	74.15	68.17	65.26	-1695.6	-1048.9
10	.16	1.66	7.77	1.34	42.43	43.95	.4731	.2575	.0312	2.0485	73.86	71.16	68.72	67.39	-1734.1	-1076.4
11	.01	1.51	6.79	-.88	42.23	39.04	.4789	.2901	.0308	2.0328	70.78	67.80	69.10	69.98	-1767.7	-1097.9

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2979	2.1927	84.23	85.85	39.40

Stator

RUN NO908, SPEED CODE 10, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.777	4.700	1092.2	869.4	754.2	868.6	790.0	-37.3	48.9	-2.4	.9324	.7199	2.2094	1.2928
2	24.704	4.236	1053.3	869.9	739.6	867.6	749.9	-63.9	47.4	-4.1	.8970	.7229	2.2491	1.2845
3	21.716	3.768	1020.0	850.6	718.4	847.6	724.1	-71.2	46.8	-4.7	.8657	.7060	2.2410	1.2817
4	12.971	2.313	960.8	797.7	674.3	795.4	684.4	-61.2	46.0	-4.4	.8073	.6571	2.2051	1.2858
5	3.729	.058	894.5	745.0	615.3	743.0	649.2	-54.2	46.6	-4.2	.7421	.6076	2.1407	1.2965
6	-.463	-1.069	889.4	748.6	618.9	747.4	638.6	-41.9	45.9	-3.2	.7352	.6091	2.1402	1.3031
7	-2.408	-1.620	889.6	753.7	629.5	752.8	628.6	-37.5	45.0	-2.9	.7350	.6136	2.1425	1.3029
8	-4.166	-2.137	882.4	749.0	632.2	747.8	615.7	-42.2	44.3	-3.2	.7286	.6095	2.1282	1.3027
9	-10.485	-3.045	829.0	685.0	574.9	681.9	597.3	-64.9	46.4	-5.4	.6783	.5515	2.0087	1.3144
10	-13.416	-3.292	820.4	669.5	553.8	666.4	605.3	-64.8	48.1	-5.5	.6680	.5358	1.9734	1.3261
11	-16.672	-3.433	812.0	670.3	525.8	667.0	618.8	-66.3	50.5	-5.6	.6572	.5349	1.9590	1.3331

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-2.23	.75	13.82	51.30	71.69	88.71	.3736	.1829	.0422	.9212	62.27	86.68	88.06
2	-2.27	.91	10.25	51.55	71.34	90.61	.3502	.1050	.0246	.9572	74.70	91.44	92.34
3	-2.47	.94	8.61	51.53	69.79	89.35	.3489	.0738	.0176	.9714	81.19	91.87	92.72
4	-4.50	-.26	8.13	50.33	66.21	84.79	.3611	.0395	.0100	.9863	89.52	88.53	89.71
5	-4.89	.45	8.40	50.75	60.37	78.52	.3791	.0266	.0072	.9919	92.56	81.78	83.59
6	-5.42	.31	9.39	49.11	60.83	78.50	.3731	.0419	.0117	.9873	88.01	79.96	81.95
7	-6.32	-.45	9.83	47.82	62.02	78.95	.3640	.0433	.0122	.9870	87.06	80.12	82.10
8	-7.02	-1.03	9.57	47.51	62.35	78.10	.3601	.0337	.0097	.9901	89.25	79.40	81.43
9	-6.87	-.65	9.84	51.81	55.70	68.75	.4148	.0902	.0269	.9765	75.18	70.02	72.76
10	-7.50	-1.26	11.83	53.59	53.11	65.95	.4357	.1265	.0382	.9679	66.56	65.62	68.68
11	-10.72	-4.58	14.00	56.08	49.89	65.22	.4368	.1432	.0438	.9641	60.83	63.43	66.65

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
12416.	175.80	1.2979	2.1428	81.49	83.33

TABLE 9.24
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 10, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.331	31.216	486.7	1035.1	486.7	633.6	.0	818.5	.0	51.9	.4443	.8747	964.7	1129.6	.9864	.5965	1080.5	705.8
2	25.073	27.311	530.7	1002.6	530.7	637.9	.0	773.5	.0	50.2	.4863	.8464	1023.5	1161.1	1.0565	.6302	1152.9	746.4
3	20.807	23.633	570.6	972.0	570.6	624.8	.0	744.5	.0	49.8	.5249	.8182	1079.5	1193.2	1.1231	.6476	1221.1	769.3
4	9.837	12.927	649.9	916.2	649.9	584.7	.0	705.4	.0	50.3	.6027	.7633	1232.4	1289.8	1.2922	.6887	1393.3	826.7
5	-2.158	1.981	701.8	860.5	701.8	540.7	.0	669.3	.0	51.1	.6548	.7081	1416.3	1419.6	1.4748	.7611	1580.6	924.8
6	-7.360	-2.879	710.7	855.0	710.7	544.4	.0	659.2	.0	50.3	.6638	.7005	1505.0	1484.1	1.5547	.8098	1664.4	988.3
7	-9.821	-5.414	708.1	850.9	708.1	552.3	.0	647.2	.0	49.4	.6613	.6964	1546.6	1518.6	1.5884	.8444	1701.0	1031.7
8	-12.292	-7.904	701.7	840.8	701.7	553.5	.0	633.0	.0	48.6	.6547	.6875	1587.2	1551.8	1.6192	.8770	1735.3	1072.7
9	-18.371	-15.395	669.8	773.1	669.8	458.8	.0	622.2	.0	53.2	.6226	.6241	1703.1	1646.5	1.7010	.9061	1830.0	1122.4
10	-19.222	-17.622	659.2	754.6	659.2	416.2	.0	629.4	.0	56.0	.6120	.6055	1741.7	1679.1	1.7289	.9061	1862.3	1129.2
11	-19.084	-19.160	654.1	745.2	654.1	380.9	.0	640.5	.0	58.8	.6069	.5944	1775.4	1711.2	1.7556	.9066	1892.1	1136.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.04	4.17	12.91	36.63	33.79	63.74	.5264	.0496	.0093	2.4350	97.79	97.50	62.52	25.89	-964.7	-311.0
2	-.03	3.70	11.62	30.87	36.16	64.90	.5220	.0292	.0056	2.3952	98.46	98.26	61.92	31.05	-1023.5	-387.6
3	-.23	3.32	10.86	26.00	38.16	63.91	.5293	.0431	.0082	2.3531	97.40	97.08	61.50	35.50	-1079.5	-448.7
4	.75	3.25	10.10	16.96	41.71	60.16	.5511	.1064	.0199	2.2893	92.31	91.39	61.89	44.92	-1232.4	-584.4
5	1.56	3.57	8.92	9.42	43.69	55.71	.5441	.1649	.0283	2.2318	86.12	84.50	63.66	54.23	-1416.3	-750.2
6	1.60	3.42	6.47	8.32	44.01	56.21	.5288	.1782	.0301	2.2409	84.36	82.53	64.79	56.47	-1505.0	-824.9
7	1.57	3.29	5.85	8.01	43.92	57.19	.5133	.1761	.0295	2.2441	84.17	82.31	65.50	57.49	-1546.6	-871.4
8	1.53	3.14	5.94	7.53	43.69	57.43	.4980	.1751	.0286	2.2357	83.83	81.93	66.29	58.75	-1587.2	-918.8
9	.95	2.45	8.82	3.00	42.50	46.99	.4938	.2393	.0315	2.1459	76.71	74.14	68.55	65.55	-1703.1	-1024.3
10	.52	2.02	8.39	1.09	42.08	42.36	.4980	.2699	.0319	2.1263	73.75	70.89	69.08	68.00	-1741.7	-1049.7
11	.35	1.85	6.91	-.66	41.88	38.57	.5015	.2984	.0315	2.1223	71.28	68.16	69.44	70.10	-1775.4	-1070.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.3079	2.2565	84.83	86.44	39.17

Stator

RUN NO908, SPEED CODE 10, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.734	4.777	1078.9	817.0	731.6	816.4	793.0	-33.2	49.9	-2.3	.9181	.6718	2.2424	1.2952
2	24.654	4.366	1041.1	817.9	719.0	815.8	752.9	-58.3	48.3	-4.0	.8841	.6749	2.2789	1.2870
3	21.682	3.935	1010.3	799.3	699.1	796.4	729.4	-68.6	47.8	-4.8	.8550	.6588	2.2712	1.2850
4	12.951	2.548	952.6	757.0	649.3	755.3	697.0	-51.9	47.6	-3.9	.7973	.6193	2.2518	1.2923
5	3.783	.273	899.2	717.6	602.8	716.2	667.3	-44.4	48.0	-3.5	.7434	.5814	2.2093	1.3062
6	-.264	-.880	895.8	723.0	605.8	722.2	659.9	-34.3	47.4	-2.7	.7375	.5841	2.2121	1.3146
7	-2.171	-1.455	893.5	727.9	612.9	727.0	650.1	-35.4	46.7	-2.8	.7349	.5883	2.2147	1.3146
8	-3.899	-1.987	887.1	722.7	617.3	721.7	637.1	-39.4	45.9	-3.1	.7292	.5838	2.2008	1.3148
9	-10.149	-2.972	839.0	656.8	555.2	653.8	629.0	-61.9	48.8	-5.4	.6822	.5237	2.0819	1.3327
10	-13.191	-3.251	829.1	644.6	527.5	642.1	639.7	-57.1	51.0	-5.0	.6703	.5109	2.0519	1.3458
11	-16.554	-3.440	827.7	649.0	507.6	646.7	653.9	-55.5	53.0	-4.9	.6656	.5130	2.0426	1.3533

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-1.28	1.71	13.95	52.13	71.13	87.07	.4145	.1837	.0424	.9225	67.01	87.75	89.04
2	-1.36	1.82	10.38	52.34	70.98	88.83	.3929	.1139	.0267	.9546	76.93	92.26	93.09
3	-1.49	1.92	8.49	52.63	69.52	87.41	.3944	.0877	.0209	.9665	81.65	92.49	93.29
4	-2.91	1.33	8.59	51.47	65.22	83.66	.4004	.0427	.0108	.9854	90.46	89.12	90.27
5	-3.52	1.82	9.03	51.50	60.68	78.66	.4159	.0352	.0095	.9892	91.73	82.86	84.63
6	-3.86	1.86	9.88	50.17	61.06	78.80	.4093	.0444	.0124	.9866	89.21	80.76	82.75
7	-4.59	1.27	9.89	49.49	61.89	79.23	.4022	.0452	.0128	.9864	88.60	80.88	82.86
8	-5.37	.62	9.67	49.06	62.42	78.34	.4010	.0414	.0119	.9878	89.23	80.11	82.16
9	-4.42	1.79	9.87	54.23	54.99	68.34	.4657	.0954	.0284	.9750	78.37	69.91	72.79
10	-4.58	1.66	12.30	56.03	51.67	65.93	.4844	.1314	.0397	.9661	71.14	65.80	69.00
11	-8.23	-2.09	14.76	57.82	49.29	65.66	.4823	.1467	.0449	.9625	66.74	63.89	67.26

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
[illegible]	[illegible]	1.3079	2.2016	81.97	83.83

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 10, POINT NO 6

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.378	31.292	491.9	1031.2	491.9	620.0	.0	824.0	.0	52.8	.4492	.8703	963.8	1128.5	.9882	.5829	1082.1	690.7
2	25.118	27.429	533.0	1001.7	533.0	628.2	.0	780.2	.0	50.9	.4885	.8447	1022.5	1160.0	1.0569	.6191	1153.1	734.1
3	20.848	23.751	570.6	974.1	570.6	618.7	.0	752.4	.0	50.4	.5248	.8193	1078.5	1192.1	1.1222	.6384	1220.1	759.0
4	9.860	12.967	645.0	916.1	645.0	572.0	.0	715.6	.0	51.3	.5978	.7619	1231.3	1288.6	1.2884	.6734	1390.0	809.7
5	-2.296	1.947	691.7	871.9	691.7	538.7	.0	685.6	.0	51.9	.6446	.7164	1415.0	1418.3	1.4678	.7472	1575.0	909.4
6	-7.635	-2.953	697.6	865.1	697.6	535.4	.0	679.4	.0	51.7	.6506	.7069	1503.6	1482.7	1.5458	.7888	1657.6	965.3
7	-10.088	-5.501	693.8	858.9	693.8	540.6	.0	667.4	.0	50.8	.6467	.7008	1545.2	1517.2	1.5789	.8219	1693.8	1007.2
8	-12.517	-7.995	686.4	848.6	686.4	542.0	.0	652.9	.0	50.1	.6392	.6916	1585.7	1550.4	1.6092	.8546	1727.9	1048.5
9	-18.566	-15.439	652.5	791.5	652.5	452.8	.0	649.2	.0	54.7	.6053	.6366	1701.5	1644.9	1.6905	.8798	1822.3	1093.9
10	-19.486	-17.636	641.2	775.7	641.2	411.1	.0	657.8	.0	57.5	.5941	.6201	1740.1	1677.6	1.7182	.8789	1854.5	1099.5
11	-19.324	-19.184	636.0	763.1	636.0	368.5	.0	668.3	.0	60.7	.5889	.6063	1773.8	1709.6	1.7449	.8776	1884.4	1104.6

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-.30	3.91	12.93	36.34	34.08	62.90	.5416	.0453	.0085	2.4506	97.99	97.73	62.26	25.92	-963.8	-304.5
2	-.14	3.59	11.53	30.85	36.28	64.53	.5334	.0210	.0040	2.4192	98.91	98.77	61.80	30.95	-1022.5	-379.9
3	-.24	3.30	10.61	26.24	38.16	63.94	.5381	.0315	.0061	2.3846	98.09	97.85	61.48	35.24	-1078.5	-439.7
4	.91	3.41	10.17	17.05	41.51	59.42	.5639	.1052	.0196	2.3163	92.52	91.61	62.05	45.00	-1231.3	-573.1
5	1.87	3.88	8.37	10.28	43.33	56.09	.5551	.1626	.0283	2.2797	86.64	85.03	63.96	53.69	-1415.0	-732.7
6	1.99	3.82	6.21	8.98	43.55	55.74	.5447	.1846	.0314	2.2847	84.20	82.30	65.19	56.21	-1503.6	-803.2
7	2.01	3.73	5.76	8.54	43.41	56.41	.5295	.1848	.0310	2.2839	83.80	81.85	65.94	57.40	-1545.2	-849.8
8	1.99	3.60	5.88	8.05	43.13	56.66	.5136	.1841	.0302	2.2748	83.41	81.43	66.75	58.69	-1585.7	-897.5
9	1.46	2.96	8.50	3.83	41.82	46.69	.5120	.2512	.0335	2.1988	76.35	73.65	69.06	65.23	-1701.5	-995.8
10	1.06	2.56	8.05	1.96	41.35	42.13	.5168	.2817	.0338	2.1826	73.51	70.52	69.62	67.66	-1740.1	-1019.8
11	.88	2.38	7.01	-.23	41.13	37.56	.5211	.3114	.0327	2.1737	70.95	67.70	69.97	70.20	-1773.8	-1041.3

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.3153	2.2952	84.77	86.42	38.81

Stator

RUN NO908, SPEED CODE 10, POINT NO 6

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.815	4.798	1072.8	782.4	716.5	782.0	798.5	-26.6	50.7	-1.9	.9114	.6405	2.2599	1.2971
2	24.773	4.420	1038.2	785.5	707.8	783.7	759.6	-53.1	49.1	-3.8	.8804	.6452	2.2972	1.2894
3	21.817	4.025	1009.7	768.2	690.0	765.5	737.1	-64.3	48.5	-4.7	.8534	.6304	2.2917	1.2877
4	13.088	2.734	949.9	730.9	634.3	729.7	707.1	-41.8	48.6	-3.3	.7934	.5955	2.2804	1.2962
5	4.007	.481	907.7	699.5	597.4	698.5	683.3	-37.1	48.9	-3.0	.7490	.5643	2.2518	1.3132
6	.054	-.686	903.2	701.5	594.4	700.9	680.1	-30.4	48.8	-2.5	.7414	.5635	2.2503	1.3239
7	-1.879	-1.274	899.0	703.7	598.9	702.9	670.4	-33.3	48.2	-2.7	.7370	.5654	2.2500	1.3241
8	-3.650	-1.817	891.9	697.9	603.1	696.9	657.1	-37.2	47.5	-3.1	.7306	.5603	2.2364	1.3245
9	-9.877	-2.893	853.0	641.8	545.3	639.0	656.0	-59.9	50.5	-5.3	.6908	.5084	2.1339	1.3464
10	-12.840	-3.224	845.5	629.2	518.1	627.3	668.1	-47.9	52.7	-4.3	.6807	.4953	2.1046	1.3600
11	-16.243	-3.463	840.7	631.6	492.3	630.2	681.5	-41.7	54.9	-3.7	.6731	.4959	2.0937	1.3676

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-.47	2.52	14.31	52.56	70.40	85.54	.4434	.1838	.0424	.9233	69.70	88.13	89.39
2	-.64	2.55	10.58	52.86	70.69	87.41	.4234	.1223	.0287	.9515	77.73	92.48	93.30
3	-.79	2.62	8.60	53.21	69.47	86.05	.4259	.0993	.0237	.9621	81.50	92.75	93.53
4	-1.82	2.42	9.24	51.91	64.45	82.72	.4269	.0430	.0109	.9854	91.31	89.49	90.62
5	-2.58	2.76	9.53	51.93	60.88	78.50	.4439	.0406	.0110	.9875	91.51	83.17	84.95
6	-2.47	3.26	10.12	51.33	60.50	78.11	.4427	.0490	.0137	.9851	89.49	80.32	82.40
7	-3.06	2.80	9.97	50.94	61.03	78.24	.4380	.0489	.0138	.9852	89.22	80.26	82.34
8	-3.83	2.16	9.74	50.53	61.54	77.28	.4392	.0492	.0141	.9854	89.00	79.49	81.64
9	-2.75	3.47	9.92	55.85	54.47	68.27	.5024	.0978	.0292	.9737	80.38	69.64	72.63
10	-2.91	3.33	13.01	56.99	51.20	65.86	.5184	.1276	.0386	.9663	75.02	65.66	68.98
11	-6.31	-.17	15.87	58.63	48.23	65.44	.5159	.1410	.0432	.9633	71.68	63.75	67.23

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
12459.	173.17	1.3153	2.2365	81.82	83.73

TABLE 9.26
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 15, POINT NO 1

SL	EPS1-1	EPS1-2	V-1	V-2	VM-1	VM-2	VO-1	VO-2	B-1	B-2	M-1	M-2	U-1	U-2	M'-1	M'-2	V'-1	V'-2
	DEGREE	DEGREE	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC	DEGREE	DEGREE			FT/SEC	FT/SEC			FT/SEC	FT/SEC
1	29.491	31.036	544.1	1074.6	544.1	687.4	.0	825.9	.0	49.9	.4992	.9063	1013.3	1184.6	1.0552	.6547	1150.2	776.2
2	25.410	27.047	593.6	1065.5	593.6	693.5	.0	808.8	.0	49.1	.5472	.8965	1075.1	1219.7	1.1321	.6783	1228.0	806.1
3	21.151	23.415	639.9	1050.8	639.9	694.9	.0	788.3	.0	48.4	.5928	.8823	1133.9	1253.4	1.2062	.7021	1302.0	836.2
4	9.579	13.104	719.6	970.2	719.6	680.6	.0	691.5	.0	45.4	.6729	.8111	1294.5	1354.8	1.3851	.7944	1481.1	950.3
5	-3.124	-2.248	754.8	841.9	754.8	562.4	.0	626.4	.0	48.1	.7090	.6928	1487.7	1491.2	1.5671	.8489	1668.2	1031.5
6	-7.400	-2.601	757.6	815.5	757.6	552.2	.0	600.1	.0	47.3	.7119	.6690	1580.9	1558.9	1.6474	.9077	1753.0	1106.4
7	-9.429	-5.007	754.8	825.5	754.8	585.2	.0	582.3	.0	44.7	.7090	.6788	1624.6	1595.2	1.6828	.9616	1791.4	1169.8
8	-11.718	-7.379	748.4	826.0	748.4	604.7	.0	562.6	.0	42.7	.7025	.6801	1667.2	1630.0	1.7153	1.0102	1827.6	1226.8
9	-18.176	-15.093	712.1	762.0	712.1	547.5	.0	530.0	.0	43.6	.6652	.6232	1788.9	1729.5	1.7988	1.0783	1925.4	1318.5
10	-19.402	-17.517	698.5	720.8	698.5	485.6	.0	512.7	.0	47.1	.6515	.5854	1829.5	1763.8	1.8265	1.0748	1958.3	1323.4
11	-19.227	-19.206	692.7	669.2	692.7	399.8	.0	536.7	.0	52.8	.6456	.5391	1864.9	1797.5	1.8542	1.0656	1989.4	1322.7

SL	INCS	INCM	DEV	TURN	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B	LOSS-P	PT2/	SEFF-P	SEFF-A	B'-1	B'-2	VO'-1	VO'-2
	DEGREE	DEGREE	DEGREE	DEGREE				TOTAL	TOTAL	PT1	TOT-ST	TOT-ST	DEGREE	DEGREE	FT/SEC	FT/SEC
1	-1.49	2.72	14.38	33.70	36.85	67.28	.4969	.1276	.0237	2.4600	93.98	93.18	61.07	27.37	-1013.3	-360.6
2	-1.48	2.25	10.92	30.12	39.25	68.34	.5116	.1217	.0234	2.4620	93.51	92.66	60.47	30.35	-1075.1	-410.8
3	-1.77	1.77	8.94	26.38	41.30	68.80	.5181	.1223	.0239	2.4491	92.83	91.89	59.95	33.57	-1133.9	-465.1
4	-.54	1.95	9.40	16.37	44.31	67.76	.4953	.1198	.0227	2.3075	90.77	89.65	60.59	44.22	-1294.5	-683.3
5	1.04	3.04	11.67	6.15	45.43	59.40	.4988	.2238	.0358	2.0674	79.08	76.88	63.13	56.98	-1487.7	-864.7
6	1.27	3.10	9.95	4.51	45.51	53.35	.4755	.2318	.0355	2.0347	77.24	74.91	64.47	59.96	-1580.9	-958.7
7	1.23	2.95	8.19	5.33	45.43	56.98	.4495	.2091	.0327	2.0598	79.08	76.90	65.16	59.83	-1624.6	-1012.9
8	1.16	2.77	7.45	5.66	45.24	59.28	.4266	.1900	.0297	2.0694	80.48	78.43	65.92	60.26	-1667.2	-1067.4
9	.69	2.19	8.38	3.18	44.05	53.47	.4021	.2191	.0287	1.9927	76.34	73.99	68.29	65.11	-1788.9	-1199.5
10	.37	1.87	8.48	.85	43.58	46.96	.4080	.2511	.0295	1.9431	71.98	69.30	68.94	68.07	-1829.5	-1231.1
11	.21	1.71	8.93	-2.82	43.37	38.23	.4163	.2931	.0279	1.8655	67.12	64.14	69.30	72.12	-1864.9	-1260.8

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.3018	2.1681	81.80	83.64	41.22

Stator

RUN NO908, SPEED CODE 15, POINT NO 1

SL	EPS1-1	EPS1-2	V-1	V-2	VM-1	VM-2	VO-1	VO-2	B-1	B-2	M-1	M-2	PT2/	TT2/
	DEGREE	DEGREE	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC	DEGREE	DEGREE			PT1	TT1
1	27.700	4.916	1136.7	1025.4	804.9	1018.5	802.7	-119.4	47.5	-6.8	.9681	.8585	2.0695	1.3191
2	24.676	4.539	1122.2	1060.0	797.1	1054.0	789.9	-113.0	46.8	-6.0	.9525	.8911	2.1884	1.3163
3	21.909	4.010	1103.5	1078.9	790.0	1072.3	770.4	-119.5	45.9	-6.0	.9391	.9092	2.2713	1.3161
4	14.127	2.338	1021.2	1001.4	759.3	992.3	683.0	-134.8	42.6	-7.7	.8598	.8408	2.2061	1.2999
5	4.920	-.016	897.8	882.7	644.7	873.3	624.7	-128.4	44.2	-8.4	.7437	.7298	2.0292	1.2995
6	-.235	-1.199	872.1	870.2	631.7	861.2	601.3	-125.3	43.6	-8.3	.7200	.7186	2.0005	1.2992
7	-2.596	-1.738	881.6	882.3	659.2	873.8	585.4	-122.4	41.6	-8.0	.7293	.7307	2.0196	1.2956
8	-4.418	-2.233	884.6	889.4	678.9	880.5	567.2	-125.1	39.9	-8.1	.7332	.7383	2.0176	1.2920
9	-10.261	-3.145	849.4	847.0	652.5	837.1	536.0	-129.5	39.7	-8.8	.6969	.6980	1.9039	1.2976
10	-13.047	-3.380	816.2	791.4	611.1	781.1	541.0	-127.7	42.0	-9.2	.6693	.6459	1.8048	1.3061
11	-16.512	-3.436	779.7	774.0	555.4	763.0	547.3	-130.2	45.4	-9.6	.6347	.6294	1.7621	1.3104

SL	INCS	INCM	DEV	TURN	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B	LOSS-P	PT2/	SEFF-P	%EFF-A	%EFF-P
	DEGREE	DEGREE	DEGREE	DEGREE				TOTAL	TOTAL	PT1	STATC-ST	TOT-STG	TOT-STG
1	-3.65	-.66	9.71	53.99	74.99	86.74	.2819	.3554	.0816	.8392	-46.82	73.08	75.63
2	-2.93	.25	8.38	52.77	75.14	92.64	.2416	.2509	.0587	.8888	-91.76	79.04	81.17
3	-3.37	.04	7.33	51.90	75.03	96.53	.2129	.1649	.0393	.9286	-161.40	83.37	85.19
4	-7.82	-3.58	4.81	50.33	72.94	92.49	.2158	.1019	.0254	.9613	-178.34	84.38	85.99
5	-7.29	-1.95	4.21	52.54	60.38	80.76	.2373	.0553	.0148	.9833	-150.78	74.38	76.76
6	-7.73	-2.01	4.32	51.87	59.04	79.32	.2395	.0789	.0218	.9767	-252.17	73.08	75.53
7	-9.67	-3.80	4.71	49.60	62.06	80.63	.2300	.0920	.0258	.9722	-633.36	74.81	77.13
8	-11.38	-5.39	4.71	48.01	64.34	81.19	.2134	.0758	.0216	.9774	221.08	75.90	78.12
9	-13.58	-7.37	6.50	48.44	61.11	74.43	.2238	.1215	.0360	.9676	352.21	67.78	70.50
10	-13.56	-7.32	8.12	51.23	56.31	67.49	.2637	.2215	.0664	.9463	-462.33	59.94	63.04
11	-15.80	-9.66	10.04	54.97	50.39	64.85	.2768	.2759	.0836	.9346	*******	56.48	59.73

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 9.27

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 15, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.399	30.976	536.2	1083.9	536.2	681.1	.0	843.2	.0	50.7	.4916	.9127	1014.4	1187.7	1.0519	.6427	1147.4	763.3
2	25.290	26.933	584.2	1067.4	584.2	688.3	.0	815.8	.0	49.5	.5380	.8972	1076.2	1220.9	1.1277	.6714	1224.5	798.7
3	20.993	23.294	628.7	1048.1	628.7	693.7	.0	785.6	.0	48.3	.5817	.8799	1135.1	1254.7	1.2006	.7030	1297.6	837.4
4	9.377	13.031	707.4	961.3	707.4	652.5	.0	705.9	.0	47.2	.6605	.8004	1295.9	1356.2	1.3786	.7670	1476.4	921.3
5	-2.478	2.134	750.1	845.8	750.1	593.8	.0	647.9	.0	50.0	.7042	.6934	1489.2	1492.7	1.5654	.8236	1667.5	1004.7
6	-6.699	-2.646	760.5	828.8	760.5	550.4	.0	619.6	.0	48.3	.7149	.6781	1582.5	1560.5	1.6506	.8918	1755.7	1090.0
7	-8.956	-5.033	780.3	839.7	780.3	586.5	.0	600.9	.0	45.5	.7347	.6885	1626.3	1594.8	1.6877	.9477	1795.2	1166.7
8	-11.489	-7.425	755.0	836.2	755.0	601.6	.0	580.8	.0	43.8	.7093	.6865	1668.9	1631.7	1.7208	.9941	1831.7	1210.9
9	-18.144	-15.194	719.1	762.3	719.1	519.7	.0	557.7	.0	46.6	.6724	.6195	1790.7	1731.2	1.8044	1.0430	1929.7	1283.6
10	-19.231	-17.590	705.9	730.6	705.9	464.2	.0	564.2	.0	50.0	.6589	.5895	1831.4	1766.6	1.8322	1.0393	1962.7	1288.0
11	-19.043	-19.233	700.1	697.4	700.1	396.7	.0	573.6	.0	54.9	.6531	.5584	1866.8	1799.3	1.8599	1.0316	1993.8	1288.3

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	-1.14	3.08	13.53	34.91	36.44	66.97	.5099	.1357	.0254	2.4968	93.73	92.89	61.43	26.52	-1014.4	-344.6
2	-1.09	2.64	10.74	30.70	38.81	68.31	.5176	.1191	.0230	2.4868	93.77	92.94	60.86	30.16	-1076.2	-405.1
3	-1.33	2.21	9.18	26.58	40.82	69.40	.5148	.1050	.0205	2.4685	93.83	93.02	60.39	33.81	-1135.1	-469.0
4	-.12	2.38	10.03	16.17	43.89	65.56	.5152	.1380	.0259	2.3221	89.75	88.50	61.02	44.86	-1295.9	-680.3
5	1.19	3.20	11.93	6.04	45.29	53.84	.5174	.2223	.0354	2.1338	80.05	77.86	63.29	57.25	-1489.2	-844.8
6	1.17	3.00	9.56	4.80	45.60	54.88	.4879	.2150	.0333	2.1278	79.76	77.55	64.37	59.57	-1582.5	-940.8
7	1.07	2.79	7.71	5.64	45.59	59.08	.4611	.1882	.0299	2.1604	81.92	79.90	65.00	59.35	-1626.3	-995.8
8	.97	2.58	7.19	5.73	45.44	61.05	.4395	.1703	.0268	2.1670	83.15	81.25	65.73	60.00	-1668.9	-1050.9
9	.51	2.01	9.05	2.34	44.29	52.28	.4260	.2161	.0282	2.0727	77.11	74.70	68.11	65.77	-1790.7	-1173.5
10	.17	1.67	8.89	.23	43.84	46.27	.4324	.2530	.0292	2.0393	73.11	70.36	68.73	68.50	-1831.4	-1201.4
11	.01	1.51	8.59	-2.68	43.63	39.15	.4403	.2925	.0284	1.9977	69.06	65.98	69.10	71.78	-1866.8	-1225.8

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.3111	2.2274	82.40	84.24	41.12

Stator

RUN NO908, SPEED CODE 15, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.460	4.715	1141.6	981.1	795.5	980.0	818.6	-47.7	48.3	-2.8	.9701	.7955	2.2653	1.3208
2	24.319	4.191	1120.1	977.7	789.4	976.3	794.7	-52.6	47.1	-3.0	.9495	.8117	2.3436	1.3184
3	21.508	3.620	1096.8	968.7	782.7	966.9	768.3	-60.1	46.0	-3.5	.9277	.8045	2.3691	1.3150
4	13.479	1.893	1007.9	881.6	727.8	878.4	697.2	-75.4	44.4	-4.9	.8445	.7268	2.2601	1.3066
5	3.797	-.393	895.5	778.1	620.0	774.9	646.1	-70.7	46.2	-5.2	.7383	.6332	2.1063	1.3099
6	-1.170	-1.462	879.7	780.9	623.3	778.7	620.7	-59.2	44.9	-4.4	.7239	.6360	2.1093	1.3087
7	-3.147	-1.960	890.1	800.7	653.7	798.5	604.1	-59.2	42.8	-4.2	.7340	.6544	2.1265	1.3082
8	-4.709	-2.431	890.0	807.6	670.3	805.4	585.4	-59.8	41.2	-4.2	.7351	.6615	2.1311	1.3016
9	-10.328	-3.210	839.2	750.2	621.7	747.0	563.8	-69.8	42.5	-5.3	.6878	.6077	2.0092	1.3144
10	-13.296	-3.383	818.6	715.4	584.3	711.9	573.3	-70.1	45.0	-5.6	.6664	.5748	1.9396	1.3264
11	-16.721	-3.422	797.4	708.6	541.3	704.9	585.5	-72.5	48.1	-5.8	.6448	.5675	1.9135	1.3330

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-2.81	.17	13.45	51.09	74.68	93.47	.3289	.2030	.0468	.9080	48.20	81.87	83.80
2	-2.56	.62	11.36	50.17	75.19	97.38	.3000	.1301	.0306	.9428	59.73	86.32	87.83
3	-3.26	.15	9.83	49.51	75.31	97.81	.2918	.0929	.0222	.9602	68.02	88.01	89.35
4	-6.11	-1.87	7.63	49.23	70.80	90.35	.3095	.0481	.0121	.9823	82.68	85.36	86.91
5	-5.24	.10	7.36	51.44	59.63	78.57	.3428	.0388	.0105	.9884	86.26	76.36	78.66
6	-6.43	-.70	8.25	49.24	60.34	78.82	.3339	.0727	.0202	.9782	73.48	76.86	78.83
7	-8.52	-2.65	8.44	47.01	63.90	81.09	.3131	.0679	.0192	.9794	71.73	78.77	80.86
8	-10.11	-4.12	8.55	45.44	65.97	81.76	.2923	.0376	.0113	.9883	79.45	79.86	81.88
9	-10.77	-4.56	9.94	47.81	60.16	72.88	.3285	.0884	.0264	.9768	58.35	69.77	72.62
10	-10.81	-4.30	11.76	50.55	55.69	67.82	.3615	.1438	.0435	.9645	42.17	63.74	66.80
11	-13.11	-6.97	13.81	53.89	50.87	66.21	.3681	.1719	.0526	.9582	28.83	61.04	64.35

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
13112.	183.47	1.3111	2.1629	79.04	81.15

TABLE 9.28
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO 908, SPEED CODE 15, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.379	31.386	525.6	1078.6	525.7	844.2	.0	865.1	.0	53.1	.4814	.9045	1012.7	1186.0	1.0451	.6034	1141.0	719.6
2	25.172	27.526	571.0	1051.4	571.0	646.2	.0	829.3	.0	51.9	.5252	.8800	1074.4	1218.9	1.1191	.6316	1216.7	764.6
3	20.950	23.845	612.9	1025.9	612.9	640.2	.0	801.0	.0	51.2	.5661	.8559	1133.3	1252.6	1.1900	.6540	1288.4	783.6
4	9.993	13.059	697.8	971.9	697.8	598.4	.0	765.8	.0	52.0	.6508	.8016	1293.8	1354.0	1.3709	.6921	1470.0	839.1
5	-1.823	2.065	753.0	899.2	753.0	526.6	.0	728.9	.0	54.2	.7072	.7302	1486.8	1490.2	1.5653	.7517	1666.6	925.7
6	-6.648	-2.721	764.8	879.9	764.8	535.3	.0	698.3	.0	52.4	.7194	.7127	1579.9	1557.9	1.6511	.8203	1756.3	1012.7
7	-9.034	-5.216	763.4	880.0	763.4	558.9	.0	679.7	.0	50.4	.7179	.7132	1623.6	1594.2	1.6874	.8666	1794.1	1071.0
8	-11.538	-7.686	756.9	876.2	756.9	571.1	.0	664.5	.0	49.1	.7113	.7099	1666.2	1629.0	1.7196	.9082	1830.0	1120.9
9	-17.976	-15.222	719.8	812.3	719.8	480.0	.0	645.3	.0	53.3	.6731	.6494	1787.8	1728.4	1.8023	.9399	1927.3	1176.6
10	-19.118	-17.515	706.2	796.5	706.2	437.9	.0	665.3	.0	56.1	.6593	.6325	1828.4	1762.7	1.8298	.9383	1960.0	1181.6
11	-19.136	-19.113	699.6	777.7	699.6	382.6	.0	677.0	.0	60.1	.6526	.6131	1863.0	1796.4	1.8570	.9327	1990.0	1183.0

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	-.70	3.61	13.26	35.62	35.89	65.61	.5480	.1069	.0201	2.5851	95.27	94.61	61.86	26.24	-1012.7	-320.7
2	-.60	3.19	11.47	30.95	38.18	66.61	.5502	.0908	.0174	2.5578	95.42	94.78	61.35	30.90	-1074.4	-389.6
3	-.75	2.79	10.43	25.90	40.13	66.53	.5526	.0908	.0176	2.5281	94.86	94.17	60.97	35.06	-1133.3	-451.7
4	.22	2.72	9.64	16.90	43.55	62.80	.5764	.1485	.0274	2.4738	90.02	88.69	61.38	44.48	-1293.8	-588.2
5	1.06	3.06	10.03	7.80	45.38	55.50	.5767	.2095	.0350	2.3935	83.30	81.18	63.15	55.35	-1486.8	-761.3
6	1.01	2.84	7.98	6.22	45.72	57.06	.5448	.1998	.0324	2.3938	83.21	81.07	64.20	57.98	-1579.9	-859.7
7	.95	2.67	6.78	6.45	45.68	60.11	.5206	.1826	.0298	2.4139	84.29	82.27	64.88	58.42	-1623.6	-914.5
8	.89	2.50	6.37	6.47	45.49	61.79	.5019	.1735	.0280	2.4226	84.71	82.73	65.65	59.18	-1666.2	-964.5
9	.44	1.94	8.84	2.48	44.32	51.46	.4967	.2344	.0309	2.3391	78.26	75.57	68.04	65.56	-1787.8	-1073.2
10	.12	1.62	8.24	.82	43.85	46.64	.5019	.2669	.0317	2.3228	75.31	72.29	68.68	67.86	-1828.4	-1097.4
11	.00	1.50	7.63	-1.72	43.62	40.48	.5084	.3009	.0307	2.3035	72.28	68.94	69.09	70.81	-1863.8	-1119.4

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.3453	2.4311	83.44	85.35	40.88

Stator

RUN NO 908, SPEED CODE 15, POINT NO 3

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.831	4.700	1121.1	797.6	743.2	797.0	839.4	-30.0	51.0	-2.1	.9965	.6957	2.4084	1.3281
2	24.735	4.260	1089.1	802.0	730.6	800.7	807.7	-45.5	49.9	-3.2	.9169	.6509	2.4486	1.3231
3	21.701	3.818	1062.3	790.0	715.8	788.4	784.9	-49.3	49.2	-3.5	.8913	.6407	2.4512	1.3220
4	12.872	2.409	1006.7	744.7	663.8	743.9	756.8	-36.3	49.3	-2.8	.8341	.5985	2.4220	1.3333
5	3.337	.162	937.0	687.7	591.2	686.3	727.0	-45.1	50.9	-3.8	.7693	.5466	2.3498	1.3480
6	-1.006	-.952	919.7	699.2	597.1	698.4	699.5	-33.2	49.5	-2.7	.7484	.5563	2.3632	1.3979
7	-2.974	-1.499	920.9	717.1	617.9	716.3	682.8	-34.1	47.9	-2.7	.7499	.5718	2.3849	1.3464
8	-4.669	-2.019	920.6	721.6	632.8	720.7	668.6	-35.8	46.6	-2.8	.7498	.5754	2.3838	1.3476
9	-10.446	-2.998	876.7	670.7	574.3	669.1	662.5	-47.4	49.4	-4.0	.7060	.5282	2.2752	1.3683
10	-13.183	-3.280	870.5	654.6	548.3	653.0	676.1	-45.6	51.5	-4.0	.6966	.5118	2.2370	1.3832
11	-16.435	-3.447	860.9	654.8	513.3	653.3	691.1	-44.6	54.2	-3.9	.6843	.5104	2.2212	1.3916

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%E F-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-.09	2.90	14.12	53.14	73.19	90.47	.4626	.1531	.0353	.9328	76.54	86.80	88.30
2	.19	3.37	11.20	53.08	73.11	92.47	.4929	.0967	.0227	.9594	83.85	90.02	91.18
3	-.07	3.34	9.82	52.72	72.36	91.78	.4406	.0728	.0174	.9706	87.39	90.47	91.57
4	-1.20	3.09	9.72	52.04	68.02	88.91	.4556	.0514	.0130	.9813	90.74	86.08	87.66
5	-.56	4.78	8.81	54.67	60.90	79.13	.4860	.0570	.0154	.9818	89.51	79.21	81.52
6	-1.79	3.93	9.88	52.24	62.16	80.59	.4617	.0519	.0143	.9890	89.70	79.85	82.09
7	-3.41	2.46	9.95	50.61	64.83	82.82	.4428	.0494	.0140	.9846	89.47	81.15	83.27
8	-4.67	1.32	9.96	49.48	66.75	83.06	.4340	.0439	.0125	.9866	90.25	80.82	82.98
9	-3.88	2.33	11.22	53.42	59.51	74.28	.4818	.0870	.0260	.9757	81.89	71.71	74.72
10	-4.12	2.13	13.38	55.42	56.15	71.07	.5041	.1192	.0361	.9676	75.99	67.33	70.73
11	-7.03	-.90	15.75	58.03	52.00	70.23	.5049	.1326	.0406	.9645	72.62	65.18	68.78

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
13081.	182.38	1.345[illegible]	2.3480	80.34	82.80

TABLE 9.29

BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO908, SPEED CODE 15, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.365	31.285	818.8	1077.8	818.8	654.9	.0	856.0	.0	52.3	.4746	.7082	1011.9	1104.9	1.0408	.6188	1137.0	[illegible]
2	25.179	27.399	566.3	1051.6	566.3	656.4	.0	821.6	.0	51.1	.5206	.8814	1073.6	1218.0	1.1159	.6427	1213.8	766.8
3	20.959	23.717	610.3	1026.0	610.3	651.8	.0	792.4	.0	50.4	.5635	.8579	1132.4	1281.7	1.1878	.6666	1286.3	797.3
4	9.904	13.031	699.2	965.3	699.2	615.1	.0	744.0	.0	50.4	.6522	.7988	1292.7	1353.0	1.3709	.7163	1469.7	866.8
5	-1.892	2.118	756.6	879.1	756.6	527.2	.0	703.4	.0	53.2	.7109	.7157	1485.7	1489.1	1.5666	.7704	1667.2	946.2
6	-6.508	-2.627	770.2	860.8	770.2	536.7	.0	672.9	.0	51.3	.7251	.6993	1578.7	1556.7	1.6536	.8401	1756.6	1039.0
7	-8.868	-6.102	770.2	866.9	770.2	569.2	.0	653.8	.0	48.8	.7250	.7054	1622.4	1593.0	1.6906	.8938	1798.9	1098.1
8	-11.416	-7.575	764.9	863.7	764.9	584.2	.0	636.1	.0	47.2	.7196	.7031	1664.9	1627.8	1.7236	.9369	1832.2	1161.0
9	-17.996	-16.198	729.2	792.7	729.2	488.1	.0	624.7	.0	51.6	.6827	.6368	1706.4	1727.1	1.8065	.9688	1929.8	1208.6
10	-19.110	-17.516	716.0	773.6	716.0	443.4	.0	633.9	.0	54.5	.6693	.6173	1827.0	1761.3	1.8341	.9667	1962.3	1211.6
11	-19.084	-19.127	709.8	752.9	709.8	387.4	.0	645.6	.0	58.6	.6630	.5964	1862.4	1796.0	1.8615	.9608	1993.0	1212.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	-.40	3.81	13.44	35.74	35.52	65.95	.5334	.1158	.0217	2.5498	94.83	94.12	62.17	26.43	-1011.9	-328.9
2	-.41	3.32	11.48	30.62	37.95	66.64	.5383	.1006	.0192	2.5233	94.67	94.18	61.53	30.91	-1073.6	-376.4
3	-.67	2.87	10.37	26.05	40.01	66.90	.5404	.0978	.0188	2.4940	94.41	93.66	61.05	35.00	-1132.4	-459.2
4	.14	2.64	9.64	16.62	43.60	63.80	.5852	.1302	.0259	2.4225	90.24	88.98	61.28	44.64	-1292.7	-609.0
5	.93	2.93	10.84	6.87	45.49	54.64	.5605	.2123	.0347	2.3098	82.47	80.33	63.02	56.15	-1485.7	-785.7
6	.83	2.65	8.62	5.40	45.88	56.29	.5286	.2019	.0321	2.3106	82.49	80.36	64.02	58.62	-1578.7	-883.8
7	.72	2.44	6.99	6.02	45.88	60.27	.5019	.1778	.0288	2.3411	84.21	82.25	64.65	58.63	-1622.4	-939.1
8	.64	2.25	6.48	6.10	45.73	62.32	.4813	.1638	.0264	2.3512	85.06	83.20	65.40	59.30	-1664.9	-991.6
9	.17	1.67	9.06	1.99	44.63	51.51	.4769	.2262	.0295	2.2569	78.17	75.60	67.77	65.78	-1786.4	-1102.4
10	-.17	1.33	8.53	.25	44.19	46.46	.4822	.2593	.0304	2.2354	74.99	72.08	68.39	68.14	-1827.0	-1127.4
11	-.30	1.20	7.88	-2.27	43.98	40.29	.4890	.2949	.0297	2.2190	71.75	68.51	68.79	71.07	-1862.4	-1149.4

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.3335	2.3652	83.38	85.24	41.00

Stator

RUN NO908, SPEED CODE 15, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.729	4.684	1129.0	899.6	757.3	893.9	830.6	-36.4	50.2	-2.4	.9509	.6883	2.3788	1.3293
2	24.591	4.162	1093.0	849.9	744.6	848.7	800.2	-46.1	49.1	-3.0	.9220	.6944	2.4238	1.3197
3	21.571	3.669	1066.2	838.3	731.1	836.8	776.1	-49.8	48.3	-3.4	.8966	.6899	2.4281	1.3180
4	12.878	2.136	1003.1	778.2	682.5	776.8	735.1	-46.0	47.6	-3.4	.8342	.6298	2.3739	1.3236
5	3.343	-.122	920.2	706.0	595.6	704.3	701.5	-48.5	49.7	-3.9	.7529	.5648	2.2781	1.3358
6	-1.182	-1.215	904.1	717.7	602.5	716.7	674.1	-36.9	48.2	-2.9	.7382	.5749	2.2876	1.3347
7	-3.181	-1.733	910.8	737.7	630.8	736.8	657.0	-36.1	46.2	-2.8	.7499	.5927	2.3122	1.3322
8	-4.791	-2.222	911.2	744.0	648.3	743.1	640.4	-37.2	44.7	-2.9	.7469	.5982	2.3136	1.3317
9	-10.465	-3.113	861.5	686.7	585.9	684.5	631.5	-55.8	47.5	-4.6	.6973	.5450	2.1927	1.3613
10	-13.255	-3.343	852.3	664.4	558.1	662.2	644.2	-53.9	49.6	-4.6	.6856	.5234	2.1463	1.3666
11	-16.597	-3.448	841.4	663.0	522.8	660.9	659.2	-52.6	52.4	-4.5	.6722	.5206	2.1282	1.3736

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-.94	2.04	13.81	52.59	73.50	92.43	.4213	.1490	.0344	.9342	74.30	86.41	87.93
2	-.64	2.54	11.33	52.10	73.39	94.70	.3986	.0872	.0205	.9631	83.29	89.82	90.98
3	-1.02	2.39	9.98	51.61	72.80	94.23	.3948	.0603	.0144	.9755	87.81	90.48	91.68
4	-2.82	1.92	9.13	51.02	68.97	88.01	.4158	.0435	.0110	.9893	91.03	86.38	87.90
5	-1.77	3.57	8.64	53.63	60.22	78.61	.4497	.0478	.0129	.9852	90.04	78.69	80.96
6	-3.09	2.63	9.65	51.17	61.53	80.05	.4273	.0547	.0152	.9833	87.71	79.48	81.68
7	-5.09	.77	9.88	49.00	65.04	82.53	.4068	.0556	.0157	.9828	86.64	81.24	83.28
8	-6.59	-.60	9.93	47.58	67.29	83.06	.3927	.0396	.0119	.9879	89.64	81.42	83.48
9	-5.82	.40	10.61	52.09	59.67	73.52	.4449	.0877	.0262	.9761	79.14	71.42	74.33
10	-5.76	.28	12.73	54.23	56.12	69.65	.4727	.1302	.0374	.9656	70.81	68.86	69.87
11	-8.82	-2.48	15.11	56.88	51.96	68.63	.4751	.1477	.0452	.9616	66.08	64.27	67.77

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
13081.	182.94	1.3335	2.3097	80.80	82.89

TABLE 9.30
BLADE ELEMENT AND OVERALL PERFORMANCE WITH UNIFORM INLET

Rotor

RUN NO 908, SPEED CODE 15, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.402	31.439	518.1	1075.9	518.1	630.4	.0	871.8	.0	53.9	.4742	.9009	1012.1	1186.1	1.0407	.5895	1137.0	703.9
2	25.183	27.639	563.6	1048.2	563.6	631.9	.0	836.4	.0	52.8	.5180	.8760	1073.8	1218.2	1.1196	.6170	1212.7	738.3
3	20.966	23.957	605.7	1023.5	605.7	627.1	.0	808.9	.0	52.1	.5591	.8530	1132.6	1251.9	1.1865	.6399	1284.4	767.8
4	10.052	13.111	692.1	977.1	692.1	581.7	.0	785.0	.0	53.4	.6450	.8037	1293.0	1353.2	1.3668	.6689	1466.5	813.1
5	-1.846	2.089	750.1	916.1	750.1	523.1	.0	752.0	.0	56.2	.7042	.7421	1485.9	1489.4	1.5627	.7324	1664.5	904.1
6	-6.863	-2.740	762.0	898.0	762.0	532.1	.0	723.4	.0	53.5	.7166	.7253	1579.0	1557.0	1.6486	.7988	1753.3	989.0
7	-9.302	-5.273	760.1	894.2	760.1	550.7	.0	704.8	.0	51.0	.7148	.7223	1622.7	1593.3	1.6045	.8445	1791.9	1045.6
8	-11.807	-7.775	753.3	888.3	753.3	559.2	.0	690.2	.0	50.8	.7075	.7169	1665.2	1628.1	1.7166	.8812	1827.6	1091.9
9	-18.226	-15.276		834.4	715.8	465.7	.0	692.3	.0	55.7	.6690	.6633	1786.8	1727.4	1.7991	.9023	1924.8	1136.1
10	-19.348	-17.528	702.3	820.5	702.3	421.2	.0	704.1	.0	58.6	.6553	.6477	1827.3	1761.7	1.8267	.8986	1957.6	1138.3
11	-19.321	-19.113	696.1	807.4	696.1	370.3	.0	717.4	.0	62.3	.6490	.6328	1862.7	1796.3	1.8541	.8933	1988.5	1139.8

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	SEFF-P TOT-ST	SEFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VB'-1 FT/SEC	VB'-2 FT/SEC
1	-.37	3.84	13.23	35.97	35.50	65.11	.5610	.0923	.0173	2.6190	95.98	95.41	62.20	26.22	-1012.1	-313.3
2	-.30	3.44	11.56	30.67	37.82	66.09	.5628	.0782	.0149	2.5924	96.13	95.58	61.65	30.99	-1073.8	-381.9
3	-.48	3.06	10.49	26.12	39.81	66.17	.5641	.0778	.0149	2.5671	95.67	95.07	61.24	35.12	-1132.6	-443.0
4	.41	2.91	9.46	17.26	43.34	61.99	.5958	.1444	.0273	2.5309	90.37	89.08	61.55	44.28	-1293.0	-568.2
5	1.13	3.14	9.35	8.56	45.29	56.22	.5929	.2020	.0343	2.4795	84.42	82.34	63.22	54.66	-1485.9	-737.4
6	1.09	2.91	7.34	6.94	45.65	57.82	.5623	.1950	.0322	2.4829	84.14	82.02	64.28	57.34	-1579.0	-833.7
7	1.04	2.76	6.43	6.90	45.59	60.33	.5391	.1814	.0299	2.4959	84.87	82.84	64.97	58.07	-1622.7	-888.7
8	1.00	2.61	6.20	6.75	45.39	61.56	.5216	.1761	.0286	2.5000	84.94	82.93	65.76	59.01	-1665.2	-937.9
9	.57	2.07	8.72	2.73	44.18	50.65	.5233	.2468	.0326	2.4286	78.00	75.15	68.17	65.44	-1786.8	-1035.1
10	.24	1.74	8.28	.91	43.71	45.51	.5296	.2797	.0332	2.4195	75.10	71.91	68.80	67.89	-1827.3	-1057.8
11	.11	1.61	7.54	-1.53	43.49	39.76	.5360	.3128	.0320	2.4038	72.36	68.84	69.20	70.72	-1862.7	-1077.9

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.3569	2.5023	83.78	85.70	40.68

Stator

RUN NO 908, SPEED CODE 15, POINT NO 5

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.922	4.759	1113.7	748.8	724.2	748.2	846.1	-26.4	52.0	-2.0	.9381	.6026	2.4360	1.3306
2	24.856	4.379	1081.6	753.1	711.6	751.7	814.6	-45.5	50.9	-3.4	.9085	.6076	2.4725	1.3258
3	21.814	3.993	1056.2	741.7	697.7	739.8	793.0	-53.0	50.2	-4.0	.8893	.5979	2.4755	1.3249
4	12.926	2.706	1008.1	713.5	643.6	713.0	775.6	-26.3	50.8	-2.1	.8326	.5700	2.4730	1.3411
5	3.469	.460	950.4	671.6	583.9	670.6	749.9	-37.4	52.1	-3.2	.7732	.5308	2.4263	1.3889
6	-.709	-.680	934.8	682.1	590.7	681.6	724.5	-27.6	50.8	-2.3	.7583	.5393	2.4394	1.3604
7	-2.639	-1.242	932.7	695.7	607.4	695.1	707.8	-27.4	49.4	-2.3	.7568	.5510	2.4558	1.3897
8	-4.343	-1.769	930.1	698.3	619.2	697.6	694.1	-31.4	48.3	-2.6	.7545	.5527	2.4525	1.3611
9	-10.093	-2.879	895.4	655.3	559.0	653.6	699.5	-47.7	51.6	-4.2	.7169	.5115	2.3575	1.3880
10	-12.842	-3.221	890.6	643.8	530.8	642.4	715.2	-42.1	53.9	-3.7	.7083	.4990	2.3257	1.4046
11	-14.155	-3.464	888.7	646.4	499.1	645.1	731.7	-40.1	56.4	-3.5	.6978	.4993	2.3132	1.4140

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	SEFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	.87	3.86	14.25	53.97	72.61	87.91	.5039	.1590	.0367	.9310	77.81	87.40	88.86
2	1.20	4.38	10.98	54.30	72.52	89.72	.4866	.1084	.0255	.9550	83.77	90.36	91.48
3	.96	4.37	9.30	54.27	71.86	88.94	.4862	.0882	.0211	.9647	86.43	90.78	91.86
4	.37	4.61	10.40	52.94	67.15	85.90	.4906	.0805	.0193	.9780	90.16	86.33	87.93
5	.66	6.00	9.38	55.32	61.44	79.83	.5155	.0665	.0180	.9784	88.81	80.05	82.34
6	-.50	5.22	10.28	53.13	62.78	81.15	.4940	.0601	.0168	.9810	89.13	80.28	82.56
7	-1.91	3.96	10.43	51.64	65.00	82.90	.4775	.0565	.0160	.9822	89.26	81.29	83.46
8	-3.00	2.99	10.22	50.89	66.54	82.88	.4732	.0560	.0161	.9826	89.02	80.67	82.91
9	-1.63	4.59	11.10	55.80	58.86	74.72	.6229	.0945	.0282	.9729	82.49	71.37	74.63
10	-1.71	4.84	13.62	57.59	55.24	72.04	.5413	.1231	.0373	.9654	77.65	67.21	70.77
11	-4.79	1.35	16.09	59.93	51.42	71.46	.5408	.1358	.0416	.9624	74.76	65.15	68.92

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %

APPENDIX 3

BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW (TABULATIONS)

TABLE 10.1
BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO911, SPEED CODE 70, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.892	31.561	384.9	796.0	384.9	616.5	.0	503.5	.0	39.0	.3488	.7039	674.2	789.5	.7036	.6009	776.4	679.8
2	24.522	27.951	417.8	784.0	417.8	624.6	.0	473.8	.0	37.1	.3795	.6937	715.3	811.5	.7524	.6283	828.4	710.1
3	20.346	24.522	447.3	760.5	447.3	620.5	.0	439.6	.0	35.3	.4071	.6729	754.5	833.9	.7983	.6506	877.1	735.2
4	9.789	14.635	507.1	694.3	507.1	584.1	.0	375.4	.0	32.9	.4638	.6124	861.3	901.4	.9141	.6933	999.5	786.0
5	-1.999	4.905	484.7	641.2	484.7	530.4	.0	360.3	.0	34.3	.4425	.5608	989.9	992.1	1.0061	.7216	1102.2	825.0
6	-5.774	.447	430.6	607.8	430.6	480.5	.0	372.3	.0	37.6	.3914	.5276	1061.8	1037.2	1.0332	.7121	1136.6	820.3
7	-9.008	-2.032	394.3	587.8	394.3	451.1	.0	376.9	.0	39.6	.3576	.5083	1080.9	1061.3	1.0434	.7088	1150.6	819.7
8	-11.187	-4.656	366.6	566.1	366.6	422.8	.0	376.4	.0	41.3	.3319	.4880	1109.3	1084.5	1.0576	.7109	1168.3	824.7
9	-16.761	-13.014	315.5	495.8	315.5	329.8	.0	370.2	.0	47.6	.2848	.4239	1190.3	1150.7	1.1115	.7245	1231.4	847.3
10	-17.804	-15.774	305.0	474.0	305.0	303.7	.0	363.9	.0	49.3	.2751	.4046	1217.3	1173.5	1.1322	.7381	1254.9	864.7
11	-18.421	-18.141	299.7	457.1	299.7	288.3	.0	354.8	.0	50.2	.2703	.3899	1240.8	1196.0	1.1514	.7584	1276.5	889.2

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	-3.15	1.06	11.73	34.70	28.67	50.57	.2801	.1035	.0197	1.4810	93.43	93.08	59.41	24.72	-674.2	-285.9
2	-3.06	.67	8.89	30.56	30.78	51.49	.2883	.0662	.0130	1.4734	95.18	94.94	58.88	28.32	-715.3	-337.7
3	-3.13	.41	7.82	26.14	32.60	51.27	.2914	.0504	.0100	1.4513	95.56	95.36	58.59	32.45	-754.5	-394.4
4	-1.96	.54	7.33	17.03	35.96	48.07	.3182	.0770	.0151	1.3893	91.08	90.69	59.18	42.15	-861.3	-526.0
5	1.83	3.83	4.78	13.83	33.58	42.88	.3467	.1243	.0234	1.3760	84.02	83.32	63.92	50.09	-989.9	-631.9
6	4.58	6.41	4.00	13.77	29.53	38.21	.3762	.1685	.0303	1.3796	78.69	77.74	67.77	54.00	-1051.8	-664.9
7	6.08	7.80	4.73	13.64	26.93	35.59	.3874	.1839	.0317	1.3844	76.93	75.88	70.01	56.37	-1080.9	-684.4
8	6.49	8.60	6.01	12.93	24.98	33.16	.3926	.1943	.0317	1.3841	75.42	74.31	71.75	58.82	-1109.3	-708.1
9	7.44	8.94	9.84	8.47	21.45	25.54	.4039	.2383	.0301	1.3581	68.23	66.86	75.04	66.57	-1190.3	-780.5
10	7.13	8.63	9.28	6.80	20.74	23.50	.3982	.2431	.0276	1.3507	66.84	65.44	75.63	68.89	-1217.3	-809.6
11	7.04	8.54	7.48	5.46	20.38	22.35	.3854	.2391	.0246	1.3462	66.51	65.12	76.13	70.67	-1240.8	-841.2

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1214	1.3960	82.63	83.40	27.82

Stator

RUN NO911, SPEED CODE 70, POINT NO 1

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.914	6.958	867.2	941.6	716.4	938.6	488.7	-75.8	36.8	-4.5	.7742	.8496	1.3215	1.1276
2	25.086	4.758	845.6	918.9	709.9	915.8	459.4	-75.6	34.9	-4.6	.7544	.8279	1.3231	1.1238
3	22.310	4.533	818.1	901.7	696.4	898.5	429.3	-75.7	33.2	-4.7	.7292	.8126	1.3270	1.1183
4	14.089	3.864	745.7	852.1	646.9	848.6	370.8	-77.1	30.4	-5.2	.6615	.7662	1.3321	1.1087
5	5.937	2.478	687.0	774.5	586.3	770.6	358.2	-77.9	31.5	-5.8	.6038	.6879	1.3124	1.1131
6	7.474	1.536	653.5	755.6	538.4	752.3	370.5	-70.4	34.6	-5.4	.5700	.6670	1.3282	1.1210
7	.801	.925	635.1	748.3	511.3	745.5	376.7	-65.8	36.4	-5.0	.5517	.6583	1.3419	1.1264
8	-1.383	.234	616.1	738.8	486.6	735.9	377.8	-64.8	37.8	-5.0	.5335	.6481	1.3537	1.1299
9	-8.892	-1.848	557.5	700.4	413.2	696.2	374.3	-76.5	42.3	-6.2	.4790	.6099	1.3297	1.1365
10	-12.440	-2.621	539.8	697.6	393.3	693.2	369.8	-78.7	43.7	-6.4	.4630	.6072	1.3238	1.1368
11	-16.231	-3.296	529.7	704.7	387.3	700.2	361.4	-79.2	43.8	-6.4	.4542	.6141	1.3228	1.1360

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-14.36	-11.37	11.72	41.27	56.09	67.11	.0630	.3285	.0757	.8923	252.54	65.02	66.33
2	-14.83	-11.64	9.76	39.50	56.21	61.86	.0651	.3234	.0758	.8975	256.72	67.38	68.60
3	-16.08	-12.67	8.59	37.93	55.45	61.85	.0516	.2876	.0686	.9123	227.60	71.32	72.40
4	-20.87	-15.82	7.33	35.57	51.72	60.87	.0151	.1673	.0421	.9569	148.62	78.58	79.40
5	-19.93	-14.59	6.79	37.32	46.36	55.56	.0518	.2116	.0569	.9527	175.31	71.52	72.55
6	-16.76	-11.03	7.25	39.91	42.00	53.93	.0403	.1758	.0488	.9644	149.86	69.88	71.02
7	-14.92	-9.05	7.64	41.41	39.59	53.14	.0292	.1497	.0423	.9713	136.73	69.39	70.60
8	-13.50	-7.51	7.77	42.83	37.46	52.17	.0173	.1322	.0379	.9762	128.42	69.62	70.85
9	-10.92	-4.71	9.02	48.58	31.32	48.24	-.0148	.1490	.0444	.9784	122.84	62.16	63.61
10	-11.42	-5.67	10.92	50.08	29.71	47.70	-.0454	.1397	.0421	.9811	118.32	61.00	62.48
11	-17.41	-11.27	13.24	50.16	29.25	47.94	-.0736	.1321	.0403	.9826	115.31	61.21	62.67

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
8716.	124.12	1.1214	1.3293	69.82	70.98

TABLE 10.2
BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

RUN NO911, SPEED CODE 70, POINT NO 2

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.785	31.140	348.2	765.2	348.2	582.4	.0	539.8	.0	44.5	.3149	.6711	675.1	790.9	.6089	.5241	759.8	597.5
2	24.376	27.272	377.7	750.9	377.7	554.6	.0	506.3	.0	42.1	.3421	.6591	716.2	812.5	.7335	.5560	809.7	633.5
3	20.044	23.638	403.8	726.3	403.8	549.0	.0	475.5	.0	40.7	.3665	.6371	755.4	835.0	.7773	.5757	856.6	656.3
4	9.086	13.283	454.1	655.4	454.1	504.7	.0	418.0	.0	39.6	.4135	.5723	862.4	902.6	.8876	.6110	974.7	699.7
5	-2.770	3.081	420.3	606.4	420.3	452.1	.0	404.2	.0	41.8	.3818	.5252	991.1	953.4	.9780	.6432	1076.5	742.7
6	-7.689	-1.575	368.3	583.7	368.3	403.2	.0	422.0	.0	46.2	.3334	.5017	1053.2	1038.5	1.0101	.6332	1115.7	736.7
7	-9.913	-4.161	335.6	570.3	335.6	371.8	.0	432.4	.0	49.1	.3033	.4881	1082.3	1062.7	1.0240	.6263	1133.1	731.8
8	-11.966	-6.890	313.2	559.0	313.2	346.0	.0	439.1	.0	51.5	.2827	.4768	1110.7	1085.9	1.0416	.6257	1154.0	733.6
9	-17.098	-14.876	270.5	531.7	270.5	281.4	.0	451.1	.0	57.6	.2437	.4498	1151.8	1152.2	1.1008	.6390	1222.1	755.4
10	-18.086	-17.202	261.4	522.4	261.4	260.8	.0	452.7	.0	59.5	.2354	.4408	1218.8	1175.0	1.1224	.6480	1246.5	768.0
11	-18.614	-19.249	256.3	514.2	256.3	242.3	.0	453.6	.0	61.5	.2307	.4329	1242.4	1197.5	1.1420	.6587	1268.6	782.4

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	-.69	3.52	11.55	37.33	26.00	46.04	.3824	.1030	.0196	1.5264	94.14	93.80	61.87	24.54	-675.1	-250.7
2	-.57	3.16	9.25	32.70	27.96	47.42	.3759	.0543	.0106	1.5198	96.44	96.25	61.37	28.68	-716.2	-306.3
3	-.61	2.93	8.42	28.06	29.64	47.10	.3771	.0440	.0087	1.5000	96.50	96.32	61.12	33.05	-755.4	-359.5
4	.73	3.23	8.99	18.06	32.63	43.31	.4018	.0802	.0153	1.4446	91.92	91.52	61.87	43.81	-862.4	-464.6
5	4.95	6.46	7.22	14.51	29.69	38.37	.4206	.1708	.0216	1.4438	86.57	85.89	67.04	52.54	-991.1	-589.2
6	7.60	9.43	6.68	14.11	25.85	33.75	.4535	.1716	.0288	1.4538	81.25	80.26	70.79	56.69	-1053.2	-616.5
7	8.93	10.65	7.64	13.58	23.49	30.88	.4711	.1975	.0314	1.4604	78.65	77.51	72.86	59.28	-1082.3	-630.3
8	9.57	11.18	8.82	12.70	21.90	28.59	.4814	.2176	.0326	1.4633	76.44	75.18	74.33	61.63	-1110.7	-646.9
9	9.53	11.03	11.05	9.36	18.90	23.01	.4959	.2673	.0322	1.4630	70.45	68.86	77.13	67.77	-1191.8	-701.0
10	9.14	10.64	10.15	7.94	18.28	21.28	.4943	.2795	.0305	1.4622	68.86	67.18	77.70	69.76	-1218.8	-722.3
11	9.02	10.52	8.48	6.44	17.93	19.76	.4904	.2900	.0283	1.4614	67.44	65.69	78.11	71.67	-1242.4	-743.9

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1383	1.4656	83.50	84.34	24.80

RUN NO911, SPEED CODE 70, POINT NO 2

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.314	4.728	820.6	745.4	632.2	744.4	523.1	-38.3	42.0	-2.9	.7248	.6524	1.4756	1.1388
2	24.235	4.256	798.5	724.5	630.1	723.5	490.5	-39.2	39.8	-3.0	.7052	.6343	1.4707	1.1313
3	21.261	3.822	770.7	701.4	615.1	700.1	464.2	-43.1	38.5	-3.5	.6797	.6137	1.4591	1.1274
4	12.702	2.372	695.1	633.5	559.2	631.2	412.9	-53.7	36.9	-4.8	.6095	.5520	1.4261	1.1211
5	4.584	-.741	640.6	577.4	498.1	575.3	402.8	-49.5	39.0	-4.9	.5565	.4991	1.4237	1.1277
6	1.335	-2.852	616.0	556.2	449.5	554.5	421.2	-44.0	43.1	-4.5	.5311	.4777	1.4320	1.1373
7	-.425	-4.271	602.7	547.2	419.8	545.6	432.5	-40.9	45.8	-4.3	.5174	.4681	1.4391	1.1444
8	-2.348	-5.898	591.4	539.0	394.6	537.7	440.4	-38.1	48.1	-4.1	.5059	.4595	1.4462	1.1507
9	-8.944	-11.765	566.3	523.1	335.1	522.2	456.6	-31.5	53.9	-3.5	.4804	.4423	1.4389	1.1666
10	-11.676	-13.908	558.7	522.5	316.8	521.7	460.2	-29.6	55.8	-3.3	.4727	.4407	1.4334	1.1716
11	-14.588	-13.792	553.0	542.4	301.7	542.2	463.4	-27.8	57.4	-3.0	.4668	.4577	1.4259	1.1764

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-9.09	-6.10	13.35	44.91	51.88	61.81	.2461	.1129	.0261	.9667	46.77	86.09	86.80
2	-9.91	-6.73	11.34	42.83	52.33	60.80	.2464	.1109	.0260	.9686	48.20	88.78	89.34
3	-10.79	-7.38	9.87	41.95	51.37	59.26	.2480	.0989	.0236	.9732	53.32	89.50	90.02
4	-13.55	-9.30	7.66	41.76	46.98	54.08	.2608	.0599	.0151	.9865	70.85	88.16	88.71
5	-12.43	-7.10	7.66	43.95	41.60	48.95	.2928	.0704	.0190	.9865	68.58	83.20	83.99
6	-8.17	-2.45	8.06	47.69	37.12	46.62	.3097	.0738	.0205	.9869	66.51	78.71	79.73
7	-5.45	.42	8.38	50.14	34.43	45.47	.3181	.0729	.0206	.9876	65.47	75.92	77.09
8	-3.18	2.81	8.72	52.20	32.19	44.43	.3235	.0716	.0205	.9884	63.51	73.79	75.08
9	.63	6.84	11.75	57.41	27.03	42.14	.3365	.1132	.0338	.9835	28.72	65.77	67.45
10	.20	6.44	14.03	59.09	25.50	41.70	.3330	.1383	.0419	.9805	-7.73	63.16	64.94
11	-3.77	2.37	16.63	60.42	24.23	42.60	.2950	.1764	.0541	.9757	-272.37	60.48	62.36

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
8727.	110.68	1.1383	1.4396	79.35	80.36

TABLE 10.3
BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

RUN NO911, SPEED CODE 95, POINT NO 1

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.911	31.813	499.1	1016.3	499.1	731.7	.0	705.3	.0	43.8	.4561	.8772	918.2	1075.1	.9551	.7077	1045.1	819.9
2	24.512	28.385	544.4	1004.4	544.4	723.7	.0	696.5	.0	43.9	.4995	.8639	974.2	1105.2	1.0239	.7149	1116.0	831.2
3	20.310	25.005	585.2	979.4	585.2	714.1	.0	670.3	.0	43.3	.5391	.8406	1027.5	1135.7	1.0892	.7316	1182.5	852.4
4	9.574	15.138	672.0	898.3	672.0	692.6	.0	572.0	.0	39.8	.6248	.7689	1173.0	1227.7	1.2569	.8163	1351.9	953.7
5	-1.698	5.315	655.8	800.8	655.8	579.9	.0	552.2	.0	43.7	.6087	.6730	1348.1	1351.2	1.3913	.8298	1499.1	987.3
6	-6.036	.802	588.7	780.5	588.7	547.5	.0	556.2	.0	45.3	.5424	.6509	1432.5	1412.6	1.4271	.8476	1548.7	1016.4
7	-8.213	-1.770	541.1	767.8	541.1	524.6	.0	560.6	.0	46.6	.4984	.6373	1472.1	1445.4	1.4387	.8538	1568.4	1028.7
8	-10.451	-4.360	502.4	752.8	502.4	501.0	.0	561.8	.0	47.9	.4593	.6222	1510.7	1477.0	1.4553	.8624	1592.0	1043.4
9	-16.397	-13.019	448.4	691.0	448.4	404.6	.0	560.2	.0	53.5	.4081	.5641	1621.0	1567.1	1.5309	.8858	1681.9	1085.2
10	-17.574	-15.803	436.9	670.5	436.9	373.5	.0	556.9	.0	55.4	.3973	.5455	1657.8	1598.2	1.5591	.8999	1714.4	1106.3
11	-18.285	-18.213	430.8	653.9	430.8	353.4	.0	550.2	.0	56.7	.3916	.5307	1689.9	1628.8	1.5853	.9212	1743.9	1135.0

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VB'-1 FT/SEC	VB'-2 FT/SEC
1	-1.93	2.78	13.71	33.93	36.31	65.69	.3765	.1933	.0362	1.9817	89.66	88.64	60.63	26.70	-918.2	-369.9
2	-1.96	1.77	10.05	30.52	38.82	65.03	.4120	.2042	.0396	1.9699	87.71	86.51	59.99	29.47	-974.2	-408.7
3	-2.12	1.42	8.58	26.38	40.90	64.22	.4259	.2073	.0408	1.9369	86.36	85.06	59.60	33.21	-1027.5	-465.5
4	-1.29	1.21	8.82	16.21	44.56	62.29	.4132	.1741	.0333	1.8259	84.92	83.19	55.05	43.64	-1173.0	-655.0
5	1.97	3.98	8.83	9.92	41.96	50.32	.4498	.2596	.0447	1.7464	74.17	72.10	64.06	54.14	-1348.1	-799.0
6	4.47	6.30	7.27	10.39	37.05	46.98	.4514	.2564	.0424	1.8004	74.68	72.52	67.67	57.27	-1432.5	-856.3
7	5.90	7.62	7.46	10.73	33.80	44.72	.4531	.2516	.0402	1.8413	75.40	73.24	69.83	59.10	-1472.1	-884.9
8	6.84	8.45	8.16	10.64	31.24	42.51	.4526	.2461	.0376	1.8744	76.00	73.83	71.61	60.97	-1510.7	-915.2
9	6.79	8.29	10.08	6.79	27.04	33.94	.4569	.2816	.0341	1.8595	71.36	68.82	74.39	67.60	-1621.0	-1007.0
10	6.40	7.90	10.14	5.22	27.15	31.31	.4528	.2910	.0318	1.8524	70.05	67.41	74.97	69.75	-1657.8	-1041.3
11	6.90	7.80	8.28	3.92	26.79	29.68	.4429	.2940	.0290	1.8483	69.38	66.68	75.39	71.46	-1689.9	-1078.6

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2493	1.8473	76.84	78.72	35.24

RUN NO911, SPEED CODE 95, POINT NO 1

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	28.397	4.991	1090.6	1058.1	848.4	1051.0	685.2	-122.3	41.6	-6.5	.9524	.9192	1.6364	1.2431
2	25.832	4.776	1069.5	1036.2	824.9	1028.8	680.7	-123.6	41.8	-6.7	.9290	.8959	1.6438	1.2458
3	23.188	4.551	1040.7	1027.0	808.7	1019.0	655.2	-128.1	40.9	-7.1	.9016	.8864	1.6675	1.2465
4	15.343	3.863	953.8	986.1	768.5	976.1	565.0	-139.4	37.1	-8.1	.8226	.8544	1.7236	1.2251
5	6.791	2.132	853.8	885.8	653.8	875.9	549.1	-132.6	40.2	-8.6	.7223	.7530	1.6880	1.2367
6	2.554	1.061	832.9	864.0	621.8	854.7	554.1	-126.4	41.7	-8.4	.6991	.7286	1.7315	1.2485
7	.397	.429	821.1	858.9	600.3	848.1	560.1	-122.8	43.0	-8.2	.6859	.7193	1.7701	1.2669
8	-1.692	-.253	808.8	848.3	580.7	839.6	563.0	-121.2	44.1	-8.2	.6728	.7091	1.8098	1.2639
9	-9.340	-2.096	760.9	814.4	508.3	804.7	566.2	-125.2	48.3	-8.8	.6255	.6730	1.7839	1.2817
10	-12.801	-2.742	746.3	813.9	486.8	804.1	565.6	-126.0	49.7	-8.8	.6114	.6713	1.7751	1.2860
11	-16.467	-3.314	737.2	823.4	478.8	813.6	560.6	-126.1	50.3	-8.7	.6029	.6794	1.7734	1.2874

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-P TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-9.50	-6.51	9.76	48.10	71.81	75.39	.1992	.3943	.0905	.8252	-400.90	62.00	64.49
2	-7.89	-4.71	7.66	48.52	70.39	75.35	.2080	.3873	.0905	.8330	-336.34	62.00	64.52
3	-8.40	-4.99	6.27	47.93	69.41	76.19	.2003	.3418	.0812	.8571	-289.83	63.88	66.32
4	-13.34	-9.10	4.41	45.21	66.60	78.22	.1612	.1717	.0430	.9370	396.03	74.71	76.53
5	-11.27	-5.93	3.96	48.82	55.07	70.42	.1804	.1003	.0268	.9703	221.43	68.09	70.31
6	-9.58	-3.86	4.19	50.14	51.89	68.16	.1922	.1053	.0291	.9704	226.22	68.26	70.58
7	-8.29	-2.47	4.44	51.24	49.81	67.05	.1940	.1079	.0303	.9707	208.48	68.90	71.25
8	-7.21	-1.23	4.59	52.30	47.96	65.76	.1967	.1198	.0341	.9685	204.30	69.88	72.24
9	-4.97	1.24	6.46	57.09	41.30	60.82	.2012	.1759	.0521	.9596	197.68	63.76	66.53
10	-5.44	.41	8.51	58.58	39.38	60.07	.1894	.1852	.0555	.9591	180.86	62.20	65.06
11	-10.90	-4.76	10.90	59.01	38.69	60.29	.1703	.1868	.0567	.9595	163.78	61.79	64.68

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %

TABLE 10.4
BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO911• SPEED CODE 95• POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.414	31.649	493.4	1027.6	493.4	722.6	.0	730.8	.0	45.1	.4507	.8852	915.7	1072.2	.9501	.6886	1040.2	799.3
2	24.527	28.230	538.5	1012.7	538.5	720.6	.0	711.5	.0	44.6	.4938	.8703	971.5	1102.1	1.0186	.7044	1110.7	819.7
3	20.282	24.826	579.4	985.4	579.4	713.9	.0	679.2	.0	43.7	.5334	.8455	1024.7	1132.6	1.0837	.7256	1177.1	845.7
4	9.402	14.961	665.5	899.0	665.5	675.6	.0	593.1	.0	41.5	.6183	.7669	1169.8	1224.3	1.2504	.7887	1345.9	924.6
5	-1.655	5.170	645.5	800.7	645.5	552.3	.0	579.8	.0	46.5	.5984	.6697	1344.4	1347.5	1.3824	.7910	1491.3	945.7
6	-5.850	.680	579.6	790.7	579.6	528.6	.0	588.0	.0	47.9	.5336	.6563	1428.5	1408.7	1.4193	.8102	1541.7	976.1
7	-8.091	-1.836	533.4	784.3	533.4	511.6	.0	594.5	.0	49.0	.4889	.6460	1468.1	1441.5	1.4318	.8175	1562.0	989.5
8	-10.438	-4.503	496.9	774.3	496.9	493.2	.0	596.9	.0	50.0	.4541	.6371	1506.5	1473.0	1.4495	.8273	1586.4	1005.4
9	-16.735	-13.712	442.8	717.3	442.8	390.1	.0	601.9	.0	56.4	.4028	.5821	1616.5	1562.8	1.5250	.8417	1676.1	1037.1
10	-17.889	-15.960	431.4	698.4	431.4	354.9	.0	601.5	.0	58.8	.3921	.5645	1653.2	1593.8	1.5532	.8518	1708.6	1053.9
11	-18.451	-18.328	425.4	682.9	425.4	327.8	.0	599.0	.0	60.8	.3866	.5501	1685.2	1624.3	1.5794	.8671	1738.1	1076.4

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	V0'-1 FT/SEC	V0'-2 FT/SEC
1	-1.71	2.50	12.18	35.68	35.95	65.61	.3991	.1894	.0359	2.0308	90.20	89.20	60.85	25.17	-915.7	-341.6
2	-1.75	1.98	9.02	31.75	38.48	65.73	.4240	.1825	.0358	2.0182	89.32	88.24	60.13	28.44	-971.5	-390.6
3	-1.95	1.59	7.86	27.27	40.59	65.33	.4315	.1757	.0348	1.9830	88.55	87.42	59.77	32.50	-1024.7	-453.4
4	-1.13	1.37	8.42	16.77	44.28	61.75	.4374	.1739	.0334	1.8660	85.01	83.67	60.01	43.24	-1169.8	-631.2
5	2.26	4.27	9.06	9.98	41.46	48.92	.4803	.2639	.0452	1.7987	74.92	72.81	64.36	54.37	-1344.4	-767.7
6	4.72	6.55	7.08	10.84	36.60	46.47	.4811	.2563	.0426	1.8731	76.01	73.84	67.92	57.08	-1428.5	-820.6
7	6.10	7.82	6.98	11.41	33.43	44.80	.4825	.2488	.0403	1.9263	77.02	74.85	70.03	58.63	-1468.1	-847.0
8	6.98	8.59	7.47	11.46	31.00	43.07	.4814	.2410	.0376	1.9683	77.81	75.64	71.74	60.29	-1506.5	-876.1
9	6.96	8.46	10.68	7.16	27.59	33.69	.4919	.2837	.0347	1.9603	72.86	70.23	74.56	67.41	-1616.5	-960.9
10	6.57	8.07	10.20	5.32	26.90	30.59	.4901	.2971	.0323	1.9539	71.30	68.54	75.13	69.81	-1653.2	-992.3
11	6.44	7.94	8.71	3.64	26.56	28.27	.4838	.3066	.0296	1.9499	70.15	67.29	75.53	71.89	-1685.2	-1025.3

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2609	1.9117	77.78	79.68	34.90

Stator

RUN NO911• SPEED CODE 95• POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	28.167	4.744	1098.9	984.3	838.7	983.0	710.0	-51.7	42.9	-2.9	.9573	.8425	1.8395	1.2512
2	25.510	4.382	1075.0	960.5	821.2	959.0	693.7	-54.5	42.4	-3.2	.9328	.8193	1.8355	1.2514
3	22.431	4.099	1043.9	936.0	805.4	933.8	664.1	-64.0	41.3	-3.9	.9037	.7973	1.8262	1.2471
4	15.004	3.345	950.5	853.1	748.5	848.4	585.8	-89.5	38.8	-6.0	.8165	.7235	1.7874	1.2329
5	6.257	1.762	847.7	753.7	621.5	749.7	576.5	-78.0	43.0	-5.9	.7131	.6278	1.7566	1.2486
6	1.932	.762	836.0	742.4	596.5	739.5	585.7	-65.3	44.5	-5.0	.6978	.6138	1.8153	1.2627
7	-.166	.164	829.9	740.0	579.4	737.8	594.2	-57.8	45.7	-4.5	.6895	.6092	1.8607	1.2725
8	-2.127	-.464	823.2	735.9	566.0	734.1	597.8	-52.1	46.6	-4.1	.6814	.6037	1.9085	1.2799
9	-9.200	-2.183	778.7	703.7	486.3	702.0	608.1	-48.8	51.5	-4.0	.6360	.5703	1.8913	1.3017
10	-12.581	-2.799	765.0	703.3	460.8	701.7	610.7	-48.1	53.4	-3.9	.6223	.5683	1.8849	1.3089
11	-16.311	-3.323	756.2	712.0	446.1	710.4	610.5	-48.0	54.6	-3.8	.6133	.5750	1.8834	1.3124

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-8.22	-5.73	13.31	45.82	71.94	83.48	.2609	.2116	.0488	.9058	20.75	75.62	77.59
2	-7.30	-4.12	11.19	45.59	71.29	82.62	.2680	.2094	.0492	.9098	22.74	75.27	77.26
3	-7.98	-4.57	9.47	45.15	70.48	81.56	.2710	.1917	.0458	.9202	28.20	75.95	77.86
4	-11.65	-7.41	6.51	44.80	66.12	76.58	.2847	.1264	.0318	.9545	50.88	77.41	79.14
5	-8.47	-3.13	6.63	48.94	53.61	66.90	.3192	.0678	.0182	.9805	73.42	70.18	72.41
6	-6.82	-1.10	7.55	44.54	51.18	65.28	.3290	.0840	.0233	.9766	66.96	70.60	72.92
7	-5.58	.29	8.20	50.19	49.53	64.53	.3314	.0940	.0266	.9744	61.63	71.11	73.48
8	-4.76	1.23	8.74	50.61	48.27	63.67	.3341	.1107	.0317	.9704	53.69	72.33	74.69
9	-1.72	4.50	11.30	55.50	40.81	58.84	.3495	.1480	.0442	.9650	27.43	66.07	68.91
10	-2.14	4.06	13.45	57.28	38.48	58.12	.3431	.1519	.0460	.9654	8.98	64.18	67.14
11	-6.61	-.47	15.79	58.41	37.16	58.37	.3278	.1528	.0468	.9659	-21.55	63.34	66.39

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11837.	155.74	1.2609	1.8283	72.02	74.25

TABLE 10.5
BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO911, SPEED CODE 95, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.973	31.656	491.3	1018.7	491.3	709.7	.0	730.8	.0	45.6	.4487	.8763	915.8	1072.3	.9491	.6775	1039.3	787.6
2	24.617	28.151	535.8	1003.8	535.8	708.7	.0	710.9	.0	45.0	.4913	.8616	971.6	1102.2	1.0172	.6949	1109.5	809.6
3	20.385	24.725	576.3	978.0	576.3	703.8	.0	679.0	.0	44.0	.5304	.8382	1024.8	1132.7	1.0821	.7177	1175.7	837.4
4	9.435	14.824	661.6	896.1	661.6	668.9	.0	596.3	.0	41.9	.6144	.7637	1169.9	1224.4	1.2481	.7820	1344.0	917.6
5	-1.825	5.059	639.4	798.7	639.4	545.5	.0	583.4	.0	47.0	.5923	.6674	1344.5	1347.6	1.3792	.7845	1488.8	938.9
6	-6.145	.563	572.5	790.1	572.5	521.0	.0	594.0	.0	48.6	.5267	.6550	1428.7	1408.8	1.4160	.8018	1539.1	967.1
7	-8.449	-1.943	525.9	785.0	525.9	504.7	.0	601.2	.0	49.7	.4818	.6478	1468.2	1441.6	1.4286	.8089	1559.5	980.3
8	-10.858	-4.705	489.8	775.0	489.8	485.7	.0	603.9	.0	50.8	.4472	.6369	1506.7	1473.1	1.4467	.8183	1584.3	995.8
9	-17.286	-13.433	435.3	721.0	435.3	377.2	.0	614.5	.0	57.8	.3958	.5839	1616.7	1563.0	1.5225	.8266	1674.3	1020.8
10	-18.336	-16.120	424.0	702.6	424.0	340.1	.0	614.9	.0	60.4	.3853	.5666	1653.4	1594.0	1.5509	.8358	1706.9	1036.5
11	-18.722	-18.433	418.4	687.4	418.4	311.4	.0	612.8	.0	62.6	.3800	.5524	1685.4	1624.4	1.5772	.8506	1736.5	1058.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	-1.60	7.62	12.56	35.42	35.82	65.00	.4096	.1851	.0350	2.0354	90.46	89.48	60.97	25.55	-915.8	-341.5
2	-1.61	2.12	9.44	31.47	38.32	65.26	.4320	.1753	.0342	2.0245	89.78	88.74	60.34	28.87	-971.6	-391.4
3	-1.80	1.74	8.23	27.06	40.42	65.08	.4378	.1658	.0327	1.9935	89.26	88.19	59.93	32.86	-1024.8	-453.7
4	-.90	1.52	8.54	16.75	44.08	61.88	.4427	.1619	.0311	1.8880	86.18	84.92	60.16	43.37	-1169.9	-628.1
5	2.48	4.49	9.27	9.99	41.16	48.92	.4851	.2521	.0429	1.8241	76.28	74.23	64.57	54.58	-1344.5	-764.2
6	4.48	6.81	7.27	10.90	36.26	46.33	.4876	.2476	.0410	1.9010	77.09	74.98	68.17	57.27	-1428.7	-814.8
7	6.38	8.10	7.13	11.54	33.07	44.68	.4894	.2412	.0389	1.9553	77.98	75.86	70.31	58.77	-1468.2	-840.4
8	7.25	8.86	7.66	11.54	30.68	42.85	.4886	.2363	.0367	1.9930	78.44	76.25	72.02	60.48	-1506.7	-869.2
9	7.25	8.75	11.11	7.02	27.26	32.80	.5041	.2885	.0346	1.9823	72.72	70.04	74.86	67.84	-1616.7	-948.5
10	6.85	8.35	10.76	5.04	26.58	29.51	.5026	.3036	.0322	1.9750	71.06	68.22	75.41	70.37	-1653.4	-979.1
11	6.70	8.20	9.35	3.25	26.25	27.02	.4964	.3146	.0293	1.9701	69.82	66.88	75.79	72.54	-1685.4	-1011.6

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.2630	1.9316	78.50	80.36	34.64

Stator

RUN NO911, SPEED CODE 95, POINT NO 4

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	28.089	4.738	1087.8	961.5	823.9	960.4	710.2	-46.6	43.4	-2.7	.9459	.8203	1.8662	1.2513
2	25.379	4.365	1064.3	938.0	807.7	936.7	693.0	-49.3	42.8	-2.9	.9220	.7977	1.8617	1.2511
3	22.678	4.087	1034.6	913.3	793.6	911.5	663.9	-57.9	41.7	-3.6	.8944	.7758	1.8513	1.2468
4	14.865	3.343	945.3	830.1	739.4	826.0	589.0	-82.3	39.3	-5.7	.8110	.7017	1.8099	1.2342
5	6.321	1.798	843.1	729.9	611.9	726.0	580.0	-75.5	43.6	-5.9	.7083	.6050	1.7809	1.2501
6	2.148	.813	832.5	717.6	586.3	715.1	591.1	-59.6	45.3	-4.8	.6940	.5914	1.8398	1.2649
7	.136	.222	827.7	714.5	569.2	712.8	601.0	-49.7	46.5	-4.0	.6866	.5860	1.8844	1.2756
8	-1.769	-.398	821.3	709.4	556.4	708.1	604.1	-41.7	47.3	-3.4	.6788	.5798	1.9305	1.2826
9	-8.627	-2.161	779.1	673.4	471.3	672.2	620.4	-39.3	52.9	-3.3	.6348	.5430	1.9108	1.3077
10	-12.094	-2.803	765.5	671.7	443.5	670.6	624.0	-38.8	55.0	-3.3	.6211	.5398	1.9038	1.3156
11	-15.991	-3.345	756.3	679.4	426.5	678.3	624.6	-38.7	56.4	-3.2	.6117	.5455	1.9020	1.3197

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-7.72	-4.73	13.51	46.12	71.46	84.06	.2732	.1898	.0438	.9169	35.37	77.54	79.39
2	-6.89	-3.71	11.43	45.76	70.94	83.11	.2800	.1886	.0443	.9202	36.56	77.27	79.14
3	-7.60	-4.19	9.76	45.25	70.29	81.91	.2841	.1748	.0418	.9285	40.87	77.89	79.69
4	-11.78	-6.43	6.84	44.95	66.21	76.41	.3033	.1237	.0311	.9560	58.35	78.79	80.45
5	-7.05	-7.51	6.64	49.56	53.53	66.31	.3441	.0701	.0188	.9800	76.83	71.57	73.75
6	-6.06	-.34	7.84	50.02	50.98	64.57	.3555	.0886	.0246	.9756	71.08	71.72	74.00
7	-4.75	1.12	8.69	50.53	49.27	63.73	.3600	.1008	.0285	.9727	66.65	71.88	74.22
8	-3.98	2.01	9.42	50.70	48.04	62.81	.3637	.1182	.0339	.9685	60.75	73.04	75.37
9	-.34	5.87	11.93	56.25	39.92	57.60	.3905	.1530	.0457	.9639	46.35	65.93	68.82
10	-.61	5.63	14.06	58.25	37.36	56.79	.3868	.1550	.0470	.9648	38.99	63.86	66.91
11	-4.84	1.30	16.39	59.58	35.83	56.99	.3731	.1555	.0477	.9655	27.94	62.94	66.07

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %

BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

RUN NO 11, SPEED CODE 10, POINT NO 1

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.908	31.831	517.7	1066.8	517.7	753.9	.0	754.9	.0	44.9	.4739	.9154	982.0	1127.4	1.0006	.7215	1093.2	840.9
2	24.505	28.440	566.5	1052.5	566.5	743.5	.0	745.0	.0	45.1	.5208	.8996	1021.5	1158.9	1.0739	.7273	1168.0	851.0
3	20.278	25.086	611.3	1020.9	611.3	737.0	.0	709.5	.0	43.9	.5646	.8716	1077.4	1190.9	1.1441	.7540	1238.7	883.2
4	9.569	15.318	707.5	926.8	707.5	702.9	.0	604.0	.0	40.9	.6606	.7877	1230.0	1287.3	1.3250	.8332	1419.0	980.3
5	-1.698	5.575	695.9	832.4	695.9	590.0	.0	587.2	.0	45.0	.6489	.6938	1413.6	1416.8	1.4591	.8486	1576.6	1018.1
6	-5.869	.908	627.7	812.2	627.7	559.6	.0	588.7	.0	46.3	.5808	.6718	1502.1	1481.2	1.5062	.8712	1628.0	1053.4
7	-8.022	-1.673	578.3	799.9	578.3	537.1	.0	592.8	.0	47.9	.5323	.6583	1543.6	1513.6	1.5174	.8788	1648.4	1067.8
8	-10.279	-4.348	538.3	785.8	538.3	513.6	.0	594.8	.0	48.8	.4936	.6438	1584.1	1548.8	1.5342	.8877	1673.0	1083.5
9	-16.360	-13.014	482.1	730.5	482.1	417.8	.0	599.3	.0	54.4	.4399	.5902	1699.7	1643.3	1.6123	.9085	1766.8	1124.6
10	-17.561	-15.807	470.4	711.7	470.4	385.4	.0	598.3	.0	56.5	.4289	.5727	1738.3	1675.8	1.6419	.9208	1800.8	1149.4
11	-18.256	-18.217	464.1	695.8	464.1	362.5	.0	593.9	.0	58.0	.4229	.5582	1772.0	1707.9	1.6692	.9399	1831.7	1171.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	-1.67	2.55	13.20	34.71	37.45	68.70	.3959	.2201	.0413	2.1163	88.66	87.43	60.90	26.19	-962.8	-372.5
2	-1.77	1.47	9.70	31.05	40.07	67.82	.4327	.2332	.0454	2.0990	86.56	85.11	60.18	29.13	-1021.5	-413.9
3	-2.03	1.51	8.84	26.22	42.29	67.51	.4352	.2191	.0430	2.0519	85.91	84.45	59.69	33.47	-1077.4	-485.4
4	-1.34	1.11	5.60	15.32	46.13	64.05	.4292	.2027	.0382	1.9030	82.46	80.84	59.75	44.42	-1230.0	-683.3
5	1.70	3.71	9.39	9.09	43.56	51.85	.4634	.2833	.0481	1.8285	72.81	70.46	63.80	54.70	-1413.6	-829.6
6	4.12	5.95	7.78	9.54	38.55	48.70	.4613	.2721	.0444	1.8964	74.05	71.66	67.32	57.78	-1502.1	-892.5
7	5.53	7.25	7.92	9.90	35.22	46.48	.4618	.2637	.0416	1.9480	75.12	72.74	69.46	59.56	-1543.6	-922.9
8	6.46	8.07	8.56	9.45	32.62	44.24	.4611	.2562	.0387	1.9513	75.95	73.56	71.22	61.37	-1584.1	-954.0
9	6.41	7.91	10.96	6.33	29.19	35.57	.4675	.2936	.0355	1.9890	71.50	68.68	74.01	67.68	-1699.7	-1044.0
10	6.02	7.52	10.19	4.78	28.51	32.77	.4650	.3051	.0332	1.9839	70.10	67.16	74.68	69.80	-1738.3	-1077.5
11	5.91	7.41	8.39	3.42	28.16	30.86	.4569	.3113	.0305	1.9808	69.24	66.22	75.00	71.58	-1772.0	-1114.0

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2777	1.9520	75.70	77.84	36.66

RUN NO 11, SPEED CODE 10, POINT NO 1

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	28.499	4.899	1142.6	1072.4	874.9	1066.8	734.8	-113.9	42.8	-5.9	.9924	.9216	1.7462	1.2724
2	25.991	4.681	1118.7	1050.8	851.0	1044.3	726.2	-116.4	42.8	-6.2	.9664	.8977	1.7526	1.2770
3	23.409	4.430	1083.9	1035.6	836.0	1028.2	689.8	-123.6	41.4	-6.8	.9345	.8848	1.7695	1.2718
4	15.697	3.699	984.9	983.4	783.7	972.9	596.5	-143.7	38.1	-8.4	.8438	.8425	1.8064	1.2489
5	6.832	1.980	887.8	883.0	668.7	872.5	583.9	-135.5	41.3	-8.8	.7452	.7412	1.7726	1.2643
6	7.464	.947	866.8	859.0	638.1	849.8	586.6	-125.0	42.6	-8.4	.7218	.7152	1.8220	1.2762
7	.292	.378	855.3	850.7	617.0	842.3	592.3	-119.0	43.8	-8.0	.7087	.7050	1.8887	1.2850
8	-1.783	-.325	843.7	842.2	597.6	834.3	595.6	-115.2	44.9	-7.9	.6960	.6949	1.9159	1.2928
9	-9.414	-2.101	802.5	817.1	526.7	809.0	605.5	-114.8	49.2	-8.0	.6533	.6659	1.9057	1.3159
10	-12.850	-2.737	789.9	819.1	504.8	811.0	607.6	-114.7	50.7	-8.0	.6405	.6658	1.8993	1.3226
11	-16.523	-3.247	781.8	829.4	494.9	821.5	605.2	-114.7	51.5	-7.9	.6323	.6742	1.8981	1.3253

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-8.36	-5.37	10.29	48.71	74.89	79.85	.2299	.3736	.0858	.8251	-134.15	63.31	66.02
2	-6.90	-3.72	8.15	49.04	73.54	79.65	.2392	.3666	.0857	.8333	-119.69	62.68	65.45
3	-7.84	-4.43	6.58	48.19	72.81	80.31	.2307	.3228	.0768	.8578	-173.90	65.19	67.81
4	-12.34	-8.10	4.14	46.49	68.68	81.17	.1989	.1552	.0385	.9415	-395.05	73.68	75.90
5	-10.16	-4.82	3.74	50.14	56.92	72.74	.2260	.0850	.0227	.9737	-316.62	67.15	69.64
6	-8.69	-2.97	4.23	50.99	53.92	70.19	.2392	.1007	.0278	.9703	-245.11	67.59	70.16
7	-7.47	-1.61	4.64	51.86	51.87	68.93	.2425	.1096	.0307	.9686	-467.04	68.38	70.98
8	-6.47	-.43	4.94	52.74	50.02	67.59	.2455	.1236	.0352	.9657	*******	69.59	72.19
9	-4.07	2.14	7.22	57.23	43.33	63.12	.2509	.1686	.0500	.9583	468.91	63.92	66.98
10	-4.83	1.47	9.35	58.73	41.31	62.46	.2408	.1759	.0529	.9579	239.12	62.22	65.40
11	-9.67	-3.53	11.76	59.38	40.43	62.70	.2231	.1775	.0540	.9583	216.63	61.63	64.86

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
12446.	163.54	1.2777	1.8271	67.58	70.16

TABLE 10.7
BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO911, SPEED CODE 10, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.960	31.809	517.7	1069.3	517.2	754.8	.0	757.4	.0	45.0	.4734	.9174	963.7	1128.3	1.0010	.7216	1093.7	841.0
2	24.547	28.443	566.6	1053.3	566.6	752.1	.0	737.5	.0	44.5	.5210	.9014	1022.4	1159.9	1.0797	.7382	1168.9	862.6
3	20.253	25.083	611.2	1022.3	611.2	742.7	.0	702.5	.0	43.6	.5645	.8733	1078.3	1191.9	1.1448	.7598	1239.5	889.4
4	9.430	15.276	705.6	927.6	705.6	696.5	.0	612.6	.0	41.6	.6587	.7871	1231.1	1288.4	1.3246	.8236	1419.0	970.5
5	-1.679	5.424	693.3	830.7	693.3	577.7	.0	597.0	.0	46.1	.6462	.6909	1414.8	1418.0	1.4686	.8350	1575.5	1004.0
6	-5.811	.835	625.9	815.1	625.9	551.5	.0	600.1	.0	47.3	.5789	.6727	1503.4	1482.4	1.5053	.8588	1628.5	1040.5
7	-7.988	-1.707	577.3	805.2	577.3	532.2	.0	609.3	.0	48.4	.5314	.6614	1545.0	1517.0	1.5181	.8679	1649.3	1056.5
8	-10.271	-4.361	537.8	792.9	537.8	511.7	.0	605.7	.0	49.4	.4932	.6486	1585.4	1550.1	1.5352	.8786	1674.2	1074.1
9	-16.443	-13.044	479.6	737.9	479.6	413.0	.0	611.5	.0	55.3	.4376	.5950	1701.2	1644.7	1.6127	.8972	1767.5	1112.7
10	-17.654	-15.833	467.2	719.3	467.2	379.0	.0	611.3	.0	57.5	.4259	.5775	1739.8	1677.3	1.6420	.9083	1801.5	1131.3
11	-18.330	-18.247	460.6	703.6	460.6	353.6	.0	608.3	.0	59.3	.4197	.5630	1773.5	1709.4	1.6693	.9255	1832.3	1156.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	-1.61	2.60	13.07	34.89	37.49	69.43	.3969	.2058	.0387	2.1380	89.51	88.36	60.95	26.06	-963.7	-370.9
2	-1.74	1.99	9.92	30.85	40.15	69.45	.4222	.1993	.0387	2.1207	88.48	87.23	60.20	29.35	-1022.4	-422.4
3	-2.01	1.53	8.88	26.19	42.32	68.68	.4302	.1949	.0382	2.0733	87.40	86.07	59.71	33.52	-1078.3	-489.4
4	-1.37	1.18	9.54	15.46	46.07	63.90	.4383	.2021	.0381	1.9234	82.70	81.08	59.82	44.37	-1231.1	-675.8
5	1.81	3.81	9.67	8.91	43.45	51.14	.4744	.2864	.0483	1.8466	72.87	70.48	63.90	54.99	-1414.8	-821.1
6	4.20	6.03	7.86	9.54	38.49	48.91	.4715	.2744	.0447	1.9218	74.25	71.83	67.40	57.86	-1503.4	-882.3
7	5.58	7.30	7.88	9.99	35.21	46.49	.4711	.2647	.0418	1.9774	75.46	73.05	69.51	69.52	-1545.0	-912.7
8	6.49	8.10	8.40	10.03	32.64	44.55	.4691	.2550	.0387	2.0243	76.46	74.06	71.25	61.22	-1585.4	-944.4
9	6.51	8.01	10.98	6.40	29.07	35.53	.4768	.2930	.0354	2.0254	72.05	69.20	74.11	67.71	-1701.2	-1033.2
10	6.14	7.64	10.30	4.79	28.35	37.56	.4748	.3055	.0331	2.0210	70.61	67.63	74.70	69.91	-1739.8	-1066.0
11	6.04	7.54	8.63	3.31	27.98	30.40	.4679	.3136	.0304	2.0181	69.61	66.54	75.13	71.81	-1773.5	-1101.1

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2817	1.9774	76.17	78.31	36.57

Stator

RUN NO911, SPEED CODE 10, POINT NO 2

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	28.418	4.822	1144.5	1040.4	878.9	1037.7	738.0	-79.4	42.1	-4.0	.9945	.8887	1.8281	1.2739
2	25.950	4.536	1119.1	1016.6	857.6	1013.6	719.1	-77.9	42.3	-4.3	.9679	.8652	1.8299	1.2742
3	23.772	4.268	1004.5	996.5	839.0	992.8	687.1	-86.7	41.2	-4.9	.9394	.8473	1.8341	1.2698
4	15.664	3.523	903.8	927.9	775.8	921.4	605.0	-109.3	38.8	-6.7	.8413	.7875	1.8323	1.2529
5	6.781	1.840	883.3	824.9	654.1	818.1	593.6	-105.6	42.4	-7.4	.7395	.6863	1.7962	1.2691
6	2.307	.815	866.4	806.1	627.0	801.0	598.0	-90.5	43.7	-6.5	.7198	.6655	1.8539	1.2821
7	.172	.212	857.2	800.4	608.2	796.2	604.1	-81.2	44.8	-5.8	.7081	.6578	1.9022	1.2914
8	-1.935	-.426	847.6	793.7	592.0	790.2	606.5	-74.7	45.7	-5.4	.6979	.6498	1.9549	1.2987
9	-9.344	-2.156	806.0	767.9	517.8	764.6	617.7	-71.3	50.2	-5.3	.6547	.6209	1.9487	1.3227
10	-12.741	-2.776	793.4	769.4	494.1	766.2	620.8	-70.7	51.9	-5.2	.6416	.6203	1.9436	1.3302
11	-16.420	-3.315	785.1	779.3	481.7	776.1	619.9	-70.6	52.9	-5.1	.6331	.6281	1.9426	1.3336

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-8.40	-5.41	12.19	46.77	75.79	83.47	.2522	.3090	.0712	.8551	-30.49	68.57	71.07
2	-7.41	-4.23	10.08	46.60	75.03	83.04	.2589	.3036	.0712	.8620	-26.03	68.61	71.11
3	-8.06	-4.65	8.47	46.07	73.89	82.86	.2555	.2697	.0643	.8814	-20.51	70.10	72.49
4	-11.66	-7.42	5.77	45.53	68.55	80.73	.2455	.1818	.0356	.9462	12.68	74.60	76.63
5	-9.07	-3.73	5.21	49.76	56.10	71.20	.2805	.0754	.0202	.9770	53.64	67.59	70.10
6	-7.65	-1.93	6.15	50.17	53.52	69.07	.2918	.0906	.0251	.9735	45.85	68.25	70.83
7	-6.50	-.63	6.86	50.61	51.69	67.97	.2938	.0992	.0280	.9717	37.32	69.09	71.70
8	-5.63	.36	7.40	51.07	50.16	66.84	.2958	.1137	.0326	.9684	23.91	70.52	73.11
9	-3.03	3.19	9.95	55.54	43.12	62.34	.3039	.1520	.0453	.9623	-53.13	64.96	68.02
10	-3.65	2.60	12.11	57.16	40.94	61.67	.2956	.1574	.0476	.9622	-201.85	63.10	66.39
11	-8.27	-2.13	14.48	58.06	39.82	61.92	.2790	.1587	.0486	.9626	-708.50	62.48	65.74

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %

TABLE 10.8

BLADE ELEMENT AND OVERALL PERFORMANCE WITH TIP-RADIALLY DISTORTED INLET FLOW

RUN NO911, SPEED CODE 10, POINT NO 3

Rotor

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	28.936	31.706	516.6	1069.6	516.6	743.9	.0	768.6	.0	45.8	.4728	.9163	962.1	1126.5	.9994	.7071	1092.0	825.5
2	24.527	28.287	564.8	1052.9	564.8	744.3	.0	744.8	.0	45.0	.5192	.9001	1020.7	1157.9	1.0724	.7277	1166.5	851.2
3	20.221	24.889	608.6	1022.7	608.6	736.0	.0	710.0	.0	44.1	.5620	.8727	1076.5	1190.0	1.1419	.7498	1236.7	878.7
4	9.267	15.041	701.3	929.4	701.3	685.6	.0	627.5	.0	42.7	.6543	.7868	1229.0	1286.3	1.3202	.8050	1415.0	950.8
5	-1.720	5.214	683.6	831.7	683.6	559.8	.0	615.1	.0	47.8	.6365	.6895	1412.4	1415.7	1.4610	.8099	1569.2	976.9
6	-5.859	.677	614.6	820.6	614.6	535.5	.0	621.8	.0	49.1	.5678	.6749	1500.9	1480.0	1.4984	.8320	1621.8	1011.6
7	-8.075	-1.862	565.6	814.0	565.6	517.8	.0	628.0	.0	50.2	.5200	.6662	1542.4	1514.4	1.5104	.8402	1642.8	1026.6
8	-10.417	-4.545	526.6	803.6	526.6	499.6	.0	629.4	.0	51.2	.4824	.6550	1582.8	1547.5	1.5281	.8520	1668.1	1045.2
9	-16.738	-13.253	469.5	751.0	469.5	397.9	.0	636.9	.0	57.4	.4280	.6032	1698.4	1642.0	1.6064	.8683	1762.1	1081.0
10	-17.906	-15.993	457.5	733.2	457.5	362.2	.0	637.5	.0	59.7	.4167	.5863	1736.9	1674.5	1.6360	.8784	1796.2	1098.4
11	-18.468	-18.350	451.2	718.1	451.2	334.0	.0	635.7	.0	61.8	.4108	.5722	1770.6	1706.5	1.6634	.8938	1827.2	1121.7

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VØ'-1 FT/SEC	VØ'-2 FT/SEC
1	-1.63	2.59	12.57	35.38	37.47	69.31	.4125	.1934	.0365	2.1714	90.29	89.19	60.94	25.56	-962.1	-357.9
2	-1.71	2.02	9.60	31.21	40.02	69.74	.4328	.1802	.0351	2.1554	89.73	88.59	60.24	29.03	-1020.7	-413.1
3	-1.95	1.59	8.56	26.57	42.17	69.13	.4395	.1747	.0344	2.1102	88.80	87.60	59.77	33.20	-1076.5	-479.9
4	-1.71	1.29	9.23	15.87	45.82	63.91	.4542	.1942	.0368	1.9652	83.73	82.15	59.93	44.06	-1229.0	-658.8
5	2.09	4.09	9.83	9.03	43.04	50.41	.4934	.2836	.0476	1.8920	73.87	71.47	64.18	55.15	-1412.4	-800.6
6	4.54	6.37	7.90	9.83	38.00	47.85	.4915	.2730	.0444	1.9777	75.23	72.79	67.73	57.90	-1500.9	-858.2
7	5.93	7.65	7.83	10.39	34.69	46.07	.4919	.2640	.0417	2.0398	76.37	73.94	69.86	59.47	-1542.4	-886.4
8	6.83	8.44	8.31	10.47	32.14	44.33	.4892	.2542	.0387	2.0888	77.33	74.91	71.59	61.12	-1582.8	-918.1
9	6.82	8.32	11.19	6.51	28.64	34.90	.4981	.2952	.0353	2.0903	72.75	69.85	74.43	67.92	-1698.4	-1005.1
10	6.44	7.94	10.64	4.74	27.93	31.71	.4963	.3092	.0329	2.0855	71.24	68.19	75.00	70.26	-1736.9	-1037.0
11	6.31	7.81	9.12	3.09	27.58	29.25	.4903	.3196	.0301	2.0823	70.09	66.93	75.40	72.31	-1770.6	-1070.8

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2894	2.0265	77.05	79.18	36.26

RUN NO911, SPEED CODE 10, POINT NO 3

Stator

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VØ-1 FT/SEC	VØ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	28.246	4.735	1142.3	1002.6	864.3	1001.6	746.9	-45.0	43.5	-2.5	.9902	.8533	1.9405	1.2776
2	25.710	4.359	1116.1	977.3	847.9	976.2	725.8	-47.6	42.8	-2.7	.9639	.8264	1.9356	1.2764
3	23.096	4.076	1081.9	950.9	829.7	949.3	694.4	-56.1	41.8	-3.3	.9318	.8030	1.9244	1.2713
4	15.411	3.303	981.6	862.7	761.2	858.8	619.7	-82.3	40.0	-5.4	.8370	.7244	1.8786	1.2586
5	6.603	1.695	879.3	756.1	631.8	751.6	611.5	-82.8	44.2	-6.3	.7333	.6223	1.8411	1.2772
6	2.209	.703	866.6	742.3	606.5	739.1	619.0	-67.9	45.6	-5.2	.7170	.6063	1.9082	1.2918
7	.071	.115	860.5	738.8	588.4	736.5	627.9	-58.1	46.8	-4.5	.7084	.6006	1.9605	1.3027
8	-1.941	-.500	853.3	733.9	575.4	732.2	630.1	-50.2	47.6	-3.9	.6998	.5946	2.0172	1.3100
9	-9.121	-2.189	813.3	707.9	497.6	706.3	643.3	-46.8	52.5	-3.8	.6577	.5662	2.0112	1.3354
10	-17.528	-7.802	801.0	709.1	472.0	707.6	647.2	-46.1	54.3	-3.7	.6448	.5654	2.0068	1.3439
11	-16.281	-3.324	792.7	718.3	456.6	716.9	647.9	-45.9	55.6	-3.6	.6361	.5722	2.0059	1.3482

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-7.61	-4.62	13.71	46.03	75.86	87.71	.2789	.2283	.0527	.8937	27.19	75.00	77.18
2	-6.88	-3.69	11.65	45.56	75.46	86.84	.2852	.2257	.0530	.8984	28.72	75.02	77.19
3	-7.50	-4.09	10.01	45.10	74.38	85.66	.2878	.2048	.0490	.9109	34.32	75.72	77.81
4	-10.49	-6.25	7.06	45.42	68.54	79.99	.3042	.1283	.0323	.9520	57.30	76.21	78.19
5	-7.23	-1.89	6.28	50.53	55.37	69.02	.3533	.0772	.0207	.9768	75.70	68.63	71.15
6	-5.70	.02	7.35	50.85	52.85	67.11	.3643	.0938	.0260	.9728	70.72	69.35	71.96
7	-4.44	1.42	8.17	51.35	51.06	66.20	.3679	.1052	.0297	.9700	66.55	69.91	72.57
8	-3.72	2.27	8.88	51.50	49.82	65.28	.3702	.1210	.0347	.9662	60.93	71.46	74.08
9	-.81	5.41	11.49	56.23	42.37	60.80	.3849	.1507	.0450	.9623	45.23	65.74	68.87
10	-1.27	4.98	13.65	58.01	39.58	60.16	.3791	.1537	.0466	.9628	36.25	63.87	67.15
11	-5.64	.50	15.99	59.18	38.57	60.43	.3646	.1548	.0475	.9633	23.26	63.03	66.39

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
12436.	161.78	1.2894	1.9280	71.17	73.67

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APPENDIX 4

BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW (TABULATIONS)

TABLE 11.1
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 70, POINT NO 21

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.525	29.024	198.4	731.7	198.4	466.6	.0	563.7	.0	49.4	.1783	.6375	674.3	789.5	.6319	.4517	702.9	818.4
2	25.193	24.193	216.6	727.3	216.6	493.7	.0	534.0	.0	46.2	.1947	.6344	715.4	811.6	.6718	.4941	747.4	566.4
3	20.341	20.133	246.8	698.5	246.8	491.3	.0	496.5	.0	44.4	.2221	.6093	754.5	834.0	.7144	.5199	793.9	596.1
4	7.686	8.978	335.2	610.2	335.2	447.8	.0	414.5	.0	42.3	.3030	.5308	861.4	901.5	.8354	.5755	924.3	661.6
5	-4.502	-1.649	456.0	608.8	456.0	483.6	.0	369.7	.0	37.4	.4153	.5300	990.0	992.2	.9927	.6863	1089.9	788.3
6	-9.067	-5.903	480.7	608.0	480.7	500.4	.0	345.4	.0	34.6	.4387	.5300	1051.9	1037.3	1.0554	.7443	1156.6	853.9
7	-11.048	-7.980	489.0	606.4	489.0	510.2	.0	327.7	.0	32.7	.4465	.5293	1081.0	1061.5	1.0834	.7801	1186.5	893.7
8	-12.902	-9.945	489.9	600.5	489.9	517.8	.0	304.0	.0	30.4	.4474	.5254	1109.4	1084.7	1.1075	.8196	1212.7	936.8
9	-17.712	-16.155	445.8	508.9	445.8	441.7	.0	252.7	.0	29.5	.4057	.4444	1190.4	1150.8	1.1568	.8791	1271.1	1000.9
10	-18.460	-18.071	430.1	469.3	430.1	400.9	.0	243.9	.0	30.9	.3910	.4089	1217.4	1173.6	1.1737	.8822	1291.1	1012.5
11	-18.573	-19.277	426.2	455.3	426.2	390.3	.0	234.4	.0	30.6	.3873	.3967	1241.0	1196.1	1.1924	.9093	1312.1	1037.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	10.59	14.80	12.10	48.07	13.76	38.32	.4763	-.0581	-.0110	1.6185	103.01	103.25	73.15	25.09	-674.3	-225.9
2	10.77	14.50	9.06	44.23	14.99	40.61	.4589	-.0531	-.0104	1.6016	103.28	103.53	72.71	28.49	-715.4	-277.6
3	9.65	13.19	9.02	37.72	17.06	40.23	.4509	-.0084	-.0016	1.5511	100.33	100.39	71.37	33.65	-754.5	-337.5
4	7.23	9.73	12.14	21.41	23.28	35.90	.4473	.1569	.0283	1.3897	82.97	82.19	68.37	46.96	-861.4	-487.0
5	3.24	5.25	6.85	13.17	32.09	38.02	.3972	.2329	.0420	1.3030	67.91	66.73	65.33	52.16	-990.0	-622.5
6	2.40	4.23	4.12	11.47	34.04	39.10	.3644	.2378	.0426	1.2769	64.14	62.92	65.60	54.13	-1051.9	-691.9
7	1.92	3.69	3.54	10.67	34.76	39.82	.3418	.2306	.0410	1.2638	63.18	61.98	65.85	55.18	-1081.0	-733.7
8	1.60	3.21	3.59	9.96	34.96	40.46	.3122	.2063	.0360	1.2563	64.78	63.67	66.36	56.40	-1109.4	-780.6
9	1.81	3.31	6.83	5.86	31.99	34.22	.2762	.2055	.0291	1.2003	58.43	57.39	69.42	63.56	-1190.4	-898.1
10	1.71	3.21	6.71	3.95	30.90	30.95	.2737	.2195	.0278	1.1812	54.11	53.06	70.28	66.32	-1217.4	-929.7
11	1.58	3.08	4.39	3.10	30.67	30.18	.2612	.2149	.0254	1.1758	53.69	52.66	70.67	67.57	-1241.0	-961.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1141	1.3369	74.87	75.83	26.44

Stator

RUN NO912, SPEED CODE 70, POINT NO 21

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.710	4.232	777.0	913.3	552.8	912.7	546.1	-33.3	47.2	-2.0	.6807	.8148	1.5205	1.1418
2	24.888	3.481	763.0	886.2	560.6	885.5	517.6	-36.8	44.8	-2.3	.6686	.7897	1.5006	1.1363
3	22.082	2.847	733.0	855.7	550.1	854.5	484.4	-46.3	43.0	-3.0	.6419	.7615	1.4678	1.1308
4	13.270	.956	650.4	771.9	505.6	768.7	409.2	-69.9	39.5	-5.2	.5680	.6834	1.3577	1.1190
5	3.013	-1.126	651.3	726.7	536.9	724.3	368.8	-60.0	34.5	-4.7	.5694	.6408	1.2743	1.1164
6	-1.328	-2.004	652.3	713.3	552.9	710.4	346.0	-64.6	32.0	-5.2	.5710	.6294	1.2437	1.1120
7	-3.405	-2.392	652.0	707.4	562.5	704.1	329.7	-68.0	30.4	-5.5	.5716	.6254	1.2346	1.1066
8	-5.217	-2.739	649.2	698.1	572.1	694.6	307.0	-70.5	28.3	-5.8	.5706	.6182	1.2267	1.1013
9	-11.656	-3.175	580.7	635.8	521.1	632.0	256.2	-69.3	26.5	-6.2	.5102	.5618	1.1679	1.0923
10	-14.573	-3.341	553.7	627.6	495.4	623.9	247.5	-68.6	27.1	-6.2	.4857	.5546	1.1546	1.0905
11	-17.347	-3.448	550.7	633.5	496.7	629.8	237.9	-68.4	26.3	-6.1	.4834	.5604	1.1508	1.0893

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	-3.92	-.93	14.18	49.26	44.24	62.89	-.0097	.2194	.0506	.9416	147.21	89.70	90.27
2	-4.90	-1.72	12.05	47.13	45.06	62.09	-.0087	.1967	.0462	.9499	143.07	90.24	90.76
3	-6.26	-2.85	10.29	46.06	49.10	60.64	-.0147	.1483	.0355	.9637	131.52	88.41	88.97
4	-10.92	-6.68	7.34	44.70	39.76	55.89	-.0032	.0395	.0100	.9922	108.84	76.70	77.63
5	-16.97	-11.63	7.83	39.24	41.35	52.78	.0605	.0598	.0161	.9882	121.87	61.59	62.84
6	-19.27	-13.55	7.40	37.24	42.30	51.66	.0776	.0824	.0229	.9836	136.24	57.43	58.68
7	-20.88	-15.01	7.16	35.93	42.95	51.23	.0792	.0953	.0269	.9810	145.50	58.29	59.48
8	-23.02	-17.03	7.00	34.08	43.70	50.46	.0580	.0639	.0183	.9880	124.56	59.43	60.63
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	-28.48	-22.24	[illegible]	33.33	38.98	44.08	.0355	.1278	.0385	.9811	139.12	46.38	47.42
11	-34.86	-28.72	13.49	32.46	37.01	44.26	.0239	.1387	.0424	.9794	139.62	45.91	46.93

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 70, POINT NO 22

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.796	28.981	168.9	710.5	168.9	381.0	.0	599.7	.0	56.7	.1516	.6149	676.0	790.4	.6245	.3688	695.8	426.1
2	25.474	24.181	183.2	702.1	183.2	400.2	.0	576.8	.0	54.3	.1645	.6076	716.1	812.5	.6637	.4019	739.2	464.4
3	20.619	19.969	209.6	681.2	209.6	403.3	.0	549.0	.0	52.8	.1883	.5892	755.4	834.9	.7044	.4276	783.9	494.4
4	8.144	8.889	289.2	623.5	289.2	391.4	.0	485.3	.0	50.7	.2608	.5379	862.3	902.5	.8201	.4935	909.5	572.1
5	-3.920	-1.600	403.1	592.5	403.1	389.1	.0	446.8	.0	49.0	.3657	.5092	991.0	993.3	.9708	.5767	1069.9	670.9
6	-7.957	-5.668	427.5	590.0	427.5	408.9	.0	425.4	.0	46.1	.3885	.5072	1053.1	1038.4	1.0330	.6335	1136.5	736.9
7	-9.707	-7.674	436.6	589.6	436.6	422.6	.0	411.2	.0	44.2	.3971	.5072	1082.2	1062.6	1.0613	.6680	1167.0	776.5
8	-11.485	-9.518	440.3	586.3	440.3	436.7	.0	391.2	.0	41.8	.4005	.5051	1110.6	1085.8	1.0868	.7068	1194.7	820.5
9	-16.487	-15.658	404.5	529.0	404.5	395.3	.0	351.6	.0	41.3	.3671	.4549	1191.7	1152.1	1.1420	.7677	1258.5	892.7
10	-17.675	-17.662	390.3	506.7	390.3	365.9	.0	350.6	.0	43.2	.3539	.4396	1218.7	1174.9	1.1602	.7735	1279.7	901.9
11	-18.279	-19.079	386.2	495.7	386.2	349.0	.0	352.0	.0	44.7	.3500	.4241	1242.3	1197.4	1.1791	.7826	1300.9	914.6

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VO'-1 FT/SEC	VO'-2 FT/SEC
1	13.03	17.24	12.83	49.77	11.96	32.08	.6066	.0427	.0080	1.6250	97.94	97.81	75.59	25.82	-676.0	-190.7
2	13.36	17.09	10.18	45.70	12.95	33.84	.5909	.0411	.0080	1.6145	97.64	97.50	75.30	29.61	-716.1	-235.7
3	12.35	15.89	9.84	39.60	14.81	34.14	.5766	.0600	.0116	1.5866	96.07	95.83	74.07	34.47	-755.4	-286.0
4	10.01	12.51	11.55	24.78	20.51	33.02	.5462	.1523	.0277	1.4880	86.27	85.52	71.15	46.37	-862.3	-417.2
5	5.82	7.82	9.25	13.35	28.90	32.55	.5104	.2420	.0412	1.4065	73.17	71.88	67.91	54.56	-991.0	-546.5
6	4.80	6.63	6.28	11.71	30.80	34.26	.4731	.2399	.0407	1.3935	71.49	70.16	67.99	56.29	-1053.1	-613.0
7	4.19	5.91	5.36	11.11	31.53	35.51	.4491	.2310	.0392	1.3881	71.39	70.07	68.12	57.00	-1082.2	-651.5
8	3.68	5.29	4.96	10.67	31.87	36.85	.4190	.2082	.0350	1.3861	72.98	71.74	68.44	57.77	-1110.6	-694.6
9	3.48	4.98	6.68	7.67	29.37	33.44	.3777	.1915	.0273	1.3638	72.51	71.32	71.08	63.41	-1191.7	-800.5
10	3.36	4.86	6.05	6.26	28.35	30.89	.3784	.2069	.0269	1.3561	70.10	68.82	71.92	65.66	-1218.7	-824.4
11	3.27	4.77	4.02	5.16	28.09	29.43	.3771	.2201	.0265	1.3536	68.18	66.83	72.36	67.20	-1242.3	-845.4

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1900	1.4406	78.16	79.22	23.80

Stator

RUN NO912, SPEED CODE 70, POINT NO 22

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.526	4.259	734.6	675.0	448.5	674.8	581.8	-15.3	54.8	-1.3	.6375	.5823	1.5491	1.1518
2	24.504	3.546	721.7	654.6	459.2	654.3	560.8	-18.3	52.9	-1.6	.6260	.5643	1.5349	1.1487
3	21.415	2.990	700.7	631.0	450.7	630.4	536.4	-26.3	51.5	-2.4	.6073	.5434	1.5121	1.1459
4	12.600	1.330	645.8	568.1	433.4	566.0	478.8	-49.5	48.3	-5.0	.5583	.4878	1.4347	1.1905
5	2.423	-.862	620.3	555.0	431.5	553.0	445.7	-47.0	45.9	-4.9	.5345	.4756	1.3875	1.1424
6	-2.208	-1.921	620.7	563.0	451.3	561.2	426.0	-45.7	43.4	-4.7	.5350	.4832	1.3782	1.1405
7	-4.424	-2.392	621.6	569.3	464.7	567.6	412.9	-45.0	41.7	-4.5	.5362	.4897	1.3779	1.1368
8	-6.324	-2.806	620.1	567.9	478.8	566.1	394.1	-45.4	39.6	-4.6	.5358	.4891	1.3763	1.1334
9	-12.652	-3.246	579.4	525.5	456.9	523.1	356.2	-50.1	38.5	-5.4	.5003	.4515	1.3414	1.1315
10	-15.160	-3.374	566.6	520.2	440.1	517.7	356.9	-50.9	39.8	-5.6	.4882	.4461	1.3323	1.1346
11	-17.574	-3.458	565.3	526.4	435.7	524.0	360.1	-51.1	40.5	-5.5	.4862	.4513	1.3298	1.1362

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	3.64	6.63	14.95	56.04	37.27	55.30	.2611	.1874	.0933	.9554	-8.48	87.91	88.61
2	3.23	6.41	12.81	54.50	37.95	54.10	.2679	.1785	.0420	.9593	1.71	87.57	88.28
3	2.18	5.59	10.98	53.81	37.72	52.42	.2791	.1634	.0391	.9645	14.17	85.88	86.65
4	-2.13	2.11	7.54	53.30	36.15	47.59	.3192	.1189	.0299	.9776	49.90	77.33	78.42
5	-5.54	-.20	7.71	50.80	35.64	46.58	.3182	.0460	.0124	.9919	79.06	68.91	70.28
6	-7.95	-2.22	7.94	48.02	37.31	47.31	.3040	.0422	.0117	.9925	78.95	68.35	69.71
7	-9.59	-3.73	8.14	46.23	38.48	47.94	.2870	.0338	.0095	.9940	80.91	70.13	71.41
8	-11.71	-5.72	8.21	44.18	39.79	47.80	.2705	.0162	.0046	.9972	89.14	71.65	72.87
9	-14.81	-8.59	9.81	43.90	37.86	43.43	.2957	.0799	.0238	.9879	52.25	66.60	67.92
10	-15.78	-9.54	11.77	45.36	36.24	42.61	.3035	.1066	.0322	.9841	36.25	63.51	69.92
11	-20.66	-19.52	14.11	46.04	35.75	42.89	.2950	.1166	.0357	.9826	19.94	62.30	63.75

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
8726.	106.17	1.1900	1.4151	74.53	75.71

TABLE 11.3
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 70, POINT NO 23

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.230	29.001	144.3	715.7	144.3	349.3	.0	624.7	.0	60.0	.1294	.6181	673.2	788.2	.6175	.3331	688.5	385.6
2	24.892	24.297	158.4	705.6	158.4	363.4	.0	604.9	.0	58.1	.1422	.6090	714.2	810.2	.6564	.3603	731.5	417.4
3	19.823	20.147	187.6	688.6	187.6	366.5	.0	582.8	.0	57.0	.1685	.5936	753.3	832.6	.6971	.3825	776.3	443.6
4	7.640	9.107	260.5	642.7	260.5	355.4	.0	535.5	.0	56.0	.2346	.5519	860.0	900.0	.8091	.4371	898.6	509.1
5	-4.367	-1.424	352.0	607.6	352.0	339.4	.0	504.0	.0	56.1	.3184	.5187	988.3	993.6	.9490	.5065	1049.1	593.2
6	-8.301	-5.545	377.5	600.2	377.5	357.8	.0	481.9	.0	53.4	.3420	.5121	1050.2	1035.6	1.0110	.5625	1116.0	659.3
7	-9.988	-7.583	387.6	597.0	387.6	371.5	.0	467.3	.0	51.5	.3513	.5095	1079.2	1059.7	1.0395	.5968	1146.7	699.2
8	-11.721	-9.466	392.2	592.1	392.2	387.9	.0	447.3	.0	49.0	.3556	.5059	1107.5	1082.8	1.0653	.6362	1174.9	744.6
9	-16.651	-15.676	361.6	543.4	361.6	348.1	.0	417.2	.0	49.8	.3272	.4627	1188.4	1148.9	1.1242	.6901	1242.2	810.3
10	-17.798	-17.677	349.2	524.6	349.2	322.7	.0	413.6	.0	51.5	.3158	.4458	1215.4	1171.7	1.1436	.7001	1264.5	823.9
11	-18.348	-19.089	345.8	514.1	345.8	306.4	.0	412.9	.0	52.9	.3126	.4360	1238.9	1194.1	1.1630	.7116	1286.2	839.1

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	14.96	19.18	11.36	53.17	10.39	29.60	.6669	.1216	.0232	1.6237	94.35	93.97	77.53	24.35	-673.2	-163.5
2	15.18	18.91	9.20	48.50	11.40	30.95	.6552	.1179	.0231	1.6135	93.54	93.12	77.12	28.63	-714.2	-205.4
3	13.84	17.38	8.81	42.12	13.50	31.30	.6430	.1310	.0257	1.5931	91.89	91.36	75.56	33.44	-753.3	-249.8
4	11.70	14.20	10.46	27.56	18.80	30.37	.6191	.2004	.0372	1.5254	83.84	82.88	72.84	45.29	-860.0	-364.5
5	8.35	10.36	9.80	15.33	25.62	28.90	.5883	.2763	.0465	1.4633	73.17	71.72	70.44	55.11	-988.3	-486.6
6	7.13	8.96	7.11	13.21	27.59	30.59	.5473	.2723	.0452	1.4519	71.69	70.20	70.33	57.12	-1050.2	-553.7
7	6.41	8.13	6.24	12.47	28.38	31.87	.5210	.2632	.0436	1.4468	71.53	70.05	70.34	57.88	-1079.2	-592.4
8	5.82	7.43	5.71	12.05	28.77	33.44	.4883	.2407	.0396	1.4453	72.81	71.39	70.58	58.53	-1107.5	-635.5
9	5.34	6.84	7.53	8.69	26.57	30.08	.4525	.2357	.0326	1.4290	71.26	69.81	72.94	64.25	-1188.4	-731.7
10	5.13	6.63	6.94	7.14	25.68	27.87	.4483	.2450	.0307	1.4235	69.76	68.25	73.69	66.55	-1215.4	-758.0
11	4.98	6.48	5.05	5.84	25.45	26.46	.4434	.2545	.0293	1.4217	68.41	66.84	74.07	68.24	-1238.9	-781.2

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1568	1.4877	76.44	77.69	21.49

Stator

RUN NO912, SPEED CODE 70, POINT NO 23

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.647	4.384	731.2	572.1	408.3	571.9	606.6	-15.9	58.4	-1.6	.6326	.4875	1.5487	1.1578
2	24.619	3.780	718.4	555.4	411.1	555.1	589.1	-18.5	57.0	-1.9	.6209	.4729	1.5367	1.1566
3	21.564	3.293	701.4	537.2	408.2	536.5	570.5	-25.3	55.9	-2.7	.6056	.4569	1.5207	1.1556
4	12.855	1.779	658.0	488.9	391.3	486.9	529.0	-44.4	54.0	-5.2	.5658	.4144	1.4685	1.1555
5	2.801	-.465	627.6	475.1	375.7	473.7	502.8	-36.2	53.3	-4.4	.5368	.4014	1.4300	1.1605
6	-1.916	-1.588	623.0	486.2	394.0	484.8	482.6	-36.6	50.8	-4.3	.5326	.4113	1.4240	1.1593
7	-4.179	-2.086	621.3	494.2	407.2	492.8	469.3	-37.1	49.1	-4.3	.5314	.4189	1.4245	1.1563
8	-6.114	-2.528	618.2	494.8	423.3	493.4	450.6	-37.7	46.9	-4.4	.5294	.4199	1.4245	1.1539
9	-12.492	-3.108	582.8	462.7	401.1	461.1	422.8	-39.0	47.0	-4.8	.4979	.3916	1.4018	1.1550
10	-15.017	-3.294	571.3	458.9	386.5	457.2	420.7	-39.2	48.2	-4.9	.4872	.3878	1.3957	1.1575
11	-17.484	-3.441	568.4	464.8	380.7	463.2	422.1	-39.2	48.9	-4.8	.4840	.3927	1.3941	1.1591

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	7.24	10.23	14.66	59.93	34.31	49.58	.4072	.1888	.0436	.9557	56.82	84.35	85.26
2	7.26	10.44	12.51	58.83	34.74	48.41	.4162	.1863	.0438	.9579	58.09	83.41	84.36
3	6.60	10.01	10.67	58.53	34.58	46.96	.4295	.1784	.0427	.9613	60.71	81.76	82.77
4	3.54	7.78	7.32	59.19	33.18	42.87	.4718	.1525	.0384	.9706	68.72	74.65	75.95
5	1.78	7.12	8.20	57.63	31.70	41.65	.4725	.1065	.0287	.9812	77.11	67.06	68.64
6	-.52	5.20	8.28	55.12	33.34	42.69	.4499	.0942	.0262	.9835	78.01	66.69	68.27
7	-2.17	3.70	8.37	53.43	34.55	43.49	.4301	.0829	.0234	.9856	79.28	68.09	69.61
8	-4.39	1.60	8.43	51.29	36.07	43.55	.4163	.0695	.0199	.9882	81.42	69.13	70.60
9	-6.24	-.03	10.44	51.84	34.10	40.84	.4395	.1076	.0321	.9837	72.01	65.39	66.96
10	-7.41	-1.17	12.48	53.03	32.74	39.85	.4437	.1240	.0375	.9816	67.28	63.47	65.11
11	-12.29	-6.15	14.82	53.70	32.18	39.89	.4338	.1306	.0400	.9807	63.40	62.59	64.26

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %

TABLE 11.4
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 95, POINT NO 21

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.404	29.459	303.2	960.3	303.2	549.5	.0	787.6	.0	54.3	.2735	.8122	914.0	1070.2	.8686	.5225	963.0	617.9
2	24.982	24.666	331.8	951.4	331.8	566.8	.0	764.1	.0	52.6	.2998	.8039	969.6	1100.1	.9259	.5567	1024.8	658.9
3	20.332	20.400	370.0	929.6	370.0	568.9	.0	735.2	.0	51.4	.3349	.7843	1022.7	1130.5	.9847	.5844	1087.6	692.8
4	7.938	9.211	493.6	869.6	493.6	582.3	.0	645.9	.0	47.5	.4511	.7324	1167.6	1222.0	1.1584	.6898	1267.7	819.1
5	-4.674	-1.391	663.9	780.1	663.9	550.8	.0	552.4	.0	45.1	.6167	.6544	1341.8	1344.9	1.3906	.8097	1497.1	965.2
6	-8.709	-5.596	697.8	777.0	697.8	588.4	.0	507.5	.0	40.8	.6508	.6543	1425.8	1406.0	1.4805	.9044	1587.4	1074.0
7	-10.467	-7.662	709.0	777.2	709.0	609.7	.0	482.0	.0	38.3	.6621	.6564	1465.3	1438.7	1.5202	.9581	1627.8	1134.5
8	-12.308	-9.594	709.4	776.4	709.4	628.9	.0	455.3	.0	35.8	.6625	.6579	1503.7	1470.2	1.5528	1.0116	1662.6	1193.9
9	-17.236	-15.865	644.9	666.3	644.9	535.9	.0	396.0	.0	36.1	.5977	.5623	1613.5	1559.9	1.6105	1.0813	1737.6	1281.3
10	-18.128	-17.844	621.2	622.3	621.2	488.4	.0	385.5	.0	37.8	.5743	.5234	1650.1	1590.8	1.6300	1.0938	1763.1	1300.5
11	-18.411	-19.173	619.5	605.1	619.5	472.4	.0	378.2	.0	38.2	.5677	.5082	1682.0	1621.2	1.6544	1.1169	1790.8	1329.8

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	8.56	12.78	13.55	44.59	19.02	48.56	.5659	-.0421	-.0079	2.3487	101.83	102.07	71.13	26.54	-914.0	-282.6
2	8.64	12.38	10.44	40.73	20.71	50.31	.5658	-.0132	-.0025	2.3212	100.67	100.76	70.59	29.86	-969.6	-336.0
3	7.83	11.38	9.36	35.56	23.00	50.50	.5627	.0289	.0056	2.2567	98.28	98.08	69.56	34.00	-1022.7	-395.2
4	5.57	8.06	9.44	22.44	30.79	51.33	.5247	.1502	.0284	1.9986	87.54	86.30	66.70	44.27	-1167.6	-576.1
5	1.66	3.66	9.89	8.54	42.27	47.51	.4800	.2746	.0460	1.6878	69.86	67.62	63.75	55.20	-1341.8	-792.5
6	.87	2.70	6.76	7.30	44.89	51.03	.4295	.2600	.0436	1.6476	69.14	66.94	64.07	56.77	-1425.8	-898.5
7	.40	2.12	5.82	6.87	45.89	53.15	.4013	.2464	.0412	1.6300	69.43	67.30	64.33	57.47	-1465.3	-956.8
8	.13	1.74	5.33	6.74	46.27	55.16	.3719	.2204	.0366	1.6287	71.57	69.59	64.89	58.15	-1503.7	-1014.8
9	.50	2.00	8.28	3.10	42.63	46.78	.3395	.2124	.0286	1.5533	69.53	67.63	68.11	65.00	-1613.5	-1163.8
10	.50	2.00	7.97	1.48	41.20	42.51	.3291	.2232	.0268	1.5281	67.39	65.43	69.06	67.58	-1650.1	-1205.3
11	.43	1.93	5.67	.66	40.70	41.17	.3196	.2266	.0254	1.5202	66.59	64.61	69.52	68.86	-1682.0	-1243.1

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2327	1.8056	77.46	79.19	35.44

Stator

RUN NO912, SPEED CODE 95, POINT NO 21

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.481	4.232	1005.6	1063.7	652.9	1060.3	764.9	-86.0	52.0	-4.5	.8559	.9134	2.1059	1.2700
2	24.471	3.457	990.2	1044.5	653.4	1040.7	744.1	-88.8	50.7	-4.8	.8419	.8950	2.0797	1.2682
3	21.452	2.812	967.9	1025.7	648.7	1021.1	718.3	-97.5	49.4	-5.4	.8210	.8779	2.0398	1.2643
4	12.939	.904	912.4	967.9	652.9	959.9	637.3	-123.9	44.8	-7.3	.7726	.8268	1.8617	1.2501
5	2.715	-1.293	833.8	893.2	626.0	884.4	550.7	-124.9	41.4	-8.0	.7037	.7610	1.6369	1.2334
6	-2.027	-2.177	833.6	883.5	660.8	874.4	508.2	-126.5	37.6	-8.2	.7065	.7555	1.5827	1.2226
7	-4.150	-2.550	835.0	883.6	680.2	874.4	484.3	-127.6	35.5	-8.3	.7098	.7582	1.5739	1.2152
8	-5.894	-2.886	835.7	877.3	698.4	867.7	459.0	-129.4	33.4	-8.5	.7129	.7543	1.5681	1.2091
9	-12.088	-3.237	754.2	802.1	638.5	791.0	401.4	-132.7	32.6	-9.5	.6422	.6870	1.4703	1.1970
10	-14.864	-3.365	725.3	792.5	610.6	781.3	391.4	-132.6	33.3	-9.6	.6161	.6781	1.4464	1.1967
11	-17.521	-3.446	722.0	800.4	610.6	789.3	385.3	-132.4	33.1	-9.4	.6131	.6855	1.4393	1.1966

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	.84	3.83	11.71	56.48	55.87	78.10	.1314	.2651	.0611	.8996	264.91	87.67	88.87
2	.97	4.15	9.61	55.45	56.33	77.83	.1329	.2537	.0595	.9068	255.20	86.63	87.91
3	.16	3.57	7.97	54.80	55.98	77.46	.1319	.2203	.0525	.9215	225.59	85.26	86.63
4	-5.63	-1.39	5.19	52.14	55.96	75.51	.1331	.1048	.0263	.9663	151.46	77.46	79.29
5	-10.12	-4.78	4.53	49.39	52.34	70.16	.1420	.0569	.0152	.9839	133.60	64.67	66.98
6	-13.73	-8.01	4.36	45.82	55.48	69.43	.1491	.1021	.0282	.9708	169.36	62.95	65.22
7	-15.78	-9.92	4.37	43.82	57.34	69.45	.1447	.1170	.0328	.9664	180.54	64.26	66.42
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	-20.69	-14.47	5.77	42.06	53.31	80.49	.1241	.1797	.0531	.9588	177.96	59.06	61.17
10	-22.26	-16.01	7.78	42.88	50.47	58.97	.1248	.2195	.0657	.9507	193.74	56.53	58.68
11	-28.06	-21.93	10.20	42.55	50.32	59.01	.1143	.2337	.0709	.9475	189.56	55.75	57.91

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11814.	158.15	1.2327	1.7297	72.77	74.75

TABLE 11.5
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 95, POINT NO 22

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.553	29.505	272.3	942.8	272.3	462.9	.0	821.4	.0	59.9	.2453	.7914	915.3	1071.8	.8602	.4418	955.0	526.3
2	25.310	24.904	298.0	927.3	298.0	480.4	.0	788.9	.0	57.5	.2688	.7780	971.1	1101.7	.9161	.4859	1015.8	579.1
3	20.742	20.612	335.7	909.5	335.7	492.6	.0	764.5	.0	56.5	.3034	.7617	1024.3	1132.2	.9740	.5148	1077.9	614.7
4	9.037	9.531	451.0	861.6	451.0	494.2	.0	705.8	.0	54.6	.4107	.7175	1169.3	1223.8	1.1413	.5962	1253.3	716.0
5	-3.000	-1.112	601.9	809.5	601.9	493.8	.0	641.4	.0	52.4	.5554	.6701	1343.8	1346.9	1.3586	.7128	1472.5	861.1
6	-7.382	-5.253	638.6	793.1	638.6	517.4	.0	601.1	.0	49.3	.5915	.6569	1428.0	1408.1	1.4490	.7940	1564.3	958.6
7	-9.348	-7.323	651.1	786.2	651.1	533.1	.0	577.8	.0	47.3	.6039	.6519	1467.5	1440.9	1.4891	.8412	1605.4	1014.5
8	-11.324	-9.240	654.4	776.9	654.4	545.4	.0	553.2	.0	45.3	.6072	.6451	1505.9	1472.4	1.5236	.8875	1642.0	1068.8
9	-16.633	-15.570	604.1	699.3	604.1	484.7	.0	504.1	.0	45.7	.5575	.5783	1615.9	1562.2	1.5921	.9625	1725.1	1163.9
10	-17.810	-17.643	584.1	670.4	584.1	446.3	.0	500.6	.0	47.8	.5379	.5522	1652.6	1593.2	1.6143	.9720	1752.8	1180.1
11	-18.306	-19.093	577.5	656.3	577.5	421.6	.0	502.9	.0	49.5	.5316	.5384	1684.6	1623.7	1.6391	.9824	1780.8	1197.4

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VB'-1 FT/SEC	VB'-2 FT/SEC
1	10.42	14.63	14.73	45.26	17.75	42.08	.6593	.0693	.0128	2.3306	97.08	96.73	72.98	27.72	-915.3	-250.4
2	10.56	14.30	12.49	40.59	19.35	44.78	.6376	.0616	.0117	2.3059	96.96	96.59	72.51	31.92	-971.1	-312.8
3	9.66	13.20	11.33	35.42	21.75	45.51	.6289	.0850	.0162	2.2654	95.24	94.68	71.38	35.96	-1024.3	-367.6
4	7.47	9.97	11.13	22.66	29.30	46.04	.6019	.1755	.0322	2.1088	87.04	85.64	68.61	45.95	-1169.3	-518.1
5	3.81	5.81	9.70	10.89	39.63	46.30	.5542	.2610	.0440	1.9216	76.19	73.96	65.90	55.01	-1343.8	-705.5
6	2.78	4.60	7.31	8.66	42.30	49.04	.5096	.2542	.0420	1.8812	75.08	72.81	65.97	57.31	-1428.0	-807.0
7	2.22	3.94	6.61	7.89	43.30	50.89	.4832	.2448	.0401	1.8632	75.03	72.80	66.15	58.25	-1467.5	-863.1
8	1.82	3.42	6.41	7.35	43.75	52.45	.4568	.2282	.0368	1.8539	75.90	73.76	66.58	59.22	-1505.9	-919.2
9	1.74	3.24	8.36	4.26	40.77	46.89	.4165	.2155	.0289	1.8152	75.55	73.45	69.34	65.08	-1615.9	-1058.1
10	1.64	3.14	7.80	2.80	39.54	43.04	.4138	.2296	.0278	1.8019	73.78	71.56	70.20	67.41	-1652.6	-1092.6
11	1.59	3.09	5.86	1.63	39.21	40.63	.4116	.2466	.0274	1.7971	71.92	69.56	70.68	69.05	-1684.6	-1120.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.2693	1.9757	78.98	80.85	33.39

Stator

RUN NO912, SPEED CODE 95, POINT NO 22

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VB-1 FT/SEC	VB-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.212	4.327	966.8	751.5	547.7	750.5	796.7	-38.2	57.7	-2.8	.8142	.6173	2.1686	1.2809
2	24.091	3.637	949.1	735.2	557.1	734.2	768.4	-39.7	55.8	-3.0	.7987	.6037	2.1441	1.2779
3	20.787	3.087	931.2	723.2	554.4	721.8	748.2	-44.8	54.8	-3.5	.7820	.5932	2.1149	1.2773
4	11.842	1.298	887.9	694.9	550.0	692.4	697.0	-58.5	52.1	-4.8	.7417	.5686	1.9977	1.2768
5	1.682	-1.043	844.1	679.2	550.7	678.2	639.7	-38.0	49.3	-3.2	.7014	.5554	1.8653	1.2751
6	-2.704	-2.090	831.8	688.1	574.3	687.0	601.7	-39.3	46.4	-3.3	.6920	.5650	1.8362	1.2673
7	-4.777	-2.557	827.0	695.6	589.3	694.5	580.2	-40.6	44.6	-3.3	.6888	.5729	1.8316	1.2618
8	-6.545	-2.978	820.2	693.0	601.9	691.5	557.1	-44.2	42.9	-3.7	.6843	.5718	1.8293	1.2568
9	-12.596	-3.376	762.8	625.9	566.5	622.8	510.8	-62.2	42.6	-5.7	.6348	.5137	1.7589	1.2548
10	-15.415	-3.445	745.4	615.3	544.2	611.3	509.3	-65.5	43.9	-6.1	.6183	.5034	1.7395	1.2604
11	-17.598	-3.445	742.9	621.5	535.6	618.0	514.8	-66.3	44.9	-6.1	.6142	.5080	1.7337	1.2640

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	6.60	9.58	13.38	60.57	48.98	71.25	.4146	.1884	.0435	.9339	60.89	87.94	89.16
2	6.14	9.33	11.35	58.88	50.43	70.41	.4174	.1839	.0432	.9376	61.61	87.45	88.70
3	5.52	8.93	9.84	58.28	50.47	69.69	.4199	.1674	.0400	.9448	64.65	85.90	87.27
4	1.66	5.90	7.70	56.92	50.40	67.80	.4246	.1096	.0276	.9669	75.67	78.83	80.74
5	-2.20	3.14	9.36	52.48	50.62	66.66	.4056	.0636	.0172	.9824	84.22	70.76	73.16
6	-4.95	.77	9.33	49.64	53.27	67.82	.3814	.0560	.0156	.9848	84.55	70.84	73.18
7	-6.65	-.78	9.33	47.99	54.99	68.71	.3632	.0456	.0129	.9877	86.22	72.02	74.26
8	-8.37	-2.38	9.14	46.60	56.52	68.[illegible]6	.3491	.0283	.0081	.9926	90.48	73.25	75.39
9	-10.71	-4.49	9.57	48.24	53.07	59.[illegible]4	.3980	.1104	.0329	.9747	68.40	68.63	70.98
10	-11.72	-5.48	11.28	49.92	50.58	58.13	.4123	.1435	.0433	.9677	59.89	65.73	68.24
11	-16.35	-10.21	13.56	50.91	49.48	58.23	.4064	.1558	.0476	.9651	54.15	64.40	67.00

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %

TABLE II.6
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 95, POINT NO 23

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.388	29.512	284.6	949.7	284.6	488.3	.0	814.6	.0	58.3	.2565	.7986	916.1	1072.6	.8645	.4644	959.3	552.3
2	25.095	24.872	312.7	935.0	312.7	512.2	.0	782.2	.0	56.0	.2822	.7859	971.9	1102.6	.9214	.5078	1020.9	604.2
3	20.521	20.610	354.4	912.9	354.4	520.3	.0	750.1	.0	54.5	.3206	.7665	1025.1	1133.1	.9811	.5425	1084.6	646.1
4	8.778	9.492	476.3	853.4	476.3	516.4	.0	679.4	.0	52.4	.4346	.7131	1170.3	1224.8	1.1529	.6275	1263.5	781.0
5	-3.319	-1.181	626.9	794.7	626.9	512.6	.0	607.4	.0	49.8	.5799	.6608	1344.9	1348.0	1.3727	.7490	1483.8	900.7
6	-7.731	-5.362	665.3	783.7	665.3	541.2	.0	566.0	.0	46.3	.6181	.6526	1429.1	1409.2	1.4645	.8339	1576.4	1001.3
7	-9.716	-7.459	678.5	780.3	678.5	560.0	.0	543.4	.0	44.1	.6313	.6509	1468.7	1442.0	1.5053	.8833	1617.8	1058.9
8	-11.736	-9.422	681.5	774.7	681.5	576.1	.0	517.9	.0	41.9	.6343	.6477	1507.1	1473.6	1.5396	.9329	1654.1	1115.8
9	-17.095	-15.790	630.7	685.1	630.7	500.6	.0	467.7	.0	42.7	.5837	.5701	1617.2	1563.5	1.6065	1.0026	1735.8	1204.7
10	-18.191	-17.812	611.5	650.9	611.5	457.1	.0	463.4	.0	44.9	.5647	.5394	1653.9	1594.5	1.6285	1.0110	1743.3	1220.0
11	-18.453	-19.177	604.9	636.0	604.9	434.5	.0	469.5	.0	46.4	.5583	.5253	1685.9	1624.9	1.6531	1.0233	1791.2	1239.1

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	V0'-1 FT/SEC	V0'-2 FT/SEC
1	9.68	13.90	14.19	45.07	18.27	49.26	.6338	.0183	.0034	2.3609	99.22	99.13	72.25	27.18	-916.1	-258.0
2	9.74	13.47	11.83	40.43	19.99	46.88	.6160	.0231	.0044	2.3301	98.84	98.71	71.69	31.26	-971.9	-320.4
3	8.69	12.23	10.95	34.83	22.59	47.89	.6020	.0480	.0092	2.2740	97.24	96.92	70.41	36.58	-1025.1	-382.9
4	6.39	8.89	11.34	21.37	30.44	47.74	.5743	.1524	.0279	2.0792	88.25	87.01	67.53	46.16	-1170.3	-545.4
5	2.95	4.96	10.00	9.73	40.60	47.49	.5255	.2431	.0407	1.8699	76.58	74.48	65.04	55.32	-1344.9	-740.7
6	1.93	3.76	7.26	7.86	43.39	50.64	.4806	.2359	.0390	1.8294	75.57	73.45	65.12	57.26	-1429.1	-842.5
7	1.37	3.09	6.39	7.27	44.46	52.76	.4540	.2250	.0371	1.8122	75.68	73.60	65.30	58.04	-1468.7	-898.7
8	1.00	2.61	6.03	6.92	44.93	54.69	.4264	.2047	.0334	1.8057	77.03	75.08	65.76	58.84	-1507.1	-955.6
9	.97	2.47	8.44	3.41	42.12	47.57	.3905	.2022	.0270	1.7443	75.36	73.39	68.57	65.16	-1617.2	-1095.8
10	.84	2.34	8.02	1.77	40.99	43.27	.3884	.2195	.0263	1.7229	73.01	70.91	69.40	67.63	-1653.9	-1131.1
11	.77	2.27	5.96	.72	40.69	41.06	.3853	.2359	.0261	1.7161	71.10	68.87	69.86	69.15	-1685.9	-1160.4

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2563	1.9366	80.13	81.85	34.49

Stator

RUN NO912, SPEED CODE 95, POINT NO 23

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.260	4.259	979.7	831.3	579.2	830.3	790.1	-41.1	56.1	-2.8	.8273	.6893	2.1667	1.4788
2	24.127	3.631	961.6	811.9	587.3	810.8	761.3	-42.1	54.2	-2.9	.8113	.6730	2.1537	1.2745
3	20.860	2.949	939.1	794.6	586.9	793.3	733.1	-45.3	52.7	-3.2	.7914	.6582	2.1191	1.2712
4	11.906	1.124	889.2	750.6	576.3	748.4	670.7	-54.9	49.7	-4.2	.7416	.6204	1.9707	1.2657
5	1.697	-1.174	834.1	723.9	573.6	722.1	605.6	-49.9	46.5	-4.0	.6967	.5982	1.8214	1.2597
6	-2.681	-2.169	826.9	730.4	601.5	728.3	567.4	-54.9	43.4	-4.3	.6920	.6061	1.7861	1.2518
7	-4.714	-2.602	825.2	737.0	619.1	734.7	545.6	-58.2	41.5	-4.5	.6919	.6136	1.7810	1.2452
8	-6.416	-2.994	821.9	733.5	635.1	730.8	521.6	-62.2	39.5	-4.9	.6907	.6120	1.7769	1.2396
9	-12.334	-3.376	755.2	658.4	588.0	654.2	473.9	-74.2	39.4	-6.4	.6329	.5462	1.6883	1.2363
10	-14.931	-3.451	733.4	646.5	561.9	642.0	471.2	-76.1	40.7	-6.7	.6125	.5346	1.6654	1.2409
11	-17.504	-3.449	730.8	652.5	555.1	648.0	475.3	-76.6	41.5	-6.7	.6086	.5392	1.6588	1.2439

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	4.92	7.91	13.46	58.81	51.43	75.33	.3397	.1947	.0449	.9300	43.19	89.62	90.68
2	4.48	7.66	11.47	57.09	52.76	74.50	.3416	.1866	.0438	.9352	45.24	89.12	90.21
3	3.42	6.83	10.12	55.90	53.03	73.55	.3430	.1652	.0395	.9446	50.60	87.73	88.93
4	-.73	3.51	8.34	53.90	52.25	70.69	.3480	.0937	.0236	.9718	70.50	80.34	82.09
5	-4.92	.42	8.62	50.50	51.96	68.54	.3380	.0472	.0127	.9870	83.19	71.84	74.07
6	-7.95	-2.23	8.29	47.67	54.95	69.38	.3219	.0542	.0151	.9852	78.97	71.58	73.76
7	-9.82	-3.95	8.15	46.00	56.89	70.14	.3074	.0505	.0143	.9862	78.39	73.03	75.09
8	-11.77	-5.78	7.93	44.41	58.72	69.70	.2907	.0239	.0069	.9936	87.91	74.43	76.38
9	-13.91	-7.70	8.81	45.80	53.94	60.58	.3345	.1005	.0299	.9773	58.12	68.25	70.46
10	-14.87	-8.63	10.63	47.41	51.05	58.66	.3479	.1354	.0408	.9700	45.76	65.08	67.44
11	-19.67	-13.53	12.95	48.19	50.13	58.70	.3419	.1489	.0454	.9671	35.69	63.73	66.17

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
11892.	153.87	1.2563	.8831	77.25	79.50

TABLE 11.7
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 10, POINT NO 11

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.254	29.601	338.9	991.1	338.9	562.1	.0	816.3	.0	54.7	.3063	.8322	966.8	1132.1	.9259	.5419	1024.5	699.7
2	24.855	24.839	371.8	981.6	371.8	575.3	.0	795.3	.0	53.3	.3367	.8229	1025.7	1163.7	.9879	.5727	1091.0	683.1
3	20.235	20.565	413.5	962.0	413.5	580.4	.0	767.2	.0	52.1	.3754	.8053	1081.9	1195.9	1.0515	.6040	1158.2	721.6
4	7.850	9.323	547.0	911.4	547.0	606.6	.0	680.3	.0	47.9	.5022	.7620	1235.1	1292.7	1.2403	.7206	1350.9	861.9
5	-4.981	-1.279	720.3	802.9	720.3	551.4	.0	582.9	.0	46.6	.6737	.6668	1419.4	1422.7	1.4888	.8349	1591.8	1009.7
6	-8.992	-5.540	754.2	801.9	754.2	594.9	.0	537.8	.0	42.1	.7085	.6691	1508.3	1487.3	1.5841	.9349	1686.4	1120.5
7	-10.744	-7.642	764.4	803.0	764.4	617.6	.0	513.2	.0	39.7	.7190	.6718	1550.1	1522.0	1.6257	.9895	1728.3	1182.8
8	-12.597	-9.627	762.6	801.5	762.6	635.3	.0	488.7	.0	37.5	.7172	.6724	1590.7	1555.2	1.6589	1.0419	1764.0	1241.4
9	-17.575	-15.988	693.5	691.6	693.5	540.3	.0	431.8	.0	38.3	.6465	.5774	1706.8	1650.1	1.7173	1.1127	1842.3	1332.8
10	-18.409	-17.974	669.2	647.3	669.2	489.0	.0	424.1	.0	40.4	.6219	.5381	1745.5	1682.8	1.7375	1.1226	1869.4	1350.3
11	-18.530	-19.251	662.3	630.5	662.3	470.4	.0	419.9	.0	41.3	.6151	.5229	1779.4	1715.0	1.7632	1.1428	1898.6	1377.9

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	VΘ'-1 FT/SEC	VΘ'-2 FT/SEC
1	7.55	11.76	15.66	41.47	20.71	51.47	.5713	-.0796	-.0146	2.5618	103.41	103.89	70.12	28.65	-966.8	-315.8
2	7.57	11.30	12.42	37.67	22.57	52.92	.5761	-.0379	-.0072	2.5302	101.91	102.17	69.51	31.85	-1025.7	-368.4
3	6.77	10.31	11.03	32.82	24.96	53.48	.5711	.0049	.0008	2.4636	99.73	99.70	68.49	35.67	-1081.9	-428.7
4	4.58	7.08	10.03	20.86	33.04	55.75	.5297	.1257	.0235	2.1891	89.98	88.84	65.72	44.85	-1235.1	-612.4
5	1.08	3.09	11.40	6.46	44.35	49.46	.4922	.2699	.0435	1.8036	71.34	68.92	63.18	56.71	-1419.4	-839.8
6	.40	2.23	7.92	5.68	46.96	53.72	.4410	.2559	.0416	1.7629	70.85	68.48	63.60	57.92	-1508.3	-949.6
7	-.00	1.72	6.86	5.43	47.94	56.05	.4140	.2449	.0398	1.7440	71.00	68.69	63.93	58.50	-1550.1	-1008.8
8	-.20	1.40	6.34	5.40	48.28	57.96	.3872	.2237	.0361	1.7427	72.66	70.49	64.56	59.16	-1590.7	-1066.5
9	.21	1.71	9.10	1.98	44.76	48.98	.3508	.2214	.0288	1.6611	70.37	68.23	67.81	65.83	-1706.8	-1218.4
10	.18	1.68	8.82	.31	43.39	44.11	.3472	.2371	.0275	1.6328	67.87	65.63	68.74	68.43	-1745.5	-1258.7
11	.09	1.59	6.54	-.59	43.11	42.42	.3397	.2464	.0265	1.6235	66.55	64.25	69.18	69.73	-1779.4	-1295.1

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.2618	1.9513	78.68	80.52	37.45

Stator

RUN NO912, SPEED CODE 10, POINT NO 11

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VΘ-1 FT/SEC	VΘ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	27.431	4.284	1036.4	1057.4	667.2	1054.5	793.2	-78.0	52.4	-4.1	.8759	.8964	2.2831	1.2963
2	24.334	3.552	1021.1	1039.1	665.1	1036.0	774.7	-80.7	51.3	-4.4	.8610	.8788	2.2550	1.2955
3	21.268	2.929	1001.0	1024.1	663.2	1020.3	749.8	-88.8	50.0	-4.9	.8427	.8655	2.2161	1.2921
4	12.882	1.048	953.3	975.8	676.8	969.1	671.3	-114.5	45.3	-6.7	.8014	.8238	2.0270	1.2789
5	2.839	-1.204	855.9	887.8	628.3	879.4	581.2	-121.6	42.8	-7.9	.7156	.7467	1.7503	1.2611
6	-1.926	-2.108	857.8	878.4	667.7	868.9	538.5	-128.8	38.9	-8.4	.7204	.7413	1.6906	1.2507
7	-4.022	-2.489	859.9	880.3	688.2	870.1	515.6	-133.4	36.9	-8.7	.7241	.7452	1.6835	1.2442
8	-5.746	-2.838	861.4	875.1	706.8	864.3	492.5	-137.1	35.0	-9.0	.7277	.7422	1.6808	1.2386
9	-11.847	-3.235	778.6	792.5	644.0	780.4	437.6	-138.1	34.6	-10.0	.6558	.6685	1.5728	1.2288
10	-14.674	-3.365	748.9	781.4	612.5	769.2	430.9	-137.5	35.8	-10.1	.6287	.6578	1.5462	1.2305
11	-17.435	-3.431	745.1	788.6	609.6	776.6	428.5	-137.2	36.0	-9.9	.6246	.6641	1.5383	1.2315

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	1.23	4.22	12.10	56.48	59.12	82.24	.1679	.2700	.0622	.8943	558.29	89.59	90.70
2	1.57	4.75	10.02	55.63	59.39	82.02	.1705	.2596	.0609	.9012	533.36	88.31	89.55
3	.71	4.12	8.44	54.87	59.38	81.99	.1690	.2261	.0540	.9162	415.65	87.16	88.48
4	-5.18	-.94	5.81	51.98	60.44	80.87	.1673	.1065	.0267	.9638	201.17	79.93	81.76
5	-8.69	-3.35	4.70	50.65	59.62	73.87	.1808	.0586	.0157	.9829	188.39	66.29	68.78
6	-12.41	-6.69	4.16	47.34	58.38	73.06	.1909	.1054	.0291	.9690	296.84	64.49	66.97
7	-14.39	-8.52	3.96	45.62	60.41	73.19	.1876	.1170	.0328	.9653	317.36	65.63	68.01
8	-16.33	-10.34	3.78	43.99	62.31	72.45	.1662	.0808	.0230	.9771	173.79	66.97	69.25
9	-18.66	-12.44	5.26	44.61	55.84	63.13	.1825	.1710	.0504	.9594	253.93	60.31	62.71
10	-19.79	-13.55	7.28	45.85	52.48	61.35	.1867	.2095	.0626	.9514	288.34	57.49	59.96
11	-25.19	-19.05	9.70	45.91	51.99	61.33	.1779	.2233	.0676	.9483	263.76	56.51	59.01

TABLE 11.8
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 10, POINT NO 12

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.508	29.387	315.1	992.3	315.1	504.9	.0	854.3	.0	58.7	.2894	.8287	963.9	1128.6	.9153	.4799	1014.1	574.6
2	25.279	24.619	343.3	976.4	343.3	534.1	.0	817.4	.0	56.0	.3104	.8155	1022.6	1140.1	.9751	.6300	1078.7	634.6
3	20.709	20.297	382.4	955.6	382.4	544.6	.0	785.2	.0	54.4	.3465	.7972	1078.6	1192.2	1.0369	.5672	1144.4	679.9
4	8.495	9.112	519.5	898.8	519.5	558.8	.0	704.0	.0	51.1	.4710	.7474	1231.3	1288.7	1.2218	.6725	1334.5	808.8
5	-4.005	-1.369	701.1	813.8	701.1	532.9	.0	615.1	.0	49.1	.6541	.6732	1415.1	1418.4	1.4734	.7973	1579.3	963.9
6	-8.128	-5.442	737.6	805.7	737.6	571.9	.0	567.4	.0	44.8	.6913	.6687	1503.7	1482.8	1.5698	.8959	1674.9	1079.4
7	-10.011	-7.496	748.9	805.5	748.9	597.2	.0	540.7	.0	42.1	.7029	.6705	1545.3	1517.3	1.6119	.9528	1717.2	1144.7
8	-12.053	-9.469	747.8	805.3	747.8	619.6	.0	514.4	.0	39.6	.7018	.6724	1585.8	1550.5	1.6458	1.0079	1753.3	1207.2
9	-17.571	-15.883	674.7	697.5	674.7	515.0	.0	470.4	.0	42.0	.6275	.5778	1701.6	1645.1	1.7029	1.0629	1830.5	1282.6
10	-18.530	-17.912	648.1	655.3	648.1	460.8	.0	465.9	.0	44.8	.6009	.5401	1740.2	1677.7	1.7218	1.0686	1857.0	1296.5
11	-18.650	-19.226	641.0	639.9	641.0	437.5	.0	467.0	.0	46.4	.5939	.5255	1773.9	1709.8	1.7475	1.0820	1886.2	1317.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/ PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	8.89	13.06	14.81	43.60	19.45	46.05	.6403	.0089	.0016	2.5620	99.63	99.58	71.41	27.80	-963.9	-274.3
2	9.03	12.76	12.43	39.11	21.09	49.27	.6166	.0039	.0007	2.5317	99.81	99.79	70.97	31.86	-1022.6	-342.8
3	8.25	11.79	11.30	34.04	23.40	50.55	.6021	.0262	.0050	2.4759	98.52	98.33	69.97	35.94	-1078.6	-407.0
4	5.83	8.33	11.04	21.11	31.56	52.19	.5691	.1418	.0261	2.2204	89.05	87.79	66.97	45.86	-1231.3	-584.7
5	1.60	3.61	11.13	7.25	43.84	49.57	.5179	.2612	.0424	1.8987	74.13	71.75	63.70	56.44	-1415.1	-803.2
6	.79	2.62	7.98	6.00	46.49	53.84	.4656	.2443	.0396	1.8580	74.00	71.69	63.98	57.98	-1503.7	-915.4
7	.34	2.06	6.88	5.74	47.48	56.68	.4359	.2285	.0371	1.8426	74.67	72.45	64.27	58.52	-1545.3	-976.7
8	.12	1.73	6.23	5.83	47.82	59.29	.4067	.2033	.0329	1.8447	76.71	74.66	64.88	59.04	-1585.8	-1036.0
9	.70	2.20	9.34	2.24	43.94	48.82	.3805	.2160	.0279	1.7690	73.43	71.26	68.30	66.06	-1701.6	-1174.7
10	.74	2.29	9.23	.47	42.39	43.43	.3789	.2348	.0267	1.7433	70.91	68.60	69.31	68.84	-1740.2	-1211.8
11	.66	2.16	7.11	-.56	42.09	41.12	.3752	.2519	.0264	1.7346	68.94	66.49	69.75	70.30	-1773.9	-1242.7

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.2744	2.0151	79.36	81.23	36.48

Stator

RUN NO912, SPEED CODE 10, POINT NO 12

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/ PT1	TT2/ TT1
1	26.985	4.211	1025.2	903.3	604.4	901.5	828.1	-56.1	56.1	-3.5	.8609	.7463	2.3562	1.3069
2	23.769	3.428	1006.4	883.4	616.6	881.6	795.3	-57.0	54.0	-3.6	.8442	.7298	2.3245	1.3016
3	20.517	2.801	985.1	866.6	617.8	864.5	767.4	-60.1	52.5	-3.9	.8253	.7156	2.2765	1.2980
4	11.857	.901	933.2	818.8	623.2	815.9	694.7	-68.8	48.5	-4.8	.7795	.6752	2.0673	1.2882
5	1.768	-1.332	857.5	763.7	599.4	760.9	613.2	-64.7	45.6	-4.9	.7128	.6297	1.8418	1.2746
6	-2.618	-2.293	852.7	769.7	636.1	766.7	567.9	-68.1	41.8	-5.1	.7116	.6382	1.8049	1.2630
7	-4.853	-2.633	853.8	778.4	658.9	775.2	543.0	-70.6	39.6	-5.2	.7146	.6479	1.8057	1.2562
8	-6.105	-2.999	855.2	776.4	680.3	773.0	518.3	-73.1	37.4	-5.4	.7181	.6477	1.8104	1.2505
9	-11.723	-3.398	773.3	682.5	608.9	678.3	476.7	-75.7	38.5	-6.3	.6455	.5641	1.7092	1.2500
10	-14.962	-3.476	743.9	666.5	573.7	662.2	473.5	-75.6	40.2	-6.5	.6183	.5489	1.6820	1.2547
11	-17.261	-3.480	740.1	671.3	565.5	667.0	477.5	-75.5	41.1	-6.4	.6133	.5524	1.6737	1.2579

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2 PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	4.98	7.97	12.75	59.58	53.85	80.55	.3097	.1999	.0461	.9239	27.68	90.18	91.28
2	4.27	7.45	10.76	57.59	55.68	79.90	.3105	.1921	.0451	.9293	29.66	90.14	91.22
3	3.20	6.61	9.42	56.38	56.13	79.18	.3112	.1710	.0409	.9389	36.16	88.65	89.86
4	-1.95	2.29	7.72	53.30	56.90	76.46	.3142	.0953	.0240	.9691	62.23	79.77	81.68
5	-5.83	-.49	7.71	50.51	54.35	71.71	.3152	.0543	.0146	.9845	77.18	69.31	71.79
6	-9.52	-3.80	7.52	46.87	58.30	72.66	.3017	.0721	.0200	.9792	68.09	69.74	72.10
7	-11.72	-5.85	7.47	44.78	60.82	73.67	.2886	.0719	.0203	.9791	65.35	71.71	73.93
8	-13.88	-7.89	7.39	42.83	63.22	73.38	.2653	.0235	.0067	.9934	85.04	73.70	75.76
9	-14.79	-8.57	8.91	44.82	55.67	62.05	.3154	.1000	.0298	.9770	51.40	66.12	68.53
10	-15.38	-9.14	10.88	46.66	51.74	59.70	.3307	.1389	.0419	.9688	37.05	62.82	65.38
11	-20.10	-13.96	13.23	47.48	50.65	59.59	.3256	.1537	.0469	.9655	24.49	61.40	64.04

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
12460.	162.77	1.2744	1.9532	76.68	78.73

TABLE 11.9
BLADE ELEMENT AND OVERALL PERFORMANCE WITH HUB RADIALLY DISTORTED INLET FLOW

Rotor

RUN NO912, SPEED CODE 10, POINT NO 13

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	U-1 FT/SEC	U-2 FT/SEC	M'-1	M'-2	V'-1 FT/SEC	V'-2 FT/SEC
1	29.476	29.425	301.8	989.6	301.8	489.8	.0	859.8	.0	59.6	.2722	.8254	964.4	1129.2	.9115	.4663	1010.5	559.0
2	25.208	24.729	330.9	973.0	330.9	516.5	.0	824.6	.0	57.1	.2989	.8113	1023.2	1160.8	.9714	.5139	1075.3	616.3
3	20.672	20.374	372.3	953.8	372.3	527.3	.0	794.8	.0	55.6	.3372	.7942	1079.2	1192.9	1.0337	.5502	1141.6	660.7
4	8.649	9.257	504.3	901.4	504.3	542.3	.0	720.0	.0	52.6	.4613	.7476	1232.0	1289.4	1.2177	.6523	1331.3	786.4
5	-3.679	-1.299	683.9	824.2	683.9	524.3	.0	636.0	.0	50.5	.6368	.6798	1415.9	1419.2	1.4640	.7773	1572.4	942.5
6	-7.930	-5.396	723.9	812.3	723.9	558.3	.0	590.0	.0	46.6	.6773	.6716	1504.6	1483.6	1.5622	.8712	1669.6	1053.7
7	-9.862	-7.462	736.9	809.9	736.9	581.6	.0	563.6	.0	44.1	.6906	.6712	1546.2	1518.2	1.6052	.9263	1712.8	1117.8
8	-11.907	-9.428	737.8	805.7	737.8	601.5	.0	536.1	.0	41.6	.6915	.6696	1586.7	1551.3	1.6401	.9807	1749.8	1180.0
9	-17.411	-15.834	670.7	707.4	670.7	506.8	.0	493.5	.0	43.9	.6235	.5834	1702.6	1646.0	1.7011	1.0385	1829.9	1259.0
10	-18.418	-17.863	645.8	669.3	645.8	456.9	.0	490.0	.0	46.6	.5984	.5493	1741.2	1678.6	1.7214	1.0449	1857.1	1273.0
11	-18.600	-19.203	638.8	654.3	638.8	431.9	.0	491.4	.0	48.2	.5917	.5350	1774.9	1710.7	1.7472	1.0577	1886.3	1293.5

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P TOT-ST	%EFF-A TOT-ST	B'-1 DEGREE	B'-2 DEGREE	Vθ'-1 FT/SEC	Vθ'-2 FT/SEC
1	9.58	13.79	15.11	44.04	18.81	49.87	.6550	.0300	.0055	2.5560	98.77	98.60	72.14	28.10	-964.4	-269.4
2	9.67	13.40	12.82	39.37	20.52	47.88	.6326	.0269	.0051	2.5245	98.70	98.52	71.62	32.25	-1023.2	-336.2
3	8.75	12.29	11.60	34.23	23.01	49.22	.6182	.0480	.0091	2.4739	97.35	97.00	70.47	36.24	-1079.2	-398.1
4	6.27	8.76	11.15	21.43	31.25	51.14	.5800	.1497	.0275	2.2513	88.79	87.47	67.41	45.97	-1232.0	-569.5
5	2.17	4.17	10.89	8.06	43.06	49.56	.5319	.2581	.0422	1.9595	75.47	73.10	64.26	56.20	-1415.9	-783.2
6	1.21	3.04	7.98	6.42	45.91	53.42	.4829	.2463	.0400	1.9134	74.83	72.48	64.40	57.98	-1504.6	-893.6
7	.70	2.42	6.97	6.02	46.99	56.12	.4539	.2327	.0377	1.8952	75.24	72.96	64.63	58.61	-1546.2	-954.6
8	.41	2.02	6.46	5.90	47.42	58.55	.4246	.2091	.0337	1.8920	76.96	74.84	65.17	59.28	-1586.7	-1015.2
9	.81	2.31	9.27	2.42	43.82	49.03	.3969	.2187	.0283	1.8267	74.26	72.04	68.41	65.99	-1702.6	-1152.5
10	.81	2.31	9.06	.70	42.37	43.88	.3955	.2372	.0272	1.8041	71.92	69.54	69.37	68.67	-1741.2	-1188.6
11	.73	2.23	6.99	-.36	42.07	41.48	.3919	.2544	.0268	1.7963	70.02	67.50	69.82	70.18	-1774.9	-1219.3

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.2833	2.0548	79.42	81.34	36.12

Stator

RUN NO912, SPEED CODE 10, POINT NO 13

SL	EPSI-1 DEGREE	EPSI-2 DEGREE	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	Vθ-1 FT/SEC	Vθ-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	M-1	M-2	PT2/PT1	TT2/TT1
1	27.002	4.231	1018.3	844.8	584.7	843.6	833.8	-45.3	57.2	-3.0	.8530	.6925	2.3581	1.3094
2	23.778	3.468	999.6	827.0	595.9	825.7	803.6	-46.0	55.1	-3.1	.8367	.6778	2.3263	1.3050
3	20.442	2.863	980.3	813.5	597.6	812.0	777.1	-48.4	53.7	-3.4	.8193	.6665	2.2844	1.3024
4	11.638	.985	932.7	776.8	604.2	774.9	710.6	-54.6	50.0	-4.0	.7767	.6358	2.1040	1.2956
5	1.581	-1.273	864.4	731.7	587.5	730.2	634.0	-46.3	47.2	-3.6	.7162	.5987	1.8929	1.2851
6	-2.738	-2.215	856.3	741.8	620.0	740.2	590.6	-48.1	43.6	-3.7	.7115	.6104	1.8573	1.2744
7	-4.686	-2.626	855.3	751.8	641.3	750.2	565.9	-49.6	41.5	-3.8	.7125	.6211	1.8582	1.2472
8	-6.273	-3.011	853.2	749.8	660.6	748.0	540.1	-53.1	39.4	-4.1	.7129	.6208	1.8612	1.2417
9	-11.939	-3.420	778.8	659.9	597.0	656.2	500.1	-69.0	40.4	-6.0	.6470	.5414	1.7651	1.2629
10	-14.602	-3.487	752.9	644.0	564.4	640.0	498.2	-71.4	42.1	-6.3	.6228	.5265	1.7390	1.2682
11	-17.326	-3.479	749.3	648.7	555.7	644.7	502.6	-72.0	43.1	-6.3	.6179	.5298	1.7309	1.2715

SL	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	RHOVM-1	RHOVM-2	D-FAC	OMEGA-B TOTAL	LOSS-P TOTAL	PT2/PT1	%EFF-P STATC-ST	%EFF-A TOT-STG	%EFF-P TOT-STG
1	6.03	9.02	13.22	60.16	52.49	78.46	.3615	.1943	.0448	.9270	49.60	89.56	90.73
2	5.44	8.62	11.26	58.26	54.22	77.78	.3626	.1889	.0442	.9315	50.60	89.24	90.42
3	4.45	7.86	9.98	57.08	54.75	77.18	.3626	.1698	.0406	.9400	54.67	87.79	89.10
4	-.45	3.79	8.50	54.02	55.82	75.15	.3616	.1021	.0257	.9671	70.81	79.87	81.81
5	-4.30	1.04	8.94	50.80	54.23	71.19	.3581	.0657	.0177	.9812	79.76	70.02	72.53
6	-7.68	-1.95	8.88	47.36	57.86	72.54	.3368	.0704	.0196	.9798	76.28	70.40	72.82
7	-9.78	-3.91	8.89	45.30	60.29	73.78	.3188	.0619	.0175	.9822	76.96	72.39	74.65
8	-11.90	-5.91	8.73	43.47	62.55	73.49	.2990	.0233	.0067	.9935	89.69	74.11	76.23
9	-12.86	-6.65	9.28	46.38	55.72	62.21	.3595	.1048	.0312	.9756	63.34	66.96	69.45
10	-13.46	-7.21	11.03	48.43	52.10	59.82	.3772	.1433	.0432	.9674	52.46	63.79	66.44
11	-18.13	-11.99	13.31	49.36	50.96	59.72	.3727	.1580	.0483	.9642	44.69	62.42	65.15

NCORR INLET	WCORR INLET	TO/TO INLET	PO/PO INLET	EFF-AD INLET	EFF-P INLET

APPENDIX 5

OVERALL PERFORMANCE AND FLOW DISTRIBUTIONS WITH CIRCUMFERENTIALLY DISTORTED INLET FLOW (TABULATIONS)

TABLE 12
STAGE OVERALL PERFORMANCE FOR INLET CIRCUMFERENTIAL DISTORTION

% Design Speed	$W\sqrt{\theta_{11}}/\delta_{11}$	P_{17}/P_{11}	η_{ad}	T_{17}/T_{11}
70	122.7	1.349	75.5	1.118
	114.9	1.444	82.3	1.135
	107.3	1.478	80.5	1.147
95	163.6	1.826	72.0	1.246
	159.2	1.905	77.6	1.261
	151.5	1.936	76.6	1.272
100	174.1	1.958	77.3	1.274
	167.4	2.036	77.5	1.291
	161.2	2.054	76.1	1.300

NOTE: Symbol definitions appear in Appendix 1

TABLE 13.1

ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11, 70% OF DESIGN SPEED, $W\sqrt{\theta}/\delta$ = 107.32 LBM/SEC.

Circumferential Position % Span	12°								42°								72°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^\circ_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$	P_{11}/P_o	P_{11}/P_o	$90-\beta^\circ_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$	P_{11}/P_o	P_{11}/P_o	$90-\beta^\circ_{11}$	M	V	V_m	V_θ	$90-\beta_{11}$
10 (Hub)	.982	.966	104.0	.15	171	166	-41	11.1	.980	.966	102.5	.14	161	157	-35	10.6	.976	.964	98.3	.13	145	144	-21	9.9
30	.982	.952	104.2	.21	236	229	-58	12.2	.981	.951	100.2	.21	233	229	-41	12.4	.977	.950	97.5	.20	221	220	-29	12.0
50	.981	.950	102.4	.22	241	236	-52	10.9	.982	.949	100.3	.22	246	242	-44	11.3	.980	.947	97.3	.22	246	244	-31	11.4
70	.974	.957	104.1	.16	176	171	-43	7.1	.974	.956	101.1	.16	182	179	-35	7.5	.975	.954	98.6	.18	198	196	-30	8.2
90 (Tip)	.975	.963	105.5	.14	152	146	-41	5.5	.972	.961	101.7	.13	141	138	-29	5.3	.969	.958	97.6	.13	145	143	-19	5.5
MR	.982	.956	103.6	.19	216	210	-51	9.4	.981	.956	101.0	.19	214	211	-41	9.4	.977	.954	97.8	.19	208	206	-28	9.4
	102°								132°								162°							
10 (Hub)	.975	.963	94.2	.13	146	145	-11	10.1	.980	.961	82.6	.17	186	184	24	13.3	.970	.931	61.6	.24	269	237	128	25.1
30	.972	.950	97.1	.18	206	204	-25	11.2	.977	.947	90.6	.21	234	234	-3	13.1	.976	.914	70.9	.31	339	321	111	24.4
50	.982	.946	97.3	.23	255	253	-32	11.8	.976	.942	91.6	.22	250	249	-7	11.9	.970	.910	69.7	.30	335	314	116	20.2
70	.974	.953	97.5	.18	198	196	-26	8.3	.969	.949	91.6	.17	191	190	-5	8.1	.963	.920	68.9	.26	283	264	202	14.7
90 (Tip)	.966	.956	96.0	.12	137	136	-14	5.2	.974	.953	86.1	.13	146	146	10	5.7	.944	.931	63.1	.14	161	144	73	7.0
MR	.976	.953	96.3	.19	207	205	-23	9.3	.977	.951	88.0	.20	221	221	8	10.4	.968	.919	67.7	.27	302	279	114	18.3
	192°								222°								252°							
10 (Hub)	.941	.906	57.1	.23	259	217	140	23.8	.906	.899	81.7	.10	112	111	16	10.2	.953	.898	113.1	.29	325	299	-127	21.5
30	.934	.896	68.8	.24	270	252	98	19.3	.904	.889	85.1	.15	171	171	14	12.0	.918	.888	106.8	.22	243	233	-70	14.7
50	.913	.896	70.8	.16	181	171	59	10.7	.903	.889	85.3	.15	169	168	14	10.0	.909	.891	112.5	.17	187	172	-71	9.4
70	.903	.898	61.7	.08	90	79	43	4.2	.902	.894	87.5	.11	121	121	5	6.3	.903	.896	120.5	.10	114	98	-58	4.8
90 (Tip)	.905	.902	46.6	.06	68	50	47	2.4	.902	.898	87.3	.08	91	91	4	4.2	.906	.903	127.6	.07	81	64	-49	2.8
MR	.927	.900	64.1	.21	232	208	101	12.1	.903	.893	85.2	.13	145	144	12	8.5	.926	.894	112.6	.23	252	233	-97	10.6
	282°								312°								342°							
10 (Hub)	.969	.906	114.3	.31	342	312	-141	22.0	.980	.936	110.8	.26	287	268	-102	20.0	.977	.962	111.7	.15	168	156	-62	10.2
30	.962	.891	109.4	.33	368	347	-122	20.3	.973	.918	103.4	.29	323	314	-75	19.4	.983	.947	108.3	.23	257	244	-81	12.7
50	.958	.894	113.1	.32	350	322	-137	16.2	.980	.918	97.6	.31	340	337	-45	18.4	.981	.946	107.6	.23	254	242	-77	11.0
70	.955	.913	118.3	.26	285	251	-135	11.4	.975	.931	100.5	.26	286	281	-52	13.6	.973	.955	108.5	.16	182	173	-58	7.1
90 (Tip)	.970	.927	127.8	.26	284	224	-174	9.0	.977	.943	102.1	.23	253	248	-53	10.8	.975	.962	108.3	.14	159	151	-50	5.7
MR	.962	.903	114.8	.30	335	304	-140	15.8	.977	.927	102.8	.27	304	297	-68	16.4	.980	.952	109.3	.21	229	216	-75	9.3

1. Inlet Plenum Conditions: P_o = 2062 psf, T_o = 490.6°R
2. *V_m Calculation is Based on Standard Day Inlet Plenum Conditions*
3. *Circumferential Reference Position is TDC Looking Forward*
4. Relative Position of Circumferential Distortion Screen is 165–285°
5. $\beta^\circ_{11} = \tan^{-1}\left[\tan\beta'_{11}/\cos\epsilon\right]$

TABLE 13.2
ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11, 70% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 114.89 LBM/SEC.

Circumferential Position % Span	P_{11}/P_o	P_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
				12°				
10 (Hub)	.979	.958	105.9	.18	197	190	-54	12.4
30	.979	.925	106.5	.29	316	303	-89	15.5
50	.978	.917	105.1	.30	336	324	-87	14.4
70	.972	.943	104.4	.21	231	224	-57	9.2
90 (Tip)	.971	.952	107.3	.17	186	177	-55	6.6
MR	.979	.934	105.8	.26	287	277	-78	11.6
				102°				
10 (Hub)	.970	.957	93.0	.14	154	154	-8	10.7
30	.969	.942	96.8	.20	223	222	-26	12.2
50	.979	.922	97.0	.29	325	323	-40	14.9
70	.971	.945	98.0	.20	219	217	-31	9.1
90 (Tip)	.963	.950	96.8	.14	155	154	-18	5.9
MR	.973	.940	95.7	.22	249	247	-25	10.6
				192°				
10 (Hub)	.934	.891	52.3	.26	289	229	177	26.7
30	.931	.880	65.5	.28	315	287	131	22.7
50	.904	.879	67.1	.20	224	206	87	13.2
70	.892	.885	56.3	.10	113	94	63	5.1
90 (Tip)	.899	.890	32.9	.12	132	72	111	3.6
MR	.920	.884	59.6	.24	266	229	134	14.3
				282°				
10 (Hub)	.964	.891	113.9	.34	373	341	-151	23.5
30	.955	.873	108.4	.36	397	377	-125	21.8
50	.949	.874	110.8	.34	381	356	-135	17.9
70	.945	.886	114.9	.30	336	304	-141	13.7
90 (Tip)	.957	.900	122.0	.30	331	281	-175	11.2
MR	.953	.883	112.9	.33	369	340	-143	17.6

Circumferential Position % Span	P_{11}/P_o	P_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
				42°				
10 (Hub)	.978	.960	102.6	.16	180	175	-39	11.7
30	.979	.939	102.3	.24	271	265	-58	14.0
50	.980	.919	101.8	.30	336	329	-69	14.8
70	.973	.946	101.0	.20	221	217	-42	9.0
90 (Tip)	.971	.954	105.2	.16	181	174	-47	6.6
MR	.979	.940	102.2	.24	269	263	-57	11.2
				132°				
10 (Hub)	.962	.9395	78.8	.18	205	201	40	14.7
30	.957	.9225	88.2	.23	255	255	8	14.4
50	.954	.910	91.9	.26	283	283	-10	13.4
70	.953	.927	90.7	.20	218	218	-3	9.3
90 (Tip)	.948	.935	87.8	.14	158	158	6	6.2
MR	.956	.924	86.0	.22	246	246	17	11.6
				222°				
10 (Hub)	.894	.884	74.8	.13	143	138	37	13.1
30	.890	.872	80.1	.17	189	186	32	13.4
50	.891	.870	81.5	.18	204	202	30	12.1
70	.889	.877	81.9	.14	156	154	22	8.1
90 (Tip)	.893	.884	83.2	.12	136	135	16	6.3
MR	.891	.876	80.1	.16	173	170	30	10.6
				312°				
10 (Hub)	.978	.922	109.5	.29	321	303	-107	22.2
30	.944	.890	101.8	.33	365	357	-75	21.8
50	.968	.8895	98.5	.35	383	379	-57	20.3
70	.974	.912	100.5	.31	346	340	-63	16.1
90 (Tip)	.977	.9235	102.3	.28	307	300	-66	12.9
MR	.968	.902	102.4	.32	350	342	-75	18.7

Circumferential Position % Span	P_{11}/P_o	P_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
				72°				
10 (Hub)	.978	.960	99.7	.16	183	180	-31	12.2
30	.977	.942	99.7	.23	255	252	-43	13.5
50	.979	.924	99.1	.29	322	318	-51	14.5
70	.972	.946	100.6	.19	216	213	-40	8.8
90 (Tip)	.968	.953	99.3	.15	167	165	-27	6.3
MR	.978	.942	99.5	.23	258	255	-43	11.1
				162°				
10 (Hub)	.967	.922	57.7	.26	291	246	155	27.2
30	.973	.903	67.9	.33	363	337	137	26.3
50	.968	.898	69.8	.33	362	340	125	22.0
70	.959	.909	68.1	.28	307	284	114	15.9
90 (Tip)	.940	.920	60.3	.17	191	166	95	8.2
MR	.965	.908	65.8	.29	326	297	134	19.9
				252°				
10 (Hub)	.904	.880	106.3	.20	221	212	-62	17.0
30	.890	.869	98.7	.19	206	204	-31	13.5
50	.889	.869	102.0	.18	199	195	-41	10.9
70	.883	.877	103.5	.10	116	113	-27	5.7
90 (Tip)	.885	.881	97.9	.08	91	90	-13	4.1
MR	.892	.874	102.3	.17	192	187	-41	10.2
				342°				
10 (Hub)	.974	.953	112.9	.18	201	185	-78	11.8
30	.979	.907	108.8	.33	367	348	-119	17.2
50	.978	.905	107.9	.33	369	351	-113	15.2
70	.969	.938	108.6	.22	242	229	-77	9.3
90 (Tip)	.969	.947	110.9	.18	202	189	-72	7.0
MR	.977	.921	109.8	.29	323	304	-109	12.1

1. Inlet Plenum Conditions: P_o = 2056 psf, T_o = 491.2°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{11} = \tan^{-1} \left[\tan\beta^{\circ}_{11}/\cos\right]$

TABLE 13.3

ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS

WEDGE PROBE STATION 11, 70% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 122.69 LBM/SEC.

Circumferential Position	% Span	P_{11}/P_o	P_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
12°	10 (Hub)	.978	.953	108.6	.19	215	204	-69	13.2
	30	.976	.905	105.0	.33	365	353	-95	17.8
	50	.976	.903	105.8	.34	371	357	-101	15.7
	70	.971	.935	104.7	.23	257	249	-65	10.1
	90 (Tip)	.968	.945	107.0	.19	206	197	-60	7.3
	MR	.977	.920	106.4	.29	324	311	-91	12.8
42°	10 (Hub)	.976	.955	102.7	.17	194	189	-43	12.5
	30	.976	.920	101.8	.29	323	316	-66	16.5
	50	.977	.905	102.1	.33	366	358	-76	16.0
	70	.970	.938	101.9	.22	242	236	-50	9.7
	90 (Tip)	.969	.947	103.1	.18	202	197	-46	7.4
	MR	.976	.927	102.2	.27	303	296	-64	12.4
72°	10 (Hub)	.974	.955	99.3	.17	186	183	-30	12.4
	30	.974	.925	99.2	.27	303	299	-49	15.9
	50	.976	.905	99.8	.33	366	361	-62	16.3
	70	.970	.938	98.8	.22	245	243	-38	10.1
	90 (Tip)	.965	.945	99.0	.17	190	188	-30	7.1
	MR	.975	.928	99.4	.27	295	291	-48	12.4
102°	10 (Hub)	.969	.953	93.4	.16	175	174	-10	12.1
	30	.963	.935	96.3	.21	232	231	-26	12.7
	50	.976	.904	97.3	.33	367	364	-47	16.6
	70	.971	.937	96.2	.23	252	250	-27	10.5
	90 (Tip)	.960	.944	96.4	.16	175	173	-19	6.6
	MR	.970	.929	95.8	.25	276	275	-28	11.7
132°	10 (Hub)	.975	.947	77.0	.20	228	222	51	16.4
	30	.969	.914	88.0	.29	321	321	11	17.9
	50	.969	.897	90.7	.33	369	369	-4	17.4
	70	.962	.929	90.0	.22	250	250	0	10.6
	90 (Tip)	.959	.938	85.7	.18	196	195	15	7.6
	MR	.971	.920	85.2	.28	308	307	26	14.0
162°	10 (Hub)	.964	.909	55.4	.29	320	264	182	30.4
	30	.971	.893	66.8	.35	395	354	152	28.0
	50	.966	.887	68.2	.35	386	359	143	23.5
	70	.956	.893	67.2	.31	346	319	134	18.1
	90 (Tip)	.935	.907	60.0	.21	232	201	116	10.1
	MR	.962	.896	64.5	.32	354	319	152	22.0
192°	10 (Hub)	.927	.871	49.3	.30	333	253	217	31.4
	30	.927	.858	64.1	.33	368	331	161	26.8
	50	.899	.861	66.1	.35	274	250	111	16.3
	70	.880	.867	55.2	.14	158	130	90	7.2
	90 (Tip)	.891	.872	29.5	.18	199	98	173	5.2
	MR	.912	.864	57.6	.28	309	261	166	17.4
222°	10 (Hub)	.882	.862	72.8	.18	200	191	59	18.5
	30	.875	.847	77.2	.22	240	234	53	17.0
	50	.874	.844	78.3	.22	249	244	50	14.9
	70	.874	.848	75.6	.21	232	225	58	12.0
	90 (Tip)	.877	.859	81.3	.18	195	193	30	9.0
	MR	.876	.851	76.6	.21	228	222	53	14.3
252°	10 (Hub)	.895	.857	104.2	.25	278	269	-68	21.0
	30	.873	.842	96.9	.23	251	250	-30	16.4
	50	.871	.839	97.9	.23	259	256	-36	14.3
	70	.869	.848	100.3	.19	207	204	-37	10.1
	90 (Tip)	.868	.856	100.1	.14	161	158	-28	7.1
	MR	.877	.848	99.9	.22	245	242	-42	13.8
282°	10 (Hub)	.957	.874	116.7	.36	399	357	-179	23.7
	30	.951	.849	108.7	.41	446	423	-143	23.8
	50	.945	.848	109.5	.40	435	410	-145	20.2
	70	.941	.860	114.0	.36	398	364	-162	16.0
	90 (Tip)	.952	.876	119.3	.35	384	335	-188	13.2
	MR	.949	.859	112.9	.38	417	384	-162	19.4
312°	10 (Hub)	.976	.906	112.6	.33	363	335	-139	23.4
	30	.966	.886	103.9	.36	392	380	-94	22.6
	50	.972	.884	100.5	.37	408	401	-74	21.0
	70	.972	.892	101.9	.35	388	380	-80	17.7
	90 (Tip)	.969	.905	102.8	.31	345	337	-77	14.3
	MR	.971	.893	104.3	.35	384	372	-95	19.8
342°	10 (Hub)	.975	.946	116.1	.21	230	206	-101	12.8
	30	.976	.899	110.8	.34	379	354	-134	17.3
	50	.976	.898	109.7	.35	383	361	-129	15.5
	70	.970	.914	109.7	.29	325	306	-109	12.1
	90 (Tip)	.968	.939	110.7	.21	230	215	-81	7.9
	MR	.975	.914	112.1	.31	339	314	-127	13.1

1. Inlet Plenum Conditions: P_o = 2040 psf, T_o = 490.6°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{11} = \tan^{-1}\left[\tan\beta'_{11}/\cos\right]$

TABLE 13.4
ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11, 95% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 151.54 LBM/SEC.

Circumferential Position % Span	12°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.961	.881	105.7	.35	391	376	-106	17.4
30	.961	.847	103.6	.43	470	457	-110	17.2
50	.957	.847	103.5	.42	461	448	-107	14.7
70	.958	.861	103.5	.39	431	419	-101	12.4
90 (Tip)	.9 7	.877	103.2	.35	391	381	-89	10.3
MR	.960	.861	104.4	.40	437	424	-109	14.4

Circumferential Position % Span	42°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.959	.882	101.0	.35	383	376	-73	17.9
30	.958	.849	99.9	.42	460	453	-79	17.4
50	.960	.845	100.1	.43	473	465	-83	15.5
70	.958	.857	100.1	.40	443	436	-78	13.1
90 (Tip)	.957	.873	100.5	.36	401	394	-73	10.8
MR	.959	.861	100.4	.40	435	428	-79	14.9

Circumferential Position % Span	72°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.944	.888	97.8	.30	329	326	-45	16.0
30	.955	.847	97.9	.42	459	455	-63	17.7
50	.959	.841	98.5	.44	479	474	-71	15.9
70	.958	.852	97.7	.41	454	450	-61	13.6
90 (Tip)	.952	.868	97.6	.37	404	401	-54	11.0
MR	.953	.860	98.0	.39	424	420	-59	14.8

Circumferential Position % Span	102°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.953	.878	92.3	.34	378	378	-15	18.8
30	.944	.845	95.8	.40	442	440	-45	17.4
50	.959	.835	95.8	.45	491	487	-58	16.4
70	.957	.846	96.6	.42	466	463	-58	14.0
90 (Tip)	.949	.862	95.0	.37	412	411	-36	11.4
MR	.952	.855	94.8	.39	434	433	-36	

Circumferential Position % Span	132°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.956	.865	78.5	.38	418	410	84	22.1
30	.953	.832	89.4	.44	487	487	5	19.7
50	.946	.822	92.2	.45	495	495	-19	17.1
70	.942	.833	91.2	.42	464	464	-10	14.4
90 (Tip)	.940	.850	89.4	.38	421	421	4	12.0
MR	.952	.842	85.9	.42	463	462	33	17.1

Circumferential Position % Span	162°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.941	.845	62.8	.39	434	386	198	30.3
30	.939	.810	70.0	.46	507	477	174	27.0
50	.926	.803	72.7	.45	497	474	148	22.1
70	.928	.811	70.1	.44	484	455	165	18.7
90 (Tip)	.921	.830	70.7	.39	426	402	141	14.5
MR	.932	.818	69.2	.44	477	446	169	22.5

Circumferential Position % Span	192°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.877	.799	57.7	.37	405	343	217	28.0
30	.863	.777	70.2	.39	429	403	145	22.7
50	.821	.776	71.8	.28	313	297	98	13.7
70	.806	.783	68.1	.21	229	213	85	8.5
90 (Tip)	.820	.792	52.1	.22	248	196	152	7.3
MR	.846	.785	65.6	.33	363	330	150	16.0

Circumferential Position % Span	222°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.811	.784	79.4	.22	241	237	44	16.2
30	.810	.760	84.5	.30	335	333	32	17.2
50	.801	.763	86.1	.26	291	291	20	12.7
70	.799	.771	87.6	.23	251	251	11	9.5
90 (Tip)	.812	.782	89.0	.23	258	258	5	8.7
MR	.806	.770	85.0	.25	282	281	25	12.9

Circumferential Position % Span	252°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.840	.781	106.7	.33	360	345	-104	19.7
30	.811	.766	100.5	.29	319	313	-58	15.0
50	.805	.771	103.7	.25	277	269	-65	11.0
70	.806	.781	107.6	.21	235	224	-71	8.0
90 (Tip)	.814	.792	105.0	.20	219	211	-57	6.9
MR	.817	.776	104.6	.27	301	292	-76	12.1

Circumferential Position % Span	282°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.918	.806	116.1	.44	478	429	-210	21.9
30	.927	.777	108.7	.51	555	526	-177	22.2
50	.918	.780	111.1	.49	533	497	-192	18.3
70	.927	.801	115.1	.46	505	457	-214	14.9
90 (Tip)	.943	.835	124.1	.42	460	381	-258	11.1
MR	.925	.795	113.8	.47	514	470	-207	17.7

Circumferential Position % Span	312°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.957	.854	109.2	.41	447	422	-147	22.8
30	.942	.815	101.7	.46	503	492	-102	22.1
50	.961	.814	97.8	.49	537	532	-73	21.0
70	.958	.840	98.9	.44	480	474	-75	16.7
90 (Tip)	.953	.870	102.2	.36	401	392	-85	12.4
MR	.954	.834	101.7	.44	484	474	-99	19.0

Circumferential Position % Span	342°							
	P_{11}/P_o	P_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.947	.869	112.6	.35	390	360	-150	16.1
30	.962	.834	108.5	.46	499	473	-159	17.3
50	.957	.834	106.9	.45	491	470	-142	15.1
70	.958	.853	107.5	.41	450	429	-136	12.5
90 (Tip)	.953	.874	108.2	.35	389	369	-121	9.9
MR	.955	.847	109.6	.42	458	432	-153	14.2

1. Inlet Plenum Conditions: P_o = 2000 psf, T_o = 491.5°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
4. $\beta_{11} = \tan^{-1} [\tan\beta_{11}/\cos]$

TABLE 13.5
ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11, 95% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 159.20 LBM/SEC.

Circumferential Position % Span	12° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.956	.865	106.0	.38	419	403	-115	18.4
30	.954	.824	104.2	.46	507	491	-124	18.3
50	.955	.811	103.6	.49	534	519	-126	16.8
70	.956	.821	104.7	.47	514	498	-131	14.4
90 (Tip)	.953	.846	103.9	.42	457	444	-110	11.9
MR	.955	.836	104.7	.44	483	467	-123	16.0

Circumferential Position % Span	42° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.956	.870	102.8	.37	406	396	-90	18.5
30	.954	.830	102.0	.45	493	483	-102	18.2
50	.956	.818	102.4	.48	521	509	-112	16.6
70	.955	.828	101.3	.46	499	489	-98	14.5
90 (Tip)	.955	.850	101.3	.41	451	443	-88	12.0
MR	.955	.842	102.4	.43	470	459	-101	16.0

Circumferential Position % Span	72° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.955	.871	99.0	.36	401	397	-63	18.9
30	.950	.832	99.7	.44	480	474	-81	18.1
50	.957	.818	99.8	.48	522	514	-89	17.0
70	.952	.829	99.9	.45	491	484	-84	14.4
90 (Tip)	.945	.850	99.5	.39	430	424	-71	11.6
MR	.954	.843	99.5	.42	464	458	-76	16.0

Circumferential Position % Span	102° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.941	.869	93.7	.34	375	374	-24	18.5
30	.946	.833	97.1	.43	471	468	-58	18.2
50	.957	.820	99.0	.48	520	514	-81	17.0
70	.956	.830	96.8	.45	496	492	-59	14.8
90 (Tip)	.945	.850	96.1	.39	432	430	-46	11.9
MR	.948	.842	96.4	.41	454	452	-50	16.1

Circumferential Position % Span	132° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.950	.857	77.6	.39	424	414	91	22.4
30	.949	.823	89.2	.46	499	499	7	20.2
50	.939	.812	92.1	.46	504	503	-18	17.3
70	.934	.823	92.4	.43	471	470	-19	14.5
90 (Tip)	.934	.840	89.8	.39	431	431	2	12.2
MR	.947	.833	85.6	.43	472	470	36	17.3

Circumferential Position % Span	162° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.939	.853	112.5	.37	411	379	-157	16.9
30	.956	.810	108.2	.49	537	510	-167	18.4
50	.954	.798	106.5	.51	556	533	-158	16.9
70	.953	.810	106.1	.49	532	511	-147	14.7
90 (Tip)	.949	.836	107.2	.43	471	450	-138	11.9
MR	.949	.822	109.2	.46	501	473	-165	15.8

Circumferential Position % Span	192° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.866	.781	51.6	.39	428	335	266	29.5
30	.851	.761	66.9	.40	442	406	173	23.4
50	.801	.763	69.1	.26	293	274	104	12.7
70	.785	.769	60.2	.17	191	166	95	6.7
90 (Tip)	.798	.776	51.8	.20	220	173	136	6.3
MR	.833	.769	61.1	.34	374	328	181	15.7

Circumferential Position % Span	222° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.795	.764	73.4	.24	268	254	77	18.2
30	.789	.740	79.0	.30	334	328	64	17.4
50	.786	.740	81.4	.29	325	321	48	14.2
70	.781	.750	79.9	.24	270	266	47	10.3
90 (Tip)	.789	.760	84.4	.23	258	257	25	8.8
MR	.788	.749	79.1	.27	297	292	56	13.8

Circumferential Position % Span	252° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.821	.760	103.9	.33	368	357	-88	20.6
30	.792	.742	97.1	.31	339	337	-42	16.3
50	.784	.745	97.7	.27	301	298	-41	12.4
70	.785	.755	100.0	.24	261	258	-45	9.4
90 (Tip)	.795	.766	97.6	.23	254	252	-34	8.3
MR	.797	.752	99.6	.29	318	314	-53	13.4

Circumferential Position % Span	282° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.928	.788	114.5	.49	532	484	-220	24.2
30	.905	.756	108.0	.51	559	531	-173	22.5
50	.890	.754	107.6	.49	538	513	-163	19.1
70	.887	.769	112.2	.46	498	461	-188	15.2
90 (Tip)	.914	.794	122.5	.45	495	418	-266	12.1
MR	.904	.770	111.8	.48	529	491	-196	18.6

Circumferential Position % Span	312° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.950	.835	107.5	.43	473	452	-142	24.2
30	.936	.792	100.6	.49	539	530	-99	23.6
50	.955	.780	96.7	.54	591	587	-68	23.0
70	.952	.794	97.7	.52	561	556	-76	19.3
90 (Tip)	.948	.826	100.4	.45	490	482	-88	15.2
MR	.948	.802	100.3	.49	539	530	-97	21.1

Circumferential Position % Span	342° P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.936	.836	60.5	.40	443	386	218	31.1
30	.937	.803	69.4	.47	518	485	182	27.6
50	.917	.795	70.7	.46	499	471	165	22.3
70	.920	.801	69.6	.45	491	460	171	19.0
90 (Tip)	.907	.820	69.0	.38	421	393	151	14.3
MR	.925	.809	67.9	.44	483	448	182	22.9

1. Inlet Plenum Conditions: P_o = 1992 psf, T_o = 490.9°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{11} = \tan^{-1} [\tan \beta^{\circ}_{11}/\cos]$

TABLE 13.6
ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11; 95% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 163.62 LBM/SEC.

Circumferential Position % Span	P_{11}/P_o	P_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
				12°				
10 (Hub)	.956	.862	107.9	.39	427	407	-131	18.3
30	.953	.820	105.1	.47	512	494	-134	18.3
50	.953	.805	104.3	.50	542	526	-134	16.9
70	.954	.815	104.8	.48	523	506	-134	14.6
90 (Tip)	.951	.841	105.0	.42	463	448	-120	11.9
MR	.954	.831	105.9	.45	491	472	-135	16.0
				102°				
10 (Hub)	.942	.866	92.5	.35	384	384	-17	19.0
30	.938	.829	96.7	.42	464	461	-54	18.0
50	.953	.815	97.6	.48	524	519	-69	17.3
70	.951	.826	96.8	.45	496	493	-59	14.8
90 (Tip)	.940	.845	95.8	.39	433	431	-44	11.9
MR	.944	.839	95.4	.41	455	453	-43	16.2
				192°				
10 (Hub)	.865	.771	49.5	.41	450	342	292	31.0
30	.857	.752	64.8	.44	478	433	203	25.5
50	.800	.752	66.4	.30	329	301	132	14.3
70	.779	.757	57.8	.20	222	187	118	7.7
90 (Tip)	.794	.765	42.7	.23	257	174	189	6.6
MR	.832	.759	58.5	.37	403	344	210	17.0
				282°				
10 (Hub)	.898	.764	114.2	.49	531	484	-218	24.2
30	.903	.729	106.8	.56	608	582	-176	24.3
50	.885	.718	106.9	.55	601	575	-175	21.1
70	.874	.726	109.3	.52	567	535	-187	17.5
90 (Tip)	.898	.751	117.8	.51	557	492	-260	14.2
MR	.891	.736	110.1	.53	576	541	-198	20.3

Circumferential Position % Span	P_{11}/P_o	P_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
				42°				
10 (Hub)	.955	.867	102.5	.38	413	403	-89	18.8
30	.952	.826	101.9	.45	497	487	-102	18.4
50	.953	.811	101.9	.49	530	518	-110	16.9
70	.953	.823	101.7	.46	504	494	-102	14.5
90 (Tip)	.952	.848	102.1	.41	450	440	-94	11.9
MR	.953	.837	102.1	.43	476	466	-100	16.1
				132°				
10 (Hub)	.949	.854	76.8	.37	429	417	98	22.7
30	.941	.820	88.7	.45	490	490	11	19.9
50	.937	.808	91.9	.47	509	509	-17	17.5
70	.930	.818	91.0	.43	473	473	-9	14.6
90 (Tip)	.933	.836	88.6	.40	439	439	11	12.5
MR	.943	.830	85.0	.43	472	470	41	17.4
				222°				
10 (Hub)	.794	.748	69.5	.29	325	304	114	22.2
30	.780	.726	73.8	.32	356	341	99	18.7
50	.776	.723	75.2	.32	355	343	91	15.6
70	.773	.733	75.3	.28	305	295	78	11.7
90 (Tip)	.778	.744	81.3	.25	280	277	42	9.5
MR	.780	.734	74.2	.30	330	318	90	15.5
				312°				
10 (Hub)	.947	.826	110.2	.45	489	459	-169	24.0
30	.930	.778	101.6	.51	557	546	-112	24.1
50	.952	.763	98.5	.57	617	610	-92	23.4
70	.949	.770	99.6	.55	602	593	-101	20.2
90 (Tip)	.945	.804	101.9	.49	530	519	-109	16.1
MR	.945	.785	102.1	.52	567	554	-119	21.6

Circumferential Position % Span	P_{11}/P_o	P_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
				72°				
10 (Hub)	.954	.869	100.0	.37	406	400	-71	18.9
30	.947	.829	99.1	.44	482	476	-77	18.3
50	.953	.815	100.5	.48	522	513	-95	16.9
70	.950	.827	100.3	.45	492	484	-88	14.4
90 (Tip)	.944	.847	99.5	.40	436	430	-72	11.7
MR	.952	.840	99.9	.42	466	459	-80	16.0
				162°				
10 (Hub)	.927	.832	57.9	.40	436	369	232	30.5
30	.937	.797	67.6	.49	530	490	202	28.3
50	.917	.790	70.2	.47	510	480	173	22.8
70	.913	.795	69.6	.45	492	461	172	19.0
90 (Tip)	.892	.813	67.6	.37	403	373	154	13.6
MR	.920	.803	66.8	.45	487	448	192	22.8
				252°				
10 (Hub)	.804	.741	101.9	.34	379	371	-78	21.6
30	.777	.716	92.2	.34	380	380	-15	18.6
50	.775	.712	93.7	.35	387	386	-25	16.1
70	.773	.716	92.3	.33	368	367	-15	13.5
90 (Tip)	.781	.729	91.8	.32	350	350	-11	11.6
MR	.782	.722	94.6	.34	375	374	-30	16.3
				342°				
10 (Hub)	.939	.847	114.9	.39	426	387	-180	16.9
30	.955	.802	109.0	.50	549	519	-179	18.6
50	.951	.789	108.5	.52	569	540	-181	16.9
70	.950	.797	107.6	.51	551	525	-167	14.9
90 (Tip)	.946	.826	108.2	.44	487	462	-152	12.1
MR	.948	.814	111.0	.47	514	480	-184	15.9

1. Inlet Plenum Conditions: P_o = 1984 psf, T_o = 491.6°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{11} = \tan^{-1} \left[\tan\beta^{\circ}_{11}/\cos\right]$

TABLE 13.7
ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11, 100% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 161.22 LBM/SEC.

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
12°								
10 (Hub)	.954	.864	104.7	.38	4.6	402	-106	17.7
30	.954	.825	103.9	.46	504	490	-121	17.4
50	.951	.817	102.5	.47	513	501	-111	15.6
70	.954	.835	102.4	.44	481	470	-104	13.2
90 (Tip)	.951	.858	104.0	.39	425	412	-103	10.6
MR	.953	.838	103.8	.43	474	460	-113	14.9
102°								
10 (Hub)	.946	.861	91.3	.37	407	407	-9	19.3
30	.934	.821	95.9	.43	474	472	-49	17.6
50	.953	.804	96.7	.50	543	540	-63	17.2
70	.952	.814	95.8	.48	521	518	-52	14.9
90 (Tip)	.943	.838	94.7	.41	454	453	-38	11.9
MR	.944	.831	94.4	.43	472	471	-36	16.2
192°								
10 (Hub)	.859	.770	57.1	.40	437	367	238	28.8
30	.842	.745	71.6	.42	464	441	146	23.3
50	.796	.741	74.1	.32	356	342	98	14.9
70	.786	.750	70.5	.26	290	273	97	10.4
90 (Tip)	.798	.758	51.4	.27	301	235	188	8.4
MR	.823	.752	66.7	.36	398	365	158	17.2
282°								
10 (Hub)	.898	.776	117.3	.46	504	448	-231	21.5
30	.913	.746	108.0	.54	591	562	-182	22.6
50	.905	.749	110.5	.53	572	536	-200	18.7
70	.917	.771	114.5	.50	549	500	-227	15.4
90 (Tip)	.933	.808	122.9	.46	500	420	-272	11.5
MR	.911	.765	113.5	.51	551	505	-219	17.9

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
42°								
10 (Hub)	.953	.867	100.2	.37	408	402	-73	18.1
30	.951	.827	99.8	.45	494	487	-84	17.8
50	.954	.816	100.0	.48	523	515	-91	16.2
70	.953	.833	99.5	.44	486	479	-80	13.6
90 (Tip)	.950	.855	99.7	.39	430	424	-73	11.0
MR	.953	.839	100.0	.43	471	464	-82	15.3
132°								
10 (Hub)	.949	.847	77.6	.41	448	437	96	22.5
30	.945	.807	89.7	.48	524	524	3	20.1
50	.938	.791	92.7	.50	544	543	-25	17.7
70	.933	.803	92.2	.47	512	512	-20	14.9
90 (Tip)	.932	.825	89.3	.42	462	462	51	12.4
MR	.945	.818	85.9	.46	501	500	36	17.5
222°								
10 (Hub)	.786	.755	81.1	.24	266	263	41	16.9
30	.785	.728	85.1	.33	365	364	31	17.7
50	.777	.728	84.9	.31	341	340	30	14.1
70	.778	.739	85.2	.27	303	302	26	10.9
90 (Tip)	.789	.751	87.6	.27	294	294	12	9.4
MR	.782	.738	84.6	.29	320	319	30	13.8
312°								
10 (Hub)	.951	.837	110.5	.43	473	443	-166	22.5
30	.935	.793	102.2	.49	536	524	-113	22.2
50	.955	.789	96.5	.53	576	572	-65	21.5
70	.952	.812	98.9	.48	527	520	-81	17.3
90 (Tip)	.950	.850	101.6	.40	441	432	-89	13.0
MR	.948	.811	101.7	.48	521	510	-106	19.3

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta^*_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
72°								
10 (Hub)	.938	.864	97.0	.34	379	376	-46	17.4
30	.947	.826	97.6	.45	489	484	-65	17.9
50	.952	.811	98.3	.48	529	523	-76	16.6
70	.952	.825	97.8	.46	499	494	-68	14.1
90 (Tip)	.947	.850	97.3	.40	435	431	-55	11.3
MR	.945	.836	97.6	.42	465	461	-61	15.5
162°								
10 (Hub)	.933	.821	62.4	.43	472	419	218	31.4
30	.931	.784	70.3	.50	548	516	185	27.7
50	.914	.769	71.9	.50	548	520	170	23.2
70	.917	.773	72.0	.50	545	518	168	20.1
90 (Tip)	.908	.799	71.1	.43	474	448	153	15.4
MR	.922	.787	69.6	.48	525	492	183	23.6
252°								
10 (Hub)	.821	.754	107.5	.35	386	368	-116	19.8
30	.788	.734	102.1	.32	356	348	-75	15.6
50	.784	.738	102.5	.29	325	317	-70	12.3
70	.785	.751	106.3	.25	280	268	-78	9.1
90 (Tip)	.791	.766	106.6	.22	241	231	-69	7.1
MR	.795	.746	104.9	.30	335	324	-86	12.8
342°								
10 (Hub)	.936	.853	112.1	.37	403	374	-152	16.0
30	.954	.810	107.7	.49	533	508	-162	17.6
50	.950	.806	106.6	.49	535	513	-153	15.7
70	.950	.827	106.5	.45	492	472	-140	13.1
90 (Tip)	.945	.854	107.4	.38	422	403	-126	10.3
MR	.946	.825	109.0	.45	490	463	-159	14.5

1. Inlet Plenum Conditions: P_o = 1983 psf, T_o = 492.4°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta^*_{11} = \tan^{-1}\ [\tan\beta^*_{11}/\cos]$

TABLE 13.8
ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11, 100% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 167.42 LBM/SEC.

Circumferential Position % Span	12°								42°								72°							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$	P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$	P_{11}/P_o	p_{11}/P_o	$90-\beta^{\circ}_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.950	.851	105.5	.40	438	422	-117	18.4	.951	.855	101.7	.39	432	423	-87	18.9	.952	.857	99.5	.39	431	425	-71	19.2
30	.947	.804	104.1	.49	533	517	-130	18.3	.947	.808	101.2	.48	526	516	-102	18.6	.941	.811	98.1	.46	508	503	-72	18.5
50	.948	.786	103.4	.52	570	554	-132	17.0	.950	.792	101.0	.52	562	551	-108	17.2	.954	.793	99.2	.52	565	557	-91	17.5
70	.950	.794	103.1	.51	557	543	-126	15.0	.949	.799	100.8	.50	547	537	-102	15.1	.948	.802	99.1	.49	538	532	-85	15.0
90 (Tip)	.947	.824	103.9	.45	492	477	-118	12.1	.949	.829	101.3	.44	486	477	-96	12.3	.937	.829	97.7	.42	465	461	-62	12.0
MR	.949	.817	104.4	.47	510	494	-127	16.2	.949	.821	101.3	.46	503	493	-99	16.4	.949	.823	99.0	.45	498	492	-78	16.4
	102°								132°								162°							
10 (Hub)	.931	.853	93.2	.36	394	394	-22	18.5	.942	.839	77.5	.41	450	440	97	22.6	.930	.816	61.7	.44	479	422	227	31.9
30	.937	.811	96.8	.46	501	498	-59	18.4	.943	.799	89.5	.49	537	537	5	20.6	.926	.776	70.3	.51	554	522	186	28.0
50	.951	.792	98.0	.52	563	558	-78	17.6	.903	.781	92.8	.51	551	551	-27	17.9	.907	.762	71.3	.50	550	521	176	23.3
70	.951	.801	97.6	.50	540	541	-72	15.4	.925	.792	92.4	.48	521	521	-22	15.2	.912	.769	72.6	.50	545	520	163	20.0
90 (Tip)	.938	.827	96.0	.43	469	467	-49	12.3	.924	.815	90.0	.43	468	468	0	12.6	.905	.793	71.8	.44	480	456	150	15.6
MR	.939	.821	95.8	.44	486	484	-49	16.4	.939	.809	85.8	.47	509	507	37	17.8	.917	.781	69.6	.48	529	495	185	23.8
	192°								222°								252°							
10 (Hub)	.852	.758	55.5	.41	452	373	256	29.9	.771	.738	74.4	.25	278	268	75	17.9	.814	.738	107.3	.38	417	398	-124	21.2
30	.829	.734	67.5	.42	461	426	176	23.2	.767	.711	82.1	.33	365	361	50	17.9	.772	.715	101.7	.33	368	360	-74	16.2
50	.777	.732	70.2	.29	326	307	110	13.5	.761	.711	83.5	.31	347	345	39	14.4	.767	.719	100.5	.31	339	333	-62	13.0
70	.762	.738	65.2	.21	236	214	99	8.2	.761	.722	81.7	.28	305	302	44	11.1	.767	.732	102.4	.26	289	282	-62	9.7
90 (Tip)	.778	.749	63.3	.23	259	231	116	7.9	.772	.733	85.8	.27	302	301	22	9.7	.775	.742	99.2	.25	274	271	-44	8.5
MR	.811	742	64.0	.36	394	354	173	16.5	.766	.721	81.2	.29	324	321	50	14.2	.781	.728	102.9	.32	354	345	-79	13.7
	282°								312°								342°							
10 (Hub)	.904	.765	114.2	.49	539	491	-221	23.6	.943	.821	109.8	.45	491	462	-167	23.3	.929	.840	112.1	.38	421	390	-159	16.6
30	.898	.733	109.5	.55	593	559	-198	22.2	.932	.776	100.6	.52	563	554	-104	23.5	.950	.793	107.6	.51	560	534	-170	18.4
50	.885	.731	108.2	.53	576	547	-180	19.3	.949	.762	96.4	.57	616	612	-69	22.8	.946	.777	107.1	.54	584	559	-171	16.8
70	.885	.749	114.8	.49	539	489	-226	15.1	.946	.779	96.4	.53	580	577	-65	19.2	.947	.786	105.6	.52	569	548	-153	15.0
90 (Tip)	.910	.780	123.1	.47	519	434	-284	11.9	.942	.811	99.1	.47	511	504	-81	15.2	.942	.817	106.2	.45	498	478	-139	12.0
MR	.895	.748	112.9	.51	558	514	-217	18.4	.942	.786	100.3	.52	561	552	-100	20.8	.941	.805	109.0	.48	522	494	-170	15.8

1. Inlet Plenum Conditions: P_o = 1978 psf, T_o = 492.0°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{11} = \tan^{-1} [\tan \beta^{\circ}_{11}/\cos]$

TABLE 13.9
ROTOR INLET CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 11, 100% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 174.06 LBM/SEC.

12°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.950	.848	106.9	.41	446	427	-130	18.4
30	.947	.799	104.4	.50	544	527	-136	18.5
50	.949	.783	104.8	.53	577	558	-148	16.9
70	.950	.789	103.8	.52	568	551	-135	15.1
90 (Tip)	.948	.821	105.2	.46	501	483	-132	12.2
MR	.949	.813	105.5	.48	519	500	-138	16.2

42°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.951	.853	102.9	.40	437	426	-97	20.9
30	.946	.805	101.4	.49	531	520	-105	18.6
50	.950	.789	102.2	.52	569	556	-120	17.1
70	.950	.795	101.5	.51	555	544	-111	15.1
90 (Tip)	.949	.825	101.4	.45	493	483	-97	12.4
MR	.949	.818	102.2	.47	509	498	-107	16.8

72°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.944	.852	98.7	.39	425	420	-64	19.0
30	.941	.806	98.7	.48	519	513	-78	18.7
50	.948	.788	99.6	.52	568	560	-95	17.5
70	.944	.795	99.0	.50	546	540	-85	15.2
90 (Tip)	.938	.823	99.1	.44	477	471	-75	12.2
MR	.944	.818	99.0	.4	501	495	-78	16.5

102°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.936	.850	91.4	.37	410	410	-10	19.3
30	.929	.808	96.5	.45	495	492	-56	18.2
50	.948	.787	97.4	.52	569	564	-73	17.8
70	.947	.793	96.6	.51	556	552	-64	15.7
90 (Tip)	.934	.822	95.8	.43	474	472	-48	12.3
MR	.938	.817	94.9	.45	490	488	-42	16.7

132°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.942	.835	75.4	.42	460	446	116	23.2
30	.939	.794	88.3	.49	539	539	16	20.8
50	.928	.776	92.3	.51	558	558	-23	18.1
70	.921	.786	91.6	.48	526	526	-15	15.4
90 (Tip)	.922	.810	88.9	.43	476	475	10	12.8
MR	.937	.805	84.5	.47	515	512	49	18.1

162°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.922	.810	57.5	.43	476	401	255	31.6
30	.931	.772	68.1	.52	569	528	212	28.8
50	.908	.758	70.9	.51	560	529	183	23.6
70	.906	.762	70.2	.50	548	516	186	20.1
90 (Tip)	.885	.788	69.4	.41	452	423	159	14.5
MR	.913	.776	67.3	.49	553	492	206	23.7

192°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.849	.746	49.4	.43	476	362	310	31.2
30	.838	.724	65.6	.46	507	461	209	25.6
50	.771	.724	67.8	.30	335	310	127	13.8
70	.756	.729	61.3	.23	252	221	121	8.5
90 (Tip)	.767	.738	51.6	.23	259	203	161	7.1
MR	.810	.731	60.1	.39	424	367	212	17.2

222°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.767	.722	69.6	.29	324	304	113	20.9
30	.756	.697	76.0	.34	375	364	91	18.6
50	.754	.693	78.7	.35	384	377	76	16.0
70	.753	.700	78.3	.32	358	351	72	13.0
90 (Tip)	.758	.712	80.4	.30	329	325	55	10.6
MR	.757	.704	76.3	.32	358	348	85	15.8

252°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.786	.715	103.2	.37	408	397	-93	21.6
30	.754	.687	93.0	.37	405	404	-21	18.7
50	.751	.680	94.6	.38	418	417	-33	16.3
70	.751	.685	91.0	.36	400	400	-7	14.0
90 (Tip)	.759	.699	92.0	.35	381	381	-13	11.9
MR	.760	.693	94.9	.37	404	403	-35	16.5

282°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.882	.740	116.7	.51	552	493	-248	23.1
30	.892	.703	107.6	.59	641	611	-194	24.1
50	.877	.690	107.2	.59	641	612	-190	21.2
70	.865	.697	110.6	.56	611	572	-215	17.5
90 (Tip)	.895	.727	120.2	.55	600	519	-301	14.0
MR	.880	.709	111.4	.57	612	570	-224	20.0

312°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.940	.810	110.5	.47	510	479	-178	23.8
30	.923	.761	102.5	.53	579	565	-125	23.6
50	.946	.742	96.4	.60	647	643	-72	23.8
70	.944	.750	99.9	.58	629	620	-108	20.0
90 (Tip)	.941	.786	100.9	.51	559	549	-106	16.2
MR	.939	.766	101.9	.55	593	580	-122	21.5

342°

Circumferential Position % Span	P_{11}/P_o	p_{11}/P_o	$90-\beta_{11}$	M	V	V_m	V_θ	$90-\beta'_{11}$
10 (Hub)	.928	.833	113.7	.40	436	399	-175	16.7
30	.951	.785	108.6	.53	577	547	-184	18.6
50	.947	.768	107.4	.56	602	574	-179	17.1
70	.946	.773	106.6	.55	592	567	-169	15.3
90 (Tip)	.940	.807	107.7	.47	516	492	-157	12.2
MR	.942	.797	110.0	.49	539	506	-184	16.0

1. Inlet Plenum Conditions: P_o = 1967 psf, T_o = 493.8°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta_{11} = \tan^{-1} [\tan\beta'_{11}/\cos]$

TABLE 14.1
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 70% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 107.32 LBM/SEC.

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
	3°43'							
10 (Hub)	1.560	1.137	92.0	.69	787	787	-27	41.8
30	1.475	1.143	93.3	.61	705	704	-41	36.6
50	1.448	1.155	92.3	.58	669	669	-27	33.8
70	1.400	1.158	93.6	.53	619	618	-39	29.9
90 (Tip)	1.333	1.156	92.3	.46	536	535	-22	25.6
MR	1.461	1.149	92.8	.60	690	689	-33	33.5
	111°43'							
10 (Hub)	1.492	1.136	95.7	.64	729	725	-72	38.2
30	1.438	1.141	95.6	.58	671	668	-65	34.5
50	1.418	1.157	95.5	.55	633	630	-61	31.4
70	1.409	1.158	95.5	.54	626	623	-60	29.6
90 (Tip)	1.345	1.146	96.8	.48	564	560	-67	25.7
MR	1.432	1.147	95.7	.57	659	656	-65	31.9
	201°43'							
10 (Hub)	1.315	1.199	95.2	.37	431	430	-39	25.7
30	1.364	1.207	94.8	.42	493	491	-41	27.3
50	1.373	1.211	94.7	.43	502	500	-41	26.3
70	1.408	1.200	95.5	.48	569	567	-55	27.4
90 (Tip)	1.415	1.206	95.6	.48	567	564	-55	26.1
MR	1.375	1.204	95.2	.44	5.7	515	-46	26.6
	273°43'							
10 (Hub)	1.568	1.153	92.0	.68	772	772	-27	41.4
30	1.487	1.162	92.3	.60	692	691	-28	36.5
50	1.424	1.170	92.4	.54	622	621	-26	32.0
70	1.392	1.170	93.8	.50	589	588	-39	28.7
90 (Tip)	1.353	1.171	91.4	.46	537	536	-13	25.8
MR	1.461	1.164	92.5	.58	668	668	-29	32.9

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
	33°43'							
10 (Hub)	1.518	1.123	92.4	.67	768	768	-33	41.0
30	1.454	1.140	94.2	.60	690	688	-50	35.7
50	1.433	1.145	92.7	.58	667	666	-32	33.6
70	1.414	1.148	93.5	.55	645	644	-40	30.9
90 (Tip)	1.342	1.144	91.4	.48	565	565	-14	26.9
MR	1.445	1.139	93.1	.59	685	684	-37	33.6
	141°43'							
10 (Hub)	1.461	1.162	95.8	.58	670	667	-68	36.0
30	1.433	1.167	95.8	.55	632	629	-64	32.9
50	1.404	1.178	95.8	.51	589	586	-59	29.6
70	1.400	1.176	95.8	.51	591	588	-59	28.2
90 (Tip)	1.344	1.168	96.6	.45	531	527	-61	24.5
MR	1.418	1.170	95.9	.53	615	612	-63	30.2
	231°43'							
10 (Hub)	1.387	1.186	94.0	.48	560	558	-39	32.0
30	1.379	1.191	94.0	.46	539	537	-38	29.5
50	1.367	1.198	94.0	.44	514	513	-36	27.0
70	1.366	1.190	94.0	.45	528	527	-37	26.1
90 (Tip)	1.347	1.192	95.4	.42	496	494	-47	23.3
MR	1.372	1.191	94.2	.45	532	531	-39	27.6
	303°43'							
10 (Hub)	1.592	1.138	92.7	.71	806	805	-39	42.2
30	1.513	1.151	93.3	.64	727	725	-42	37.4
50	1.450	1.168	92.0	.56	652	652	-23	33.3
70	1.374	1.165	94.2	.49	576	574	-42	28.1
90 (Tip)	1.320	1.171	92.4	.42	492	491	-20	23.8
MR	1.475	1.156	93.0	.60	691	690	-37	33.0

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
	81°43'							
10 (Hub)	1.513	1.133	96.4	.66	752	747	-84	38.6
30	1.445	1.135	96.2	.60	686	682	-74	34.7
50	1.425	1.149	95.8	.56	651	647	-66	31.9
70	1.410	1.150	95.6	.55	640	637	-62	30.0
90 (Tip)	1.345	1.140	96.8	.49	575	571	-68	26.1
MR	1.440	1.141	96.1	.59	677	674	-72	32.3
	171°43'							
10 (Hub)	1.366	1.202	95.5	.43	506	504	-49	29.2
30	1.355	1.205	95.4	.41	483	481	-45	26.7
50	1.351	1.209	95.4	.40	472	469	-44	24.8
70	1.375	1.210	95.3	.43	509	507	-47	25.0
90 (Tip)	1.335	1.199	96.1	.40	467	464	-50	22.0
MR	1.360	1.206	95.5	.42	491	489	-47	25.5
	243°43'							
10 (Hub)	1.406	1.170	89.3	.52	604	604	7	35.6
30	1.397	1.176	91.4	.50	582	581	-14	32.2
50	1.376	1.182	90.3	.47	550	550	-3	29.4
70	1.367	1.186	92.6	.46	536	536	-24	26.9
90 (Tip)	1.361	1.188	93.8	.45	523	522	-35	24.7
MR	1.384	1.180	91.3	.48	564	564	-12	29.8
	333°43'							
10 (Hub)	1.542	1.134	93.5	.68	775	774	-47	40.8
30	1.478	1.148	93.3	.61	702	701	-40	36.5
50	1.450	1.159	92.0	.58	665	665	-23	33.8
70	1.394	1.163	94.8	.52	604	602	-51	29.0
90 (Tip)	1.326	1.161	91.7	.44	519	519	-16	25.0
MR	1.455	1.151	93.3	.59	681	679	-39	33.0

1. Inlet Plenum Conditions: P_o = 2062 psf, T_o = 490.6°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{17} = \tan^{-1}\left[\tan\beta_{17}/\cos\right]$

TABLE 14.2
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 70% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 114.89 LBM/SEC.

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
	3°43'							
10 (Hub)	1.511	1.036	93.5	.75	856	854	-52	43.4
30	1.445	1.046	94.3	.70	789	787	-59	39.1
50	1.411	1.040	93.6	.67	770	768	-48	37.0
70	1.374	1.040	94.1	.64	740	738	-53	34.2
90 (Tip)	1.305	1.049	95.1	.57	654	651	-58	29.4
MR	1.423	1.041	94.0	.68	779	778	-54	36.6
	111°43'							
10 (Hub)	1.468	1.050	95.5	.71	804	800	-77	40.8
30	1.402	1.052	95.8	.65	741	738	-75	36.8
50	1.374	1.067	96.0	.61	699	696	-73	33.7
70	1.348	1.067	95.9	.59	676	673	-69	31.3
90 (Tip)	1.289	1.069	97.1	.52	601	597	-74	27.0
MR	1.389	1.060	95.9	.63	723	720	-74	33.9
	201°43'							
10 (Hub)	1.272	1.121	95.2	.43	503	501	-45	29.2
30	1.292	1.121	95.1	.46	530	528	-48	28.9
50	1.301	1.127	95.0	.46	533	531	-47	27.5
70	1.303	1.122	94.8	.47	548	546	-46	26.7
90 (Tip)	1.312	1.122	95.0	.48	556	554	-48	25.8
MR	1.295	1.123	95.0	.46	533	531	-47	27.6
	273°43'							
10 (Hub)	1.525	1.038	92.2	.76	857	857	-33	44.1
30	1.449	1.047	92.1	.70	786	786	-29	40.0
50	1.392	1.051	92.7	.65	736	735	-34	36.2
70	1.368	1.050	93.1	.63	717	716	-38	33.7
90 (Tip)	1.304	1.063	92.1	.55	627	627	-23	29.3
MR	1.423	1.048	92.5	.68	767	766	-33	36.7

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
	33°43'							
10 (Hub)	1.50	1.034	93.2	.75	847	845	-47	43.3
30	1.42	1.044	94.5	.68	771	769	-60	38.4
50	1.40	1.047	94.0	.66	752	750	-52	36.2
70	1.37	1.045	94.0	.64	733	731	-52	34.0
90 (Tip)	1.29	1.052	95.7	.55	634	631	-63	28.5
MR	1.41	1.043	94.1	.67	766	764	-55	36.1
	141°43'							
10 (Hub)	1.441	1.077	96.2	.66	751	747	-81	38.7
30	1.380	1.081	96.2	.60	686	682	-74	34.8
50	1.355	1.099	96.2	.56	639	635	-69	31.4
70	1.340	1.097	96.2	.54	627	623	-67	29.4
90 (Tip)	1.292	1.091	97.3	.50	573	568	-73	25.9
MR	1.372	1.088	96.3	.58	671	667	-74	32.0
	231°43'							
10 (Hub)	1.36	1.105	94.3	.55	637	635	-47	35.2
30	1.34	1.110	94.2	.52	601	599	-44	32.1
50	1.32	1.112	94.2	.50	578	577	-42	29.6
70	1.31	1.110	94.2	.49	575	573	-42	27.9
90 (Tip)	1.26	1.110	94.4	.43	505	503	-39	23.9
MR	1.33	1.110	94.2	.51	591	589	-44	29.7
	303°43'							
10 (Hub)	1.581	1.014	93.7	.82	918	916	-59	45.2
30	1.497	1.040	94.1	.74	832	830	-59	40.6
50	1.440	1.041	93.2	.70	788	787	-44	37.8
70	1.382	1.039	95.6	.65	745	742	-72	33.8
90 (Tip)	1.298	1.046	91.8	.56	646	646	-20	30.0
MR	1.461	1.034	94.0	.72	813	811	-56	37.5

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
	81°43'							
10 (Hub)	1.494	1.032	95.1	.75	845	842	-74	42.3
30	1.425	1.041	95.5	.68	776	772	-74	38.1
50	1.383	1.054	95.5	.64	725	722	-69	34.7
70	1.352	1.049	95.5	.61	704	701	-67	32.4
90 (Tip)	1.290	1.055	96.6	.54	627	623	-72	28.0
MR	1.404	1.045	95.5	.66	756	753	-72	35.1
	171°43'							
10 (Hub)	1.354	1.113	96.5	.54	622	618	-71	33.8
30	1.323	1.112	96.3	.50	584	580	-64	30.8
50	1.309	1.117	96.3	.48	559	556	-61	28.3
70	1.318	1.121	95.6	.49	568	565	-55	27.3
90 (Tip)	1.275	1.113	95.9	.45	517	515	-53	24.1
MR	1.322	1.116	96.1	.50	579	575	-62	28.9
	243°43'							
10 (Hub)	1.356	1.088	90.1	.57	658	658	-1	37.7
30	1.353	1.099	91.6	.55	636	636	-18	34.5
50	1.323	1.097	91.8	.52	605	605	-19	31.4
70	1.317	1.097	90.8	.52	601	601	-8	30.0
90 (Tip)	1.267	1.098	91.6	.46	531	530	-15	25.5
MR	1.330	1.096	91.1	.53	617	617	-12	31.8
	333°43'							
10 (Hub)	1.539	1.024	94.0	.79	884	882	-61	44.0
30	1.460	1.044	95.0	.71	801	798	-70	39.2
50	1.419	1.038	93.5	.68	777	776	-48	37.3
70	1.387	1.037	94.6	.66	753	751	-60	34.5
90 (Tip)	1.304	1.045	94.8	.57	657	654	-54	29.6
MR	1.438	1.036	94.[illegible]	.70	795	793	-60	36.9

1. Inlet Plenum Conditions: P_o = 2056 psf, T_o = 491.2°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{17} = \tan^{-1} \left[\tan\beta^{\circ}_{17}/\cos\right]$

TABLE 14.3
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 70% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 122.69 LBM/SEC.

3°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.507	.767	94.8	1.03	1116	1112	-92	49.7
30	1.413	.773	95.9	.97	1054	1048	-108	45.9
50	1.342	.768	95.2	.93	1017	1013	-92	43.6
70	1.307	.740	96.0	.94	1028	1022	-108	41.8
90 (Tip)	1.219	.749	95.4	.86	946	942	-89	38.5
MR	1.375	.760	95.5	.96	1046	1042	-100	43.9

33°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.488	.779	93.3	1.01	1095	1094	-63	50.1
30	1.399	.802	94.5	.93	1014	1011	-80	45.6
50	1.326	.785	94.5	.90	986	983	-77	43.1
70	1.296	.772	95.4	.89	983	978	-92	40.9
90 (Tip)	1.199	.790	96.3	.80	878	873	-96	36.1
MR	1.360	.785	94.6	.92	1010	1007	-81	43.2

81°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.470	.781	97.3	.99	1081	1072	-138	47.3
30	1.377	.795	96.8	.92	1005	998	-119	44.2
50	1.282	.786	96.1	.87	953	947	-101	41.5
70	1.262	.778	96.6	.86	947	941	-109	39.4
90 (Tip)	1.178	.787	98.4	.78	866	857	-127	35.0
MR	1.333	.785	96.9	.90	990	982	-119	41.5

111°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.437	.807	96.5	.95	1032	1025	-116	46.7
30	1.349	.825	96.9	.87	951	944	-115	42.7
50	1.265	.826	96.8	.80	891	884	-105	39.5
70	1.246	.816	96.5	.80	888	883	-100	37.8
90 (Tip)	1.158	.822	98.8	.72	797	787	-122	32.9
MR	1.310	.818	96.9	.85	934	927	-111	39.9

141°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.384	.866	96.4	.85	937	931	-105	44.2
30	1.311	.865	96.7	.79	880	874	-102	40.8
50	1.247	.874	96.5	.73	818	812	-92	37.3
70	1.215	.868	96.7	.71	797	791	-93	34.9
90 (Tip)	1.147	.871	99.2	.64	716	706	-114	30.2
MR	1.278	.868	96.8	.76	851	845	-101	37.5

171°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.284	.886	95.7	.75	840	836	-83	41.8
30	1.224	.895	96.2	.68	772	768	-83	37.7
50	1.191	.902	96.2	.64	729	725	-78	34.6
70	1.171	.902	96.2	.62	708	704	-76	32.3
90 (Tip)	1.110	.909	97.0	.54	615	610	-75	27.5
MR	1.209	.897	96.1	.67	754	750	-81	34.8

201°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.199	.902	95.9	.65	743	739	-76	38.6
30	1.169	.904	95.7	.62	705	701	-70	35.6
50	1.153	.899	95.7	.61	694	691	-69	33.6
70	1.116	.910	95.6	.55	632	630	-61	29.8
90 (Tip)	1.112	.911	95.5	.54	617	614	-60	28.0
MR	1.155	.905	95.7	.60	688	684	-68	33.1

231°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.290	.866	93.8	.78	875	873	-57	43.8
30	1.252	.876	94.4	.73	825	822	-63	40.2
50	1.216	.884	94.4	.69	782	779	-60	37.0
70	1.183	.875	94.3	.67	761	759	-58	34.6
90 (Tip)	1.124	.873	96.5	.61	693	688	-79	30.3
MR	1.225	.875	94.4	.71	803	800	-62	37.2

243°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.311	.859	91.2	.80	897	897	-19	45.9
30	1.272	.875	93.3	.75	839	838	-48	41.3
50	1.243	.863	91.7	.74	830	830	-24	39.9
70	1.197	.857	92.4	.71	797	797	-34	36.8
90 (Tip)	1.130	.855	94.1	.64	724	722	-52	32.2
MR	1.242	.862	92.4	.74	831	831	-34	39.2

273°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.545	.758	92.1	1.06	1137	1136	-42	51.9
30	1.434	.751	94.4	1.01	1079	1076	-83	47.4
50	1.374	.757	94.1	.96	1041	1038	-74	44.8
70	1.349	.771	93.3	.93	1012	1010	-59	42.8
90 (Tip)	1.233	.780	96.4	.84	912	906	-101	37.1
MR	1.406	.762	93.7	.98	1055	1053	-69	44.8

303°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.609	.737	95.0	1.12	1183	1178	-103	51.0
30	1.529	.750	95.5	1.06	1128	1123	-109	47.8
50	1.418	.764	95.5	.98	1059	1054	-101	44.5
70	1.384	.751	97.3	.98	1055	1046	-134	41.8
90 (Tip)	1.291	.731	96.8	.94	1009	1002	-119	39.5
MR	1.466	.748	96.0	1.03	1100	1094	-114	44.9

333°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.553	.743	94.6	1.08	1154	1150	-93	50.6
30	1.450	.754	95.5	1.01	1089	1084	-105	46.9
50	1.377	.751	95.1	.97	1053	1049	-93	44.6
70	1.329	.723	96.9	.98	1058	1050	-127	42.1
90 (Tip)	1.242	.708	97.3	.93	1007	999	-128	39.2
MR	1.409	.739	95.7	1.01	1084	1078	-108	44.7

1. Inlet Plenum Conditions: P_o = 2040 psf, T_o = 490.6°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{17} = \tan^{-1} [\tan\beta'_{17}/\cos]$

TABLE 14.4
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 95% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 151.54 LBM/SEC.

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta_{17}^*$	M	V	V_m	V_θ	$90-\beta'_{17}$
3°43'								
10 (Hub)	2.131	1.192	94.8	.95	1100	1096	-91	41.4
30	2.000	1.244	93.7	.85	998	996	-65	37.5
50	1.793	1.251	94.2	.74	881	878	-64	32.5
70	1.707	1.256	93.9	.68	826	824	-56	29.4
90 (Tip)	1.576	1.267	93.8	.57	707	706	-47	24.7
MR	1.893	1.237	94.1	.80	956	954	-69	33.1
111°43'								
10 (Hub)	1.998	1.199	95.5	.89	1033	1028	-99	39.3
30	1.849	1.213	96.5	.80	939	933	-106	34.8
50	1.760	1.218	96.4	.75	884	878	-99	31.7
70	1.755	1.215	95.8	.74	893	888	-90	30.6
90 (Tip)	1.652	1.210	97.6	.68	832	824	-110	27.2
MR	1.828	1.211	96.2	.79	935	930	-100	32.7
201°43'								
10 (Hub)	1.387	1.377	99.1	.10	126	125	-20	6.1
30	1.573	1.394	98.1	.42	516	511	-73	21.4
50	1.496	1.387	96.8	.33	411	408	-48	16.6
70	1.756	1.382	102.8	.60	733	715	-162	24.5
90 (Tip)	1.790	1.400	99.5	.60	749	738	-124	24.6
MR	1.646	1.388	99.9	.50	618	609	-106	18.6
273°43'								
10 (Hub)	2.002	1.225	93.2	.87	1014	1012	-57	39.8
30	1.899	1.256	92.8	.79	931	930	-46	36.0
50	1.807	1.280	90.7	.72	856	856	-10	32.8
70	1.725	1.290	92.4	.66	797	797	-34	29.0
90 (Tip)	1.608	1.304	93.8	.56	687	685	-46	24.0
MR	1.841	1.265	92.5	.75	894	894	-39	32.3

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta_{17}^*$	M	V	V_m	V_θ	$90-\beta'_{17}$
33°43'								
10 (Hub)	2.058	1.195	94.0	.92	1069	1067	-74	41.0
30	1.907	1.232	94.7	.82	960	957	-78	36.1
50	1.788	1.228	94.1	.75	896	894	-63	32.9
70	1.755	1.231	94.5	.73	879	876	-69	30.7
90 (Tip)	1.595	1.226	91.6	.62	768	768	-21	27.0
MR	1.856	1.221	94.1	.80	946	944	-67	33.5
141°43'								
10 (Hub)	1.926	1.253	95.9	.81	951	946	-98	37.0
30	1.809	1.261	96.4	.74	871	866	-97	33.0
50	1.728	1.276	96.3	.67	806	801	-89	29.6
70	1.745	1.270	95.3	.69	835	831	-77	29.2
90 (Tip)	1.656	1.277	99.2	.62	765	755	-122	25.1
MR	1.792	1.266	96.2	.72	863	858	-94	30.8
231°43'								
10 (Hub)	1.733	1.308	92.2	.65	784	783	-30	33.4
30	1.677	1.326	92.4	.59	714	713	-30	29.4
50	1.649	1.336	92.4	.56	679	679	-28	26.7
70	1.705	1.334	95.9	.60	737	733	-75	26.3
90 (Tip)	1.661	1.334	95.9	.57	704	700	-72	24.2
MR	1.690	1.327	93.6	.60	729	727	-46	28.0
303°43'								
10 (Hub)	2.279	1.169	94.2	1.03	1166	1163	-86	43.1
30	2.137	1.240	94.0	.92	1056	1054	-73	38.9
50	1.780	1.262	94.0	.72	856	854	-60	31.8
70	1.659	1.272	92.9	.63	765	764	-39	27.9
90 (Tip)	1.557	1.287	95.0	.53	657	654	-57	22.9
MR	1.966	1.235	93.9	.84	989	987	-67	32.9

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta_{17}^*$	M	V	V_m	V_θ	$90-\beta'_{17}$
81°43'								
10 (Hub)	2.034	1.188	95.6	.91	1063	1057	-110	39.8
30	1.880	1.208	96.7	.82	963	957	-113	35.3
50	1.783	1.184	96.1	.79	928	923	-99	33.0
70	1.774	1.181	95.5	.79	934	930	-90	31.8
90 (Tip)	1.660	1.175	97.0	.72	872	865	-107	28.4
MR	1.852	1.189	96.1	.82	970	964	-104	33.7
171°43'								
10 (Hub)	1.762	1.321	95.2	.65	787	784	-71	32.5
30	1.697	1.327	95.9	.60	727	723	-75	28.9
50	1.684	1.353	95.9	.57	692	689	-72	26.3
70	1.705	1.353	94.9	.58	719	716	-61	25.9
90 (Tip)	1.610	1.346	99.4	.51	642	633	-104	21.6
MR	1.704	1.339	95.8	.60	727	723	-73	27.0
243°43'								
10 (Hub)	1.723	1.290	89.4	.66	794	794	8	34.7
30	1.678	1.305	90.3	.61	736	736	-3	30.8
50	1.665	1.324	90.0	.58	704	704	0	28.1
70	1.696	1.326	92.7	.60	735	734	-35	27.0
90 (Tip)	1.647	1.331	95.8	.56	691	687	-70	23.8
MR	1.687	1.313	91.2	.61	739	739	-16	28.9
333°43'								
10 (Hub)	2.217	1.165	94.5	1.00	1148	1144	-91	42.5
30	2.079	1.235	93.3	.90	1039	1037	-60	38.7
50	1.726	1.250	94.4	.69	834	832	-65	31.0
70	1.671	1.260	93.3	.65	791	790	-46	28.6
90 (Tip)	1.577	1.280	94.3	.55	691	689	-52	24.0
MR	1.924	1.228	93.9	.83	977	974	-67	33.0

1. Inlet Plenum Conditions: P_o = 2000 psf, T_o = 491.5°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{17} = \tan^{-1} [\tan\beta_{17}^*/\cos]$

TABLE 14.5
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 95% OF DESIGN SPEED , W $\sqrt{\theta}/\delta$ = 159.20 LBM/SEC.

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
	3°43'								33°43'								81°43'							
10 (Hub)	2.125	.981	95.3	1.11	1250	1245	-116	44.4	2.093	1.003	93.9	1.08	1226	1223	-84	44.6	2.046	1.015	98.2	1.05	1198	1185	-171	41.8
30	2.003	1.028	94.5	1.02	1165	1162	-90	41.3	1.935	1.023	95.5	1.00	1142	1137	-110	40.2	1.903	1.036	97.9	.97	1114	1104	-152	38.5
50	1.807	.986	96.7	.97	1122	1114	-130	37.6	1.790	.991	96.9	.96	1106	1098	-132	37.1	1.769	1.027	97.3	.92	1059	1050	-134	35.9
70	1.795	.971	95.6	.98	1135	1130	-111	36.7	1.798	.982	96.0	.97	1121	1115	-117	36.2	1.750	.993	96.8	.94	1083	1076	-128	35.0
90 (Tip)	1.693	.958	96.4	.94	1101	1094	-122	34.2	1.663	.968	97.1	.91	1070	1062	-132	33.2	1.647	.982	98.6	.89	1045	1033	-156	32.2
MR	1.912	.988	95.5	1.02	1167	1162	-113	38.8	1.883	.997	95.7	1.00	1146	1140	-114	38.3	1.848	1.014	97.6	.97	1112	1102	-148	36.7
	111°43'								141°43'								171°43'							
10 (Hub)	1.991	1.049	97.2	1.00	1142	1133	-143	41.1	1.894	1.132	96.5	.89	1031	1024	-116	38.8	1.702	1.227	95.5	.70	835	832	-79	33.9
30	1.838	1.075	97.5	.91	1048	1039	-136	37.2	1.758	1.150	97.3	.80	939	931	-120	34.5	1.624	1.235	96.5	.64	765	761	-86	29.9
50	1.733	1.073	97.1	.86	998	990	-124	34.4	1.666	1.159	97.2	.74	877	870	-110	31.3	1.595	1.254	95.6	.60	723	720	-70	27.3
70	1.713	1.066	96.9	.85	996	989	-121	32.9	1.665	1.155	97.0	.74	883	877	-107	30.0	1.617	1.253	95.1	.61	748	745	-67	26.7
90 (Tip)	1.594	1.058	98.9	.79	934	923	-144	29.5	1.579	1.156	99.0	.68	823	813	-129	26.7	1.505	1.257	99.8	.51	635	626	-108	21.4
MR	1.801	1.065	97.3	.90	1042	1034	-133	35.0	1.734	1.149	97.2	.79	930	923	-116	32.3	1.625	1.243	96.0	.63	761	757	-79	27.8
	201°43'								231°43'								243°43'							
10 (Hub)	1.333	1.290	98.3	.22	271	268	-39	12.6	1.689	1.205	92.6	.71	854	853	-39	35.5	1.656	1.191	89.0	.70	843	843	15	36.5
30	1.497	1.310	96.4	.44	541	538	-60	22.6	1.599	1.208	94.0	.65	776	775	-54	31.0	1.610	1.201	91.7	.66	791	791	-23	32.2
50	1.404	1.305	95.8	.33	405	403	-41	16.5	1.556	1.230	94.0	.59	715	714	-50	27.5	1.557	1.206	91.6	.62	741	740	-21	28.9
70	1.646	1.299	103.2	.59	724	705	-166	24.1	1.592	1.224	93.6	.63	757	756	-48	27.4	1.590	1.210	90.4	.64	768	768	-5	28.6
90 (Tip)	1.666	1.324	101.4	.58	717	703	-141	23.3	1.539	1.221	93.6	.59	716	714	-45	24.9	1.506	1.213	90.4	.56	691	691	-5	24.8
MR	1.537	1.305	99.6	.49	603	594	-100	19.8	1.604	1.217	93.5	.64	775	773	-48	29.3	1.595	1.203	90.6	.65	779	779	-8	30.2
	273°43'								303°43'								333°43'							
10 (Hub)	1.919	1.067	93.5	.96	1097	1095	-67	41.8	2.248	1.012	94.1	1.13	1260	1257	-90	45.3	2.231	1.003	95.2	1.13	1263	1258	-115	44.7
30	1.806	1.094	93.6	.88	1015	1013	-63	38.0	2.101	1.046	94.9	1.05	1181	1177	-101	41.4	2.068	1.033	95.1	1.05	1183	1178	-105	41.3
50	1.735	1.100	91.8	.83	975	974	-31	35.8	1.799	1.039	95.9	.92	1064	1058	-109	36.6	1.730	1.016	96.4	.91	1054	1048	-118	36.1
70	1.686	1.120	92.0	.79	929	929	-32	32.9	1.771	1.001	96.4	.94	1088	1082	-121	35.4	1.754	.951	96.2	.98	1131	1125	-123	36.3
90 (Tip)	1.526	1.120	92.9	.68	818	817	-41	28.1	1.590	1.005	93.2	.84	987	986	-56	32.6	1.634	.962	95.2	.90	1063	1059	-96	33.7
MR	1.763	1.098	92.8	.85	994	992	-48	35.3	1.954	1.022	95.1	1.01	1149	1144	-102	38.3	1.929	.996	95.7	1.02	1165	1159	-115	38.4

1. Inlet Plenum Conditions: P_o = 1992 psf, T_o = 490.9°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta^{\circ}_{17} = \tan^{-1} [\tan\beta^{\circ}_{17}/\cos]$

TABLE 14.6
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 95% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 163.62 LBM/SEC.

3°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.112	.970	95.8	1.12	1254	1247	-127	44.2
30	2.018	.992	94.4	1.06	1197	1194	-92	42.0
50	1.778	.942	98.7	1.00	1143	1130	-173	37.1
70	1.779	.912	98.1	1.03	1169	1158	-165	36.4
90 (Tip)	1.680	.811	98.8	1.08	1217	1203	-186	35.6
MR	1.903	.940	96.9	1.06	1198	1189	-144	39.1

33°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.073	.961	94.0	1.11	1251	1248	-88	45.1
30	1.934	.970	95.7	1.04	1184	1178	-117	41.1
50	1.775	.939	97.3	1.00	1144	1134	-145	37.7
70	1.789	.909	96.9	1.03	1174	1166	-142	37.0
90 (Tip)	1.653	.794	98.5	1.08	1219	1206	-180	35.8
MR	1.872	.929	96.2	1.05	1194	1187	-129	39.3

81°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.041	.977	98.5	1.08	1226	1212	-181	42.2
30	1.905	1.006	98.4	1.00	1137	1124	-166	38.7
50	1.760	.979	98.3	.95	1092	1080	-157	36.2
70	1.716	.937	98.5	.97	1106	1093	-164	34.7
90 (Tip)	1.623	.811	99.7	1.05	1176	1159	-198	34.4
MR	1.835	.959	98.5	1.01	1146	1133	-170	37.2

111°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.970	.946	98.4	1.08	1213	1200	-177	42.0
30	1.842	.975	98.3	1.00	1127	1115	-163	38.5
50	1.719	.952	98.3	.96	1092	1080	-157	36.1
70	1.665	.896	98.5	.98	1115	1103	-165	34.9
90 (Tip)	1.556	.780	99.6	1.04	1170	1154	-194	34.4
MR	1.778	.927	98.5	1.01	1143	1130	-169	37.2

141°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.886	.888	97.8	1.10	1222	1210	-166	42.5
30	1.750	.924	98.3	1.00	1127	1115	-164	38.6
50	1.634	.913	98.1	.95	1082	1071	-152	36.0
70	1.590	.866	98.9	.97	1105	1092	-171	34.6
90 (Tip)	1.507	.767	100.1	1.03	1159	1141	-204	34.0
MR	1.697	.885	98.4	1.01	1140	1128	-167	37.1

171°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.673	.822	98.3	1.06	1195	1183	-172	41.7
30	1.536	.852	98.7	.96	1091	1079	-164	37.6
50	1.456	.848	97.3	.91	1053	1044	-134	35.7
70	1.438	.811	97.9	.94	1083	1073	-149	34.5
90 (Tip)	1.342	.808	99.3	.88	1024	1011	-165	31.4
MR	1.511	.830	98.2	.97	1104	1092	-157	36.2

201°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.308	.888	96.3	.76	908	903	-100	35.7
30	1.305	.879	96.3	.77	912	907	-100	34.2
50	1.266	.854	96.0	.77	916	911	-96	32.7
70	1.184	.825	95.5	.74	878	874	-84	30.3
90 (Tip)	1.179	.843	95.6	.71	849	845	-83	28.2
MR	1.256	.859	96.0	.76	899	894	-94	32.2

231°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.517	.841	96.8	.96	1110	1102	-132	40.5
30	1.417	.837	97.5	.90	1045	1036	-137	37.1
50	1.341	.813	96.5	.88	1023	1016	-116	35.3
70	1.348	.793	95.2	.90	1049	1045	-95	34.7
90 (Tip)	1.230	.800	98.8	.81	954	943	-146	29.9
MR	1.391	.819	96.7	.90	1051	1044	-122	35.5

243°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.564	.918	93.1	1.01	1157	1156	-62	43.5
30	1.477	.821	96.1	.96	1094	1088	-116	38.9
50	1.390	.795	95.7	.93	1068	1063	-106	36.7
70	1.396	.813	95.1	.91	1051	1047	-93	34.9
90 (Tip)	1.272	.820	96.9	.82	952	945	-114	30.5
MR	1.439	.813	95.1	.94	1081	1077	-97	36.9

273°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.018	.912	96.8	1.13	1257	1248	-150	43.7
30	1.806	.900	98.8	1.05	1175	1161	-179	39.4
50	1.699	.914	98.0	.98	1116	1105	-155	36.8
70	1.674	.884	96.0	1.00	1131	1125	-119	36.4
90 (Tip)	1.547	.846	99.5	.97	1101	1086	-182	32.9
MR	1.777	.896	97.6	1.04	1169	1159	-154	37.8

303°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.270	.991	94.4	1.16	1274	1271	-98	45.4
30	1.971	.982	95.9	1.05	1172	1166	-120	40.7
50	1.796	.931	99.3	1.02	1144	1129	-184	36.9
70	1.802	.923	97.5	1.03	1156	1146	-150	36.4
90 (Tip)	1.648	.837	98.0	1.03	1160	1149	-161	34.8
MR	1.939	.946	96.7	1.07	1191	1183	-140	38.8

333°43'

Circumferential Position % Span	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.240	.980	95.8	1.15	1278	1272	-129	44.7
30	2.048	.999	94.8	1.07	1194	1190	-99	41.7
50	1.703	.928	99.0	.97	1110	1096	-174	36.3
70	1.773	.900	97.0	1.03	1171	1162	-143	36.9
90 (Tip)	1.672	.918	97.7	1.06	1197	1186	-161	35.7
MR	1.929	.940	96.6	1.07	1199	1191	-138	39.1

1. Inlet Plenum Conditions: P_o = 1984 psf, T_o = 491.6°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta_{17} = \tan^{-1}[\tan\beta^{\circ}_{17}/\cos]$

TABLE 14.7
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 100% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 161.22 LBM/SEC.

3°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.282	1.186	95.2	1.01	1174	1170	-105	41.5
30	2.150	1.244	93.6	.92	1079	1077	-68	38.2
50	1.859	1.250	94.8	.78	933	930	-78	32.4
70	1.780	1.257	93.7	.72	885	884	-58	29.9
90 (Tip)	1.645	1.262	93.6	.63	785	784	-49	25.8
MR	2.003	1.235	94.2	.86	1026	1023	-76	33.6

33°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.206	1.189	94.3	.98	1148	1145	-86	41.3
30	2.038	1.219	94.3	.89	1049	1046	-78	37.2
50	1.839	1.224	95.8	.79	941	936	-95	32.2
70	1.838	1.212	94.7	.79	957	953	-79	31.4
90 (Tip)	1.684	1.221	93.3	.69	856	855	-50	27.8
MR	1.961	1.211	94.6	.86	1023	1019	-82	34.0

81°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.164	1.190	96.2	.97	1129	1123	-122	40.0
30	2.006	1.202	95.9	.89	1044	1038	-108	36.4
50	1.842	1.161	96.4	.84	993	986	-111	33.3
70	1.858	1.156	95.7	.85	1013	1009	-100	32.5
90 (Tip)	1.768	1.155	96.8	.80	965	965	-116	29.8
MR	1.953	1.175	96.1	.88	1044	1038	-111	34.4

111°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.145	1.205	95.7	.95	1105	1099	-110	39.6
30	1.970	1.219	96.4	.86	1010	1004	-112	35.4
50	1.805	1.203	96.7	.78	937	931	-110	31.8
70	1.837	1.208	96.2	.80	960	954	-103	31.0
90 (Tip)	1.748	1.204	97.1	.75	915	908	-113	28.4
MR	1.928	1.209	96.3	.85	1004	998	-110	33.2

141°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.071	1.270	95.5	.87	1022	1017	-99	37.7
30	1.921	1.280	96.3	.78	933	927	-102	33.4
50	1.772	1.278	96.7	.70	845	839	-98	29.4
70	1.825	1.290	96.4	.72	879	874	-98	28.9
90 (Tip)	1.748	1.286	98.4	.68	837	828	-122	26.1
MR	1.890	1.280	96.4	.77	922	916	-103	31.3

171°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.854	1.354	95.2	.69	830	827	-76	32.6
30	1.787	1.356	95.5	.64	779	775	-75	29.4
50	1.732	1.372	95.5	.59	721	718	-69	26.2
70	1.779	1.375	94.8	.61	762	759	-64	26.1
90 (Tip)	1.668	1.369	97.8	.54	681	674	-92	22.1
MR	1.779	1.366	95.5	.63	769	765	-73	27.3

201°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.447	1.406	98.3	.20	255	252	-37	11.4
30	1.595	1.424	97.5	.41	506	502	-66	20.2
50	1.534	1.421	97.1	.33	420	417	-52	16.1
70	1.801	1.414	102.5	.60	745	727	-161	23.8
90 (Tip)	1.866	1.428	98.6	.63	789	780	-118	24.8
MR	1.682	1.418	99.5	.50	626	617	-103	19.3

231°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.807	1.338	92.6	.67	819	818	-37	33.1
30	1.755	1.344	92.9	.63	769	768	-39	29.8
50	1.730	1.358	92.9	.60	734	733	-37	27.2
70	1.793	1.353	94.5	.65	795	792	-62	27.1
90 (Tip)	1.735	1.356	94.9	.60	753	750	-64	24.7
MR	1.770	1.349	93.4	.63	779	777	-47	28.4

243°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.801	1.317	88.9	.68	834	833	15	34.8
30	1.753	1.327	91.0	.64	783	782	-13	30.8
50	1.734	1.339	90.0	.62	754	754	0	28.5
70	1.761	1.345	92.2	.63	775	774	-30	27.2
90 (Tip)	1.684	1.354	93.9	.57	705	704	-48	23.5
MR	1.755	1.334	91.0	.64	780	780	-13	29.0

273°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.085	1.251	93.9	.89	1045	1043	-71	39.0
30	2.002	1.287	93.6	.82	972	970	-61	35.5
50	1.887	1.305	90.7	.75	895	895	-10	32.6
70	1.800	1.322	91.8	.68	830	829	-26	28.8
90 (Tip)	1.666	1.332	95.6	.57	717	713	-71	23.5
MR	1.923	1.294	92.8	.77	929	928	-46	31.9

303°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.459	1.224	95.2	1.05	1203	1198	-110	42.1
30	2.305	1.262	94.0	.97	1120	1117	-79	39.0
50	1.841	1.299	95.0	.72	872	869	-77	30.6
70	1.718	1.310	92.9	.64	781	780	-39	27.2
90 (Tip)	1.608	1.328	94.7	.53	666	663	-54	22.2
MR	2.090	1.273	94.4	.87	1031	1028	-78	32.2

333°43'

Circumferential Position % Span	P_{17}/P_o	P_{17}/P_o	$90-\beta_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.419	1.208	94.6	1.05	1201	1197	-95	42.3
30	2.223	1.257	93.2	.94	1096	1094	-62	38.8
50	1.792	1.288	94.0	.70	853	851	-59	30.4
70	1.711	1.290	93.9	.65	800	798	-55	27.5
90 (Tip)	1.633	1.306	93.9	.57	723	721	-49	24.0
MR	2.046	1.260	93.9	.86	1024	1022	-70	32.6

1. Inlet Plenum Conditions: P_o = 1983 psf, T_o = 492.4°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta'_{17} = \tan^{-1}\left[\tan\beta'_{17}/\cos\right]$

TABLE 14.8
STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS
WEDGE PROBE STATION 17, 100% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 167.42 LBM/SEC.

Circumferential Position % Span	3°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.272	1.050	94.8	1.11	1264	1260	-105	43.6
30	2.124	1.083	95.7	1.03	1187	1181	-119	39.8
50	1.883	1.048	97.0	.95	1117	1109	-136	36.0
70	1.884	1.039	95.2	.96	1134	1129	-103	35.5
90 (Tip)	1.757	1.034	95.0	.90	1083	1078	-95	33.0
MR	2.019	1.053	95.5	1.01	1175	1169	-113	37.6

Circumferential Position % Span	33°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.233	1.075	93.6	1.08	1238	1235	-78	43.7
30	2.055	1.085	94.7	1.00	1158	1154	-94	39.7
50	1.836	1.037	97.3	.94	1100	1091	-141	35.5
70	1.888	1.017	95.6	.98	1145	1139	-111	35.6
90 (Tip)	1.770	1.001	96.7	.94	1112	1104	-130	33.0
MR	1.986	1.048	95.3	1.00	1162	1157	-108	37.5

Circumferential Position % Span	81°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.181	1.085	97.9	1.05	1210	1198	-167	40.9
30	2.034	1.098	97.0	.98	1135	1124	-155	37.7
50	1.800	1.044	97.7	.92	1070	1060	-144	34.6
70	1.842	1.028	96.9	.95	1109	1101	-134	34.2
90 (Tip)	1.770	1.058	97.7	.98	1134	1124	-152	35.9
MR	1.951	1.058	97.7	.98	1134	1124	-152	35.9

Circumferential Position % Span	111°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.145	1.122	97.2	1.01	1161	1152	-146	40.2
30	1.963	1.118	97.5	.93	1085	1076	-142	36.7
50	1.778	1.092	97.5	.86	1017	1009	-133	33.5
70	1.805	1.083	96.7	.89	1042	1035	-122	32.8
90 (Tip)	1.715	1.082	98.3	.84	1001	991	-145	30.0
MR	1.909	1.102	97.3	.92	1077	1068	-137	34.5

Circumferential Position % Span	141°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.054	1.181	95.9	.93	1078	1072	-112	38.9
30	1.886	1.195	96.7	.83	982	976	-115	34.6
50	1.721	1.192	97.6	.74	891	883	-117	30.4
70	1.768	1.201	97.3	.76	918	911	-117	29.6
90 (Tip)	1.701	1.195	98.3	.73	884	875	-128	27.3
MR	1.850	1.193	97.0	.82	970	963	-118	32.2

Circumferential Position % Span	171°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.798	1.289	94.4	.71	851	849	-66	33.5
30	1.731	1.302	95.5	.65	790	787	-76	29.8
50	1.680	1.316	95.6	.60	737	734	-71	26.7
70	1.720	1.324	94.9	.62	768	765	-65	26.3
90 (Tip)	1.582	1.317	100.1	.52	651	641	-114	20.9
MR	1.721	1.309	95.5	.64	780	777	-75	27.4

Circumferential Position % Span	201°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.366	1.362	99.4	.06	79	78	-13	3.6
30	1.544	1.381	99.0	.40	502	496	-79	19.8
50	1.466	1.376	97.1	.30	381	378	-47	14.8
70	1.721	1.368	102.8	.58	723	705	-161	23.2
90 (Tip)	1.805	1.380	99.7	.63	784	773	-132	24.5
MR	1.630	1.374	100.2	.50	624	614	-111	17.2

Circumferential Position % Span	231°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.761	1.267	92.7	.70	854	853	-40	34.1
30	1.687	1.270	94.0	.65	792	790	-55	30.2
50	1.659	1.287	94.0	.61	750	748	-52	27.4
70	1.704	1.287	94.0	.65	790	788	-55	27.1
90 (Tip)	1.645	1.280	94.0	.61	754	752	-52	24.9
MR	1.699	1.278	93.7	.65	795	793	-51	28.7

Circumferential Position % Span	243°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	1.737	1.242	88.6	.71	860	860	21	35.7
30	1.692	1.253	91.8	.67	810	810	-26	31.4
50	1.628	1.259	91.8	.62	750	750	-24	28.0
70	1.672	1.261	90.3	.65	788	788	-4	28.0
90 (Tip)	1.579	1.267	91.2	.57	704	704	-15	24.0
MR	1.673	1.255	90.6	.65	796	795	-9	29.4

Circumferential Position % Span	273°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.014	1.128	93.7	.95	1104	1102	-72	40.5
30	1.905	1.153	93.6	.88	1029	1027	-65	37.0
50	1.806	1.167	91.8	.82	966	966	-31	34.2
70	1.734	1.189	92.5	.75	904	903	-40	30.7
90 (Tip)	1.581	1.186	93.0	.66	802	801	-42	26.4
MR	1.841	1.162	93.0	.84	992	991	-52	33.8

Circumferential Position % Span	303°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.406	1.091	95.4	1.13	1268	1262	-120	43.4
30	2.260	1.128	94.8	1.05	1193	1189	-99	40.4
50	1.871	1.136	97.1	.88	1029	1021	-128	34.0
70	1.771	1.097	95.8	.86	1016	1010	-103	32.6
90 (Tip)	1.591	1.114	91.5	.73	888	888	-24	29.2
MR	2.057	1.112	95.3	.98	1134	1129	-105	35.9

Circumferential Position % Span	333°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.422	1.103	93.6	1.12	1268	1265	-79	44.4
30	2.159	1.102	95.2	1.03	1182	1177	-108	40.0
50	1.820	1.094	95.4	.88	1045	1041	-99	35.0
70	1.799	1.065	96.0	.90	1066	1061	-111	33.7
90 (Tip)	1.688	1.072	92.8	.82	992	991	-47	31.6
MR	2.035	1.089	94.0	.99	1149	1145	-96	36.9

1. Inlet Plenum Conditions: P_o = 1978 psf, T_o = 492.0°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta^{\circ}_{17} = \tan^{-1}\left[\tan\beta'_{17}/\cos\right]$

TABLE 14.9

STATOR EXIT CIRCUMFERENTIAL DISTRIBUTIONS

WEDGE PROBE STATION 17, 100% OF DESIGN SPEED, W $\sqrt{\theta}/\delta$ = 174.06 LBM/SEC.

Circumferential Position % Span	3°43'								33°43'								81°43'							
	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$	P_{17}/P_o	p_{17}/P_o	$90-\beta^{\circ}_{17}$	M	V	V_m	V_θ	$90-\beta'_{17}$
10 (Hub)	2.258	1.043	95.3	1.11	1264	1258	-117	43.2	2.221	1.029	95.5	1.011	1266	1260	-121	43.3	2.170	1.061	98.6	1.07	1224	1211	-182	40.7
30	2.128	1.044	95.1	1.06	1214	1209	-107	40.6	2.059	1.039	95.3	1.04	1193	1188	-111	40.1	2.026	1.083	98.5	.99	1140	1127	-168	37.4
50	1.889	.995	97.4	1.00	1161	1151	-150	36.7	1.835	.993	97.6	.98	1137	1127	-150	36.2	1.828	1.024	98.7	.95	1099	1087	-166	34.8
70	1.880	.960	97.5	1.03	1186	1175	-155	35.6	1.867	.956	97.8	1.03	1180	1169	-161	35.5	1.797	.976	98.5	.98	1122	1110	-165	33.8
90 (Tip)	1.763	.848	97.9	1.08	1234	1222	-171	35.0	1.747	.844	97.7	1.07	1228	1217	-165	35.1	1.731	.870	99.4	1.04	1184	1168	-194	33.4
MR	2.016	.994	96.5	1.06	1213	1205	-137	38.2	1.976	.988	96.7	1.05	1202	1194	-139	38.0	1.937	1.020	98.6	1.00	1153	1140	-173	36.0
	111°43'								141°43'								171°43'							
10 (Hub)	2.108	1.032	98.1	1.06	1212	1200	-170	40.8	2.012	.973	97.7	1.07	1216	1205	-163	41.1	1.778	.865	97.7	1.07	1216	1205	-164	41.0
30	1.963	1.051	98.2	.99	1131	1119	-162	37.4	1.877	.997	98.1	1.00	1134	1123	-159	37.5	1.643	.890	98.2	.98	1124	1112	-160	37.2
50	1.800	1.000	98.4	.96	1102	1090	-161	35.0	1.718	.954	98.0	.96	1099	1089	-154	35.1	1.550	.868	97.7	.95	1100	1090	-147	35.3
70	1.759	.945	98.8	.99	1128	1115	-172	33.9	1.700	.903	98.2	.99	1138	1126	-162	34.3	1.537	.842	98.7	.97	1119	1106	-168	33.7
90 (Tip)	1.675	.837	99.3	1.05	1186	1170	-192	33.5	1.646	.788	98.1	1.08	1221	1209	-172	34.7	1.456	.809	99.8	.96	1109	1093	-189	31.8
MR	1.888	.991	98.5	1.01	1150	1138	-169	36.1	1.812	.940	98.0	1.01	1157	1145	-161	36.5	1.612	.861	98.2	.99	1140	1128	-163	35.8
	201°43'								231°43'								243°43'							
10 (Hub)	1.351	.870	97.4	.82	976	968	-126	35.7	1.587	.824	98.7	1.01	1178	1165	-177	39.9	1.619	.821	93.4	1.04	1196	1194	-72	42.7
30	1.364	.857	96.7	.84	997	990	-116	34.9	1.462	.835	98.8	.93	1088	1076	-167	36.3	1.519	.816	97.0	.99	1135	1127	-138	38.0
50	1.308	.789	96.4	.88	1041	1034	-116	34.4	1.403	.810	97.0	.92	1080	1072	-133	35.2	1.459	.812	95.2	.95	1104	1100	-100	36.3
70	1.215	.764	96.3	.84	999	992	-119	31.6	1.413	.800	96.0	.94	1095	1089	-114	34.2	1.452	.813	95.9	.95	1097	1091	-113	34.3
90 (Tip)	1.230	.788	96.5	.82	982	975	-113	30.0	1.277	.797	99.7	.85	1006	991	-170	29.7	1.327	.828	96.9	.85	995	988	-120	30.2
MR	1.300	.816	96.3	.84	1001	994	-119	33.3	1.449	.815	97.8	.95	1104	1094	-150	35.1	1.494	.817	95.5	.97	1122	1117	-108	36.3
	273°43'								303°43'								333°43'							
10 (Hub)	2.154	.978	94.8	1.12	1268	1264	-107	43.6	2.394	1.026	93.3	1.17	1303	1301	-76	45.1	2.380	1.052	93.7	1.15	1286	1284	-83	44.5
30	1.890	.952	98.2	1.04	1180	1168	-169	38.4	2.060	1.009	97.4	1.06	1198	1188	-155	39.2	2.131	1.022	95.5	1.08	1220	1214	-118	40.5
50	1.784	.954	96.6	.99	1133	1126	-130	36.5	1.848	.939	98.9	1.03	1173	1158	-182	36.4	1.789	.953	98.2	.99	1142	1131	-162	36.0
70	1.752	.915	97.0	1.01	1152	1144	-141	35.2	1.828	.939	97.2	1.02	1166	1157	-146	35.4	1.838	.934	98.0	1.03	1180	1169	-164	35.3
90 (Tip)	1.635	.873	98.6	.99	1133	1120	-169	32.7	1.643	.857	99.7	1.01	1154	1138	-194	32.8	1.719	.850	98.6	1.06	1204	1191	-179	34.2
MR	1.873	.942	96.8	1.04	1185	1176	-141	37.3	2.008	.969	96.8	1.08	1214	1205	-145	37.8	2.020	.979	96.4	1.07	1217	1209	-137	38.1

1. Inlet Plenum Conditions: P_o = 1967 psf, T_o = 493.8°R
2. V_m Calculation is Based on Standard Day Inlet Plenum Conditions
3. Circumferential Reference Position is TDC Looking Forward
4. Relative Position of Circumferential Distortion Screen is 165°-285°
5. $\beta^{\circ}_{17} = \tan^{-1} [\tan \beta^{\circ}_{17}/\cos]$

TABLE 15.1

STATOR DISCHARGE CIRCUMFERENTIAL DISTRIBUTIONS
TEMPERATURE RAKES - T_{17}/T_o
70% SPEED

% Span	Circumferential Position - Degrees 21°13'	51°13'	81°13'	111°13'	141°13'	171°13'	189°13'	219°13'	249°13'	279°13'	309°13'	339°13'
10 (Hub)	1.1469	1.1418	1.1400	1.1317	1.1128	1.0793	1.0777	1.0974	1.1422	1.1477	1.1644	1.1498
30	1.1220	1.1018	1.1164	1.0991	1.0964	1.0540	1.0657	1.0957	1.1293	1.1613	1.1453	1.1258
50	1.1228	1.1158	1.1102	1.1020	1.0951	1.0693	1.0694	1.0963	1.1265	1.1679	1.1524	1.1337
70	1.1223	1.1167	1.1127	1.1059	1.0988	1.0806	1.0767	1.1115	1.1299	1.1813	1.1488	1.1292
90 (Tip)	1.1108	1.1058	1.1002	1.0936	1.0869	1.0702	1.0706	1.0974	1.1173	1.1774	1.1437	1.1244
MR	1.1224	1.1137	1.1141	1.1048	1.0985	1.0717	1.0735	1.0994	1.1304	1.1693	1.1541	1.1322
			$W\sqrt{\theta}/\delta$ = 122.69 lbm/sec.		P_o = 2040 psf		T_o = 490.6°R					
10 (Hub)	1.1388	1.1344	1.1327	1.1258	1.1194	1.0994	1.1046	1.1115	1.1423	1.1770	1.1685	1.1511
30	1.1260	1.1122	1.1277	1.1295	1.0949	1.0850	1.0952	1.1109	1.1385	1.1626	1.1423	1.1269
50	1.1312	1.1235	1.1216	1.1192	1.1167	1.1007	1.0989	1.1190	1.1458	1.1736	1.1559	1.1366
70	1.1347	1.1322	1.1291	1.1276	1.1242	1.1148	1.1191	1.1420	1.1637	1.1904	1.1583	1.1387
90 (Tip)	1.1307	1.1286	1.1255	1.1243	1.1225	1.1155	1.1224	1.1470	1.1697	1.2007	1.1654	1.1373
MR	1.1327	1.1261	1.1266	1.1253	1.1151	1.0519	1.1065	1.1234	1.1488	1.1771	1.1565	1.1392
			$W\sqrt{\theta}/\delta$ = 114.89 lbm/sec.		P_o = 2056 psf		T_o = 491.2°R					
10 (Hub)	1.1378	1.1352	1.1340	1.1279	1.1248	1.1120	1.1148	1.1206	1.1495	1.1745	1.1660	1.1528
30	1.1393	1.1251	1.1221	1.1143	1.1281	1.1090	1.1072	1.1211	1.1418	1.1584	1.1488	1.1358
50	1.1394	1.1348	1.1311	1.1253	1.1284	1.1146	1.1145	1.1329	1.1542	1.1679	1.1648	1.1511
70	1.1491	1.1454	1.1414	1.1375	1.1383	1.1333	1.1411	1.1581	1.1761	1.1905	1.1769	1.1572
90 (Tip)	1.1584	1.1511	1.1408	1.1371	1.1377	1.1371	1.1450	1.1775	1.1964	1.2100	1.1919	1.1681
MR	1.1432	1.1364	1.1334	1.1277	1.1312	1.1190	1.1219	1.1380	1.1586	1.1758	1.1666	1.1514
			$W\sqrt{\theta}/\delta$ = 107.32 lbm/sec.		P_o = 2062 psf		T_o = 490.6°R					

TABLE 15.2

STATOR DISCHARGE CIRCUMFERENTIAL DISTRIBUTIONS
TEMPERATURE RAKES - T_{17}/T_o
95% SPEED

% Span	Circumferential Position - Degrees 21°13'	51°13'	81°13'	111°13'	141°13'	171°13'	189°13'	219°13'	249°13'	279°13'	309°13'	339°13'
10 (Hub)	1.2777	1.2587	1.2524	1.2458	1.2301	1.1864	1.1676	1.1619	1.2250	1.3123	1.3211	1.2876
30	1.2672	1.2488	1.2204	1.2208	1.2094	1.1602	1.1287	1.1579	1.2291	1.2983	1.3097	1.2796
50	1.2512	1.2410	1.2318	1.2215	1.2123	1.1612	1.1380	1.1695	1.2416	1.3195	1.2926	1.2732
70	1.2561	1.2513	1.2434	1.2309	1.2204	1.1728	1.1509	1.2214	1.2461	1.3336	1.2656	1.2642
90 (Tip)	1.2595	1.2493	1.2408	1.2245	1.2152	1.1687	1.1373	1.2028	1.2291	1.3320	1.2867	1.2677
MR	1.2578	1.2467	1.2352	1.2262	1.2155	1.1706	1.1467	1.1799	1.2378	1.3181	1.2979	1.2760
			$W\sqrt{\theta}/\delta$ = 163.62 lbm/sec.		P_o = 1984 psf		T_o = 491.6°R					
10 (Hub)	1.2735	1.2611	1.2574	1.2473	1.2267	1.1862	1.1918	1.1983	1.2582	1.2814	1.3103	1.2804
30	1.2672	1.2491	1.2218	1.2160	1.2096	1.1756	1.1777	1.2109	1.2400	1.3052	1.2899	1.2737
50	1.2512	1.2413	1.2327	1.2269	1.2224	1.1992	1.1900	1.2266	1.2696	1.3388	1.2701	1.2686
70	1.2578	1.2518	1.2448	1.2369	1.2284	1.2133	1.2305	1.3021	1.2967	1.3745	1.2895	1.2595
90 (Tip)	1.2604	1.2485	1.2425	1.2320	1.2232	1.2189	1.2325	1.3184	1.3052	1.3875	1.3256	1.2827
MR	1.2575	1.2470	1.2370	1.2294	1.2218	1.1986	1.2016	1.2440	1.2689	1.3289	1.2956	1.2709
			$W\sqrt{\theta}/\delta$ = 159.20 lbm/sec.		P_o = 1992 psf		T_o = 490.9°R					
10 (Hub)	1.2649	1.2549	1.2533	1.2403	1.2247		1.1965	1.2181	1.2710	1.2947	1.3046	1.2788
30	1.2579	1.2347	1.2267	1.2210	1.2046		1.1986	1.2314	1.2551	1.3122	1.2972	1.2741
50	1.2519	1.2466	1.2405	1.2347	1.2314		1.2085	1.2510	1.2869	1.3402	1.2753	1.2631
70	1.2753	1.2651	1.2536	1.2476	1.2417		1.2604	1.3312	1.3266	1.3677	1.3130	1.2809
90 (Tip)	1.3016	1.2813	1.2589	1.2480	1.2393		1.2654	1.3391	1.3392	1.4009	1.3550	1.3099
MR	1.2652	1.2512	1.2421	1.2352	1.2276		1.2217	1.2663	1.2892	1.3320	1.3057	1.2779
			$W\sqrt{\theta}/\delta$ = 151.54 lbm/sec.		P_o = 2000 psf		T_o = 491.5°R					

TABLE 15.3

STATOR DISCHARGE CIRCUMFERENTIAL DISTRIBUTIONS
TEMPERATURE RAKES - T_{17}/T_o
100% SPEED

	Circumferential Position - Degrees											
% Span	21°13'	51°13'	81°13'	111°13'	141°13'	171°13'	189°13'	219°13'	249°13'	279°13'	309°13'	339°13'
10(Hub)	1.3043	1.2892	1.2868	1.2751	1.2625	1.2103	1.1910	1.1825	1.2632	1.3513	1.3482	1.3158
30	1.2883	1.2788	1.2644	1.2586	1.2378	1.1717	1.1569	1.1793	1.2582	1.3317	1.3408	1.3095
50	1.2868	1.2711	1.2607	1.2500	1.2400	1.1873	1.1603	1.1975	1.2701	1.3460	1.3302	1.3106
70	1.2730	1.2684	1.2601	1.2510	1.2443	1.1970	1.1674	1.2472	1.2798	1.3556	1.3059	1.2865
90(Tip)	1.2896	1.2758	1.2690	1.2548	1.2444	1.1970	1.1558	1.2325	1.2623	1.3609	1.3023	1.2981
MR	1.2834	1.2726	1.2648	1.2547	1.2421	1.1924	1.1695	1.2047	1.2702	1.3475	1.3305	1.3079

$W\sqrt{\theta}/\delta$ = 174.06 lbm/sec. P_o = 1967 psf T_o = 493.8°R

10(Hub)	1.2999	1.2900	1.2854	1.2753	1.2525	1.2106	1.2116	1.2229	1.2867	1.3171	1.3498	1.3147
30	1.2900	1.2740	1.2559	1.2613	1.2330	1.2084	1.2060	1.2463	1.2751	1.3437	1.3323	1.3041
50	1.2844	1.2686	1.2571	1.2498	1.2439	1.2219	1.2150	1.2640	1.3053	1.3751	1.3033	1.3027
70	1.2786	1.2710	1.2627	1.2547	1.2515	1.2353	1.2539	1.3474	1.3341	1.4099	1.3219	1.2804
90(Tip)	1.2901	1.2790	1.2700	1.2571	1.2497	1.2403	1.2537	1.3660	1.3422	1.4326	1.3694	1.3145
MR	1.2832	1.2728	1.2629	1.2576	1.2461	1.2230	1.2254	1.2820	1.3033	1.3654	1.3321	1.3021

$W\sqrt{\theta}/\delta$ = 167.42 lbm/sec. P_o = 1978 psf T_o = 4920°R

10(Hub)	1.2182	1.2810	1.2788	1.2699	1.2493	1.2195	1.2903	1.2414	1.3005	1.3236	1.3470	1.3176
30	1.2219	1.2692	1.2564	1.2551	1.2372	1.2093	1.2759	1.2620	1.2874	1.3456	1.3387	1.3130
50	1.2347	1.2669	1.2589	1.2548	1.2508	1.2334	1.2746	1.2859	1.3180	1.3734	1.3059	1.3015
70	1.2774	1.2839	1.2744	1.2635	1.2588	1.2482	1.3005	1.3689	1.3522	1.4036	1.3334	1.3083
90(Tip)	1.2846	1.3052	1.2875	1.2718	1.2595	1.2580	1.3306	1.3694	1.3639	1.4401	1.3850	1.3412
MR	1.2439	1.2757	1.2666	1.2613	1.2506	1.2321	1.2879	1.2984	1.3186	1.3659	1.3382	1.3138

$W\sqrt{\theta}/\delta$ = 161.22 lbm/sec. P_o = 1983 psf T_o = 492.4°R

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