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SINGLE STAGE EXPERIMENTAL EVALUATION OF SLOTTED ROTOR AND STATOR BLADING

PART V - DATA AND PERFORMANCE FOR SLOTTED ROTOR 3 - SLOTTED STATOR 2

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ABSTRACT

An investigation of a single stage axial flow compressor, comprised of a slotted rotor and a slotted stator, was conducted as part of an overall program to evaluate the effect of slots on the performance of highly loaded compressor blade rows. The test blades were 65-series airfoils. The rotor blades had a calculated unslotted D-factor of 0.611 and an inlet relative Mach number of 0.784 near the tip. The stator blades had a calculated unslotted D-factor of 0.592 and an inlet Mach number of 0.567 near the hub.

At design equivalent rotor speed and flow conditions, the slotted rotor achieved an adiabatic efficiency of 85.7% at a pressure ratio of 1.33. The stage efficiency and pressure ratio for design conditions were 79.7% and 1.30, respectively.

CONTENTS

SECTION		PAGE
I	SUMMARY	I-1
II	INTRODUCTION	II-1
III	TEST EQUIPMENT	III-1
	A. Facility	III-1
	B. Compressor Test Rig	III-1
	C. Stage Blading Design	III-2
	D. Instrumentation	III-5
IV	PROCEDURES	IV-1
	A. Test Procedure	IV-1
	B. Data Reduction Procedures	IV-2
V	RESULTS AND DISCUSSION	V-1
	A. Overall Performance	V-1
	B. Blade Element Performance	V-3
VI	CONCLUDING DISCUSSION	VI-1
VII	ILLUSTRATIONS	VII-1
	APPENDIX A - Definition of Symbols	A-1
	APPENDIX B - Tabulated Performance	B-1
	APPENDIX C - References	C-1

ILLUSTRATIONS

FIGURE		PAGE
III-1	Compressor Research Facility	VII-2
III-2	Rotating Axial Flow Cascade Test Rig	VII-3
III-3	Flow Path	VII-4
III-4	Rotating Cascade Rig Bleed	VII-5
III-5	Slot Geometry and Location	VII-6
III-6	Typical Slotted Rotor 3 Blade	VII-7
III-7	Typical Slotted Stator 2 Vane	VII-8
III-8	Instrumentation, Station 1 (View Looking Downstream)	VII-9

ILLUSTRATIONS (Continued)

FIGURE		PAGE
III-9	Instrumentation, Station 2 (View Looking Downstream)	VII-10
III-10	Instrumentation, Station 2A (View Looking Downstream)	VII-11
III-11	Instrumentation, Station 3 (View Looking Downstream)	VII-12
III-12	Probe Configurations	VII-13
III-13	Anemometer Probe	VII-14
III-14	Strain Gage Locations	VII-15
V-1	Overall Performance; Slotted Rotor 3 Only	VII-16
V-2	Overall Performance; Inlet Guide Vane, Slotted Rotor 3	VII-17
V-3	Overall Performance; Inlet Guide Vane, Slotted Rotor 3, Slotted Stator 2	VII-18
V-4	Airflow Continuity Comparison	VII-19
V-5	Sample Plot of Transient Data	VII-20
V-6	Corrected Bellmouth Static Pressure vs Corrected Weight Flow	VII-21
V-7	Comparison of Steady-State and Transient Performance Results	VII-22
V-8	Guide Vane Exit Air Angle Distribution, 100% Design Equivalent Rotor Speed	VII-23
V-9	Relative Air Angle and Mach Number Distribution Into Slotted Rotor 3, Design Equivalent Rotor Speed	VII-24
V-10	Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 10% Span From Tip	VII-25
V-11	Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 30% Span From Tip	VII-26
V-12	Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 50% Span From Tip	VII-27
V-13	Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed	VII-28
V-14	Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 90% Span From Tip	VII-29
V-15	Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 10% Span From Tip	VII-30

ILLUSTRATIONS (Continued)

FIGURE		PAGE
V-16	Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 30% Span From Tip.	VII-31
V-17	Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 50% Span From Tip.	VII-32
V-18	Variation of Rotor Blade Element Parameters With Incidence; 70% Span From Tip	VII-33
V-19	Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 90% Span From Tip.	VII-34
V-20	Loss Parameter vs Diffusion Factor at 90 and 30% Span From Tip - 50, 70, 90, and 100% Design Speed.	VII-35
V-21	Loss Parameter vs Diffusion Factor at 70 and 50% Span From Tip - 50, 70, 90, and 100% Design Speed.	VII-36
V-22	Loss Parameter vs Diffusion Factor at 10% Span From Tip - 50, 70, 90, and 100% Design Speed. . . .	VII-37
V-23	Rotor Wake Surveys - 70% Design Equivalent Rotor Speed	VII-38
V-24	Rotor Wake Surveys - 90% Design Equivalent Rotor Speed	VII-39
V-25	Rotor Wake Surveys - 100% Design Equivalent Rotor Speed	VII-40
V-26	Rotor Wake Surveys - 110% Design Equivalent Rotor Speed	VII-41
V-27	Stator Inlet Air Angle and Mach Number Distribution, Design Rotor Speed.	VII-42
V-28	Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 10% Span From Tip.	VII-43
V-29	Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 30% Span From Tip.	VII-44
V-30	Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 50% Span From Tip.	VII-45

ILLUSTRATIONS (Continued)

FIGURE PAGE

V-31 Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 70% Span From Tip. VII-46

V-32 Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 90% Span From Tip. VII-47

SECTION I
SUMMARY

A single-stage investigation of a slotted rotor - slotted stator combination was conducted as part of an overall program to evaluate the effect of slots on the performance of highly loaded compressor rotor and stator blade rows. The single-stage rig had a hub/tip ratio of 0.8 and the rotor tip diameter was approximately 40 in.

The test rotor blades were 65-series airfoils having a calculated unslotted D-factor of 0.611 and an inlet relative Mach number of 0.784 at a radial station 10% of the span from the blade tip. Design rotor tip velocity was 790 fps. The rotor blades had a constant chord length of 2.21 in., an aspect ratio of 1.71 and solidity of 1.50 at the mean radius.

The stator blades, also 65-series airfoils, had a calculated unslotted D-factor of 0.592 and an inlet Mach number of 0.567 at a radial position 90% of span from the tip. The stator blades had a constant chord length of 2.18 inches, an aspect ratio of 1.66, and solidity of 1.10 at the mean radius.

Rotor and stator blades were slotted at 50 and 55% chord, respectively. the slots extended from 5 to 45% span and 50 to 100% span from the tip in the rotor blades, and from 5 to 95% span in the stator blades.

For design equivalent rotor speed and flow conditions, the slotted rotor achieved an adiabatic efficiency of 85.7% and a corresponding pressure ratio of 1.33. The measured slotted rotor D-factor values corresponding to design conditions were approximately 0.69, 0.58, and 0.76 at radial positions 10, 50, and 90% of span from the blade tip. Measured deviation angles were approximately 3 degrees higher than the predicted deviation angle in the tip region, and slightly lower than or equal to the predicted deviation angles at other span locations. Measured loss coefficients were approximately 20% greater than the predicted values at 50 and 70% span positions. At the 10, 30, and 90% span positions from the tip the measured loss coefficients were greater than the predicted values by a factor of two or more.

For design equivalent rotor speed and flow conditions, the inlet guide vane-slotted rotor - slotted stator combination achieved an adiabatic efficiency of 79.7% and a corresponding pressure ratio of 1.30. The measured D-factor values for the slotted stator at design conditions were approximately 0.61, 0.45, and 0.58 at 10, 50, and 90% span positions, respectively. Measured loss coefficients and deviation angles were generally slightly greater than the corresponding predicted values at 10, 30, and 70% span position. At 50 and 90% span positions, the measured loss coefficients and deviation angles were nearly equal to the predicted values.

SECTION II
INTRODUCTION

Pratt & Whitney Aircraft is engaged in a program under NASA Contract NAS3-7603 to investigate the application of slots to rotors and stators. A systematic investigation is being conducted to establish the feasibility and extent to which slotted blade concepts can be used to increase allowable blade loadings and the stable operating range of compressor stages. To accomplish this objective, three stator blade rows and three rotor blade rows were built for test. Tests with stators used a representative state-of-the-art rotor to generate the stator inlet flow.

An aerodynamic analysis and design of the test blading and associated hardware were accomplished under the design phase of the program (Reference 1). All rotors and stators were designed with the same rotor exit and stator inlet absolute velocities and air angle distributions to permit testing of any combination of rotor and stator. It was assumed for design purposes that the flow deviation angle for slotted rotors and stators would be approximately one-half the values normally used for unslotted blades. As part of the design effort, a series of annular cascade tests with slotted stators was conducted to establish preliminary criteria for the design of rotor and stator slots for the rotating stage test program (Reference 2).

The overall and blade element performance data for each of the three rotors and stators will be presented in separate data reports (e.g., References 3 through 5). Following publication of these data reports, the results will be analyzed and discussed in a final report on this program.

This report presents the data and performance results obtained with a stage comprising slotted rotor configuration 3 and slotted stator configuration 2 (Reference 1), which had been tested previously behind the lightly loaded flow generation rotor. The test rotor and stator blades were designed with 65-series airfoil sections. Rotor 3 design values of D-factor (without slots) and inlet relative Mach number were 0.611 and 0.784, respectively, at a radial location 10% of span from the blade tip. The rotor blades were slotted at approximately 50% chord; the slots extended from 5 to 45% and 50 to 100% span from the tip.

For stator 2 in combination with rotor 3, the calculated values of D-factor (without slots) and inlet Mach number were 0.592 and 0.567, respectively, at a radial location 90% of the span from the blade tip. The stator blades were slotted at 55% chord, and the slots extended from 5 to 95% of the span.

A set of inlet guide vanes was used to establish the whirl distribution into the test rotor. Exit guide vanes were used to turn the stage exit flow back to near axial.

Overall performance and blade element data were obtained at 50, 70, 90, 100, and 110% of the design equivalent rotor speed. Blade element data were obtained at five radial locations behind each of the three blade rows. Rotor wake surveys at five spanwise locations, using a hot-film anemometer, were obtained at choke, near stall, and approximately maximum efficiency flow conditions at each rotor speed.

Details of the test equipment, procedures, and test results for the slotted rotor 3, slotted stator 2 configuration and pertinent design details are presented in this report. Complete aerodynamic and mechanical design detail are included in Reference 1.

SECTION III
TEST EQUIPMENT

A. FACILITY

The compressor test facility is shown schematically in figure III-1. The compressor rotor is powered by a single-stage turbine using exhaust gases from a J75 slave engine. The turbine speed is regulated by a hydraulically actuated inlet flow control valve. The slave engine exhaust is also used to drive a two-stage exhaust-ejector system.

Air entered the compressor test rig through a 103 ft combined inlet duct, plenum, and bellmouth inlet, and exhausted through an exit diffuser to the atmosphere. An area contraction ratio from plenum to compressor inlet of approximately 10:1 provided essentially stagnation conditions in the plenum. The inlet duct and plenum were mounted on a track and could be rolled away from the compressor rig inlet to facilitate configuration changes. The plenum was sealed to the compressor rig inlet section with an inflatable rubber tube seal.

B. COMPRESSOR TEST RIG

The compressor rig, shown in figure III-2, comprises bellmouth inlet, test section, and exhaust section. The test section has a hub/tip ratio of 0.8 and a rotor tip diameter of approximately 40 in. The rotor assembly and shaft are supported on two bearings that transmit loads to the outer case through struts located in the inlet and exhaust case assemblies. The test section has a split outer case that permits guide vane, rotor, and stator assembly changes without removing the rig from the test stand. A set of motor-driven throttle vanes is located in the exhaust case to vary flow rate.

A section view of the flow path is shown in figure III-3. Flow is accelerated through the inlet strut station and guide vanes in a convergent passage to the rotor inlet. Thereafter, the inner wall diameter remains constant at 32.85 in. while the outer wall converges through the rotor blade and stator vane rows to a diameter of 40 in. In general, the flow path is designed to simulate the middle-stage environment of a state-of-the-art multistage compressor.

Provisions were made for end wall bleed at the rotor tip and stator root and tip as shown in figure III-4. Bleed air flowed through perforated plate shrouds, shroud manifolds, and 24 approximately equally spaced tubes to individual main collector manifolds for the rotor and stator. The collector manifolds exhausted the bleed flow through the ejector system. Rotor and stator bleed flow were controlled and measured separately.

C. STAGE BLADING DESIGN

To expedite the research program, the aerodynamic and mechanical design of the blading was completed and fabrication initiated before completion of the annular cascade program. Final slot configurations were based on the results of these cascade tests. The design details for the inlet guide vanes (slotted rotor 3 and slotted stator 2), are given in Reference 1. Pertinent design information is given below for convenience.

1. Inlet Guide Vane

The inlet guide vane was designed to provide a rotor prewhirl distribution of 0.73 deg at the root (90% span) and 5.38 deg at the tip (10% span) section.

The NACA series 400 vane was chosen for this purpose. Details of the guide vane geometry are presented in table III-1.

2. Rotor 3

Slotted rotor 3 blading was designed with an equivalent circular arc camber that varied from 51.9 deg at the hub (90% span) to 27.3 deg at the tip (10% span). NACA series-65 blade sections were selected for the rotor blades because this series airfoil has adequate thickness for slots, suitable loading distribution, and is capable of operating in the required Mach number range ($M'_{tip} = 0.78$). It was assumed for design purposes that slots would reduce the flow deviation angle approximately one-half of the normal values. Slotted rotor blade trailing edge metal angles were established in accordance with this assumption. Design D-factor loading at the rotor tip was 0.697 for the slotted blading and 0.611 for the same blading without slots (i.e., with full deviation), as reported in Reference 1.

Solidity, thickness ratios, and aspect ratios for the selected series airfoils for both rotor blades and stator vanes were representative of the middle stage of a state-of-the-art compressor. Details of the rotor design are presented in table III-1.

Table III-1. Geometry Design Data

Inlet Guide Vane 3

Airfoil Series: 400
No. of Blades: 50
Aspect Ratio: 1.774

Span (From Tip), %	κ_1	κ_2	ϕ	$\gamma°$	c	σ	t/c	$\delta°$
90	-0.19	0.73	-0.90	0.52	2.205	1.044	0.060	0.00
50	-0.97	3.64	-4.61	1.83	2.207	0.957	0.060	0.49
10	-1.77	6.67	-8.44	3.31	2.210	0.882	0.060	1.29

Rotor 3

Airfoil Series: 65
No. of Blades: 60
Aspect Ratio: 1.707

Span (From Tip), %	κ_1	κ_2	ϕ	$\gamma°$	i_m	O/O*	c	σ	t/c	$\delta°$	$\bar{\omega}$
90	58.80	6.90	51.90	32.87	-2.22	1.280	2.210	1.250	0.075	16.70	0.076
50	59.45	22.96	36.49	41.25	-1.20	1.271	2.210	1.149	0.059	11.66	0.061
10	61.29	34.01	27.28	47.66	-1.57	1.241	2.210	1.071	0.044	9.20	0.053

Stator 2*

Airfoil Series: 65
No. of Blades: 58
Aspect Ratio: 1.663

Span (From Tip), %	κ_1	κ_2	ϕ	$\gamma°$*	i_m	O/O	c	σ	t/c	$\delta°$	$\bar{\omega}$
90	49.37	10.52	38.85	29.95	-3.06	1.203	2.182	1.192	0.090	12.34	0.044
50	49.37	10.52	38.85	29.95	-1.60	1.290	2.182	1.099	0.090	11.88	0.039
10	49.37	10.52	38.85	29.95	-0.77	1.374	2.182	1.026	0.090	12.50	0.036

*Stator 2 metal angles are revised from those in Reference 1 to reflect the actual installation.

3. Stator 2

Three stators having unslotted root D-factor loading levels of approximately 0.52, 0.60, and 0.70 were designed for evaluation of slotted stators behind a flow generation rotor as part of the contract program (Reference 1). The stators are 65-series airfoil sections. The slotted stator having a calculated D-factor of 0.592 was selected for test behind slotted rotor 3 to provide a stage comprising a highly loaded slotted rotor - slotted stator combination. Slotted stator 2 was considered, on the basis of test results behind the flow generation rotor, to have an incidence range that would not limit slotted rotor 3 evaluation. The selected stator had a constant equivalent circular arc camber of 38.85 deg and was untwisted. The stator was installed behind slotted rotor 3 with a blade-chord angle of 29.95 degrees. This blade-chord angle, which differs from the design chord angle (Reference 1) by about 4 degrees, was selected to ensure that stator minimum loss incidence would occur within the expected range of rotor exit angle based on review of slotted rotor 1 and 2 turning characteristics (References 3 and 4). Additional details of the stator design are presented in table III-1.

4. Slot Design

The rotor and stator slot geometry and location were based on the results of preliminary annular cascade tests of slotted stator vanes and an analysis of their respective suction surface boundary layer separation (References 1 and 2).

The selected slot geometry was similar to a preferred slot geometry determined in the annular cascade program. Blade thickness at the intersection of slot centerline and blade meanline was selected as an approximate scaling parameter to scale the slot size from the oversize (6.5-in. chord) annular cascade vanes to the 2.21-in. chord rotor 3 and 2.182-in. chord stator 2 blading. The angle between slot centerline and blade meanline was held constant over the blade span, i.e., the slot followed the twist of the rotor blades. The slot spanwise position and geometry variables with corresponding dimensions at root, mean, and tip sections for rotor 3 and stator 2 are presented in figure III-5.

The slot centerline intersected the rotor and stator blade suction surfaces, respectively, at 50 and 55% chord, approximately halfway between their minimum pressure and calculated boundary layer separation points. This relative slot location was determined under the annular cascade tests to be superior to an alternative location near the separation point.

According to Reference 1, the design spanwise extent of slots was 5 to 45% and 55 to 90% of span from the tip for rotors and 5 to 95% span for stators. Because the test results of slotted rotors 1 and 2 (References 3 and 4) indicated high losses in the blade-end regions, it was considered desirable to extend the rotor 3 slots to the hub and tip, if mechanically feasible. Bench fatigue life tests with sample blades indicated that the 55 to 90% span slot section could be extended to the blade platform without influencing the first bending and torsion fatigue characteristics. Extension of the 5 to 45% span slot section to the blade tip was not possible because of the large reduction in fatigue life for torsional vibration. (Exploratory bench tests have shown that the spanwise extent of blade tip slots is limited to about 15 to 25%.) The rotor 3 blade slots were subsequently modified to extend the 55 to 90% slot section to the blade platform before test. The resulting slotted rotor and stator blade configurations are shown in figures III-6 and III-7, respectively.

D. INSTRUMENTATION

Instrumentation was provided for overall and blade element performance measurements for each blade row. Axial locations of instrumentation stations are indicated in figure III-3, and schematics showing the detailed instrumentation at each axial location are presented in figures III-8 through III-11.

1. Rig Inlet Conditions

Weight flow was measured with an ASME standard thin plate orifice located in the inlet duct.

Six static pressure taps and six temperature probes were located in the plenum chamber for measurement of inlet total pressure and temperature.

Six equally spaced static pressure taps were located on both the inner and outer walls upstream of the inlet guide vanes (Station 0). From a rig calibration over a wide range of weight flows, a correlation between these static pressures and weight flow was derived and used to check subsequent weight flow measurements.

Two of the plenum pressure taps and three of the outer wall pressure taps at Station 0 were close-coupled to pressure transducers for stall transient pressure measurements.

2. Guide Vane Exit/Rotor Inlet; Station 1

A sectional view of the flow path at Station 1 showing the circumferential and radial location of instrumentation is presented in figure III-8. Rotor inlet air angle measurements were obtained at two circumferential locations with 20-deg wedge traverse probes. A 20-tube wake traverse probe, approximately aligned with the average guide vane exit air angle, was installed to measure guide vane wake total pressure distribution. Four static pressure taps were located on both the inner and outer wall. The wedge probes and static pressure taps were located approximately along extensions of guide vane midchannel lines. Redundant midchannel total pressure data were available from the 20-deg wedge probe.

3. Rotor Exit/Stator Inlet; Station 2

A sectional view of the flow path showing the circumferential and radial location of instrumentation at Station 2 is presented in figure III-9. Two 20-deg wedge traverse probes were used for air angle, total pressure, and total temperature measurements. Three sets of Kiel head total pressure probes were located at radial positions corresponding to 10, 30, 50, 70, and 90% span. The probes were circumferentially located so that each set approximately averaged the pressures across a guide vane wake. Four static pressure taps were located on both the inner and outer wall. An 8-deg wedge traverse probe was used for radial static pressure measurements. A traversable hot-film anemometer probe was located at Station 2 for rotor wake surveys.

4. Stator Exit; Station 2A

A sectional view of the flow path showing circumferential and radial location of instrumentation at Station 2A is presented in figure III-10. A 20-tube rake traverse probe was used for measurement of stator vane wake total pressure distribution. Four static pressure taps were located on both the inner and outer wall, and an 8-deg wedge traverse probe was provided for radial static pressure measurement. The 20-deg wedge traverse probe at this station, normally used to measure stator exit air angles, did not function properly during this test; stator exit air angles were therefore measured at Station 3.

5. Station 3

Station 3 is one-chord length farther from the stator exit plane than Station 2A. Instrumentation at this station (figure III-11) included two 20-deg wedge traverse probes, four sets of Kiel head total pressure probes at 10, 30, 50, 70, and 90% span location, three sets of Kiel head temperature probes at the same five span locations, and four static pressure taps on both the inner and outer wall. One set of Kiel total pressure probes were connected to close-coupled transducers for stall transient stator exit total pressure measurement. Stator exit air angles were obtained with the two 20-deg wedge probes. Stage exit total temperature was based on the Kiel head probe temperature measurements at Station 3. Data obtained from the other instrumentation at this station were generally used for comparison with the Station 2A data.

6. Description of Probes

Details of the 20-deg and 8-deg wedge probes, wake probe, and Kiel pressure and temperature probes are shown in figure III-12. The 20-deg wedge probe contained side pressure pickups for air angle measurement, a total pressure pickup, and a total temperature pickup.

The wake probe contained 20 total pressure pickups formed by 0.042-in. OD hypo tubing and spaced as shown in the figure.

7. Instrumentation Readout

Traverse probe data (total pressure, static pressure, air angle, total temperature, and radial travel) were recorded on magnetic tape at the rate of 60 samples (2.5-in. probe travel) per minute. Steady-state pressure measurements were obtained using a Scannivalve multichannel pressure transducer system that includes automatic data recording on IBM cards. Kiel probe temperatures were indicated on a precision potentiometer, and were manually recorded.

Plenum pressures, two OD static pressures at Station 0, primary and bleed system flow-measuring-orifice pressures, and two Station 3 midspan Kiel probe pressures were recorded on manometer tubes in the test stand control room to permit setting the desired flow conditions.

8. Special Instrumentation

a. Rotor Wake Instrumentation

Rotor wake surveys were obtained with a DISA 55479 hot-film anemometer probe, located as shown in figure III-9. Anemometer output voltage was recorded on a VR-2800 tape recorder. The hot-film probe is shown in figure III-13.

b. Rotor Speed

Rotor rpm was measured with an electromagnetic pickup mounted adjacent to a 60-tooth gear on the rotor shaft. Gear tooth passing frequency was displayed as rpm on an Anadex digital readout system. A closed loop control system maintained rotor speed within approximately ± 1%.

c. Stress Measurements

Five rotor blades were instrumented with strain gages as in figure III-14 (to monitor and record) torsional and bending stresses.

d. Vibration

Displacement pickups were mounted on forward and rear sections of the compressor rig outer case to monitor rig vibration.

e. Bleed Flow Rate

Bleed flow rates from the rotor and stator were measured by means of standard ASME thin plate orifices located in the respective bleed manifold exit pipes.

SECTION IV
PROCEDURES

A. TEST PROCEDURE

1. Wall Bleed Flow Rate Selection

The maximum bleed flow rate (limited by the perforated shroud effective flow area) was selected for rotor 3 to reduce as much as possible the radial flow gradients that were anticipated on the basis of the results obtained with slotted rotors 1 and 2 (References 3 and 4).

Stator 2 bleed flow was also set at the maximum to be consistent with the percentage bleed flow selected in the previous test of slotted stator 2 behind the flow generation rotor.

2. Stress Survey

Blade stresses were monitored during rig operation at design speed and during operation into the stall region at all rotor speed conditions.

3. Performance Tests

Overall and blade element performance data were obtained at five rotor speed conditions (50, 70, 90, 100 and 110% of design speed) and at approximately six points per speed line to adequately define stator and stage performance between choke and stall. The near-stall point was determined on the basis of blade stresses monitored on oscilloscopes and stage exit total pressures monitored on manometers. At each set point, the fixed pressure and temperature instrumentation data were recorded five times, corresponding to five discrete radial locations of the inlet guide vane and stator vane wake probes. Traverse data were usually recorded during the last recording of fixed instrumentation. In this manner, representative average values of flow and pressures could be determined for the time period (approximately 45 min) of data recording at each point.

Relatively high blade stresses and abrupt stall characteristics of slotted rotors 1 and 2 precluded steady-state testing in the stall region, although rotating stall patterns were obtained during stall transients by means of high-response pressure transducers (References 3 and 4). The need for better definition of the pressure-flow characteristic in the stall region led to incorporation of a transient measuring technique that

involved measurement of plenum pressure, bellmouth static pressure, and stator exit total pressure at five radial locations using close-coupled pressure transducers recorded ten times per second. Rotor speed was also recorded. A stall transient recording was obtained at each of the five rotor speed conditions. The stage exit throttle valve was stepped towards the closed position until surge occurred, and then reopened. The entire transient from the time the valve closure was initiated until stable operation was re-established was approximately 15 seconds.

4. Rotor Wake Surveys

Rotor wake surveys were obtained following the recording of blade element and overall performance data at the choke, approximately maximum efficiency, and near-stall conditions on each of the five speed lines. Hot-film anemometer output was recorded at five spanwise locations between the inner and outer wall behind the rotor.

B. DATA REDUCTION PROCEDURES

1. Preliminary Data Reduction

Data reduction was accomplished in three steps using three computer programs. The first step involved conversion of raw data to engineering units. Traverse data (total pressure, static pressure, total temperature, and air angle), obtained at approximately 0.04-in. increments across the span, were automatically plotted (as well as tabulated). The plotted and tabulated data were reviewed to identify and eliminate any obviously questionable data before the subsequent data reduction step.

The second data reduction step accomplished the following:

1. Mach number corrections to temperature data
2. Mass average of wake probe data
3. Circumferential arithmetic average of fixed and traverse instrumentation data
4. Correction of all pressure and temperature data to NASA standard day ambient conditions

5. Selection by interpolation of total and static pressure, total temperature, and air angle values at specified radial locations for input for the final data reduction step.

All corrected data, which included individual data values as well as averaged quantities, were available for further inspection in the printed results from this computer program. The third step in the data reduction procedure involved calculation of overall and blade element performance parameters. These parameters are defined in the following paragraphs.

2. Parameter Calculation

The following overall and blade element performance parameters were calculated for the analysis of test data and the evaluation of slotted rotor 3 - slotted stator 2 performance. Symbols are defined in Appendix A.

a. Overall Performance

(1) Weight Flow

Weight flow is presented in terms of corrected weight flow, defined as:

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

where:

W = actual weight flow

θ = ratio of total temperature (plenum) to NASA standard sea level temperature

δ = ratio of total pressure (plenum) to NASA standard sea level pressure.

Values of corrected weight flow presented in the figures and tables include rotor and stator bleed flow rates. Percentage bleed flow rates for the respective blade rows are tabulated separately (table B-1).

(2) Pressure Ratio

Pressure ratios were calculated for the rotor, guide vane-rotor, and guide vane-rotor-stator blade row combinations. Behind the rotor, fixed Kiel head and traverse probe total pressure data were arithmetically averaged at each span location and the profile thus defined was mass-flow averaged across the span.

Behind the guide vane and stator, the wake probe pressures were first mass-flow integrated at each span location, and the resulting average pressures were then mass-flow averaged in the radial direction.

(3) Adiabatic Efficiency

Adiabatic efficiency across the rotor is defined as

$$\eta_{ad} = \frac{\left(\frac{\overline{P}_2}{\overline{P}_1}\right)^{\frac{\gamma-1}{\gamma}} - 1}{\frac{\overline{T}_3}{T_1} - 1}$$

where:

$\overline{P}_1$ = mass-averaged pressure behind the guide vane
T_1 = 518.7°R
$\overline{P}_2$ = mass-averaged pressure behind the rotor
$\overline{T}_3$ = mass-averaged temperature behind the stator.

To obtain adiabatic efficiencies for the guide-vane-rotor combination or for the entire stage, appropriate average pressures were used.

b. Blade Element Performance

(1) Diffusion Factor

Diffusion factor for the rotor is defined as

$$D = 1 - \frac{V_2'}{V_1'} + \frac{\Delta V'\theta_{(1-2)}}{2\sigma V_1'}$$

Diffusion factor for the stator is defined as

$$D = 1 - \frac{V_{2A}}{V_2} + \frac{\Delta V\theta_{(2-2A)}}{2\sigma V_2}$$

(2) Deviation

Rotor blade deviation is defined as

$$\delta_2^\circ = \beta_2' - \kappa_2'$$

Stator deviation is defined as

$$\delta^{\circ}_{2A} = \beta_3 - \kappa_{2A}$$

where κ'_2 and κ_{2A} are the rotor blade and stator vane trailing edge metal angles based on equivalent circular arc camber lines for the 65-series airfoil.

(3) Incidence Angle

Rotor incidence is defined as

$$i_{m_1} = \beta'_1 - \kappa'_1$$

Stator incidence is defined as

$$i_{m_2} = \beta_2 - \kappa_2$$

where κ'_1 and κ_2 are the rotor blade and stator vane leading edge metal angles based on the equivalent circular arc camber lines for the 65-series airfoil.

(4) Total Pressure Loss Coefficient

Total pressure loss coefficient for the rotor is defined as

$$\bar{\omega}'_{(1-2)} = \frac{\bar{P}'_1 - P'_2}{\bar{P}'_1 - p_1}$$

For the inlet guide vanes, total pressure loss coefficient is defined as

$$\bar{\omega}_{(0-1)} = \frac{14.69 - \bar{P}_1}{q_o}$$

where q_o is obtained from isentropic flow relationships using orifice weight flow and the annular area at the guide-vane inlet, and $(\bar{\ })$ refers to mass-average wake total pressures.

Total pressure loss coefficient for the stator is defined as

$$\bar{\omega}_{(2-2A)} = \frac{P_2 - \bar{P}_{2A}}{P_2 - p_2}$$

(5) Loss Parameter

Rotor total pressure loss is also presented in terms of the loss parameter,

$$\frac{\bar{\omega}'_{(1-2)} \cos \beta'_2}{2\sigma}$$

SECTION V
RESULTS AND DISCUSSION

Overall performance is presented in terms of pressure rise and efficiency characteristics as functions of rotative speed and weight flow. Blade element performance for slotted rotor 3 and slotted stator 2 is presented in terms of diffusion factor, deviation, and loss coefficient as functions of incidence angle. Slotted rotor 3 performance results are compared with (1) predicted unslotted rotor performance and (2) available NASA rotating cascade performance results. A brief description of the guide vane exit air angle distribution is included in this section. Overall and blade element experimental performance parameters and bleed flow and blade element vector diagram data for the guide vane, rotor, and stator are tabulated in Appendix B. The results of rotor wake surveys are included under the discussion of rotor performance.

A. OVERALL PERFORMANCE

Overall performance is presented in terms of efficiency and pressure ratio vs corrected weight flow, $W\sqrt{\theta}/\delta$, and corrected specific weight flow, $W\sqrt{\theta}/\delta A_A$, in figures V-1, V-2, and V-3, for rotor, guide vane-rotor, and guide vane-rotor-stator combinations. Each figure contains the performance results obtained at the five test rotor speed conditions. Values of corrected airflow obtained from integration of flow profiles downstream of the rotor and stator are compared with the main orifice measured values minus bleed flow in figure V-4. The figure shows that general agreement was obtained within 0 to -5%. A tabulation of performance and bleed percentages is given in table B-1.

Figure V-1 shows that, at design equivalent rotor speed, slotted rotor 3 obtained an efficiency of 85.7% and a pressure ratio of 1.325 at design flow (91.4 lb/sec) compared with the predicted values of 89.7% and 1.34. Comparison of figures V-1 and V-2 indicates that guide vane losses had no appreciable effect on the overall performance. The stage efficiency and pressure ratio (figure V-3) corresponding to design equivalent rotor speed and flow are approximately 80% and 1.30.

The unusual efficiency characteristics in figures V-1, V-2, and V-3, particularly at the low rotor speeds, are attributable to two factors:

temperature measurement accuracy limits and the particular variation of rotor 3 blade element losses with incidence angle. The temperature rise across the stage, based on mass-averaged temperature measured at Station 3 (figure III-11), varied from 7.8°F at choke flow on the 50% rotor speed line to 67.5°F at near-stall flow on the 110% rotor speed line. A 1-deg error in temperature at these extreme flow and rotor speed conditions will cause respective errors in efficiency of 12.8% and approximately 1.5%. Reduced rotor total pressure loss at low rotor speeds, and the relatively low root region loss at choke flow conditions (see paragraph B2 below) are considered as partial causes of the apparent systematic change in the efficiency characteristic from speed line to speed line in figures V-1 and V-2.

The stall points and the stall line indicated in figure V-3 were established from transient recordings of stage exit total pressure and weight-flow-correlated bellmouth static pressure. A sample plot of the transient data is presented in figure V-5. Plenum pressure and rotor rpm are included in the plot. Total pressure ratio was calculated using an arithmetic average of the five spanwise stator exit total pressure values and plenum pressure, and weight flow was obtained from the correlation curve of corrected bellmouth static pressure and corrected weight flow shown in figure V-6. The pressure ratio-weight flow values thus determined are compared with the steady-state data points for design rotor speed in figure V-7. The stall point, defined as point No. 9 in figures V-5 and V-7, occurred at a weight flow of approximately 80 lb/sec whereas the near-stall steady-state point weight flow was 85 lb/sec. The difference in pressure ratio level between the steady-state data and the transient data results from the difference in the instrumentation and averaging techniques that were used to calculate stator exit total pressure. The steady-state stall limit in figure V-7 is established by applying the shape of the transient data distribution to extend the steady-state characteristic to the stall weight flow value. Relatively high blade stresses and the grossly nonsteady nature of flow in the stall region (figure V-5) prevented attempts to determine the pressure ratio-flow characteristic through the stall transient.

B. BLADE ELEMENT PERFORMANCE

1. Inlet Guide Vane

Inlet guide vane exit air angle distributions are presented in figure V-8 for a representative design speed line test point. Air angle data obtained with each of two 20-deg wedge probes are identified by symbol, and the design air angle distribution is shown for comparison. The air angles measured with the two probes are different by approximately 2.5 deg over the span. Near the hub the average of the measured angles agrees closely with the predicted guide vane exit air angle. Near the tip the average of the measured air angles is about 1.5 deg less than the predicted value. Inlet guide vane vector diagram and blade element data are presented in table B-2.

2. Rotor

a. Rotor Inlet Conditions

Rotor inlet relative Mach number and air angle radial distributions for the design speed data points are presented in figure V-9. The calculated design point distributions of rotor inlet relative Mach number and air angle are shown for comparison. The design Mach number distribution is seen to follow, at a slightly higher level, the near-stall test point Mach number distribution.

The measured air angle distribution that most closely corresponds to design point flow condition (labeled W_{corr} = 91.03 in figure V-9) is approximately 1-deg less than the predicted value at a radial position 90% of the span from the rotor tip and 1-deg more than the predicted value at 10% span from the tip.

b. Loss Coefficient, Deviation, D-Factor

Blade element performance data obtained at the design equivalent speed are presented in terms of loss coefficient, deviation, and D-factor vs incidence in figures V-10 through V-14. Each figure corresponds to one spanwise location. Calculated design values of loss coefficient, deviation, and D-factor (without slots) are shown in the figures for comparison with the slotted rotor data. The measured D-factor values are nearly the same as the predicted values for all span locations except 90% from the root where the measured D-factor is higher than calculated. The measured

deviation angle is equal to or less than the predicted values at radial locations of 30, 50, 70, and 90% span from the tip and exceeds the predicted value at 10% span from the tip. The measured loss coefficients are significantly higher than the corresponding predicted loss values in the hub and tip regions, and are approximately the same in magnitude as the predicted values at 50 and 70% span from the tip.

The relatively high losses in the hub and tip regions indicate a significant departure from two-dimensional flow characteristics near the inner and outer walls. This departure is attributed to the generation of secondary flows from blade pressure to suction surface through the wall boundary layer and radially along the blade suction surface toward the mean radius section.

The radial gradients of pressure and flow thus generated within the blade row tend to invalidate the normal design definitions of blade element performance along design streamlines. It might be concluded from the tip-region loss coefficients in figure V-10 that the wall/blade flow interaction losses obscure the normal two-dimensional blade profile losses over the test incidence angle range. The general hub region loss level (see figure V-14) shows a strong influence of wall-associated (secondary flow) losses.

Blade element parameters for the five speed lines are combined in figures V-15 through V-19 to show the general consistency of measured deviation angles and D-factor and to identify Mach number effects on loss coefficient. Deviation angle and D-factor results indicate fair repeatability for the five speed lines. The loss coefficient data indicate a definite Mach number effect on loss, as illustrated by the data points for the various speed lines. The Mach number ranges from choke to near-stall conditions at 50% span were approximately 0.41 to 0.37 for the 50% speed line and 0.89 to 0.81 for the 110% speed line. Corresponding loss coefficient values at design incidence along these speed lines (figure V-17) are approximately 0.05 and 0.12. Another apparent Mach number-associated effect on the loss coefficient distribution in figures V-16 through V-18 is the narrowing low-loss incidence range as Mach number increases. This characteristic is particularly evident at the 50 and 70% span locations. In figure V-19 it is noted that the hub region minimum loss data for 50 and 70% rotor

speed conditions nearly match the level of predicted loss but at an incidence angle nearly 10 deg lower than the design incidence angle and at a loading level of D = 0.40 compared to the design loading level of 0.63.

c. Loss Parameter

Loss parameter, $\bar{\omega}'_{1-2} \cos \beta'_2/2\sigma$, is presented as a function of D-factor for 70 and 50% span, 90 and 30% span, and 10% span locations in figures V-20, V-21, and V-22, respectively. Data for 50 and 70% and 90 and 100% of design equivalent rotor speed are indicated by symbol in each figure. NASA correlation curves (reproduced from Reference 6) for NACA 65-series and circular arc series rotating cascade minimum loss data (reference incidence) are shown for comparison. The 90 and 30% span data in figure V-20 are characteristically different, and within each characteristic group of data the influence of Mach number can be seen. The loss parameter level for the 90% span (hub region) data indicates a relatively high contribution of secondary flow loss to the total measured loss in this region. The 30% span minimum loss data points for 50 and 70% design speed conditions are in good agreement with the NASA correlation curve. Furthermore, the trend of these data with increasing D-factor (and increasing incidence angle) is toward a loss parameter level that would fall well below an extrapolation of the NASA correlation curve.

All of the speed line data for both the 70 and 50% span locations represented in figure V-21 exhibit a trend similar to that of the 30% span low-speed data in figure V-20. The minimum loss data points are in good agreement with the NASA correlation curve with an indication of reasonably low-loss levels at relatively high loading levels if the data were extrapolated to higher incidence angles (i.e., higher than minimum loss incidence).

Although a minimum (profile) loss was not readily apparent for the tip region loss data (figure V-15) because of the overriding influence of secondary flow, the corresponding loss parameter values in figure V-22 are predominantly on or to the right of the NASA correlation curve for 10% span data (in the direction of higher loading). Data points that might be considered minimum loss points for the 50 and 70% speed data are seen to lie on either side of the NASA correlation curve.

d. Rotor Wake Survey Results

Rotor wake surveys were obtained at three flow conditions along the 70, 90, 100, and 110% speed line; choke, approximately maximum efficiency, and near stall. A hot-film anemometer probe (figure III-13) was traversed behind the rotor from the inner to the outer wall to obtain blade wake definition (axial velocity component) at several span locations. A sample of the hot-film anemometer output for each desired radial location was displayed on an oscilloscope so that from 10 to 15 consecutive wake traces were superimposed. The oscilloscpe display thus established is presented in figures V-23 through V-26.

The rotor wakes generally support the loss coefficient observations made in the preceding paragraphs. Near the hub (90% span), the velocity profiles for the maximum efficiency and stall points are sinusoidal, whereas distinct blade wakes, increasing in size with increasing rotor speed, are defined for the choke point. The tip region rotor wakes (10% span), particularly for the design equivalent rotor speed (see figure V-25), indicate a sinusoidal pattern for the near-maximum efficiency data point, with the appearance of an intrablade disturbance at the choke and near-stall conditions. These intrablade disturbances are attributed to (1) secondary flows that are generated in the blade row, and/or (2) guide vane wakes that maintain their identity through the rotor blade row (References 3 and 7). The somewhat random appearance of these disturbances (e.g., see figures V-23 and V-24, near-stall point at 10% span), and their magnitude in comparison with the rotor blade wake suggest the probability of a combination of the above two causes.

The rotor wakes at 30, 50, and 70% span location reflect the relatively high loss coefficients at the choke point and the decrease in loss coefficient as stall conditions are approached (figures V-11, V-12, V-13).

3. Stator

a. Inlet Conditions

Stator inlet Mach number and air angle distributions for rotor 3 design equivalent speed data are compared in figure V-27 with corresponding design distributions. The indicated design distribution of stator inlet Mach number corresponds to unslotted rotor 3 predicted (design point)

exit conditions. The experimental Mach number values shown for a corrected flow rate of 91.03 lb/sec are below the predicted curve near the hub and tip and above the predicted curve between about 40 and 80% of span positions. This observation is consistent with the relatively high rotor losses measured near the walls (figures V-10 and V-14).

The design distribution of stator inlet air angle was obtained by combining the actual (installed) stator blade chord angle with the stator design incidence angle distribution as calculated for operation of stator 2 behind the flow generation rotor (Reference 1). As seen in figure V-27, the hub and tip region data indicate operation over a wide range of incidence both above and below the design incidence, whereas the data for 30, 50, and 70% span sections indicate operation at or below design incidence.

b. Blade Element Performance Data

Blade element performance data for slotted stator 2 behind slotted rotor 3 are presented in figures V-28 through V-32 for all speed lines. In general, the measured D-factor and deviation angles form a fairly well defined curve with incidence angle at each span location. The loss coefficient results indicate a consistent spread according to speed line at all five span locations. The separation, which suggests a Mach number effect, is greater at the tip than at the hub. However, the tip Mach number varied from 0.24 to only 0.55 over the speed and flow range, whereas tip Mach number varied from 0.27 to 0.70 over the range of operation.

Assessment of the slotted stator 2 performance at each radial station in terms of D-factor, deviation angle, and loss coefficient relative to the corresponding predicted (design) values is complicated by the fact that design incidence at different spanwise positions corresponded to significantly different flow conditions. More specifically, the hub and tip regions were operating closest to their design incidence at a flow rate of approximately 98 lb/sec while the 30, 50, and 70% span positions were within -0.5, -2.2, and -1.0 deg of their respective design incidence values at the near-stall flow rate of 85.5 lb/sec. Since the radial velocity and flow gradients, particularly near the walls of conventionally designed highly loaded blade rows, have been observed to increase markedly as flow decreases, it is necessary for the blade element performance evaluation of slotted stator 2 to consider the magnitude and relative influence of the radial gradients that

were present at each blade element station at its design incidence. The hub section (90% span) velocity triangle data for a flow rate of 97.9 lb/sec in table B-2 indicate a local increase in velocity (flow) ratio across the stator over the design velocity ratio. The relatively high velocity ratio, which reflects a slight shift in flow toward the wall, accounts for the low D-factor (D = 0.437 compared with a design value of 0.596) and low loss coefficient (see figure V-32).

Essentially the same discussion applies to the performance results in the tip region (figure V-28). What appears at first inspection to be a general Mach number effect on loss coefficient is actually caused by a gradual increase in axial (flow) ratio near the wall as rotor speed and incidence angle decrease. This influence on loss is apparently independent of the two-dimensional loss-deviation relationship since the deviation angles for all rotor speeds form a fairly singular distribution with incidence angle. Determination of the cause of the unusual trends of loss coefficient with incidence angle for all of the speed lines represented in figure V-28 requires further analysis of the data. It is noted that the increase in loss near the indicated design incidence corresponds to an increase in deviation angle. Similar preliminary evaluation of the blade element performance at the 30, 50, and 70% span locations in figures V-29 through V-31 can be derived from the tabulated blade element results in table B-2.

Slotted stator 2 was previously tested behind a lightly loaded flow generation rotor. The results of this test will be published in a separate data and performance report. The data obtained from both tests of slotted stator 2 are being further analyzed jointly, and the results of this analysis will be included in the final report on this program.

SECTION VI
CONCLUDING DISCUSSION

Blade element data at five radial locations and overall performance data were obtained for the slotted rotor 3 and slotted stator 2 configurations at several flow conditions, including choke and near-stall, along five rotor speed lines between (and including) 50 and 110% of the design speed.

The measured slotted rotor pressure ratio and efficiency at design weight flow were 85% and 1.325 compared with calculated design values of 89.7% and 1.34 for an unslotted rotor. Slotted stator 2 losses resulted in a stage efficiency and pressure ratio of about 80% and 1.30, respectively.

The slotted rotor 3 blade element performance indicated an influence on inlet Mach number at the highest speeds tested. High hub and tip losses as a result of severe secondary flows were also noted. Loss levels for the 50 and 70% design rotor speed data were in good agreement with, and indicated trends toward improved performance relative to, NASA design correlations of loss parameter and diffusion factor.

The slotted stator 2 blade element performance was influenced to a lesser extent than the rotor by radial velocity and flow gradients. For the stator it was noted that the velocity gradients near the wall decreased slightly through the blade row, and that this decrease was more pronounced at the lower rotor speeds.

Evaluation of stator performance at design incidence is complicated by the fact that design incidence at different span locations corresponds to different flow conditions, and the different flow conditions have different associated radial velocity and flow gradients. The relative influence of these different radial gradients will be considered in the further analysis of stator 2 performance.

SECTION VII
ILLUSTRATIONS

This section contains the illustrations that have been referenced in the preceding sections.

FD 10891B

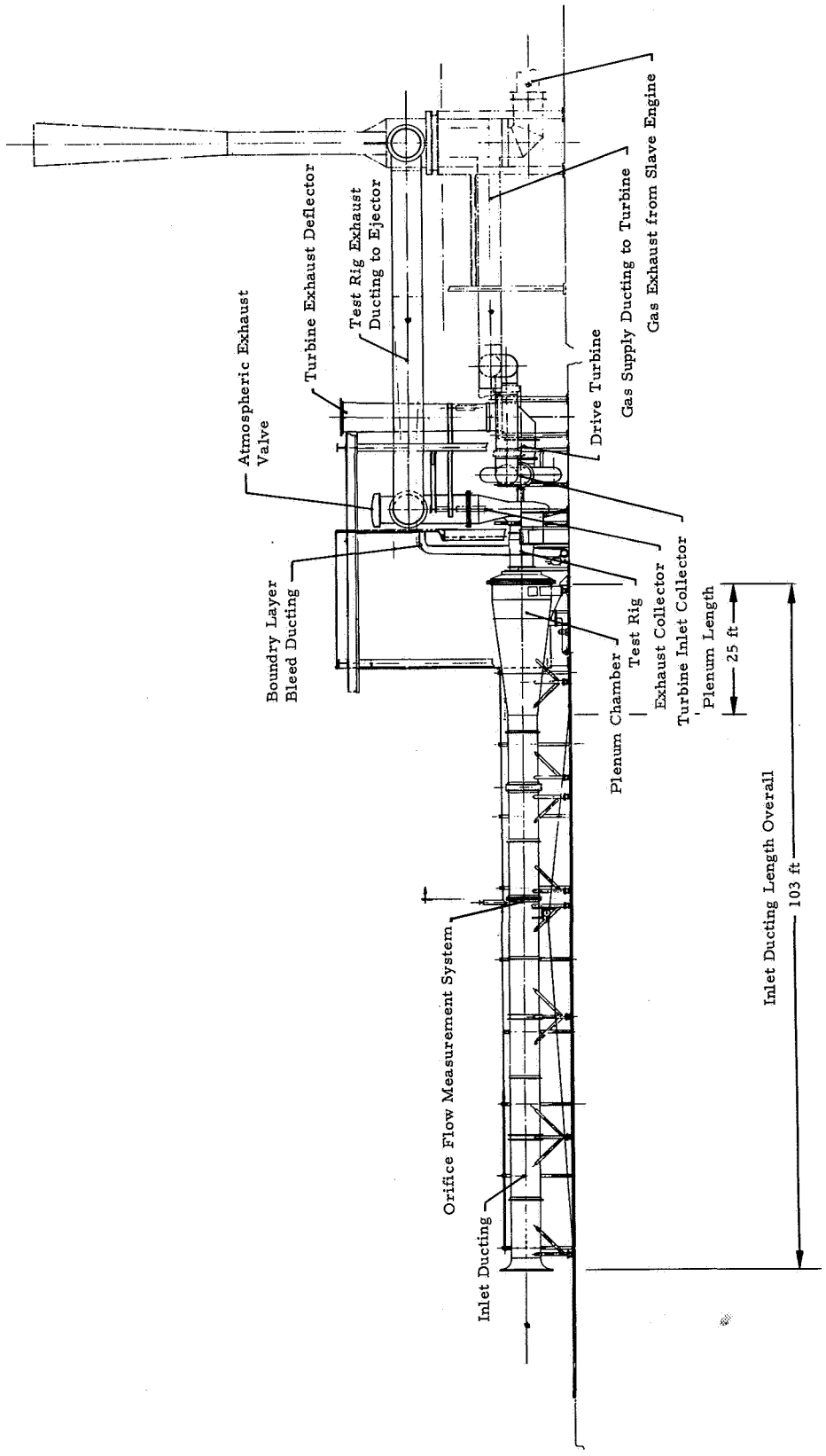
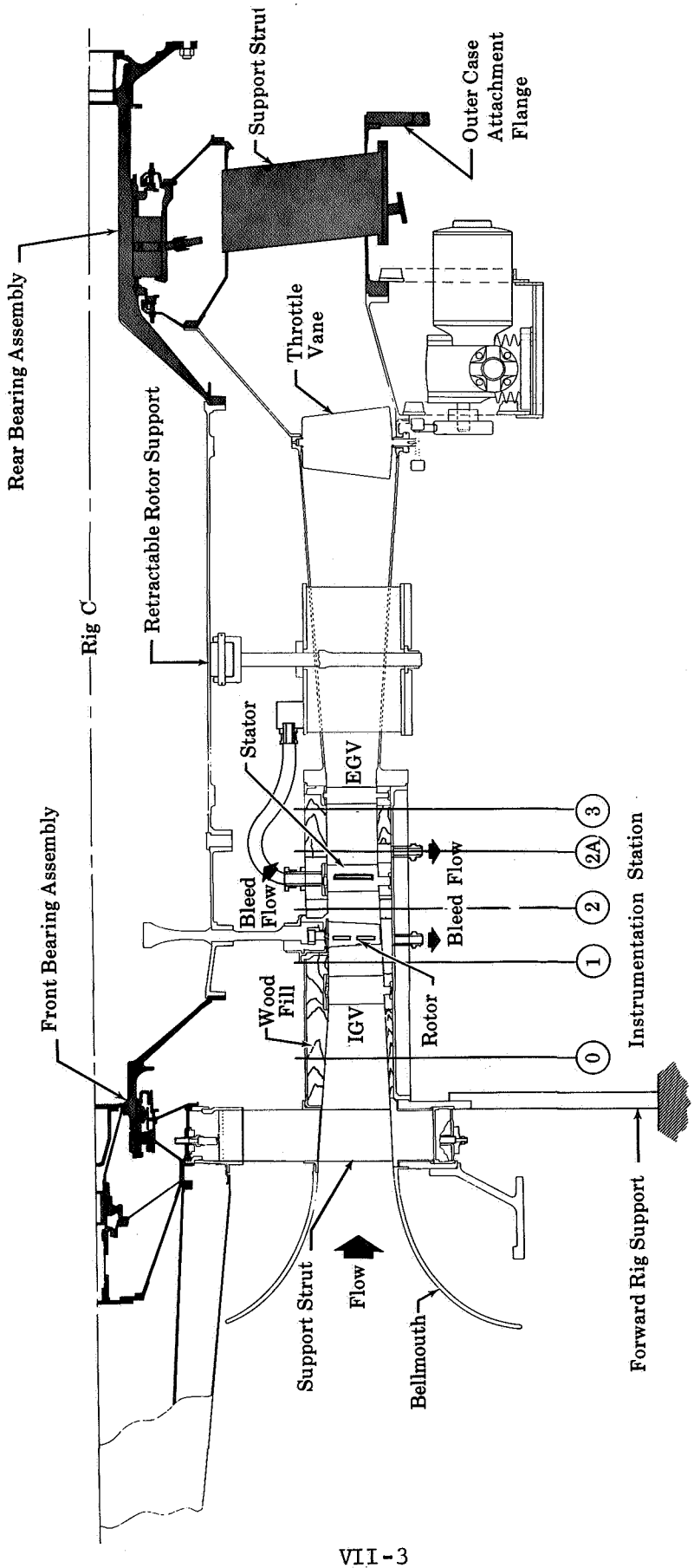


Figure III-1. Compressor Research Facility



FD 14681A

Figure III-2. Rotating Axial Flow Cascade Test Rig

FD 14685

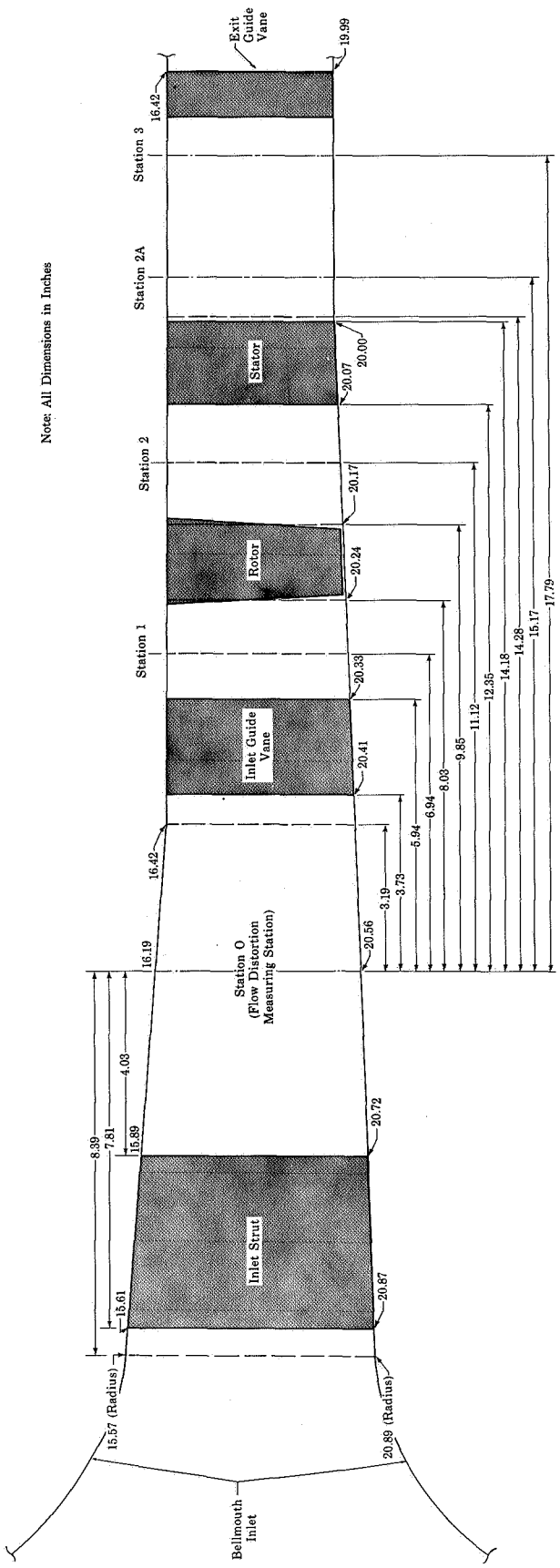


Figure III-3. Flow Path

FD 14683

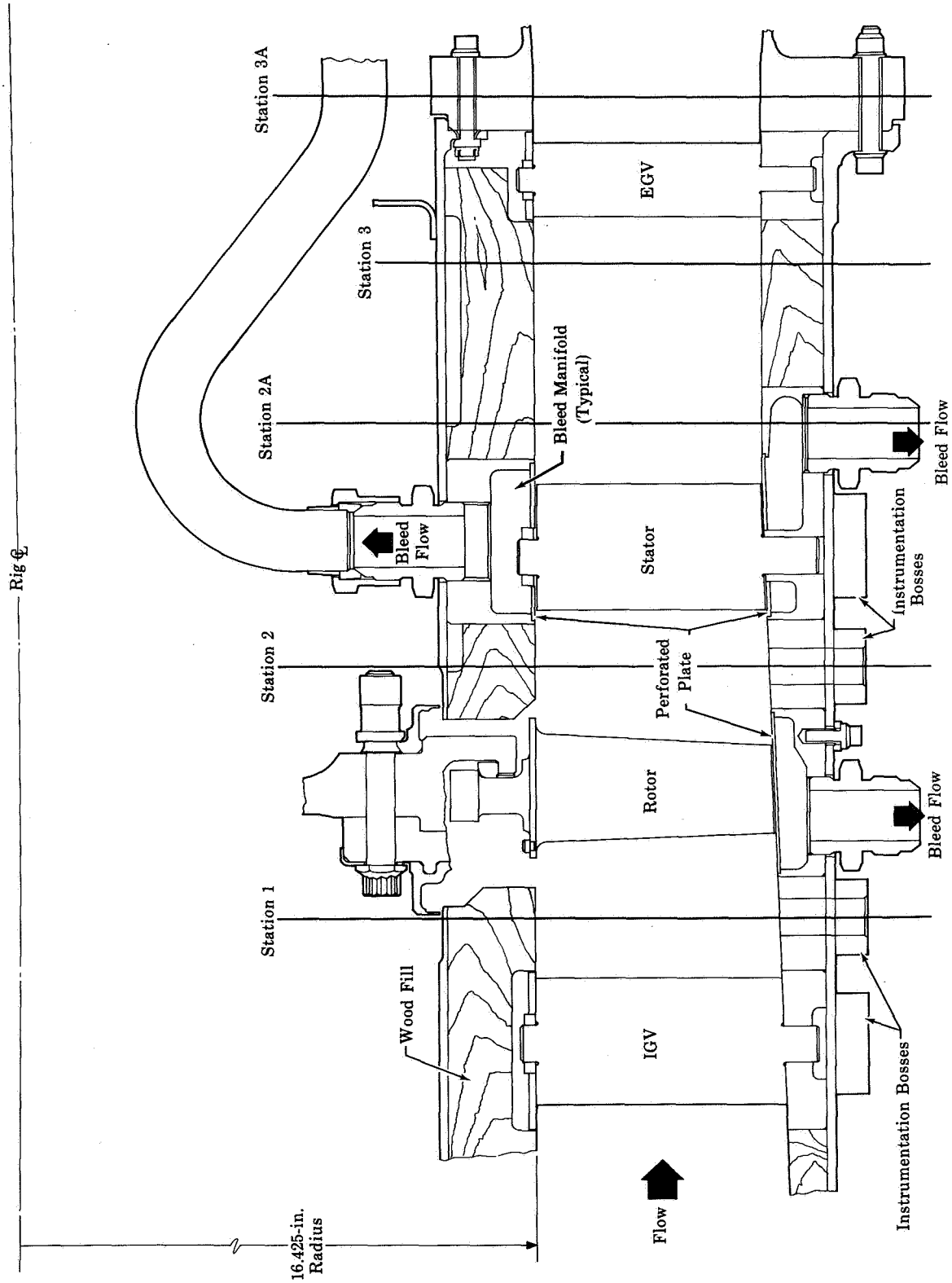
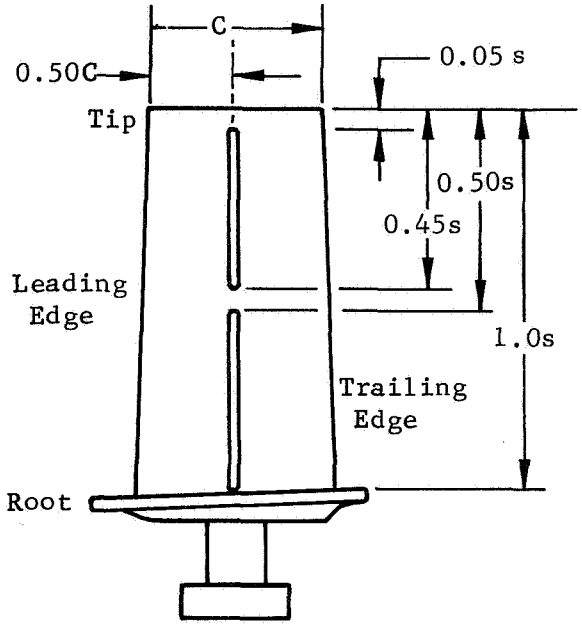


Figure III-4. Rotating Cascade Rig Bleed

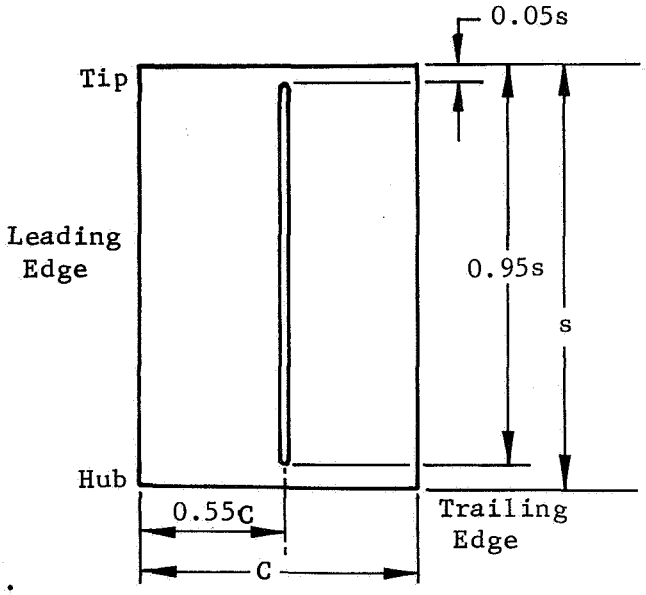
Rotor

	Root	Mean	Tip
Y_1	0.092	0.075	0.058
Y_2	0.050	0.050	0.050
t	0.167	0.133	0.098
R	0.105	0.105	0.105
r_1	0.013	0.013	0.013
r_2	0.005	0.005	0.005
R_p	0.230	0.230	0.230
ψ	30°	30°	30°



Stator

Y_1	0.095
Y_2	0.050
t	0.194
R	0.152
r_1	0.019
r_2	0.005
R_p	0.332
ψ	30°



Slot Location

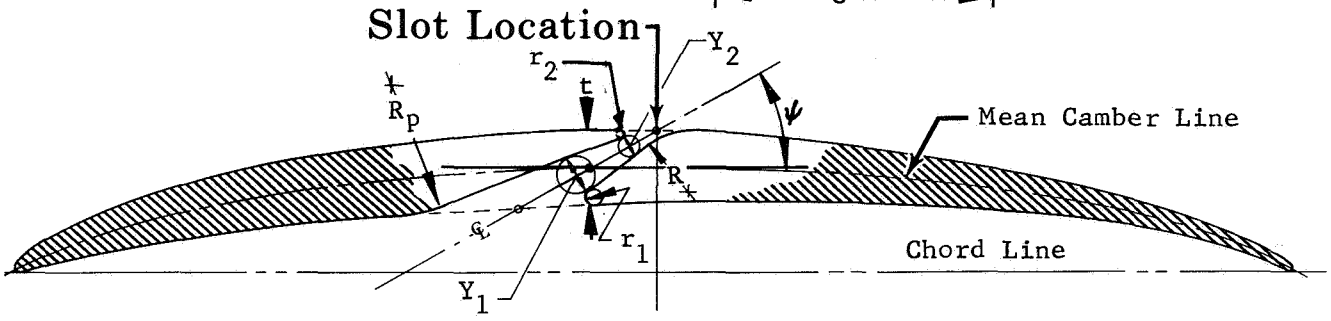
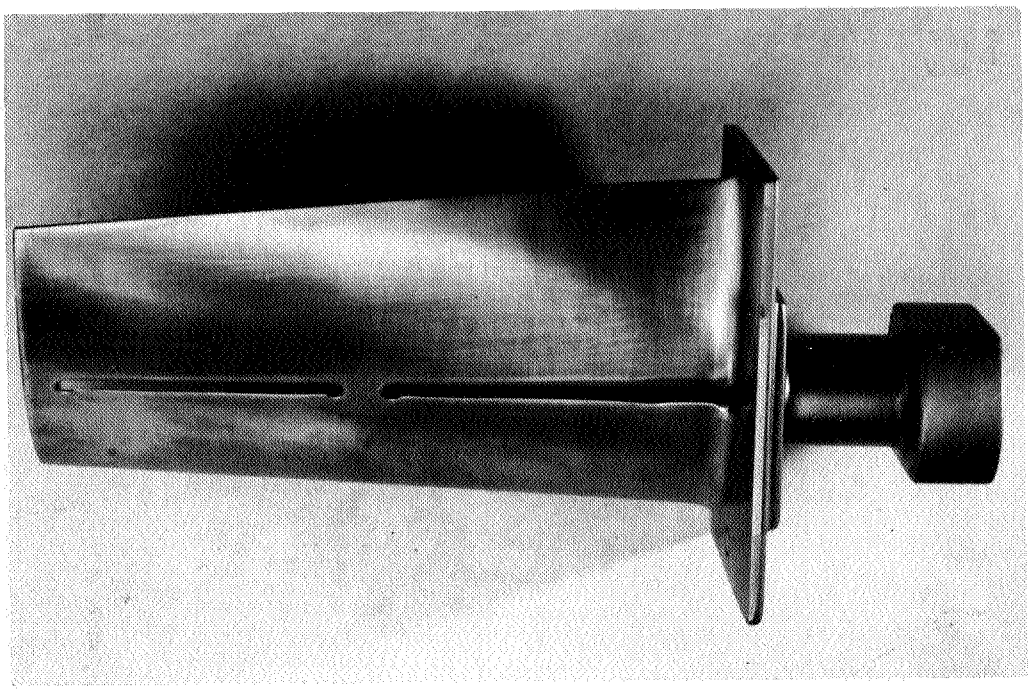
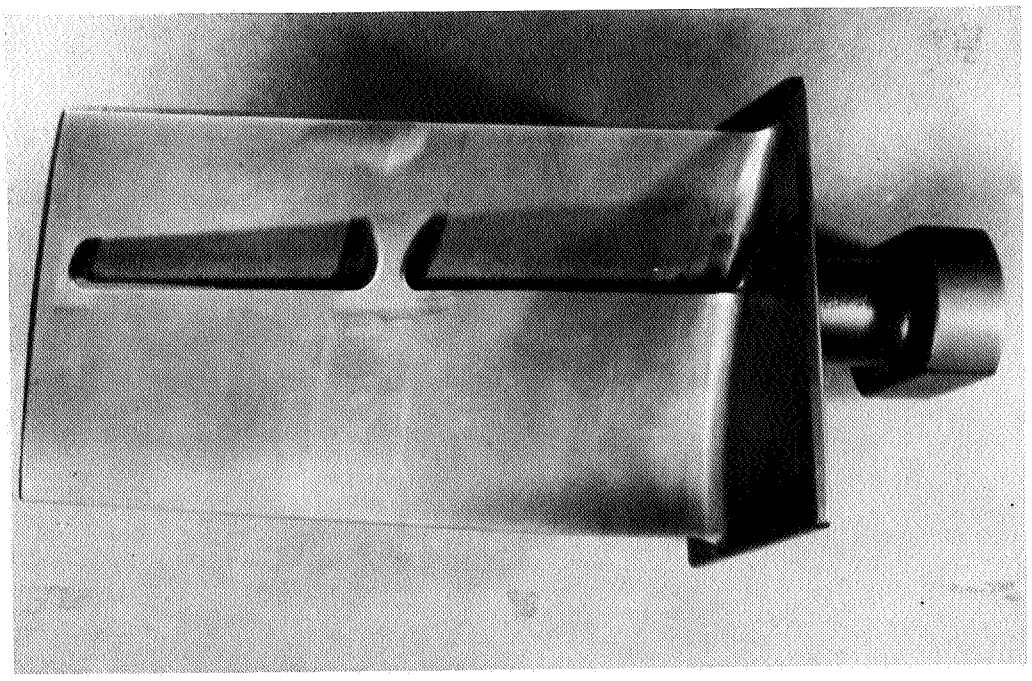


Figure III-5. Slot Geometry and Location FD 21376



PRESSURE SURFACE

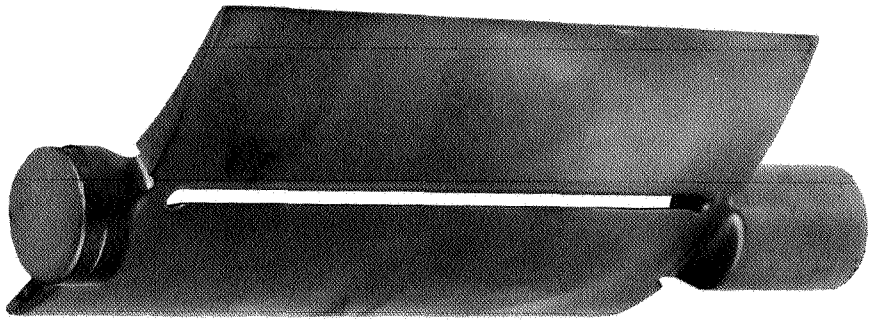
FD 21378



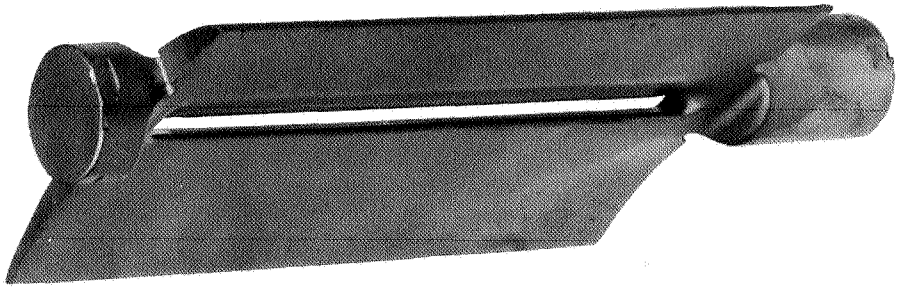
SUCTION SURFACE

Figure III-6. Typical Slotted Rotor 3 Blade

FD 22149

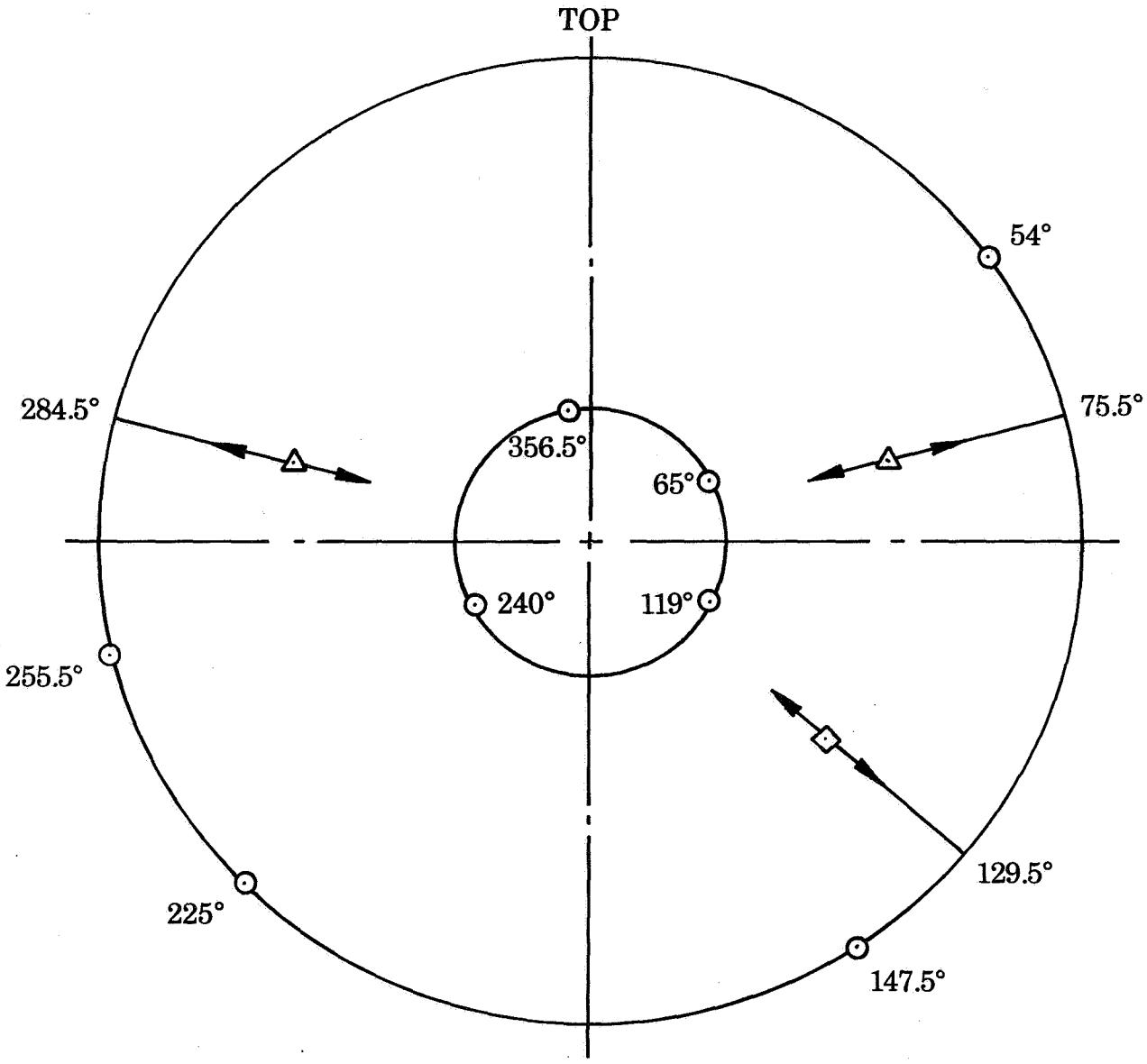


Suction Surface



Pressure Surface

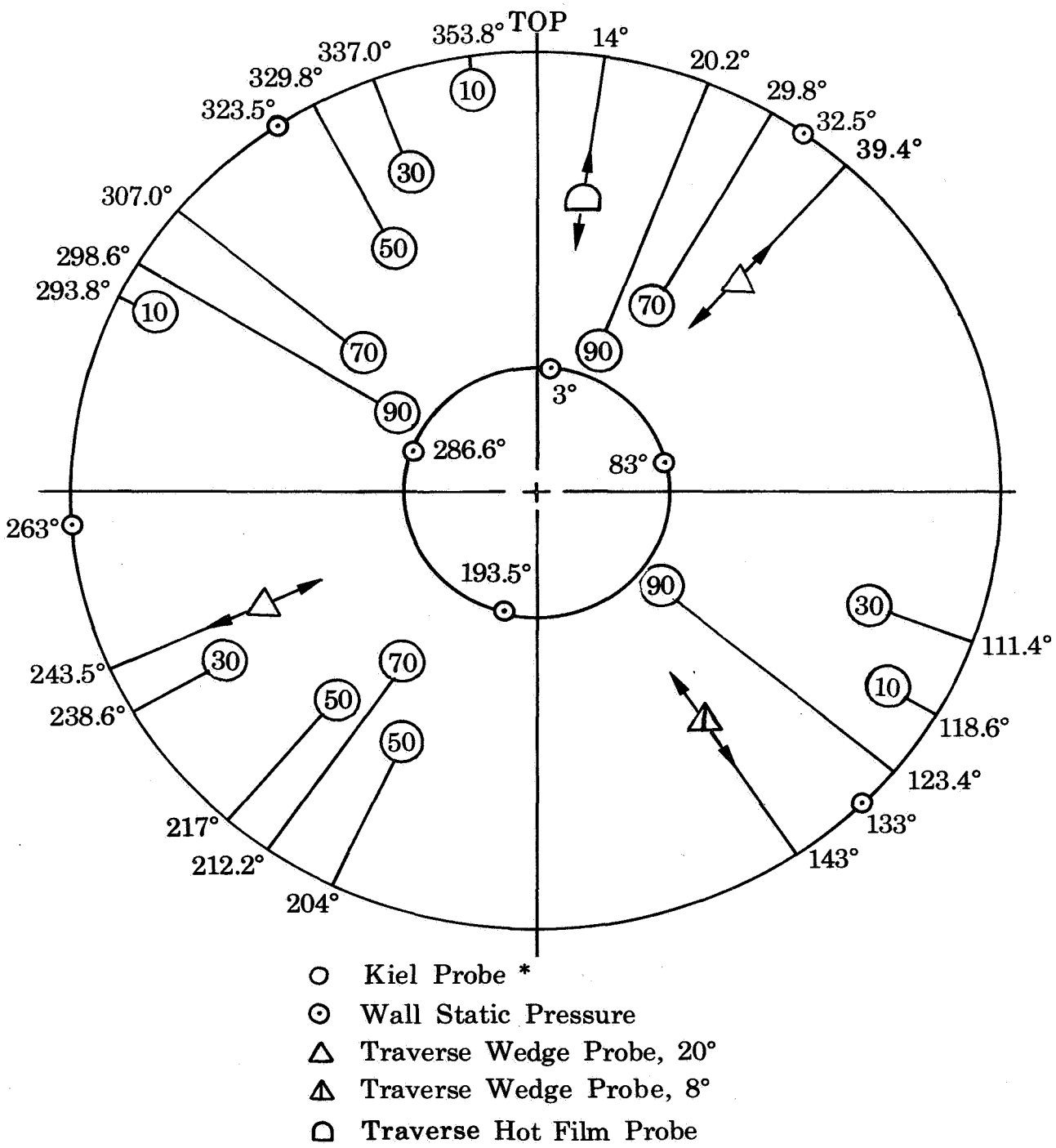
Figure III-7. Typical Slotted Stator 2 Vane



⊙ Wall Static Pressure
△ Traverse Wedge Probe, 20°
◇ Traverse Wake Probe

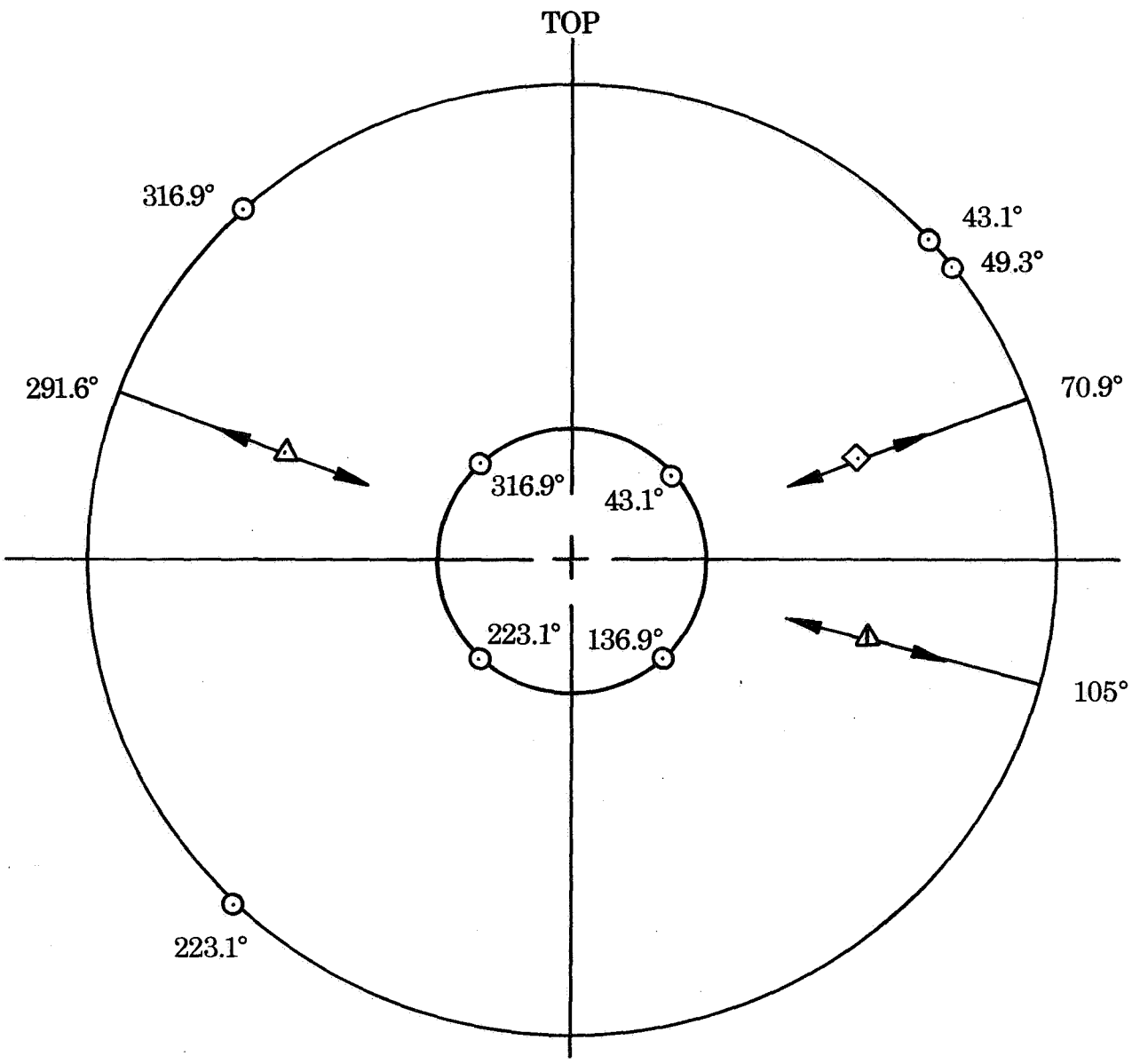
Probe angular position is measured clockwise from the top.

Figure III-8. Instrumentation, Station 1 (View Looking Downstream) FD 18596C



Probe angular position is measured clockwise from the top.
*Radial location as a percent of span from tip is denoted by the number within the symbol

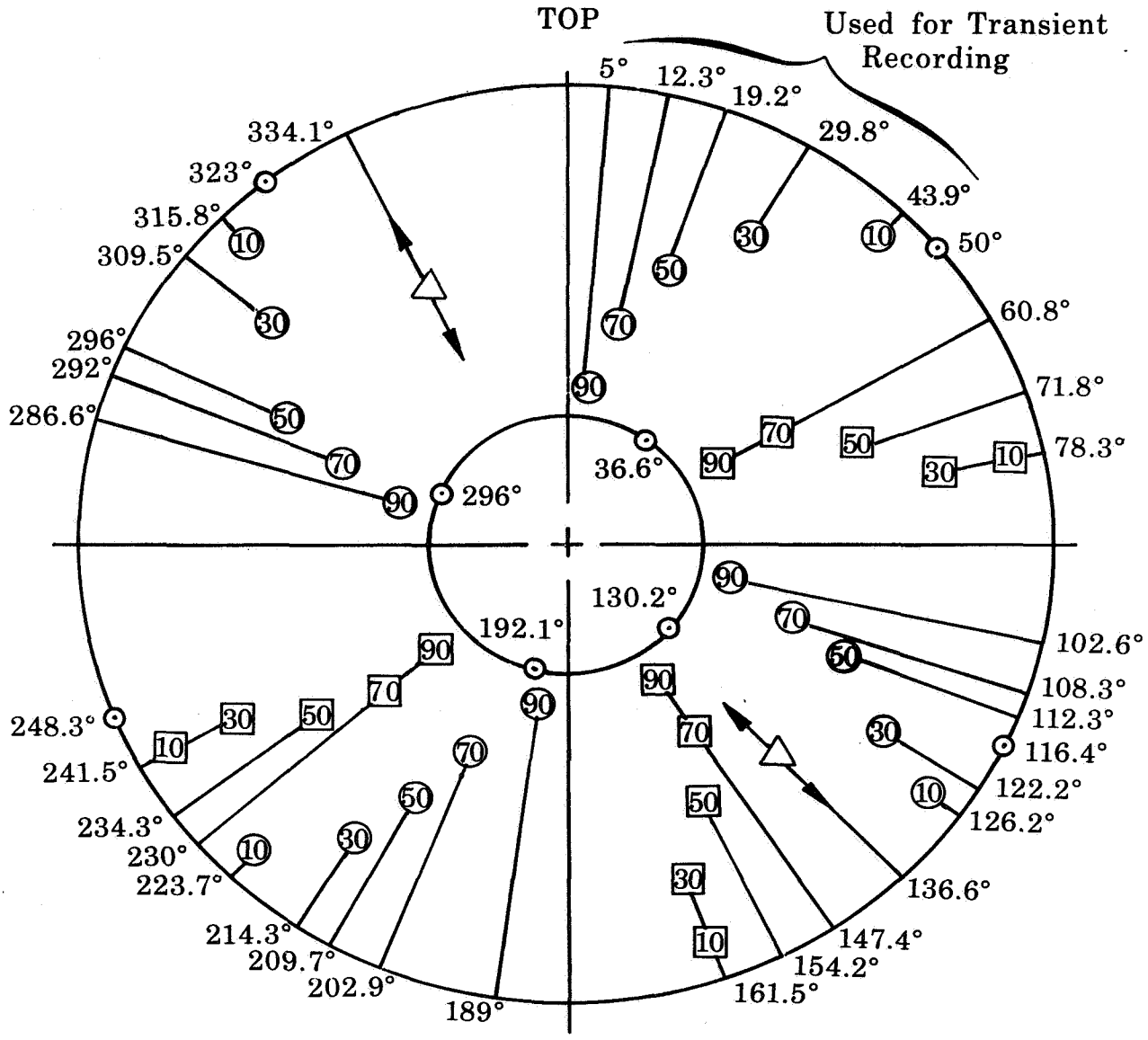
Figure III-9. Instrumentation, Station 2 (View Looking Downstream) FD 18595D



⊙ Wall Static Pressure
△ Traverse Wedge Probe, 20°
◭ Traverse Wedge Probe, 8°
◇ Traverse Wake Probe

Probe angular position is measured clockwise from the top.

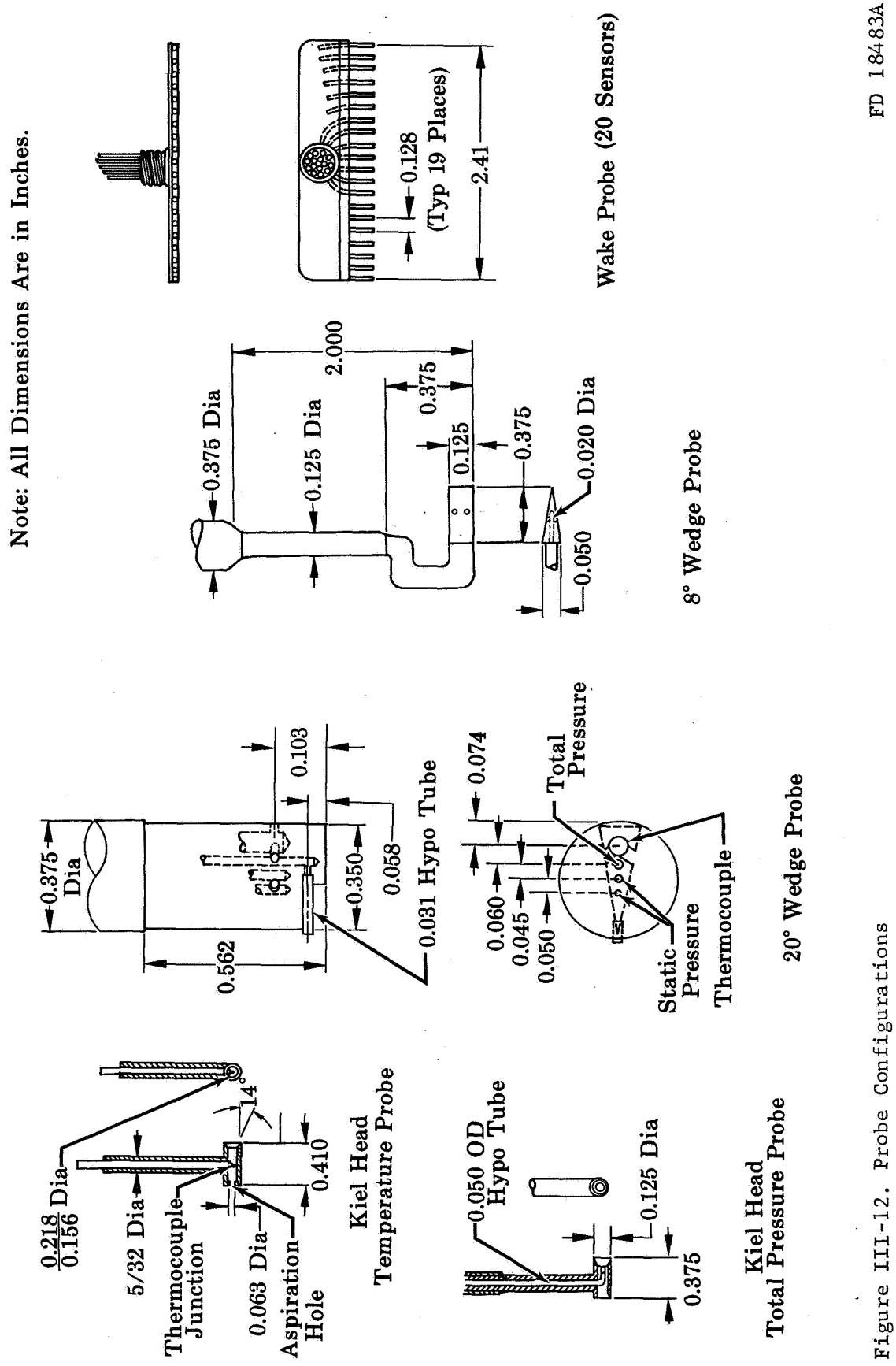
Figure III-10. Instrumentation, Station 2A (View Looking Downstream) FD 18594C



⊙ Wall Static
△ Traverse Wedge Probe, 20°
○ Kiel Probe *
□ Temperature *

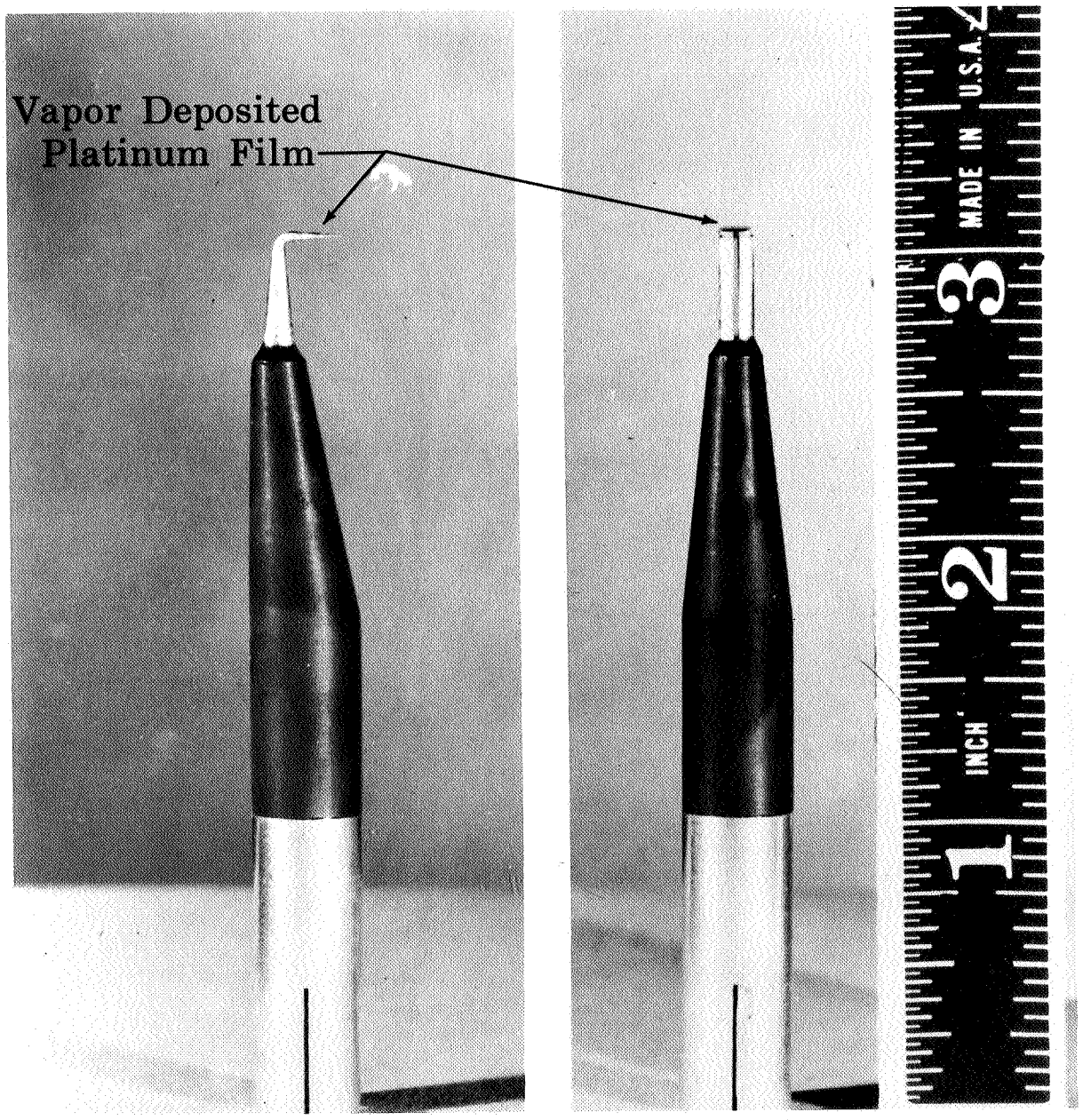
Probe angular position is measured clockwise from the top.
*Radial location as a percent of span from tip is denoted by the number within the symbol

Figure III-11. Instrumentation, Station 3 (View Looking Downstream) FD 18597D



FD 18483A

Figure III-12. Probe Configurations



Side View

Front View

Figure III-13. Anemometer Probe

FD 18603

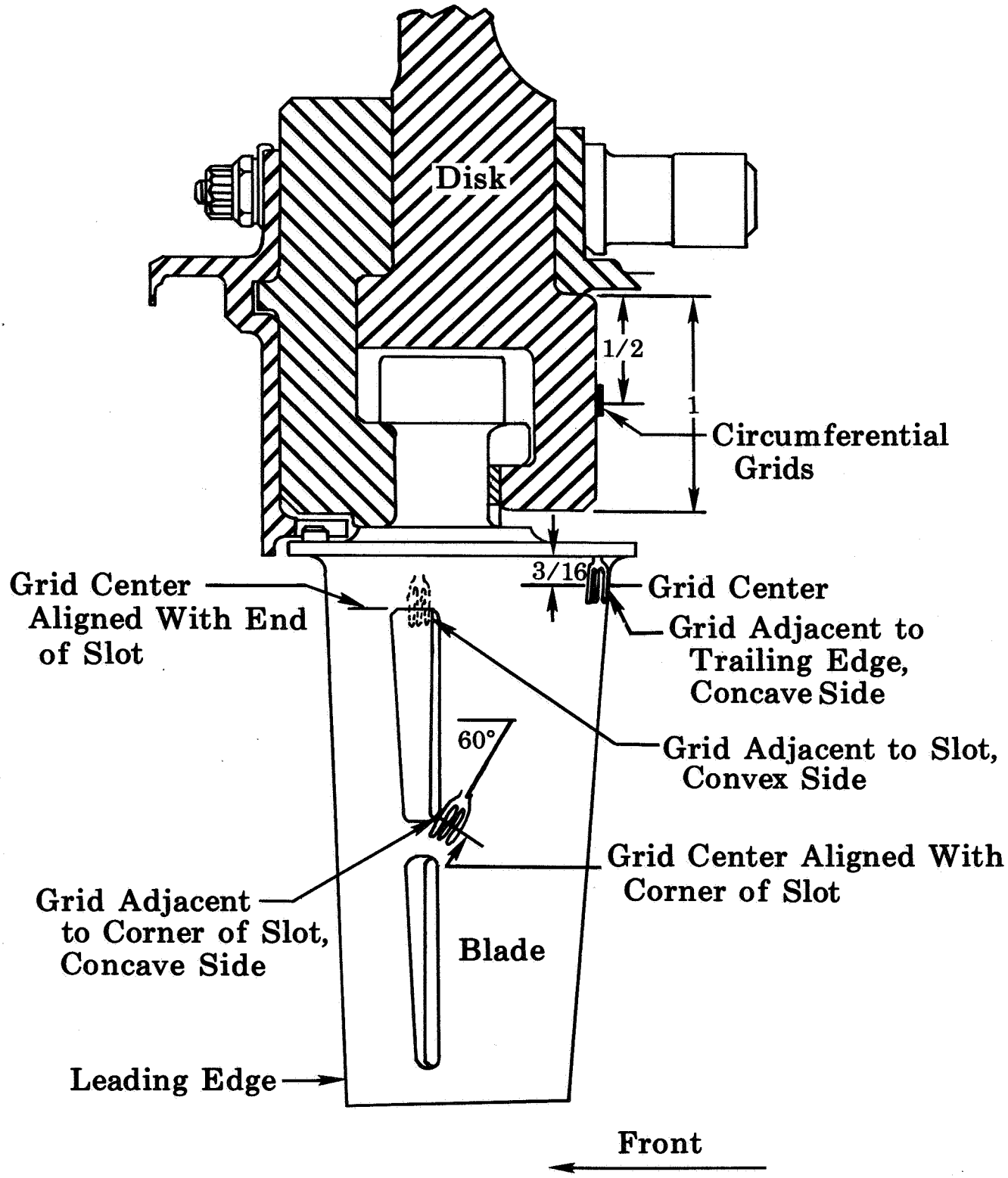


Figure III-14. Strain Gage Locations FD 18598

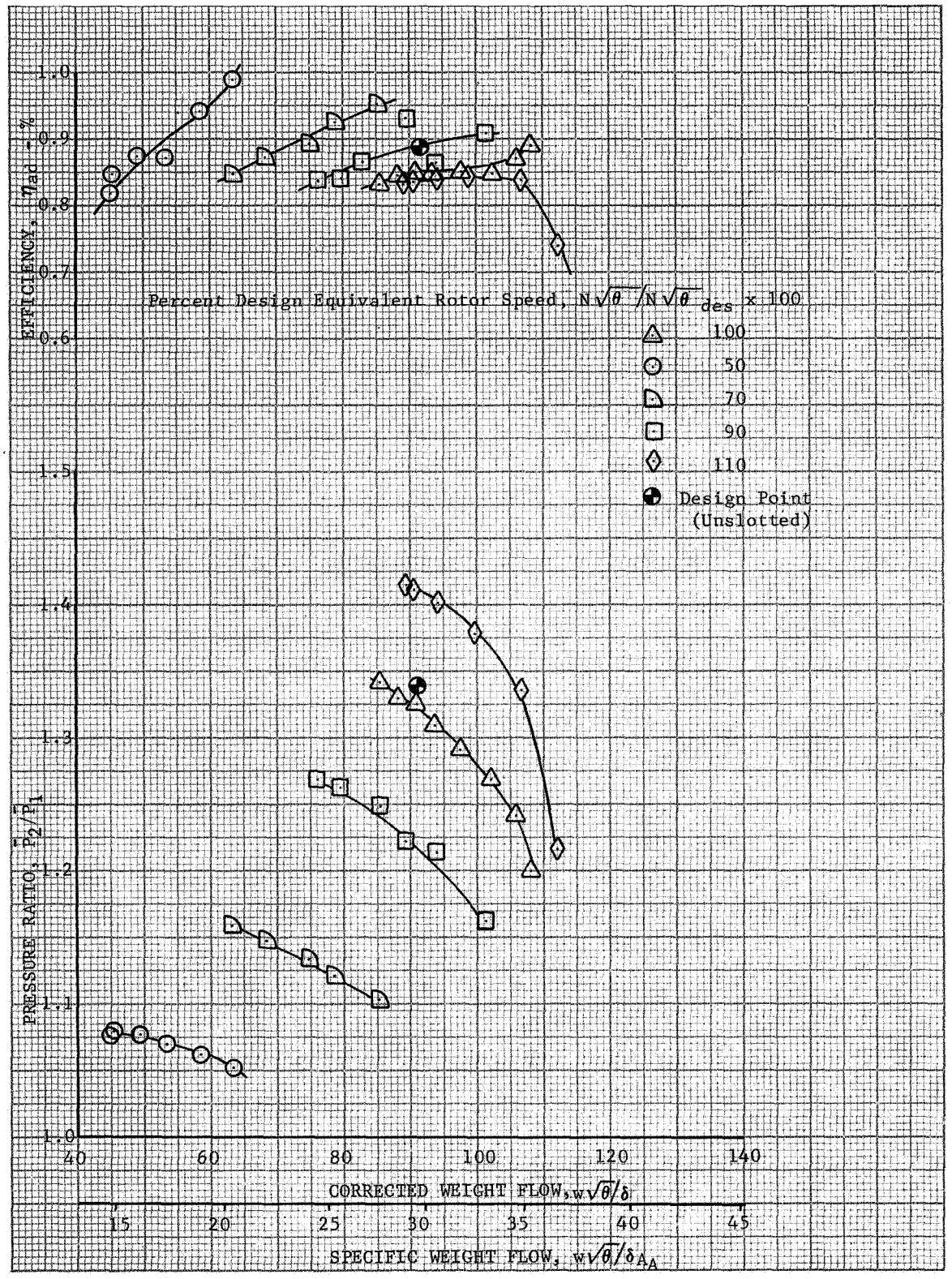


Figure V-1. Overall Performance; Slotted Rotor 3 Only DF 56793

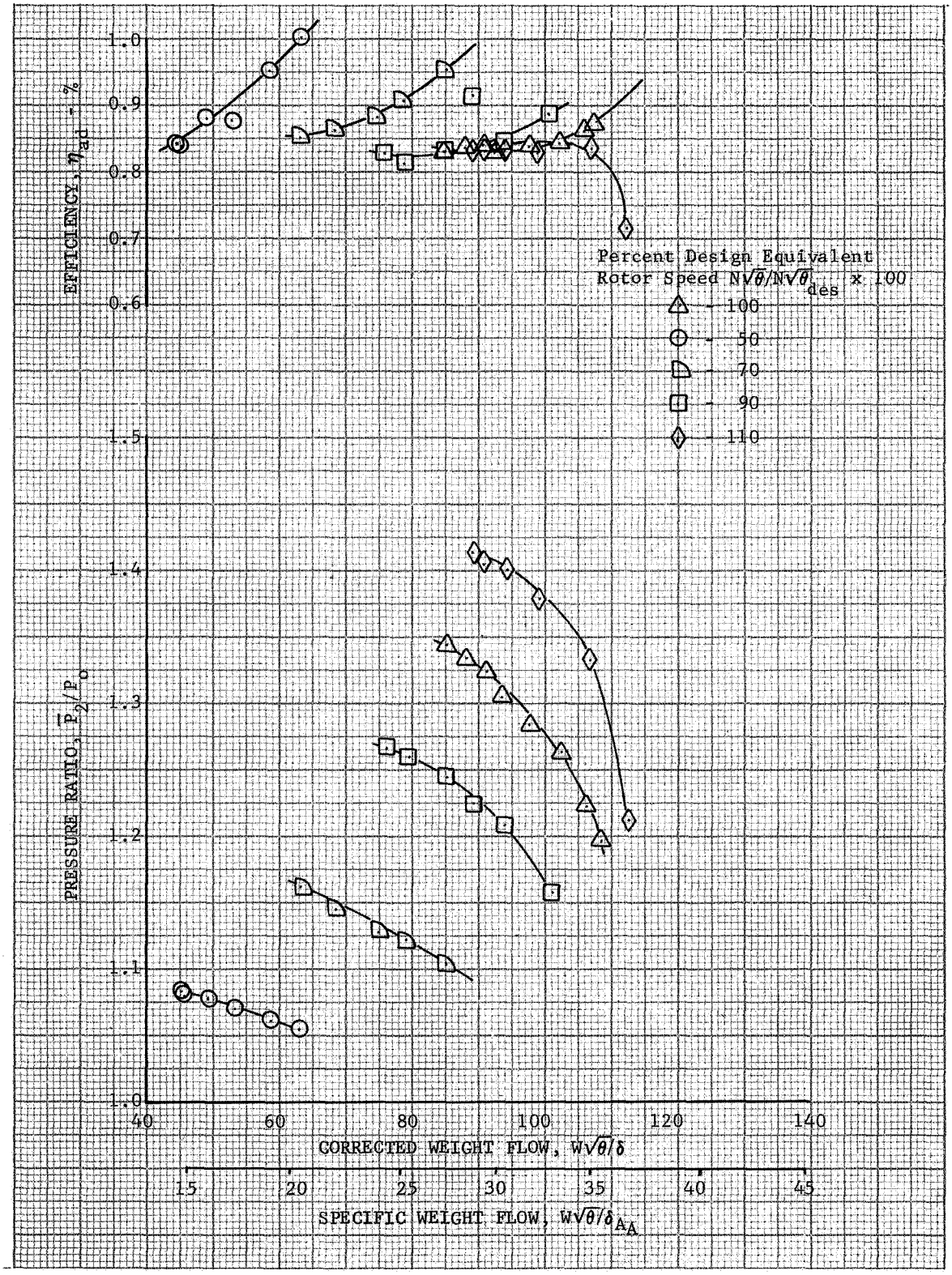


Figure V-2. Overall Performance; Inlet Guide Vane, Slotted Rotor 3 DF 56794

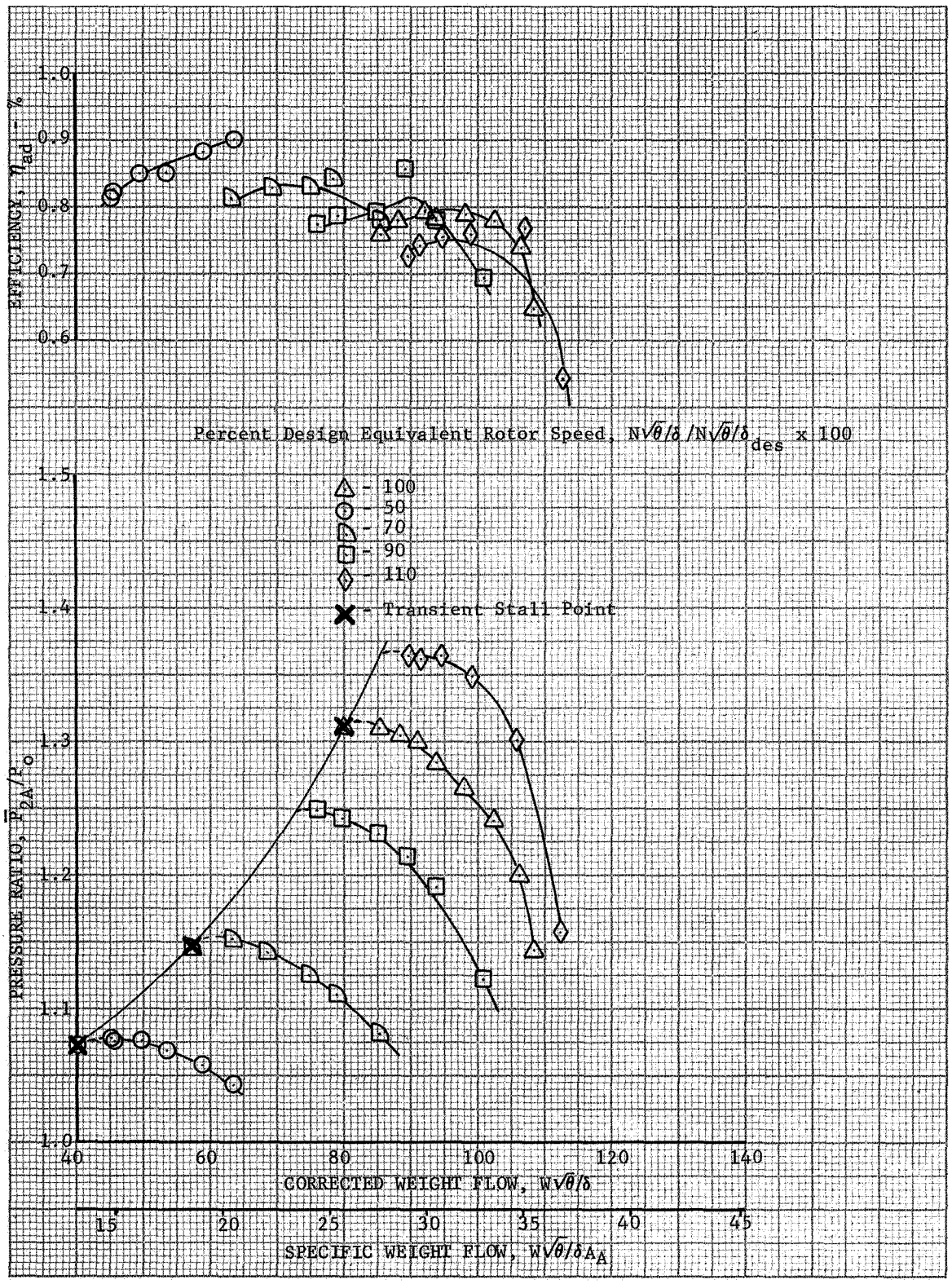


Figure V-3. Overall Performance; Inlet Guide Vane, Slotted Rotor 3, Slotted Stator 2 DF 56795

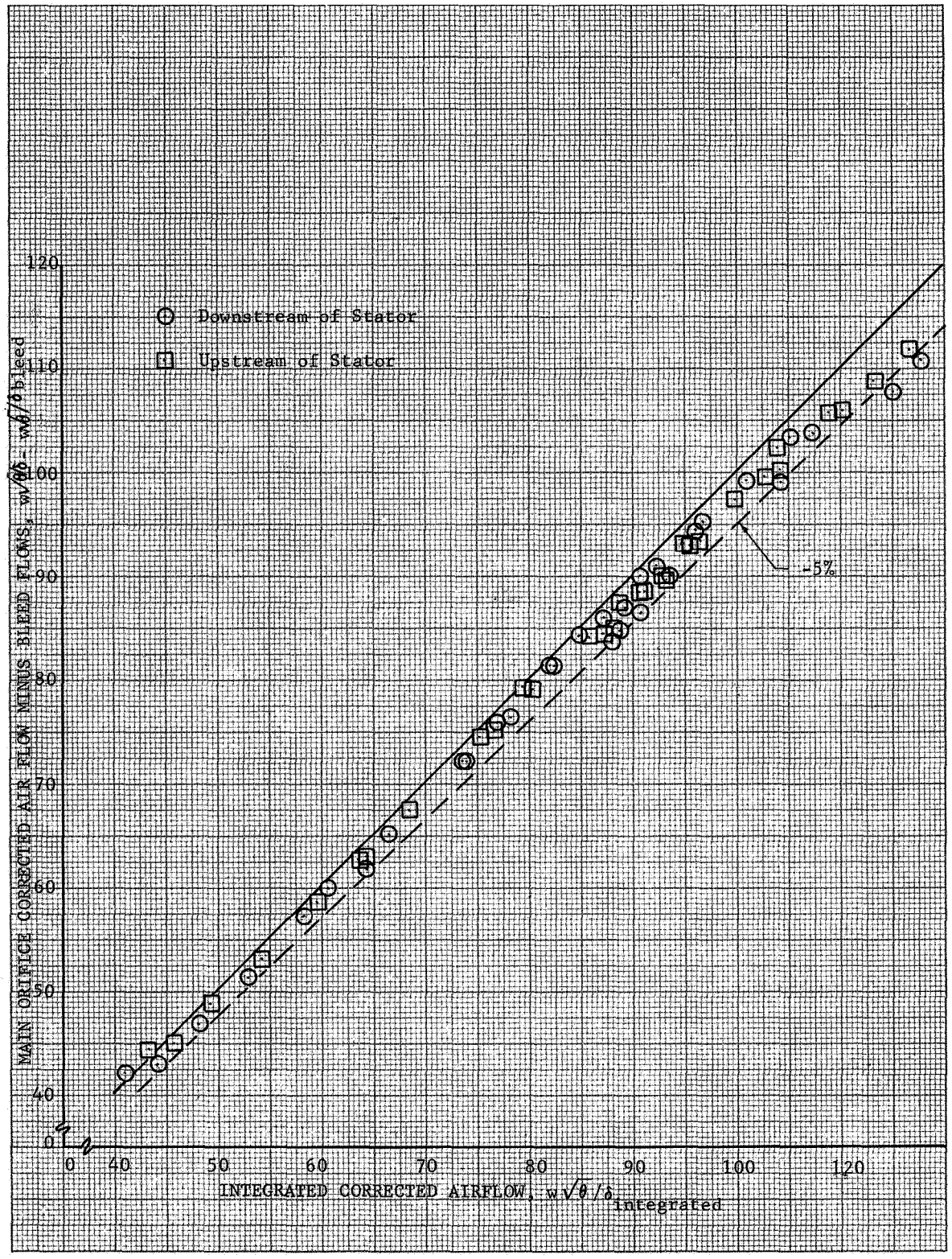


Figure V-4. Airflow Continuity Comparison

DF 56796

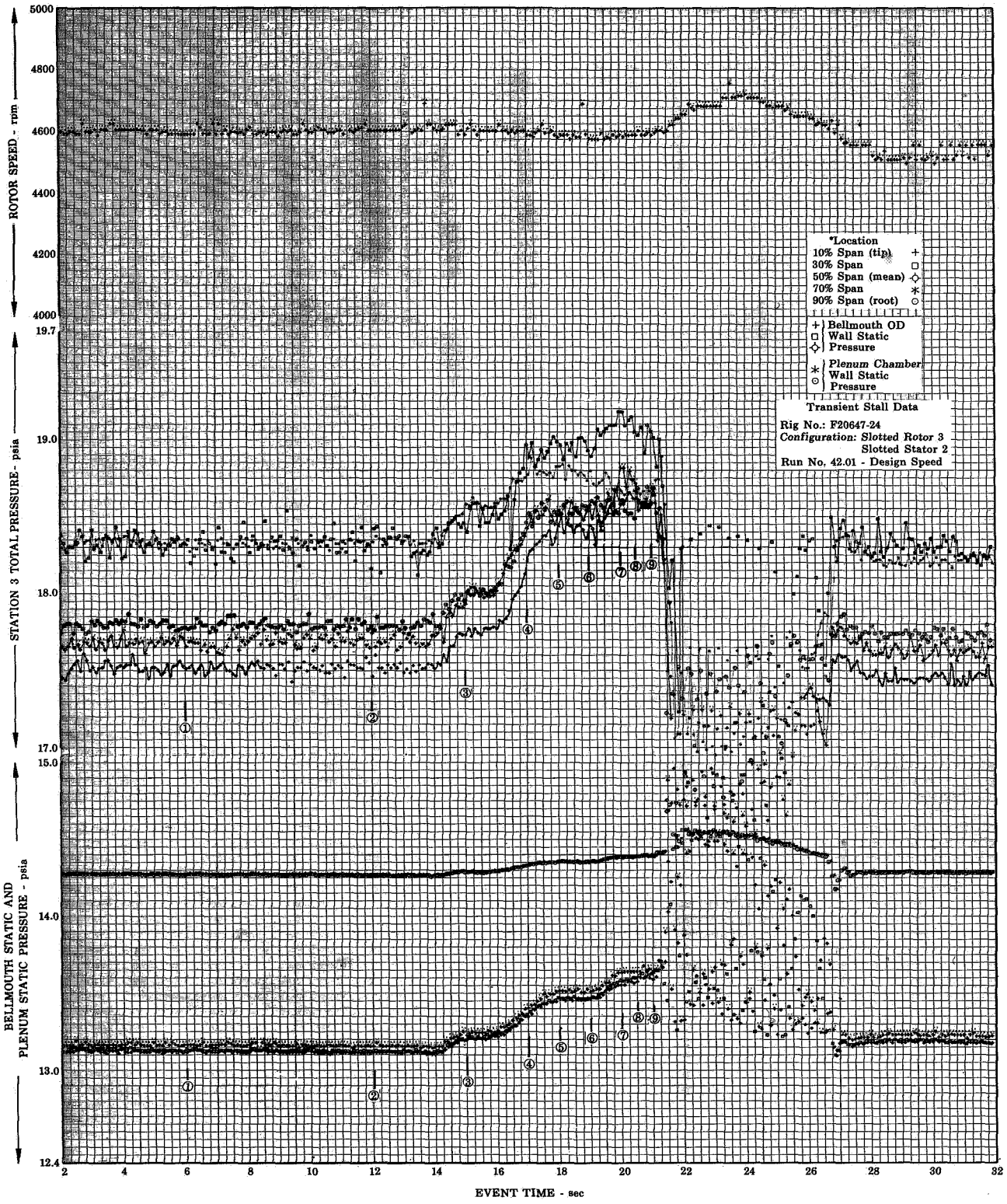


Figure V-5. Sample Plot of Transient Data FD 22188

DF 56819

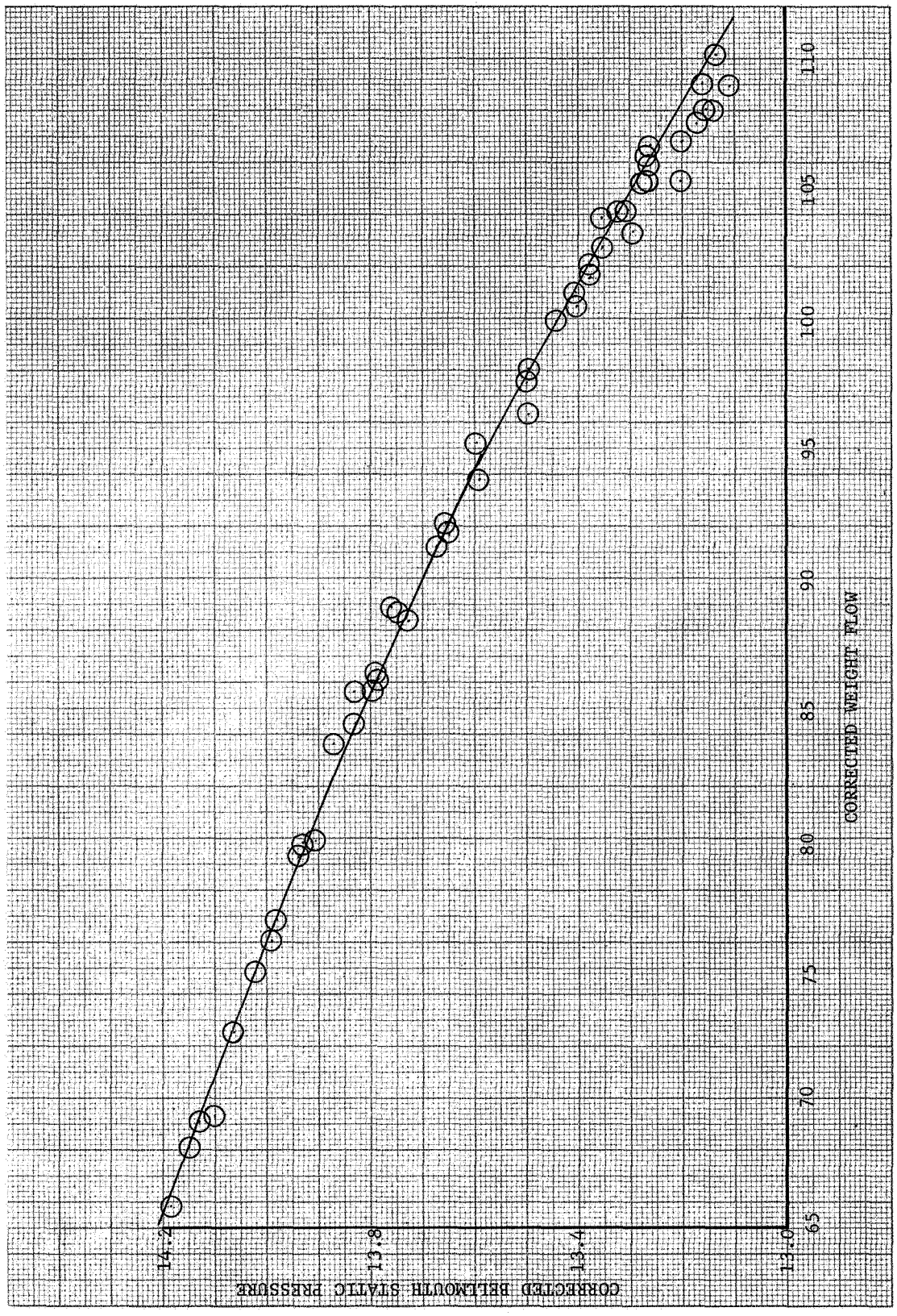


Figure V-6. Corrected Bellmouth Static Pressure vs Corrected Weight Flow

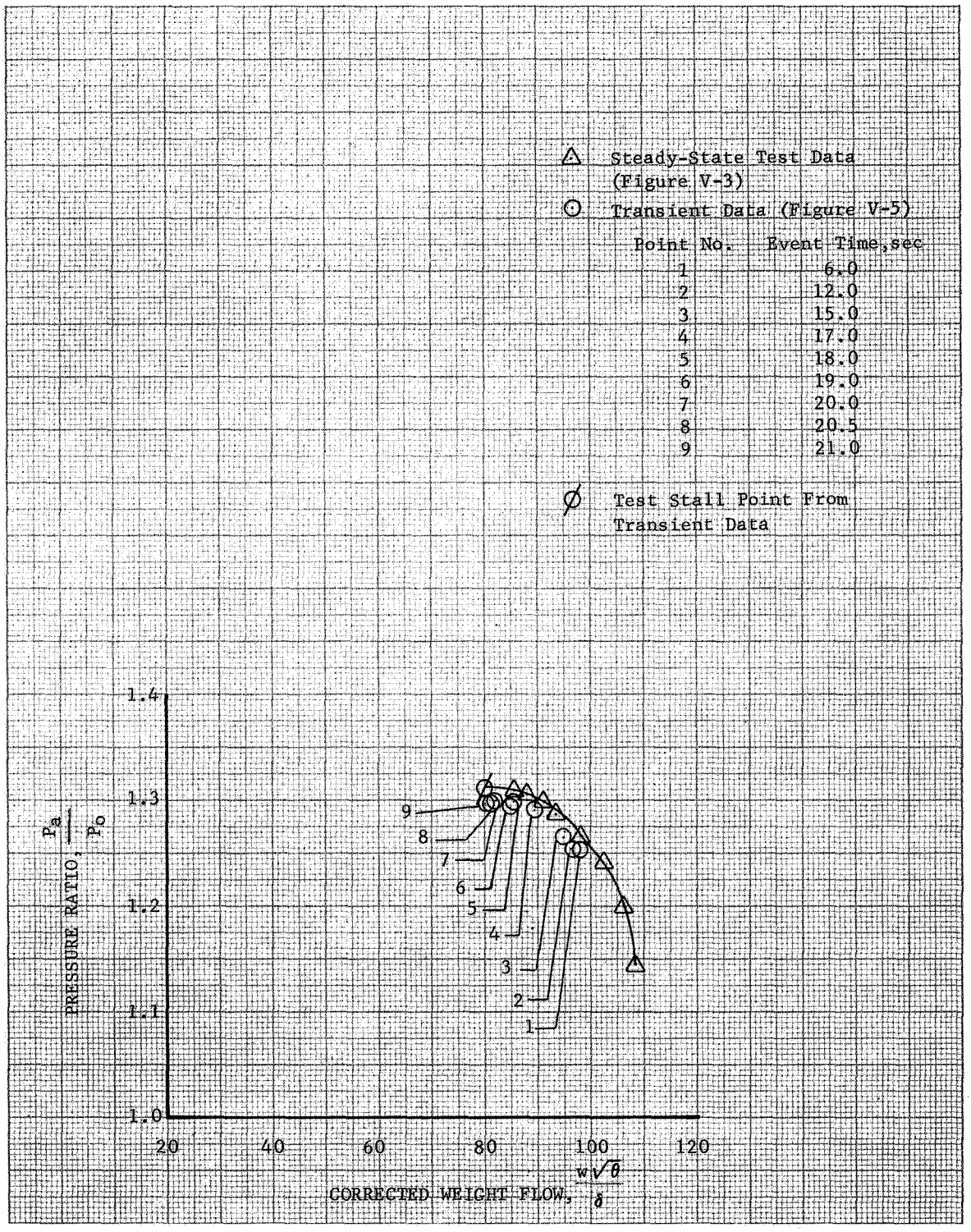


Figure V-7. Comparison of Steady-State and Transient Performance Results

DF 56818

DF 56797

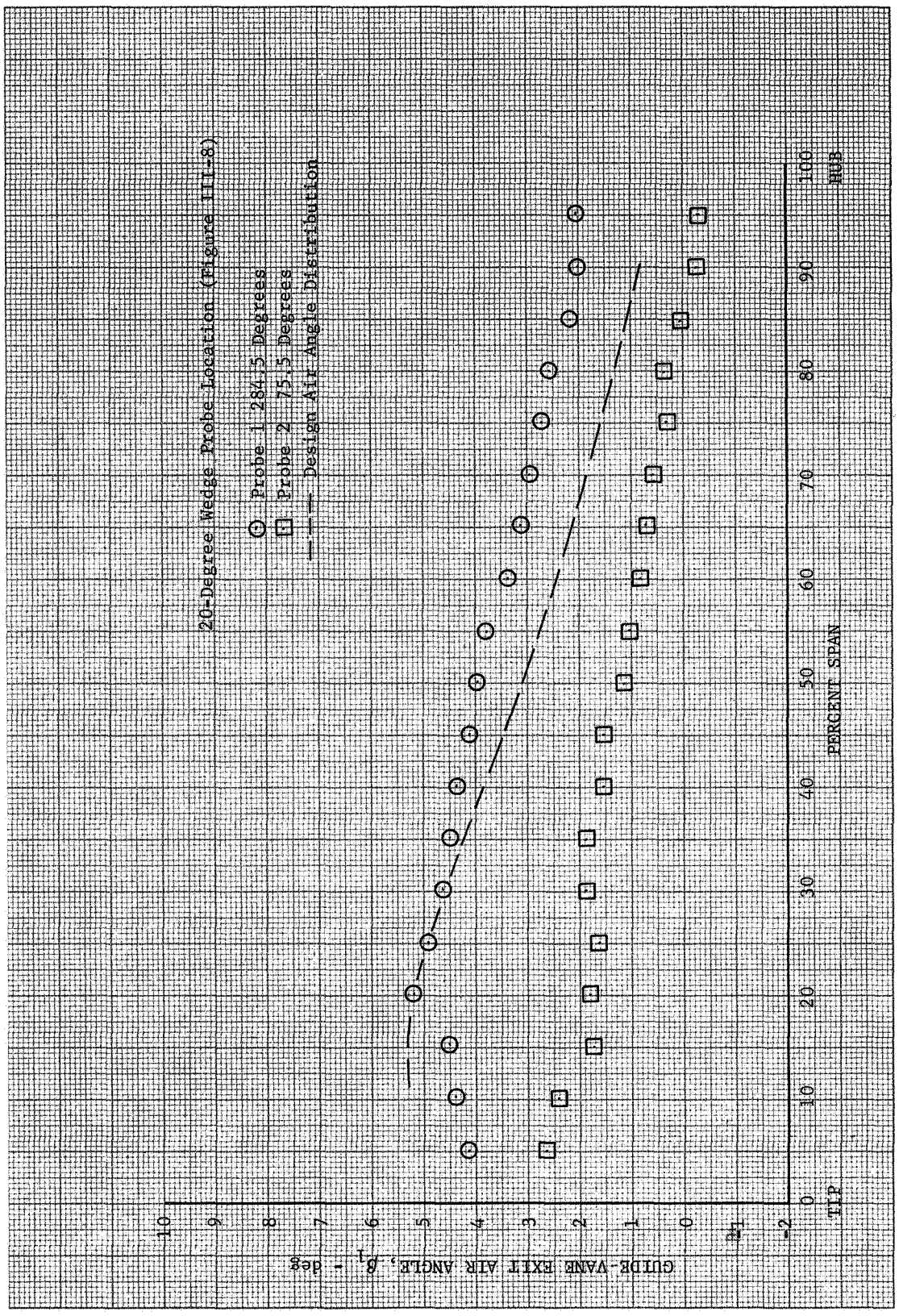
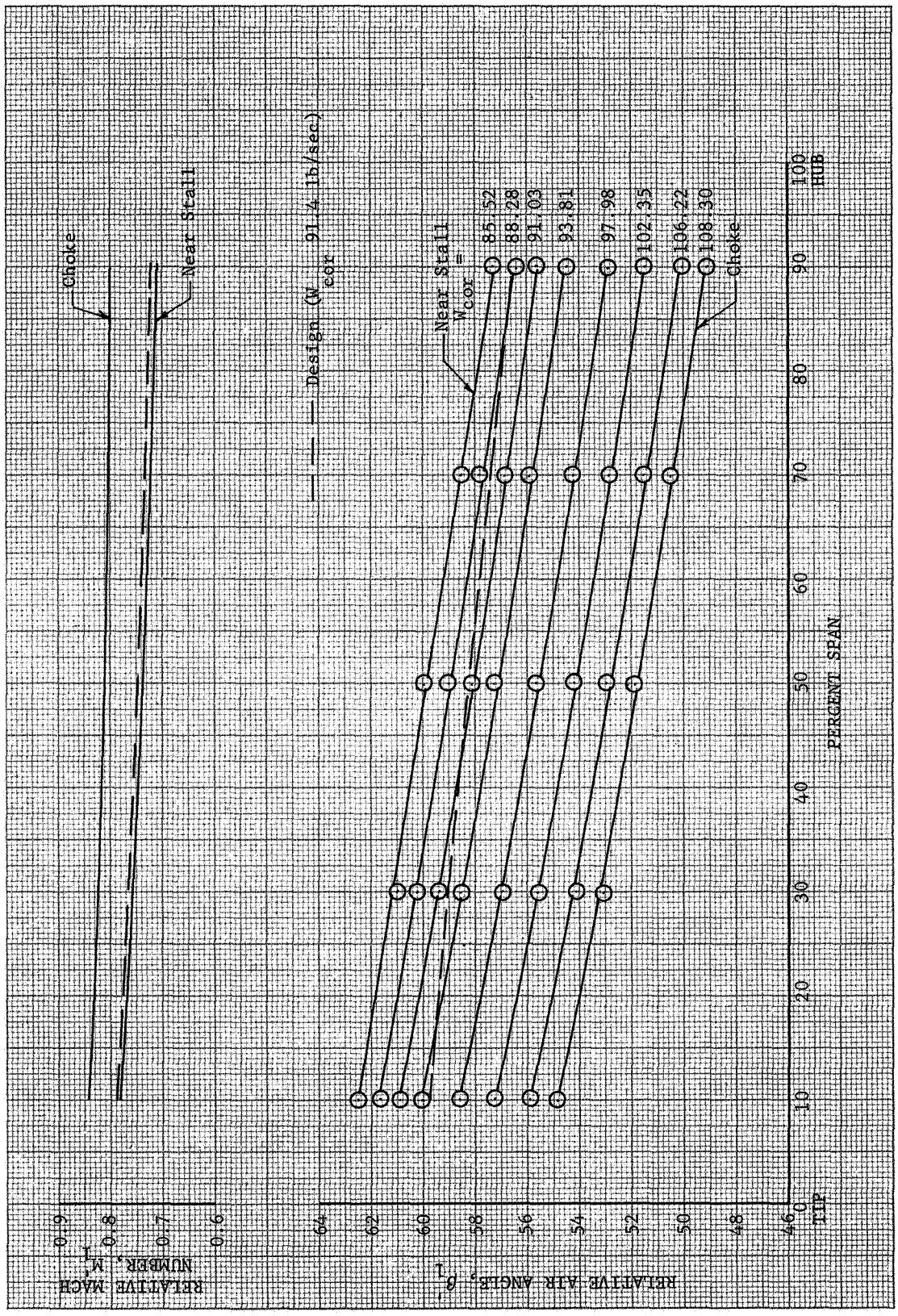


Figure V-8. Guide Vane Exit Air Angle Distribution, 100% Design Equivalent Rotor Speed



DF 56798

Figure V-9. Relative Air Angle and Mach Number Distribution Into Slotted Rotor 3, Design Equivalent Rotor Speed

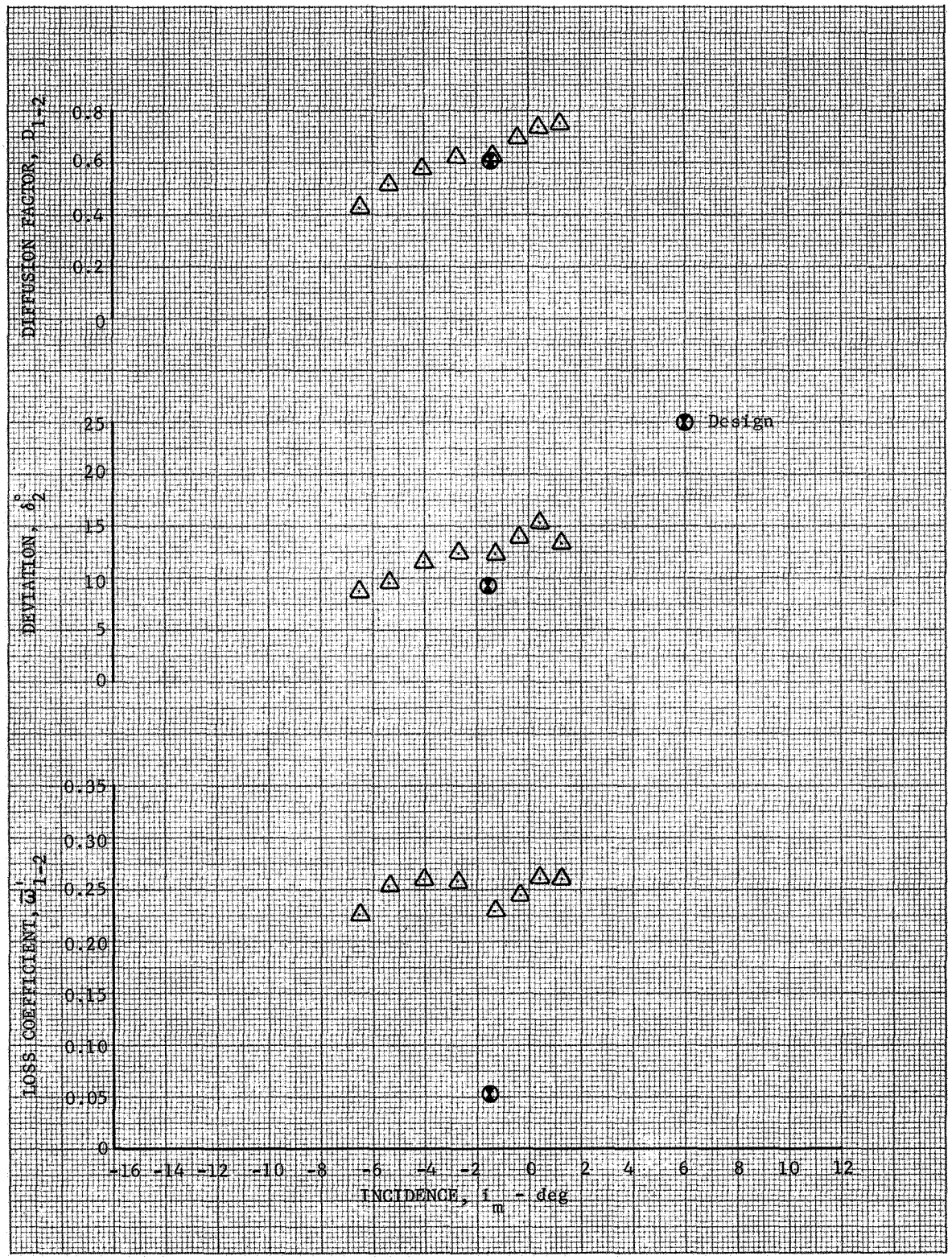


Figure V-10. Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 10% Span From Tip

DF 56799

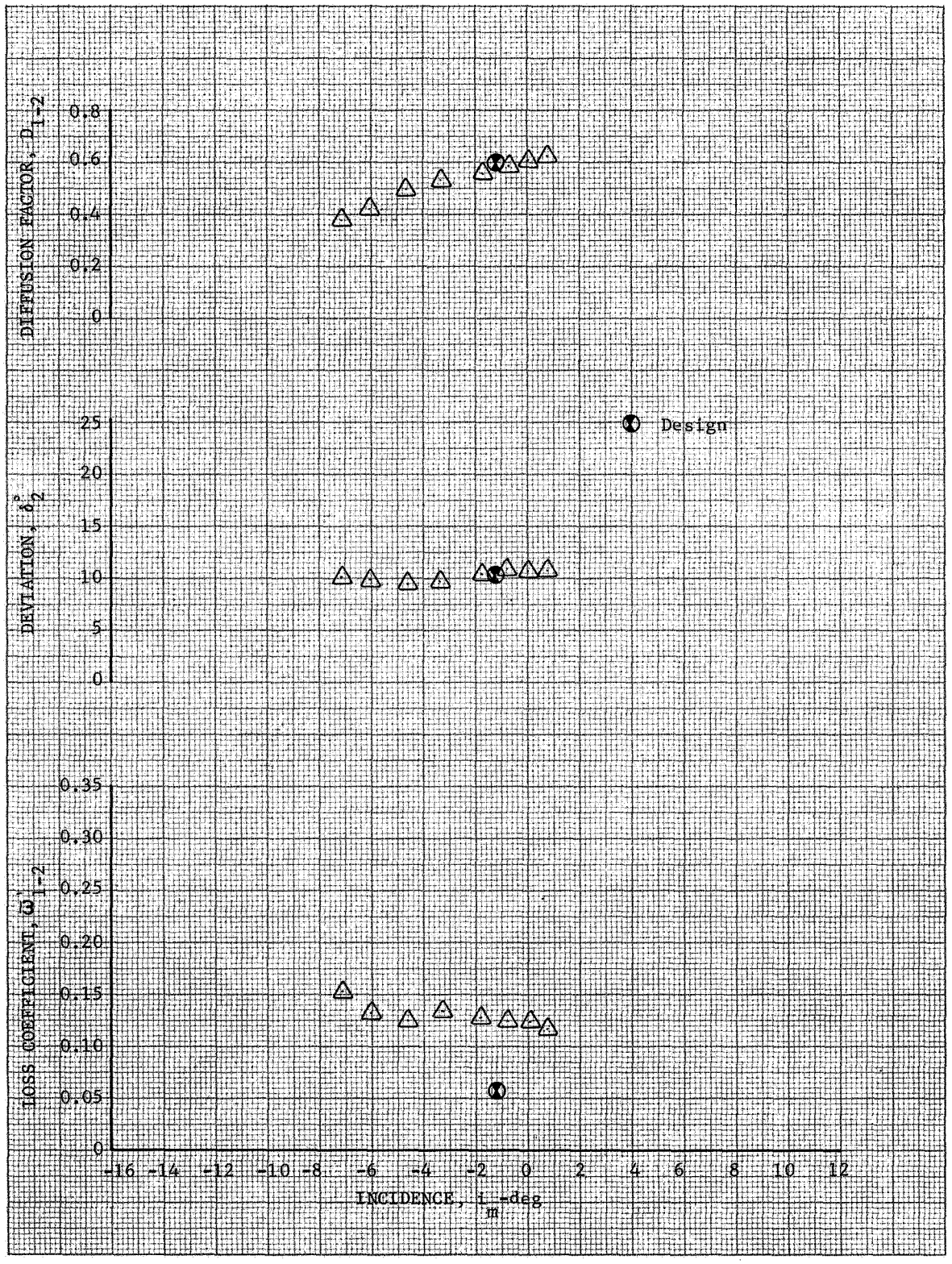


Figure V-11. Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 30% Span From Tip

DF 56800

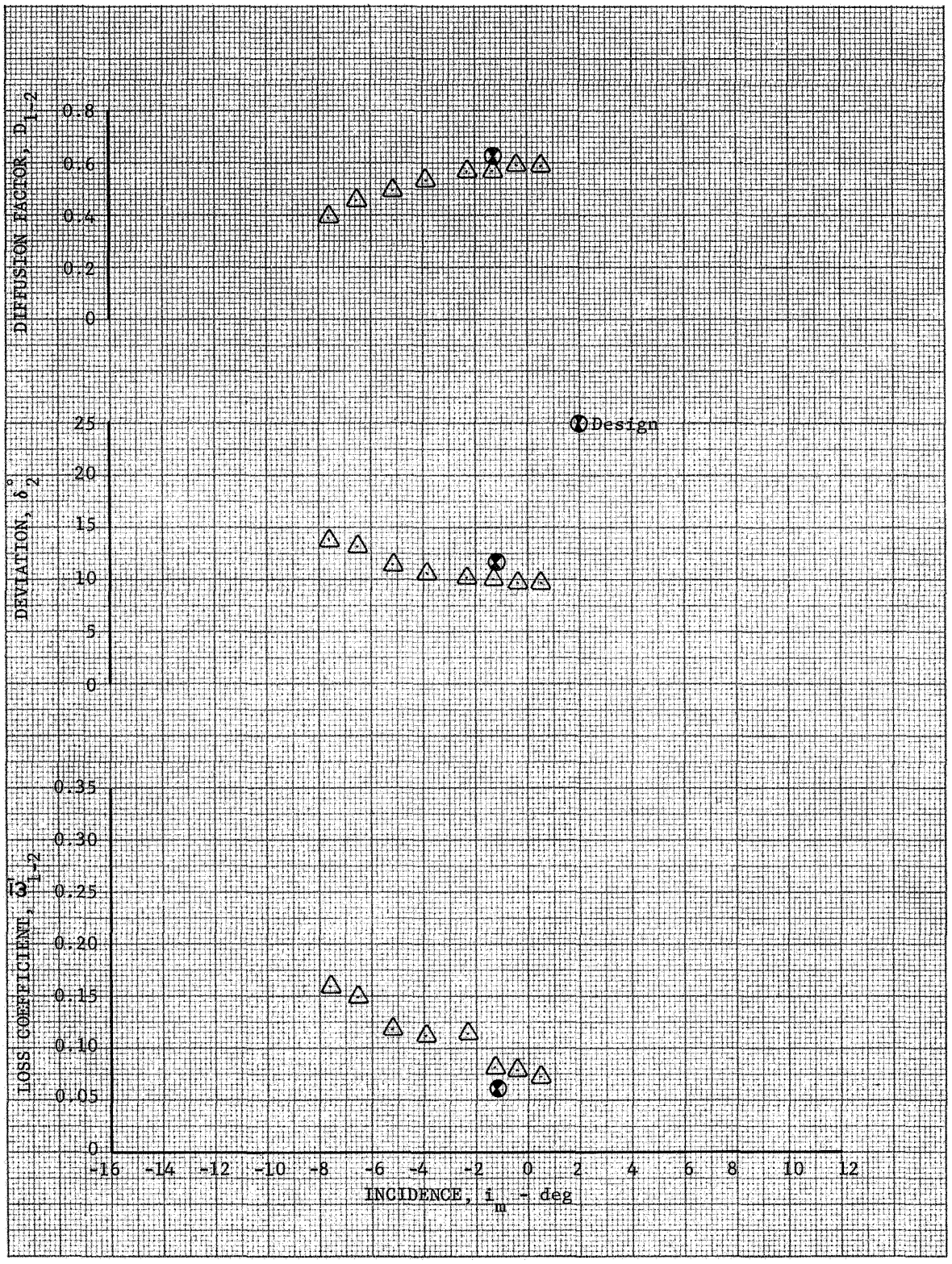


Figure V-12. Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 50% Span From Tip

DF 56801

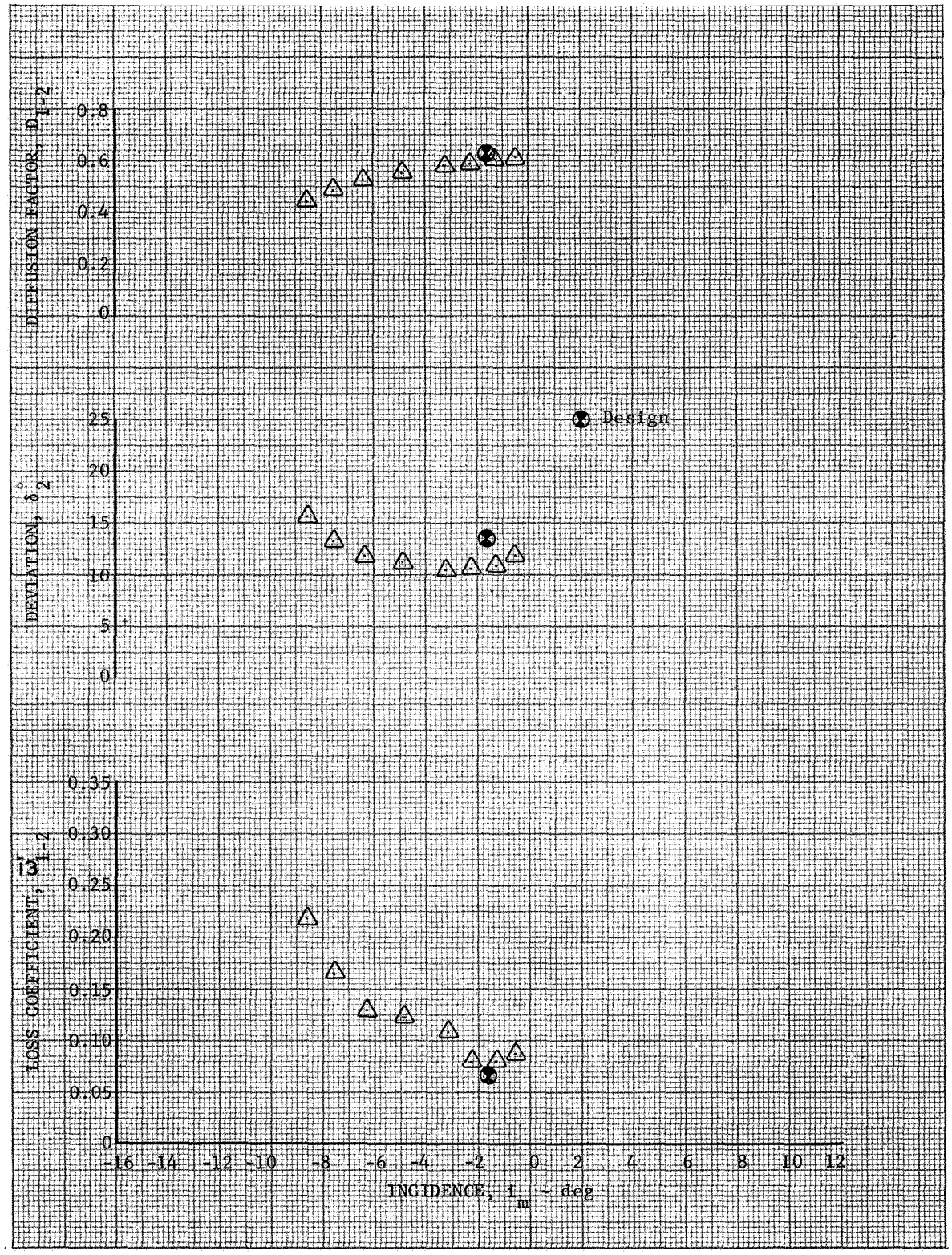


Figure V-13. Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 70% Span From Tip

DF 56802

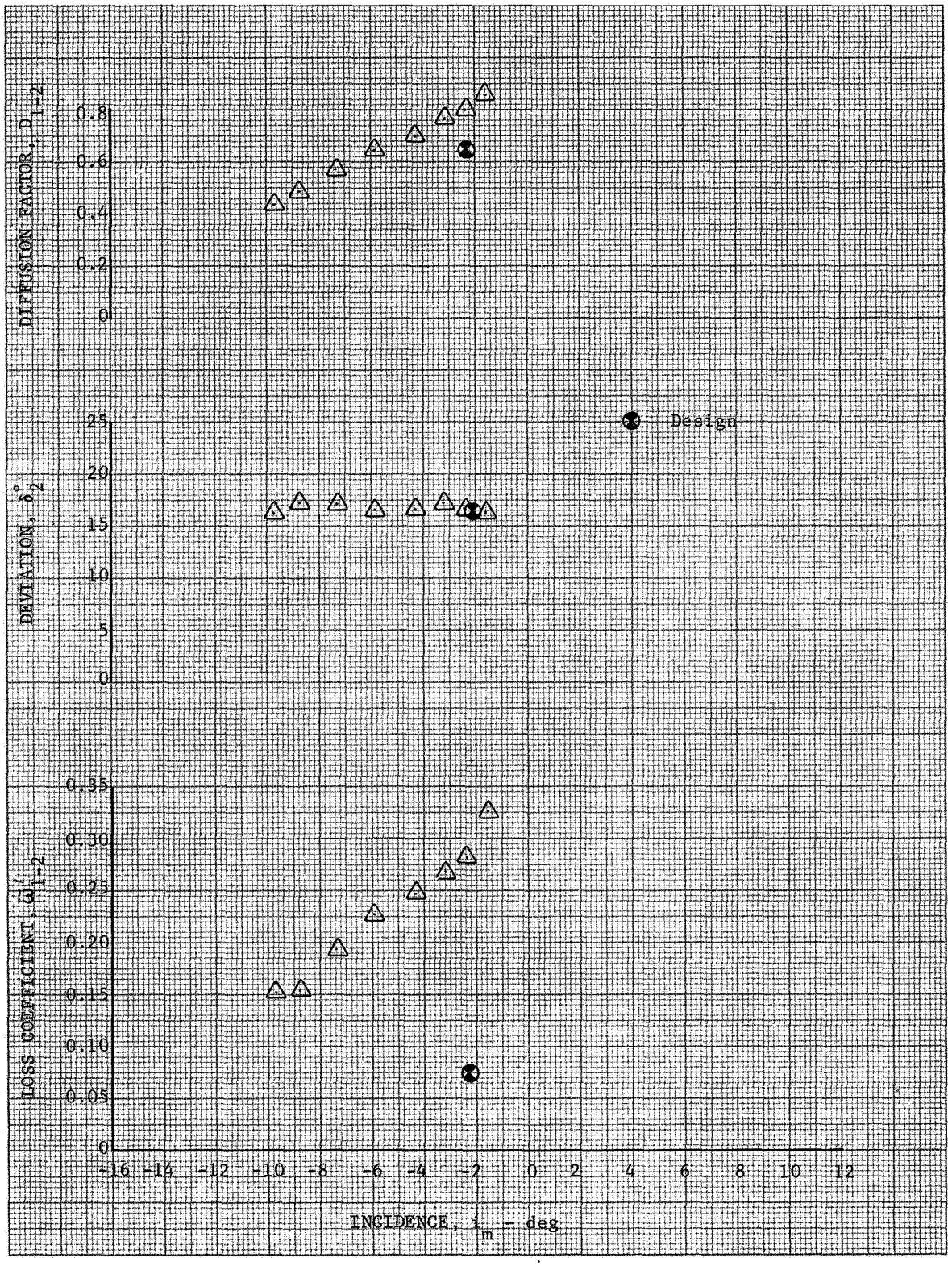


Figure V-14. Rotor Blade Element Performance; 100% Design Equivalent Rotor Speed, 90% Span From Tip

DF 56803

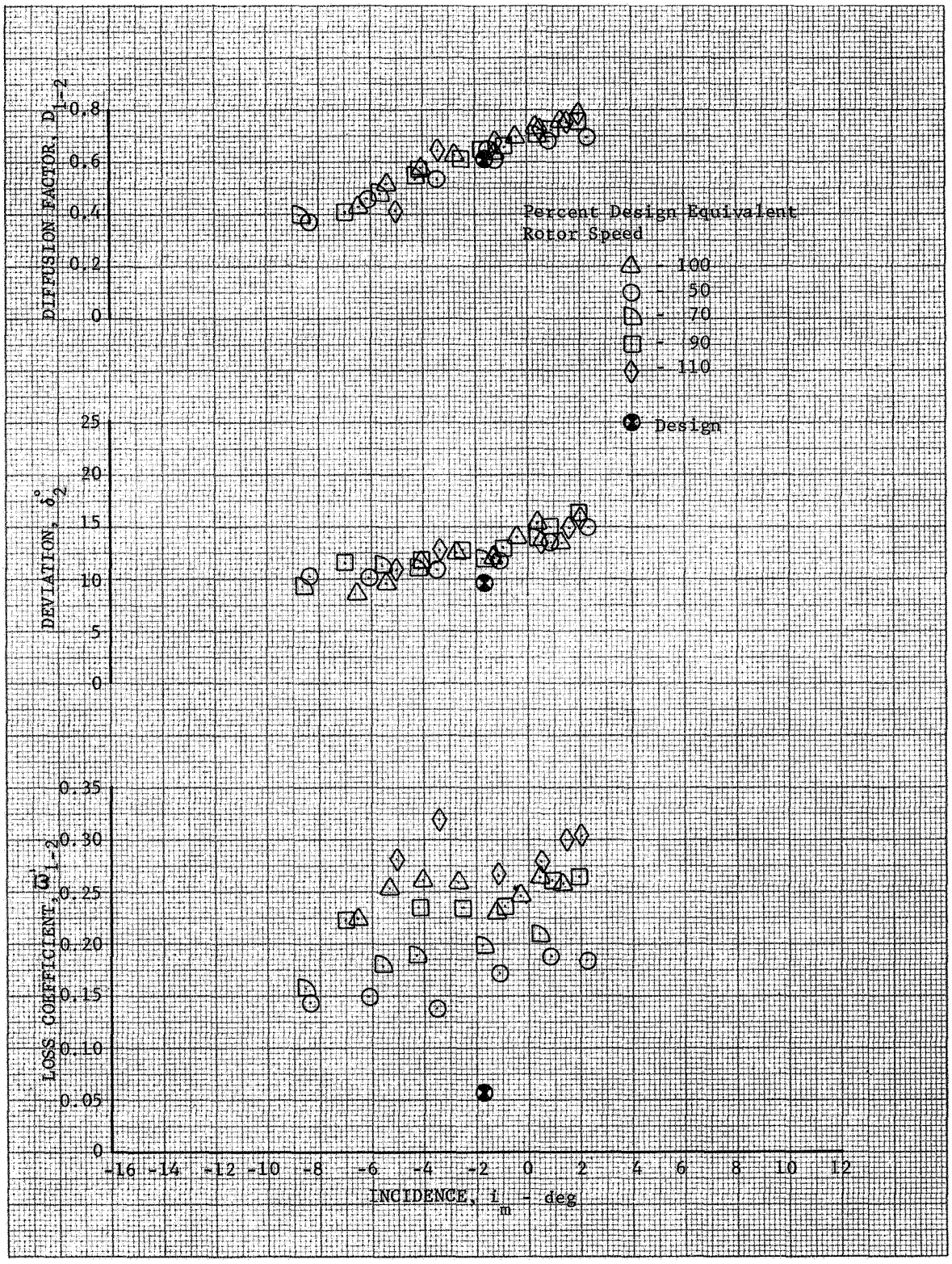


Figure V-15. Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 10% Span From Tip

DF 56804

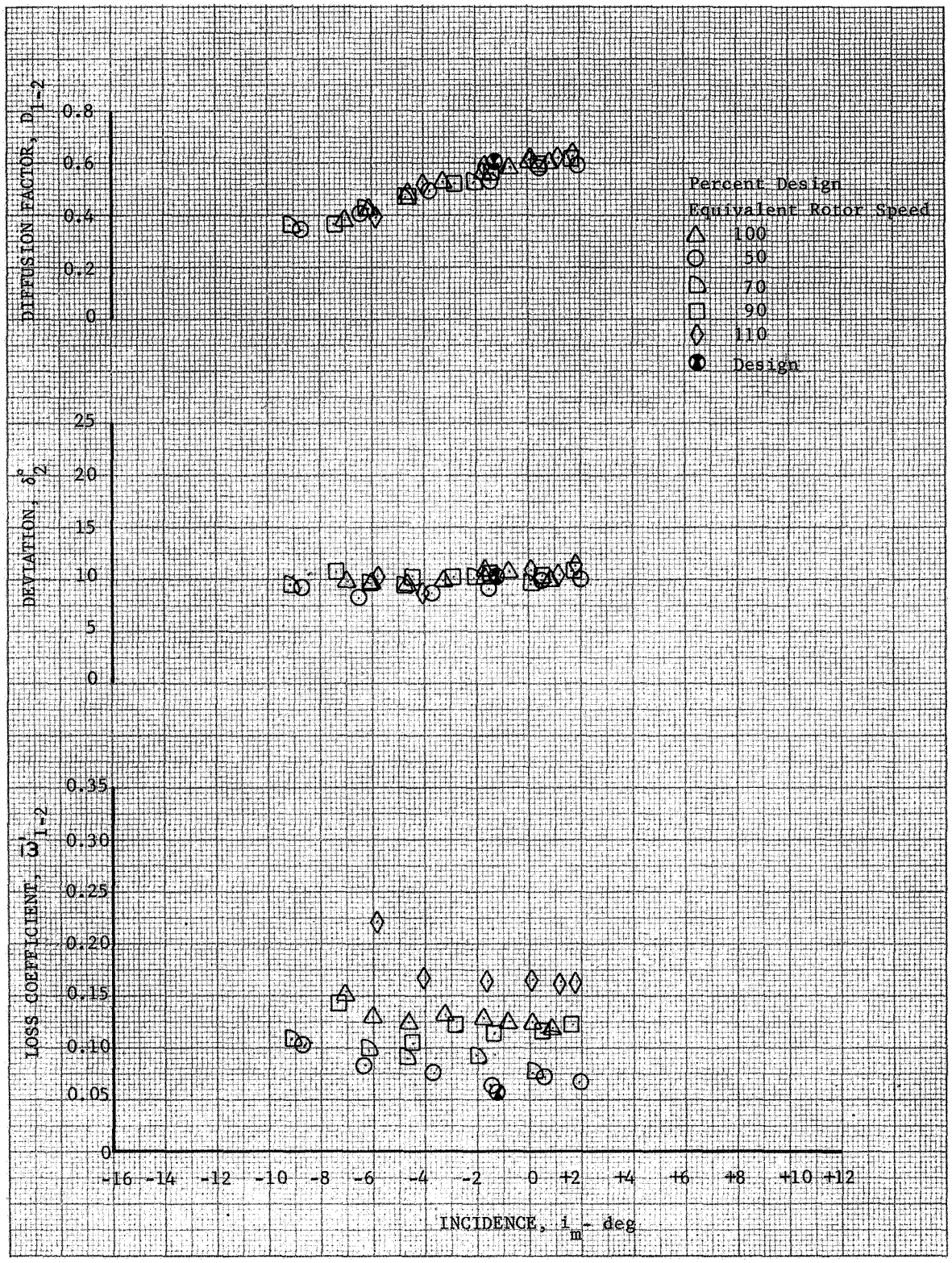


Figure V-16. Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 30% Span From Tip

DF 56805

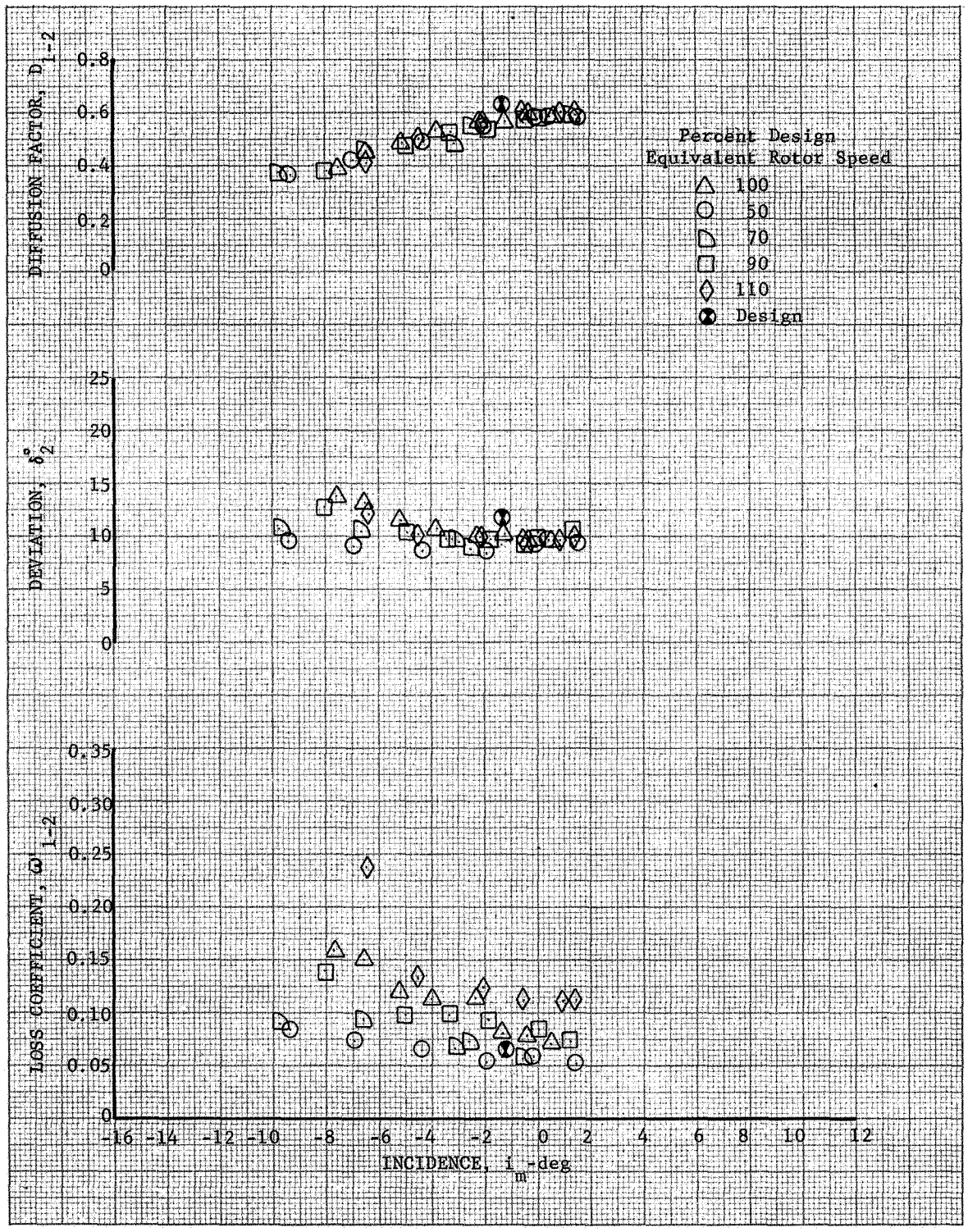


Figure V-17. Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 50% Span From Tip

DF 56806

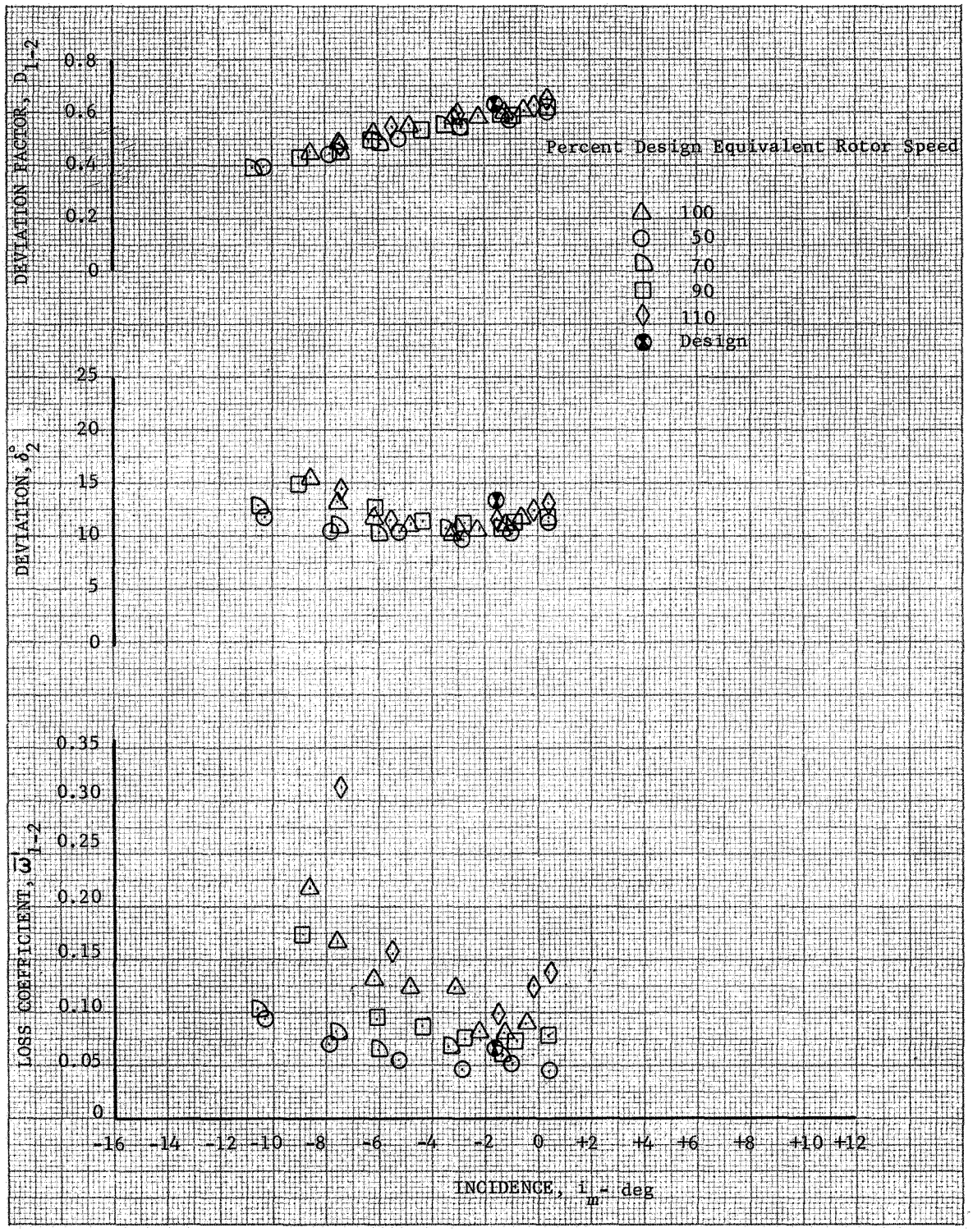


Figure V-18. Variation of Rotor Blade Element Parameters With Incidence; 70% Span From Tip

DF 56807

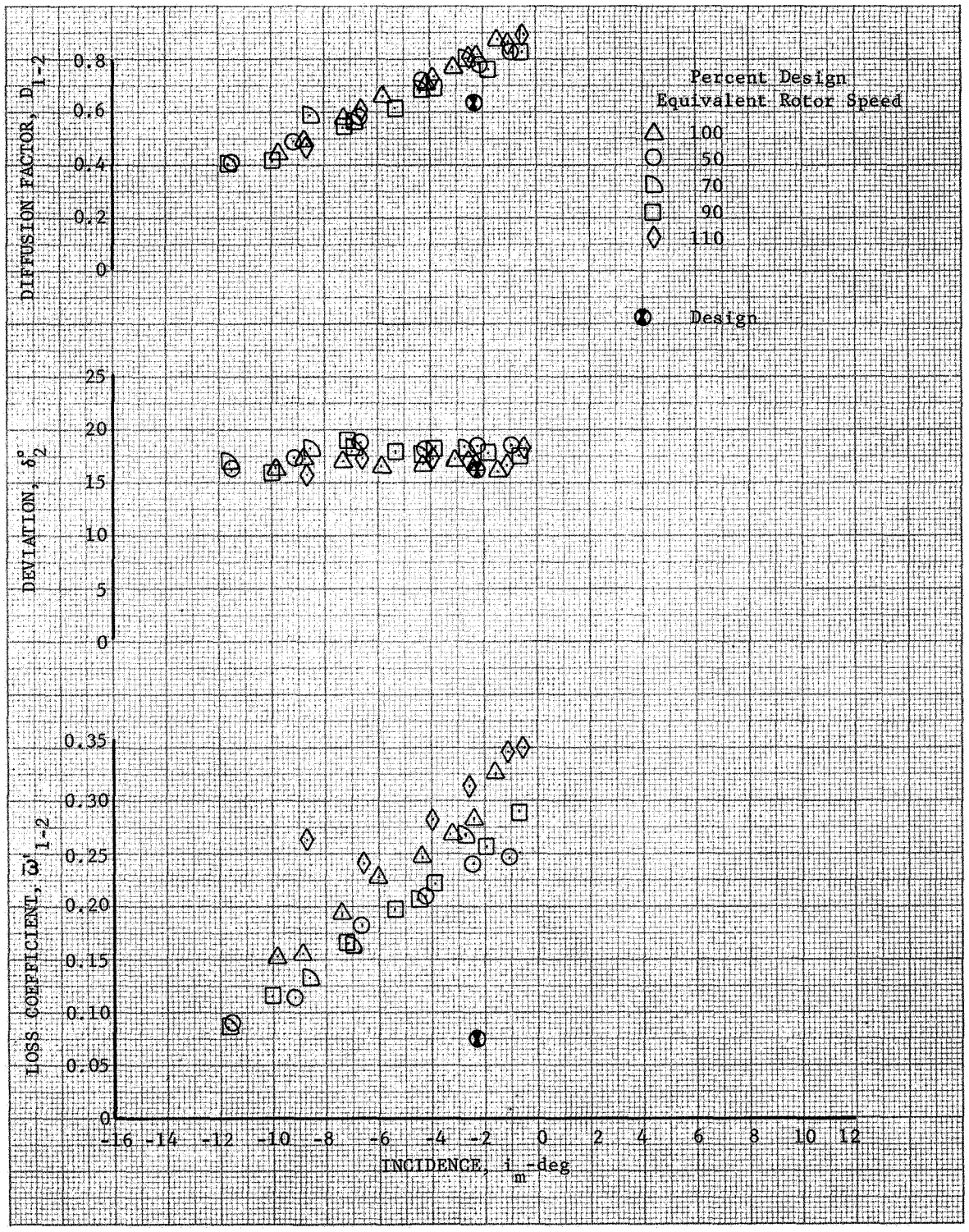
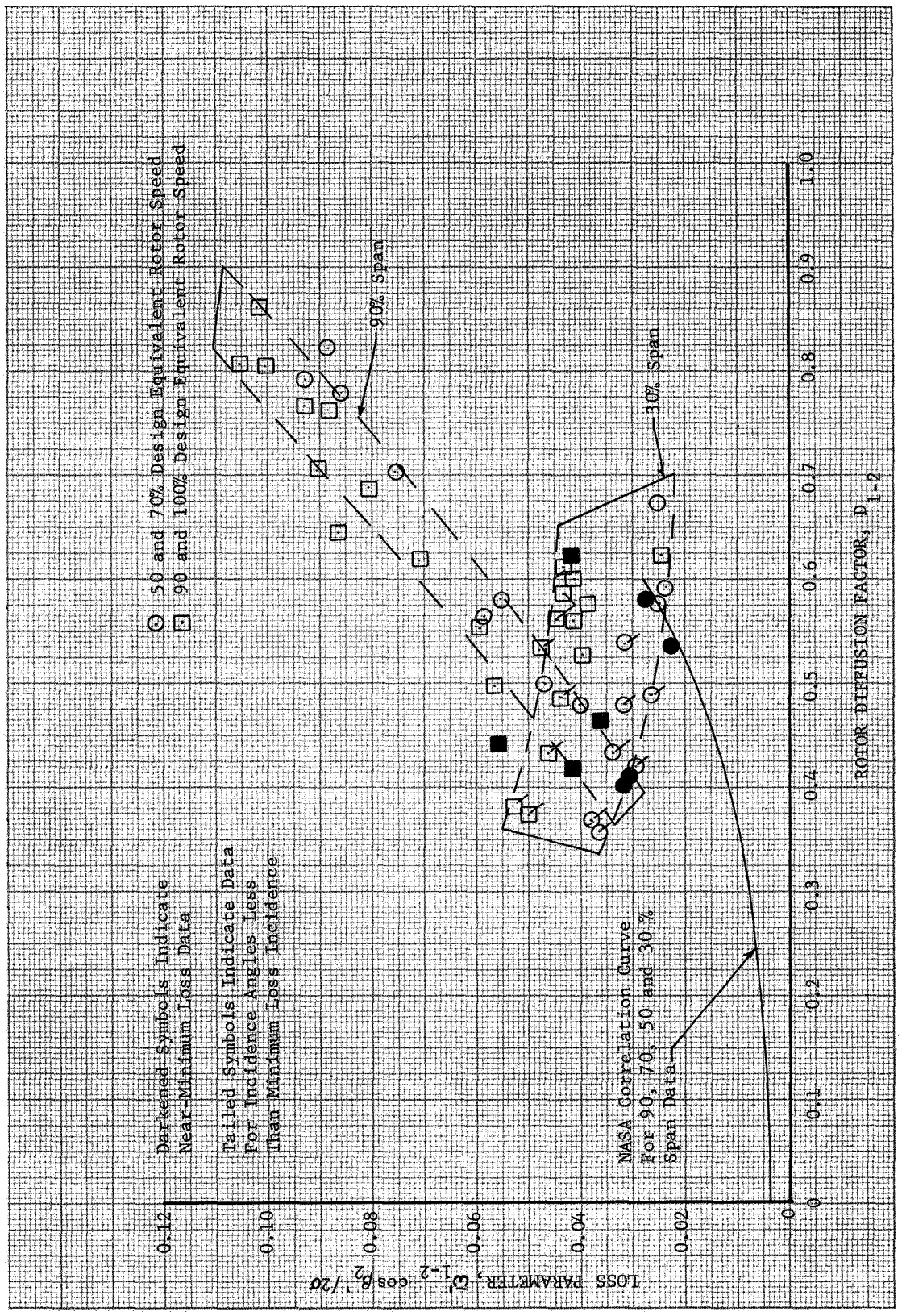


Figure V-19. Variation of Rotor Blade Element Parameters With Incidence; Slotted Rotor 3, 90% Span From Tip

DF 56808



DF 56809

Figure V-20. Loss Parameter vs Diffusion Factor at 90 and 30% Span From Tip - 50, 70, 90, and 100% Design Speed

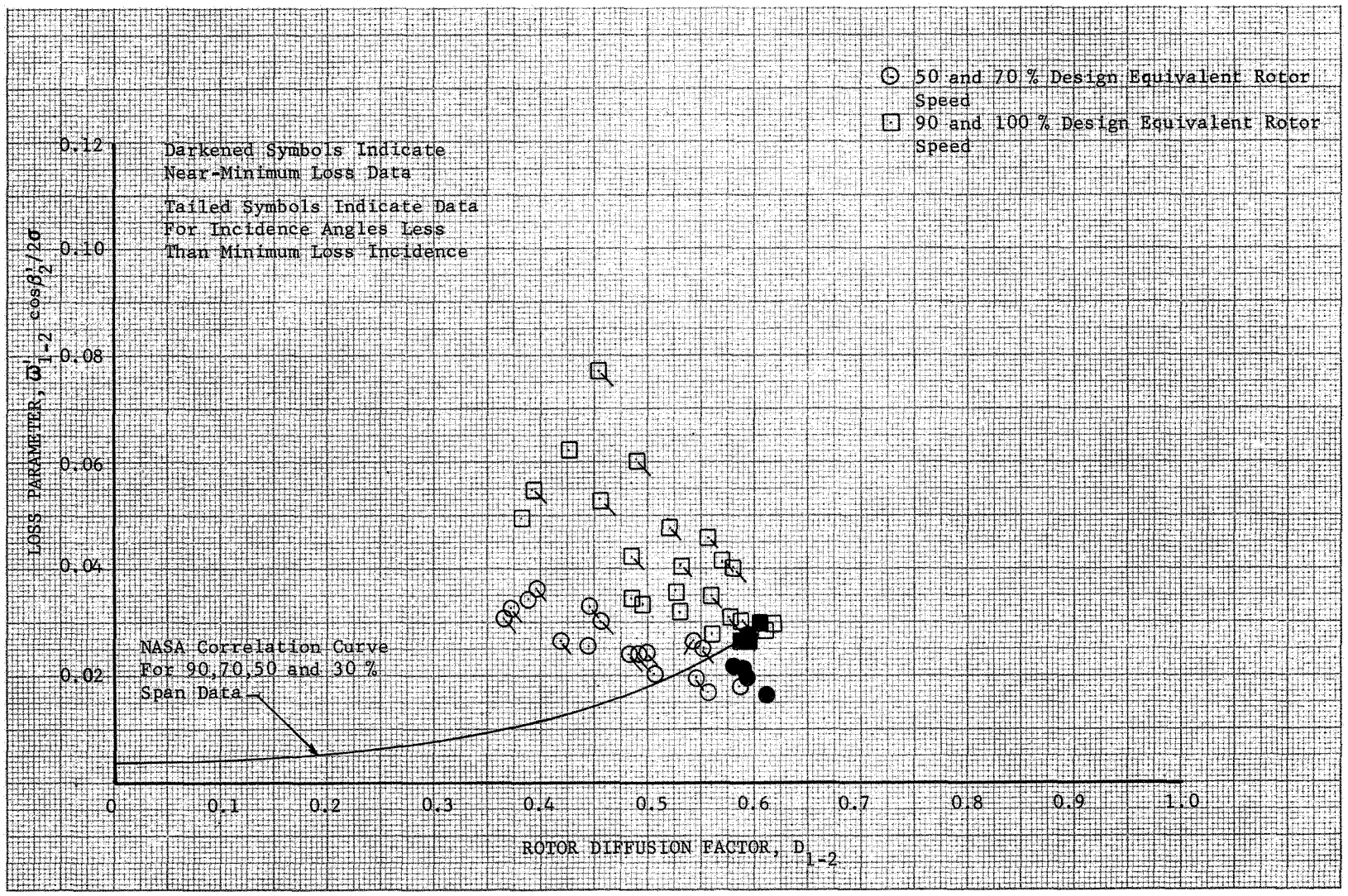
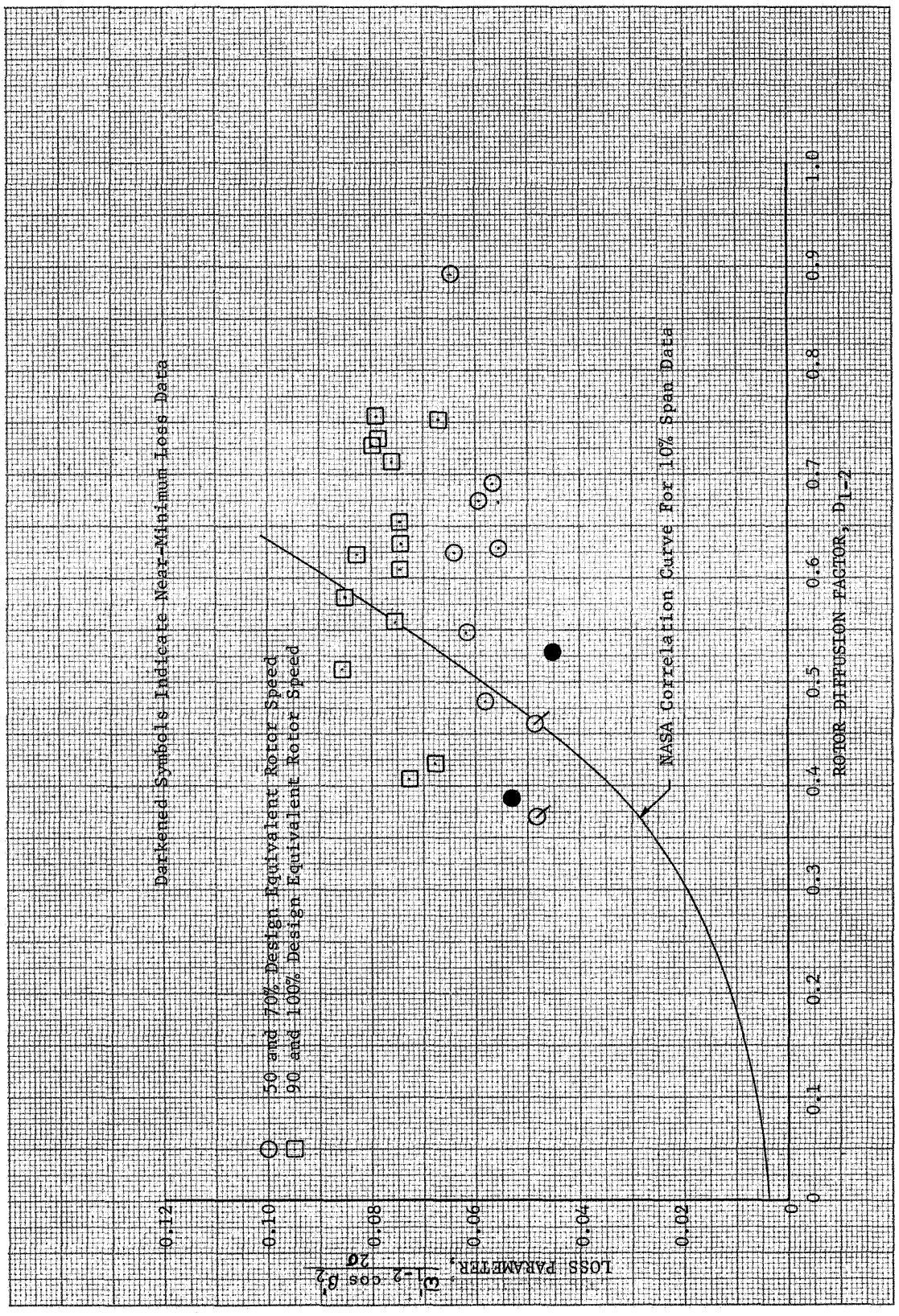


Figure V-21. Loss Parameter vs Diffusion Factor at 70 and 50% Span From Tip - 50, 70, 90, and 100% Design Speed

DF 56810



DF 56811

Figure V-22. Loss Parameter vs Diffusion Factor at 10% Span From Tip - 50, 70, 90, and 100% Design Speed

Major Scale Division: Vertical = 60 ft/sec

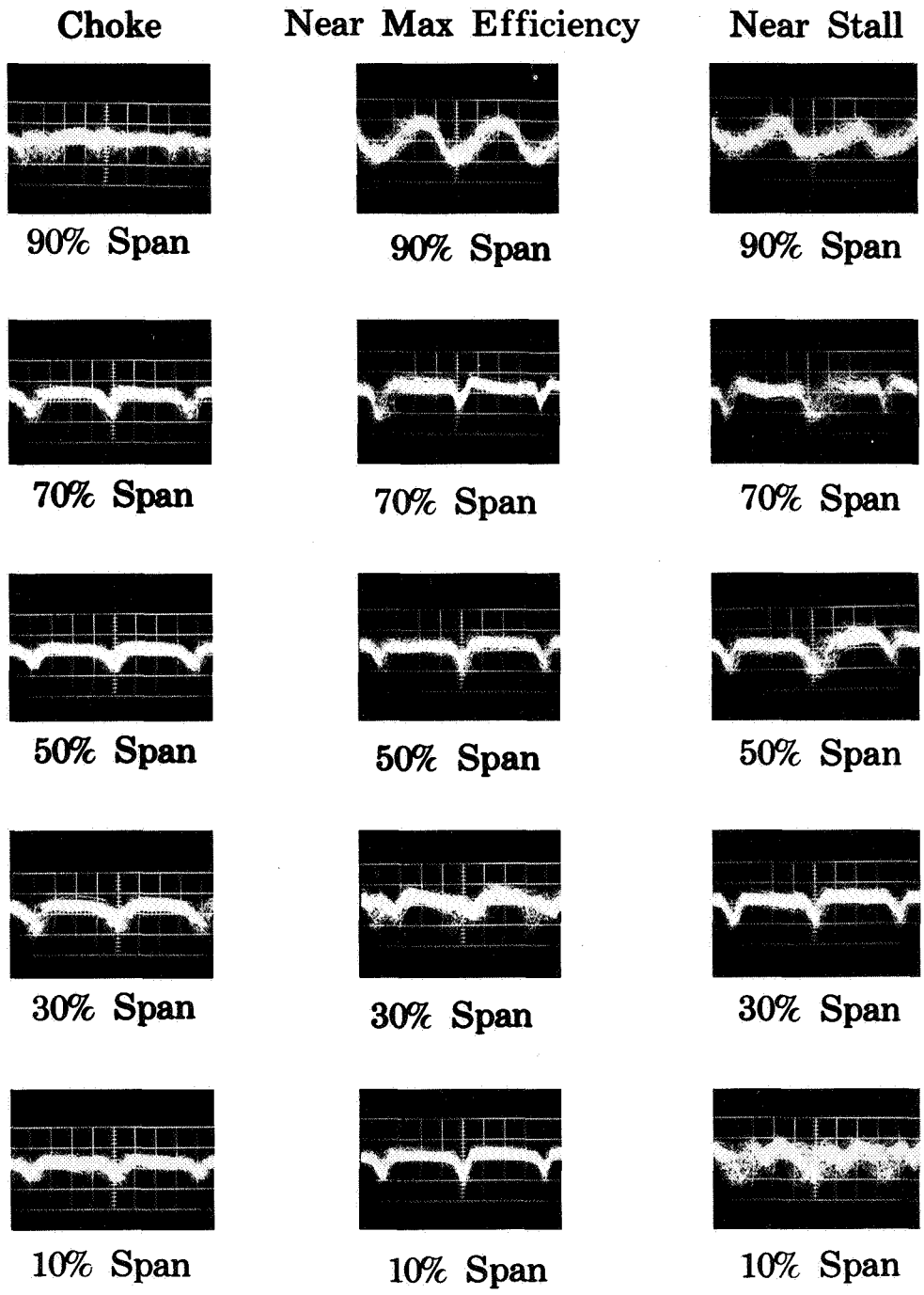


Figure V-23. Rotor Wake Surveys - 70% Design Equivalent Rotor Speed FD 21379

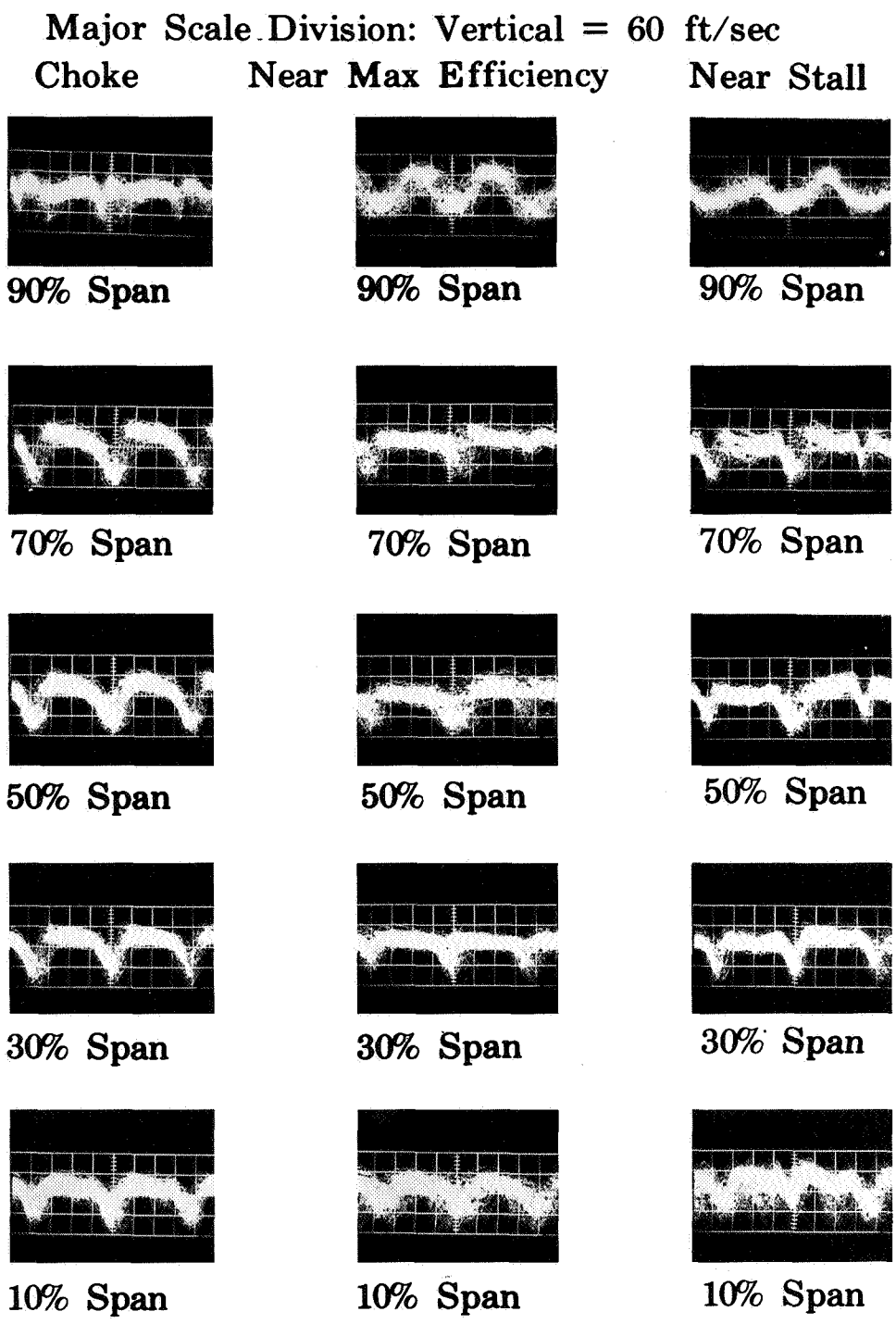


Figure V-24. Rotor Wake Surveys - 90% Design Equivalent Rotor Speed

FD 21380

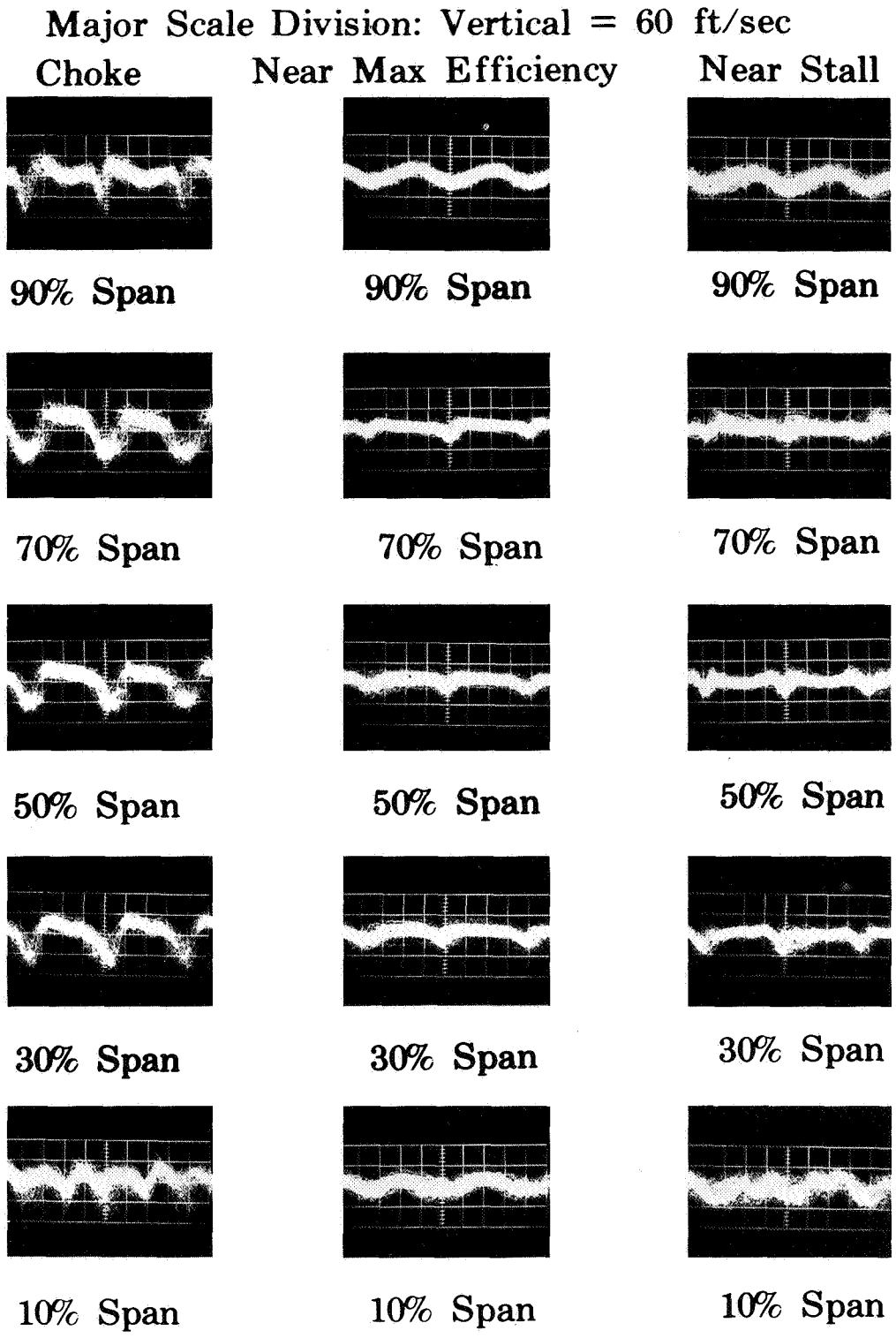


Figure V-25. Rotor Wake Surveys - 100% Design Equivalent Rotor Speed

FD 21381

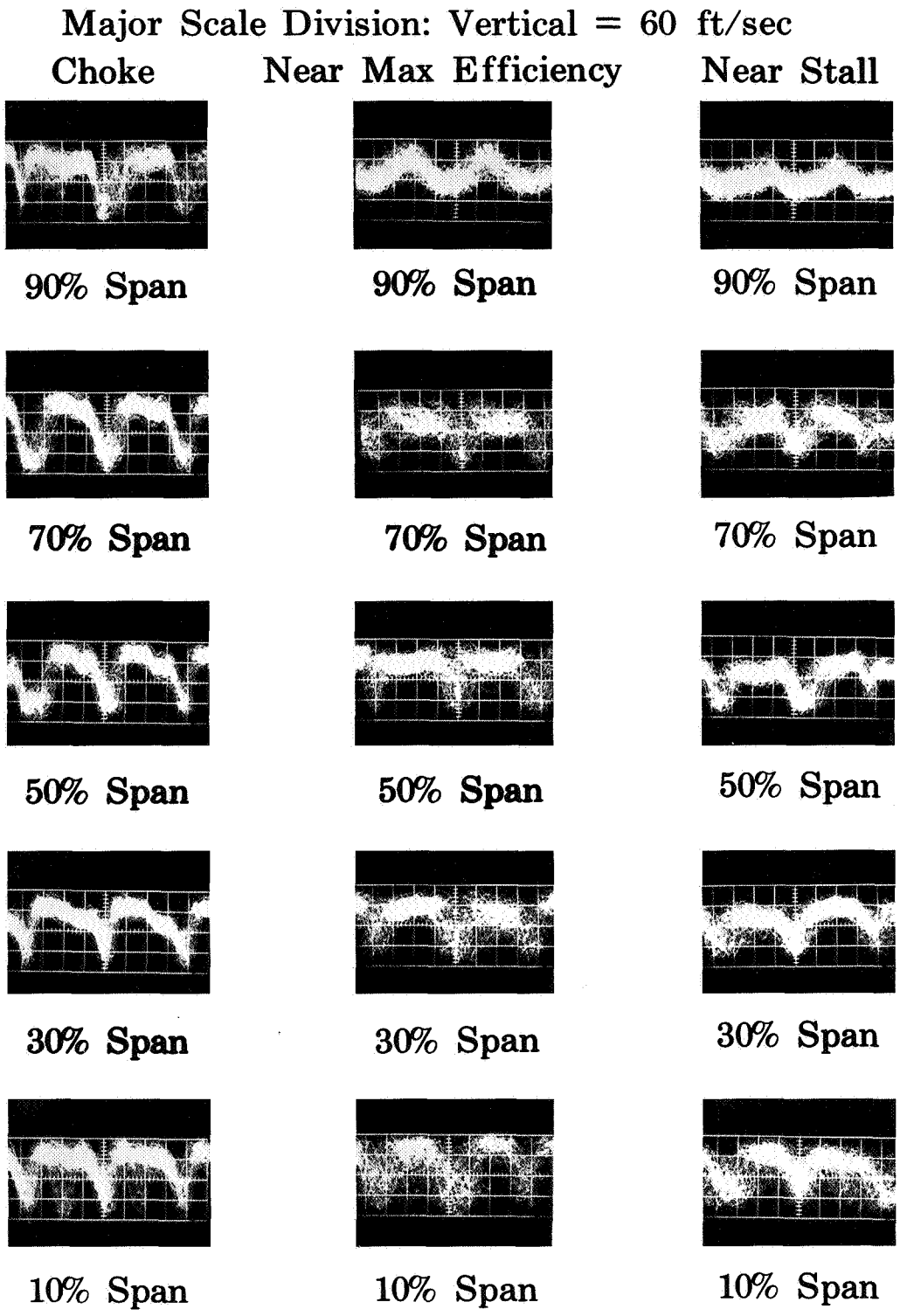


Figure V-26. Rotor Wake Surveys - 110% Design Equivalent Rotor Speed

FD 21382

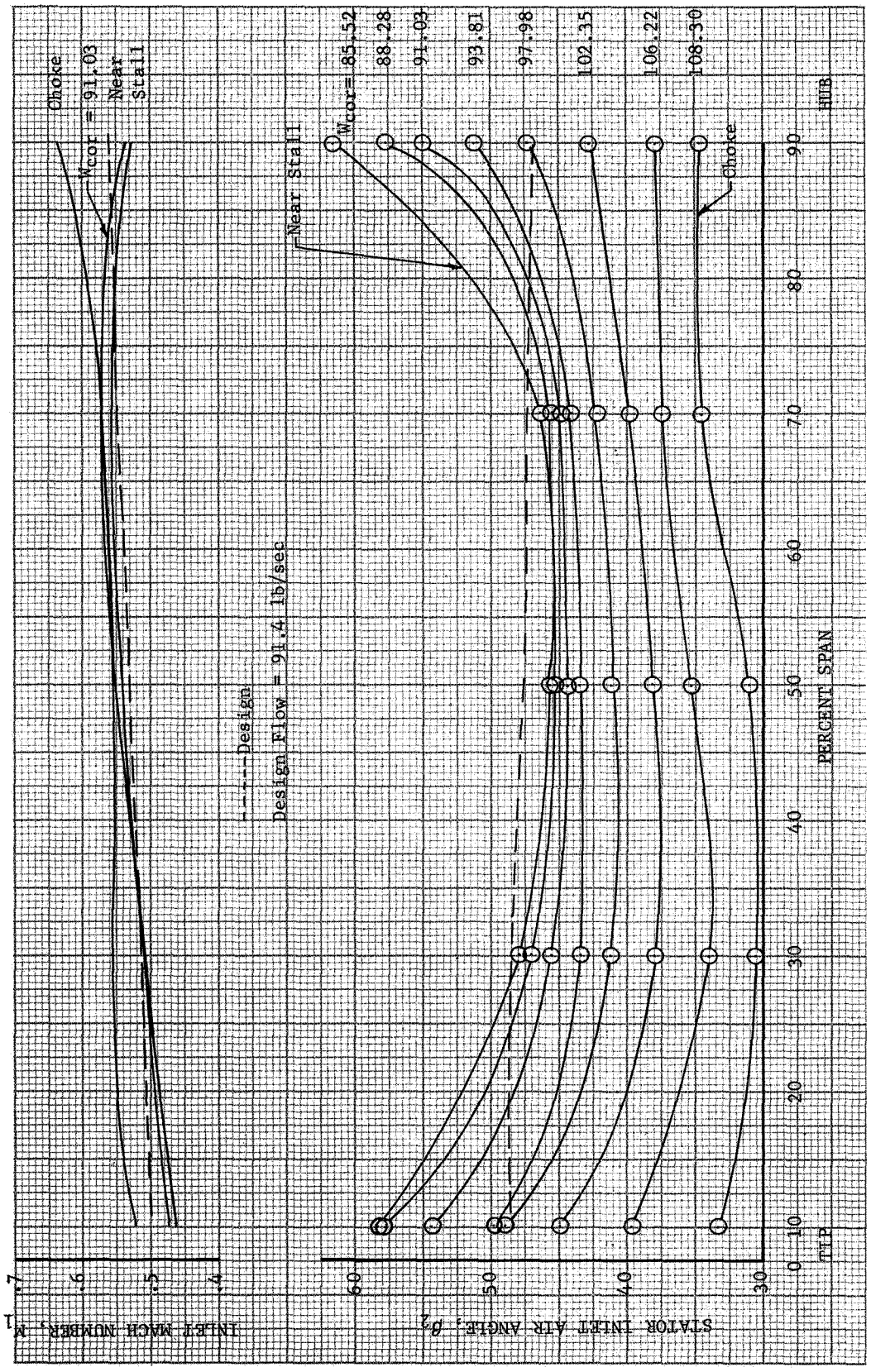


Figure V-27. Stator Inlet Air Angle and Mach Number Distribution, Design Rotor Speed

DF 56812

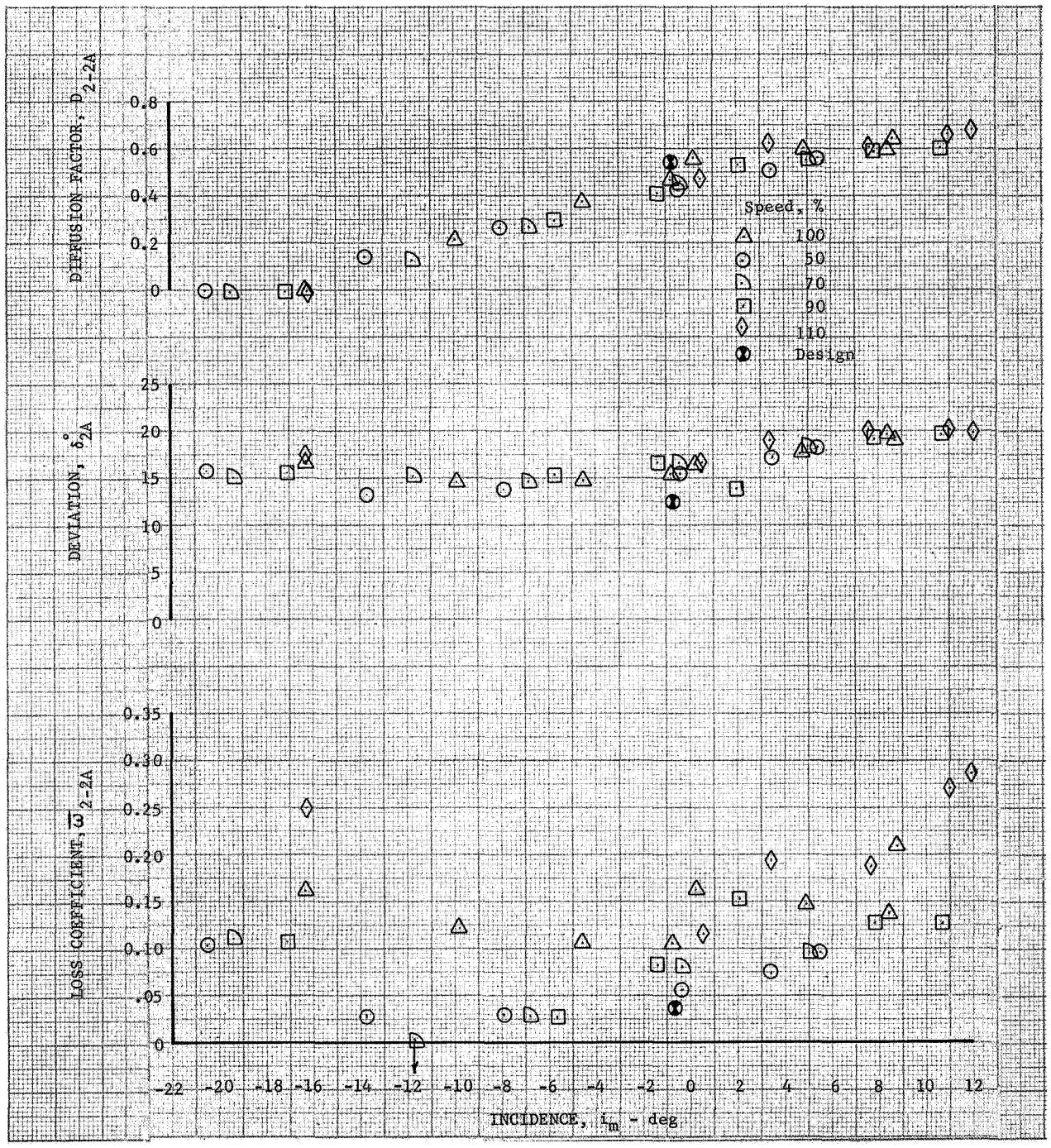


Figure V-28. Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 10% Span From Tip

DF 56813

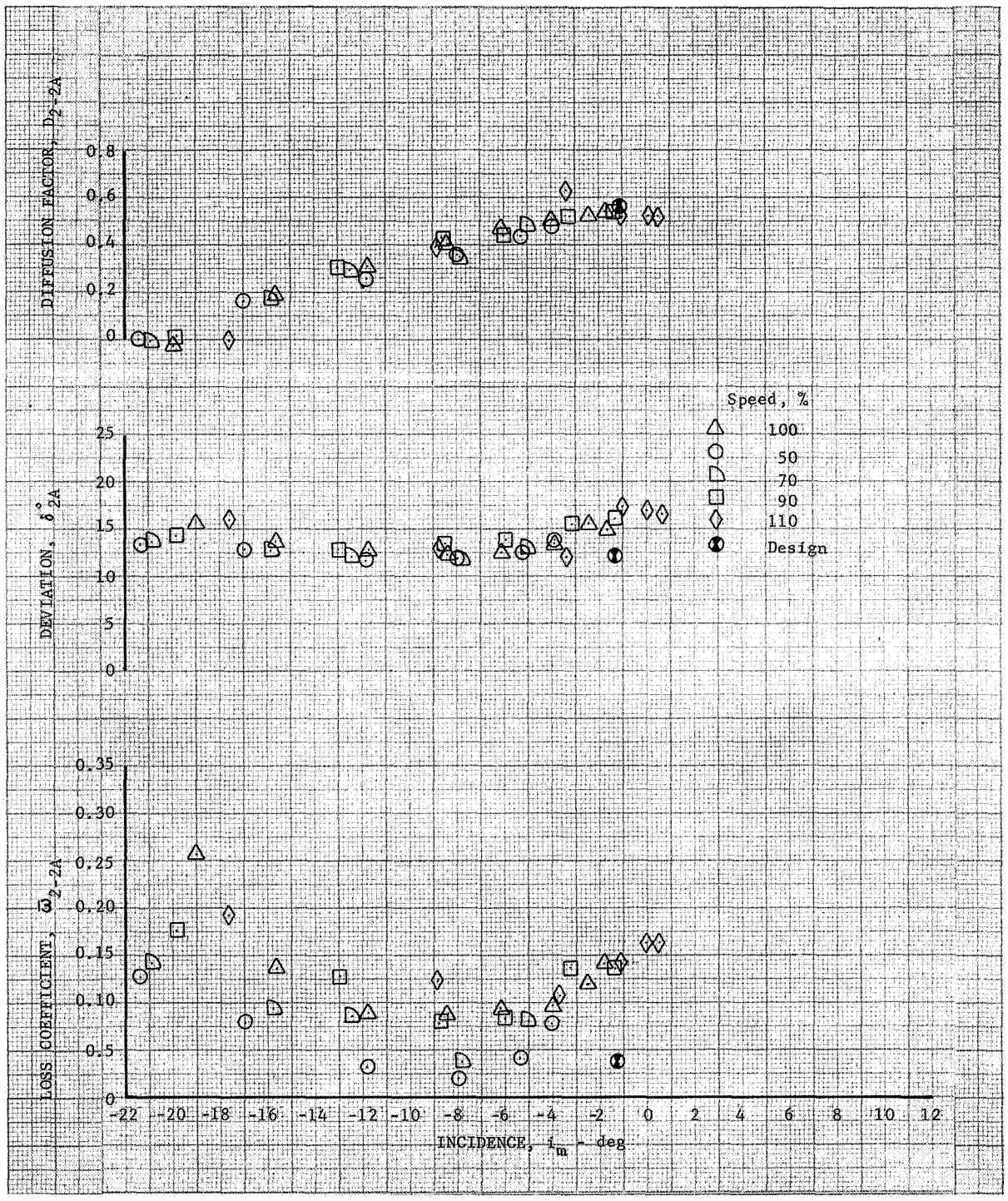


Figure V-29. Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 30% Span From Tip

DF 56814

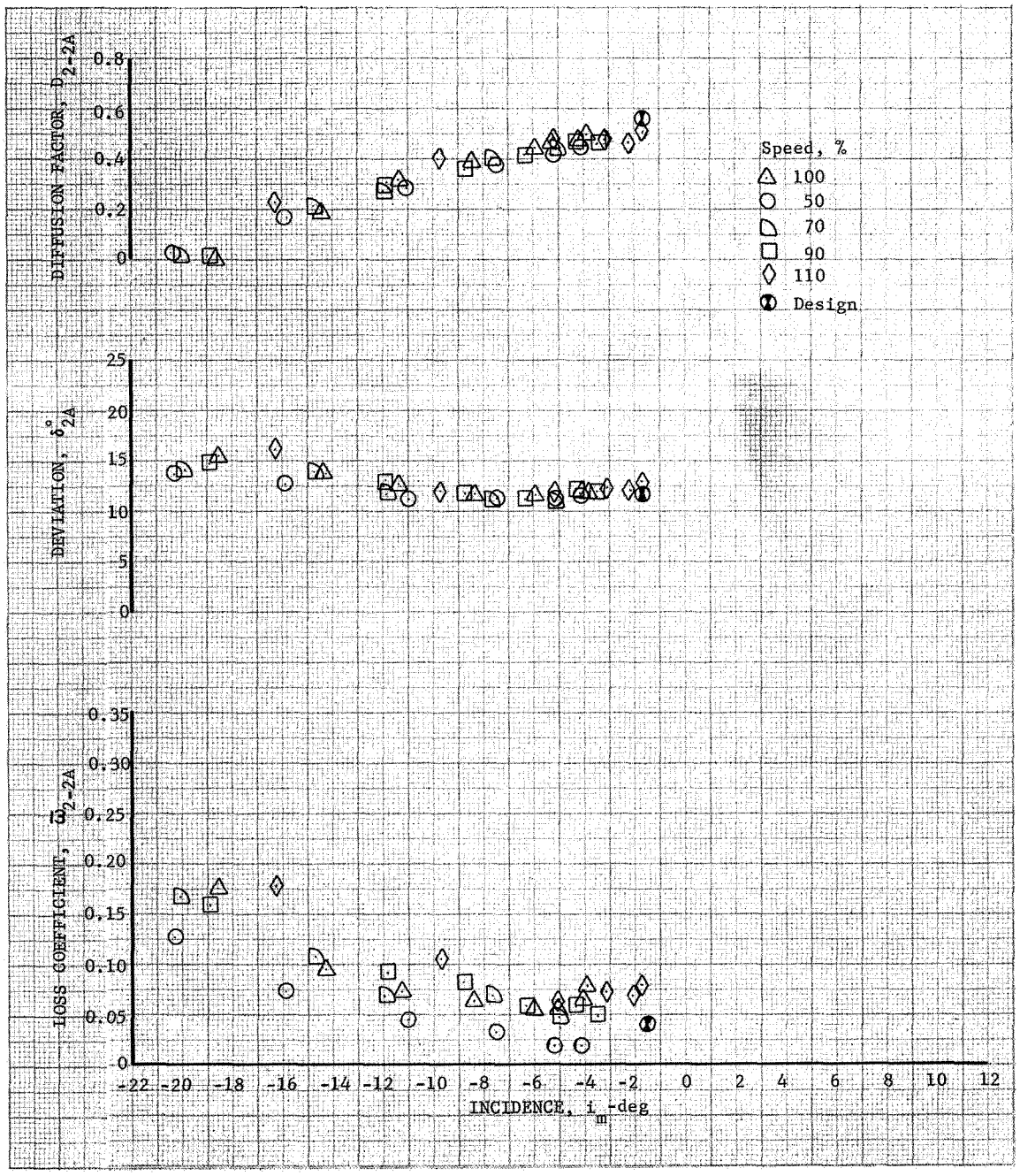


Figure V-30. Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 50% Span From Tip

DF 56815

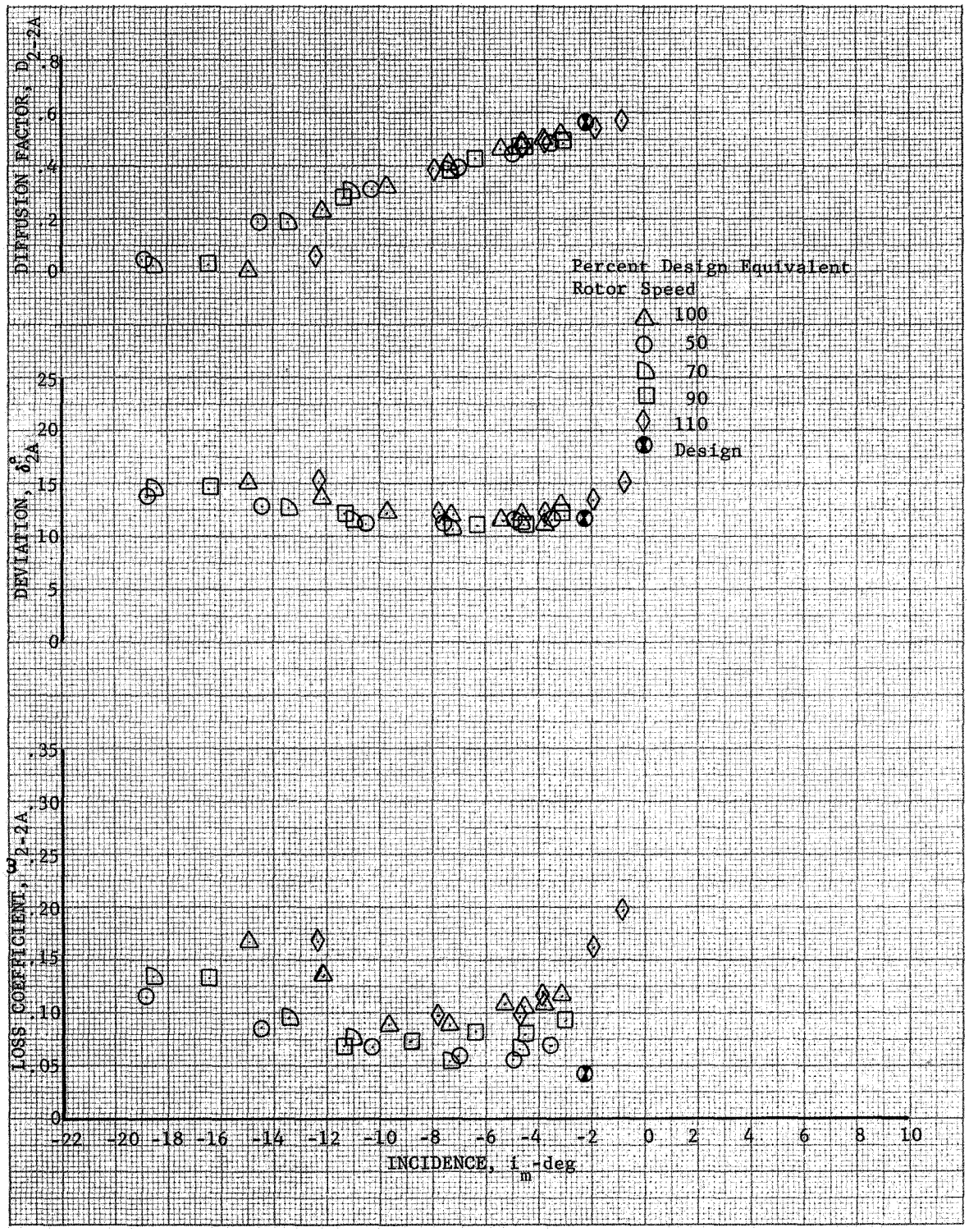


Figure V-31. Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 70% Span From Tip

DF 56816

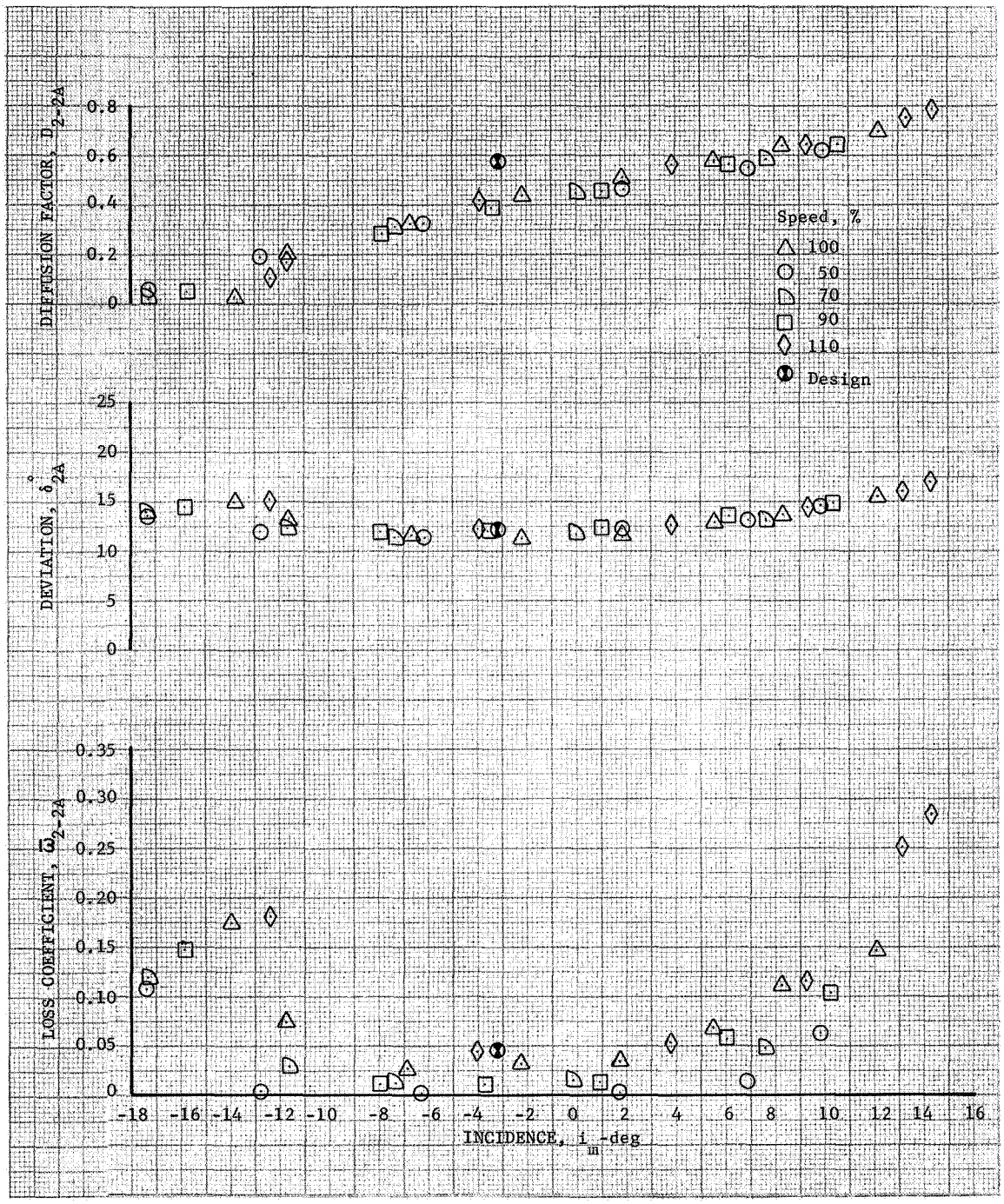


Figure V-32. Variation of Stator Blade Element Parameters With Incidence; Slotted Stator 2, 90% Span From Tip

DF 56817

APPENDIX A
DEFINITION OF SYMBOLS

A. GENERAL NOMENCLATURE

A_A	Flow path annular area, $in.^2$
c	Chord length, in.
D	Diffusion factor
i_m	Incidence angle, deg (based on equivalent circular arc)
M	Absolute Mach number
O	Minimum blade passage gap, in.
O*	Critical blade passage gap, in.
P	Total pressure, psia
p	Static pressure, psia
q	Pressure equivalent of the velocity head, psia
R	Reynolds number based on chord length
S	Blade spacing, in.
s	Blade span, in.
t	Blade maximum thickness, in.
T	Temperature, °R
U	Rotor speed, ft/sec
V	Absolute velocity, ft/sec
W	Actual flow rate, lb_m/sec
β	Absolute air angle, deg
γ	Ratio of specific heats
$\gamma°$	Blade-chord angle, deg
δ	Ratio of total pressure to NASA standard sea level pressure of 2116 psf
$\delta°$	Deviation angle, deg
η_{ad}	Adiabatic efficiency
θ	Ratio of total temperature to NASA standard sea level temperature of 518.7°R
κ	Blade metal angle, deg (based on equivalent circular arc)
ρ	Density, lb_m/ft^3
σ	Solidity, c/S
ϕ	Blade camber angle, $_1 - _2$, deg
$\bar{\omega}$	Total pressure loss coefficient

Subscripts:

0	Guide vane inlet
1	Rotor inlet
2	Rotor exit
2A	Stator exit
z	Axial component
θ	Tangential component

Superscripts:

'	Related to rotor blade
—	Mass-averaged value

B. SLOT NOMENCLATURE

A_2	Slot throat area, $in.^2$
R	Coanda radius, in.
R_p	Pressure surface edge radius, in.
r_1	Slot leading edge radius, in.
r_2	Slot trailing edge radius, in.
t	Blade thickness at intersection of slot centerline and mean camber line, in.
Y_1	Slot capture dimension, in.
Y_2	Slot throat dimension, in.
ψ	Angle formed by slot centerline and mean camber line, deg

C. BLADE ELEMENT TABULATION NOMENCLATURE FOR TABLE B-2

PCT SPAN	Percent span
DIA	Diameter, inches
BETA	Absolute air angle, degrees
BETA(PR)	Relative air angle, degrees
V	Absolute velocity, ft/sec
VZ	Axial component of velocity, ft/sec
V-THETA	Tangential components of absolute velocity, ft/sec
V(PR)	Relative velocity, ft/sec
V-THETA PR	Tangential component of relative velocity, ft/sec
U	Wheel speed, ft/sec

M	Absolute Mach number
M(PR)	Relative Mach number
TURN	Air turning, degrees
TURN(PR)	Relative air turning, degrees
UUBAR	Loss coefficient
DFAC	Diffusion factor
EFFP	Polytropic efficiency
EFF	Adiabatic efficiency
INCID	Incidence, degrees
DEV	Deviation, degrees
LOSS PARA	Loss parameter

APPENDIX B
TABULATED PERFORMANCE

The overall performance and percent rotor and stator bleed flow rates for each test point are presented in table B-1.

Table B-2 presents blade element data for each test point. Definition of the blade element parameters as tabulated in the computer printouts is presented in Appendix A.

Table B-1. Tabulation of Overall Performance and Percent Bleed Flows

Corrected Main Orifice Weight Flow $W\sqrt{\theta}/\delta$, lb/sec	Overall Performance: Stage $\bar{P}_{2A}/P_o$	Stage η_{ad}, %	Rotor $\bar{P}_2/\bar{P}_1$	Rotor η_{ad}, %	Percent Bleed: Rotor	Percent Bleed: Stator
	50% Design Equivalent Rotor Speed					
45.04	1.08	81.53	1.08	82.185	2.04	5.10
45.76	1.08	82.43	1.08	85.000	1.85	4.58
49.3	1.08	85.33	1.08	87.771	1.58	3.86
53.68	1.07	85.15	1.07	87.312	1.32	3.27
58.96	1.06	88.43	1.06	94.903	1.08	3.32
63.33	1.05	83.58	1.05	99.801	0.98	1.90
	70% Design Equivalent Rotor Speed					
63.57	1.15	81.51	1.16	85.01	1.68	4.23
68.41	1.14	83.12	1.15	87.72	1.42	3.48
75.05	1.13	83.24	1.14	89.55	1.19	2.95
78.95	1.11	84.74	1.12	92.95	1.07	2.35
85.19	1.08	78.35	1.11	95.87	0.79	1.37
	90% Design Equivalent Rotor Speed					
76.09	1.24	77.84	1.27	84.09	1.50	4.15
79.74	1.24	78.61	1.26	84.68	1.34	3.75
85.09	1.23	79.24	1.25	84.55	1.18	3.27
89.21	1.21	80.12	1.23	93.99	1.03	2.83
93.73	1.19	78.4	1.22	86.58	0.90	2.42
100.61	1.12	69.57	1.16	91.5	0.79	0.10

Table B-1. Tabulation of Overall Performance and Percent Bleed Flows (Continued)

Corrected Main Orifice Weight Flow $W\sqrt{\theta}/\delta$, lb/sec	Overall Performance: Stage $\bar{P}_{2A}/P_o$	Stage η_{ad}, %	Rotor $\bar{P}_2/\bar{P}_1$	Rotor η_{ad}, %	Percent Bleed: Rotor	Percent Bleed: Stator
	100% Design Equivalent Rotor Speed					
85.52	1.31	76.69	1.34	83.95	1.37	3.86
88.25	1.31	78.29	1.34	85.08	1.25	3.67
91.03	1.30	79.73	1.33	85.76	1.19	3.5
93.81	1.29	78.68	1.31	85.03	1.08	3.25
97.98	1.27	79.03	1.29	85.78	1.0	2.87
102.35	1.24	78.18	1.27	85.86	1.15	3.44
106.22	1.20	74.50	1.24	87.5	0.65	1.80
108.3	1.14	65.3	1.20	89.91	0.52	0.84
	110% Design Equivalent Rotor Speed					
89.53	1.37	72.82	1.42	84.67	1.42	4.11
90.9	1.36	74.27	1.41	84.54	1.39	3.97
94.4	1.37	76.05	1.40	84.22	1.32	3.61
99.57	1.35	77.26	1.38	83.62	1.2	3.2
107.0	1.30	77.02	1.34	84.28	0.94	2.73
112.36	1.16	54.85	1.22	74.53	0.57	0.98

Table B-2. Blade Element Performance

PERCENT DESIGN SPEED = 50.30

CORRECTED WEIGHT FLOW = 45.04

CORRECTED ROTOR SPEED = 2277.70

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.360	1.401	1.689	2.035	2.831
V 0	185.31	185.31	185.31	185.31	185.31
V 1	206.52	203.13	199.99	196.94	191.28
VZ 0	185.30	185.30	185.30	185.30	185.30
VZ 1	206.47	203.07	199.90	196.82	191.05
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	4.90	4.97	5.89	6.99	9.45
M 0	0.1664	0.1664	0.1664	0.1664	0.1664
M 1	0.1856	0.1825	0.1797	0.1769	0.1718
TURN	-1.36	-1.40	-1.69	-2.03	-2.83
UUBAR	0.0071	0.0107	0.0110	0.0096	0.0369
DFAC	-0.102	-0.082	-0.063	-0.043	-0.005
EFFP	0.8329	0.7870	0.7404	0.6829	0.3023
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.630	0.819	1.951	3.125	3.839

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	59.314	45.935	45.311	45.441	54.820
BETA 2A	25.300	22.500	22.275	23.600	28.900
V 2	303.23	323.64	311.34	295.45	265.79
V 2A	190.05	229.86	234.61	212.76	181.41
VZ 2	154.75	225.09	218.95	207.30	153.13
VZ 2A	171.82	212.36	217.11	194.96	158.82
V-THETA 2	260.77	232.55	221.35	210.52	217.24
V-THETA 2A	81.22	87.96	88.93	85.18	87.67
M 2	0.2693	0.2883	0.2774	0.2631	0.2364
M 2A	0.1682	0.2039	0.2083	0.1889	0.1609
TURN	34.014	23.434	23.036	21.841	25.920
UUBAR	0.0637	0.0683	0.0176	0.0754	0.0971
DFAC	0.6203	0.4847	0.4401	0.4812	0.5580
EFFP	1.1891	0.8106	0.9494	0.8852	0.8982
INCID	9.94	-3.44	-4.06	-3.93	5.45
DEV	14.78	11.98	11.76	13.08	18.38
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.360	1.401	1.689	2.035	2.831
BETA 2	59.314	45.935	45.311	45.441	54.820
BETA(PR) 1	57.909	59.485	60.887	62.194	63.673
BETA(PR) 2	25.270	27.256	32.937	38.915	48.866
V 1	206.52	203.13	199.99	196.94	191.28
V 2	303.23	323.64	311.34	295.45	265.79
VZ 1	206.47	203.07	199.90	196.82	191.05
VZ 2	154.75	225.09	218.95	207.30	153.13
V-THETA 1	4.90	4.97	5.89	6.99	9.45
V-THETA 2	260.77	232.55	221.35	210.52	217.24
V(PR) 1	388.6	399.9	410.9	421.9	430.8
V(PR) 2	171.1	253.2	260.9	266.4	232.8
VTHETA PR1	-329.2	-344.5	-359.0	-373.2	-386.1
VTHETA PR2	-73.0	-116.0	-141.8	-167.4	-175.3
U 1	334.15	349.50	364.85	380.20	395.55
U 2	333.82	348.51	363.20	377.89	392.57
M 1	0.1856	0.1825	0.1797	0.1769	0.1718
M 2	0.2693	0.2883	0.2774	0.2631	0.2364
M(PR) 1	0.3493	0.3594	0.3692	0.3791	0.3870
M(PR) 2	0.1520	0.2256	0.2325	0.2373	0.2070
TURN(PR)	32.639	32.229	27.950	23.279	14.807
UUBAR	0.2445	0.0444	0.0523	0.0678	0.1828
DFAC	0.8221	0.6055	0.5961	0.5916	0.6929
EFFP	0.6831	0.8879	0.9201	0.9012	0.8245
EFF	0.6797	0.8865	0.9192	0.9000	0.8227
INCID	-0.89	0.43	1.44	2.04	2.38
LOSS PARAMETER	0.08844	0.01650	0.01910	0.02378	0.05638
DEV	18.370	11.206	9.977	10.165	14.856

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 50.37

CORRECTED WEIGHT FLOW = 45.76

CORRECTED ROTOR SPEED = 2280.60

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.100	1.126	1.843	2.293	2.772
V 0	188.36	188.36	188.36	188.36	188.36
V 1	219.00	215.64	212.33	209.33	204.34
VZ 0	188.35	188.35	188.35	188.35	188.35
VZ 1	218.96	215.60	212.22	209.16	204.10
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	4.21	4.24	6.83	8.37	9.88
M 0	0.1692	0.1692	0.1692	0.1692	0.1692
M 1	0.1969	0.1939	0.1909	0.1881	0.1836
TURN	-1.10	-1.13	-1.84	-2.29	-2.77
UUBAR	0.0051	0.0028	0.0089	0.0114	0.0361
DFAC	-0.152	-0.133	-0.109	-0.088	-0.057
EFFP	0.9183	0.8848	0.8490	0.8190	0.6750
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.370	1.094	1.797	2.867	3.898

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	56.257	44.518	44.232	44.156	52.860
BETA 2A	23.659	21.877	21.887	23.037	27.960
V 2	306.07	331.02	316.21	297.61	270.19
V 2A	209.42	245.54	242.94	224.50	193.54
VZ 2	170.01	236.03	226.57	213.52	163.13
VZ 2A	191.82	227.86	225.43	206.60	170.95
V-THETA 2	254.50	232.09	220.58	207.32	215.39
V-THETA 2A	84.04	91.49	90.57	87.85	90.74
M 2	0.2718	0.2950	0.2817	0.2649	0.2401
M 2A	0.1856	0.2180	0.2159	0.1994	0.1717
TURN	32.597	22.640	22.345	21.119	24.900
UUBAR	0.0137	0.0541	0.0199	0.0417	0.0747
DFAC	0.5481	0.4435	0.4189	0.4361	0.5114
EFFP	2.1787	0.9556	1.1817	1.1910	1.9323
INCID	6.89	-4.85	-5.14	-5.21	3.49
DEV	13.14	11.36	11.37	12.52	17.44
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.100	1.126	1.843	2.293	2.772
BETA 2	56.257	44.518	44.232	44.156	52.860
BETA(PR) 1	56.465	58.050	59.375	60.673	62.143
BETA(PR) 2	25.128	26.341	32.273	38.697	47.445
V 1	219.00	215.64	212.33	209.33	204.34
V 2	306.07	331.02	316.21	297.61	270.19
VZ 1	218.96	215.60	212.22	209.16	204.10
VZ 2	170.01	236.03	226.57	213.52	163.13
V-THETA 1	4.21	4.24	6.83	8.37	9.88
V-THETA 2	254.50	232.09	220.58	207.32	215.39
V(PR) 1	396.3	407.4	416.6	427.0	436.8
V(PR) 2	187.8	263.4	268.0	273.6	241.2
VTHETA PR1	-330.4	-345.7	-358.5	-372.3	-386.2
VTHETA PR2	-79.7	-116.9	-143.1	-171.0	-177.7
U 1	334.58	349.95	365.32	380.69	396.06
U 2	334.24	348.95	363.66	378.37	393.07
M 1	0.1969	0.1939	0.1909	0.1881	0.1836
M 2	0.2718	0.2950	0.2817	0.2649	0.2401
M(PR) 1	0.3564	0.3663	0.3745	0.3838	0.3925
M(PR) 2	0.1667	0.2347	0.2387	0.2435	0.2143
TURN(PR)	31.338	31.709	27.102	21.976	14.698
UUBAR	0.2377	0.0496	0.0592	0.0720	0.1878
DFAC	0.7779	0.5881	0.5828	0.5749	0.6754
EFFP	0.6460	0.8717	0.8800	0.8349	0.7437
EFF	0.6423	0.8702	0.8786	0.8330	0.7410
INCID	-2.33	-1.00	-0.07	0.52	0.85
LOSS PARAMETER	0.08608	0.01858	0.02177	0.02533	0.05928
DEV	18.228	10.291	9.313	9.947	13.435

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 50.40

CORRECTED WEIGHT FLOW = 49.30

CORRECTED ROTOR SPEED = 2282.17

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.008	1.276	1.968	2.684	3.324
V 0	203.37	203.37	203.37	203.37	203.37
V 1	234.58	231.17	227.25	225.42	220.16
VZ 0	203.37	203.37	203.37	203.37	203.37
VZ 1	234.54	231.11	227.12	225.17	219.79
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	4.13	5.15	7.80	10.56	12.77
M 0	0.1828	0.1828	0.1828	0.1828	0.1828
M 1	0.2110	0.2079	0.2044	0.2027	0.1980
TURN	-1.01	-1.28	-1.97	-2.68	-3.32
UUBAR	0.0041	0.0032	0.0154	0.0041	0.0298
DFAC	-0.144	-0.124	-0.098	-0.081	-0.050
EFFP	0.9246	0.8921	0.8338	0.8590	0.7112
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.278	0.944	1.672	2.476	3.346

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	51.174	42.376	41.857	41.483	48.978
BETA 2A	22.660	21.586	21.757	22.358	26.141
V 2	312.61	339.36	323.20	304.14	275.92
V 2A	232.64	263.62	257.71	245.49	214.03
VZ 2	195.99	250.70	240.72	227.85	181.10
VZ 2A	214.69	245.13	239.35	227.03	192.14
V-THETA 2	243.54	228.73	215.66	201.46	208.17
V-THETA 2A	89.63	96.99	95.53	93.38	94.30
M 2	0.2779	0.3026	0.2882	0.2709	0.2455
M 2A	0.2065	0.2344	0.2293	0.2184	0.1901
TURN	28.514	20.790	20.100	19.125	22.837
UUBAR	0.0046	0.0579	0.0312	0.0189	0.0556
DFAC	0.4612	0.3926	0.3720	0.3616	0.4281
EFFP	2.9892	1.0624	1.4286	1.6585	1.3974
INCID	1.80	-6.99	-7.51	-7.89	-0.39
DEV	12.14	11.07	11.24	11.84	15.62
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.008	1.276	1.968	2.684	3.324
BETA 2	51.174	42.376	41.857	41.483	48.978
BETA(PR) 1	54.653	56.185	57.591	58.703	60.187
BETA(PR) 2	24.890	25.665	31.626	37.867	45.637
V 1	234.58	231.17	227.25	225.42	220.16
V 2	312.61	339.36	323.20	304.14	275.92
VZ 1	234.54	231.11	227.12	225.17	219.79
VZ 2	195.99	250.70	240.72	227.85	181.10
V-THETA 1	4.13	5.15	7.80	10.56	12.77
V-THETA 2	243.54	228.73	215.66	201.46	208.17
V(PR) 1	405.4	415.3	423.8	433.5	442.1
V(PR) 2	216.1	278.1	282.7	288.6	259.0
VTHETA PR1	-330.7	-345.0	-357.8	-370.4	-383.6
VTHETA PR2	-90.9	-120.5	-148.2	-177.2	-185.2
U 1	334.81	350.19	365.57	380.95	396.33
U 2	334.47	349.19	363.91	378.63	393.34
M 1	0.2110	0.2079	0.2044	0.2027	0.1980
M 2	0.2779	0.3026	0.2882	0.2709	0.2455
M(PR) 1	0.3647	0.3736	0.3811	0.3898	0.3975
M(PR) 2	0.1920	0.2480	0.2521	0.2571	0.2304
TURN(PR)	29.763	30.521	25.965	20.836	14.550
UUBAR	0.2074	0.0451	0.0531	0.0628	0.1710
DFAC	0.7025	0.5561	0.5491	0.5381	0.6283
EFFP	0.6582	0.8820	0.8874	0.8455	0.7713
EFF	0.6547	0.8806	0.8861	0.8438	0.7691
INCID	-4.15	-2.86	-1.86	-1.45	-1.10
LOSS(PARAMETER	0.07525	0.01699	0.01967	0.02235	0.05581
DEV	17.990	9.615	8.666	9.117	11.627

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 50.23

CORRECTED WEIGHT FLOW = 53.68

CORRECTED ROTOR SPEED = 2274.56

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.049	1.361	2.088	2.542	3.501
V 0	222.12	222.12	222.12	222.12	222.12
V 1	254.71	251.13	247.67	244.93	239.35
VZ 0	222.12	222.12	222.12	222.12	222.12
VZ 1	254.66	251.05	247.50	244.69	238.90
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	4.66	5.96	9.02	10.86	14.61
M 0	0.1998	0.1998	0.1998	0.1998	0.1998
M 1	0.2293	0.2261	0.2229	0.2204	0.2154
TURN	-1.05	-1.36	-2.09	-2.54	-3.50
UUBAR	0.0300	-0.0206	-0.0129	-0.0129	0.0151
DFAC	-0.137	-0.117	-0.094	-0.077	-0.043
EFFP	1.0195	0.9859	0.9512	0.9436	0.7789
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.319	0.859	1.552	2.618	3.169

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	43.152	38.890	38.328	37.645	41.444
BETA 2A	22.056	21.983	21.653	22.428	24.458
V 2	323.35	344.99	328.50	308.67	278.62
V 2A	267.77	288.15	281.85	269.78	245.85
VZ 2	235.89	268.53	257.70	244.41	208.86
VZ 2A	248.18	267.20	261.96	249.38	223.79
V-THETA 2	221.15	216.60	203.73	188.53	184.42
V-THETA 2A	100.55	107.86	104.00	102.93	101.79
M 2	0.2876	0.3078	0.2930	0.2750	0.2479
M 2A	0.2384	0.2568	0.2513	0.2405	0.2189
TURN	21.096	16.907	16.675	15.217	16.986
UUBAR	0.0036	0.0661	0.0434	0.0324	0.0294
DFAC	0.3275	0.3024	0.2804	0.2579	0.2644
EFFP	4.0884	2.3104	9.4286	-3.1058	-2.1484
INCID	-6.22	-10.48	-11.04	-11.72	-7.93
DEV	11.54	11.46	11.13	11.91	13.94
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.049	1.361	2.088	2.542	3.501
BETA 2	43.152	38.890	38.328	37.645	41.444
BETA(PR) 1	52.261	53.803	55.141	56.437	57.870
BETA(PR) 2	25.440	26.080	31.669	37.691	44.830
V 1	254.71	251.13	247.67	244.93	239.35
V 2	323.35	344.99	328.50	308.67	278.62
VZ 1	254.66	251.05	247.50	244.69	238.90
VZ 2	235.89	268.53	257.70	244.41	208.86
V-THETA 1	4.66	5.96	9.02	10.86	14.61
V-THETA 2	221.15	216.60	203.73	188.53	184.42
V(PR) 1	416.1	425.1	433.0	442.6	449.2
V(PR) 2	261.2	299.0	302.8	308.9	294.5
VTHETA PR1	-329.0	-343.1	-355.3	-368.8	-380.4
VTHETA PR2	-112.2	-131.4	-159.0	-188.8	-207.6
U 1	333.69	349.02	364.35	379.68	395.01
U 2	333.36	348.03	362.70	377.36	392.03
M 1	0.2293	0.2261	0.2229	0.2204	0.2154
M 2	0.2876	0.3078	0.2930	0.2750	0.2479
M(PR) 1	0.3746	0.3827	0.3898	0.3983	0.4042
M(PR) 2	0.2324	0.2667	0.2700	0.2752	0.2620
TURN(PR)	26.821	27.723	23.471	18.747	13.040
UUBAR	0.1528	0.0543	0.0643	0.0746	0.1356
DFAC	0.5797	0.5047	0.4992	0.4883	0.5283
EFFP	0.6276	0.8147	0.8108	0.7639	0.6826
EFF	0.6241	0.8127	0.8088	0.7616	0.6798
INCID	-6.54	-5.25	-4.31	-3.71	-3.42
LOSS PARAMETER	0.05519	0.02039	0.023812	0.02661	0.04490
DEV	18.540	10.030	8.709	8.941	10.820

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 50.22

CORRECTED WEIGHT FLOW = 58.96

CORRECTED ROTOR SPEED = 2273.89

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.948	1.366	2.042	2.526	3.579
V 0	244.98	244.98	244.98	244.98	244.98
V 1	278.29	274.91	271.55	269.54	263.39
VZ 0	244.98	244.98	244.98	244.98	244.98
VZ 1	278.25	274.84	271.38	269.28	262.88
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	4.60	6.55	9.68	11.88	16.44
M 0	0.2205	0.2205	0.2205	0.2205	0.2205
M 1	0.2508	0.2477	0.2447	0.2428	0.2372
TURN	-0.95	-1.37	-2.04	-2.53	-3.58
UUBAR	0.0251	-0.0169	-0.0092	-0.0141	0.0182
DFAC	-0.127	-0.108	-0.088	-0.075	-0.040
EFFP	1.0185	0.9870	0.9512	0.9699	0.7843
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.218	0.854	1.598	2.634	3.091

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	36.658	34.864	33.519	32.510	35.671
BETA 2A	22.673	23.410	23.277	23.437	24.086
V 2	347.80	355.77	337.98	319.45	285.81
V 2A	318.54	322.06	309.98	293.78	272.77
VZ 2	279.00	291.92	281.78	269.39	232.19
VZ 2A	293.92	295.55	284.75	269.54	249.02
V-THETA 2	207.65	203.37	186.64	171.69	166.66
V-THETA 2A	122.79	127.96	122.50	116.85	111.32
M 2	0.3103	0.3180	0.3019	0.2851	0.2547
M 2A	0.2848	0.2881	0.2774	0.2627	0.2435
TURN	13.985	11.453	10.242	9.073	11.585
UUBAR	0.0362	0.0839	0.0713	0.0797	0.0263
DFAC	0.1860	0.1874	0.1696	0.1623	0.1419
EFFP	0.5932	-1.1247	-0.4724	-0.3019	-0.2178
INCID	-12.71	-14.51	-15.85	-16.86	-13.70
DEV	12.15	12.89	12.76	12.92	13.57
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.948	1.366	2.042	2.526	3.579
BETA 2	36.658	34.864	33.519	32.510	35.671
BETA(PR) 1	49.776	51.244	52.570	53.782	55.215
BETA(PR) 2	24.238	26.344	31.982	37.346	44.132
V 1	278.29	274.91	271.55	269.54	263.39
V 2	347.80	355.77	337.98	319.45	285.81
VZ 1	278.25	274.84	271.38	269.28	262.88
VZ 2	279.00	291.92	281.78	269.39	232.19
V-THETA 1	4.60	6.55	9.68	11.88	16.44
V-THETA 2	207.65	203.37	186.64	171.69	166.66
V(PR) 1	430.9	439.0	446.5	455.7	460.8
V(PR) 2	306.0	325.7	332.2	338.9	323.5
VTHETA PR1	-329.0	-342.4	-354.6	-367.7	-378.4
VTHETA PR2	-125.6	-144.6	-175.9	-205.6	-225.3
U 1	333.59	348.92	364.24	379.57	394.89
U 2	333.26	347.92	362.59	377.25	391.92
M 1	0.2508	0.2477	0.2447	0.2428	0.2372
M 2	0.3103	0.3180	0.3019	0.2851	0.2547
M(PR) 1	0.3883	0.3956	0.4023	0.4106	0.4150
M(PR) 2	0.2730	0.2912	0.2968	0.3025	0.2883
TURN(PR)	25.538	24.899	20.589	16.437	11.083
UUBAR	0.1104	0.0687	0.0725	0.0834	0.1478
DFAC	0.4778	0.4463	0.4311	0.4195	0.4572
EFFP	0.6871	0.8195	0.7871	0.7291	0.6222
EFF	0.6842	0.8177	0.7851	0.7269	0.6195
INCID	-9.02	-7.81	-6.88	-6.37	-6.07
LOSS PARAMETER	0.04026	0.02574	0.02676	0.02989	0.04953
DEV	17.338	10.294	9.022	8.596	10.122

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 50.23

CORRECTED WEIGHT FLOW = 63.33

CORRECTED ROTOR SPEED = 2274.34

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.945	1.394	2.307	2.849	3.534
V 0	264.09	264.09	264.09	264.09	264.09
V 1	302.29	299.86	294.88	291.11	284.91
VZ 0	264.08	264.08	264.08	264.08	264.08
VZ 1	302.25	299.77	294.64	290.75	284.36
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	4.98	7.29	11.87	14.47	17.56
M 0	0.2379	0.2379	0.2379	0.2379	0.2379
M 1	0.2728	0.2705	0.2660	0.2625	0.2569
TURN	-0.94	-1.39	-2.31	-2.85	-3.53
UUBAR	0.0215	-0.0278	-0.0123	-0.0077	0.0171
DFAC	-0.136	-0.121	-0.093	-0.074	-0.044
EFFP	1.0138	1.0388	0.9792	0.9549	0.8141
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.215	0.826	1.333	2.311	3.136

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	32.076	30.535	29.006	28.046	28.863
BETA 2A	24.035	24.575	24.403	24.179	25.905
V 2	374.07	361.95	347.96	324.30	294.94
V 2A	371.46	362.06	349.69	331.78	313.37
VZ 2	316.96	311.75	304.31	286.22	258.30
VZ 2A	339.25	329.27	318.45	302.67	281.88
V-THETA 2	198.65	183.89	168.72	152.48	142.37
V-THETA 2A	151.29	150.58	144.48	135.89	136.91
M 2	0.3346	0.3240	0.3114	0.2900	0.2634
M 2A	0.3338	0.3252	0.3142	0.2977	0.2807
TURN	8.041	5.960	4.603	3.866	2.958
UUBAR	0.1061	0.1134	0.1270	0.1288	0.1038
DFAC	0.0599	0.0402	0.0273	0.0020	-0.0521
EFFP	0.2330	0.3439	0.3385	0.4352	0.5416
INCID	-17.29	-18.84	-20.36	-21.32	-20.51
DEV	13.52	14.06	13.88	13.66	15.39
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.945	1.394	2.307	2.849	3.534
BETA 2	32.076	30.535	29.006	28.046	28.863
BETA(PR) 1	47.398	48.740	50.104	51.473	53.003
BETA(PR) 2	23.021	27.762	32.509	38.152	44.021
V 1	302.29	299.86	294.88	291.11	284.91
V 2	374.07	361.95	347.96	324.30	294.94
VZ 1	302.25	299.77	294.64	290.75	284.36
VZ 2	316.96	311.75	304.31	286.22	258.30
V-THETA 1	4.98	7.29	11.87	14.47	17.56
V-THETA 2	198.65	183.89	168.72	152.48	142.37
V(PR) 1	446.5	454.5	459.4	466.8	472.5
V(PR) 2	344.4	352.3	360.9	364.0	359.2
VTHETA PR1	-328.7	-341.7	-352.4	-365.2	-377.4
VTHETA PR2	-134.7	-164.1	-193.9	-224.8	-249.6
U 1	333.66	348.99	364.31	379.64	394.97
U 2	333.33	347.99	362.66	377.33	392.00
M 1	0.2728	0.2705	0.2660	0.2625	0.2569
M 2	0.3346	0.3240	0.3114	0.2900	0.2634
M(PR) 1	0.4029	0.4101	0.4144	0.4210	0.4260
M(PR) 2	0.3080	0.3154	0.3229	0.3254	0.3208
TURN(PR)	24.377	20.978	17.595	13.320	8.982
UUBAR	0.0870	0.0921	0.0828	0.1034	0.1433
DFAC	0.4018	0.3883	0.3657	0.3583	0.3699
EFFP	0.7175	0.7628	0.7402	0.6646	0.5652
EFF	0.7150	0.7608	0.7381	0.6623	0.5627
INCID	-11.40	-10.31	-9.35	-8.68	-8.29
LOSS PARAMETER	0.03203	0.03407	0.03038	0.03666	0.04811
DEV	16.121	11.712	9.549	9.402	10.011

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 70.17

CORRECTED WEIGHT FLOW = 63.57

CORRECTED ROTOR SPEED = 3177.20

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.906	1.277	2.124	2.723	3.553
V 0	265.17	265.17	265.17	265.17	265.17
V 1	309.31	304.14	299.02	295.44	287.97
VZ 0	265.17	265.17	265.17	265.17	265.17
VZ 1	309.27	304.07	298.81	295.11	287.42
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	4.89	6.78	11.08	14.03	17.84
M 0	0.2389	0.2389	0.2389	0.2389	0.2389
M 1	0.2792	0.2745	0.2698	0.2665	0.2597
TURN	-0.91	-1.28	-2.12	-2.72	-3.55
UUBAR	0.0266	-0.0162	-0.0070	-0.0119	0.0159
DFAC	-0.158	-0.134	-0.106	-0.087	-0.051
EFFP	1.1275	1.1092	1.0895	1.1242	1.0075
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.176	0.943	1.516	2.437	3.117

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	56.985	44.742	44.221	44.430	54.480
BETA 2A	23.746	21.557	21.719	23.538	29.079
V 2	425.38	458.08	442.44	414.00	375.93
V 2A	276.15	333.58	330.69	296.53	257.17
VZ 2	231.77	325.37	317.08	295.64	218.41
VZ 2A	252.77	310.25	307.22	271.85	224.76
V-THETA 2	356.69	322.45	308.57	289.81	305.97
V-THETA 2A	111.20	122.57	122.38	118.42	124.99
M 2	0.3748	0.4063	0.3923	0.3665	0.3311
M 2A	0.2422	0.2936	0.2915	0.2611	0.2262
TURN	33.239	23.185	22.501	20.891	25.401
UUBAR	0.0488	0.0628	0.0451	0.0824	0.0921
DFAC	0.5916	0.4621	0.4442	0.4802	0.5535
EFFP	1.5626	0.8741	1.0637	1.0425	3.0306
INCID	7.62	-4.63	-5.15	-4.94	5.11
DEV	13.23	11.04	11.20	13.02	18.56
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.906	1.277	2.124	2.723	3.553
BETA 2	56.985	44.742	44.221	44.430	54.480
BETA(PR) 1	56.156	57.687	59.028	60.249	61.706
BETA(PR) 2	25.178	26.706	31.991	38.753	47.890
V 1	309.31	304.14	299.02	295.44	287.97
V 2	425.38	458.08	442.44	414.00	375.93
VZ 1	309.27	304.07	298.81	295.11	287.42
VZ 2	231.77	325.37	317.08	295.64	218.41
V-THETA 1	4.89	6.78	11.08	14.03	17.84
V-THETA 2	356.69	322.45	308.57	289.81	305.97
V(PR) 1	555.3	568.8	580.6	594.7	606.4
V(PR) 2	256.1	364.2	373.9	379.1	325.7
VTHETA PR1	-461.2	-480.7	-497.9	-516.3	-533.9
VTHETA PR2	-109.0	-163.7	-198.1	-237.3	-241.6
U 1	466.11	487.52	508.94	530.35	551.76
U 2	465.65	486.14	506.63	527.12	547.61
M 1	0.2792	0.2745	0.2698	0.2665	0.2597
M 2	0.3748	0.4063	0.3923	0.3665	0.3311
M(PR) 1	0.5013	0.5134	0.5239	0.5365	0.5469
M(PR) 2	0.2257	0.3231	0.3315	0.3356	0.2869
TURN(PR)	30.978	30.981	27.037	21.496	13.816
UUBAR	0.2568	0.0578	0.0581	0.0775	0.2082
DFAC	0.7913	0.5924	0.5819	0.5771	0.6927
EFFP	0.6471	0.8710	0.8796	0.8372	0.7008
EFF	0.6402	0.8680	0.8769	0.8337	0.6949
INCID	-2.64	-1.36	-0.42	0.10	0.42
LOSS PARAMETER	0.09296	0.02159	0.02144	0.02760	0.06517
DEV	18.278	10.656	9.031	10.003	13.880

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 70.02

CORRECTED WEIGHT FLOW = 68.41

CORRECTED ROTOR SPEED = 3170.56

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.944	1.587	2.531	3.085	3.804
V 0	286.64	286.64	286.64	286.64	286.64
V 1	328.96	325.73	321.29	318.55	311.62
VZ 0	286.64	286.64	286.64	286.64	286.64
VZ 1	328.91	325.61	320.98	318.09	310.93
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	5.42	9.02	14.19	17.15	20.67
M 0	0.2585	0.2585	0.2585	0.2585	0.2585
M 1	0.2972	0.2943	0.2902	0.2877	0.2813
TURN	-0.94	-1.59	-2.53	-3.09	-3.80
UUBAR	0.0274	0.0282	0.0387	0.0349	0.0640
DFAC	-0.139	-0.120	-0.095	-0.080	-0.049
EFFP	0.8810	0.8692	0.8235	0.8205	0.6861
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.214	0.633	1.109	2.075	2.866

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	49.324	42.060	41.718	41.635	49.000
BETA 2A	22.487	21.441	21.662	22.554	27.607
V 2	439.70	465.71	447.70	413.28	382.26
V 2A	328.04	364.21	348.75	326.16	288.80
VZ 2	286.59	345.76	334.18	308.88	250.79
VZ 2A	303.10	339.01	324.12	301.21	255.92
V-THETA 2	333.47	311.98	297.93	274.57	288.50
V-THETA 2A	125.46	133.14	128.73	125.10	133.83
M 2	0.3879	0.4136	0.3973	0.3662	0.3371
M 2A	0.2892	0.3219	0.3087	0.2884	0.2548
TURN	26.837	20.619	20.055	19.081	21.393
UUBAR	0.0158	0.0539	0.0672	0.0373	0.0801
DFAC	0.4513	0.3855	0.3932	0.3825	0.4444
EFFP	8.4222	1.1718	1.9848	2.1069	-8.9527
INCID	-0.05	-7.31	-7.65	-7.73	-0.37
DEV	11.97	10.92	11.14	12.03	17.09
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.944	1.587	2.531	3.085	3.804
BETA 2	49.324	42.060	41.718	41.635	49.000
BETA(PR) 1	54.418	55.709	56.969	58.154	59.599
BETA(PR) 2	24.600	26.600	31.855	39.147	45.808
V 1	328.96	325.73	321.29	318.55	311.62
V 2	439.70	465.71	447.70	413.28	382.26
VZ 1	328.91	325.61	320.98	318.09	310.93
VZ 2	286.59	345.76	334.18	308.88	250.79
V-THETA 1	5.42	9.02	14.19	17.15	20.67
V-THETA 2	333.47	311.98	297.93	274.57	288.50
V(PR) 1	565.3	577.9	588.9	602.8	614.4
V(PR) 2	315.2	386.7	393.4	398.3	359.8
VTHETA PR1	-459.7	-477.5	-493.7	-512.1	-529.9
VTHETA PR2	-131.2	-173.1	-207.6	-251.4	-258.0
U 1	465.14	486.51	507.87	529.24	550.61
U 2	464.68	485.12	505.57	526.02	546.46
M 1	0.2972	0.2943	0.2902	0.2877	0.2813
M 2	0.3879	0.4136	0.3973	0.3662	0.3371
M(PR) 1	0.5107	0.5221	0.5318	0.5444	0.5547
M(PR) 2	0.2781	0.3434	0.3491	0.3529	0.3173
TURN(PR)	29.818	29.109	25.115	19.006	13.790
UUBAR	0.2066	0.0661	0.0709	0.0910	0.1961
DFAC	0.6738	0.5508	0.5443	0.5372	0.6257
EFFP	0.6315	0.8504	0.8387	0.7955	0.6691
EFF	0.6245	0.8471	0.8353	0.7916	0.6631
INCID	-4.38	-3.34	-2.48	-2.00	-1.69
LOSS PARAMETER	0.07513	0.02471	0.02622	0.03183	0.06381
DEV	17.700	10.550	8.895	10.397	11.798

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 69.99

CORRECTED WEIGHT FLOW = 75.05

CORRECTED ROTOR SPEED = 3169.00

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.890	1.825	2.567	3.189	3.557
V 0	316.74	316.74	316.74	316.74	316.74
V 1	361.21	357.40	352.89	351.02	343.04
VZ 0	316.73	316.73	316.73	316.73	316.73
VZ 1	361.16	357.22	352.54	350.47	342.38
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	5.61	11.38	15.80	19.53	21.28
M 0	0.2860	0.2860	0.2860	0.2860	0.2860
M 1	0.3270	0.3235	0.3193	0.3176	0.3102
TURN	-0.89	-1.83	-2.57	-3.19	-3.56
UUBAR	0.0218	0.0260	0.0350	0.0245	0.0578
DFAC	-0.132	-0.110	-0.088	-0.076	-0.048
EFFP	0.9715	0.9557	0.9204	0.9532	0.8083
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.160	0.395	1.073	1.971	3.113

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	42.035	38.316	37.416	37.090	42.550
BETA 2A	22.009	22.169	22.518	22.751	25.415
V 2	457.02	481.52	450.44	426.53	388.84
V 2A	381.76	404.36	385.18	358.63	339.54
VZ 2	339.44	377.80	357.76	340.24	286.45
VZ 2A	353.94	374.47	355.81	330.73	306.68
V-THETA 2	306.02	298.54	273.68	257.23	262.95
V-THETA 2A	143.07	152.58	147.51	138.69	145.72
M 2	0.4046	0.4285	0.4045	0.3790	0.3440
M 2A	0.3384	0.3591	0.3424	0.3184	0.3010
TURN	20.026	16.147	14.898	14.340	17.135
UUBAR	0.0117	0.0732	0.0663	0.0867	0.0287
DFAC	0.3135	0.2926	0.2726	0.2913	0.2760
EFFP	4.1823	1.9910	0.3418	4.1302	-1.3021
INCID	-7.33	-11.05	-11.95	-12.28	-6.82
DEV	11.49	11.65	12.00	12.23	14.90
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.890	1.825	2.567	3.189	3.557
BETA 2	42.035	38.316	37.416	37.090	42.550
BETA(PR) 1	51.821	53.048	54.367	55.474	57.091
BETA(PR) 2	25.020	26.254	32.922	38.281	44.678
V 1	361.21	357.40	352.89	351.02	343.04
V 2	457.02	481.52	450.44	426.53	388.84
VZ 1	361.16	357.22	352.54	350.47	342.38
VZ 2	339.44	377.80	357.76	340.24	286.45
V-THETA 1	5.61	11.38	15.80	19.53	21.28
V-THETA 2	306.02	298.54	273.68	257.23	262.95
V(PR) 1	584.3	594.2	605.1	618.4	630.2
V(PR) 2	374.6	421.3	426.2	433.4	402.8
VTHETA PR1	-459.3	-474.9	-491.8	-509.5	-529.1
VTHETA PR2	-158.4	-186.3	-231.6	-268.5	-283.2
U 1	464.91	486.27	507.62	528.98	550.34
U 2	464.45	484.88	505.32	525.76	546.20
M 1	0.3270	0.3235	0.3193	0.3176	0.3102
M 2	0.4046	0.4285	0.4045	0.3790	0.3440
M(PR) 1	0.5290	0.5379	0.5476	0.5595	0.5699
M(PR) 2	0.3316	0.3749	0.3827	0.3851	0.3564
TURN(PR)	26.801	26.795	21.445	17.193	12.413
UUBAR	0.1617	0.0643	0.0657	0.0898	0.1853
DFAC	0.5639	0.4939	0.4839	0.4775	0.5472
EFFP	0.6387	0.8234	1.3816	0.7800	0.6529
EFF	0.6322	0.8198	1.3889	0.7762	0.6474
INCID	-6.98	-6.00	-5.08	-4.68	-4.20
LOSS PARAMETER	0.05861	0.02412	0.02400	0.03181	0.06159
DEV	18.120	10.204	9.962	9.531	10.668

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 70.36

CORRECTED WEIGHT FLOW = 78.95

CORRECTED ROTOR SPEED = 3185.97

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.838	1.790	2.570	3.161	3.600
V 0	334.81	334.81	334.81	334.81	334.81
V 1	383.06	379.18	374.55	371.17	363.00
VZ 0	334.81	334.81	334.81	334.81	334.81
VZ 1	383.02	379.00	374.17	370.60	362.28
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	5.60	11.84	16.80	20.47	22.79
M 0	0.3026	0.3026	0.3026	0.3026	0.3026
M 1	0.3472	0.3436	0.3393	0.3362	0.3286
TURN	-0.84	-1.79	-2.57	-3.16	-3.60
UUBAR	0.0062	0.0082	0.0151	0.0132	0.0434
DFAC	-0.136	-0.114	-0.093	-0.077	-0.048
EFFP	0.9480	0.9371	0.9063	0.9044	0.7598
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.108	0.430	1.070	1.999	3.070

SLOTTED STATOR 2

STATION 2 - STATION 3

PCT SPAN	90	70	50	30	10
BETA 2	37.670	35.788	34.643	33.740	37.603
BETA 2A	22.826	23.433	23.728	23.530	24.917
V 2	477.20	488.29	457.33	433.21	388.31
V 2A	433.83	435.95	406.60	391.78	378.77
VZ 2	377.73	396.10	376.25	360.24	307.64
VZ 2A	399.86	400.00	372.23	359.20	343.52
V-THETA 2	291.63	285.55	259.98	240.61	236.95
V-THETA 2A	168.29	173.37	163.61	156.41	159.58
M 2	0.4249	0.4358	0.4079	0.3859	0.3444
M 2A	0.3868	0.3889	0.3628	0.3492	0.3373
TURN	14.845	12.355	10.915	10.210	12.686
UUBAR	0.0261	0.0915	0.1077	0.0959	-0.0340
DFAC	0.1988	0.2076	0.2072	0.1883	0.1236
EFFP	1.8447	6.0349	-5.5295	-1.7019	-0.2122
INCID	-11.70	-13.58	-14.73	-15.63	-11.77
DEV	12.31	12.91	13.21	13.01	14.40
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.838	1.790	2.570	3.161	3.600
BETA 2	37.670	35.788	34.643	33.740	37.603
BETA(PR) 1	50.327	51.533	52.833	54.067	55.670
BETA(PR) 2	24.897	27.013	33.396	38.638	45.419
V 1	383.06	379.18	374.55	371.17	363.00
V 2	477.20	488.29	457.33	433.21	388.31
VZ 1	383.02	379.00	374.17	370.60	362.28
VZ 2	377.73	396.10	376.25	360.24	307.64
V-THETA 1	5.60	11.84	16.80	20.47	22.79
V-THETA 2	291.63	285.55	259.98	240.61	236.95
V(PR) 1	600.0	609.3	619.3	631.5	642.4
V(PR) 2	416.4	444.6	450.7	461.2	438.3
VTHETA PR1	-461.8	-477.0	-493.5	-511.3	-530.5
VTHETA PR2	-175.3	-201.9	-248.1	-288.0	-312.2
U 1	467.40	488.87	510.34	531.81	553.29
U 2	466.93	487.48	508.03	528.57	549.12
M 1	0.3472	0.3436	0.3393	0.3362	0.3286
M 2	0.4249	0.4358	0.4079	0.3859	0.3444
M(PR) 1	0.5438	0.5521	0.5611	0.5720	0.5815
M(PR) 2	0.3708	0.3968	0.4019	0.4108	0.3887
TURN(PR)	25.430	24.520	19.437	15.429	10.251
UUBAR	0.1303	0.0800	0.0903	0.0968	0.1788
DFAC	0.4961	0.4589	0.4459	0.4319	0.4805
EFFP	0.7406	0.8515	0.8318	0.7828	0.6303
EFF	0.7360	0.8487	0.8289	0.7794	0.6253
INCID	-8.47	-7.52	-6.62	-6.08	-5.62
LOSS PARAMETER	0.04728	0.0298	0.03281	0.03408	0.05829
DEV	17.997	10.963	10.436	9.888	11.409

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 70.13

CORRECTED WEIGHT FLOW = 85.19

CORRECTED ROTOR SPEED = 3175.70

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.924	1.607	2.650	3.209	3.529
V 0	364.37	364.37	364.37	364.37	364.37
V 1	425.41	419.92	414.36	410.75	401.70
VZ 0	364.36	364.36	364.36	364.36	364.36
VZ 1	425.36	419.75	413.92	410.10	400.94
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	6.86	11.77	19.15	22.99	24.73
M 0	0.3299	0.3299	0.3299	0.3299	0.3299
M 1	0.3867	0.3815	0.3763	0.3730	0.3645
TURN	-0.92	-1.61	-2.65	-3.21	-3.53
UUBAR	0.0098	-0.0014	0.0069	0.0022	0.0322
DFAC	-0.158	-0.136	-0.110	-0.094	-0.067
EFFP	1.0017	0.9772	0.9487	0.9601	0.8395
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.194	0.613	0.990	1.951	3.141

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	31.987	30.802	29.357	28.581	30.000
BETA 2A	24.478	24.983	24.799	24.396	25.752
V 2	516.73	493.30	474.46	448.51	418.30
V 2A	521.20	500.31	479.67	467.02	452.72
VZ 2	438.27	423.72	413.53	393.85	362.26
VZ 2A	474.36	453.49	435.44	425.32	407.76
V-THETA 2	273.72	252.60	232.60	214.57	209.15
V-THETA 2A	215.96	211.30	201.19	192.89	196.70
M 2	0.4632	0.4417	0.4247	0.4012	0.3731
M 2A	0.4697	0.4505	0.4320	0.4198	0.4056
TURN	7.509	5.818	4.558	4.186	4.248
UUBAR	0.1185	0.1334	0.1663	0.1439	0.1090
DFAC	0.0381	0.0227	0.0197	-0.0175	-0.0664
EFFP	0.5538	0.5751	0.5515	0.7561	0.8436
INCID	-17.38	-18.57	-20.01	-20.79	-19.37
DEV	13.96	14.46	14.28	13.88	15.23
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.924	1.607	2.650	3.209	3.529
BETA 2	31.987	30.802	29.357	28.581	30.000
BETA(PR) 1	47.181	48.564	49.785	51.037	52.725
BETA(PR) 2	23.625	28.838	33.508	38.412	43.032
V 1	425.41	419.92	414.36	410.75	401.70
V 2	516.73	493.30	474.46	448.51	418.30
VZ 1	425.36	419.75	413.92	410.10	400.94
VZ 2	438.27	423.72	413.53	393.85	362.26
V-THETA 1	6.86	11.77	19.15	22.99	24.73
V-THETA 2	273.72	252.60	232.60	214.57	209.15
V(PR) 1	625.8	634.3	641.1	652.2	662.0
V(PR) 2	478.4	483.7	495.9	502.6	495.6
VTHETA PR1	-459.0	-475.5	-489.5	-507.1	-526.8
VTHETA PR2	-191.7	-233.3	-273.8	-312.3	-338.2
U 1	465.89	487.29	508.70	530.10	551.50
U 2	465.43	485.91	506.39	526.87	547.35
M 1	0.3867	0.3815	0.3763	0.3730	0.3645
M 2	0.4632	0.4417	0.4247	0.4012	0.3731
M(PR) 1	0.5688	0.5763	0.5823	0.5922	0.6008
M(PR) 2	0.4288	0.4331	0.4439	0.4496	0.4420
TURN(PR)	23.555	19.726	16.277	12.625	9.692
UUBAR	0.0851	0.0992	0.0897	0.1074	0.1561
DFAC	0.4057	0.3970	0.3739	0.3665	0.3882
EFFP	0.8527	0.8082	0.7913	0.7543	0.6331
EFF	0.8502	0.8052	0.7883	0.7511	0.6290
INCID	-11.62	-10.49	-9.66	-9.11	-8.57
LOSS PARAMETER	0.03119	0.03632	0.03255	0.03795	0.05327
DEV	16.725	12.788	10.548	9.662	9.022

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 89.75

CORRECTED WEIGHT FLOW = 76.09

CORRECTED ROTOR SPEED = 4063.81

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.882	1.598	2.554	3.121	3.651
V 0	321.54	321.54	321.54	321.54	321.54
V 1	366.64	362.18	356.26	353.48	344.97
VZ 0	321.54	321.54	321.54	321.54	321.54
VZ 1	366.59	362.03	355.90	352.96	344.27
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	5.64	10.10	15.87	19.25	21.97
M 0	0.2904	0.2904	0.2904	0.2904	0.2904
M 1	0.3320	0.3279	0.3224	0.3198	0.3120
TURN	-0.88	-1.60	-2.55	-3.12	-3.65
UUBAR	0.0340	0.0394	0.0548	0.0475	0.0799
DFAC	-0.132	-0.110	-0.083	-0.068	-0.037
EFFP	0.8677	0.8395	0.7711	0.7755	0.6123
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.152	0.622	1.086	2.039	3.019

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	59.709	46.313	45.826	48.075	60.050
BETA 2A	25.657	22.915	22.706	26.567	30.440
V 2	544.50	570.90	549.76	517.84	476.82
V 2A	328.95	395.04	401.92	345.62	313.20
VZ 2	274.64	394.33	383.10	346.00	238.05
VZ 2A	296.51	363.87	370.77	309.13	270.03
V-THETA 2	470.16	412.83	394.30	385.28	413.15
V-THETA 2A	142.43	153.81	155.14	154.57	158.68
M 2	0.4757	0.5027	0.4844	0.4545	0.4169
M 2A	0.2843	0.3432	0.3504	0.3004	0.2723
TURN	34.052	23.399	23.120	21.508	29.610
UUBAR	0.1031	0.0931	0.0472	0.1355	0.1282
DFAC	0.6470	0.5060	0.4670	0.5439	0.6064
EFFP	1.0952	0.8016	0.9196	0.8909	1.3746
INCID	10.34	-3.06	-3.54	-1.29	10.68
DEV	15.14	12.39	12.19	16.05	19.92
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.882	1.598	2.554	3.121	3.651
BETA 2	59.709	46.313	45.826	48.075	60.050
BETA(PR) 1	58.169	59.453	60.734	61.830	63.275
BETA(PR) 2	24.547	27.921	33.514	39.864	50.353
V 1	366.64	362.18	356.26	353.48	344.97
V 2	544.50	570.90	549.76	517.84	476.82
VZ 1	366.59	362.03	355.90	352.96	344.27
VZ 2	274.64	394.33	383.10	346.00	238.05
V-THETA 1	5.64	10.10	15.87	19.25	21.97
V-THETA 2	470.16	412.83	394.30	385.28	413.15
V(PR) 1	695.1	712.3	728.0	747.7	765.5
V(PR) 2	301.9	446.3	459.5	450.8	373.1
VTHETA PR1	-590.5	-613.5	-635.1	-659.1	-683.8
VTHETA PR2	-125.4	-209.0	-253.7	-288.9	-287.3
U 1	596.18	623.57	650.96	678.35	705.73
U 2	595.59	621.80	648.01	674.21	700.42
M 1	0.3320	0.3279	0.3224	0.3198	0.3120
M 2	0.4757	0.5027	0.4844	0.4545	0.4169
M(PR) 1	0.6294	0.6448	0.6588	0.6765	0.6923
M(PR) 2	0.2638	0.3930	0.4049	0.3956	0.3262
TURN(PR)	33.622	31.533	27.220	21.966	12.922
UUBAR	0.2898	0.0774	0.0728	0.1229	0.2647
DFAC	0.8320	0.6106	0.5979	0.6234	0.7594
EFFP	0.6898	0.8663	0.9029	0.8330	0.7742
EFF	0.6797	0.8614	0.8995	0.8273	0.7669
INCID	-0.63	0.40	1.28	1.68	1.98
LOSS PARAMETER	0.10548	0.02859	0.02641	0.02457	0.07894
DEV	17.647	11.871	10.554	11.114	16.343

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 89.77

CORRECTED WEIGHT FLOW = 79.74

CORRECTED ROTOR SPEED = 4065.00

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.861	1.569	2.463	3.070	3.405
V 0	338.51	338.51	338.51	338.51	338.51
V 1	384.49	379.71	373.39	370.35	361.29
VZ 0	338.51	338.51	338.51	338.51	338.51
VZ 1	384.45	379.56	373.04	369.82	360.66
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	5.78	10.40	16.04	19.83	21.46
M 0	0.3060	0.3060	0.3060	0.3060	0.3060
M 1	0.3485	0.3441	0.3382	0.3354	0.3270
TURN	-0.86	-1.57	-2.46	-3.07	-3.40
UUBAR	0.0349	0.0407	0.0566	0.0498	0.0827
DFAC	-0.128	-0.106	-0.079	-0.064	-0.034
EFFP	0.8650	0.8344	0.7618	0.7631	0.5895
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.131	0.651	1.177	2.090	3.265

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	55.500	44.900	44.986	46.186	57.200
BETA 2A	24.017	21.720	22.356	26.084	29.944
V 2	549.60	579.34	554.70	523.95	479.36
V 2A	359.86	417.55	407.89	357.12	317.34
VZ 2	311.30	410.37	392.33	362.74	259.68
VZ 2A	328.71	387.90	377.23	320.75	274.98
V-THETA 2	452.94	408.94	392.13	378.08	402.94
V-THETA 2A	146.46	154.52	155.14	157.02	158.40
M 2	0.4801	0.5113	0.4890	0.4606	0.4188
M 2A	0.3119	0.3636	0.3559	0.3109	0.2758
TURN	31.483	23.180	22.630	20.102	27.256
UUBAR	0.0599	0.0771	0.0569	0.1325	0.1268
DFAC	0.5779	0.4709	0.4592	0.5186	0.5897
EFFP	1.5183	0.7919	0.9431	0.9085	1.4232
INCID	6.13	-4.47	-4.38	-3.18	7.83
DEV	13.50	11.20	11.84	15.56	19.42
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.861	1.569	2.463	3.070	3.405
BETA 2	55.500	44.900	44.986	46.186	57.200
BETA(PR) 1	56.937	58.250	59.571	60.689	62.215
BETA(PR) 2	24.645	27.435	33.131	39.247	48.902
V 1	384.49	379.71	373.39	370.35	361.29
V 2	549.60	579.34	554.70	523.95	479.36
VZ 1	384.45	379.56	373.04	369.82	360.66
VZ 2	311.30	410.37	392.33	362.74	259.68
V-THETA 1	5.78	10.40	16.04	19.83	21.46
V-THETA 2	452.94	408.94	392.13	378.08	402.94
V(PR) 1	704.7	721.3	736.6	755.4	773.7
V(PR) 2	342.5	462.4	468.5	468.4	395.0
VTHETA PR1	-590.6	-613.4	-635.1	-658.7	-684.5
VTHETA PR2	-142.8	-213.0	-256.1	-296.3	-297.7
U 1	596.36	623.75	651.15	678.54	705.94
U 2	595.76	621.98	648.20	674.41	700.63
M 1	0.3485	0.3441	0.3382	0.3354	0.3270
M 2	0.4801	0.5113	0.4890	0.4606	0.4188
M(PR) 1	0.6388	0.6536	0.6672	0.6842	0.7003
M(PR) 2	0.2992	0.4081	0.4130	0.4117	0.3451
TURN(PR)	32.292	30.814	26.440	21.442	13.314
UUBAR	0.2551	0.0711	0.0828	0.1170	0.2605
DFAC	0.7669	0.5907	0.5890	0.5993	0.7277
EFFP	0.6687	0.8922	0.8889	0.8384	0.7332
EFF	0.6581	0.8883	0.8850	0.8330	0.7249
INCID	-1.86	-0.80	0.12	0.54	0.93
LOSS PARAMETER	0.09277	0.02638	0.03018	0.04087	0.07994
DEV	17.745	11.385	10.171	10.497	14.892

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 89.78

CORRECTED WEIGHT FLOW = 85.09

CORRECTED ROTOR SPEED = 4065.30

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.074	1.979	2.743	3.433	3.799
V 0	363.88	363.88	363.88	363.88	363.88
V 1	411.77	407.26	400.18	397.45	386.99
VZ 0	363.88	363.88	363.88	363.88	363.88
VZ 1	411.70	407.02	399.73	396.74	386.14
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	7.72	14.06	19.15	23.80	25.64
M 0	0.3295	0.3295	0.3295	0.3295	0.3295
M 1	0.3739	0.3697	0.3631	0.3606	0.3509
TURN	-1.07	-1.98	-2.74	-3.43	-3.80
UUBAR	0.0412	0.0425	0.0598	0.0491	0.0862
DFAC	-0.121	-0.099	-0.073	-0.058	-0.026
EFFP	0.8500	0.8320	0.7530	0.7682	0.5727
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.344	0.241	0.897	1.727	2.871

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	50.328	43.010	43.068	43.486	51.400
BETA 2A	22.868	21.695	22.109	24.382	29.477
V 2	558.01	590.76	562.32	524.75	486.33
V 2A	404.97	444.13	430.27	389.11	332.94
VZ 2	356.23	431.98	410.80	380.73	303.41
VZ 2A	373.15	412.67	398.63	354.41	289.84
V-THETA 2	429.51	402.97	383.98	361.12	380.08
V-THETA 2A	157.37	164.18	161.94	160.63	163.83
M 2	0.4892	0.5230	0.4968	0.4626	0.4258
M 2A	0.3529	0.3882	0.3770	0.3402	0.2901
TURN	27.460	21.315	20.959	19.104	21.923
UUBAR	0.0129	0.0803	0.0551	0.0828	0.1503
DFAC	0.4777	0.4246	0.4147	0.4398	0.5349
EFFP	1.7916	0.7693	1.0623	0.9554	1.3849
INCID	0.96	-6.36	-6.30	-5.88	2.03
DEV	12.35	11.17	11.59	13.86	13.96
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.074	1.979	2.743	3.433	3.799
BETA 2	50.328	43.010	43.068	43.486	51.400
BETA(PR) 1	55.033	56.275	57.689	58.788	60.422
BETA(PR) 2	25.025	26.889	32.752	39.455	46.577
V 1	411.77	407.26	400.18	397.45	386.99
V 2	558.01	590.76	562.32	524.75	486.33
VZ 1	411.70	407.02	399.73	396.74	386.14
VZ 2	356.23	431.98	410.80	380.73	303.41
V-THETA 1	7.72	14.06	19.15	23.80	25.64
V-THETA 2	429.51	402.97	383.98	361.12	380.08
V(PR) 1	718.4	733.1	747.8	765.6	782.3
V(PR) 2	393.1	484.4	488.5	493.1	441.4
VTHETA PR1	-588.7	-609.7	-632.0	-654.8	-680.4
VTHETA PR2	-166.3	-219.1	-264.3	-313.3	-320.6
U 1	596.40	623.80	651.20	678.59	705.99
U 2	595.81	622.03	648.24	674.46	700.68
M 1	0.3739	0.3697	0.3631	0.3606	0.3509
M 2	0.4892	0.5230	0.4968	0.4626	0.4258
M(PR) 1	0.6523	0.6655	0.6786	0.6946	0.7092
M(PR) 2	0.3446	0.4288	0.4316	0.4347	0.3865
TURN(PR)	30.008	29.386	24.937	19.334	13.845
UUBAR	0.2215	0.0743	0.0919	0.1168	0.2320
DFAC	0.6868	0.5619	0.5619	0.5600	0.6551
EFFP	0.6820	0.9101	0.8832	0.8396	0.7194
EFF	0.6722	0.9069	0.8793	0.8346	0.7112
INCID	-3.77	-2.77	-1.76	-1.36	-0.87
LOSS PARAMETER	0.08029	0.02772	0.03365	0.04069	0.07456
DEV	18.125	10.839	9.792	10.705	12.567

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 89.82

CORRECTED WEIGHT FLOW = 89.21

CORRECTED ROTOR SPEED = 4066.99

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.925	1.865	2.733	3.189	3.971
V 0	383.89	383.89	383.89	383.89	383.89
V 1	437.82	432.67	425.04	422.00	412.74
VZ 0	383.89	383.89	383.89	383.89	383.89
VZ 1	437.77	432.44	424.55	421.34	411.75
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	7.07	14.08	20.26	23.48	28.58
M 0	0.3480	0.3480	0.3480	0.3480	0.3480
M 1	0.3983	0.3935	0.3863	0.3835	0.3748
TURN	-0.92	-1.87	-2.73	-3.19	-3.97
UUBAR	0.0394	0.0429	0.0611	0.0509	0.0777
DFAC	-0.132	-0.108	-0.080	-0.067	-0.036
EFFP	0.8664	0.8441	0.7680	0.7812	0.6443
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.195	0.355	0.907	1.971	2.699

STATOR 2

STATION 2 - STATION 3

PCT SPAN	90	70	50	30	10
BETA 2	45.728	40.709	40.647	40.795	48.000
BETA 2A	22.531	21.940	22.490	23.345	27.628
V 2	573.50	595.71	569.02	533.07	482.48
V 2A	446.85	472.09	449.25	419.15	371.12
VZ 2	400.34	451.57	431.74	403.56	322.84
VZ 2A	412.75	437.90	415.08	384.83	328.80
V-THETA 2	410.65	388.53	370.65	348.28	358.55
V-THETA 2A	171.23	176.39	171.84	166.10	172.09
M 2	0.5038	0.5284	0.5037	0.4719	0.4236
M 2A	0.3913	0.4145	0.3952	0.3682	0.3251
TURN	23.197	18.769	18.157	17.450	20.372
UUBAR	0.0129	0.0719	0.0784	0.0849	0.0827
DFAC	0.3950	0.3629	0.3697	0.3760	0.4218
EFFP	2.7795	0.8404	1.2000	0.8745	2.7093
INCID	-3.64	-8.66	-8.72	-8.57	-1.37
DEV	12.01	11.42	11.97	12.83	17.11
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	-90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.925	1.865	2.733	3.189	3.971
BETA 2	45.728	40.709	40.647	40.795	48.000
BETA(PR) 1	53.406	54.666	56.075	57.264	58.719
BETA(PR) 2	24.850	27.369	32.765	38.971	46.685
V 1	437.82	432.67	425.04	422.00	412.74
V 2	573.50	595.71	569.02	533.07	482.48
VZ 1	437.77	432.44	424.55	421.34	411.75
VZ 2	400.34	451.57	431.74	403.56	322.84
V-THETA 1	7.07	14.08	20.26	23.48	28.58
V-THETA 2	410.65	388.53	370.65	348.28	358.55
V(PR) 1	734.3	747.7	760.7	779.2	793.0
V(PR) 2	441.2	508.5	513.4	519.1	470.6
VTHETA PR1	-589.6	-610.0	-631.2	-655.4	-677.7
VTHETA PR2	-185.4	-233.8	-277.9	-326.5	-342.4
U 1	596.65	624.06	651.47	678.88	706.29
U 2	596.06	622.28	648.51	674.74	700.97
M 1	0.3983	0.3935	0.3863	0.3835	0.3748
M 2	0.5038	0.5284	0.5037	0.4719	0.4236
M(PR) 1	0.6681	0.6800	0.6914	0.7080	0.7202
M(PR) 2	0.3876	0.4510	0.4545	0.4595	0.4132
TURN(PR)	28.556	27.297	23.310	18.293	12.033
UUBAR	0.1957	0.0845	0.0980	0.1226	0.2323
DFAC	0.6183	0.5301	0.5283	0.5270	0.6084
EFFP	0.6733	0.8938	0.8670	0.8752	0.6996
EFF	0.6636	0.8903	0.8628	0.8715	0.6916
INCID	-5.39	-4.38	-3.38	-2.89	-2.57
LOSS PARAMETER	0.07104	0.03136	0.03588	0.03911	0.07437
DEV	17.950	11.319	9.805	10.221	12.675

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 89.84

CORRECTED WEIGHT FLOW = 93.73

CORRECTED ROTOR SPEED = 4067.78

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.979	1.928	2.686	3.259	3.705
V 0	406.38	406.38	406.38	406.38	406.38
V 1	465.45	459.29	450.60	447.22	437.68
VZ 0	406.38	406.38	406.38	406.38	406.38
VZ 1	465.38	459.03	450.11	446.50	436.76
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	7.95	15.45	21.11	25.42	28.28
M 0	0.3689	0.3689	0.3689	0.3689	0.3689
M 1	0.4243	0.4185	0.4103	0.4071	0.3982
TURN	-0.98	-1.93	-2.69	-3.26	-3.71
UUBAR	0.0385	0.0435	0.0627	0.0506	0.0734
DFAC	-0.136	-0.111	-0.082	-0.068	-0.040
EFFP	0.8758	0.8495	0.7708	0.7887	0.6671
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.249	0.292	0.954	1.901	2.965

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	41.376	38.086	37.497	36.449	43.695
BETA 2A	22.615	22.579	23.087	23.269	25.995
V 2	586.24	594.97	572.55	538.34	488.33
V 2A	496.03	501.11	478.14	439.08	422.10
VZ 2	439.91	468.30	454.25	433.03	353.08
VZ 2A	457.89	462.70	439.85	403.37	379.39
V-THETA 2	387.50	367.00	348.52	319.83	337.35
V-THETA 2A	190.74	192.40	187.49	173.46	185.00
M 2	0.5185	0.5294	0.5091	0.4777	0.4303
M 2A	0.4373	0.4424	0.4226	0.3873	0.3718
TURN	18.762	15.507	14.410	13.180	17.700
UUBAR	0.0125	0.0687	0.0907	0.1288	0.0263
DFAC	0.2940	0.2859	0.2932	0.3137	0.2900
EFFP	2.1991	0.8007	0.9474	0.8152	8.9753
INCID	-7.99	-11.28	-11.87	-12.92	-5.68
DEV	12.09	12.06	12.57	12.75	15.48
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.979	1.928	2.686	3.259	3.705
BETA 2	41.376	38.086	37.497	36.449	43.695
BETA(PR) 1	51.678	52.981	54.477	55.661	57.216
BETA(PR) 2	25.377	28.608	33.452	39.348	45.853
V 1	465.45	459.29	450.60	447.22	437.68
V 2	586.24	594.97	572.55	538.34	488.33
VZ 1	465.38	459.03	450.11	446.50	436.76
VZ 2	439.91	468.30	454.25	433.03	353.08
V-THETA 1	7.95	15.45	21.11	25.42	28.28
V-THETA 2	387.50	367.00	348.52	319.83	337.35
V(PR) 1	750.5	762.4	774.7	791.5	806.6
V(PR) 2	486.9	533.4	544.4	560.0	506.9
VTHETA PR1	-588.8	-608.7	-630.5	-653.6	-678.1
VTHETA PR2	-208.7	-255.4	-300.1	-355.0	-363.8
U 1	596.76	624.18	651.59	679.01	706.42
U 2	596.17	622.41	648.64	674.87	701.10
M 1	0.4243	0.4185	0.4103	0.4071	0.3982
M 2	0.5185	0.5294	0.5091	0.4777	0.4303
M(PR) 1	0.6842	0.6947	0.7054	0.7206	0.7338
M(PR) 2	0.4306	0.4747	0.4841	0.4969	0.4467
TURN(PR)	26.301	24.373	21.024	16.313	11.363
UUBAR	0.1647	0.0921	0.0951	0.1032	0.2326
DFAC	0.5530	0.4940	0.4839	0.4654	0.5578
EFFP	0.7356	0.9007	0.9017	0.8510	0.6905
EFF	0.7280	0.8977	0.8988	0.8469	0.6831
INCID	-7.12	-6.07	-4.97	-4.49	-4.07
LOSS PARAMETER	0.05956	0.03380	0.03454	0.03600	0.07576
DEV	18.477	12.558	10.492	10.598	11.843

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 89.80

CORRECTED WEIGHT FLOW = 100.60

CORRECTED ROTOR SPEED = 4066.19

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.027	1.981	2.819	3.327	3.978
V 0	441.76	441.76	441.76	441.76	441.76
V 1	513.93	506.90	499.16	494.74	484.17
VZ 0	441.76	441.76	441.76	441.76	441.76
VZ 1	513.85	506.60	498.56	493.90	483.00
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	9.21	17.53	24.55	28.71	33.58
M 0	0.4021	0.4021	0.4021	0.4021	0.4021
M 1	0.4704	0.4637	0.4563	0.4521	0.4420
TURN	-1.03	-1.98	-2.82	-3.33	-3.98
UUBAR	0.0243	0.0319	0.0429	0.0352	0.0604
DFAC	-0.153	-0.127	-0.101	-0.086	-0.056
EFFP	0.9242	0.8974	0.8553	0.8654	0.7582
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.297	0.239	0.821	1.833	2.692

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.027	1.981	2.819	3.327	3.978
BETA 2	33.570	32.939	30.459	29.579	32.235
BETA(PR) 1	48.817	50.124	51.501	52.772	54.316
BETA(PR) 2	22.963	31.049	35.705	39.379	45.062
V 1	513.93	506.90	499.16	494.74	484.17
V 2	657.77	593.11	575.61	558.70	507.45
VZ 1	513.85	506.60	498.56	493.90	483.00
VZ 2	548.06	497.77	496.17	485.89	429.24
V-THETA 1	9.21	17.53	24.55	28.71	33.58
V-THETA 2	363.71	322.50	291.79	275.79	270.67
V(PR) 1	780.4	790.2	800.9	816.4	828.0
V(PR) 2	595.2	581.0	611.0	628.6	607.7
VTHETA PR1	-587.3	-606.4	-626.8	-650.0	-672.6
VTHETA PR2	-232.2	-299.7	-356.6	-398.8	-430.2
U 1	596.53	623.93	651.34	678.74	706.15
U 2	595.94	622.16	648.38	674.61	700.83
M 1	0.4704	0.4637	0.4563	0.4521	0.4420
M 2	0.5898	0.5302	0.5153	0.5000	0.4509
M(PR) 1	0.7143	0.7228	0.7321	0.7460	0.7560
M(PR) 2	0.5337	0.5194	0.5470	0.5626	0.5400
TURN(PR)	25.854	19.075	15.796	13.393	9.254
UUBAR	0.1141	0.1737	0.1392	0.1434	0.2212
DFAC	0.4185	0.4270	0.3850	0.3713	0.4067
EFFP	0.8625	0.7593	0.8039	0.7930	0.5833
EFF	0.8586	0.7539	0.7997	0.7889	0.5765
INCID	-9.98	-8.93	-7.95	-7.38	-6.97
LOSS PARAMETER	0.04204	0.06224	0.04919	0.05002	0.07302
DEV	16.063	14.999	12.745	10.629	11.052

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	33.570	32.939	30.459	29.579	32.235
BETA 2A	24.990	25.072	25.384	24.961	26.422
V 2	657.77	593.11	575.61	558.70	507.45
V 2A	660.54	605.94	584.33	566.89	538.97
VZ 2	548.06	497.77	496.17	485.89	429.24
VZ 2A	598.70	548.85	527.92	513.94	482.68
V-THETA 2	363.71	322.50	291.79	275.79	270.67
V-THETA 2A	279.05	256.77	250.49	239.22	239.83
M 2	0.5898	0.5302	0.5153	0.5000	0.4509
M 2A	0.5957	0.5460	0.5265	0.5091	0.4822
TURN	8.580	7.867	5.075	4.618	5.813
UUBAR	0.1450	0.1346	0.1592	0.1753	0.1063
DFAC	0.0496	0.0270	0.0181	0.0172	-0.0310
EFFP	0.8830	0.6316	0.7595	1.4102	0.7063
INCID	-15.80	-16.43	-18.91	-19.79	-17.14
DEV	14.47	14.55	14.86	14.44	15.90
DIA	33.565	34.995	36.424	37.854	39.284

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 100.04

CORRECTED WEIGHT FLOW = 85.52

CORRECTED ROTOR SPEED = 4529.70

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.700	1.500	2.500	3.300	3.400
V 0	365.92	365.92	365.92	365.92	365.92
V 1	423.21	418.60	410.37	406.62	397.40
VZ 0	365.91	365.91	365.91	365.91	365.91
VZ 1	423.18	418.46	409.97	405.95	396.70
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	5.17	10.96	17.90	23.41	23.57
M 0	0.3313	0.3313	0.3313	0.3313	0.3313
M 1	0.3847	0.3804	0.3727	0.3692	0.3606
TURN	-0.70	-1.50	-2.50	-3.30	-3.40
UUBAR	0.0009	0.0028	0.0279	0.0223	0.0521
DFAC	-0.150	-0.129	-0.096	-0.078	-0.052
EFFP	1.0233	1.0195	0.9375	0.9515	0.8220
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DFV	0.030	0.720	1.140	1.860	3.270

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	61.570	46.209	45.542	47.735	58.100
BETA 2A	26.405	23.425	22.415	25.450	29.750
V 2	612.61	636.85	622.51	586.37	548.27
V 2A	348.61	427.62	446.22	393.78	334.69
VZ 2	291.66	440.72	436.00	394.37	289.73
VZ 2A	312.24	392.37	412.50	355.57	290.57
V-THETA 2	538.73	459.72	444.33	433.94	465.47
V-THETA 2A	155.03	170.00	170.15	169.22	166.07
M 2	0.5320	0.5591	0.5469	0.5131	0.4761
M 2A	0.2983	0.3696	0.3863	0.3400	0.2382
TURN	35.165	22.784	23.127	22.285	28.350
UUBAR	0.1406	0.1155	0.0767	0.1401	0.2125
DFAC	0.6923	0.5270	0.4837	0.5426	0.6589
EFFP	1.0364	0.7493	0.8358	0.8140	1.1577
INCID	12.20	-3.16	-3.83	-1.64	8.73
DFV	15.89	12.91	11.90	14.93	19.23
DIA	33.564	36.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.700	1.500	2.500	3.300	3.400
BETA 2	61.570	46.209	45.542	47.735	58.100
BETA(PR) 1	57.307	58.546	59.916	61.012	62.532
BETA(PR) 2	23.222	27.901	32.519	38.843	47.416
V 1	423.21	418.60	410.37	406.62	397.40
V 2	612.61	636.85	622.51	586.37	548.27
VZ 1	423.18	418.46	409.97	405.95	396.70
VZ 2	291.66	440.72	436.00	394.37	289.73
V-THETA 1	5.17	10.96	17.90	23.41	23.57
V-THETA 2	538.73	459.72	444.33	433.94	465.47
V(PR) 1	783.5	801.9	817.9	837.6	860.0
V(PR) 2	317.4	498.7	517.1	506.3	428.2
VTHETA PR1	-659.4	-684.1	-707.7	-732.7	-763.1
VTHETA PR2	-125.1	-233.4	-278.0	-317.6	-315.3
U 1	664.52	695.06	725.60	756.11	786.65
U 2	663.87	693.08	722.29	751.51	780.72
M 1	0.3847	0.3804	0.3727	0.3692	0.3606
M 2	0.5320	0.5591	0.5469	0.5131	0.4761
M(PR) 1	0.7122	0.7287	0.7428	0.7606	0.7804
M(PR) 2	0.2756	0.4378	0.4543	0.4430	0.3718
TURN(PR)	34.085	30.645	27.397	22.169	15.116
UUBAR	0.3264	0.0894	0.0729	0.1197	0.2598
DFAC	0.8663	0.6128	0.5975	0.6220	0.7502
EFFP	0.6770	0.8667	0.9112	0.8562	0.7558
EFF	0.6641	0.8608	0.9072	0.8501	0.7458
INCID	-1.49	-0.50	0.47	0.86	1.24
LOSS PARAMETER	0.11990	0.02978	0.02675	0.04205	0.06769
DFV	16.322	11.851	9.559	10.093	13.406

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 100.10

CORRECTED WEIGHT FLOW = 88.28

CORRECTED ROTOR SPEED = 4532.54

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.815	1.702	2.798	3.259	3.842
V 0	379.32	379.32	379.32	379.32	379.32
V 1	435.86	429.75	423.58	418.94	409.82
VZ 0	379.31	379.31	379.31	379.31	379.31
VZ 1	435.82	429.57	423.08	418.26	408.90
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	6.20	12.76	20.67	23.82	27.46
M 0	0.3438	0.3438	0.3438	0.3438	0.3438
M 1	0.3965	0.3907	0.3850	0.3806	0.3721
TURN	-0.82	-1.70	-2.80	-3.26	-3.84
UUBAR	0.0248	0.0323	0.0399	0.0374	0.0618
DFAC	-0.141	-0.116	-0.089	-0.072	-0.042
EFFP	0.9081	0.8767	0.8387	0.8290	0.7040
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.085	0.518	0.842	1.901	2.828

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.815	1.702	2.798	3.259	3.842
BETA 2	57.649	45.643	45.258	46.994	57.800
BETA(PR) 1	56.512	57.823	59.045	60.283	61.709
BETA(PR) 2	23.656	27.020	32.692	39.618	49.127
V 1	435.86	429.75	423.58	418.94	409.82
V 2	615.54	647.22	621.96	580.27	534.36
VZ 1	435.82	429.57	423.08	418.26	408.90
VZ 2	329.38	452.49	437.80	395.79	284.75
V-THETA 1	6.20	12.76	20.67	23.82	27.46
V-THETA 2	520.00	462.76	441.77	424.35	452.17
V(PR) 1	789.9	806.6	822.5	843.7	862.7
V(PR) 2	359.6	507.9	520.2	513.8	435.1
VTHETA PR1	-658.7	-682.7	-705.4	-732.8	-759.7
VTHETA PR2	-144.3	-230.8	-281.0	-327.6	-329.0
U 1	664.94	695.50	726.05	756.59	787.14
U 2	664.29	693.52	722.75	751.98	781.21
M 1	0.3965	0.3907	0.3850	0.3806	0.3721
M 2	0.5356	0.5698	0.5469	0.5090	0.4665
M(PR) 1	0.7185	0.7334	0.7475	0.7666	0.7833
M(PR) 2	0.3129	0.4472	0.4574	0.4507	0.3799
TURN(PR)	32.856	30.802	26.353	20.665	12.581
UUBAR	0.2847	0.0802	0.0797	0.1244	0.2603
DFAC	0.8040	0.6043	0.5931	0.6105	0.7335
EFFP	0.6960	0.9132	0.9126	0.8848	0.8177
EFF	0.6839	0.9093	0.9088	0.8800	0.8107
INCID	-2.29	-1.23	-0.40	0.13	0.42
LOSS PARAMETER	0.10435	0.02987	0.02921	0.04321	0.07956
DEV	16.756	10.970	9.732	10.868	15.117

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	57.649	45.643	45.258	46.994	57.800
BETA 2A	24.500	22.050	22.325	26.350	30.040
V 2	615.54	647.22	621.96	580.27	534.36
V 2A	374.05	448.39	450.59	395.96	347.31
VZ 2	329.38	452.49	437.80	395.79	284.75
VZ 2A	340.37	415.59	416.82	354.82	300.66
V-THETA 2	520.00	462.76	441.77	424.35	452.17
V-THETA 2A	155.11	168.33	171.16	175.75	173.87
M 2	0.5356	0.5698	0.5469	0.5090	0.4665
M 2A	0.3213	0.3877	0.3908	0.3424	0.2997
TURN	33.149	23.593	22.933	20.644	27.760
UUBAR	0.1100	0.1092	0.0674	0.1181	0.1391
DFAC	0.6396	0.5057	0.4737	0.5210	0.6070
EFFP	1.1573	0.7474	0.8979	0.7573	0.8339
INCID	8.28	-3.73	-4.11	-2.38	8.43
DEV	13.98	11.53	11.81	15.83	19.52
DIA	33.564	34.992	36.420	37.848	39.276

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 100.07

CORRECTED WEIGHT FLOW = 91.03

CORRECTED ROTOR SPEED = 4531.20

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.870	2.100	2.900	3.410	3.800
V 0	392.86	392.86	392.86	392.86	392.86
V 1	449.33	443.51	437.02	432.42	423.04
VZ 0	392.86	392.86	392.86	392.86	392.86
VZ 1	449.28	443.22	436.46	431.65	422.11
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	6.82	16.25	22.11	25.72	28.04
M 0	0.3563	0.3563	0.3563	0.3563	0.3563
M 1	0.4091	0.4037	0.3976	0.3932	0.3845
TURN	-0.87	-2.10	-2.90	-3.41	-3.80
UUBAR	0.0267	0.0308	0.0429	0.0389	0.0624
DFAC	-0.135	-0.108	-0.083	-0.067	-0.039
EFFP	0.9019	0.8796	0.8270	0.8216	0.6953
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.140	0.120	0.740	1.750	2.870

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	54.940	44.790	44.210	45.530	54.210
BETA 2A	23.620	22.480	22.490	24.300	28.420
V 2	618.43	652.72	618.74	580.97	535.26
V 2A	404.38	461.70	454.63	404.53	342.25
VZ 2	355.25	463.23	443.51	406.99	313.03
VZ 2A	370.50	426.62	420.05	368.69	301.00
V-THETA 2	506.22	459.85	431.44	414.59	434.18
V-THETA 2A	162.02	176.54	173.90	166.47	162.89
M 2	0.5383	0.5750	0.5446	0.5097	0.4658
M 2A	0.3487	0.4003	0.3951	0.3507	0.2957
TURN	31.320	22.310	21.720	21.230	25.790
UUBAR	0.0654	0.1026	0.0544	0.0989	0.1493
DFAC	0.5783	0.4820	0.4548	0.5063	0.6107
EFFP	1.5530	0.8307	0.9380	0.9094	1.3666
INCID	5.57	-4.58	-5.16	-3.84	4.84
DEV	13.10	11.96	11.97	13.78	17.90
DIA	33.564	34.992	36.420	37.848	39.276

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.870	2.100	2.900	3.410	3.800
BETA 2	54.940	44.790	44.210	45.530	54.210
BETA(PR) 1	55.672	56.867	58.192	59.426	60.916
BETA(PR) 2	23.960	26.748	33.279	39.640	47.930
V 1	449.33	443.51	437.02	432.42	423.04
V 2	618.43	652.72	618.74	580.97	535.26
VZ 1	449.28	443.22	436.46	431.65	422.11
VZ 2	355.25	463.23	443.51	406.99	313.03
V-THETA 1	6.82	16.25	22.11	25.72	28.04
V-THETA 2	506.22	459.85	431.44	414.59	434.18
V(PR) 1	796.7	810.9	828.1	848.6	868.4
V(PR) 2	388.7	518.7	530.5	528.5	467.2
VTHETA PR1	-657.9	-679.0	-703.7	-730.6	-758.9
VTHETA PR2	-157.9	-233.5	-291.1	-337.2	-346.8
U 1	664.74	695.29	725.84	756.36	786.91
U 2	664.09	693.31	722.53	751.76	780.98
M 1	0.4091	0.4037	0.3976	0.3932	0.3845
M 2	0.5383	0.5750	0.5446	0.5097	0.4658
M(PR) 1	0.7254	0.7380	0.7533	0.7717	0.7892
M(PR) 2	0.3384	0.4570	0.4670	0.4636	0.4065
TURN(PR)	31.711	30.119	24.913	19.786	12.986
UUBAR	0.2674	0.0803	0.0839	0.1242	0.2442
DFAC	0.7619	0.5897	0.5773	0.5892	0.6883
EFFP	0.6812	0.8984	0.9063	0.8552	0.7350
EFF	0.6688	0.8939	0.9023	0.8494	0.7252
INCID	-3.13	-2.18	-1.26	-0.72	-0.37
LOSS PARAMETER	0.08776	0.02999	0.03055	0.04314	0.07642
DEV	17.060	10.698	10.319	10.890	13.920

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 100.04

CORRECTED WEIGHT FLOW = 93.81

CORRECTED ROTOR SPEED = 4529.86

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.936	1.797	2.790	3.200	3.400
V 0	406.77	406.77	406.77	406.77	406.77
V 1	467.19	460.56	453.78	449.27	439.42
VZ 0	406.76	406.76	406.76	406.76	406.76
VZ 1	467.12	460.33	453.24	448.57	438.65
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	7.63	14.44	22.09	25.08	26.06
M 0	0.3693	0.3693	0.3693	0.3693	0.3693
M 1	0.4260	0.4197	0.4133	0.4091	0.3998
TURN	-0.94	-1.80	-2.79	-3.20	-3.40
UUBAR	0.0225	0.0314	0.0408	0.0365	0.0624
DFAC	-0.139	-0.114	-0.088	-0.072	-0.047
EFFP	0.9174	0.8827	0.8395	0.8374	0.7083
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.206	0.423	0.850	1.960	3.270

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	51.179	44.017	43.447	43.309	49.600
BETA 2A	22.440	22.130	22.190	23.210	27.400
V 2	630.74	658.88	622.08	587.94	542.51
V 2A	444.82	475.83	465.35	423.03	356.82
VZ 2	395.41	473.82	451.64	427.82	351.61
VZ 2A	411.14	440.78	430.88	388.80	316.79
V-THETA 2	491.42	457.83	427.80	403.29	413.14
V-THETA 2A	169.80	179.25	175.75	166.72	164.21
M 2	0.5499	0.5805	0.5467	0.5159	0.4722
M 2A	0.3853	0.4135	0.4055	0.3677	0.3089
TURN	28.739	21.887	21.257	20.099	22.200
UUBAR	0.0348	0.1081	0.0547	0.0992	0.1620
DFAC	0.5075	0.4623	0.4365	0.4714	0.5697
EFFP	2.1031	0.9259	1.3381	1.0603	1.7221
INCID	1.91	-5.35	-5.92	-6.06	0.23
DEV	11.92	11.61	11.67	12.69	16.88
DIA	33.564	34.992	36.420	37.848	39.276

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.936	1.797	2.790	3.200	3.400
BETA 2	51.179	44.017	43.447	43.309	49.600
BETA(PR) 1	54.584	55.929	57.208	58.467	60.028
BETA(PR) 2	23.567	26.407	33.109	39.146	46.274
V 1	467.19	460.56	453.78	449.27	439.42
V 2	630.74	658.88	622.08	587.94	542.51
VZ 1	467.12	460.33	453.24	448.57	438.65
VZ 2	395.41	473.82	451.64	427.82	351.61
V-THETA 1	7.63	14.44	22.09	25.08	26.06
V-THETA 2	491.42	457.83	427.80	403.29	413.14
V(PR) 1	806.1	821.7	836.9	857.7	878.0
V(PR) 2	431.4	529.0	539.2	551.6	508.7
VTHETA PR1	-656.9	-680.6	-703.5	-731.1	-760.6
VTHETA PR2	-172.5	-235.3	-294.5	-348.2	-367.6
U 1	664.55	695.08	725.61	756.14	786.67
U 2	663.89	693.11	722.32	751.53	780.75
M 1	0.4260	0.4197	0.4133	0.4091	0.3998
M 2	0.5499	0.5805	0.5467	0.5159	0.4722
M(PR) 1	0.7350	0.7488	0.7623	0.7810	0.7989
M(PR) 2	0.3761	0.4661	0.4738	0.4841	0.4427
TURN(PR)	31.017	29.522	24.099	19.322	13.754
UUBAR	0.2475	0.1082	0.1135	0.1280	0.2286
DFAC	0.7041	0.5825	0.5695	0.5610	0.6342
EFFP	0.6706	0.8611	0.8321	0.8178	0.6983
EFF	0.6581	0.8551	0.8253	0.8108	0.6876
INCID	-4.22	-3.12	-2.24	-1.68	-1.26
LOSS PARAMETER	0.09079	0.04006	0.04137	0.04478	0.07386
DEV	16.667	10.357	10.149	10.396	12.264

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 99.91

CORRECTED WEIGHT FLOW = 97.98

CORRECTED ROTOR SPEED = 4524.09

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.837	1.829	2.837	3.270	3.407
V 0	428.06	428.06	428.06	428.06	428.06
V 1	496.21	488.75	480.04	474.89	463.71
VZ 0	428.06	428.06	428.06	428.06	428.06
VZ 1	496.16	488.50	479.45	474.12	462.89
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	7.25	15.60	23.76	27.09	27.56
M 0	0.3892	0.3892	0.3892	0.3892	0.3892
M 1	0.4535	0.4464	0.4381	0.4333	0.4227
TURN	-0.84	-1.83	-2.84	-3.27	-3.41
UUBAR	0.0240	0.0301	0.0427	0.0347	0.0595
DFAC	-0.151	-0.123	-0.093	-0.077	-0.049
EFFP	0.9216	0.8963	0.8447	0.8527	0.7292
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.107	0.391	0.803	1.890	3.263

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	47.159	42.112	40.868	41.100	48.700
BETA 2A	21.993	22.210	22.303	22.900	26.250
V 2	645.25	658.66	624.86	595.64	539.86
V 2A	485.09	502.60	486.23	457.19	397.78
VZ 2	438.75	488.62	472.53	448.85	356.31
VZ 2A	449.79	465.31	449.85	421.16	356.76
V-THETA 2	473.12	441.68	408.85	391.56	405.58
V-THETA 2A	181.66	189.99	184.53	177.90	175.93
M 2	0.5652	0.5822	0.5517	0.5250	0.4720
M 2A	0.4222	0.4388	0.4255	0.3996	0.3464
TURN	25.166	19.902	18.565	18.200	22.450
UUBAR	0.0327	0.0869	0.0603	0.0873	0.1057
DFAC	0.4367	0.4037	0.3854	0.4028	0.4732
EFFP	1.9728	0.9117	1.1306	1.0528	1.9436
INCID	-2.21	-7.26	-8.50	-8.27	-0.67
DEV	11.47	11.69	11.78	12.38	15.73
DIA	33.564	34.992	36.420	37.848	39.276

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.837	1.829	2.837	3.270	3.407
BETA 2	47.159	42.112	40.868	41.100	48.700
BETA(PR) 1	52.917	54.251	55.627	56.929	58.593
BETA(PR) 2	23.407	27.147	33.482	38.655	46.401
V 1	496.21	488.75	480.04	474.89	463.71
V 2	645.25	658.66	624.86	595.64	539.86
VZ 1	496.16	488.50	479.45	474.12	462.89
VZ 2	438.75	488.62	472.53	448.85	356.31
V-THETA 1	7.25	15.60	23.76	27.09	27.56
V-THETA 2	473.12	441.68	408.85	391.56	405.58
V(PR) 1	822.9	836.1	849.2	868.9	888.3
V(PR) 2	478.1	549.1	566.5	574.8	516.7
VTHETA PR1	-656.4	-678.6	-700.9	-728.1	-758.1
VTHETA PR2	-189.9	-250.5	-312.5	-359.0	-374.2
U 1	663.70	694.20	724.70	755.18	785.67
U 2	663.05	692.22	721.40	750.58	779.75
M 1	0.4535	0.4464	0.4381	0.4333	0.4227
M 2	0.5652	0.5822	0.5517	0.5250	0.4720
M(PR) 1	0.7520	0.7637	0.7751	0.7927	0.8097
M(PR) 2	0.4188	0.4954	0.5002	0.5066	0.4518
TURN(PR)	29.510	27.104	22.145	18.274	12.192
UUBAR	0.2266	0.1230	0.1123	0.1340	0.2581
DFAC	0.6447	0.5571	0.5330	0.5328	0.6246
EFFP	0.6894	0.8629	0.8592	0.8386	0.7049
EFF	0.6780	0.8574	0.8538	0.8327	0.6953
INCID	-5.88	-4.80	-3.82	-3.22	-2.70
LOSS PARAMETER	0.08694	0.04577	0.04076	0.04721	0.08309
DEV	16.507	11.097	10.522	9.905	12.391

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 99.96

CORRECTED WEIGHT FLOW = 102.35

CORRECTED ROTOR SPEED = 4526.31

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.884	1.890	2.769	3.294	3.291
V 0	451.00	451.00	451.00	451.00	451.00
V 1	520.40	513.13	504.89	498.99	488.45
VZ 0	450.99	450.99	450.99	450.99	450.99
VZ 1	520.34	512.85	504.30	498.17	487.64
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	8.03	16.93	24.39	28.67	28.04
M 0	0.4107	0.4107	0.4107	0.4107	0.4107
M 1	0.4766	0.4696	0.4618	0.4561	0.4461
TURN	-0.88	-1.89	-2.77	-3.29	-3.29
UUBAR	0.0288	0.0333	0.0425	0.0387	0.0588
DFAC	-0.145	-0.119	-0.092	-0.073	-0.050
EFFP	0.9098	0.8879	0.8460	0.8403	0.7351
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.154	0.330	0.871	1.866	3.379

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	42.691	39.694	38.089	37.722	44.900
BETA 2A	22.220	22.850	23.050	23.265	25.425
V 2	658.15	662.10	624.39	605.87	546.06
V 2A	537.04	537.82	511.86	497.64	436.86
VZ 2	483.75	509.46	491.43	479.24	386.80
VZ 2A	497.16	495.62	471.00	457.18	394.55
V-THETA 2	446.26	422.87	385.18	370.69	385.45
V-THETA 2A	203.09	208.85	200.41	196.56	187.56
M 2	0.5799	0.5870	0.5528	0.5355	0.4782
M 2A	0.4709	0.4722	0.4504	0.4376	0.3824
TURN	20.471	16.844	15.039	14.457	19.475
UUBAR	0.0275	0.0852	0.0703	0.0893	0.1057
DFAC	0.3382	0.3288	0.3152	0.3153	0.3791
EFFP	2.0496	0.9041	1.2821	1.3444	10.4254
INCID	-6.68	-9.68	-11.28	-11.65	-4.47
DEV	11.70	12.33	12.53	12.75	14.91
DIA	33.564	34.992	36.420	37.848	39.276

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.884	1.890	2.769	3.294	3.291
BETA 2	42.691	39.694	38.089	37.722	44.900
BETA(PR) 1	51.578	52.880	54.255	55.575	57.246
BETA(PR) 2	24.171	27.895	34.407	38.430	45.579
V 1	520.40	513.13	504.89	498.99	488.45
V 2	658.15	662.10	624.39	605.87	546.06
VZ 1	520.34	512.85	504.30	498.17	487.64
VZ 2	483.75	509.46	491.43	479.24	386.80
V-THETA 1	8.03	16.93	24.39	28.67	28.04
V-THETA 2	446.26	422.87	385.18	370.69	385.45
V(PR) 1	837.3	849.8	863.3	881.2	901.3
V(PR) 2	530.2	576.4	595.6	611.8	552.6
VTHETA PR1	-656.0	-677.6	-700.6	-726.9	-758.0
VTHETA PR2	-217.1	-269.7	-336.6	-380.3	-394.7
U 1	664.03	694.54	725.04	755.55	786.05
U 2	663.37	692.56	721.75	750.94	780.13
M 1	0.4766	0.4696	0.4618	0.4561	0.4461
M 2	0.5799	0.5870	0.5528	0.5355	0.4782
M(PR) 1	0.7668	0.7777	0.7895	0.8055	0.8232
M(PR) 2	0.4672	0.5111	0.5274	0.5407	0.4839
TURN(PR)	27.407	24.984	19.948	17.145	11.668
UUBAR	0.1943	0.1294	0.1188	0.1249	0.2598
DFAC	0.5754	0.5222	0.4946	0.4859	0.5795
EFFP	0.7223	0.9552	0.8405	0.8194	0.6580
EFF	0.7125	0.8498	0.8350	0.8133	0.6478
INCID	-7.22	-6.17	-5.19	-4.58	-4.04
LOSS PARAMETER	0.03881	0.04785	0.04265	0.04413	0.08501
DEV	17.271	11.845	11.447	9.680	11.569

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 100.09

CORRECTED WEIGHT FLOW = 106.22

CORRECTED ROTOR SPEED = 4532.09

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.018	1.797	2.561	3.327	3.259
V 0	471.88	471.88	471.88	471.88	471.88
V 1	547.14	539.29	530.63	525.12	513.90
VZ 0	471.88	471.88	471.88	471.88	471.88
VZ 1	547.05	539.03	530.10	524.23	513.07
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	9.72	16.91	23.71	30.47	29.22
M 0	0.4304	0.4304	0.4304	0.4304	0.4304
M 1	0.5023	0.4947	0.4864	0.4811	0.4703
TURN	-1.02	-1.80	-2.56	-3.33	-3.26
UUBAR	0.0240	0.0312	0.0422	0.0363	0.0591
DFAC	-0.150	-0.124	-0.099	-0.079	-0.056
EFFP	0.9258	0.8989	0.8550	0.8580	0.7516
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.288	0.423	1.079	1.833	3.411

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	37.722	37.210	35.026	33.864	39.500
BETA 2A	23.750	24.200	24.510	24.380	25.301
V 2	685.90	659.97	618.36	616.24	570.72
V 2A	619.43	581.73	561.82	554.70	523.15
VZ 2	542.54	525.62	506.37	511.71	440.38
VZ 2A	566.97	530.61	511.20	505.24	472.97
V-THETA 2	419.65	399.11	354.91	343.39	363.02
V-THETA 2A	249.47	238.47	233.07	228.97	223.58
M 2	0.6097	0.5870	0.5499	0.5469	0.5029
M 2A	0.5497	0.5158	0.4991	0.4923	0.4624
TURN	13.972	13.010	10.516	9.484	14.199
UUBAR	0.0739	0.1344	0.0936	0.1368	0.1222
DFAC	0.2005	0.2249	0.1815	0.1885	0.2046
EFFP	2.4232	1.0749	2.6763	-16.0343	-0.3005
INCID	-11.65	-12.16	-14.34	-15.51	-9.87
DEV	13.23	13.68	13.99	13.86	14.78
DIA	33.564	34.992	36.420	37.848	39.276

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.018	1.797	2.561	3.327	3.259
BETA 2	37.722	37.210	35.026	33.864	39.500
BETA(PR) 1	50.138	51.536	52.953	54.169	55.902
BETA(PR) 2	24.265	29.248	35.990	38.602	43.514
V 1	547.14	539.29	530.63	525.12	513.90
V 2	685.90	659.97	618.36	616.24	570.72
VZ 1	547.05	539.03	530.10	524.23	513.07
VZ 2	542.54	525.62	506.37	511.71	440.38
V-THETA 1	9.72	16.91	23.71	30.47	29.22
V-THETA 2	419.65	399.11	354.91	343.39	363.02
V(PR) 1	853.5	866.6	879.9	895.5	915.2
V(PR) 2	595.1	602.4	625.8	654.8	607.2
VTHETA PR1	-655.2	-678.5	-702.3	-726.0	-757.8
VTHETA PR2	-244.6	-294.3	-367.8	-408.5	-418.1
U 1	664.87	695.43	725.98	756.51	787.06
U 2	664.22	693.45	722.68	751.90	781.13
M 1	0.5023	0.4947	0.4864	0.4811	0.4703
M 2	0.6097	0.5870	0.5499	0.5469	0.5029
M(PR) 1	0.7835	0.7949	0.8065	0.8204	0.8376
M(PR) 2	0.5290	0.5358	0.5565	0.5811	0.5351
TURN(PR)	25.873	22.288	16.963	15.567	12.388
UUBAR	0.1551	0.1658	0.1492	0.1304	0.2528
DFAC	0.4943	0.4901	0.4553	0.4314	0.5140
EFFP	0.7911	0.8107	0.8140	0.7855	0.6560
EFF	0.7839	0.8044	0.8085	0.7790	0.6467
INCID	-8.66	-7.51	-6.50	-5.98	-5.39
LOSS PARAMETER	0.05658	0.06050	0.05259	0.04594	0.08561
DEV	17.365	13.198	13.030	9.852	9.504

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 99.94

CORRECTED WEIGHT FLOW = 108.30

CORRECTED ROTOR SPEED = 4525.45

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.868	1.885	2.786	3.493	3.608
V 0	483.34	483.34	483.34	483.34	483.34
V 1	566.30	557.58	548.46	543.38	531.00
VZ 0	483.34	483.34	483.34	483.34	483.34
VZ 1	566.23	557.28	547.81	542.37	529.95
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	8.58	18.34	26.66	33.11	33.41
M 0	0.4413	0.4413	0.4413	0.4413	0.4413
M 1	0.5208	0.5123	0.5035	0.4986	0.4867
TURN	-0.87	-1.88	-2.79	-3.49	-3.61
UUBAR	0.0145	0.0244	0.0357	0.0258	0.0522
DFAC	-0.163	-0.134	-0.106	-0.080	-0.062
EFFP	0.9530	0.9231	0.8828	0.9009	0.7925
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.138	0.335	0.854	1.667	3.062

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	34.564	34.445	30.819	30.428	33.100
BETA 2A	25.600	25.700	26.130	26.400	27.500
V 2	714.02	645.81	624.58	626.40	593.39
V 2A	731.25	676.77	664.37	651.35	658.49
VZ 2	587.99	532.58	536.38	540.13	497.09
VZ 2A	659.46	609.82	596.47	583.42	584.09
V-THETA 2	405.09	365.28	319.99	317.25	324.05
V-THETA 2A	315.96	293.49	292.60	289.61	304.06
M 2	0.6427	0.5756	0.5580	0.5594	0.5269
M 2A	0.6597	0.6111	0.6011	0.5869	0.5913
TURN	8.964	8.745	4.689	4.028	5.690
UUBAR	0.1707	0.1661	0.1740	0.2585	0.1641
DFAC	0.0281	0.0009	-0.0431	-0.0179	-0.0917
EFFP	3.5215	0.6745	0.7521	1.1731	0.9601
INCID	-14.81	-14.93	-18.55	-18.94	-16.27
DEV	15.08	15.18	15.61	15.88	16.98
DIA	33.564	34.992	36.420	37.848	39.276

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.868	1.885	2.786	3.493	3.608
BETA 2	34.564	34.445	30.819	30.428	33.100
BETA(PR) 1	49.172	50.501	51.984	53.097	54.844
BETA(PR) 2	23.704	31.562	36.825	38.754	42.527
V 1	566.30	557.58	548.46	543.38	531.00
V 2	714.02	645.81	624.58	626.40	593.39
VZ 1	566.23	557.28	547.81	542.37	529.95
VZ 2	587.99	532.58	536.38	540.13	497.09
V-THETA 1	8.58	18.34	26.66	33.11	33.41
V-THETA 2	405.09	365.28	319.99	317.25	324.05
V(PR) 1	866.1	876.1	887.5	903.3	920.4
V(PR) 2	642.2	625.0	670.1	692.6	674.5
VTHETA PR1	-655.3	-676.1	-698.2	-722.3	-752.5
VTHETA PR2	-258.2	-327.2	-401.6	-433.6	-455.9
U 1	663.91	694.41	724.91	755.41	785.90
U 2	663.25	692.43	721.62	750.80	779.99
M 1	0.5208	0.5123	0.5035	0.4986	0.4867
M 2	0.6427	0.5756	0.5580	0.5594	0.5269
M(PR) 1	0.7965	0.8051	0.8148	0.8289	0.8436
M(PR) 2	0.5780	0.5571	0.5987	0.6185	0.5989
TURN(PR)	25.467	18.939	15.059	14.344	12.317
UUBAR	0.1530	0.2171	0.1569	0.1505	0.2246
DFAC	0.4411	0.4531	0.3916	0.3800	0.4216
EFFP	0.9502	0.7071	0.7667	0.7690	0.6524
EFF	0.9486	0.6994	0.7608	0.7631	0.6442
INCID	-9.63	-8.55	-7.57	-7.05	-6.45
LOSS PARAMETER	0.05604	0.07738	0.05466	0.05295	0.07730
DEV	16.904	15.512	13.865	10.004	8.517

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 110.43

CORRECTED WEIGHT FLOW = 89.52

CORRECTED ROTOR SPEED = 5000.49

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.892	1.870	2.874	3.343	3.859
V 0	385.43	385.43	385.43	385.43	385.43
V 1	447.19	442.02	434.89	431.05	421.91
VZ 0	385.43	385.43	385.43	385.43	385.43
VZ 1	447.13	441.79	434.34	430.31	420.95
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	6.96	14.43	21.81	25.14	28.39
M 0	0.3494	0.3494	0.3494	0.3494	0.3494
M 1	0.4071	0.4023	0.3956	0.3920	0.3834
TURN	-0.89	-1.87	-2.87	-3.34	-3.86
UUBAR	0.0168	0.0192	0.0335	0.0270	0.0524
DFAC	-0.152	-0.128	-0.099	-0.084	-0.056
EFFP	0.9345	0.9222	0.8702	0.8793	0.7681
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.162	0.350	0.766	1.817	2.811

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	63.673	48.650	47.634	50.014	61.400
BETA 2A	27.594	25.454	23.770	26.640	30.559
V 2	665.14	681.56	676.93	636.76	598.90
V 2A	321.30	431.62	504.67	442.57	359.49
VZ 2	294.98	450.28	456.16	409.18	286.69
VZ 2A	284.76	389.73	461.86	395.59	309.56
V-THETA 2	596.15	511.63	500.15	487.89	525.82
V-THETA 2A	148.83	185.51	203.41	198.44	182.78
M 2	0.5778	0.5939	0.5909	0.5542	0.5157
M 2A	0.2714	0.3678	0.4337	0.3787	0.3067
TURN	36.080	23.196	23.864	23.375	30.841
UUBAR	0.2876	0.1955	0.0772	0.1626	0.2867
DFAC	0.7975	0.5755	0.4541	0.5207	0.6822
EFFP	0.5895	0.6574	0.8307	0.6617	1.0248
INCID	14.30	-0.72	-1.74	0.64	12.03
DEV	17.07	14.93	13.25	16.12	20.04
DIA	33.564	34.992	36.420	37.848	39.276

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.892	1.870	2.874	3.343	3.859
BETA 2	63.673	48.650	47.634	50.014	61.400
BETA(PR) 1	58.394	59.596	60.863	62.008	63.383
BETA(PR) 2	24.866	29.377	33.086	39.867	49.531
V 1	447.19	442.02	434.89	431.05	421.91
V 2	665.14	681.56	676.93	636.76	598.90
VZ 1	447.13	441.79	434.34	430.31	420.95
VZ 2	294.98	450.28	456.16	409.18	286.69
V-THETA 1	6.96	14.43	21.81	25.14	28.39
V-THETA 2	596.15	511.63	500.15	487.89	525.82
V(PR) 1	853.2	872.9	892.1	916.8	939.6
V(PR) 2	325.1	516.7	544.4	533.1	441.7
VTHETA PR1	-726.6	-752.9	-779.2	-809.6	-840.0
VTHETA PR2	-136.7	-253.5	-297.2	-341.7	-336.0
U 1	733.60	767.30	801.00	834.70	868.40
U 2	732.87	765.12	797.37	829.61	861.86
M 1	0.4071	0.4023	0.3956	0.3920	0.3834
M 2	0.5778	0.5939	0.5909	0.5542	0.5157
M(PR) 1	0.7767	0.7944	0.8114	0.8337	0.8538
M(PR) 2	0.2824	0.4503	0.4752	0.4640	0.3804
TURN(PR)	33.528	30.218	27.777	22.141	13.852
UUBAR	0.3509	0.1363	0.1126	0.1633	0.3026
DFAC	0.8942	0.6469	0.6259	0.6517	0.7853
EFFP	0.7553	0.8282	0.8790	0.8527	0.7330
EFF	0.7435	0.8193	0.8726	0.8452	0.7201
INCID	-0.41	0.55	1.41	1.86	2.09
LOSS PARAMETER	0.1277	0.0497	0.0411	0.0566	0.09181
DEV	17.966	13.327	10.126	11.117	15.521

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 109.81

CORRECTED WEIGHT FLOW = 90.90

CORRECTED ROTOR SPEED = 4971.99

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.000	1.910	2.703	3.407	3.805
V 0	392.21	392.21	392.21	392.21	392.21
V 1	454.59	450.14	442.91	439.67	430.26
VZ 0	392.21	392.21	392.21	392.21	392.21
VZ 1	454.52	449.89	442.42	438.89	429.31
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	7.94	15.00	20.89	26.13	28.55
M 0	0.3557	0.3557	0.3557	0.3557	0.3557
M 1	0.4141	0.4099	0.4031	0.4000	0.3912
TURN	-1.00	-1.91	-2.70	-3.41	-3.81
UUBAR	0.0076	0.0065	0.0222	0.0131	0.0409
DFAC	-0.149	-0.128	-0.102	-0.086	-0.059
EFFP	0.9582	0.9578	0.9038	0.9261	0.8091
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.270	0.310	0.937	1.753	2.865

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.000	1.910	2.703	3.407	3.805
BETA 2	62.547	47.563	47.072	49.495	60.400
BETA(PR) 1	57.790	58.972	60.297	61.365	62.788
BETA(PR) 2	23.872	28.456	32.977	39.390	48.732
V 1	454.59	450.14	442.91	439.67	430.26
V 2	667.66	689.27	675.25	637.63	598.27
VZ 1	454.52	449.89	442.42	438.89	429.31
VZ 2	307.80	465.10	459.90	414.16	295.51
V-THETA 1	7.94	15.00	20.89	26.13	28.55
V-THETA 2	592.47	508.70	494.42	484.82	520.19
V(PR) 1	852.7	872.8	892.9	915.8	938.8
V(PR) 2	336.6	529.0	548.2	535.9	448.0
VTHETA PR1	-721.5	-747.9	-775.5	-803.8	-834.9
VTHETA PR2	-136.2	-252.1	-298.4	-340.1	-336.8
U 1	729.42	762.92	796.43	829.94	863.45
U 2	728.69	760.76	792.82	824.89	856.95
M 1	0.4141	0.4099	0.4031	0.4000	0.3912
M 2	0.5771	0.6015	0.5902	0.5551	0.5166
M(PR) 1	0.7767	0.7948	0.8126	0.8333	0.8536
M(PR) 2	0.2910	0.4617	0.4791	0.4666	0.3869
TURN(PR)	33.918	30.517	27.320	21.975	14.055
UUBAR	0.3450	0.1216	0.1133	0.1631	0.2993
DFAC	0.8785	0.6311	0.6196	0.6462	0.7755
EFFP	0.6899	0.8370	0.8843	0.8426	0.7520
EFF	0.6753	0.8286	0.8783	0.8348	0.7402
INCID	-1.01	-0.08	0.85	1.22	1.50
LOSS PARAMETER	0.1262	0.04475	0.04135	0.07226	0.09219
DEV	16.972	12.406	10.017	10.640	14.722

SLOTTED STATOR 2

STATION 2 - STATION 3

PCT SPAN	90	70	50	30	10
BETA 2	62.547	47.563	47.072	49.495	60.400
BETA 2A	26.866	23.929	23.015	27.569	30.710
V 2	667.66	689.27	675.25	637.63	598.27
V 2A	332.17	452.47	500.37	435.46	363.43
VZ 2	307.80	465.10	459.90	414.16	295.51
VZ 2A	296.32	413.58	460.54	386.01	312.46
V-THETA 2	592.47	508.70	494.42	484.82	520.19
V-THETA 2A	150.11	183.52	195.63	201.54	185.60
M 2	0.5771	0.6015	0.5902	0.5551	0.5166
M 2A	0.2813	0.3867	0.4305	0.3731	0.3102
TURN	35.681	23.635	24.057	21.925	29.690
UUBAR	0.2591	0.1644	0.0716	0.1659	0.2679
DFAC	0.7789	0.5494	0.4605	0.5279	0.6684
EFFP	0.8158	0.7182	0.8504	0.7225	0.8535
INCID	13.18	-1.81	-2.30	0.12	11.03
DEV	16.35	13.41	12.49	17.05	20.19
DIA	33.564	34.992	36.420	37.848	39.276

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 109.92

CORRECTED WEIGHT FLOW = 94.40

CORRECTED ROTOR SPEED = 4977.38

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.150	2.055	3.083	3.515	3.707
V 0	409.75	409.75	409.75	409.75	409.75
V 1	479.73	473.60	465.49	461.23	448.99
VZ 0	409.75	409.75	409.75	409.75	409.75
VZ 1	479.64	473.30	464.82	460.36	448.05
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	9.63	16.99	25.03	28.28	29.03
M 0	0.3721	0.3721	0.3721	0.3721	0.3721
M 1	0.4379	0.4321	0.4245	0.4204	0.4089
TURN	-1.15	-2.06	-3.08	-3.52	-3.71
UUBAR	0.0062	0.0090	0.0231	0.0140	0.0506
DFAC	-0.159	-0.135	-0.105	-0.090	-0.058
EFFP	1.0031	0.9958	0.9529	0.9782	0.8366
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.420	0.165	0.557	1.645	2.963

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	58.672	45.621	46.210	48.399	57.000
BETA 2A	24.920	22.649	22.964	27.764	30.719
V 2	673.01	706.42	679.74	636.99	599.87
V 2A	405.71	485.63	493.06	428.25	382.63
VZ 2	349.92	494.07	470.39	422.93	326.71
VZ 2A	367.93	448.18	453.98	378.95	328.94
V-THETA 2	574.88	504.90	490.70	476.33	503.09
V-THETA 2A	170.94	187.01	192.37	199.49	195.46
M 2	0.5827	0.6185	0.5951	0.5554	0.5194
M 2A	0.3457	0.4170	0.4249	0.3673	0.3276
TURN	33.752	22.972	23.246	20.635	26.281
UUBAR	0.1178	0.1174	0.0716	0.1435	0.1871
DFAC	0.6476	0.5089	0.4745	0.5339	0.6151
EFFP	1.0932	0.8129	0.9005	0.7774	0.9831
INCID	9.30	-3.75	-3.16	-0.97	7.63
DEV	14.40	12.13	12.44	17.24	20.20
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.150	2.055	3.083	3.515	3.707
BETA 2	58.672	45.621	46.210	48.399	57.000
BETA(PR) 1	56.351	57.634	58.957	60.161	61.793
BETA(PR) 2	23.836	27.453	32.786	39.565	47.359
V 1	479.73	473.60	465.49	461.23	448.99
V 2	673.01	706.42	679.74	636.99	599.87
VZ 1	479.64	473.30	464.82	460.36	448.05
VZ 2	349.92	494.07	470.39	422.93	326.71
V-THETA 1	9.63	16.99	25.03	28.28	29.03
V-THETA 2	574.88	504.90	490.70	476.33	503.09
V(PR) 1	865.6	884.1	901.4	925.2	947.9
V(PR) 2	382.6	556.8	559.5	548.6	482.3
VTHETA PR1	-720.6	-746.8	-772.3	-802.6	-835.4
VTHETA PR2	-154.6	-256.7	-303.0	-349.4	-354.8
U 1	730.21	763.75	797.30	830.84	864.39
U 2	729.48	761.58	793.68	825.78	857.88
M 1	0.4379	0.4321	0.4245	0.4204	0.4089
M 2	0.5827	0.6185	0.5951	0.5554	0.5194
M(PR) 1	0.7902	0.8067	0.8219	0.8434	0.8633
M(PR) 2	0.3312	0.4875	0.4899	0.4783	0.4176
TURN(PR)	32.515	30.181	26.171	20.595	14.433
UUBAR	0.3138	0.0973	0.1124	0.1653	0.2794
DFAC	0.8183	0.6017	0.6069	0.6309	0.7328
EFFP	0.6875	0.8634	0.8847	0.8342	0.7603
EFF	0.6730	0.8563	0.8788	0.8262	0.7492
INCID	-2.45	-1.42	-0.49	0.01	0.50
LOSS PARAMETER	0.1150	0.0361	0.0411	0.0515	0.0886
DEV	16.936	11.403	9.826	10.815	13.349

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 110.02

CORRECTED WEIGHT FLOW = 99.57

CORRECTED ROTOR SPEED = 4981.60

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	0.874	1.935	2.990	3.679	4.017
V 0	436.32	436.32	436.32	436.32	436.32
V 1	509.54	503.14	494.52	490.31	479.08
VZ 0	436.32	436.32	436.32	436.32	436.32
VZ 1	509.48	502.85	493.85	489.30	477.91
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	7.77	16.99	25.79	31.46	33.56
M 0	0.3969	0.3969	0.3969	0.3969	0.3969
M 1	0.4662	0.4601	0.4519	0.4479	0.4372
TURN	-0.87	-1.93	-2.99	-3.68	-4.02
UUBAR	0.0019	0.0054	0.0210	0.0116	0.0402
DFAC	-0.159	-0.133	-0.103	-0.086	-0.058
EFFP	0.9788	0.9668	0.9158	0.9385	0.8208
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.144	0.285	0.650	1.481	2.653

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	53.158	44.646	44.243	45.934	52.865
BETA 2A	23.323	22.411	22.168	25.851	29.950
V 2	681.48	717.01	682.29	638.32	597.51
V 2A	451.69	508.71	497.87	441.19	369.87
VZ 2	408.62	510.13	488.78	443.94	360.72
VZ 2A	414.79	470.29	461.07	397.04	320.48
V-THETA 2	545.39	503.86	476.04	458.66	476.34
V-THETA 2A	178.83	193.95	187.85	192.37	184.66
M 2	0.5906	0.6292	0.5982	0.5578	0.5188
M 2A	0.3873	0.4385	0.4303	0.3800	0.3172
TURN	29.835	22.235	22.076	20.083	22.915
UUBAR	0.0516	0.0982	0.0623	0.1068	0.1919
DFAC	0.5616	0.4791	0.4626	0.5068	0.6218
EFFP	1.6094	0.8826	1.0075	0.8999	0.9407
INCID	3.79	-4.72	-5.13	-3.44	3.49
DEV	12.80	11.89	11.65	15.33	19.43
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	0.874	1.935	2.990	3.679	4.017
BETA 2	53.158	44.646	44.243	45.934	52.865
BETA(PR) 1	54.830	56.068	57.399	58.552	60.114
BETA(PR) 2	24.325	26.861	33.074	39.643	46.661
V 1	509.54	503.14	494.52	490.31	479.08
V 2	681.48	717.01	682.29	638.32	597.51
VZ 1	509.48	502.85	493.85	489.30	477.91
VZ 2	408.62	510.13	488.78	443.94	360.72
V-THETA 1	7.77	16.99	25.79	31.46	33.56
V-THETA 2	545.39	503.86	476.04	458.66	476.34
V(PR) 1	884.5	900.8	916.6	937.8	959.1
V(PR) 2	448.4	571.8	583.3	576.5	525.6
VTHETA PR1	-723.1	-747.4	-772.2	-800.1	-831.6
VTHETA PR2	-184.7	-258.4	-318.3	-367.8	-382.3
U 1	730.83	764.40	797.97	831.55	865.12
U 2	730.10	762.23	794.35	826.48	858.61
M 1	0.4662	0.4601	0.4519	0.4479	0.4372
M 2	0.5906	0.6292	0.5982	0.5578	0.5188
M(PR) 1	0.8093	0.8237	0.8376	0.8567	0.8753
M(PR) 2	0.3887	0.5018	0.5114	0.5038	0.4564
TURN(PR)	30.506	29.206	24.325	18.909	13.453
UUBAR	0.2819	0.1207	0.1214	0.1642	0.2620
DFAC	0.7353	0.5919	0.5802	0.5960	0.6754
EFFP	0.6648	0.9562	0.8625	0.8206	0.7478
EFF	0.6499	0.8489	0.8558	0.8124	0.7369
INCID	-3.97	-2.98	-2.05	-1.60	-1.18
LOSS PARAMETER	0.1026	0.0451	0.0443	0.0570	0.0834
DEV	17.425	10.811	10.114	10.893	12.651

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 110.07

CORRECTED WEIGHT FLOW = 106.90

CORRECTED ROTOR SPEED = 4983.75

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.046	2.178	3.018	3.635	3.404
V 0	475.58	475.58	475.58	475.58	475.58
V 1	557.48	549.89	540.36	535.76	522.97
VZ 0	475.58	475.58	475.58	475.58	475.58
VZ 1	557.39	549.50	539.61	534.68	522.05
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	10.18	20.89	28.44	33.97	31.05
M 0	0.4340	0.4340	0.4340	0.4340	0.4340
M 1	0.5124	0.5050	0.4958	0.4914	0.4791
TURN	-1.05	-2.18	-3.02	-3.64	-3.40
UUBAR	0.0010	0.0044	0.0197	0.0086	0.0391
DFAC	-0.162	-0.134	-0.105	-0.089	-0.065
EFFP	1.0162	1.0031	0.9582	0.9900	0.8742
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.316	0.042	0.622	1.525	3.266

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	45.425	41.573	39.661	40.659	49.859
BETA 2A	22.668	22.887	22.519	23.533	27.440
V 2	711.41	721.40	697.59	667.85	593.68
V 2A	539.74	552.08	534.13	506.31	436.59
VZ 2	499.30	539.68	537.03	506.63	382.73
VZ 2A	498.04	508.61	493.40	464.20	387.47
V-THETA 2	506.76	478.70	445.23	435.14	453.85
V-THETA 2A	208.01	214.71	204.56	202.16	201.19
M 2	0.6217	0.6360	0.6133	0.5855	0.5164
M 2A	0.4688	0.4803	0.4661	0.4411	0.3782
TURN	22.757	18.686	17.142	17.126	22.419
UUBAR	0.0426	0.0972	0.1021	0.1225	0.1153
DFAC	0.4165	0.3944	0.3915	0.4075	0.4748
EFFP	2.3729	0.9768	1.5674	1.6785	2.2138
INCID	-3.94	-7.80	-9.71	-8.71	0.49
DEV	12.15	12.37	12.00	13.01	16.92
DIA	33.565	34.995	36.424	37.854	39.284

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.046	2.178	3.018	3.635	3.404
BETA 2	45.425	41.573	39.661	40.659	49.859
BETA(PR) 1	52.292	53.545	54.973	56.175	57.969
BETA(PR) 2	24.130	27.743	33.053	37.709	46.629
V 1	557.48	549.89	540.36	535.76	522.97
V 2	711.41	721.40	697.59	667.85	593.68
VZ 1	557.39	549.50	539.61	534.68	522.05
VZ 2	499.30	539.68	537.03	506.63	382.73
V-THETA 1	10.18	20.89	28.44	33.97	31.05
V-THETA 2	506.76	478.70	445.23	435.14	453.85
V(PR) 1	911.3	924.8	940.2	960.5	984.3
V(PR) 2	547.1	609.8	640.7	640.4	557.3
VTHETA PR1	-721.0	-743.8	-769.9	-797.9	-834.4
VTHETA PR2	-223.7	-283.9	-349.5	-391.7	-405.1
U 1	731.14	764.73	798.32	831.91	865.49
U 2	730.42	762.56	794.70	826.84	858.98
M 1	0.5124	0.5050	0.4958	0.4914	0.4791
M 2	0.6217	0.6360	0.6133	0.5855	0.5164
M(PR) 1	0.8375	0.8493	0.8627	0.8810	0.9018
M(PR) 2	0.4781	0.5376	0.5633	0.5614	0.4848
TURN(PR)	28.162	25.802	21.920	18.466	11.340
UUBAR	0.2407	0.1565	0.1313	0.1672	0.3192
DFAC	0.6169	0.5484	0.5142	0.5268	0.6419
EFFP	0.6714	0.8124	0.7906	0.7548	0.6470
EFF	0.6576	0.8040	0.7814	0.7446	0.6342
INCID	-6.51	-5.50	-4.48	-3.98	-3.32
LOSS PARAMETER	0.0877	0.0580	0.0479	0.0596	0.1024
DEV	17.230	11.693	10.093	8.959	12.619

Table B-2. Blade Element Performance (Continued)

PERCENT DESIGN SPEED = 110.21

CORRECTED WEIGHT FLOW = 112.36

CORRECTED ROTOR SPEED = 4990.21

INLET GUIDE VANE 3

STATION 0 - STATION 1

PCT SPAN	90	70	50	30	10
DIA	33.622	35.167	36.712	38.256	39.801
BETA 0	0.000	0.000	0.000	0.000	0.000
BETA 1	1.182	2.045	2.848	3.530	2.976
V 0	506.22	506.22	506.22	506.22	506.22
V 1	600.25	590.80	579.88	574.23	559.60
VZ 0	506.22	506.22	506.22	506.22	506.22
VZ 1	600.12	590.42	579.17	573.14	558.84
V-THETA 0	0.00	0.00	0.00	0.00	0.00
V-THETA 1	12.38	21.08	28.81	35.36	29.05
M 0	0.4631	0.4631	0.4631	0.4631	0.4631
M 1	0.5540	0.5447	0.5341	0.5286	0.5144
TURN	-1.18	-2.05	-2.85	-3.53	-2.98
UUBAR	0.0299	0.0350	0.0468	0.0317	0.0602
DFAC	-0.174	-0.146	-0.116	-0.098	-0.075
EFFP	0.9479	0.9310	0.8931	0.9231	0.8184
INCID	0.1901	0.5901	0.9701	1.3701	1.7701
DEV	-0.452	0.175	0.792	1.630	3.694

SLOTTED ROTOR 3

STATION 1 - STATION 2

PCT SPAN	90	70	50	30	10
DIA	33.589	35.067	36.545	38.023	39.501
BETA 1	1.182	2.045	2.848	3.530	2.976
BETA 2	37.012	37.055	33.127	31.864	33.116
BETA(PR) 1	50.178	51.589	53.070	54.300	56.288
BETA(PR) 2	22.701	30.566	34.995	38.954	44.794
V 1	600.25	590.80	579.88	574.23	559.60
V 2	781.36	711.00	702.45	681.67	624.20
VZ 1	600.12	590.42	579.17	573.14	558.84
VZ 2	623.92	567.42	588.28	578.94	522.81
V-THETA 1	12.38	21.08	28.81	35.36	29.05
V-THETA 2	470.36	428.43	383.88	359.86	341.02
V(PR) 1	937.1	950.3	963.9	982.2	1006.9
V(PR) 2	676.3	659.0	718.1	744.5	736.7
VTHETA PR1	-719.7	-744.6	-770.5	-797.6	-837.6
VTHETA PR2	-261.0	-335.1	-411.8	-468.1	-519.1
U 1	732.09	765.72	799.35	832.98	866.62
U 2	731.36	763.55	795.73	827.91	860.09
M 1	0.5540	0.5447	0.5341	0.5286	0.5144
M 2	0.6960	0.6315	0.6263	0.6089	0.5535
M(PR) 1	0.8649	0.8762	0.8878	0.9041	0.9256
M(PR) 2	0.6025	0.5853	0.6402	0.6650	0.6533
TURN(PR)	27.477	21.023	18.075	15.346	11.494
UUBAR	0.2617	0.3125	0.2354	0.2208	0.2827
DFAC	0.4732	0.4866	0.4181	0.3960	0.4200
EFFP	0.6922	0.6197	0.6966	0.7326	0.5951
EFF	0.6811	0.6086	0.6875	0.7250	0.5854
INCID	-8.62	-7.46	-6.38	-5.85	-5.00
LOSS PARAMETER	0.09656	0.11256	0.08401	0.07735	0.09381
DEV	15.801	14.516	12.035	10.204	10.784

SLOTTED STATOR 2

STATION 2 - STATION 2A

PCT SPAN	90	70	50	30	10
BETA 2	37.012	37.055	33.127	31.864	33.116
BETA 2A	25.903	25.986	26.943	26.852	28.084
V 2	781.36	711.00	702.45	681.67	624.20
V 2A	760.00	715.09	714.44	705.51	655.02
VZ 2	623.92	567.42	588.28	578.94	522.81
VZ 2A	683.65	642.80	636.90	629.44	577.90
V-THETA 2	470.36	428.43	383.88	359.86	341.02
V-THETA 2A	332.00	313.32	323.71	318.67	308.36
M 2	0.6960	0.6315	0.6263	0.6089	0.5535
M 2A	0.6844	0.6414	0.6435	0.6328	0.5834
TURN	11.109	11.069	6.184	5.012	5.032
UUBAR	0.1801	0.1669	0.1752	0.1934	0.2499
DFAC	0.1013	0.0652	0.0225	-0.0054	-0.0223
EFFP	0.5382	0.7031	0.7817	2.1738	2.2723
INCID	-12.36	-12.32	-16.24	-17.51	-16.25
DEV	15.38	15.47	16.42	16.33	17.56
DIA	33.565	34.995	36.424	37.854	39.284

APPENDIX C
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