NASA TECHNICAL MEMORANDUM

NASA TM X-3338

NASA TM X-3338

OVERALL AND BLADE ELEMENT PERFORMANCE OF A 1.20-PRESSURE-RATIO FAN STAGE WITH ROTOR BLADES RESET -5°

George W. Lewis, Jr., Walter M. Osborn, and Royce D. Moore

Lewis Research Center
Cleveland, Ohio 44135

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • MARCH 1976

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TM X-3338		

4. Title and Subtitle	5. Report Date
OVERALL AND BLADE ELEMENT PERFORMANCE OF A 1.20-PRESSURE-RATIO FAN STAGE WITH ROTOR BLADES RESET -5°	March 1976
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
George W. Lewis, Jr., Walter M. Osborn, and Royce D. Moore	E-8057
	10. Work Unit No. 505-04

9. Performing Organization Name and Address	11. Contract or Grant No.
Lewis Research Center National Aeronautics and Space Administration Cleveland, Ohio 44135	
	13. Type of Report and Period Covered Technical Memorandum

12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code
National Aeronautics and Space Administration Washington, D.C. 20546	

15. Supplementary Notes

16. Abstract

A 51-cm-diam model of a fan stage for a short-haul aircraft was tested in a single-stage-compressor research facility. This stage was designed and built on contract by the Hamilton Standard Division of United Technologies Corporation. In the present study the rotor blades were set 5° toward the axial direction (opened) from design setting angle. Surveys of the air flow conditions ahead of the rotor, between the rotor and stator, and behind the stator were made over the stable operating range of the stage. At the design speed of 213.3 m/sec and a weight flow of 31.5 kg/sec, the stage pressure ratio and efficiency were 1.195 and 0.88, respectively. The design speed rotor peak efficiency of 0.91 occurred at the same flow rate.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Compressors Turbomachinery Axial flow Fans	Unclassified - unlimited STAR Category 02 (rev.)

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	91	$4.75

* For sale by the National Technical Information Service, Springfield, Virginia 22161

OVERALL AND BLADE ELEMENT PERFORMANCE OF A 1.20-PRESSURE-RATIO FAN STAGE WITH ROTOR BLADES RESET -5°

by George W. Lewis, Jr., Walter M. Osborn, and Royce D. Moore

Lewis Research Center

SUMMARY

A 51-centimeter-diameter model of a fan stage for short-haul aircraft was tested in a single-stage-compressor research facility at Lewis. This stage was designed and built on contract by the Hamilton Standard Division of United Technologies Corporation. In the present study the rotor blades, which were adjustable through axial position, were set 5° toward the axial direction (opened) from design setting angle. Surveys of the air flow conditions ahead of the rotor, between the rotor and stator, and behind the stator were made over the stable operating range of the stage. At the design speed of 213.3 meters per second and weight flow of 31.5 kilograms per second, the stage pressure ratio and efficiency were 1.195 and 0.88, respectively. The design speed rotor peak efficiency of 0.91 occurred at the same flow rate.

INTRODUCTION

NASA is currently evaluating short-haul aircraft for commercial application. These aircraft must have an efficient and reliable propulsion system satisfying the low noise requirements for urban communities. The aircraft engines must be capable of a variety of operating conditions: takeoff, cruise, approach, and thrust reversal on landing.

In support of this program the Lewis Research Center is investigating a variety of fan compressor inlet stages. These stages provide the potential for high bypass flows in aircraft engines. The Hamilton Standard Division of United Technologies Corporation has designed a fan stage under contract from which two stages were built with adjustable rotor blades: a 197-centimeter-diameter version for acoustic studies (ref. 1) and a 51-centimeter-diameter stage for aerodynamic studies. Overall performance for this stage at three rotor blade setting angles was reported in reference 2. Results indicated that the overall performance changed with rotor blade setting angle. The overall and blade-

element performances at design rotor blade setting angle were presented in reference 3. This report presents the overall and blade-element performance results for the stage with rotor blades set at design -5°. Data are presented over the stable operating range at 5 speeds from 80 to 120 percent of design speed. The data in this report are presented in plotted and in tabular form. The symbols and equations are defined in appendixes A and B. The tests were conducted in the single-stage compressor test facility at Lewis.

APPARATUS AND PROCEDURE

Compressor Test Facility

The compressor stage was tested in the single-stage compressor facility, which is described in detail in reference 4 and shown schematically in figure 1. Atmospheric air enters the test facility at an inlet located on the roof of the building, passes through the flow measuring orifice and into the plenum chamber upstream of the test stage. The air then passes through the experimental compressor stage into the collector and is exhausted to the atmosphere. Weight flow is controlled by a sleeve valve located in the discharge collector.

Test Stage

The adjustable rotor blade test stage was designed and built by Hamilton Standard. A detailed description of the aerodynamic design was presented in reference 3. The design tables are presented herein (tables I to V) for convenience, and the flow path is shown in figure 2. The definitions and units used for the tabular data are presented in appendix C. Briefly, the fan stage was designed for a pressure ratio of 1.20, a rotor tip speed of 213.3 meters per second, and a weight flow per unit annulus area of 195.3 kilograms per second per square meter. For the present test the rotor blades were opened 5°, and this configuration is designated stage 55C-55. The design tables do not reflect the 5° reset.

Instrumentation

The compressor weight flow was determined from measurements on a calibrated thin-plate orifice. The orifice temperature was determined from an average of two Chromel-Constantan thermocouples. Orifice pressures were measured by calibrated transducers.

Radial surveys of the flow were made upstream of the rotor, between the rotor and stator, and downstream of the stator (see fig. 2 for axial location). Total pressure, total temperature, and flow angle were measured with the combination probe (fig. 3(a)), and the static pressure was measured with a 8° C-shaped wedge probe (fig. 3(b)). Each probe was equipped with a null-balancing control system. The thermocouple material was Chromel-Constantan. Two combination probes and two wedge static probes were used at each of the three measuring stations.

Inner and outer wall static-pressure taps were located at the same axial stations as the survey probes. The circumferential locations of both types of survey probes along with inner and outer wall static-pressure taps are shown in figure 4. An electronic speed counter, in conjunction with a magnetic pickup, was used to measure rotative speed (rpm). The estimated errors of the data, based on inherent accuracies of the instrumentation and recording systems, are as follows:

Flow, kg/sec	±0.3
Rotative speed, rpm	±30
Flow angle, deg.	±1
Temperature, K	±0.6
Rotor-inlet total pressure, N/cm^2	±0.01
Rotor-outlet total pressure, N/cm^2	±0.10
Stator-outlet total pressure, N/cm^2	±0.10
Rotor-inlet static pressure, N/cm^2	±0.04
Rotor-outlet static pressure, N/cm^2	±0.07
Stator-outlet static pressure, N/cm^2	±0.07

Test Procedure

The stage survey data were taken over a range of weight flow from maximum flow to the near-stall conditions: At 80, 90, 100, 110, and 120 percent of design speed, radial surveys were taken at three or more weight flows. Data were recorded at nine radial positions for each speed and weight flow.

At each radial position the two combination probes behind the stator were circumferentially traversed to nine different locations across the stator gap. The wedge probes were set at midgap because preliminary studies showed that the static pressure across the stator gap was constant. Values of total pressure, total temperature, and flow angle were recorded at each circumferential position. At the last circumferential position, values of pressure, temperature, and flow angle were also recorded at stations 1 and 2. All probes were then moved to the next radial position, and the circumferential traverse procedure repeated.

Stall was determined at each rotative speed by closing the sleeve valve in the collector until an abrupt drop in total-pressure ratio occurred. Survey data were obtained at a weight flow within 1/2 kilogram per second of actual stall weight flow.

Calculation Procedure

Measured total temperatures and total pressures were corrected for Mach number and streamline slope. These corrections were based on the instrument probe calibrations given in reference 5. The stream static pressure was corrected for Mach number and streamline slope based on an average calibration for the type of probe used.

Because of the physical construction of the C-shaped static-pressure wedges, it was not possible to obtain static-pressure measurements at 5, 10, and 95 percent of span from the rotor tip. The static pressure at 95 percent span was obtained by assuming a linear variation in static pressure between the values at the inner wall and the probe measurement at 90 percent span. A similar variation was assumed between the static-pressure measurements at the outer wall and the 15 percent span position to obtain the static pressure at 5 and 10 percent span positions.

At each radial position averaged values of the nine circumferential measurements of total pressure, temperature rise, and flow angle downstream of the stator (station 3) were obtained. The nine values of total temperature were mass averaged to obtain the stage total-temperature rise. The nine values of total pressure were energy averaged. The measured values of pressure, temperature, and flow angle were used to calculate axial and tangential velocities at each circumferential position. The flow angles presented for each radial position are calculated based on the mass-average of the axial and tangential velocities. To obtain the overall performance, the radial values of total temperature were mass averaged, and the values of total pressure were energy averaged. At each measuring station the integrated weight flow was computed based on the radial survey data. These data, measured at the three measuring stations, have been translated to planes approximating the blade leading and trailing edges by the method presented in reference 6.

Orifice weight flow, total pressures, static pressures, and temperatures were all corrected to sea-level standard-day conditions based on the rotor inlet conditions.

RESULTS AND DISCUSSION

The results from this investigation will be presented in three main sections. The overall performances for the rotor and the stage are given first. Radial distributions of several performance parameters are then presented for the rotor and stator followed by

the blade-element data. The data presented are computer plotted and occasionally a data point will be omitted because it falls outside the range of the parameters shown in the figure. A brief discussion of the results is included.

All the plotted data, together with some additional performance parameters, are listed in tabular form. The overall performance data are presented in table VI. The blade-element data are given first for the rotor and then for the stator in tables VII and VIII. The abbreviations and units used for the tabular data are defined in appendix C.

Overall Performance

The overall performance for rotor 55C and stage 55C-55 are presented in figures 5 and 6. Data are presented from 80 to 120 percent of design speed. At each speed line data were taken at several values of weight flow from choke to the near-stall conditions. Design-point values with the original design blade setting angle are shown as solid symbols in both figures for reference purposes and assessment of test results.

Rotor. - The peak efficiency for rotor 55C at design speed was 0.91 and occurred at a weight flow of 31.5 kilograms per second ((197 kg/sec)/m^2 annulus area). Corresponding values of total-pressure ratio and total-temperature ratio are 1.210 and 1.062. At 80 percent of design speed efficiencies up to 0.94 were obtained for this rotor. The rotor peak efficiency was 0.88 at 110 percent of design speed. At 120 percent of design speed, rotor peak efficiency was 0.83, and this value occurred at the near-stall condition. The weight flow range from choke to near-stall was drastically reduced at this speed.

Stage. - The peak efficiency for stage 55C-55 at design speed was 0.88 and, like the rotor, occurred at the weight flow of 31.5 kilograms per second. The corresponding measured value of stage total-pressure ratio is 1.195. The stage peak efficiency decreased from 0.92 at 80 percent of design speed to 0.82 at 120 percent of design speed. At tip speeds from 80 to 100 percent of design, the pressure ratio is relatively constant with weight flow change. However, at 110 and 120 percent of design speeds, the stage pressure ratio falls off rapidly with increasing flow, the flow range from choke to stall is reduced, and choke weight flow does not increase proportionately with tip speed.

Radial Distributions

The radial distributions of several parameters obtained at design speed are presented in figure 7 for rotor 55C and in figure 8 for stator 55. In each figure data are presented for three weight flows: near maximum, peak efficiency, and near stall. The solid symbols depict performance as designed (stage 55-55) and a line is faired through

the peak efficiency data. Temperature-rise efficiency, temperature ratio, pressure ratio, mean incidence angle, meridional velocity ratio, deviation angle, total-loss parameter, total-loss coefficient, and diffusion factor are presented as functions of percent span from the blade tip.

Rotor. - At the peak efficiency weight flow of 31.5 kilograms per second the radial distribution of all parameters except deviation angle and incidence angle show good agreement with the reference values (fig. 7). The deviation angle is higher than reference in the blade tip region and lower in the hub region. Because of the rotor blade reset, the incidence angle is approximately 4° higher than the reference values across the entire span. There is a radial shift in meridional velocity ratio as the flow is reduced to the near stall condition (26.2 kg/sec). The rotor tip region velocity ratio is lower than the reference values, and from 30 percent span to the hub the velocity ratio is higher than the reference values. The total loss parameter and coefficient and the D factor are higher in the tip region at this flow.

Stator. - At the peak efficiency weight flow of 31.5 kilograms per second stator incidence angles were close to reference values, and deviation angles were less than reference values over the blade span. The flow has shifted radially toward the hub region as indicated by the higher hub velocity ratios. The losses in the tip region for peak efficiency flow are high, whereas in the hub region losses are minimal. At the near stall weight flow of 26.2 kilograms per second, the values of incidence angle and meridional velocity ratio across the stator in the blade tip region are a result of the low axial velocity at the rotor exit.

Variations of Blade-Element Performance with Incidence Angle

The variations of several blade-element performance parameters with incidence angle are shown in figure 9 for the rotor and in figure 10 for the stator. The data are represented for 80, 100, and 120 percent of design speed at blade elements located at 5, 10, 30, 50, 70, 90, and 95 percent of blade span as measured from the rotor-outlet blade tip. Reference values are indicated by solid symbols.

Rotor. - At speeds of 80 and 100 percent of design speed, the rotor total-pressure ratio is relatively constant with incidence angle at all span locations except the 90 and 95 percent spans where pressure ratio drops off near minimum incidence angle. At 120 percent of design speed a rapid increase in total-pressure ratio occurs with the increasing angle at all span locations. For tip speeds of 80 and 100 percent of design speed, minimum total-pressure loss coefficients are indicated at near zero incidence angle for the 30, 50, and 70 percent span locations. At 120 percent of design speed the highest losses were obtained from 30 percent span to the hub, but these losses decreased rapidly with

increasing incidence angle. At the 5 and 10 percent span locations, losses increase with increasing incidence angle.

Stator. - Total-pressure loss coefficients are higher than reference values for all incidence angles at the 5, 10, and 30 percent span locations for the three speed levels. The blade loading is high at the reference incidence angle and greater than the reference values at these locations. At the 30, 50, 70, and 90 percent spans, the minimum loss is defined and occurs near reference incidence angle. From 50 percent span to the hub, the loss coefficient is near reference value over the entire range of incidence angles except for the minimum incidence values at 120 percent of design speed where the loss coefficients rise rapidly. Deviation angles are lower than reference values over the incidence angle range and for each speed except near stall at 5 and 10 percent spans.

SUMMARY OF RESULTS

This report presents the aerodynamic design, the overall performance, and blade-element performance of a 51-centimeter-diameter fan stage suitable for application in short-haul aircraft. Radial surveys of the flow conditions at the rotor inlet, rotor outlet, and stator outlet were made over the stable operating flow range of the stage at equivalent rotative speeds from 80 to 120 percent of design speed. Flow and performance parameters were calculated across nine selected blade elements. The following principle results were obtained:

1. The fan stage peak-efficiency of 0.88 occurred at an equivalent weight flow of 31.5 kilograms per second, a design speed of 213.3 meters per second, and a stage pressure ratio of 1.195. The pressure ratio was approximately constant over the flow range of 33.8 to 26.2 kilograms per second.

2. At the design speed and peak efficiency weight flow, the flow parameters at the rotor exit are generally in good agreement with reference (design) values. The flow shifts toward the rotor hub as flow is reduced to the near stall condition.

3. Stator losses are higher than reference values in the tip region. In the midspan region minimum loss with incidence angle is defined and occurs near the reference incidence angle.

4. Operation at 120 percent of design speed resulted in a stage pressure ratio of 1.280 and an efficiency of 0.827.

Lewis Research Center,
National Aeronautics and Space Administration,
Cleveland, Ohio, October 2, 1975,
505-04.

APPENDIX A

SYMBOLS

A_{an} annulus area at rotor leading edge

A_f frontal area at rotor leading edge

C_p specific heat at constant pressure

c aerodynamic chord, cm

D diffusion factor

i_{mc} mean incidence angle, angle between inlet air direction and line tangent to blade mean camber line at leading edge, deg

N rotative speed, rpm

P total pressure, N/cm^2

p static pressure, N/cm^2

r radius, cm

T total temperature, K

U wheel speed, m/sec

V air velocity, m/sec

W weight flow, kg/sec

Z axial distance references from rotor blade hub leading edge, cm

α_c cone angle, deg

α_s slope of streamline, deg

β air angle, angle between air velocity and axial direction, deg

β_c' relative meridional air angle based on cone angle, arctan (tan β_m' cos α_c/cos α_s), deg

γ ratio of specific heats

δ ratio of rotor inlet total pressure to standard pressure of 10.13 N/m^2

δ^o deviation angle, angle between exit air direction and tangent to blade mean camber line at trailing edge, deg

θ ratio of rotor inlet total temperature to standard temperature of 288.2 K

η efficiency

κ_{mc} angle between the blade mean camber line and the meridional plane, deg

σ solidity, ratio of chord to spacing

$\bar{\omega}$ total loss coefficient

$\bar{\omega}_p$ profile loss coefficient

$\bar{\omega}_s$ shock loss coefficient

Subscripts:

ad adiabatic (temperature rise)

id ideal

LE blade leading edge

m meridional direction

mom momentum rise

p polytropic

TE blade trailing edge

z axial direction

θ tangential direction

1 instrumentation plane upstream of rotor

2 instrumentation plane between rotor and stator

3 instrumentation plane downstream of stator

Superscript:

′ relative to blade

APPENDIX B

EQUATIONS

Performance parameters are defined as follows:

Mean incidence angle

$$i_{mc} = (\beta'_c)_{LE} - (\kappa_{mc})_{LE} \tag{B1}$$

Deviation angle

$$\delta^o = (\beta'_c)_{TE} - (\kappa_{mc})_{TE} \tag{B2}$$

Diffusion factor

$$D = 1 - \frac{V'_{TE}}{V'_{LE}} + \left| \frac{(rV_\theta)_{TE} - (rV_\theta)_{LE}}{(r_{TE} + r_{LE})\sigma V'_{LE}} \right| \tag{B3}$$

Total loss coefficient

$$\bar{\omega} = \frac{(P'_{id})_{TE} - (P')_{TE}}{P'_{LE} - p_{LE}} \tag{B4}$$

Profile loss coefficient

$$\bar{\omega}_p = \bar{\omega} - \bar{\omega}_s \tag{B5}$$

Total loss parameter

$$\frac{\bar{\omega} \cos (\beta'_m)_{TE}}{2\sigma} \tag{B6}$$

Profile loss parameter

$$\frac{\bar{\omega}_p \cos (\beta'_m)_{TE}}{2\sigma} \tag{B7}$$

Adiabatic (temperature-rise) efficiency

$$\eta_{ad} = \frac{\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1}{\frac{T_{TE}}{T_{LE}} - 1} \tag{B8}$$

Momentum-rise efficiency

$$\eta_{mom} = \frac{\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1}{\frac{(UV_\theta)_{TE} - (UV_\theta)_{LE}}{T_{LE}C_p}} \tag{B9}$$

Equivalent weight flow

$$\frac{W\sqrt{\theta}}{\delta} \tag{B10}$$

Equivalent rotative speed

$$\frac{N}{\sqrt{\theta}} \tag{B11}$$

Weight flow per unit annulus area

$$\frac{\left(\frac{W\sqrt{\theta}}{\delta}\right)}{A_{an}} \tag{B12}$$

Weight flow per unit frontal area

$$\frac{\left(\frac{W\sqrt{\theta}}{\delta}\right)}{A_f} \tag{B13}$$

Head-rise coefficient

$$\frac{C_p T_{LE}}{U_{tip}^2}\left[\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1\right] \tag{B14}$$

Flow coefficient

$$\left(\frac{V_z}{U_{tip}}\right)_{LE} \tag{B15}$$

Polytropic efficiency

$$\eta_p = \frac{\ln\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma}}{\ln\left(\frac{T_{TE}}{T_{LE}}\right)} \tag{B16}$$

APPENDIX C

DEFINITIONS AND UNITS USED IN TABLES

ABS	absolute
AERO CHORD	straight line between blade leading and trailing edges along design streamline, cm
AREA RATIO	ratio of actual flow area to critical area (where local Mach number is one)
BETAM	meridional air angle, deg
CONE ANGLE	angle between axial direction and conical surface representing blade element, deg
DEV	deviation angle (defined by eq. (B2)), deg
D-FACT	diffusion factor (defined by eq. (B3))
EFF	adiabatic efficiency (defined by eq. (B8))
IN	inlet (leading edge of blade)
INCIDENCE	incidence angle (mean defined by eq. (B1)), deg
KIC	angle between blade mean camber line at leading edge and meridional plane, deg
KOC	angle between blade mean camber line at transition point and meridional plane, deg
KTC	angle between blade mean camber line at trailing edge and meridional plane, deg
LOSS COEFF	loss coefficient (total defined by eq. (B4) and profile by eq. (B5))
LOSS PARAM	loss parameter (total defined by eq. (B6) and profile by eq. (B7))
MERID	meridional
MERID VEL R	meridional velocity ratio
OUT	outlet (trailing edge of blade)
PERCENT SPAN	percent of blade span from tip at rotor outlet
PHISS	suction surface camber ahead of assumed shock location, deg
PRESS	pressure, N/cm^2
PROF	profile

RADII	radius, cm
REL	relative to the blade
RI	inlet radius (leading edge of blade), cm
RO	outlet radius (trailing edge of blade), cm
RP	radial position
RPM	equivalent rotative speed, rpm
SETTING ANGLE	angle between aerodynamic chord and meridional plane, deg
SOLIDITY	ratio of aerodynamic chord to blade spacing
SPEED	speed, m/sec
SS	suction surface
STREAMLINE SLOPE	slope of streamline, deg
TANG	tangential
TEMP	temperature, K
TI	thickness of blade at leading edge, cm
TM	thickness of blade at maximum thickness, cm
TO	thickness at blade at trailing edge, cm
TOT	total
TOTAL CAMBER	difference between inlet and outlet blade mean camber lines, deg
VEL	velocity, m/sec
WT FLOW	equivalent weight flow, kg/sec
X FACTOR	ratio of suction surface camber ahead of assumed shock location of multiple circular arc blade section to that of double circular arc blade section
ZIC	axial distance to blade leading edge from inlet, cm
ZMC	axial distance to blade maximum thickness point from inlet, cm
ZOC	axial distance to blade trailing edge from inlet, cm
ZTC	axial distance to transition point from inlet, cm

REFERENCES

1. Woodward, Richard P.; Glaser, Fredrick W.; and Wasniak, Joseph A.: Noise Comparisons of Two 1.2-Pressure-Ratio Fans with 15 and 42 Rotor Blades. NASA TM X-2891, 1973.

2. Lewis, George W.; Moore, Royce D.; and Kovich, George: Performance of a 1.20-Pressure-Ratio STOL Fan Stage at Three Rotor Blade Setting Angles. NASA TM X-2837, 1973.

3. Lewis, George W.; and Tysl, Edward R.: Overall and Blade-Element Performance of a 1.20-Pressure-Ratio Fan Stage with Rotor Blades at Design Setting Angle. NASA TM X-3101, 1974.

4. Urasek, Donald C.; and Janetzke, David C.: Overall and Blade-Element Performance of Tandem-Bladed Transonic Compressor Rotor with Tip Speed of 1375 Feet per Second. NASA TM X-12484, 1972.

5. Glawe, George F.; Krause, Lloyd M.; and Dudzinski, Thomas J.: A Small, Combination Sensing Probe for Measurement of Temperature, Pressure, and Flow Direction. NASA TN D-4816, 1968.

6. Ball, Calvin L.; Janetzke, David C.; and Reid, Lonnie: Performance of 1380-Foot-Per-Second-Tip-Speed Axial-Flow Compressor Rotor Blade with Tip Solidity of 1.5. NASA TM X-2379, 1972.

TABLE I. - DESIGN OVERALL PARAMETERS

FOR STAGE 55-55

ROTOR TOTAL PRESSURE RATIO	1.205
STAGE TOTAL PRESSURE RATIO	1.196
ROTOR TOTAL TEMPERATURE RATIO	1.058
STAGE TOTAL TEMPERATURE RATIO	1.058
ROTOR ADIABATIC EFFICIENCY.	0.940
STAGE ADIABATIC EFFICIENCY.	0.903
ROTOR POLYTROPIC EFFICIENCY	0.941
STAGE POLYTROPIC EFFICIENCY	0.906
ROTOR HEAD RISE COEFFICIENT	0.348
STAGE HEAD RISE COEFFICIENT	0.334
FLOW COEFFICIENT.	0.861
WT FLOW PER UNIT FRONTAL AREA	153.970
WT FLOW PER UNIT ANNULUS AREA	195.295
WT FLOW	31.207
RPM	8020.000
TIP SPEED	213.323

TABLE II. - DESIGN BLADE-ELEMENT PARAMETERS FOR ROTOR 55

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
TIP	25.400	25.400	0.	27.6	48.4	38.1	288.2	1.063	10.14	1.213
1	24.730	24.714	0.	28.8	47.8	34.9	288.2	1.065	10.14	1.226
2	24.026	24.028	-0.	29.7	47.2	32.1	288.2	1.067	10.14	1.235
3	23.323	23.343	-0.	30.4	46.5	29.7	288.2	1.067	10.14	1.238
4	21.172	21.285	-0.	31.6	44.1	24.1	288.2	1.064	10.14	1.231
5	18.320	18.542	-0.	32.9	40.2	16.6	288.2	1.057	10.14	1.208
6	15.539	15.799	-0.	34.7	35.7	7.9	288.2	1.051	10.14	1.178
7	13.541	13.741	-0.	36.1	32.0	1.4	288.2	1.044	10.14	1.144
8	12.907	13.056	-0.	36.6	30.7	-0.7	288.2	1.042	10.14	1.130
9	12.288	12.370	-0.	37.1	29.4	-2.8	288.2	1.040	10.14	1.115
HUB	11.684	11.684	0.	37.6	28.1	-4.8	288.2	1.037	10.14	1.098

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	189.4	184.1	285.3	207.3	189.4	163.1	0.	85.3	213.3	213.3
1	188.1	190.0	280.2	203.0	188.1	166.5	0.	91.5	207.7	207.6
2	186.9	194.1	275.0	198.9	186.9	168.6	-0.	96.2	201.8	201.8
3	185.9	196.3	270.1	194.9	185.9	169.3	-0.	99.4	195.9	196.0
4	183.6	197.6	255.6	184.4	183.6	168.3	-0.	103.6	177.8	178.8
5	181.8	196.3	238.2	172.0	181.8	164.8	-0.	106.6	153.9	155.7
6	181.3	194.5	223.4	161.4	181.3	159.9	-0.	110.6	130.5	132.7
7	182.0	189.8	214.7	153.5	182.0	153.5	-0.	111.7	113.7	115.4
8	182.6	187.2	212.3	150.4	182.6	150.4	-0.	111.5	108.4	109.6
9	183.2	184.1	210.3	147.0	183.2	146.9	-0.	111.0	103.2	103.9
HUB	183.9	180.4	208.5	143.4	183.9	142.9	0.	110.2	98.1	98.1

	ABS MACH NO		REL MACH NO		MERID MACH NO		STREAMLINE SLOPE		MERID
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	VEL R
TIP	0.575	0.540	0.865	0.608	0.575	0.478	0.78	0.46	0.861
1	0.570	0.557	0.850	0.595	0.570	0.488	0.66	0.55	0.885
2	0.567	0.570	0.834	0.584	0.567	0.495	0.61	0.66	0.902
3	0.563	0.577	0.818	0.573	0.563	0.497	0.62	0.79	0.911
4	0.556	0.582	0.774	0.543	0.556	0.496	0.85	1.14	0.917
5	0.550	0.579	0.721	0.508	0.550	0.487	1.26	1.43	0.907
6	0.549	0.576	0.676	0.478	0.549	0.473	1.39	1.40	0.882
7	0.551	0.563	0.650	0.455	0.551	0.455	1.04	0.98	0.843
8	0.553	0.555	0.643	0.446	0.553	0.446	0.78	0.71	0.824
9	0.555	0.546	0.637	0.436	0.555	0.436	0.44	0.37	0.802
HUB	0.557	0.535	0.631	0.425	0.557	0.424	0.05	-0.03	0.777

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
TIP	0.	-2.0	6.1	0.441	0.903	0.051	0.051	0.023	0.023
1	5.00	-2.4	7.2	0.458	0.917	0.047	0.047	0.022	0.022
2	10.00	-2.9	8.0	0.470	0.928	0.043	0.043	0.020	0.020
3	15.00	-3.2	8.5	0.479	0.936	0.039	0.039	0.019	0.019
4	30.00	-3.6	10.5	0.493	0.958	0.027	0.027	0.013	0.013
5	50.00	-3.7	12.2	0.503	0.970	0.019	0.019	0.009	0.009
6	70.00	-3.9	12.6	0.512	0.949	0.032	0.032	0.015	0.015
7	85.00	-2.4	12.4	0.517	0.884	0.070	0.070	0.031	0.031
8	90.00	-1.7	12.3	0.520	0.844	0.090	0.090	0.039	0.039
9	95.00	-0.9	12.2	0.524	0.792	0.116	0.116	0.049	0.049
HUB	100.00	0.0	12.0	0.529	0.724	0.145	0.145	0.059	0.059

TABLE III. - DESIGN BLADE-ELEMENT PARAMETERS FOR STATOR 55

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
TIP	25.938	25.938	27.9	-0.	27.9	-0.	306.2	1.000	12.29	0.992
1	25.231	25.299	28.9	0.	28.9	0.	307.0	1.000	12.43	0.992
2	24.547	24.672	29.7	-0.	29.7	-0.	307.5	1.000	12.51	0.993
3	23.877	24.048	30.3	-0.	30.3	-0.	307.5	1.000	12.55	0.994
4	21.847	22.222	31.2	-0.	31.2	-0.	306.6	1.000	12.48	0.997
5	19.166	19.826	32.3	-0.	32.3	-0.	304.7	1.000	12.24	0.996
6	16.502	17.464	34.0	-0.	34.0	-0.	302.7	1.000	11.94	0.991
7	14.518	15.682	35.4	-0.	35.4	-0.	301.0	1.000	11.60	0.985
8	13.859	15.069	35.9	-0.	35.9	-0.	300.3	1.000	11.45	0.982
9	13.202	14.447	36.4	-0.	36.4	-0.	299.6	1.000	11.30	0.979
HUB	12.548	13.818	36.9	0.	36.9	0.	298.9	1.000	11.13	0.976

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	178.6	169.2	178.6	169.2	157.9	169.2	83.5	-0.	0.	0.
1	185.4	175.1	185.4	175.1	162.3	175.1	89.6	0.	0.	0.
2	190.0	178.9	190.0	178.9	165.1	178.9	94.1	-0.	0.	0.
3	192.7	180.8	192.7	180.8	166.5	180.8	97.2	-0.	0.	0.
4	194.8	179.9	194.8	179.9	166.7	179.9	100.9	-0.	0.	0.
5	193.0	172.7	193.0	172.7	163.1	172.7	103.1	-0.	0.	0.
6	189.3	160.6	189.3	160.6	156.9	160.6	105.9	-0.	0.	0.
7	182.6	143.7	182.6	143.7	148.9	143.7	105.8	-0.	0.	0.
8	179.3	135.4	179.3	135.4	145.3	135.4	105.0	-0.	0.	0.
9	175.3	125.7	175.3	125.7	141.2	125.7	104.0	-0.	0.	0.
HUB	170.9	114.6	170.9	114.6	136.6	114.6	102.6	0.	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		STREAMLINE SLOPE		MERID
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	VEL R
TIP	0.523	0.494	0.523	0.494	0.462	0.494	0.63	-0.10	1.071
1	0.543	0.511	0.543	0.511	0.475	0.511	0.86	0.05	1.079
2	0.557	0.523	0.557	0.523	0.484	0.523	1.10	0.22	1.084
3	0.566	0.528	0.566	0.528	0.488	0.528	1.34	0.39	1.086
4	0.573	0.526	0.573	0.526	0.490	0.526	2.08	0.95	1.079
5	0.569	0.506	0.569	0.506	0.481	0.506	3.13	1.72	1.058
6	0.559	0.471	0.559	0.471	0.464	0.471	4.25	2.42	1.024
7	0.540	0.420	0.540	0.420	0.440	0.420	5.10	2.77	0.965
8	0.530	0.396	0.530	0.396	0.430	0.396	5.35	2.76	0.932
9	0.519	0.367	0.519	0.367	0.418	0.367	5.58	2.68	0.890
HUB	0.505	0.334	0.505	0.334	0.404	0.334	5.80	2.54	0.839

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
TIP	0.	-12.5	16.0	0.380	0.049	0.049	0.034	0.034
1	5.00	-11.6	15.6	0.385	0.042	0.042	0.029	0.029
2	10.00	-10.9	15.3	0.386	0.036	0.036	0.024	0.024
3	15.00	-10.3	15.0	0.387	0.030	0.030	0.019	0.019
4	30.00	-9.8	14.0	0.382	0.017	0.017	0.010	0.010
5	50.00	-9.1	13.0	0.382	0.018	0.018	0.010	0.010
6	70.00	-7.8	11.7	0.400	0.046	0.046	0.021	0.021
7	85.00	-6.8	10.9	0.440	0.086	0.086	0.035	0.035
8	90.00	-6.4	10.7	0.464	0.103	0.103	0.040	0.040
9	95.00	-6.0	10.4	0.494	0.123	0.123	0.046	0.046
HUB	100.00	-5.6	10.1	0.533	0.147	0.147	0.052	0.052

TABLE IV. - BLADE GEOMETRY FOR ROTOR 55

	PERCENT	RADII		BLADE ANGLES			DELTA	CONE
RP	SPAN	RI	RO	KIC	KTC	KOC	INC	ANGLE
TIP	0.	25.400	25.400	50.40	41.08	32.00	0.	0.057
1	5.	24.730	24.714	50.29	38.96	27.64	0.	-0.124
2	10.	24.026	24.028	50.05	37.05	24.05	-0.	0.057
3	15.	23.323	23.343	49.67	35.44	21.21	-0.	0.152
4	30.	21.172	21.285	47.72	30.64	13.56	-0.	0.892
5	50.	18.320	18.542	43.95	24.18	4.41	-0.	1.806
6	70.	15.539	15.799	39.62	17.42	-4.79	-0.	2.239
7	85.	13.541	13.741	34.40	11.69	-11.02	-0.	1.813
8	90.	12.907	13.056	32.39	9.69	-13.01	-0.	1.375
9	95.	12.288	12.370	30.27	7.66	-14.95	-0.	0.769
HUB	100.	11.684	11.684	28.06	5.61	-16.84	0.	0.057

	BLADE THICKNESSES			AXIAL DIMENSIONS			
RP	TI	TM	TO	ZI	ZMC	ZTC	ZO
TIP	0.019	0.239	0.019	-0.636	2.690	2.690	6.522
1	0.025	0.264	0.025	-0.671	2.650	2.650	6.546
2	0.031	0.293	0.031	-0.685	2.639	2.639	6.588
3	0.036	0.326	0.036	-0.680	2.658	2.658	6.644
4	0.050	0.441	0.050	-0.659	2.648	2.648	6.597
5	0.063	0.591	0.063	-0.572	2.669	2.669	6.455
6	0.083	0.741	0.083	-0.371	2.753	2.753	6.284
7	0.091	0.839	0.091	-0.206	2.824	2.824	6.116
8	0.090	0.862	0.090	-0.142	2.852	2.852	6.057
9	0.088	0.881	0.088	-0.073	2.881	2.881	5.998
HUB	0.084	0.896	0.084	0.	2.912	2.912	5.938

	AERO	SETTING	TOTAL		X
RP	CHORD	ANGLE	CAMBER	SOLIDITY	FACTOR
TIP	9.499	41.14	18.40	0.893	1.000
1	9.274	38.96	22.65	0.896	1.000
2	9.105	37.05	26.00	0.905	1.000
3	8.980	35.44	28.47	0.919	1.000
4	8.428	30.66	34.15	0.948	1.000
5	7.703	24.22	39.54	0.998	1.000
6	6.978	17.48	44.41	1.063	1.000
7	6.458	11.74	45.42	1.130	1.000
8	6.290	9.73	45.40	1.157	1.000
9	6.126	7.69	45.22	1.186	1.000
HUB	5.966	5.61	44.89	1.219	1.000

TABLE V. - BLADE GEOMETRY FOR STATOR 55

RP	PERCENT SPAN	RADII RI	RO	BLADE ANGLES KIC	KTC	KOC	DELTA INC	CONE ANGLE
TIP	0.	25.938	25.938	40.40	17.86	-16.01	-0.	0.057
1	5.	25.231	25.299	40.47	18.05	-15.65	0.	0.378
2	10.	24.547	24.672	40.54	18.23	-15.31	-0.	0.693
3	15.	23.877	24.048	40.61	18.40	-14.98	-0.	0.952
4	30.	21.847	22.222	41.00	19.02	-14.04	-0.	2.087
5	50.	19.166	19.826	41.42	19.69	-13.02	-0.	3.692
6	70.	16.502	17.464	41.78	20.44	-11.73	-0.	5.406
7	85.	14.518	15.682	42.13	20.97	-10.93	-0.	6.564
8	90.	13.859	15.069	42.23	21.15	-10.66	-0.	6.832
9	95.	13.202	14.447	42.32	21.32	-10.38	-0.	7.039
HUB	100.	12.548	13.818	42.40	21.48	-10.10	0.	7.185

RP	BLADE THICKNESSES TI	TM	TO	AXIAL DIMENSIONS ZI	ZMC	ZTC	ZO
TIP	0.188	0.953	0.087	21.634	25.502	25.502	31.982
1	0.188	0.953	0.087	21.628	25.489	25.489	31.967
2	0.188	0.953	0.087	21.631	25.486	25.486	31.961
3	0.188	0.953	0.087	21.642	25.490	25.490	31.963
4	0.188	0.953	0.087	21.650	25.473	25.473	31.937
5	0.188	0.953	0.087	21.662	25.453	25.453	31.899
6	0.188	0.953	0.087	21.673	25.426	25.426	31.844
7	0.188	0.953	0.087	21.681	25.404	25.404	31.800
8	0.188	0.953	0.087	21.684	25.398	25.398	31.787
9	0.188	0.953	0.087	21.686	25.392	25.392	31.775
HUB	0.188	0.953	0.087	21.689	25.387	25.387	31.764

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	X FACTOR
TIP	10.584	11.92	56.40	0.714	1.000
1	10.584	12.15	56.12	0.733	1.000
2	10.584	12.36	55.85	0.753	1.000
3	10.584	12.57	55.59	0.773	1.000
4	10.584	13.28	55.04	0.841	1.000
5	10.585	14.07	54.44	0.951	1.000
6	10.586	15.00	53.51	1.091	1.000
7	10.588	15.67	53.06	1.228	1.000
8	10.588	15.88	52.88	1.282	1.000
9	10.589	16.09	52.69	1.341	1.000
HUB	10.589	16.30	52.50	1.406	1.000

TABLE VI. - OVERALL PERFORMANCE FOR STAGE 55C-55

(a) 80 Percent of design speed

Parameter	Reading				
	1662	1661	1646	1647	1648
ROTOR TOTAL PRESSURE RATIO	1.124	1.126	1.129	1.132	1.130
STAGE TOTAL PRESSURE RATIO	1.105	1.114	1.120	1.123	1.122
ROTOR TOTAL TEMPERATURE RATIO	1.038	1.038	1.038	1.040	1.041
STAGE TOTAL TEMPERATURE RATIO	1.036	1.036	1.036	1.038	1.040
ROTOR TEMP. RISE EFFICIENCY	0.906	0.911	0.935	0.906	0.859
STAGE TEMP. RISE EFFICIENCY	0.801	0.869	0.916	0.897	0.839
ROTOR MOMENTUM RISE EFFICIENCY	0.890	0.900	0.898	0.871	0.810
ROTOR HEAD RISE COEFFICIENT	0.344	0.342	0.353	0.360	0.356
STAGE HEAD RISE COEFFICIENT	0.293	0.311	0.328	0.338	0.335
FLOW COEFFICIENT	1.149	1.003	0.885	0.780	0.680
WT FLOW PER UNIT FRONTAL AREA	157.03	144.05	130.42	117.35	104.16
WT FLOW PER UNIT ANNULUS AREA	199.18	182.72	165.43	148.85	132.12
WT FLOW AT ORIFICE	31.83	29.20	26.43	23.78	21.11
WT FLOW AT ROTOR INLET	32.30	29.59	26.82	24.17	21.48
WT FLOW AT ROTOR OUTLET	32.98	30.11	27.31	24.52	21.74
WT FLOW AT STATOR OUTLET	33.40	30.63	28.01	25.64	23.50
ROTATIVE SPEED	6361.8	6417.6	6401.8	6394.0	6395.4
PERCENT OF DESIGN SPEED	79.3	80.0	79.8	79.7	79.7

(b) 90 Percent of design speed

Parameter	Reading				
	1660	1659	1650	1651	1652
ROTOR TOTAL PRESSURE RATIO	1.164	1.164	1.169	1.171	1.169
STAGE TOTAL PRESSURE RATIO	1.148	1.149	1.155	1.160	1.158
ROTOR TOTAL TEMPERATURE RATIO	1.048	1.049	1.050	1.051	1.053
STAGE TOTAL TEMPERATURE RATIO	1.047	1.046	1.047	1.049	1.051
ROTOR TEMP. RISE EFFICIENCY	0.916	0.905	0.916	0.907	0.856
STAGE TEMP. RISE EFFICIENCY	0.852	0.875	0.898	0.889	0.833
ROTOR MOMENTUM RISE EFFICIENCY	0.887	0.892	0.885	0.870	0.811
ROTOR HEAD RISE COEFFICIENT	0.348	0.347	0.356	0.361	0.355
STAGE HEAD RISE COEFFICIENT	0.316	0.318	0.329	0.339	0.334
FLOW COEFFICIENT	1.047	0.966	0.880	0.792	0.690
WT FLOW PER UNIT FRONTAL AREA	160.36	152.34	142.64	131.08	117.14
WT FLOW PER UNIT ANNULUS AREA	203.41	193.24	180.93	166.26	148.58
WT FLOW AT ORIFICE	32.50	30.88	28.91	26.57	23.74
WT FLOW AT ROTOR INLET	33.00	31.33	29.35	27.05	24.20
WT FLOW AT ROTOR OUTLET	33.67	31.90	29.89	27.60	24.69
WT FLOW AT STATOR OUTLET	34.44	32.66	30.83	28.79	26.75
ROTATIVE SPEED	7220.6	7226.6	7236.6	7226.9	7238.0
PERCENT OF DESIGN SPEED	90.0	90.1	90.2	90.1	90.2

(c) 100 Percent of design speed

Parameter	Reading				
	1658	1653	1654	1655	1656
ROTOR TOTAL PRESSURE RATIO	1.204	1.210	1.211	1.212	1.209
STAGE TOTAL PRESSURE RATIO	1.187	1.195	1.198	1.199	1.195
ROTOR TOTAL TEMPERATURE RATIO	1.062	1.062	1.062	1.064	1.066
STAGE TOTAL TEMPERATURE RATIO	1.061	1.059	1.060	1.062	1.064
ROTOR TEMP. RISE EFFICIENCY	0.877	0.908	0.900	0.887	0.838
STAGE TEMP. RISE EFFICIENCY	0.828	0.884	0.878	0.858	0.818
ROTOR MOMENTUM RISE EFFICIENCY	0.850	0.871	0.868	0.857	0.802
ROTOR HEAD RISE COEFFICIENT	0.345	0.354	0.358	0.359	0.354
STAGE HEAD RISE COEFFICIENT	0.317	0.331	0.336	0.339	0.331
FLOW COEFFICIENT	1.003	0.899	0.845	0.785	0.705
WT FLOW PER UNIT FRONTAL AREA	166.54	155.42	148.52	140.94	129.44
WT FLOW PER UNIT ANNULUS AREA	211.25	197.14	188.38	178.78	164.19
WT FLOW AT ORIFICE	33.76	31.50	30.10	28.57	26.24
WT FLOW AT ROTOR INLET	34.30	32.04	30.69	29.12	26.78
WT FLOW AT ROTOR OUTLET	35.04	32.58	31.21	29.66	27.29
WT FLOW AT STATOR OUTLET	36.27	33.87	32.59	31.25	29.79
ROTATIVE SPEED	8045.2	8031.5	8023.7	8024.6	8022.8
PERCENT OF DESIGN SPEED	100.3	100.1	100.0	100.1	100.0

TABLE VI. - Concluded. OVERALL PERFORMANCE

FOR STAGE 55C-55

(d) 110 Percent of design speed

Parameter	Reading		
	1751	1750	1748
ROTOR TOTAL PRESSURE RATIO	1.199	1.255	1.258
STAGE TOTAL PRESSURE RATIO	1.152	1.238	1.241
ROTOR TOTAL TEMPERATURE RATIO	1.068	1.076	1.078
STAGE TOTAL TEMPERATURE RATIO	1.065	1.072	1.074
ROTOR TEMP. RISE EFFICIENCY	0.776	0.878	0.867
STAGE TEMP. RISE EFFICIENCY	0.633	0.875	0.862
ROTOR MOMENTUM RISE EFFICIENCY	0.741	0.851	0.838
ROTOR HEAD RISE COEFFICIENT	0.281	0.353	0.356
STAGE HEAD RISE COEFFICIENT	0.218	0.331	0.335
FLOW COEFFICIENT	0.979	0.880	0.779
WT FLOW PER UNIT FRONTAL AREA	172.51	162.70	150.60
WT FLOW PER UNIT ANNULUS AREA	218.82	206.38	191.02
WT FLOW AT ORIFICE,	34.97	32.98	30.52
WT FLOW AT ROTOR INLET	35.57	33.53	31.03
WT FLOW AT ROTOR OUTLET	37.44	34.39	31.68
WT FLOW AT STATOR OUTLET	37.88	35.87	33.58
ROTATIVE SPEED,	8805.6	8812.8	8824.5
PERCENT OF DESIGN SPEED	109.8	109.9	110.0

(e) 120 Percent of design speed

Parameter	Reading		
	1754	1753	1752
ROTOR TOTAL PRESSURE RATIO	1.211	1.230	1.304
STAGE TOTAL PRESSURE RATIO	1.140	1.211	1.280
ROTOR TOTAL TEMPERATURE RATIO	1.082	1.082	1.095
STAGE TOTAL TEMPERATURE RATIO	1.081	1.079	1.088
ROTOR TEMP. RISE EFFICIENCY	0.687	0.741	0.832
STAGE TEMP. RISE EFFICIENCY	0.469	0.711	0.827
ROTOR MOMENTUM RISE EFFICIENCY	0.666	0.687	0.794
ROTOR HEAD RISE COEFFICIENT	0.249	0.270	0.348
STAGE HEAD RISE COEFFICIENT	0.169	0.249	0.322
FLOW COEFFICIENT	0.920	0.884	0.818
WT FLOW PER UNIT FRONTAL AREA	174.58	171.43	164.35
WT FLOW PER UNIT ANNULUS AREA	221.44	217.45	208.46
WT FLOW AT ORIFICE,	35.38	34.75	33.31
WT FLOW AT ROTOR INLET	36.00	35.32	33.86
WT FLOW AT ROTOR OUTLET	38.33	36.49	34.66
WT FLOW AT STATOR OUTLET	39.52	37.81	36.89
ROTATIVE SPEED,	9603.7	9614.7	9627.7
PERCENT OF DESIGN SPEED	119.7	119.9	120.0

TABLE VII. - BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(a) 80 Percent of design speed; reading 1662

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.729	24.714	-0.0	20.0	40.3	27.6	289.1	1.038	9.95	1.140
2	24.026	24.028	-0.0	19.8	38.9	25.4	289.0	1.038	10.13	1.137
3	23.322	23.343	-0.0	20.3	38.7	23.8	288.6	1.040	10.15	1.136
4	21.173	21.285	-0.0	23.2	35.7	17.0	288.1	1.041	10.15	1.136
5	18.321	18.542	-0.0	26.6	32.1	8.3	287.8	1.039	10.15	1.131
6	15.540	15.799	-0.0	28.5	28.0	0.7	287.7	1.036	10.15	1.117
7	13.541	13.741	-0.0	29.8	24.6	-4.5	287.8	1.032	10.15	1.096
8	12.906	13.056	-0.0	31.4	23.8	-6.1	287.8	1.029	10.14	1.067
9	12.289	12.370	-0.0	32.1	23.3	-6.9	287.6	1.027	10.09	1.050

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	194.5	197.4	254.9	209.3	194.5	185.4	-0.0	67.6	164.7	164.6
2	198.4	204.0	255.0	212.5	198.4	192.0	-0.0	69.1	160.2	160.2
3	194.4	204.7	248.9	209.9	194.4	192.0	-0.0	71.0	155.5	155.6
4	195.8	210.0	241.3	201.8	195.8	193.0	-0.0	82.7	140.9	141.7
5	194.9	213.7	230.1	193.0	194.9	191.0	-0.0	95.7	122.2	123.6
6	194.7	215.0	220.4	189.0	194.7	189.0	-0.0	102.6	103.3	105.0
7	196.9	213.0	216.5	185.4	196.9	184.8	-0.0	106.0	90.1	91.5
8	194.6	201.9	212.7	173.2	194.6	172.3	-0.0	105.3	85.9	86.9
9	190.1	192.4	207.1	164.2	190.1	163.0	-0.0	102.2	82.1	82.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.590	0.588	0.773	0.623	0.590	0.552	0.953	0.773
2	0.603	0.609	0.775	0.634	0.603	0.573	0.967	0.775
3	0.590	0.611	0.756	0.627	0.590	0.573	0.988	0.756
4	0.596	0.628	0.734	0.604	0.596	0.578	0.986	0.734
5	0.593	0.641	0.700	0.579	0.593	0.573	0.980	0.700
6	0.592	0.647	0.671	0.569	0.592	0.568	0.970	0.671
7	0.599	0.642	0.659	0.558	0.599	0.557	0.939	0.659
8	0.592	0.606	0.647	0.520	0.592	0.517	0.885	0.647
9	0.578	0.577	0.629	0.492	0.578	0.489	0.857	0.629

RP	PERCENT SPAN	INCIDENCE MEAN	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-5.0	5.0	0.327	1.000	-0.000	-0.000	-0.000	-0.000
2	10.00	-6.1	6.3	0.317	0.972	0.011	0.011	0.005	0.005
3	15.00	-6.0	7.6	0.312	0.936	0.027	0.027	0.013	0.013
4	30.00	-7.0	8.4	0.345	0.912	0.040	0.040	0.020	0.020
5	50.00	-6.9	8.9	0.371	0.920	0.038	0.038	0.019	0.019
6	70.00	-6.7	10.5	0.364	0.899	0.047	0.047	0.022	0.022
7	85.00	-4.8	11.5	0.362	0.832	0.072	0.072	0.032	0.032
8	90.00	-3.6	11.9	0.401	0.650	0.138	0.138	0.059	0.059
9	95.00	-1.9	13.1	0.416	0.517	0.188	0.188	0.079	0.079

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(b) 80 Percent of design speed; reading 1661

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	23.5	44.0	30.4	289.1	1.041	10.01	1.139
2	24.026	24.028	-0.0	23.0	42.7	27.7	289.0	1.041	10.13	1.140
3	23.322	23.343	-0.0	23.4	42.4	25.9	288.5	1.041	10.14	1.141
4	21.173	21.285	0.0	25.7	39.6	19.9	288.0	1.040	10.15	1.137
5	18.321	18.542	-0.0	28.7	35.6	11.4	287.9	1.037	10.15	1.124
6	15.540	15.799	-0.0	30.9	31.4	2.8	287.8	1.035	10.14	1.117
7	13.541	13.741	-0.0	33.1	27.8	-4.9	287.8	1.033	10.15	1.108
8	12.906	13.056	-0.0	34.8	26.9	-6.4	287.7	1.031	10.13	1.080
9	12.289	12.370	-0.0	35.5	26.4	-8.2	287.7	1.030	10.08	1.076

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	172.0	177.6	239.2	188.8	172.0	162.9	-0.0	70.7	166.2	166.1
2	175.0	184.7	238.0	192.0	175.0	170.0	-0.0	72.1	161.2	161.3
3	171.5	186.1	232.2	189.8	171.5	170.7	-0.0	73.9	156.5	156.7
4	172.4	188.6	223.7	180.8	172.4	170.0	0.0	81.6	142.5	143.3
5	171.5	189.1	210.9	169.2	171.5	165.9	-0.0	90.8	122.8	124.2
6	171.6	192.1	201.1	165.0	171.6	164.9	-0.0	98.5	104.8	106.5
7	172.7	194.4	195.2	163.4	172.7	162.8	-0.0	106.3	91.0	92.4
8	170.7	183.0	191.4	151.1	170.7	150.2	-0.0	104.6	86.6	87.6
9	166.7	179.4	186.1	147.5	166.7	146.0	-0.0	104.2	82.7	83.2

	ABS MACH NO		REL MACH NO		MERID MACH NO				MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT			VEL R	MACH NO
1	0.518	0.525	0.720	0.558	0.518	0.481			0.947	0.720
2	0.528	0.547	0.718	0.568	0.528	0.503			0.971	0.718
3	0.517	0.552	0.700	0.563	0.517	0.506			0.996	0.700
4	0.520	0.560	0.675	0.537	0.520	0.505			0.986	0.675
5	0.517	0.563	0.636	0.504	0.517	0.494			0.968	0.636
6	0.518	0.573	0.607	0.492	0.518	0.492			0.961	0.607
7	0.521	0.581	0.590	0.488	0.521	0.487			0.943	0.590
8	0.515	0.546	0.578	0.451	0.515	0.448			0.880	0.578
9	0.503	0.535	0.561	0.440	0.503	0.435			0.876	0.610

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	-1.3	7.7	0.376	0.921	0.037	0.037	0.018	0.018
2	10.00	-2.4	8.6	0.361	0.939	0.029	0.029	0.014	0.014
3	15.00	-2.3	9.7	0.356	0.937	0.031	0.031	0.015	0.015
4	30.00	-3.1	11.4	0.385	0.934	0.034	0.034	0.017	0.017
5	50.00	-3.4	12.0	0.414	0.918	0.043	0.043	0.021	0.021
6	70.00	-3.2	12.6	0.412	0.919	0.044	0.044	0.020	0.020
7	85.00	-1.6	11.1	0.406	0.885	0.062	0.062	0.027	0.027
8	90.00	-0.5	11.6	0.448	0.724	0.141	0.141	0.060	0.060
9	95.00	1.1	11.8	0.444	0.716	0.148	0.148	0.062	0.062

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(c) 80 Percent of design speed; reading 1646

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	27.8	47.9	32.5	289.2	1.041	9.98	1.142
2	24.026	24.028	-0.0	26.2	46.3	29.7	288.9	1.042	10.13	1.143
3	23.322	23.343	-0.0	26.8	45.7	27.4	288.5	1.042	10.14	1.144
4	21.173	21.285	-0.0	29.3	42.9	20.8	288.0	1.041	10.15	1.141
5	18.321	18.542	-0.0	32.4	39.3	12.2	287.9	1.037	10.15	1.130
6	15.540	15.799	-0.0	34.7	34.8	2.2	287.7	1.034	10.15	1.120
7	13.541	13.741	0.0	37.0	31.1	-5.5	287.8	1.032	10.15	1.104
8	12.906	13.056	0.	38.5	29.9	-7.1	287.6	1.029	10.14	1.081
9	12.289	12.370	-0.0	39.5	29.5	-10.2	287.9	1.029	10.11	1.084

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	149.2	160.2	222.6	168.0	149.2	141.6	-0.0	74.7	165.2	165.1
2	154.1	169.0	222.9	174.5	154.1	151.6	-0.0	74.7	161.1	161.1
3	152.4	171.2	218.2	172.1	152.4	152.9	-0.0	77.1	156.1	156.2
4	152.3	173.5	208.0	161.9	152.3	151.3	-0.0	84.9	141.7	142.4
5	151.0	173.9	195.0	150.2	151.0	146.9	-0.0	93.2	123.4	124.9
6	150.0	175.9	182.6	144.7	150.0	144.6	-0.0	100.2	104.1	105.8
7	151.3	176.0	176.7	141.1	151.3	140.5	0.0	106.0	91.2	92.6
8	150.2	166.5	173.2	131.3	150.2	130.3	0.	103.7	86.3	87.3
9	146.9	166.7	168.5	130.6	146.9	128.6	-0.0	106.1	82.4	83.0

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.446	0.471	0.666	0.494	0.446	0.416	0.950	0.773
2	0.462	0.498	0.668	0.514	0.462	0.447	0.984	0.731
3	0.457	0.505	0.654	0.508	0.457	0.451	1.003	0.708
4	0.457	0.513	0.624	0.479	0.457	0.447	0.994	0.642
5	0.453	0.515	0.585	0.445	0.453	0.435	0.973	0.607
6	0.450	0.522	0.548	0.430	0.450	0.429	0.964	0.559
7	0.454	0.523	0.530	0.419	0.454	0.418	0.928	0.592
8	0.451	0.494	0.520	0.390	0.451	0.387	0.867	0.600
9	0.440	0.495	0.505	0.388	0.440	0.382	0.875	0.615

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	2.6	9.9	0.433	0.935	0.035	0.035	0.017	0.017
2	10.00	1.2	10.6	0.402	0.933	0.036	0.036	0.017	0.017
3	15.00	1.0	11.2	0.403	0.925	0.043	0.043	0.021	0.021
4	30.00	0.2	12.2	0.438	0.944	0.033	0.033	0.016	0.016
5	50.00	0.3	12.8	0.470	0.968	0.019	0.019	0.009	0.009
6	70.00	0.1	12.0	0.468	0.966	0.021	0.021	0.010	0.010
7	85.00	1.7	10.6	0.469	0.905	0.059	0.059	0.026	0.026
8	90.00	2.5	10.9	0.502	0.776	0.131	0.131	0.056	0.056
9	95.00	4.0	9.8	0.491	0.798	0.125	0.125	0.052	0.052

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(d) 80 Percent of design speed; reading 1647

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	34.8	51.3	33.7	289.0	1.046	10.02	1.145
2	24.026	24.028	0.	32.3	49.6	30.8	288.9	1.045	10.13	1.141
3	23.322	23.343	-0.0	32.3	49.3	28.1	288.4	1.046	10.14	1.148
4	21.173	21.285	-0.0	33.2	46.5	21.4	288.1	1.043	10.14	1.147
5	18.321	18.542	-0.0	36.2	42.7	12.3	287.9	1.038	10.14	1.133
6	15.540	15.799	0.0	37.9	38.4	2.7	287.8	1.035	10.15	1.120
7	13.541	13.741	0.	40.9	34.6	-5.6	287.8	1.030	10.14	1.098
8	12.906	13.056	-0.0	42.3	33.6	-7.7	287.9	1.029	10.14	1.085
9	12.289	12.370	0.0	42.4	33.0	-10.2	287.8	1.029	10.10	1.088

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	132.6	148.1	212.2	146.2	132.6	121.7	-0.0	84.4	165.6	165.5
2	136.6	154.6	210.7	152.1	136.6	130.7	0.	82.6	160.4	160.4
3	134.8	159.2	206.7	152.6	134.8	134.6	-0.0	85.0	156.6	156.8
4	135.0	162.9	195.9	146.4	135.0	136.3	-0.0	89.3	142.0	142.7
5	132.8	161.5	180.6	133.4	132.8	130.3	-0.0	95.4	122.3	123.8
6	131.7	162.7	167.9	128.5	131.7	128.4	0.0	99.9	104.2	105.9
7	131.3	158.2	159.4	120.2	131.3	119.6	0.	103.6	90.5	91.8
8	130.0	152.5	156.1	113.8	130.0	112.8	-0.0	102.6	86.4	87.4
9	127.0	153.5	151.4	115.2	127.0	113.4	0.0	103.4	82.4	83.0

	ABS MACH NO		REL MACH NO		MERID MACH NO				MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT			VEL R	MACH NO
1	0.395	0.433	0.632	0.427	0.395	0.356			0.918	0.819
2	0.408	0.453	0.629	0.446	0.408	0.383			0.957	0.779
3	0.402	0.467	0.617	0.448	0.402	0.395			0.998	0.766
4	0.403	0.480	0.585	0.431	0.403	0.401			1.010	0.706
5	0.397	0.477	0.539	0.394	0.397	0.385			0.982	0.650
6	0.393	0.481	0.501	0.380	0.393	0.380			0.975	0.605
7	0.392	0.468	0.476	0.356	0.392	0.354			0.911	0.601
8	0.388	0.451	0.466	0.336	0.388	0.333			0.868	0.606
9	0.379	0.454	0.452	0.341	0.379	0.335			0.893	0.612

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	6.0	11.0	0.533	0.851	0.097	0.097	0.045	0.045
2	10.00	4.5	11.7	0.495	0.843	0.101	0.101	0.048	0.048
3	15.00	4.6	11.9	0.486	0.878	0.082	0.082	0.039	0.039
4	30.00	3.7	12.8	0.494	0.930	0.049	0.049	0.024	0.024
5	50.00	3.7	12.9	0.527	0.954	0.033	0.033	0.016	0.016
6	70.00	3.7	12.5	0.517	0.950	0.037	0.037	0.017	0.017
7	85.00	5.2	10.4	0.536	0.893	0.076	0.076	0.034	0.034
8	90.00	6.2	10.3	0.557	0.819	0.127	0.127	0.055	0.055
9	95.00	7.7	9.7	0.528	0.838	0.122	0.122	0.051	0.051

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(e) 80 Percent of design speed; reading 1648

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	48.8	55.5	34.2	288.7	1.053	10.04	1.140
2	24.026	24.028	-0.0	43.3	53.6	31.7	288.7	1.050	10.13	1.134
3	23.322	23.343	-0.0	41.8	53.3	29.5	288.5	1.050	10.14	1.132
4	21.173	21.285	-0.0	37.1	50.5	21.6	288.1	1.045	10.14	1.148
5	18.321	18.542	0.0	39.2	46.4	11.6	288.0	1.040	10.14	1.138
6	15.540	15.799	-0.0	40.3	42.1	2.6	287.8	1.034	10.14	1.120
7	13.541	13.741	-0.0	42.3	38.1	-4.6	287.8	1.029	10.14	1.097
8	12.906	13.056	-0.0	43.3	37.0	-7.1	288.0	1.029	10.14	1.088
9	12.289	12.370	-0.0	44.4	36.0	-11.1	287.8	1.029	10.12	1.090

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	113.9	137.8	201.0	109.9	113.9	90.8	-0.0	103.7	165.6	165.5
2	118.4	141.9	199.8	121.4	118.4	103.3	-0.0	97.2	160.9	160.9
3	116.5	143.7	194.9	123.0	116.5	107.1	-0.0	95.8	156.3	156.4
4	117.1	155.2	184.0	133.2	117.1	123.8	-0.0	93.5	141.9	142.6
5	116.6	156.6	169.0	123.9	116.6	121.4	0.0	98.9	122.4	123.9
6	115.0	155.2	155.1	118.5	115.0	118.4	-0.0	100.3	104.0	105.8
7	115.6	150.1	146.9	111.3	115.6	110.9	-0.0	101.1	90.7	92.1
8	115.1	147.1	144.0	107.8	115.1	107.0	-0.0	100.9	86.6	87.6
9	113.4	148.0	140.1	107.7	113.4	105.7	-0.0	103.6	82.3	82.8

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.338	0.401	0.597	0.319	0.338	0.264	0.797	0.860
2	0.352	0.413	0.594	0.354	0.352	0.301	0.873	0.823
3	0.346	0.419	0.579	0.359	0.346	0.312	0.919	0.804
4	0.348	0.455	0.547	0.391	0.348	0.363	1.057	0.742
5	0.347	0.461	0.503	0.365	0.347	0.357	1.041	0.677
6	0.342	0.458	0.461	0.350	0.342	0.349	1.030	0.622
7	0.344	0.443	0.437	0.329	0.344	0.328	0.960	0.608
8	0.342	0.434	0.428	0.318	0.342	0.316	0.930	0.608
9	0.337	0.437	0.417	0.318	0.337	0.312	0.932	0.608

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	10.2	11.6	0.741	0.722	0.225	0.225	0.104	0.104
2	10.00	8.6	12.6	0.661	0.729	0.210	0.210	0.099	0.099
3	15.00	8.6	13.3	0.636	0.729	0.217	0.217	0.103	0.103
4	30.00	7.7	13.1	0.545	0.891	0.089	0.089	0.044	0.044
5	50.00	7.4	12.2	0.562	0.935	0.056	0.056	0.027	0.027
6	70.00	7.5	12.4	0.542	0.961	0.034	0.034	0.016	0.016
7	85.00	8.7	11.4	0.549	0.913	0.070	0.070	0.031	0.031
8	90.00	9.6	10.9	0.556	0.858	0.116	0.116	0.050	0.050
9	95.00	10.7	8.9	0.544	0.874	0.109	0.109	0.045	0.045

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(f) 90 Percent of design speed; reading 1660

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	23.9	42.9	29.4	289.2	1.052	9.96	1.186
2	24.026	24.028	-0.0	23.3	41.5	26.8	289.0	1.052	10.14	1.186
3	23.322	23.343	-0.0	23.9	41.3	24.9	288.6	1.053	10.15	1.186
4	21.173	21.285	-0.0	26.3	38.3	18.3	288.0	1.053	10.15	1.182
5	18.321	18.542	-0.0	28.9	34.4	10.1	287.8	1.048	10.15	1.164
6	15.540	15.799	-0.0	30.6	30.2	1.9	287.7	1.044	10.15	1.150
7	13.541	13.741	-0.0	33.1	26.8	-5.1	287.8	1.040	10.15	1.129
8	12.906	13.056	-0.0	34.8	26.0	-6.6	287.7	1.037	10.15	1.092
9	12.289	12.370	-0.0	35.5	25.6	-8.4	287.7	1.036	10.06	1.089

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	201.8	203.5	275.4	213.5	201.8	186.0	-0.0	82.5	187.4	187.3
2	205.6	211.9	274.6	218.1	205.6	194.7	-0.0	83.7	182.0	182.0
3	201.3	213.4	268.0	215.1	201.3	195.1	-0.0	86.4	176.9	177.1
4	202.8	217.7	258.4	205.6	202.8	195.2	-0.0	96.3	160.1	161.0
5	201.9	218.5	244.6	194.4	201.9	191.4	-0.0	105.5	138.1	139.7
6	201.7	221.7	233.3	190.8	201.7	190.7	-0.0	113.0	117.2	119.2
7	202.7	220.4	227.1	185.3	202.7	184.6	-0.0	120.3	102.4	104.0
8	200.0	207.5	222.5	171.6	200.0	170.4	-0.0	118.4	97.5	98.6
9	194.2	203.3	215.2	167.4	194.2	165.6	-0.0	118.0	92.8	93.5

	ABS MACH NO		REL MACH NO		MERID MACH NO			MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT		VEL R	MACH NO
1	0.614	0.603	0.838	0.632	0.614	0.551		0.922	0.838
2	0.627	0.630	0.837	0.648	0.627	0.578		0.947	0.837
3	0.613	0.635	0.816	0.640	0.613	0.580		0.969	0.816
4	0.619	0.649	0.788	0.613	0.619	0.582		0.962	0.788
5	0.616	0.654	0.746	0.582	0.616	0.573		0.948	0.746
6	0.615	0.666	0.712	0.573	0.615	0.573		0.946	0.712
7	0.618	0.663	0.693	0.557	0.618	0.555		0.911	0.693
8	0.610	0.622	0.678	0.514	0.610	0.511		0.852	0.678
9	0.591	0.609	0.655	0.501	0.591	0.496		0.853	0.677

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	-2.4	6.8	0.392	0.952	0.022	0.022	0.011	0.011
2	10.00	-3.5	7.8	0.374	0.952	0.023	0.023	0.011	0.011
3	15.00	-3.3	8.7	0.373	0.936	0.032	0.032	0.016	0.016
4	30.00	-4.4	9.8	0.401	0.927	0.038	0.038	0.019	0.019
5	50.00	-4.6	10.7	0.423	0.928	0.037	0.037	0.018	0.018
6	70.00	-4.5	11.7	0.412	0.928	0.037	0.037	0.017	0.017
7	85.00	-2.6	11.0	0.420	0.875	0.062	0.062	0.027	0.027
8	90.00	-1.4	11.4	0.460	0.680	0.151	0.151	0.065	0.065
9	95.00	0.3	11.5	0.454	0.685	0.151	0.151	0.063	0.063

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(g) 90 Percent of design speed; reading 1659

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.729	24.714	-0.0	26.1	45.1	31.2	289.2	1.053	9.97	1.180
2	24.026	24.028	-0.0	25.0	43.8	28.5	289.0	1.053	10.13	1.183
3	23.322	23.343	-0.0	25.4	43.5	26.5	288.6	1.054	10.15	1.183
4	21.173	21.285	-0.0	27.1	40.6	20.7	288.0	1.052	10.15	1.178
5	18.321	18.542	-0.0	30.7	36.7	11.5	287.8	1.049	10.15	1.165
6	15.540	15.799	-0.0	32.7	32.3	2.1	287.8	1.045	10.15	1.154
7	13.541	13.741	-0.0	35.0	28.7	-5.4	287.7	1.041	10.15	1.134
8	12.906	13.056	-0.0	36.5	27.9	-6.7	287.7	1.038	10.14	1.101
9	12.289	12.370	-0.0	37.2	27.2	-9.1	287.6	1.038	10.10	1.100

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	186.2	190.2	264.0	199.8	186.2	170.9	-0.0	83.6	187.1	187.0
2	189.9	199.0	263.1	205.2	189.9	180.3	-0.0	84.2	182.1	182.1
3	186.3	200.8	256.8	202.7	186.3	181.4	-0.0	86.2	176.7	176.9
4	186.9	203.4	246.2	193.6	186.9	181.1	-0.0	92.5	160.2	161.0
5	186.2	205.1	232.3	180.0	186.2	176.4	-0.0	104.7	138.8	140.5
6	186.1	209.5	220.2	176.5	186.1	176.4	-0.0	113.0	117.6	119.5
7	186.9	209.4	213.0	172.3	186.9	171.6	-0.0	120.1	102.3	103.8
8	184.7	197.5	208.9	159.8	184.7	158.7	-0.0	117.5	97.7	98.8
9	180.7	195.8	203.2	157.9	180.7	155.9	-0.0	118.5	92.9	93.5

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.563	0.561	0.799	0.589	0.563	0.504	0.918	0.799
2	0.575	0.588	0.797	0.607	0.575	0.533	0.950	0.797
3	0.564	0.594	0.778	0.600	0.564	0.537	0.973	0.778
4	0.567	0.604	0.747	0.575	0.567	0.538	0.969	0.747
5	0.565	0.611	0.704	0.536	0.565	0.525	0.947	0.704
6	0.564	0.626	0.668	0.527	0.564	0.527	0.948	0.668
7	0.567	0.627	0.646	0.516	0.567	0.514	0.918	0.646
8	0.560	0.589	0.634	0.477	0.560	0.474	0.859	0.665
9	0.547	0.584	0.615	0.471	0.547	0.465	0.863	0.695

RP	PERCENT SPAN	INCIDENCE MEAN	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-0.1	8.5	0.420	0.915	0.043	0.043	0.021	0.021
2	10.00	-1.2	9.5	0.397	0.929	0.036	0.036	0.018	0.018
3	15.00	-1.2	10.3	0.393	0.914	0.046	0.046	0.023	0.023
4	30.00	-2.1	12.1	0.412	0.912	0.049	0.049	0.024	0.024
5	50.00	-2.3	12.0	0.452	0.916	0.048	0.048	0.024	0.024
6	70.00	-2.4	11.9	0.442	0.935	0.037	0.037	0.018	0.018
7	85.00	-0.7	10.6	0.442	0.891	0.061	0.061	0.027	0.027
8	90.00	0.5	11.3	0.480	0.725	0.148	0.148	0.064	0.064
9	95.00	1.9	10.9	0.470	0.724	0.155	0.155	0.064	0.064

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(h) 90 Percent of design speed; reading 1650

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	29.3	47.8	32.8	289.1	1.055	9.98	1.181
2	24.026	24.028	0.0	27.6	46.2	29.7	289.0	1.055	10.13	1.184
3	23.322	23.343	-0.0	27.9	45.8	27.4	288.7	1.055	10.15	1.187
4	21.173	21.285	0.	30.5	43.1	20.6	287.9	1.054	10.14	1.188
5	18.321	18.542	-0.0	33.7	39.3	11.5	287.8	1.048	10.15	1.169
6	15.540	15.799	-0.0	35.5	34.9	1.9	287.9	1.045	10.15	1.156
7	13.541	13.741	-0.0	37.7	31.3	-5.7	287.8	1.040	10.14	1.134
8	12.906	13.056	-0.0	39.3	30.4	-7.4	287.8	1.038	10.14	1.107
9	12.289	12.370	-0.0	40.2	29.7	-10.4	287.7	1.038	10.10	1.111

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	170.0	178.4	253.3	185.2	170.0	155.6	-0.0	87.3	187.8	187.7
2	174.4	187.8	252.0	191.7	174.4	166.5	0.0	86.9	182.0	182.0
3	171.2	190.4	245.8	189.6	171.2	168.3	-0.0	89.1	176.3	176.4
4	171.7	194.4	235.1	178.9	171.7	167.5	0.	98.6	160.7	161.5
5	169.3	193.6	218.6	164.4	169.3	161.1	-0.0	107.3	138.3	140.0
6	168.6	197.0	205.6	160.5	168.6	160.4	-0.0	114.4	117.8	119.7
7	168.7	195.5	197.5	155.4	168.7	154.6	-0.0	119.6	102.7	104.2
8	167.1	185.7	193.6	144.9	167.1	143.7	-0.0	117.6	97.9	99.0
9	163.3	186.1	188.1	144.6	163.3	142.2	-0.0	120.1	93.3	93.9

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.512	0.524	0.763	0.543	0.512	0.457	0.915	0.883
2	0.526	0.553	0.760	0.564	0.526	0.490	0.955	0.829
3	0.516	0.561	0.741	0.559	0.516	0.496	0.983	0.808
4	0.518	0.575	0.710	0.529	0.518	0.495	0.976	0.739
5	0.511	0.574	0.659	0.488	0.511	0.478	0.952	0.683
6	0.508	0.586	0.620	0.477	0.508	0.477	0.951	0.642
7	0.509	0.582	0.596	0.463	0.509	0.461	0.916	0.673
8	0.504	0.552	0.584	0.431	0.504	0.427	0.860	0.686
9	0.492	0.553	0.566	0.430	0.492	0.423	0.871	0.700

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	2.6	10.2	0.461	0.889	0.063	0.063	0.029	0.029
2	10.00	1.2	10.7	0.430	0.903	0.055	0.055	0.026	0.026
3	15.00	1.2	11.2	0.426	0.912	0.052	0.052	0.025	0.025
4	30.00	0.4	12.0	0.461	0.937	0.040	0.040	0.020	0.020
5	50.00	0.3	12.1	0.495	0.942	0.037	0.037	0.018	0.018
6	70.00	0.3	11.7	0.483	0.939	0.040	0.040	0.019	0.019
7	85.00	1.9	10.3	0.483	0.904	0.061	0.061	0.027	0.027
8	90.00	3.0	10.6	0.516	0.779	0.135	0.135	0.058	0.058
9	95.00	4.5	9.5	0.501	0.806	0.126	0.126	0.052	0.052

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(i) 90 Percent of design speed; reading 1651

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	35.3	50.8	33.5	288.9	1.058	10.00	1.185
2	24.026	24.028	-0.0	32.8	49.0	30.8	288.8	1.058	10.13	1.181
3	23.322	23.343	-0.0	32.2	48.8	28.2	288.5	1.059	10.14	1.187
4	21.173	21.285	-0.0	33.3	46.0	21.4	288.0	1.055	10.15	1.192
5	18.321	18.542	-0.0	35.9	42.3	12.1	288.0	1.049	10.15	1.175
6	15.540	15.799	-0.0	38.0	37.9	2.3	287.9	1.044	10.14	1.156
7	13.541	13.741	-0.0	40.2	34.4	-4.8	287.9	1.039	10.14	1.127
8	12.906	13.056	-0.0	41.4	33.4	-6.9	287.7	1.037	10.14	1.111
9	12.289	12.370	-0.0	42.3	32.5	-10.5	288.0	1.037	10.10	1.115

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	152.8	167.7	241.8	164.0	152.8	136.8	-0.0	96.9	187.4	187.3
2	157.5	173.9	240.3	170.3	157.5	146.2	-0.0	94.2	181.5	181.5
3	154.6	179.0	234.7	171.9	154.6	151.5	-0.0	95.4	176.5	176.7
4	155.4	184.4	223.7	165.5	155.4	154.1	-0.0	101.3	160.8	161.7
5	152.3	184.3	205.8	152.6	152.3	149.2	-0.0	108.1	138.3	140.0
6	150.6	184.2	190.9	145.2	150.6	145.1	-0.0	113.5	117.4	119.3
7	150.0	179.1	181.7	137.2	150.0	136.7	-0.0	115.7	102.6	104.1
8	148.5	173.4	177.9	131.0	148.5	130.1	-0.0	114.6	97.8	99.0
9	145.6	174.4	172.7	131.1	145.6	128.9	-0.0	117.4	92.9	93.5

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.458	0.490	0.724	0.479	0.458	0.400	0.895	0.925
2	0.473	0.509	0.721	0.499	0.473	0.428	0.928	0.878
3	0.464	0.525	0.704	0.504	0.464	0.444	0.980	0.860
4	0.467	0.543	0.672	0.487	0.467	0.454	0.992	0.798
5	0.457	0.544	0.617	0.451	0.457	0.441	0.980	0.734
6	0.452	0.545	0.573	0.430	0.452	0.430	0.963	0.681
7	0.450	0.531	0.545	0.407	0.450	0.405	0.911	0.684
8	0.445	0.514	0.533	0.388	0.445	0.385	0.876	0.690
9	0.436	0.517	0.517	0.388	0.436	0.382	0.885	0.693

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	5.5	10.8	0.545	0.851	0.097	0.097	0.045	0.045
2	10.00	4.0	11.8	0.508	0.842	0.102	0.102	0.048	0.048
3	15.00	4.1	12.0	0.489	0.856	0.098	0.098	0.047	0.047
4	30.00	3.3	12.8	0.500	0.930	0.049	0.049	0.024	0.024
5	50.00	3.3	12.7	0.523	0.962	0.028	0.028	0.014	0.014
6	70.00	3.3	12.1	0.522	0.956	0.033	0.033	0.015	0.015
7	85.00	5.0	11.2	0.529	0.896	0.074	0.074	0.033	0.033
8	90.00	6.0	11.1	0.544	0.822	0.126	0.126	0.054	0.054
9	95.00	7.3	9.4	0.528	0.847	0.114	0.114	0.047	0.047

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(j) 90 Percent of design speed; reading 1652

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	0.	48.9	54.8	34.0	288.8	1.067	10.03	1.181
2	24.026	24.028	-0.0	43.3	53.2	31.7	288.8	1.065	10.13	1.172
3	23.322	23.343	-0.0	41.0	52.8	28.8	288.5	1.064	10.14	1.175
4	21.173	21.285	-0.0	37.1	50.0	21.3	288.0	1.059	10.14	1.193
5	18.321	18.542	-0.0	38.8	46.1	12.3	288.0	1.051	10.14	1.177
6	15.540	15.799	-0.0	40.1	41.7	2.7	287.9	1.044	10.14	1.155
7	13.541	13.741	-0.0	41.3	37.9	-4.0	287.9	1.039	10.14	1.126
8	12.906	13.056	-0.0	42.4	36.7	-6.7	287.9	1.038	10.14	1.116
9	12.289	12.370	-0.0	43.4	35.9	-10.4	287.8	1.037	10.11	1.120

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	132.3	156.5	229.4	124.1	132.3	102.9	0.	117.9	187.3	187.2
2	136.6	160.5	227.8	137.4	136.6	116.9	-0.0	110.1	182.3	182.3
3	134.1	165.1	221.9	142.1	134.1	124.5	-0.0	108.4	176.8	177.0
4	134.5	176.3	209.2	151.0	134.5	140.7	-0.0	106.3	160.3	161.1
5	133.6	176.4	192.8	140.6	133.6	137.4	-0.0	110.6	139.0	140.7
6	132.2	175.8	176.9	134.7	132.2	134.5	-0.0	113.2	117.6	119.5
7	132.0	171.3	167.3	129.0	132.0	128.6	-0.0	113.2	102.7	104.3
8	131.2	168.1	163.5	124.9	131.2	124.1	-0.0	113.4	97.7	98.8
9	128.8	169.7	159.1	125.4	128.8	123.3	-0.0	116.5	93.3	93.9

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.394	0.454	0.684	0.360	0.394	0.298	0.778	0.969
2	0.408	0.467	0.680	0.399	0.408	0.340	0.855	0.931
3	0.400	0.481	0.662	0.414	0.400	0.363	0.928	0.908
4	0.402	0.517	0.625	0.443	0.402	0.413	1.046	0.837
5	0.399	0.519	0.576	0.414	0.399	0.404	1.028	0.770
6	0.395	0.519	0.528	0.398	0.395	0.397	1.018	0.703
7	0.394	0.507	0.499	0.381	0.394	0.381	0.975	0.691
8	0.392	0.497	0.488	0.369	0.392	0.367	0.946	0.688
9	0.384	0.502	0.475	0.371	0.384	0.365	0.957	0.692

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	9.5	11.3	0.746	0.724	0.222	0.222	0.103	0.103
2	10.00	8.1	12.7	0.664	0.716	0.222	0.222	0.104	0.104
3	15.00	8.2	12.6	0.625	0.735	0.216	0.216	0.103	0.103
4	30.00	7.3	12.7	0.547	0.883	0.097	0.097	0.048	0.048
5	50.00	7.2	12.9	0.560	0.942	0.049	0.049	0.024	0.024
6	70.00	7.0	12.5	0.542	0.953	0.040	0.040	0.019	0.019
7	85.00	8.5	12.1	0.531	0.894	0.088	0.088	0.039	0.039
8	90.00	9.3	11.3	0.538	0.843	0.132	0.132	0.057	0.057
9	95.00	10.6	9.5	0.522	0.880	0.105	0.105	0.044	0.044

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(k) 100 Percent of design speed; reading 1658

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	27.1	44.2	30.4	289.2	1.071	9.94	1.222
2	24.026	24.028	-0.0	26.3	42.9	27.2	289.0	1.067	10.12	1.230
3	23.322	23.343	-0.0	26.3	42.4	25.1	288.6	1.068	10.15	1.232
4	21.173	21.285	-0.0	28.6	39.5	18.3	288.1	1.068	10.15	1.230
5	18.321	18.542	-0.0	30.7	35.6	9.9	287.8	1.062	10.15	1.211
6	15.540	15.799	-0.0	32.3	31.2	1.5	287.8	1.056	10.15	1.189
7	13.541	13.741	-0.0	35.0	27.8	-5.0	287.7	1.049	10.16	1.145
8	12.906	13.056	-0.0	36.2	27.1	-6.5	287.7	1.046	10.15	1.114
9	12.289	12.370	-0.0	36.5	26.5	-8.0	287.5	1.044	10.09	1.105

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	215.2	213.4	300.1	220.2	215.2	189.9	-0.0	97.4	209.1	208.9
2	218.0	224.4	297.2	226.1	218.0	201.2	-0.0	99.3	202.6	202.6
3	215.0	228.1	291.4	225.6	215.0	204.4	-0.0	101.2	196.6	196.8
4	216.4	233.4	280.5	215.9	216.4	205.0	-0.0	111.6	178.3	179.3
5	215.7	236.2	265.1	206.1	215.7	203.0	-0.0	120.6	154.1	156.0
6	216.0	238.9	252.6	202.1	216.0	202.1	-0.0	127.5	130.8	133.0
7	216.2	230.5	244.4	189.6	216.2	188.9	-0.0	132.1	113.9	115.6
8	212.7	220.7	238.9	179.2	212.7	178.1	-0.0	130.3	108.7	110.0
9	207.1	216.1	231.5	175.4	207.1	173.7	-0.0	128.5	103.5	104.2

	ABS MACH NO		REL MACH NO		MERID MACH NO			MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT		VEL R	MACH NO
1	0.658	0.628	0.917	0.648	0.658	0.559		0.882	0.917
2	0.668	0.665	0.911	0.670	0.668	0.596		0.923	0.911
3	0.658	0.677	0.892	0.670	0.658	0.607		0.951	0.892
4	0.664	0.695	0.860	0.643	0.664	0.611		0.947	0.860
5	0.662	0.707	0.813	0.617	0.662	0.608		0.941	0.813
6	0.663	0.718	0.775	0.608	0.663	0.607		0.935	0.775
7	0.663	0.693	0.750	0.570	0.663	0.568		0.874	0.750
8	0.651	0.662	0.732	0.538	0.651	0.534		0.837	0.732
9	0.633	0.648	0.708	0.526	0.633	0.521		0.839	0.777

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	-1.1	7.8	0.447	0.835	0.090	0.090	0.043	0.043
2	10.00	-2.1	8.1	0.425	0.905	0.050	0.050	0.025	0.025
3	15.00	-2.2	8.9	0.415	0.899	0.056	0.056	0.028	0.028
4	30.00	-3.2	9.7	0.441	0.903	0.056	0.056	0.028	0.028
5	50.00	-3.4	10.5	0.452	0.909	0.053	0.053	0.026	0.026
6	70.00	-3.4	11.3	0.439	0.911	0.050	0.050	0.023	0.023
7	85.00	-1.6	11.0	0.465	0.800	0.104	0.104	0.046	0.046
8	90.00	-0.3	11.5	0.487	0.686	0.157	0.157	0.068	0.068
9	95.00	1.3	12.0	0.477	0.662	0.172	0.172	0.072	0.072

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(l) 100 Percent of design speed; reading 1653

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	30.2	47.1	32.4	289.3	1.069	9.93	1.229
2	24.026	24.028	-0.0	28.8	45.5	29.2	289.2	1.067	10.13	1.227
3	23.322	23.343	-0.0	28.6	45.2	27.2	288.7	1.068	10.14	1.232
4	21.173	21.285	0.	30.7	42.4	20.5	288.0	1.066	10.15	1.230
5	18.321	18.542	-0.0	33.8	38.7	11.4	287.8	1.061	10.16	1.213
6	15.540	15.799	-0.0	35.9	34.5	1.4	287.7	1.056	10.15	1.196
7	13.541	13.741	-0.0	38.4	31.0	-5.8	287.8	1.049	10.15	1.158
8	12.906	13.056	-0.0	39.8	30.1	-7.8	287.7	1.046	10.14	1.132
9	12.289	12.370	0.	40.4	29.4	-10.6	287.5	1.047	10.10	1.136

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	193.5	197.8	284.1	202.5	193.5	171.0	-0.0	99.4	208.0	207.9
2	198.2	207.2	282.6	208.1	198.2	181.6	-0.0	99.8	201.4	201.5
3	194.6	210.8	276.1	207.9	194.6	185.0	-0.0	101.1	195.8	196.0
4	195.0	214.9	264.1	197.3	195.0	184.8	0.	109.8	178.0	179.0
5	193.0	216.1	247.2	183.1	193.0	179.5	-0.0	120.2	154.5	156.3
6	190.3	219.3	230.9	177.8	190.3	177.8	-0.0	128.5	130.8	133.0
7	189.8	213.9	221.4	168.6	189.8	167.7	-0.0	132.8	114.0	115.7
8	187.3	205.5	216.6	159.4	187.3	157.9	-0.0	131.5	108.7	109.9
9	183.1	205.4	210.2	159.1	183.1	156.4	0.	133.2	103.3	104.0

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.587	0.580	0.861	0.593	0.587	0.501	0.884	0.967
2	0.602	0.610	0.858	0.613	0.602	0.534	0.916	0.898
3	0.591	0.622	0.838	0.613	0.591	0.546	0.951	0.882
4	0.593	0.636	0.803	0.584	0.593	0.547	0.947	0.803
5	0.587	0.642	0.752	0.544	0.587	0.533	0.930	0.752
6	0.578	0.654	0.702	0.530	0.578	0.530	0.934	0.702
7	0.576	0.639	0.672	0.503	0.576	0.501	0.884	0.748
8	0.569	0.613	0.657	0.475	0.569	0.471	0.843	0.766
9	0.555	0.613	0.637	0.474	0.555	0.466	0.855	0.780

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	1.8	9.8	0.482	0.878	0.071	0.071	0.033	0.033
2	10.00	0.4	10.2	0.459	0.897	0.059	0.059	0.029	0.029
3	15.00	0.5	10.9	0.446	0.905	0.057	0.057	0.028	0.028
4	30.00	-0.3	12.0	0.473	0.928	0.045	0.045	0.022	0.022
5	50.00	-0.3	12.0	0.504	0.937	0.040	0.040	0.020	0.020
6	70.00	-0.1	11.2	0.494	0.938	0.041	0.041	0.019	0.019
7	85.00	1.6	10.2	0.506	0.868	0.082	0.082	0.036	0.036
8	90.00	2.7	10.2	0.528	0.781	0.133	0.133	0.057	0.057
9	95.00	4.2	9.4	0.511	0.792	0.135	0.135	0.056	0.056

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(m) 100 Percent of design speed; reading 1654

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	33.1	48.8	33.4	289.1	1.070	9.95	1.225
2	24.026	24.028	0.0	30.7	47.3	30.5	288.8	1.070	10.13	1.226
3	23.322	23.343	0.0	30.4	46.9	27.8	288.7	1.070	10.14	1.234
4	21.173	21.285	-0.0	32.3	44.1	20.9	288.1	1.067	10.15	1.236
5	18.321	18.542	0.0	35.4	40.3	11.6	287.8	1.061	10.15	1.215
6	15.540	15.799	-0.0	37.3	36.3	1.7	287.8	1.055	10.15	1.198
7	13.541	13.741	-0.0	40.0	32.9	-5.6	287.6	1.049	10.15	1.157
8	12.906	13.056	-0.0	41.2	31.9	-7.8	287.7	1.047	10.15	1.136
9	12.289	12.370	-0.0	41.9	31.2	-11.1	287.7	1.048	10.10	1.141

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	182.0	188.7	276.1	189.5	182.0	158.1	-0.0	103.1	207.6	207.5
2	186.6	198.8	275.1	198.5	186.6	171.0	0.0	101.4	202.1	202.1
3	183.4	203.8	268.4	198.8	183.4	175.8	0.0	103.2	195.9	196.1
4	184.0	209.0	256.2	189.1	184.0	176.6	-0.0	111.7	178.3	179.2
5	181.2	208.4	237.6	173.5	181.2	169.9	0.0	120.6	153.7	155.5
6	177.7	210.8	220.6	167.7	177.7	167.6	-0.0	127.9	130.7	132.9
7	175.9	203.9	209.6	157.0	175.9	156.3	-0.0	131.0	114.0	115.7
8	174.1	197.5	205.1	150.0	174.1	148.7	-0.0	130.0	108.3	109.6
9	170.5	198.7	199.2	150.6	170.5	147.8	-0.0	132.8	103.1	103.7

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.550	0.551	0.834	0.553	0.550	0.462	0.869	0.999
2	0.565	0.583	0.833	0.582	0.565	0.502	0.916	0.952
3	0.555	0.599	0.812	0.584	0.555	0.516	0.958	0.927
4	0.557	0.617	0.776	0.558	0.557	0.521	0.960	0.855
5	0.549	0.617	0.719	0.514	0.549	0.503	0.938	0.791
6	0.537	0.627	0.667	0.499	0.537	0.498	0.943	0.746
7	0.532	0.607	0.634	0.467	0.532	0.465	0.888	0.760
8	0.526	0.587	0.620	0.446	0.526	0.442	0.854	0.766
9	0.515	0.590	0.601	0.448	0.515	0.439	0.867	0.775

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	3.5	10.8	0.522	0.847	0.095	0.095	0.044	0.044
2	10.00	2.2	11.4	0.482	0.860	0.087	0.087	0.041	0.041
3	15.00	2.2	11.6	0.469	0.878	0.079	0.079	0.038	0.038
4	30.00	1.4	12.3	0.493	0.926	0.050	0.050	0.024	0.024
5	50.00	1.3	12.2	0.526	0.936	0.044	0.044	0.022	0.022
6	70.00	1.7	11.5	0.515	0.956	0.031	0.031	0.015	0.015
7	85.00	3.5	10.4	0.530	0.864	0.093	0.093	0.041	0.041
8	90.00	4.5	10.2	0.544	0.790	0.143	0.143	0.061	0.061
9	95.00	5.9	8.8	0.526	0.809	0.138	0.138	0.057	0.057

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(n) 100 Percent of design speed; reading 1655

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	37.2	50.9	34.5	289.1	1.074	9.95	1.226
2	24.026	24.028	-0.0	34.1	49.3	31.5	289.0	1.071	10.14	1.223
3	23.322	23.343	-0.0	33.1	48.9	28.8	288.6	1.072	10.15	1.233
4	21.173	21.285	-0.0	34.3	46.1	21.1	288.0	1.069	10.15	1.240
5	18.321	18.542	-0.0	37.2	42.5	12.1	287.9	1.062	10.15	1.216
6	15.540	15.799	0.0	38.8	38.3	2.0	287.8	1.055	10.15	1.197
7	13.541	13.741	0.0	40.9	34.8	-4.8	287.7	1.048	10.15	1.154
8	12.906	13.056	-0.0	42.0	33.9	-7.1	287.8	1.047	10.14	1.139
9	12.289	12.370	0.0	42.8	33.1	-10.9	287.7	1.047	10.10	1.146

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	169.1	180.3	268.0	174.4	169.1	143.7	-0.0	108.9	207.9	207.8
2	173.6	189.2	266.4	183.8	173.6	156.7	-0.0	106.0	202.0	202.0
3	171.1	194.9	260.3	186.2	171.1	163.2	-0.0	106.5	196.1	196.3
4	170.9	202.3	246.5	179.2	170.9	167.2	-0.0	114.0	177.6	178.5
5	168.1	201.1	227.9	163.9	168.1	160.2	-0.0	121.6	154.0	155.9
6	165.8	203.6	211.2	158.9	165.8	158.8	0.0	127.5	130.8	133.0
7	163.2	195.1	198.9	147.9	163.2	147.4	0.0	127.8	113.7	115.4
8	161.5	190.4	194.5	142.6	161.5	141.5	-0.0	127.4	108.5	109.8
9	158.5	192.7	189.1	143.9	158.5	141.3	0.0	131.0	103.2	103.8

	ABS MACH NO		REL MACH NO		MERID MACH NO				MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT			VEL R	MACH NO
1	0.509	0.524	0.806	0.507	0.509	0.418			0.850	1.031
2	0.523	0.553	0.803	0.537	0.523	0.458			0.903	0.986
3	0.516	0.570	0.784	0.545	0.516	0.478			0.954	0.962
4	0.516	0.595	0.744	0.527	0.516	0.492			0.978	0.887
5	0.507	0.594	0.687	0.484	0.507	0.473			0.954	0.824
6	0.500	0.604	0.636	0.471	0.500	0.471			0.957	0.765
7	0.491	0.579	0.599	0.439	0.491	0.437			0.903	0.762
8	0.486	0.564	0.585	0.423	0.486	0.419			0.877	0.768
9	0.477	0.572	0.569	0.427	0.477	0.419			0.892	0.772

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	5.6	11.9	0.576	0.811	0.129	0.129	0.059	0.059
2	10.00	4.3	12.4	0.530	0.831	0.113	0.113	0.053	0.053
3	15.00	4.2	12.6	0.507	0.854	0.102	0.102	0.048	0.048
4	30.00	3.4	12.5	0.518	0.912	0.065	0.065	0.032	0.032
5	50.00	3.5	12.7	0.550	0.924	0.057	0.057	0.028	0.028
6	70.00	3.6	11.8	0.534	0.953	0.036	0.036	0.017	0.017
7	85.00	5.4	11.2	0.543	0.870	0.097	0.097	0.043	0.043
8	90.00	6.5	10.9	0.551	0.805	0.147	0.147	0.063	0.063
9	95.00	7.8	9.1	0.532	0.837	0.130	0.130	0.054	0.054

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(o) 100 Percent of design speed; reading 1656

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	50.1	54.4	33.9	289.0	1.085	9.97	1.221
2	24.026	24.028	-0.0	43.6	52.6	30.8	288.9	1.080	10.13	1.210
3	23.322	23.343	-0.0	41.0	52.2	28.5	288.6	1.079	10.14	1.214
4	21.173	21.285	-0.0	36.7	49.4	21.1	288.1	1.072	10.15	1.239
5	18.321	18.542	-0.0	39.0	45.5	11.7	287.9	1.064	10.15	1.221
6	15.540	15.799	-0.0	39.9	41.1	2.3	287.8	1.056	10.15	1.195
7	13.541	13.741	0.0	41.5	37.4	-4.5	287.7	1.048	10.14	1.157
8	12.906	13.056	0.0	42.6	36.4	-7.1	287.7	1.047	10.14	1.145
9	12.289	12.370	-0.0	43.2	35.5	-10.2	287.8	1.046	10.10	1.146

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	148.7	173.2	255.5	133.9	148.7	111.1	-0.0	132.9	207.7	207.6
2	154.1	179.4	253.5	151.2	154.1	129.8	-0.0	123.8	201.3	201.3
3	152.1	183.8	248.0	157.9	152.1	138.7	-0.0	120.6	195.8	196.0
4	152.5	197.1	234.2	169.3	152.5	158.0	-0.0	117.8	177.7	178.6
5	151.6	197.4	216.3	156.7	151.6	153.4	-0.0	124.2	154.2	156.0
6	150.0	197.5	198.9	151.6	150.0	151.5	-0.0	126.8	130.6	132.8
7	148.3	191.2	186.8	143.7	148.3	143.3	0.0	126.7	113.6	115.3
8	147.3	188.0	183.0	139.4	147.3	138.4	0.0	127.2	108.6	109.9
9	144.9	188.3	178.0	139.5	144.9	137.3	-0.0	128.9	103.5	104.1

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.445	0.500	0.764	0.387	0.445	0.321	0.747	1.073
2	0.462	0.520	0.760	0.439	0.462	0.377	0.843	1.025
3	0.456	0.534	0.743	0.459	0.456	0.403	0.912	1.002
4	0.458	0.578	0.703	0.497	0.458	0.463	1.036	0.925
5	0.455	0.581	0.649	0.461	0.455	0.452	1.012	0.852
6	0.450	0.584	0.597	0.448	0.450	0.448	1.010	0.781
7	0.445	0.567	0.560	0.426	0.445	0.425	0.966	0.766
8	0.441	0.557	0.549	0.413	0.441	0.410	0.940	0.769
9	0.434	0.558	0.533	0.413	0.434	0.407	0.948	0.770

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	9.1	11.3	0.766	0.688	0.259	0.259	0.120	0.120
2	10.00	7.5	11.8	0.673	0.702	0.236	0.236	0.112	0.112
3	15.00	7.5	12.3	0.628	0.719	0.230	0.230	0.110	0.110
4	30.00	6.6	12.5	0.543	0.877	0.102	0.102	0.050	0.050
5	50.00	6.5	12.3	0.565	0.915	0.073	0.073	0.036	0.036
6	70.00	6.4	12.1	0.540	0.933	0.058	0.058	0.027	0.027
7	85.00	8.0	11.5	0.533	0.880	0.100	0.100	0.044	0.044
8	90.00	9.0	10.9	0.540	0.839	0.135	0.135	0.058	0.058
9	95.00	10.3	9.7	0.523	0.864	0.118	0.118	0.049	0.049

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(p) 110 Percent of design speed; reading 1751

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	23.8	44.4	31.4	288.8	1.073	10.04	1.189
2	24.026	24.028	-0.0	22.7	43.6	28.3	288.7	1.073	10.14	1.225
3	23.322	23.343	-0.0	23.4	43.2	26.2	288.3	1.075	10.14	1.228
4	21.173	21.285	-0.0	25.8	40.0	19.9	288.1	1.074	10.14	1.221
5	18.321	18.542	-0.0	28.9	36.2	11.5	287.9	1.069	10.15	1.205
6	15.540	15.799	-0.0	30.3	32.0	2.3	287.9	1.065	10.14	1.208
7	13.541	13.741	-0.0	32.4	28.5	-3.6	288.0	1.055	10.15	1.154
8	12.906	13.056	-0.0	34.0	27.7	-5.6	288.0	1.051	10.14	1.113
9	12.289	12.370	-0.0	34.3	27.1	-6.7	287.9	1.047	10.11	1.086

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	232.4	236.5	325.4	253.6	232.4	216.4	-0.0	95.3	227.7	227.5
2	232.5	251.1	321.1	263.0	232.5	231.6	-0.1	96.8	221.5	221.5
3	229.3	253.6	314.5	259.4	229.3	232.7	-0.0	100.9	215.2	215.4
4	232.1	257.4	303.1	246.4	232.1	231.7	-0.0	112.1	194.9	196.0
5	231.1	258.9	286.3	231.3	231.1	226.7	-0.0	125.1	169.1	171.1
6	229.5	270.6	270.6	233.8	229.5	233.6	-0.0	136.6	143.4	145.8
7	229.9	262.4	261.7	221.8	229.9	221.4	-0.0	140.7	125.0	126.8
8	226.8	252.3	256.2	210.1	226.8	209.1	-0.0	141.1	119.1	120.5
9	221.6	244.6	248.8	203.5	221.6	202.1	-0.0	137.8	113.3	114.0

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.716	0.703	1.003	0.753	0.716	0.643	0.931	1.000
2	0.717	0.751	0.990	0.786	0.717	0.693	0.996	0.990
3	0.707	0.759	0.969	0.776	0.707	0.696	1.015	0.969
4	0.716	0.772	0.936	0.739	0.716	0.695	0.998	0.936
5	0.713	0.780	0.884	0.697	0.713	0.683	0.981	0.884
6	0.708	0.821	0.835	0.709	0.708	0.709	1.018	0.835
7	0.709	0.797	0.807	0.674	0.709	0.673	0.963	0.807
8	0.699	0.765	0.789	0.637	0.699	0.634	0.922	0.819
9	0.681	0.741	0.765	0.616	0.681	0.612	0.912	0.860

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	-0.9	8.8	0.384	0.700	0.146	0.146	0.070	0.070
2	10.00	-1.4	9.2	0.348	0.817	0.092	0.092	0.045	0.045
3	15.00	-1.5	10.0	0.350	0.805	0.103	0.103	0.050	0.050
4	30.00	-2.7	11.3	0.383	0.789	0.117	0.117	0.058	0.058
5	50.00	-2.8	12.1	0.412	0.794	0.115	0.115	0.057	0.057
6	70.00	-2.6	12.0	0.376	0.850	0.087	0.087	0.041	0.041
7	85.00	-0.9	12.4	0.392	0.755	0.127	0.127	0.056	0.056
8	90.00	0.3	12.4	0.419	0.613	0.190	0.190	0.082	0.082
9	95.00	1.8	13.2	0.417	0.510	0.231	0.231	0.097	0.097

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(q) 110 Percent of design speed; reading 1750

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	35.6	47.5	33.0	288.9	1.089	10.06	1.246
2	24.026	24.028	-0.0	31.1	46.7	29.9	288.8	1.087	10.13	1.276
3	23.322	23.343	-0.0	30.5	46.2	27.3	288.6	1.087	10.14	1.291
4	21.173	21.285	-0.0	31.9	43.2	19.9	288.1	1.085	10.14	1.296
5	18.321	18.542	-0.0	34.5	39.3	11.5	287.8	1.074	10.14	1.264
6	15.540	15.799	-0.0	35.8	34.9	2.2	287.8	1.066	10.14	1.240
7	13.541	13.741	-0.0	38.3	31.3	-4.7	287.8	1.058	10.14	1.184
8	12.906	13.056	-0.0	39.4	30.2	-6.6	287.9	1.054	10.14	1.153
9	12.289	12.370	-0.0	39.7	29.6	-8.9	287.7	1.054	10.11	1.155

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	209.7	205.7	310.1	199.5	209.7	167.3	-0.0	119.7	228.4	228.3
2	209.0	219.7	304.5	217.0	209.0	188.2	-0.0	113.3	221.4	221.4
3	206.3	226.3	298.0	219.4	206.3	195.0	-0.0	114.8	215.1	215.2
4	208.8	235.4	286.3	212.7	208.8	200.0	-0.0	124.2	195.8	196.8
5	207.3	233.7	267.8	196.6	207.3	192.7	-0.0	132.3	169.5	171.6
6	205.2	236.8	250.3	192.3	205.2	192.2	-0.0	138.4	143.3	145.7
7	205.9	229.1	241.1	180.3	205.9	179.7	-0.0	142.0	125.3	127.1
8	203.7	220.2	235.8	171.2	203.7	170.1	-0.0	139.8	118.7	120.1
9	199.5	220.1	229.4	171.4	199.5	169.3	-0.0	140.6	113.2	114.0

	ABS MACH NO		REL MACH NO		MERID MACH NO			MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT		VEL R	MACH NO
1	0.640	0.599	0.947	0.581	0.640	0.487		0.798	1.079
2	0.638	0.644	0.929	0.636	0.638	0.551		0.900	1.035
3	0.629	0.665	0.909	0.645	0.629	0.573		0.945	1.009
4	0.638	0.696	0.875	0.629	0.638	0.591		0.958	0.916
5	0.633	0.694	0.818	0.584	0.633	0.572		0.930	0.850
6	0.627	0.708	0.765	0.575	0.627	0.574		0.936	0.792
7	0.629	0.685	0.736	0.539	0.629	0.537		0.873	0.831
8	0.622	0.657	0.720	0.511	0.622	0.508		0.835	0.842
9	0.608	0.657	0.699	0.512	0.608	0.506		0.849	0.860

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	2.2	10.3	0.572	0.730	0.171	0.171	0.080	0.080
2	10.00	1.6	10.8	0.493	0.827	0.112	0.112	0.053	0.053
3	15.00	1.5	11.0	0.474	0.874	0.083	0.083	0.040	0.040
4	30.00	0.4	11.4	0.486	0.911	0.061	0.061	0.030	0.030
5	50.00	0.3	12.1	0.515	0.934	0.045	0.045	0.022	0.022
6	70.00	0.3	12.0	0.494	0.964	0.024	0.024	0.011	0.011
7	85.00	1.9	11.3	0.515	0.858	0.089	0.089	0.039	0.039
8	90.00	2.8	11.4	0.532	0.771	0.139	0.139	0.060	0.060
9	95.00	4.3	11.0	0.512	0.785	0.136	0.136	0.057	0.057

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(r) 110 Percent of design speed; reading 1748

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	42.5	50.9	33.1	289.0	1.096	10.07	1.270
2	24.026	24.028	-0.0	37.1	50.1	31.5	288.7	1.093	10.13	1.270
3	23.322	23.343	-0.0	35.6	49.5	28.8	288.5	1.091	10.14	1.279
4	21.173	21.285	-0.0	34.5	46.6	22.1	288.0	1.085	10.14	1.295
5	18.321	18.542	-0.0	37.4	42.7	12.3	287.9	1.075	10.14	1.267
6	15.540	15.799	-0.0	38.6	38.3	2.1	287.8	1.067	10.14	1.245
7	13.541	13.741	-0.0	40.8	34.6	-4.3	287.9	1.057	10.14	1.186
8	12.906	13.056	-0.0	41.6	33.4	-6.5	287.8	1.055	10.14	1.167
9	12.289	12.370	-0.0	42.1	32.7	-9.3	287.8	1.054	10.11	1.168

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	185.8	197.7	294.6	173.9	185.8	145.7	-0.0	133.6	228.6	228.5
2	185.5	203.0	288.9	189.8	185.5	161.9	-0.0	122.4	221.5	221.5
3	183.3	208.7	282.4	193.6	183.3	169.6	-0.0	121.5	214.7	214.9
4	185.4	219.0	269.9	194.8	185.4	180.5	-0.0	124.0	196.1	197.2
5	183.3	218.9	249.3	177.9	183.3	173.8	-0.0	133.1	168.9	171.0
6	182.4	224.2	232.3	175.2	182.4	175.1	-0.0	139.9	143.9	146.3
7	182.2	213.9	221.3	162.5	182.2	162.0	-0.0	139.7	125.6	127.4
8	180.6	208.5	216.4	157.0	180.6	156.0	-0.0	138.4	119.3	120.6
9	177.1	208.4	210.4	156.7	177.1	154.6	-0.0	139.7	113.6	114.3

	ABS MACH NO		REL MACH NO		MERID MACH NO			MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT		VEL R	MACH NO
1	0.562	0.572	0.891	0.503	0.562	0.421		0.784	1.141
2	0.561	0.590	0.875	0.551	0.561	0.470		0.873	1.099
3	0.555	0.608	0.855	0.564	0.555	0.494		0.925	1.069
4	0.562	0.643	0.818	0.572	0.562	0.530		0.973	0.993
5	0.555	0.646	0.755	0.525	0.555	0.513		0.948	0.911
6	0.552	0.666	0.704	0.520	0.552	0.520		0.960	0.847
7	0.552	0.636	0.670	0.483	0.552	0.482		0.889	0.846
8	0.547	0.620	0.655	0.466	0.547	0.463		0.864	0.849
9	0.536	0.619	0.636	0.466	0.536	0.459		0.873	0.855

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	5.6	10.4	0.663	0.735	0.196	0.196	0.092	0.092
2	10.00	5.0	12.4	0.577	0.765	0.173	0.173	0.082	0.082
3	15.00	4.8	12.6	0.549	0.803	0.148	0.148	0.070	0.070
4	30.00	3.9	13.5	0.521	0.901	0.076	0.076	0.037	0.037
5	50.00	3.7	12.9	0.556	0.939	0.047	0.047	0.023	0.023
6	70.00	3.7	11.9	0.531	0.958	0.033	0.033	0.015	0.015
7	85.00	5.2	11.7	0.547	0.870	0.094	0.094	0.042	0.042
8	90.00	6.0	11.5	0.553	0.825	0.126	0.126	0.054	0.054
9	95.00	7.4	10.6	0.536	0.842	0.118	0.118	0.049	0.049

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(s) 120 Percent of design speed; reading 1754

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	0.0	24.7	46.3	31.5	288.7	1.089	10.05	1.197
2	24.026	24.028	-0.0	23.5	45.5	28.5	288.6	1.089	10.13	1.233
3	23.322	23.343	-0.0	23.9	44.9	26.7	288.3	1.089	10.15	1.234
4	21.173	21.285	-0.0	26.1	41.8	20.9	288.1	1.087	10.14	1.227
5	18.321	18.542	-0.0	28.6	37.9	13.3	287.9	1.080	10.15	1.212
6	15.540	15.799	-0.0	30.4	33.6	3.1	287.9	1.077	10.15	1.232
7	13.541	13.741	-0.0	32.7	30.0	-3.8	288.1	1.070	10.14	1.183
8	12.906	13.056	0.0	34.3	29.2	-5.9	287.9	1.065	10.14	1.131
9	12.289	12.370	0.0	35.2	28.6	-8.0	288.1	1.061	10.09	1.109

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	237.7	254.9	344.0	271.8	237.7	231.6	0.0	106.4	248.7	248.5
2	238.1	269.5	339.4	281.4	238.1	247.2	-0.0	107.4	241.8	241.9
3	235.2	271.4	332.1	277.6	235.2	248.1	-0.0	110.0	234.4	234.6
4	238.2	273.6	319.6	262.9	238.2	245.6	-0.0	120.5	213.1	214.2
5	237.2	272.9	300.6	246.2	237.2	239.7	-0.0	130.4	184.7	186.9
6	235.4	287.0	282.5	247.9	235.4	247.6	-0.0	145.3	156.3	158.9
7	235.5	284.8	272.0	240.1	235.5	239.6	-0.0	153.9	136.0	138.0
8	232.0	273.8	265.8	227.2	232.0	226.0	0.0	154.4	129.7	131.2
9	226.1	269.7	257.6	222.7	226.1	220.5	0.0	155.3	123.5	124.3

	ABS MACH NO		REL MACH NO		MERID MACH NO			
RP	IN	OUT	IN	OUT	IN	OUT	MERID PEAK SS VEL R	MACH NO
1	0.735	0.757	1.063	0.807	0.735	0.688	0.974	1.118
2	0.736	0.806	1.049	0.842	0.736	0.739	1.038	1.075
3	0.727	0.813	1.026	0.832	0.727	0.743	1.055	1.046
4	0.737	0.822	0.989	0.789	0.737	0.738	1.031	0.989
5	0.734	0.822	0.930	0.742	0.734	0.722	1.011	0.930
6	0.728	0.873	0.873	0.754	0.728	0.753	1.052	0.873
7	0.728	0.868	0.841	0.732	0.728	0.730	1.017	0.889
8	0.716	0.832	0.821	0.691	0.716	0.687	0.974	0.922
9	0.696	0.820	0.793	0.677	0.696	0.670	0.975	0.945

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	1.0	8.9	0.383	0.592	0.220	0.218	0.104	0.104
2	10.00	0.4	9.5	0.346	0.693	0.170	0.169	0.082	0.082
3	15.00	0.2	10.5	0.344	0.699	0.171	0.170	0.083	0.083
4	30.00	-0.9	12.3	0.377	0.691	0.181	0.181	0.089	0.089
5	50.00	-1.1	13.8	0.399	0.704	0.176	0.176	0.086	0.086
6	70.00	-1.1	12.9	0.366	0.795	0.129	0.129	0.061	0.061
7	85.00	0.6	12.2	0.369	0.705	0.178	0.178	0.079	0.079
8	90.00	1.8	12.1	0.398	0.546	0.264	0.264	0.113	0.113
9	95.00	3.4	12.0	0.391	0.488	0.294	0.294	0.123	0.123

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(t) 120 Percent of design speed; reading 1753

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	0.0	32.2	47.5	33.7	288.9	1.093	10.04	1.182
2	24.026	24.028	-0.0	28.1	46.6	30.2	288.7	1.093	10.13	1.229
3	23.322	23.343	-0.0	27.5	46.1	28.1	288.3	1.090	10.14	1.243
4	21.173	21.285	-0.0	28.9	43.1	22.4	288.0	1.087	10.15	1.248
5	18.321	18.542	-0.0	32.4	39.0	12.0	287.9	1.082	10.14	1.254
6	15.540	15.799	-0.0	33.7	34.6	2.2	287.9	1.076	10.15	1.253
7	13.541	13.741	-0.0	35.8	30.9	-5.0	288.0	1.068	10.14	1.205
8	12.906	13.056	-0.0	36.9	30.0	-6.8	288.0	1.063	10.14	1.162
9	12.289	12.370	-0.0	37.2	29.3	-8.6	287.9	1.060	10.12	1.149

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	228.1	226.8	337.8	230.9	228.1	192.0	0.0	120.7	249.1	249.0
2	228.5	245.7	332.7	250.9	228.5	216.8	-0.0	115.6	241.8	241.8
3	225.9	251.2	325.9	252.7	225.9	222.8	-0.0	116.0	234.9	235.1
4	228.4	254.1	312.6	240.6	228.4	222.4	-0.0	122.8	213.5	214.6
5	227.5	260.4	292.6	224.8	227.5	219.9	-0.0	139.5	184.1	186.3
6	227.0	271.1	275.7	225.7	227.0	225.5	-0.0	150.5	156.5	159.1
7	227.9	269.3	265.6	219.2	227.9	218.4	-0.0	157.5	136.5	138.5
8	225.0	259.7	259.8	209.0	225.0	207.6	-0.0	156.1	130.0	131.5
9	220.4	257.2	252.7	207.2	220.4	204.8	-0.0	155.5	123.6	124.4

	ABS MACH NO		REL MACH NO		MERID MACH NO			
RP	IN	OUT	IN	OUT	IN	OUT	MERID PEAK SS VEL R	MACH NO
1	0.702	0.664	1.039	0.676	0.702	0.562	0.842	1.159
2	0.703	0.726	1.024	0.741	0.703	0.640	0.949	1.120
3	0.695	0.745	1.003	0.749	0.695	0.661	0.987	1.107
4	0.704	0.756	0.963	0.716	0.704	0.662	0.974	1.002
5	0.701	0.779	0.902	0.673	0.701	0.658	0.967	0.908
6	0.699	0.819	0.849	0.681	0.699	0.681	0.993	0.849
7	0.702	0.815	0.818	0.664	0.702	0.661	0.958	0.908
8	0.692	0.785	0.800	0.632	0.692	0.627	0.923	0.928
9	0.677	0.777	0.776	0.626	0.677	0.619	0.929	0.946

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	2.2	11.1	0.516	0.525	0.271	0.269	0.126	0.125
2	10.00	1.6	11.2	0.438	0.655	0.203	0.202	0.097	0.097
3	15.00	1.5	11.9	0.418	0.710	0.172	0.171	0.082	0.082
4	30.00	0.3	13.9	0.438	0.754	0.150	0.150	0.073	0.073
5	50.00	0.0	12.6	0.472	0.811	0.121	0.121	0.059	0.059
6	70.00	-0.0	12.0	0.440	0.881	0.077	0.077	0.036	0.036
7	85.00	1.5	11.0	0.439	0.801	0.123	0.123	0.054	0.054
8	90.00	2.6	11.2	0.457	0.694	0.182	0.182	0.078	0.078
9	95.00	4.0	11.3	0.441	0.670	0.196	0.196	0.082	0.082

TABLE VII. - Concluded. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 55C

(u) 120 Percent of design speed; reading 1752

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.729	24.714	-0.0	42.9	49.7	32.7	289.1	1.116	10.05	1.295
2	24.026	24.028	-0.0	36.9	48.6	29.8	288.9	1.112	10.14	1.312
3	23.322	23.343	-0.0	35.1	48.2	27.3	288.5	1.110	10.14	1.327
4	21.173	21.285	-0.0	35.1	45.3	20.1	288.0	1.102	10.14	1.347
5	18.321	18.542	-0.0	37.5	41.3	9.8	287.8	1.094	10.14	1.331
6	15.540	15.799	-0.0	37.7	36.8	1.4	287.8	1.081	10.14	1.291
7	13.541	13.741	-0.0	40.3	33.0	-5.4	287.8	1.069	10.14	1.219
8	12.906	13.056	-0.0	41.0	32.0	-7.1	287.8	1.065	10.14	1.191
9	12.289	12.370	-0.0	40.8	31.3	-8.7	287.7	1.063	10.11	1.189

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	212.2	216.9	327.8	188.7	212.2	158.8	-0.0	147.8	249.9	249.7
2	213.6	229.3	323.2	211.2	213.6	183.4	-0.0	137.7	242.6	242.6
3	210.6	236.1	315.7	217.2	210.6	193.1	-0.0	135.9	235.2	235.4
4	211.3	245.6	300.6	214.0	211.3	200.9	-0.0	141.2	213.8	214.9
5	210.2	250.7	279.7	201.9	210.2	199.0	-0.0	152.5	184.6	186.8
6	209.6	252.1	261.7	199.5	209.6	199.4	-0.0	154.3	156.7	159.3
7	210.1	241.0	250.5	184.7	210.1	183.9	-0.0	155.9	136.4	138.4
8	207.6	233.5	244.9	177.6	207.6	176.3	-0.0	153.1	129.8	131.3
9	203.2	231.4	237.9	177.1	203.2	175.1	-0.0	151.3	123.7	124.5

	ABS MACH NO		REL MACH NO		MERID MACH NO				MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT			VEL R	MACH NO
1	0.648	0.626	1.001	0.544	0.648	0.458			0.749	1.233
2	0.653	0.666	0.988	0.614	0.653	0.533			0.859	1.187
3	0.644	0.689	0.965	0.634	0.644	0.563			0.917	1.156
4	0.646	0.723	0.920	0.630	0.646	0.591			0.951	1.067
5	0.643	0.743	0.856	0.598	0.643	0.590			0.947	0.983
6	0.641	0.753	0.801	0.595	0.641	0.595			0.951	0.913
7	0.643	0.720	0.766	0.552	0.643	0.549			0.875	0.921
8	0.635	0.697	0.748	0.530	0.635	0.526			0.849	0.929
9	0.620	0.691	0.726	0.529	0.620	0.523			0.862	0.941

	PERCENT	INCIDENCE	DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	4.4	10.1	0.676	0.663	0.247	0.244	0.116	0.114
2	10.00	3.6	10.7	0.582	0.723	0.202	0.201	0.097	0.096
3	15.00	3.5	11.1	0.546	0.765	0.176	0.176	0.085	0.085
4	30.00	2.6	11.6	0.537	0.873	0.097	0.097	0.048	0.048
5	50.00	2.3	10.4	0.553	0.908	0.072	0.072	0.036	0.036
6	70.00	2.2	11.2	0.518	0.939	0.046	0.046	0.022	0.022
7	85.00	3.6	10.6	0.540	0.836	0.115	0.115	0.050	0.050
8	90.00	4.6	10.9	0.547	0.785	0.146	0.146	0.063	0.063
9	95.00	6.1	11.3	0.524	0.807	0.133	0.133	0.055	0.055

TABLE VIII. - BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(a) 80 Percent of design speed; reading 1662

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	20.1	-7.2	20.1	-7.2	300.1	0.995	11.35	0.948
2	24.547	24.671	19.8	-5.6	19.8	-5.6	300.1	0.997	11.51	0.964
3	23.876	24.049	20.2	-5.2	20.2	-5.2	300.1	0.997	11.53	0.977
4	21.847	22.222	22.9	-4.6	22.9	-4.6	299.8	0.998	11.53	0.988
5	19.164	19.827	26.1	-3.7	26.1	-3.7	299.0	1.000	11.48	0.995
6	16.502	17.465	28.0	-3.6	28.0	-3.6	298.0	1.001	11.34	0.996
7	14.519	15.682	29.3	-3.8	29.3	-3.8	297.0	1.002	11.13	0.988
8	13.858	15.070	30.8	-5.2	30.8	-5.2	296.0	1.002	10.82	0.990
9	13.200	14.448	31.5	-6.5	31.5	-6.5	295.5	1.003	10.60	0.991

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	192.2	178.0	192.2	178.0	180.5	176.6	66.2	-22.2	0.	0.
2	199.6	191.3	199.6	191.3	187.8	190.4	67.7	-18.7	0.	0.
3	201.1	196.7	201.1	196.7	188.7	195.9	69.4	-17.9	0.	0.
4	207.4	204.6	207.4	204.6	191.1	204.0	80.5	-16.5	0.	0.
5	210.5	210.2	210.5	210.2	189.0	209.8	92.6	-13.7	0.	0.
6	209.6	216.2	209.6	216.2	185.1	215.7	98.2	-13.6	0.	0.
7	204.9	216.5	204.9	216.5	178.7	216.0	100.3	-14.4	0.	0.
8	193.4	207.5	193.4	207.5	166.0	206.7	99.2	-18.7	0.	0.
9	183.5	200.3	183.5	200.3	156.6	199.0	95.8	-22.5	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.571	0.528	0.571	0.528	0.536	0.524	0.979	0.571
2	0.595	0.569	0.595	0.569	0.560	0.567	1.014	0.595
3	0.600	0.586	0.600	0.586	0.563	0.584	1.038	0.600
4	0.620	0.612	0.620	0.612	0.571	0.610	1.067	0.620
5	0.631	0.630	0.631	0.630	0.566	0.629	1.110	0.631
6	0.629	0.650	0.629	0.650	0.556	0.649	1.165	0.629
7	0.615	0.652	0.615	0.652	0.537	0.651	1.209	0.615
8	0.579	0.624	0.579	0.624	0.497	0.621	1.245	0.579
9	0.548	0.601	0.548	0.601	0.468	0.597	1.271	0.548

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-20.3	8.5	0.387	0.261	0.261	0.177	0.177
2	10.00	-20.7	9.7	0.329	0.169	0.169	0.111	0.111
3	15.00	-20.4	9.7	0.302	0.109	0.109	0.070	0.070
4	30.00	-18.1	9.4	0.290	0.051	0.051	0.030	0.030
5	50.00	-15.3	9.3	0.263	0.022	0.022	0.012	0.012
6	70.00	-13.9	8.1	0.208	0.016	0.016	0.007	0.007
7	85.00	-12.9	7.1	0.165	0.052	0.052	0.021	0.021
8	90.00	-11.4	5.5	0.158	0.049	0.049	0.019	0.019
9	95.00	-10.9	4.0	0.142	0.046	0.046	0.017	0.017

TABLE VIII. - Continued. - BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(b) 80 Percent of design speed; reading 1661

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	23.5	-5.8	23.5	-5.8	301.0	0.996	11.39	0.969
2	24.547	24.671	23.0	-5.0	23.0	-5.0	300.7	0.997	11.55	0.976
3	23.876	24.049	23.3	-4.4	23.3	-4.4	300.4	0.998	11.58	0.984
4	21.847	22.222	25.3	-4.6	25.3	-4.6	299.5	0.999	11.54	0.994
5	19.164	19.827	28.1	-4.4	28.1	-4.4	298.6	0.999	11.41	0.999
6	16.502	17.465	30.2	-4.0	30.2	-4.0	297.9	1.000	11.33	0.997
7	14.519	15.682	32.5	-3.6	32.5	-3.6	297.4	0.999	11.24	0.989
8	13.858	15.070	34.1	-4.8	34.1	-4.8	296.5	1.000	10.94	0.997
9	13.200	14.448	34.8	-5.7	34.8	-5.7	296.2	1.001	10.86	0.994

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	173.4	159.0	173.4	159.0	158.9	158.2	69.3	-16.1	0.	0.
2	181.0	169.2	181.0	169.2	166.7	168.6	70.6	-14.6	0.	0.
3	182.9	173.4	182.9	173.4	168.1	172.9	72.2	-13.4	0.	0.
4	186.3	178.8	186.3	178.8	168.5	178.2	79.5	-14.5	0.	0.
5	186.4	181.2	186.4	181.2	164.4	180.7	87.8	-13.7	0.	0.
6	187.4	183.9	187.4	183.9	161.9	183.5	94.3	-12.9	0.	0.
7	187.2	185.1	187.2	185.1	157.9	184.7	100.6	-11.7	0.	0.
8	175.5	177.4	175.5	177.4	145.2	176.8	98.5	-14.8	0.	0.
9	171.1	172.5	171.1	172.5	140.6	171.6	97.6	-17.1	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.511	0.468	0.511	0.468	0.469	0.466	0.996	0.511
2	0.535	0.500	0.535	0.500	0.493	0.498	1.012	0.535
3	0.542	0.513	0.542	0.513	0.498	0.511	1.029	0.542
4	0.553	0.530	0.553	0.530	0.500	0.528	1.057	0.553
5	0.554	0.538	0.554	0.538	0.489	0.537	1.099	0.554
6	0.558	0.547	0.558	0.547	0.482	0.546	1.133	0.558
7	0.558	0.552	0.558	0.552	0.471	0.550	1.170	0.558
8	0.522	0.528	0.522	0.528	0.432	0.526	1.217	0.522
9	0.509	0.513	0.509	0.513	0.418	0.510	1.221	0.509

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-16.9	9.8	0.418	0.190	0.190	0.129	0.129
2	10.00	-17.6	10.4	0.377	0.136	0.136	0.090	0.090
3	15.00	-17.3	10.5	0.354	0.091	0.091	0.058	0.058
4	30.00	-15.7	9.4	0.339	0.034	0.034	0.020	0.020
5	50.00	-13.3	8.7	0.311	0.003	0.003	0.002	0.002
6	70.00	-11.6	7.7	0.275	0.017	0.017	0.008	0.008
7	85.00	-9.7	7.3	0.248	0.059	0.059	0.024	0.024
8	90.00	-8.2	5.9	0.233	0.017	0.017	0.007	0.007
9	95.00	-7.6	4.7	0.234	0.039	0.039	0.015	0.015

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(c) 80 Percent of design speed; reading 1646

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	27.9	-4.4	27.9	-4.4	301.1	0.997	11.40	0.982
2	24.547	24.671	26.2	-4.1	26.2	-4.1	300.9	0.997	11.58	0.980
3	23.876	24.049	26.6	-4.1	26.6	-4.1	300.8	0.998	11.60	0.986
4	21.847	22.222	28.9	-4.0	28.9	-4.0	299.8	0.998	11.58	0.995
5	19.164	19.827	31.8	-3.7	31.8	-3.7	298.5	0.999	11.47	0.998
6	16.502	17.465	34.0	-2.8	34.0	-2.8	297.5	0.999	11.37	0.994
7	14.519	15.682	36.3	-3.0	36.3	-3.0	297.0	1.000	11.21	0.993
8	13.858	15.070	37.7	-3.7	37.7	-3.7	296.0	1.001	10.96	1.002
9	13.200	14.448	38.7	-5.8	38.7	-5.8	296.4	1.001	10.96	0.993

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	156.6	143.3	156.6	143.3	138.4	142.9	73.2	-11.1	0.	0.
2	165.8	150.4	165.8	150.4	148.8	150.0	73.1	-10.7	0.	0.
3	168.4	154.5	168.4	154.5	150.6	154.1	75.4	-11.0	0.	0.
4	171.4	160.1	171.4	160.1	150.1	159.7	82.8	-11.2	0.	0.
5	171.2	160.6	171.2	160.6	145.6	160.3	90.2	-10.3	0.	0.
6	171.5	159.3	171.5	159.3	142.1	159.1	95.9	-7.9	0.	0.
7	169.4	157.8	169.4	157.8	136.6	157.6	100.3	-8.1	0.	0.
8	159.6	152.0	159.6	152.0	126.2	151.6	97.7	-9.9	0.	0.
9	158.9	147.1	158.9	147.1	123.9	146.3	99.4	-14.8	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.460	0.420	0.460	0.420	0.406	0.418	1.032	0.460
2	0.488	0.441	0.488	0.441	0.438	0.440	1.008	0.488
3	0.496	0.454	0.496	0.454	0.444	0.453	1.023	0.496
4	0.506	0.472	0.506	0.472	0.443	0.471	1.064	0.506
5	0.507	0.474	0.507	0.474	0.431	0.473	1.101	0.507
6	0.509	0.471	0.509	0.471	0.422	0.471	1.119	0.509
7	0.503	0.467	0.503	0.467	0.405	0.466	1.154	0.503
8	0.473	0.449	0.473	0.449	0.374	0.448	1.201	0.473
9	0.470	0.434	0.470	0.434	0.367	0.432	1.180	0.470

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-12.6	11.2	0.452	0.136	0.136	0.092	0.092
2	10.00	-14.4	11.2	0.428	0.135	0.135	0.089	0.089
3	15.00	-14.0	10.9	0.414	0.088	0.088	0.057	0.057
4	30.00	-12.1	10.0	0.390	0.032	0.032	0.019	0.019
5	50.00	-9.7	9.3	0.366	0.010	0.010	0.005	0.005
6	70.00	-7.8	8.9	0.342	0.034	0.034	0.016	0.016
7	85.00	-5.9	8.0	0.321	0.045	0.045	0.018	0.018
8	90.00	-4.6	6.9	0.302	-0.013	-0.013	-0.005	-0.005
9	95.00	-3.7	4.6	0.333	0.050	0.050	0.019	0.019

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(d) 80 Percent of design speed; reading 1647

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	34.8	-2.6	34.8	-2.6	302.4	0.998	11.48	0.987
2	24.547	24.671	32.2	-2.2	32.2	-2.2	302.0	0.998	11.56	0.989
3	23.876	24.049	32.0	-2.8	32.0	-2.8	301.6	0.997	11.64	0.987
4	21.847	22.222	32.8	-2.9	32.8	-2.9	300.5	0.998	11.63	0.994
5	19.164	19.827	35.5	-2.8	35.5	-2.8	298.9	0.998	11.49	0.998
6	16.502	17.465	37.1	-1.2	37.1	-1.2	297.8	0.998	11.36	0.993
7	14.519	15.682	40.1	-2.5	40.1	-2.5	296.6	1.001	11.14	0.995
8	13.858	15.070	41.5	-4.4	41.5	-4.4	296.1	1.002	11.00	0.999
9	13.200	14.448	41.5	-6.9	41.5	-6.9	296.2	1.001	10.99	0.992

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	144.9	131.9	144.9	131.9	119.0	131.8	82.7	-6.0	0.	0.
2	151.7	137.6	151.7	137.6	128.4	137.5	80.9	-5.2	0.	0.
3	156.5	140.7	156.5	140.7	132.7	140.5	83.1	-6.8	0.	0.
4	160.8	146.1	160.8	146.1	135.2	145.9	87.0	-7.3	0.	0.
5	158.8	144.5	158.8	144.5	129.3	144.4	92.3	-7.1	0.	0.
6	158.5	139.9	158.5	139.9	126.4	139.9	95.6	-2.9	0.	0.
7	152.2	133.7	152.2	133.7	116.5	133.6	98.0	-5.9	0.	0.
8	146.0	128.8	146.0	128.8	109.4	128.4	96.7	-9.8	0.	0.
9	146.2	124.0	146.2	124.0	109.5	123.1	96.9	-14.9	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.423	0.384	0.423	0.384	0.347	0.384	1.107	0.423
2	0.444	0.402	0.444	0.402	0.376	0.402	1.071	0.444
3	0.459	0.412	0.459	0.412	0.389	0.411	1.059	0.459
4	0.473	0.429	0.473	0.429	0.398	0.428	1.079	0.473
5	0.468	0.425	0.468	0.425	0.381	0.424	1.117	0.468
6	0.468	0.412	0.468	0.412	0.373	0.412	1.107	0.468
7	0.450	0.393	0.450	0.393	0.344	0.393	1.147	0.450
8	0.431	0.378	0.431	0.378	0.323	0.377	1.173	0.431
9	0.432	0.364	0.432	0.364	0.323	0.361	1.124	0.432

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-5.7	13.0	0.507	0.114	0.114	0.078	0.078
2	10.00	-8.3	13.1	0.469	0.087	0.087	0.057	0.057
3	15.00	-8.6	12.2	0.471	0.094	0.094	0.061	0.061
4	30.00	-8.2	11.2	0.437	0.044	0.044	0.026	0.026
5	50.00	-5.9	10.2	0.414	0.016	0.016	0.009	0.009
6	70.00	-4.7	10.6	0.394	0.052	0.052	0.024	0.024
7	85.00	-2.1	8.4	0.390	0.041	0.041	0.017	0.017
8	90.00	-0.8	6.3	0.393	0.010	0.010	0.004	0.004
9	95.00	-0.9	3.5	0.428	0.064	0.064	0.024	0.024

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(e) 80 Percent of design speed; reading 1648

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	48.8	1.2	48.8	1.2	304.0	0.996	11.45	0.991
2	24.547	24.671	43.1	1.2	43.1	1.2	303.1	0.997	11.49	0.992
3	23.876	24.049	41.6	-0.2	41.6	-0.2	302.8	0.997	11.49	0.995
4	21.847	22.222	36.6	-1.3	36.6	-1.3	301.1	0.998	11.64	0.991
5	19.164	19.827	38.5	-1.1	38.5	-1.1	299.6	0.997	11.54	0.993
6	16.502	17.465	39.5	0.2	39.5	0.2	297.7	0.999	11.36	0.990
7	14.519	15.682	41.5	-2.7	41.5	-2.7	296.2	1.003	11.12	0.994
8	13.858	15.070	42.5	-5.6	42.5	-5.6	296.2	1.003	11.03	0.997
9	13.200	14.448	43.5	-9.2	43.5	-9.2	296.0	1.002	11.03	0.994

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	135.0	119.6	135.0	119.6	88.9	119.6	101.6	2.5	0.	0.
2	139.2	122.8	139.2	122.8	101.6	122.8	95.2	2.5	0.	0.
3	141.1	125.8	141.1	125.8	105.6	125.8	93.6	-0.4	0.	0.
4	153.0	133.8	153.0	133.8	122.8	133.8	91.1	-3.1	0.	0.
5	153.8	133.0	153.8	133.0	120.4	133.0	95.7	-2.6	0.	0.
6	151.0	125.7	151.0	125.7	116.6	125.7	96.0	0.4	0.	0.
7	144.4	119.1	144.4	119.1	108.1	119.0	95.6	-5.6	0.	0.
8	140.8	115.1	140.8	115.1	103.9	114.6	95.1	-11.3	0.	0.
9	140.9	111.9	140.9	111.9	102.1	110.4	97.0	-17.8	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.392	0.347	0.392	0.347	0.258	0.347	1.346	0.540
2	0.405	0.357	0.405	0.357	0.296	0.357	1.209	0.470
3	0.411	0.366	0.411	0.366	0.308	0.366	1.191	0.444
4	0.448	0.391	0.448	0.391	0.360	0.391	1.089	0.448
5	0.452	0.390	0.452	0.390	0.354	0.390	1.105	0.452
6	0.445	0.368	0.445	0.368	0.344	0.368	1.078	0.445
7	0.426	0.349	0.426	0.349	0.319	0.349	1.100	0.426
8	0.415	0.337	0.415	0.337	0.306	0.335	1.103	0.425
9	0.416	0.328	0.416	0.328	0.301	0.323	1.081	0.453

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	8.3	16.8	0.614	0.091	0.091	0.062	0.062
2	10.00	2.6	16.5	0.558	0.078	0.078	0.052	0.052
3	15.00	1.0	14.8	0.539	0.042	0.042	0.027	0.027
4	30.00	-4.4	12.7	0.488	0.071	0.071	0.042	0.042
5	50.00	-2.9	11.9	0.466	0.051	0.051	0.027	0.027
6	70.00	-2.3	11.9	0.450	0.080	0.080	0.037	0.037
7	85.00	-0.7	8.2	0.451	0.047	0.047	0.019	0.019
8	90.00	0.2	5.1	0.467	0.029	0.029	0.011	0.011
9	95.00	1.1	1.3	0.500	0.057	0.057	0.021	0.021

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(f) 90 Percent of design speed; reading 1660

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	24.1	-5.9	24.1	-5.9	304.4	0.995	11.81	0.958
2	24.547	24.671	23.3	-4.8	23.3	-4.8	304.1	0.996	12.02	0.969
3	23.876	24.049	23.8	-4.5	23.8	-4.5	304.1	0.996	12.04	0.977
4	21.847	22.222	25.9	-4.4	25.9	-4.4	303.2	0.998	12.00	0.991
5	19.164	19.827	28.3	-4.0	28.3	-4.0	301.5	1.001	11.81	1.001
6	16.502	17.465	30.1	-3.5	30.1	-3.5	300.3	1.002	11.67	0.995
7	14.519	15.682	32.6	-3.9	32.6	-3.9	299.4	1.001	11.47	0.987
8	13.858	15.070	34.2	-5.2	34.2	-5.2	298.5	1.001	11.08	0.998
9	13.200	14.448	34.9	-6.2	34.9	-6.2	298.1	1.002	10.96	0.994

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	198.2	183.0	198.2	183.0	180.9	182.0	80.8	-19.0	0.	0.
2	207.2	194.9	207.2	194.9	190.3	194.2	81.9	-16.2	0.	0.
3	209.4	199.1	209.4	199.1	191.6	198.5	84.5	-15.6	0.	0.
4	214.7	206.0	214.7	206.0	193.1	205.4	93.8	-15.7	0.	0.
5	214.9	209.7	214.9	209.7	189.2	209.2	102.1	-14.5	0.	0.
6	215.7	212.1	215.7	212.1	186.6	211.7	108.2	-13.0	0.	0.
7	211.5	213.0	211.5	213.0	178.2	212.5	113.9	-14.4	0.	0.
8	198.4	204.7	198.4	204.7	164.0	203.9	111.5	-18.4	0.	0.
9	193.3	198.3	193.3	198.3	158.6	197.1	110.5	-21.4	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.586	0.539	0.586	0.539	0.535	0.537	1.006	0.586
2	0.615	0.577	0.615	0.577	0.565	0.575	1.020	0.615
3	0.622	0.590	0.622	0.590	0.569	0.588	1.036	0.622
4	0.640	0.613	0.640	0.613	0.575	0.611	1.064	0.640
5	0.642	0.625	0.642	0.625	0.565	0.624	1.106	0.642
6	0.646	0.634	0.646	0.634	0.559	0.633	1.135	0.646
7	0.634	0.638	0.634	0.638	0.534	0.637	1.193	0.634
8	0.593	0.612	0.593	0.612	0.490	0.610	1.243	0.593
9	0.577	0.592	0.577	0.592	0.473	0.588	1.243	0.577

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-16.4	9.7	0.420	0.201	0.201	0.137	0.137
2	10.00	-17.3	10.6	0.373	0.140	0.140	0.092	0.092
3	15.00	-16.8	10.5	0.358	0.099	0.099	0.064	0.064
4	30.00	-15.1	9.7	0.342	0.036	0.036	0.021	0.021
5	50.00	-13.1	9.1	0.306	-0.003	-0.003	-0.002	-0.002
6	70.00	-11.7	8.2	0.268	0.022	0.022	0.010	0.010
7	85.00	-9.6	7.1	0.232	0.053	0.053	0.022	0.022
8	90.00	-8.1	5.5	0.216	0.008	0.008	0.003	0.003
9	95.00	-7.5	4.2	0.221	0.032	0.032	0.012	0.012

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(g) 90 Percent of design speed; reading 1659

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	26.2	-5.0	26.2	-5.0	304.5	0.996	11.77	0.969
2	24.547	24.671	25.0	-4.7	25.0	-4.7	304.3	0.996	11.98	0.972
3	23.876	24.049	25.3	-4.7	25.3	-4.7	304.1	0.996	12.00	0.981
4	21.847	22.222	26.7	-4.3	26.7	-4.3	303.1	0.998	11.95	0.993
5	19.164	19.827	30.1	-3.9	30.1	-3.9	301.8	0.999	11.82	0.998
6	16.502	17.465	32.1	-3.2	32.1	-3.2	300.6	1.000	11.71	0.993
7	14.519	15.682	34.4	-3.5	34.4	-3.5	299.6	1.000	11.51	0.989
8	13.858	15.070	35.9	-4.7	35.9	-4.7	298.7	1.000	11.16	1.000
9	13.200	14.448	36.6	-5.8	36.6	-5.8	298.5	1.000	11.11	0.991

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	185.6	169.8	185.6	169.8	166.5	169.1	81.9	-14.9	0.	0.
2	194.8	179.6	194.8	179.6	176.5	179.0	82.4	-14.7	0.	0.
3	197.2	183.8	197.2	183.8	178.3	183.2	84.3	-15.1	0.	0.
4	200.7	190.1	200.7	190.1	179.3	189.5	90.2	-14.4	0.	0.
5	201.8	192.2	201.8	192.2	174.5	191.7	101.3	-12.9	0.	0.
6	203.9	194.7	203.9	194.7	172.8	194.4	108.2	-10.8	0.	0.
7	201.1	194.6	201.1	194.6	165.9	194.3	113.7	-11.8	0.	0.
8	188.9	187.0	188.9	187.0	153.0	186.3	110.7	-15.2	0.	0.
9	186.3	181.3	186.3	181.3	149.6	180.4	111.0	-18.4	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.546	0.498	0.546	0.498	0.490	0.496	1.016	0.546
2	0.575	0.529	0.575	0.529	0.521	0.527	1.014	0.575
3	0.583	0.542	0.583	0.542	0.527	0.540	1.027	0.583
4	0.595	0.562	0.595	0.562	0.532	0.561	1.057	0.595
5	0.600	0.570	0.600	0.570	0.519	0.569	1.099	0.600
6	0.608	0.579	0.608	0.579	0.515	0.578	1.125	0.608
7	0.600	0.580	0.600	0.580	0.495	0.579	1.171	0.600
8	0.562	0.556	0.562	0.556	0.455	0.554	1.218	0.562
9	0.554	0.538	0.554	0.538	0.445	0.536	1.206	0.554

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-14.3	10.6	0.441	0.168	0.168	0.114	0.114
2	10.00	-15.5	10.6	0.408	0.139	0.139	0.092	0.092
3	15.00	-15.3	10.3	0.393	0.095	0.095	0.061	0.061
4	30.00	-14.3	9.7	0.361	0.032	0.032	0.019	0.019
5	50.00	-11.3	9.2	0.341	0.010	0.010	0.005	0.005
6	70.00	-9.8	8.6	0.306	0.032	0.032	0.015	0.015
7	85.00	-7.8	7.5	0.278	0.051	0.051	0.021	0.021
8	90.00	-6.4	6.0	0.262	0.002	0.002	0.001	0.001
9	95.00	-5.8	4.6	0.277	0.045	0.045	0.017	0.017

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(h) 90 Percent of design speed; reading 1650

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	29.4	-4.3	29.4	-4.3	304.9	0.997	11.78	0.979
2	24.547	24.671	27.5	-4.0	27.5	-4.0	304.8	0.996	11.99	0.977
3	23.876	24.049	27.8	-4.2	27.8	-4.2	304.6	0.997	12.04	0.981
4	21.847	22.222	30.1	-3.7	30.1	-3.7	303.4	0.997	12.05	0.991
5	19.164	19.827	33.1	-3.4	33.1	-3.4	301.7	0.999	11.87	0.997
6	16.502	17.465	34.8	-2.3	34.8	-2.3	300.8	0.998	11.73	0.992
7	14.519	15.682	37.1	-2.9	37.1	-2.9	299.4	1.000	11.50	0.992
8	13.858	15.070	38.6	-3.7	38.6	-3.7	298.6	1.001	11.22	1.002
9	13.200	14.448	39.5	-6.1	39.5	-6.1	298.6	1.000	11.22	0.990

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	174.3	158.7	174.3	158.7	151.8	158.2	85.5	-12.0	0.	0.
2	184.0	166.0	184.0	166.0	163.2	165.6	85.1	-11.5	0.	0.
3	187.1	169.7	187.1	169.7	165.6	169.2	87.1	-12.6	0.	0.
4	191.7	176.8	191.7	176.8	165.9	176.5	96.1	-11.4	0.	0.
5	190.3	176.8	190.3	176.8	159.5	176.5	103.8	-10.5	0.	0.
6	191.7	175.7	191.7	175.7	157.4	175.6	109.5	-6.9	0.	0.
7	187.8	173.1	187.8	173.1	149.9	172.9	113.2	-8.9	0.	0.
8	177.6	166.4	177.6	166.4	138.8	166.0	110.8	-10.8	0.	0.
9	177.0	160.4	177.0	160.4	136.6	159.4	112.5	-17.1	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
RP	IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
1	0.511	0.464	0.511	0.464	0.445	0.462	1.042 0.511
2	0.541	0.486	0.541	0.486	0.480	0.485	1.015 0.541
3	0.551	0.498	0.551	0.498	0.487	0.496	1.022 0.551
4	0.566	0.521	0.566	0.521	0.490	0.520	1.064 0.566
5	0.564	0.522	0.564	0.522	0.472	0.521	1.106 0.564
6	0.569	0.519	0.569	0.519	0.467	0.519	1.116 0.569
7	0.558	0.512	0.558	0.512	0.445	0.511	1.154 0.558
8	0.527	0.492	0.527	0.492	0.412	0.491	1.196 0.527
9	0.525	0.473	0.525	0.473	0.405	0.470	1.167 0.525

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-11.1	11.3	0.471	0.129	0.129	0.087	0.087
2	10.00	-13.0	11.3	0.446	0.127	0.127	0.084	0.084
3	15.00	-12.8	10.7	0.437	0.101	0.101	0.065	0.065
4	30.00	-10.9	10.3	0.409	0.048	0.048	0.028	0.028
5	50.00	-8.4	9.6	0.383	0.016	0.016	0.009	0.009
6	70.00	-7.0	9.5	0.355	0.042	0.042	0.019	0.019
7	85.00	-5.1	8.0	0.334	0.042	0.042	0.017	0.017
8	90.00	-3.7	7.0	0.321	-0.009	-0.009	-0.003	-0.003
9	95.00	-2.9	4.3	0.358	0.058	0.058	0.022	0.022

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(i) 90 Percent of design speed; reading 1651

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	35.4	-2.7	35.4	-2.7	305.8	0.998	11.85	0.984
2	24.547	24.671	32.7	-2.6	32.7	-2.6	305.5	0.997	11.96	0.986
3	23.876	24.049	32.0	-2.9	32.0	-2.9	305.4	0.997	12.04	0.987
4	21.847	22.222	32.9	-3.0	32.9	-3.0	303.9	0.998	12.09	0.992
5	19.164	19.827	35.3	-2.5	35.3	-2.5	302.1	0.998	11.92	0.995
6	16.502	17.465	37.3	-1.2	37.3	-1.2	300.6	0.998	11.73	0.990
7	14.519	15.682	39.5	-2.6	39.5	-2.6	299.0	1.001	11.43	0.993
8	13.858	15.070	40.6	-4.3	40.6	-4.3	298.4	1.002	11.27	0.997
9	13.200	14.448	41.6	-7.4	41.6	-7.4	298.7	1.002	11.26	0.991

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	163.9	147.1	163.9	147.1	133.6	147.0	94.9	-6.9	0.	0.
2	170.6	153.9	170.6	153.9	143.5	153.7	92.2	-6.9	0.	0.
3	175.9	157.8	175.9	157.8	149.2	157.6	93.2	-7.9	0.	0.
4	181.8	164.7	181.8	164.7	152.7	164.4	98.7	-8.6	0.	0.
5	181.0	163.1	181.0	163.1	147.8	163.0	104.6	-7.2	0.	0.
6	179.2	156.7	179.2	156.7	142.5	156.7	108.7	-3.4	0.	0.
7	172.1	149.8	172.1	149.8	132.8	149.6	109.5	-6.7	0.	0.
8	165.9	144.5	165.9	144.5	125.9	144.1	108.0	-10.9	0.	0.
9	165.8	140.1	165.8	140.1	124.1	138.9	110.0	-17.9	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.478	0.428	0.478	0.428	0.390	0.427	1.100	0.478
2	0.499	0.449	0.499	0.449	0.420	0.448	1.071	0.499
3	0.515	0.461	0.515	0.461	0.437	0.460	1.057	0.515
4	0.535	0.483	0.535	0.483	0.449	0.482	1.077	0.535
5	0.534	0.479	0.534	0.479	0.436	0.479	1.103	0.534
6	0.530	0.461	0.530	0.461	0.421	0.461	1.100	0.530
7	0.509	0.440	0.509	0.440	0.393	0.440	1.127	0.509
8	0.490	0.424	0.490	0.424	0.372	0.423	1.145	0.490
9	0.490	0.411	0.490	0.411	0.367	0.407	1.120	0.490

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-5.1	13.0	0.526	0.111	0.111	0.075	0.075
2	10.00	-7.8	12.7	0.483	0.092	0.092	0.061	0.061
3	15.00	-8.6	12.1	0.474	0.077	0.077	0.050	0.050
4	30.00	-8.1	11.1	0.443	0.048	0.048	0.029	0.029
5	50.00	-6.1	10.5	0.419	0.031	0.031	0.016	0.016
6	70.00	-4.5	10.5	0.404	0.058	0.058	0.027	0.027
7	85.00	-2.7	8.4	0.395	0.045	0.045	0.018	0.018
8	90.00	-1.7	6.3	0.399	0.017	0.017	0.007	0.007
9	95.00	-0.8	3.1	0.434	0.061	0.061	0.023	0.023

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(j) 90 Percent of design speed; reading 1652

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	48.9	1.5	48.9	1.5	308.2	0.997	11.84	0.989
2	24.547	24.671	43.2	1.2	43.2	1.2	307.5	0.996	11.87	0.991
3	23.876	24.049	40.8	0.2	40.8	0.2	307.0	0.995	11.92	0.990
4	21.847	22.222	36.6	-0.9	36.6	-0.9	304.8	0.997	12.10	0.987
5	19.164	19.827	38.2	-1.0	38.2	-1.0	302.6	0.998	11.93	0.994
6	16.502	17.465	39.3	0.2	39.3	0.2	300.6	0.998	11.72	0.987
7	14.519	15.682	40.6	-2.4	40.6	-2.4	299.0	1.002	11.42	0.992
8	13.858	15.070	41.7	-5.5	41.7	-5.5	298.7	1.002	11.31	0.994
9	13.200	14.448	42.6	-8.8	42.6	-8.8	298.6	1.002	11.32	0.990

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	153.1	136.3	153.1	136.3	100.6	136.2	115.5	3.6	0.	0.
2	157.4	140.0	157.4	140.0	114.7	140.0	107.8	3.0	0.	0.
3	162.1	142.7	162.1	142.7	122.7	142.7	106.0	0.4	0.	0.
4	173.7	151.6	173.7	151.6	139.4	151.6	103.6	-2.4	0.	0.
5	173.1	151.5	173.1	151.5	136.1	151.5	107.0	-2.7	0.	0.
6	170.9	142.8	170.9	142.8	132.2	142.8	108.3	0.5	0.	0.
7	164.7	135.7	164.7	135.7	125.1	135.6	107.1	-5.6	0.	0.
8	160.8	130.9	160.8	130.9	120.1	130.4	106.9	-12.5	0.	0.
9	161.4	127.7	161.4	127.7	118.8	126.2	109.2	-19.6	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.444	0.394	0.444	0.394	0.291	0.394	1.354	0.613
2	0.457	0.406	0.457	0.406	0.333	0.405	1.220	0.531
3	0.472	0.414	0.472	0.414	0.357	0.414	1.164	0.486
4	0.509	0.442	0.509	0.442	0.408	0.442	1.087	0.509
5	0.509	0.443	0.509	0.443	0.400	0.443	1.113	0.509
6	0.504	0.418	0.504	0.418	0.390	0.418	1.080	0.504
7	0.486	0.397	0.486	0.397	0.369	0.397	1.084	0.486
8	0.474	0.383	0.474	0.383	0.355	0.381	1.085	0.474
9	0.476	0.374	0.476	0.374	0.351	0.369	1.063	0.489

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	8.5	17.2	0.608	0.087	0.087	0.059	0.059
2	10.00	2.7	16.6	0.551	0.070	0.070	0.046	0.046
3	15.00	0.2	15.1	0.539	0.072	0.072	0.046	0.046
4	30.00	-4.4	13.1	0.487	0.080	0.080	0.047	0.047
5	50.00	-3.2	12.0	0.453	0.035	0.035	0.018	0.018
6	70.00	-2.5	11.9	0.445	0.082	0.082	0.037	0.037
7	85.00	-1.6	8.6	0.445	0.056	0.056	0.023	0.023
8	90.00	-0.7	5.2	0.465	0.042	0.042	0.016	0.016
9	95.00	0.2	1.6	0.497	0.071	0.071	0.026	0.026

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(k) 100 Percent of design speed; reading 1658

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	27.3	-5.3	27.3	-5.3	309.7	0.994	12.15	0.966
2	24.547	24.671	26.3	-3.5	26.3	-3.5	308.4	0.997	12.45	0.964
3	23.876	24.049	26.3	-4.1	26.3	-4.1	308.3	0.997	12.51	0.974
4	21.847	22.222	28.2	-3.7	28.2	-3.7	307.5	0.998	12.48	0.989
5	19.164	19.827	30.2	-3.1	30.2	-3.1	305.6	1.001	12.30	0.998
6	16.502	17.465	31.8	-2.4	31.8	-2.4	303.8	1.002	12.07	0.993
7	14.519	15.682	34.5	-3.8	34.5	-3.8	301.9	1.001	11.62	0.992
8	13.858	15.070	35.7	-5.0	35.7	-5.0	300.9	1.002	11.30	1.000
9	13.200	14.448	36.0	-6.5	36.0	-6.5	300.1	1.003	11.16	0.998

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	207.7	193.0	207.7	193.0	184.5	192.2	95.4	-17.7	0.	0.
2	219.1	202.6	219.1	202.6	196.4	202.2	97.2	-12.3	0.	0.
3	223.5	208.5	223.5	208.5	200.4	208.0	98.9	-14.9	0.	0.
4	229.8	216.9	229.8	216.9	202.5	216.4	108.7	-14.1	0.	0.
5	231.8	221.0	231.8	221.0	200.3	220.6	116.7	-11.9	0.	0.
6	231.8	222.4	231.8	222.4	197.0	222.2	122.1	-9.2	0.	0.
7	220.7	218.8	220.7	218.8	181.8	218.3	125.0	-14.5	0.	0.
8	210.4	212.1	210.4	212.1	170.8	211.3	122.8	-18.5	0.	0.
9	204.9	205.3	204.9	205.3	165.8	204.0	120.4	-23.1	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.610	0.566	0.610	0.566	0.542	0.564	1.042	0.610
2	0.648	0.596	0.648	0.596	0.581	0.595	1.029	0.648
3	0.662	0.615	0.662	0.615	0.594	0.614	1.038	0.662
4	0.684	0.643	0.684	0.643	0.602	0.641	1.069	0.684
5	0.692	0.657	0.692	0.657	0.598	0.656	1.102	0.692
6	0.695	0.664	0.695	0.664	0.590	0.663	1.128	0.695
7	0.661	0.654	0.661	0.654	0.544	0.653	1.201	0.661
8	0.629	0.633	0.629	0.633	0.510	0.631	1.237	0.629
9	0.612	0.612	0.612	0.612	0.495	0.608	1.230	0.612

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-13.1	10.4	0.442	0.154	0.154	0.105	0.105
2	10.00	-14.2	11.8	0.407	0.148	0.148	0.098	0.098
3	15.00	-14.3	10.9	0.395	0.103	0.103	0.067	0.067
4	30.00	-12.8	10.3	0.372	0.039	0.039	0.023	0.023
5	50.00	-11.2	9.9	0.334	0.007	0.007	0.004	0.004
6	70.00	-10.0	9.4	0.294	0.027	0.027	0.012	0.012
7	85.00	-7.7	7.2	0.258	0.030	0.030	0.012	0.012
8	90.00	-6.6	5.7	0.246	-0.002	-0.002	-0.001	-0.001
9	95.00	-6.4	4.0	0.251	0.007	0.007	0.003	0.003

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(l) 100 Percent of design speed; reading 1653

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	30.3	-4.4	30.3	-4.4	309.3	0.996	12.20	0.976
2	24.547	24.671	28.8	-4.1	28.8	-4.1	308.6	0.997	12.43	0.974
3	23.876	24.049	28.5	-4.0	28.5	-4.0	308.3	0.996	12.50	0.980
4	21.847	22.222	30.3	-3.6	30.3	-3.6	306.9	0.997	12.49	0.991
5	19.164	19.827	33.3	-2.8	33.3	-2.8	305.2	0.999	12.32	0.996
6	16.502	17.465	35.3	-1.9	35.3	-1.9	303.7	0.999	12.14	0.990
7	14.519	15.682	37.8	-2.5	37.8	-2.5	301.9	1.001	11.75	0.996
8	13.858	15.070	39.2	-4.1	39.2	-4.1	301.0	1.002	11.48	1.000
9	13.200	14.448	39.8	-7.0	39.8	-7.0	301.0	1.001	11.47	0.988

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	192.9	176.0	192.9	176.0	166.5	175.5	97.3	-13.6	0.	0.
2	202.7	184.2	202.7	184.2	177.7	183.7	97.7	-13.2	0.	0.
3	206.9	188.7	206.9	188.7	181.7	188.3	98.8	-13.1	0.	0.
4	211.7	195.1	211.7	195.1	182.7	194.8	106.9	-12.2	0.	0.
5	212.1	195.5	212.1	195.5	177.4	195.3	116.3	-9.5	0.	0.
6	213.0	193.4	213.0	193.4	173.8	193.3	123.0	-6.4	0.	0.
7	205.0	189.6	205.0	189.6	162.0	189.4	125.7	-8.4	0.	0.
8	196.1	181.7	196.1	181.7	152.0	181.2	123.9	-13.0	0.	0.
9	194.9	174.8	194.9	174.8	149.7	173.5	124.8	-21.4	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.564	0.513	0.564	0.513	0.487	0.512	1.054	0.564
2	0.596	0.539	0.596	0.539	0.522	0.537	1.034	0.596
3	0.609	0.553	0.609	0.553	0.535	0.552	1.036	0.609
4	0.626	0.574	0.626	0.574	0.540	0.573	1.066	0.626
5	0.629	0.577	0.629	0.577	0.526	0.576	1.101	0.629
6	0.634	0.572	0.634	0.572	0.517	0.572	1.112	0.634
7	0.610	0.561	0.610	0.561	0.482	0.560	1.169	0.610
8	0.583	0.537	0.583	0.537	0.452	0.535	1.192	0.583
9	0.579	0.516	0.579	0.516	0.445	0.512	1.159	0.579

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-10.2	11.2	0.479	0.124	0.124	0.084	0.084
2	10.00	-11.7	11.2	0.454	0.120	0.120	0.079	0.079
3	15.00	-12.1	11.0	0.437	0.090	0.090	0.058	0.058
4	30.00	-10.7	10.4	0.411	0.038	0.038	0.022	0.022
5	50.00	-8.2	10.2	0.386	0.017	0.017	0.009	0.009
6	70.00	-6.5	9.8	0.363	0.044	0.044	0.020	0.020
7	85.00	-4.4	8.4	0.333	0.017	0.017	0.007	0.007
8	90.00	-3.1	6.6	0.337	-0.001	-0.001	-0.000	-0.000
9	95.00	-2.6	3.4	0.374	0.060	0.060	0.022	0.022

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(m) 100 Percent of design speed; reading 1654

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	25.230	25.298	33.2	-3.8	33.2	-3.8	309.4	0.997	12.19	0.981
2	24.547	24.671	30.7	-3.3	30.7	-3.3	309.0	0.997	12.43	0.979
3	23.876	24.049	30.3	-3.4	30.3	-3.4	309.0	0.996	12.51	0.981
4	21.847	22.222	31.9	-3.3	31.9	-3.3	307.5	0.998	12.55	0.991
5	19.164	19.827	34.8	-2.7	34.8	-2.7	305.4	0.999	12.33	0.998
6	16.502	17.465	36.7	-1.1	36.7	-1.1	303.7	0.998	12.16	0.987
7	14.519	15.682	39.4	-2.4	39.4	-2.4	301.8	1.002	11.74	0.995
8	13.858	15.070	40.5	-4.2	40.5	-4.2	301.2	1.002	11.53	0.998
9	13.200	14.448	41.3	-7.4	41.3	-7.4	301.4	1.001	11.53	0.990

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	184.3	166.4	184.3	166.4	154.1	166.0	101.0	-10.9	0.	0.
2	194.7	174.9	194.7	174.9	167.5	174.6	99.3	-10.2	0.	0.
3	200.1	179.3	200.1	179.3	172.8	179.0	100.9	-10.7	0.	0.
4	205.9	187.3	205.9	187.3	174.7	187.0	108.9	-10.7	0.	0.
5	204.5	186.8	204.5	186.8	168.0	186.6	116.7	-8.7	0.	0.
6	204.7	180.7	204.7	180.7	164.1	180.7	122.4	-3.6	0.	0.
7	195.6	173.5	195.6	173.5	151.2	173.4	124.0	-7.2	0.	0.
8	188.5	166.5	188.5	166.5	143.3	166.1	122.5	-12.2	0.	0.
9	188.5	161.6	188.5	161.6	141.6	160.3	124.4	-20.9	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.537	0.484	0.537	0.484	0.450	0.483	1.077	0.537
2	0.570	0.510	0.570	0.510	0.490	0.509	1.043	0.570
3	0.587	0.524	0.587	0.524	0.507	0.523	1.036	0.587
4	0.607	0.549	0.607	0.549	0.515	0.548	1.070	0.607
5	0.605	0.549	0.605	0.549	0.497	0.549	1.111	0.605
6	0.607	0.532	0.607	0.532	0.487	0.532	1.101	0.607
7	0.580	0.511	0.580	0.511	0.449	0.510	1.147	0.580
8	0.558	0.489	0.558	0.489	0.424	0.488	1.159	0.558
9	0.558	0.475	0.558	0.475	0.419	0.471	1.132	0.558

RP	PERCENT SPAN	INCIDENCE MEAN	DEV	D-FACT	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-7.2	11.9	0.511	0.108	0.108	0.073	0.073
2	10.00	-9.9	12.0	0.474	0.108	0.108	0.071	0.071
3	15.00	-10.3	11.5	0.464	0.092	0.092	0.060	0.060
4	30.00	-9.1	10.8	0.433	0.041	0.041	0.024	0.024
5	50.00	-6.7	10.4	0.404	0.010	0.010	0.005	0.005
6	70.00	-5.1	10.6	0.392	0.060	0.060	0.027	0.027
7	85.00	-2.8	8.6	0.376	0.025	0.025	0.010	0.010
8	90.00	-1.8	6.5	0.386	0.009	0.009	0.004	0.004
9	95.00	-1.1	3.0	0.421	0.055	0.055	0.020	0.020

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(n) 100 Percent of design speed; reading 1655

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	37.3	-2.3	37.3	-2.3	310.5	0.998	12.20	0.986
2	24.547	24.671	34.0	-2.2	34.0	-2.2	309.6	0.998	12.40	0.982
3	23.876	24.049	33.0	-2.6	33.0	-2.6	309.4	0.997	12.51	0.983
4	21.847	22.222	33.9	-2.5	33.9	-2.5	308.0	0.998	12.58	0.989
5	19.164	19.827	36.6	-2.4	36.6	-2.4	305.8	0.999	12.34	0.997
6	16.502	17.465	38.1	-0.5	38.1	-0.5	303.8	0.999	12.16	0.986
7	14.519	15.682	40.3	-2.2	40.3	-2.2	301.6	1.003	11.71	0.994
8	13.858	15.070	41.3	-4.6	41.3	-4.6	301.3	1.003	11.55	0.997
9	13.200	14.448	42.2	-7.9	42.2	-7.9	301.3	1.001	11.58	0.986

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	176.1	158.6	176.1	158.6	140.2	158.5	106.6	-6.3	0.	0.
2	185.4	165.4	185.4	165.4	153.6	165.3	103.8	-6.4	0.	0.
3	191.3	170.3	191.3	170.3	160.5	170.1	104.2	-7.7	0.	0.
4	199.3	178.3	199.3	178.3	165.4	178.1	111.1	-7.7	0.	0.
5	197.3	176.9	197.3	176.9	158.5	176.8	117.6	-7.4	0.	0.
6	197.7	170.3	197.7	170.3	155.6	170.3	122.1	-1.6	0.	0.
7	187.1	160.8	187.1	160.8	142.8	160.6	120.9	-6.2	0.	0.
8	181.8	155.4	181.8	155.4	136.6	154.9	120.0	-12.6	0.	0.
9	182.9	150.1	182.9	150.1	135.6	148.7	122.8	-20.6	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.512	0.459	0.512	0.459	0.407	0.459	1.131	0.512
2	0.541	0.480	0.541	0.480	0.448	0.480	1.076	0.541
3	0.559	0.495	0.559	0.495	0.469	0.495	1.060	0.559
4	0.586	0.521	0.586	0.521	0.486	0.520	1.077	0.586
5	0.582	0.518	0.582	0.518	0.467	0.518	1.116	0.582
6	0.585	0.500	0.585	0.500	0.460	0.500	1.095	0.585
7	0.554	0.471	0.554	0.471	0.423	0.471	1.125	0.554
8	0.537	0.455	0.537	0.455	0.404	0.454	1.134	0.537
9	0.541	0.439	0.541	0.439	0.401	0.435	1.097	0.541

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-3.2	13.4	0.536	0.083	0.083	0.057	0.057
2	10.00	-6.5	13.1	0.501	0.099	0.099	0.066	0.066
3	15.00	-7.6	12.4	0.487	0.089	0.089	0.058	0.058
4	30.00	-7.1	11.6	0.457	0.052	0.052	0.031	0.031
5	50.00	-4.9	10.6	0.432	0.015	0.015	0.008	0.008
6	70.00	-3.7	11.2	0.418	0.067	0.067	0.031	0.031
7	85.00	-2.0	8.7	0.408	0.034	0.034	0.014	0.014
8	90.00	-1.0	6.0	0.420	0.019	0.019	0.008	0.008
9	95.00	-0.2	2.6	0.462	0.077	0.077	0.028	0.028

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(o) 100 Percent of design speed; reading 1656

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	50.2	0.9	50.2	0.9	313.6	0.994	12.18	0.990
2	24.547	24.671	43.6	1.1	43.6	1.1	311.9	0.996	12.26	0.988
3	23.876	24.049	40.8	0.1	40.8	0.1	311.4	0.995	12.31	0.988
4	21.847	22.222	36.3	-0.8	36.3	-0.8	308.8	0.997	12.58	0.983
5	19.164	19.827	38.4	-0.8	38.4	-0.8	306.4	0.997	12.39	0.991
6	16.502	17.465	39.3	0.2	39.3	0.2	303.9	0.998	12.12	0.984
7	14.519	15.682	40.8	-2.3	40.8	-2.3	301.6	1.003	11.73	0.991
8	13.858	15.070	41.9	-5.5	41.9	-5.5	301.2	1.003	11.60	0.993
9	13.200	14.448	42.5	-9.0	42.5	-9.0	301.0	1.003	11.58	0.990

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	169.5	151.1	169.5	151.1	108.5	151.1	130.2	2.4	0.	0.
2	175.8	155.1	175.8	155.1	127.3	155.1	121.2	3.1	0.	0.
3	180.4	158.5	180.4	158.5	136.5	158.5	117.9	0.3	0.	0.
4	194.0	168.8	194.0	168.8	156.4	168.7	114.7	-2.2	0.	0.
5	193.5	169.0	193.5	169.0	151.7	169.0	120.2	-2.5	0.	0.
6	191.8	160.1	191.8	160.1	148.5	160.1	121.4	0.5	0.	0.
7	183.5	151.8	183.5	151.8	138.9	151.7	119.9	-6.1	0.	0.
8	179.5	146.5	179.5	146.5	133.6	145.8	119.9	-14.1	0.	0.
9	178.8	142.4	178.8	142.4	131.8	140.7	120.8	-22.2	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.489	0.435	0.489	0.435	0.313	0.435	1.392	0.696
2	0.509	0.448	0.509	0.448	0.369	0.448	1.218	0.600
3	0.524	0.459	0.524	0.459	0.396	0.459	1.161	0.538
4	0.568	0.491	0.568	0.491	0.458	0.491	1.079	0.568
5	0.569	0.494	0.569	0.494	0.446	0.494	1.114	0.569
6	0.566	0.469	0.566	0.469	0.438	0.469	1.079	0.566
7	0.542	0.444	0.542	0.444	0.411	0.444	1.092	0.542
8	0.530	0.428	0.530	0.428	0.395	0.426	1.092	0.530
9	0.528	0.416	0.528	0.416	0.389	0.411	1.068	0.538

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	9.7	16.6	0.622	0.069	0.069	0.047	0.047
2	10.00	3.0	16.5	0.562	0.075	0.075	0.050	0.050
3	15.00	0.2	15.1	0.541	0.070	0.070	0.045	0.045
4	30.00	-4.7	13.3	0.486	0.085	0.085	0.051	0.051
5	50.00	-3.1	12.2	0.454	0.045	0.045	0.024	0.024
6	70.00	-2.6	11.9	0.445	0.083	0.083	0.038	0.038
7	85.00	-1.4	8.6	0.442	0.050	0.050	0.020	0.020
8	90.00	-0.4	5.2	0.465	0.043	0.043	0.017	0.017
9	95.00	0.1	1.5	0.492	0.058	0.058	0.021	0.021

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(p) 110 Percent of design speed; reading 1751

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	24.0	-3.3	24.0	-3.3	309.8	0.995	11.94	0.939
2	24.547	24.671	22.9	-3.0	22.9	-3.0	309.8	0.996	12.42	0.930
3	23.876	24.049	23.5	-2.6	23.5	-2.6	309.9	0.995	12.45	0.943
4	21.847	22.222	25.6	-2.8	25.6	-2.8	309.5	0.997	12.38	0.963
5	19.164	19.827	28.5	-2.8	28.5	-2.8	307.8	0.998	12.23	0.974
6	16.502	17.465	30.1	-2.2	30.1	-2.2	306.7	0.999	12.25	0.970
7	14.519	15.682	32.3	-3.0	32.3	-3.0	304.0	1.001	11.71	0.974
8	13.858	15.070	33.8	-4.6	33.8	-4.6	302.6	1.001	11.29	0.983
9	13.200	14.448	34.0	-7.0	34.0	-7.0	301.3	1.002	10.97	0.980

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	229.2	217.2	229.2	217.2	209.4	216.8	93.4	-12.5	0.	0.
2	244.1	227.7	244.1	227.7	224.9	227.4	94.8	-11.8	0.	0.
3	247.6	234.0	247.6	234.0	227.2	233.7	98.6	-10.7	0.	0.
4	253.0	246.2	253.0	246.2	228.2	245.9	109.2	-12.2	0.	0.
5	253.6	253.4	253.6	253.4	222.9	253.1	121.0	-12.4	0.	0.
6	261.1	262.8	261.1	262.8	225.9	262.6	130.8	-10.2	0.	0.
7	249.5	266.8	249.5	266.8	210.9	266.4	133.2	-14.1	0.	0.
8	239.0	258.6	239.0	258.6	198.7	257.8	132.9	-20.6	0.	0.
9	230.7	245.7	230.7	245.7	191.2	243.9	129.2	-30.1	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO			MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT		VEL R	MACH NO
1	0.679	0.642	0.679	0.642	0.620	0.641		1.036	0.679
2	0.728	0.676	0.728	0.676	0.670	0.675		1.011	0.728
3	0.739	0.696	0.739	0.696	0.678	0.695		1.029	0.739
4	0.758	0.736	0.758	0.736	0.683	0.735		1.078	0.758
5	0.762	0.762	0.762	0.762	0.670	0.761		1.135	0.762
6	0.789	0.795	0.789	0.795	0.682	0.795		1.162	0.789
7	0.753	0.812	0.753	0.812	0.637	0.811		1.263	0.753
8	0.720	0.786	0.720	0.786	0.599	0.783		1.298	0.720
9	0.694	0.744	0.694	0.744	0.575	0.738		1.276	0.694

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-16.4	12.3	0.368	0.228	0.228	0.155	0.155
2	10.00	-17.7	12.3	0.356	0.237	0.237	0.157	0.157
3	15.00	-17.1	12.4	0.340	0.187	0.187	0.121	0.121
4	30.00	-15.4	11.2	0.310	0.117	0.117	0.069	0.069
5	50.00	-12.9	10.2	0.274	0.081	0.081	0.043	0.043
6	70.00	-11.8	9.5	0.235	0.089	0.089	0.041	0.041
7	85.00	-9.9	7.9	0.164	0.082	0.082	0.033	0.033
8	90.00	-8.5	6.1	0.161	0.058	0.058	0.023	0.023
9	95.00	-8.4	3.4	0.185	0.071	0.071	0.026	0.026

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(q) 110 Percent of design speed; reading 1750

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	35.7	-2.9	35.7	-2.9	314.6	0.996	12.54	0.984
2	24.547	24.671	31.1	-2.0	31.1	-2.0	313.9	0.996	12.92	0.974
3	23.876	24.049	30.4	-1.9	30.4	-1.9	313.6	0.996	13.09	0.974
4	21.847	22.222	31.5	-1.7	31.5	-1.7	312.5	0.995	13.15	0.986
5	19.164	19.827	34.0	-1.7	34.0	-1.7	309.1	0.996	12.83	0.995
6	16.502	17.465	35.3	-0.1	35.3	-0.1	306.7	0.997	12.57	0.984
7	14.519	15.682	37.8	-2.4	37.8	-2.4	304.5	0.999	12.01	0.991
8	13.858	15.070	38.9	-4.0	38.9	-4.0	303.4	1.000	11.69	1.003
9	13.200	14.448	39.2	-7.5	39.2	-7.5	303.1	0.998	11.68	0.986

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	200.7	182.2	200.7	182.2	162.9	182.0	117.2	-9.2	0.	0.
2	214.7	190.9	214.7	190.9	183.8	190.8	111.0	-6.6	0.	0.
3	221.7	196.7	221.7	196.7	191.2	196.6	112.2	-6.5	0.	0.
4	231.5	207.7	231.5	207.7	197.4	207.6	121.1	-6.2	0.	0.
5	229.1	206.8	229.1	206.8	190.0	206.7	128.0	-6.1	0.	0.
6	229.5	202.2	229.5	202.2	187.4	202.2	132.5	-0.3	0.	0.
7	219.1	195.5	219.1	195.5	173.0	195.3	134.4	-8.3	0.	0.
8	209.7	189.8	209.7	189.8	163.2	189.4	131.7	-13.2	0.	0.
9	208.3	180.0	208.3	180.0	161.4	178.5	131.8	-23.4	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.583	0.528	0.583	0.528	0.473	0.527	1.117	0.583
2	0.628	0.555	0.628	0.555	0.538	0.555	1.038	0.628
3	0.651	0.573	0.651	0.573	0.561	0.573	1.028	0.651
4	0.683	0.609	0.683	0.609	0.582	0.609	1.052	0.683
5	0.679	0.609	0.679	0.609	0.563	0.609	1.088	0.679
6	0.684	0.597	0.684	0.597	0.558	0.597	1.079	0.684
7	0.653	0.578	0.653	0.578	0.515	0.577	1.129	0.653
8	0.623	0.560	0.623	0.560	0.485	0.559	1.161	0.623
9	0.619	0.531	0.619	0.531	0.480	0.526	1.106	0.619

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-4.7	12.8	0.521	0.080	0.080	0.054	0.054
2	10.00	-9.4	13.3	0.474	0.112	0.112	0.074	0.074
3	15.00	-10.2	13.1	0.458	0.105	0.105	0.068	0.068
4	30.00	-9.5	12.3	0.427	0.051	0.051	0.030	0.030
5	50.00	-7.5	11.3	0.400	0.019	0.019	0.010	0.010
6	70.00	-6.6	11.7	0.376	0.061	0.061	0.028	0.028
7	85.00	-4.4	8.5	0.364	0.038	0.038	0.015	0.015
8	90.00	-3.4	6.7	0.355	-0.011	-0.011	-0.004	-0.004
9	95.00	-3.2	2.9	0.405	0.063	0.063	0.023	0.023

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(r) 110 Percent of design speed; reading 1748

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	42.7	0.5	42.7	0.5	316.8	0.995	12.79	0.980
2	24.547	24.671	37.1	0.1	37.1	0.1	315.4	0.995	12.87	0.983
3	23.876	24.049	35.5	-0.7	35.5	-0.7	314.6	0.995	12.97	0.984
4	21.847	22.222	34.1	-0.8	34.1	-0.8	312.5	0.996	13.13	0.987
5	19.164	19.827	36.9	-0.9	36.9	-0.9	309.3	0.996	12.85	0.993
6	16.502	17.465	38.1	0.7	38.1	0.7	307.2	0.995	12.63	0.975
7	14.519	15.682	40.2	-2.0	40.2	-2.0	304.4	1.001	12.03	0.990
8	13.858	15.070	41.0	-4.3	41.0	-4.3	303.5	1.002	11.83	0.999
9	13.200	14.448	41.5	-8.2	41.5	-8.2	303.4	1.000	11.81	0.991

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	193.1	171.0	193.1	171.0	142.0	171.0	130.8	1.6	0.	0.
2	198.7	176.1	198.7	176.1	158.5	176.1	119.9	0.2	0.	0.
3	204.7	179.8	204.7	179.8	166.6	179.8	118.8	-2.1	0.	0.
4	215.5	190.2	215.5	190.2	178.4	190.2	120.8	-2.7	0.	0.
5	214.5	187.8	214.5	187.8	171.6	187.8	128.7	-2.9	0.	0.
6	217.3	179.5	217.3	179.5	171.1	179.5	134.0	2.0	0.	0.
7	204.8	171.8	204.8	171.8	156.5	171.7	132.2	-5.9	0.	0.
8	198.7	168.4	198.7	168.4	150.0	168.0	130.4	-12.5	0.	0.
9	197.5	161.6	197.5	161.6	147.8	159.9	130.9	-23.1	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.558	0.492	0.558	0.492	0.410	0.492	1.204	0.637
2	0.576	0.508	0.576	0.508	0.460	0.508	1.111	0.576
3	0.596	0.521	0.596	0.521	0.485	0.521	1.079	0.596
4	0.632	0.554	0.632	0.554	0.523	0.554	1.066	0.632
5	0.632	0.550	0.632	0.550	0.506	0.550	1.094	0.632
6	0.643	0.526	0.643	0.526	0.507	0.526	1.049	0.643
7	0.607	0.503	0.607	0.503	0.464	0.503	1.097	0.607
8	0.588	0.494	0.588	0.494	0.444	0.492	1.120	0.588
9	0.585	0.473	0.585	0.473	0.438	0.468	1.082	0.585

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	2.2	16.2	0.570	0.104	0.104	0.071	0.071
2	10.00	-3.4	15.4	0.513	0.082	0.082	0.055	0.055
3	15.00	-5.1	14.3	0.502	0.075	0.075	0.048	0.048
4	30.00	-6.9	13.2	0.455	0.054	0.054	0.032	0.032
5	50.00	-4.6	12.1	0.442	0.031	0.031	0.016	0.016
6	70.00	-3.8	12.4	0.444	0.103	0.103	0.047	0.047
7	85.00	-2.0	9.0	0.426	0.044	0.044	0.018	0.018
8	90.00	-1.3	6.4	0.423	0.004	0.004	0.002	0.002
9	95.00	-0.9	2.2	0.463	0.046	0.046	0.017	0.017

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(s) 120 Percent of design speed; reading 1754

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	25.0	-2.5	25.0	-2.5	314.5	0.994	12.03	0.918
2	24.547	24.671	23.8	-3.0	23.8	-3.0	314.3	0.996	12.49	0.910
3	23.876	24.049	24.0	-3.0	24.0	-3.0	313.8	0.998	12.52	0.927
4	21.847	22.222	26.0	-3.4	26.0	-3.4	313.2	0.997	12.45	0.950
5	19.164	19.827	28.2	-3.3	28.2	-3.3	311.0	1.002	12.30	0.958
6	16.502	17.465	30.3	-3.8	30.3	-3.8	310.1	1.005	12.50	0.942
7	14.519	15.682	32.8	-4.3	32.8	-4.3	308.2	1.004	12.00	0.950
8	13.858	15.070	34.4	-5.7	34.4	-5.7	306.7	1.003	11.47	0.959
9	13.200	14.448	35.2	-7.3	35.2	-7.3	305.8	1.002	11.19	0.953

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	246.3	268.7	246.3	268.7	223.2	268.5	104.2	-11.8	0.	0.
2	261.0	277.9	261.0	277.9	238.9	277.5	105.1	-14.7	0.	0.
3	264.1	284.1	264.1	284.1	241.2	283.8	107.6	-14.7	0.	0.
4	268.3	295.6	268.3	295.6	241.2	295.1	117.4	-17.3	0.	0.
5	266.8	304.6	266.8	304.6	235.1	304.1	126.2	-17.6	0.	0.
6	275.6	323.6	275.6	323.6	237.9	322.9	139.1	-21.4	0.	0.
7	268.8	322.7	268.8	322.7	225.9	321.8	145.7	-24.4	0.	0.
8	257.7	322.3	257.7	322.3	212.7	320.7	145.5	-31.9	0.	0.
9	252.5	322.5	252.5	322.5	206.3	319.9	145.5	-40.7	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.729	0.806	0.729	0.806	0.660	0.805	1.203	0.729
2	0.778	0.837	0.778	0.837	0.712	0.835	1.162	0.778
3	0.788	0.858	0.788	0.858	0.720	0.857	1.177	0.788
4	0.804	0.900	0.804	0.900	0.723	0.898	1.224	0.804
5	0.802	0.932	0.802	0.932	0.706	0.931	1.294	0.802
6	0.833	1.002	0.833	1.002	0.719	1.000	1.357	0.833
7	0.813	1.003	0.813	1.003	0.683	1.000	1.425	0.813
8	0.777	1.005	0.777	1.005	0.642	1.000	1.508	0.777
9	0.761	1.008	0.761	1.008	0.622	1.000	1.551	0.761

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	-15.4	13.1	0.230	0.277	0.277	0.189	0.189
2	10.00	-16.8	12.3	0.240	0.272	0.272	0.181	0.181
3	15.00	-16.6	12.0	0.223	0.217	0.217	0.140	0.140
4	30.00	-15.0	10.7	0.195	0.144	0.144	0.086	0.086
5	50.00	-13.2	9.7	0.138	0.122	0.122	0.064	0.064
6	70.00	-11.5	8.0	0.087	0.158	0.158	0.072	0.072
7	85.00	-9.4	6.6	0.050	0.142	0.142	0.058	0.058
8	90.00	-7.9	5.0	0.011	0.124	0.124	0.048	0.048
9	95.00	-7.2	3.2	-0.009	0.147	0.147	0.054	0.054

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(t) 120 Percent of design speed; reading 1753

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	32.4	-3.5	32.4	-3.5	315.8	0.994	11.87	0.980
2	24.547	24.671	28.2	-3.1	28.2	-3.1	315.5	0.994	12.45	0.956
3	23.876	24.049	27.5	-3.2	27.5	-3.2	314.3	0.997	12.60	0.960
4	21.847	22.222	28.6	-3.5	28.6	-3.5	312.9	0.998	12.66	0.989
5	19.164	19.827	32.0	-2.8	32.0	-2.8	311.6	0.998	12.72	0.996
6	16.502	17.465	33.5	-0.6	33.5	-0.6	309.7	1.000	12.72	0.987
7	14.519	15.682	35.7	-2.2	35.7	-2.2	307.7	0.999	12.22	0.982
8	13.858	15.070	36.8	-4.0	36.8	-4.0	306.2	1.001	11.79	1.001
9	13.200	14.448	37.1	-7.2	37.1	-7.2	305.3	1.000	11.62	0.985

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	220.7	194.6	220.7	194.6	186.3	194.3	118.3	-11.9	0.	0.
2	239.4	204.9	239.4	204.9	211.0	204.6	113.1	-11.1	0.	0.
3	245.5	210.5	245.5	210.5	217.7	210.2	113.4	-11.8	0.	0.
4	249.7	227.4	249.7	227.4	219.1	227.0	119.6	-13.8	0.	0.
5	254.7	237.6	254.7	237.6	216.0	237.4	135.0	-11.5	0.	0.
6	261.4	247.0	261.4	247.0	218.1	247.0	144.1	-2.6	0.	0.
7	255.6	244.4	255.6	244.4	207.5	244.3	149.1	-9.2	0.	0.
8	245.6	239.0	245.6	239.0	196.7	238.4	147.1	-16.6	0.	0.
9	241.7	226.1	241.7	226.1	192.8	224.3	145.7	-28.2	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.645	0.565	0.645	0.565	0.544	0.564	1.042	0.645
2	0.705	0.597	0.705	0.597	0.621	0.596	0.970	0.705
3	0.726	0.615	0.726	0.615	0.644	0.614	0.966	0.726
4	0.742	0.670	0.742	0.670	0.651	0.669	1.036	0.742
5	0.760	0.705	0.760	0.705	0.645	0.704	1.099	0.760
6	0.785	0.737	0.785	0.737	0.655	0.737	1.133	0.785
7	0.769	0.732	0.769	0.732	0.624	0.731	1.177	0.769
8	0.737	0.715	0.737	0.715	0.590	0.713	1.212	0.737
9	0.725	0.674	0.725	0.674	0.579	0.669	1.164	0.725

	PERCENT	INCIDENCE		DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN				TOT	PROF	TOT	PROF
1	5.00	-8.1		12.1	0.520	0.081	0.081	0.055	0.055
2	10.00	-12.3		12.2	0.488	0.157	0.157	0.104	0.104
3	15.00	-13.1		11.8	0.471	0.134	0.134	0.087	0.087
4	30.00	-12.4		10.6	0.405	0.036	0.036	0.021	0.021
5	50.00	-9.4		10.3	0.365	0.013	0.013	0.007	0.007
6	70.00	-8.4		11.1	0.305	0.038	0.038	0.018	0.018
7	85.00	-6.5		8.8	0.287	0.055	0.055	0.022	0.022
8	90.00	-5.5	-5.5	6.7	0.278	-0.002	-0.002	-0.001	-0.001
9	95.00	-5.3	-5.3	3.3	0.325	0.051	0.051	0.019	0.019

TABLE VIII. - Concluded. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 55

(u) 120 Percent of design speed; reading 1752

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	25.230	25.298	43.1	0.1	43.1	0.1	322.5	0.992	13.01	0.988
2	24.547	24.671	37.0	-0.2	37.0	-0.2	321.1	0.993	13.29	0.973
3	23.876	24.049	35.1	-0.6	35.1	-0.6	320.2	0.992	13.46	0.971
4	21.847	22.222	34.8	-0.5	34.8	-0.5	317.4	0.995	13.67	0.979
5	19.164	19.827	37.0	-0.5	37.0	-0.5	314.7	0.993	13.50	0.986
6	16.502	17.465	37.3	0.5	37.3	0.5	311.0	0.995	13.09	0.973
7	14.519	15.682	39.9	-3.1	39.9	-3.1	307.9	0.999	12.36	0.989
8	13.858	15.070	40.6	-5.4	40.6	-5.4	306.6	1.001	12.08	1.001
9	13.200	14.449	40.4	-9.2	40.4	-9.2	305.8	1.001	12.03	0.993

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	211.7	188.2	211.7	188.2	154.5	188.2	144.8	0.3	0.	0.
2	224.1	192.7	224.1	192.7	179.0	192.7	134.8	-0.7	0.	0.
3	231.1	197.5	231.1	197.5	189.1	197.5	132.9	-2.0	0.	0.
4	241.2	210.3	241.2	210.3	198.1	210.3	137.6	-1.9	0.	0.
5	245.1	212.1	245.1	212.1	195.7	212.0	147.6	-2.0	0.	0.
6	243.7	202.7	243.7	202.7	193.7	202.7	147.8	1.6	0.	0.
7	230.0	192.8	230.0	192.8	176.4	192.6	147.5	-10.4	0.	0.
8	221.8	188.5	221.8	188.5	168.5	187.6	144.3	-17.9	0.	0.
9	218.6	180.8	218.6	180.8	166.4	178.4	141.8	-29.1	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.610	0.540	0.610	0.540	0.445	0.540	1.218	0.709
2	0.650	0.555	0.650	0.555	0.519	0.555	1.077	0.650
3	0.673	0.571	0.673	0.571	0.551	0.571	1.044	0.673
4	0.708	0.612	0.708	0.612	0.582	0.612	1.062	0.708
5	0.724	0.621	0.724	0.621	0.578	0.621	1.084	0.724
6	0.725	0.595	0.725	0.595	0.576	0.595	1.046	0.725
7	0.684	0.566	0.684	0.566	0.525	0.565	1.091	0.684
8	0.659	0.553	0.659	0.553	0.500	0.550	1.114	0.659
9	0.649	0.530	0.649	0.530	0.494	0.523	1.072	0.649

	PERCENT	INCIDENCE	DEV	D-FACT	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN			TOT	PROF	TOT	PROF
1	5.00	2.7	15.8	0.576	0.053	0.053	0.036	0.036
2	10.00	-3.5	15.1	0.541	0.108	0.108	0.072	0.072
3	15.00	-5.5	14.4	0.521	0.110	0.110	0.071	0.071
4	30.00	-6.2	13.5	0.469	0.072	0.072	0.043	0.043
5	50.00	-4.4	12.5	0.450	0.046	0.046	0.024	0.024
6	70.00	-4.5	12.2	0.435	0.091	0.091	0.042	0.042
7	85.00	-2.3	7.9	0.432	0.042	0.042	0.017	0.017
8	90.00	-1.7	5.3	0.426	-0.005	-0.005	-0.002	-0.002
9	95.00	-2.0	1.2	0.456	0.029	0.029	0.010	0.010

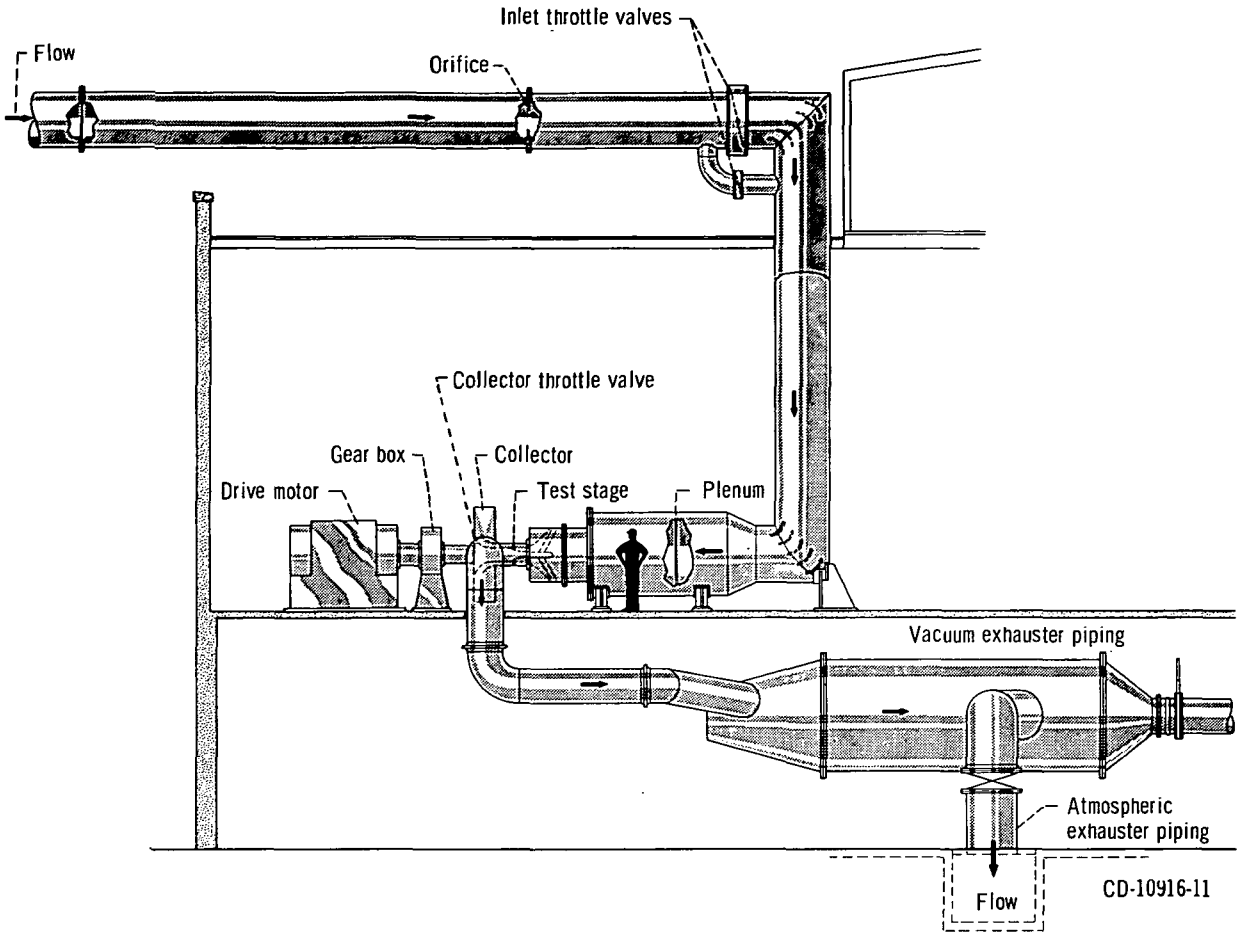
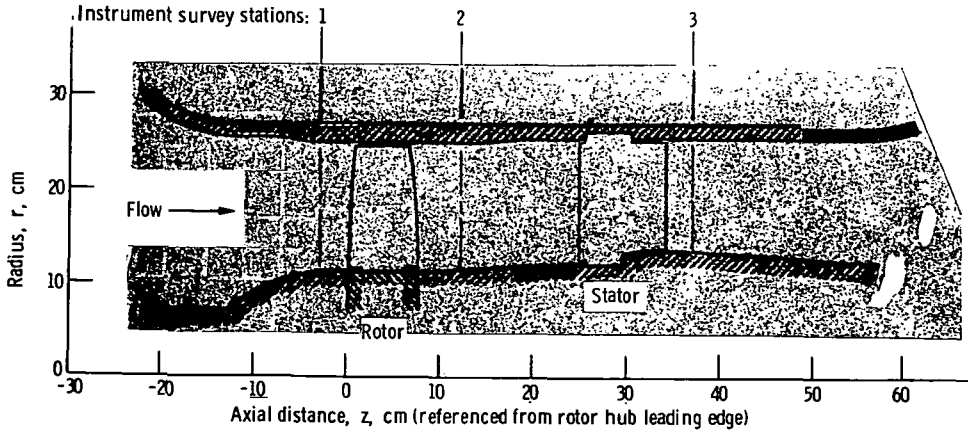
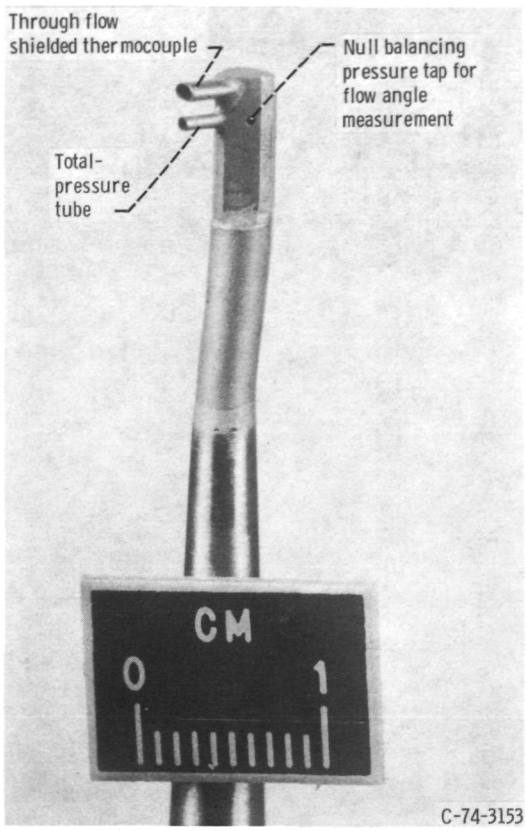


Figure 1. - Single-stage compressor facility.

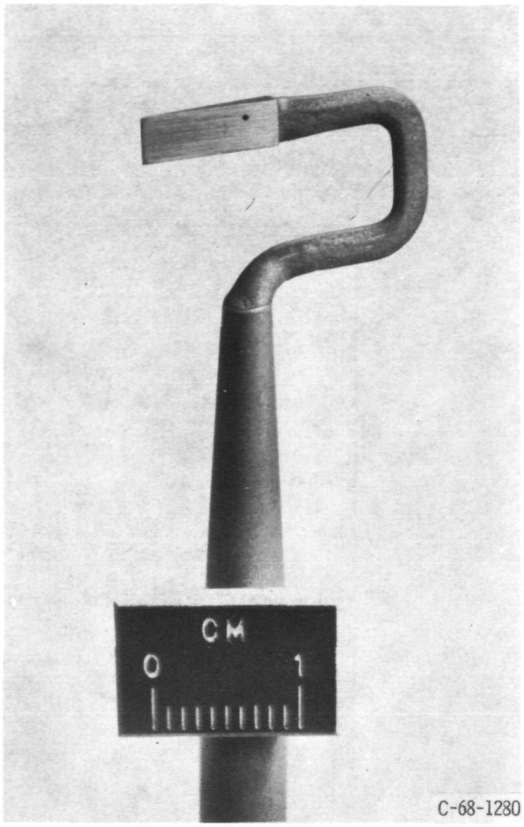


Axial location, z, cm	Hub	Tip
	Radius, r, cm	
-15	7.8	26.0
-10	10.4	26.0
-5	11.5	25.7
0	11.55	25.4
5	11.55	25.4
10	11.60	25.4
15	11.85	25.6
20	12.25	25.85
25	12.55	25.94
30	13.10	
35	13.90	
40	13.40	
45	13.00	
50	12.50	

Figure 2. - Fan stage 55 flow path.



(a) Combination total pressure, total temperature, and flow angle probe.



(b) Static-pressure probe; 8^0 C-shaped wedge.

Figure 3. - Survey probes.

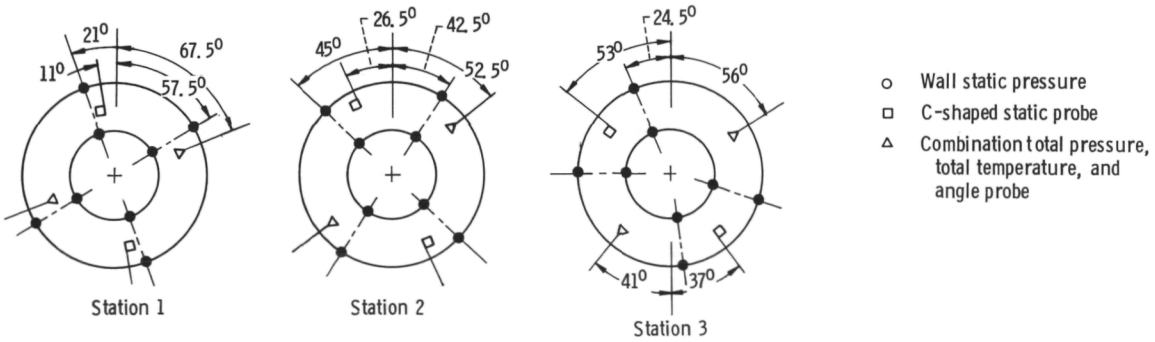


Figure 4. - Circumferential location of survey instrumentation at each station looking downstream.

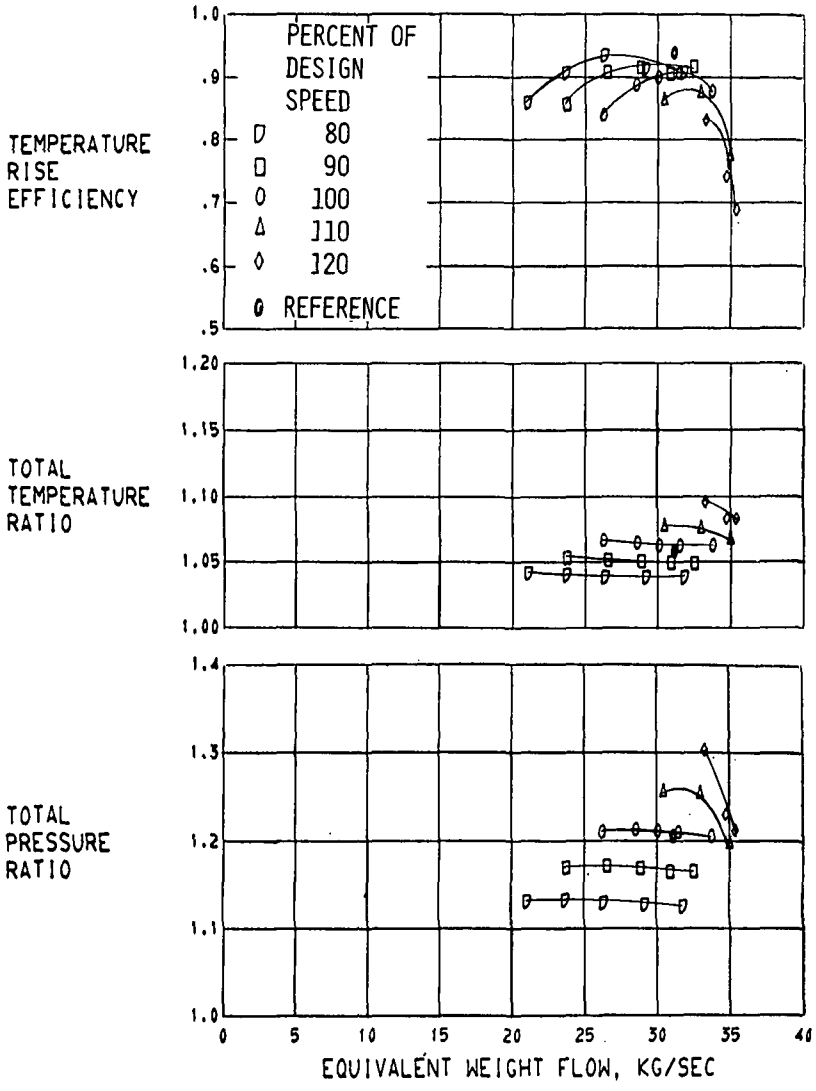


FIGURE 5. - OVERALL PERFORMANCE FOR ROTOR 55C.

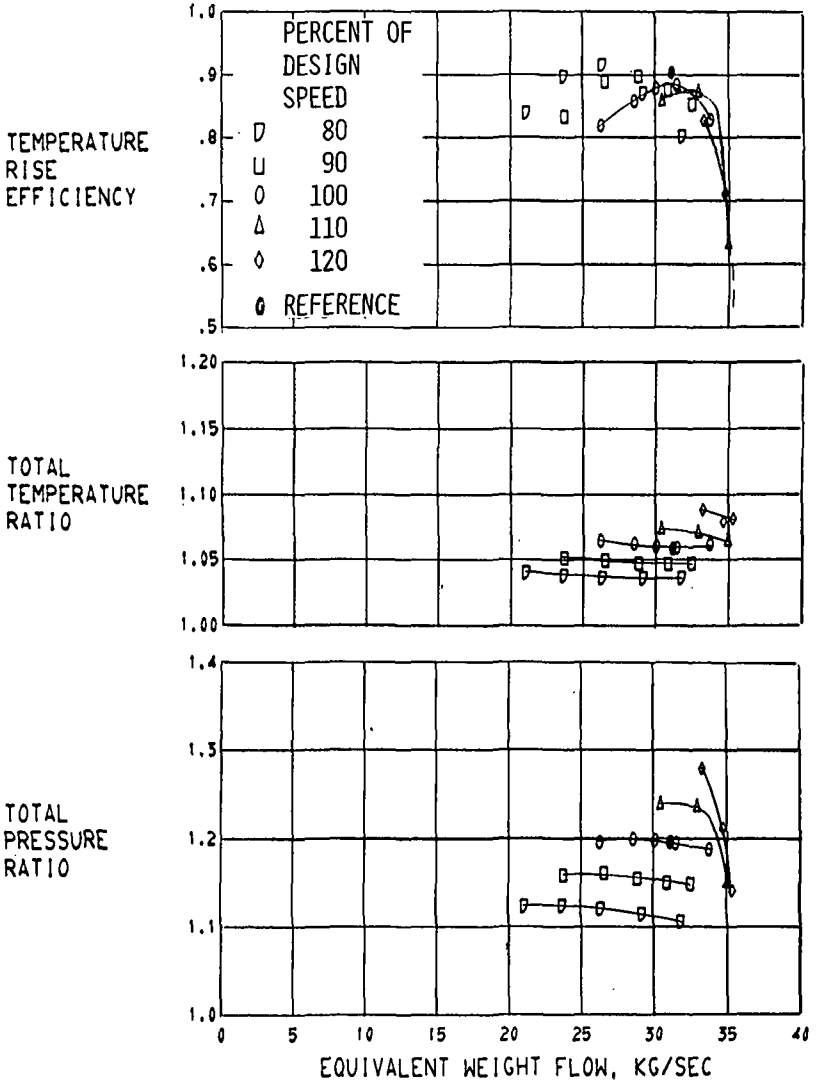
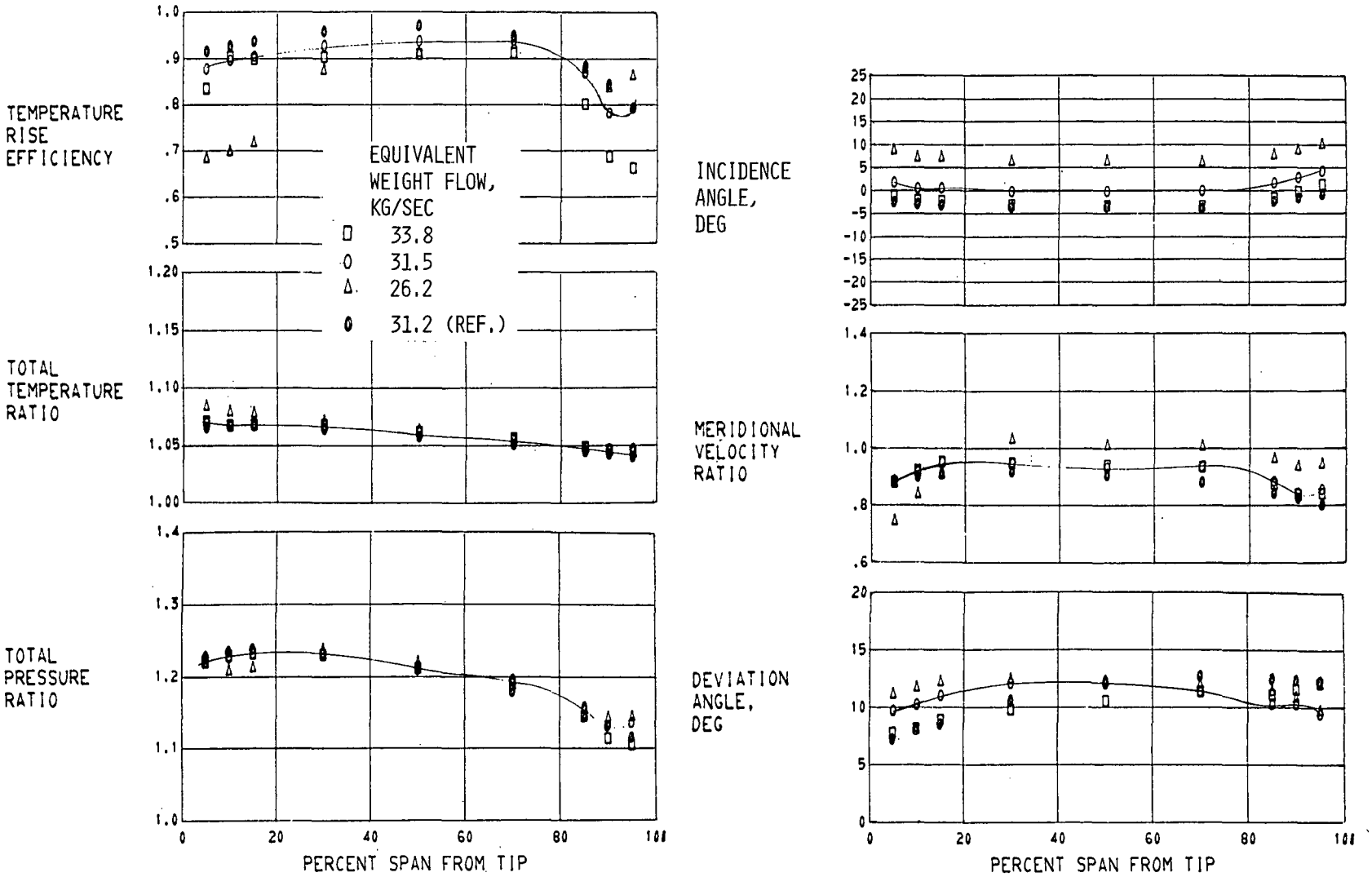


FIGURE 6. - OVERALL PERFORMANCE FOR STAGE 55C-55.


TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
EQUIVALENT WEIGHT FLOW, KG/SEC
33.8
31.5
26.2
31.2 (REF.)
INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
DEVIATION ANGLE, DEG
PERCENT SPAN FROM TIP
PERCENT SPAN FROM TIP

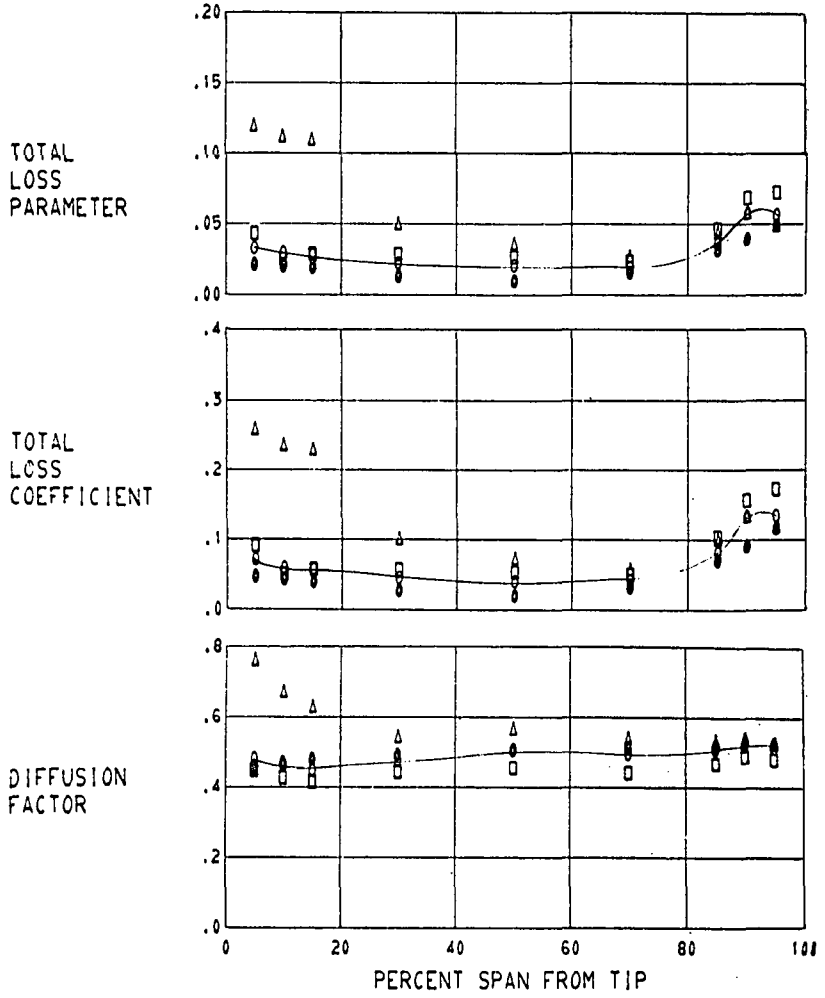


FIGURE 7. - RADIAL DISTRIBUTION OF PERFORMANCE FOR ROTOR 55C. 100 PERCENT DESIGN SPEED.

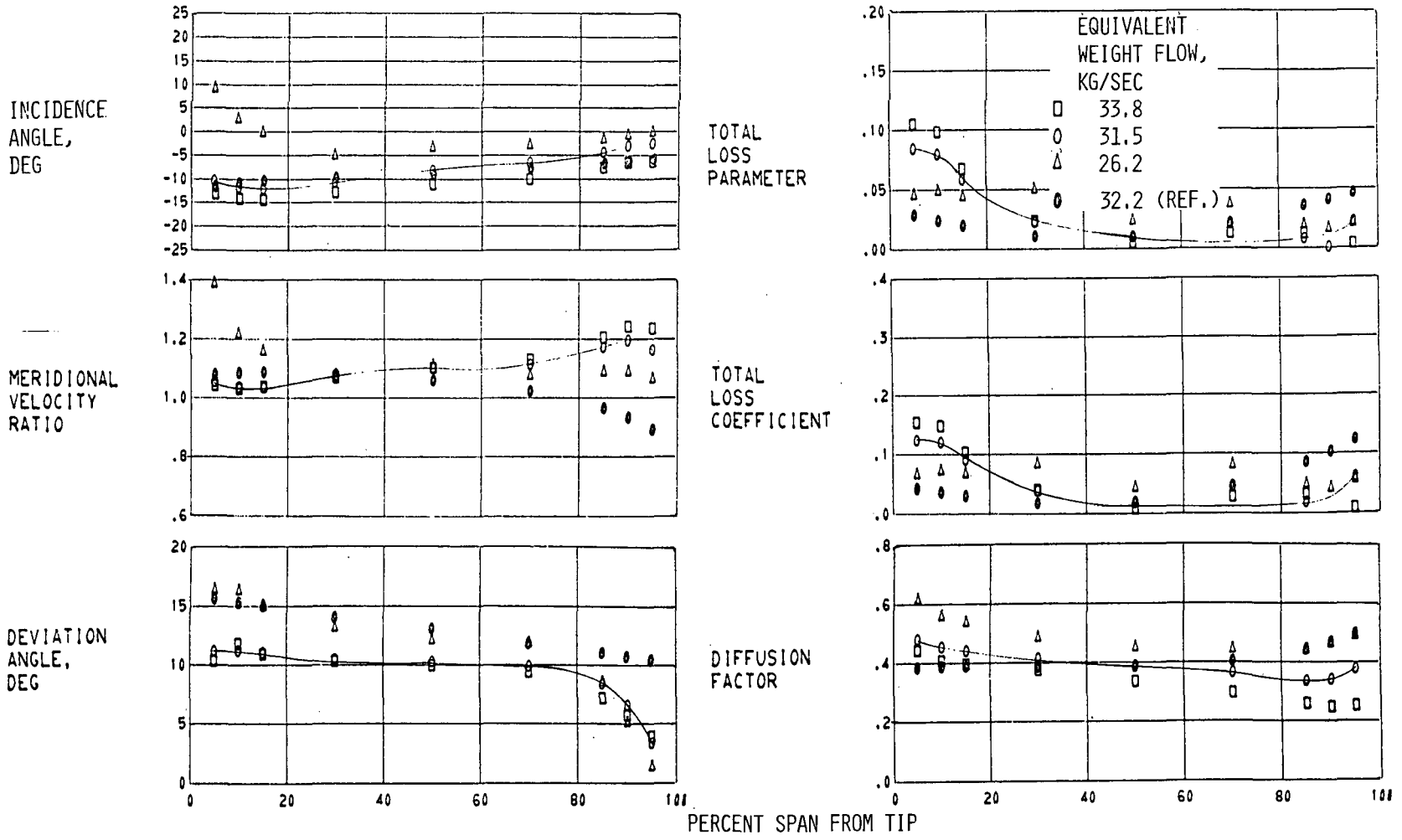
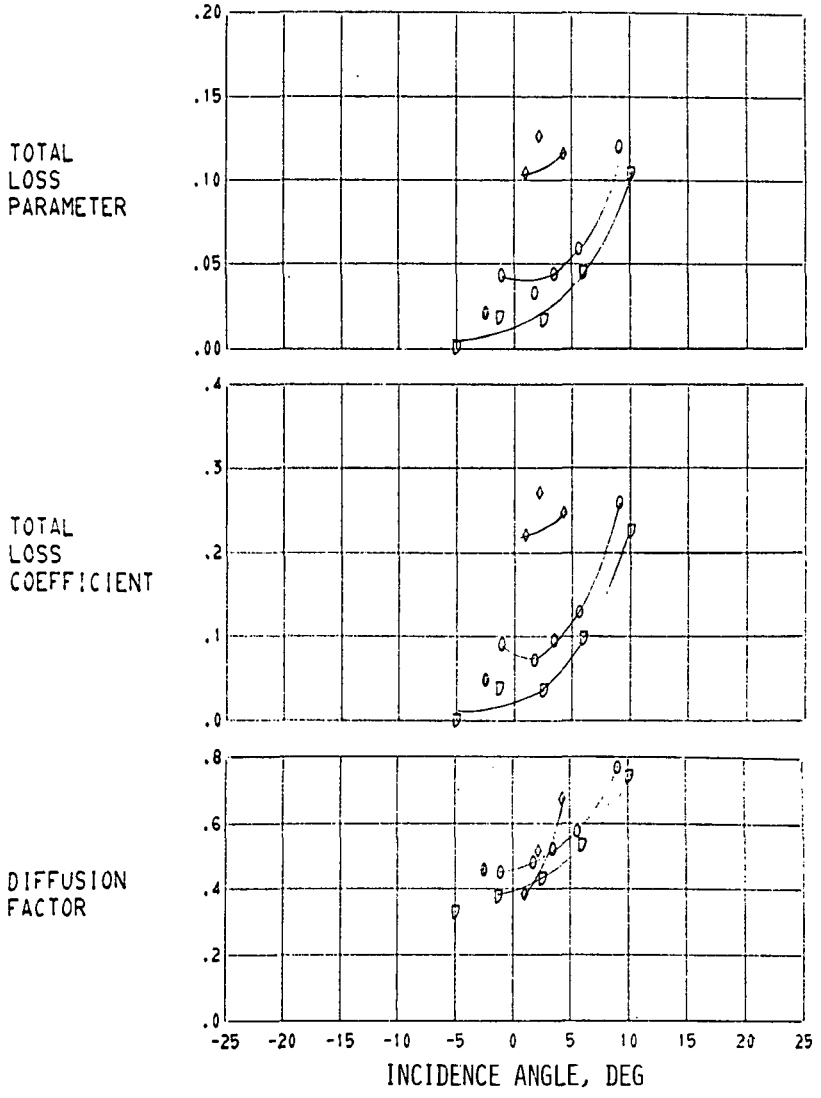


FIGURE 8. - RADIAL DISTRIBUTION OF PERFORMANCE FOR STATOR 55. 100 PERCENT OF DESIGN SPEED.

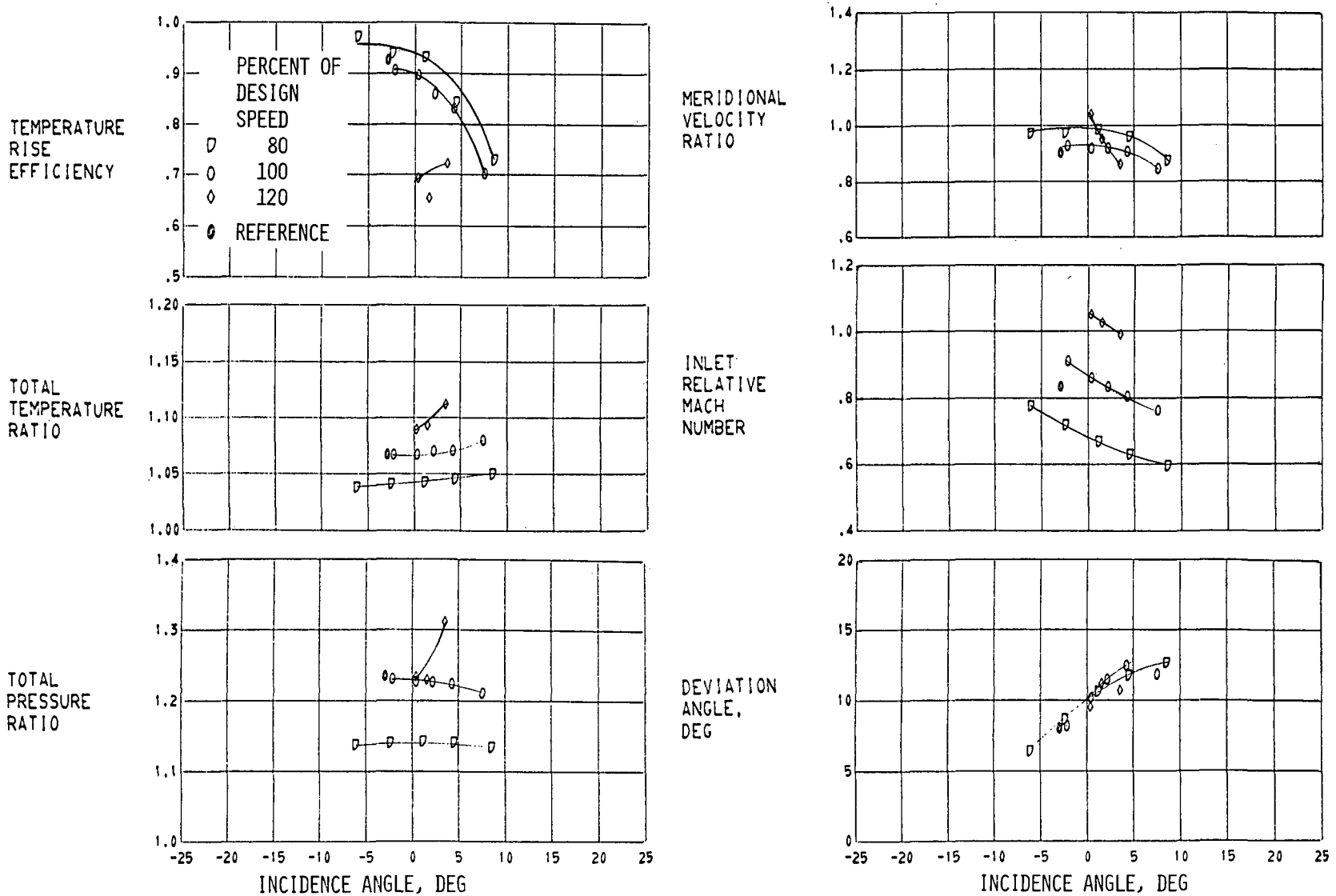
Page Intentionally Left Blank

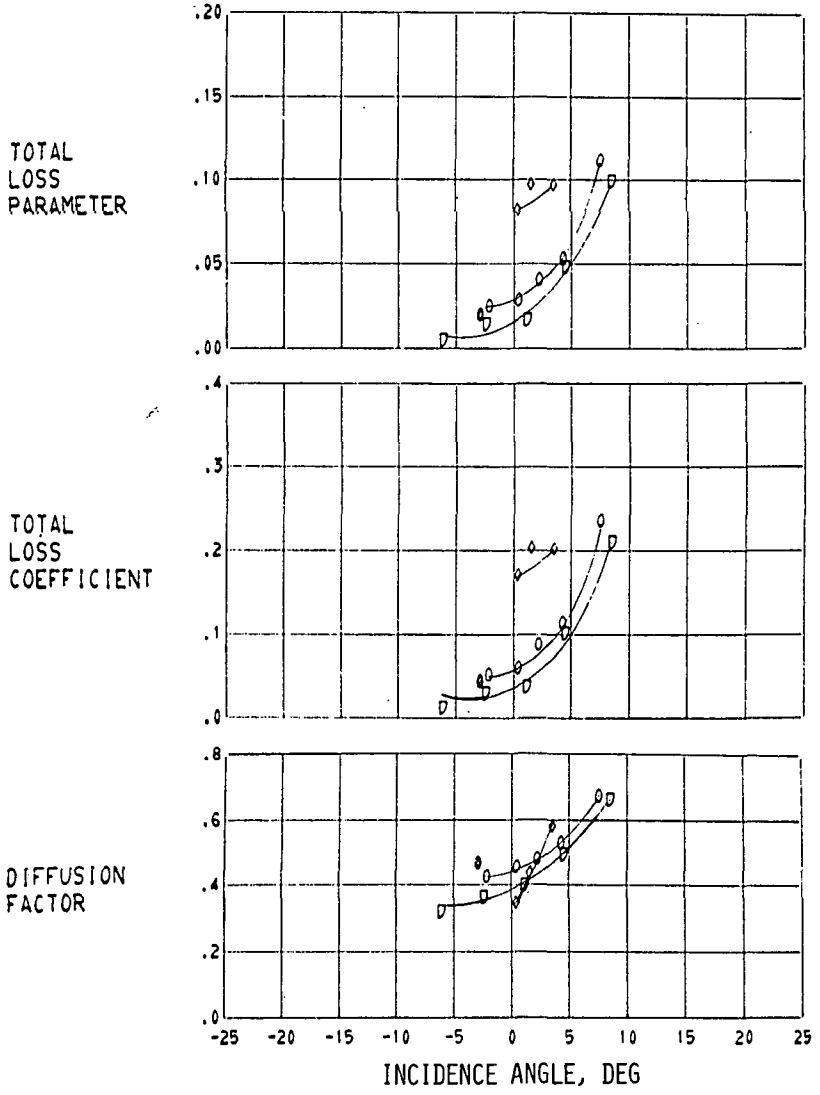
TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
PERCENT OF DESIGN SPEED
80
100
120
REFERENCE
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, DEG
INCIDENCE ANGLE, DEG



(A) 5 PERCENT SPAN.

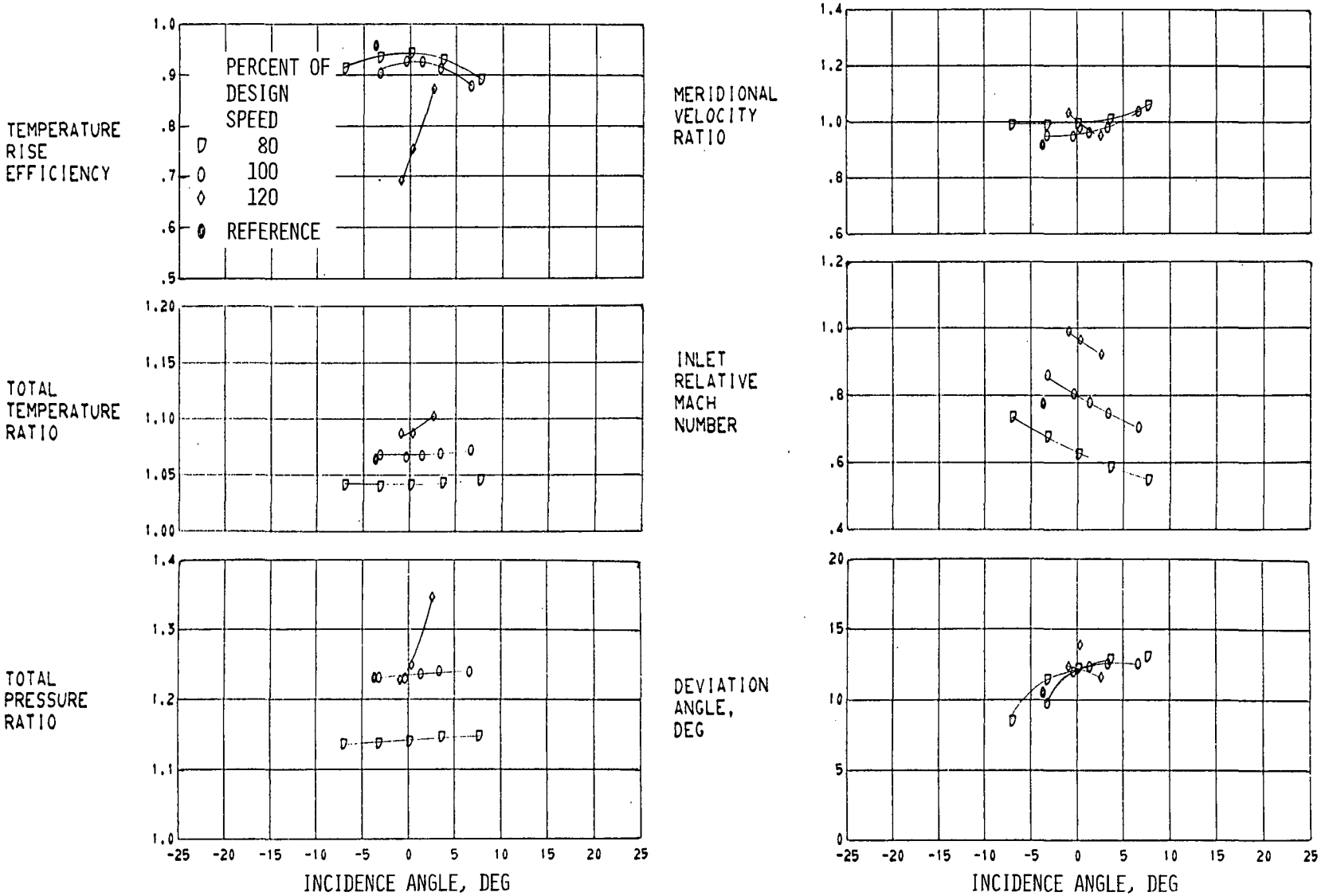
FIGURE 9. - BLADE-ELEMENT PERFORMANCE FOR ROTOR 55C.

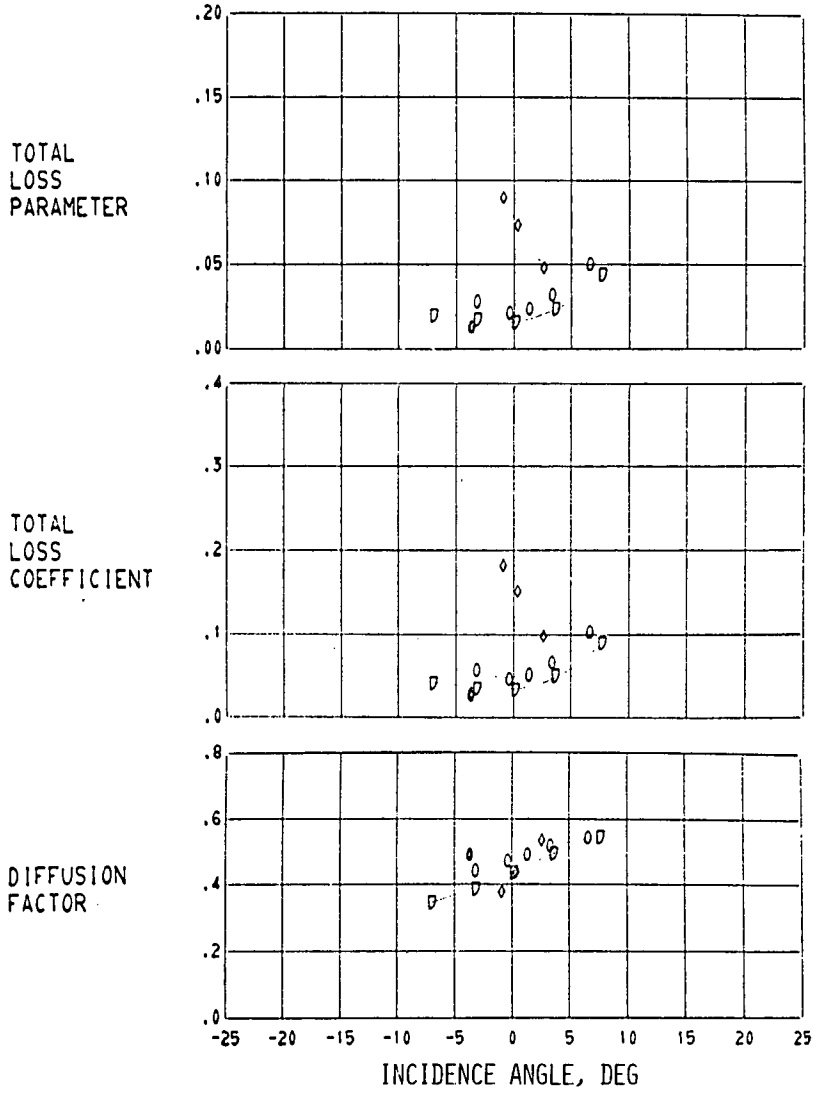

TEMPERATURE RISE EFFICIENCY
PERCENT OF DESIGN SPEED
80
100
120
REFERENCE
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, DEG



(B) 10 PERCENT SPAN.

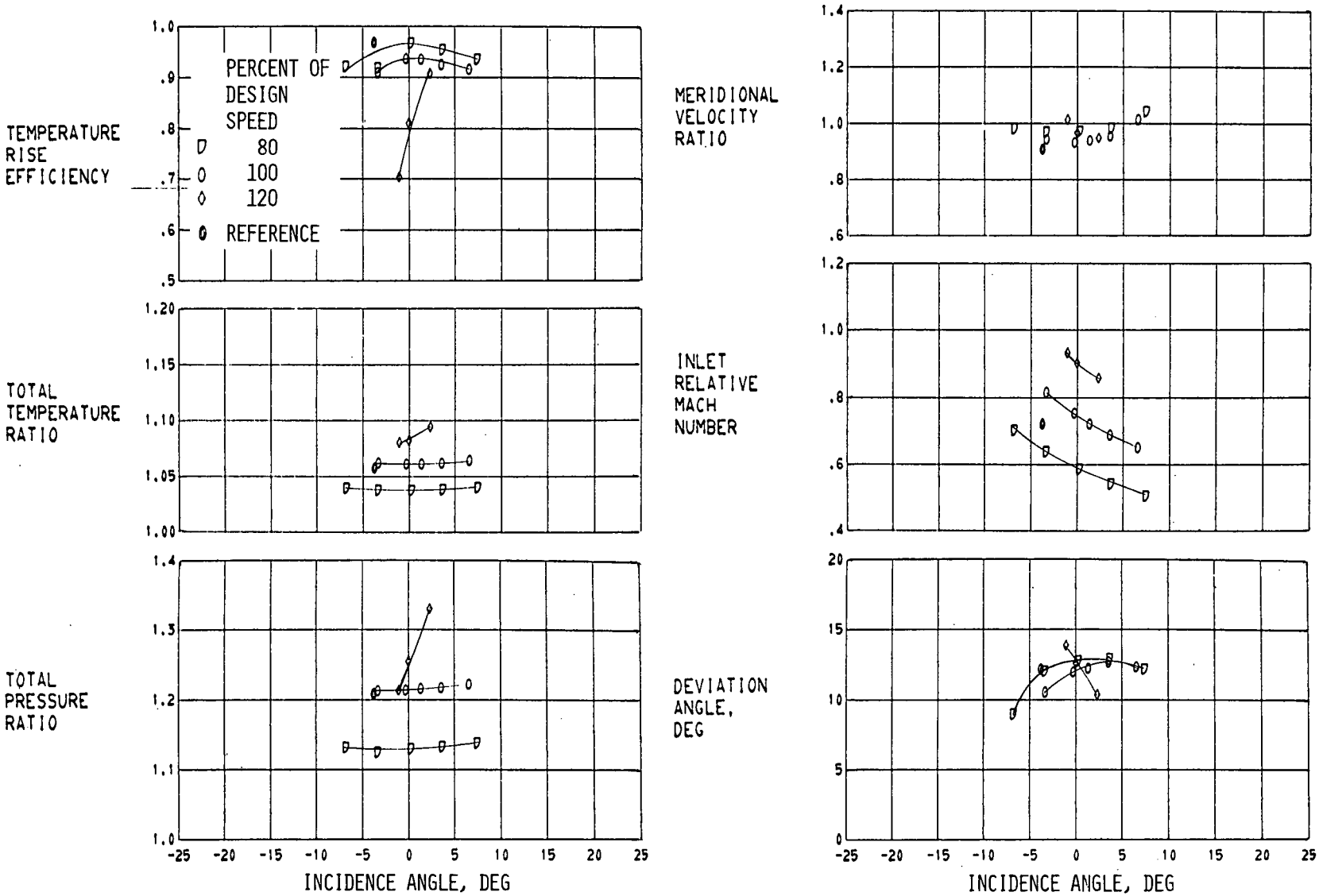
FIGURE 9. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR ROTOR 55C.

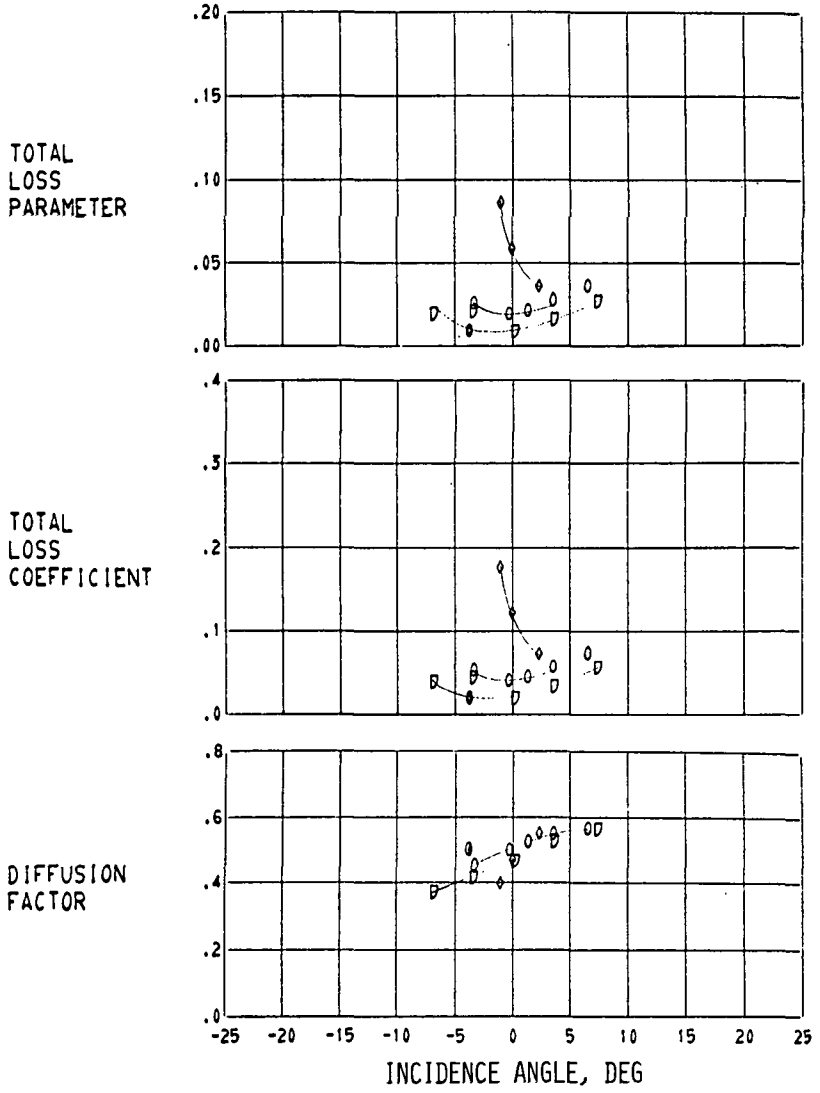

TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
PERCENT OF DESIGN SPEED
80
100
120
REFERENCE
INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, DEG



(C) 30 PERCENT SPAN.

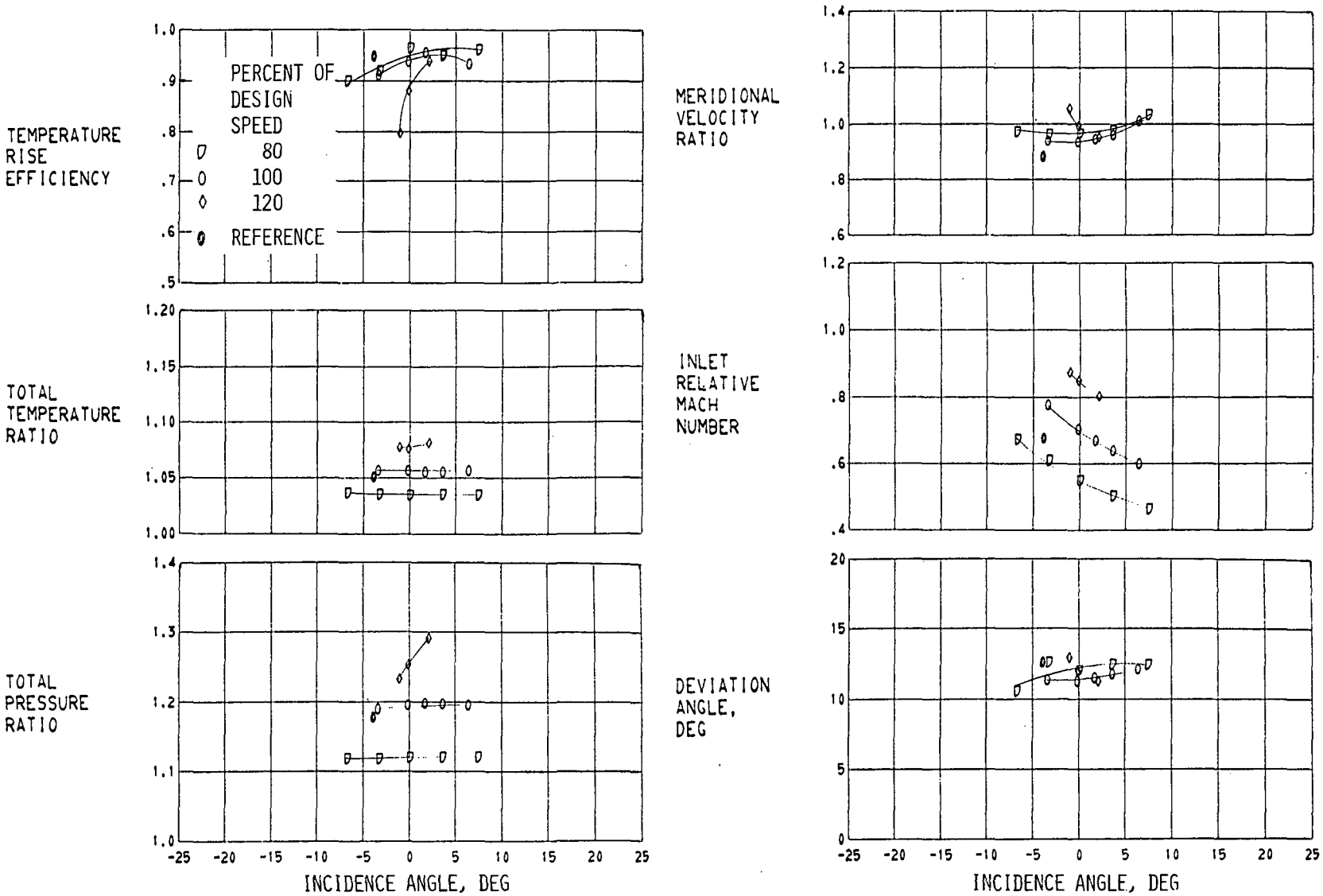
FIGURE 9. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR ROTOR 55C.

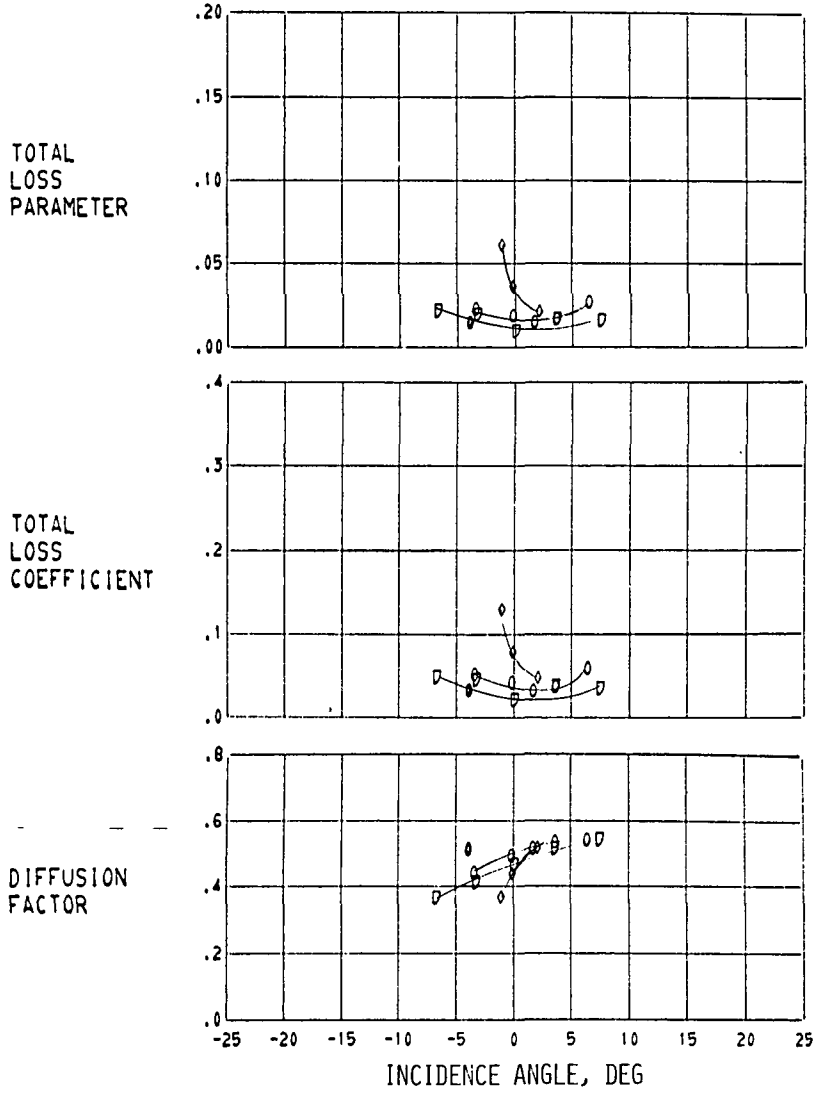

TEMPERATURE RISE EFFICIENCY
PERCENT OF DESIGN SPEED
80
100
120
REFERENCE
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, DEG



(D) 50 PERCENT SPAN.

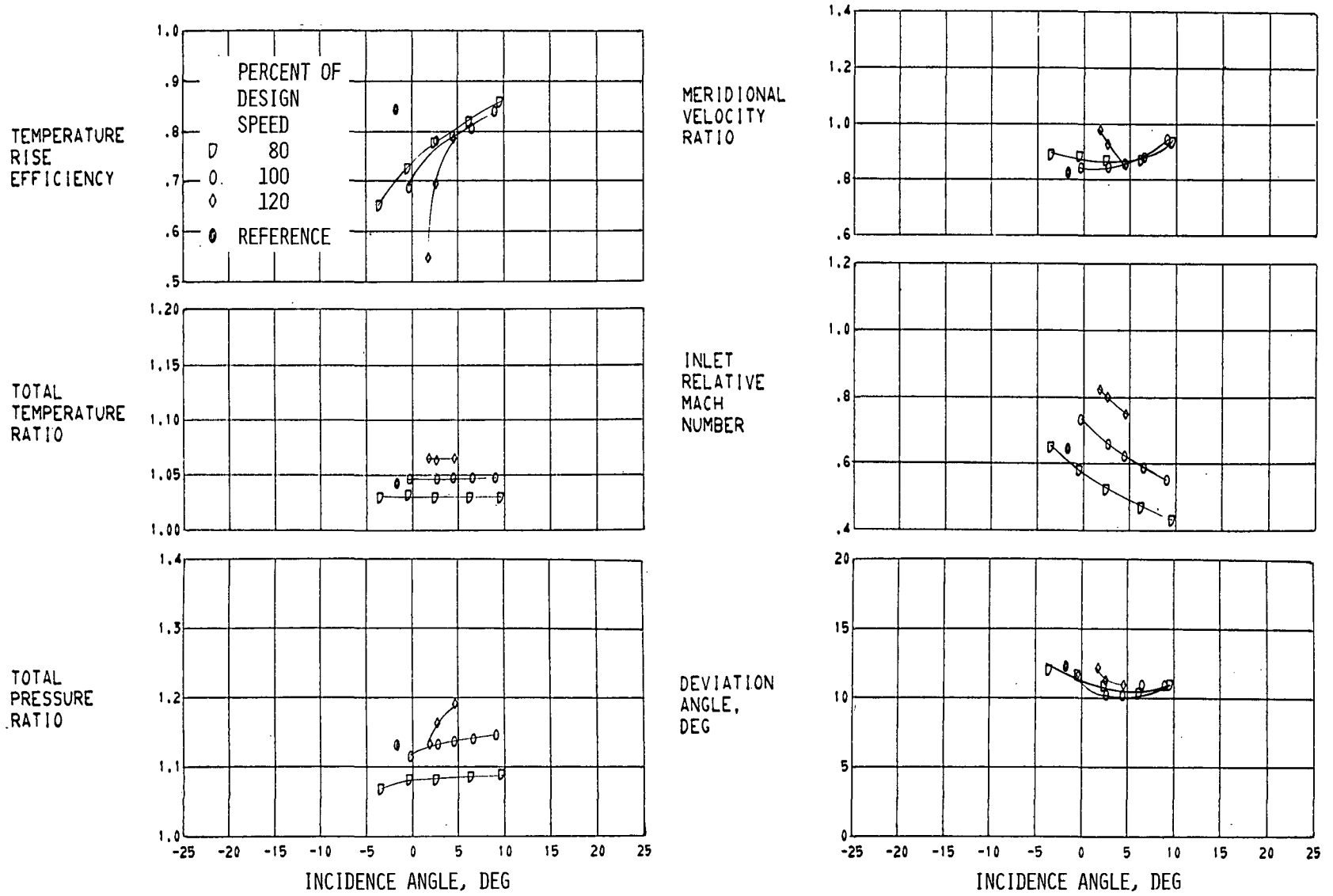
FIGURE 9. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR ROTOR 55C.

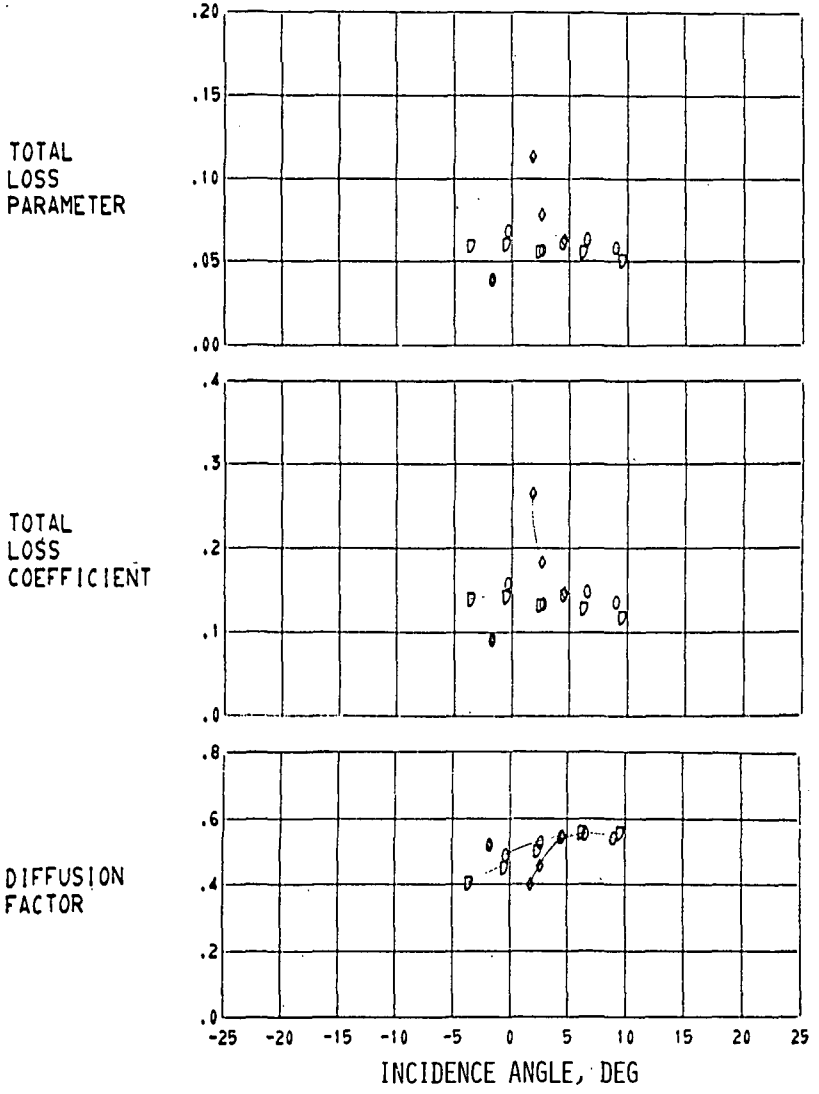

TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
PERCENT OF DESIGN SPEED
80
100
120
REFERENCE
INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, DEG



(E) 70 PERCENT SPAN.

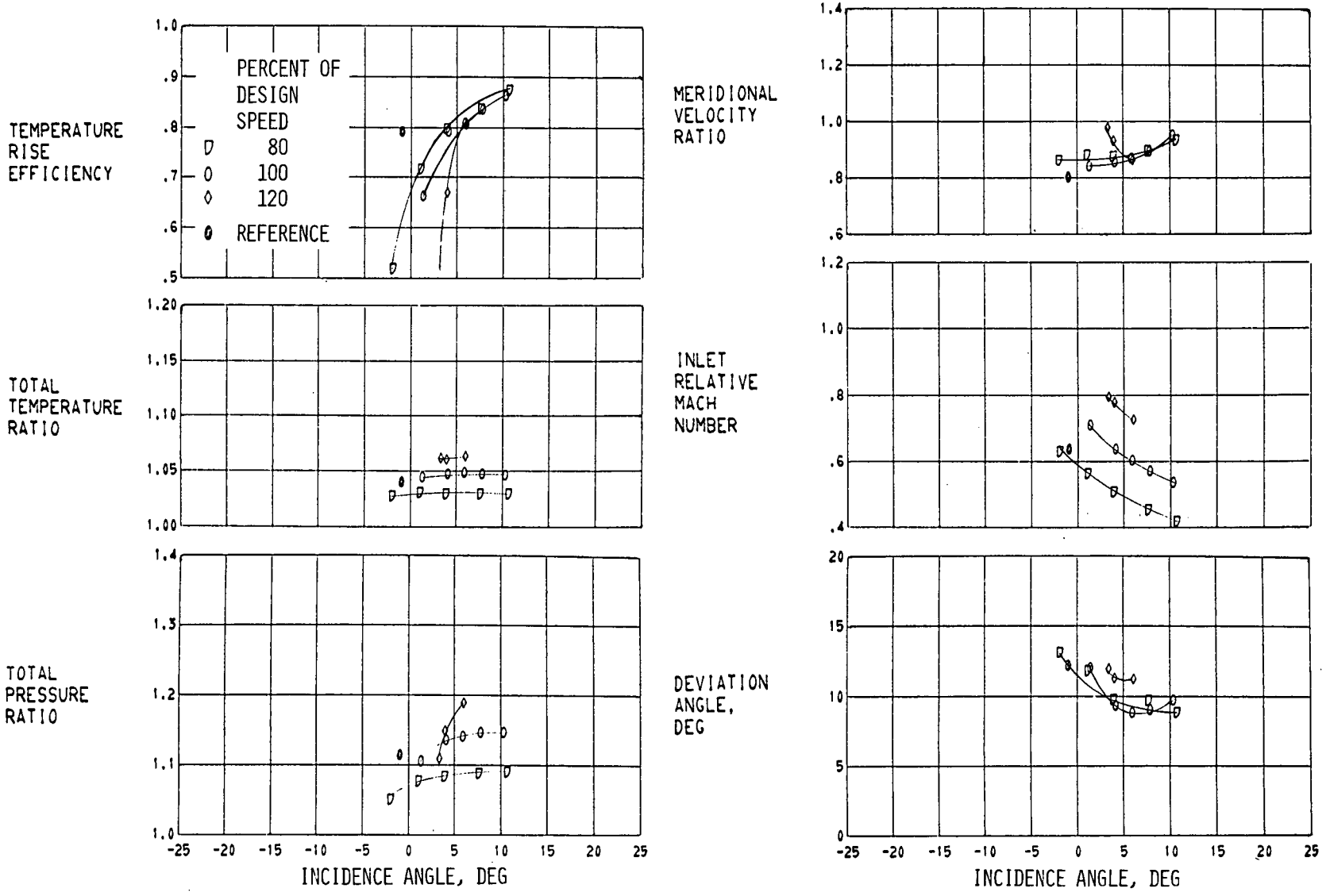
FIGURE 9. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR ROTOR 55C.

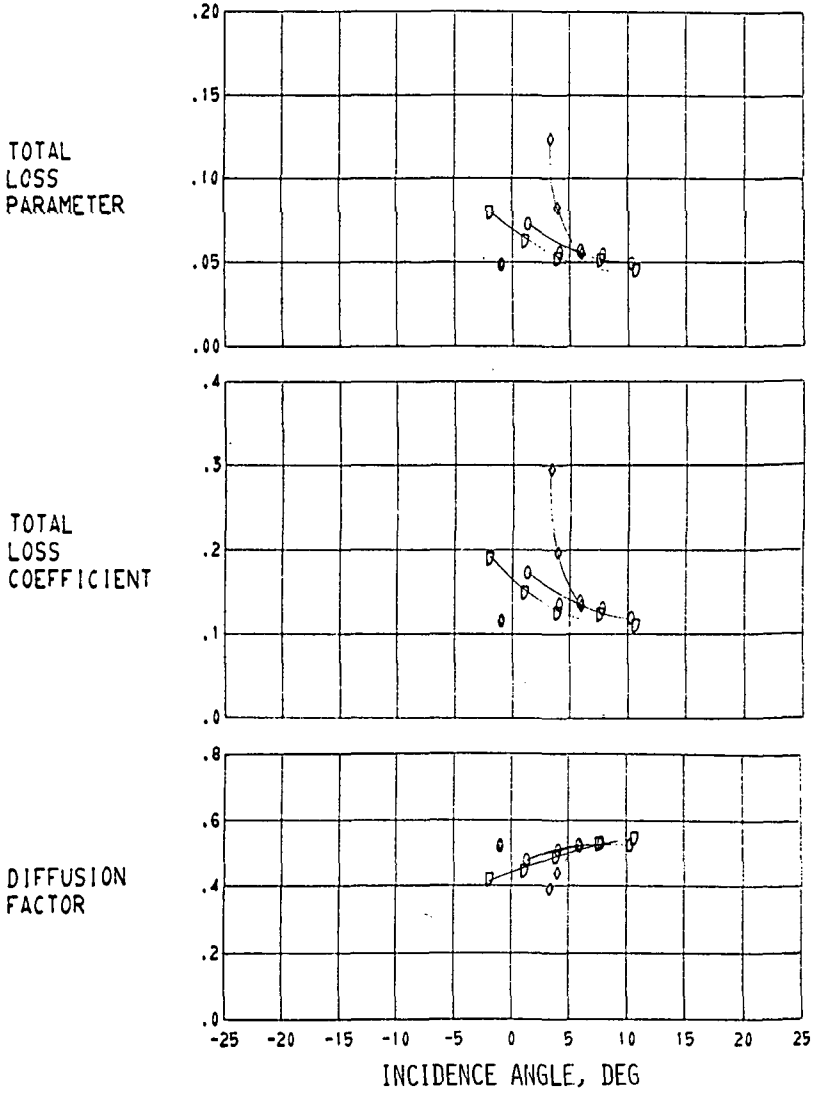

TEMPERATURE RISE EFFICIENCY
PERCENT OF DESIGN SPEED
80
100
120
REFERENCE
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, DEG



(F) 90 PERCENT SPAN.

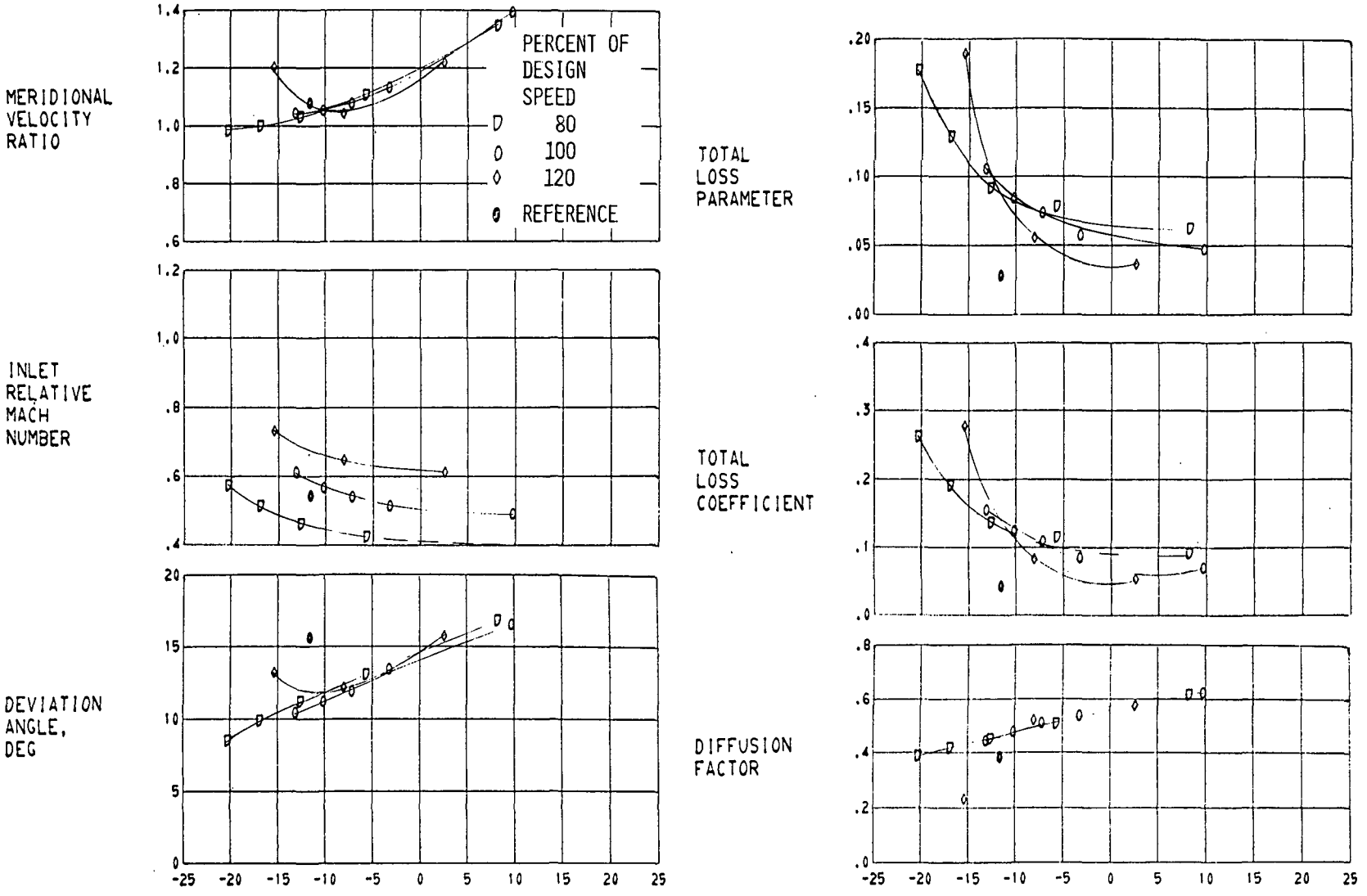
FIGURE 9. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR ROTOR 55C.


TEMPERATURE RISE EFFICIENCY
PERCENT OF DESIGN SPEED
80
100
120
REFERENCE
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, DEG



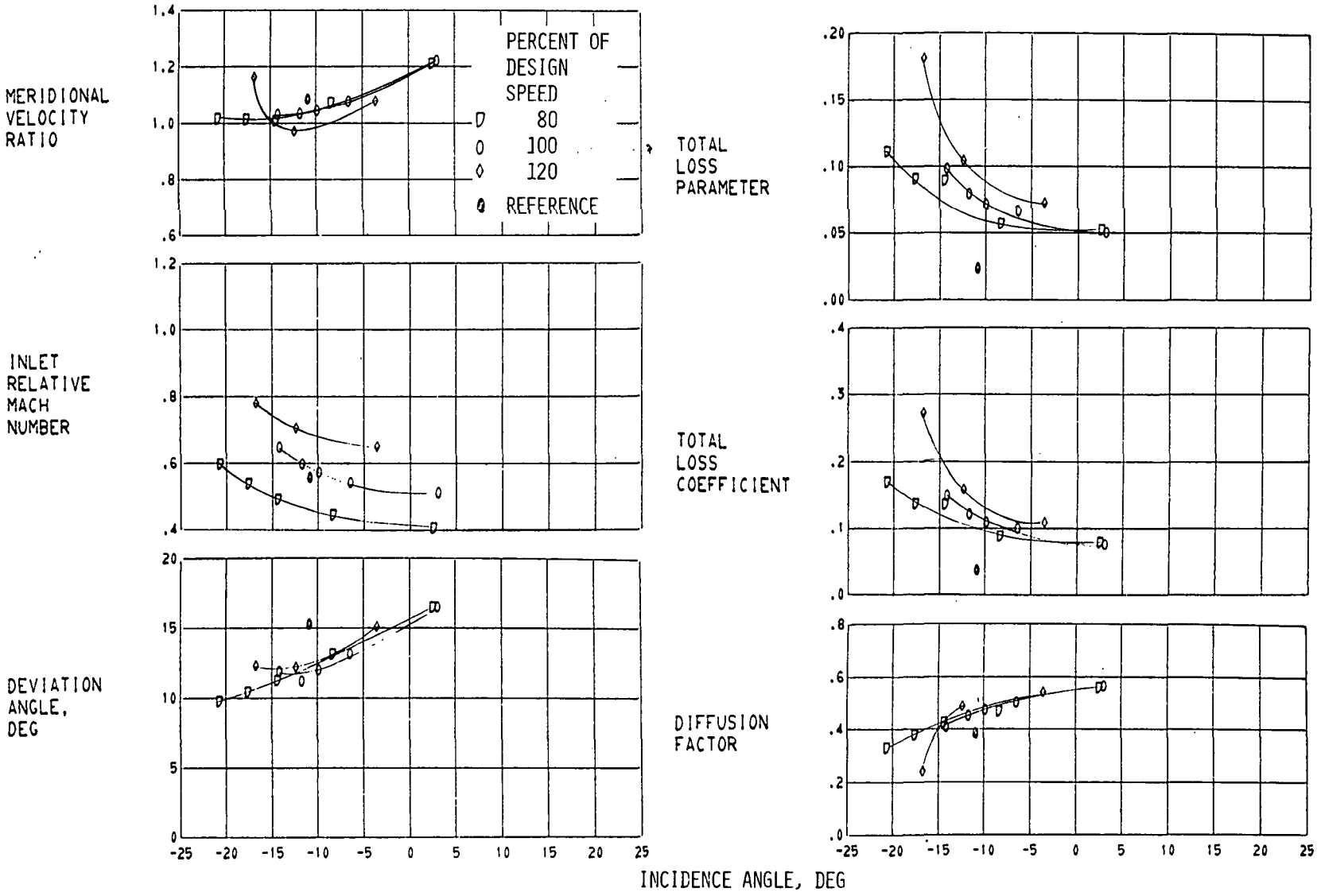
(G) 95 PERCENT SPAN.

FIGURE 9. - CONCLUDED. BLADE-ELEMENT PERFORMANCE FOR ROTOR 55C.



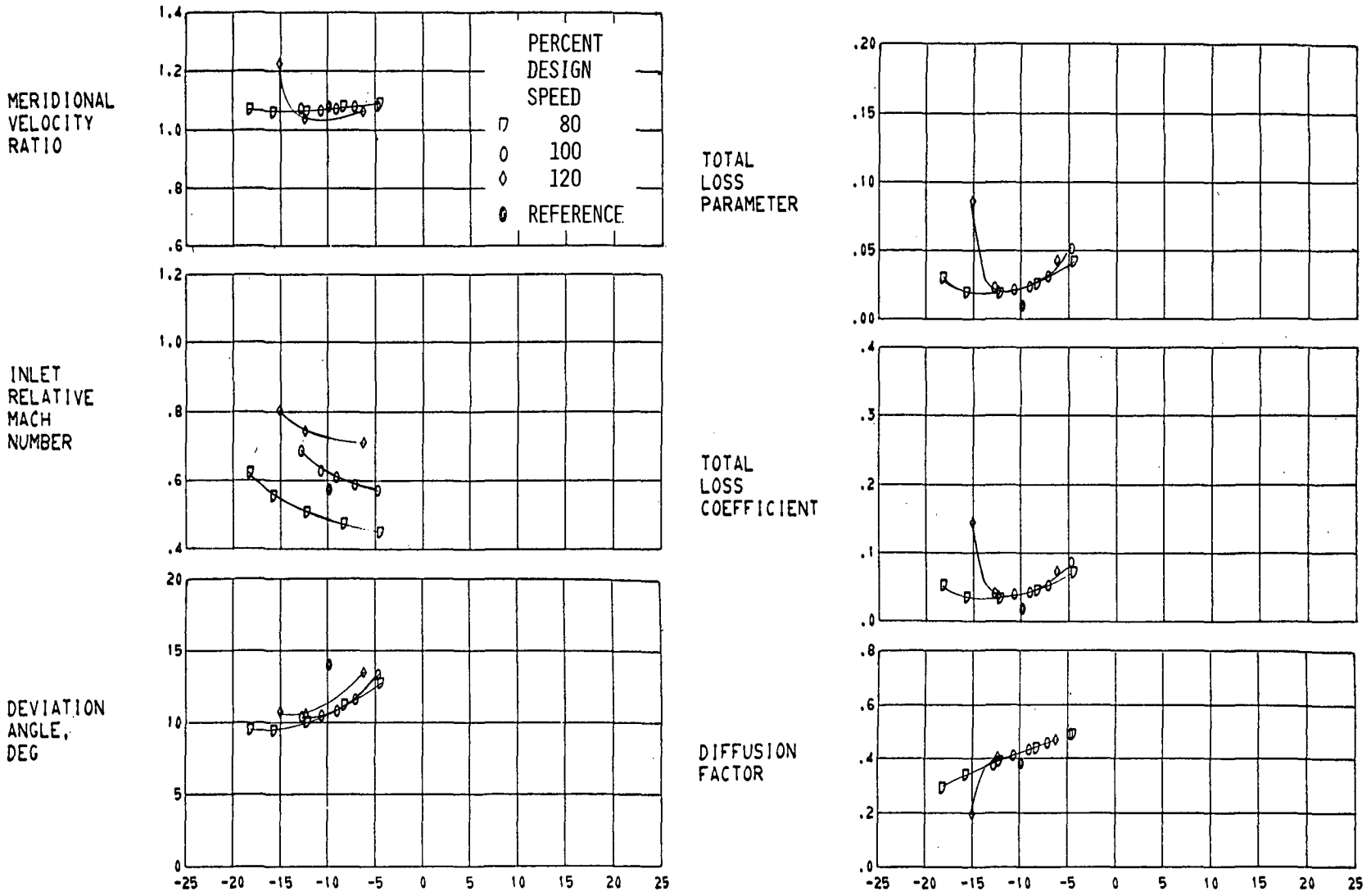
(A) 5 PERCENT SPAN.

FIGURE 10. - BLADE-ELEMENT PERFORMANCE FOR STATOR 55.



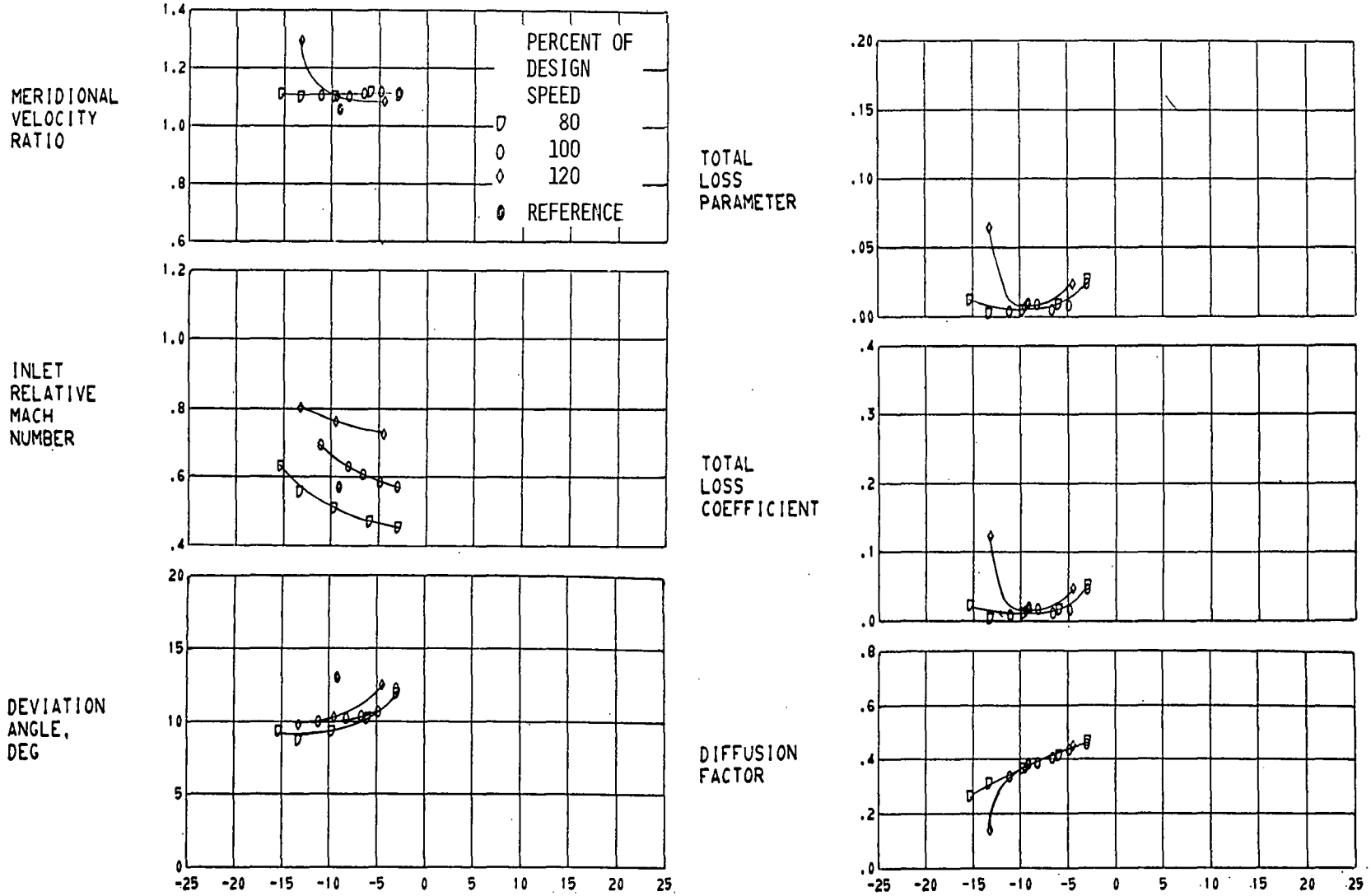
(B) 10 PERCENT SPAN.

FIGURE 10. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR STATOR 55.



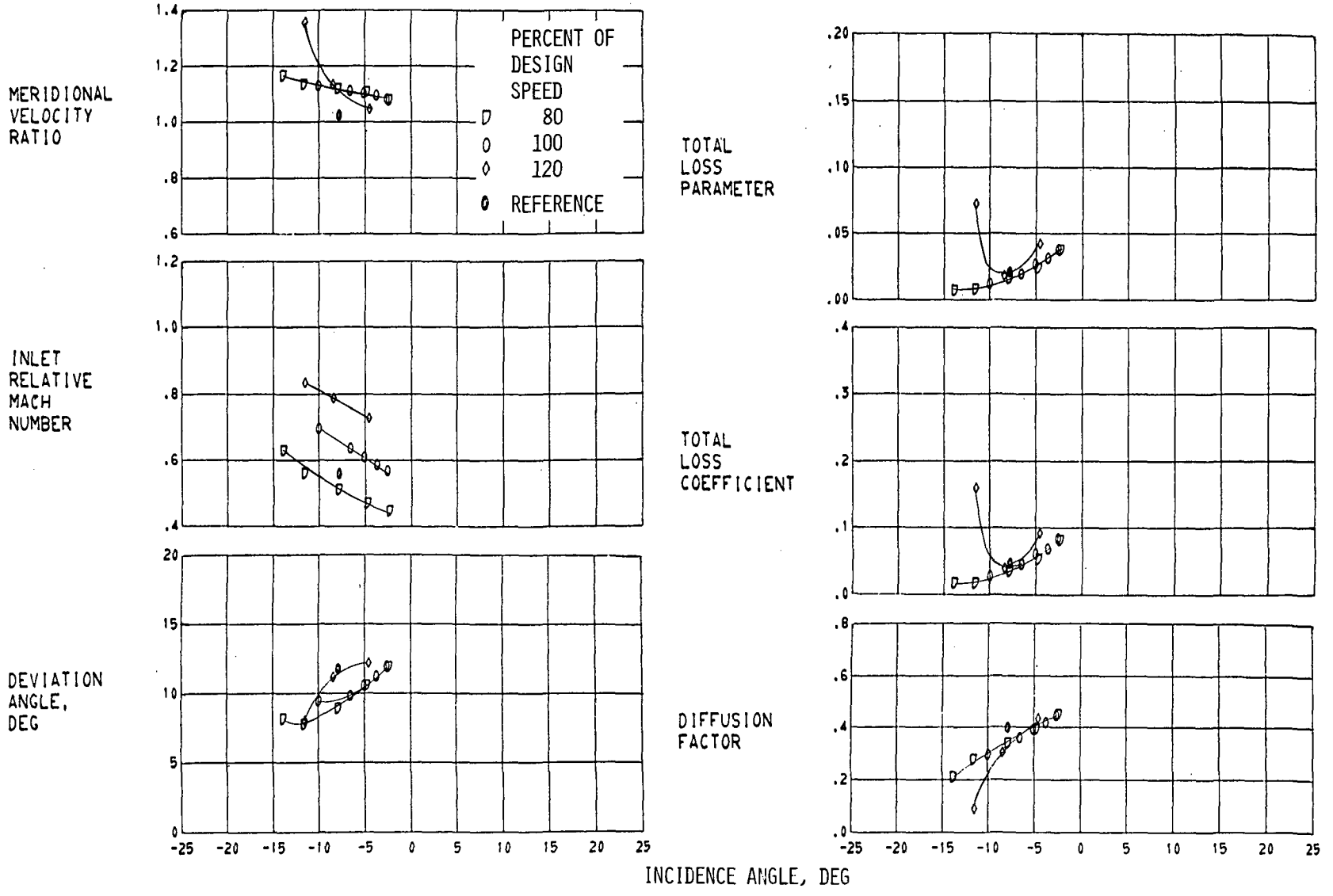
(C) 30 PERCENT SPAN.

FIGURE 10. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR STATOR 55.



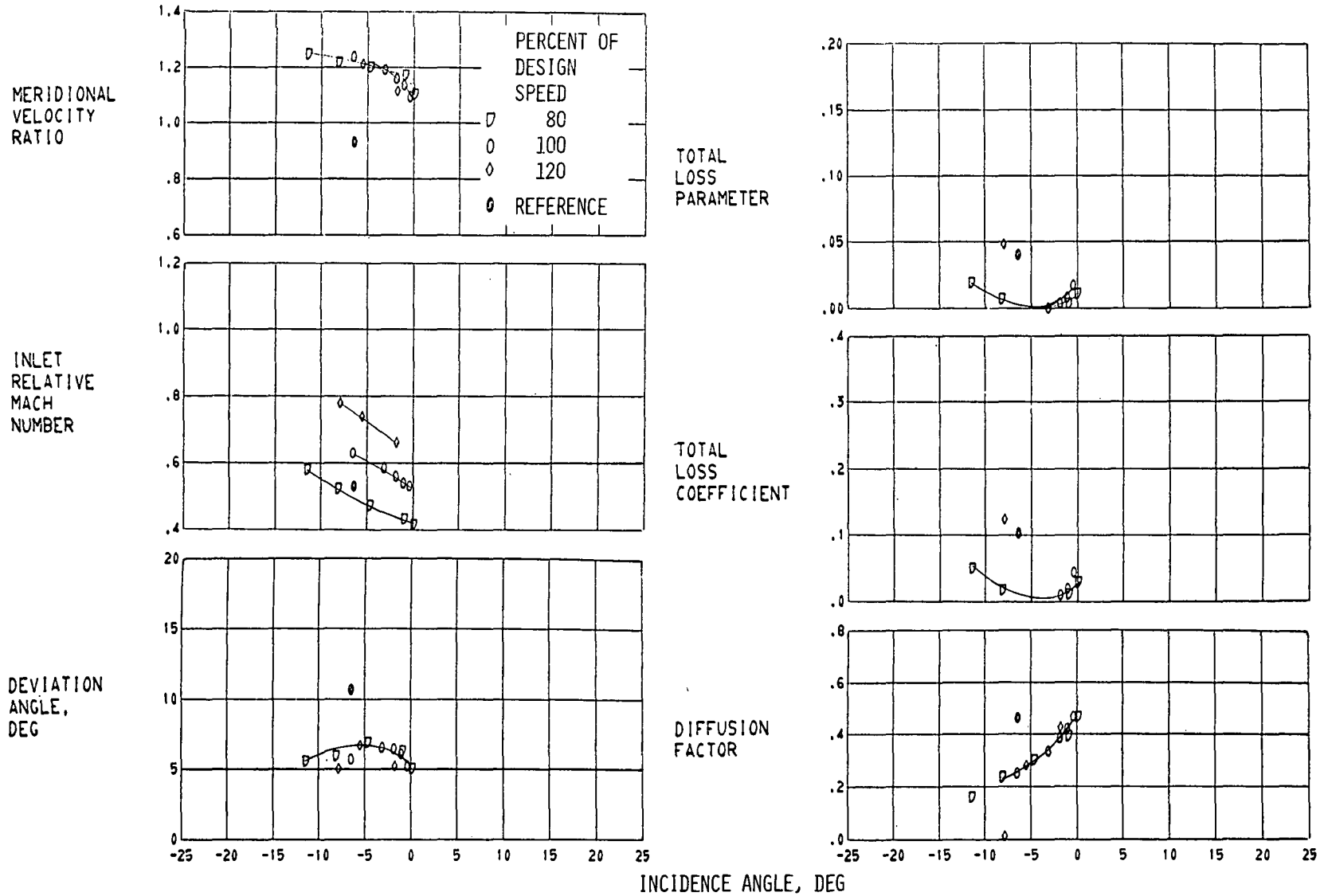
(D) 50 PERCENT SPAN.

FIGURE 10. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR STATOR 55.



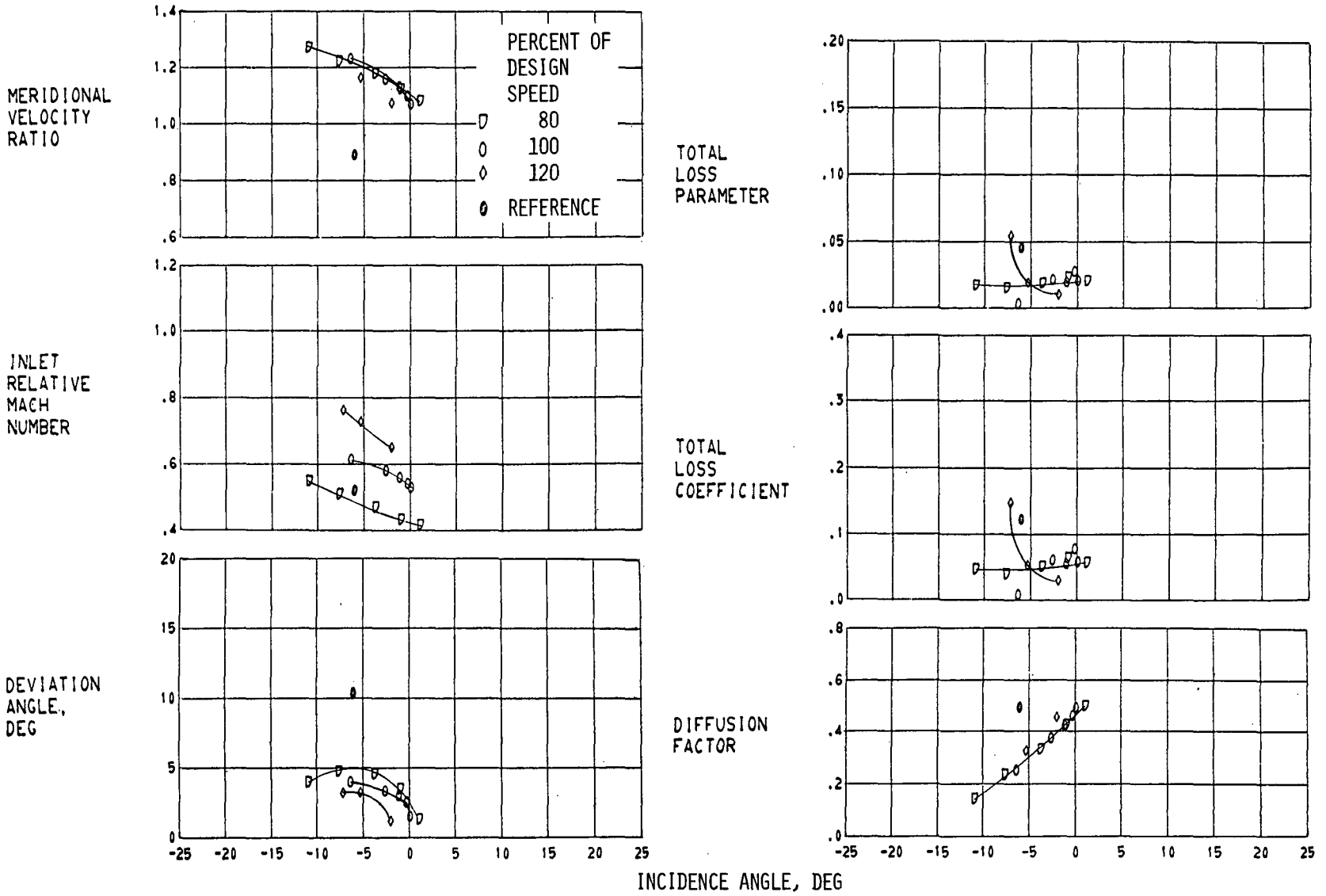
(E) 70 PERCENT SPAN.

FIGURE 10. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR STATOR 55.



(F) 90 PERCENT SPAN.

FIGURE 10. - CONTINUED. BLADE-ELEMENT PERFORMANCE FOR STATOR 55.



(G) 95 PERCENT SPAN.

FIGURE 10. - CONCLUDED. BLADE-ELEMENT PERFORMANCE FOR STATOR 55.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

SPECIAL FOURTH-CLASS RATE BOOK

POSTAGE AND FEES PAID
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
451

U.S.MAIL

POSTMASTER: If Undeliverable (Section 158 Postal Manual) Do Not Return

"The aeronautical and space activities of the United States shall be conducted so as to contribute . . . to the expansion of human knowledge of phenomena in the atmosphere and space. The Administration shall provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."

—NATIONAL AERONAUTICS AND SPACE ACT OF 1958

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS

TECHNICAL REPORTS: Scientific and technical information considered important, complete, and a lasting contribution to existing knowledge.

TECHNICAL NOTES: Information less broad in scope but nevertheless of importance as a contribution to existing knowledge.

TECHNICAL MEMORANDUMS: Information receiving limited distribution because of preliminary data, security classification, or other reasons. Also includes conference proceedings with either limited or unlimited distribution.

CONTRACTOR REPORTS: Scientific and technical information generated under a NASA contract or grant and considered an important contribution to existing knowledge.

TECHNICAL TRANSLATIONS: Information published in a foreign language considered to merit NASA distribution in English.

SPECIAL PUBLICATIONS: Information derived from or of value to NASA activities. Publications include final reports of major projects, monographs, data compilations, handbooks, sourcebooks, and special bibliographies.

TECHNOLOGY UTILIZATION PUBLICATIONS: Information on technology used by NASA that may be of particular interest in commercial and other non-aerospace applications. Publications include Tech Briefs, Technology Utilization Reports and Technology Surveys.

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546