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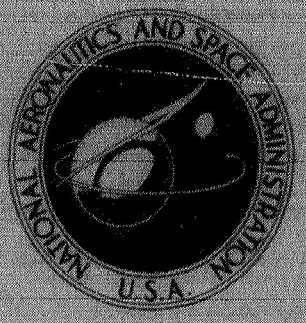

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PERFORMANCE OF LOW-PRESSURE-RATIO FAN STAGE AT TWO OFF-DESIGN BLADE SETTING ANGLES

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16. Abstract

The overall and blade-element performance of a low pressure ratio, low tip speed fan stage at design speed is presented for two off-design rotor blade angle settings. The rotor design tip speed is 243.8 m/sec and weight flow per unit annulus area is 175.8 kg/sec. Design weight flow and pressure ratio are 29.9 kg/sec and 1.151, respectively.

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SUMMARY

The overall and blade-element performance are presented for a low pressure ratio fan stage at two off-design rotor blade setting angles. The rotor design tip speed is 243.8 meters per second and the weight flow per unit annulus area is 175.8 kilograms per second. Design value of weight flow and pressure ratio are 29.9 kilograms per second and 1.51, respectively. Rotor experimental peak efficiency of 0.918 occurred at a weight flow of 32.41 kilograms per second.

At design speed for a $+3^{\circ}$ (closed) rotor blade setting angle, rotor peak efficiency was 0.943 at a weight flow of 30.25 kilograms per second; for a -3° (opened) rotor blade setting angle, rotor peak efficiency was 0.907 at a weight flow of 34.01 kilograms per second.

At the peak efficiency weight flows, radial distributions of rotor suction surface incidence angles for the two off-design settings agreed within about 1° of the design reference values. Radial distributions of rotor deviation angles also agreed within $\pm 1^{\circ}$.

Rotor and stator losses were relatively low and did not vary significantly over the range of incidence angles when the rotor blade setting angle was changed.

INTRODUCTION

NASA is currently engaged in investigating short-haul-type aircraft for commercial application. These aircraft must be dependable, economical, and have an efficient and reliable propulsion system which satisfies the low noise requirement for urban communities. The aircraft engines must be capable of a variety of operating conditions including takeoff, cruise, and approach, as well as possible thrust reversal on landing.

In support of this program, the Lewis Research Center is investigating a variety of fan stages for short-haul engines. Fans under investigation may have adjustable rotor

blades to provide for varied flight demands with optimum fan performance. A reduced number of rotor blades and low solidity permit using devices for changing the rotor blade setting angle during engine operation. In addition, reverse pitch may be used for reverse thrust braking after landing thereby eliminating the weight penalty of conventional aircraft thrust reversers.

A 51-centimeter-diameter experimental fan stage incorporating provisions for manually adjusting the rotor blade setting angle has been designed, fabricated, and tested. The performance with the rotor blades at design setting angle is reported in reference 1.

This report presents the performance of the fan stage of reference 1 (designated stage 51BA-51) when the rotor blades were set at two off-design angle settings. In the first configuration (designated stage 51BC-51), the rotor blade setting angle, measured from the axial direction, was increased 3° (closed) from design. In the second configuration (designated stage 51BB-51) the rotor blade setting angle was decreased 3° (opened) from design.

Overall performance for both rotor and stage along with blade-element performance for both rotor and stator are presented for both configurations tested. The data are presented over the stable operating flow range at design speed.

AERODYNAMIC DESIGN

The design of the fan stage 51BA-51 used in this investigation is discussed in detail in reference 1. The stage was designed for an overall pressure ratio of 1.151 at a weight flow of 29.9 kilograms per second (175.8 $kg/sec/m^2$ of annulus area). The design rotor tip speed is 243.8 meters per second. The flow path of the stage is shown in figure 1. The convention designating rotor blade setting angles is also illustrated in figure 1. There are 12 rotor blades having a solidity of 0.65 at the tip, increasing to a value of 0.98 at the hub. Having a solidity of less than unity allows the blades to pass through "flat pitch" for reverse thrust applications. The aspect ratio of the rotor blade based on chord at the hub is 2.9. There are 32 stator blades with a hub solidity of 2.48. The stator blade aspect ratio is 3.1.

All significant design parameters for fan stage 51BA-51 are listed in tables I to V. The symbols are defined in appendix A. The equations used for calculating the overall and blade-element performance parameters are presented in appendix B. All abbreviations along with units presented in the tables are listed in appendix C.

APPARATUS AND PROCEDURE

Compressor Test Facility

The compressor stage was tested in the Lewis single-stage compressor facility, which is described in detail in reference 2. A schematic diagram of the facility is shown in figure 2. Atmospheric air enters the test facility at an inlet located on the roof of the building and flows 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.

Test Stage

The rotor 51B and stator 51 are shown in figures 3 and 4, respectively. The rotor blades are mounted in a split rotor disk with the blades prevented from turning by friction pins in each half of the disk. The compression of the friction pins against the blade bases is adjustable from the front side of the rotor disk allowing the blade angle to be reset without disassembling the rotor. The ambient nonrotating radial tip clearance of the rotor was a nominal 0.05 centimeter at the stacking line. However, the radial tip clearances at the leading and trailing edges of the blades were approximately three times greater due to the convex contour of the blade tip. The stator blade leading edge was located two rotor hub chord lengths behind the rotor blade trailing edge.

Instrumentation

The fan stage weight flow was determined from measurements on a calibrated thin-plate orifice. The temperature at the orifice was measured with two chromel-constantan thermocouples. Pressures at the orifice were measured by calibrated transducers.

Radial surveys of the flow were made upstream of the rotor, between the rotor and the stator, and downstream of the stator (fig. 1). The survey probes are shown in figure 5. Total pressure, total temperature, and flow angle were measured with the combination probe (fig. 5(a)), and static pressure was measured with an 8° C-shaped wedge probe (fig. 5(b)). Each probe was positioned with a null-balancing, stream-directional sensitive control system that automatically alined the probe to the direction of the flow. The probes were angularly pre-alined in an air tunnel. Two combination probes and two wedge probes were used at each measuring station. The probe thermocouple material was chromel-constantan. The temperatures downstream of the rotor and stator were

measured as differences above temperatures upstream of the rotor.

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 6. The combination probes downstream of the stator (station 3) were circumferentially traversed one stator blade passage (11.2°) counterclockwise from the nominal values shown. All pressures were obtained with calibrated strain-gage transducers.

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 system are as follows:

Weight 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

An indication of the consistency of the data can be observed by comparing the integrated weight flow at each measuring station to the orifice weight flow.

Test Procedure

The stage survey data were taken over a range of weight flows from maximum flow to the near-stall conditions at design speed. Data were recorded at nine radial positions for each 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 two wedge probes were set at midgap because previous studies showed that the static pressure across the stator gap was constant. Values of pressure, 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 traversed to the next radial position and the circumferential traverse procedure repeated.

For each configuration the backpressure on the stage was increased by closing the sleeve valve in the collector until a drop in total pressure at the blade tip was detected. This was accomplished by comparing the radial distribution of discharge total pressures between succeeding on-line computer printouts obtained as the valve was closed. This point was arbitrarily taken as the limit of stable operation at the low end of the weight flow range and usually occurred before any definite indications of stall were observed such as change in noise level or increase in blade stresses.

Calculation Procedure

Measured total temperatures and total pressures were corrected for Mach number and streamline slope. These corrections were based on instrument probe calibrations given in reference 3. 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. The static pressure at 95 percent of 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 of span. A linear variation was also assumed between the static pressure measurements at the outer wall and the 15-percent span to obtain the static pressure at 5 and 10 percent of span.

At each radial position, averaged values of the nine circumferential measurements of pressure, temperature, and flow angle downstream of the stator (station 3) were obtained. The nine values of total temperature were mass-averaged to obtain the stator-outlet total temperature presented. 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 were calculated based on these mass-averaged 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.

The data, measured at the three measuring stations, have been translated to the blade leading and trailing edges by the method presented in reference 2.

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

RESULTS AND DISCUSSION

The results of this investigation are presented in three main sections. The overall performance at design speed for both rotor and stage are compared at the two off-design rotor blade settings with the overall performance at the design setting angle. Radial distributions of several performance parameters for both rotor and stator of each configuration are then compared. Finally comparisons of blade-element data for rotor and stator of each configuration are made. The data presented are computer plotted, and occasionally a data point is omitted when it falls outside the range of parameters shown in the figures.

All of the plotted data together with some additional parameters are presented in tabular form for each off-design stage configuration. The overall performance data are presented in table VI. The blade-element data are presented first for the rotor in tables VII to IX and then for the stator in tables X to XII. The definitions and units used for the tabular data are presented in appendix C.

Overall Performance

The overall performance for the rotor at the two off-design blade settings are shown in figure 7 and for the stage in figure 8. The overall performance at design rotor blade setting (ref. 1) is also shown for comparison. Data are presented for several weight flows at design speed.

The step which occurs in both rotor and stage performance curves has been discussed in reference 1; a rapid forward movement of the flow separation point on the suction surface of the rotor blade may be occurring over a small portion of the suction surface incidence range.

As was expected weight flow increased with the opened rotor blade setting angle and decreased with the closed blade setting angle. Maximum flow increased 1.5 kilograms per second with the -3° (opened) rotor blade setting angle and decreased 1.5 kilograms per second with the $+3^{\circ}$ (closed) blade setting angle. Rotor peak efficiency at design setting angle was 0.918 (ref. 1). Rotor peak efficiency increased 2.5 points for the closed rotor blade setting angle and decreased 1.1 points for the open setting angle. For the $+3^{\circ}$ (closed) rotor blade setting angle, rotor peak efficiency pressure ratio was 1.134 at a weight flow of 30.25 kilograms per second and for the -3° (opened) setting angle, 1.148 at a weight flow of 34.01 kilograms per second.

The trends in stage performance were similar to those for the rotor for corresponding changes in rotor blade setting angles.

Radial Distributions

The radial distributions of selected flow and performance parameters at design speed for both rotor and stator are shown in figures 9 and 10. The results are presented for the two off-design configurations at the peak efficiency flow rates. Radial distributions of flow and performance for the design configuration are included for reference.

Rotor. - In general, the changes in radial distribution of the flow and performance parameters occurred evenly over the entire blade span. Some small differences were noted in the extreme hub and tip regions. For example, the decrease in rotor efficiency in the hub region as the rotor is reset is the greatest as the angle is changed from $+3^{\circ}$ to design angle. At peak efficiencies the suction surface incidence angles agreed within about 1° with the reference values over the entire blade span. The diffusion factor radial distribution did not change over the range of blade setting angles although the total loss parameters showed small increases with the increases in weight flow over the range of blade setting angles tested. Deviation angles for each configuration agreed with the reference values within about 1°.

Stator. - Radial distribution of suction surface incidence angles were unchanged from design for each configuration. No significant changes from design in radial distribution of the stator performance parameters occurred with the change of rotor blade setting angles. For all three rotor setting angles, the losses seemed to rise rapidly in the hub region from 85 to 95 percent span. Losses in the tip region were also high.

Variations with Incidence Angle

The variations of selected blade-element performance parameters are presented in figure 11 for the rotor and in figure 12 for the stator. The data are presented for the two off-design configurations for 100 percent design speed at the 5, 10, 30, 50, 70, 90, and 95 percent of blade span (measured from the tip). Data for the design stage configuration is included for comparison.

Measured suction-surface incidence angles corresponding to minimum losses were not conclusively defined for either the rotor or stator. The blade elements for rotor 51B seem to be mismatched. At 90 and 95 percent spans, peak efficiency occurs near minimum flow whereas at 30, 50, and 70 percent span, it occurs near maximum flow. At 5 and 10 percent span locations, peak efficiency occurred at about midflow. This mismatch was observed with all three rotor setting angles. For each element peak efficiency was highest for the design $+3^{\circ}$ angle. This may be due to lower inlet relative Mach numbers and lower choke margins as the blades were closed down. The change

in slope of the pressure ratio curve observed in the overall rotor performance plot is also observed in the blade-element curves. The greatest changes were noted in the midspan of the blade and less pronounced in the end regions.

SUMMARY OF RESULTS

The overall and blade-element performance are presented for a low pressure ratio fan stage at two off-design rotor blade setting angles. The first fan stage rotor blade setting angle measured from the axial direction was closed 3° from design and the second was opened 3° from design. Design values of weight flow, pressure ratio, and temperature ratio are 29.9 kilograms per second, 1.151, and 1.047, respectively. The rotor design tip speed is 243.8 meters per second, and the weight flow per unit annulus area is 175.8 kilograms per second. Rotor peak efficiency for the design configuration was 0.918 at a weight flow of 32.41 kilograms per second. The following principal results were obtained:

1. At design speed, the rotor peak efficiency for the off-design fan stage with rotor blades 3° closed was 0.943 at a weight flow of 30.25 kilograms per second. The rotor peak efficiency for the off-design fan stage with rotor blades 3° opened was 0.905 at a weight flow of 34.01 kilograms per second.

2. The radial distributions of rotor suction surface incidence angles at the peak efficiency weight flows were within about 1° of the reference design values. The radial distributions of rotor deviation angles were essentially unchanged with reset (within about 1°). Stator suction surface incidence angles were unchanged with rotor blade reset.

3. Stator losses were relatively constant for each configuration.

Lewis Research Center,
National Aeronautics and Space Administration,
Cleveland, Ohio, November 5, 1976,
505-04.

APPENDIX A

SYMBOLS

A_{an} annulus area at rotor leading edge, m^2

A_f frontal area at rotor leading edge, m^2

C_p specific heat at constant pressure, 1004 J/kg/K

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

i_{ss} suction-surface incidence angle, angle between inlet air direction and line tangent to blade suction surface 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 referenced 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, $\arctan(\tan \beta'_m \cos \alpha_c / \cos \alpha_s)$, deg

γ ratio of specific heats

γ_b blade setting angle

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

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

η efficiency

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

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

κ_{ss} angle between blade suction-surface camber line at leading edge and meridional plane, deg

σ solidity, ratio of chord to spacing

$\overline{\omega}$ total loss coefficient

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

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

Subscripts:

ad adiabatic (temperature rise)

id ideal

LE blade leading edge

m meridional direction

mom momentum-rise

p polytropic

r radial direction

TE blade trailing edge

tip tip

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

Suction-surface incidence angle:

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

Mean incidence angle:

$$i_{mc} = \left(\beta'_c\right)_{LE} - \left(\kappa_{mc}\right)_{LE} \tag{B2}$$

Deviation angle:

$$\delta^o = \left(\beta'_c\right)_{TE} - \left(\kappa_{mc}\right)_{TE} \tag{B3}$$

Diffusion factor:

$$D = 1 - \frac{V'_{TE}}{V'_{LE}} + \left| \frac{\left(rV_\theta\right)_{TE} - \left(rV_\theta\right)_{LE}}{(r_{TE} + r_{LE})\sigma(V'_{LE})} \right| \tag{B4}$$

Total loss coefficient:

$$\overline{\omega} = \frac{\left(P'_{id}\right)_{TE} - P'_{TE}}{P'_{LE} - p_{LE}} \tag{B5}$$

Profile loss coefficient:

$$\overline{\omega}_p = \overline{\omega} - \overline{\omega}_s \tag{B6}$$

Total loss parameter:

$$\frac{\overline{\omega} \cos \left(\beta'_m\right)_{TE}}{2\sigma} \tag{B7}$$

Profile loss parameter:

$$\frac{\overline{\omega}_p \cos\left(\beta'_m\right)_{TE}}{2\sigma} \tag{B8}$$

Adiabatic (temperature-rise) efficiency:

$$\eta_{ad} = \frac{\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1}{\frac{T_{TE}}{T_{LE}} - 1} \tag{B9}$$

Momentum-rise efficiency:

$$\eta_{mom} = \frac{\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1}{\frac{\left(UV_\theta\right)_{TE} - \left(UV_\theta\right)_{LE}}{T_{LE}C_p}} \tag{B10}$$

Equivalent weight flow:

$$\frac{W\sqrt{\theta}}{\delta} \tag{B11}$$

Equivalent rotative speed:

$$\frac{N}{\sqrt{\theta}} \tag{B12}$$

Weight flow per unit annulus area:

$$\frac{\frac{W\sqrt{\theta}}{\delta}}{A_{an}} \tag{B13}$$

Weight flow per unit frontal area:

$$\frac{\frac{W\sqrt{\theta}}{\delta}}{A_f} \tag{B14}$$

Head-rise coefficient:

$$\frac{C_p T_{LE}}{U_{tip}^2}\left[\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1\right] \tag{B15}$$

Flow coefficient:

$$\left(\frac{V_z}{U_{tip}}\right)_{LE} \tag{B16}$$

Polytropic efficiency:

$$\eta_p = \frac{\ln\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma}}{\ln \frac{T_{TE}}{T_{LE}}} \tag{B17}$$

APPENDIX C

DEFINITIONS AND UNITS USED IN TABLES

ABS	absolute
AERO CHORD	aerodynamic chord, cm
AREA RATIO	ratio of actual minimum flow area to critical area (where local Mach number is 1)
BETAM	meridional air angle, deg
CONE ANGLE	angle between axial direction and conical surface representing blade element, deg
DELTA INC	difference between mean camber blade angle and suction-surface blade angle at leading edge, deg
DEV	deviation angle (defined by eq. (B3)), deg
D-FACT	diffusion factor (defined by eq. (B4))
EFF	adiabatic efficiency (defined by eq. (B9))
IN	inlet (leading edge of blade)
INCIDENCE	incidence angle (suction surface defined by eq. (B1) and mean defined by eq. (B2)), deg
KIC	angle between blade mean camber line at leading edge and meridional plane, deg
KOC	angle between blade mean camber line at trailing edge and meridional plane, deg
KTC	angle between blade mean camber line at transition point and meridional plane, deg
LOSS COEFF	loss coefficient (total defined by eq. (B5) and profile defined by eq. (B6))
LOSS PARAM	loss parameter (total defined by eq. (B7) and profile defined by eq. (B8))
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 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 of 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

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TABLE I. - DESIGN OVERALL PARAMETERS

FOR FAN STAGE 51B-51

ROTOR TOTAL PRESSURE RATIO.....	1.159
STAGE TOTAL PRESSURE RATIO	1.151
ROTOR TOTAL TEMPERATURE RATIO.....	1.047
STAGE TOTAL TEMPERATURE RATIO	1.047
ROTOR ADIABATIC EFFICIENCY.....	0.911
STAGE ADIABATIC EFFICIENCY	0.865
ROTOR POLYTROPIC EFFICIENCY.....	0.913
STAGE POLYTROPIC EFFICIENCY	0.868
ROTOR HEAD RISE COEFFICIENT.....	0.210
STAGE HEAD RISE COEFFICIENT	0.199
FLOW COEFFICIENT.....	0.681
WT FLOW PER UNIT FRONTAL AREA	147.704
WT FLOW PER UNIT ANNULUS AREA.....	175.838
WT FLOW	29.937
RPM.....	9167.300
TIP SPEED	243.839

TABLE II. - DESIGN BLADE-ELEMENT PARAMETERS FOR ROTOR 51A

	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.	24.4	55.3	48.9	288.2	1.058	10.14	1.184
1	24.647	24.638	-0.	24.5	54.5	47.5	288.2	1.057	10.14	1.183
2	23.868	23.876	0.	24.6	53.6	46.0	288.2	1.056	10.14	1.183
3	23.085	23.114	0.	24.8	52.7	44.5	288.2	1.055	10.14	1.182
4	20.732	20.828	0.	25.6	49.8	39.5	288.2	1.051	10.14	1.175
5	17.607	17.780	0.	27.1	45.5	31.6	288.2	1.046	10.14	1.159
6	14.533	14.732	0.	28.9	40.6	22.2	288.2	1.040	10.14	1.134
7	12.294	12.446	0.	30.0	36.2	14.2	288.2	1.034	10.14	1.111
8	11.565	11.684	0.	30.2	34.7	11.6	288.2	1.032	10.14	1.102
9	10.844	10.922	0.	30.3	33.0	9.0	288.2	1.030	10.14	1.092
HUB	10.160	10.160	-0.	30.4	31.4	6.3	288.2	1.028	10.14	1.083

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	169.0	167.5	296.7	231.8	169.0	152.5	0.	69.2	243.8	243.8
1	169.0	168.2	290.8	226.3	169.0	153.0	-0.	69.8	236.6	236.5
2	168.9	168.8	284.7	220.8	168.9	153.4	0.	70.4	229.1	229.2
3	168.8	169.3	278.6	215.3	168.8	153.7	0.	71.1	221.6	221.9
4	168.0	170.1	260.5	198.8	168.0	153.4	0.	73.5	199.0	199.9
5	165.9	169.9	236.8	177.6	165.9	151.2	0.	77.5	169.0	170.7
6	163.0	168.3	214.6	159.1	163.0	147.3	0.	81.4	139.5	141.4
7	161.0	166.0	199.6	148.2	161.0	143.7	0.	83.0	118.0	119.5
8	160.5	164.8	195.2	145.4	160.5	142.4	0.	82.9	111.0	112.2
9	160.2	163.5	191.0	142.9	160.2	141.1	0.	82.5	104.1	104.9
HUB	159.8	162.1	187.2	140.7	159.8	139.9	-0.	82.0	97.5	97.5

	ABS MACH NO		REL MACH NO		MERID MACH NO		STREAMLINE SLOPE		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
TIP	0.509	0.490	0.894	0.678	0.509	0.446	-0.22	-0.28	0.903	1.233
1	0.509	0.492	0.876	0.662	0.509	0.448	-0.07	-0.13	0.906	1.199
2	0.509	0.494	0.858	0.647	0.509	0.449	0.09	0.03	0.908	1.166
3	0.509	0.496	0.840	0.631	0.509	0.450	0.27	0.21	0.910	1.136
4	0.506	0.500	0.785	0.584	0.506	0.451	0.83	0.78	0.913	1.015
5	0.499	0.500	0.713	0.523	0.499	0.445	1.46	1.46	0.912	0.764
6	0.490	0.497	0.645	0.470	0.490	0.435	1.67	1.76	0.904	0.645
7	0.484	0.491	0.600	0.438	0.484	0.425	1.31	1.48	0.892	0.600
8	0.483	0.488	0.587	0.430	0.483	0.422	1.04	1.20	0.887	0.587
9	0.481	0.484	0.574	0.423	0.481	0.418	0.70	0.84	0.881	0.574
HUB	0.480	0.481	0.563	0.417	0.480	0.415	0.37	0.47	0.875	0.563

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
TIP	0.	-1.0	-5.6	5.5	0.398	0.846	0.072	0.072	0.037	0.036
1	5.00	-1.0	-5.6	5.3	0.405	0.865	0.064	0.064	0.033	0.033
2	10.00	-0.8	-5.7	5.2	0.411	0.882	0.057	0.057	0.030	0.030
3	15.00	-0.7	-5.9	5.5	0.417	0.896	0.050	0.050	0.027	0.027
4	30.00	-0.1	-7.2	7.2	0.439	0.929	0.036	0.036	0.020	0.020
5	50.00	1.0	-9.3	10.4	0.470	0.941	0.031	0.031	0.018	0.018
6	70.00	2.2	-11.2	14.0	0.494	0.922	0.043	0.043	0.024	0.024
7	85.00	3.1	-11.8	13.8	0.494	0.887	0.060	0.060	0.033	0.033
8	90.00	3.5	-11.7	12.6	0.489	0.872	0.067	0.067	0.036	0.036
9	95.00	3.8	-11.6	10.9	0.481	0.854	0.074	0.074	0.039	0.039
HUB	100.00	4.1	-11.5	9.0	0.471	0.832	0.081	0.081	0.041	0.041

TABLE III. - DESIGN BLADE-ELEMENT PARAMETERS FOR STATOR 51

	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	23.4	-0.	23.4	-0.	305.0	1.000	12.00	0.993
1	24.595	24.608	23.5	0.	23.5	0.	304.6	1.000	11.99	0.994
2	23.861	23.887	23.6	-0.	23.6	-0.	304.2	1.000	11.99	0.994
3	23.128	23.166	23.8	-0.	23.8	-0.	303.9	1.000	11.98	0.994
4	20.917	20.995	24.7	-0.	24.7	-0.	302.8	1.000	11.91	0.994
5	17.955	18.080	26.6	-0.	26.6	-0.	301.3	1.000	11.74	0.993
6	14.946	15.110	29.0	-0.	29.0	-0.	299.6	1.000	11.50	0.992
7	12.647	12.787	30.7	-0.	30.7	-0.	298.1	1.000	11.26	0.990
8	11.870	11.967	31.1	-0.	31.1	-0.	297.4	1.000	11.17	0.989
9	11.087	11.125	31.3	-0.	31.3	-0.	296.8	1.000	11.07	0.987
HUB	10.160	10.160	31.6	0.	31.6	0.	296.0	1.000	10.96	0.986

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	174.6	161.8	174.6	161.8	160.2	161.8	69.4	-0.	0.	0.
1	175.2	161.7	175.2	161.7	160.6	161.7	69.9	0.	0.	0.
2	175.6	161.4	175.6	161.4	160.8	161.4	70.4	-0.	0.	0.
3	175.7	161.0	175.7	161.0	160.8	161.0	71.0	-0.	0.	0.
4	175.1	158.4	175.1	158.4	159.0	158.4	73.1	-0.	0.	0.
5	171.6	151.7	171.6	151.7	153.5	151.7	76.7	-0.	0.	0.
6	165.6	140.7	165.6	140.7	144.9	140.7	80.2	-0.	0.	0.
7	160.0	128.1	160.0	128.1	137.6	128.1	81.7	-0.	0.	0.
8	158.2	122.2	158.2	122.2	135.5	122.2	81.6	-0.	0.	0.
9	156.3	115.5	156.3	115.5	133.5	115.5	81.3	-0.	0.	0.
HUB	154.1	107.8	154.1	107.8	131.2	107.8	80.8	0.	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		STREAMLINE SLOPE		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
TIP	0.512	0.472	0.512	0.472	0.469	0.472	-0.07	-0.04	1.010	0.512
1	0.514	0.472	0.514	0.472	0.471	0.472	0.10	0.13	1.007	0.514
2	0.515	0.472	0.515	0.472	0.472	0.472	0.24	0.27	1.004	0.515
3	0.516	0.471	0.516	0.471	0.472	0.471	0.38	0.41	1.001	0.516
4	0.515	0.464	0.515	0.464	0.468	0.464	0.79	0.81	0.996	0.515
5	0.506	0.444	0.506	0.444	0.452	0.444	1.30	1.30	0.988	0.506
6	0.489	0.412	0.489	0.412	0.427	0.412	1.68	1.61	0.971	0.489
7	0.473	0.375	0.473	0.375	0.406	0.375	1.44	1.31	0.931	0.473
8	0.467	0.358	0.467	0.358	0.400	0.358	1.02	0.91	0.902	0.467
9	0.462	0.338	0.462	0.338	0.395	0.338	0.44	0.34	0.865	0.462
HUB	0.456	0.315	0.456	0.315	0.388	0.315	-0.26	-0.31	0.821	0.456

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
TIP	0.	9.2	-0.0	4.1	0.274	0.	0.041	0.041	0.020	0.020
1	5.00	9.2	-0.0	4.1	0.272	0.	0.039	0.039	0.019	0.019
2	10.00	9.2	-0.0	4.0	0.270	0.	0.037	0.037	0.018	0.018
3	15.00	9.2	-0.0	4.0	0.270	0.	0.037	0.037	0.017	0.017
4	30.00	9.2	-0.0	4.0	0.269	0.	0.038	0.038	0.016	0.016
5	50.00	9.2	-0.0	4.1	0.276	0.	0.045	0.045	0.016	0.016
6	70.00	9.1	-0.0	4.2	0.294	0.	0.056	0.056	0.017	0.017
7	85.00	9.1	0.0	4.2	0.328	0.	0.072	0.072	0.018	0.018
8	90.00	9.1	0.0	4.1	0.349	0.	0.081	0.081	0.019	0.019
9	95.00	9.1	0.0	4.0	0.375	0.	0.092	0.092	0.020	0.020
HUB	100.00	9.1	0.0	3.9	0.406	0.	0.106	0.106	0.021	0.021

TABLE IV. - BLADE GEOMETRY FOR ROTOR 51B A

RP	PERCENT SPAN	RADII RI	RO	BLADE ANGLES KIC	KTC	KOC	DELTA INC	CONE ANGLE
TIP	0.	25.400	25.400	56.30	49.79	43.33	4.58	0.057
1	5.	24.647	24.638	55.42	48.81	42.20	4.66	-0.093
2	10.	23.868	23.876	54.45	47.61	40.77	4.88	0.082
3	15.	23.085	23.114	53.40	46.18	38.96	5.25	0.290
4	30.	20.732	20.828	49.93	41.12	32.31	7.07	0.959
5	50.	17.607	17.780	44.49	32.84	21.19	10.36	1.698
6	70.	14.533	14.732	38.37	23.30	8.20	13.41	1.993
7	85.	12.294	12.446	33.12	16.79	0.44	14.90	1.590
8	90.	11.565	11.684	31.20	15.12	-0.99	15.19	1.273
9	95.	10.844	10.922	29.21	13.68	-1.88	15.39	0.853
HUB	100.	10.160	10.160	27.30	12.33	-2.70	15.56	0.057

RP	BLADE THICKNESSES TI	TM	TO	AXIAL DIMENSIONS ZI	ZMC	ZTC	ZO
TIP	0.086	0.429	0.086	-0.155	2.460	2.460	5.445
1	0.083	0.430	0.083	-0.157	2.461	2.461	5.443
2	0.086	0.441	0.086	-0.165	2.461	2.461	5.450
3	0.098	0.464	0.098	-0.181	2.460	2.460	5.467
4	0.121	0.584	0.121	-0.232	2.455	2.455	5.521
5	0.159	0.779	0.157	-0.271	2.455	2.455	5.556
6	0.189	0.923	0.177	-0.241	2.466	2.466	5.490
7	0.186	0.944	0.187	-0.148	2.479	2.479	5.339
8	0.184	0.933	0.186	-0.103	2.483	2.483	5.271
9	0.182	0.914	0.183	-0.051	2.486	2.486	5.194
HUB	0.179	0.896	0.179	0.	2.490	2.490	5.116

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	X FACTOR	PHISS	AREA RATIO
TIP	8.629	49.80	12.97	0.649	1.000	13.99	0.
1	8.460	48.81	13.22	0.656	1.000	13.71	-0.015
2	8.287	47.61	13.68	0.663	1.000	13.56	0.028
3	8.115	46.18	14.44	0.671	1.000	13.58	0.138
4	7.599	41.13	17.62	0.698	1.000	13.18	0.154
5	6.910	32.85	23.30	0.746	1.000	10.14	0.175
6	6.229	23.26	30.16	0.813	1.000	4.28	0.194
7	5.726	16.82	32.67	0.884	1.000	-1.52	0.206
8	5.561	15.14	32.19	0.914	1.000	-3.60	0.203
9	5.393	13.69	31.08	0.946	1.000	-5.76	0.196
HUB	5.232	12.33	30.00	0.984	1.000	-7.81	0.190

TABLE V. - BLADE GEOMETRY FOR STATOR 51

RP	PERCENT SPAN	RADII RI	RO	BLADE ANGLES KIC	KTC	KOC	DELTA INC	CONE ANGLE
TIP	0.	25.400	25.400	14.20	5.04	-4.13	9.22	0.057
1	5.	24.595	24.608	14.30	5.12	-4.07	9.21	0.144
2	10.	23.861	23.887	14.44	5.20	-4.03	9.21	0.306
3	15.	23.128	23.166	14.63	5.31	-4.01	9.21	0.448
4	30.	20.917	20.995	15.51	5.75	-4.00	9.19	0.915
5	50.	17.955	18.080	17.40	6.64	-4.11	9.17	1.461
6	70.	14.946	15.110	19.85	7.81	-4.23	9.13	1.913
7	85.	12.647	12.787	21.60	8.70	-4.20	9.11	1.642
8	90.	11.870	11.967	21.95	8.92	-4.11	9.11	1.140
9	95.	11.087	11.125	22.20	9.10	-3.99	9.12	0.439
HUB	100.	10.160	10.160	22.49	9.32	-3.85	9.13	0.057

RP	BLADE THICKNESSES TI	TM	TO	AXIAL DIMENSIONS ZI	ZMC	ZTC	ZO
TIP	0.099	0.495	0.099	25.452	27.898	27.898	30.379
1	0.099	0.495	0.099	25.455	27.900	27.900	30.381
2	0.099	0.495	0.099	25.456	27.900	27.900	30.381
3	0.099	0.495	0.099	25.455	27.899	27.899	30.380
4	0.099	0.495	0.099	25.458	27.897	27.897	30.378
5	0.099	0.495	0.099	25.467	27.896	27.896	30.378
6	0.099	0.495	0.099	25.479	27.894	27.894	30.379
7	0.099	0.495	0.099	25.488	27.891	27.891	30.377
8	0.099	0.495	0.099	25.491	27.891	27.891	30.377
9	0.099	0.495	0.099	25.494	27.892	27.892	30.378
HUB	0.099	0.494	0.099	25.498	27.894	27.894	30.380

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	X FACTOR	PHISS	AREA RATIO
TIP	4.945	5.04	18.33	0.992	1.000	-2.24	0.273
1	4.945	5.12	18.38	1.024	1.000	-2.36	0.266
2	4.945	5.20	18.47	1.055	1.000	-2.43	0.261
3	4.945	5.31	18.64	1.088	1.000	-2.48	0.257
4	4.945	5.76	19.51	1.202	1.000	-2.50	0.252
5	4.946	6.65	21.51	1.398	1.000	-2.26	0.259
6	4.948	7.83	24.08	1.677	1.000	-2.03	0.281
7	4.947	8.72	25.79	1.981	1.000	-2.19	0.305
8	4.946	8.94	26.07	2.114	1.000	-2.41	0.300
9	4.946	9.11	26.19	2.268	1.000	-2.72	0.288
HUB	4.946	9.32	26.34	2.479	1.000	-3.09	0.275

TABLE VI. - OVERALL PERFORMANCE AT 100 PERCENT DESIGN SPEED

(a) Stage 51B A

Parameter	Reading number				
	1766	1767	1768	1769	1771
ROTOR TOTAL PRESSURE RATIO	1.127	1.145	1.137	1.152	1.155
STAGE TOTAL PRESSURE RATIO	1.117	1.134	1.126	1.139	1.141
ROTOR TOTAL TEMPERATURE RATIO	1.039	1.043	1.042	1.046	1.048
STAGE TOTAL TEMPERATURE RATIO	1.035	1.039	1.039	1.044	1.046
ROTOR TEMP. RISE EFFICIENCY	0.898	0.918	0.902	0.889	0.881
STAGE TEMP. RISE EFFICIENCY	0.908	0.927	0.894	0.860	0.836
ROTOR MOMENTUM RISE EFFICIENCY	0.880	0.917	0.897	0.885	0.872
ROTOR HEAD RISE COEFFICIENT	0.170	0.192	0.182	0.202	0.206
STAGE HEAD RISE COEFFICIENT	0.156	0.178	0.168	0.185	0.188
FLOW COEFFICIENT	0.799	0.762	0.695	0.618	0.592
WT FLOW PER UNIT FRONTAL AREA	164.92	159.91	149.87	136.51	131.78
WT FLOW PER UNIT ANNULUS AREA	196.34	190.37	178.42	162.52	156.88
WT FLOW AT ORIFICE	33.43	32.41	30.38	27.67	26.71
WT FLOW AT ROTOR INLET	33.45	32.45	30.39	27.76	26.76
WT FLOW AT ROTOR OUTLET	33.58	32.64	30.54	28.01	27.03
WT FLOW AT STATOR OUTLET	33.22	32.35	30.06	27.51	26.56
ROTATIVE SPEED	9152.1	9161.2	9168.0	9158.4	9141.9
PERCENT OF DESIGN SPEED	99.8	99.9	100.0	99.9	99.7

(b) Stage 51B B

Parameter	Reading number					
	1796	1797	1798	1800	1801	1807
ROTOR TOTAL PRESSURE RATIO	1.115	1.148	1.145	1.158	1.161	1.164
STAGE TOTAL PRESSURE RATIO	1.100	1.136	1.132	1.142	1.146	1.148
ROTOR TOTAL TEMPERATURE RATIO	1.037	1.044	1.044	1.047	1.049	1.051
STAGE TOTAL TEMPERATURE RATIO	1.034	1.041	1.041	1.045	1.047	1.048
ROTOR TEMP. RISE EFFICIENCY	0.845	0.907	0.900	0.901	0.886	0.875
STAGE TEMP. RISE EFFICIENCY	0.824	0.909	0.889	0.871	0.852	0.838
ROTOR MOMENTUM RISE EFFICIENCY	0.817	0.885	0.879	0.888	0.871	0.868
ROTOR HEAD RISE COEFFICIENT	0.154	0.196	0.191	0.207	0.212	0.216
STAGE HEAD RISE COEFFICIENT	0.135	0.180	0.175	0.188	0.193	0.196
FLOW COEFFICIENT	0.852	0.819	0.755	0.700	0.669	0.655
WT FLOW PER UNIT FRONTAL AREA	172.25	167.82	159.30	150.58	145.55	143.03
WT FLOW PER UNIT ANNULUS AREA	205.06	199.79	189.65	179.26	173.28	170.28
WT FLOW AT ORIFICE	34.91	34.01	32.29	30.52	29.50	28.99
WT FLOW AT ROTOR INLET	34.88	34.04	32.29	30.58	29.57	29.09
WT FLOW AT ROTOR OUTLET	35.37	34.34	32.47	30.94	29.87	29.43
WT FLOW AT STATOR OUTLET	34.68	33.96	31.96	30.26	29.28	28.81
ROTATIVE SPEED	9179.1	9175.3	9186.1	9181.5	9184.9	9177.3
PERCENT OF DESIGN SPEED	100.1	100.1	100.2	100.2	100.2	100.1

TABLE VI. - Concluded.

(c) Stage 51B C

Parameter	Reading number					
	1830	1829	1828	1827	1824	1841
ROTOR TOTAL PRESSURE RATIO	1.112	1.134	1.131	1.140	1.148	1.153
STAGE TOTAL PRESSURE RATIO	1.103	1.124	1.123	1.129	1.136	1.139
ROTOR TOTAL TEMPERATURE RATIO	1.034	1.039	1.039	1.042	1.046	1.047
STAGE TOTAL TEMPERATURE RATIO	1.031	1.036	1.037	1.041	1.044	1.046
ROTOR TEMP. RISE EFFICIENCY	0.912	0.943	0.924	0.902	0.881	0.877
STAGE TEMP. RISE EFFICIENCY	0.915	0.935	0.906	0.869	0.843	0.828
ROTOR MOMENTUM RISE EFFICIENCY	0.894	0.936	0.915	0.915	0.888	0.876
ROTOR HEAD RISE COEFFICIENT	0.150	0.177	0.175	0.185	0.196	0.202
STAGE HEAD RISE COEFFICIENT	0.138	0.166	0.165	0.171	0.180	0.184
FLOW COEFFICIENT	0.756	0.695	0.642	0.600	0.552	0.528
WT FLOW PER UNIT FRONTAL AREA	158.33	149.24	140.26	132.92	124.75	119.41
WT FLOW PER UNIT ANNULUS AREA	188.50	177.67	166.98	158.25	148.52	142.16
WT FLOW AT ORIFICE	32.09	30.25	28.43	26.94	25.29	24.20
WT FLOW AT ROTOR INLET	32.24	30.39	28.58	27.11	25.30	24.39
WT FLOW AT ROTOR OUTLET	32.23	30.46	28.59	27.27	25.53	24.63
WT FLOW AT STATOR OUTLET	31.83	30.05	28.26	26.73	25.16	24.22
ROTATIVE SPEED	9153.2	9167.4	9148.3	9171.4	9169.7	9169.1
PERCENT OF DESIGN SPEED	99.8	100.0	99.8	100.0	100.0	100.0

TABLE VII. - BLADE-ELEMENT DATA AT BLADE EDGES FOR 51B A

AT 100 PERCENT DESIGN SPEED

(a) Reading number 1766

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.648	24.638	0.0	18.0	50.7	47.1	289.1	1.044	10.08	1.122
2	23.868	23.876	0.0	15.7	49.6	44.8	288.9	1.041	10.13	1.140
3	23.086	23.114	0.0	16.2	48.7	43.1	288.6	1.041	10.14	1.139
4	20.731	20.828	0.0	18.2	45.2	37.7	287.9	1.042	10.14	1.137
5	17.607	17.780	0.0	21.3	40.7	28.9	287.9	1.039	10.14	1.134
6	14.531	14.732	0.0	23.8	35.7	18.7	287.8	1.037	10.14	1.127
7	12.294	12.446	0.0	24.2	31.6	12.8	287.7	1.030	10.14	1.096
8	11.565	11.684	0.0	24.1	30.1	11.4	287.8	1.027	10.14	1.080
9	10.843	10.922	0.0	25.5	28.7	8.9	287.7	1.027	10.11	1.069

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	193.0	176.9	304.7	247.3	193.0	168.3	0.1	54.6	235.9	235.8
2	194.6	186.8	300.2	253.2	194.6	179.8	0.1	50.6	228.7	228.8
3	194.3	187.9	294.3	247.4	194.3	180.5	0.1	52.3	221.2	221.5
4	197.0	190.7	279.7	228.9	197.0	181.1	0.1	59.7	198.8	199.7
5	196.1	193.9	258.6	206.4	196.1	180.6	0.1	70.5	168.8	170.4
6	193.6	198.2	238.5	191.4	193.6	181.3	0.1	80.0	139.4	141.3
7	191.7	193.4	225.0	180.9	191.7	176.4	0.1	79.3	117.8	119.3
8	191.2	188.7	220.9	175.8	191.2	172.3	0.1	77.0	110.8	111.9
9	189.4	183.4	216.0	167.6	189.4	165.6	0.1	78.9	104.0	104.8

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.585	0.522	0.924	0.729	0.585	0.496	0.872	1.138
2	0.591	0.553	0.911	0.750	0.591	0.533	0.924	1.104
3	0.590	0.558	0.894	0.734	0.590	0.535	0.929	1.075
4	0.600	0.567	0.852	0.680	0.600	0.538	0.919	0.941
5	0.597	0.578	0.787	0.615	0.597	0.538	0.921	0.787
6	0.589	0.592	0.725	0.572	0.589	0.542	0.936	0.725
7	0.583	0.579	0.684	0.542	0.583	0.528	0.920	0.684
8	0.581	0.565	0.671	0.526	0.581	0.516	0.901	0.671
9	0.575	0.548	0.656	0.501	0.575	0.495	0.874	0.656

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-4.7	-9.4	4.9	0.324	0.766	0.080	0.080	0.041	0.041
2	10.00	-4.9	-9.7	4.0	0.283	0.921	0.026	0.026	0.014	0.014
3	15.00	-4.7	-10.0	4.2	0.292	0.924	0.026	0.026	0.014	0.014
4	30.00	-4.7	-11.8	5.4	0.335	0.902	0.036	0.036	0.020	0.020
5	50.00	-3.8	-14.2	7.8	0.385	0.929	0.028	0.028	0.017	0.017
6	70.00	-2.7	-16.1	10.5	0.405	0.942	0.025	0.025	0.014	0.014
7	85.00	-1.6	-16.5	12.3	0.396	0.882	0.044	0.044	0.025	0.025
8	90.00	-1.1	-16.3	12.4	0.396	0.824	0.062	0.062	0.033	0.033
9	95.00	-0.5	-15.9	10.8	0.418	0.716	0.103	0.103	0.054	0.054

TABLE VII. - Continued.

(b) Reading number 1767

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.648	24.638	0.0	20.6	51.8	47.5	289.1	1.051	10.09	1.148
2	23.868	23.876	0.0	18.4	50.8	44.8	288.9	1.048	10.13	1.167
3	23.086	23.114	0.0	18.6	49.9	43.2	288.6	1.047	10.14	1.166
4	20.731	20.828	0.0	20.9	46.4	37.4	288.0	1.046	10.14	1.161
5	17.607	17.780	0.0	23.8	42.1	29.0	287.8	1.043	10.14	1.149
6	14.531	14.732	0.0	25.8	37.1	19.2	287.8	1.038	10.14	1.132
7	12.294	12.446	0.0	25.9	32.9	14.0	287.7	1.031	10.14	1.095
8	11.565	11.684	0.0	25.5	31.4	12.3	287.8	1.028	10.14	1.086
9	10.843	10.922	0.0	28.1	30.1	8.5	287.8	1.029	10.11	1.076

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	185.8	172.0	300.6	238.3	185.8	161.0	0.1	60.6	236.4	236.3
2	186.7	182.0	295.3	243.4	186.7	172.7	0.1	57.5	229.0	229.0
3	186.5	183.4	289.4	238.4	186.5	173.8	0.1	58.6	221.5	221.7
4	188.5	186.3	273.6	219.0	188.5	174.0	0.1	66.5	198.4	199.4
5	186.9	187.5	251.9	196.1	186.9	171.6	0.1	75.7	169.0	170.6
6	184.3	188.6	231.0	179.8	184.3	169.7	0.1	82.1	139.5	141.4
7	181.9	180.6	216.8	167.4	181.9	162.4	0.1	78.9	118.0	119.4
8	181.4	178.6	212.6	165.0	181.4	161.2	0.1	77.0	111.0	112.1
9	179.4	174.2	207.4	155.4	179.4	153.7	0.1	81.9	104.2	104.9

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.562	0.505	0.909	0.699	0.562	0.472	0.866	1.158
2	0.565	0.537	0.894	0.718	0.565	0.509	0.925	1.124
3	0.565	0.541	0.877	0.704	0.565	0.513	0.932	1.096
4	0.572	0.551	0.830	0.648	0.572	0.515	0.923	0.964
5	0.567	0.556	0.764	0.582	0.567	0.509	0.918	0.764
6	0.559	0.561	0.700	0.535	0.559	0.505	0.921	0.700
7	0.551	0.538	0.657	0.499	0.551	0.484	0.893	0.657
8	0.549	0.533	0.644	0.492	0.549	0.481	0.888	0.644
9	0.543	0.518	0.628	0.463	0.543	0.457	0.857	0.628

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-3.6	-8.3	5.3	0.361	0.785	0.087	0.087	0.045	0.045
2	10.00	-3.7	-8.5	4.0	0.322	0.942	0.023	0.023	0.012	0.012
3	15.00	-3.5	-8.8	4.2	0.327	0.948	0.021	0.021	0.011	0.011
4	30.00	-3.5	-10.6	5.1	0.374	0.947	0.022	0.022	0.013	0.013
5	50.00	-2.4	-12.8	7.8	0.423	0.949	0.023	0.023	0.013	0.013
6	70.00	-1.3	-14.7	11.0	0.442	0.938	0.029	0.029	0.017	0.017
7	85.00	-0.2	-15.1	13.6	0.434	0.856	0.059	0.059	0.033	0.033
8	90.00	0.2	-15.0	13.3	0.423	0.845	0.061	0.061	0.033	0.033
9	95.00	0.9	-14.5	10.4	0.460	0.732	0.113	0.113	0.059	0.059

TABLE VII. - Continued.

(c) Reading number 1768

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	24.648	24.638	0.0	21.6	54.4	48.2	289.1	1.050	10.10	1.158
2	23.868	23.876	0.0	19.7	53.3	46.1	288.8	1.048	10.13	1.167
3	23.086	23.114	0.0	19.7	52.4	44.8	288.4	1.047	10.13	1.163
4	20.731	20.828	0.0	21.5	49.1	40.3	288.0	1.044	10.14	1.147
5	17.607	17.780	0.0	24.5	44.8	33.5	287.9	1.039	10.14	1.127
6	14.531	14.732	0.0	26.8	39.8	23.3	287.8	1.036	10.14	1.116
7	12.294	12.446	0.0	28.1	35.5	14.3	287.8	1.032	10.13	1.107
8	11.565	11.684	0.0	28.4	34.0	11.3	287.8	1.031	10.14	1.103
9	10.843	10.922	0.0	30.9	32.5	7.6	287.8	1.031	10.11	1.091

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	169.5	168.1	290.9	234.3	169.5	156.3	0.1	62.0	236.6	236.5
2	171.1	174.5	286.1	236.8	171.1	164.3	0.1	58.8	229.4	229.5
3	170.7	174.2	279.5	231.3	170.7	164.0	0.1	58.6	221.5	221.7
4	172.2	172.6	262.8	210.6	172.2	160.6	0.1	63.3	198.6	199.5
5	170.2	168.1	239.9	183.5	170.2	153.0	0.1	69.6	169.2	170.9
6	167.3	169.0	217.6	164.4	167.3	150.9	0.1	76.2	139.4	141.3
7	165.4	171.7	203.2	156.3	165.4	151.5	0.1	80.9	118.2	119.6
8	164.9	172.3	198.8	154.5	164.9	151.5	0.1	82.0	111.2	112.3
9	163.4	167.1	193.7	144.6	163.4	143.3	0.1	85.8	104.1	104.9

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	0.510	0.493	0.876	0.687	0.510	0.458	0.922	1.196
2	0.516	0.513	0.862	0.697	0.516	0.483	0.960	1.161
3	0.515	0.513	0.843	0.681	0.515	0.483	0.961	1.130
4	0.520	0.509	0.793	0.621	0.520	0.474	0.933	1.003
5	0.514	0.497	0.724	0.542	0.514	0.452	0.899	0.736
6	0.504	0.500	0.656	0.487	0.504	0.447	0.902	0.656
7	0.498	0.510	0.612	0.464	0.498	0.450	0.916	0.612
8	0.497	0.512	0.599	0.459	0.497	0.450	0.919	0.599
9	0.492	0.496	0.583	0.429	0.492	0.425	0.877	0.583

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-1.0	-5.7	6.0	0.357	0.847	0.065	0.065	0.033	0.033
2	10.00	-1.2	-6.1	5.3	0.327	0.931	0.029	0.029	0.015	0.015
3	15.00	-1.0	-6.3	5.9	0.328	0.939	0.026	0.026	0.014	0.014
4	30.00	-0.9	-7.9	8.0	0.371	0.910	0.039	0.039	0.021	0.021
5	50.00	0.3	-10.0	12.3	0.430	0.899	0.045	0.045	0.025	0.025
6	70.00	1.4	-12.0	15.1	0.461	0.881	0.058	0.058	0.033	0.033
7	85.00	2.4	-12.5	13.9	0.457	0.915	0.042	0.042	0.023	0.023
8	90.00	2.8	-12.4	12.3	0.449	0.918	0.040	0.040	0.022	0.022
9	95.00	3.3	-12.1	9.5	0.488	0.824	0.088	0.088	0.046	0.046

TABLE VII. - Continued.

(d) Reading number 1769

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	24.648	24.638	0.0	26.9	57.2	49.4	288.8	1.059	10.10	1.180
2	23.868	23.876	0.0	24.4	56.3	47.1	288.7	1.056	10.13	1.188
3	23.086	23.114	0.0	25.0	55.5	45.7	288.4	1.054	10.14	1.183
4	20.731	20.828	0.0	26.7	52.4	41.5	288.0	1.049	10.13	1.164
5	17.607	17.780	0.0	29.2	48.1	35.0	287.9	1.042	10.14	1.137
6	14.531	14.732	0.0	30.9	43.2	24.4	287.9	1.038	10.14	1.127
7	12.294	12.446	0.0	31.9	38.9	15.3	287.9	1.034	10.14	1.114
8	11.565	11.684	0.0	32.6	37.4	11.6	287.9	1.033	10.13	1.110
9	10.843	10.922	0.0	35.5	36.0	7.6	287.9	1.032	10.12	1.098

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	152.3	158.2	281.1	217.0	152.3	141.2	0.1	71.5	236.3	236.2
2	152.6	164.3	274.8	219.7	152.6	149.6	0.1	67.8	228.6	228.7
3	152.5	164.1	268.9	213.1	152.5	148.8	0.1	69.3	221.6	221.9
4	153.4	161.4	251.2	192.4	153.4	144.1	0.1	72.6	199.0	199.9
5	151.2	155.0	226.4	165.3	151.2	135.4	0.1	75.5	168.7	170.3
6	148.3	156.5	203.4	147.5	148.3	134.3	0.1	80.4	139.3	141.3
7	145.8	157.0	187.4	138.2	145.8	133.3	0.1	83.0	117.9	119.4
8	144.8	157.5	182.3	135.5	144.8	132.7	0.1	84.8	110.9	112.0
9	143.2	152.0	177.0	124.8	143.2	123.7	0.1	88.3	104.1	104.9

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	0.456	0.461	0.842	0.632	0.456	0.411	0.927	1.232
2	0.457	0.480	0.824	0.642	0.457	0.437	0.981	1.196
3	0.457	0.480	0.806	0.624	0.457	0.435	0.976	1.168
4	0.460	0.473	0.754	0.564	0.460	0.423	0.940	1.044
5	0.453	0.456	0.679	0.486	0.453	0.398	0.896	0.811
6	0.445	0.461	0.610	0.435	0.445	0.396	0.906	0.610
7	0.437	0.464	0.561	0.408	0.437	0.394	0.914	0.561
8	0.434	0.465	0.546	0.400	0.434	0.392	0.917	0.546
9	0.429	0.449	0.530	0.368	0.429	0.365	0.864	0.530

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	1.8	-2.9	7.2	0.422	0.817	0.095	0.095	0.047	0.047
2	10.00	1.8	-3.1	6.3	0.386	0.903	0.050	0.050	0.026	0.026
3	15.00	2.1	-3.2	6.8	0.399	0.909	0.047	0.047	0.024	0.024
4	30.00	2.4	-4.6	9.2	0.441	0.897	0.054	0.054	0.029	0.029
5	50.00	3.6	-6.7	13.8	0.494	0.880	0.064	0.064	0.035	0.035
6	70.00	4.8	-8.6	16.2	0.519	0.910	0.052	0.052	0.029	0.029
7	85.00	5.8	-9.1	14.8	0.514	0.928	0.043	0.043	0.023	0.023
8	90.00	6.2	-9.0	12.6	0.512	0.931	0.041	0.041	0.022	0.022
9	95.00	6.8	-8.6	9.5	0.559	0.845	0.096	0.096	0.050	0.050

TABLE VII. - Concluded.

(e) Reading number 1771

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.648	24.638	0.0	29.6	58.4	50.3	288.8	1.062	10.11	1.182
2	23.868	23.876	0.0	26.0	57.3	47.5	288.6	1.058	10.14	1.192
3	23.086	23.114	0.0	26.0	56.5	46.1	288.3	1.056	10.14	1.186
4	20.731	20.828	0.0	28.7	53.5	41.9	288.0	1.051	10.13	1.165
5	17.607	17.780	0.0	31.4	49.5	35.2	287.9	1.044	10.13	1.142
6	14.531	14.732	0.0	32.8	44.6	24.4	287.9	1.039	10.14	1.131
7	12.294	12.446	0.0	33.1	40.1	15.6	287.9	1.034	10.13	1.116
8	11.565	11.684	0.0	33.8	38.4	11.8	287.8	1.033	10.13	1.110
9	10.843	10.922	0.0	36.7	36.8	7.4	288.0	1.032	10.10	1.100

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	145.4	153.4	277.5	208.7	145.4	133.4	0.1	75.9	236.5	236.4
2	147.1	161.5	272.1	214.9	147.1	145.2	0.1	70.7	229.1	229.1
3	145.8	160.8	264.3	208.4	145.8	144.5	0.1	70.6	220.5	220.8
4	146.3	156.8	246.1	184.8	146.3	137.5	0.1	75.4	198.0	198.9
5	143.6	151.5	221.3	158.4	143.6	129.4	0.1	78.9	168.5	170.1
6	141.3	153.1	198.3	141.2	141.3	128.7	0.1	82.9	139.2	141.1
7	140.0	152.8	182.9	132.9	140.0	128.0	0.1	83.5	117.8	119.3
8	139.7	153.3	178.3	130.2	139.7	127.5	0.1	85.2	110.8	111.9
9	138.2	148.8	172.7	120.2	138.2	119.2	0.1	89.0	103.6	104.4

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.435	0.446	0.830	0.606	0.435	0.387	0.917	1.249
2	0.440	0.471	0.814	0.627	0.440	0.424	0.987	1.211
3	0.436	0.470	0.791	0.609	0.436	0.422	0.991	1.174
4	0.438	0.459	0.737	0.541	0.438	0.402	0.939	1.050
5	0.430	0.445	0.663	0.465	0.430	0.380	0.901	0.828
6	0.423	0.450	0.593	0.416	0.423	0.379	0.910	0.593
7	0.419	0.451	0.547	0.392	0.419	0.378	0.914	0.547
8	0.418	0.453	0.533	0.385	0.418	0.376	0.912	0.533
9	0.413	0.439	0.516	0.355	0.413	0.352	0.863	0.516

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	3.0	-1.7	8.1	0.456	0.789	0.116	0.116	0.057	0.057
2	10.00	2.8	-2.0	6.7	0.406	0.883	0.063	0.063	0.032	0.032
3	15.00	3.1	-2.1	7.1	0.410	0.886	0.063	0.063	0.032	0.032
4	30.00	3.6	-3.5	9.6	0.469	0.882	0.066	0.066	0.035	0.035
5	50.00	5.0	-5.3	14.0	0.524	0.888	0.064	0.064	0.035	0.035
6	70.00	6.2	-7.2	16.2	0.546	0.927	0.045	0.045	0.025	0.025
7	85.00	6.9	-8.0	15.2	0.533	0.937	0.039	0.039	0.021	0.021
8	90.00	7.2	-8.0	12.8	0.532	0.931	0.043	0.043	0.023	0.023
9	95.00	7.6	-7.8	9.3	0.577	0.860	0.091	0.091	0.048	0.048

TABLE VIII. - BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 51B B AT 100 PERCENT DESIGN SPEED

(a) Reading number 1796

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	24.648	24.638	-0.0	15.0	48.9	44.6	288.8	1.043	10.07	1.115
2	23.868	23.876	-0.0	13.6	47.8	42.4	288.7	1.043	10.13	1.133
3	23.086	23.114	-0.0	14.3	46.9	40.9	288.5	1.041	10.14	1.130
4	20.731	20.828	0.	16.2	43.4	35.7	288.0	1.039	10.14	1.122
5	17.607	17.780	-0.0	19.3	39.0	28.3	287.9	1.036	10.14	1.108
6	14.531	14.732	-0.0	22.4	34.0	17.1	287.8	1.036	10.14	1.119
7	12.294	12.446	-0.0	23.1	30.0	10.5	287.8	1.032	10.14	1.100
8	11.565	11.684	-0.0	22.8	28.5	9.3	287.8	1.029	10.14	1.083
9	10.843	10.922	-0.0	24.7	27.2	6.3	287.8	1.028	10.11	1.066

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	206.6	195.2	314.1	264.8	206.6	188.5	-0.0	50.5	236.5	236.4
2	208.4	204.5	310.3	269.2	208.4	198.8	-0.0	48.3	229.8	229.9
3	208.0	204.9	304.6	262.8	208.0	198.5	-0.0	50.6	222.5	222.7
4	211.0	206.4	290.2	244.2	211.0	198.2	0.	57.6	199.3	200.3
5	209.4	203.8	269.3	218.6	209.4	192.4	-0.0	67.2	169.3	171.0
6	206.9	212.6	249.6	205.6	206.9	196.5	-0.0	81.2	139.6	141.5
7	204.8	212.8	236.5	199.1	204.8	195.7	-0.0	83.6	118.4	119.8
8	204.2	208.2	232.4	194.4	204.2	191.9	-0.0	80.8	110.9	112.1
9	202.6	202.0	227.8	184.7	202.6	183.6	-0.0	84.4	104.0	104.8

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	0.630	0.579	0.958	0.786	0.630	0.560	0.912	1.221
2	0.636	0.610	0.947	0.802	0.636	0.592	0.954	1.191
3	0.635	0.612	0.930	0.784	0.635	0.593	0.955	1.164
4	0.645	0.617	0.888	0.731	0.645	0.593	0.939	1.028
5	0.640	0.610	0.824	0.655	0.640	0.576	0.919	0.824
6	0.632	0.639	0.763	0.618	0.632	0.591	0.950	0.763
7	0.625	0.641	0.722	0.599	0.625	0.589	0.956	0.722
8	0.623	0.627	0.710	0.585	0.623	0.578	0.940	0.710
9	0.618	0.607	0.695	0.555	0.618	0.552	0.906	0.695

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-3.6	-8.2	5.4	0.279	0.732	0.086	0.084	0.047	0.046
2	10.00	-3.7	-8.5	4.6	0.250	0.852	0.048	0.047	0.027	0.026
3	15.00	-3.5	-8.7	5.0	0.261	0.874	0.040	0.040	0.022	0.022
4	30.00	-3.6	-10.6	6.4	0.301	0.864	0.044	0.044	0.026	0.026
5	50.00	-2.5	-12.9	10.1	0.357	0.831	0.056	0.056	0.033	0.033
6	70.00	-1.4	-14.8	11.9	0.378	0.913	0.033	0.033	0.019	0.019
7	85.00	-0.1	-15.0	13.1	0.360	0.858	0.052	0.052	0.029	0.029
8	90.00	0.3	-14.9	13.2	0.355	0.797	0.070	0.070	0.038	0.038
9	95.00	1.0	-14.4	11.2	0.386	0.670	0.111	0.111	0.058	0.058

TABLE VIII. - Continued.

(b) Reading number 1797

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.648	24.638	-0.0	20.3	50.1	44.8	288.9	1.054	10.07	1.157
2	23.868	23.876	-0.0	18.1	48.8	42.4	288.7	1.051	10.13	1.172
3	23.086	23.114	-0.0	18.4	47.9	40.5	288.6	1.050	10.14	1.171
4	20.731	20.828	-0.0	20.6	44.5	35.0	288.0	1.047	10.14	1.164
5	17.607	17.780	-0.0	23.5	40.0	26.4	287.9	1.044	10.14	1.151
6	14.531	14.732	-0.0	25.3	35.1	16.9	287.9	1.039	10.14	1.134
7	12.294	12.446	-0.0	25.7	31.1	11.3	287.8	1.031	10.14	1.098
8	11.565	11.684	-0.0	25.6	29.7	9.4	287.8	1.029	10.14	1.090
9	10.843	10.922	-0.0	27.4	28.3	5.8	287.8	1.029	10.11	1.082

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	197.9	185.3	308.6	244.7	197.9	173.7	-0.0	64.4	236.8	236.7
2	200.2	194.6	304.2	250.3	200.2	185.0	-0.0	60.4	229.0	229.0
3	200.4	196.8	298.8	245.8	200.4	186.8	-0.0	62.1	221.6	221.9
4	203.2	198.7	284.7	227.1	203.2	185.9	-0.0	69.9	199.4	200.3
5	201.6	199.8	263.2	204.5	201.6	183.1	-0.1	79.7	169.2	170.8
6	198.6	201.7	242.9	190.6	198.6	182.3	-0.0	86.2	139.8	141.7
7	195.9	194.7	228.7	178.9	195.9	175.4	-0.0	84.5	118.0	119.5
8	195.3	193.6	224.9	176.9	195.3	174.6	-0.0	83.7	111.3	112.5
9	193.5	190.2	219.8	169.6	193.5	168.8	-0.0	87.6	104.1	104.9

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
RP	IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
1	0.601	0.545	0.938	0.720	0.601	0.511	0.878 1.239
2	0.609	0.575	0.926	0.740	0.609	0.547	0.924 1.200
3	0.610	0.583	0.909	0.728	0.610	0.553	0.932 1.170
4	0.620	0.590	0.868	0.675	0.620	0.552	0.915 1.045
5	0.615	0.595	0.802	0.609	0.615	0.545	0.909 0.802
6	0.605	0.603	0.740	0.569	0.605	0.545	0.918 0.740
7	0.596	0.583	0.696	0.535	0.596	0.525	0.896 0.696
8	0.594	0.580	0.684	0.530	0.594	0.523	0.894 0.684
9	0.588	0.569	0.668	0.507	0.588	0.505	0.872 0.668

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-2.3	-7.0	5.6	0.366	0.788	0.087	0.085	0.047	0.046
2	10.00	-2.6	-7.5	4.6	0.327	0.903	0.039	0.038	0.022	0.021
3	15.00	-2.5	-7.8	4.6	0.332	0.922	0.031	0.031	0.018	0.018
4	30.00	-2.5	-9.5	5.7	0.379	0.934	0.027	0.027	0.016	0.016
5	50.00	-1.5	-11.8	8.3	0.427	0.933	0.029	0.029	0.017	0.017
6	70.00	-0.2	-13.6	11.7	0.435	0.945	0.023	0.023	0.014	0.014
7	85.00	0.9	-14.0	13.8	0.428	0.868	0.050	0.050	0.028	0.028
8	90.00	1.5	-13.7	13.4	0.418	0.856	0.053	0.053	0.029	0.029
9	95.00	2.1	-13.3	10.7	0.440	0.774	0.087	0.087	0.046	0.046

TABLE VIII. - Continued.

(c) Reading number 1798

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	24.648	24.638	-0.0	21.5	52.0	45.8	288.9	1.054	10.09	1.163
2	23.868	23.876	-0.0	20.2	50.9	43.4	288.8	1.051	10.13	1.177
3	23.086	23.114	-0.0	19.6	50.1	42.2	288.5	1.050	10.14	1.172
4	20.731	20.828	-0.0	21.4	46.7	37.2	287.9	1.046	10.14	1.157
5	17.607	17.780	-0.0	24.1	42.4	30.2	287.9	1.041	10.14	1.134
6	14.531	14.732	-0.0	26.4	37.5	20.4	287.9	1.038	10.13	1.121
7	12.294	12.446	0.0	27.8	33.3	11.2	287.9	1.034	10.14	1.115
8	11.565	11.684	-0.0	28.3	31.9	8.1	287.8	1.033	10.13	1.113
9	10.843	10.922	-0.0	30.8	30.5	4.4	287.8	1.032	10.10	1.097

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	184.9	178.9	300.2	238.6	184.9	166.5	-0.0	65.5	236.5	236.4
2	186.8	186.8	296.3	241.0	186.8	175.2	-0.0	64.6	230.1	230.1
3	186.1	187.3	289.9	238.1	186.1	176.5	-0.0	62.7	222.3	222.6
4	187.6	186.5	273.5	218.0	187.6	173.6	-0.0	68.1	199.0	199.9
5	185.3	181.8	250.9	191.9	185.3	165.9	-0.0	74.3	169.2	170.8
6	182.0	182.4	229.5	174.3	182.0	163.4	-0.0	81.1	139.8	141.7
7	179.7	186.8	215.2	168.5	179.7	165.3	0.0	87.1	118.3	119.7
8	179.2	188.3	211.1	167.4	179.2	165.7	-0.0	89.3	111.6	112.8
9	177.2	181.7	205.6	156.5	177.2	156.0	-0.0	93.1	104.3	105.1

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	0.559	0.525	0.908	0.701	0.559	0.489	0.901	1.260
2	0.566	0.551	0.897	0.711	0.566	0.517	0.938	1.230
3	0.564	0.553	0.878	0.703	0.564	0.521	0.948	1.199
4	0.569	0.552	0.830	0.645	0.569	0.514	0.926	1.069
5	0.562	0.539	0.761	0.569	0.562	0.492	0.895	0.808
6	0.551	0.542	0.695	0.518	0.551	0.485	0.898	0.695
7	0.544	0.557	0.651	0.502	0.544	0.493	0.920	0.651
8	0.542	0.562	0.639	0.499	0.542	0.494	0.925	0.639
9	0.536	0.541	0.622	0.466	0.536	0.465	0.880	0.622

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-0.4	-5.1	6.6	0.371	0.810	0.082	0.080	0.044	0.043
2	10.00	-0.5	-5.4	5.6	0.351	0.927	0.031	0.030	0.017	0.016
3	15.00	-0.3	-5.6	6.2	0.340	0.921	0.033	0.033	0.018	0.018
4	30.00	-0.2	-7.3	7.9	0.382	0.927	0.031	0.031	0.018	0.018
5	50.00	0.9	-9.5	12.0	0.435	0.902	0.042	0.042	0.024	0.024
6	70.00	2.2	-11.3	15.2	0.459	0.882	0.054	0.054	0.031	0.031
7	85.00	3.2	-11.7	13.7	0.447	0.925	0.035	0.035	0.019	0.019
8	90.00	3.7	-11.5	12.0	0.440	0.935	0.030	0.030	0.017	0.017
9	95.00	4.3	-11.1	9.3	0.479	0.825	0.083	0.083	0.044	0.044

TABLE VIII. - Continued.

(d) Reading number 1800

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	24.648	24.638	-0.0	25.2	54.1	46.5	288.9	1.060	10.10	1.179
2	23.868	23.876	-0.0	22.5	52.9	43.8	288.7	1.057	10.14	1.194
3	23.086	23.114	-0.0	22.2	52.0	42.4	288.4	1.056	10.14	1.193
4	20.731	20.828	-0.0	24.5	48.9	38.0	288.0	1.050	10.13	1.170
5	17.607	17.780	-0.0	27.1	44.7	31.0	287.9	1.044	10.14	1.144
6	14.531	14.732	-0.0	29.0	39.8	20.8	287.9	1.039	10.14	1.132
7	12.294	12.446	-0.0	30.6	35.6	11.3	287.9	1.035	10.13	1.119
8	11.565	11.684	-0.0	30.5	34.0	8.3	287.8	1.034	10.13	1.117
9	10.843	10.922	-0.0	33.3	32.6	4.4	287.9	1.033	10.10	1.101

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	170.9	171.2	291.7	225.1	170.9	154.9	-0.0	72.9	236.4	236.3
2	173.3	180.5	287.3	231.1	173.3	166.7	-0.0	69.2	229.1	229.2
3	173.7	181.8	282.2	228.0	173.7	168.3	-0.0	68.8	222.4	222.6
4	174.4	178.2	265.1	205.7	174.4	162.1	-0.0	74.0	199.6	200.6
5	171.4	172.9	241.2	179.6	171.4	153.9	-0.0	78.8	169.6	171.3
6	167.8	173.5	218.5	162.3	167.8	151.8	-0.0	84.2	139.9	141.8
7	165.1	175.7	203.1	154.2	165.1	151.2	-0.0	89.4	118.2	119.7
8	164.8	177.2	198.8	154.2	164.8	152.6	-0.0	90.0	111.2	112.3
9	163.0	170.7	193.4	143.0	163.0	142.6	-0.0	93.8	104.0	104.8

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	0.515	0.500	0.879	0.658	0.515	0.453	0.906	1.284
2	0.522	0.530	0.866	0.678	0.522	0.489	0.962	1.247
3	0.524	0.534	0.851	0.670	0.524	0.495	0.969	1.220
4	0.527	0.525	0.801	0.606	0.527	0.478	0.930	1.094
5	0.517	0.510	0.728	0.530	0.517	0.454	0.898	0.856
6	0.506	0.514	0.659	0.480	0.506	0.449	0.904	0.659
7	0.497	0.521	0.612	0.458	0.497	0.449	0.916	0.612
8	0.497	0.526	0.599	0.458	0.497	0.453	0.926	0.599
9	0.491	0.506	0.582	0.424	0.491	0.423	0.875	0.582

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	1.7	-2.9	7.3	0.419	0.809	0.094	0.092	0.049	0.048
2	10.00	1.5	-3.4	6.1	0.377	0.910	0.043	0.043	0.024	0.023
3	15.00	1.6	-3.6	6.5	0.374	0.927	0.036	0.035	0.020	0.020
4	30.00	1.9	-5.1	8.7	0.425	0.914	0.041	0.041	0.023	0.023
5	50.00	3.2	-7.2	12.8	0.476	0.898	0.050	0.050	0.029	0.029
6	70.00	4.4	-9.0	15.6	0.496	0.918	0.043	0.043	0.025	0.025
7	85.00	5.5	-9.4	13.9	0.491	0.933	0.036	0.036	0.020	0.020
8	90.00	5.8	-9.4	12.3	0.473	0.939	0.033	0.033	0.018	0.018
9	95.00	6.3	-9.0	9.3	0.518	0.833	0.091	0.091	0.048	0.048

TABLE VIII. - Continued.

(e) Reading number 1801

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	24.648	24.638	-0.0	27.9	55.3	47.0	288.8	1.064	10.10	1.187
2	23.868	23.876	-0.0	23.9	54.1	44.3	288.7	1.060	10.14	1.204
3	23.086	23.114	-0.0	24.6	53.2	42.9	288.4	1.058	10.14	1.193
4	20.731	20.828	-0.0	26.6	50.1	38.2	288.1	1.052	10.14	1.174
5	17.607	17.780	-0.0	28.6	45.9	31.4	287.9	1.045	10.13	1.146
6	14.531	14.732	-0.0	30.7	41.1	21.2	287.9	1.040	10.13	1.133
7	12.294	12.446	-0.0	31.7	36.8	11.7	287.9	1.036	10.13	1.123
8	11.565	11.684	-0.0	32.1	35.3	8.5	287.8	1.034	10.13	1.117
9	10.843	10.922	-0.0	34.8	33.9	4.4	288.0	1.034	10.11	1.103

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	164.2	167.4	288.7	217.2	164.2	148.0	-0.0	78.3	237.4	237.3
2	166.5	177.6	284.1	226.7	166.5	162.3	-0.0	72.0	230.2	230.2
3	165.9	175.8	276.7	218.3	165.9	159.9	-0.0	73.1	221.4	221.6
4	166.8	173.8	259.9	197.8	166.8	155.4	-0.0	77.8	199.3	200.2
5	163.7	168.0	235.2	172.9	163.7	147.6	-0.0	80.3	168.8	170.5
6	160.0	167.9	212.5	154.8	160.0	144.4	-0.0	85.8	139.8	141.7
7	158.3	171.0	197.8	148.6	158.3	145.5	-0.0	89.9	118.6	120.0
8	157.3	170.9	192.7	146.3	157.3	144.7	-0.0	90.9	111.4	112.5
9	155.2	165.5	187.0	136.2	155.2	135.8	-0.0	94.6	104.2	105.0

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	0.494	0.488	0.868	0.633	0.494	0.431	0.901	1.303
2	0.501	0.520	0.855	0.664	0.501	0.475	0.975	1.266
3	0.499	0.515	0.833	0.640	0.499	0.469	0.964	1.226
4	0.502	0.511	0.783	0.581	0.502	0.457	0.932	1.103
5	0.493	0.495	0.708	0.509	0.493	0.435	0.901	0.867
6	0.481	0.496	0.639	0.457	0.481	0.426	0.902	0.639
7	0.476	0.507	0.595	0.440	0.476	0.431	0.919	0.595
8	0.473	0.507	0.579	0.434	0.473	0.429	0.920	0.579
9	0.466	0.490	0.561	0.403	0.466	0.402	0.875	0.561

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	2.9	-1.7	7.8	0.454	0.792	0.110	0.109	0.057	0.056
2	10.00	2.7	-2.2	6.5	0.393	0.906	0.049	0.048	0.026	0.026
3	15.00	2.8	-2.5	6.9	0.408	0.896	0.054	0.054	0.029	0.029
4	30.00	3.1	-3.9	8.9	0.454	0.897	0.054	0.054	0.030	0.030
5	50.00	4.4	-6.0	13.2	0.495	0.888	0.059	0.059	0.034	0.034
6	70.00	5.8	-7.6	16.0	0.521	0.909	0.051	0.051	0.029	0.029
7	85.00	6.7	-8.2	14.3	0.508	0.945	0.031	0.031	0.017	0.017
8	90.00	7.1	-8.1	12.5	0.500	0.931	0.039	0.039	0.021	0.021
9	95.00	7.7	-7.7	9.3	0.540	0.843	0.093	0.093	0.049	0.049

TABLE VIII. - Concluded.

(f) Reading number 1807

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	24.648	24.638	-0.0	28.5	56.0	47.0	288.9	1.067	10.10	1.194
2	23.868	23.876	-0.0	24.7	54.7	44.3	288.8	1.062	10.14	1.206
3	23.086	23.114	-0.0	25.0	53.7	43.1	288.4	1.059	10.14	1.198
4	20.731	20.828	-0.0	27.4	50.6	38.5	288.0	1.054	10.13	1.176
5	17.607	17.780	-0.0	30.1	46.6	31.2	287.9	1.047	10.14	1.150
6	14.531	14.732	-0.0	31.7	41.8	21.2	287.8	1.041	10.13	1.134
7	12.294	12.446	-0.0	32.3	37.4	11.9	287.9	1.036	10.14	1.121
8	11.565	11.684	-0.0	32.8	35.8	8.6	287.9	1.034	10.13	1.115
9	10.843	10.922	-0.0	35.5	34.4	4.4	287.9	1.034	10.10	1.103

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	159.8	167.2	286.2	215.2	159.8	146.8	-0.1	79.9	237.3	237.2
2	162.4	175.9	281.1	223.2	162.4	159.8	-0.1	73.5	229.3	229.4
3	163.4	174.9	275.9	217.3	163.4	158.6	-0.1	73.9	222.2	222.5
4	163.7	172.0	258.0	195.0	163.7	152.7	-0.1	79.0	199.4	200.3
5	160.2	166.9	233.3	168.9	160.2	144.4	-0.1	83.7	169.6	171.2
6	156.5	165.4	209.8	150.9	156.5	140.7	-0.1	87.0	139.8	141.7
7	154.3	167.4	194.1	144.7	154.3	141.6	-0.1	89.4	117.7	119.1
8	153.9	167.6	189.8	142.6	153.9	140.9	-0.1	90.7	111.0	112.1
9	152.2	162.9	184.4	133.0	152.2	132.6	-0.1	94.6	104.1	104.8

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	0.480	0.486	0.859	0.626	0.480	0.427	0.919	1.311
2	0.488	0.514	0.845	0.653	0.488	0.467	0.984	1.268
3	0.491	0.512	0.830	0.636	0.491	0.464	0.971	1.236
4	0.493	0.505	0.777	0.572	0.493	0.448	0.933	1.109
5	0.482	0.491	0.702	0.497	0.482	0.425	0.901	0.880
6	0.470	0.488	0.631	0.445	0.470	0.415	0.899	0.631
7	0.463	0.495	0.583	0.428	0.463	0.419	0.918	0.583
8	0.462	0.496	0.570	0.422	0.462	0.417	0.916	0.570
9	0.457	0.482	0.553	0.393	0.457	0.392	0.871	0.553

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	3.6	-1.0	7.8	0.461	0.781	0.123	0.121	0.064	0.063
2	10.00	3.3	-1.6	6.5	0.403	0.893	0.058	0.057	0.031	0.031
3	15.00	3.3	-2.0	7.2	0.412	0.904	0.051	0.051	0.028	0.028
4	30.00	3.7	-3.4	9.1	0.464	0.884	0.062	0.062	0.035	0.035
5	50.00	5.1	-5.2	13.0	0.518	0.865	0.076	0.076	0.044	0.044
6	70.00	6.4	-7.0	16.0	0.538	0.902	0.057	0.057	0.033	0.033
7	85.00	7.2	-7.7	14.4	0.517	0.926	0.043	0.043	0.024	0.024
8	90.00	7.6	-7.6	12.6	0.512	0.917	0.049	0.049	0.026	0.026
9	95.00	8.2	-7.2	9.3	0.551	0.839	0.098	0.098	0.051	0.051

TABLE IX. - BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 51B C

AT 100 PERCENT DESIGN SPEED

(a) Reading number 1830

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.648	24.638	0.0	16.1	52.4	50.0	288.8	1.038	10.09	1.105
2	23.868	23.876	0.0	14.3	51.3	47.8	288.8	1.036	10.13	1.118
3	23.086	23.114	0.0	14.4	50.2	46.2	288.7	1.035	10.13	1.118
4	20.731	20.828	0.0	16.5	46.8	40.5	287.9	1.035	10.13	1.121
5	17.607	17.780	0.0	20.1	42.3	31.9	287.9	1.035	10.14	1.121
6	14.531	14.732	0.0	22.3	37.2	22.1	287.9	1.033	10.14	1.113
7	12.294	12.446	0.0	22.9	32.9	15.9	287.8	1.027	10.14	1.088
8	11.565	11.684	0.0	22.4	31.3	14.9	287.9	1.023	10.14	1.074
9	10.843	10.922	0.0	23.7	30.1	12.8	287.8	1.023	10.11	1.059

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	182.5	166.6	299.2	249.1	182.5	160.1	0.0	46.2	237.2	237.1
2	183.6	174.4	293.8	251.6	183.6	169.0	0.0	43.0	229.4	229.4
3	184.2	176.0	288.0	246.5	184.2	170.5	0.0	43.7	221.4	221.7
4	186.2	180.6	272.2	227.8	186.2	173.2	0.0	51.4	198.5	199.4
5	185.3	183.5	250.6	203.2	185.3	172.4	0.0	63.0	168.8	170.5
6	183.7	187.1	230.6	186.9	183.7	173.1	0.0	70.9	139.4	141.3
7	181.8	182.8	216.5	175.0	181.8	168.4	0.0	71.2	117.6	119.0
8	181.4	178.3	212.4	170.6	181.4	164.9	0.0	67.9	110.5	111.6
9	179.2	171.4	207.1	160.9	179.2	156.9	0.0	69.0	103.8	104.6

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.552	0.491	0.905	0.735	0.552	0.472	0.877	1.067
2	0.555	0.516	0.889	0.745	0.555	0.500	0.920	1.029
3	0.557	0.522	0.872	0.730	0.557	0.505	0.926	0.994
4	0.565	0.537	0.825	0.677	0.565	0.515	0.930	0.828
5	0.562	0.546	0.760	0.604	0.562	0.513	0.930	0.760
6	0.556	0.558	0.699	0.557	0.556	0.516	0.943	0.699
7	0.551	0.546	0.656	0.523	0.551	0.503	0.926	0.656
8	0.549	0.533	0.643	0.510	0.549	0.493	0.909	0.643
9	0.542	0.511	0.627	0.480	0.542	0.468	0.876	0.627

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-6.0	-10.7	4.8	0.285	0.753	0.077	0.077	0.038	0.038
2	10.00	-6.1	-11.0	4.0	0.254	0.892	0.033	0.033	0.017	0.017
3	15.00	-6.2	-11.4	4.3	0.257	0.920	0.024	0.024	0.012	0.012
4	30.00	-6.1	-13.2	5.2	0.298	0.940	0.020	0.020	0.011	0.011
5	50.00	-5.2	-15.5	7.7	0.359	0.951	0.018	0.018	0.010	0.010
6	70.00	-4.2	-17.6	10.6	0.380	0.946	0.022	0.022	0.012	0.012
7	85.00	-3.2	-18.1	12.4	0.379	0.919	0.029	0.029	0.016	0.016
8	90.00	-2.9	-18.1	12.9	0.373	0.898	0.033	0.033	0.018	0.018
9	95.00	-2.1	-17.5	11.7	0.400	0.707	0.100	0.100	0.052	0.052

TABLE IX. - Continued.

(b) Reading number 1829

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.648	24.638	0.0	19.9	54.6	50.7	288.7	1.046	10.10	1.141
2	23.868	23.876	0.0	18.1	53.4	48.2	288.7	1.043	10.13	1.151
3	23.086	23.114	0.0	18.0	52.4	46.9	288.5	1.042	10.14	1.150
4	20.731	20.828	0.0	20.5	49.2	41.3	288.1	1.042	10.13	1.147
5	17.607	17.780	0.0	23.7	44.7	32.9	288.0	1.038	10.14	1.136
6	14.531	14.732	0.0	25.9	39.7	23.3	287.9	1.035	10.14	1.121
7	12.294	12.446	0.0	26.3	35.4	17.0	287.8	1.029	10.14	1.095
8	11.565	11.684	0.0	26.0	33.8	15.2	287.9	1.026	10.14	1.086
9	10.843	10.922	0.0	28.4	32.4	11.5	287.8	1.026	10.11	1.077

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	168.0	158.9	290.2	235.9	168.0	149.4	0.0	54.0	236.6	236.5
2	170.2	166.8	285.2	237.7	170.2	158.5	0.0	51.8	228.9	229.0
3	170.6	167.8	279.9	233.4	170.6	159.6	0.0	51.9	221.9	222.2
4	171.8	170.6	263.0	212.5	171.8	159.7	0.0	59.9	199.1	200.1
5	170.6	171.3	240.0	186.9	170.6	156.9	0.0	68.9	168.8	170.4
6	167.9	171.8	218.3	168.1	167.9	154.5	0.0	75.1	139.6	141.5
7	166.2	166.6	203.8	156.2	166.2	149.4	0.0	73.7	118.0	119.5
8	166.1	164.7	199.9	153.3	166.1	148.0	0.0	72.2	111.2	112.3
9	163.9	160.0	194.1	143.5	163.9	140.7	0.0	76.2	104.0	104.7

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.506	0.466	0.874	0.692	0.506	0.438	0.890	1.106
2	0.513	0.491	0.859	0.700	0.513	0.466	0.931	1.066
3	0.514	0.495	0.844	0.688	0.514	0.470	0.936	1.039
4	0.518	0.504	0.794	0.627	0.518	0.471	0.930	0.913
5	0.515	0.507	0.724	0.553	0.515	0.464	0.919	0.724
6	0.506	0.509	0.658	0.498	0.506	0.458	0.920	0.658
7	0.501	0.495	0.614	0.464	0.501	0.444	0.899	0.614
8	0.500	0.489	0.602	0.455	0.500	0.440	0.891	0.602
9	0.494	0.475	0.585	0.426	0.494	0.417	0.858	0.585

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-3.8	-8.5	5.5	0.329	0.842	0.061	0.061	0.030	0.030
2	10.00	-4.1	-9.0	4.4	0.304	0.946	0.020	0.020	0.010	0.010
3	15.00	-4.0	-9.2	4.9	0.304	0.963	0.014	0.014	0.007	0.007
4	30.00	-3.7	-10.8	6.0	0.355	0.962	0.016	0.016	0.008	0.008
5	50.00	-2.8	-13.2	8.7	0.414	0.969	0.014	0.014	0.008	0.008
6	70.00	-1.6	-15.1	11.7	0.443	0.957	0.020	0.020	0.011	0.011
7	85.00	-0.8	-15.7	13.6	0.439	0.914	0.037	0.037	0.020	0.020
8	90.00	-0.4	-15.6	13.2	0.432	0.909	0.038	0.038	0.020	0.020
9	95.00	0.2	-15.2	10.4	0.469	0.820	0.077	0.077	0.040	0.040

TABLE IX. - Continued.

(c) Reading number 1828

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.648	24.638	0.0	21.2	56.5	51.1	289.0	1.048	10.10	1.152
2	23.868	23.876	0.0	19.7	55.4	49.1	288.9	1.046	10.13	1.157
3	23.086	23.114	0.0	19.7	54.5	47.8	288.2	1.044	10.14	1.153
4	20.731	20.828	0.0	22.2	51.3	43.3	288.0	1.040	10.14	1.139
5	17.607	17.780	-0.0	25.1	47.1	36.2	288.0	1.036	10.14	1.124
6	14.531	14.732	0.0	27.3	42.0	26.0	287.9	1.034	10.14	1.115
7	12.294	12.446	0.0	28.3	37.5	18.0	287.8	1.029	10.13	1.097
8	11.565	11.684	0.0	28.7	36.0	15.0	287.9	1.027	10.13	1.094
9	10.843	10.922	0.0	31.5	34.7	11.1	288.0	1.028	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	156.3	155.7	283.5	231.3	156.3	145.2	0.0	56.3	236.5	236.4
2	157.9	160.8	278.4	231.5	157.9	151.4	0.0	54.3	229.3	229.3
3	158.0	160.9	272.0	225.7	158.0	151.4	0.0	54.3	221.4	221.6
4	158.5	159.1	253.6	202.5	158.5	147.3	0.0	60.0	198.0	198.9
5	156.7	156.4	230.1	175.6	156.7	141.6	-0.0	66.3	168.4	170.1
6	154.7	158.4	208.2	156.5	154.7	140.7	0.0	72.7	139.3	141.3
7	153.2	156.4	193.0	144.8	153.2	137.7	0.0	74.2	117.5	119.0
8	152.3	156.4	188.3	142.1	152.3	137.2	0.0	75.1	110.7	111.9
9	150.3	151.8	182.8	131.9	150.3	129.5	0.0	79.3	104.0	104.8

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.469	0.456	0.850	0.677	0.469	0.425	0.929	1.135
2	0.474	0.472	0.835	0.679	0.474	0.444	0.959	1.101
3	0.475	0.473	0.817	0.663	0.475	0.445	0.959	1.069
4	0.476	0.468	0.762	0.596	0.476	0.434	0.929	0.943
5	0.471	0.461	0.691	0.518	0.471	0.418	0.904	0.691
6	0.464	0.468	0.625	0.463	0.464	0.416	0.910	0.625
7	0.460	0.463	0.580	0.429	0.460	0.408	0.899	0.580
8	0.457	0.463	0.565	0.421	0.457	0.407	0.901	0.565
9	0.451	0.449	0.548	0.390	0.451	0.383	0.861	0.548

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-1.9	-6.5	5.9	0.335	0.862	0.058	0.058	0.028	0.028
2	10.00	-2.0	-6.9	5.4	0.315	0.927	0.030	0.030	0.015	0.015
3	15.00	-1.9	-7.2	5.9	0.319	0.936	0.027	0.027	0.013	0.013
4	30.00	-1.6	-8.7	8.0	0.371	0.938	0.026	0.026	0.014	0.014
5	50.00	-0.4	-10.8	12.0	0.431	0.931	0.031	0.031	0.017	0.017
6	70.00	0.6	-12.8	14.5	0.464	0.933	0.033	0.033	0.018	0.018
7	85.00	1.4	-13.5	14.6	0.469	0.944	0.027	0.027	0.014	0.014
8	90.00	1.8	-13.4	13.0	0.465	0.946	0.026	0.026	0.014	0.014
9	95.00	2.5	-12.9	10.0	0.508	0.821	0.093	0.093	0.048	0.048

TABLE IX. - Continued.

(d) Reading number 1827

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	24.648	24.638	0.0	24.2	58.4	51.9	288.9	1.053	10.10	1.164
2	23.868	23.876	0.0	21.8	57.2	49.9	288.7	1.050	10.13	1.168
3	23.086	23.114	0.0	22.1	56.3	48.5	288.5	1.048	10.14	1.165
4	20.731	20.828	0.0	24.7	53.2	43.8	288.1	1.045	10.13	1.153
5	17.607	17.780	0.0	27.4	49.1	38.1	287.9	1.039	10.14	1.126
6	14.531	14.732	0.0	30.0	44.1	27.2	287.7	1.035	10.14	1.118
7	12.294	12.446	0.0	30.7	39.6	18.2	287.9	1.031	10.14	1.106
8	11.565	11.684	0.0	31.3	38.0	14.9	287.8	1.029	10.13	1.100
9	10.843	10.922	0.0	34.0	36.5	11.2	287.9	1.029	10.11	1.088

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	146.0	150.8	278.4	222.6	146.0	137.5	0.0	61.9	237.1	237.0
2	147.9	155.7	272.9	224.4	147.9	144.6	0.0	57.9	229.4	229.5
3	148.1	156.1	266.9	218.3	148.1	144.6	0.0	58.9	222.1	222.4
4	149.2	155.4	249.1	195.6	149.2	141.1	0.0	65.0	199.5	200.4
5	146.8	147.8	224.1	166.8	146.8	131.2	0.0	68.0	169.3	171.0
6	143.8	149.6	200.3	145.7	143.8	129.6	0.0	74.8	139.6	141.5
7	142.2	150.5	184.7	136.3	142.2	129.5	0.0	76.8	117.8	119.3
8	142.0	150.3	180.2	133.0	142.0	128.5	0.0	78.0	111.0	112.1
9	140.2	144.3	174.4	121.9	140.2	119.6	0.0	80.7	103.7	104.5

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	0.437	0.439	0.832	0.649	0.437	0.401	0.942	1.166
2	0.443	0.455	0.817	0.656	0.443	0.423	0.978	1.128
3	0.444	0.457	0.799	0.639	0.444	0.423	0.976	1.098
4	0.447	0.456	0.747	0.574	0.447	0.414	0.946	0.976
5	0.440	0.434	0.671	0.490	0.440	0.386	0.894	0.739
6	0.431	0.441	0.600	0.429	0.431	0.382	0.901	0.600
7	0.426	0.444	0.553	0.402	0.426	0.382	0.910	0.553
8	0.425	0.444	0.540	0.393	0.425	0.380	0.905	0.540
9	0.419	0.426	0.522	0.360	0.419	0.353	0.853	0.522

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-0.0	-4.7	6.7	0.370	0.836	0.078	0.078	0.037	0.037
2	10.00	-0.3	-5.1	6.1	0.338	0.918	0.038	0.038	0.018	0.018
3	15.00	-0.1	-5.4	6.5	0.347	0.924	0.035	0.035	0.017	0.017
4	30.00	0.3	-6.8	8.5	0.402	0.912	0.043	0.043	0.022	0.022
5	50.00	1.6	-8.8	13.9	0.460	0.892	0.054	0.054	0.028	0.028
6	70.00	2.8	-10.6	15.7	0.504	0.916	0.047	0.047	0.026	0.026
7	85.00	3.5	-11.4	14.7	0.499	0.937	0.036	0.036	0.019	0.019
8	90.00	3.8	-11.4	12.9	0.500	0.940	0.033	0.033	0.018	0.018
9	95.00	4.3	-11.1	10.1	0.547	0.841	0.093	0.093	0.048	0.048

TABLE IX. - Continued.

(e) Reading number 1824

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	24.648	24.638	-0.0	28.8	60.2	52.7	288.7	1.060	10.11	1.176
2	23.868	23.876	-0.0	25.3	59.1	50.2	288.5	1.055	10.13	1.180
3	23.086	23.114	-0.0	25.6	58.3	48.8	288.3	1.054	10.14	1.179
4	20.731	20.828	-0.0	28.3	55.4	44.8	288.0	1.048	10.14	1.158
5	17.607	17.780	-0.0	31.3	51.5	39.1	288.0	1.041	10.13	1.134
6	14.531	14.732	-0.0	33.4	46.7	28.1	287.9	1.037	10.13	1.124
7	12.294	12.446	-0.0	34.0	42.3	18.6	287.9	1.032	10.13	1.111
8	11.565	11.684	-0.0	34.8	40.6	14.9	287.9	1.031	10.13	1.105
9	10.843	10.922	-0.0	38.0	39.1	10.6	287.9	1.031	10.11	1.095

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	135.8	145.2	273.3	210.0	135.8	127.2	-0.0	70.0	237.2	237.1
2	137.1	151.4	266.8	213.7	137.1	136.8	-0.0	64.8	228.9	229.0
3	137.2	152.4	261.4	208.5	137.2	137.4	-0.0	65.9	222.4	222.7
4	137.4	148.4	241.9	184.0	137.4	130.6	-0.0	70.5	199.1	200.0
5	134.1	140.5	215.6	154.6	134.1	120.0	-0.0	73.1	168.8	170.5
6	131.6	142.0	191.8	134.3	131.6	118.5	-0.0	78.2	139.5	141.4
7	129.9	142.4	175.5	124.5	129.9	118.0	-0.0	79.7	118.0	119.5
8	129.6	142.2	170.7	120.9	129.6	116.8	-0.0	81.1	111.0	112.1
9	128.2	137.4	165.2	110.2	128.2	108.3	-0.0	84.6	104.0	104.8

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	0.405	0.421	0.815	0.609	0.405	0.369	0.937	1.194
2	0.409	0.441	0.797	0.623	0.409	0.399	0.998	1.152
3	0.410	0.445	0.781	0.608	0.410	0.401	1.001	1.127
4	0.411	0.434	0.723	0.538	0.411	0.382	0.951	1.002
5	0.400	0.412	0.644	0.453	0.400	0.352	0.895	0.780
6	0.393	0.417	0.573	0.394	0.393	0.348	0.901	0.573
7	0.388	0.419	0.524	0.366	0.388	0.347	0.908	0.524
8	0.387	0.419	0.509	0.356	0.387	0.344	0.901	0.509
9	0.383	0.404	0.493	0.324	0.383	0.319	0.844	0.493

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	1.8	-2.9	7.5	0.427	0.789	0.116	0.116	0.054	0.054
2	10.00	1.6	-3.2	6.4	0.382	0.882	0.062	0.062	0.030	0.030
3	15.00	1.9	-3.3	6.8	0.390	0.892	0.058	0.058	0.028	0.028
4	30.00	2.5	-4.6	9.5	0.449	0.886	0.062	0.062	0.032	0.032
5	50.00	4.1	-6.3	14.9	0.511	0.893	0.060	0.060	0.031	0.031
6	70.00	5.3	-8.1	16.5	0.552	0.913	0.054	0.054	0.030	0.030
7	85.00	6.1	-8.8	15.2	0.549	0.938	0.040	0.040	0.021	0.021
8	90.00	6.4	-8.8	12.9	0.553	0.918	0.054	0.054	0.028	0.028
9	95.00	6.9	-8.5	9.5	0.605	0.847	0.105	0.105	0.054	0.054

TABLE IX. - Concluded.

(f) Reading number 1841

RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
24.648	24.638	0.0	32.5	61.5	53.6	288.5	1.063	10.12	1.178
23.868	23.876	0.0	28.3	60.3	51.0	288.4	1.058	10.13	1.184
23.086	23.114	0.0	28.0	59.3	49.2	288.3	1.056	10.14	1.181
20.731	20.828	0.0	30.4	56.6	45.1	288.1	1.051	10.13	1.165
17.607	17.780	0.0	33.1	52.7	39.2	288.0	1.043	10.13	1.141
14.531	14.732	0.0	34.7	47.9	28.2	288.0	1.038	10.13	1.131
12.294	12.446	0.0	35.5	43.3	19.3	288.0	1.032	10.13	1.112
11.565	11.684	0.0	36.6	41.7	15.5	288.0	1.031	10.13	1.106
10.843	10.922	0.0	40.1	40.3	10.5	288.1	1.031	10.11	1.097

ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
128.8	140.8	269.5	200.1	128.8	118.8	0.0	75.7	236.8	236.7
130.5	147.0	263.8	205.6	130.5	129.5	0.0	69.6	229.2	229.3
131.4	148.6	257.5	200.8	131.4	131.2	0.0	69.8	221.5	221.8
131.4	145.8	238.5	178.1	131.4	125.7	0.0	73.8	199.0	199.9
128.8	138.8	212.6	150.1	128.8	116.3	0.0	75.9	169.2	170.9
126.4	140.4	188.4	131.0	126.4	115.5	0.0	79.9	139.8	141.7
124.8	137.6	171.6	118.7	124.8	112.0	0.0	80.0	117.8	119.2
124.5	137.0	166.8	114.2	124.5	110.1	0.0	81.6	111.0	112.2
122.8	133.5	161.0	103.8	122.8	102.1	0.0	86.0	104.1	104.9

ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
0.384	0.408	0.803	0.579	0.384	0.344	0.922 1.210
0.389	0.427	0.786	0.598	0.389	0.376	0.992 1.171
0.392	0.433	0.768	0.585	0.392	0.382	0.999 1.136
0.392	0.425	0.712	0.520	0.392	0.367	0.956 1.015
0.384	0.406	0.634	0.439	0.384	0.340	0.903 0.797
0.377	0.412	0.562	0.384	0.377	0.339	0.914 0.562
0.372	0.405	0.511	0.349	0.372	0.329	0.897 0.511
0.371	0.403	0.497	0.336	0.371	0.324	0.884 0.497
0.366	0.392	0.480	0.305	0.366	0.300	0.831 0.480

PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
SPAN	MEAN	SS				TOT	PROF	TOT	PROF
5.00	3.0	-1.6	8.4	0.472	0.759	0.142	0.142	0.064	0.064
10.00	2.9	-2.0	7.2	0.420	0.850	0.085	0.085	0.041	0.041
15.00	2.9	-2.3	7.2	0.422	0.871	0.074	0.074	0.036	0.036
30.00	3.6	-3.4	9.8	0.476	0.878	0.071	0.071	0.036	0.036
50.00	5.2	-5.1	15.1	0.534	0.900	0.060	0.060	0.031	0.031
70.00	6.5	-6.9	16.6	0.567	0.952	0.032	0.032	0.017	0.017
85.00	7.2	-7.7	15.8	0.574	0.969	0.020	0.020	0.011	0.011
90.00	7.5	-7.7	13.5	0.584	0.958	0.028	0.028	0.015	0.015
95.00	8.1	-7.3	9.3	0.638	0.881	0.085	0.085	0.044	0.044

TABLE X. - BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 51

WITH STAGE 51B A-51 AT 100 PERCENT DESIGN SPEED

(a) Reading number 1766

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.595	24.608	17.1	1.3	17.1	1.3	301.7	0.997	11.31	0.979
2	23.861	23.886	14.9	1.1	14.9	1.1	300.9	0.998	11.55	0.978
3	23.127	23.167	15.4	0.7	15.4	0.7	300.4	0.997	11.55	0.983
4	20.917	20.996	17.5	0.2	17.5	0.2	299.8	0.995	11.53	0.993
5	17.955	18.080	20.8	0.8	20.8	0.8	299.2	0.996	11.50	0.996
6	14.945	15.110	23.9	1.7	23.9	1.7	298.5	0.997	11.43	0.997
7	12.647	12.786	24.9	2.5	24.9	2.5	296.4	0.999	11.11	0.996
8	11.869	11.966	24.9	3.1	24.9	3.1	295.6	1.001	10.95	0.989
9	11.087	11.125	26.5	4.2	26.5	4.2	295.4	1.001	10.80	0.974

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	185.4	165.9	185.4	165.9	177.2	165.8	54.7	3.6	0.	0.
2	196.2	174.1	196.2	174.1	189.6	174.0	50.6	3.4	0.	0.
3	197.0	176.8	197.0	176.8	189.9	176.8	52.3	2.1	0.	0.
4	197.8	180.0	197.8	180.0	188.6	180.0	59.4	0.7	0.	0.
5	196.5	181.8	196.5	181.8	183.7	181.8	69.8	2.7	0.	0.
6	194.6	182.0	194.6	182.0	177.9	181.9	78.9	5.6	0.	0.
7	185.2	170.7	185.2	170.7	168.0	170.5	78.0	7.4	0.	0.
8	179.8	161.0	179.8	161.0	163.0	160.8	75.8	8.6	0.	0.
9	174.2	145.7	174.2	145.7	155.9	145.3	77.7	10.8	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	0.548	0.488	0.548	0.488	0.524	0.488	0.936	0.548
2	0.583	0.514	0.583	0.514	0.563	0.514	0.918	0.583
3	0.586	0.523	0.586	0.523	0.565	0.523	0.931	0.586
4	0.589	0.534	0.589	0.534	0.562	0.534	0.954	0.589
5	0.586	0.541	0.586	0.541	0.548	0.541	0.989	0.586
6	0.581	0.542	0.581	0.542	0.531	0.541	1.022	0.581
7	0.553	0.507	0.553	0.507	0.502	0.507	1.015	0.553
8	0.536	0.478	0.536	0.478	0.486	0.477	0.986	0.536
9	0.519	0.430	0.519	0.430	0.464	0.429	0.932	0.519

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	2.8	-6.4	5.3	0.240	0.	0.112	0.112	0.055	0.055
2	10.00	0.5	-8.7	5.1	0.227	0.	0.105	0.105	0.050	0.050
3	15.00	0.8	-8.4	4.7	0.220	0.	0.060	0.060	0.028	0.028
4	30.00	2.0	-7.2	4.2	0.213	0.	0.034	0.034	0.014	0.014
5	50.00	3.4	-5.8	5.0	0.197	0.	0.021	0.021	0.008	0.008
6	70.00	4.1	-5.1	6.0	0.177	0.	0.016	0.016	0.005	0.005
7	85.00	3.3	-5.8	6.7	0.174	0.	0.021	0.021	0.005	0.005
8	90.00	3.0	-6.1	7.2	0.193	0.	0.061	0.061	0.014	0.014
9	95.00	4.3	-4.8	8.2	0.248	0.	0.155	0.155	0.034	0.034

TABLE X. - Continued.

(b) Reading number 1767

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	24.595	24.608	19.7	1.6	19.7	1.6	303.9	0.995	11.58	0.982
2	23.861	23.886	17.6	1.5	17.6	1.5	302.8	0.997	11.82	0.977
3	23.127	23.167	17.8	1.1	17.8	1.1	302.2	0.997	11.82	0.986
4	20.917	20.996	20.1	0.8	20.1	0.8	301.2	0.996	11.78	0.991
5	17.955	18.080	23.2	1.1	23.2	1.1	300.1	0.996	11.65	0.996
6	14.945	15.110	25.9	1.9	25.9	1.9	298.9	0.997	11.47	0.998
7	12.647	12.786	26.6	2.2	26.6	2.2	296.5	1.000	11.10	0.999
8	11.869	11.966	26.4	3.0	26.4	3.0	295.9	1.001	11.01	0.989
9	11.087	11.125	29.1	4.5	29.1	4.5	296.1	1.000	10.88	0.976

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	179.8	161.7	179.8	161.7	169.2	161.6	60.7	4.6	0.	0.
2	190.6	168.4	190.6	168.4	181.7	168.4	57.5	4.4	0.	0.
3	191.7	171.2	191.7	171.2	182.5	171.2	58.5	3.2	0.	0.
4	192.7	173.8	192.7	173.8	181.0	173.8	66.2	2.3	0.	0.
5	189.8	173.2	189.8	173.2	174.4	173.2	74.9	3.4	0.	0.
6	185.3	169.2	185.3	169.2	166.7	169.1	81.0	5.7	0.	0.
7	173.4	155.3	173.4	155.3	155.1	155.2	77.6	6.0	0.	0.
8	170.6	145.8	170.6	145.8	152.9	145.6	75.8	7.7	0.	0.
9	166.0	131.1	166.0	131.1	145.1	130.7	80.7	10.2	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	0.529	0.474	0.529	0.474	0.498	0.474	0.935	0.529
2	0.563	0.495	0.563	0.495	0.537	0.495	0.927	0.563
3	0.568	0.504	0.568	0.504	0.540	0.504	0.938	0.563
4	0.572	0.514	0.572	0.514	0.537	0.514	0.960	0.572
5	0.564	0.513	0.564	0.513	0.518	0.513	0.993	0.564
6	0.551	0.501	0.551	0.501	0.495	0.501	1.015	0.551
7	0.516	0.459	0.516	0.459	0.461	0.459	1.001	0.516
8	0.507	0.430	0.507	0.430	0.455	0.430	0.952	0.507
9	0.493	0.386	0.493	0.386	0.431	0.385	0.901	0.493

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	5.4	-3.8	5.7	0.253	0.	0.106	0.106	0.052	0.052
2	10.00	3.1	-6.1	5.5	0.248	0.	0.117	0.117	0.055	0.055
3	15.00	3.2	-6.1	5.1	0.239	0.	0.072	0.072	0.033	0.033
4	30.00	4.6	-4.6	4.8	0.236	0.	0.043	0.043	0.018	0.018
5	50.00	5.8	-3.3	5.2	0.222	0.	0.020	0.020	0.007	0.007
6	70.00	6.1	-3.1	6.2	0.207	0.	0.010	0.010	0.003	0.003
7	85.00	5.0	-4.1	6.4	0.208	0.	0.003	0.003	0.001	0.001
8	90.00	4.4	-4.7	7.1	0.240	0.	0.067	0.067	0.016	0.016
9	95.00	6.9	-2.2	8.5	0.304	0.	0.157	0.157	0.034	0.034

TABLE X. - Continued.

(c) Reading number 1768

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	24.595	24.608	20.7	2.0	20.7	2.0	303.6	0.997	11.69	0.977
2	23.861	23.886	18.8	2.1	18.8	2.1	302.8	0.998	11.83	0.979
3	23.127	23.167	18.8	1.6	18.8	1.6	301.9	0.998	11.78	0.986
4	20.917	20.996	20.7	0.6	20.7	0.6	300.7	0.996	11.63	0.993
5	17.955	18.080	23.9	0.9	23.9	0.9	299.0	0.998	11.42	0.999
6	14.945	15.110	26.8	1.6	26.8	1.6	298.2	0.998	11.31	1.002
7	12.647	12.786	28.8	2.3	28.8	2.3	297.1	0.998	11.22	0.992
8	11.869	11.966	29.3	3.7	29.3	3.7	296.7	0.999	11.18	0.978
9	11.087	11.125	31.9	5.3	31.9	5.3	296.6	1.000	11.03	0.973

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	175.5	153.7	175.5	153.7	164.1	153.6	62.1	5.3	0.	0.
2	182.3	159.7	182.3	159.7	172.5	159.6	58.9	5.7	0.	0.
3	181.6	160.6	181.6	160.6	171.9	160.5	58.6	4.5	0.	0.
4	178.2	159.0	178.2	159.0	166.7	159.0	63.0	1.7	0.	0.
5	169.9	154.6	169.9	154.6	155.3	154.5	68.9	2.6	0.	0.
6	166.3	151.9	166.3	151.9	148.4	151.9	75.1	4.4	0.	0.
7	165.3	143.3	165.3	143.3	144.9	143.1	79.6	5.8	0.	0.
8	165.0	133.6	165.0	133.6	143.9	133.3	80.7	8.7	0.	0.
9	159.7	121.2	159.7	121.2	135.5	120.7	84.5	11.2	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	0.516	0.449	0.516	0.449	0.482	0.449	0.936	0.516
2	0.538	0.468	0.538	0.468	0.509	0.468	0.925	0.503
3	0.536	0.472	0.536	0.472	0.508	0.471	0.934	0.505
4	0.527	0.468	0.527	0.468	0.493	0.468	0.954	0.527
5	0.502	0.456	0.502	0.456	0.459	0.455	0.995	0.502
6	0.492	0.448	0.492	0.448	0.439	0.448	1.023	0.492
7	0.490	0.422	0.490	0.422	0.429	0.422	0.988	0.490
8	0.489	0.393	0.489	0.393	0.427	0.392	0.926	0.469
9	0.473	0.355	0.473	0.355	0.401	0.354	0.890	0.473

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	6.4	-2.8	6.1	0.282	0.	0.137	0.137	0.067	0.067
2	10.00	4.4	-4.8	6.1	0.262	0.	0.116	0.116	0.055	0.055
3	15.00	4.2	-5.0	5.6	0.253	0.	0.077	0.077	0.035	0.035
4	30.00	5.2	-4.0	4.6	0.250	0.	0.039	0.039	0.016	0.016
5	50.00	6.5	-2.7	5.1	0.230	0.	0.003	0.003	0.001	0.001
6	70.00	7.0	-2.2	5.9	0.213	0.	-0.012	-0.012	-0.004	-0.004
7	85.00	7.2	-1.9	6.5	0.246	0.	0.055	0.055	0.014	0.014
8	90.00	7.3	-1.8	7.8	0.293	0.	0.143	0.143	0.034	0.034
9	95.00	9.7	0.6	9.3	0.342	0.	0.190	0.190	0.042	0.042

TABLE X. - Continued.

(d) Reading number 1769

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	24.595	24.608	25.8	3.5	25.8	3.5	305.9	0.998	11.92	0.975
2	23.861	23.886	23.4	3.4	23.4	3.4	304.8	0.999	12.04	0.975
3	23.127	23.167	24.0	2.7	24.0	2.7	304.0	0.999	11.99	0.982
4	20.917	20.996	25.8	1.4	25.8	1.4	302.3	0.996	11.80	0.994
5	17.955	18.080	28.6	1.4	28.6	1.4	300.2	0.998	11.52	1.000
6	14.945	15.110	30.9	2.0	30.9	2.0	298.9	0.998	11.43	0.995
7	12.647	12.786	32.6	3.2	32.6	3.2	297.6	0.998	11.29	0.987
8	11.869	11.966	33.4	4.6	33.4	4.6	297.2	0.999	11.25	0.976
9	11.087	11.125	36.6	5.8	36.6	5.8	297.2	1.000	11.11	0.977

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	164.3	142.3	164.3	142.3	147.9	142.0	71.6	8.7	0.	0.
2	170.8	146.6	170.8	146.6	156.7	146.4	67.8	8.7	0.	0.
3	170.3	147.4	170.3	147.4	155.5	147.3	69.3	7.0	0.	0.
4	165.8	145.9	165.8	145.9	149.3	145.9	72.3	3.5	0.	0.
5	156.4	137.9	156.4	137.9	137.3	137.9	74.8	3.3	0.	0.
6	154.1	131.4	154.1	131.4	132.2	131.3	79.2	4.6	0.	0.
7	151.6	119.2	151.6	119.2	127.8	119.0	81.6	6.7	0.	0.
8	151.4	107.9	151.4	107.9	126.4	107.5	83.4	8.7	0.	0.
9	146.1	97.3	146.1	97.3	117.3	96.8	87.0	9.8	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	0.479	0.413	0.479	0.413	0.431	0.412	0.980	0.479
2	0.500	0.427	0.500	0.427	0.459	0.426	0.934	0.500
3	0.499	0.430	0.499	0.430	0.456	0.429	0.947	0.499
4	0.487	0.427	0.487	0.427	0.438	0.427	0.977	0.487
5	0.460	0.404	0.460	0.404	0.404	0.404	1.004	0.460
6	0.454	0.385	0.454	0.385	0.389	0.385	0.993	0.454
7	0.447	0.349	0.447	0.349	0.377	0.349	0.931	0.447
8	0.447	0.316	0.447	0.316	0.373	0.314	0.851	0.447
9	0.430	0.284	0.430	0.284	0.346	0.282	0.825	0.498

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	11.5	2.3	7.6	0.321	0.	0.174	0.174	0.085	0.085
2	10.00	9.0	-0.2	7.4	0.305	0.	0.161	0.161	0.076	0.076
3	15.00	9.4	0.2	6.7	0.302	0.	0.112	0.112	0.051	0.051
4	30.00	10.3	1.1	5.4	0.292	0.	0.040	0.040	0.017	0.017
5	50.00	11.2	2.0	5.5	0.281	0.	-0.003	-0.003	-0.001	-0.001
6	70.00	11.1	2.0	6.2	0.291	0.	0.035	0.035	0.010	0.010
7	85.00	11.0	1.9	7.4	0.338	0.	0.102	0.102	0.026	0.026
8	90.00	11.5	2.4	8.7	0.404	0.	0.184	0.184	0.043	0.043
9	95.00	14.4	5.2	9.8	0.450	0.	0.197	0.197	0.043	0.043

TABLE X. - Concluded.

(e) Reading number 1771

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	24.595	24.608	28.6	4.5	28.6	4.5	306.7	1.000	11.94	0.976
2	23.861	23.886	25.0	4.0	25.0	4.0	305.4	1.001	12.08	0.973
3	23.127	23.167	25.1	3.1	25.1	3.1	304.6	0.999	12.03	0.979
4	20.917	20.996	27.8	1.6	27.8	1.6	302.6	0.997	11.81	0.995
5	17.955	18.080	30.8	1.5	30.8	1.5	300.5	0.998	11.58	0.998
6	14.945	15.110	32.8	2.3	32.8	2.3	299.1	0.998	11.47	0.993
7	12.647	12.786	33.8	3.5	33.8	3.5	297.7	0.998	11.31	0.985
8	11.869	11.966	34.6	4.7	34.6	4.7	297.2	0.999	11.25	0.977
9	11.087	11.125	37.8	5.8	37.8	5.8	297.2	1.000	11.11	0.977

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	158.9	139.5	158.9	138.5	139.5	138.1	76.0	10.8	0.	0.
2	167.6	142.2	167.6	142.2	152.0	141.9	70.7	10.0	0.	0.
3	166.6	142.7	166.6	142.7	151.0	142.4	70.6	7.7	0.	0.
4	160.8	141.4	160.8	141.4	142.2	141.4	75.1	3.9	0.	0.
5	152.7	132.5	152.7	132.5	131.2	132.4	78.1	3.6	0.	0.
6	150.7	124.3	150.7	124.3	126.7	124.2	81.7	4.9	0.	0.
7	147.8	110.8	147.8	110.8	122.8	110.6	82.2	6.7	0.	0.
8	147.6	101.9	147.6	101.9	121.5	101.5	83.9	8.4	0.	0.
9	143.1	92.3	143.1	92.3	113.1	91.8	87.6	9.3	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	0.462	0.401	0.462	0.401	0.406	0.400	0.939	0.538
2	0.490	0.413	0.490	0.413	0.444	0.412	0.934	0.490
3	0.488	0.415	0.488	0.415	0.442	0.414	0.944	0.488
4	0.471	0.413	0.471	0.413	0.417	0.413	0.994	0.499
5	0.448	0.387	0.448	0.387	0.385	0.387	1.009	0.506
6	0.443	0.364	0.443	0.364	0.372	0.363	0.980	0.493
7	0.435	0.324	0.435	0.324	0.382	0.323	0.901	0.469
8	0.435	0.298	0.435	0.298	0.358	0.297	0.836	0.475
9	0.421	0.269	0.421	0.269	0.333	0.268	0.812	0.508

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	14.3	5.1	8.5	0.329	0.	0.173	0.173	0.084	0.084
2	10.00	10.5	1.3	8.1	0.323	0.	0.179	0.179	0.085	0.085
3	15.00	10.4	1.2	7.1	0.317	0.	0.137	0.137	0.063	0.063
4	30.00	12.3	3.1	5.6	0.304	0.	0.034	0.034	0.014	0.014
5	50.00	13.4	4.2	5.7	0.306	0.	0.017	0.017	0.006	0.006
6	70.00	13.0	3.8	6.5	0.326	0.	0.059	0.059	0.017	0.017
7	85.00	12.2	3.1	7.7	0.378	0.	0.121	0.121	0.031	0.031
8	90.00	12.7	3.6	8.8	0.430	0.	0.186	0.186	0.044	0.044
9	95.00	15.6	6.4	9.8	0.475	0.	0.196	0.196	0.043	0.043

TABLE XI. - BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 51

WITH STAGE 51B B-51 AT 100 PERCENT DESIGN SPEED

(a) Reading number 1796

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.595	24.608	14.2	1.0	14.2	1.0	301.3	0.995	11.23	0.967
2	23.861	23.886	12.9	0.8	12.9	0.8	301.0	0.996	11.47	0.973
3	23.127	23.167	13.5	0.5	13.5	0.5	300.2	0.997	11.45	0.983
4	20.917	20.996	15.5	0.2	15.5	0.2	299.2	0.995	11.38	0.987
5	17.955	18.080	18.8	0.6	18.8	0.6	298.2	0.998	11.23	1.002
6	14.945	15.110	22.6	1.3	22.6	1.3	298.1	0.997	11.35	0.990
7	12.647	12.786	23.9	2.3	23.9	2.3	297.0	0.997	11.15	0.990
8	11.869	11.966	23.8	3.4	23.8	3.4	296.1	0.999	10.98	0.987
9	11.087	11.125	25.8	5.3	25.8	5.3	295.8	0.999	10.77	0.967

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	206.0	179.2	206.0	179.2	199.7	179.2	50.5	3.0	0.	0.
2	216.3	189.3	216.3	189.3	210.9	189.2	48.3	2.7	0.	0.
3	216.1	191.4	216.1	191.4	210.1	191.4	50.5	1.6	0.	0.
4	215.1	192.4	215.1	192.4	207.3	192.4	57.4	0.5	0.	0.
5	206.9	194.2	206.9	194.2	195.9	194.2	66.6	2.0	0.	0.
6	208.5	195.7	208.5	195.7	192.5	195.6	80.0	4.3	0.	0.
7	202.9	191.5	202.9	191.5	185.5	191.4	82.2	7.6	0.	0.
8	197.4	183.8	197.4	183.8	180.6	183.5	79.6	10.9	0.	0.
9	191.1	166.1	191.1	166.1	172.0	165.4	83.2	15.3	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	0.614	0.530	0.614	0.530	0.595	0.530	0.897	0.614
2	0.648	0.562	0.648	0.562	0.631	0.562	0.897	0.648
3	0.648	0.570	0.648	0.570	0.630	0.570	0.911	0.648
4	0.646	0.574	0.646	0.574	0.622	0.574	0.928	0.646
5	0.620	0.580	0.620	0.580	0.587	0.580	0.991	0.620
6	0.625	0.585	0.625	0.585	0.578	0.585	1.016	0.625
7	0.609	0.573	0.609	0.573	0.557	0.573	1.032	0.609
8	0.592	0.549	0.592	0.549	0.542	0.548	1.016	0.592
9	0.572	0.494	0.572	0.494	0.515	0.492	0.962	0.572

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-0.1	-9.3	5.0	0.243	0.	0.145	0.145	0.071	0.071
2	10.00	-1.5	-10.7	4.8	0.225	0.	0.110	0.110	0.052	0.052
3	15.00	-1.1	-10.3	4.5	0.218	0.	0.068	0.068	0.031	0.031
4	30.00	-0.0	-9.2	4.2	0.215	0.	0.052	0.052	0.022	0.022
5	50.00	1.4	-7.8	4.7	0.173	0.	-0.010	-0.010	-0.003	-0.003
6	70.00	2.7	-6.4	5.5	0.169	0.	0.042	0.042	0.013	0.013
7	85.00	2.3	-6.8	6.5	0.148	0.	0.045	0.045	0.011	0.011
8	90.00	1.8	-7.3	7.5	0.150	0.	0.063	0.063	0.015	0.015
9	95.00	3.6	-5.5	9.3	0.209	0.	0.164	0.164	0.036	0.036

TABLE XI. - Continued.

(b) Reading number 1797

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	24.595	24.608	19.4	1.6	19.4	1.6	304.5	0.995	11.66	0.972
2	23.861	23.886	17.2	1.5	17.2	1.5	303.5	0.995	11.88	0.973
3	23.127	23.167	17.5	1.1	17.5	1.1	303.0	0.996	11.87	0.984
4	20.917	20.996	19.8	0.8	19.8	0.8	301.7	0.996	11.80	0.990
5	17.955	18.080	23.0	1.2	23.0	1.2	300.5	0.996	11.67	0.997
6	14.945	15.110	25.4	1.9	25.4	1.9	299.0	0.998	11.50	1.000
7	12.647	12.786	26.5	2.2	26.5	2.2	296.7	1.001	11.13	1.001
8	11.869	11.966	26.5	3.0	26.5	3.0	296.1	1.000	11.05	0.986
9	11.087	11.125	28.5	4.1	28.5	4.1	296.3	1.000	10.94	0.968

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	194.2	169.6	194.2	169.6	183.2	169.5	64.5	4.6	0.	0.
2	204.4	177.8	204.4	177.8	195.3	177.8	60.4	4.7	0.	0.
3	206.4	181.7	206.4	181.7	196.8	181.7	62.1	3.6	0.	0.
4	206.0	184.3	206.0	184.3	193.9	184.3	69.6	2.5	0.	0.
5	202.3	184.7	202.3	184.7	186.3	184.7	79.0	3.8	0.	0.
6	198.0	182.0	198.0	182.0	178.9	181.9	85.0	6.2	0.	0.
7	186.6	169.1	186.6	169.1	167.1	169.0	83.2	6.4	0.	0.
8	184.5	158.8	184.5	158.8	165.1	158.6	82.4	8.2	0.	0.
9	180.7	143.8	180.7	143.8	158.8	143.4	86.3	10.2	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	0.573	0.498	0.573	0.498	0.541	0.498	0.926	0.573
2	0.607	0.524	0.607	0.524	0.579	0.524	0.910	0.607
3	0.613	0.537	0.613	0.537	0.585	0.537	0.923	0.613
4	0.613	0.546	0.613	0.546	0.577	0.546	0.951	0.613
5	0.603	0.548	0.603	0.548	0.555	0.548	0.991	0.603
6	0.591	0.541	0.591	0.541	0.534	0.540	1.017	0.591
7	0.557	0.502	0.557	0.502	0.499	0.501	1.012	0.557
8	0.551	0.470	0.551	0.470	0.493	0.470	0.961	0.551
9	0.539	0.424	0.539	0.424	0.473	0.423	0.903	0.539

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	5.1	-4.1	5.6	0.277	0.	0.143	0.143	0.070	0.070
2	10.00	2.7	-6.5	5.5	0.259	0.	0.121	0.121	0.057	0.057
3	15.00	2.9	-6.3	5.1	0.250	0.	0.072	0.072	0.033	0.033
4	30.00	4.2	-4.9	4.8	0.241	0.	0.044	0.044	0.018	0.018
5	50.00	5.6	-3.6	5.3	0.219	0.	0.013	0.013	0.004	0.004
6	70.00	5.6	-3.6	6.2	0.199	0.	-0.001	-0.001	-0.000	-0.000
7	85.00	4.9	-4.3	6.4	0.197	0.	-0.005	-0.005	-0.001	-0.001
8	90.00	4.6	-4.5	7.1	0.234	0.	0.073	0.073	0.017	0.017
9	95.00	6.3	-2.8	8.0	0.297	0.	0.177	0.177	0.039	0.039

TABLE XI. - Continued.

(c) Reading number 1798

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	24.595	24.608	20.5	1.9	20.5	1.9	304.6	0.996	11.74	0.975
2	23.861	23.886	19.3	2.0	19.3	2.0	303.6	0.998	11.92	0.977
3	23.127	23.167	18.7	1.5	18.7	1.5	303.0	0.997	11.88	0.985
4	20.917	20.996	20.6	0.6	20.6	0.6	301.2	0.996	11.73	0.991
5	17.955	18.080	23.6	0.8	23.6	0.8	299.6	0.997	11.50	0.999
6	14.945	15.110	26.5	1.4	26.5	1.4	298.7	0.998	11.36	1.002
7	12.647	12.786	28.5	2.0	28.5	2.0	297.7	0.998	11.30	0.990
8	11.869	11.966	29.2	3.4	29.2	3.4	297.4	0.998	11.28	0.974
9	11.087	11.125	31.9	4.8	31.9	4.8	297.1	0.999	11.07	0.970

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	187.1	163.3	187.1	163.3	175.2	163.2	65.6	5.5	0.	0.
2	195.5	170.6	195.5	170.6	184.5	170.5	64.7	5.9	0.	0.
3	195.8	171.9	195.8	171.9	185.5	171.9	62.7	4.5	0.	0.
4	192.9	170.6	192.9	170.6	180.5	170.6	67.8	1.9	0.	0.
5	184.0	166.7	184.0	166.7	168.6	166.6	73.6	2.4	0.	0.
6	179.3	164.0	179.3	164.0	160.5	164.0	79.9	4.0	0.	0.
7	179.5	156.5	179.5	156.5	157.7	156.4	85.7	5.5	0.	0.
8	179.9	146.7	179.9	146.7	157.0	146.4	87.9	8.8	0.	0.
9	173.4	134.0	173.4	134.0	147.1	133.5	91.7	11.3	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	0.551	0.478	0.551	0.478	0.516	0.478	0.932	0.551
2	0.578	0.501	0.578	0.501	0.546	0.501	0.924	0.578
3	0.580	0.506	0.580	0.506	0.549	0.506	0.926	0.580
4	0.572	0.504	0.572	0.504	0.536	0.504	0.945	0.572
5	0.546	0.492	0.546	0.492	0.500	0.492	0.988	0.546
6	0.532	0.485	0.532	0.485	0.476	0.485	1.022	0.532
7	0.534	0.462	0.534	0.462	0.469	0.462	0.991	0.534
8	0.535	0.433	0.535	0.433	0.467	0.432	0.933	0.535
9	0.515	0.394	0.515	0.394	0.437	0.393	0.907	0.515

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	6.2	-3.0	6.0	0.284	0.	0.135	0.135	0.066	0.066
2	10.00	4.9	-4.3	6.0	0.270	0.	0.116	0.116	0.055	0.055
3	15.00	4.0	-5.2	5.5	0.258	0.	0.075	0.075	0.035	0.035
4	30.00	5.1	-4.1	4.6	0.257	0.	0.047	0.047	0.019	0.019
5	50.00	6.2	-3.0	4.9	0.232	0.	0.008	0.008	0.003	0.003
6	70.00	6.6	-2.5	5.6	0.211	0.	-0.014	-0.014	-0.004	-0.004
7	85.00	6.9	-2.2	6.2	0.240	0.	0.056	0.056	0.014	0.014
8	90.00	7.3	-1.8	7.5	0.288	0.	0.149	0.149	0.035	0.035
9	95.00	9.7	0.6	8.8	0.329	0.	0.183	0.183	0.040	0.040

TABLE XI. - Continued.

(d) Reading number 1800

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	24.595	24.608	24.2	2.3	24.2	2.3	306.1	0.998	11.91	0.976
2	23.861	23.886	21.6	2.6	21.6	2.6	305.2	0.998	12.10	0.973
3	23.127	23.167	21.3	2.1	21.3	2.1	304.5	0.997	12.09	0.979
4	20.917	20.996	23.7	1.0	23.7	1.0	302.4	0.996	11.86	0.992
5	17.955	18.080	26.5	1.1	26.5	1.1	300.5	0.997	11.59	0.997
6	14.945	15.110	29.1	1.7	29.1	1.7	299.1	0.998	11.47	0.994
7	12.647	12.786	31.3	2.5	31.3	2.5	298.0	0.998	11.35	0.989
8	11.869	11.966	31.4	3.9	31.4	3.9	297.7	0.998	11.32	0.974
9	11.087	11.125	34.4	5.2	34.4	5.2	297.5	0.999	11.12	0.973

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	178.3	155.1	178.3	155.1	162.6	155.0	73.1	6.2	0.	0.
2	188.4	161.2	188.4	161.2	175.2	161.1	69.2	7.4	0.	0.
3	189.4	163.0	189.4	163.0	176.5	162.9	68.8	5.9	0.	0.
4	183.7	161.0	183.7	161.0	168.3	161.0	73.7	2.8	0.	0.
5	174.7	153.5	174.7	153.5	156.3	153.5	78.0	2.9	0.	0.
6	170.7	148.1	170.7	148.1	149.2	148.1	83.0	4.4	0.	0.
7	169.3	140.4	169.3	140.4	144.6	140.2	87.9	6.1	0.	0.
8	169.9	129.7	169.9	129.7	144.9	129.4	88.6	8.8	0.	0.
9	163.4	117.7	163.4	117.7	134.8	117.2	92.4	10.7	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	0.522	0.452	0.522	0.452	0.476	0.451	0.953	0.522
2	0.554	0.471	0.554	0.471	0.515	0.471	0.919	0.554
3	0.558	0.477	0.558	0.477	0.520	0.477	0.923	0.558
4	0.542	0.473	0.542	0.473	0.497	0.473	0.957	0.542
5	0.516	0.451	0.516	0.451	0.462	0.451	0.982	0.516
6	0.505	0.436	0.505	0.436	0.441	0.436	0.992	0.505
7	0.501	0.413	0.501	0.413	0.428	0.412	0.970	0.501
8	0.503	0.381	0.503	0.381	0.429	0.380	0.893	0.503
9	0.484	0.344	0.484	0.344	0.399	0.343	0.869	0.504

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	9.9	0.7	6.4	0.313	0.	0.141	0.141	0.069	0.069
2	10.00	7.1	-2.1	6.7	0.299	0.	0.142	0.142	0.067	0.067
3	15.00	6.7	-2.6	6.1	0.292	0.	0.110	0.110	0.050	0.050
4	30.00	8.1	-1.0	5.0	0.284	0.	0.043	0.043	0.018	0.018
5	50.00	9.1	-0.0	5.2	0.274	0.	0.020	0.020	0.007	0.007
6	70.00	9.2	0.1	5.9	0.269	0.	0.035	0.035	0.010	0.010
7	85.00	9.7	0.6	6.7	0.292	0.	0.070	0.070	0.018	0.018
8	90.00	9.5	0.4	8.0	0.347	0.	0.164	0.164	0.039	0.039
9	95.00	12.2	3.1	9.2	0.390	0.	0.181	0.181	0.040	0.040

TABLE XI. - Continued.

(e) Reading number 1801

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	24.595	24.608	26.8	3.1	26.8	3.1	307.1	0.998	12.00	0.975
2	23.861	23.886	22.9	3.3	22.9	3.3	306.1	0.999	12.21	0.969
3	23.127	23.167	23.6	2.8	23.6	2.8	305.0	0.999	12.09	0.982
4	20.917	20.996	25.7	1.3	25.7	1.3	303.1	0.996	11.90	0.992
5	17.955	18.080	28.0	1.2	28.0	1.2	300.8	0.998	11.61	0.998
6	14.945	15.110	30.8	1.8	30.8	1.8	299.4	0.998	11.48	0.995
7	12.647	12.786	32.4	2.7	32.4	2.7	298.2	0.998	11.38	0.985
8	11.869	11.966	33.0	4.1	33.0	4.1	297.7	0.998	11.31	0.976
9	11.087	11.125	35.9	5.5	35.9	5.5	297.7	1.000	11.15	0.973

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	173.9	151.7	173.9	151.7	155.2	151.5	78.4	8.2	0.	0.
2	185.0	157.0	185.0	157.0	170.4	156.7	72.1	9.1	0.	0.
3	182.7	157.6	182.7	157.6	167.4	157.5	73.0	7.6	0.	0.
4	178.8	155.8	178.8	155.8	161.1	155.7	77.5	3.4	0.	0.
5	169.6	147.4	169.6	147.4	149.8	147.4	79.6	3.0	0.	0.
6	165.3	140.6	165.3	140.6	142.0	140.5	84.5	4.3	0.	0.
7	165.0	130.3	165.0	130.3	139.3	130.1	88.5	6.1	0.	0.
8	164.1	120.2	164.1	120.2	137.6	119.9	89.5	8.5	0.	0.
9	158.7	107.9	158.7	107.9	128.5	107.4	93.2	10.3	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	0.508	0.440	0.508	0.440	0.453	0.440	0.976	0.547
2	0.543	0.457	0.543	0.457	0.500	0.456	0.920	0.543
3	0.537	0.460	0.537	0.460	0.492	0.459	0.940	0.537
4	0.526	0.456	0.526	0.456	0.474	0.456	0.967	0.526
5	0.500	0.432	0.500	0.432	0.441	0.432	0.984	0.500
6	0.488	0.413	0.488	0.413	0.419	0.412	0.989	0.488
7	0.488	0.382	0.488	0.382	0.412	0.382	0.934	0.488
8	0.486	0.352	0.486	0.352	0.407	0.351	0.872	0.486
9	0.469	0.315	0.469	0.315	0.380	0.314	0.836	0.529

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	12.5	3.3	7.2	0.325	0.	0.152	0.152	0.074	0.074
2	10.00	8.5	-0.7	7.4	0.313	0.	0.169	0.169	0.080	0.080
3	15.00	8.9	-0.3	6.8	0.301	0.	0.099	0.099	0.046	0.046
4	30.00	10.2	1.0	5.3	0.301	0.	0.047	0.047	0.019	0.019
5	50.00	10.6	1.4	5.3	0.291	0.	0.015	0.015	0.005	0.005
6	70.00	10.9	1.8	6.0	0.293	0.	0.033	0.033	0.010	0.010
7	85.00	10.8	1.7	6.9	0.336	0.	0.102	0.102	0.026	0.026
8	90.00	11.1	2.0	8.2	0.384	0.	0.163	0.163	0.039	0.039
9	95.00	13.7	4.6	9.5	0.435	0.	0.194	0.194	0.042	0.042

TABLE XI. - Concluded.

(f) Reading number 1807

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.595	24.608	27.5	3.6	27.5	3.6	308.2	0.999	12.06	0.974
2	23.861	23.886	23.7	3.8	23.7	3.8	306.6	1.000	12.23	0.969
3	23.127	23.167	24.0	3.0	24.0	3.0	305.3	1.000	12.15	0.979
4	20.917	20.996	26.4	1.4	26.4	1.4	303.5	0.996	11.92	0.992
5	17.955	18.080	29.5	1.4	29.5	1.4	301.5	0.996	11.66	0.996
6	14.945	15.110	31.8	1.9	31.8	1.9	299.5	0.998	11.49	0.996
7	12.647	12.786	33.0	2.8	33.0	2.8	298.2	0.998	11.36	0.985
8	11.869	11.966	33.7	4.3	33.7	4.3	297.8	0.999	11.29	0.977
9	11.087	11.125	36.6	5.7	36.6	5.7	297.6	1.000	11.14	0.975

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	173.5	150.1	173.5	150.1	154.0	149.9	80.0	9.4	0.	0.
2	183.1	154.4	183.1	154.4	167.7	154.1	73.6	10.1	0.	0.
3	181.7	155.2	181.7	155.2	166.0	155.0	73.9	8.1	0.	0.
4	176.8	153.3	176.8	153.3	158.3	153.3	78.7	3.7	0.	0.
5	168.3	144.6	168.3	144.6	146.5	144.6	82.8	3.5	0.	0.
6	162.8	137.3	162.8	137.3	138.4	137.2	85.8	4.5	0.	0.
7	161.6	125.4	161.6	125.4	135.6	125.3	87.9	6.1	0.	0.
8	161.1	116.1	161.1	116.1	134.1	115.8	89.3	8.7	0.	0.
9	156.3	104.3	156.3	104.3	125.5	103.8	93.2	10.3	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	0.506	0.435	0.506	0.435	0.449	0.434	0.973	0.563
2	0.537	0.449	0.537	0.449	0.491	0.448	0.919	0.537
3	0.533	0.452	0.533	0.452	0.487	0.452	0.934	0.533
4	0.520	0.449	0.520	0.449	0.465	0.448	0.968	0.520
5	0.495	0.424	0.495	0.424	0.431	0.424	0.987	0.526
6	0.480	0.402	0.480	0.402	0.408	0.402	0.991	0.513
7	0.477	0.368	0.477	0.368	0.401	0.367	0.924	0.484
8	0.476	0.340	0.476	0.340	0.396	0.339	0.864	0.489
9	0.462	0.304	0.462	0.304	0.371	0.303	0.827	0.534

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	13.2	4.0	7.7	0.333	0.	0.163	0.163	0.079	0.079
2	10.00	9.2	0.0	7.8	0.321	0.	0.172	0.172	0.081	0.081
3	15.00	9.4	0.1	7.0	0.312	0.	0.122	0.122	0.056	0.056
4	30.00	10.9	1.7	5.4	0.309	0.	0.047	0.047	0.019	0.019
5	50.00	12.1	2.9	5.5	0.309	0.	0.024	0.024	0.009	0.009
6	70.00	11.9	2.8	6.1	0.305	0.	0.028	0.028	0.008	0.008
7	85.00	11.4	2.3	7.0	0.351	0.	0.101	0.101	0.025	0.025
8	90.00	11.7	2.6	8.4	0.397	0.	0.160	0.160	0.038	0.038
9	95.00	14.4	5.3	9.7	0.449	0.	0.185	0.185	0.041	0.041

TABLE XII. - BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 51

WITH STAGE 51B C-51 AT 100 PERCENT DESIGN SPEED

(a) Reading number 1830

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.595	24.608	15.4	1.0	15.4	1.0	300.0	0.995	11.15	0.979
2	23.861	23.886	13.6	0.9	13.6	0.9	299.3	0.997	11.32	0.983
3	23.127	23.167	13.7	0.3	13.7	0.3	298.8	0.999	11.33	0.990
4	20.917	20.996	15.9	0.1	15.9	0.1	298.0	0.997	11.36	0.993
5	17.955	18.080	19.6	0.5	19.6	0.5	297.9	0.996	11.36	0.994
6	14.945	15.110	22.3	1.4	22.3	1.4	297.3	0.998	11.28	0.999
7	12.647	12.786	23.6	2.0	23.6	2.0	295.5	0.999	11.03	0.995
8	11.869	11.966	23.1	2.5	23.1	2.5	294.5	1.001	10.89	0.990
9	11.087	11.125	24.7	3.8	24.7	3.8	294.5	1.001	10.71	0.981

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	174.5	156.0	174.5	156.0	168.3	155.9	46.3	2.7	0.	0.
2	182.8	164.0	182.8	164.0	177.7	164.0	43.0	2.7	0.	0.
3	184.3	167.3	184.3	167.3	179.0	167.3	43.7	1.0	0.	0.
4	187.2	171.4	187.2	171.4	180.1	171.4	51.1	0.4	0.	0.
5	186.0	174.6	186.0	174.6	175.3	174.6	62.4	1.5	0.	0.
6	183.8	175.4	183.8	175.4	170.0	175.4	69.9	4.3	0.	0.
7	175.3	164.2	175.3	164.2	160.7	164.1	70.1	5.7	0.	0.
8	169.9	155.4	169.9	155.4	156.2	155.3	66.8	6.8	0.	0.
9	162.9	141.3	162.9	141.3	148.0	141.0	67.9	9.4	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	0.516	0.460	0.516	0.460	0.497	0.460	0.927	0.516
2	0.542	0.485	0.542	0.485	0.527	0.485	0.923	0.542
3	0.547	0.495	0.547	0.495	0.532	0.495	0.935	0.547
4	0.558	0.509	0.558	0.509	0.536	0.509	0.952	0.558
5	0.554	0.519	0.554	0.519	0.522	0.519	0.996	0.554
6	0.547	0.522	0.547	0.522	0.506	0.522	1.032	0.547
7	0.522	0.488	0.522	0.488	0.479	0.488	1.021	0.522
8	0.506	0.461	0.506	0.461	0.466	0.461	0.994	0.506
9	0.484	0.418	0.484	0.418	0.440	0.417	0.952	0.484

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	1.1	-8.1	5.0	0.228	0.	0.125	0.125	0.061	0.061
2	10.00	-0.8	-10.0	5.0	0.207	0.	0.096	0.096	0.045	0.045
3	15.00	-0.9	-10.1	4.3	0.198	0.	0.052	0.052	0.024	0.024
4	30.00	0.3	-8.8	4.1	0.197	0.	0.035	0.035	0.014	0.014
5	50.00	2.2	-7.0	4.6	0.178	0.	0.030	0.030	0.011	0.011
6	70.00	2.5	-6.6	5.6	0.151	0.	0.005	0.005	0.002	0.002
7	85.00	2.0	-7.1	6.2	0.156	0.	0.030	0.030	0.008	0.008
8	90.00	1.2	-7.9	6.6	0.169	0.	0.064	0.064	0.015	0.015
9	95.00	2.5	-6.7	7.8	0.212	0.	0.131	0.131	0.029	0.029

TABLE XII. - Continued.

(b) Reading number 1829

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	24.595	24.608	19.0	1.6	19.0	1.6	301.9	0.997	11.53	0.981
2	23.861	23.886	17.3	1.6	17.3	1.6	301.2	0.998	11.66	0.983
3	23.127	23.167	17.2	1.1	17.2	1.1	300.7	0.998	11.66	0.990
4	20.917	20.996	19.8	0.7	19.8	0.7	300.1	0.997	11.63	0.993
5	17.955	18.080	23.2	1.2	23.2	1.2	299.0	0.998	11.51	0.997
6	14.945	15.110	26.0	1.8	26.0	1.8	297.8	0.999	11.36	0.999
7	12.647	12.786	26.9	2.3	26.9	2.3	296.0	1.000	11.10	0.996
8	11.869	11.966	26.8	2.8	26.8	2.8	295.5	1.000	11.01	0.987
9	11.087	11.125	29.4	4.3	29.4	4.3	295.4	1.000	10.89	0.979

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	165.8	148.6	165.8	148.6	156.8	148.5	54.1	4.2	0.	0.
2	174.2	155.8	174.2	155.8	166.3	155.7	51.9	4.4	0.	0.
3	175.0	158.0	175.0	158.0	167.2	158.0	51.8	3.1	0.	0.
4	176.1	159.7	176.1	159.7	165.7	159.7	59.6	2.0	0.	0.
5	173.3	158.3	173.3	158.3	159.3	158.2	68.2	3.3	0.	0.
6	169.0	154.8	169.0	154.8	151.9	154.7	74.1	4.8	0.	0.
7	160.3	140.7	160.3	140.7	143.0	140.6	72.5	5.7	0.	0.
8	157.6	131.9	157.6	131.9	140.7	131.8	71.1	6.5	0.	0.
9	152.8	119.3	152.8	119.3	133.1	119.0	75.1	8.9	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	0.487	0.435	0.487	0.435	0.461	0.435	0.947	0.487
2	0.514	0.458	0.514	0.458	0.490	0.457	0.937	0.514
3	0.517	0.465	0.517	0.465	0.494	0.465	0.945	0.517
4	0.521	0.471	0.521	0.471	0.490	0.471	0.964	0.521
5	0.513	0.467	0.513	0.467	0.472	0.467	0.993	0.513
6	0.501	0.457	0.501	0.457	0.450	0.457	1.019	0.501
7	0.475	0.415	0.475	0.415	0.424	0.415	0.984	0.475
8	0.467	0.389	0.467	0.389	0.417	0.388	0.937	0.467
9	0.452	0.351	0.452	0.351	0.394	0.350	0.894	0.452

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	4.7	-4.5	5.7	0.251	0.	0.126	0.126	0.062	0.062
2	10.00	2.9	-6.3	5.6	0.235	0.	0.101	0.101	0.048	0.048
3	15.00	2.6	-6.6	5.1	0.225	0.	0.057	0.057	0.026	0.026
4	30.00	4.3	-4.9	4.7	0.229	0.	0.042	0.042	0.018	0.018
5	50.00	5.8	-3.4	5.3	0.220	0.	0.021	0.021	0.008	0.008
6	70.00	6.1	-3.0	6.0	0.205	0.	0.004	0.004	0.001	0.001
7	85.00	5.3	-3.8	6.5	0.227	0.	0.031	0.031	0.008	0.008
8	90.00	4.9	-4.2	6.9	0.259	0.	0.093	0.093	0.022	0.022
9	95.00	7.2	-1.9	8.3	0.314	0.	0.163	0.163	0.036	0.036

TABLE XII. - Continued.

(c) Reading number 1828

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	24.595	24.608	20.3	2.0	20.3	2.0	302.8	0.998	11.63	0.979
2	23.861	23.886	18.9	2.2	18.9	2.2	302.2	0.999	11.72	0.984
3	23.127	23.167	18.9	1.6	18.9	1.6	300.9	0.999	11.69	0.991
4	20.917	20.996	21.4	0.6	21.4	0.6	299.6	0.998	11.54	0.997
5	17.955	18.080	24.6	0.8	24.6	0.8	298.4	0.999	11.39	1.001
6	14.945	15.110	27.4	1.7	27.4	1.7	297.6	0.999	11.30	1.000
7	12.647	12.786	29.0	2.2	29.0	2.2	296.0	1.000	11.12	0.995
8	11.869	11.966	29.5	3.5	29.5	3.5	295.8	1.000	11.08	0.985
9	11.087	11.125	32.5	5.3	32.5	5.3	296.1	1.000	10.96	0.980

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	162.3	142.9	162.3	142.9	152.2	142.8	56.4	4.9	0.	0.
2	167.7	148.8	167.7	148.8	158.6	148.7	54.3	5.8	0.	0.
3	167.4	150.0	167.4	150.0	158.4	150.0	54.3	4.1	0.	0.
4	163.9	148.7	163.9	148.7	152.6	148.7	59.7	1.7	0.	0.
5	158.0	144.6	158.0	144.6	143.7	144.6	65.7	2.1	0.	0.
6	155.9	140.5	155.9	140.5	138.5	140.4	71.6	4.1	0.	0.
7	150.8	129.9	150.8	129.9	132.0	129.8	73.1	5.0	0.	0.
8	150.1	120.6	150.1	120.6	130.7	120.3	73.9	7.3	0.	0.
9	145.4	109.4	145.4	109.4	122.7	109.0	78.1	10.1	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	0.476	0.417	0.476	0.417	0.446	0.417	0.938	0.476
2	0.493	0.435	0.493	0.435	0.466	0.435	0.938	0.493
3	0.493	0.440	0.493	0.440	0.466	0.440	0.947	0.493
4	0.483	0.437	0.483	0.437	0.450	0.437	0.974	0.483
5	0.466	0.425	0.466	0.425	0.424	0.425	1.006	0.466
6	0.460	0.413	0.460	0.413	0.409	0.413	1.014	0.460
7	0.446	0.382	0.446	0.382	0.390	0.382	0.984	0.446
8	0.444	0.354	0.444	0.354	0.386	0.353	0.921	0.444
9	0.429	0.320	0.429	0.320	0.362	0.319	0.888	0.429

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	6.0	-3.2	6.0	0.275	0.	0.146	0.146	0.071	0.071
2	10.00	4.5	-4.8	6.2	0.249	0.	0.104	0.104	0.049	0.049
3	15.00	4.3	-4.9	5.6	0.242	0.	0.062	0.062	0.028	0.028
4	30.00	5.9	-3.3	4.6	0.240	0.	0.023	0.023	0.009	0.009
5	50.00	7.2	-2.0	5.0	0.228	0.	-0.008	-0.008	-0.003	-0.003
6	70.00	7.5	-1.6	5.9	0.227	0.	-0.001	-0.001	-0.000	-0.000
7	85.00	7.4	-1.7	6.4	0.252	0.	0.036	0.036	0.009	0.009
8	90.00	7.5	-1.6	7.6	0.301	0.	0.119	0.119	0.028	0.028
9	95.00	10.3	1.2	9.3	0.350	0.	0.166	0.166	0.037	0.037

TABLE XII. - Continued.

(d) Reading number 1824

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	24.595	24.608	27.8	4.4	27.8	4.4	306.0	0.998	11.89	0.977
2	23.861	23.886	24.4	3.9	24.4	3.9	304.3	1.000	11.95	0.979
3	23.127	23.167	24.7	3.1	24.7	3.1	303.9	0.998	11.95	0.982
4	20.917	20.996	27.5	1.5	27.5	1.5	302.0	0.997	11.74	0.993
5	17.955	18.080	30.7	1.5	30.7	1.5	299.8	0.999	11.49	1.000
6	14.945	15.110	33.4	2.2	33.4	2.2	298.5	0.999	11.38	0.995
7	12.647	12.786	34.7	3.7	34.7	3.7	297.3	0.999	11.26	0.984
8	11.869	11.966	35.6	5.0	35.6	5.0	297.0	0.999	11.20	0.978
9	11.087	11.125	39.0	5.8	39.0	5.8	296.8	1.000	11.07	0.980

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	150.4	132.3	150.4	132.3	133.0	131.9	70.2	10.2	0.	0.
2	157.0	136.2	157.0	136.2	143.0	135.9	64.8	9.3	0.	0.
3	157.8	137.1	157.8	137.1	143.4	136.9	65.8	7.4	0.	0.
4	152.2	134.1	152.2	134.1	135.0	134.1	70.2	3.5	0.	0.
5	141.6	125.0	141.6	125.0	121.7	125.0	72.4	3.3	0.	0.
6	139.9	116.0	139.9	116.0	116.7	115.9	77.1	4.5	0.	0.
7	137.8	100.7	137.8	100.7	113.3	100.5	78.5	6.4	0.	0.
8	137.1	91.3	137.1	91.3	111.5	91.0	79.8	7.9	0.	0.
9	132.4	82.5	132.4	82.5	102.9	82.1	83.3	8.4	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	0.437	0.383	0.437	0.383	0.386	0.382	0.992	0.494
2	0.458	0.396	0.458	0.396	0.418	0.395	0.950	0.458
3	0.461	0.399	0.461	0.399	0.419	0.398	0.955	0.461
4	0.445	0.391	0.445	0.391	0.395	0.391	0.993	0.460
5	0.415	0.365	0.415	0.365	0.357	0.365	1.027	0.468
6	0.411	0.339	0.411	0.339	0.343	0.339	0.993	0.473
7	0.405	0.294	0.405	0.294	0.333	0.294	0.887	0.455
8	0.403	0.266	0.403	0.266	0.328	0.265	0.816	0.459
9	0.389	0.240	0.389	0.240	0.302	0.239	0.798	0.488

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	13.5	4.3	8.5	0.315	0.	0.187	0.187	0.091	0.091
2	10.00	9.9	0.7	7.9	0.300	0.	0.160	0.160	0.076	0.076
3	15.00	10.0	0.8	7.1	0.301	0.	0.131	0.131	0.060	0.060
4	30.00	11.9	2.8	5.5	0.301	0.	0.051	0.051	0.021	0.021
5	50.00	13.3	4.2	5.6	0.291	0.	0.001	0.001	0.000	0.000
6	70.00	13.6	4.5	6.4	0.324	0.	0.048	0.048	0.014	0.014
7	85.00	13.1	4.0	7.9	0.400	0.	0.145	0.145	0.037	0.037
8	90.00	13.7	4.5	9.1	0.457	0.	0.205	0.205	0.048	0.048
9	95.00	16.8	7.7	9.8	0.501	0.	0.201	0.201	0.044	0.044

TABLE XII. - Continued.

(e) Reading number 1827

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	24.595	24.608	23.3	2.5	23.3	2.5	304.3	0.998	11.76	0.978
2	23.861	23.886	20.9	2.8	20.9	2.8	303.0	1.000	11.84	0.982
3	23.127	23.167	21.3	2.1	21.3	2.1	302.4	0.999	11.81	0.986
4	20.917	20.996	23.9	0.9	23.9	0.9	301.2	0.997	11.68	0.991
5	17.955	18.080	26.8	1.1	26.8	1.1	299.1	0.999	11.42	1.001
6	14.945	15.110	30.0	1.9	30.0	1.9	297.9	0.999	11.34	0.997
7	12.647	12.786	31.3	2.8	31.3	2.8	296.9	0.999	11.21	0.990
8	11.869	11.966	32.1	4.2	32.1	4.2	296.3	0.999	11.15	0.981
9	11.087	11.125	35.0	5.6	35.0	5.6	296.3	1.000	11.01	0.981

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	156.8	137.1	156.8	137.1	144.0	136.9	62.0	6.1	0.	0.
2	162.0	142.1	162.0	142.1	151.3	142.0	57.9	6.8	0.	0.
3	162.1	143.2	162.1	143.2	151.1	143.1	58.8	5.3	0.	0.
4	159.8	140.7	159.8	140.7	146.1	140.7	64.8	2.3	0.	0.
5	149.1	134.1	149.1	134.1	133.1	134.1	67.3	2.7	0.	0.
6	147.3	128.7	147.3	128.7	127.5	128.6	73.7	4.3	0.	0.
7	145.4	117.7	145.4	117.7	124.2	117.5	75.6	5.8	0.	0.
8	144.5	107.9	144.5	107.9	122.5	107.6	76.8	7.9	0.	0.
9	138.5	97.5	138.5	97.5	113.4	97.0	79.5	9.5	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	0.458	0.398	0.458	0.398	0.420	0.398	0.951	0.458
2	0.475	0.414	0.475	0.414	0.443	0.414	0.938	0.475
3	0.476	0.418	0.476	0.418	0.443	0.418	0.947	0.476
4	0.469	0.412	0.469	0.412	0.429	0.412	0.963	0.469
5	0.438	0.393	0.438	0.393	0.391	0.393	1.008	0.438
6	0.434	0.378	0.434	0.378	0.376	0.377	1.009	0.434
7	0.429	0.345	0.429	0.345	0.366	0.345	0.946	0.429
8	0.426	0.316	0.426	0.316	0.361	0.315	0.879	0.426
9	0.408	0.285	0.408	0.285	0.334	0.283	0.855	0.441

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	9.0	-0.2	6.6	0.300	0.	0.163	0.163	0.079	0.079
2	10.00	6.5	-2.7	6.8	0.272	0.	0.128	0.128	0.060	0.060
3	15.00	6.6	-2.6	6.1	0.269	0.	0.095	0.095	0.043	0.043
4	30.00	8.4	-0.8	4.9	0.282	0.	0.063	0.063	0.026	0.026
5	50.00	9.4	0.3	5.2	0.255	0.	-0.010	-0.010	-0.003	-0.003
6	70.00	10.2	1.1	6.1	0.266	0.	0.026	0.026	0.008	0.008
7	85.00	9.7	0.6	7.0	0.311	0.	0.084	0.084	0.021	0.021
8	90.00	10.1	1.0	8.3	0.366	0.	0.162	0.162	0.038	0.038
9	95.00	12.8	3.7	9.6	0.407	0.	0.177	0.177	0.039	0.039

TABLE XII. - Concluded.

(f) Reading number 1841

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	24.595	24.608	31.4	5.5	31.4	5.5	306.7	1.000	11.91	0.976
2	23.861	23.886	27.3	5.2	27.3	5.2	305.2	1.002	12.00	0.976
3	23.127	23.167	27.0	4.0	27.0	4.0	304.4	1.000	11.98	0.980
4	20.917	20.996	29.5	2.2	29.5	2.2	302.7	0.996	11.80	0.992
5	17.955	18.080	32.5	1.7	32.5	1.7	300.3	0.998	11.56	0.998
6	14.945	15.110	34.7	2.7	34.7	2.7	298.8	0.998	11.46	0.989
7	12.647	12.786	36.2	4.2	36.2	4.2	297.2	0.999	11.27	0.985
8	11.869	11.966	37.4	5.3	37.4	5.3	296.8	1.000	11.21	0.980
9	11.087	11.125	41.1	5.6	41.1	5.6	296.9	1.001	11.10	0.981

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	145.4	126.7	145.4	126.7	124.0	126.1	75.8	12.2	0.	0.
2	152.1	130.5	152.1	130.5	135.2	130.0	69.7	11.9	0.	0.
3	153.6	131.3	153.6	131.3	136.8	131.0	69.8	9.1	0.	0.
4	149.3	130.0	149.3	130.0	129.9	129.9	73.5	5.0	0.	0.
5	139.8	121.2	139.8	121.2	117.9	121.2	75.1	3.6	0.	0.
6	138.3	109.4	138.3	109.4	113.7	109.3	78.7	5.1	0.	0.
7	133.3	94.3	133.3	94.3	107.6	94.0	78.8	7.0	0.	0.
8	132.3	84.6	132.3	84.6	105.1	84.2	80.3	7.8	0.	0.
9	128.8	76.0	128.8	76.0	97.0	75.6	84.7	7.4	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	0.421	0.366	0.421	0.366	0.360	0.364	1.016	0.538
2	0.443	0.378	0.443	0.378	0.394	0.376	0.961	0.483
3	0.448	0.381	0.448	0.381	0.399	0.380	0.957	0.476
4	0.436	0.379	0.436	0.379	0.380	0.379	1.000	0.500
5	0.409	0.354	0.409	0.354	0.345	0.354	1.028	0.493
6	0.406	0.319	0.406	0.319	0.334	0.319	0.961	0.489
7	0.392	0.275	0.392	0.275	0.316	0.274	0.874	0.466
8	0.389	0.246	0.389	0.246	0.309	0.245	0.801	0.472
9	0.378	0.221	0.378	0.221	0.285	0.220	0.779	0.504

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	17.1	7.9	9.6	0.342	0.	0.209	0.209	0.102	0.102
2	10.00	12.8	3.6	9.3	0.322	0.	0.191	0.191	0.090	0.090
3	15.00	12.4	3.2	8.0	0.327	0.	0.156	0.156	0.072	0.072
4	30.00	14.0	4.8	6.2	0.320	0.	0.066	0.066	0.027	0.027
5	50.00	15.1	5.9	5.8	0.315	0.	0.018	0.018	0.006	0.006
6	70.00	14.8	5.7	6.9	0.367	0.	0.098	0.098	0.029	0.029
7	85.00	14.6	5.5	8.4	0.428	0.	0.150	0.150	0.038	0.038
8	90.00	15.4	6.3	9.4	0.490	0.	0.197	0.197	0.046	0.046
9	95.00	18.9	9.8	9.6	0.542	0.	0.198	0.198	0.043	0.043

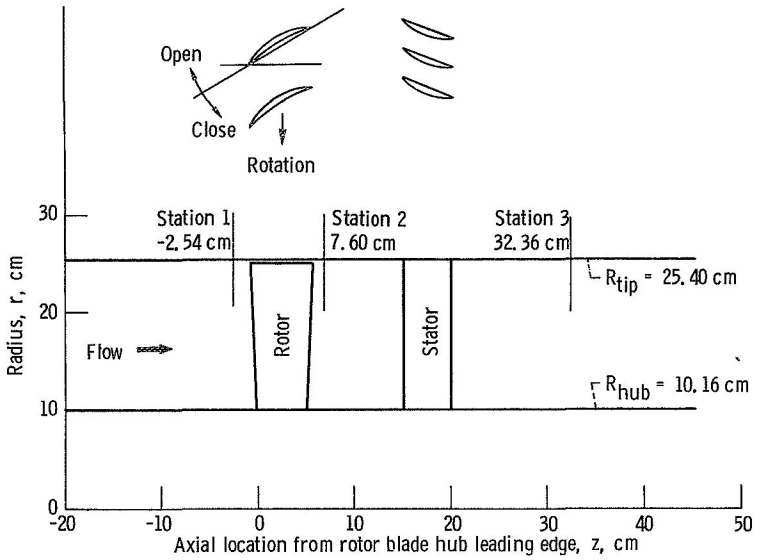


Figure 1. - Compressor flow path.

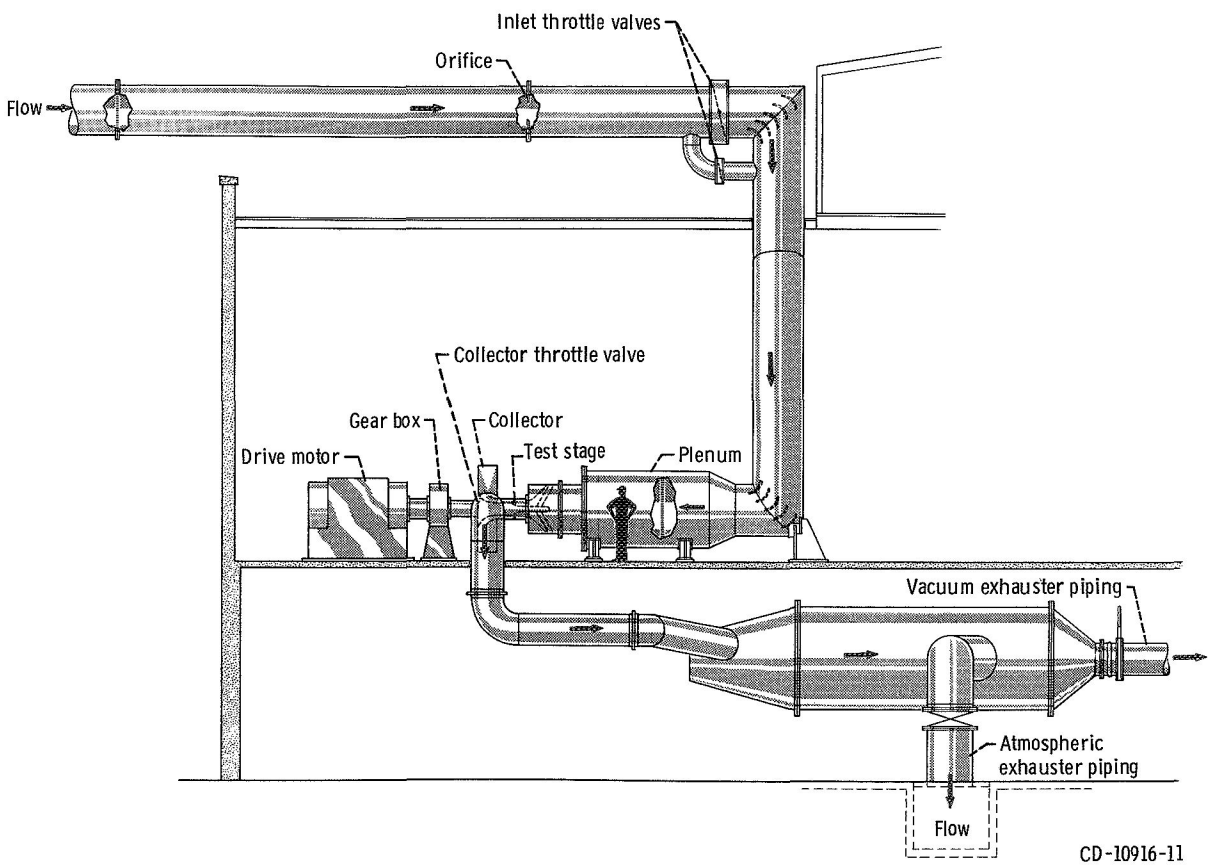


Figure 2. - Single-stage compressor facility.

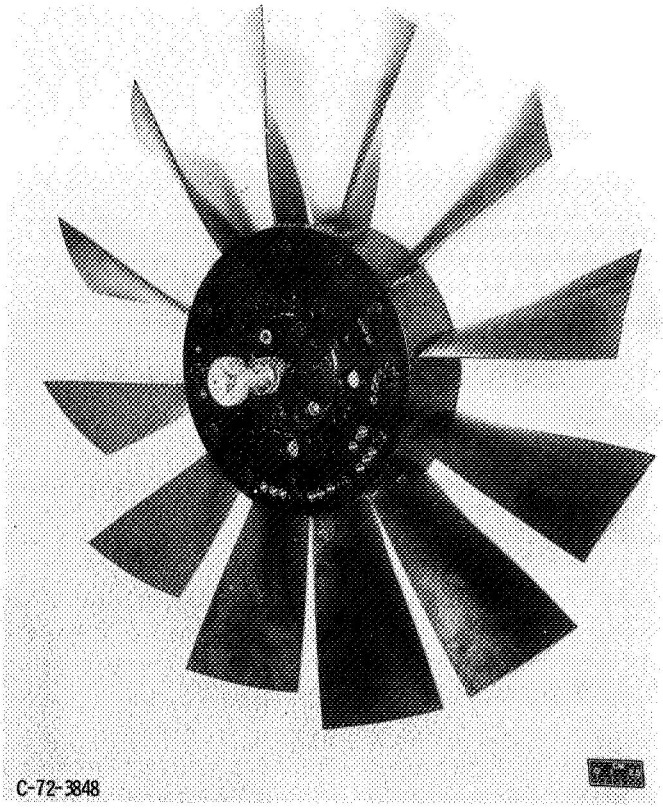


Figure 3. - Rotor 51B A.

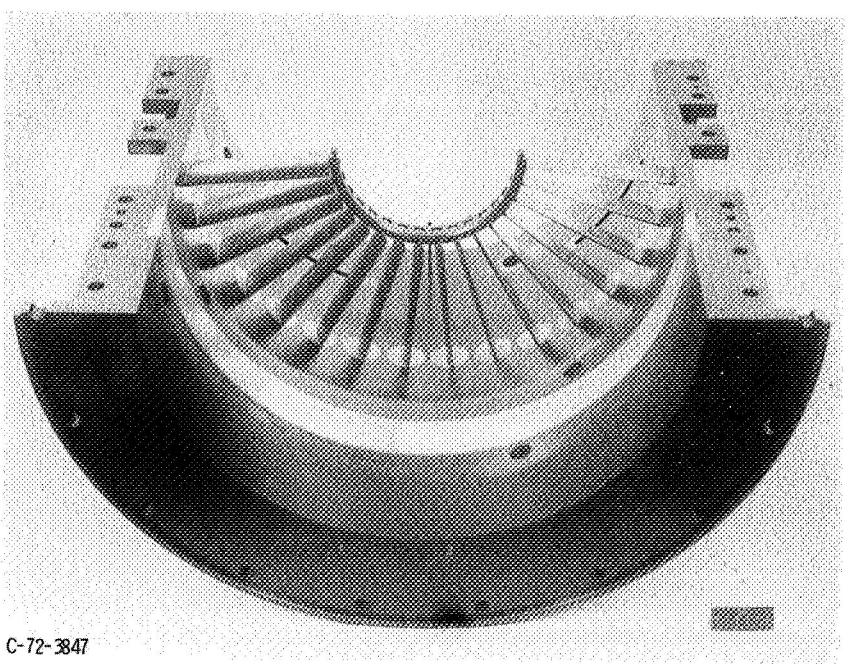
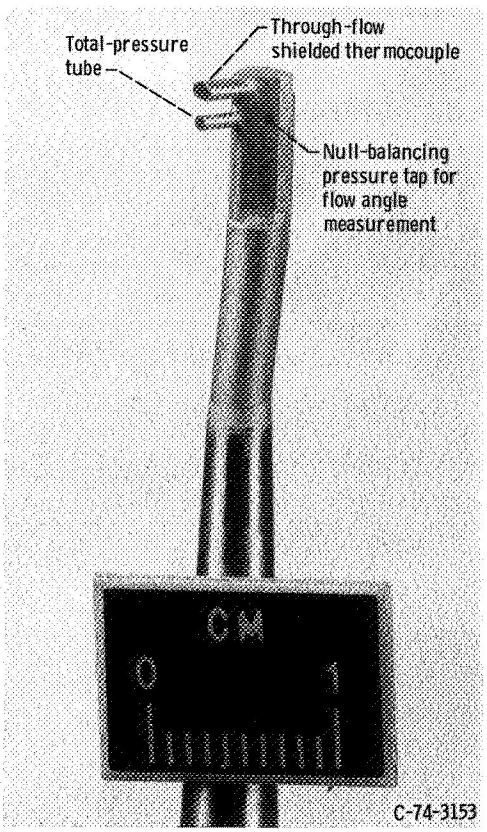
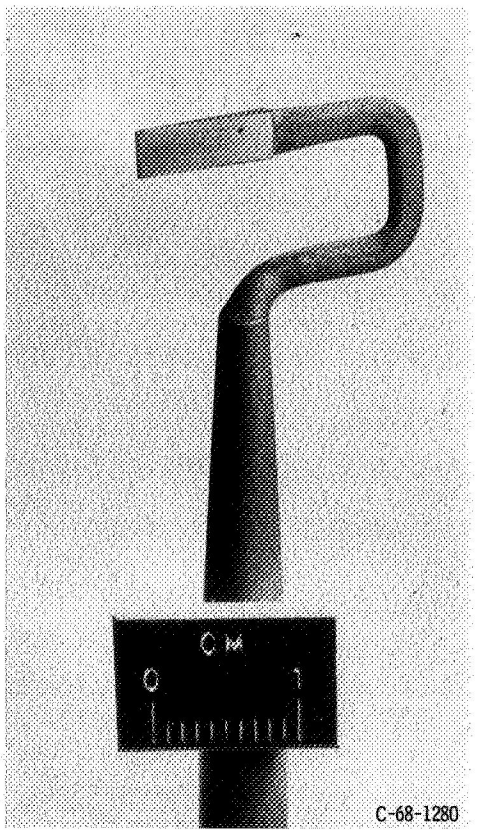


Figure 4. - Stator 51.

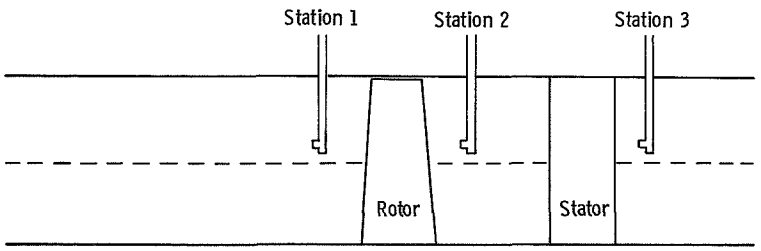


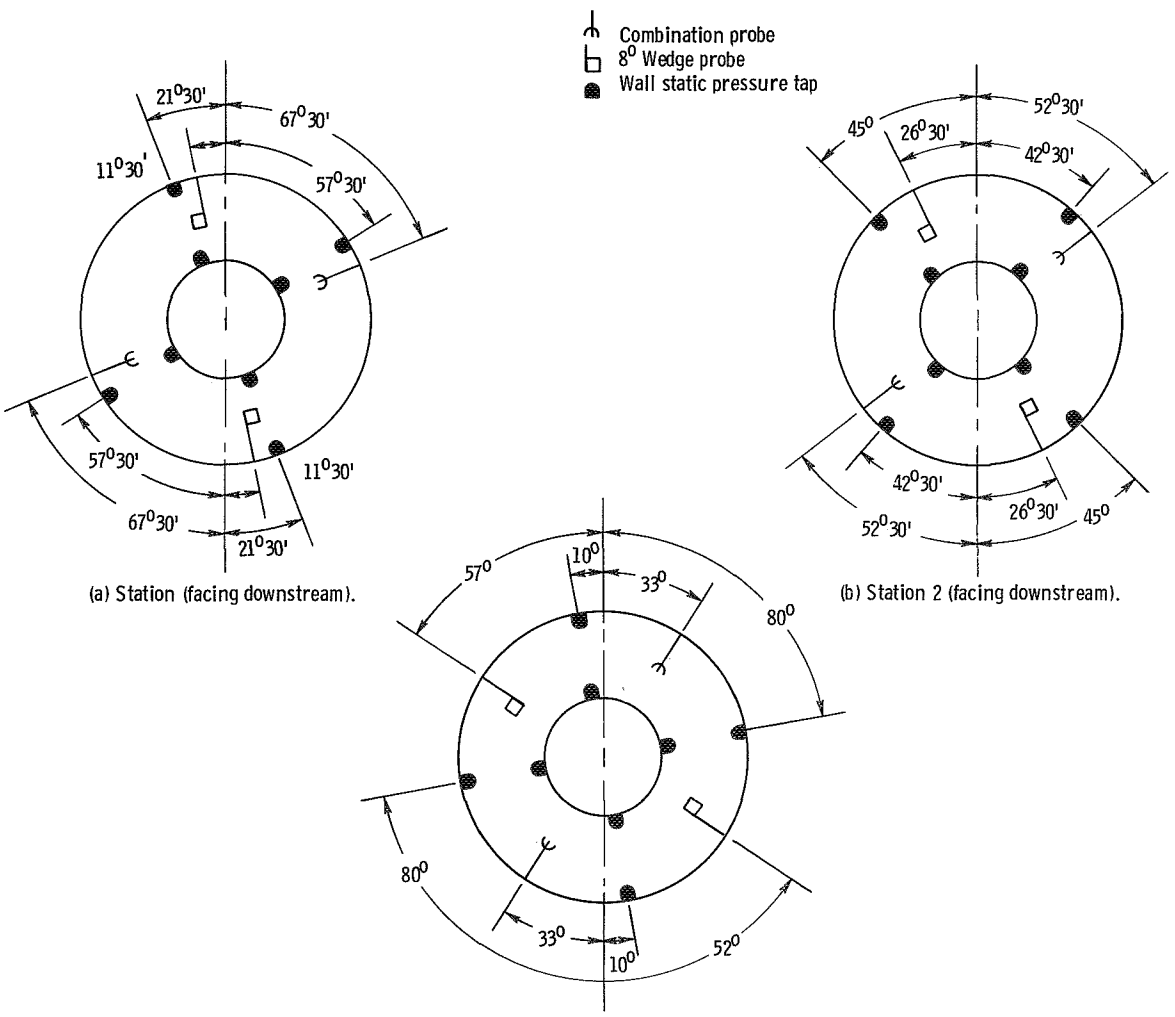
(a) Combination total pressure, total temperature, and flow angle probe.



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

Figure 5. - Survey probes.





(a) Station (facing downstream).

(b) Station 2 (facing downstream).

(c) Station 3 (facing downstream).

Figure 6. - Circumferential location of instrumentation.

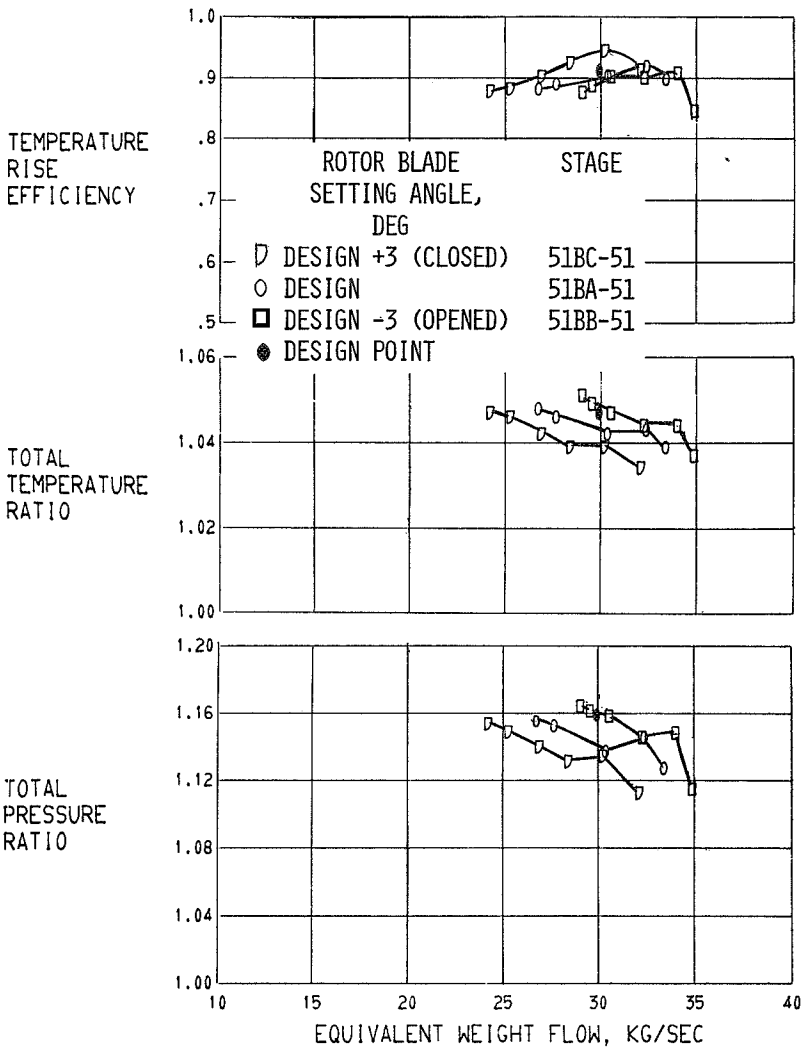


FIGURE 7. - OVERALL PERFORMANCE FOR ROTOR 51B FOR THREE ROTOR BLADE SETTING ANGLES AT 100 PERCENT DESIGN SPEED.

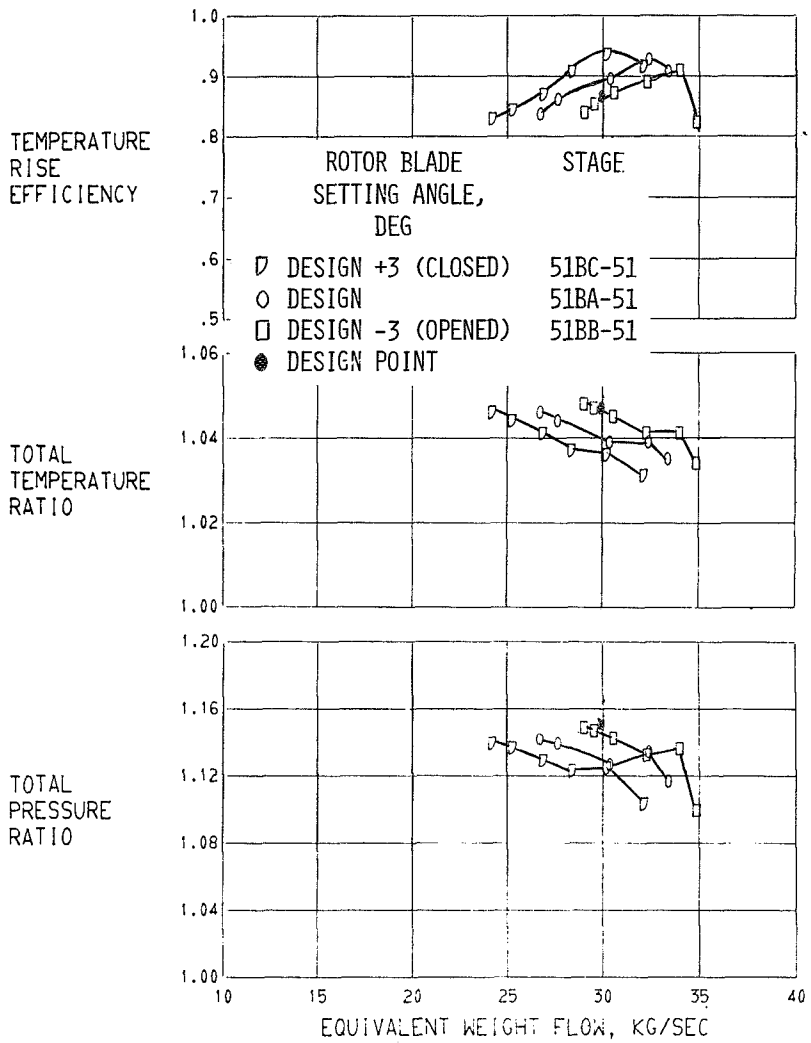
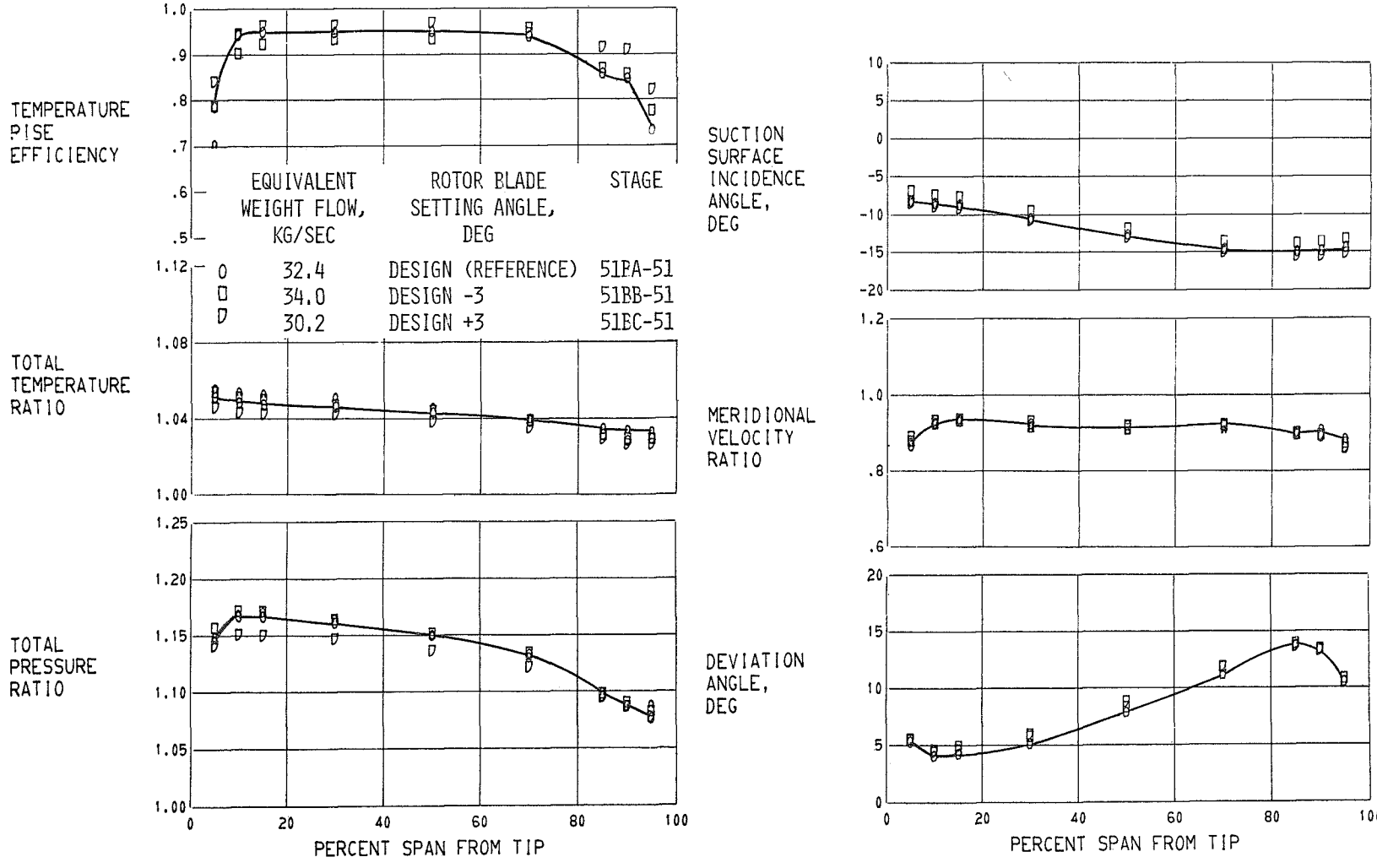


FIGURE 8. - OVERALL PERFORMANCE FOR STAGE 51B-51 FOR THREE ROTOR BLADE SETTING ANGLES AT 100 PERCENT DESIGN SPEED.


TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
SUCTION SURFACE INCIDENCE ANGLE, DEG
MERIDIONAL VELOCITY RATIO
DEVIATION ANGLE, DEG
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
0 32.4 DESIGN (REFERENCE) 51PA-51
□ 34.0 DESIGN -3 51BB-51
D 30.2 DESIGN +3 51BC-51
PERCENT SPAN FROM TIP
PERCENT SPAN FROM TIP

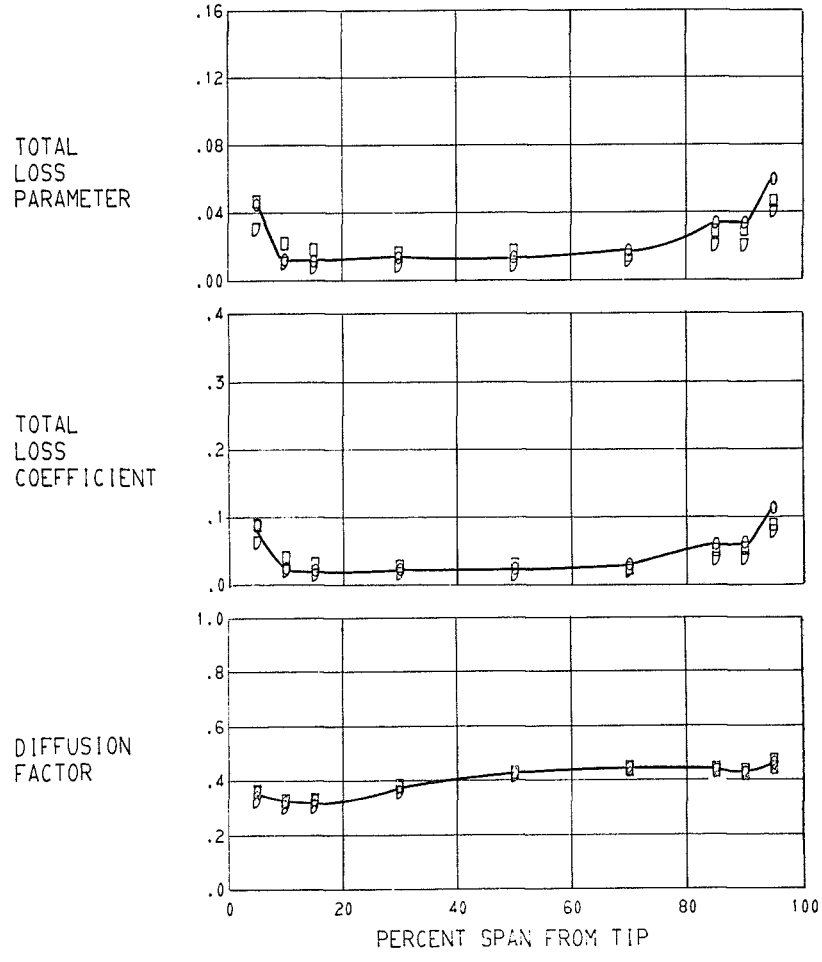


FIGURE 9. - RADIAL DISTRIBUTION OF PERFORMANCE FOR ROTOR 51B AT PEAK EFFICIENCY FOR THREE ROTOR BLADE SETTING ANGLES AT 100 PERCENT DESIGN SPEED.

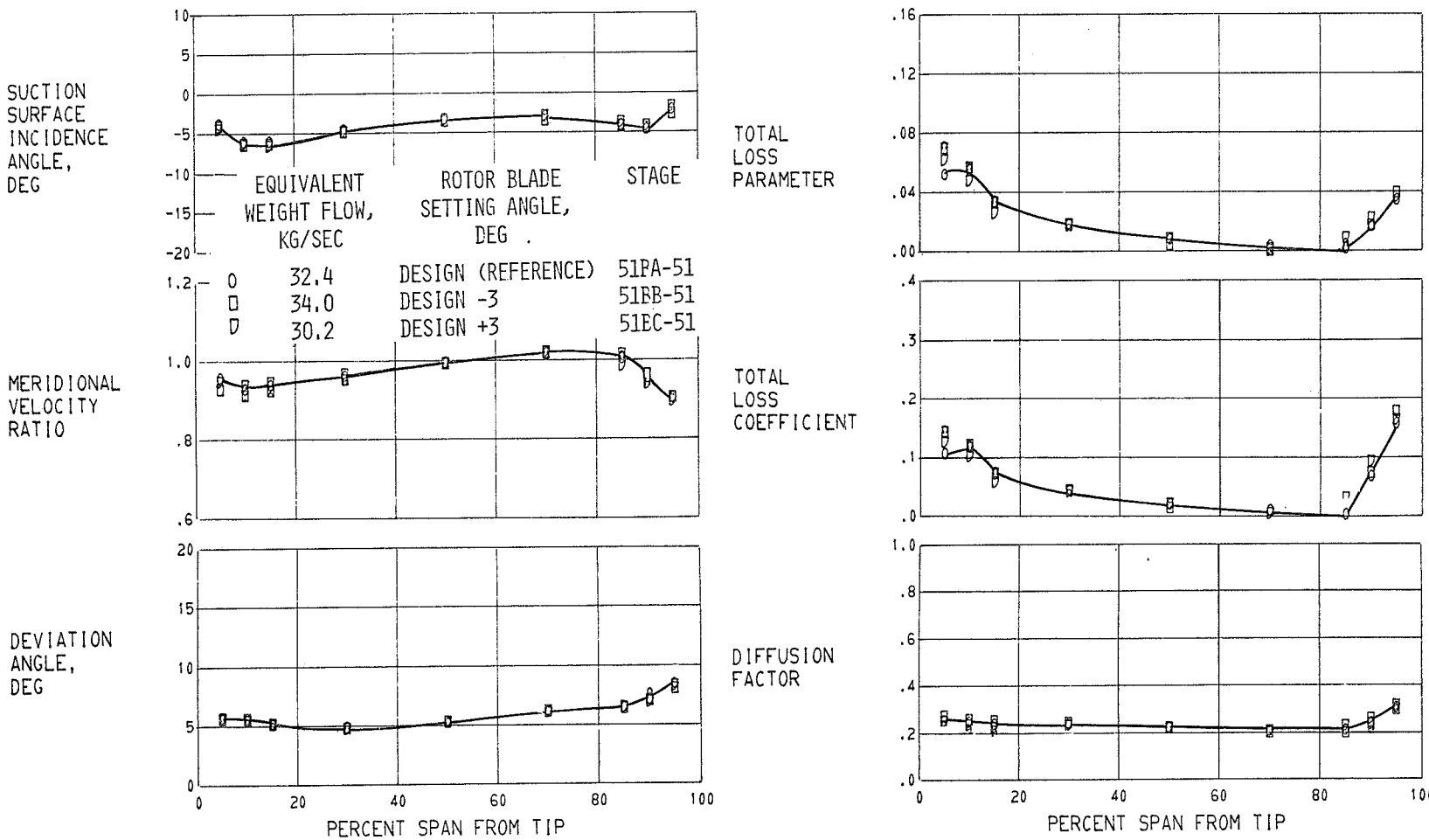
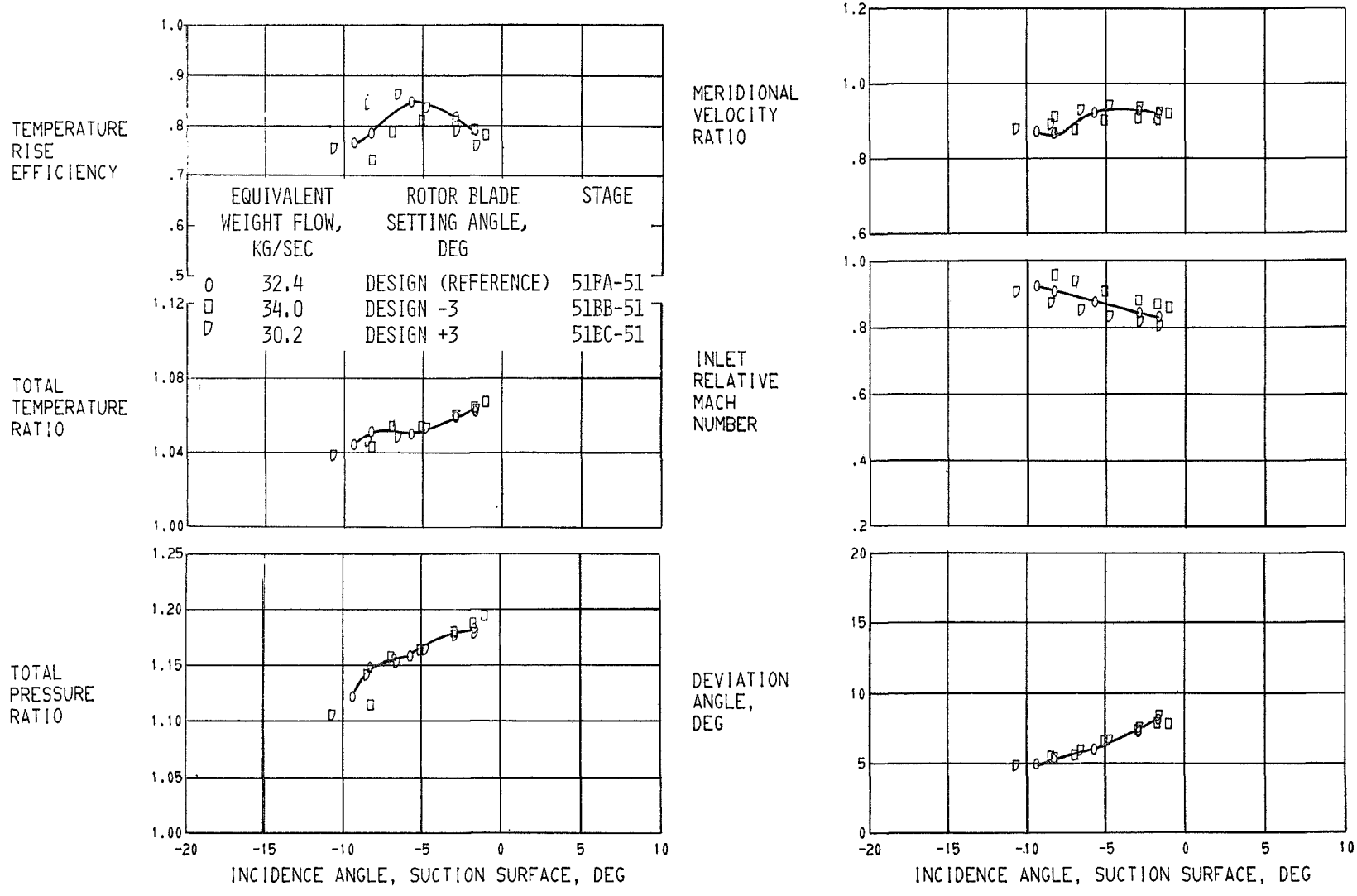
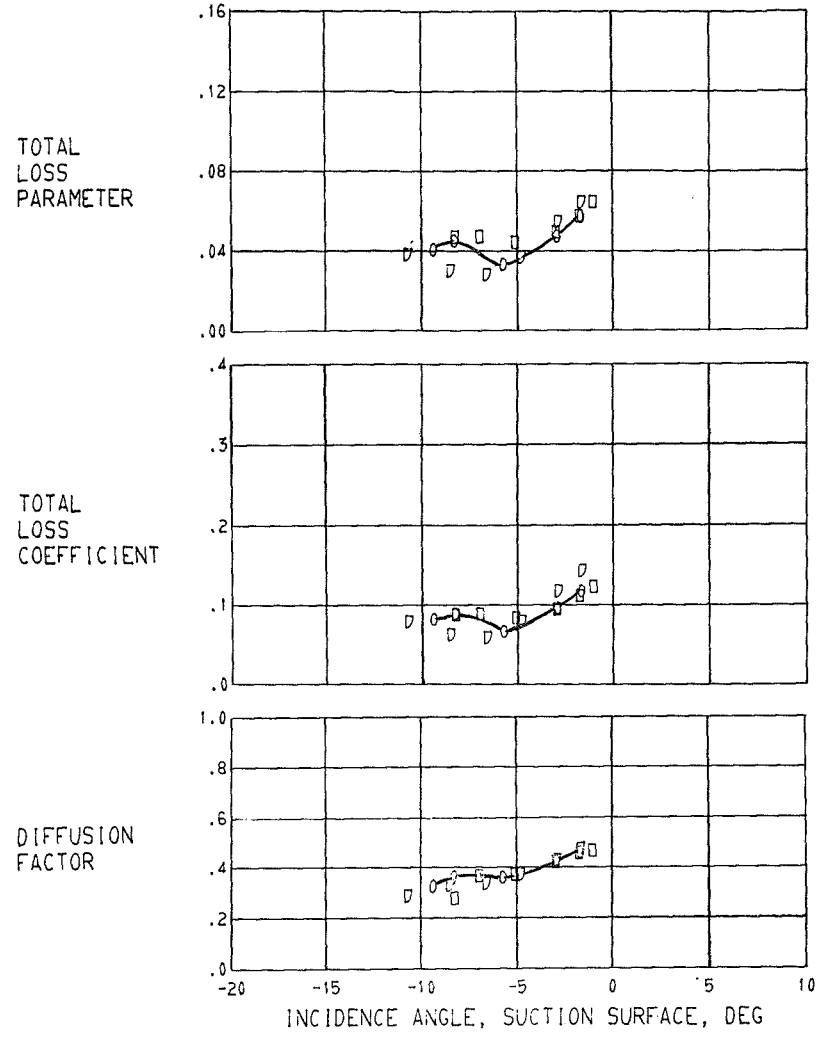


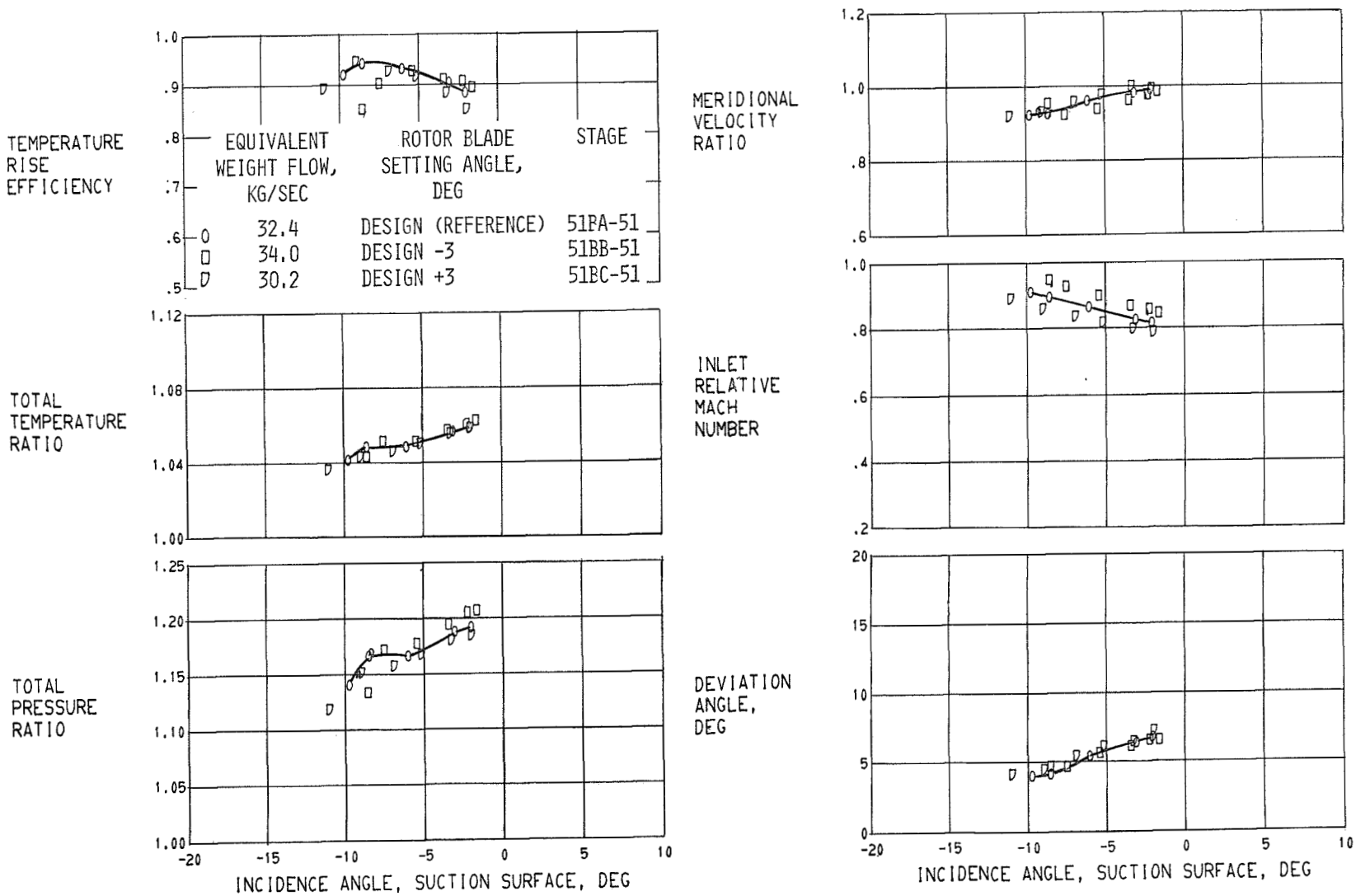
FIGURE 10. - RADIAL DISTRIBUTION OF PERFORMANCE FOR STATOR 51 AT PEAK EFFICIENCY FOR THREE ROTOR BLADE SETTING ANGLES AT 100 PERCENT DESIGN SPEED.

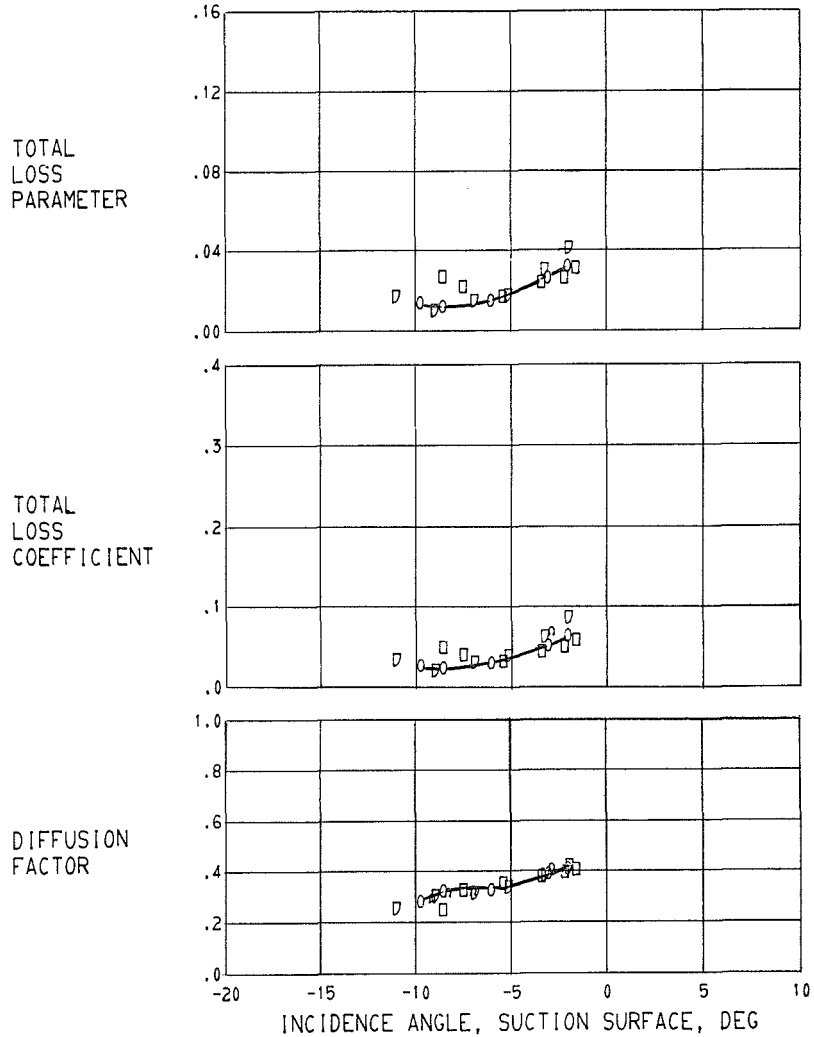

TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
0 32.4 DESIGN (REFERENCE) 51PA-51
□ 34.0 DESIGN -3 51BB-51
D 30.2 DESIGN +3 51EC-51
INCIDENCE ANGLE, SUCTION SURFACE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG



(A) 5.0 PERCENT SPAN.

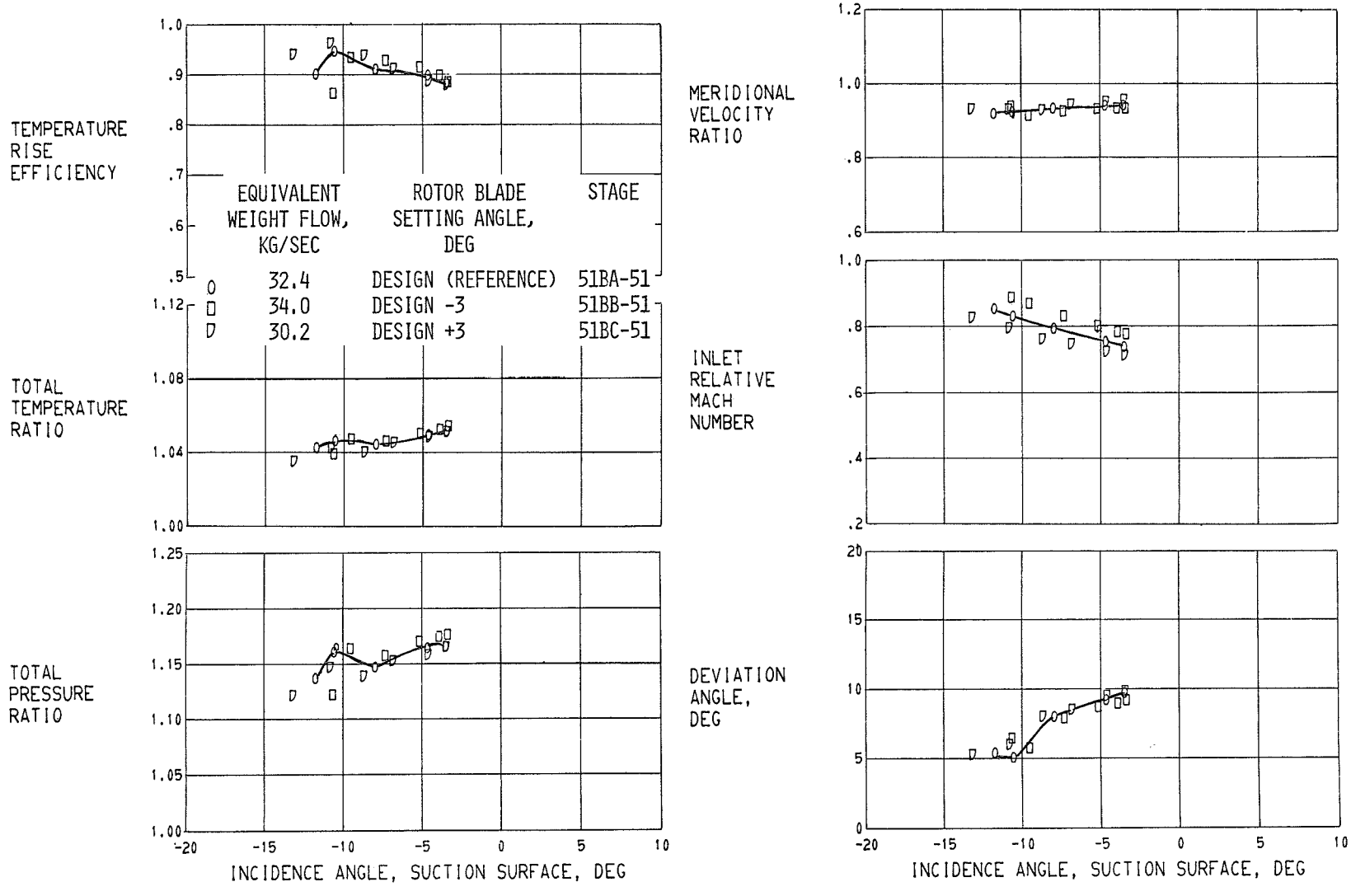
FIGURE 11. - BLADE-ELEMENT PERFORMANCE FOR ROTOR 51B FOR THREE ROTOR BLADE SETTING ANGLES AT 100 PERCENT DESIGN SPEED.

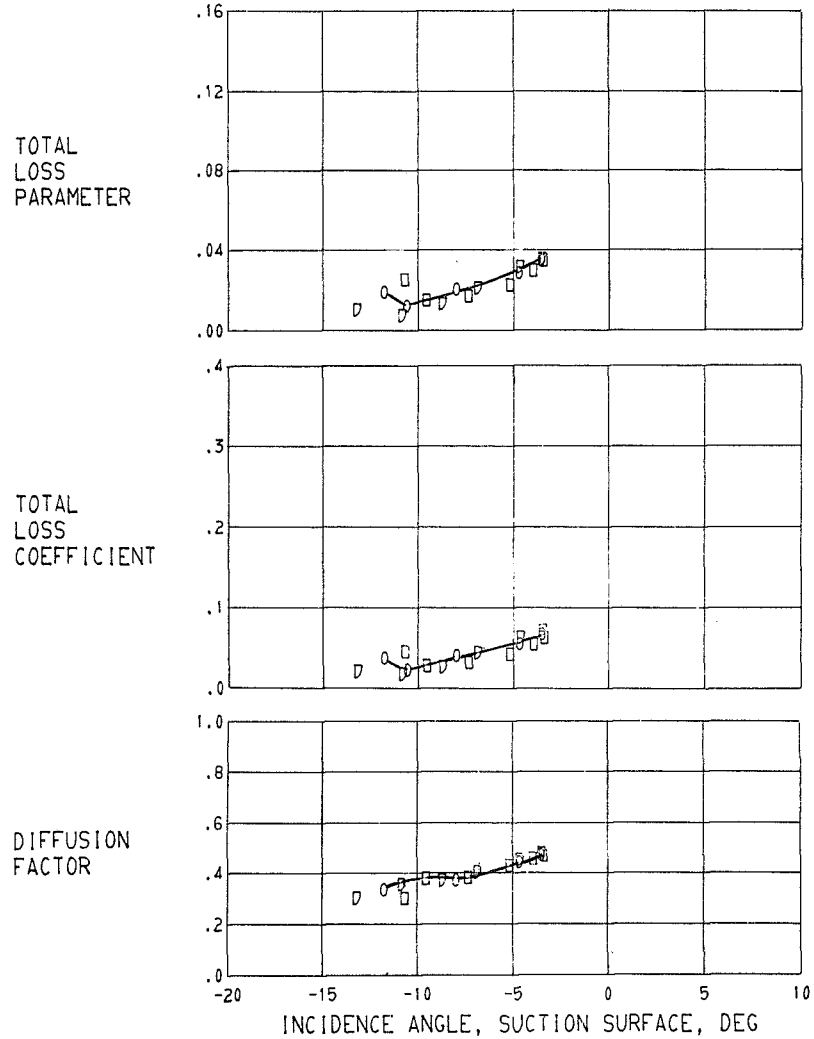

TEMPERATURE RISE EFFICIENCY
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
0 32.4 DESIGN (REFERENCE) 51BA-51
□ 34.0 DESIGN -3 51BB-51
D 30.2 DESIGN +3 51BC-51
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG



(B) 10.0 PERCENT SPAN.

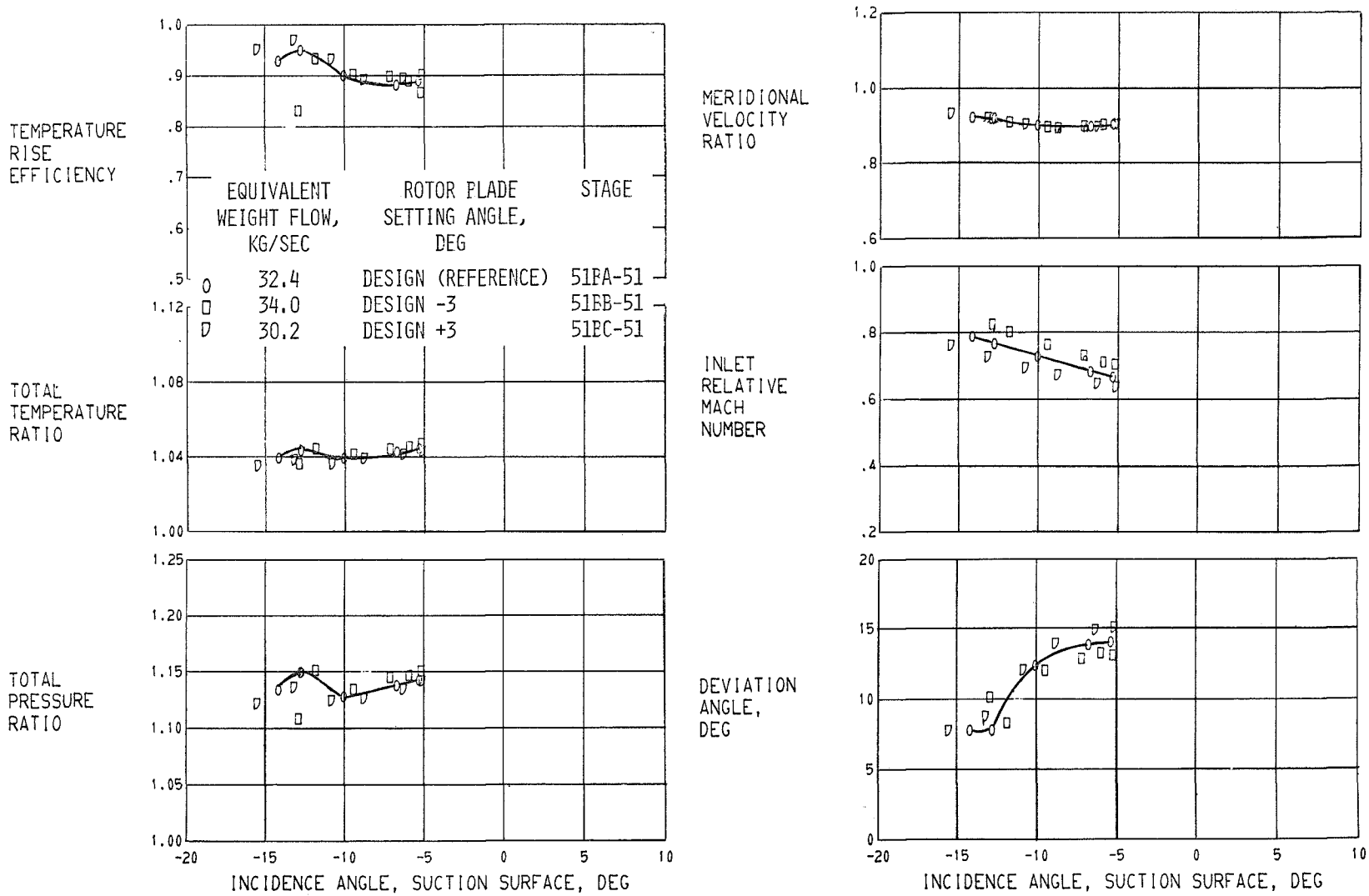
FIGURE 11. - CONTINUED.

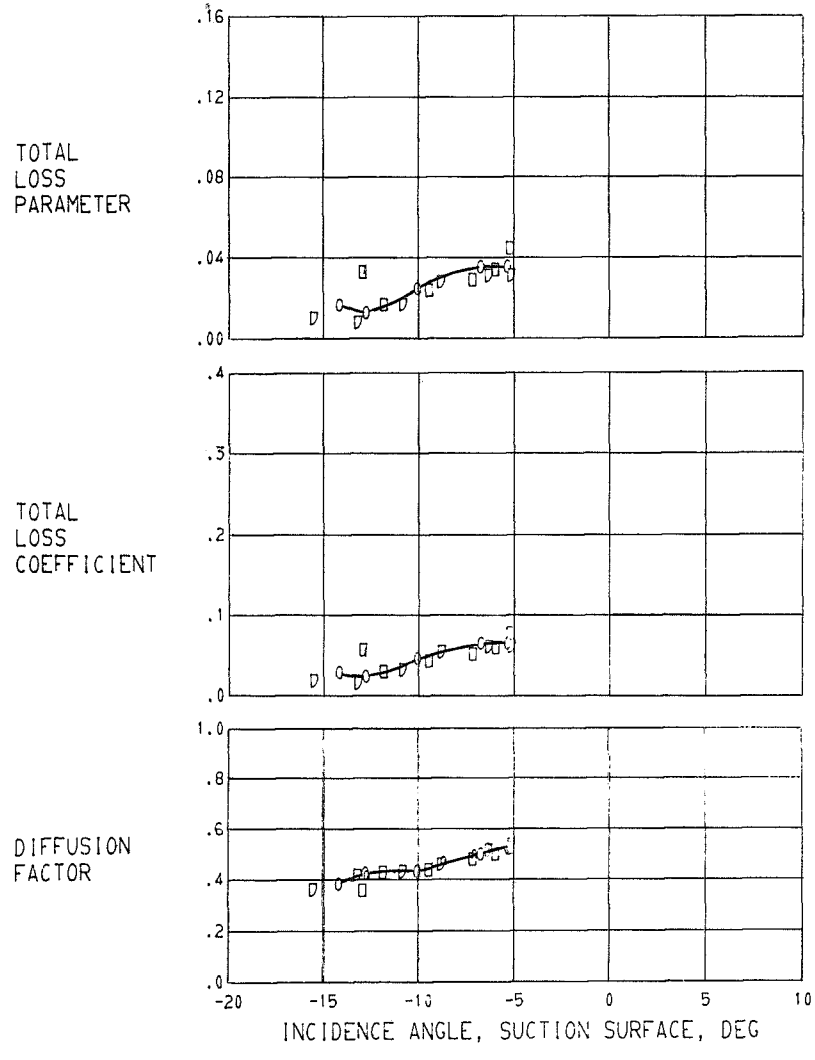

TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
32.4 DESIGN (REFERENCE) 51BA-51
34.0 DESIGN -3 51BB-51
30.2 DESIGN +3 51BC-51
INCIDENCE ANGLE, SUCTION SURFACE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG



(C) 30.0 PERCENT SPAN.

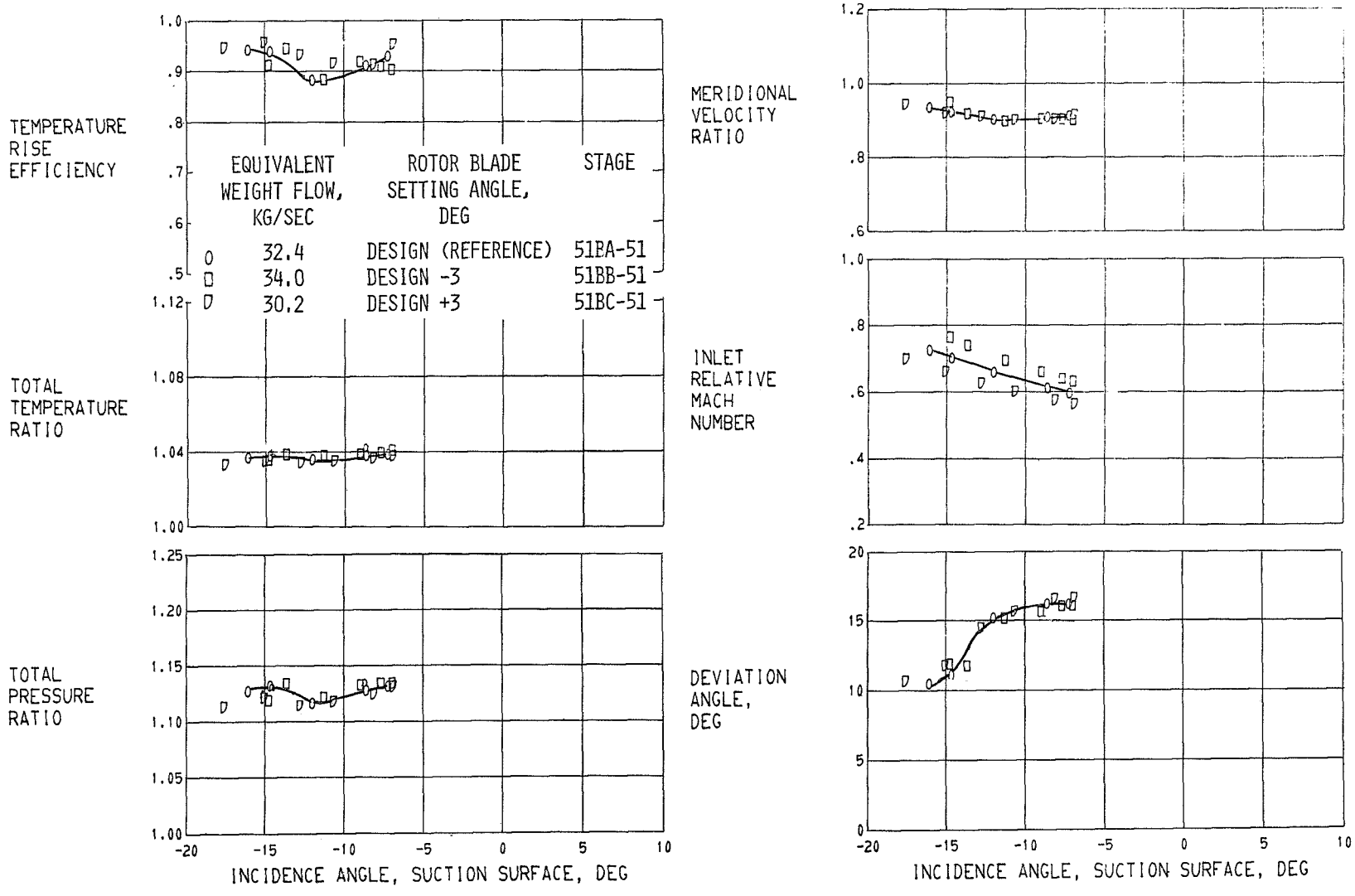
FIGURE 11. - CONTINUED.

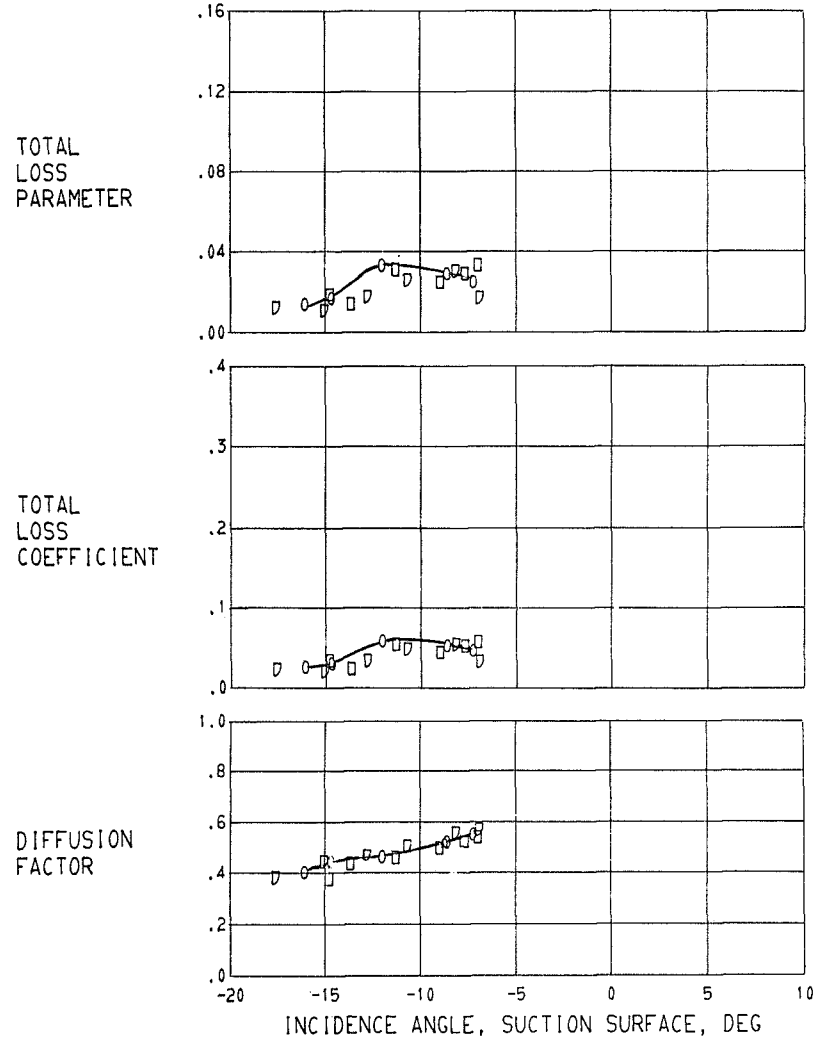

TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
0 32.4 DESIGN (REFERENCE) 51PA-51
□ 34.0 DESIGN -3 51BB-51
D 30.2 DESIGN +3 51BC-51
INCIDENCE ANGLE, SUCTION SURFACE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG



(D) 50.0 PERCENT SPAN.

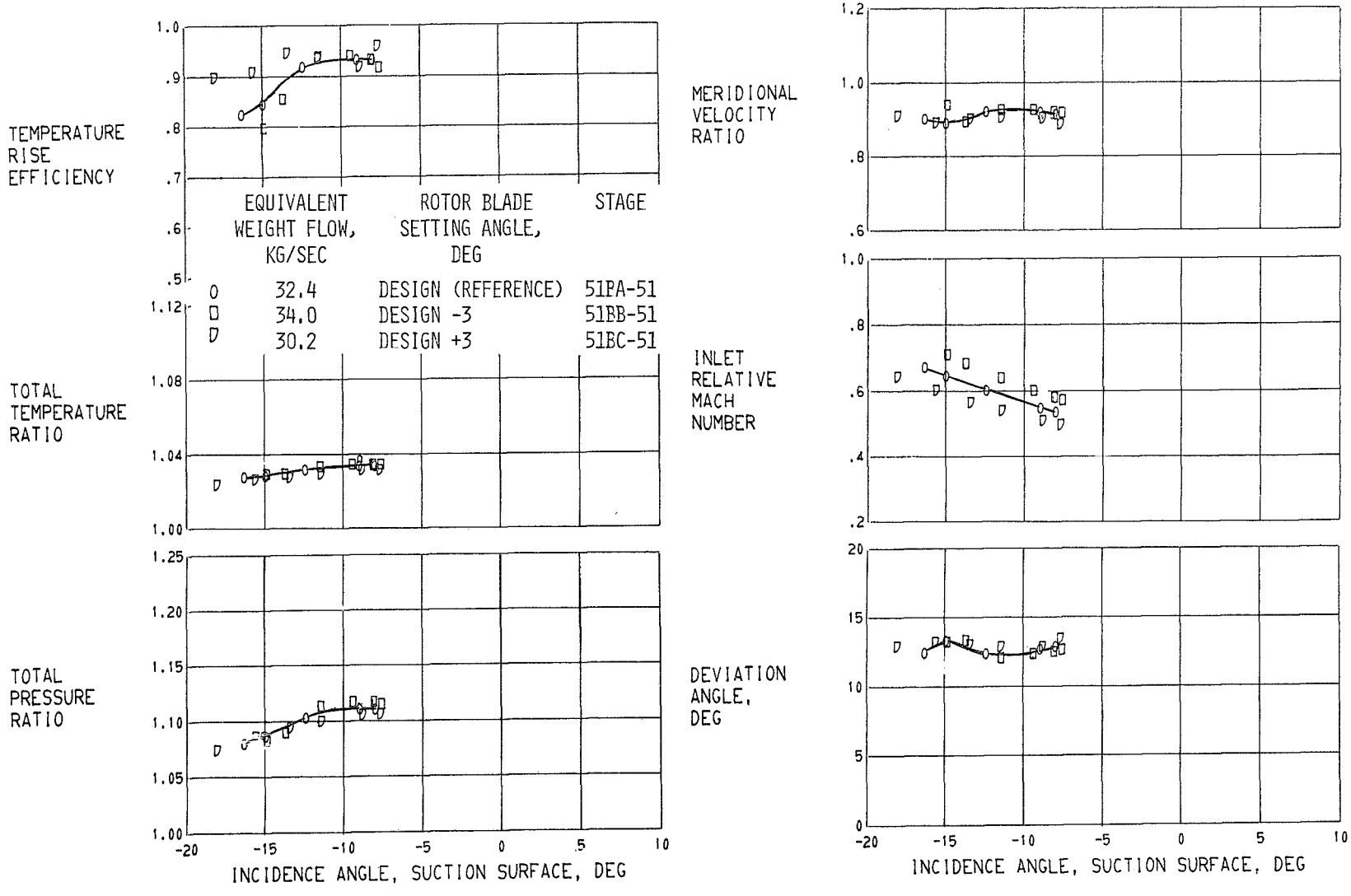
FIGURE 11. - CONTINUED.

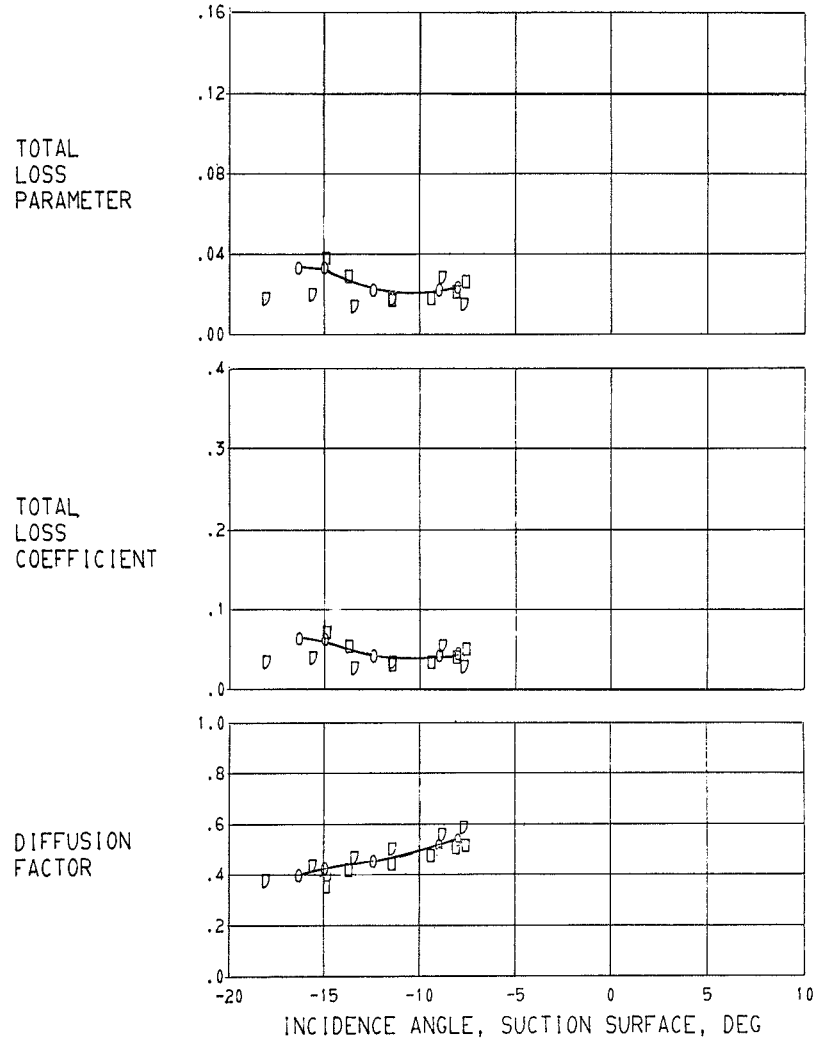

TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
0 32.4 DESIGN (REFERENCE) 51BA-51
□ 34.0 DESIGN -3 51BB-51
D 30.2 DESIGN +3 51BC-51
INCIDENCE ANGLE, SUCTION SURFACE, DEG
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG



(E) 70.0 PERCENT SPAN.

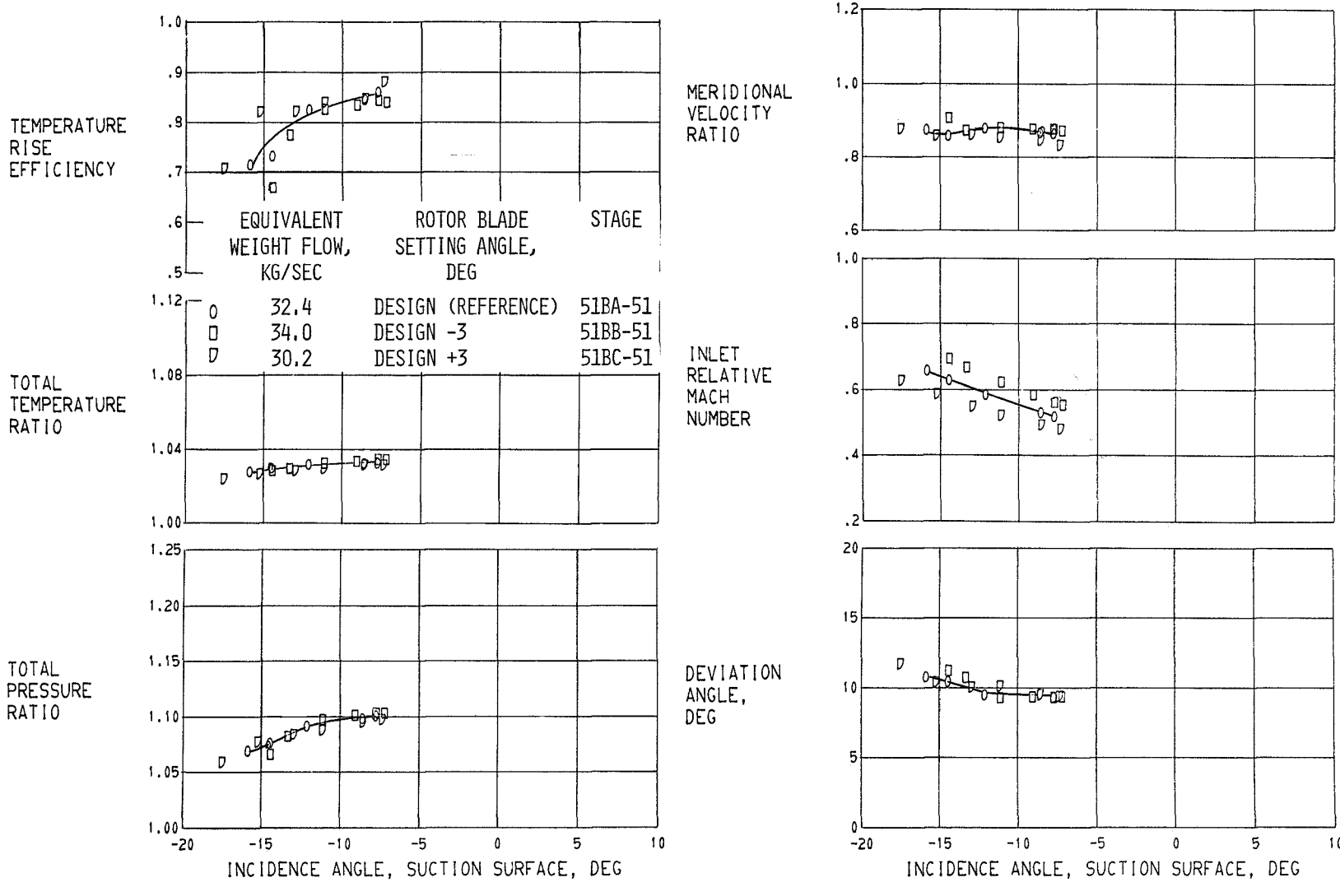
FIGURE 11. - CONTINUED.

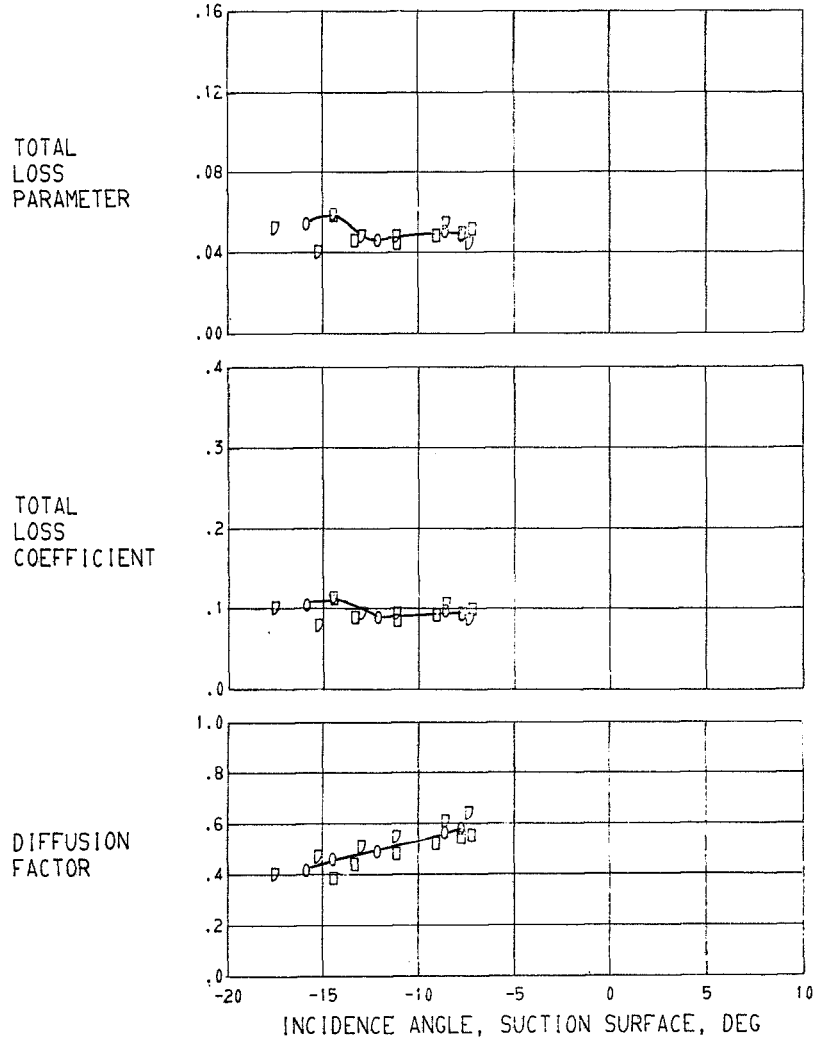

TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
0 32.4 DESIGN (REFERENCE) 51PA-51
□ 34.0 DESIGN -3 51BB-51
D 30.2 DESIGN +3 51BC-51
INCIDENCE ANGLE, SUCTION SURFACE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG



(F) 90.0 PERCENT SPAN.

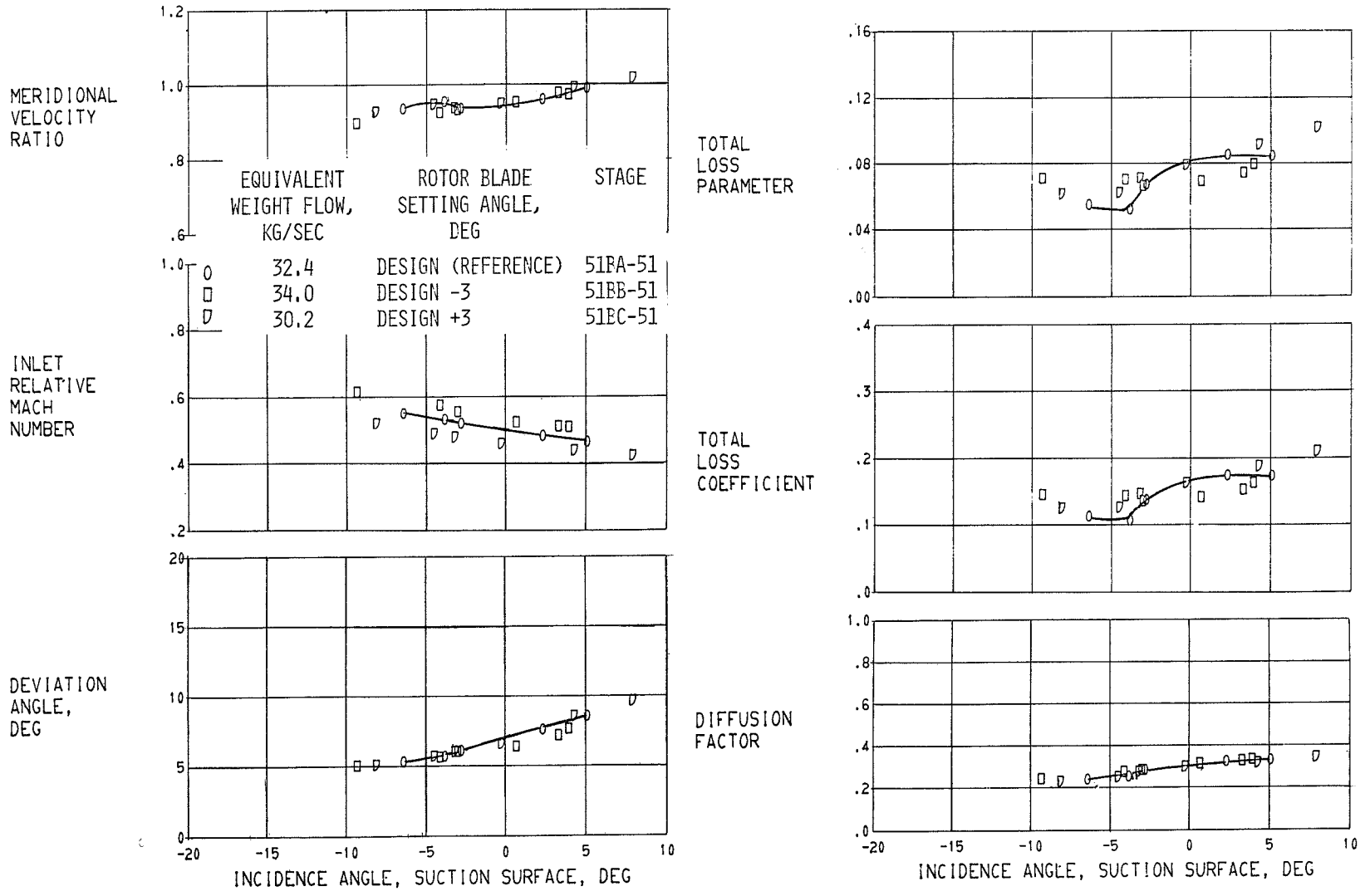
FIGURE 11. - CONTINUED.


TEMPERATURE RISE EFFICIENCY
TOTAL TEMPERATURE RATIO
TOTAL PRESSURE RATIO
MERIDIONAL VELOCITY RATIO
INLET RELATIVE MACH NUMBER
DEVIATION ANGLE, DEG
EQUIVALENT WEIGHT FLOW, KG/SEC
ROTOR BLADE SETTING ANGLE, DEG
STAGE
0 32.4 DESIGN (REFERENCE) 51BA-51
□ 34.0 DESIGN -3 51BB-51
▽ 30.2 DESIGN +3 51BC-51
INCIDENCE ANGLE, SUCTION SURFACE, DEG
INCIDENCE ANGLE, SUCTION SURFACE, DEG



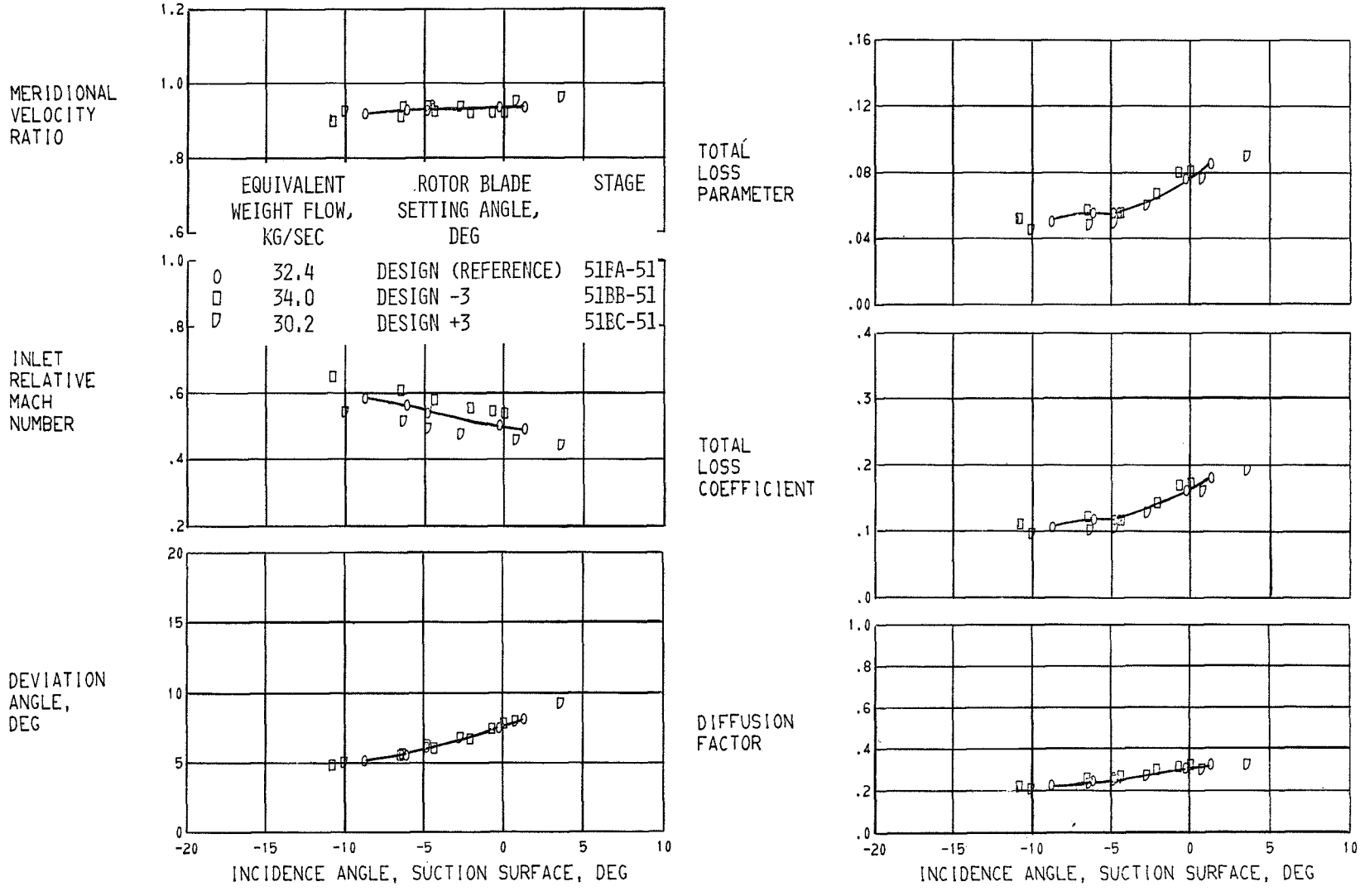
(G) 95.0 PERCENT SPAN.

FIGURE 11. - CONCLUDED.



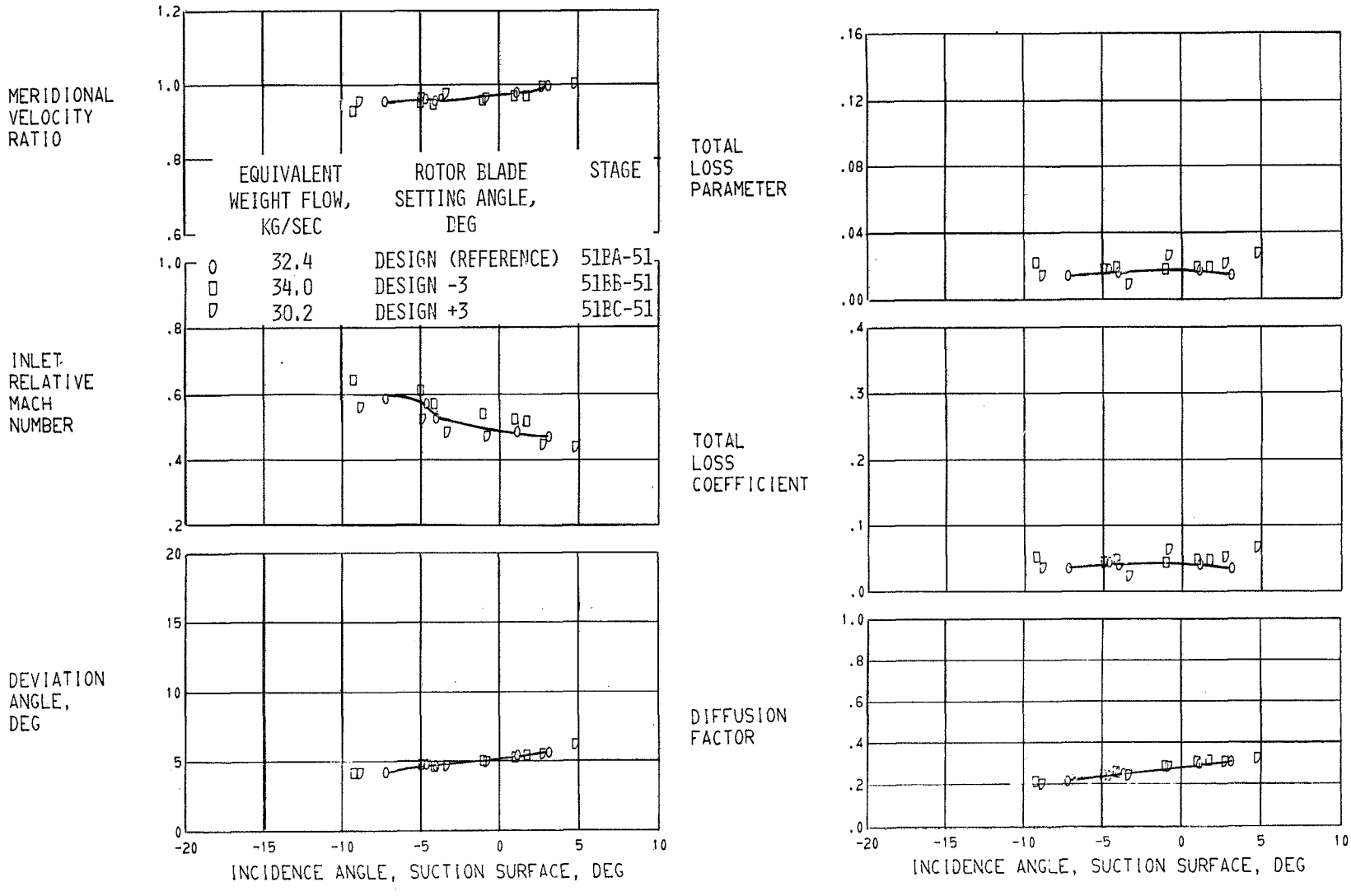
(A) 5.0 PERCENT SPAN.

FIGURE 12. - BLADE-ELEMENT PERFORMANCE FOR STATOR 51 FOR THREE ROTOR BLADE SETTING ANGLES AT 100 PERCENT DESIGN SPEED.



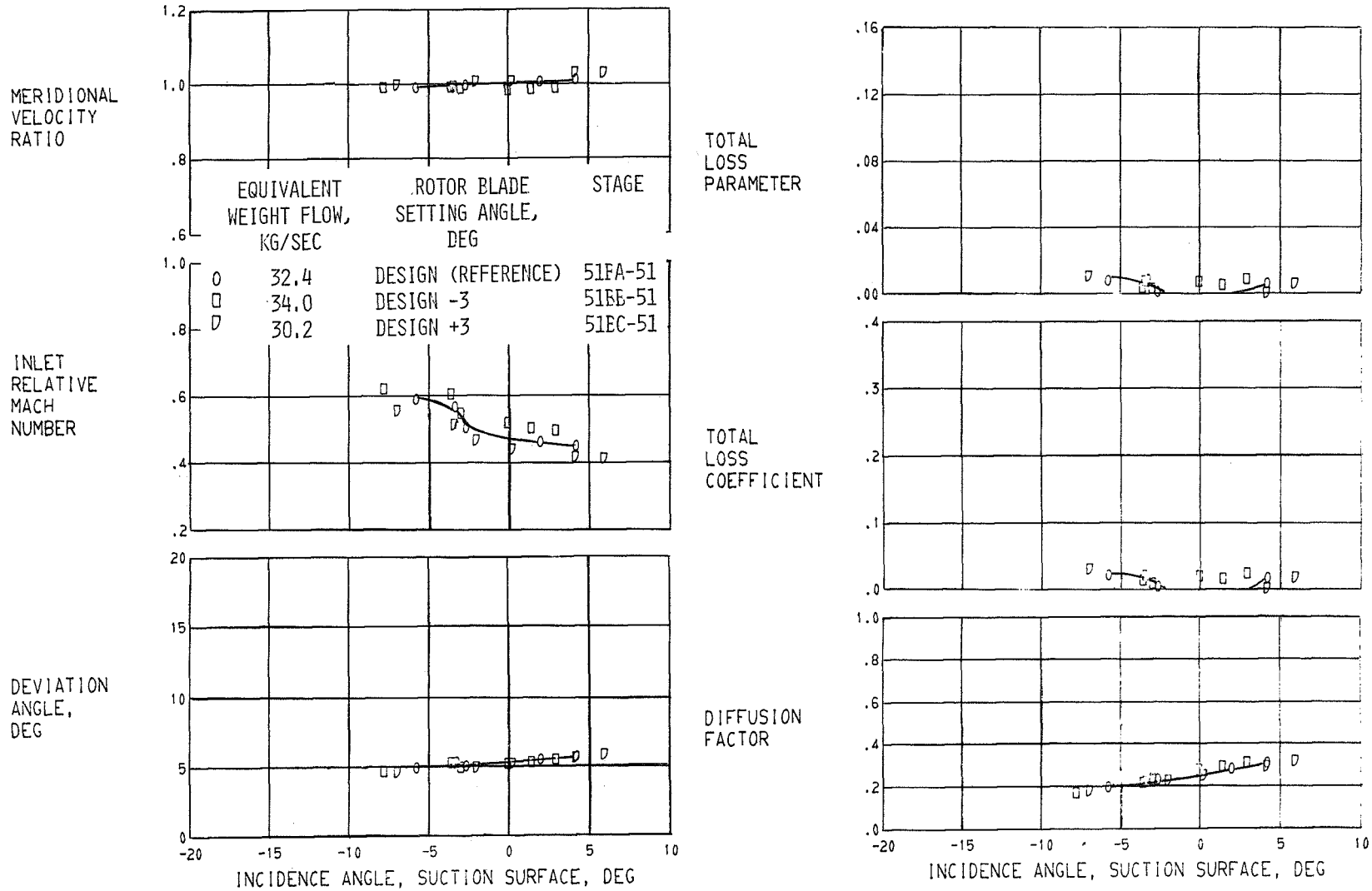
(B) 10.0 PERCENT SPAN.

FIGURE 12. - CONTINUED.



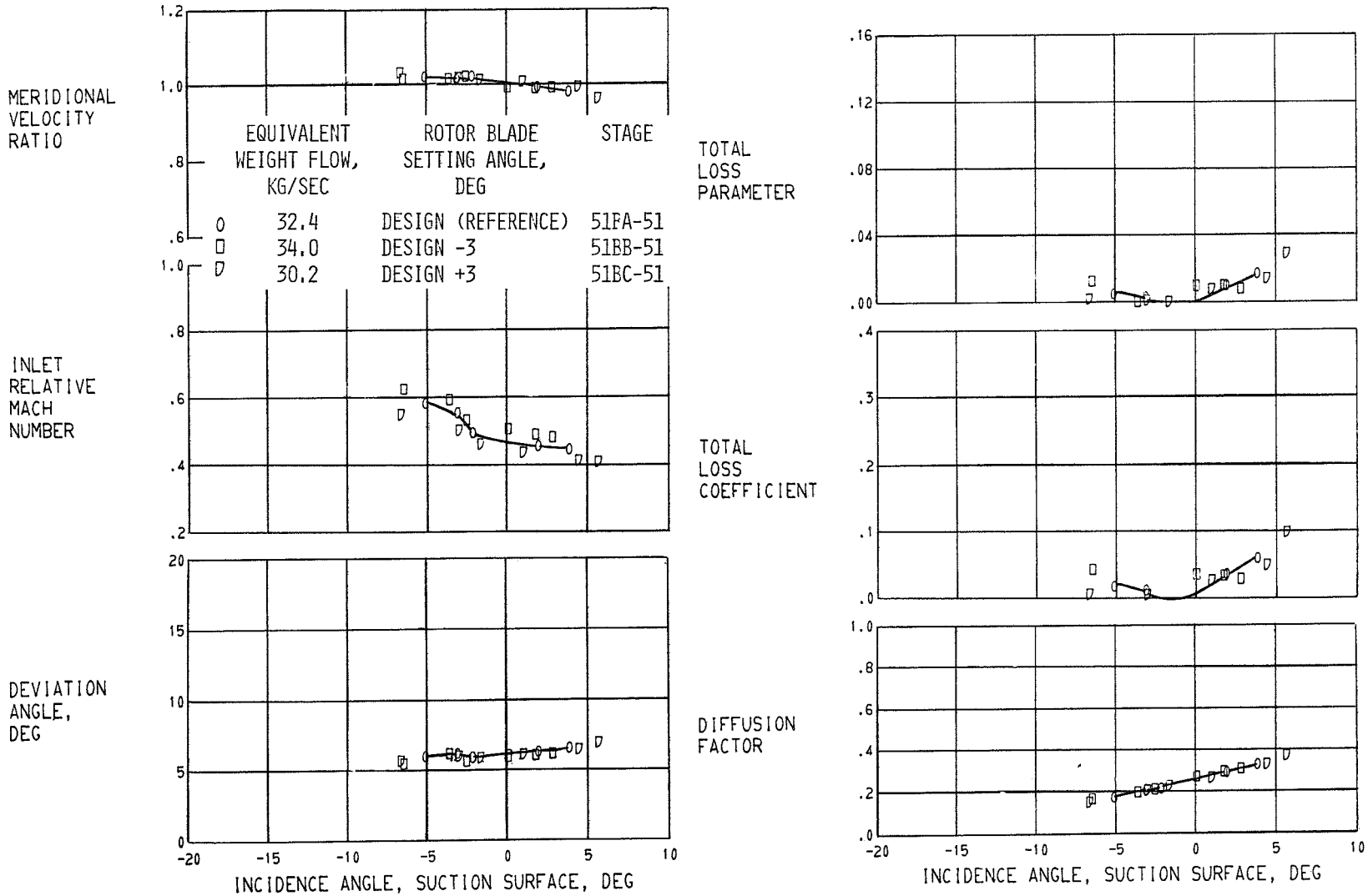
(C) 30.0 PERCENT SPAN.

FIGURE 12. - CONTINUED.



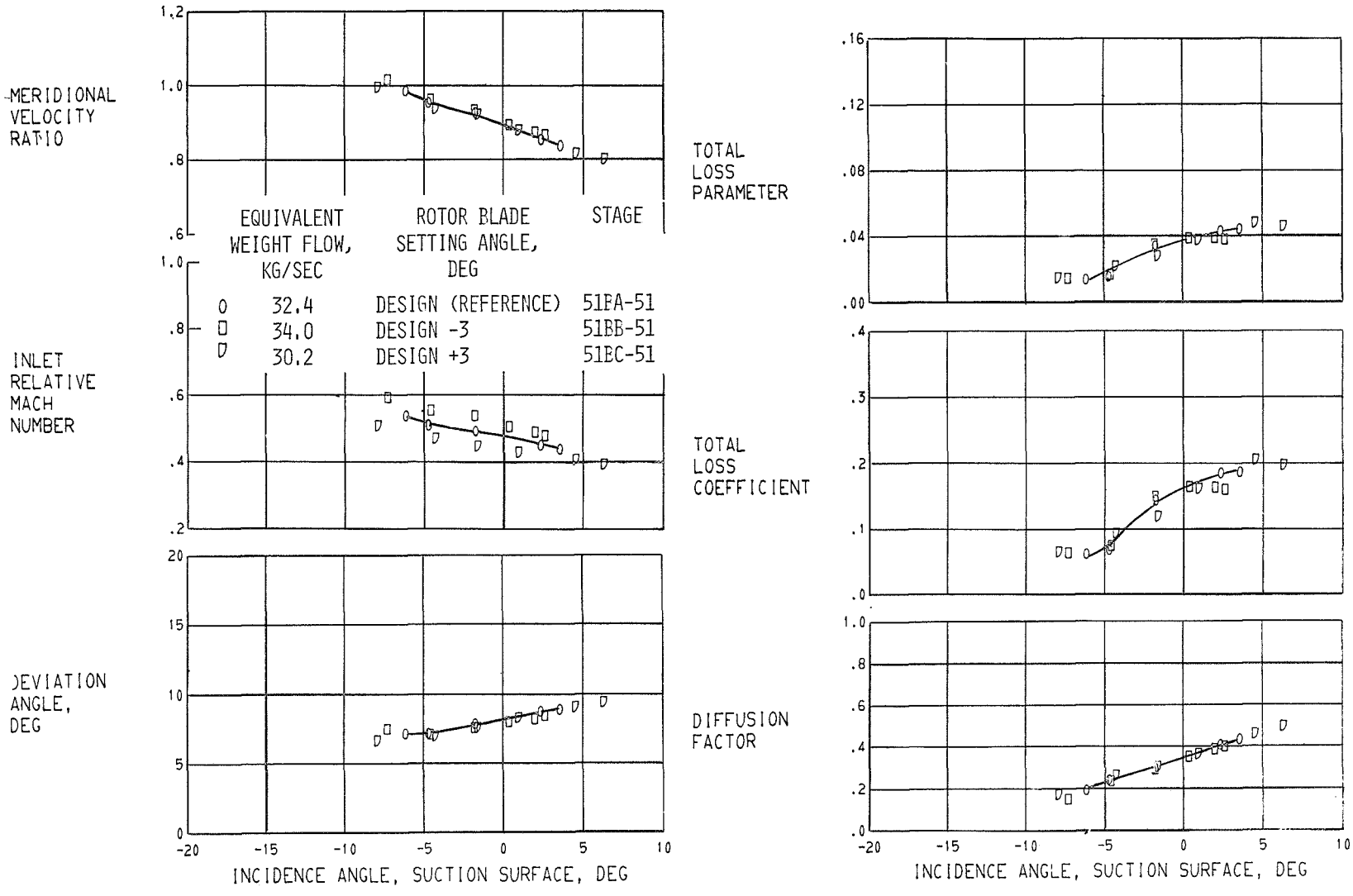
(D) 50.0 PERCENT SPAN.

FIGURE 12. - CONTINUED.



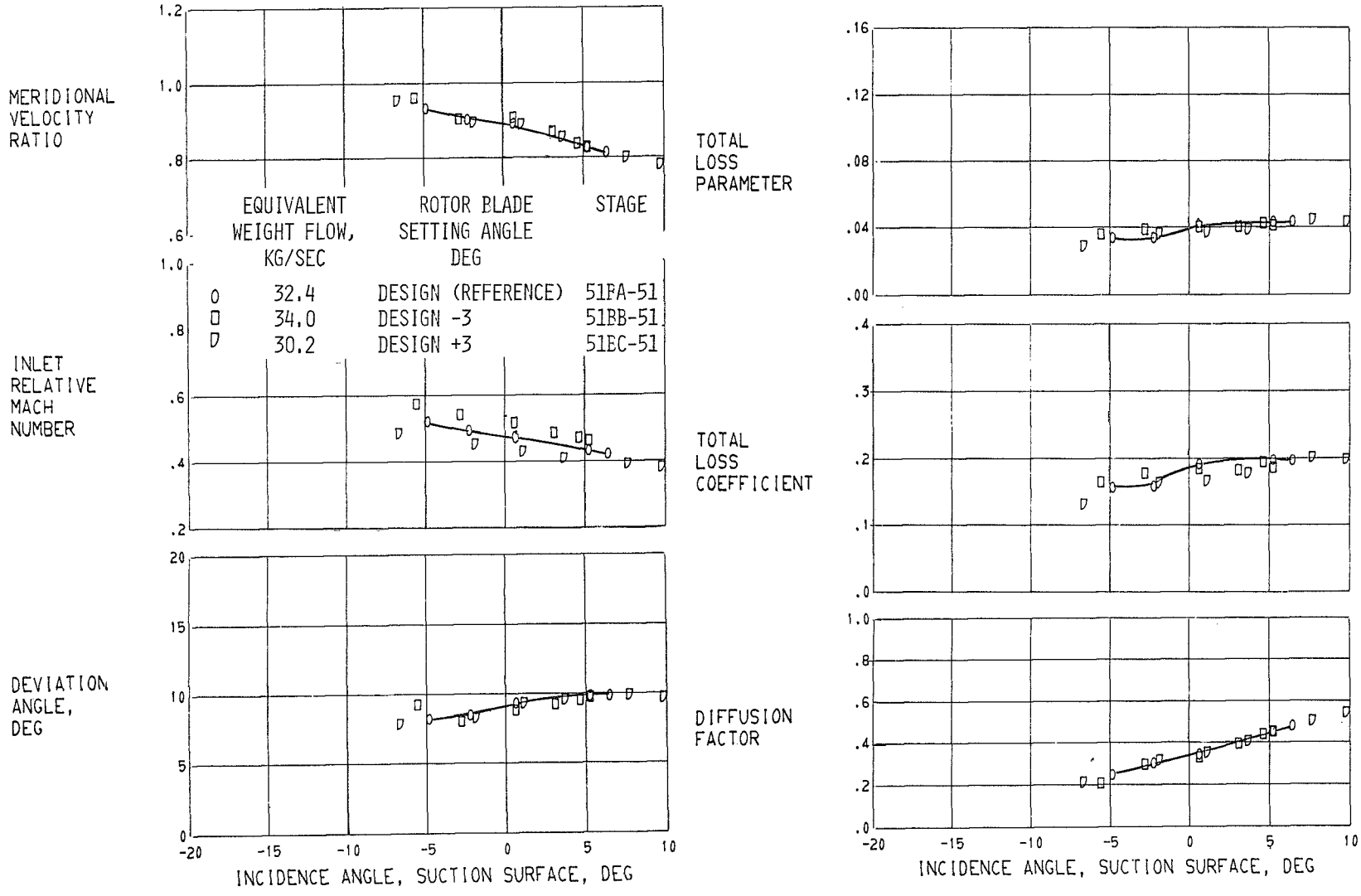
(E) 70.0 PERCENT SPAN.

FIGURE 12. - CONTINUED.



(F) 90.0 PERCENT SPAN.

FIGURE 12. - CONTINUED.



(G) 95.0 PERCENT SPAN.

FIGURE 12. - CONCLUDED.

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