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OVERALL AND BLADE-ELEMENT PERFORMANCE OF A TRANSONIC COMPRESSOR STAGE WITH MULTIPLE-CIRCULAR-ARC BLADES AT TIP SPEED OF 419 METERS PER SECOND

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16. Abstract

A 50-centimeter-diameter axial-flow transonic compressor stage with multiple-circular-arc blades was designed and tested to study the effects of blade shape on efficiency and stall margin. At design speed, peak efficiency of 0.80 occurred at an equivalent weight flow of 29.0 kilograms per second. Measured total pressure ratio and total temperature ratio at peak efficiency were 1.69 and 1.20, respectively. The stall margin at design speed and an equivalent weight flow of 29.0 kilograms per second was 9 percent. The measured stall margin at design weight flow and speed was 15 percent. A comparison of rotor performance made with and without the stator showed a decrease in pressure ratio, peak efficiency, and maximum weight flow with the addition of the stator.

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SUMMARY

A 50-centimeter-diameter axial-flow transonic compressor stage with multiple-circular-arc blade shapes and a design tip speed of 419 meters per second was tested. Detailed radial surveys of the flow conditions at the rotor blade inlet and outlet and the stator blade outlet were made. The flow and performance parameters were calculated at the rotor and stator blade leading and trailing edges across a number of selected blade elements. The radial surveys were made over the stable operating flow range at rotative speeds of 50, 70, 80, 90, and 100 percent of design speed.

Peak efficiency of the compressor stage at design speed was 0.80 and occurred at an equivalent weight flow of 29.0 kilograms per second. Total pressure ratio was 1.69 and total temperature ratio was 1.20. Design values of weight flow, pressure ratio, and temperature ratio were 29.6 kilograms per second, 1.63, and 1.19, respectively.

Blade-element data indicate relative total pressure losses for the rotor blade were generally lower than design while the stator losses were generally higher than the design values.

The stall margin of the compressor stage at design speed was 9 percent, based on weight flow and total pressure ratio at experimental peak efficiency and just prior to stall. The measured stall margin at design weight flow and speed was 15 percent.

For all rotor blade elements at design speed the minimum-loss incidence angles were within $\pm 1.0^{\circ}$ of the design incidence angles. The deviation angles at zero-degree incidence angle were within $\pm 1^{\circ}$ of design except at the tip and hub blade elements.

The minimum-loss incidence angles for the stator at design speed were within $\pm 4^{\circ}$ of the design incidence angle of zero degrees. Stator deviation angles at all blade elements were within $\pm 3^{\circ}$ of the design value.

Peak efficiency of the rotor decreased 2.6 percentage points with the addition of the stator. Pressure ratio at peak efficiency decreased from 1.79 to 1.75, and the maximum weight flow decreased from 30.1 to 29.8 kilograms per second.

INTRODUCTION

The Lewis Research Center of the National Aeronautics and Space Administration is engaged in a research program on axial-flow fans and compressors for advanced air-breathing engines. The program is directed primarily toward developing the technology to reduce the size and weight of fans and compressors while maintaining a high level of performance. Experimental studies are being conducted to improve both efficiency and stall margin for blades operating at transonic and supersonic Mach numbers.

A series of transonic rotors with the same exit total pressure distribution were designed to investigate the effects of blade shape on efficiency and stall margin. The design and performance of these rotors are presented in references 1 to 3. This report presents the design and performance of a transonic compressor stage consisting of the multiple-circular-arc (MCA) bladed rotor 6 of reference 3 and a stator which also was designed with MCA blades. This compressor stage is designated stage 6-1.

Overall performance for both the rotor and the stage, along with blade-element performance for the rotor and the stator, are presented. The data were obtained over the stable operating flow range at rotative speeds which varied from 50 to 100 percent of design speed. Surveys of the flow conditions were taken at 11 radial positions. A comparison of the rotor overall and blade-element performance with and without the stator blade row installed is made to evaluate the effect of the stator on rotor performance. All tests were conducted in the single-stage compressor facility at the Lewis Research Center.

AERODYNAMIC DESIGN

Three computer programs were used in the design of this compressor stage. These programs are the streamline analysis program, the blade geometry program, and the blade coordinate program. These three computer programs are presented in detail in references 1, 4, and 5; and only a brief description of each is presented in this report.

The streamline analysis program was used to calculate the flow-field parameters at several axial locations, including planes approximating the blade leading and trailing edges for both the rotor and the stator. The weight flow, rotative speed, flow-path geometry, and radial distributions of total pressure and temperature are inputs in this program. The program accounts for both streamline curvature and entropy gradients; boundary-layer blockage factors are also included.

The distributions of velocity vector, total pressure, and total temperature calculated in the streamline analysis program are utilized in the blade geometry program to compute blade geometry parameters. The blade-element total loss is calculated within the program. It is based on a calculated shock loss (as related to the selected blade

shape) and a profile loss. The profile losses used for this stage are based on loss-diffusion factor correlations that include the data presented in reference 6 for the rotor and the stator.

The blade geometry parameters are utilized in the blade coordinates program (ref. 5) to compute blade elements on conical surfaces approximating the stream surfaces passing through the blade. The blade elements are then stacked on a line passing through their centers of gravity. The computed cartesian blade coordinates are used directly in fabrication.

The overall design parameters for stage 6-1 are listed in table I and the flow path is shown in figure 1. This stage was designed for an overall pressure ratio of 1.63 at a weight flow of 29.6 kilograms per second (203.1 kg/sec/m^2 of annulus area). The design tip speed was 419.3 meters per second. The stage was designed for a tip solidity of 1.3 for the rotor and a hub solidity of 2.0 for the stator. This resulted in 47 rotor blades with an aspect ratio of 2.5 and 60 stator blades with an aspect ratio of 2.2.

The blade-element design parameters for rotor 6 are presented in table II. This rotor was designed for a radially constant total pressure ratio of 1.65. The stator blade-element design parameters are given in table III. The blade geometry is presented in table IV for rotor 6 and in table V for stator 1. Both the rotor and the stator utilized multiple-circular-arc blade shapes.

The symbols used in this report are defined in appendix A. The equations used for calculating the overall and blade-element performance parameters are presented in appendix B. All definitions 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 and stator are shown in figures 3 and 4, respectively. Each rotor blade has a vibration damper located at about 45 percent of span from the outlet rotor tip. The maximum thickness of the damper was 0.19 centimeter. The nonrotating radial tip

clearance of the rotor was a nominal 0.05 centimeter at ambient conditions. The axial spacing between the rotor hub trailing edge and the stator hub leading edge was 3.86 centimeters.

Instrumentation

The compressor weight flow was determined from measurements on a calibrated thin-plate orifice that was 38.9 centimeters in diameter. The orifice temperature was determined from an average of two Chromel-Alumel thermocouples.

Radial surveys of the flow were made upstream of the rotor, between the rotor and the stator, and downstream of the stator (fig. 5). The survey probes are shown in figure 6. Total pressure, total temperature, and flow angle were measured with the combination probe (fig. 6(a)), and static pressure was measured with an 8° C-shaped wedge probe (fig. 6(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 prealined in an air tunnel. The probe thermocouple material was iron constantan. Two combination probes and two wedge static probes were used at each of the measuring stations.

Inner and outer wall static pressure taps were located at the same axial stations as the survey probes. The circumferential locations of both types of survey probes, along with inner and outer wall static pressure taps, are shown in figure 5. The combination probes downstream of the stator (station 3) were circumferentially traversed one stator blade passage (6.0°) 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

Test Procedure

The stage survey data were taken over a range of weight flows from maximum flow to the near-stall conditions. At 70, 90, and 100 percent of design speed, radial surveys were taken at five weight flows. At 50 and 80 percent of design speed, radial surveys were taken for the near-stall weight flow only. Data were recorded at 11 radial positions for each speed and weight flow.

At each radial position the two combination probes behind the stator were circumferentially traversed to nine different locations across the stator gap. The wedge probes were set at mid-gap because preliminary 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.

At each of the five rotative speeds the backpressure on the stage was increased by closing the sleeve valve in the collector until a stalled condition was detected by a sudden drop in stage-outlet total pressure. This pressure was measured by a probe located at mid-passage and was recorded on an X-Y plotter. Stall was corroborated by large increases in the measured blade stresses on both rotor and stator, along with a sudden increase in noise level.

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 7. 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 30-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 4.

The weight flow at stall was obtained in the following manner: during operation at the near-stall condition, the collector valve was slowly closed in small increments. At each increment the weight flow was obtained. The weight flow obtained just before stall occurred is called the stall weight flow.

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 from this investigation are presented in four main sections. The first three sections are the results obtained from the stage configuration. The overall performance for the rotor and the stage are presented first. Radial distributions of several performance parameters are then presented for both the rotor and the stator. Blade-element data are presented for both rotor and stator. Finally, rotor overall performance and rotor radial distributions are compared with and without the stator installed behind the rotor. The data presented for the first three main sections are computer plotted, and occasionally a data point is omitted when it falls outside the range of the parameters shown in the figure.

All the plotted data together with some additional performance parameters for the stage configuration are presented in tabular form. The overall performance data are presented in table VI. The blade-element data are presented first for the rotor in table VII and then for the stator in table VIII. The definitions and units used for the tabular data are presented in appendix C.

OVERALL PERFORMANCE

The overall performance for rotor 6 and stage 6-1 are presented in figures 7 and 8, respectively. For both of these computer-plotted figures, data are presented for speeds from 50 to 100 percent of design speed. For 50 and 80 percent of design speed, the

overall performance is presented for the near-stall condition only. Design-point values are shown as solid symbols on both figures.

The stall points for each speed line were established by extrapolating the overall performance curves to the stall weight flow value recorded with the on-site computer. The stall lines (dashed lines) shown in figures 7 and 8 were then established by fairing a curve through the stall points associated with each speed line.

Peak efficiency, for both rotor and stage, occurred at a measured equivalent weight flow of 29.0 kilograms per second (199 kg/sec/m^2 of annulus area) as compared to the design weight flow of 29.6 kilograms per second (203 kg/sec/m^2 of annulus area). Peak efficiencies for the rotor and the stage at the design rotor tip speed of 419.3 meters per second were 0.86 and 0.80, respectively. The experimental values of total pressure ratio and total temperature ratio, for the rotor at peak efficiency, were 1.75 and 1.20, respectively, as compared to the design values of 1.65 and 1.19. The corresponding total pressure ratio for the stage was 1.69, as compared to the design value of 1.63.

At design speed, the stall margin for the stage was 9 percent. The stall margin, defined in appendix B, was based on the equivalent weight flow and pressure ratio at which peak efficiency occurred, as compared to the values just prior to stall. The stall margin at design speed based on the design weight flow was 15 percent.

Radial Distributions

The radial distributions of selected flow and performance parameters for both rotor and stator are shown in figures 9 and 10. The results are presented for three flow rates at design speed. The data shown represent the flow conditions at near stall, peak efficiency, and near choke. The design values are shown by solid symbols.

Rotor

The rotor total pressure ratio at peak-efficiency weight flow was greater than the design value at all spanwise locations (fig. 9). The total temperature ratio and efficiency, at peak efficiency weight flow, were also higher than design for all spanwise locations. The incidence angle was higher than design because the peak-efficiency weight flow was less than design. The deviation angles were slightly higher than design. The loading as indicated by the D-factor was higher than design, which may have been caused by the higher-than-design incidence angle. The lower-than-design loss coefficients indicate that design losses were overestimated except in the region of the damper, where measured losses were considerably higher than design for all three flow conditions. Al-

though the effect on efficiency in the damper region of the blade span was appreciable, the effect on pressure ratio was small.

Stator

The radial distribution of total loss coefficient for the stator was higher than design for all three weight flows (choke, peak efficiency, and stall). The stator blade loading as indicated by the D-factors was higher than design because of the higher-than-design incidence angles. The large difference between design and experimental loss coefficient distribution is a result of the combined effects of higher-than-design loading and underestimated losses.

Variations of Blade-Element Performance with Incidence Angle

The variations of selected blade-element performance parameters with incidence angle are shown in figure 11 for the rotor and in figure 12 for the stator. The data are presented for 70, 90, and 100 percent of speed at blade elements on streamlines located at 5, 10, 30, 50, 70, 90, and 95 percent of blade span as measured from the rotor-outlet blade tip. Design values are indicated by solid symbols. The variation in incidence-angle curves are presented primarily for future correlations in comparing the performance of these blades with other blade designs. Only a few brief observations are made herein.

The rotor-blade suction-surface incidence angles corresponding to minimum loss were within $\pm 1^{\circ}$ of the design incidence angle for all blade elements at design speed. At design incidence angle, rotor total pressure ratio was essentially achieved over the entire blade span at design speed. Rotor-blade deviation angles at the design incidence were within $\pm 1^{\circ}$ of design values except for the tip and hub elements.

The stator-blade suction-surface incidence angles corresponding to minimum loss at design speed were within $\pm 4^{\circ}$ of the design value at all blade-element span locations. The stator deviation angles at the design incidence were within $\pm 3^{\circ}$ of the design value at all blade-element span locations.

Effect of Stator on Rotor Performance

A comparison of the overall performance of the rotor with the stator installed (presented herein) and without the stator (ref. 4) is shown in figure 13. At design speed, the total pressure ratio at peak efficiency decreased from 1.79 to 1.75 with the addition of

the stator. Peak efficiency of the rotor also decreased approximately 2.6 percentage points. A comparable drop in rotor efficiency was experienced in a similar test reported in reference 8. The weight flows at peak efficiency and stall were not affected; however, the maximum weight flow decreased from 30.1 to 29.8 kilograms per second. Choking of the flow may have occurred at the stator hub. Design requirements resulted in a design area ratio of 1.0 in the region of the stator hub. At the lower speeds, the rotor overall pressure ratio at the near-stall condition is not adversely affected by the addition of the stator; but the rotor efficiency is consistently lower.

The effect of the stator on the radial distribution of rotor performance parameters at design speed is shown in figure 14 at the peak-efficiency weight flow of 29.0 kilograms per second. The rotor suction-surface incidence angle was changed less than $1/2^{\circ}$ by adding the stator. Thus, the inlet flow distribution was relatively unaffected. The meridional velocity ratios increased, indicating that the flow velocities behind the rotor are somewhat higher with the stators in place. As a result of these higher velocities, the diffusion factor was decreased along the entire rotor blade span. However, somewhat unexpectedly, the indicated element losses and deviation angles increased with the addition of the stator. This indicates that the velocity and pressure gradients along the meridional streamlines were changed by the presence of the stator. Rotor-blade-wake mixing effects can be expected to be altered somewhat. It should be pointed out that the data measurements were made in the presence of the indicated gradients and translated forward to the rotor-blade trailing edge along the design streamlines. Further discussion of the changes in rotor performance is beyond the scope of this presentation; however, these data indicate that the performance of the rotor elements was adversely changed because of the presence of the stators.

SUMMARY OF RESULTS

This report presents both the aerodynamic design and the overall and blade-element performance of a transonic compressor stage with multiple-circular-arc (MCA) blade shape incorporated in both rotor and stator. Radial surveys of the flow conditions at both the rotor inlet and outlet and the stator outlet were made over the compressor-stage operating flow range at equivalent rotative speeds from 50 to 100 percent of design speed. Flow and performance parameters were calculated across a selected number of blade elements. The rotor was previously tested with no stator. The overall performance and the radial distributions of selected performance parameters for the rotor with and without the stator are compared.

The following principal results were obtained:

1. Peak efficiency for the compressor stage at the design tip speed of 419.3 meters per second was 0.80 and occurred at an equivalent weight flow rate of 29.0 kilograms per second.

2. Total pressure ratio and total temperature ratio of the compressor stage at the equivalent weight flow corresponding to peak efficiency were 1.69 and 1.20, respectively.

3. Stall margin of the compressor stage at the design speed was 9 percent, based on the weight flows and pressure ratios at experimental peak efficiency and near stall. Stall margin of the stage at design speed, based on design weight flow, was 15 percent.

4. Peak efficiency of the compressor rotor was 0.86. The rotor total pressure ratio and total temperature ratio were 1.75 and 1.20, compared to the design values of 1.65 and 1.19.

5. The measured total-loss-parameter distribution for the rotor showed the losses to be lower than the design values except for the regions near the damper and the rotor hub. The stator losses, as indicated by the total-loss-parameter distribution, were higher than the design values over the total stator blade span.

6. At design speed the rotor-blade suction-surface incidence angles corresponding to minimum loss were within $\pm 1^{\circ}$ of the design incidence angle of zero degrees for all blade elements, while those for the stator were within $\pm 4.0^{\circ}$ of the design value.

7. At design incidence, deviation angles were within $\pm 1^{\circ}$ of design, except for the tip and hub rotor-blade elements, and within $\pm 3.0^{\circ}$ for all stator-blade elements.

8. Peak efficiency of the rotor decreased 2.6 percentage points with the addition of the stator, while pressure ratio at peak efficiency decreased from 1.79 to 1.75. The maximum weight flow decreased from 30.1 to 29.8 kilograms per second with the stator.

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APPENDIX A

SYMBOLS

A_{an} annulus area at rotor leading edge, 0.147 m^2

A_f frontal area at rotor leading edge, 0.198 m^2

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

c aerodynamic chord, cm

D diffusion factor

g acceleration of gravity, 9.8 m/sec^2

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

J mechanical equivalent of heat

N rotative speed, rpm

P total pressure, N/cm^2

p static pressure, N/cm^2

r radius, cm

SM stall margin

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, 1.40

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

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

η efficiency

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

$\bar{\omega}$ total loss coefficient

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

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

Subscripts:

ad adiabatic (temperature rise)

id ideal

LE blade leading edge

m meridional direction

mom momentum-rise

p polytropic

r radial direction

ref reference

stall stall

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:

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

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:

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

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:

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

Flow coefficient:

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

Stall margin:

$$SM = \left[\frac{\left(\frac{P_{TE}}{P_{LE}}\right)_{stall}}{\left(\frac{P_{TE}}{P_{LE}}\right)_{ref}} \times \frac{\left(\frac{W\sqrt{\theta}}{\delta}\right)_{ref}}{\left(\frac{W\sqrt{\theta}}{\delta}\right)_{stall}} - 1\right] \times 100 \tag{B17}$$

Polytropic efficiency:

$$\eta_p = \exp\left[\frac{\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma}}{\frac{T_{TE}}{T_{LE}}}\right] \tag{B18}$$

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, revolutions per minute
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 a multiple-circular-arc blade section to that of a 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 STAGE 6-1

ROTOR TOTAL PRESSURE RATIO..	1.650
STAGE TOTAL PRESSURE RATIO	1.630
ROTOR TOTAL TEMPERATURE RATIO.....	1.186
STAGE TOTAL TEMPERATURE RATIO	1.186
ROTOR ADIABATIC EFFICIENCY.....	0.828
STAGE ADIABATIC EFFICIENCY	0.806
ROTOR POLYTROPIC EFFICIENCY.....	0.839
STAGE POLYTROPIC EFFICIENCY	0.819
ROTOR HEAD RISE COEFFICIENT.....	0.253
STAGE HEAD RISE COEFFICIENT	0.246
FLOW COEFFICIENT.....	0.503
WT FLOW PER UNIT FRONTAL AREA	150.469
WT FLOW PER UNIT ANNULUS AREA.....	203.065
WT FLOW	29.601
RPM.....	16000.000
TIP SPEED	419.282

TABLE II. - DESIGN BLADE-ELEMENT PARAMETERS FOR ROTOR 6

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
TIP	25.024	24.938	0.	46.1	63.7	56.0	287.8	1.248	10.13	1.650
1	24.681	24.443	-0.	43.8	63.0	55.2	287.8	1.232	10.13	1.650
2	24.151	23.949	-0.	41.7	62.0	54.4	287.8	1.217	10.13	1.650
3	21.932	21.972	0.	39.0	58.6	50.2	287.8	1.189	10.13	1.650
4	20.778	20.983	0.	39.1	57.1	47.3	287.8	1.183	10.13	1.650
5	20.485	20.736	0.	39.2	56.7	46.5	287.8	1.182	10.13	1.650
6	20.190	20.489	0.	39.4	56.4	45.6	287.8	1.181	10.13	1.650
7	19.893	20.242	0.	39.5	56.0	44.7	287.8	1.181	10.13	1.650
8	19.593	19.995	0.	39.6	55.6	43.8	287.8	1.180	10.13	1.650
9	17.083	18.018	0.	40.4	53.0	35.2	287.8	1.172	10.13	1.650
10	14.203	16.041	0.	41.1	51.5	24.5	287.8	1.164	10.13	1.650
11	13.376	15.546	0.	41.3	51.4	21.6	287.8	1.162	10.13	1.650
HUB	12.736	15.052	-0.	41.3	51.5	18.5	287.8	1.159	10.13	1.650

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	207.0	239.0	467.6	296.3	207.0	165.7	0.	172.2	419.3	417.8
1	210.3	236.5	463.9	299.5	210.3	170.8	-0.	163.6	413.5	409.6
2	214.8	234.9	458.1	301.3	214.8	175.4	-0.	156.2	404.7	401.3
3	224.2	235.7	430.5	286.1	224.2	183.2	0.	148.4	367.5	368.1
4	225.4	238.9	414.7	273.4	225.4	185.4	0.	150.7	348.1	351.6
5	225.3	239.9	410.6	270.0	225.3	185.9	0.	151.7	343.2	347.4
6	225.2	241.1	406.4	266.4	225.2	186.4	0.	152.9	338.3	343.3
7	224.9	242.3	402.1	263.1	224.9	186.9	0.	154.1	333.3	339.2
8	224.5	243.5	397.7	259.8	224.5	187.5	0.	155.2	328.3	335.0
9	215.6	254.7	358.4	237.2	215.6	193.9	0.	165.3	286.2	301.9
10	189.6	268.6	304.2	222.3	189.6	202.4	0.	176.6	238.0	268.8
11	179.0	272.3	286.8	220.1	179.0	204.7	0.	179.6	224.1	260.5
HUB	170.0	276.5	272.8	219.0	170.0	207.7	-0.	182.6	213.4	252.2

	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	0.633	0.655	1.429	0.813	0.633	0.454	-8.64	-6.66	0.800	1.608
1	0.644	0.653	1.420	0.827	0.644	0.472	-7.79	-5.48	0.812	1.594
2	0.659	0.652	1.405	0.837	0.659	0.487	-6.45	-4.29	0.816	1.579
3	0.690	0.663	1.325	0.805	0.690	0.515	-0.71	0.83	0.817	1.528
4	0.694	0.675	1.277	0.772	0.694	0.524	2.40	3.62	0.823	1.509
5	0.694	0.678	1.264	0.763	0.694	0.525	3.21	4.35	0.825	1.504
6	0.693	0.682	1.251	0.754	0.693	0.527	4.04	5.10	0.828	1.501
7	0.692	0.686	1.238	0.745	0.692	0.529	4.89	5.87	0.831	1.497
8	0.691	0.690	1.224	0.736	0.691	0.531	5.77	6.66	0.835	1.493
9	0.661	0.728	1.099	0.677	0.661	0.554	14.10	14.04	0.899	1.467
10	0.576	0.775	0.924	0.641	0.576	0.584	26.07	24.46	1.068	1.367
11	0.542	0.788	0.868	0.637	0.542	0.592	29.84	27.76	1.144	1.285
HUB	0.513	0.802	0.823	0.636	0.513	0.603	32.84	31.19	1.222	1.232

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
TIP	0.	2.7	0.1	7.6	0.506	0.619	0.344	0.234	0.073	0.050
1	5.00	2.8	-0.0	6.7	0.484	0.664	0.290	0.186	0.061	0.039
2	10.00	3.0	-0.0	6.1	0.466	0.709	0.244	0.145	0.051	0.031
3	30.00	4.2	0.0	5.0	0.450	0.814	0.153	0.078	0.032	0.017
4	40.00	4.8	-0.0	4.9	0.456	0.840	0.136	0.072	0.029	0.015
5	42.50	4.9	-0.0	4.9	0.458	0.844	0.133	0.072	0.029	0.015
6	45.00	5.1	-0.0	4.9	0.461	0.847	0.132	0.073	0.028	0.016
7	47.50	5.2	-0.0	5.0	0.463	0.851	0.130	0.074	0.028	0.016
8	50.00	5.4	-0.0	5.0	0.464	0.855	0.128	0.074	0.027	0.016
9	70.00	6.5	-0.0	5.4	0.461	0.892	0.108	.075	0.023	0.016
10	90.00	7.3	-0.0	7.0	0.399	0.937	0.079	0.072	0.015	0.014
11	95.00	7.4	-0.1	7.8	0.364	0.951	0.067	0.066	0.012	0.012
HUB	100.00	7.9	0.5	9.1	0.332	0.966	0.051	0.051	0.009	0.009

TABLE III. - DESIGN BLADE-ELEMENT PARAMETERS FOR STATOR 1

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
TIP	24.613	24.613	37.4	0.	37.4	0.	358.7	1.000	16.72	0.988
1	24.256	24.301	35.7	-0.	35.7	-0.	354.6	1.000	16.72	0.989
2	23.853	23.932	33.9	-0.	33.9	-0.	350.5	1.000	16.72	0.989
3	22.222	22.407	31.3	0.	31.3	0.	342.3	1.000	16.72	0.989
4	21.402	21.638	31.3	0.	31.3	0.	340.6	1.000	16.72	0.989
5	21.198	21.447	31.4	0.	31.4	0.	340.3	1.000	16.72	0.989
6	20.993	21.256	31.5	0.	31.5	0.	340.1	1.000	16.72	0.989
7	20.788	21.066	31.6	0.	31.6	0.	339.8	1.000	16.72	0.989
8	20.584	20.876	31.7	0.	31.7	0.	339.6	1.000	16.72	0.989
9	18.964	19.389	32.2	0.	32.2	0.	337.5	1.000	16.72	0.988
10	17.409	17.988	32.0	0.	32.0	0.	335.0	1.000	16.72	0.985
11	17.043	17.662	31.8	0.	31.8	0.	334.3	1.000	16.72	0.984
HUB	16.678	17.602	31.5	0.	31.5	0.	333.6	1.002	16.72	0.984

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	284.6	232.1	284.6	232.1	226.0	232.1	173.0	0.	0.	0.
1	283.4	231.4	283.4	231.4	230.2	231.4	165.3	-0.	0.	0.
2	282.6	230.7	282.6	230.7	234.5	230.7	157.8	-0.	0.	0.
3	283.1	230.9	283.1	230.9	241.9	230.9	147.1	0.	0.	0.
4	284.8	232.3	284.8	232.3	243.3	232.3	148.0	0.	0.	0.
5	285.4	232.8	285.4	232.8	243.6	232.8	148.6	0.	0.	0.
6	286.0	233.3	286.0	233.3	243.9	233.3	149.5	0.	0.	0.
7	286.7	233.9	286.7	233.9	244.2	233.9	150.2	0.	0.	0.
8	287.4	234.5	287.4	234.5	244.5	234.5	151.0	0.	0.	0.
9	295.0	240.1	295.0	240.1	249.6	240.1	157.2	0.	0.	0.
10	307.3	246.9	307.3	246.9	260.6	246.9	162.8	0.	0.	0.
11	311.3	248.4	311.3	248.4	264.7	248.4	163.8	0.	0.	0.
HUB	315.6	248.7	315.6	248.7	269.1	248.7	164.8	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	0.796	0.636	0.796	0.636	0.632	0.636	-0.73	0.21	1.027	1.222
1	0.797	0.637	0.797	0.637	0.648	0.637	-0.14	0.60	1.005	1.192
2	0.800	0.639	0.800	0.639	0.664	0.639	0.52	1.03	0.984	1.164
3	0.812	0.648	0.812	0.648	0.694	0.648	3.12	2.50	0.955	1.126
4	0.820	0.655	0.820	0.655	0.701	0.655	4.51	3.25	0.955	1.129
5	0.822	0.656	0.822	0.656	0.702	0.656	4.87	3.45	0.956	1.131
6	0.825	0.658	0.825	0.658	0.703	0.658	5.24	3.65	0.957	1.134
7	0.827	0.660	0.827	0.660	0.705	0.660	5.61	3.86	0.958	1.137
8	0.830	0.662	0.830	0.662	0.706	0.662	5.98	4.08	0.959	1.140
9	0.858	0.682	0.858	0.682	0.726	0.682	9.10	6.08	0.962	1.168
10	0.903	0.706	0.903	0.706	0.766	0.706	12.11	8.56	0.947	1.208
11	0.918	0.711	0.918	0.711	0.781	0.711	12.79	9.23	0.938	1.221
HUB	0.934	0.712	0.934	0.712	0.797	0.712	13.46	9.35	0.924	1.217

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
TIP	0.	5.0	-0.0	9.8	0.414	0.	0.031	0.031	0.012	0.012
1	5.00	5.1	0.0	9.1	0.401	0.	0.034	0.034	0.013	0.013
2	10.00	5.1	0.0	8.4	0.389	0.	0.032	0.032	0.012	0.012
3	30.00	5.1	-0.0	7.2	0.362	0.	0.031	0.031	0.011	0.011
4	40.00	5.1	0.0	7.0	0.355	0.	0.031	0.031	0.010	0.010
5	42.50	5.1	0.0	7.0	0.354	0.	0.031	0.031	0.010	0.010
6	45.00	5.1	0.0	7.0	0.352	0.	0.031	0.031	0.010	0.010
7	47.50	5.1	0.0	7.0	0.351	0.	0.031	0.031	0.010	0.010
8	50.00	5.1	0.0	7.0	0.350	0.	0.032	0.032	0.010	0.010
9	70.00	5.1	0.0	6.8	0.340	0.	0.033	0.033	0.010	0.010
10	90.00	5.0	-0.0	6.4	0.337	0.	0.035	0.035	0.010	0.009
11	95.00	5.0	-0.0	6.3	0.338	0.	0.038	0.037	0.010	0.010
HUB	100.00	4.5	-0.5	6.2	0.341	0.	0.051	0.050	0.013	0.013

TABLE IV. - BLADE GEOMETRY FOR ROTOR 6

RP	PERCENT SPAN	RADII RI	RO	BLADE ANGLES KIC	KTC	KOC	DELTA INC	CONE ANGLE
TIP	0.	25.024	24.938	61.27	59.53	48.55	2.57	-2.167
1	5.	24.681	24.443	60.39	58.83	48.51	2.75	-5.794
2	10.	24.151	23.949	59.08	57.74	48.33	3.03	-4.776
3	30.	21.932	21.972	54.43	53.07	45.16	4.18	0.842
4	40.	20.778	20.983	52.27	50.40	42.35	4.77	4.083
5	43.	20.485	20.736	51.75	49.69	41.52	4.91	4.922
6	45.	20.190	20.489	51.22	48.96	40.63	5.06	5.771
7	48.	19.893	20.242	50.70	48.23	39.71	5.21	6.638
8	50.	19.593	19.995	50.19	47.49	38.76	5.35	7.520
9	70.	17.083	18.018	46.38	41.40	29.63	6.46	15.492
10	90.	14.203	16.041	44.06	36.61	17.09	7.30	26.699
11	95.	13.376	15.546	43.89	36.11	13.27	7.42	30.360
HUB	100.	12.736	15.052	43.87	35.93	9.32	7.48	31.741

RP	BLADE THICKNESSES TI	TM	TO	AXIAL DIMENSIONS ZIC	ZMC	ZTC	ZOC
TIP	0.051	0.149	0.051	0.773	1.843	2.194	3.055
1	0.051	0.156	0.051	0.745	1.843	2.171	3.087
2	0.051	0.167	0.051	0.704	1.844	2.134	3.119
3	0.051	0.211	0.051	0.541	1.834	1.941	3.257
4	0.051	0.233	0.051	0.460	1.826	1.818	3.335
5	0.051	0.239	0.051	0.440	1.825	1.785	3.356
6	0.051	0.245	0.051	0.420	1.823	1.752	3.378
7	0.051	0.251	0.051	0.399	1.821	1.716	3.399
8	0.051	0.257	0.051	0.377	1.817	1.677	3.418
9	0.051	0.305	0.051	0.206	1.791	1.336	3.578
10	0.051	0.360	0.051	0.055	1.755	0.947	3.709
11	0.051	0.376	0.051	0.023	1.741	0.845	3.728
HUB	0.051	0.389	0.051	0.000	1.728	0.768	3.745

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	X FACTOR	PHISS	AREA RATIO
TIP	4.391	58.26	12.72	1.315	0.514	5.14	1.083
1	4.432	57.50	11.88	1.350	0.532	5.11	1.075
2	4.430	56.39	10.74	1.378	0.559	5.12	1.063
3	4.425	51.62	9.27	1.508	0.672	5.88	1.042
4	4.430	48.84	9.92	1.587	0.730	6.61	1.038
5	4.433	48.09	10.23	1.609	0.745	6.83	1.038
6	4.436	47.31	10.59	1.631	0.760	7.06	1.037
7	4.439	46.52	10.99	1.655	0.775	7.30	1.037
8	4.444	45.71	11.43	1.679	0.790	7.54	1.036
9	4.525	38.55	16.75	1.929	0.915	9.63	1.033
10	4.799	30.54	26.96	2.374	1.007	11.35	1.050
11	4.939	28.54	30.62	2.555	1.006	11.41	1.063
HUB	4.979	26.69	34.54	2.681	1.000	11.35	1.074

TABLE V. - BLADE GEOMETRY FOR STATOR 1

RP	PERCENT SPAN	RADII RI	RADII RO	BLADE ANGLES KIC	BLADE ANGLES KTC	BLADE ANGLES KOC	DELTA INC	CONE ANGLE
TIP	0.	24.613	24.613	32.39	20.93	-9.84	5.05	0.057
1	5.	24.256	24.301	30.60	20.08	-9.11	5.06	0.781
2	10.	23.853	23.932	28.84	19.24	-8.38	5.08	1.391
3	30.	22.222	22.407	26.22	17.81	-7.16	5.09	3.237
4	40.	21.402	21.638	26.23	17.72	-7.03	5.09	4.111
5	43.	21.198	21.447	26.32	17.75	-7.02	5.09	4.344
6	45.	20.993	21.256	26.44	17.80	-7.02	5.09	4.583
7	48.	20.788	21.066	26.55	17.85	-7.01	5.08	4.831
8	50.	20.584	20.876	26.65	17.89	-7.01	5.08	5.088
9	70.	18.964	19.389	27.27	18.20	-6.84	5.06	7.401
10	90.	17.409	17.988	27.16	18.25	-6.42	5.03	10.046
11	95.	17.043	17.662	26.93	18.18	-6.26	5.02	10.708
HUB	100.	16.678	17.602	26.68	18.10	-6.23	5.01	15.777

RP	BLADE THICKNESSES TI	BLADE THICKNESSES TM	BLADE THICKNESSES TO	AXIAL DIMENSIONS ZIC	AXIAL DIMENSIONS ZMC	AXIAL DIMENSIONS ZTC	AXIAL DIMENSIONS ZOC
TIP	0.051	0.203	0.051	7.664	9.209	8.917	10.914
1	0.051	0.203	0.051	7.671	9.230	8.902	10.931
2	0.051	0.203	0.051	7.678	9.250	8.888	10.948
3	0.051	0.203	0.051	7.684	9.274	8.878	10.967
4	0.051	0.203	0.051	7.684	9.273	8.894	10.966
5	0.051	0.203	0.051	7.684	9.272	8.898	10.965
6	0.051	0.203	0.051	7.684	9.271	8.902	10.965
7	0.051	0.203	0.051	7.685	9.271	8.905	10.964
8	0.051	0.203	0.051	7.685	9.271	8.909	10.964
9	0.051	0.203	0.051	7.688	9.268	8.924	10.961
10	0.051	0.203	0.051	7.690	9.269	8.913	10.961
11	0.051	0.203	0.051	7.690	9.271	8.904	10.962
HUB	0.051	0.203	0.051	7.690	9.272	8.895	10.962

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	X FACTOR	PHISS	AREA RATIO
TIP	3.404	14.21	42.23	1.321	0.800	12.97	1.081
1	3.403	13.42	39.71	1.338	0.800	11.78	1.072
2	3.404	12.68	37.22	1.360	0.800	10.60	1.063
3	3.408	11.66	33.38	1.459	0.800	8.60	1.046
4	3.411	11.74	33.25	1.514	0.800	8.31	1.041
5	3.412	11.80	33.34	1.528	0.800	8.28	1.040
6	3.413	11.87	33.46	1.543	0.800	8.27	1.039
7	3.415	11.94	33.56	1.558	0.800	8.25	1.037
8	3.416	12.00	33.65	1.573	0.800	8.22	1.036
9	3.430	12.41	34.10	1.708	0.800	7.89	1.024
10	3.453	12.48	33.58	1.863	0.800	7.22	1.008
11	3.460	12.40	33.20	1.904	0.800	6.98	1.003
HUB	3.531	12.26	32.91	1.967	0.800	6.72	0.999

TABLE VI. - OVERALL PERFORMANCE FOR STAGE 6-1. SI UNITS.

(a) 100 Percent design speed

PARAMETER	READING				
	21	22	23	24	25
ROTOR TOTAL PRESSURE RATIO	1.602	1.611	1.748	1.797	1.812
STAGE TOTAL PRESSURE RATIO	1.488	1.574	1.690	1.715	1.711
ROTOR TOTAL TEMPERATURE RATIO	1.173	1.174	1.202	1.216	1.223
STAGE TOTAL TEMPERATURE RATIO	1.174	1.175	1.203	1.215	1.223
ROTOR TEMP. RISE EFFICIENCY	0.836	0.837	0.856	0.842	0.830
STAGE TEMP. RISE EFFICIENCY	0.693	0.791	0.798	0.774	0.746
ROTOR MOMENTUM RISE EFFICIENCY	0.799	0.799	0.827	0.827	0.813
ROTOR HEAD RISE COEFFICIENT	0.237	0.241	0.283	0.297	0.302
STAGE HEAD RISE COEFFICIENT	0.198	0.229	0.265	0.271	0.270
FLOW COEFFICIENT	0.428	0.428	0.413	0.392	0.374
WT FLOW PER UNIT FRONTAL AREA	151.25	151.48	147.40	142.50	137.30
WT FLOW PER UNIT ANNULUS AREA	204.12	204.44	198.92	192.31	185.29
WT FLOW AT ORIFICE	29.76	29.80	29.00	28.03	27.01
WT FLOW AT ROTOR INLET	29.69	29.64	28.97	28.00	26.99
WT FLOW AT ROTOR OUTLET	28.93	28.81	28.11	27.19	26.07
WT FLOW AT STATOR OUTLET	29.33	29.33	28.49	28.01	27.16
ROTATIVE SPEED	16002.2	15966.4	16051.2	16089.6	16086.4
PERCENT OF DESIGN SPEED	100.0	99.8	100.3	100.6	100.5

(b) 90 Percent design speed

PARAMETER	READING				
	29	30	31	36	37
ROTOR TOTAL PRESSURE RATIO	1.478	1.514	1.578	1.620	1.627
STAGE TOTAL PRESSURE RATIO	1.381	1.462	1.524	1.574	1.564
ROTOR TOTAL TEMPERATURE RATIO	1.136	1.145	1.159	1.171	1.179
STAGE TOTAL TEMPERATURE RATIO	1.137	1.145	1.159	1.170	1.178
ROTOR TEMP. RISE EFFICIENCY	0.866	0.870	0.878	0.864	0.834
STAGE TEMP. RISE EFFICIENCY	0.705	0.793	0.807	0.815	0.765
ROTOR MOMENTUM RISE EFFICIENCY	0.833	0.847	0.855	0.843	0.811
ROTOR HEAD RISE COEFFICIENT	0.238	0.253	0.280	0.298	0.300
STAGE HEAD RISE COEFFICIENT	0.195	0.230	0.257	0.279	0.274
FLOW COEFFICIENT	0.433	0.430	0.412	0.378	0.348
WT FLOW PER UNIT FRONTAL AREA	141.80	140.77	136.06	127.93	119.58
WT FLOW PER UNIT ANNULUS AREA	191.37	189.98	183.62	172.65	161.38
WT FLOW AT ORIFICE	27.90	27.69	26.77	25.17	23.53
WT FLOW AT ROTOR INLET	27.86	27.67	26.79	25.05	23.42
WT FLOW AT ROTOR OUTLET	27.34	27.18	26.27	24.45	22.49
WT FLOW AT STATOR OUTLET	27.25	26.47	25.67	25.09	23.83
ROTATIVE SPEED	14469.0	14478.9	14477.5	14473.2	14476.2
PERCENT OF DESIGN SPEED	90.4	90.5	90.5	90.5	90.5

TABLE VI. - Concluded. OVERALL PERFORMANCE FOR

STAGE 6-1. SI UNITS.

(c) 80 Percent design speed

PARAMETER	READING
	38
ROTOR TOTAL PRESSURE RATIO	1.448
STAGE TOTAL PRESSURE RATIO	1.401
ROTOR TOTAL TEMPERATURE RATIO	1.136
STAGE TOTAL TEMPERATURE RATIO	1.136
ROTOR TEMP. RISE EFFICIENCY	0.819
STAGE TEMP. RISE EFFICIENCY	0.744
ROTOR MOMENTUM RISE EFFICIENCY	0.792
ROTOR HEAD RISE COEFFICIENT	0.287
STAGE HEAD RISE COEFFICIENT	0.260
FLOW COEFFICIENT	0.321
WT FLOW PER UNIT FRONTAL AREA	100.51
WT FLOW PER UNIT ANNULUS AREA	135.65
WT FLOW AT ORIFICE	19.77
WT FLOW AT ROTOR INLET	19.61
WT FLOW AT ROTOR OUTLET	18.90
WT FLOW AT STATOR OUTLET	19.69
ROTATIVE SPEED	12802.1
PERCENT OF DESIGN SPEED	80.0

(e) 50 Percent design speed

PARAMETER	READING
	48
ROTOR TOTAL PRESSURE RATIO	1.158
STAGE TOTAL PRESSURE RATIO	1.144
ROTOR TOTAL TEMPERATURE RATIO	1.053
STAGE TOTAL TEMPERATURE RATIO	1.053
ROTOR TEMP. RISE EFFICIENCY	0.806
STAGE TEMP. RISE EFFICIENCY	0.746
ROTOR MOMENTUM RISE EFFICIENCY	0.790
ROTOR HEAD RISE COEFFICIENT	0.283
STAGE HEAD RISE COEFFICIENT	0.260
FLOW COEFFICIENT	0.295
WT FLOW PER UNIT FRONTAL AREA	59.52
WT FLOW PER UNIT ANNULUS AREA	80.32
WT FLOW AT ORIFICE	11.71
WT FLOW AT ROTOR INLET	11.66
WT FLOW AT ROTOR OUTLET	11.29
WT FLOW AT STATOR OUTLET	11.73
ROTATIVE SPEED	7983.6
PERCENT OF DESIGN SPEED	49.9

(d) 70 Percent design speed

PARAMETER	READING				
	39	40	41	42	43
ROTOR TOTAL PRESSURE RATIO	1.221	1.273	1.309	1.324	1.330
STAGE TOTAL PRESSURE RATIO	1.190	1.250	1.283	1.294	1.290
ROTOR TOTAL TEMPERATURE RATIO	1.065	1.079	1.091	1.098	1.105
STAGE TOTAL TEMPERATURE RATIO	1.066	1.079	1.090	1.097	1.103
ROTOR TEMP. RISE EFFICIENCY	0.900	0.908	0.882	0.852	0.810
STAGE TEMP. RISE EFFICIENCY	0.767	0.830	0.818	0.788	0.729
ROTOR MOMENTUM RISE EFFICIENCY	0.879	0.874	0.864	0.839	0.790
ROTOR HEAD RISE COEFFICIENT	0.196	0.238	0.267	0.278	0.282
STAGE HEAD RISE COEFFICIENT	0.170	0.219	0.246	0.254	0.251
FLOW COEFFICIENT	0.448	0.417	0.379	0.348	0.314
WT FLOW PER UNIT FRONTAL AREA	119.26	112.27	103.53	96.11	87.66
WT FLOW PER UNIT ANNULUS AREA	160.95	151.52	139.72	129.71	118.30
WT FLOW AT ORIFICE	23.46	22.09	20.37	18.91	17.24
WT FLOW AT ROTOR INLET	23.39	22.00	20.24	18.80	17.15
WT FLOW AT ROTOR OUTLET	23.11	21.51	19.79	18.40	16.58
WT FLOW AT STATOR OUTLET	22.45	20.86	19.22	17.92	16.61
ROTATIVE SPEED	11241.9	11249.5	11238.6	11254.2	11261.7
PERCENT OF DESIGN SPEED	70.3	70.3	70.2	70.3	70.4

TABLE VII. - BLADE-ELEMENT DATA AT BLADE EDGES

FOR ROTOR 6. SI UNITS.

(a) 100-Percent design speed

(a1) Reading 21

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	0.0	43.0	63.4	57.9	288.8	1.214	9.89	1.613
2	24.150	23.950	0.0	37.1	61.5	55.4	288.4	1.194	10.11	1.640
3	21.933	21.971	0.0	37.5	58.9	49.6	288.2	1.178	10.16	1.646
4	20.777	20.983	0.0	41.3	57.2	48.0	287.5	1.173	10.16	1.562
5	20.485	20.737	0.0	42.0	56.7	47.9	289.2	1.175	10.16	1.541
6	20.190	20.490	0.0	42.2	56.4	47.8	287.5	1.171	10.16	1.528
7	19.893	20.241	0.0	42.4	55.9	46.1	288.6	1.172	10.16	1.541
8	19.594	19.995	0.0	41.5	55.6	44.3	287.9	1.170	10.16	1.568
9	17.084	18.019	-0.0	39.8	52.4	36.0	288.0	1.154	10.15	1.589
10	14.204	16.040	0.0	39.7	50.9	26.5	287.9	1.150	10.15	1.592
11	13.376	15.547	0.0	42.9	51.1	21.2	288.0	1.158	10.14	1.625

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	206.8	221.8	462.6	305.4	206.8	162.3	0.0	151.2	413.8	409.8
2	219.5	227.8	460.0	320.2	219.5	181.7	0.0	137.3	404.3	400.9
3	222.5	239.2	430.3	292.9	222.5	189.6	0.0	145.7	368.3	369.0
4	224.0	234.7	413.0	263.2	224.0	176.2	0.0	155.0	347.0	350.5
5	225.9	233.0	411.0	258.1	225.9	173.1	0.0	156.0	343.3	347.5
6	224.9	230.7	406.1	254.1	224.9	170.8	0.0	155.0	338.1	343.1
7	225.8	235.6	402.8	250.7	225.8	173.9	0.0	158.9	333.6	339.5
8	225.4	240.6	398.5	251.8	225.4	180.2	0.0	159.4	328.6	335.3
9	220.1	251.7	361.0	238.9	220.1	193.3	-0.0	161.3	286.1	301.7
10	193.5	262.6	306.6	225.8	193.5	202.0	0.0	167.8	237.8	268.6
11	181.3	270.8	288.7	212.8	181.3	198.5	0.0	184.3	224.6	261.1

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.631	0.613	1.411	0.844	0.631	0.449	0.785	1.598
2	0.673	0.637	1.411	0.895	0.673	0.508	0.828	1.567
3	0.684	0.676	1.322	0.828	0.684	0.536	0.852	1.534
4	0.690	0.665	1.272	0.746	0.690	0.499	0.787	1.506
5	0.694	0.657	1.262	0.728	0.694	0.488	0.766	1.501
6	0.693	0.653	1.251	0.720	0.693	0.484	0.759	1.501
7	0.694	0.667	1.238	0.709	0.694	0.492	0.770	1.495
8	0.694	0.684	1.227	0.716	0.694	0.512	0.799	1.492
9	0.676	0.724	1.109	0.687	0.676	0.556	0.878	1.453
10	0.588	0.760	0.932	0.654	0.588	0.585	1.044	1.360
11	0.549	0.784	0.874	0.616	0.549	0.574	1.095	1.285

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	3.2	0.4	9.4	0.460	0.684	0.259	0.155	0.051	0.030
2	10.00	2.5	-0.5	7.1	0.412	0.781	0.170	0.074	0.035	0.015
3	30.00	4.4	0.2	4.5	0.432	0.859	0.112	0.036	0.024	0.008
4	40.00	4.9	0.1	5.6	0.482	0.785	0.173	0.111	0.037	0.023
5	42.50	4.9	-0.1	6.3	0.491	0.750	0.203	0.143	0.042	0.030
6	45.00	5.1	0.0	7.1	0.492	0.755	0.198	0.140	0.041	0.029
7	47.50	5.1	-0.1	6.3	0.498	0.764	0.195	0.140	0.041	0.029
8	50.00	5.3	-0.1	5.5	0.488	0.805	0.163	0.109	0.035	0.023
9	70.00	5.9	-0.6	6.2	0.457	0.918	0.074	0.041	0.015	0.009
10	90.00	6.6	-0.7	9.0	0.386	0.945	0.063	0.056	0.012	0.010
11	95.00	7.0	-0.4	7.4	0.397	0.941	0.079	0.077	0.014	0.014

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(a) Continued. 100-Percent design speed

(a2) Reading 22

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	24.681	24.442	0.0	43.8	63.5	57.9	289.0	1.217	9.97	1.619
2	24.150	23.950	-0.0	38.2	61.4	55.4	288.5	1.197	10.20	1.642
3	21.933	21.971	0.0	37.7	58.8	49.6	288.1	1.179	9.75	1.647
4	20.777	20.983	0.0	41.9	57.2	47.9	288.1	1.176	10.24	1.573
5	20.485	20.737	0.0	42.0	56.8	47.5	287.1	1.173	10.24	1.559
6	20.190	20.490	0.0	42.4	56.4	47.1	288.4	1.174	10.24	1.547
7	19.893	20.241	-0.0	42.3	56.0	45.8	287.7	1.173	10.24	1.553
8	19.594	19.995	0.0	41.6	55.6	44.3	288.0	1.171	10.24	1.573
9	17.084	18.019	0.0	40.0	52.5	36.0	288.0	1.156	10.23	1.597
10	14.204	16.040	0.0	41.6	51.0	24.7	287.7	1.150	10.23	1.605
11	13.376	15.547	0.0	44.3	51.3	17.7	288.2	1.168	10.20	1.684

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	206.1	222.5	462.2	302.0	206.1	160.6	0.0	154.0	413.7	409.7
2	220.4	228.4	460.9	315.8	220.4	179.4	-0.0	141.4	404.7	401.4
3	221.8	238.4	428.8	291.1	221.8	188.6	0.0	145.9	367.0	367.7
4	224.3	235.3	413.5	261.3	224.3	175.2	0.0	157.0	347.4	350.9
5	223.8	233.7	408.5	257.1	223.8	173.7	0.0	156.4	341.8	346.0
6	224.5	233.4	405.3	252.9	224.5	172.3	0.0	157.4	337.6	342.6
7	224.2	235.6	400.7	250.0	224.2	174.2	-0.0	158.6	332.1	337.9
8	224.5	239.9	397.0	250.7	224.5	179.5	0.0	159.2	327.5	334.2
9	219.4	251.5	360.4	238.1	219.4	192.7	0.0	161.7	285.8	301.5
10	192.0	265.2	304.9	218.4	192.0	198.4	0.0	176.1	236.8	267.5
11	179.3	280.6	286.7	210.9	179.3	201.0	0.0	195.9	223.7	260.0

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	0.628	0.614	1.409	0.833	0.628	0.443	0.779	1.599
2	0.676	0.638	1.414	0.882	0.676	0.501	0.814	1.568
3	0.682	0.674	1.318	0.823	0.682	0.533	0.850	1.529
4	0.690	0.665	1.272	0.739	0.690	0.496	0.781	1.506
5	0.689	0.663	1.259	0.729	0.689	0.492	0.776	1.502
6	0.690	0.660	1.246	0.715	0.690	0.487	0.768	1.497
7	0.690	0.667	1.233	0.708	0.690	0.494	0.777	1.493
8	0.691	0.681	1.221	0.712	0.691	0.510	0.799	1.488
9	0.674	0.723	1.106	0.684	0.674	0.554	0.878	1.454
10	0.584	0.769	0.927	0.633	0.584	0.575	1.033	1.355
11	0.542	0.812	0.867	0.610	0.542	0.581	1.121	1.281

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	3.2	0.5	9.3	0.469	0.679	0.266	0.163	0.052	0.032
2	10.00	2.4	-0.6	7.0	0.426	0.774	0.177	0.080	0.036	0.016
3	30.00	4.4	0.2	4.5	0.434	0.856	0.115	0.041	0.025	0.009
4	40.00	4.8	0.1	5.5	0.488	0.785	0.175	0.112	0.037	0.024
5	42.50	5.0	0.1	6.0	0.490	0.781	0.178	0.119	0.037	0.025
6	45.00	5.1	0.0	6.4	0.496	0.763	0.196	0.138	0.041	0.029
7	47.50	5.2	-0.0	6.1	0.497	0.773	0.190	0.135	0.040	0.028
8	50.00	5.3	-0.1	5.5	0.489	0.806	0.164	0.112	0.035	0.024
9	70.00	5.9	-0.5	6.2	0.459	0.919	0.074	0.041	0.015	0.009
10	90.00	6.8	-0.5	7.2	0.413	0.962	0.044	0.037	0.008	0.007
11	95.00	7.3	-0.2	4.0	0.408	0.955	0.064	0.063	0.012	0.012

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(a) Continued. 100-Percent design speed

(a3) Reading 23

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	0.0	49.9	64.4	56.9	289.2	1.260	9.91	1.825
2	24.150	23.950	0.0	46.5	62.5	54.2	288.4	1.237	10.11	1.839
3	21.933	21.971	-0.0	44.6	59.8	49.0	288.3	1.211	10.16	1.800
4	20.777	20.983	0.0	46.9	58.2	46.5	288.0	1.203	10.16	1.741
5	20.485	20.737	-0.0	46.8	57.6	46.0	289.2	1.203	10.16	1.719
6	20.190	20.490	0.0	47.5	57.3	45.5	288.2	1.202	10.16	1.706
7	19.893	20.241	0.0	48.5	57.3	44.8	288.4	1.201	10.16	1.711
8	19.594	19.995	0.0	48.3	57.1	43.8	286.9	1.194	10.15	1.710
9	17.084	18.019	0.0	44.6	53.7	35.9	288.2	1.176	10.15	1.687
10	14.204	16.040	0.0	45.3	52.4	25.8	287.9	1.167	10.15	1.668
11	13.376	15.547	0.0	48.4	52.7	17.2	288.1	1.180	10.12	1.743

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	199.4	234.4	460.6	276.8	199.4	151.0	0.0	179.3	415.3	411.3
2	211.9	240.2	458.4	282.2	211.9	165.3	0.0	174.4	406.5	403.1
3	214.5	242.5	426.4	263.4	214.5	172.7	-0.0	170.2	368.5	369.2
4	215.9	242.6	409.9	240.7	215.9	165.7	0.0	177.2	348.4	351.8
5	218.7	242.5	408.1	239.0	218.7	165.9	-0.0	176.8	344.5	348.8
6	217.9	241.7	403.4	232.9	217.9	163.1	0.0	178.3	339.5	344.5
7	215.2	241.9	397.8	225.8	215.2	160.1	0.0	181.3	334.6	340.5
8	212.5	242.0	390.9	222.7	212.5	160.9	0.0	180.8	328.1	334.8
9	211.2	249.1	356.6	218.8	211.2	177.3	0.0	174.9	287.4	303.1
10	184.2	256.7	301.8	200.5	184.2	180.4	0.0	182.6	239.0	269.9
11	171.6	274.5	282.9	190.8	171.6	182.3	0.0	205.2	225.0	261.5

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.606	0.637	1.400	0.752	0.606	0.410	0.757	1.518
2	0.648	0.662	1.402	0.777	0.648	0.455	0.780	1.591
3	0.657	0.676	1.306	0.735	0.657	0.482	0.805	1.551
4	0.662	0.680	1.257	0.674	0.662	0.464	0.767	1.528
5	0.670	0.677	1.250	0.668	0.670	0.464	0.759	1.521
6	0.668	0.677	1.237	0.652	0.668	0.457	0.749	1.521
7	0.659	0.678	1.218	0.633	0.659	0.449	0.744	1.523
8	0.652	0.682	1.199	0.627	0.652	0.453	0.757	1.521
9	0.646	0.708	1.091	0.622	0.646	0.584	0.840	1.485
10	0.558	0.735	0.914	0.574	0.558	0.517	0.980	1.381
11	0.517	0.787	0.853	0.547	0.517	0.523	1.063	1.301

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	4.1	1.3	8.4	0.542	0.722	0.268	0.161	0.054	0.033
2	10.00	3.5	0.4	5.8	0.522	0.804	0.180	0.080	0.038	0.017
3	30.00	5.4	1.2	3.9	0.515	0.867	0.123	0.046	0.027	0.010
4	40.00	5.9	1.1	4.1	0.550	0.847	0.143	0.078	0.031	0.017
5	42.50	5.8	0.9	4.5	0.550	0.823	0.167	0.105	0.036	0.023
6	45.00	6.0	1.0	4.9	0.559	0.817	0.174	0.113	0.037	0.024
7	47.50	6.5	1.3	5.1	0.571	0.827	0.167	0.109	0.036	0.023
8	50.00	6.8	1.4	4.9	0.569	0.853	0.142	0.086	0.030	0.019
9	70.00	7.1	0.7	6.0	0.517	0.916	0.086	0.051	0.018	0.011
10	90.00	8.2	0.9	8.3	0.471	0.941	0.076	0.069	0.014	0.013
11	95.00	8.6	1.2	3.5	0.478	0.955	0.069	0.068	0.013	0.013

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(a) Continued. 100-Percent design speed

(a4) Reading 24

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	0.0	55.5	66.0	57.2	289.3	1.285	9.92	1.907
2	24.150	23.950	0.0	50.1	64.2	54.1	288.9	1.263	10.10	1.911
3	21.933	21.971	0.0	47.6	61.3	49.1	287.9	1.226	10.15	1.850
4	20.777	20.983	0.0	49.4	59.8	47.1	288.0	1.216	10.15	1.792
5	20.485	20.737	0.0	50.1	59.4	46.5	287.9	1.214	10.15	1.778
6	20.190	20.490	0.0	51.2	59.0	45.9	288.0	1.215	10.15	1.764
7	19.893	20.241	0.0	51.1	58.7	45.4	288.0	1.213	10.16	1.747
8	19.594	19.995	-0.0	50.7	58.3	43.8	288.1	1.210	10.16	1.753
9	17.084	18.019	0.0	47.4	55.2	35.5	287.9	1.186	10.16	1.730
10	14.204	16.040	-0.0	46.7	53.5	25.5	287.7	1.174	10.15	1.700
11	13.376	15.547	0.0	49.3	53.7	17.5	287.8	1.186	10.12	1.763

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	184.9	241.2	453.9	252.1	184.9	136.6	0.0	198.7	414.6	400.6
2	196.9	243.9	452.1	267.2	196.9	156.5	0.0	187.0	406.9	4[illegible].6
3	201.8	243.7	420.7	251.1	201.8	164.3	0.0	179.9	369.2	3[illegible].8
4	203.9	242.0	405.1	231.7	203.9	157.6	0.0	183.7	350.1	353.6
5	203.8	241.8	400.7	225.6	203.8	155.2	0.0	185.5	345.0	349.3
6	204.4	242.3	397.1	218.1	204.4	151.7	0.0	188.8	340.5	345.6
7	204.4	241.3	392.8	215.6	204.4	151.4	0.0	187.9	335.5	341.4
8	204.2	244.1	388.4	214.3	204.2	154.7	-0.0	188.9	330.4	337.2
9	200.5	249.3	350.9	207.4	200.5	168.9	0.0	183.4	288.0	303.7
10	177.4	256.3	298.0	194.7	177.4	175.7	-0.0	186.6	239.5	270.5
11	165.6	271.9	279.7	185.9	165.6	177.3	0.0	206.1	225.4	262.0

	ABS MACH NO		REL MACH NO		MERID MACH NO			
RP	IN	OUT	IN	OUT	IN	OUT	MERID VEL R	PEAK SS MACH NO
1	0.559	0.650	1.372	0.679	0.559	0.368	0.739	1.646
2	0.598	0.664	1.373	0.728	0.598	0.426	0.795	1.621
3	0.615	0.676	1.283	0.696	0.615	0.456	0.814	1.581
4	0.622	0.674	1.236	0.645	0.622	0.439	0.773	1.564
5	0.622	0.674	1.223	0.629	0.622	0.433	0.762	1.560
6	0.624	0.675	1.212	0.608	0.624	0.423	0.742	1.557
7	0.624	0.673	1.199	0.601	0.624	0.422	0.741	1.554
8	0.623	0.682	1.185	0.599	0.623	0.432	0.757	1.550
9	0.611	0.706	1.069	0.587	0.611	0.478	0.843	1.522
10	0.537	0.732	0.901	0.556	0.537	0.502	0.991	1.395
11	0.499	0.777	0.843	0.532	0.499	0.507	1.071	1.314

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	5.7	2.9	8.7	0.606	0.710	0.304	0.195	0.061	0.039
2	10.00	5.2	2.1	5.8	0.558	0.772	0.230	0.127	0.049	0.027
3	30.00	6.9	2.7	4.0	0.545	0.852	0.147	0.067	0.032	0.015
4	40.00	7.5	2.7	4.8	0.572	0.841	0.159	0.090	0.034	0.019
5	42.50	7.6	2.7	5.0	0.582	0.835	0.166	0.100	0.036	0.021
6	45.00	7.7	2.7	5.3	0.598	0.820	0.183	0.119	0.039	0.025
7	47.50	7.9	2.7	5.6	0.597	0.812	0.193	0.131	0.041	0.028
8	50.00	8.0	2.6	5.0	0.595	0.830	0.176	0.117	0.038	0.025
9	70.00	8.6	2.1	5.7	0.548	0.913	0.096	0.057	0.020	0.012
10	90.00	9.3	2.0	8.0	0.487	0.939	0.083	0.075	0.016	0.014
11	95.00	9.7	2.2	3.8	0.490	0.948	0.084	0.082	0.016	0.015

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(a) Concluded. 100-Percent design speed

(a5) Reading 25

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	0.0	59.3	67.1	58.1	289.2	1.301	9.95	1.933
2	24.150	23.950	-0.0	54.2	65.5	54.8	288.8	1.279	10.09	1.928
3	21.933	21.971	0.0	49.4	62.7	49.4	288.1	1.234	10.15	1.867
4	20.777	20.983	0.0	51.0	61.1	47.4	288.0	1.220	10.15	1.807
5	20.485	20.737	0.0	52.0	60.8	47.3	288.1	1.219	10.15	1.786
6	20.190	20.490	0.0	52.9	60.5	46.4	288.2	1.219	10.15	1.778
7	19.893	20.241	0.0	53.3	60.1	45.2	288.0	1.219	10.16	1.770
8	19.594	19.995	0.0	52.7	59.7	43.4	288.0	1.217	10.16	1.779
9	17.084	18.019	0.0	48.9	56.6	34.9	287.8	1.191	10.15	1.754
10	14.204	16.040	0.0	48.9	54.7	25.0	287.7	1.177	10.15	1.704
11	13.376	15.547	0.0	50.1	55.0	18.5	287.9	1.184	10.13	1.754

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	175.8	244.6	451.2	236.9	175.8	125.0	0.0	210.2	415.5	411.5
2	185.4	245.7	446.9	249.5	185.4	143.7	-0.0	199.3	406.6	403.2
3	190.8	244.0	416.0	243.8	190.8	158.7	0.0	185.3	369.6	370.3
4	192.8	241.6	399.4	224.8	192.8	152.1	0.0	187.7	349.8	353.2
5	192.5	240.0	395.0	218.0	192.5	147.9	0.0	189.0	344.9	349.1
6	192.9	241.6	391.4	211.3	192.9	145.7	0.0	192.7	340.6	345.6
7	192.8	243.0	388.7	206.3	192.8	145.4	0.1	194.7	335.3	341.2
8	192.7	246.2	382.2	205.3	192.7	149.2	0.0	195.8	330.1	336.8
9	189.4	250.4	344.3	200.7	189.4	164.7	0.0	188.6	287.6	303.3
10	169.1	254.9	292.8	184.9	169.1	167.7	0.1	192.0	239.2	270.1
11	158.1	266.9	275.4	180.4	158.1	171.1	0.0	204.9	225.6	262.2

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.530	0.656	1.360	0.635	0.530	0.335	0.711	1.671
2	0.561	0.665	1.353	0.676	0.561	0.389	0.775	1.645
3	0.579	0.674	1.263	0.674	0.579	0.439	0.832	1.609
4	0.586	0.671	1.214	0.625	0.586	0.423	0.789	1.590
5	0.585	0.667	1.200	0.606	0.585	0.411	0.768	1.588
6	0.586	0.671	1.189	0.587	0.586	0.405	0.755	1.587
7	0.586	0.676	1.175	0.574	0.586	0.404	0.754	1.583
8	0.586	0.686	1.161	0.572	0.586	0.416	0.774	1.580
9	0.575	0.708	1.046	0.567	0.575	0.465	0.869	1.560
10	0.510	0.727	0.883	0.527	0.510	0.478	0.992	1.405
11	0.475	0.762	0.828	0.515	0.475	0.488	1.082	1.327

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	6.8	4.0	9.6	0.647	0.688	0.341	0.228	0.067	0.045
2	10.00	6.5	3.4	6.5	0.603	0.739	0.276	0.171	0.058	0.036
3	30.00	8.3	4.1	4.2	0.562	0.836	0.169	0.086	0.036	0.019
4	40.00	8.8	4.1	5.1	0.586	0.836	0.169	0.098	0.036	0.021
5	42.50	9.0	4.1	5.7	0.598	0.824	0.183	0.114	0.039	0.024
6	45.00	9.2	4.1	5.7	0.612	0.815	0.196	0.129	0.041	0.027
7	47.50	9.3	4.1	5.5	0.620	0.809	0.205	0.141	0.044	0.030
8	50.00	9.4	4.1	4.6	0.617	0.826	0.188	0.127	0.041	0.027
9	70.00	10.1	3.6	5.0	0.563	0.912	0.101	0.059	0.022	0.013
10	90.00	10.5	3.2	7.5	0.515	0.929	0.100	0.093	0.019	0.018
11	95.00	10.9	3.5	4.8	0.501	0.947	0.087	0.086	0.016	0.016

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(b) 90-Percent design speed

(b1) Reading 29

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	24.681	24.442	0.0	35.1	63.4	55.1	288.9	1.160	9.94	1.529
2	24.150	23.950	0.0	35.3	61.7	54.1	288.7	1.150	10.09	1.502
3	21.933	21.971	0.0	34.9	58.9	49.6	288.0	1.137	10.15	1.484
4	20.777	20.983	0.1	37.8	57.2	46.3	288.0	1.139	10.16	1.466
5	20.485	20.737	0.1	38.5	56.9	45.7	288.0	1.139	10.15	1.454
6	20.190	20.490	0.1	38.7	56.5	45.5	288.2	1.139	10.15	1.440
7	19.893	20.241	0.1	38.8	56.2	45.6	287.9	1.136	10.16	1.426
8	19.594	19.995	0.1	37.9	55.7	43.7	288.0	1.134	10.16	1.448
9	17.084	18.019	0.1	36.8	52.6	35.9	288.0	1.124	10.16	1.463
10	14.204	16.040	0.1	38.3	51.0	24.8	287.8	1.122	10.14	1.478
11	13.376	15.547	0.1	41.4	51.0	18.7	287.9	1.132	10.13	1.522

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	187.2	211.6	417.7	302.5	187.2	173.1	0.1	121.8	373.5	369.9
2	197.0	212.6	415.1	295.9	197.0	173.6	0.1	122.8	365.5	362.4
3	200.4	216.4	387.7	274.2	200.4	177.6	0.2	123.7	332.0	332.6
4	202.3	220.7	373.8	252.4	202.3	174.4	0.2	135.3	314.6	317.7
5	202.1	220.3	369.9	247.0	202.1	172.5	0.2	137.0	310.0	313.8
6	202.4	218.6	366.7	243.6	202.4	170.6	0.2	136.7	306.0	310.6
7	202.3	215.8	363.2	240.5	202.3	168.2	0.2	135.3	301.9	307.2
8	202.2	221.6	359.3	242.0	202.2	174.9	0.2	136.1	297.2	303.3
9	197.7	232.1	325.7	229.3	197.7	185.9	0.2	138.9	259.1	273.3
10	174.5	247.6	277.2	213.9	174.5	194.2	0.2	153.6	215.5	243.4
11	164.0	257.6	260.6	204.1	164.0	193.3	0.2	170.2	202.7	235.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.567	0.597	1.265	0.853	0.567	0.488	0.925	1.458
2	0.599	0.603	1.262	0.839	0.599	0.492	0.881	1.431
3	0.611	0.619	1.181	0.784	0.611	0.508	0.886	1.409
4	0.617	0.632	1.140	0.722	0.617	0.499	0.862	1.398
5	0.616	0.630	1.128	0.707	0.616	0.494	0.854	1.397
6	0.617	0.625	1.118	0.696	0.617	0.488	0.843	1.397
7	0.617	0.618	1.108	0.688	0.617	0.481	0.831	1.399
8	0.617	0.636	1.096	0.694	0.617	0.502	0.865	1.397
9	0.602	0.672	0.992	0.664	0.602	0.538	0.940	1.397
10	0.527	0.722	0.838	0.624	0.527	0.566	1.112	1.225
11	0.494	0.751	0.785	0.595	0.494	0.563	1.179	1.151

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	3.1	0.3	6.6	0.383	0.807	0.143	0.091	0.030	0.019
2	10.00	2.7	-0.4	5.7	0.394	0.821	0.126	0.079	0.027	0.017
3	30.00	4.4	0.3	4.5	0.399	0.869	0.094	0.060	0.020	0.013
4	40.00	4.9	0.2	3.9	0.439	0.831	0.128	0.100	0.028	0.022
5	42.50	5.1	0.2	4.2	0.448	0.812	0.144	0.118	0.031	0.026
6	45.00	5.2	0.2	4.9	0.451	0.792	0.160	0.135	0.034	0.029
7	47.50	5.4	0.2	5.9	0.451	0.783	0.167	0.142	0.035	0.030
8	50.00	5.5	0.1	4.9	0.440	0.832	0.130	0.107	0.028	0.023
9	70.00	6.1	-0.4	6.0	0.409	0.923	0.065	0.051	0.014	0.011
10	90.00	6.8	-0.5	7.3	0.352	0.964	0.040	0.040	0.008	0.008
11	95.00	7.0	-0.5	5.0	0.354	0.964	0.047	0.047	0.009	0.009

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(b) Continued. 90-Percent design speed

(b2) Reading 30

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	0.1	39.2	63.7	54.8	288.9	1.174	9.94	1.591
2	24.150	23.950	0.1	36.1	62.0	54.0	288.8	1.167	10.09	1.574
3	21.933	21.971	0.1	36.9	59.1	49.3	288.0	1.147	10.16	1.521
4	20.777	20.983	0.1	39.0	57.5	46.1	288.0	1.146	10.15	1.501
5	20.485	20.737	0.1	39.7	57.1	45.1	288.0	1.146	10.15	1.495
6	20.190	20.490	0.1	40.3	56.8	44.9	288.0	1.146	10.16	1.482
7	19.893	20.241	0.1	40.1	56.4	44.7	288.0	1.143	10.16	1.466
8	19.594	19.995	0.1	39.4	56.0	43.5	288.0	1.138	10.16	1.478
9	17.084	18.019	0.1	38.4	52.9	35.6	288.0	1.128	10.15	1.481
10	14.204	16.040	0.0	41.6	51.4	23.6	287.8	1.127	10.14	1.489
11	13.376	15.547	0.0	44.2	51.5	16.4	287.9	1.138	10.13	1.549

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	184.6	214.1	416.8	287.6	184.6	165.9	0.2	135.4	374.0	370.4
2	194.4	213.4	414.1	293.0	194.4	172.3	0.2	125.9	365.9	362.9
3	199.0	217.7	387.1	266.8	199.0	174.1	0.2	130.7	332.3	332.9
4	200.8	221.4	373.4	248.3	200.8	172.2	0.2	139.2	315.0	318.1
5	201.0	222.8	369.8	242.8	201.0	171.4	0.2	142.4	310.6	314.5
6	200.5	221.0	365.8	237.7	200.5	168.5	0.2	143.0	306.2	310.7
7	200.6	219.1	362.1	235.9	200.6	167.7	0.2	141.0	301.7	307.0
8	200.7	222.0	358.6	236.5	200.7	171.7	0.2	140.8	297.4	303.5
9	196.1	231.4	324.9	222.8	196.1	181.2	0.2	143.9	259.3	273.4
10	172.1	245.6	275.7	200.3	172.1	183.6	0.1	163.2	215.5	243.4
11	160.9	259.2	258.6	193.6	160.9	185.7	0.1	180.8	202.6	235.5

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.558	0.601	1.261	0.807	0.558	0.465	0.899	1.466
2	0.590	0.601	1.257	0.825	0.590	0.485	0.887	1.439
3	0.606	0.620	1.179	0.760	0.606	0.496	0.875	1.414
4	0.612	0.632	1.138	0.708	0.612	0.491	0.857	1.405
5	0.613	0.636	1.127	0.693	0.613	0.489	0.853	1.403
6	0.611	0.631	1.115	0.678	0.611	0.481	0.840	1.404
7	0.611	0.626	1.104	0.674	0.611	0.479	0.836	1.403
8	0.612	0.636	1.093	0.677	0.612	0.492	0.856	1.403
9	0.597	0.668	0.989	0.644	0.597	0.524	0.924	1.401
10	0.520	0.714	0.832	0.582	0.520	0.534	1.067	1.229
11	0.484	0.754	0.778	0.563	0.484	0.540	1.155	1.156

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	3.4	0.7	6.3	0.429	0.814	0.149	0.095	0.032	0.020
2	10.00	3.0	-0.0	5.6	0.402	0.829	0.133	0.085	0.028	0.018
3	30.00	4.6	0.5	4.1	0.423	0.868	0.101	0.066	0.022	0.014
4	40.00	5.2	0.4	3.7	0.453	0.843	0.125	0.096	0.027	0.021
5	42.50	5.3	0.4	3.6	0.464	0.833	0.135	0.107	0.030	0.023
6	45.00	5.5	0.4	4.2	0.471	0.817	0.149	0.123	0.032	0.027
7	47.50	5.6	0.4	4.9	0.467	0.810	0.154	0.129	0.033	0.028
8	50.00	5.7	0.3	4.6	0.458	0.852	0.119	0.095	0.026	0.020
9	70.00	6.3	-0.1	5.8	0.432	0.926	0.065	0.051	0.014	0.011
10	90.00	7.2	-0.1	6.1	0.405	0.946	0.062	0.062	0.012	0.012
11	95.00	7.5	0.1	2.8	0.398	0.966	0.048	0.048	0.009	0.009

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(b) Continued. 90-Percent design speed

(b3) Reading 31

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	24.681	24.442	0.1	46.7	65.0	54.5	289.2	1.201	9.94	1.673
2	24.150	23.950	0.1	42.8	63.4	53.3	289.0	1.186	10.09	1.655
3	21.933	21.971	0.1	41.9	60.4	49.2	287.9	1.164	10.15	1.601
4	20.777	20.983	0.1	42.7	58.8	46.3	287.9	1.158	10.15	1.573
5	20.485	20.737	0.1	43.5	58.4	45.4	287.8	1.157	10.16	1.568
6	20.190	20.490	0.1	44.8	58.1	44.6	287.9	1.159	10.16	1.559
7	19.893	20.241	0.1	44.9	57.7	43.3	287.9	1.159	10.16	1.558
8	19.594	19.995	0.1	43.8	57.2	42.5	288.0	1.155	10.15	1.554
9	17.084	18.019	0.1	41.2	53.9	35.8	287.9	1.136	10.16	1.520
10	14.204	16.040	0.0	43.9	52.6	24.2	287.8	1.133	10.15	1.523
11	13.376	15.547	0.1	46.2	52.7	17.2	287.9	1.144	10.13	1.572

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	174.3	219.0	412.3	259.0	174.3	150.3	0.2	159.2	373.8	370.2
2	183.2	218.3	409.0	267.5	183.2	160.0	0.2	148.4	365.8	362.8
3	189.0	217.8	382.5	248.0	189.0	162.1	0.2	145.5	332.7	333.3
4	190.9	219.9	368.2	233.7	190.9	161.5	0.2	149.3	315.0	318.1
5	190.6	220.6	364.0	227.7	190.6	159.9	0.2	152.0	310.3	314.1
6	190.4	221.1	360.3	220.6	190.4	157.0	0.2	155.6	306.0	310.6
7	190.7	223.6	356.8	217.7	190.7	158.4	0.2	157.8	301.8	307.0
8	191.1	224.1	353.1	219.2	191.1	161.7	0.2	155.1	297.1	303.2
9	189.1	227.8	320.8	211.4	189.1	171.5	0.2	149.9	259.3	273.5
10	164.4	239.1	270.7	188.9	164.4	172.4	0.1	165.8	215.2	243.1
11	154.4	252.0	255.0	182.7	154.4	174.5	0.1	181.9	203.1	236.0

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	0.525	0.607	1.242	0.718	0.525	0.417	0.862	1.492
2	0.554	0.610	1.237	0.747	0.554	0.447	0.873	1.467
3	0.574	0.616	1.161	0.701	0.574	0.458	0.858	1.445
4	0.580	0.624	1.118	0.663	0.580	0.458	0.846	1.435
5	0.579	0.626	1.105	0.646	0.579	0.454	0.839	1.434
6	0.578	0.627	1.094	0.626	0.578	0.445	0.824	1.436
7	0.579	0.635	1.084	0.618	0.579	0.450	0.831	1.436
8	0.580	0.637	1.072	0.624	0.580	0.460	0.846	1.434
9	0.574	0.655	0.974	0.608	0.574	0.493	0.907	1.413
10	0.495	0.691	0.815	0.546	0.495	0.498	1.049	1.238
11	0.464	0.729	0.766	0.528	0.464	0.504	1.130	1.169

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	1.9	6.0	0.514	0.787	0.193	0.137	0.041	0.029
2	10.00	4.4	1.3	4.9	0.477	0.832	0.145	0.095	0.032	0.021
3	30.00	6.0	1.8	4.0	0.478	0.877	0.105	0.068	0.023	0.015
4	40.00	6.5	1.7	3.9	0.494	0.875	0.109	0.078	0.024	0.017
5	42.50	6.6	1.7	3.9	0.505	0.871	0.114	0.085	0.025	0.018
6	45.00	6.8	1.7	4.0	0.521	0.850	0.135	0.106	0.029	0.023
7	47.50	6.9	1.7	3.5	0.525	0.851	0.135	0.108	0.030	0.024
8	50.00	7.0	1.6	3.7	0.511	0.866	0.121	0.095	0.027	0.021
9	70.00	7.3	0.9	5.9	0.465	0.932	0.064	0.050	0.013	0.010
10	90.00	8.4	1.1	6.7	0.439	0.957	0.054	0.054	0.010	0.010
11	95.00	8.7	1.3	3.6	0.433	0.958	0.062	0.062	0.012	0.012

TABLE VII. - Continued.. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(b) Continued. 90-Percent design speed

(b4) Reading 36

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	-0.0	47.7	66.9	55.6	289.7	1.221	9.96	1.721
2	24.150	23.950	-0.0	49.2	65.5	53.3	289.7	1.203	10.08	1.714
3	21.933	21.971	-0.0	46.0	62.5	49.4	288.1	1.176	10.15	1.648
4	20.777	20.983	-0.0	47.7	61.1	47.3	287.7	1.169	10.16	1.609
5	20.485	20.737	-0.0	48.5	60.7	46.7	287.6	1.168	10.16	1.600
6	20.190	20.490	-0.0	49.2	60.4	45.9	287.8	1.169	10.16	1.593
7	19.893	20.241	-0.0	49.9	60.0	44.1	287.8	1.171	10.16	1.600
8	19.594	19.995	-0.0	49.1	59.7	42.5	287.6	1.169	10.16	1.605
9	17.084	18.019	-0.0	46.9	56.7	36.6	287.6	1.147	10.16	1.555
10	14.204	16.040	-0.0	47.3	54.9	24.6	287.5	1.140	10.15	1.548
11	13.376	15.547	-0.0	49.5	55.0	16.4	287.8	1.150	10.14	1.599

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	159.5	214.9	406.4	255.9	159.5	144.5	-0.0	159.0	373.8	370.2
2	167.0	222.3	402.4	242.8	167.0	145.1	-0.0	168.4	366.1	363.0
3	172.9	217.5	374.6	232.1	172.9	151.0	-0.0	156.5	332.3	332.8
4	173.9	216.5	359.6	214.9	173.9	145.8	-0.0	160.0	314.7	317.8
5	173.7	216.4	355.6	208.9	173.7	143.4	-0.0	162.0	310.2	314.0
6	173.6	216.7	351.5	203.5	173.6	141.6	-0.0	164.1	305.6	310.2
7	174.1	221.2	348.5	198.5	174.1	142.6	-0.0	169.1	301.9	307.2
8	173.5	223.5	344.1	198.5	173.5	146.3	-0.0	169.0	297.1	303.2
9	170.3	220.8	310.0	188.0	170.3	151.0	-0.0	161.1	259.0	273.2
10	151.3	232.8	263.3	173.7	151.3	157.9	-0.0	171.0	215.4	243.3
11	142.3	248.0	247.9	167.8	142.3	161.0	-0.0	188.7	203.0	235.9

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.478	0.589	1.218	0.702	0.478	0.397	0.906	1.536
2	0.502	0.616	1.209	0.673	0.502	0.402	0.869	1.514
3	0.522	0.611	1.130	0.652	0.522	0.424	0.874	1.494
4	0.525	0.610	1.086	0.606	0.525	0.411	0.838	1.493
5	0.525	0.611	1.074	0.590	0.525	0.405	0.826	1.494
6	0.524	0.611	1.062	0.574	0.524	0.399	0.816	1.496
7	0.526	0.624	1.053	0.560	0.526	0.402	0.819	1.499
8	0.524	0.632	1.040	0.561	0.524	0.413	0.843	1.503
9	0.514	0.630	0.936	0.537	0.514	0.431	0.887	1.448
10	0.454	0.669	0.790	0.499	0.454	0.454	1.044	1.262
11	0.426	0.714	0.742	0.483	0.426	0.463	1.132	1.189

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	6.6	3.8	7.1	0.515	0.761	0.237	0.176	0.050	0.037
2	10.00	6.5	3.4	4.9	0.548	0.822	0.169	0.114	0.037	0.025
3	30.00	8.1	3.9	4.3	0.519	0.869	0.122	0.081	0.026	0.017
4	40.00	8.8	4.0	4.9	0.543	0.860	0.133	0.097	0.028	0.021
5	42.50	8.9	4.0	5.1	0.555	0.855	0.140	0.105	0.030	0.022
6	45.00	9.1	4.1	5.2	0.565	0.840	0.157	0.123	0.034	0.026
7	47.50	9.3	4.0	4.3	0.578	0.842	0.158	0.125	0.034	0.027
8	50.00	9.4	4.1	3.7	0.571	0.854	0.148	0.116	0.033	0.026
9	70.00	10.1	3.7	6.8	0.532	0.914	0.091	0.076	0.019	0.016
10	90.00	10.7	3.4	7.1	0.485	0.948	0.071	0.071	0.014	0.014
11	95.00	10.9	3.5	2.7	0.483	0.955	0.072	0.072	0.013	0.013

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(b) Concluded. 90-Percent design speed

(b5) Reading 37

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	24.681	24.442	-0.0	57.8	69.0	56.7	290.5	1.238	9.97	1.744
2	24.150	23.950	-0.0	52.8	67.4	53.7	290.4	1.220	10.07	1.736
3	21.933	21.971	-0.0	49.9	64.5	50.1	288.2	1.184	10.15	1.659
4	20.777	20.983	-0.0	51.3	63.2	48.7	287.4	1.177	10.16	1.611
5	20.485	20.737	-0.0	51.9	62.8	47.8	287.6	1.176	10.15	1.608
6	20.190	20.490	-0.0	52.8	62.5	47.1	287.3	1.176	10.15	1.599
7	19.893	20.241	-0.0	54.0	62.2	45.6	287.2	1.176	10.16	1.602
8	19.594	19.995	-0.0	53.5	61.9	44.1	287.3	1.176	10.16	1.600
9	17.084	18.019	-0.0	50.2	59.0	37.8	287.5	1.153	10.16	1.555
10	14.204	16.040	-0.0	48.8	56.9	25.1	287.4	1.142	10.15	1.555
11	13.376	15.547	-0.0	50.4	57.0	17.1	287.5	1.151	10.14	1.603

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	143.9	224.2	401.5	217.1	143.9	119.3	-0.0	189.8	374.8	371.2
2	152.3	224.5	397.1	229.4	152.3	135.8	-0.0	178.7	366.7	363.6
3	158.8	217.1	368.8	218.1	158.8	139.9	-0.0	166.0	332.8	333.4
4	159.1	213.1	352.8	202.0	159.1	133.3	-0.1	166.2	314.8	317.9
5	159.5	214.4	349.4	196.8	159.5	132.2	-0.0	168.8	310.8	314.6
6	159.0	214.4	344.8	190.5	159.0	129.5	-0.0	170.9	305.9	310.5
7	158.8	217.6	340.8	183.1	158.8	128.1	-0.0	176.0	301.5	306.8
8	158.4	219.2	336.2	181.6	158.4	130.4	-0.0	176.2	296.5	302.6
9	155.7	215.9	302.2	174.9	155.7	138.2	-0.0	165.9	259.0	273.2
10	140.0	228.8	256.7	166.4	140.0	150.6	-0.0	172.3	215.1	242.9
11	131.6	243.6	241.6	162.6	131.6	155.4	-0.0	187.6	202.6	235.4

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	0.429	0.611	1.197	0.592	0.429	0.325	0.829	1.589
2	0.455	0.617	1.186	0.631	0.455	0.373	0.892	1.562
3	0.477	0.607	1.108	0.610	0.477	0.391	0.881	1.546
4	0.479	0.598	1.062	0.567	0.479	0.374	0.838	1.550
5	0.480	0.602	1.051	0.553	0.480	0.371	0.829	1.552
6	0.478	0.603	1.038	0.535	0.478	0.364	0.815	1.557
7	0.478	0.613	1.026	0.515	0.478	0.360	0.806	1.562
8	0.477	0.617	1.012	0.511	0.477	0.367	0.823	1.566
9	0.468	0.613	0.909	0.497	0.468	0.393	0.887	1.477
10	0.419	0.657	0.768	0.478	0.419	0.432	1.076	1.280
11	0.393	0.700	0.722	0.467	0.393	0.447	1.181	1.206

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	8.7	5.9	8.1	0.633	0.723	0.293	0.225	0.060	0.046
2	10.00	8.4	5.4	5.4	0.585	0.776	0.229	0.168	0.049	0.036
3	30.00	10.1	5.9	5.0	0.558	0.846	0.152	0.104	0.032	0.022
4	40.00	10.9	6.1	6.3	0.577	0.827	0.174	0.132	0.036	0.027
5	42.50	11.0	6.1	6.3	0.588	0.826	0.178	0.136	0.037	0.028
6	45.00	11.3	6.2	6.5	0.601	0.814	0.193	0.152	0.040	0.032
7	47.50	11.4	6.2	5.9	0.620	0.819	0.191	0.151	0.040	0.032
8	50.00	11.6	6.3	5.3	0.617	0.816	0.198	0.159	0.042	0.034
9	70.00	12.5	6.0	8.0	0.567	0.881	0.137	0.121	0.028	0.025
10	90.00	12.7	5.4	7.6	0.502	0.948	0.074	0.074	0.014	0.014
11	95.00	13.0	5.5	3.4	0.490	0.956	0.074	0.074	0.014	0.014

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(c) 80-Percent design speed. Reading 38

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	-0.0	57.8	70.9	57.4	291.7	1.171	10.01	1.523
2	24.150	23.950	-0.0	52.1	69.1	54.9	290.4	1.163	10.11	1.505
3	21.933	21.971	-0.0	49.8	66.5	51.3	287.7	1.142	10.15	1.461
4	20.777	20.983	-0.0	52.4	65.4	49.3	287.6	1.138	10.14	1.441
5	20.485	20.737	-0.0	52.9	65.1	48.4	287.5	1.138	10.14	1.439
6	20.190	20.490	-0.0	53.7	64.9	48.6	287.2	1.136	10.15	1.426
7	19.893	20.241	-0.0	54.5	64.5	47.8	287.4	1.136	10.14	1.422
8	19.594	19.995	-0.0	54.6	64.2	46.5	287.7	1.137	10.14	1.421
9	17.084	18.019	-0.0	49.3	61.2	38.1	287.4	1.118	10.14	1.411
10	14.204	16.040	-0.0	47.9	58.7	25.5	287.3	1.110	10.14	1.416
11	13.376	15.547	-0.0	49.6	58.6	17.5	287.3	1.115	10.13	1.447

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	114.5	195.2	350.5	193.4	114.5	104.2	-0.0	165.1	331.2	328.0
2	123.3	192.9	346.5	206.4	123.3	118.6	-0.0	152.1	323.8	321.1
3	127.4	187.3	320.1	193.5	127.4	120.9	-0.0	143.1	293.6	294.1
4	127.4	187.3	306.2	175.2	127.4	114.3	-0.0	148.4	278.5	281.2
5	127.3	188.2	302.7	171.0	127.3	113.5	-0.0	150.1	274.6	278.0
6	126.9	185.9	298.8	166.2	126.9	110.0	-0.0	149.9	270.5	274.5
7	127.0	186.6	295.5	161.2	127.0	108.2	-0.0	151.9	266.8	271.5
8	126.7	187.9	291.6	158.4	126.7	109.0	-0.0	153.1	262.6	268.0
9	125.9	190.4	261.4	157.9	125.9	124.3	-0.0	144.3	229.1	241.6
10	115.8	202.8	223.1	150.6	115.8	135.9	-0.0	150.5	190.7	215.3
11	109.6	215.6	210.1	146.4	109.6	139.6	-0.0	164.3	179.3	208.4

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
RP	IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
1	0.338	0.542	1.035	0.537	0.338	0.289	0.910 1.546
2	0.366	0.539	1.028	0.576	0.366	0.331	0.961 1.517
3	0.380	0.530	0.955	0.547	0.380	0.342	0.949 1.494
4	0.380	0.531	0.914	0.497	0.380	0.324	0.897 1.465
5	0.380	0.534	0.903	0.485	0.380	0.322	0.892 1.457
6	0.379	0.527	0.892	0.472	0.379	0.312	0.867 1.450
7	0.379	0.529	0.882	0.457	0.379	0.307	0.852 1.441
8	0.378	0.533	0.870	0.449	0.378	0.309	0.860 1.430
9	0.376	0.546	0.780	0.452	0.376	0.356	0.988 1.327
10	0.345	0.586	0.664	0.435	0.345	0.393	1.174 1.147
11	0.326	0.624	0.625	0.424	0.326	0.404	1.274 1.078

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	10.6	7.9	8.9	0.622	0.747	0.248	0.209	0.049	0.042
2	10.00	10.1	7.1	6.6	0.563	0.760	0.229	0.196	0.048	0.041
3	30.00	12.1	7.9	6.2	0.544	0.806	0.185	0.163	0.038	0.034
4	40.00	13.1	8.3	6.9	0.581	0.797	0.202	0.187	0.042	0.038
5	42.50	13.3	8.4	6.9	0.590	0.796	0.206	0.193	0.043	0.040
6	45.00	13.6	8.5	7.9	0.599	0.782	0.222	0.211	0.045	0.043
7	47.50	13.8	8.6	8.1	0.611	0.777	0.231	0.220	0.047	0.045
8	50.00	14.0	8.6	7.7	0.615	0.772	0.241	0.233	0.049	0.048
9	70.00	14.7	8.2	8.2	0.543	0.879	0.137	0.136	0.028	0.028
10	90.00	14.5	7.2	8.0	0.476	0.953	0.067	0.067	0.013	0.013
11	95.00	14.5	7.1	3.9	0.468	0.971	0.048	0.048	0.009	0.009

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(d) 70-Percent design speed

(d1) Reading 39

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	-0.0	22.0	63.3	55.5	288.7	1.070	10.00	1.218
2	24.150	23.950	-0.0	21.2	61.4	54.1	288.5	1.066	10.12	1.215
3	21.933	21.971	-0.0	23.3	58.6	50.1	288.1	1.061	10.14	1.209
4	20.777	20.983	-0.0	25.3	57.0	47.6	288.0	1.060	10.14	1.202
5	20.485	20.737	-0.0	26.2	56.6	46.6	288.2	1.062	10.15	1.204
6	20.190	20.490	-0.0	27.7	56.2	45.4	288.0	1.065	10.15	1.204
7	19.893	20.241	-0.0	29.0	55.9	44.0	288.0	1.067	10.15	1.206
8	19.594	19.995	-0.0	28.2	55.5	42.9	288.1	1.066	10.14	1.215
9	17.084	18.019	-0.0	29.6	52.5	35.4	288.0	1.064	10.14	1.228
10	14.204	16.040	-0.0	33.8	50.5	23.2	288.0	1.069	10.14	1.248
11	13.376	15.547	-0.0	35.9	50.6	18.7	288.0	1.074	10.13	1.268

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	145.6	166.8	324.6	272.7	145.6	154.6	-0.0	62.6	290.1	287.3
2	155.0	170.9	323.7	271.7	155.0	159.3	-0.0	61.7	284.2	281.8
3	157.7	173.1	302.5	247.8	157.7	159.0	-0.0	68.5	258.1	258.5
4	158.6	174.3	291.4	233.6	158.6	157.6	-0.0	74.4	244.4	246.8
5	159.0	175.7	288.9	229.2	159.0	157.6	-0.0	77.6	241.1	244.1
6	159.0	176.9	286.0	223.2	159.0	156.7	-0.0	82.2	237.7	241.2
7	158.9	179.4	283.2	218.1	158.9	156.9	-0.0	87.0	234.3	238.4
8	158.7	182.2	280.0	219.2	158.7	160.6	-0.0	86.1	230.7	235.4
9	154.6	190.9	253.7	203.5	154.6	165.9	-0.0	94.4	201.2	212.2
10	138.2	207.1	217.1	187.2	138.2	172.1	-0.0	115.3	167.4	189.1
11	129.7	213.0	204.2	182.3	129.7	172.6	-0.0	124.9	157.7	183.3

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.436	0.485	0.971	0.792	0.436	0.449	1.062	1.235
2	0.465	0.498	0.971	0.792	0.465	0.464	1.028	1.201
3	0.474	0.506	0.909	0.725	0.474	0.465	1.008	1.170
4	0.477	0.510	0.876	0.684	0.477	0.461	0.994	1.151
5	0.478	0.514	0.868	0.671	0.478	0.461	0.991	1.146
6	0.478	0.517	0.860	0.653	0.478	0.458	0.986	1.141
7	0.478	0.524	0.851	0.637	0.478	0.459	0.987	1.137
8	0.477	0.533	0.842	0.641	0.477	0.470	1.012	1.131
9	0.464	0.561	0.762	0.598	0.464	0.487	1.073	1.069
10	0.413	0.610	0.649	0.552	0.413	0.507	1.245	0.938
11	0.387	0.628	0.609	0.537	0.387	0.509	1.331	0.885

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	3.0	0.3	6.9	0.231	0.831	0.083	0.080	0.017	0.017
2	10.00	2.4	-0.6	5.8	0.230	0.871	0.061	0.059	0.013	0.013
3	30.00	4.1	-0.0	4.9	0.256	0.910	0.043	0.043	0.009	0.009
4	40.00	4.7	-0.1	5.2	0.279	0.896	0.053	0.053	0.011	0.011
5	42.50	4.8	-0.1	5.0	0.291	0.882	0.062	0.062	0.013	0.013
6	45.00	4.9	-0.1	4.8	0.308	0.837	0.091	0.091	0.020	0.020
7	47.50	5.1	-0.1	4.2	0.323	0.820	0.105	0.105	0.023	0.023
8	50.00	5.2	-0.2	4.1	0.310	0.862	0.081	0.081	0.018	0.018
9	70.00	5.9	-0.6	5.6	0.297	0.946	0.037	0.037	0.008	0.008
10	90.00	6.3	-1.0	5.7	0.256	0.949	0.049	0.049	0.009	0.009
11	95.00	6.5	-0.9	5.0	0.236	0.952	0.055	0.055	0.010	0.010

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(d) Continued. 70-Percent design speed

(d2) Reading 40

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	-0.0	32.3	64.8	54.8	288.7	1.090	10.02	1.292
2	24.150	23.950	-0.0	31.7	63.1	53.5	288.5	1.086	10.12	1.285
3	21.933	21.971	-0.0	32.0	60.3	49.9	288.0	1.077	10.15	1.268
4	20.777	20.983	-0.0	33.6	58.9	47.1	288.1	1.076	10.14	1.265
5	20.485	20.737	-0.0	34.2	58.6	46.2	287.8	1.076	10.14	1.268
6	20.190	20.490	-0.0	35.4	58.2	45.2	288.2	1.079	10.15	1.266
7	19.893	20.241	-0.0	36.3	57.8	44.3	288.0	1.080	10.14	1.264
8	19.594	19.995	-0.0	35.5	57.5	43.0	288.1	1.079	10.14	1.268
9	17.084	18.019	-0.0	36.1	54.8	35.9	288.1	1.074	10.14	1.264
10	14.204	16.040	-0.0	38.3	53.0	24.0	288.0	1.076	10.13	1.278
11	13.376	15.547	-0.0	40.4	52.8	18.3	287.9	1.080	10.13	1.299

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	137.1	166.3	321.7	243.8	137.1	140.5	-0.0	88.9	291.0	288.2
2	144.7	168.5	319.5	241.2	144.7	143.4	-0.0	88.5	284.8	282.4
3	146.7	168.0	296.6	221.2	146.7	142.4	-0.0	89.0	257.8	258.2
4	147.7	170.7	286.1	208.9	147.7	142.2	-0.0	94.5	245.0	247.5
5	147.6	171.6	283.0	205.0	147.6	142.0	-0.0	96.5	241.4	244.4
6	147.6	172.5	280.0	199.6	147.6	140.7	-0.0	99.9	237.9	241.4
7	147.3	173.0	276.8	194.7	147.3	139.4	-0.0	102.5	234.3	238.4
8	146.7	175.4	273.4	195.3	146.7	142.7	-0.0	102.0	230.6	235.3
9	142.2	180.7	246.4	180.3	142.2	146.0	-0.0	106.5	201.2	212.2
10	126.5	195.2	209.9	167.7	126.5	153.2	-0.0	120.9	167.5	189.2
11	119.6	203.4	197.7	163.0	119.6	154.8	-0.0	131.9	157.4	183.0

	ABS MACH NO		REL MACH NO		MERID MACH NO			
RP	IN	OUT	IN	OUT	IN	OUT	MERID VEL R	PEAK SS MACH NO
1	0.409	0.478	0.960	0.701	0.409	0.404	1.025	1.27[illegible]
2	0.433	0.486	0.956	0.696	0.433	0.414	0.992	1.242
3	0.440	0.487	0.889	0.641	0.440	0.413	0.971	1.201
4	0.442	0.496	0.857	0.606	0.442	0.413	0.963	1.184
5	0.442	0.499	0.848	0.595	0.442	0.412	0.962	1.178
6	0.442	0.500	0.839	0.578	0.442	0.408	0.953	1.172
7	0.441	0.502	0.829	0.565	0.441	0.404	0.946	1.166
8	0.440	0.509	0.819	0.567	0.440	0.414	0.973	1.159
9	0.425	0.527	0.737	0.525	0.425	0.426	1.027	1.093
10	0.377	0.571	0.626	0.491	0.377	0.44[illegible]	1.211	0.958
11	0.356	0.595	0.589	0.477	0.356	0.45[illegible]	1.294	0.900

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	4.5	1.7	6.3	0.344	0.840	0.101	0.098	0.022	0.021
2	10.00	4.1	1.0	5.2	0.345	0.863	0.084	0.081	0.018	0.018
3	30.00	5.9	1.7	4.7	0.354	0.915	0.052	0.052	0.011	0.011
4	40.0	6.6	1.8	4.7	0.375	0.915	0.055	0.055	0.012	0.012
5	42.50	6.8	1.8	4.6	0.382	0.922	0.051	0.051	0.011	0.011
6	45.00	6.9	1.8	4.5	0.397	0.883	0.081	0.081	0.018	0.018
7	47.50	7.1	1.9	4.5	0.410	0.868	0.093	0.093	0.020	0.020
8	50.00	7.2	1.9	4.2	0.398	0.891	0.079	0.079	0.017	0.017
9	70.00	8.2	1.7	6.1	0.384	0.940	0.048	0.048	0.010	0.010
10	90.00	8.7	1.4	6.5	0.330	0.962	0.042	0.042	0.008	0.008
11	95.00	8.7	1.3	4.6	0.316	0.974	0.034	0.034	0.006	0.006

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(d) Continued. 70-Percent design speed

(d3) Reading 41

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	24.681	24.442	-0.0	40.0	67.0	55.5	288.7	1.107	10.04	1.337
2	24.150	23.950	-0.0	39.4	65.3	53.4	288.4	1.104	10.12	1.337
3	21.933	21.971	-0.0	38.4	62.7	50.3	288.1	1.090	10.14	1.312
4	20.777	20.983	-0.0	40.3	61.4	47.4	288.1	1.090	10.14	1.305
5	20.485	20.737	-0.0	41.1	61.1	46.3	287.9	1.089	10.14	1.305
6	20.190	20.490	-0.0	41.9	60.7	45.6	288.4	1.091	10.14	1.301
7	19.893	20.241	-0.0	43.1	60.5	45.1	288.0	1.091	10.14	1.294
8	19.594	19.995	-0.0	42.8	60.1	44.0	288.2	1.090	10.14	1.294
9	17.084	18.019	-0.0	42.1	57.5	35.9	288.0	1.083	10.14	1.293
10	14.204	16.040	-0.0	42.2	55.5	24.3	287.9	1.081	10.13	1.299
11	13.376	15.547	-0.0	44.3	55.5	17.7	288.0	1.086	10.13	1.323

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	123.2	163.8	315.7	221.5	123.2	125.4	-0.0	105.3	290.6	287.8
2	130.6	168.5	312.9	218.2	130.6	130.2	-0.0	106.9	284.3	282.0
3	133.5	165.1	290.7	202.6	133.5	129.3	-0.0	102.6	258.2	258.6
4	133.4	167.3	278.4	188.4	133.4	127.7	-0.0	108.2	244.4	246.8
5	133.2	168.5	275.1	183.7	133.2	126.9	-0.0	110.8	240.7	243.7
6	133.3	168.6	272.2	179.3	133.3	125.4	-0.0	112.6	237.3	240.8
7	132.6	168.2	268.9	173.8	132.6	122.8	-0.0	115.0	233.9	238.0
8	132.4	169.2	265.5	172.5	132.4	124.2	-0.0	115.0	230.1	234.8
9	128.5	176.1	238.9	161.3	128.5	130.7	-0.0	117.9	201.4	212.4
10	115.2	187.8	203.2	152.7	115.2	139.1	-0.0	126.1	167.4	189.0
11	108.4	197.8	191.5	148.5	108.4	141.4	-0.0	138.2	157.8	183.5

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	0.367	0.467	0.939	0.632	0.367	0.358	1.018	1.318
2	0.389	0.482	0.933	0.624	0.389	0.372	0.997	1.288
3	0.399	0.475	0.868	0.583	0.399	0.372	0.968	1.243
4	0.398	0.482	0.831	0.543	0.398	0.368	0.957	1.218
5	0.398	0.486	0.822	0.530	0.398	0.366	0.953	1.212
6	0.398	0.485	0.812	0.516	0.398	0.361	0.941	1.204
7	0.396	0.484	0.803	0.501	0.396	0.354	0.926	1.201
8	0.395	0.488	0.792	0.497	0.395	0.358	0.938	1.191
9	0.383	0.510	0.713	0.467	0.383	0.379	1.017	1.121
10	0.343	0.547	0.604	0.444	0.343	0.405	1.207	0.976
11	0.322	0.576	0.569	0.433	0.322	0.412	1.305	0.922

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	6.7	4.0	7.0	0.421	0.811	0.142	0.137	0.030	0.029
2	10.00	6.3	3.3	5.0	0.426	0.834	0.123	0.120	0.027	0.026
3	30.00	8.2	4.0	5.2	0.420	0.891	0.081	0.080	0.017	0.017
4	40.00	9.1	4.3	5.0	0.446	0.881	0.093	0.093	0.020	0.020
5	42.50	9.2	4.3	4.8	0.458	0.883	0.093	0.093	0.020	0.020
6	45.00	9.4	4.3	5.0	0.469	0.859	0.116	0.116	0.025	0.025
7	47.50	9.7	4.5	5.3	0.484	0.842	0.132	0.132	0.028	0.028
8	50.00	9.8	4.5	5.2	0.481	0.849	0.128	0.128	0.027	0.027
9	70.00	10.9	4.5	6.0	0.456	0.919	0.077	0.077	0.016	0.016
10	90.00	11.3	4.0	6.8	0.387	0.964	0.045	0.045	0.009	0.009
11	95.00	11.5	4.1	4.0	0.376	0.970	0.044	0.044	0.008	0.008

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(d) Continued. 70-Percent design speed

(d4) Reading 42

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	-0.0	46.5	68.8	56.3	288.7	1.118	10.05	1.353
2	24.150	23.950	-0.0	42.6	67.2	53.5	288.4	1.115	10.12	1.359
3	21.933	21.971	-0.0	43.5	64.7	51.3	288.1	1.099	10.14	1.324
4	20.777	20.983	-0.0	45.3	63.5	47.3	288.1	1.098	10.14	1.325
5	20.485	20.737	-0.0	45.8	63.3	47.0	288.0	1.098	10.14	1.321
6	20.190	20.490	-0.0	46.6	62.9	46.6	288.2	1.098	10.14	1.314
7	19.893	20.241	-0.0	47.7	62.7	46.0	287.9	1.098	10.14	1.310
8	19.594	19.995	-0.0	48.1	62.3	44.7	288.2	1.098	10.14	1.308
9	17.084	18.019	-0.0	45.4	59.6	36.2	288.0	1.088	10.14	1.308
10	14.204	16.040	-0.0	45.8	57.4	24.3	287.9	1.083	10.14	1.307
11	13.376	15.547	-0.0	47.3	57.3	17.7	287.9	1.087	10.13	1.325

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	112.5	163.5	311.3	202.9	112.5	112.5	-0.0	118.6	290.3	287.5
2	119.6	168.5	308.4	208.7	119.6	124.0	-0.0	114.0	284.2	281.9
3	122.2	162.4	286.1	188.6	122.2	117.8	-0.0	111.8	258.6	259.0
4	121.8	167.7	273.2	173.9	121.8	118.0	-0.0	119.2	244.5	246.9
5	121.6	167.2	270.6	170.7	121.6	116.5	-0.0	119.9	241.7	244.6
6	121.6	166.1	267.1	166.1	121.6	114.2	-0.0	120.7	237.7	241.2
7	121.3	166.4	264.4	161.2	121.3	112.0	-0.0	123.1	234.9	239.0
8	121.1	167.5	260.4	157.2	121.1	111.8	-0.0	124.7	230.5	235.3
9	118.6	173.7	234.3	151.2	118.6	121.9	-0.0	123.7	202.0	213.1
10	107.3	183.5	199.1	140.4	107.3	128.0	-0.0	131.5	167.7	189.4
11	101.0	192.3	187.1	136.8	101.0	130.3	-0.0	141.4	157.5	183.1

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.334	0.464	0.924	0.576	0.334	0.319	1.001	1.354
2	0.356	0.479	0.917	0.594	0.356	0.353	1.037	1.324
3	0.364	0.465	0.852	0.540	0.364	0.337	0.964	1.280
4	0.363	0.481	0.813	0.499	0.363	0.338	0.968	1.252
5	0.362	0.480	0.806	0.490	0.362	0.334	0.958	1.249
6	0.362	0.476	0.795	0.476	0.362	0.327	0.939	1.239
7	0.361	0.477	0.788	0.463	0.361	0.321	0.923	1.237
8	0.360	0.480	0.775	0.451	0.360	0.321	0.923	1.223
9	0.353	0.502	0.697	0.437	0.353	0.352	1.029	1.148
10	0.319	0.533	0.591	0.408	0.319	0.372	1.193	0.994
11	0.300	0.559	0.555	0.398	0.300	0.379	1.291	0.934

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	8.5	5.8	7.8	0.489	0.765	0.196	0.190	0.040	0.039
2	10.00	8.2	5.1	5.2	0.457	0.797	0.169	0.165	0.037	0.036
3	30.00	10.3	6.1	6.2	0.471	0.848	0.124	0.124	0.026	0.026
4	40.00	11.2	6.4	4.9	0.502	0.853	0.129	0.129	0.028	0.028
5	42.50	11.5	6.6	5.4	0.508	0.842	0.141	0.141	0.030	0.030
6	45.00	11.6	6.6	5.9	0.518	0.824	0.161	0.161	0.034	0.034
7	47.50	11.9	6.7	6.2	0.532	0.822	0.164	0.164	0.034	0.034
8	50.00	12.0	6.7	5.9	0.540	0.816	0.173	0.173	0.037	0.037
9	70.00	13.1	6.6	6.4	0.495	0.906	0.098	0.098	0.020	0.020
10	90.00	13.2	5.9	6.8	0.442	0.955	0.060	0.060	0.012	0.012
11	95.00	13.3	5.9	4.0	0.428	0.966	0.052	0.052	0.010	0.010

TABLE VII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(d) Concluded. 70-Percent design speed

(d5) Reading 43

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	-0.0	59.8	71.2	58.1	288.8	1.144	10.06	1.371
2	24.150	23.950	-0.0	53.9	69.6	55.6	288.5	1.133	10.12	1.361
3	21.933	21.971	-0.0	47.5	67.2	51.9	288.1	1.105	10.14	1.331
4	20.777	20.983	-0.0	49.3	65.9	48.2	288.1	1.103	10.14	1.330
5	20.485	20.737	-0.0	50.3	65.7	48.0	288.1	1.103	10.14	1.325
6	20.190	20.490	-0.0	51.2	65.4	47.7	288.1	1.103	10.14	1.318
7	19.893	20.241	-0.0	52.3	65.0	47.3	288.1	1.102	10.14	1.312
8	19.594	19.995	-0.0	52.6	64.7	45.9	288.1	1.102	10.14	1.314
9	17.084	18.019	-0.0	48.5	61.8	36.0	288.0	1.092	10.14	1.318
10	14.204	16.040	-0.0	46.7	59.2	25.0	287.9	1.085	10.14	1.315
11	13.376	15.547	-0.0	48.3	59.0	18.6	288.0	1.087	10.13	1.327

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	98.8	172.2	307.2	164.1	98.8	86.7	-0.0	148.8	290.9	288.1
2	105.6	169.4	303.6	176.3	105.6	99.7	-0.0	136.9	284.6	282.3
3	108.8	161.8	280.4	177.3	108.8	109.3	-0.0	119.3	258.4	258.9
4	109.4	166.1	268.2	162.6	109.4	108.3	-0.0	125.9	244.8	247.3
5	109.1	165.4	265.1	157.9	109.1	105.6	-0.0	127.2	241.6	244.6
6	109.1	164.6	261.8	153.2	109.1	103.2	-0.0	128.2	238.0	241.5
7	109.2	164.0	258.8	148.2	109.2	100.4	-0.0	129.7	234.6	238.7
8	109.2	166.1	255.8	145.1	109.2	101.0	-0.0	131.9	231.3	236.0
9	108.1	173.0	229.0	141.8	108.1	114.7	-0.0	129.5	201.9	212.9
10	100.0	181.0	195.3	137.0	100.0	124.2	-0.0	131.6	167.8	189.5
11	94.7	188.8	183.9	132.4	94.7	125.5	-0.0	141.0	157.6	183.2

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.292	0.484	0.910	0.461	0.292	0.243	0.878	1.407
2	0.313	0.478	0.900	0.497	0.313	0.281	0.944	1.375
3	0.323	0.462	0.833	0.506	0.323	0.312	1.005	1.321
4	0.325	0.475	0.797	0.465	0.325	0.310	0.990	1.291
5	0.324	0.473	0.787	0.452	0.324	0.302	0.968	1.285
6	0.324	0.471	0.777	0.438	0.324	0.295	0.946	1.276
7	0.324	0.469	0.768	0.424	0.324	0.287	0.920	1.269
8	0.324	0.475	0.760	0.415	0.324	0.289	0.925	1.262
9	0.321	0.499	0.680	0.409	0.321	0.331	1.061	1.172
10	0.296	0.525	0.579	0.397	0.296	0.360	1.242	1.010
11	0.281	0.548	0.545	0.384	0.281	0.364	1.326	0.948

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	10.9	8.2	9.6	0.645	0.655	0.344	0.334	0.067	0.065
2	10.00	10.6	7.6	7.2	0.582	0.689	0.297	0.290	0.061	0.060
3	30.00	12.7	8.6	6.8	0.509	0.808	0.172	0.170	0.035	0.035
4	40.00	13.6	8.8	5.9	0.542	0.823	0.167	0.167	0.035	0.035
5	42.50	13.9	9.0	6.5	0.555	0.812	0.180	0.180	0.038	0.037
6	45.00	14.1	9.0	7.0	0.566	0.799	0.196	0.196	0.041	0.041
7	47.50	14.3	9.1	7.6	0.580	0.791	0.207	0.207	0.042	0.042
8	50.00	14.5	9.1	7.1	0.588	0.792	0.210	0.210	0.044	0.044
9	70.00	15.3	8.8	6.2	0.531	0.889	0.125	0.125	0.026	0.026
10	90.00	15.0	7.7	7.5	0.449	0.962	0.053	0.053	0.010	0.010
11	95.00	15.0	7.6	4.9	0.441	0.971	0.047	0.047	0.009	0.009

TABLE VII. - Concluded. BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 6. SI UNITS.

(e) 50-Percent design speed. Reading 48

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.681	24.442	-0.1	61.2	72.6	58.5	288.8	1.074	10.10	1.179
2	24.150	23.950	-0.1	54.7	71.1	56.3	288.5	1.068	10.13	1.170
3	21.933	21.971	-0.1	46.8	68.6	51.3	288.1	1.054	10.13	1.161
4	20.777	20.983	-0.1	50.0	67.4	48.0	287.9	1.052	10.14	1.159
5	20.485	20.737	-0.1	50.3	67.2	47.4	288.3	1.053	10.14	1.158
6	20.190	20.490	-0.1	51.3	66.9	47.4	287.9	1.052	10.13	1.154
7	19.893	20.241	-0.1	52.8	66.5	47.1	288.2	1.052	10.14	1.150
8	19.594	19.995	-0.1	53.3	66.3	45.9	288.2	1.052	10.13	1.150
9	17.084	18.019	-0.1	48.6	63.4	36.0	287.9	1.046	10.14	1.151
10	14.204	16.040	-0.1	46.4	60.5	25.5	288.0	1.042	10.13	1.149
11	13.376	15.547	-0.1	49.1	60.5	17.9	288.0	1.044	10.13	1.156

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	64.6	123.3	216.7	113.5	64.6	59.4	-0.1	108.0	206.8	204.8
2	69.1	118.8	213.2	123.9	69.1	68.7	-0.1	96.9	201.6	200.0
3	72.1	116.2	197.3	127.1	72.1	79.5	-0.1	84.7	183.6	183.9
4	72.1	118.2	187.8	113.7	72.1	76.0	-0.1	90.5	173.3	175.0
5	72.2	118.5	186.1	111.8	72.2	75.7	-0.1	91.2	171.4	173.6
6	72.1	117.2	183.5	108.4	72.1	73.3	-0.1	91.4	168.7	171.2
7	72.3	116.7	181.2	103.7	72.3	70.5	-0.1	93.0	166.1	169.0
8	72.1	117.9	179.2	101.3	72.1	70.5	-0.1	94.5	163.9	167.3
9	71.5	122.3	159.7	100.1	71.5	80.9	-0.1	91.7	142.7	150.5
10	67.2	127.5	136.6	97.3	67.2	87.9	-0.1	92.4	118.9	134.2
11	63.4	134.5	128.6	92.6	63.4	88.2	-0.1	101.6	111.9	130.0

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
RP	IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
1	0.190	0.354	0.638	0.326	0.190	0.170	0.919 1.018
2	0.204	0.342	0.629	0.356	0.204	0.198	0.994 0.991
3	0.213	0.336	0.583	0.368	0.213	0.230	1.102 0.951
4	0.213	0.343	0.555	0.330	0.213	0.220	1.055 0.927
5	0.213	0.343	0.549	0.324	0.213	0.219	1.048 0.924
6	0.213	0.340	0.542	0.314	0.213	0.213	1.017 0.917
7	0.213	0.338	0.535	0.300	0.213	0.204	0.976 0.910
8	0.213	0.342	0.529	0.294	0.213	0.204	0.977 0.906
9	0.211	0.356	0.472	0.291	0.211	0.236	1.131 0.838
10	0.198	0.372	0.403	0.284	0.198	0.256	1.307 0.721
11	0.187	0.393	0.379	0.271	0.187	0.258	1.390 0.679

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	12.3	9.6	9.9	0.660	0.656	0.332	0.332	0.064	0.064
2	10.00	12.1	9.0	8.0	0.584	0.674	0.302	0.302	0.061	0.061
3	30.00	14.1	10.0	6.1	0.499	0.808	0.166	0.166	0.034	0.034
4	40.00	15.1	10.4	5.7	0.547	0.819	0.166	0.166	0.035	0.035
5	42.50	15.4	10.5	5.9	0.553	0.808	0.180	0.180	0.038	0.038
6	45.00	15.6	10.5	6.7	0.564	0.809	0.180	0.180	0.037	0.037
7	47.50	15.7	10.5	7.4	0.584	0.784	0.210	0.210	0.043	0.043
8	50.00	16.0	10.7	7.1	0.593	0.787	0.211	0.211	0.044	0.044
9	70.00	16.9	10.4	6.2	0.526	0.885	0.126	0.126	0.026	0.026
10	90.00	16.3	9.0	8.0	0.439	0.962	0.052	0.052	0.010	0.010
11	95.00	16.5	9.0	4.2	0.446	0.969	0.050	0.050	0.009	0.009

TABLE VIII. - BLADE-ELEMENT DATA AT BLADE

EDGES FOR STATOR 1. SI UNITS.

(a) 100-Percent design speed

(a1) Reading 21

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	35.3	-2.0	35.3	-2.0	350.5	0.995	15.95	0.940
2	23.853	23.932	29.3	-3.8	29.3	-3.8	344.5	1.001	16.57	0.935
3	22.222	22.408	29.5	-6.6	29.5	-6.6	339.6	1.002	16.72	0.922
4	21.402	21.638	33.8	-6.6	33.8	-6.6	337.3	1.001	15.86	0.938
5	21.199	21.448	34.6	-6.9	34.6	-6.9	339.9	0.997	15.65	0.942
6	20.993	21.255	34.8	-7.2	34.8	-7.2	336.5	1.000	15.52	0.946
7	20.787	21.067	34.9	-7.4	34.9	-7.4	338.4	0.998	15.66	0.940
8	20.584	20.876	33.8	-7.5	33.8	-7.5	337.0	0.999	15.92	0.926
9	18.964	19.388	31.6	-8.8	31.6	-8.8	332.4	1.002	16.13	0.925
10	17.409	17.988	30.6	-9.6	30.6	-9.6	331.2	1.003	16.15	0.937
11	17.043	17.661	33.7	-6.4	33.7	-6.4	333.6	1.003	16.48	0.897

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	263.7	410.1	263.7	410.1	215.3	409.9	152.3	-14.0	0.	0.
2	282.1	406.0	282.1	406.0	246.1	405.1	137.9	-26.6	0.	0.
3	292.6	290.6	292.6	290.6	254.6	288.7	144.1	-33.2	0.	0.
4	273.4	285.4	273.4	285.4	227.3	283.5	152.0	-32.9	0.	0.
5	268.8	285.3	268.8	285.3	221.2	283.3	152.6	-34.1	0.	0.
6	264.8	284.2	264.8	284.2	217.3	282.0	151.3	-35.7	0.	0.
7	270.3	285.1	270.3	285.1	221.6	282.7	154.7	-36.6	0.	0.
8	278.6	284.9	278.6	284.9	231.6	282.4	154.9	-37.3	0.	0.
9	292.6	285.8	292.6	285.8	249.3	282.4	153.2	-43.9	0.	0.
10	303.9	282.2	303.9	282.2	261.6	278.2	154.6	-47.3	0.	0.
11	302.8	399.5	302.8	399.5	251.8	397.0	168.1	-44.6	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.740	1.257	0.740	1.257	0.604	1.256	1.904	1.098
2	0.806	1.250	0.806	1.250	0.703	1.247	1.646	1.041
3	0.847	0.839	0.847	0.839	0.737	0.834	1.134	1.120
4	0.787	0.826	0.787	0.826	0.654	0.820	1.248	1.151
5	0.769	0.824	0.769	0.824	0.633	0.818	1.280	1.143
6	0.761	0.824	0.761	0.824	0.624	0.817	1.298	1.133
7	0.776	0.825	0.776	0.825	0.636	0.818	1.276	1.155
8	0.805	0.826	0.805	0.826	0.669	0.819	1.220	1.163
9	0.857	0.834	0.857	0.834	0.731	0.824	1.133	1.148
10	0.898	0.823	0.898	0.823	0.773	0.811	1.063	1.154
11	0.890	1.248	0.890	1.248	0.740	1.240	1.577	1.245

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	4.7	-0.4	7.2	-0.319	0.	0.196	0.196	0.073	0.073
2	10.00	0.4	-4.7	4.6	-0.225	0.	0.186	0.186	0.068	0.068
3	30.00	3.3	-1.8	0.6	0.214	0.	0.209	0.209	0.071	0.071
4	40.00	7.6	2.5	0.4	0.178	0.	0.184	0.184	0.060	0.060
5	42.50	8.3	3.2	0.2	0.165	0.	0.178	0.178	0.058	0.058
6	45.00	8.4	3.3	-0.2	0.155	0.	0.169	0.169	0.054	0.054
7	47.50	8.4	3.3	-0.4	0.171	0.	0.183	0.183	0.058	0.058
8	50.00	7.2	2.1	-0.5	0.196	0.	0.214	0.214	0.068	0.068
9	70.00	4.4	-0.6	-2.0	0.219	0.	0.197	0.197	0.057	0.057
10	90.00	3.6	-1.4	-3.2	0.248	0.	0.155	0.155	0.041	0.041
11	95.00	7.0	2.0	-0.1	-0.137	0.	0.256	0.255	0.067	0.067

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(a) Continued. 100-Percent design speed

(a2) Reading 22

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	24.257	24.300	36.1	3.4	36.1	3.4	351.8	0.992	16.14	0.965
2	23.853	23.932	30.5	1.5	30.5	1.5	345.3	1.001	16.75	0.956
3	22.222	22.408	29.8	-0.7	29.8	-0.7	339.7	1.001	16.07	1.010
4	21.402	21.638	34.3	-1.0	34.3	-1.0	338.8	0.997	16.10	0.985
5	21.199	21.448	34.5	-1.2	34.5	-1.2	336.8	1.004	15.96	0.986
6	20.993	21.255	35.0	-1.3	35.0	-1.3	338.7	0.994	15.85	0.989
7	20.787	21.067	34.8	-1.4	34.8	-1.4	337.7	0.998	15.90	0.986
8	20.584	20.876	33.9	-1.3	33.9	-1.3	337.4	1.001	16.10	0.976
9	18.964	19.388	31.8	-1.7	31.8	-1.7	332.9	1.001	16.35	0.977
10	17.409	17.988	32.6	-1.3	32.6	-1.3	331.0	1.007	16.42	0.972
11	17.043	17.661	35.1	-0.1	35.1	-0.1	336.7	0.998	17.19	0.926

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	263.0	241.4	263.0	241.4	212.4	241.0	155.1	14.3	0.	0.
2	280.2	247.4	280.2	247.4	241.5	247.3	142.0	6.7	0.	0.
3	290.7	247.0	290.7	247.0	252.3	247.0	144.2	-3.2	0.	0.
4	273.0	238.8	273.0	238.8	225.4	238.8	154.0	-4.0	0.	0.
5	270.0	236.8	270.0	236.8	222.5	236.8	153.0	-5.0	0.	0.
6	268.0	235.0	268.0	235.0	219.6	235.0	153.7	-5.4	0.	0.
7	270.5	235.8	270.5	235.8	222.1	235.8	154.4	-5.6	0.	0.
8	277.4	237.8	277.4	237.8	230.3	237.7	154.6	-5.2	0.	0.
9	291.8	247.3	291.8	247.3	248.0	247.2	153.6	-7.4	0.	0.
10	300.9	249.9	300.9	249.9	253.4	249.8	162.2	-5.5	0.	0.
11	311.0	255.9	311.0	255.9	254.6	255.9	178.7	-0.2	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	0.737	0.673	0.737	0.673	0.595	0.672	1.135	1.114
2	0.799	0.695	0.799	0.695	0.689	0.695	1.024	1.066
3	0.840	0.700	0.840	0.700	0.730	0.700	0.979	1.119
4	0.784	0.677	0.784	0.677	0.647	0.677	1.059	1.161
5	0.777	0.671	0.777	0.671	0.640	0.671	1.064	1.152
6	0.768	0.667	0.768	0.667	0.629	0.667	1.070	1.148
7	0.778	0.669	0.778	0.669	0.638	0.669	1.061	1.155
8	0.800	0.674	0.800	0.674	0.664	0.674	1.032	1.159
9	0.854	0.709	0.854	0.709	0.726	0.709	0.997	1.149
10	0.888	0.717	0.888	0.717	0.748	0.717	0.986	1.207
11	0.913	0.733	0.913	0.733	0.748	0.733	1.005	1.320

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	5.5	0.5	12.5	0.282	0.	0.116	0.116	0.043	0.043
2	10.00	1.6	-3.5	9.9	0.294	0.	0.128	0.128	0.047	0.047
3	30.00	3.5	-1.6	6.4	0.323	0.	-0.027	-0.027	-0.009	-0.009
4	40.00	8.1	3.0	6.1	0.315	0.	0.044	0.044	0.014	0.014
5	42.50	8.2	3.1	5.8	0.313	0.	0.041	0.041	0.013	0.013
6	45.00	8.6	3.5	5.7	0.314	0.	0.033	0.033	0.011	0.011
7	47.50	8.3	3.2	5.6	0.317	0.	0.044	0.044	0.014	0.014
8	50.00	7.3	2.2	5.8	0.325	0.	0.069	0.069	0.022	0.022
9	70.00	4.6	-0.4	5.1	0.312	0.	0.060	0.060	0.018	0.018
10	90.00	5.7	0.6	5.2	0.317	0.	0.070	0.069	0.019	0.019
11	95.00	8.3	3.3	6.2	0.326	0.	0.178	0.175	0.047	0.046

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(a) Continued. 100-Percent design speed

(a3) Reading 23

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	42.6	3.8	42.6	3.8	364.3	0.989	18.09	0.955
2	23.853	23.932	39.0	3.3	39.0	3.3	356.6	0.999	18.59	0.946
3	22.222	22.408	37.1	1.1	37.1	1.1	349.1	1.001	18.28	0.972
4	21.402	21.638	39.7	0.2	39.7	0.2	346.3	1.001	17.69	0.975
5	21.199	21.448	39.6	-0.0	39.6	-0.0	348.0	0.997	17.46	0.981
6	20.993	21.255	40.4	-0.1	40.4	-0.1	346.4	0.997	17.32	0.984
7	20.787	21.067	41.5	0.2	41.5	0.2	346.2	0.996	17.38	0.983
8	20.584	20.876	41.2	0.2	41.2	0.2	342.7	1.004	17.36	0.980
9	18.964	19.388	37.0	-0.7	37.0	-0.7	339.0	0.999	17.12	0.973
10	17.409	17.988	37.2	-0.7	37.2	-0.7	336.0	1.007	16.92	0.969
11	17.043	17.661	40.1	0.7	40.1	0.7	340.0	0.998	17.64	0.920

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	267.1	220.0	267.1	220.0	196.7	219.5	180.6	14.7	0.	0.
2	278.2	224.1	278.2	224.1	216.1	223.7	175.1	13.1	0.	0.
3	279.0	220.4	279.0	220.4	222.5	220.4	168.3	4.1	0.	0.
4	272.2	211.9	272.2	211.9	209.5	211.9	173.8	0.6	0.	0.
5	271.5	211.0	271.5	211.0	209.2	211.0	172.9	-0.2	0.	0.
6	268.6	210.0	268.6	210.0	204.6	210.0	174.0	-0.3	0.	0.
7	266.5	206.5	266.5	206.5	199.6	206.5	176.5	0.8	0.	0.
8	266.5	206.0	266.5	206.0	200.4	206.0	175.7	0.5	0.	0.
9	276.4	207.4	276.4	207.4	220.8	207.4	166.2	-2.4	0.	0.
10	278.4	205.0	278.4	205.0	221.9	205.0	168.2	-2.4	0.	0.
11	290.5	204.6	290.5	204.6	222.1	204.5	187.2	2.6	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.735	0.599	0.735	0.599	0.541	0.597	1.116	1.271
2	0.778	0.614	0.778	0.614	0.605	0.613	1.035	1.267
3	0.790	0.610	0.790	0.610	0.630	0.609	0.990	1.252
4	0.772	0.587	0.772	0.587	0.594	0.587	1.011	1.283
5	0.767	0.584	0.767	0.584	0.592	0.584	1.008	1.279
6	0.761	0.583	0.761	0.583	0.579	0.583	1.026	1.276
7	0.754	0.573	0.754	0.573	0.565	0.573	1.035	1.290
8	0.758	0.572	0.758	0.572	0.570	0.572	1.028	1.288
9	0.795	0.581	0.795	0.581	0.635	0.581	0.939	1.212
10	0.805	0.574	0.805	0.574	0.642	0.574	0.924	1.221
11	0.839	0.572	0.839	0.572	0.642	0.572	0.921	1.357

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	12.0	6.9	12.9	0.408	0.	0.148	0.148	0.055	0.055
2	10.00	10.2	5.1	11.7	0.408	0.	0.162	0.162	0.060	0.060
3	30.00	10.9	5.8	8.2	0.411	0.	0.082	0.082	0.028	0.028
4	40.00	13.5	8.4	7.2	0.431	0.	0.076	0.076	0.025	0.025
5	42.50	13.3	8.2	7.0	0.430	0.	0.058	0.058	0.019	0.019
6	45.00	14.0	8.9	6.9	0.427	0.	0.049	0.049	0.016	0.016
7	47.50	15.0	9.9	7.2	0.435	0.	0.053	0.053	0.017	0.017
8	50.00	14.6	9.5	7.2	0.434	0.	0.063	0.063	0.020	0.020
9	70.00	9.8	4.8	6.2	0.426	0.	0.079	0.079	0.023	0.023
10	90.00	10.2	5.2	5.8	0.426	0.	0.089	0.089	0.024	0.024
11	95.00	13.4	8.4	7.0	0.460	0.	0.215	0.213	0.057	0.056

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(a) Continued. 100-Percent design speed

(a4) Reading 24

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	24.257	24.300	48.8	4.6	48.8	4.6	371.8	0.987	18.93	0.947
2	23.853	23.932	42.9	4.0	42.9	4.0	365.0	0.994	19.29	0.937
3	22.222	22.408	40.4	1.8	40.4	1.8	352.9	1.000	18.79	0.954
4	21.402	21.638	42.4	0.8	42.4	0.8	350.1	0.999	18.20	0.961
5	21.199	21.448	43.2	0.5	43.2	0.5	349.5	0.999	18.05	0.962
6	20.993	21.255	44.5	0.5	44.5	0.5	349.8	0.996	17.91	0.967
7	20.787	21.067	44.4	0.5	44.4	0.5	349.3	0.996	17.74	0.974
8	20.584	20.876	43.8	0.5	43.8	0.5	348.5	0.997	17.81	0.966
9	18.964	19.388	40.0	-0.2	40.0	-0.2	341.3	0.998	17.56	0.961
10	17.409	17.988	38.7	-0.4	38.7	-0.4	337.8	1.004	17.25	0.956
11	17.043	17.661	41.2	1.1	41.2	1.1	341.2	0.997	17.85	0.915

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	266.2	219.5	266.2	219.5	175.4	218.8	200.3	17.7	0.	0.
2	275.8	232.1	275.8	232.1	202.0	231.5	187.7	16.2	0.	0.
3	274.4	211.5	274.4	211.5	209.0	211.4	177.9	6.7	0.	0.
4	267.0	202.3	267.0	202.3	197.1	202.3	180.1	2.7	0.	0.
5	265.1	199.8	265.1	199.8	193.2	199.8	181.4	1.8	0.	0.
6	263.2	199.0	263.2	199.0	187.8	199.0	184.3	1.6	0.	0.
7	261.6	198.8	261.6	198.8	187.0	198.8	183.0	1.7	0.	0.
8	264.9	197.9	264.9	197.9	191.1	197.9	183.5	1.9	0.	0.
9	271.0	195.3	271.0	195.3	207.6	195.3	174.2	-0.8	0.	0.
10	274.8	192.2	274.8	192.2	214.4	192.1	171.9	-1.2	0.	0.
11	285.4	192.0	285.4	192.0	214.6	192.0	188.0	3.6	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	0.724	0.591	0.724	0.591	0.477	0.589	1.247	1.439
2	0.761	0.631	0.761	0.631	0.557	0.630	1.146	1.339
3	0.771	0.580	0.771	0.580	0.587	0.580	1.012	1.307
4	0.751	0.556	0.751	0.556	0.554	0.556	1.026	1.318
5	0.746	0.549	0.746	0.549	0.544	0.549	1.034	1.326
6	0.739	0.548	0.739	0.548	0.528	0.548	1.060	1.344
7	0.735	0.547	0.735	0.547	0.525	0.547	1.063	1.331
8	0.746	0.545	0.746	0.545	0.538	0.545	1.035	1.334
9	0.775	0.543	0.775	0.543	0.593	0.543	0.941	1.261
10	0.791	0.535	0.791	0.535	0.617	0.535	0.896	1.242
11	0.821	0.534	0.821	0.534	0.617	0.534	0.894	1.358

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	18.2	13.1	13.7	0.432	0.	0.181	0.179	0.067	0.067
2	10.00	14.1	9.0	12.4	0.387	0.	0.197	0.197	0.072	0.072
3	30.00	14.2	9.1	9.0	0.442	0.	0.142	0.142	0.049	0.049
4	40.00	16.2	11.1	7.8	0.460	0.	0.126	0.126	0.042	0.042
5	42.50	16.9	11.8	7.5	0.467	0.	0.123	0.122	0.040	0.040
6	45.00	18.0	13.0	7.5	0.467	0.	0.107	0.107	0.035	0.035
7	47.50	17.9	12.8	7.5	0.461	0.	0.087	0.087	0.028	0.028
8	50.00	17.2	12.1	7.6	0.469	0.	0.109	0.108	0.034	0.034
9	70.00	12.9	7.8	6.6	0.466	0.	0.118	0.118	0.035	0.034
10	90.00	11.8	6.7	6.1	0.467	0.	0.131	0.131	0.035	0.035
11	95.00	14.5	9.5	7.3	0.494	0.	0.237	0.235	0.062	0.062

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(a) Concluded. 100-Percent design speed

(a5) Reading 25

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	53.1	5.4	53.1	5.4	376.3	0.988	19.23	0.930
2	23.853	23.932	47.6	5.4	47.6	5.4	369.4	0.995	19.45	0.928
3	22.222	22.408	42.4	2.1	42.4	2.1	355.4	0.999	18.95	0.940
4	21.402	21.638	44.2	0.9	44.2	0.9	351.5	1.000	18.35	0.951
5	21.199	21.448	45.3	0.7	45.3	0.7	351.0	0.999	18.13	0.956
6	20.993	21.255	46.4	0.6	46.4	0.6	351.5	0.996	18.06	0.957
7	20.787	21.067	46.7	0.5	46.7	0.5	351.1	0.994	17.98	0.958
8	20.584	20.876	46.1	0.7	46.1	0.7	350.4	0.995	18.07	0.951
9	18.964	19.388	41.7	0.5	41.7	0.5	342.8	0.997	17.81	0.949
10	17.409	17.988	41.2	-0.3	41.2	-0.3	338.6	1.003	17.30	0.954
11	17.043	17.661	42.2	1.3	42.2	1.3	340.8	1.000	17.76	0.921

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	264.9	215.3	264.9	215.3	159.1	214.3	211.9	20.3	0.	0.
2	271.1	217.5	271.1	217.5	182.9	216.5	200.1	20.5	0.	0.
3	271.5	206.7	271.5	206.7	200.4	206.6	183.2	7.7	0.	0.
4	263.9	197.3	263.9	197.3	189.2	197.2	184.0	3.2	0.	0.
5	260.0	194.8	260.0	194.8	182.8	194.8	184.9	2.3	0.	0.
6	259.9	193.5	259.9	193.5	179.4	193.5	188.1	1.9	0.	0.
7	260.4	192.6	260.4	192.6	178.4	192.6	189.6	1.8	0.	0.
8	264.2	192.1	264.2	192.1	183.3	192.1	190.2	2.3	0.	0.
9	269.5	188.8	269.5	188.8	201.3	188.8	179.2	1.6	0.	0.
10	268.8	185.9	268.8	185.9	202.4	185.9	176.9	-0.9	0.	0.
11	278.0	185.6	278.0	185.6	205.8	185.6	186.9	4.2	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO				MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT			VEL R	MACH NO
1	0.715	0.575	0.715	0.575	0.430	0.572			1.347	1.505
2	0.741	0.585	0.741	0.585	0.500	0.582			1.184	1.425
3	0.759	0.564	0.759	0.564	0.560	0.564			1.031	1.339
4	0.740	0.540	0.740	0.540	0.530	0.540			1.043	1.344
5	0.728	0.534	0.728	0.534	0.512	0.534			1.066	1.348
6	0.727	0.530	0.727	0.530	0.502	0.530			1.079	1.370
7	0.729	0.528	0.729	0.528	0.500	0.528			1.079	1.380
8	0.742	0.527	0.742	0.527	0.515	0.527			1.048	1.384
9	0.768	0.523	0.768	0.523	0.573	0.523			0.938	1.294
10	0.771	0.516	0.771	0.516	0.580	0.516			0.919	1.273
11	0.798	0.515	0.798	0.515	0.591	0.515			0.902	1.347

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	22.5	17.4	14.5	0.457	0.	0.243	0.239	0.091	0.089
2	10.00	18.7	13.6	13.8	0.441	0.	0.236	0.234	0.086	0.086
3	30.00	16.2	11.1	9.3	0.459	0.	0.188	0.187	0.064	0.064
4	40.00	18.0	12.9	7.9	0.478	0.	0.162	0.162	0.053	0.053
5	42.50	19.0	13.9	7.7	0.479	0.	0.148	0.148	0.049	0.048
6	45.00	19.9	14.9	7.6	0.486	0.	0.146	0.145	0.047	0.047
7	47.50	20.2	15.1	7.6	0.490	0.	0.142	0.141	0.046	0.045
8	50.00	19.5	14.4	7.7	0.497	0.	0.161	0.160	0.051	0.051
9	70.00	14.5	9.5	7.3	0.490	0.	0.159	0.159	0.047	0.046
10	90.00	14.2	9.2	6.1	0.483	0.	0.142	0.142	0.038	0.038
11	95.00	15.5	10.5	7.6	0.502	0.	0.230	0.228	0.060	0.060

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(b) 90-Percent design speed

(b1) Reading 29

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	24.257	24.300	27.5	1.2	27.5	1.2	335.1	1.002	15.20	0.908
2	23.853	23.932	28.0	-0.6	28.0	-0.6	332.0	1.003	15.15	0.952
3	22.222	22.408	27.7	-2.6	27.7	-2.6	327.6	1.002	15.07	0.933
4	21.402	21.638	30.5	-2.9	30.5	-2.9	328.1	0.999	14.89	0.934
5	21.199	21.448	31.2	-3.0	31.2	-3.0	328.0	0.999	14.77	0.937
6	20.993	21.255	31.5	-3.0	31.5	-3.0	328.2	0.998	14.62	0.941
7	20.787	21.067	31.7	-3.5	31.7	-3.5	327.1	1.000	14.48	0.950
8	20.584	20.876	30.5	-3.8	30.5	-3.8	326.5	1.000	14.71	0.936
9	18.964	19.388	29.0	-4.8	29.0	-4.8	323.8	0.999	14.85	0.929
10	17.409	17.988	29.6	-2.5	29.6	-2.5	323.0	1.003	14.99	0.939
11	17.043	17.661	32.4	-0.9	32.4	-0.9	326.0	0.999	15.41	0.920

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	265.5	263.8	265.5	263.8	235.4	263.8	122.8	5.6	0.	0.
2	262.8	271.0	262.8	271.0	232.0	271.0	123.3	-2.7	0.	0.
3	263.2	259.4	263.2	259.4	233.1	259.2	122.3	-11.7	0.	0.
4	261.4	258.6	261.4	258.6	225.2	258.2	132.6	-13.0	0.	0.
5	258.9	257.8	258.9	257.8	221.5	257.4	134.0	-13.4	0.	0.
6	255.5	253.3	255.5	253.3	217.9	253.0	133.4	-13.0	0.	0.
7	250.9	257.4	250.9	257.4	213.6	257.0	131.7	-15.5	0.	0.
8	260.2	257.7	260.2	257.7	224.1	257.1	132.2	-17.0	0.	0.
9	272.0	263.9	272.0	263.9	237.8	262.9	132.0	-22.0	0.	0.
10	286.2	269.0	286.2	269.0	248.7	268.8	141.5	-11.5	0.	0.
11	290.0	270.0	290.0	270.0	245.0	270.0	155.3	-4.4	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	0.765	0.758	0.765	0.758	0.678	0.758	1.120	0.921
2	0.760	0.785	0.760	0.785	0.671	0.785	1.168	0.945
3	0.767	0.754	0.767	0.754	0.679	0.753	1.112	0.963
4	0.760	0.752	0.760	0.752	0.655	0.751	1.147	1.025
5	0.752	0.749	0.752	0.749	0.644	0.748	1.162	1.029
6	0.741	0.735	0.741	0.735	0.632	0.734	1.161	1.019
7	0.728	0.749	0.728	0.749	0.619	0.748	1.203	1.002
8	0.758	0.750	0.758	0.750	0.653	0.749	1.148	1.011
9	0.801	0.775	0.801	0.775	0.700	0.772	1.106	0.997
10	0.850	0.791	0.850	0.791	0.739	0.790	1.080	1.063
11	0.858	0.792	0.858	0.792	0.725	0.792	1.102	1.160

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	-3.1	-8.1	10.3	0.171	0.	0.287	0.287	0.107	0.107
2	10.00	-0.9	-5.9	7.8	0.145	0.	0.152	0.152	0.056	0.056
3	30.00	1.5	-3.6	4.6	0.188	0.	0.209	0.209	0.072	0.072
4	40.00	4.3	-0.8	4.1	0.194	0.	0.208	0.208	0.069	0.069
5	42.50	4.9	-0.2	4.0	0.190	0.	0.202	0.202	0.066	0.066
6	45.00	5.1	-0.0	4.1	0.193	0.	0.194	0.194	0.063	0.063
7	47.50	5.2	0.1	3.6	0.161	0.	0.167	0.167	0.053	0.053
8	50.00	3.9	-1.2	3.2	0.191	0.	0.201	0.201	0.064	0.064
9	70.00	1.9	-3.2	2.1	0.194	0.	0.205	0.205	0.060	0.060
10	90.00	2.7	-2.4	4.0	0.202	0.	0.162	0.162	0.043	0.043
11	95.00	5.6	0.6	5.3	0.211	0.	0.210	0.210	0.055	0.055

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE

EDGES FOR STATOR 1. SI UNITS.

(b) Continued. 90-Percent design speed

(b2) Reading 30

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	31.6	3.4	31.6	3.4	339.2	1.000	15.81	0.943
2	23.853	23.932	28.9	2.7	28.9	2.7	337.0	0.999	15.89	0.960
3	22.222	22.408	29.7	-1.1	29.7	-1.1	330.2	1.001	15.45	0.971
4	21.402	21.638	31.7	-1.0	31.7	-1.0	330.1	0.999	15.24	0.971
5	21.199	21.448	32.4	-0.9	32.4	-0.9	330.2	0.998	15.19	0.971
6	20.993	21.255	33.1	-0.9	33.1	-0.9	329.9	0.998	15.05	0.976
7	20.787	21.067	32.9	-1.1	32.9	-1.1	329.1	0.999	14.89	0.981
8	20.584	20.876	32.0	-1.3	32.0	-1.3	327.8	1.001	15.01	0.972
9	18.964	19.388	30.8	-2.3	30.8	-2.3	324.9	0.999	15.03	0.970
10	17.409	17.988	33.3	-1.3	33.3	-1.3	324.5	1.003	15.10	0.968
11	17.043	17.661	35.6	-0.1	35.6	-0.1	327.6	0.999	15.69	0.929

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	260.7	221.7	260.7	221.7	222.1	221.3	136.4	13.3	0.	0.
2	261.8	229.1	261.8	229.1	229.3	228.8	126.4	10.9	0.	0.
3	260.9	223.1	260.9	223.1	226.7	223.1	129.3	-4.3	0.	0.
4	259.9	220.3	259.9	220.3	221.2	220.3	136.5	-3.9	0.	0.
5	259.9	219.4	259.9	219.4	219.4	219.4	139.3	-3.3	0.	0.
6	255.7	218.3	255.7	218.3	214.3	218.3	139.6	-3.4	0.	0.
7	253.1	217.6	253.1	217.6	212.6	217.6	137.3	-4.0	0.	0.
8	257.8	217.9	257.8	217.9	218.5	217.8	136.8	-4.9	0.	0.
9	267.1	224.5	267.1	224.5	229.5	224.3	136.7	-9.0	0.	0.
10	274.1	229.5	274.1	229.5	229.2	229.4	150.4	-5.2	0.	0.
11	283.5	232.1	283.5	232.1	230.7	232.1	164.9	-0.3	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	0.744	0.623	0.744	0.623	0.634	0.622	0.996	1.008
2	0.750	0.649	0.750	0.649	0.657	0.648	0.998	0.958
3	0.756	0.636	0.756	0.636	0.657	0.636	0.984	1.005
4	0.753	0.629	0.753	0.629	0.641	0.629	0.996	1.046
5	0.753	0.626	0.753	0.626	0.635	0.626	1.000	1.062
6	0.740	0.623	0.740	0.623	0.620	0.623	1.019	1.058
7	0.732	0.621	0.732	0.621	0.615	0.621	1.024	1.039
8	0.749	0.623	0.749	0.623	0.635	0.623	0.997	1.038
9	0.783	0.647	0.783	0.647	0.673	0.646	0.977	1.026
10	0.807	0.662	0.807	0.662	0.675	0.662	1.001	1.116
11	0.834	0.668	0.834	0.668	0.679	0.668	1.006	1.220

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	1.0	-4.1	12.6	0.326	0.	0.186	0.186	0.069	0.069
2	10.00	0.0	-5.1	11.1	0.287	0.	0.127	0.127	0.047	0.047
3	30.00	3.5	-1.6	6.1	0.320	0.	0.093	0.093	0.032	0.032
4	40.00	5.5	0.4	6.0	0.330	0.	0.093	0.093	0.031	0.031
5	42.50	6.1	1.0	6.1	0.334	0.	0.094	0.094	0.031	0.031
6	45.00	6.7	1.6	6.1	0.326	0.	0.080	0.080	0.026	0.026
7	47.50	6.3	1.3	5.9	0.318	0.	0.064	0.064	0.020	0.020
8	50.00	5.4	0.3	5.7	0.328	0.	0.090	0.090	0.029	0.029
9	70.00	3.6	-1.4	4.6	0.318	0.	0.091	0.091	0.027	0.027
10	90.00	6.3	1.3	5.1	0.313	0.	0.091	0.091	0.024	0.024
11	95.00	8.8	3.8	6.2	0.332	0.	0.193	0.193	0.051	0.051

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(b) Continued. 90-Percent design speed

(b3) Reading 31

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	39.3	4.0	39.3	4.0	347.4	0.995	16.64	0.947
2	23.853	23.932	35.6	3.7	35.6	3.7	342.8	0.999	16.70	0.964
3	22.222	22.408	34.8	0.4	34.8	0.4	335.2	1.001	16.26	0.973
4	21.402	21.638	35.6	-0.2	35.6	-0.2	333.4	1.001	15.98	0.973
5	21.199	21.448	36.5	-0.1	36.5	-0.1	333.1	1.000	15.92	0.971
6	20.993	21.255	37.7	-0.0	37.7	-0.0	333.8	0.997	15.84	0.973
7	20.787	21.067	37.8	-0.0	37.8	-0.0	333.6	0.997	15.82	0.970
8	20.584	20.876	36.7	-0.1	36.7	-0.1	332.6	0.998	15.78	0.970
9	18.964	19.388	33.7	-1.5	33.7	-1.5	327.2	0.999	15.44	0.967
10	17.409	17.988	35.8	-0.8	35.8	-0.8	326.2	1.004	15.45	0.964
11	17.043	17.661	37.9	0.3	37.9	0.3	329.3	0.999	15.93	0.925

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	253.5	206.7	253.5	206.7	196.3	206.2	160.5	14.5	0.	0.
2	256.1	213.3	256.1	213.3	208.3	212.8	149.0	13.8	0.	0.
3	251.8	203.4	251.8	203.4	206.7	203.4	143.9	1.3	0.	0.
4	251.1	198.9	251.1	198.9	204.1	198.9	146.3	-0.7	0.	0.
5	250.2	197.7	250.2	197.7	201.2	197.7	148.7	-0.5	0.	0.
6	248.3	197.3	248.3	197.3	196.4	197.3	151.9	-0.1	0.	0.
7	250.7	197.6	250.7	197.6	198.1	197.6	153.7	-0.0	0.	0.
8	252.4	198.1	252.4	198.1	202.5	198.1	150.7	-0.3	0.	0.
9	256.7	201.6	256.7	201.6	213.6	201.6	142.4	-5.4	0.	0.
10	260.8	200.6	260.8	200.6	211.4	200.6	152.7	-2.9	0.	0.
11	270.0	201.0	270.0	201.0	213.1	201.0	165.9	1.2	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.712	0.572	0.712	0.572	0.551	0.571	1.050	1.152
2	0.726	0.595	0.726	0.595	0.590	0.594	1.022	1.097
3	0.721	0.572	0.721	0.572	0.592	0.572	0.984	1.087
4	0.721	0.560	0.721	0.560	0.586	0.560	0.975	1.100
5	0.718	0.557	0.718	0.557	0.578	0.557	0.983	1.112
6	0.712	0.556	0.712	0.556	0.563	0.556	1.005	1.130
7	0.719	0.557	0.719	0.557	0.568	0.557	0.998	1.141
8	0.726	0.559	0.726	0.559	0.582	0.559	0.978	1.120
9	0.746	0.574	0.746	0.574	0.621	0.574	0.944	1.055
10	0.761	0.571	0.761	0.571	0.617	0.571	0.949	1.120
11	0.787	0.571	0.787	0.571	0.621	0.570	0.943	1.214

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	8.7	3.6	13.1	0.400	0.	0.185	0.185	0.069	0.069
2	10.00	6.7	1.6	12.1	0.361	0.	0.123	0.123	0.045	0.045
3	30.00	8.6	3.5	7.5	0.385	0.	0.091	0.091	0.031	0.031
4	40.00	9.4	4.3	6.8	0.400	0.	0.092	0.092	0.030	0.030
5	42.50	10.2	5.1	6.9	0.404	0.	0.100	0.100	0.033	0.033
6	45.00	11.3	6.2	7.0	0.402	0.	0.093	0.093	0.030	0.030
7	47.50	11.3	6.2	7.0	0.407	0.	0.101	0.101	0.032	0.032
8	50.00	10.0	5.0	6.9	0.404	0.	0.101	0.101	0.032	0.032
9	70.00	6.5	1.5	5.3	0.381	0.	0.106	0.106	0.031	0.031
10	90.00	8.9	3.8	5.6	0.388	0.	0.112	0.112	0.030	0.030
11	95.00	11.2	6.2	6.6	0.413	0.	0.224	0.224	0.059	0.059

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(b) Continued. 90-Percent design speed

(b4) Reading 36

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	40.5	4.5	40.5	4.5	353.6	0.990	17.14	0.958
2	23.853	23.932	42.3	5.3	42.3	5.3	348.4	0.997	17.27	0.960
3	22.222	22.408	39.2	1.3	39.2	1.3	339.0	1.000	16.73	0.974
4	21.402	21.638	40.9	-0.0	40.9	-0.0	336.4	1.000	16.35	0.977
5	21.199	21.448	41.8	-0.0	41.8	-0.0	336.0	0.998	16.25	0.978
6	20.993	21.255	42.5	0.2	42.5	0.2	336.5	0.997	16.17	0.982
7	20.787	21.067	43.2	0.5	43.2	0.5	336.9	0.995	16.26	0.978
8	20.584	20.876	42.3	0.7	42.3	0.7	336.3	0.996	16.30	0.973
9	18.964	19.388	39.8	-0.8	39.8	-0.8	329.9	0.999	15.79	0.981
10	17.409	17.988	39.6	-0.2	39.6	-0.2	327.9	1.004	15.71	0.976
11	17.043	17.661	41.7	1.0	41.7	1.0	331.0	0.998	16.21	0.932

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	246.4	204.5	246.4	204.5	187.2	203.8	160.2	16.0	0.	0.
2	251.0	206.6	251.0	206.6	185.5	205.7	169.1	18.9	0.	0.
3	245.0	194.4	245.0	194.4	189.9	194.4	154.8	4.4	0.	0.
4	239.5	186.2	239.5	186.2	181.0	186.2	156.9	-0.1	0.	0.
5	237.8	184.7	237.8	184.7	177.3	184.7	158.5	-0.0	0.	0.
6	236.8	184.9	236.8	184.9	174.5	184.9	160.1	0.6	0.	0.
7	240.6	185.5	240.6	185.5	175.4	185.5	164.6	1.6	0.	0.
8	243.6	185.6	243.6	185.6	180.1	185.6	164.1	2.4	0.	0.
9	239.0	180.0	239.0	180.0	183.5	180.0	153.1	-2.5	0.	0.
10	247.2	182.4	247.2	182.4	190.4	182.4	157.6	-0.6	0.	0.
11	258.8	179.6	258.8	179.6	193.3	179.6	172.1	3.3	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	0.684	0.562	0.684	0.562	0.519	0.560	1.089	1.135
2	0.703	0.571	0.703	0.571	0.520	0.568	1.109	1.224
3	0.695	0.542	0.695	0.542	0.539	0.542	1.024	1.150
4	0.681	0.520	0.681	0.520	0.515	0.520	1.029	1.160
5	0.676	0.516	0.676	0.516	0.504	0.516	1.042	1.170
6	0.672	0.517	0.672	0.517	0.495	0.517	1.060	1.178
7	0.684	0.519	0.684	0.519	0.498	0.519	1.058	1.210
8	0.694	0.519	0.694	0.519	0.513	0.519	1.031	1.205
9	0.687	0.507	0.687	0.507	0.527	0.507	0.981	1.114
10	0.715	0.515	0.715	0.515	0.551	0.515	0.958	1.143
11	0.748	0.505	0.748	0.505	0.559	0.505	0.929	1.250

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	9.9	4.9	13.6	0.389	0.	0.155	0.155	0.058	0.058
2	10.00	13.5	8.4	13.6	0.397	0.	0.143	0.143	0.052	0.052
3	30.00	13.0	7.9	8.4	0.416	0.	0.093	0.093	0.032	0.032
4	40.00	14.7	9.6	7.0	0.438	0.	0.088	0.088	0.029	0.029
5	42.50	15.5	10.4	7.0	0.440	0.	0.083	0.083	0.027	0.027
6	45.00	16.1	11.0	7.2	0.436	0.	0.069	0.069	0.022	0.022
7	47.50	16.7	11.6	7.5	0.445	0.	0.084	0.084	0.027	0.027
8	50.00	15.7	10.7	7.7	0.448	0.	0.097	0.097	0.031	0.031
9	70.00	12.7	7.6	6.1	0.435	0.	0.069	0.069	0.020	0.020
10	90.00	12.6	7.6	6.2	0.431	0.	0.083	0.083	0.022	0.022
11	95.00	15.0	9.9	7.3	0.474	0.	0.218	0.218	0.057	0.057

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(b) Concluded. 90-Percent design speed

(b5) Reading 37

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	51.6	6.3	51.6	6.3	359.6	0.989	17.38	0.940
2	23.853	23.932	46.2	6.0	46.2	6.0	354.3	0.995	17.49	0.937
3	22.222	22.408	43.3	1.8	43.3	1.8	341.2	1.001	16.84	0.961
4	21.402	21.638	44.9	0.6	44.9	0.6	338.1	1.000	16.37	0.969
5	21.199	21.448	45.6	0.7	45.6	0.7	338.2	0.998	16.33	0.968
6	20.993	21.255	46.5	0.8	46.5	0.8	337.9	0.998	16.23	0.972
7	20.787	21.067	47.7	1.0	47.7	1.0	337.7	0.997	16.27	0.968
8	20.584	20.876	47.2	1.3	47.2	1.3	337.8	0.996	16.25	0.968
9	18.964	19.388	43.5	-0.2	43.5	-0.2	331.3	0.999	15.79	0.975
10	17.409	17.988	41.3	0.2	41.3	0.2	328.1	1.005	15.78	0.976
11	17.043	17.661	42.6	0.8	42.6	0.8	330.8	0.998	16.24	0.933

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	243.9	197.4	243.9	197.4	151.4	196.2	191.2	21.6	0.	0.
2	248.6	197.4	248.6	197.4	172.0	196.3	179.4	20.8	0.	0.
3	239.2	186.5	239.2	186.5	174.0	186.4	164.1	5.8	0.	0.
4	231.0	177.0	231.0	177.0	163.8	177.0	163.0	1.7	0.	0.
5	231.2	175.6	231.2	175.6	161.9	175.6	165.1	2.1	0.	0.
6	229.8	174.9	229.8	174.9	158.1	174.9	166.8	2.4	0.	0.
7	231.6	174.5	231.6	174.5	155.8	174.5	171.3	3.2	0.	0.
8	233.2	174.5	233.2	174.5	158.5	174.4	171.1	4.0	0.	0.
9	229.0	167.2	229.0	167.2	166.1	167.2	157.6	-0.6	0.	0.
10	240.4	174.1	240.4	174.1	180.5	174.1	158.7	0.5	0.	0.
11	252.6	169.8	252.6	169.8	185.8	169.8	171.1	2.4	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	0.670	0.537	0.670	0.537	0.416	0.534	1.296	1.373
2	0.689	0.539	0.689	0.539	0.477	0.536	1.141	1.293
3	0.675	0.517	0.675	0.517	0.491	0.517	1.072	1.212
4	0.653	0.492	0.653	0.492	0.463	0.492	1.081	1.201
5	0.653	0.488	0.653	0.488	0.458	0.488	1.084	1.216
6	0.649	0.486	0.649	0.486	0.447	0.486	1.106	1.227
7	0.655	0.485	0.655	0.485	0.441	0.485	1.120	1.263
8	0.660	0.486	0.660	0.486	0.449	0.486	1.101	1.257
9	0.654	0.468	0.654	0.468	0.474	0.468	1.007	1.142
10	0.693	0.490	0.693	0.490	0.520	0.490	0.965	1.149
11	0.729	0.476	0.729	0.476	0.536	0.476	0.913	1.241

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	21.0	16.0	15.4	0.450	0.	0.231	0.231	0.086	0.086
2	10.00	17.4	12.3	14.4	0.440	0.	0.231	0.231	0.084	0.084
3	30.00	17.1	12.0	8.9	0.446	0.	0.150	0.150	0.051	0.051
4	40.00	18.6	13.6	7.6	0.463	0.	0.126	0.126	0.042	0.042
5	42.50	19.3	14.2	7.7	0.470	0.	0.129	0.129	0.042	0.042
6	45.00	20.1	15.0	7.8	0.469	0.	0.115	0.115	0.037	0.037
7	47.50	21.2	16.1	8.0	0.478	0.	0.127	0.127	0.041	0.041
8	50.00	20.6	15.5	8.3	0.478	0.	0.125	0.125	0.040	0.040
9	70.00	16.3	11.3	6.6	0.470	0.	0.100	0.100	0.029	0.029
10	90.00	14.4	9.3	6.6	0.449	0.	0.088	0.088	0.024	0.024
11	95.00	15.9	10.9	7.1	0.500	0.	0.226	0.226	0.059	0.059

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE

EDGES FOR STATOR 1. SI UNITS.

(c) 80-Percent design speed. Reading 38

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	51.8	6.1	51.8	6.1	341.6	0.993	15.25	0.950
2	23.853	23.932	45.8	5.9	45.8	5.9	337.7	0.997	15.22	0.954
3	22.222	22.408	43.6	1.8	43.6	1.8	328.5	1.001	14.82	0.969
4	21.402	21.638	46.3	1.1	46.3	1.1	327.3	0.998	14.61	0.968
5	21.199	21.448	46.8	1.0	46.8	1.0	327.1	0.996	14.59	0.965
6	20.993	21.255	47.7	0.9	47.7	0.9	326.4	0.997	14.47	0.970
7	20.787	21.067	48.6	0.8	48.6	0.8	326.6	0.996	14.43	0.971
8	20.584	20.876	48.6	1.1	48.6	1.1	327.0	0.995	14.41	0.971
9	18.964	19.388	42.7	0.3	42.7	0.3	321.2	1.001	14.32	0.979
10	17.409	17.988	40.5	0.3	40.5	0.3	318.8	1.004	14.36	0.981
11	17.043	17.661	42.0	0.8	42.0	0.8	320.2	1.000	14.66	0.946

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	211.8	167.7	211.8	167.7	131.1	166.8	166.4	17.9	0.	0.
2	213.0	168.6	213.0	168.6	148.4	167.7	152.8	17.2	0.	0.
3	205.2	159.3	205.2	159.3	148.7	159.2	141.4	5.0	0.	0.
4	201.3	150.8	201.3	150.8	139.0	150.8	145.5	2.9	0.	0.
5	201.4	148.8	201.4	148.8	137.8	148.7	146.9	2.6	0.	0.
6	197.8	147.2	197.8	147.2	133.1	147.2	146.3	2.4	0.	0.
7	197.3	146.0	197.3	146.0	130.6	146.0	148.0	2.1	0.	0.
8	198.4	145.9	198.4	145.9	131.3	145.9	148.7	2.8	0.	0.
9	202.3	149.4	202.3	149.4	148.8	149.4	137.1	0.8	0.	0.
10	213.4	158.0	213.4	158.0	162.2	158.0	138.6	0.9	0.	0.
11	223.9	152.9	223.9	152.9	166.4	152.9	149.8	2.1	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.591	0.464	0.591	0.464	0.366	0.461	1.272	1.215
2	0.599	0.468	0.599	0.468	0.417	0.466	1.130	1.114
3	0.584	0.447	0.584	0.447	0.423	0.447	1.071	1.053
4	0.573	0.424	0.573	0.424	0.396	0.424	1.084	1.083
5	0.573	0.418	0.573	0.418	0.392	0.418	1.080	1.092
6	0.563	0.414	0.563	0.414	0.379	0.414	1.106	1.088
7	0.562	0.411	0.562	0.411	0.372	0.410	1.118	1.100
8	0.564	0.410	0.564	0.410	0.374	0.410	1.111	1.103
9	0.582	0.423	0.582	0.423	0.428	0.423	1.004	1.000
10	0.619	0.449	0.619	0.449	0.470	0.449	0.974	1.008
11	0.650	0.434	0.650	0.434	0.483	0.434	0.919	1.093

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	21.2	16.1	15.2	0.470	0.	0.239	0.239	0.089	0.089
2	10.00	17.0	11.9	14.2	0.442	0.	0.212	0.212	0.077	0.077
3	30.00	17.3	12.3	9.0	0.451	0.	0.150	0.150	0.051	0.051
4	40.00	20.1	15.0	8.1	0.483	0.	0.162	0.162	0.053	0.053
5	42.50	20.5	15.4	8.0	0.494	0.	0.175	0.175	0.057	0.057
6	45.00	21.3	16.2	8.0	0.490	0.	0.154	0.154	0.050	0.050
7	47.50	22.1	17.0	7.8	0.496	0.	0.153	0.153	0.049	0.049
8	50.00	22.0	16.9	8.1	0.497	0.	0.147	0.147	0.047	0.047
9	70.00	15.5	10.4	7.1	0.457	0.	0.104	0.104	0.031	0.031
10	90.00	13.6	8.5	6.8	0.430	0.	0.083	0.083	0.022	0.022
11	95.00	15.3	10.3	7.0	0.487	0.	0.219	0.219	0.057	0.057

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE

EDGES FOR STATOR 1. SI UNITS.

(d) 70-Percent design speed

(d1) Reading 39

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	17.1	1.5	17.1	1.5	308.8	1.001	12.18	0.944
2	23.853	23.932	16.5	0.1	16.5	0.1	307.5	1.002	12.30	0.968
3	22.222	22.408	18.4	-2.8	18.4	-2.8	305.7	1.002	12.26	0.976
4	21.402	21.638	20.0	-3.3	20.0	-3.3	305.4	1.001	12.20	0.979
5	21.199	21.448	20.8	-3.1	20.8	-3.1	305.9	1.001	12.21	0.979
6	20.993	21.255	22.1	-2.8	22.1	-2.8	306.7	1.000	12.21	0.982
7	20.787	21.067	23.2	-2.5	23.2	-2.5	307.3	0.999	12.24	0.982
8	20.584	20.876	22.4	-2.5	22.4	-2.5	307.2	1.001	12.33	0.981
9	18.964	19.388	23.3	-3.2	23.3	-3.2	306.4	1.002	12.46	0.981
10	17.409	17.988	26.3	-2.1	26.3	-2.1	307.8	1.000	12.66	0.976
11	17.043	17.661	27.9	-1.4	27.9	-1.4	309.3	0.999	12.84	0.965

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	214.3	208.2	214.3	208.2	204.8	208.1	63.1	5.5	0.	0.
2	218.1	217.4	218.1	217.4	209.1	217.4	62.0	0.2	0.	0.
3	214.8	211.7	214.8	211.7	203.8	211.4	67.7	-10.5	0.	0.
4	213.1	210.8	213.1	210.8	200.2	210.5	72.9	-12.2	0.	0.
5	213.8	211.9	213.8	211.9	199.8	211.6	76.0	-11.6	0.	0.
6	213.7	213.4	213.7	213.4	198.0	213.1	80.2	-10.6	0.	0.
7	215.3	214.2	215.3	214.2	197.9	214.0	84.7	-9.5	0.	0.
8	219.7	216.7	219.7	216.7	203.2	216.5	83.7	-9.3	0.	0.
9	226.4	223.4	226.4	223.4	207.9	223.0	89.7	-12.3	0.	0.
10	239.8	234.0	239.8	234.0	215.0	233.9	106.2	-8.7	0.	0.
11	243.7	238.2	243.7	238.2	215.5	238.1	113.9	-5.9	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.632	0.612	0.632	0.612	0.604	0.612	1.016	0.632
2	0.646	0.643	0.646	0.643	0.619	0.643	1.040	0.646
3	0.637	0.627	0.637	0.627	0.605	0.626	1.037	0.637
4	0.632	0.625	0.632	0.625	0.594	0.623	1.051	0.632
5	0.634	0.627	0.634	0.627	0.592	0.627	1.059	0.634
6	0.632	0.632	0.632	0.632	0.586	0.631	1.076	0.632
7	0.637	0.634	0.637	0.634	0.586	0.633	1.081	0.637
8	0.651	0.641	0.651	0.641	0.602	0.641	1.066	0.651
9	0.674	0.663	0.674	0.663	0.619	0.662	1.073	0.674
10	0.716	0.697	0.716	0.697	0.642	0.697	1.088	0.793
11	0.727	0.709	0.727	0.709	0.643	0.709	1.105	0.858

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-13.5	-18.5	10.6	0.129	0.	0.236	0.236	0.088	0.088
2	10.00	-12.3	-17.4	8.4	0.107	0.	0.133	0.133	0.049	0.049
3	30.00	-7.8	-12.9	4.3	0.139	0.	0.100	0.100	0.034	0.034
4	40.00	-6.2	-11.3	3.7	0.142	0.	0.090	0.090	0.030	0.030
5	42.50	-5.5	-10.6	3.9	0.142	0.	0.088	0.088	0.029	0.029
6	45.00	-4.4	-9.5	4.2	0.138	0.	0.075	0.075	0.024	0.024
7	47.50	-3.4	-8.4	4.5	0.145	0.	0.077	0.077	0.025	0.025
8	50.00	-4.2	-9.3	4.6	0.147	0.	0.077	0.077	0.025	0.025
9	70.00	-3.8	-8.9	3.7	0.144	0.	0.074	0.074	0.022	0.022
10	90.00	-0.7	-5.7	4.3	0.151	0.	0.082	0.082	0.022	0.022
11	95.00	1.1	-3.9	4.9	0.150	0.	0.117	0.117	0.031	0.031

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(d) Continued. 70-Percent design speed

(d2) Reading 40

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	26.2	2.8	26.2	2.8	314.8	1.000	12.95	0.967
2	23.853	23.932	25.8	1.9	25.8	1.9	313.3	1.001	13.00	0.980
3	22.222	22.408	26.2	-1.7	26.2	-1.7	310.2	1.001	12.87	0.987
4	21.402	21.638	27.6	-2.4	27.6	-2.4	309.9	1.001	12.83	0.985
5	21.199	21.448	28.1	-2.2	28.1	-2.2	309.7	1.001	12.86	0.982
6	20.993	21.255	29.2	-1.9	29.2	-1.9	311.0	0.999	12.84	0.985
7	20.787	21.067	30.1	-1.7	30.1	-1.7	310.9	0.999	12.82	0.987
8	20.584	20.876	29.3	-1.6	29.3	-1.6	310.8	0.999	12.86	0.983
9	18.964	19.388	29.5	-2.2	29.5	-2.2	309.2	1.000	12.82	0.985
10	17.409	17.988	30.8	-1.4	30.8	-1.4	309.7	1.000	12.95	0.979
11	17.043	17.661	32.5	-0.5	32.5	-0.5	310.8	0.999	13.16	0.959

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	203.1	181.8	203.1	181.8	182.3	181.6	89.6	8.8	0.	0.
2	204.3	188.0	204.3	188.0	184.0	187.8	88.8	6.2	0.	0.
3	199.3	180.7	199.3	180.7	178.8	180.6	88.0	-5.4	0.	0.
4	200.0	178.8	200.0	178.8	177.2	178.7	92.6	-7.4	0.	0.
5	200.2	178.8	200.2	178.8	176.6	178.7	94.4	-6.8	0.	0.
6	199.8	180.0	199.8	180.0	174.4	179.9	97.5	-5.8	0.	0.
7	199.2	180.3	199.2	180.3	172.3	180.2	99.8	-5.4	0.	0.
8	202.6	180.5	202.6	180.5	176.7	180.4	99.1	-5.2	0.	0.
9	205.2	183.5	205.2	183.5	178.5	183.3	101.2	-7.1	0.	0.
10	217.5	190.8	217.5	190.8	186.8	190.7	111.4	-4.8	0.	0.
11	223.7	192.7	223.7	192.7	188.6	192.7	120.3	-1.8	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	0.591	0.525	0.591	0.525	0.530	0.525	0.996	0.677
2	0.596	0.545	0.596	0.545	0.537	0.545	1.021	0.687
3	0.583	0.525	0.583	0.525	0.523	0.525	1.010	0.699
4	0.586	0.520	0.586	0.520	0.519	0.520	1.008	0.727
5	0.587	0.520	0.587	0.520	0.518	0.520	1.012	0.738
6	0.584	0.523	0.584	0.523	0.510	0.523	1.031	0.755
7	0.582	0.524	0.582	0.524	0.504	0.524	1.046	0.769
8	0.593	0.525	0.593	0.525	0.517	0.524	1.021	0.763
9	0.603	0.535	0.603	0.535	0.525	0.535	1.027	0.762
10	0.641	0.557	0.641	0.557	0.551	0.557	1.021	0.830
11	0.660	0.562	0.660	0.562	0.556	0.562	1.022	0.896

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-4.4	-9.5	11.9	0.253	0.	0.159	0.159	0.059	0.059
2	10.00	-3.1	-8.1	10.3	0.228	0.	0.094	0.094	0.034	0.034
3	30.00	-0.0	-5.1	5.4	0.253	0.	0.064	0.064	0.022	0.022
4	40.00	1.4	-3.7	4.7	0.270	0.	0.073	0.073	0.024	0.024
5	42.50	1.8	-3.3	4.9	0.272	0.	0.084	0.084	0.028	0.028
6	45.00	2.8	-2.3	5.2	0.266	0.	0.072	0.072	0.023	0.023
7	47.50	3.6	-1.5	5.3	0.263	0.	0.065	0.065	0.021	0.021
8	50.00	2.7	-2.4	5.4	0.272	0.	0.082	0.082	0.026	0.026
9	70.00	2.4	-2.7	4.6	0.259	0.	0.068	0.068	0.020	0.020
10	90.00	3.8	-1.2	5.0	0.264	0.	0.087	0.087	0.023	0.023
11	95.00	5.8	0.8	5.7	0.280	0.	0.162	0.162	0.042	0.042

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(d) Continued. 70-Percent design speed

(d3) Reading 41

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	24.257	24.300	33.5	3.2	33.5	3.2	319.5	1.000	13.42	0.970
2	23.853	23.932	33.1	3.2	33.1	3.2	318.3	1.001	13.53	0.981
3	22.222	22.408	32.3	-0.5	32.3	-0.5	314.1	1.000	13.30	0.984
4	21.402	21.638	34.0	-0.7	34.0	-0.7	313.9	0.999	13.23	0.982
5	21.199	21.448	34.8	-0.6	34.8	-0.6	313.6	0.999	13.23	0.980
6	20.993	21.255	35.6	-0.5	35.6	-0.5	314.6	0.997	13.19	0.982
7	20.787	21.067	36.8	-0.5	36.8	-0.5	314.2	0.997	13.13	0.985
8	20.584	20.876	36.4	-0.4	36.4	-0.4	314.0	0.997	13.12	0.985
9	18.964	19.388	35.4	-1.0	35.4	-1.0	311.9	0.999	13.11	0.982
10	17.409	17.988	34.8	-0.8	34.8	-0.8	311.1	1.001	13.17	0.977
11	17.043	17.661	36.6	0.3	36.6	0.3	312.7	0.998	13.40	0.952

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	192.2	163.0	192.2	163.0	160.3	162.7	106.1	9.1	0.	0.
2	196.6	171.1	196.6	171.1	164.7	170.9	107.3	9.7	0.	0.
3	189.7	160.3	189.7	160.3	160.3	160.3	101.5	-1.5	0.	0.
4	189.5	157.2	189.5	157.2	157.0	157.2	106.0	-2.0	0.	0.
5	189.8	156.7	189.8	156.7	155.7	156.6	108.4	-1.5	0.	0.
6	188.8	156.4	188.8	156.4	153.5	156.4	109.9	-1.4	0.	0.
7	187.0	155.9	187.0	155.9	149.8	155.9	112.0	-1.3	0.	0.
8	188.1	155.9	188.1	155.9	151.3	155.9	111.7	-1.2	0.	0.
9	193.5	157.9	193.5	157.9	157.7	157.9	112.1	-2.9	0.	0.
10	203.8	162.6	203.8	162.6	167.4	162.5	116.2	-2.3	0.	0.
11	211.7	161.6	211.7	161.6	170.1	161.6	126.1	0.7	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	0.552	0.464	0.552	0.464	0.461	0.464	1.015	0.786
2	0.567	0.490	0.567	0.490	0.475	0.489	1.037	0.809
3	0.550	0.461	0.550	0.461	0.465	0.461	1.000	0.782
4	0.549	0.452	0.549	0.452	0.455	0.452	1.001	0.808
5	0.550	0.450	0.550	0.450	0.452	0.450	1.006	0.822
6	0.547	0.449	0.547	0.449	0.444	0.449	1.019	0.829
7	0.542	0.448	0.542	0.448	0.434	0.448	1.041	0.840
8	0.545	0.448	0.545	0.448	0.439	0.448	1.030	0.837
9	0.564	0.455	0.564	0.455	0.460	0.455	1.001	0.829
10	0.597	0.470	0.597	0.470	0.490	0.469	0.971	0.856
11	0.620	0.466	0.620	0.466	0.498	0.466	0.950	0.927

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	-2.2	12.3	0.340	0.	0.161	0.161	0.060	0.060
2	10.00	4.2	-0.8	11.6	0.312	0.	0.097	0.097	0.036	0.036
3	30.00	6.1	1.0	6.6	0.340	0.	0.084	0.084	0.029	0.029
4	40.00	7.8	2.7	6.3	0.358	0.	0.098	0.098	0.032	0.032
5	42.50	8.5	3.4	6.5	0.363	0.	0.107	0.107	0.035	0.035
6	45.00	9.2	4.1	6.5	0.362	0.	0.099	0.099	0.032	0.032
7	47.50	10.3	5.2	6.5	0.359	0.	0.085	0.085	0.027	0.027
8	50.00	9.8	4.7	6.6	0.361	0.	0.084	0.084	0.027	0.027
9	70.00	8.2	3.2	5.8	0.356	0.	0.095	0.095	0.028	0.028
10	90.00	7.8	2.8	5.6	0.356	0.	0.105	0.105	0.028	0.028
11	95.00	9.8	4.8	6.5	0.390	0.	0.211	0.211	0.055	0.055

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(d) Continued. 70-Percent design speed

(d4) Reading 42

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.257	24.300	40.0	4.1	40.0	4.1	322.7	1.000	13.60	0.971
2	23.853	23.932	36.3	4.3	36.3	4.3	321.6	0.999	13.76	0.974
3	22.222	22.408	37.4	0.4	37.4	0.4	316.5	1.000	13.43	0.984
4	21.402	21.638	39.0	0.4	39.0	0.4	316.4	0.997	13.44	0.975
5	21.199	21.448	39.6	0.4	39.6	0.4	316.4	0.997	13.40	0.975
6	20.993	21.255	40.3	0.2	40.3	0.2	316.6	0.996	13.32	0.978
7	20.787	21.067	41.4	0.1	41.4	0.1	316.0	0.996	13.28	0.979
8	20.584	20.876	41.9	-0.0	41.9	-0.0	316.3	0.995	13.26	0.980
9	18.964	19.388	38.8	-0.8	38.8	-0.8	313.4	0.999	13.26	0.976
10	17.409	17.988	38.4	-0.3	38.4	-0.3	311.9	1.001	13.25	0.979
11	17.043	17.661	39.7	0.6	39.7	0.6	312.9	1.000	13.42	0.956

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	185.9	152.9	185.9	152.9	142.3	152.5	119.5	10.9	0.	0.
2	193.6	159.7	193.6	159.7	156.1	159.2	114.5	12.1	0.	0.
3	182.2	147.9	182.2	147.9	144.8	147.9	110.5	1.1	0.	0.
4	185.5	144.0	185.5	144.0	144.1	144.0	116.9	0.9	0.	0.
5	184.2	142.7	184.2	142.7	142.0	142.7	117.3	0.9	0.	0.
6	182.0	141.9	182.0	141.9	138.7	141.9	117.8	0.6	0.	0.
7	181.0	141.0	181.0	141.0	135.7	141.0	119.8	0.2	0.	0.
8	181.5	140.7	181.5	140.7	135.2	140.7	121.1	-0.0	0.	0.
9	187.6	142.0	187.6	142.0	146.3	142.0	117.6	-2.0	0.	0.
10	195.0	147.7	195.0	147.7	152.8	147.7	121.2	-0.9	0.	0.
11	202.0	145.0	202.0	145.0	155.5	145.0	129.0	1.5	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.530	0.433	0.530	0.433	0.406	0.432	1.072	0.872
2	0.555	0.454	0.555	0.454	0.447	0.452	1.020	0.852
3	0.525	0.422	0.525	0.422	0.417	0.422	1.021	0.836
4	0.535	0.411	0.535	0.411	0.416	0.411	0.999	0.877
5	0.531	0.407	0.531	0.407	0.409	0.407	1.005	0.878
6	0.524	0.405	0.524	0.405	0.400	0.405	1.023	0.878
7	0.522	0.403	0.522	0.403	0.391	0.403	1.039	0.892
8	0.523	0.402	0.523	0.402	0.389	0.402	1.041	0.899
9	0.544	0.407	0.544	0.407	0.424	0.407	0.971	0.864
10	0.568	0.424	0.568	0.424	0.445	0.424	0.967	0.886
11	0.589	0.416	0.589	0.416	0.453	0.416	0.932	0.944

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	9.4	4.4	13.2	0.396	0.	0.163	0.163	0.061	0.061
2	10.00	7.4	2.3	12.7	0.369	0.	0.136	0.136	0.050	0.050
3	30.00	11.1	6.0	7.6	0.393	0.	0.095	0.095	0.033	0.033
4	40.00	12.8	7.7	7.4	0.429	0.	0.141	0.141	0.047	0.047
5	42.50	13.3	8.2	7.4	0.431	0.	0.143	0.143	0.047	0.047
6	45.00	13.9	8.8	7.3	0.428	0.	0.127	0.127	0.041	0.041
7	47.50	14.9	9.9	7.1	0.432	0.	0.125	0.125	0.040	0.040
8	50.00	15.2	10.2	7.0	0.435	0.	0.119	0.119	0.038	0.038
9	70.00	11.6	6.6	6.0	0.428	0.	0.131	0.131	0.038	0.038
10	90.00	11.5	6.4	6.1	0.408	0.	0.106	0.106	0.028	0.028
11	95.00	13.0	7.9	6.8	0.445	0.	0.209	0.209	0.055	0.055

TABLE VIII. - Continued. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(d) Concluded. 70-Percent design speed

(d5) Reading 43

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	24.257	24.300	54.2	6.6	54.2	6.6	330.4	0.989	13.80	0.953
2	23.853	23.932	48.0	6.5	48.0	6.5	326.9	0.994	13.78	0.959
3	22.222	22.408	41.4	1.6	41.4	1.6	318.5	1.001	13.49	0.978
4	21.402	21.638	43.2	1.5	43.2	1.5	317.8	0.998	13.49	0.969
5	21.199	21.448	44.2	1.3	44.2	1.3	317.8	0.997	13.43	0.970
6	20.993	21.255	45.1	1.1	45.1	1.1	317.7	0.997	13.36	0.972
7	20.787	21.067	46.2	0.9	46.2	0.9	317.5	0.996	13.31	0.974
8	20.584	20.876	46.5	1.0	46.5	1.0	317.6	0.996	13.32	0.972
9	18.964	19.388	41.9	0.4	41.9	0.4	314.6	0.999	13.36	0.971
10	17.409	17.988	39.4	0.4	39.4	0.4	312.2	1.003	13.33	0.978
11	17.043	17.661	40.7	0.8	40.7	0.8	313.0	1.001	13.44	0.959

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	140.3	184.9	140.3	108.2	139.4	149.9	16.0	0.	0.
2	184.8	142.5	184.8	142.5	123.6	141.5	137.5	16.2	0.	0.
3	178.3	139.0	178.3	139.0	133.7	139.0	117.9	3.9	0.	0.
4	180.4	133.6	180.4	133.6	131.6	133.6	123.5	3.5	0.	0.
5	178.5	132.0	178.5	132.0	127.9	131.9	124.4	3.1	0.	0.
6	176.7	130.1	176.7	130.1	124.7	130.1	125.2	2.6	0.	0.
7	174.9	128.8	174.9	128.8	121.0	128.8	126.3	2.1	0.	0.
8	176.5	127.8	176.5	127.8	121.5	127.8	128.1	2.2	0.	0.
9	184.1	131.9	184.1	131.9	137.0	131.9	123.1	1.0	0.	0.
10	191.3	139.5	191.3	139.5	147.9	139.5	121.3	1.0	0.	0.
11	197.1	136.2	197.1	136.2	149.3	136.2	128.6	1.9	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	0.521	0.393	0.521	0.393	0.305	0.391	1.289	1.118
2	0.524	0.401	0.524	0.401	0.350	0.398	1.145	1.016
3	0.511	0.394	0.511	0.394	0.383	0.394	1.039	0.885
4	0.518	0.380	0.518	0.380	0.378	0.379	1.015	0.923
5	0.512	0.375	0.512	0.375	0.367	0.375	1.031	0.929
6	0.507	0.370	0.507	0.370	0.358	0.370	1.044	0.933
7	0.502	0.366	0.502	0.366	0.347	0.366	1.065	0.941
8	0.507	0.363	0.507	0.363	0.349	0.363	1.052	0.953
9	0.532	0.376	0.532	0.376	0.396	0.376	0.963	0.902
10	0.556	0.400	0.556	0.400	0.430	0.400	0.943	0.885
11	0.574	0.390	0.574	0.390	0.435	0.390	0.912	0.940

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	23.6	18.5	15.7	0.511	0.	0.275	0.275	0.102	0.102
2	10.00	19.2	14.1	14.9	0.470	0.	0.238	0.238	0.087	0.087
3	30.00	15.2	10.1	8.8	0.438	0.	0.132	0.132	0.045	0.045
4	40.00	17.0	11.9	8.5	0.478	0.	0.183	0.183	0.060	0.060
5	42.50	17.9	12.8	8.4	0.482	0.	0.180	0.180	0.059	0.059
6	45.00	18.7	13.6	8.2	0.487	0.	0.172	0.172	0.056	0.056
7	47.50	19.7	14.6	7.9	0.490	0.	0.162	0.162	0.052	0.052
8	50.00	19.9	14.8	8.0	0.501	0.	0.176	0.176	0.056	0.056
9	70.00	14.8	9.7	7.3	0.476	0.	0.168	0.168	0.049	0.049
10	90.00	12.4	7.4	6.8	0.437	0.	0.118	0.118	0.032	0.032
11	95.00	14.0	9.0	7.1	0.475	0.	0.206	0.206	0.054	0.054

TABLE VIII. - Concluded. BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 1. SI UNITS.

(e) 50-Percent design speed. Reading 48

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	24.257	24.300	56.0	6.0	56.0	6.0	310.1	0.993	11.91	0.976
2	23.853	23.932	49.1	5.7	49.1	5.7	308.2	0.996	11.85	0.982
3	22.222	22.408	41.1	1.3	41.1	1.3	303.6	1.000	11.77	0.990
4	21.402	21.638	44.2	1.4	44.2	1.4	303.0	0.999	11.74	0.988
5	21.199	21.448	44.5	1.3	44.5	1.3	303.5	0.998	11.73	0.988
6	20.993	21.255	45.4	1.2	45.4	1.2	302.7	0.999	11.69	0.989
7	20.787	21.067	47.0	0.9	47.0	0.9	303.3	0.999	11.66	0.990
8	20.584	20.876	47.5	0.7	47.5	0.7	303.2	0.997	11.66	0.989
9	18.964	19.388	42.3	0.4	42.3	0.4	301.2	1.000	11.67	0.990
10	17.409	17.988	39.4	0.2	39.4	0.2	300.1	1.003	11.65	0.998
11	17.043	17.661	41.7	0.1	41.7	0.1	300.6	1.001	11.71	0.984

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	131.3	101.9	131.3	101.9	73.4	101.4	108.8	10.7	0.	0.
2	128.6	102.7	128.6	102.7	84.1	102.2	97.3	10.2	0.	0.
3	127.5	101.9	127.5	101.9	96.1	101.9	83.8	2.4	0.	0.
4	127.3	98.9	127.3	98.9	91.4	98.9	88.7	2.4	0.	0.
5	127.3	97.8	127.3	97.8	90.8	97.8	89.2	2.1	0.	0.
6	125.2	96.2	125.2	96.2	87.8	96.2	89.2	2.0	0.	0.
7	123.7	95.1	123.7	95.1	84.3	95.1	90.5	1.5	0.	0.
8	124.5	94.2	124.5	94.2	84.1	94.2	91.8	1.1	0.	0.
9	129.4	97.2	129.4	97.2	95.8	97.2	87.1	0.6	0.	0.
10	134.2	105.4	134.2	105.4	103.7	105.4	85.1	0.4	0.	0.
11	139.4	100.6	139.4	100.6	104.1	100.6	92.7	0.2	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	0.377	0.292	0.377	0.292	0.211	0.291	1.381	0.835
2	0.371	0.295	0.371	0.295	0.242	0.294	1.215	0.734
3	0.370	0.294	0.370	0.294	0.279	0.294	1.060	0.636
4	0.370	0.286	0.370	0.286	0.265	0.286	1.082	0.671
5	0.369	0.283	0.369	0.283	0.263	0.283	1.077	0.674
6	0.364	0.278	0.364	0.278	0.255	0.278	1.096	0.673
7	0.359	0.275	0.359	0.275	0.245	0.275	1.128	0.683
8	0.361	0.272	0.361	0.272	0.244	0.272	1.120	0.692
9	0.377	0.282	0.377	0.282	0.279	0.281	1.015	0.643
10	0.392	0.306	0.392	0.306	0.303	0.306	1.016	0.624
11	0.408	0.292	0.408	0.292	0.304	0.292	0.967	0.681

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	25.4	20.3	15.1	0.503	0.	0.253	0.253	0.094	0.094
2	10.00	20.3	15.2	14.1	0.450	0.	0.194	0.194	0.071	0.071
3	30.00	14.9	9.8	8.5	0.419	0.	0.110	0.110	0.038	0.038
4	40.00	17.9	12.9	8.4	0.446	0.	0.132	0.132	0.044	0.044
5	42.50	18.2	13.1	8.3	0.454	0.	0.137	0.137	0.045	0.045
6	45.00	19.0	13.9	8.2	0.456	0.	0.131	0.131	0.043	0.043
7	47.50	20.5	15.4	7.9	0.461	0.	0.119	0.119	0.038	0.038
8	50.00	20.9	15.8	7.7	0.473	0.	0.130	0.130	0.041	0.041
9	70.00	15.1	10.1	7.2	0.443	0.	0.112	0.112	0.033	0.033
10	90.00	12.4	7.4	6.6	0.381	0.	0.021	0.021	0.006	0.006
11	95.00	15.0	10.0	6.4	0.449	0.	0.153	0.153	0.040	0.040

Axial location, z, cm	Hub contour, r, cm	Casing contour, r, cm
-15.24	8.763	25.400
-12.70	9.081	↓
-10.16	9.398	
-7.62	9.779	
-5.08	10.351	
-2.54	11.328	
-1.91	11.659	
0	12.700	
1.83	13.884	25.146
3.05	14.605	24.943
3.84	15.227	24.816
5.78	16.078	24.689
6.60	16.408	24.625
7.70	16.662	↓
10.16	17.209	
11.18	17.374	
12.95	17.564	
15.49	17.564	

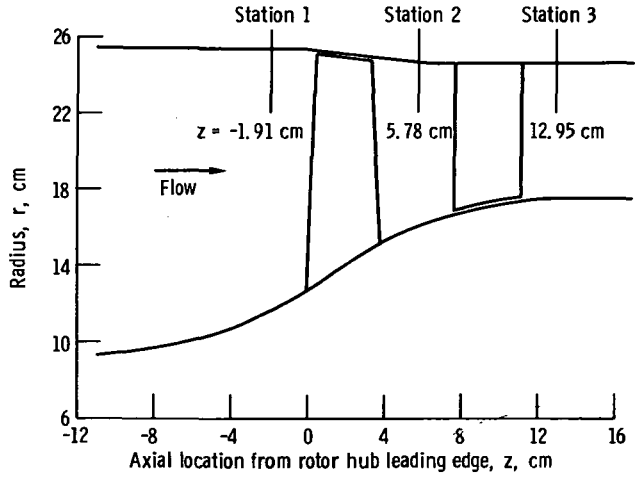


Figure 1. - Compressor flow path.

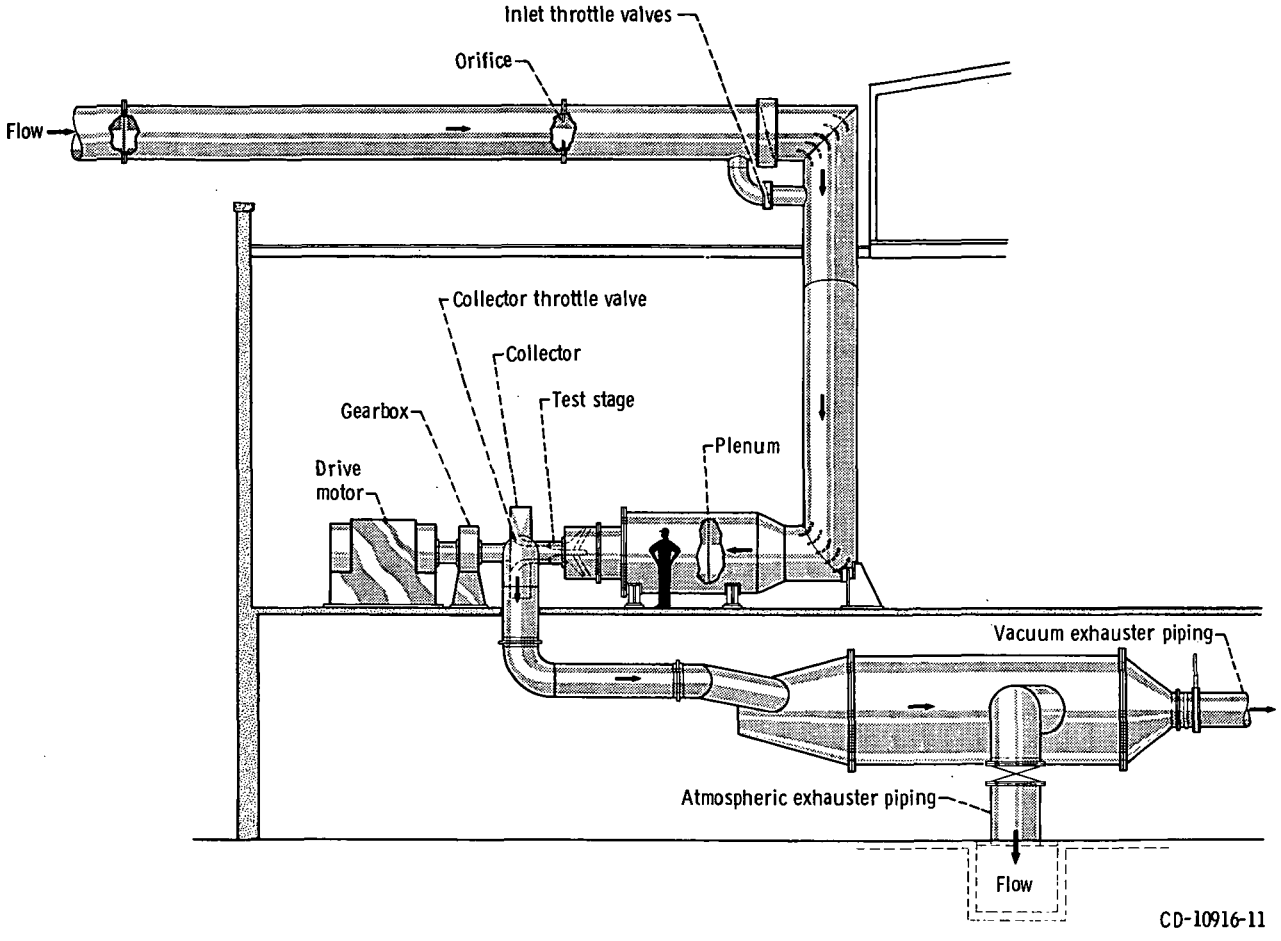


Figure 2. - Single-stage compressor facility.

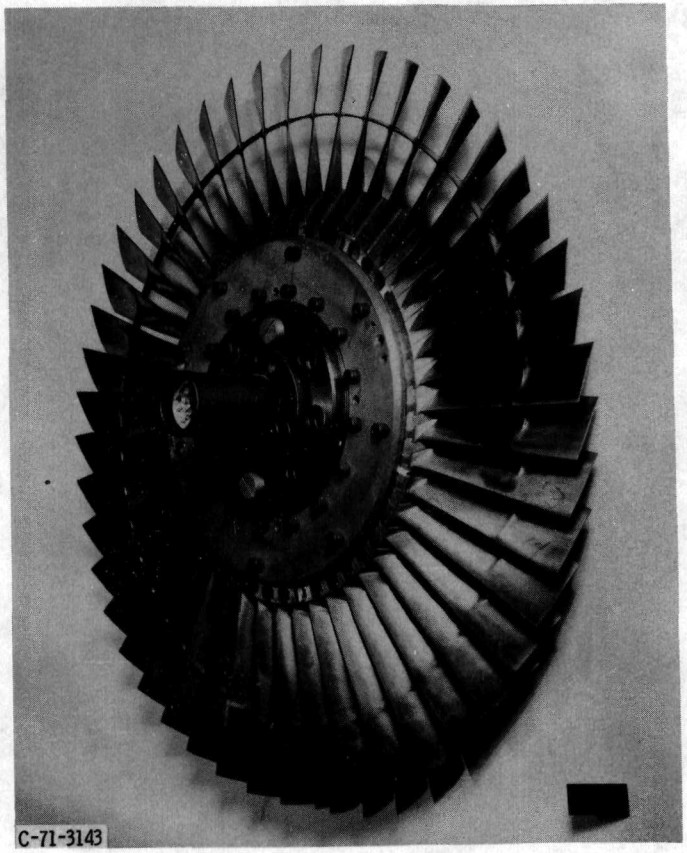


Figure 3. - Rotor 6 - stage 6-1

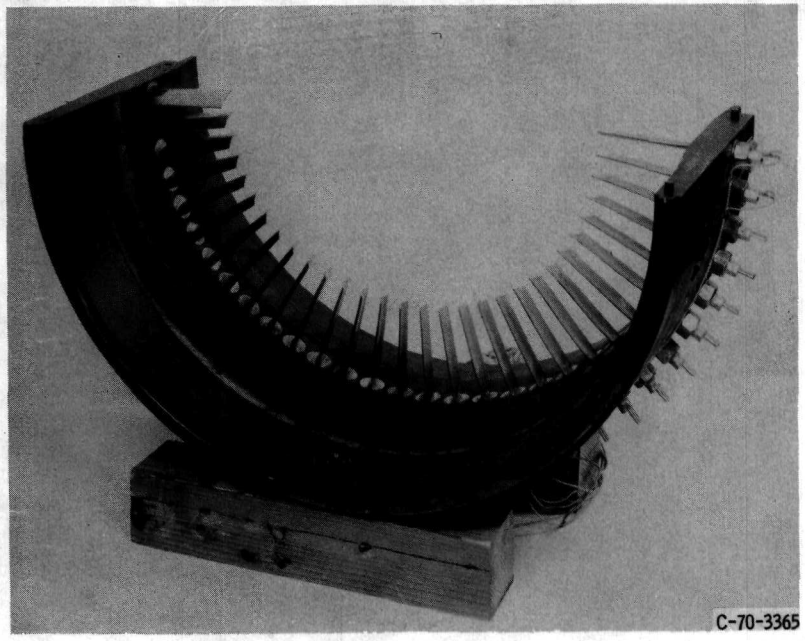


Figure 4. - Stator 1 - stage 6-1.

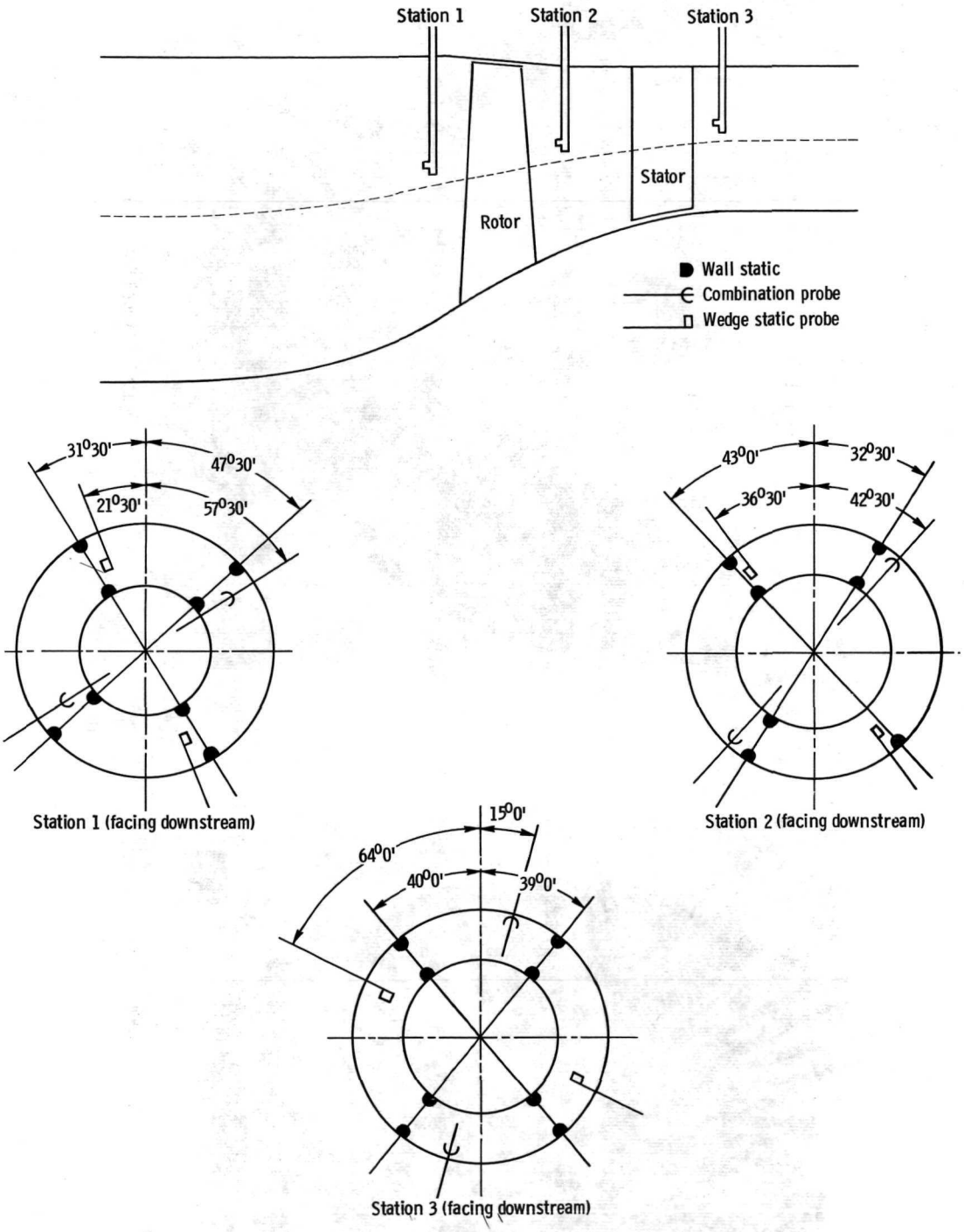
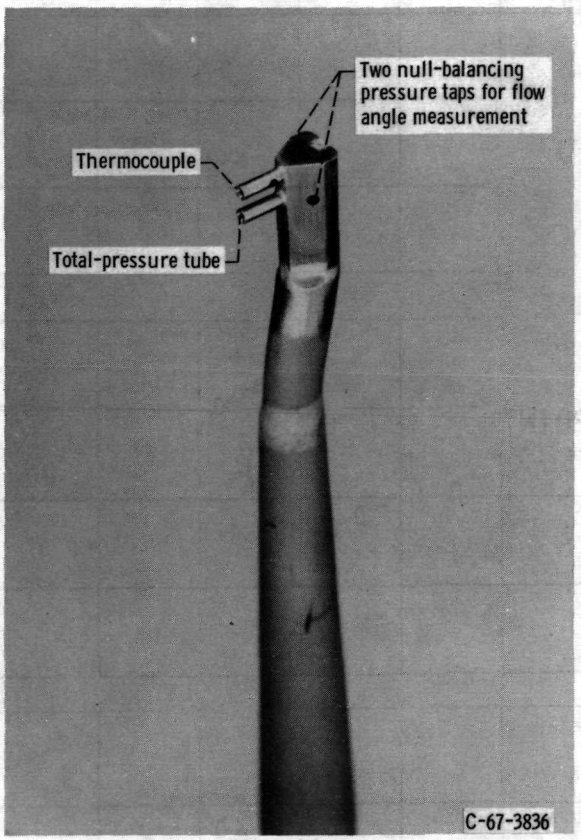


Figure 5. - Circumferential location of measurements.



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

(b) Static pressure probe.

Figure 6. - Survey probe

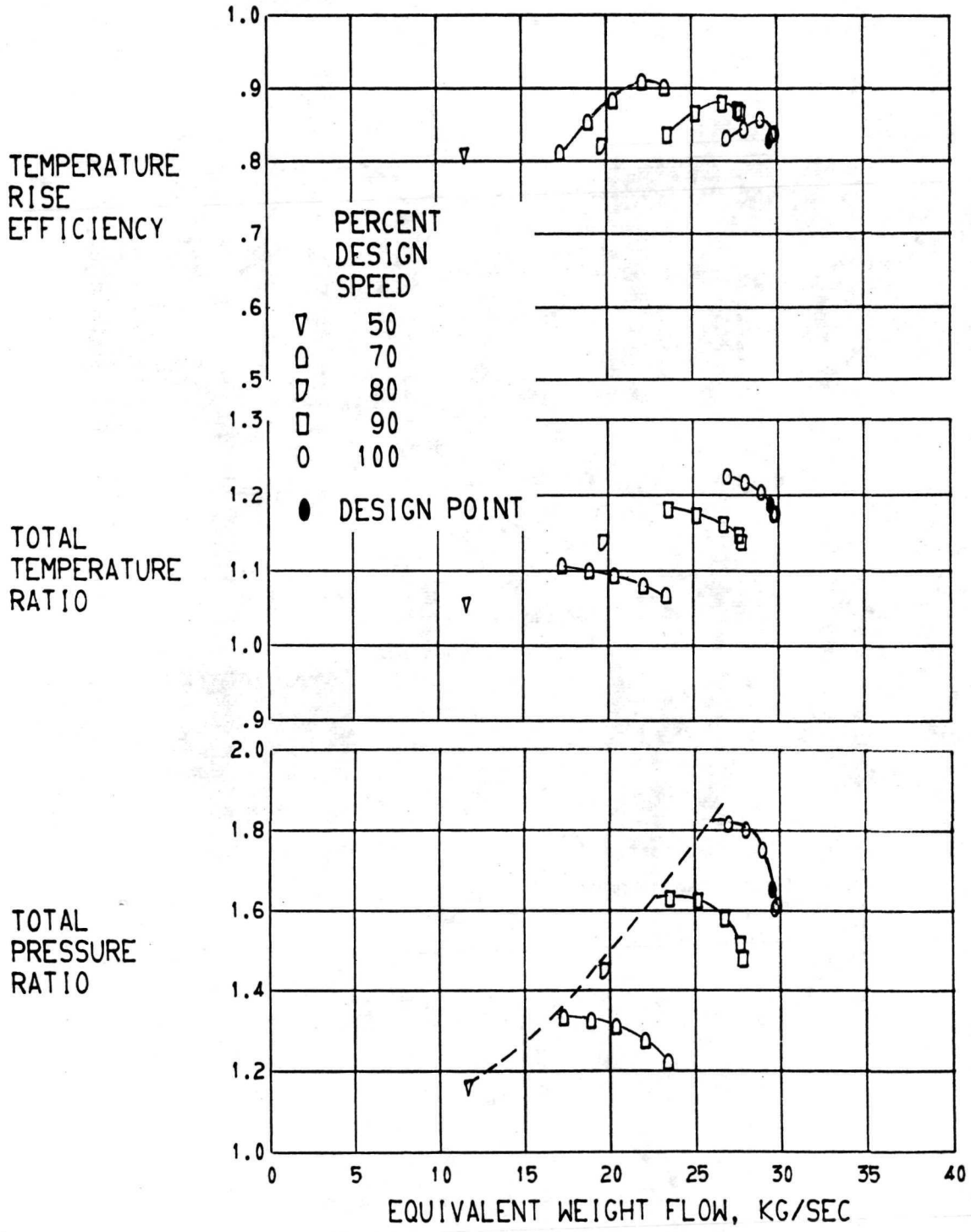


FIGURE 7. - - OVERALL PERFORMANCE FOR ROTOR 6.

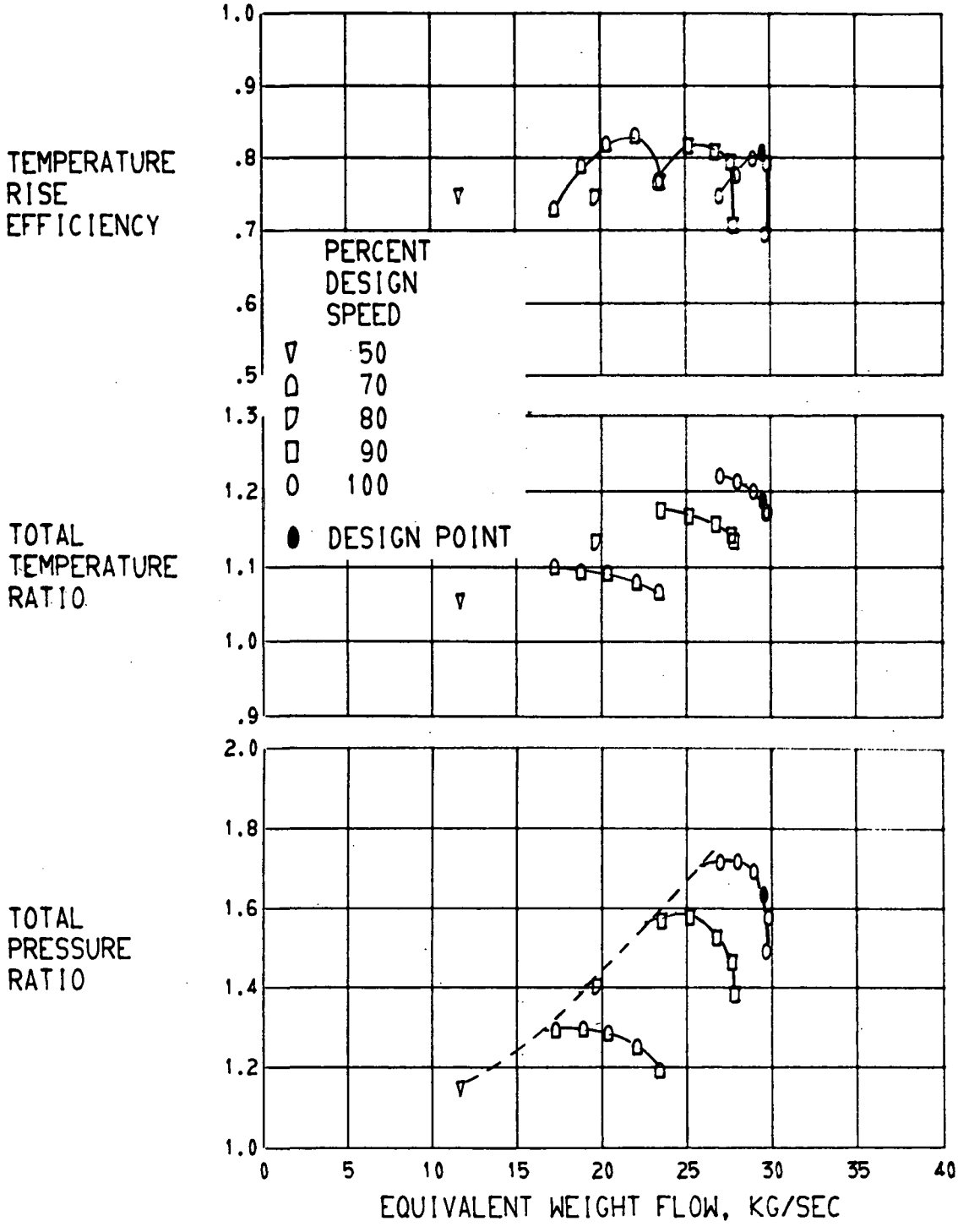


FIGURE 8. - OVERALL PERFORMANCE FOR STAGE 6 - 1.

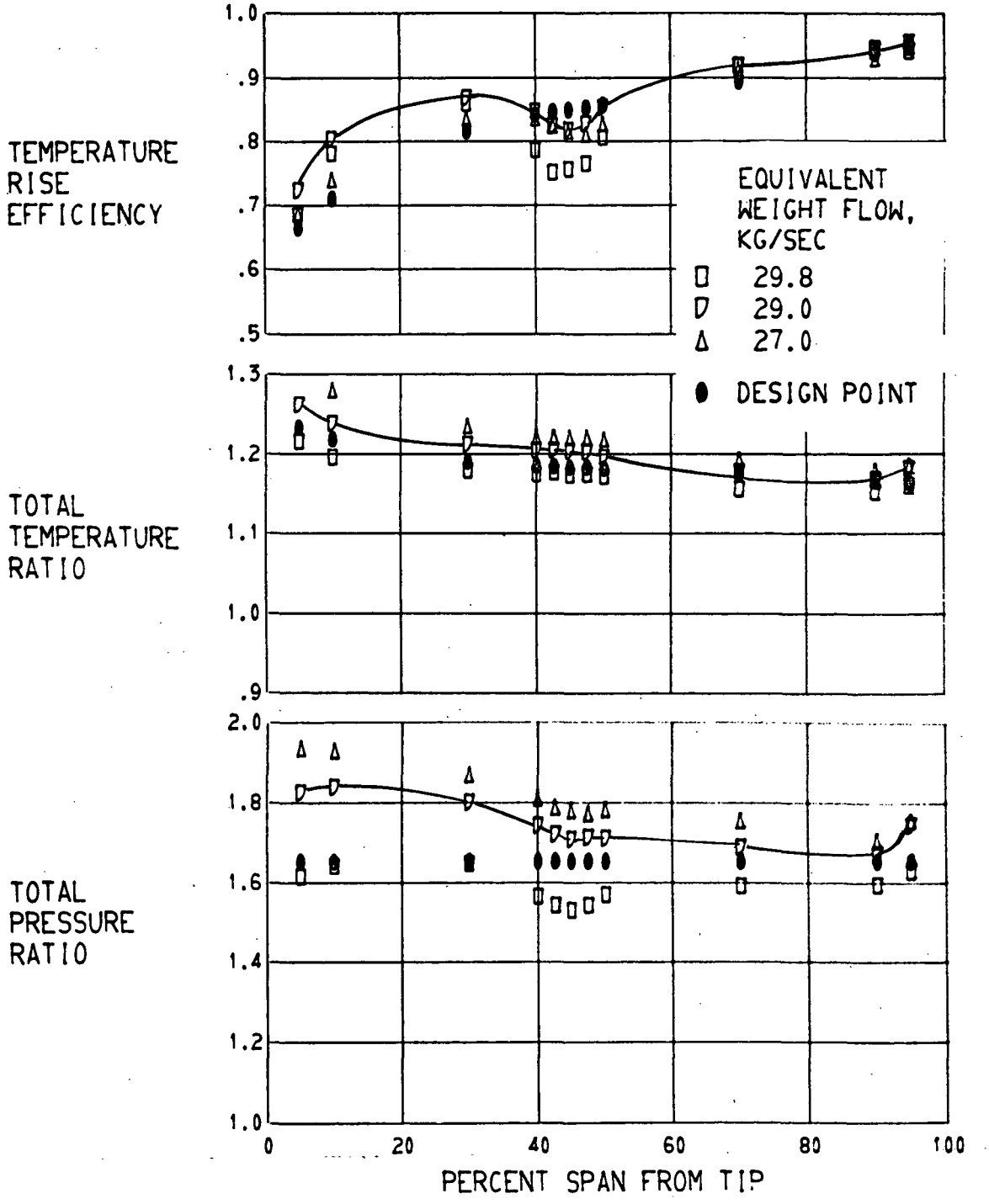


FIGURE 9. - RADIAL DISTRIBUTION OF PERFORMANCE FOR ROTOR 6. 100 PERCENT DESIGN SPEED.

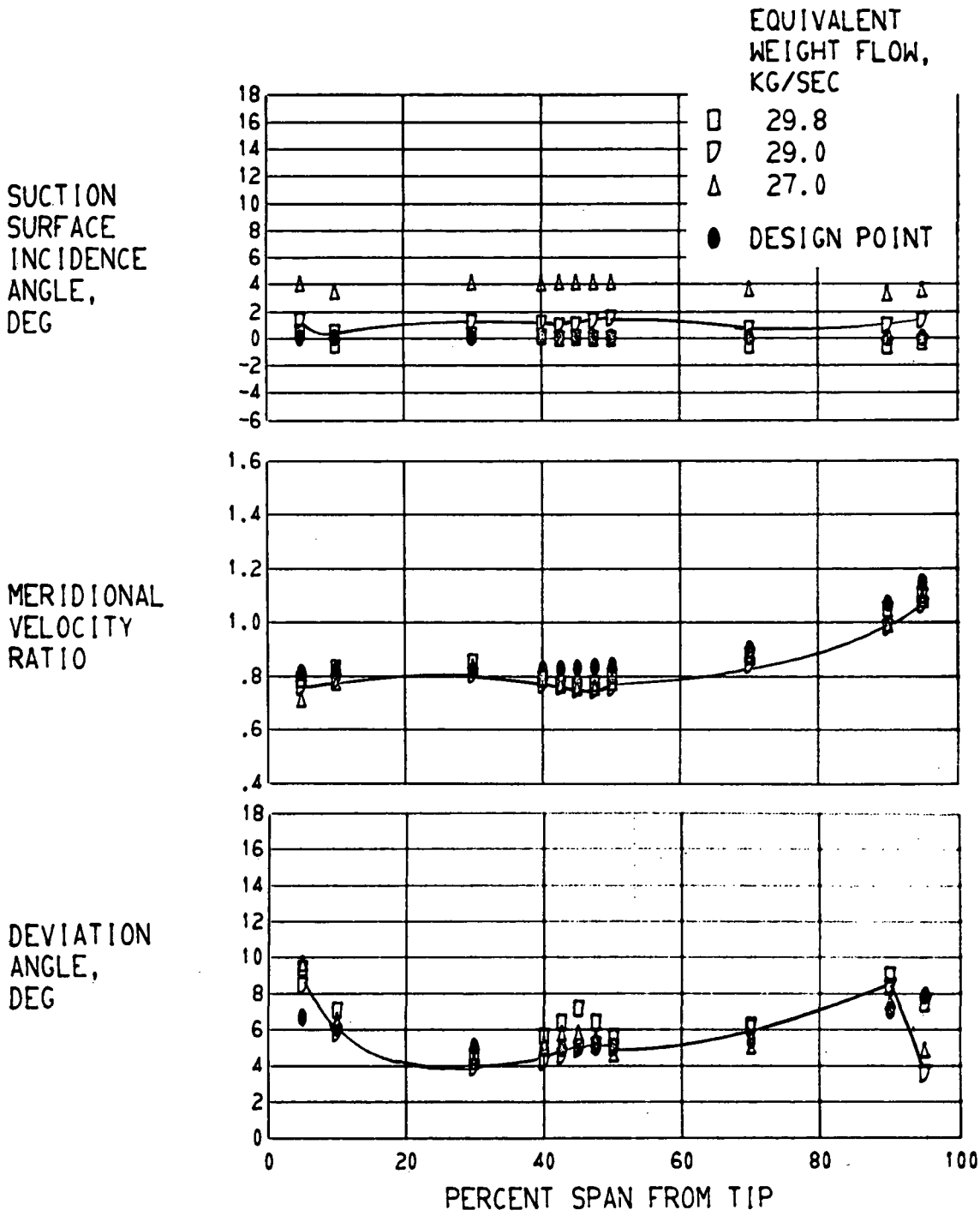


FIGURE 9. - CONTINUED. RADIAL DISTRIBUTION OF PERFORMANCE FOR ROTOR 6. 100 PERCENT DESIGN SPEED.

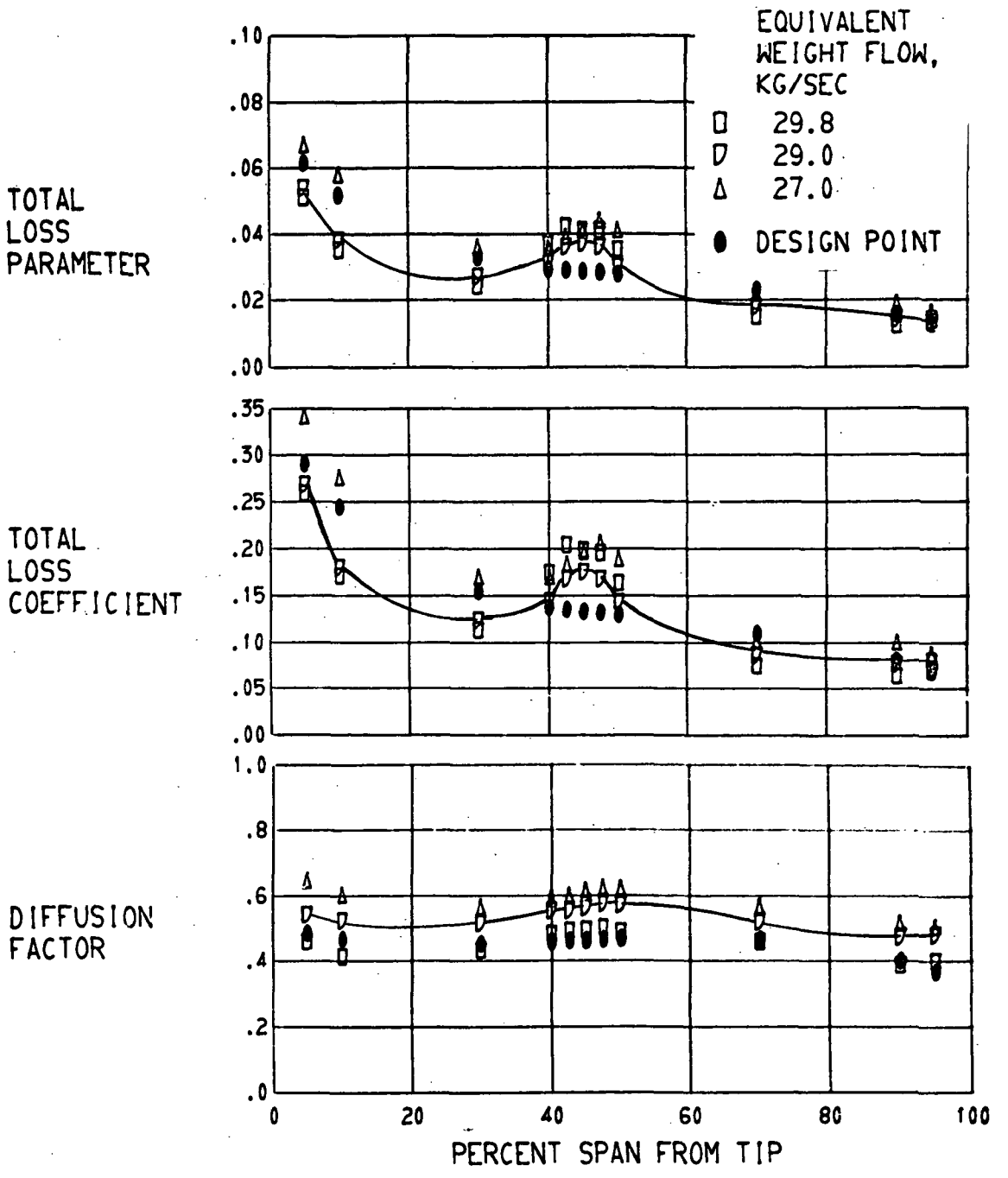


FIGURE 9. - CONCLUDED. RADIAL DISTRIBUTION OF PERFORMANCE FOR ROTOR 6. 100 PERCENT DESIGN SPEED.

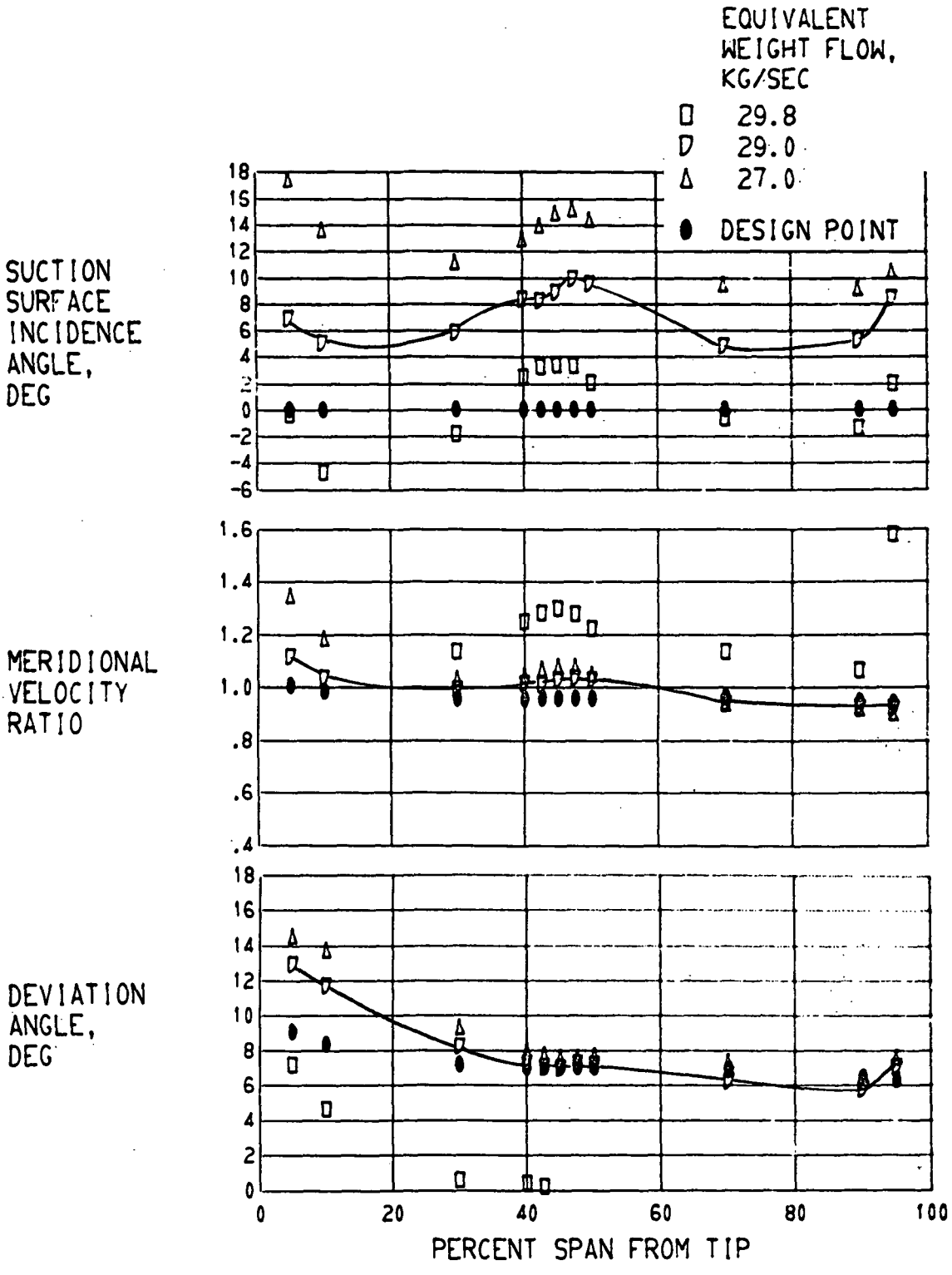


FIGURE 10. - RADIAL DISTRIBUTION OF PERFORMANCE FOR STATOR 1. 100 PERCENT DESIGN SPEED.

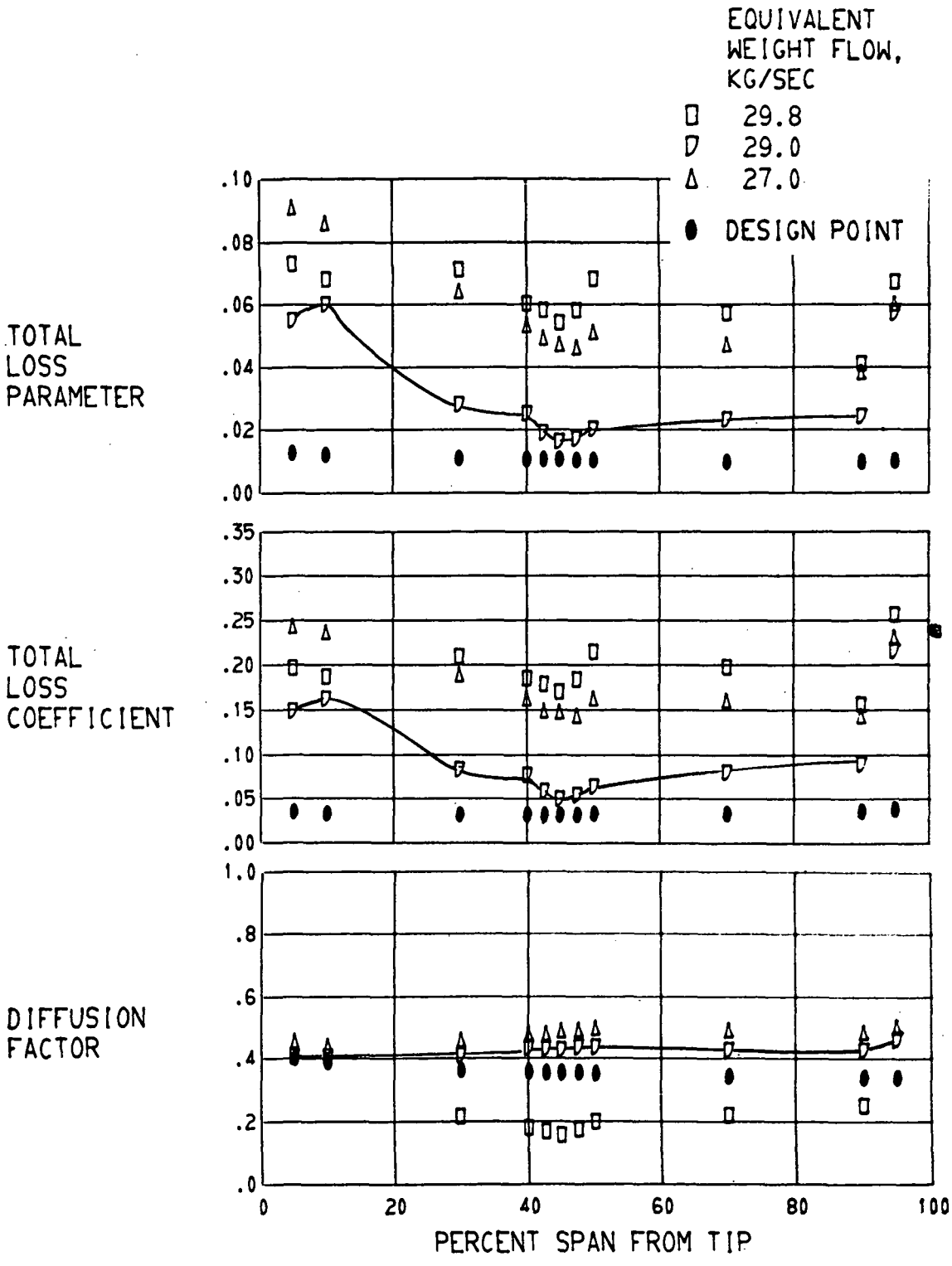
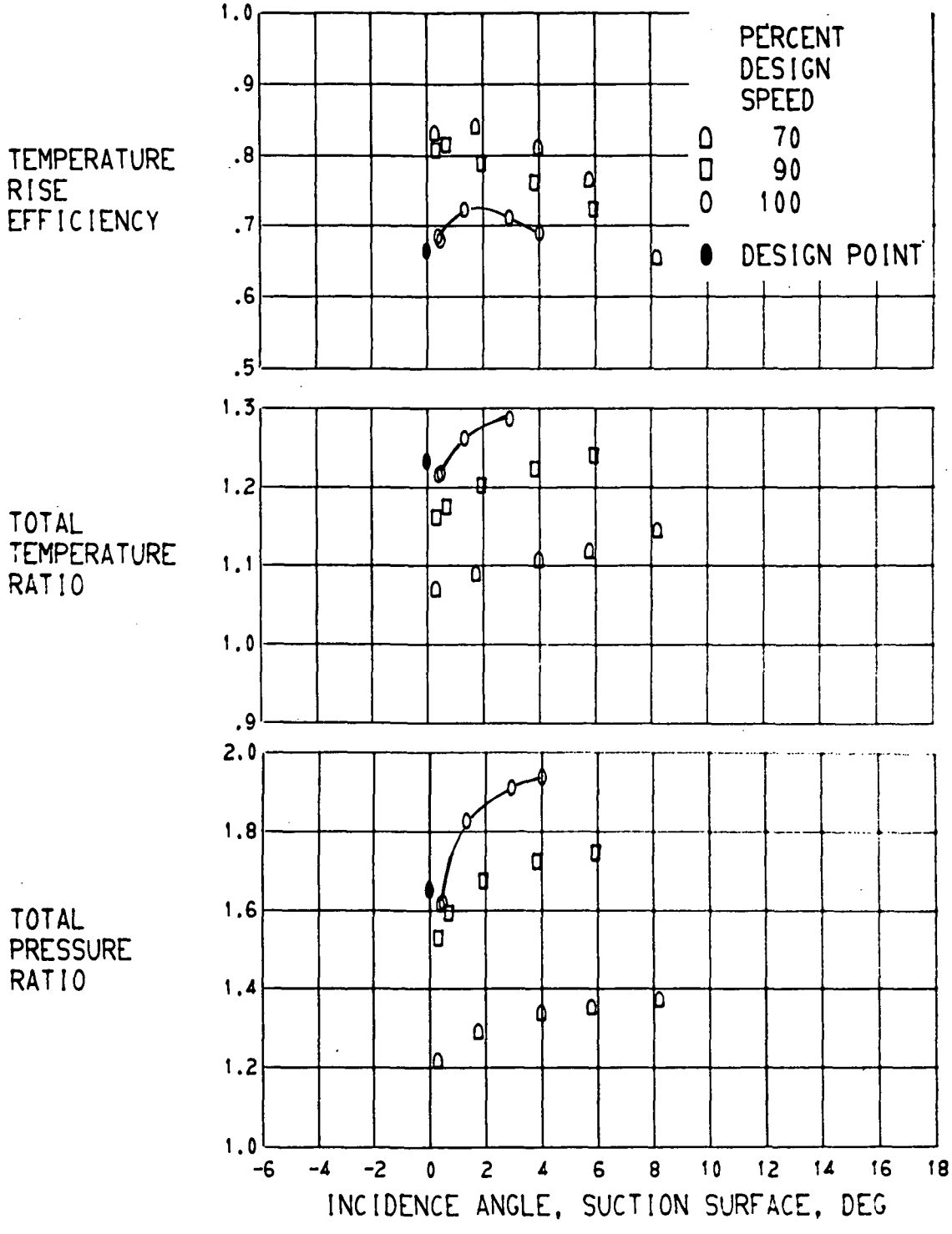
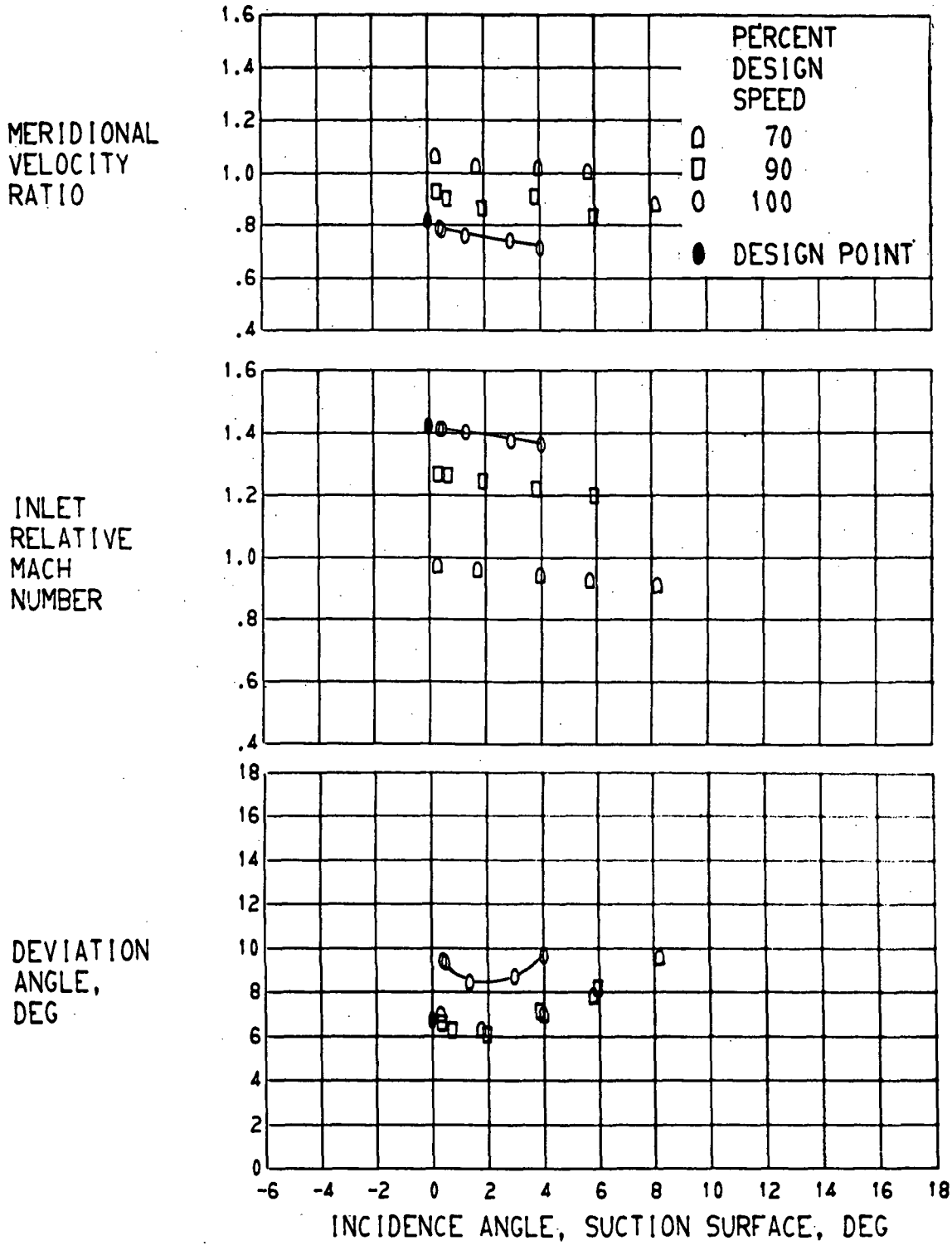


FIGURE 10. - CONCLUDED. RADIAL DISTRIBUTION OF PERFORMANCE FOR STATOR 1. 100 PERCENT DESIGN SPEED.



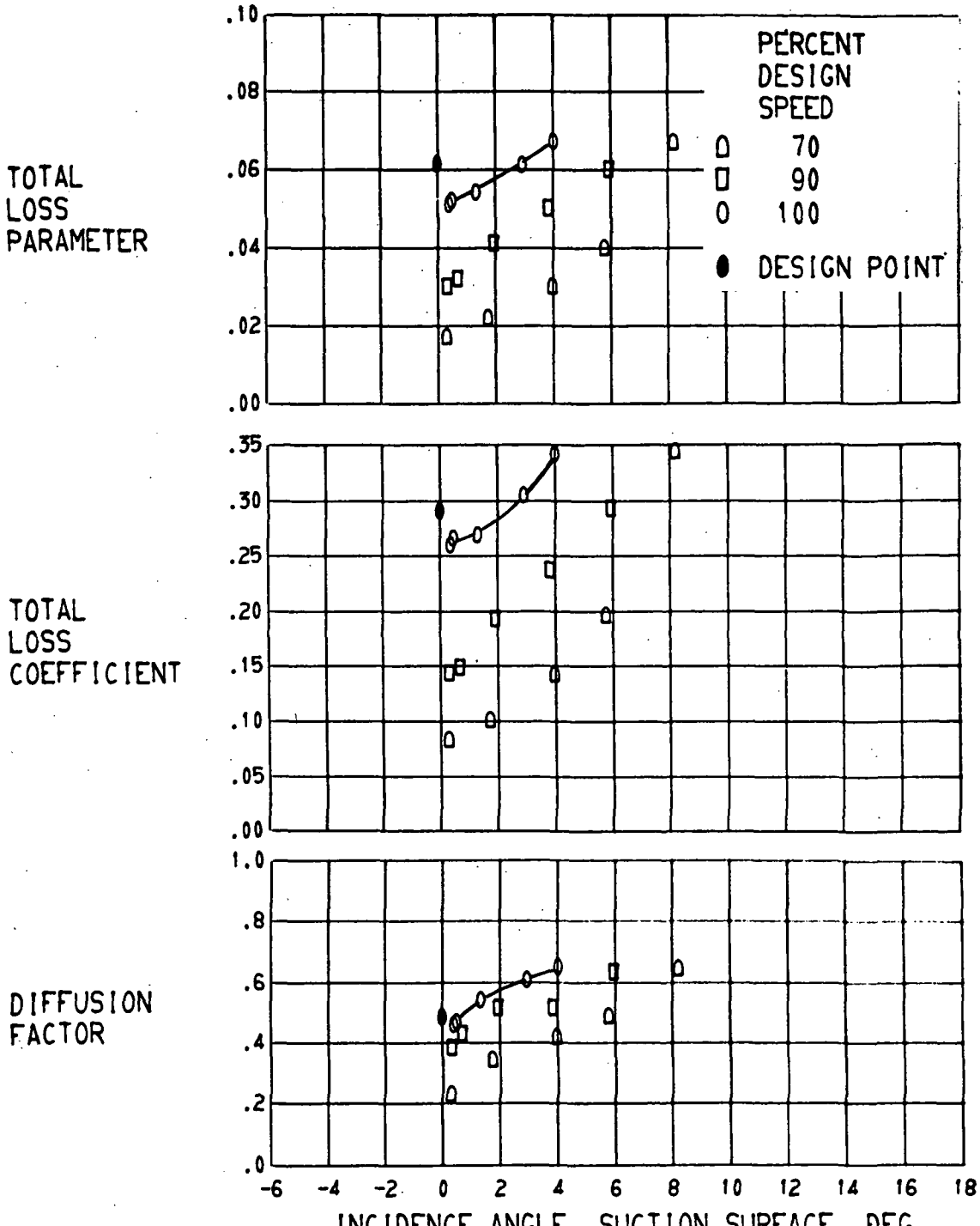
(A) 5.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



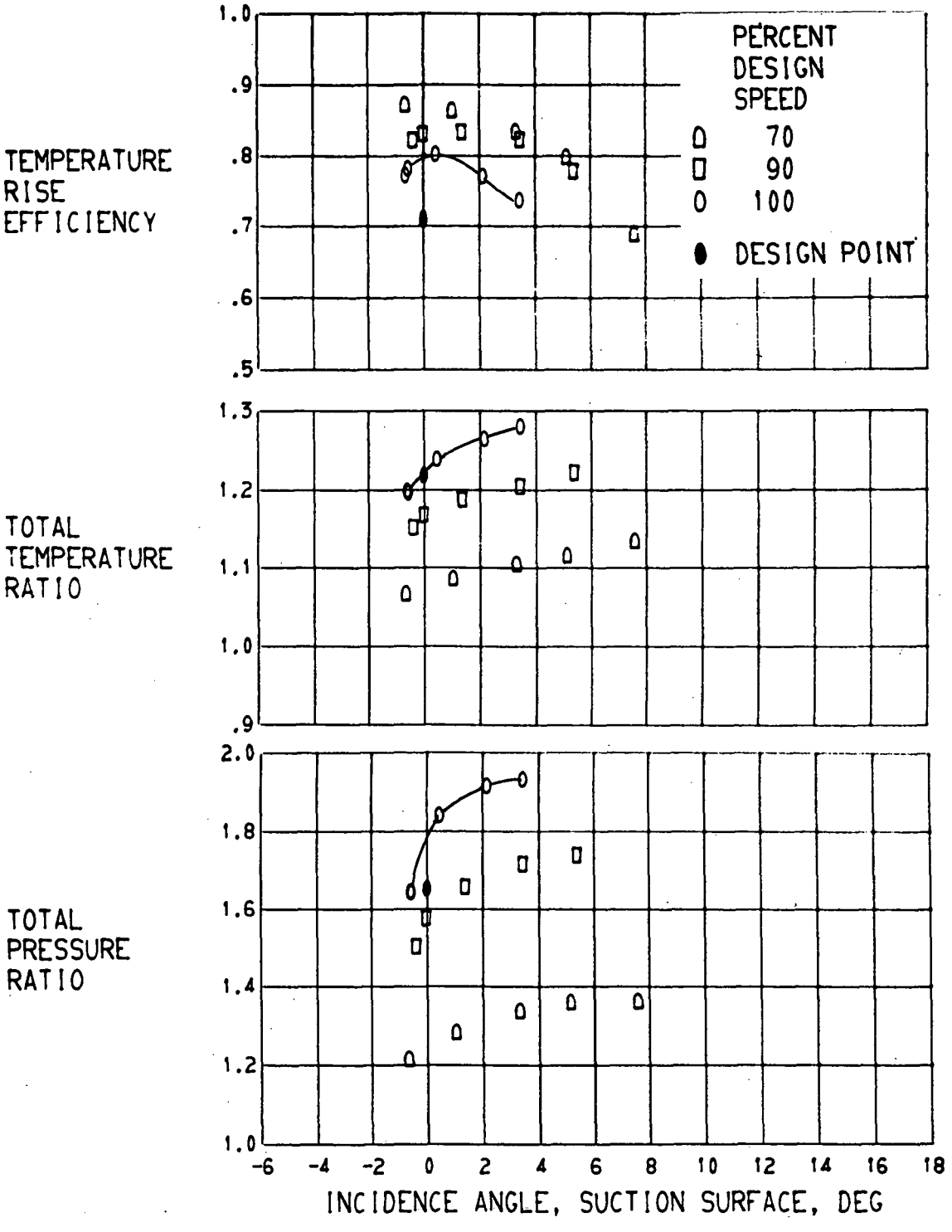
(A) CONTINUED. 5.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



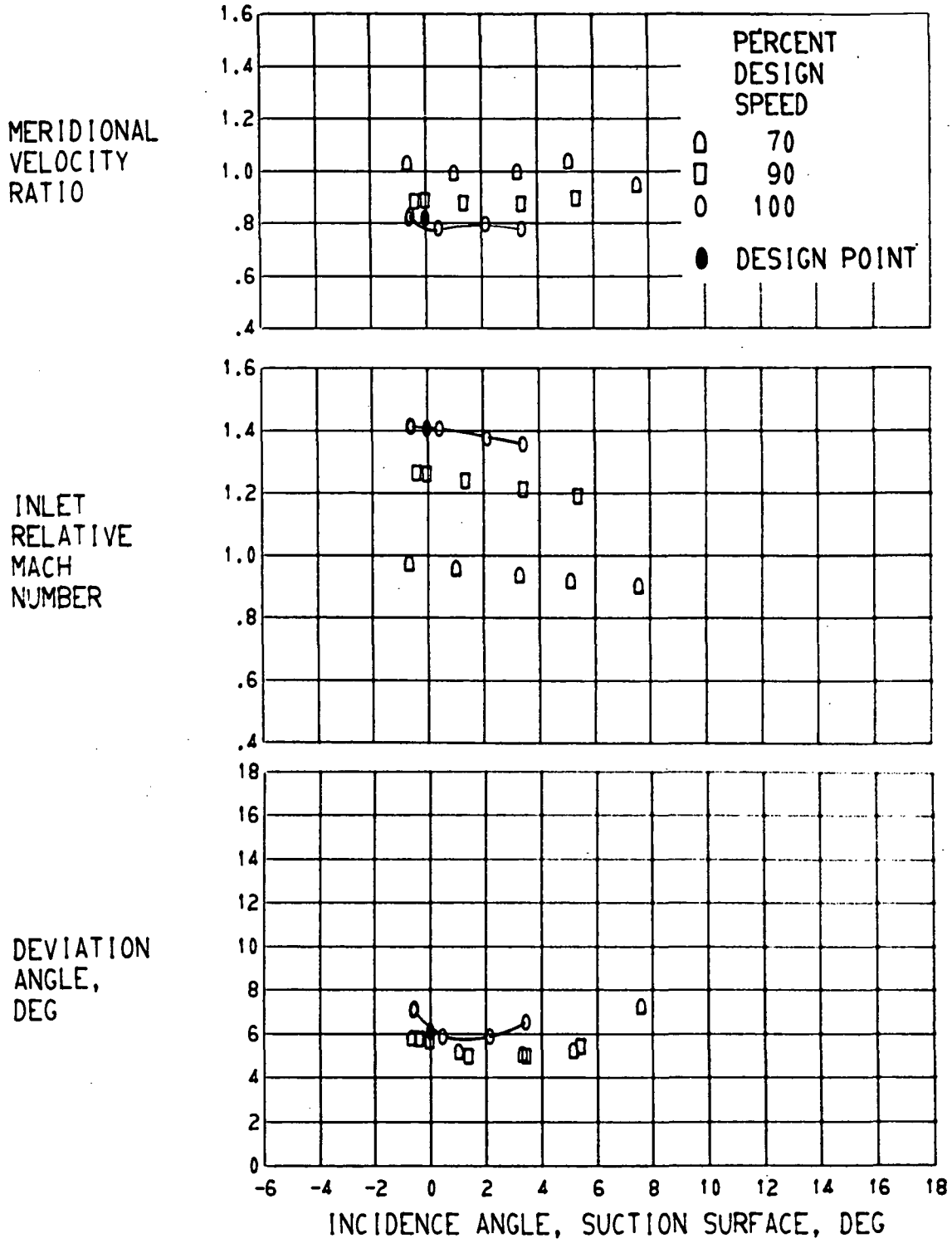
(A) CONCLUDED. 5.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



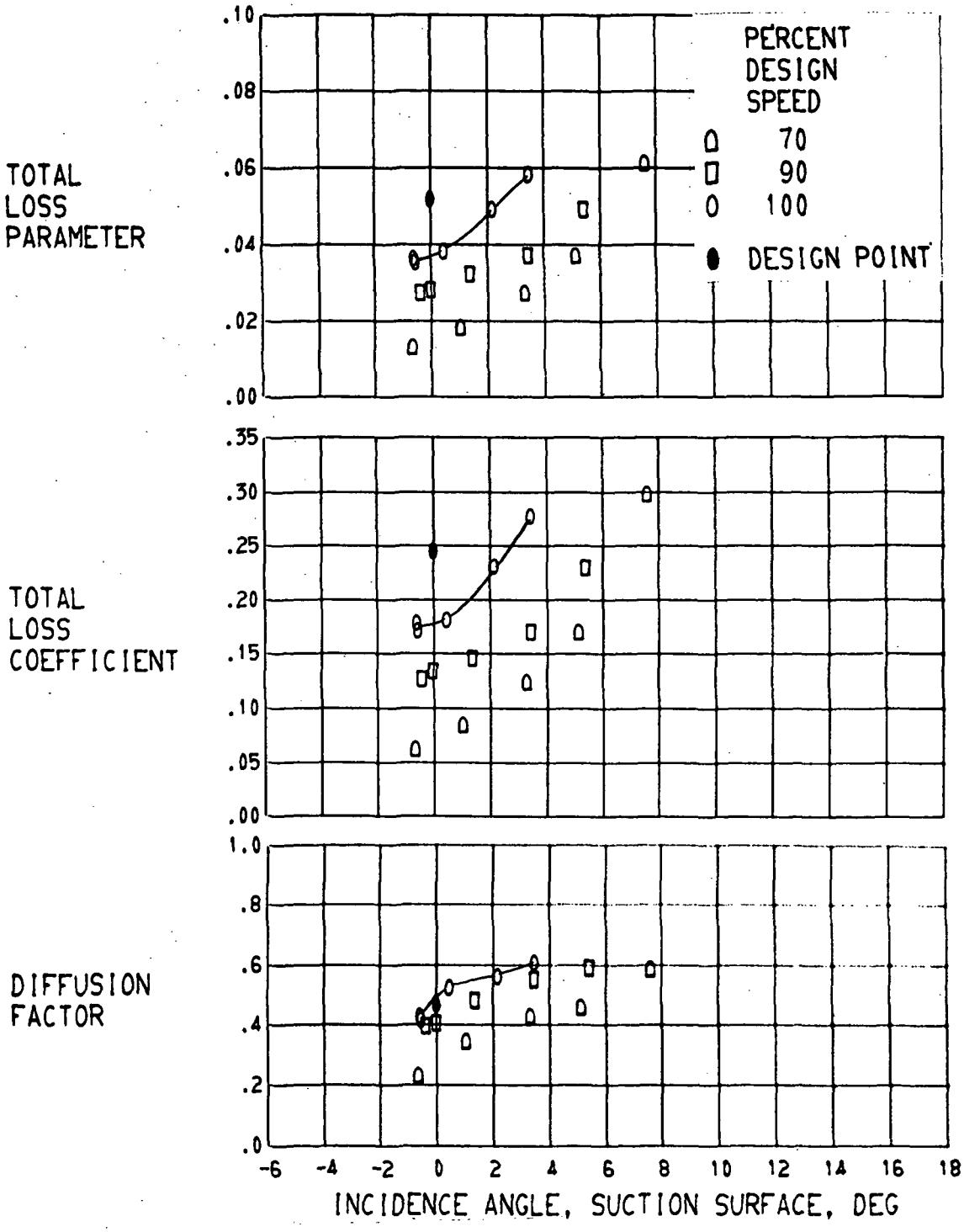
(B) 10.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



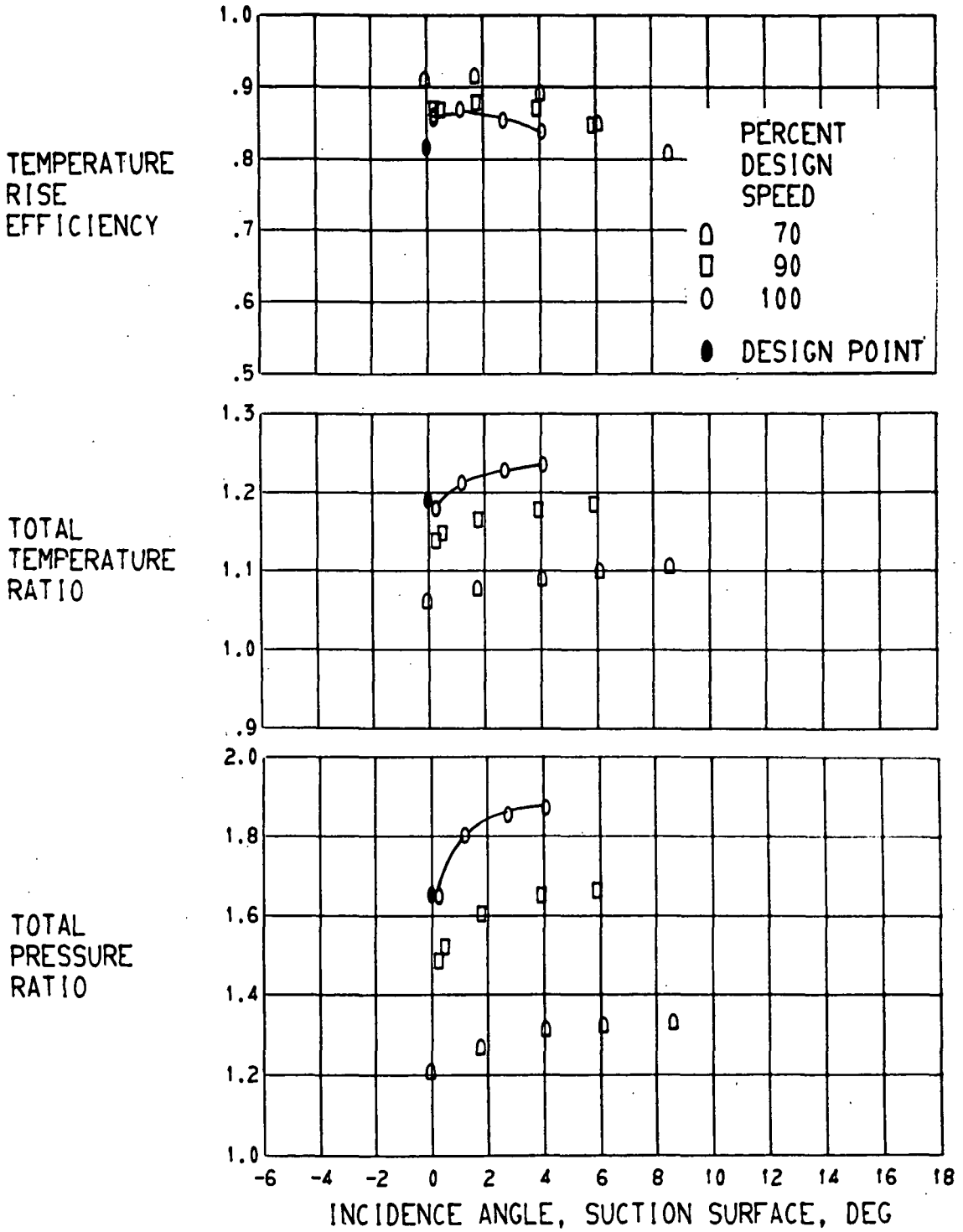
(B) CONTINUED. 10.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



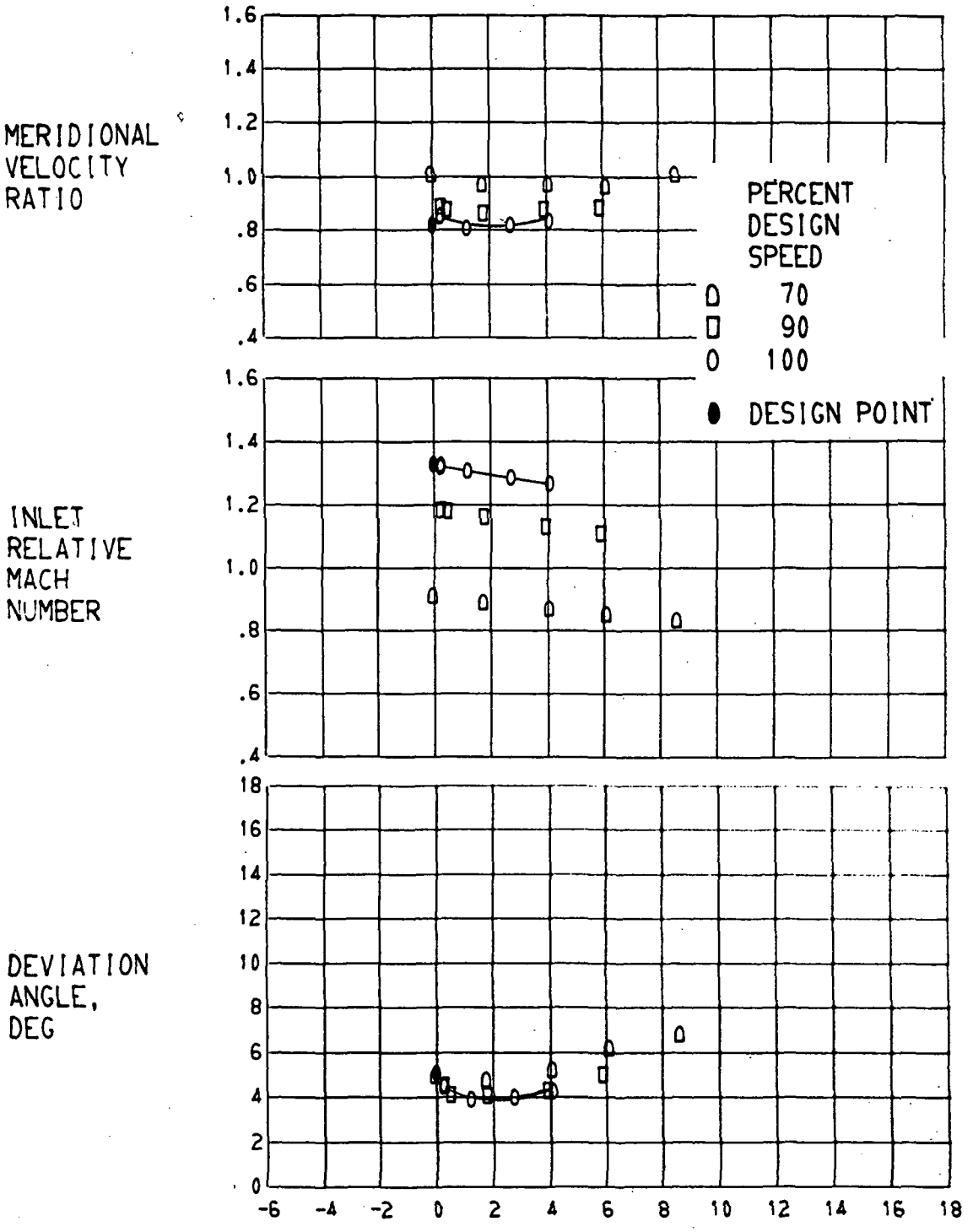
(B) CONCLUDED. 10.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



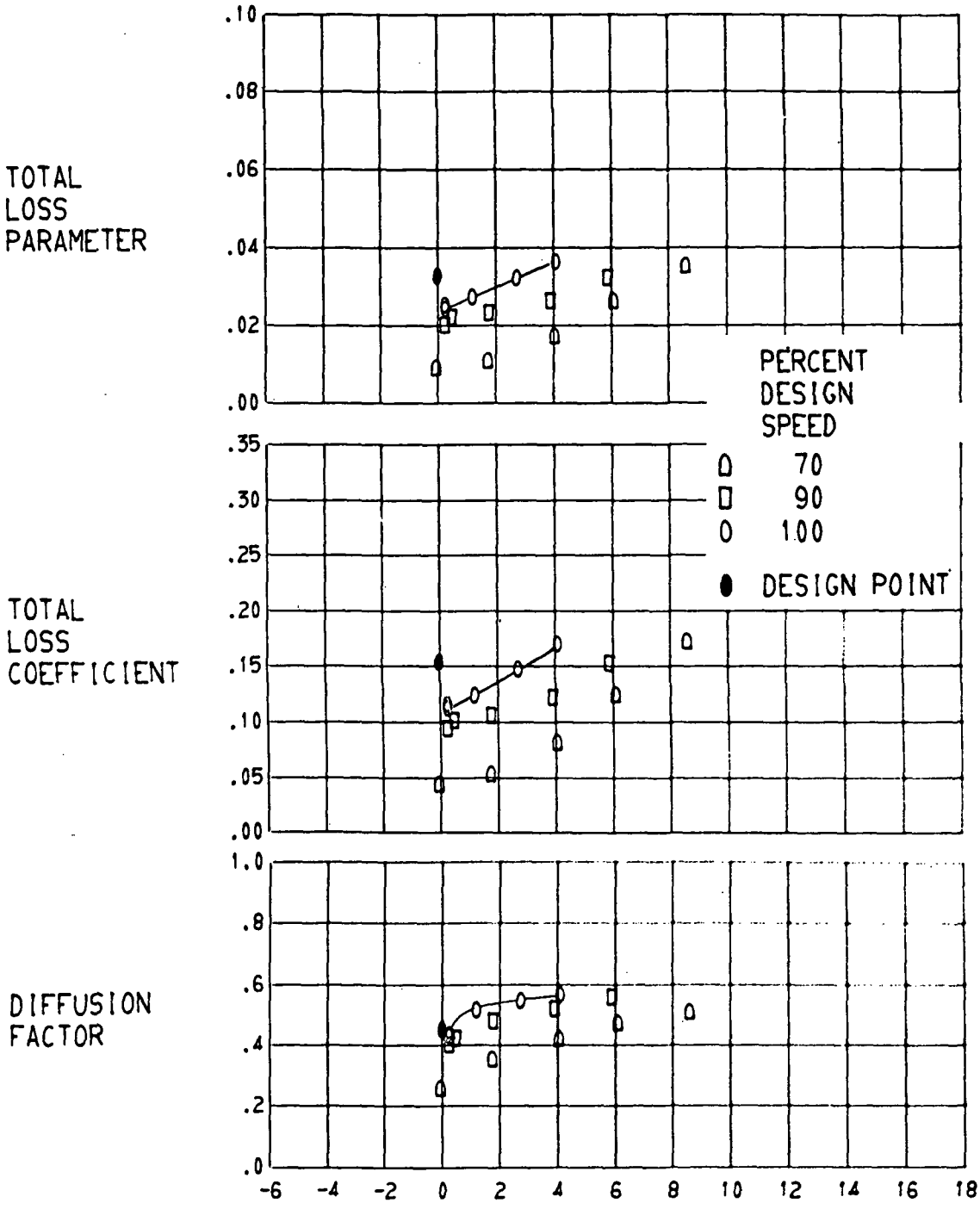
(C) 30.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



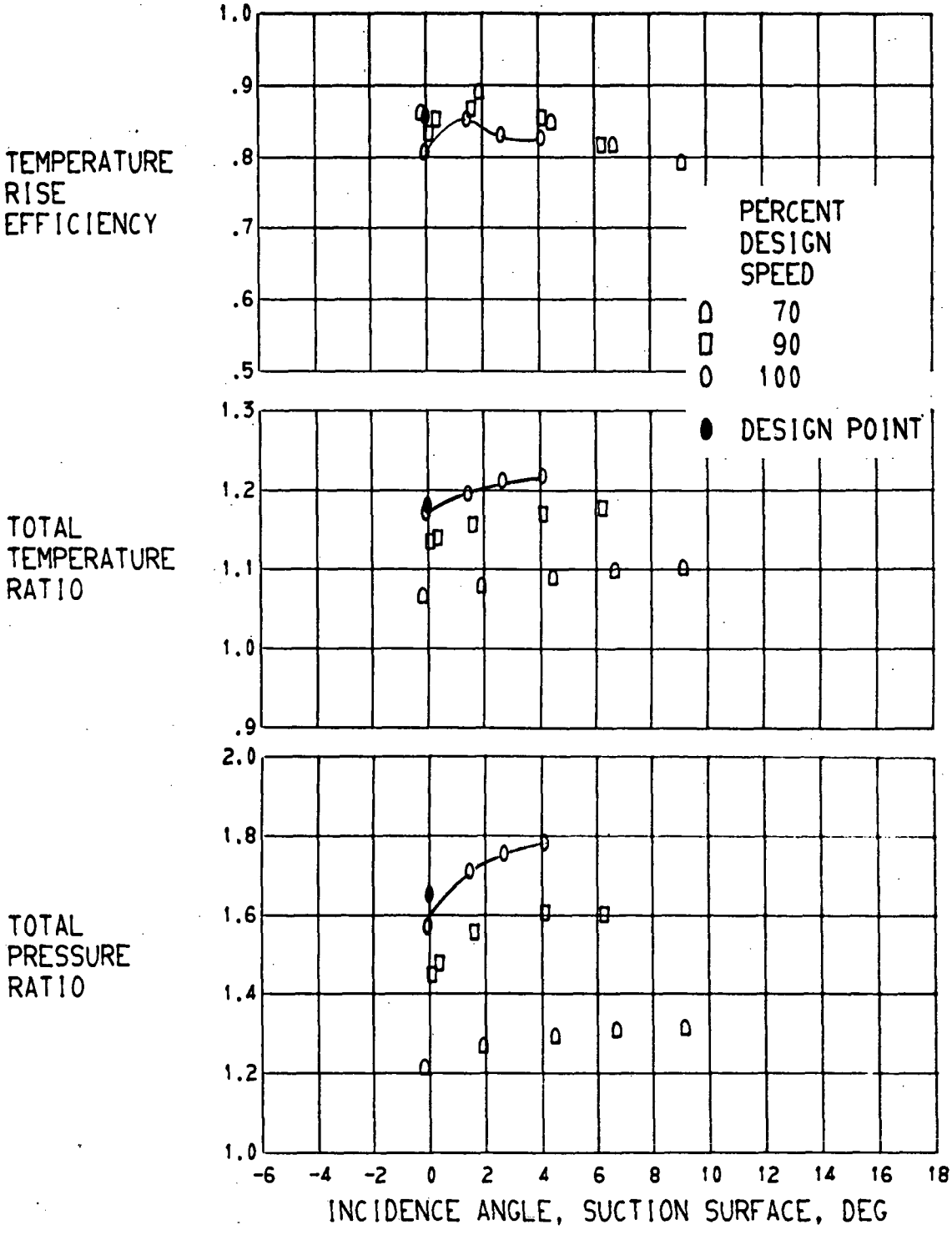
(C) CONTINUED. 30.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



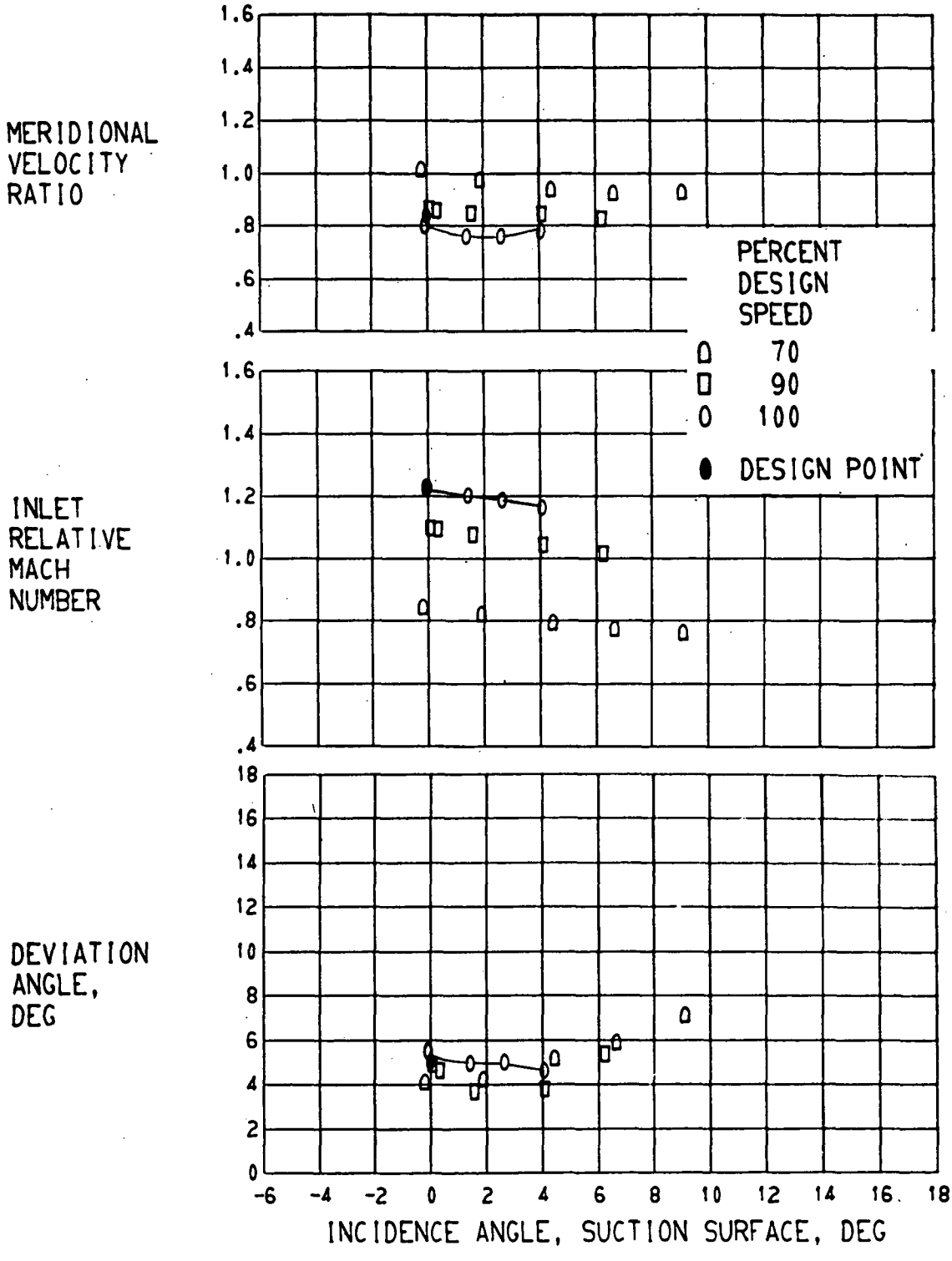
(C) CONCLUDED. 30.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



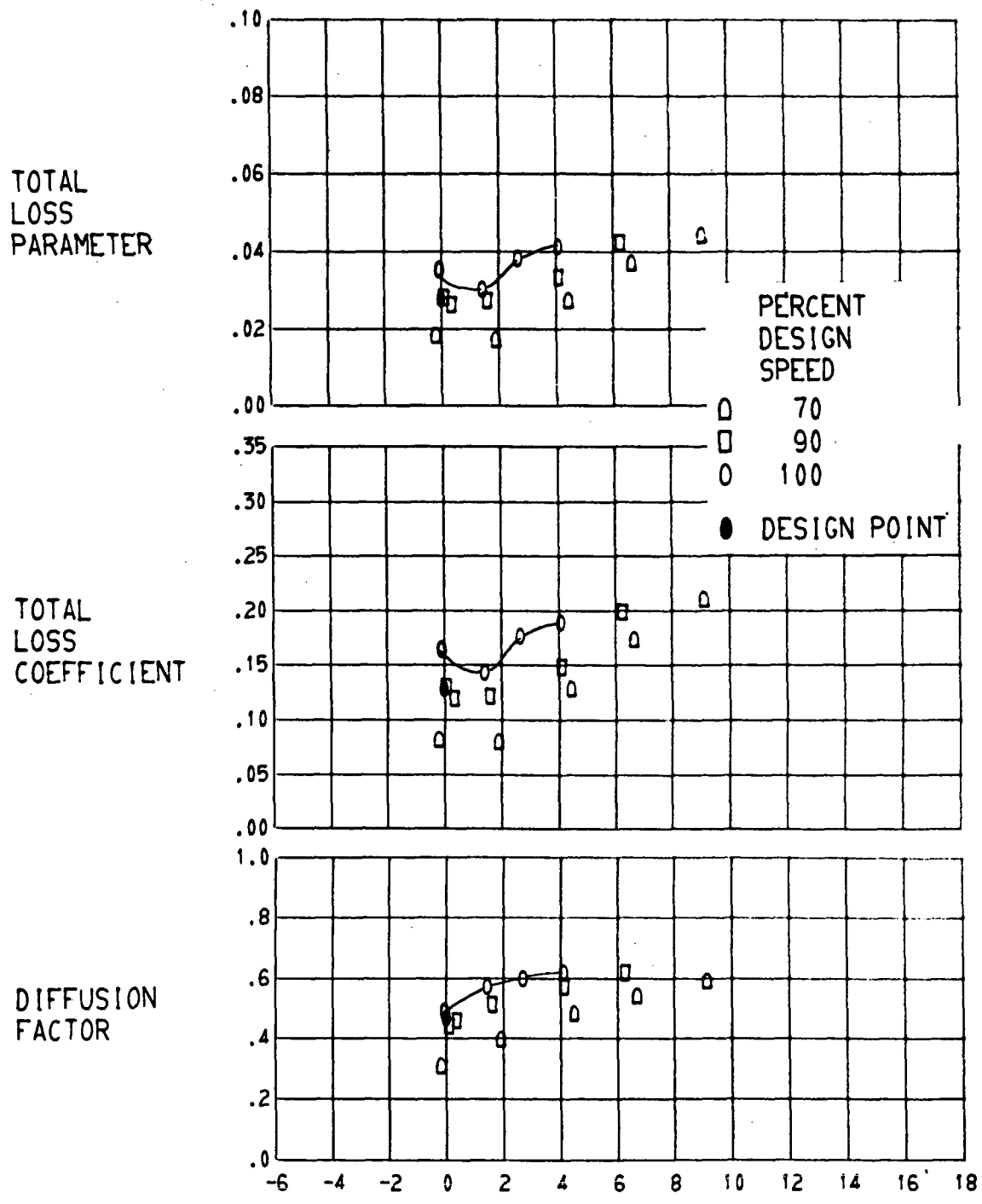
(D) 50.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



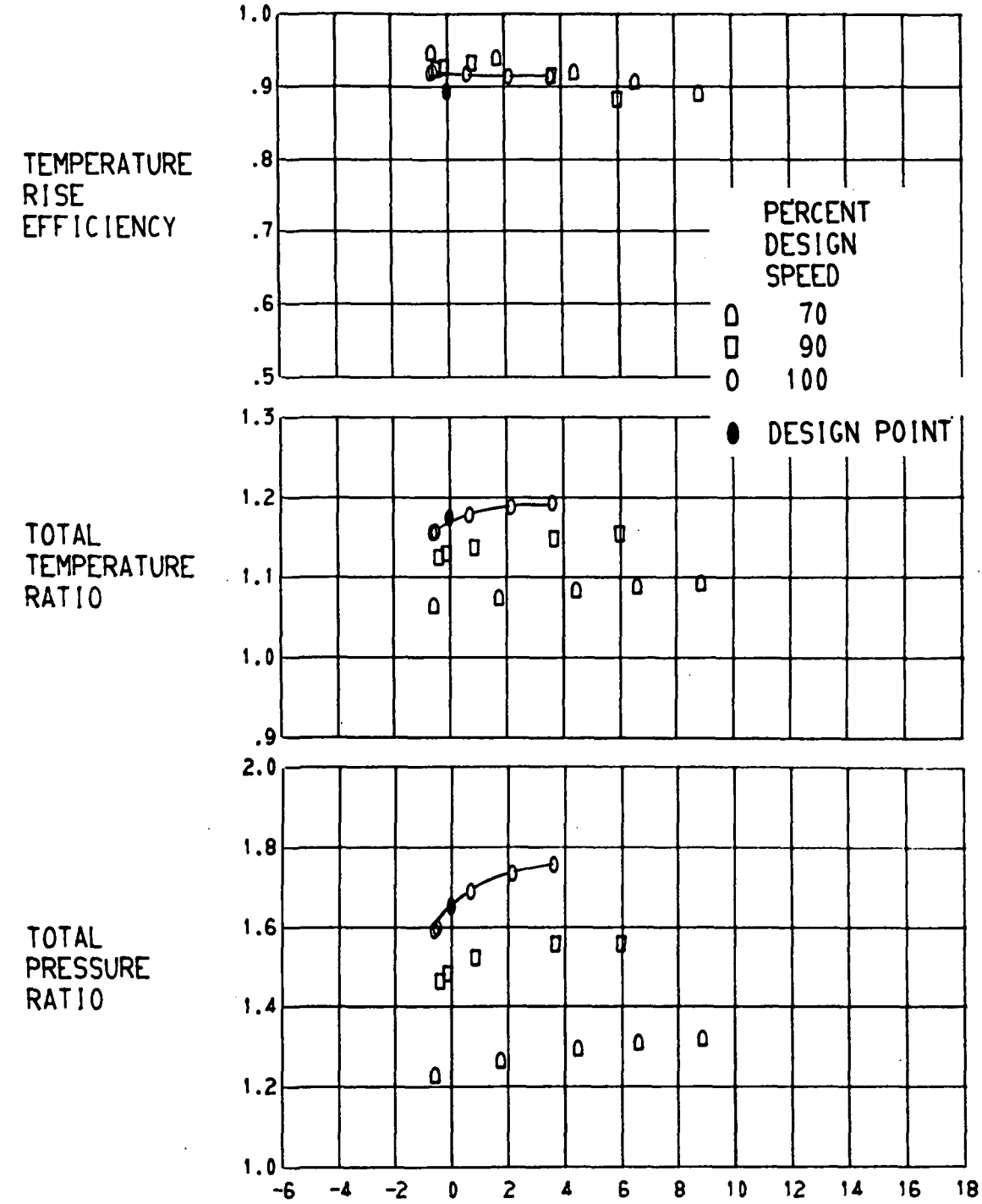
(D) CONTINUED. 50.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



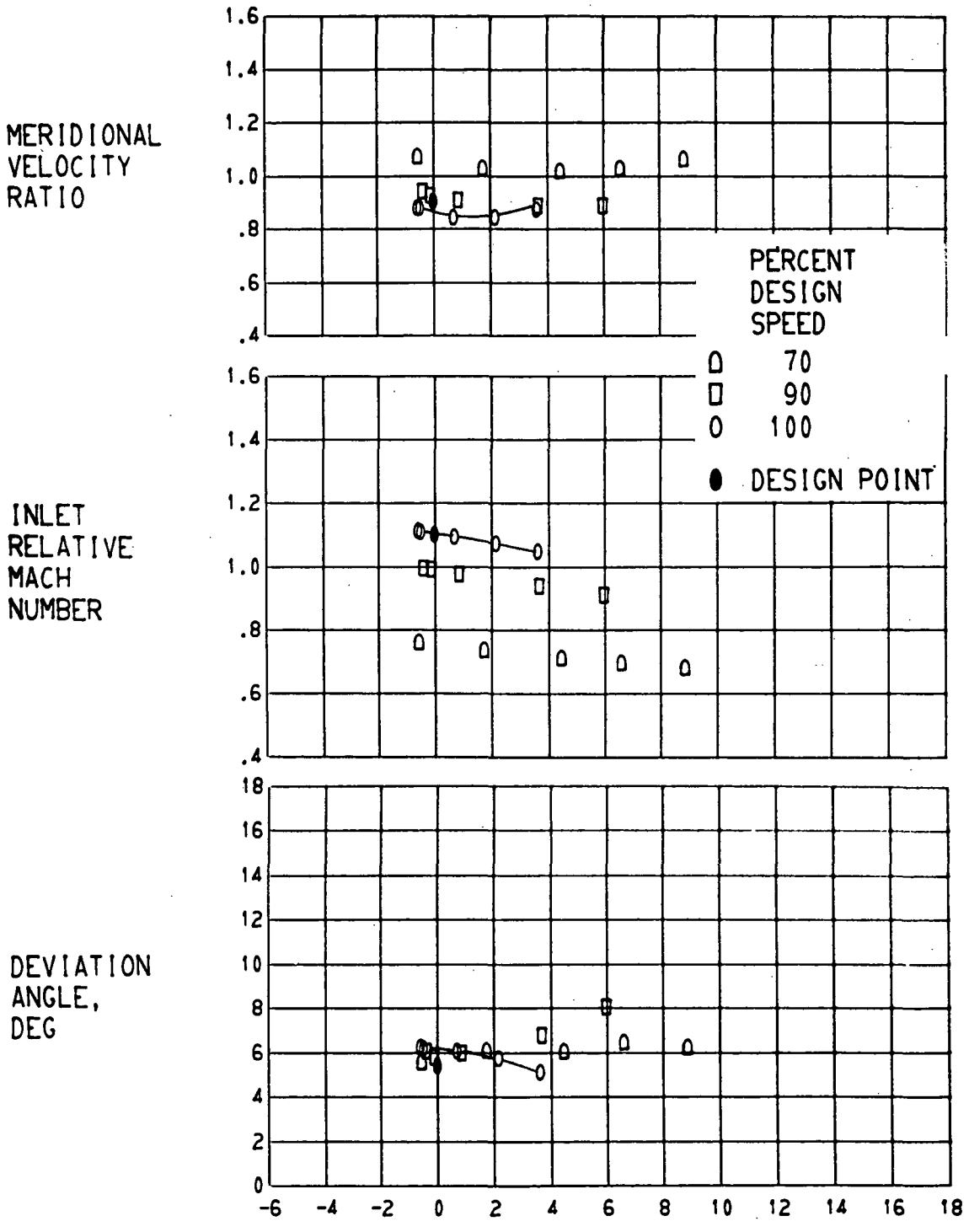
(D) CONCLUDED. 50.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



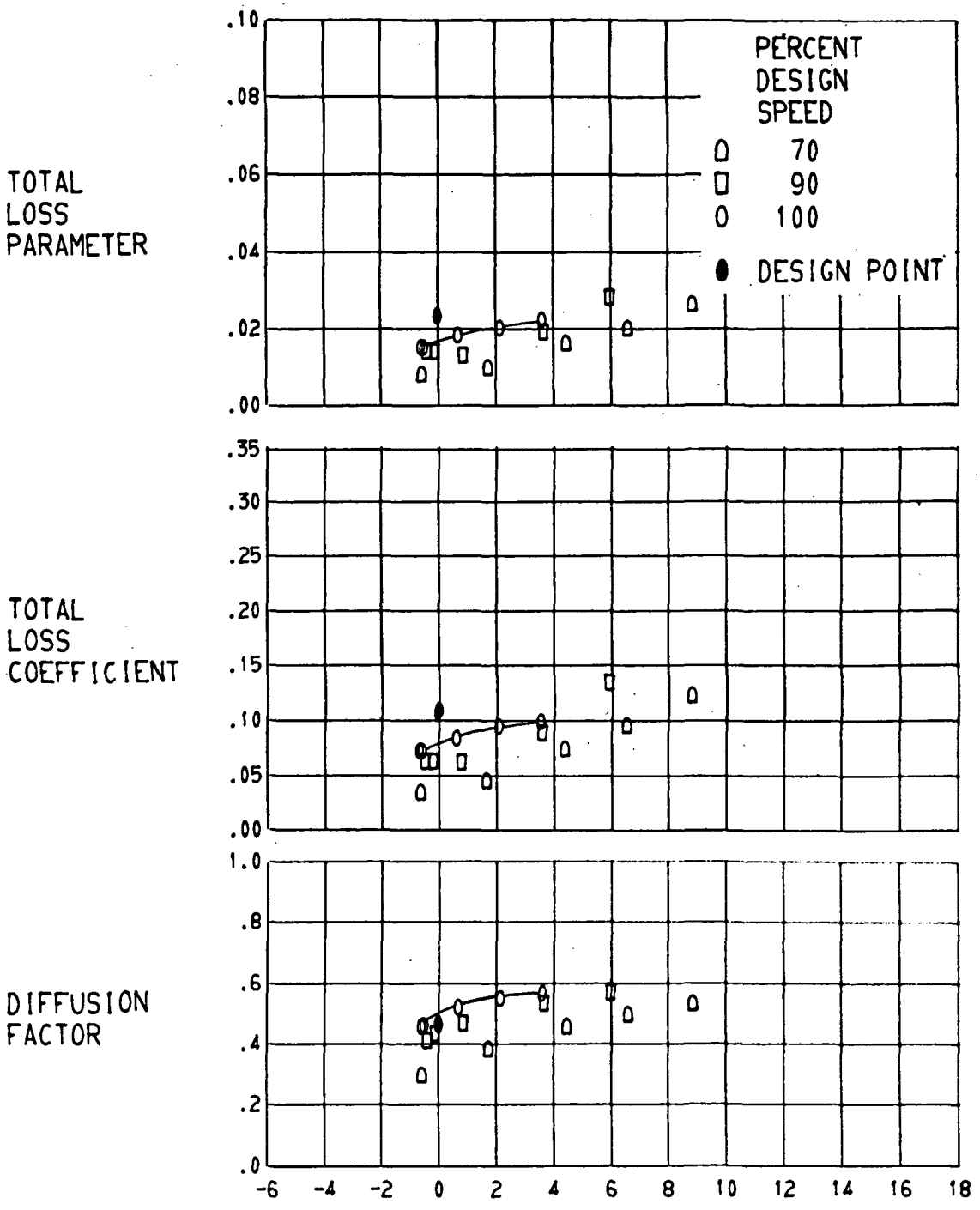
(E) 70.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



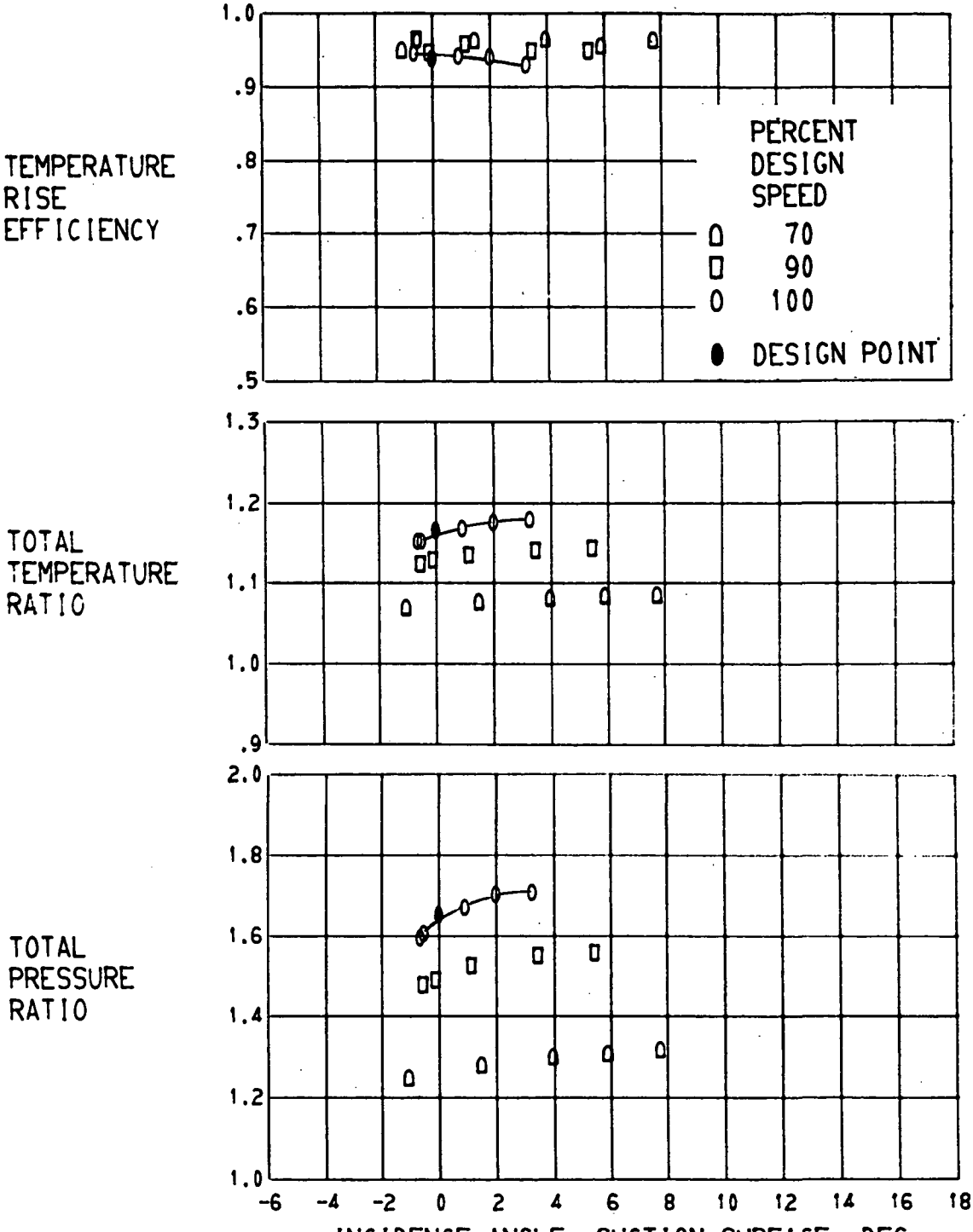
(E) CONTINUED. 70.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



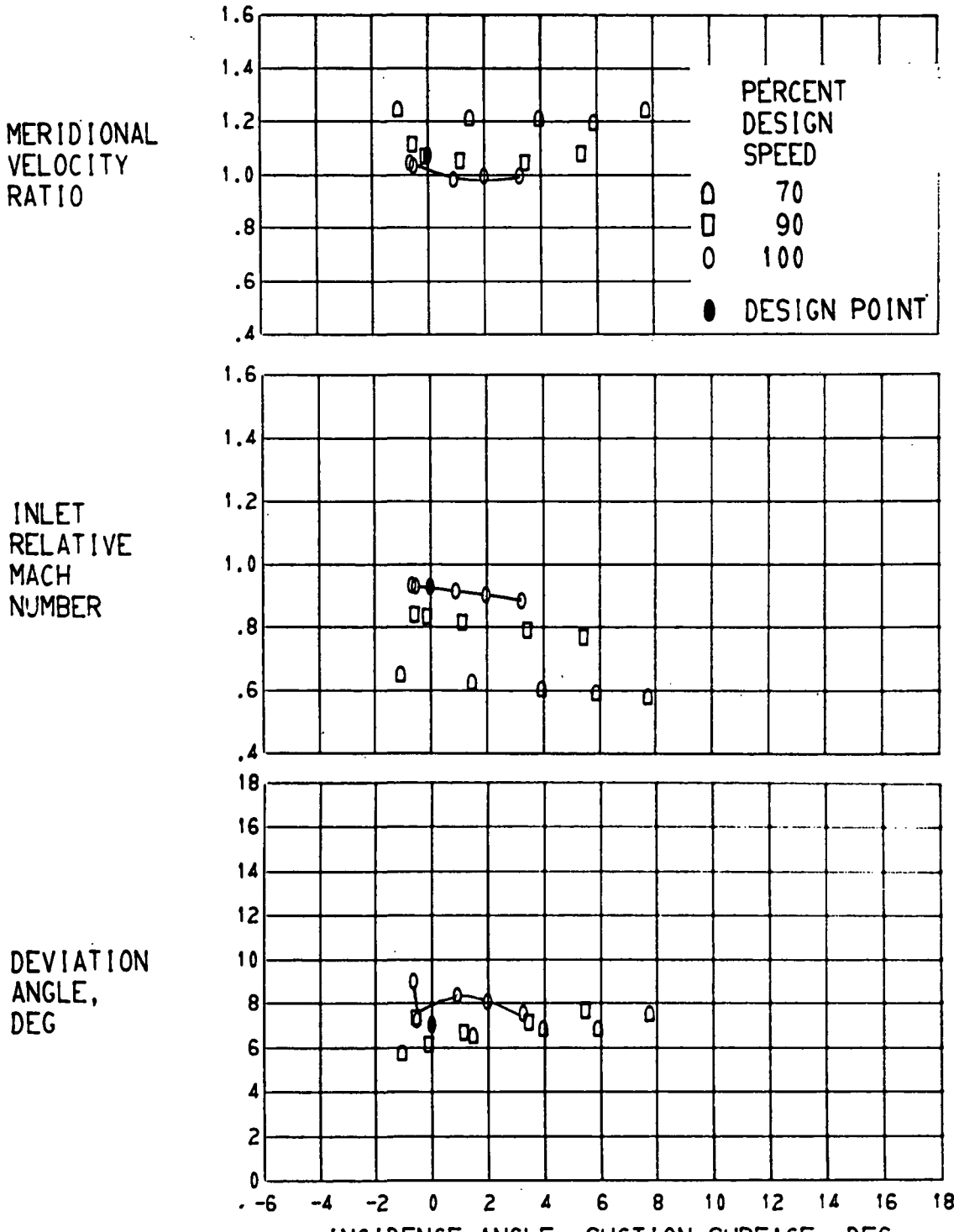
(E) CONCLUDED. 70.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



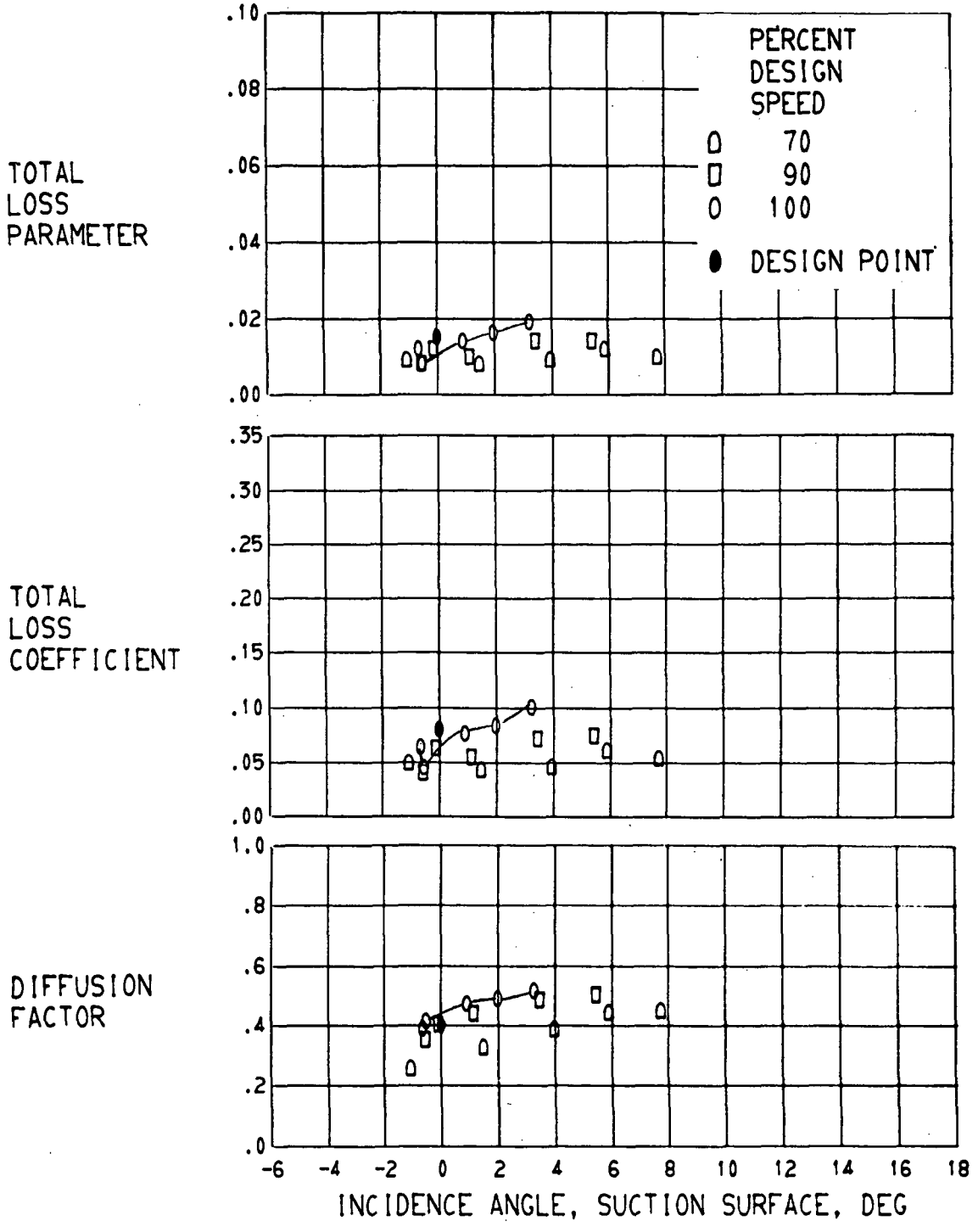
(F) 90.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



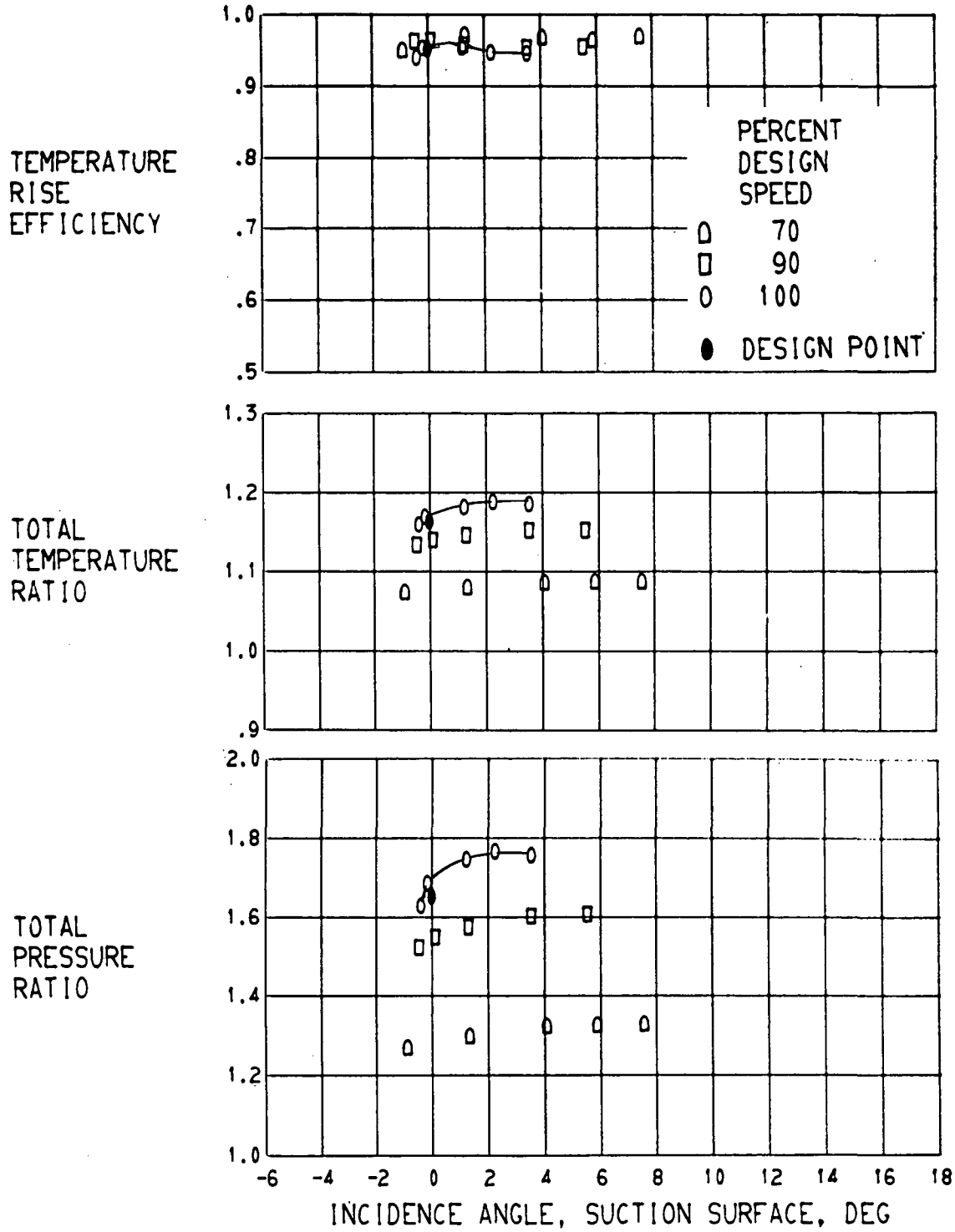
(F) CONTINUED. 90.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



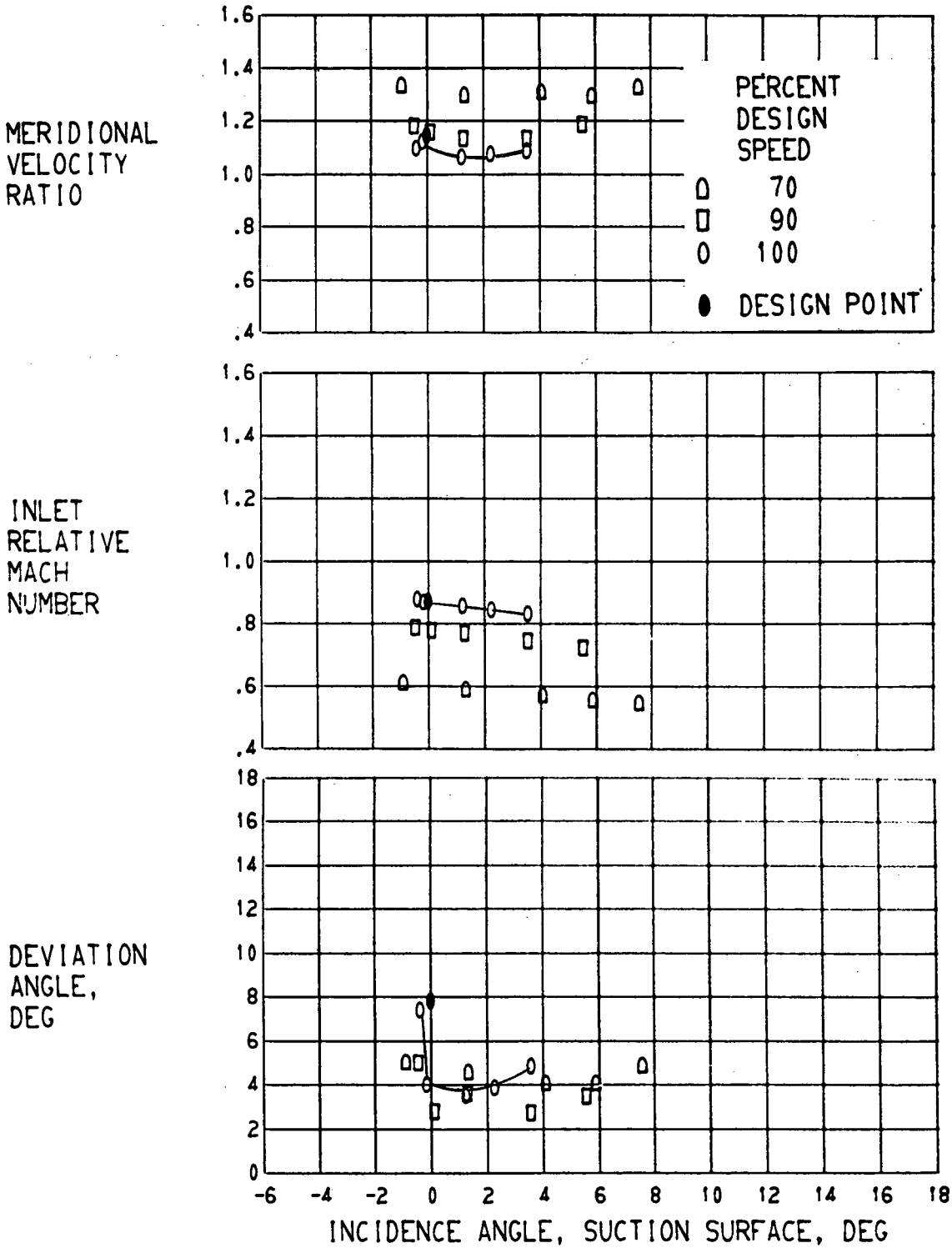
(F) CONCLUDED. 90.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



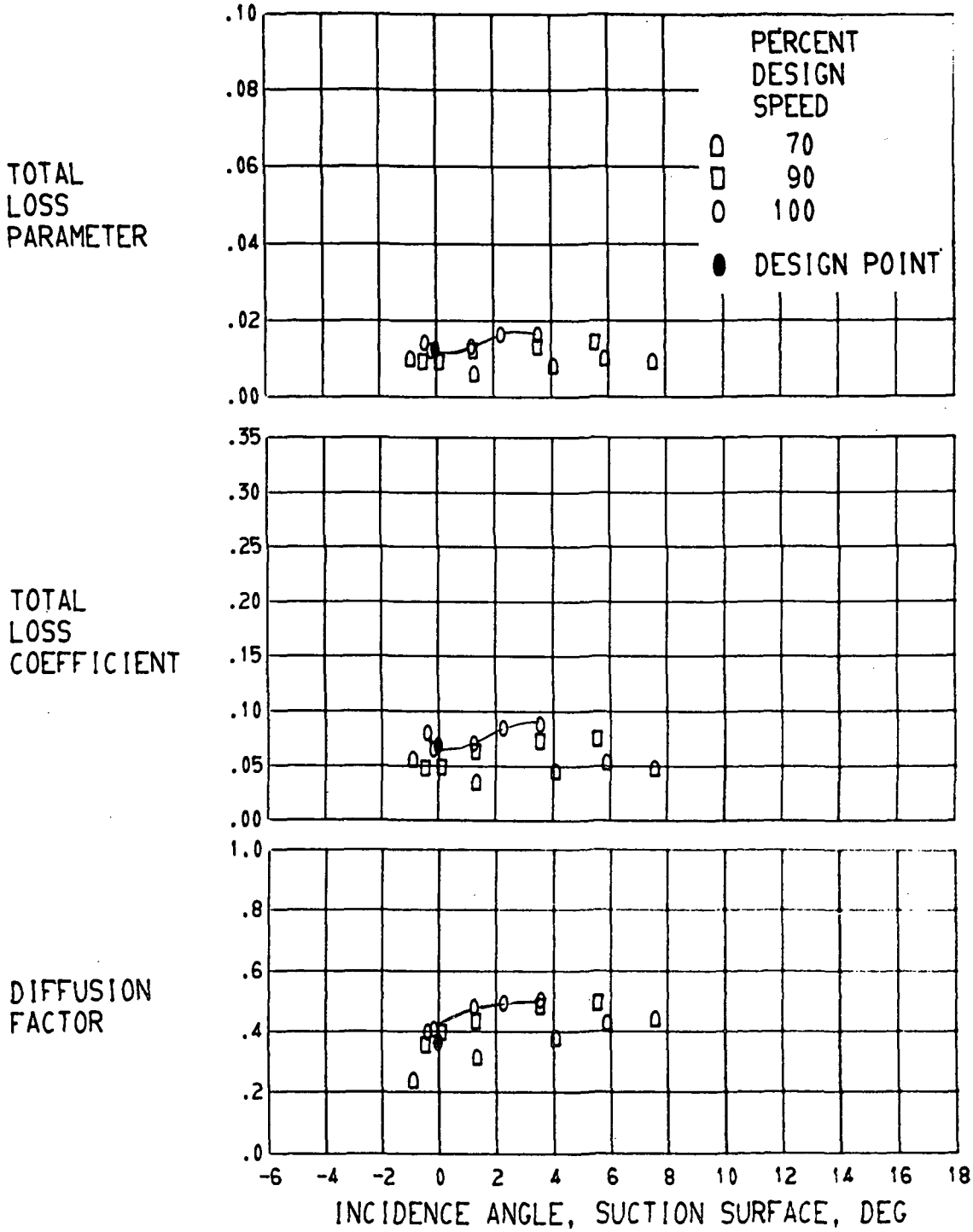
(G) 95.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



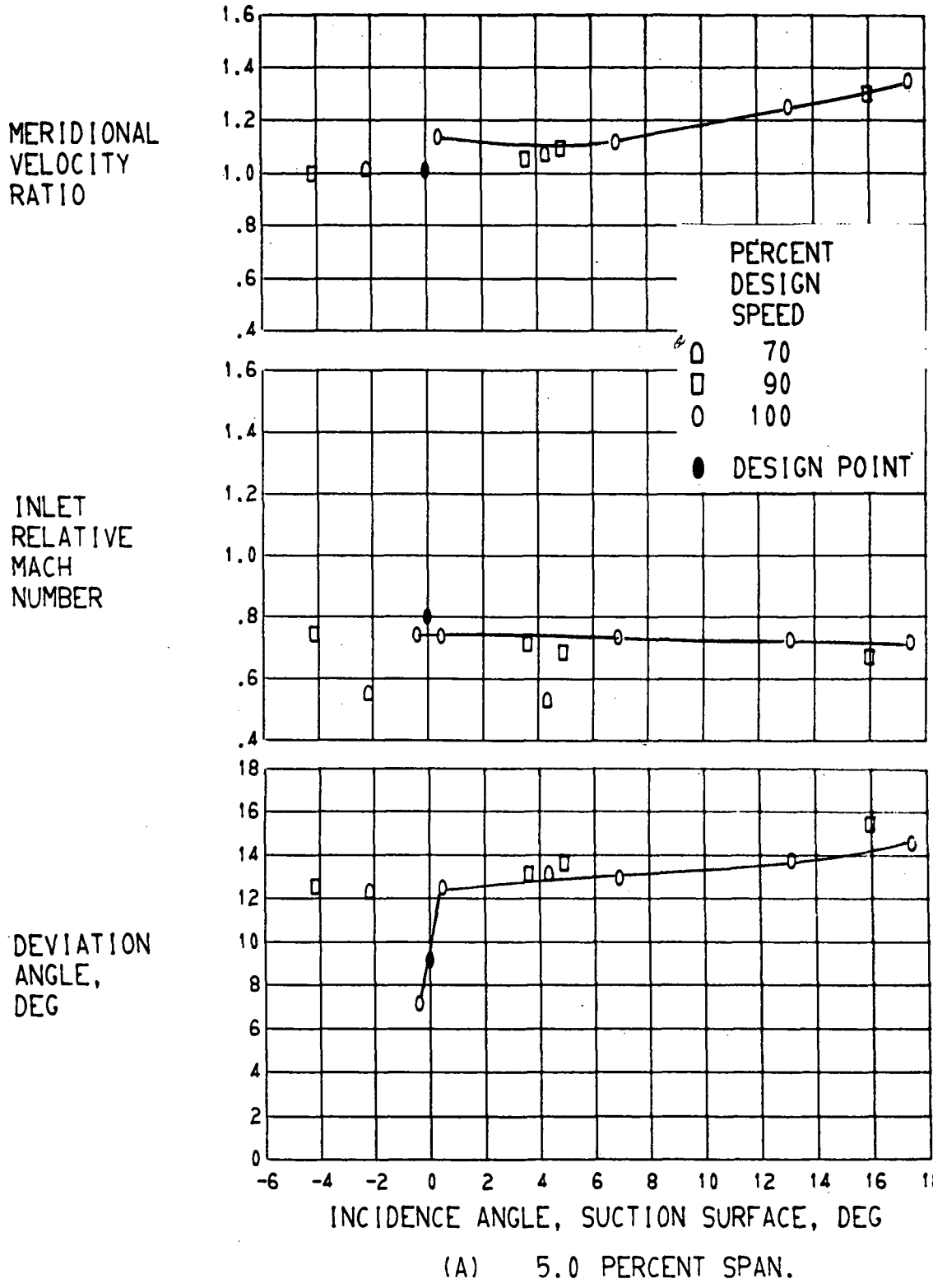
(G) CONTINUED. 95.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



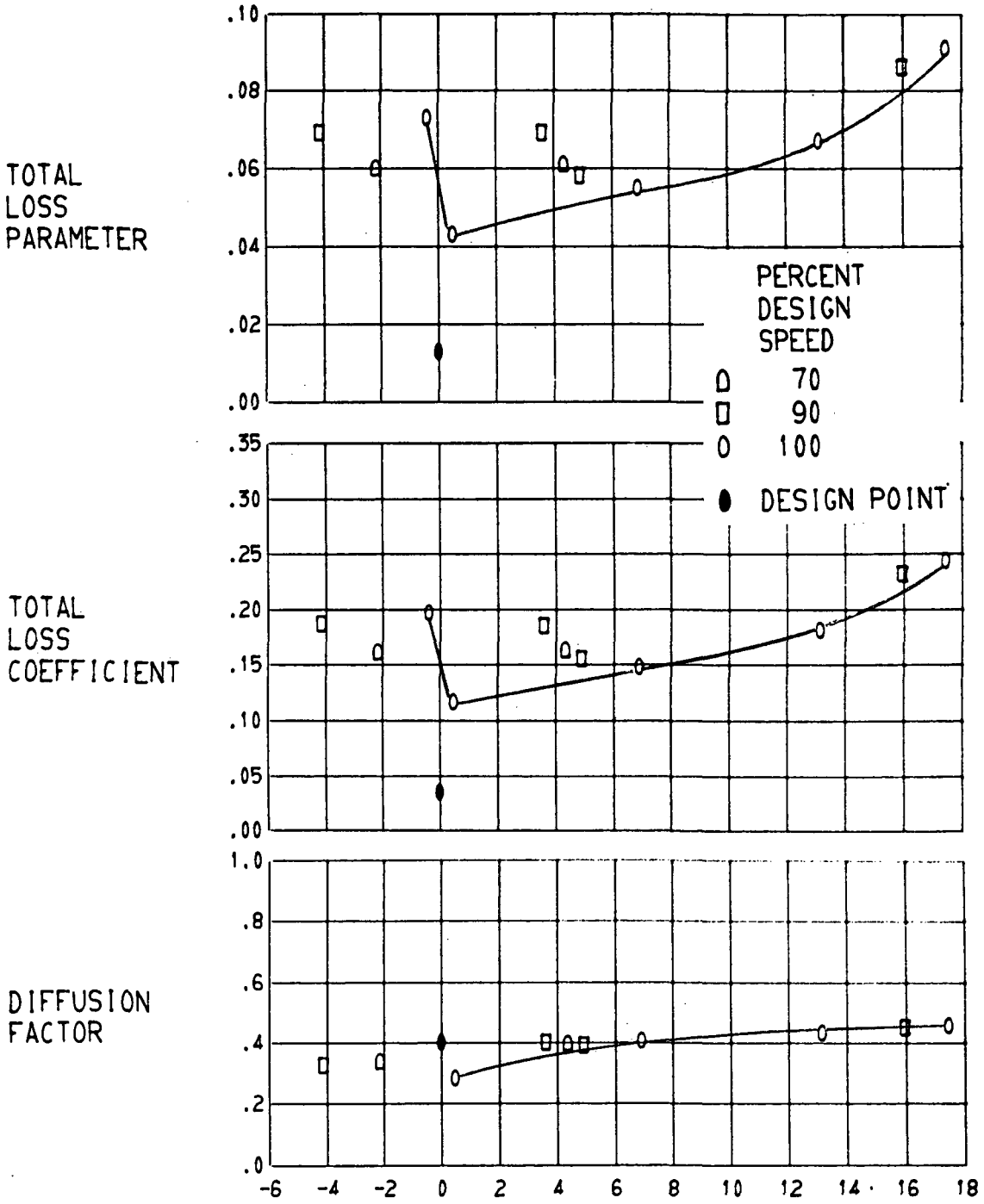
(G) CONCLUDED. 95.0 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 6.



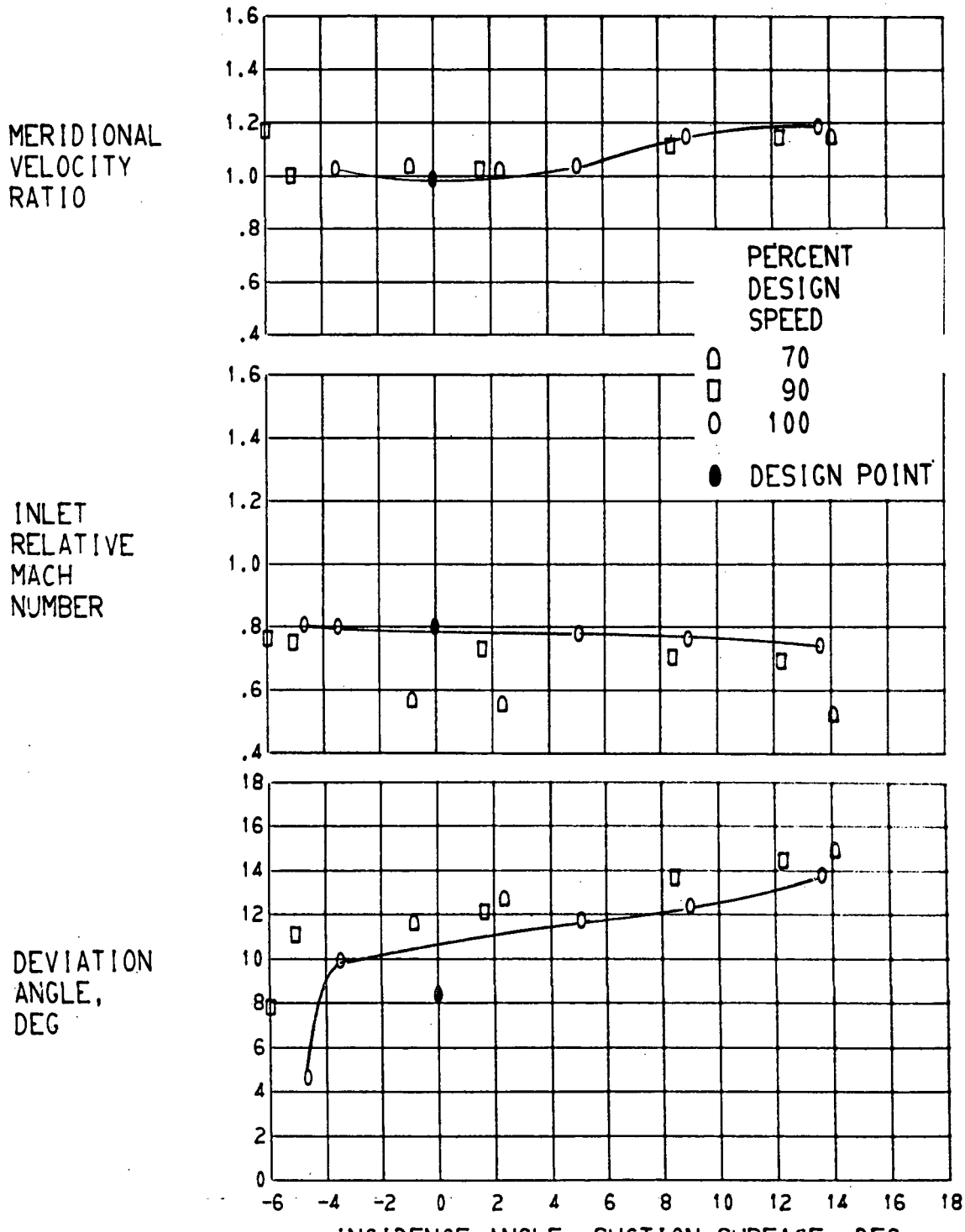
(A) 5.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



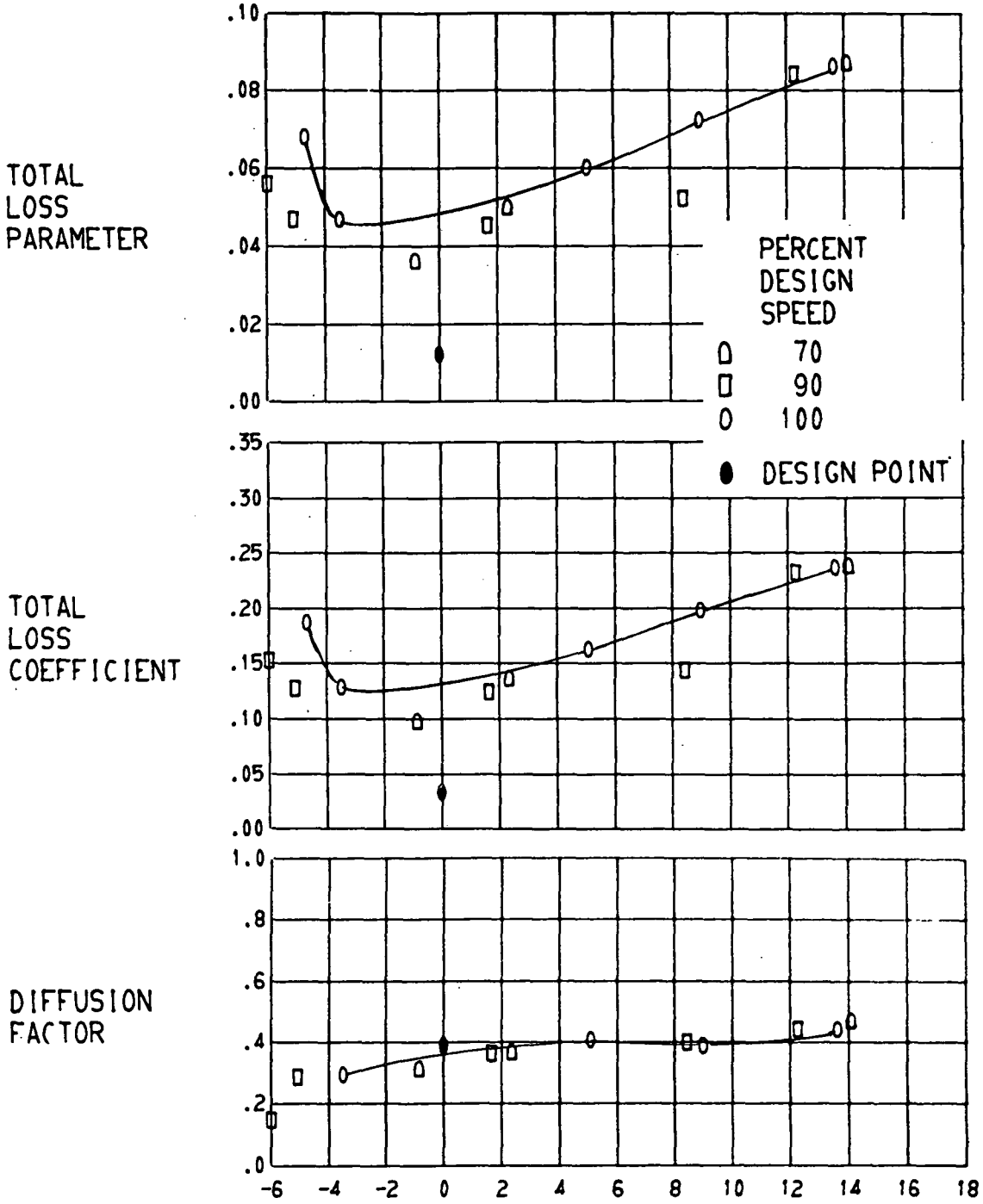
(A) CONCLUDED. 5.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



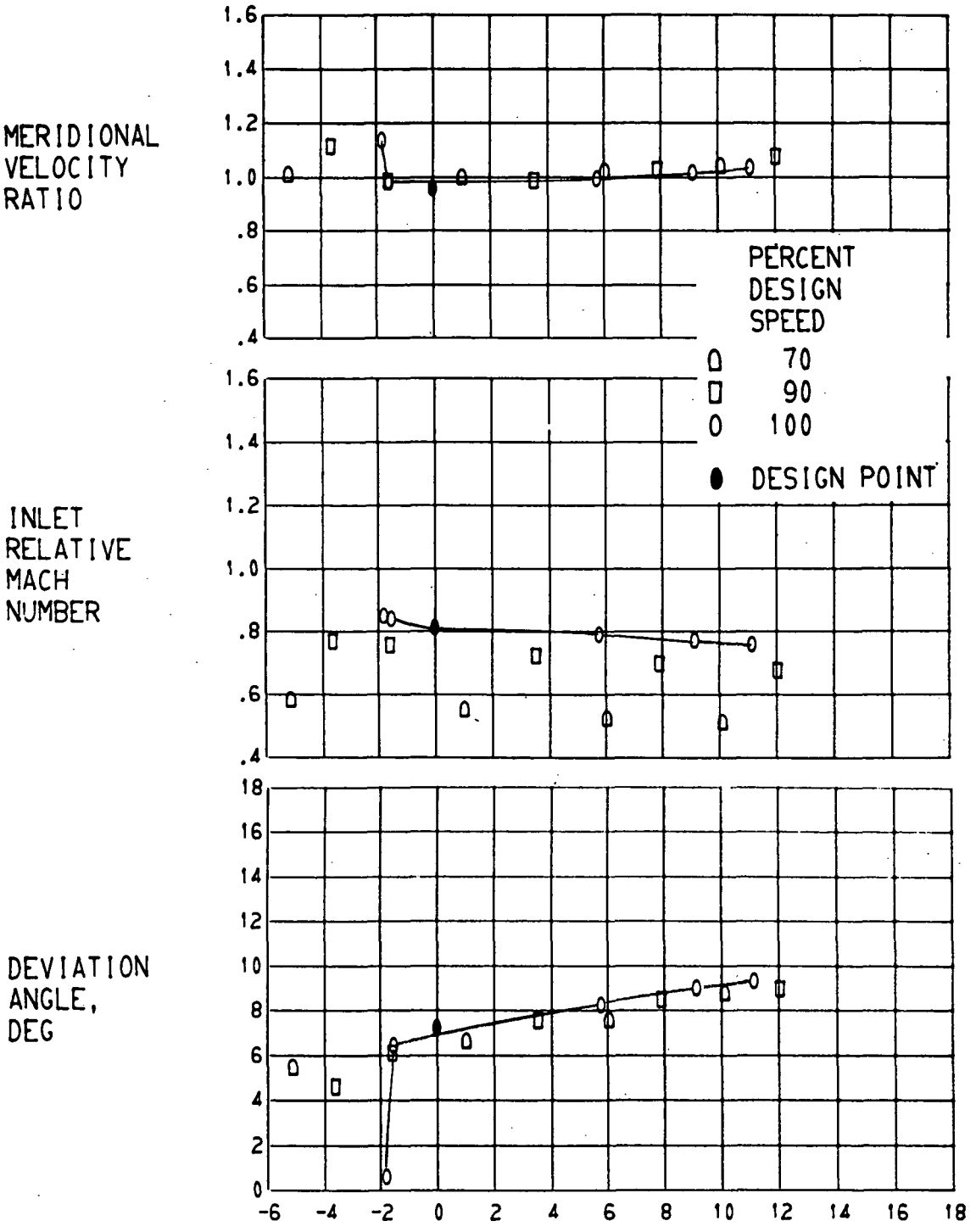
(B) 10.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



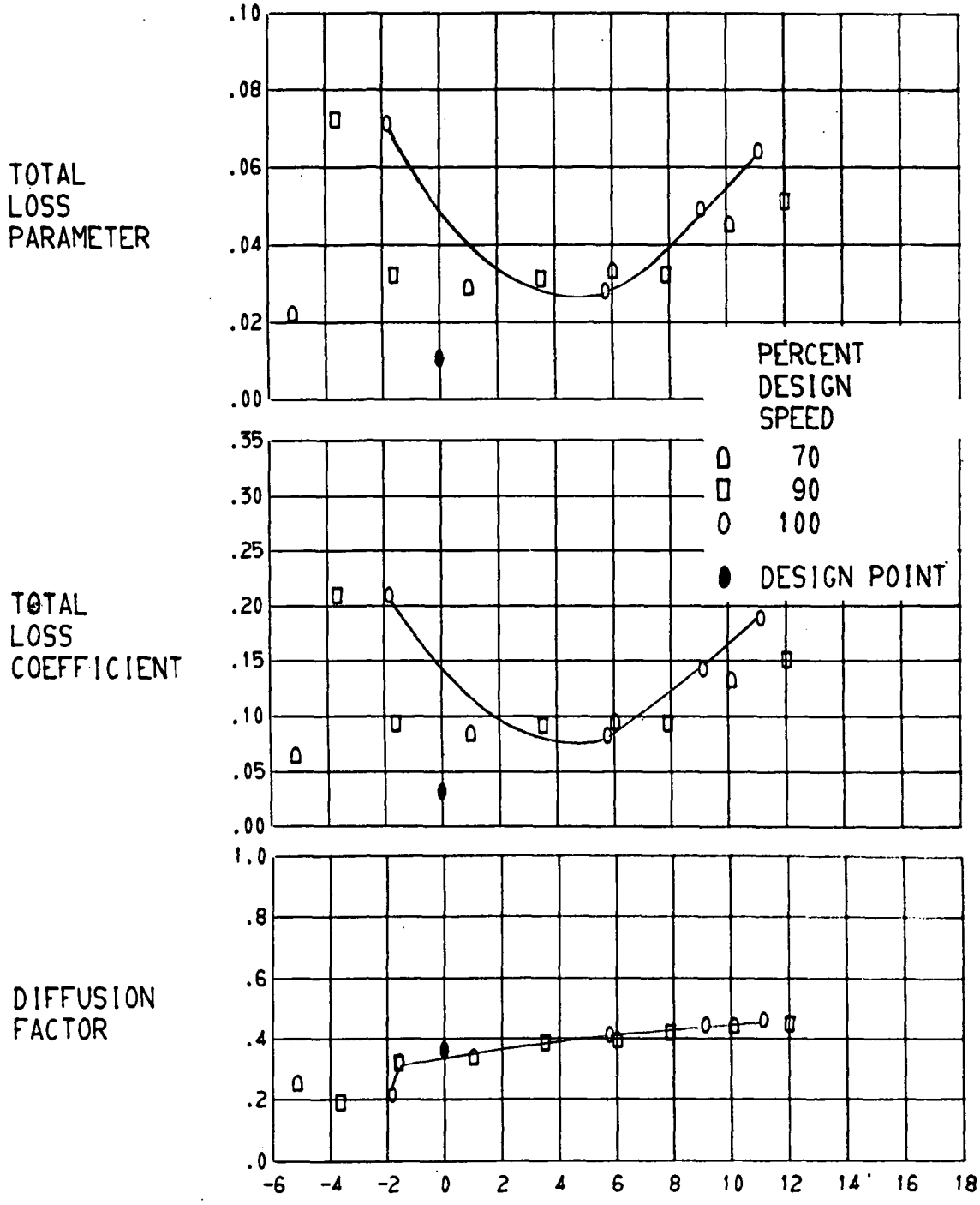
(B) CONCLUDED. 10.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



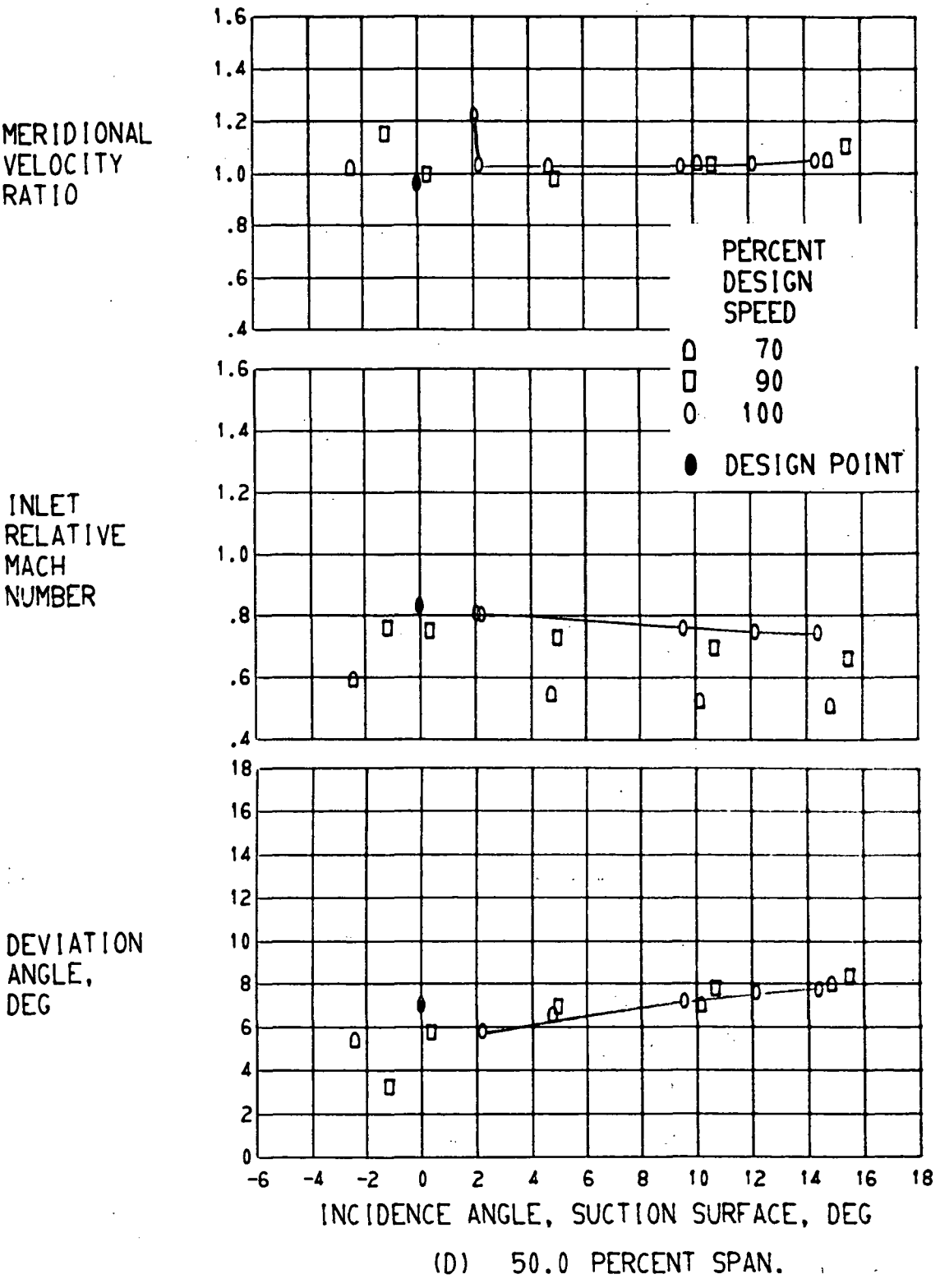
(C) 30.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



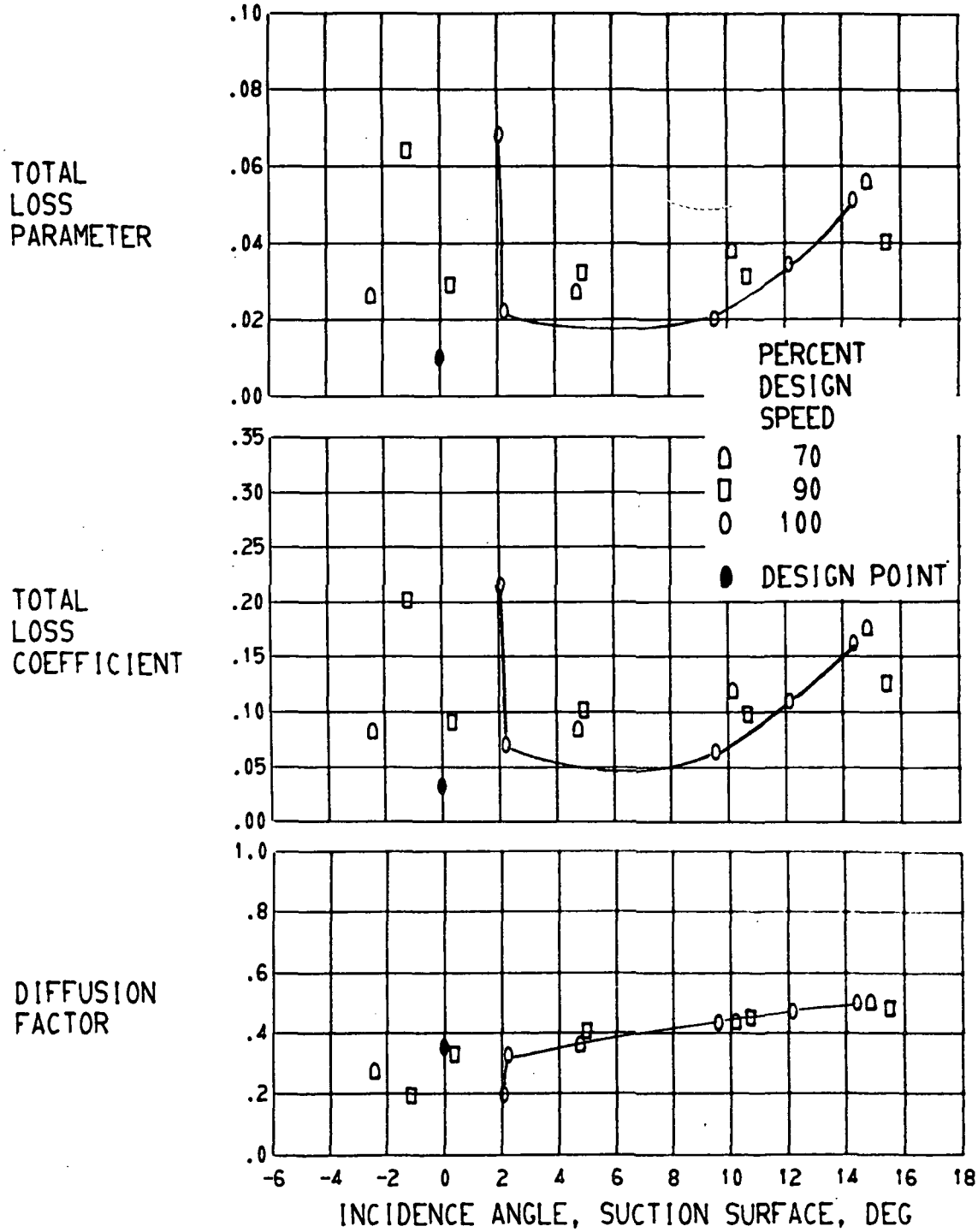
(C) CONCLUDED. 30.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



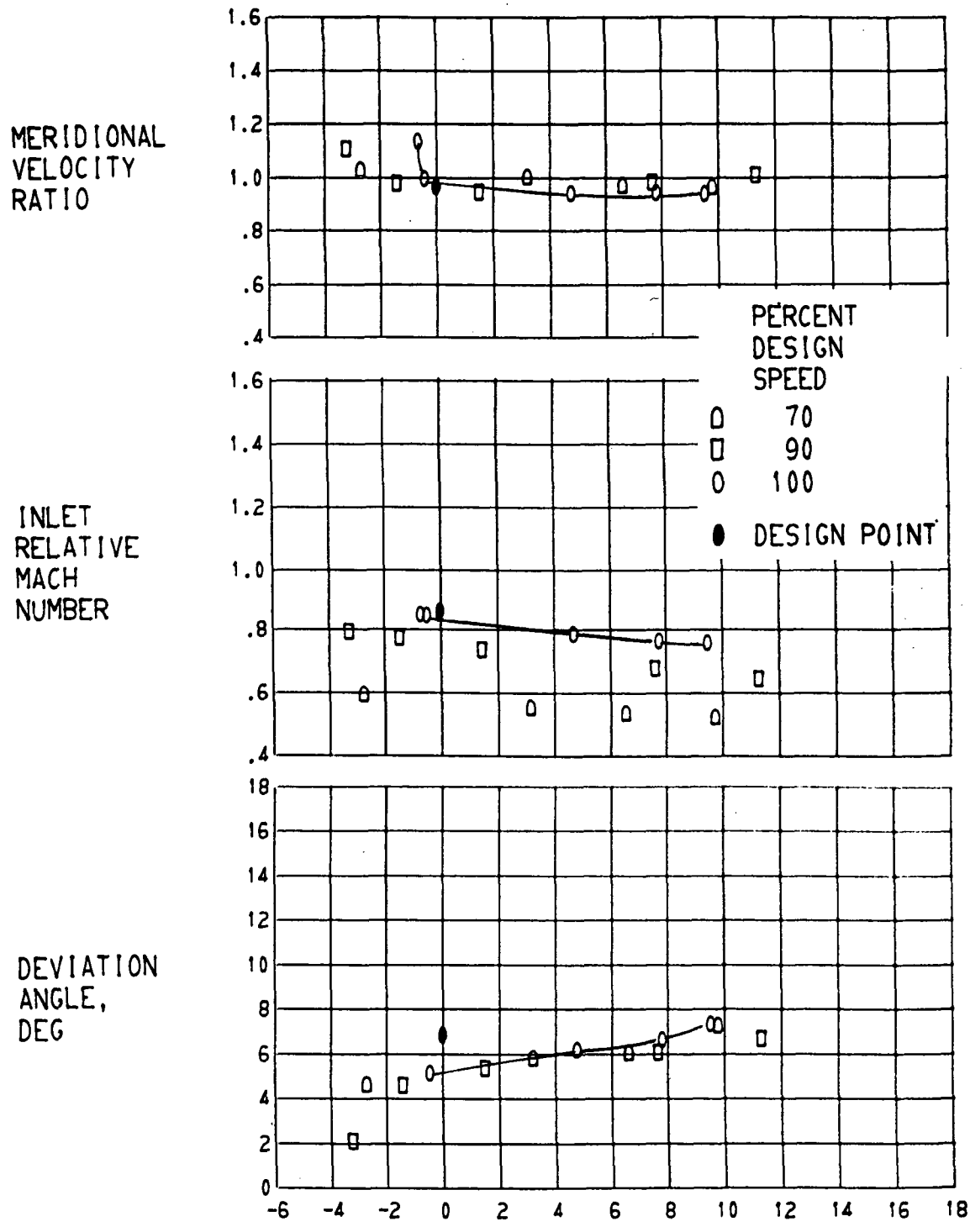
(D) 50.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



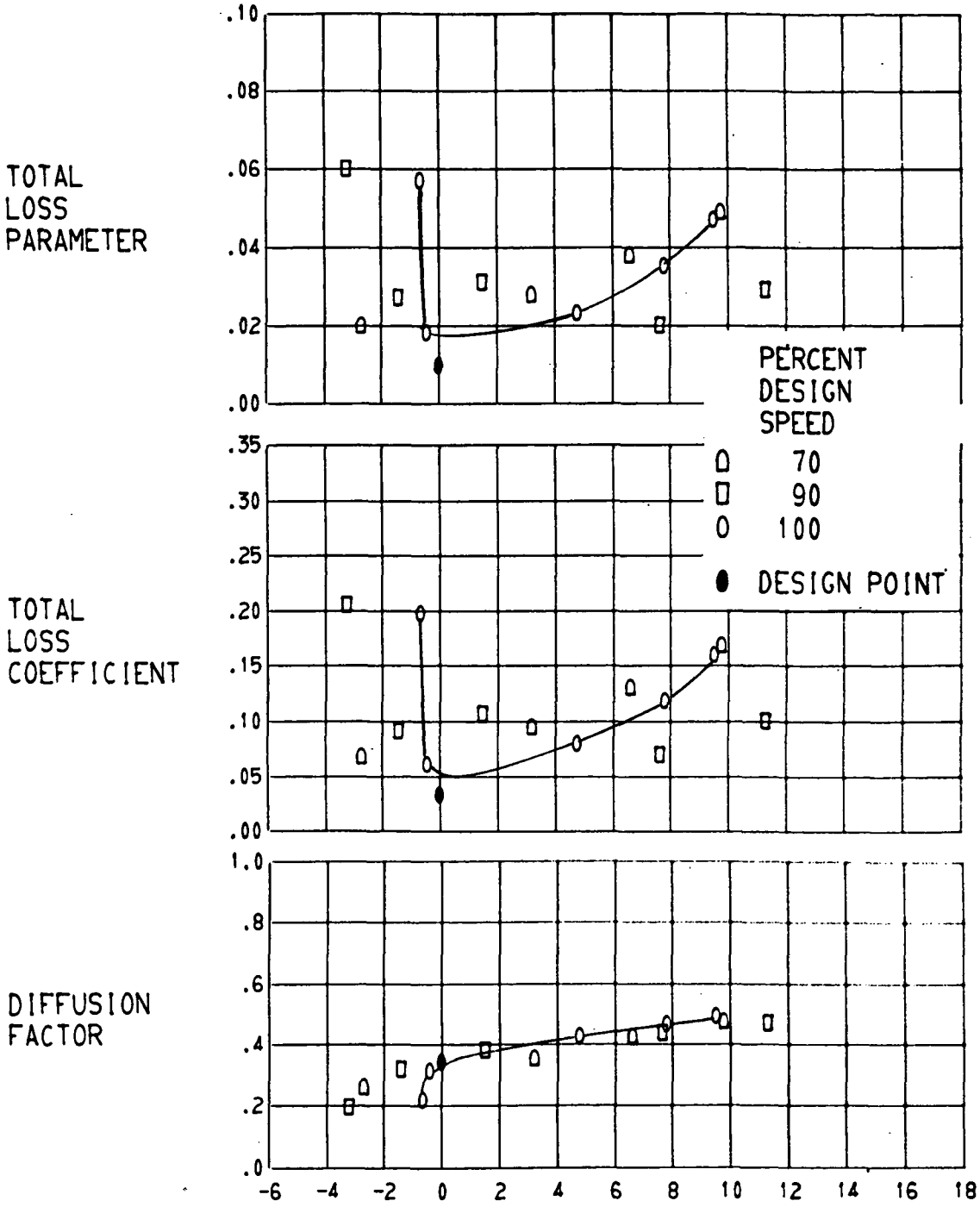
(D) CONCLUDED. 50.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



(E) 70.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



(E) CONCLUDED. 70.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.

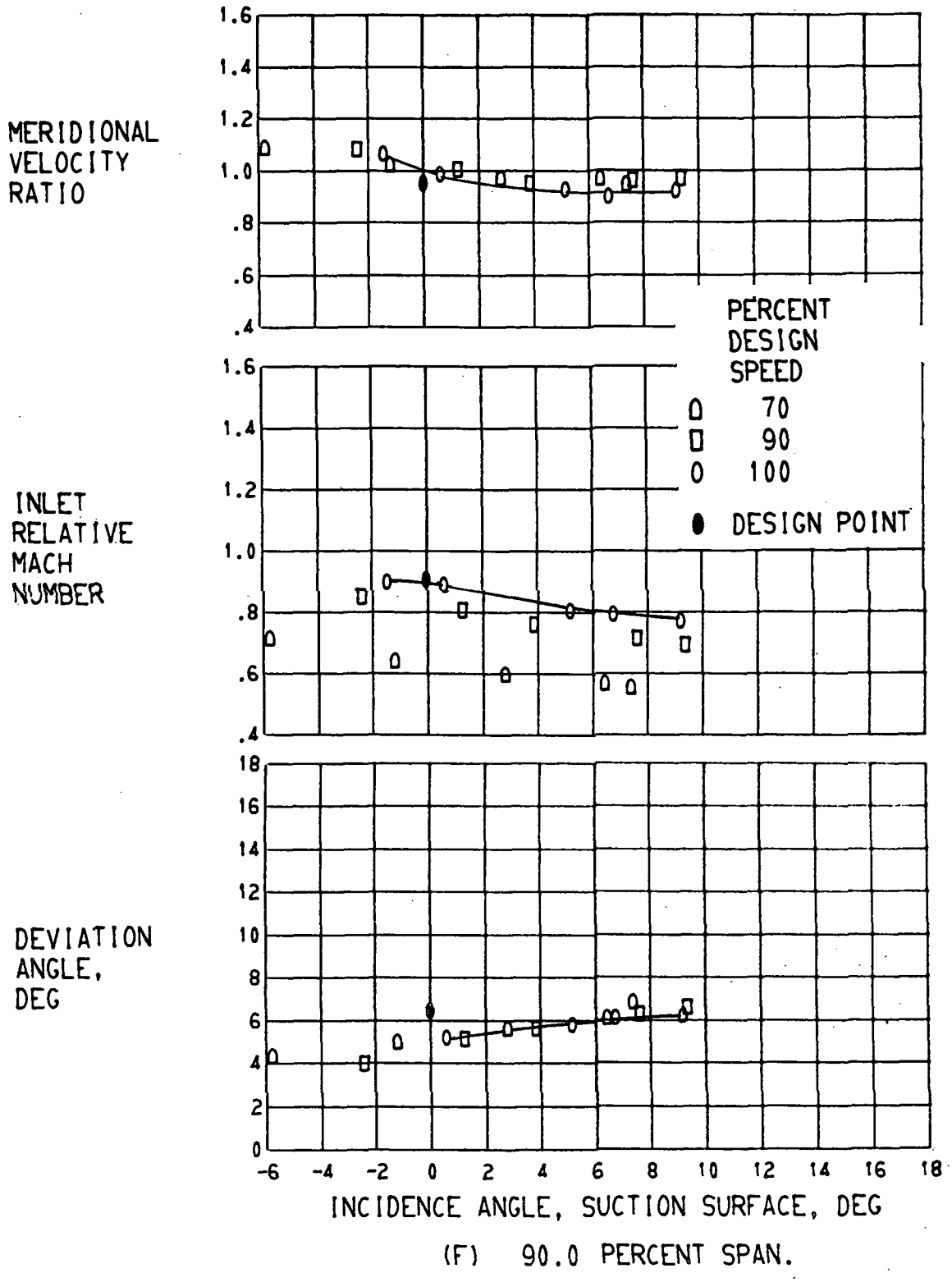
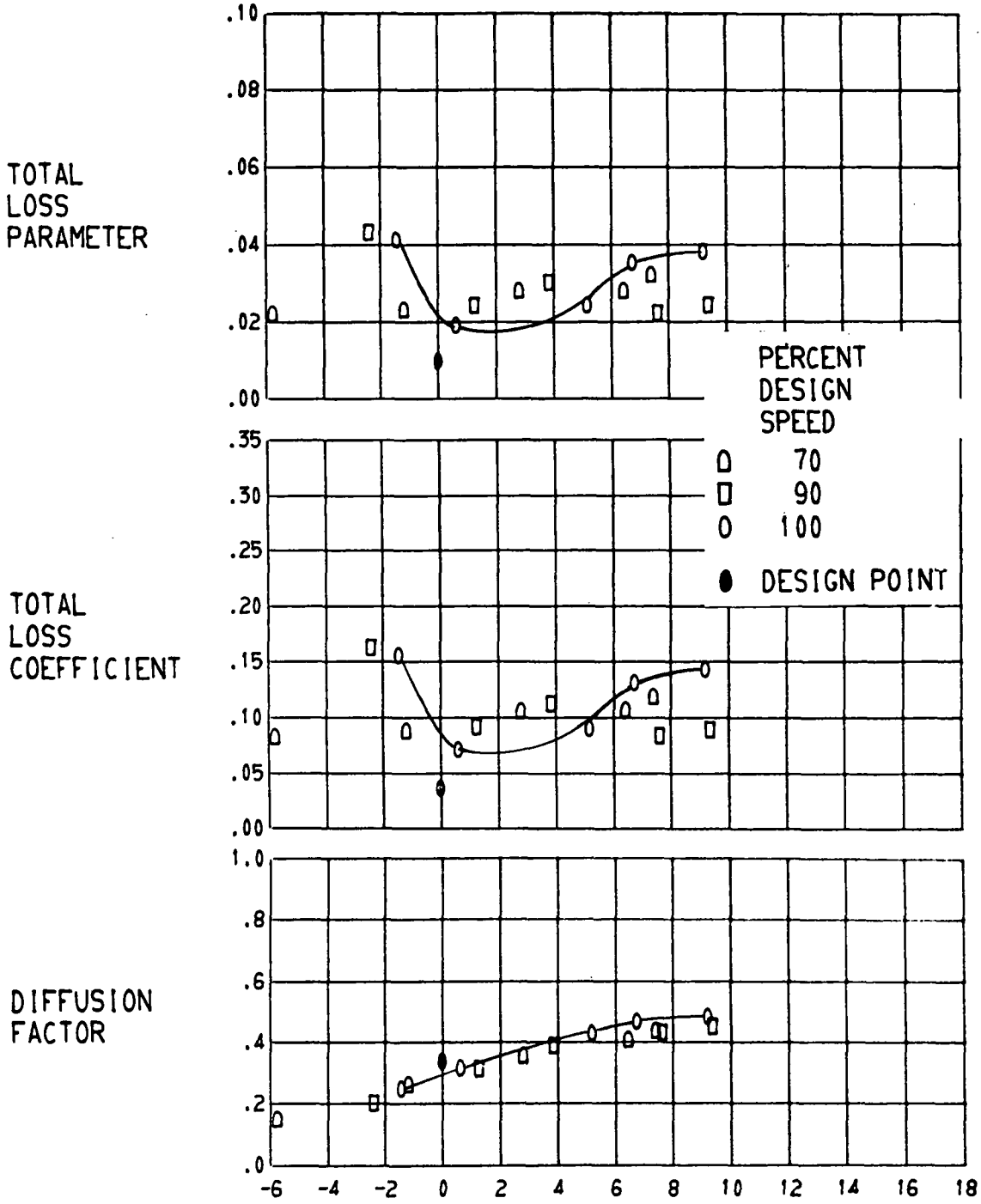
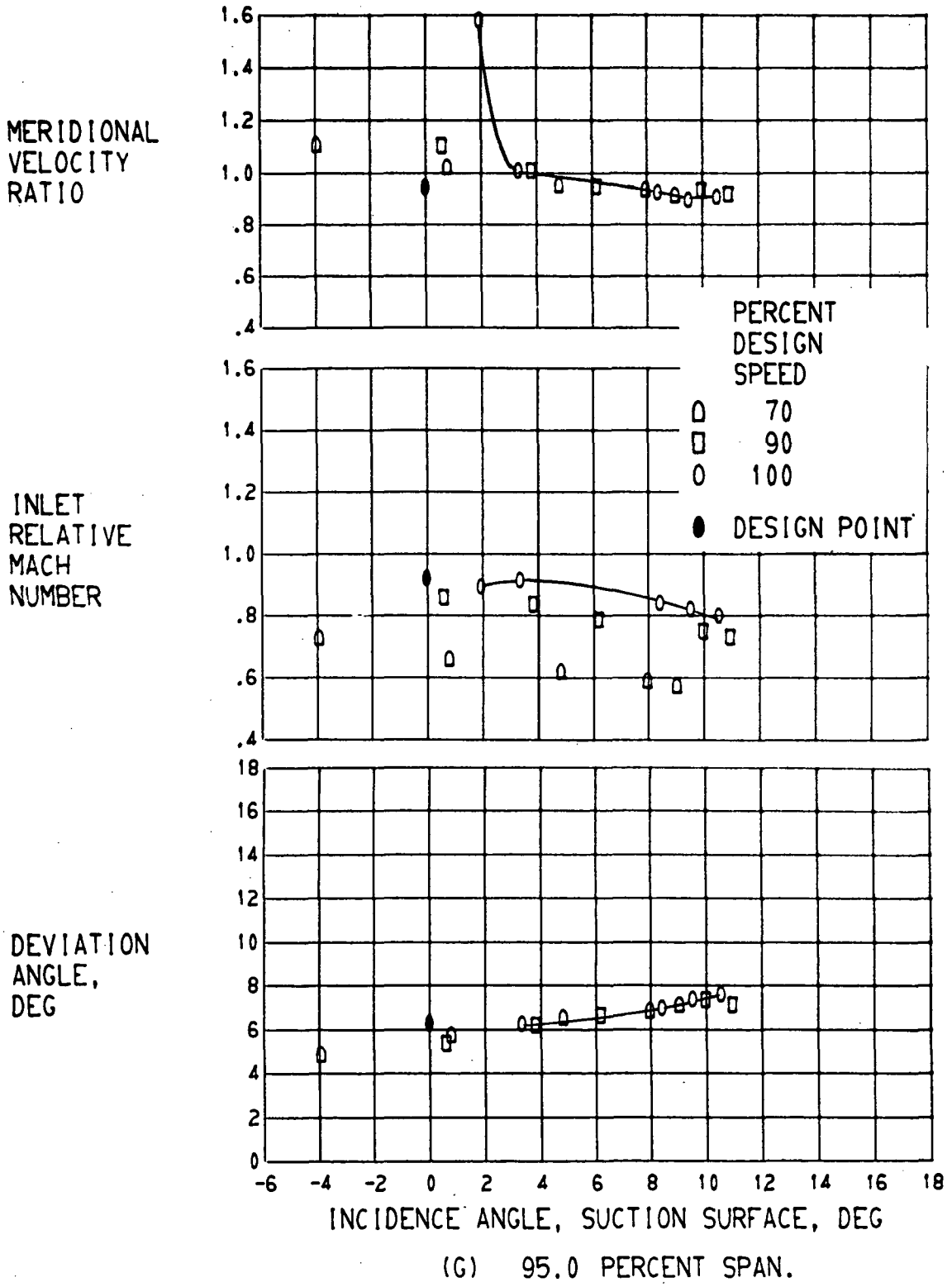


FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



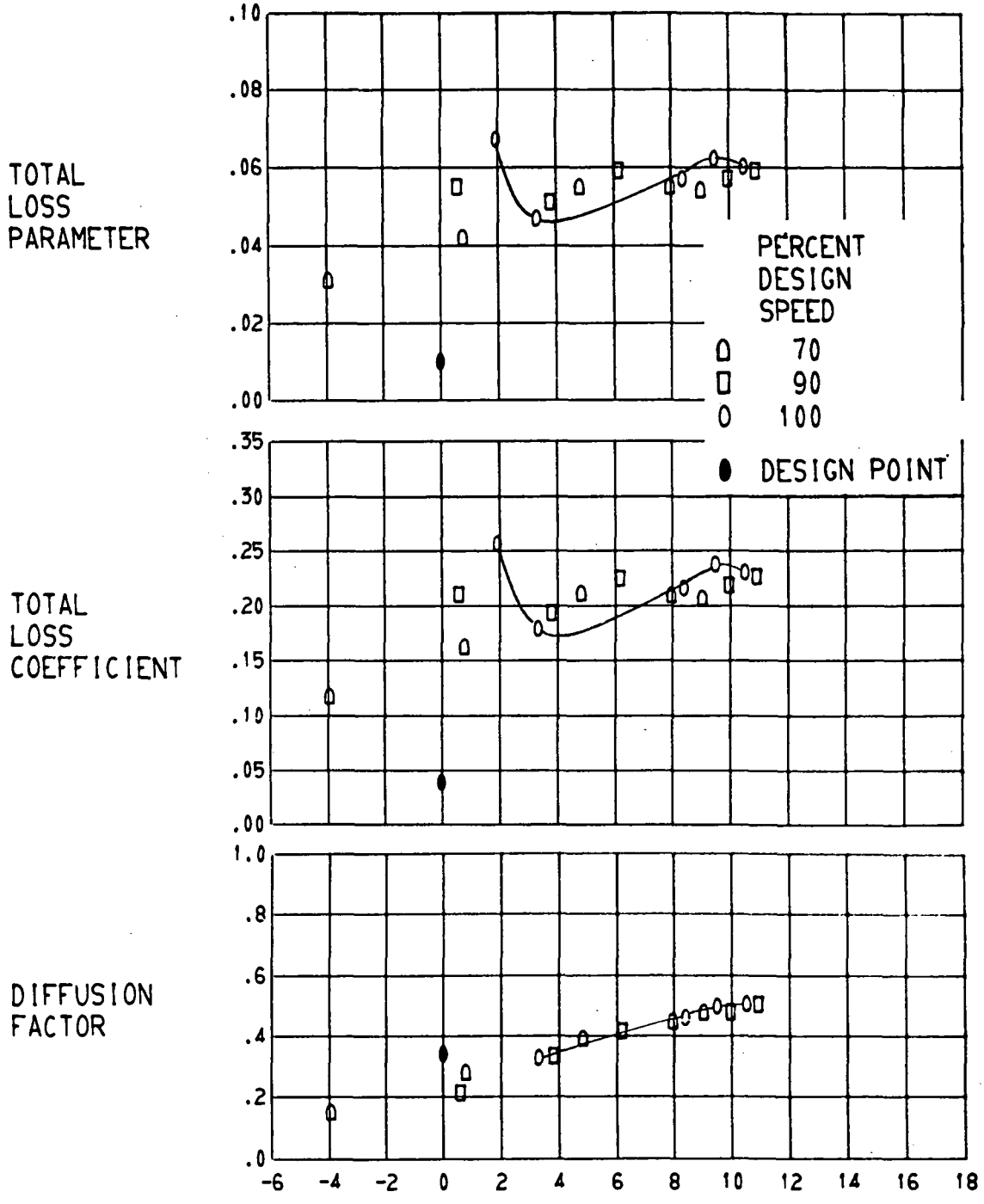
(F) CONCLUDED. 90.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



(G) 95.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.



(G) CONCLUDED. 95.0 PERCENT SPAN.

FIGURE 12. - BLADE ELEMENT PERFORMANCE FOR STATOR 1.

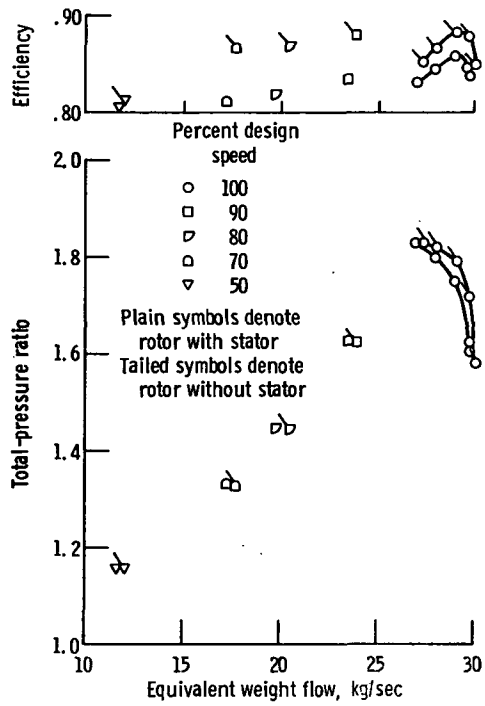


Figure 13. - Comparison of rotor overall performance at various speeds with and without stator.

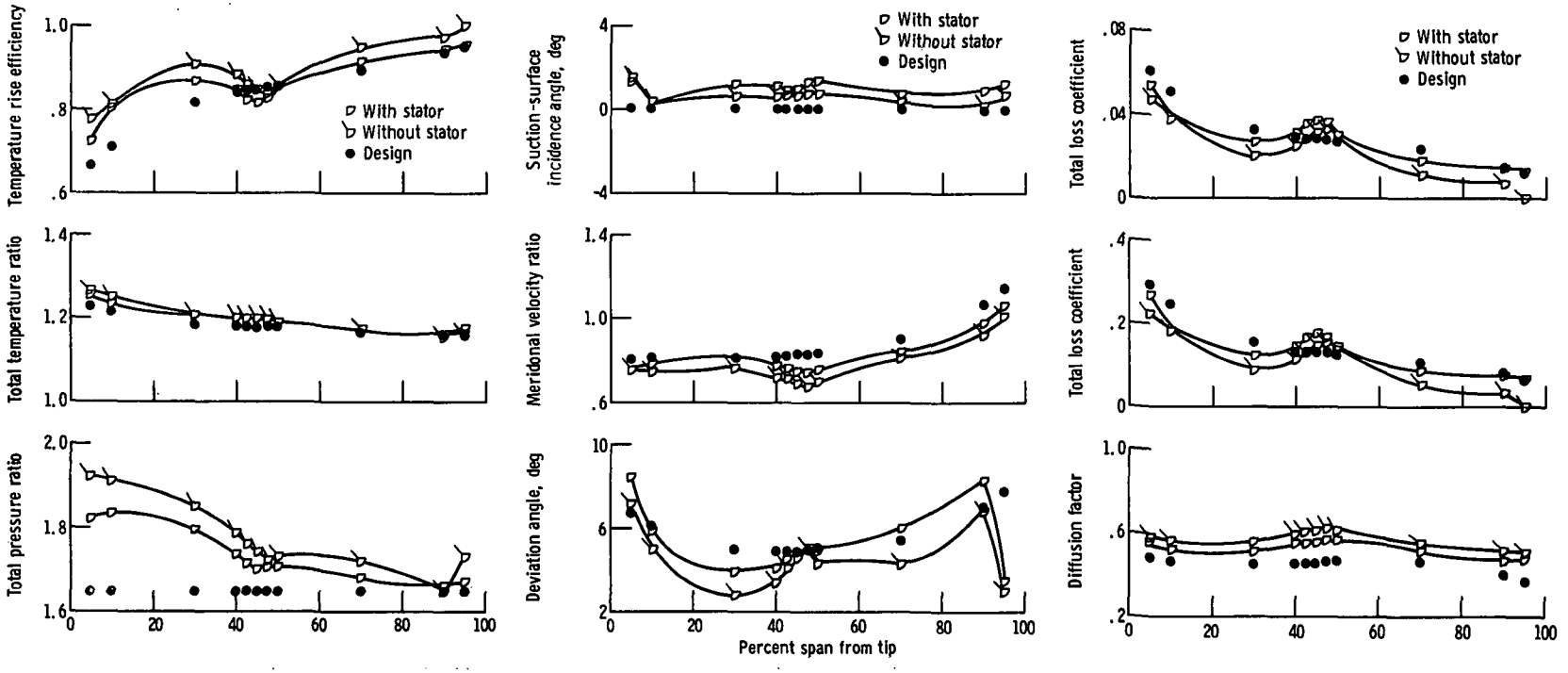


Figure 14. - Comparison of radial distribution of performance of rotor with and without stator at peak-efficiency equivalent weight flow (29.0 kg/sec).

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