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SUMMARY

A new first-stage rotor for the NASA two-stage fan incorporated low-aspect-ratio blading, which eliminated the need for midspan dampers. Although the overall aerodynamic design parameters for the rotor remained essentially unchanged, the blading is markedly different because of several design changes, which, in addition to the 1.56-aspect-ratio blading and the elimination of part span dampers, included increased flow-path convergence, end-wall bend to account for inlet boundary layer, smaller blade-leading-edge wedge angle, increased flow passage choke margin, reduced leading- and trailing-edge thicknesses, and a different approach to setting suction-surface incidence angle over the supersonic portion of the blade.

The fan was tested at speeds from 50 to 100 percent of design speed and detailed surveys of the flow conditions were made over the entire operating flow range. Test results showed that at design speed the fan achieved its design efficiency while exceeding its design pressure ratio and that the first-stage rotor achieved a peak adiabatic efficiency of 0.906 (2 percentage points greater than design) at a total-pressure ratio of 1.686; at part speeds, first-stage rotor efficiencies in excess of 0.91 were achieved. At design speed the first-stage efficiency was 0.870, 2.2 percentage points greater than design at a total-pressure ratio of 1.655; at part speeds first-stage efficiencies in excess of 0.88 were recorded. At design speed fan peak efficiency occurred very close to the stall line; however stall margin increased to a value of 8 percent with stator resets. The circumferentially grooved casing had no effect on fan performance and stall margin. Analysis of data indicated the flow range was being limited by a drop in flow in the hub region of the second stator.

INTRODUCTION

Low-aspect-ratio, turbomachinery blading offers the advantages of fewer blades and lower fabrication cost. Further, the blading is inherently more rugged because of its longer chord, thus eliminating the need for dampers that are so often required on higher-aspect-ratio blading. The aerodynamic loss associated with dampers can be very high, hampering the achievement of good efficiencies.

The overall efficiency of a previously tested NASA two-stage fan (with dampers on the first-stage rotor) was approximately 5 percentage points less than its design value (ref. 1). Analysis of the test results indicated that the first-stage stator and the second stage had potential for good performance but were hampered mainly by the dampered first-stage rotor. The dampers were responsible for large radial gradients of total pressure and deviation angle across a large portion of the blade height, resulting in mismatches in later blade rows.

In an effort to improve performance of the first stage as well as the stage matching, the original two-stage fan was reconfigured with a newly designed first-stage rotor. Lower-aspect-ratio blading was selected for the rotor to eliminate both the need of part span dampers and their associated penalties on aerodynamic performance. In addition, low-aspect-ratio blading has shown good performance. The two-stage fan with the new first-stage rotor was tested in the multistage-compressor test facility at Lewis. The performance is presented in both tabular and plotted form. The symbols and equations are defined in appendixes A and B. The definitions and units used for the tabular data are presented in appendix C.

AERODYNAMIC DESIGN

Only the low-aspect-ratio first-stage rotor is discussed herein. The other blade rows were unchanged (see ref. 2). The flow path of this fan, also unchanged, is shown in figure 1, and an assembly photograph of it is shown in figure 2. All significant blade design parameters for all four blade rows are listed in tables I to III.

The overall aerodynamic design parameters of the first-stage rotor are essentially unchanged. Although multiple-circular-arc blade sections were used throughout, the blading is markedly different from that in the earlier fan because of several interrelated design changes. Radial distributions of several blade and performance parameters for both the original design (ref. 2) and the low-aspect-ratio rotor are compared in figure 3.

To eliminate the need for part span dampers, the blade aspect ratio was decreased from 2.94 to 1.56. The axial position of the blade stacking line was unchanged from the original design but, because of increased blade chord, the leading and trailing edges of the rotor moved fore and aft, respectively. Because of the flow-path contour (see fig. 1), the rotor-inlet hub-tip ratio decreased from 0.400 to 0.375, and the exit hub-tip ratio increased from 0.461 to 0.478. The resulting change in flow-path convergence across the blade resulted in higher meridional velocity ratios across the entire blade span except in the tip region (fig. 3).

An inlet tip boundary-layer total pressure, based on unreported boundary-layer survey data taken with the configuration of reference 1, was incorporated into the new design, resulting in the rotor blading having leading-edge endwall bend. The design specified a radially constant total pressure at the rotor outlet, thus the design total-pressure ratio is greater in the tip region to account for the boundary-layer defect (fig. 3).

To reduce shock losses, the blade maximum thickness was moved rearward to minimize supersonic turning on the suction surface (fig. 3).

The original rotor had a 4 percent choke margin which appeared marginal for achieving design flow. The intent of present design was to achieve about 6 percent choke margin, a value which does not account for blade surface boundary layers. Actual values ranged from 3.6 to 6.5 percent (fig. 3).

To increase the blade natural frequency and to eliminate a potential resonant condition, the distribution of blade thickness to chord was described by a third-order polynomial from tip to hub (fig. 3). Both leading- and trailing-edge radii have been significantly reduced (fig. 3).

Deviation angles (fig. 3) for the both higher-aspect-ratio blading (ref. 2) and this low-aspect-ratio blading were computed using Carter's Rule along with modifiers. The modifiers for the high-aspect-ratio blading were based on the results obtained from several Lewis tested rotors. Those for the low-aspect-ratio blading were largely based on reference 3.

Incidence angles from tip to 58 percent of span were determined by the method described in reference 4. The method minimizes the expansion and compression system at the leading edge of a transonic rotor by setting the suction-surface blade angle at a point midway between the leading edge and the location of the first captured Mach wave on the blade. The suction-surface blade angle at this midway point is set equal to the free-stream relative flow angle, minus an adjustment to account for boundary-layer and blade blockage. This adjustment was approximately 1.6° from the tip to 58 percent of span. For the remainder of the passage (59 percent to hub), the suction-surface incidence angle was set equal to 0° at the blade inlet. The variation of suction-surface incidence angle was smooth through the transition region.

Because of the change in flow-path convergence, resulting in higher meridional velocity ratios across the entire blade span, the blade loadings (D-factors) are lower except locally at the tip. The D-factor loss correlation used in the design of the original rotor (ref. 2) was also used in the design of this low-aspect-ratio rotor. The radial distributions of D-factor and loss-coefficient for the original and redesigned first-stage rotor are also compared in figure 3.

APPARATUS AND PROCEDURE

Compressor Test Facility

The two-stage fan was tested in the multistage compressor test facility (ref. 2; and fig. 4). Atmospheric air enters the test facility at an inlet located on the roof of the building and flows through the flow-measuring orifice, through the inlet butterfly throttle valves, and into the plenum chamber upstream of the test compressor. The air then passes through the test fan into the collector and is exhausted either to the atmosphere or to an altitude exhaust system. Mass flow is controlled with a sleeve valve in the collector. For this series of tests the large inlet butterfly throttle valve remained fully open with the small valve fully closed, and the air was exhausted to the atmosphere. The rotating radial tip clearances for both rotors were calculated to be 0.04 centimeter.

Instrumentation

Radial surveys of the flow conditions were made at the fan inlet and behind the two stator-blade rows (see fig. 1). Total pressure, total temperature, and flow angle were measured with a combination probe (fig. 5). Each probe was positioned with a null-balancing, stream-direction-sensitive control system that automatically alined the probe to the direction of flow. The thermocouple material was Chromel-constantan. All pressures were measured with calibrated transducers. Two combination probes were used at the compressor inlet and behind the first-stage stator, and four combination probes were used behind the second-stage stator. The circumferential locations of the probes at each measuring station are shown in figure 6. The probes behind the stators were circumferentially traversed one stator-blade passage clockwise from the nominal values shown.

The fan mass flow was determined by means of a calibrated thin-plate orifice. 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:

Mass flow, kg/sec	±0.3
Rotative speed, rpm	±30
Flow angle, deg	±1
Temperature, K	±0.6
Total pressure, N/cm^2, at -	
Station 1	±0.07
Station 2	±0.10
Station 3	±0.17

Test Procedure

The data were taken over a mass-flow range from maximum flow to near-stall conditions at equivalent rotative speeds of 50, 70, 80, 90, and 100 percents of design speed. At each selected flow data were recorded at 11 radial positions. At each radial position the combination probes behind the stators (stations 2 and 3) were circumferentially traversed to 10 equally spaced locations across a stator-blade gap. Pressure, temperature, and flow angle were measured at each circumferential position. At the fan inlet (station 1) radial traverses were made to measure pressure, temperature, and flow angle at each radial position.

Calculation Procedure

At each radial position behind the two stationary blade rows, circumferential arrays of total pressure, total temperature, and flow angle were generated across a stator-blade gap by arithmetically averaging the measurements from the two combination probes at each circumferential position.

At each radial position the averaged values making up the circumferential arrays of total pressure, total temperature, and flow angle across one blade gap were again averaged as follows to obtain the representative value behind the two stator-blade rows at each radial position: The total-pressure array was energy averaged, the total-temperature array was mass averaged, and the flow-angle array was arithmetically averaged. These values are reported herein.

Representative radial values of total pressure and total temperature between the rotor- and stator-blade rows (necessary for individual rotor and stator performance evaluation) were obtained from the averaged circumferential arrays of total pressure and total temperature obtained downstream of the adjoining stator and translated upstream of the stator along design streamlines as follows: At each radial position total temperature was selected as the mass-averaged value of the averaged values making up the circumferential array, and the highest value of total pressure was selected from the averaged values making up the circumferential array.

Data were reduced using a computer program that calculates the radial distributions of static pressure at each measuring station and the radial distributions of flow angle at stations behind the rotors. Radial distributions of static pressure are calculated within the program from equations of continuity of mass flow and full radial equilibrium, which include gradients of entropy and enthalpy and uses design streamline curvature, slope, and endwall blockage. Inputs to this program include equivalent mass flow, corrected speed, radial distributions of total pressure and total temperature behind a rotating blade row, and equivalent mass flow along with radial distributions of total pressure, total temperature, and flow angle behind a fixed blade row.

To obtain overall performance for each rotor and stage, the radial values of total temperature were mass averaged, and the radial values of total pressure were energy averaged.

All data herein have been translated to the leading and trailing edges of each blade row by the method of reference 5. All pressures and temperatures were corrected to sea-level conditions based on the inlet conditions of the first-stage rotor. Orifice mass flow was corrected to sea-level conditions based on the inlet conditions of each stage.

RESULTS AND DISCUSSION

The experimental results of the two-stage fan with a low-aspect-ratio first-stage rotor is presented in three main sections: Overall Performance, Radial Distributions of Performance Parameters, and Fan Performance with Stator Reset and Casing Treatment. The plotted data, along with several parameters not shown in the figures, are also presented in tabular form. The overall performance is presented in tables IV to VIII. The blade-element data are presented in tables IX to XII. (The definitions and units used for the tabular data are presented in appendix C.)

Overall Performance

Two-stage fan. - The overall performance of the two-stage fan is presented in figure 7 where total-pressure ratio, total-temperature ratio, and adiabatic efficiency are plotted as functions of equivalent mass flow at 50, 70, 80, 90, and 100 percent of design speed. The fan achieved its design efficiency of 0.849 and exceeded its design total-pressure ratio at design speed (fig. 7). A peak efficiency value of 0.846 occurred at an equivalent mass flow of 34.03 kilograms per second (design mass flow was 33.248 kg/sec). The corresponding value of total-pressure ratio was 2.471; the design value was 2.399. At design speed the fan stalled at a greater-than-design mass flow. A sophisticated Nastran finite-element structural analysis program was used to restudy the untwist and uncambering of the low-aspect-ratio blading. Results showed that the blade leading edge was uncambering (opening) locally in the tip region approximately 1.2° more than had been allowed for in the original, beam-analysis design. This off-design uncambering may have allowed the fan to overflow. Peak efficiency occurred near stall, which resulted in a stall margin of only 2 percent when based on the peak efficiency mass flow of 34.03 kilograms per second. However, stall margin increases to a value of 10 percent when based on a mass flow of 34.3 kilograms per second, which corresponds to an efficiency that is 1 percentage point less than the peak value. At part speeds efficiencies in excess of 0.86 were obtained.

First stage. - The overall performance of the first stage is significantly better than design (fig. 8(a)). At design speed peak efficiency occurred at an equivalent mass flow of 34.03 kilograms per second; the design flow was 33.248 kilograms per second. The peak adiabatic efficiency of 0.870 was 2.2 percentage points greater than design. The corresponding value of total-pressure ratio was 1.655 (design value of 1.590). At the design pressure ratio the stage adiabatic efficiency was 0.865.

At the part speeds efficiencies in excess of 0.88 were demonstrated. The high-flow side of all part-speed performance curves were limited by choking in the second stage (see nondimensional stage performance), thus it appears that the maximum efficiencies for the first stage were not obtained.

The performance of the first-stage rotor (fig. 8(b)) exceeded its design values of total-pressure ratio and efficiency. At design speed peak adiabatic efficiency occurred at an equivalent mass flow of 34.03 kilograms per second; the design mass flow was 33.248 kilograms per second. The peak efficiency value of 0.906 was 1.0 percentage points greater than design. And the corresponding value of total-pressure ratio of 1.686 was also greater than design (1.629). At design pressure ratio the rotor adiabatic efficiency was 0.896.

At the part speeds the high-flow side of the performance curves were limited, and it appears that, although efficiencies in excess of 0.91 were recorded at all part speeds, the maximum first-stage rotor efficiencies for each part speed were not achieved.

Nondimensional stage performance. - The nondimensional performance parameters of the stages and rotors are presented in figure 9 for 50, 70, 80, 90, and 100 percents of design speed. The spread in the data, with respect to the speed lines, is attributed to compressibility effects.

First stage: The nondimensional performance curves for the first stage and rotor (figs. 9(a) and (b)) show characteristics similar to the dimensional performance curves (fig. 8).

Second stage: The second stage (figs. 9(b) and (c)) appears to be controlling choke and limiting the first-stage flow range, particularly at part speeds (as mentioned earlier). For both stage and rotor flow coefficient range and efficiency increase with decreasing rotative speed. For all rotative speeds peak efficiency occurred at a flow coefficient value of approximately 0.47 for both stage and rotor. At design speed the peak efficiency for the second stage was 0.842, and the design stage efficiency was 0.870. Efficiencies in excess of 0.86 at 90 percent of design speed to 0.91 at 50 percent of design speed were recorded.

At design speed the peak efficiency for the second-stage rotor was 0.877. Design rotor efficiency was 0.911. At all part speeds efficiencies in excess of 0.90 were achieved.

Radial Distribution of Performance Parameters

The radial distribution of selected flow and performance parameters are shown for the rotors and stators in figures 10 to 13 for three equivalent mass flows at design speed. These data represent the flow condition of the fan at near stall, peak efficiency, and near choke. (Design values are shown by the dashed lines.) In this section the performance at a mass flow of 34.0 kilograms per second (near peak efficiency) are compared with design values.

First stage. - Rotor total-pressure ratio met design in the hub region and exceeded design over the remainder of the blade (fig. 10). A sharp gradient in total-pressure ratio in the tip region reflects the added camber (end bend) incorporated at the rotor inlet as discussed earlier in the Aerodynamic Design section. Energy addition, as reflected in total-temperature ratio, was greater than design across the entire blade span. Adiabatic efficiency met or exceeded design over the outer 80 percent of span but deteriorated slightly in the hub region. Blade loading, as measured by D-factor, was slightly higher than design across the entire blade span. Loss-coefficient values met or were lower than design over the outer 70 percent of blade span but were significantly greater than design in the hub region of the blade, which reflects the low adiabatic efficiency in this region. Incidence angles may be higher than indicated because of the uncambering of the blade as discussed earlier in the Overall Performance section. In general, the deviation angles were lower than design over the entire rotor-blade span.

Stator incidence angles, blade loading (D-factor), and deviation angles were, in general, all greater than design values (fig. 11). However, loss-coefficient values met design values in the tip region and were lower than design over the remainder of the blade, particularly in the midregion of the blade.

Second stage. - The rotor radial distributions of total-pressure ratio and total-temperature ratio were close to design values across the entire blade (fig. 12). Meridional velocity ratio was close to design across 90 percent of span and was appreciably higher than design at the hub. This high meridional velocity at the hub locally unloaded the blade as reflected in D-factor. Values of total-loss coefficient are greater than design across the entire span, except at 5 percent of span.

Fan Performance with Stator Reset and Casing Treatment

In an attempt to increase the flow range and stall margin of the fan, additional tests with stator resets and casing treatment were conducted.

Performance with stator reset. - The performance of the fan was determined with several combinations of off-design stator blade settings. Both stators were indexed $\pm 10^{\circ}$ from design values, in 5° increments. The purpose of these tests was to determine the optimum combination of stator-blade setting angles for maximum flow range and stall margin. The tests were conducted at 70 and 100 percent of design speed. Several stator setting combinations did significantly improve the flow range and stall margin at design speed. The maximum flow range and stall margin was obtained with the first-stage stator opened 10° and the second-stage stator closed 5° from their respective design settings. The overall performance at these stator settings are compared with the overall performance at design stator settings in figure 14. At design speed with stator reset, the maximum mass flow of approximately 34.5 kilograms per second remained unchanged, but, the stall mass flow decreased to 32.2 kilograms per second as opposed to 33.6 kilograms per second at design settings. Based on peak efficiency mass flows of 34.0 kilograms per second for design settings and 34.2 kilograms for stator resets, the fan stall margin increased from 2 percent with design settings to 8 percent with reset. Fan total-pressure ratio significantly increased with reset, which was attributed to the higher pressure ratio of the second-stage rotor. With reset the second-stage rotor operated at increased incidence angles that increased the level of blade loading (D-factor) resulting in higher pressure ratios. However, the higher loadings resulted in higher loss coefficients and corresponding lower efficiencies. As a result the fan overall peak efficiency deteriorated 5 percentage points with stator reset. An examination of the plots of the blade-element performance of each blade row (not shown herein) did not reveal which element was critical, although the hub was suspected because of the deterioration in meridional velocity ratio.

Fan performance with casing treatment. - The use of casing treatment can reveal which elements may be controlling the flow range. If the rotors are tip critical, that is, if the blade elements in the tip region reach a critical operating condition and stall before the remaining elements, the fan should respond to casing treatment with improved flow range, stall margin, and in some cases, pressure ratio and efficiency (refs. 6 to 8). However, if the stators are hub critical, then essentially, no improvement in fan performance should be expected.

Circumferential grooves (casing treatment) were inserted over the tips of both fan rotors. The grooves extended over approximately 70 percent of the rotor tip projected aerodynamic chord and were centrally located between the blade leading and trailing edges. The groove width was 0.249 centimeter. The ratio of groove width to land width was 2.0, and the ratio of groove depth to land width was 6.0. The fan was then retested at 80 and 100 percent of design speed. Results showed that this casing treatment had no measurable effect on fan flow range and stall margin. That casing treatment did not affect the flow range is further evidence that a stator is controlling range.

CONCLUDING REMARKS

The present NASA two-stage fan showed a gain of 5 percentage points in overall efficiency with the new low-aspect-ratio first-stage rotor in place of the large-dampered, higher aspect-ratio rotor (see ref. 1). The efficiency of the low-aspect-ratio rotor was 9 percentage points higher than the large-dampered, higher aspect-ratio rotor. Several design factors may have contributed to this marked improvement:

(1) Elimination of the damper

(2) Lower aspect ratio blading

(3) Moving blade-element maximum thickness rearward

(4) The method of setting suction-surface incidence angle

(5) Allowance for inlet tip boundary layer

(6) Higher convergence between leading and trailing edges.

While the new low-aspect-ratio rotor was being designed, the higher-aspect-ratio rotor was being redesigned to better account for the effects of the damper and to reduce the associated losses. This redesigned rotor (build 3 of rotor one) incorporated design factors (3), (4), and (5). It was then retested with this redesigned, higher-aspect-ratio, large-dampered, first-stage rotor and reported in reference 9. The redesigned rotor showed an improvement in efficiency of only 2 percentage points. Therefore, it was concluded that these design factors did not have a great effect on improving the efficiency of the dampered configurations. From an examination of the blade-element data of the higher-aspect-ratio rotor (ref. 9) and the low-aspect-ratio rotor, it is apparent that the elimination of the damper and its associated losses, did have a significant effect on performance. It cannot, however, be established how much of the improvement was due to the low-aspect-ratio blading and how much to the higher meridional velocity ratio across the low-aspect-ratio rotor due to the flow-path convergence. It is noteworthy that eliminating the damper and smoothing the radial-flow gradients entering the downstream blade rows increased the efficiency of the second stage 2 percentage points.

Maximum mass flow with the low-aspect-ratio first-stage rotor increased significantly. This, most likely, can be attributed to three factors: (1) increasing the design throat area margin to 6 percent, (2) overcompensation of inlet boundary-layer blockage by adding a measured boundary-layer profile in addition to a reduced effective flow area in the design, and (3) the untwist-uncambering of the low-aspect-ratio blade. The 6 percent throat-area margin along with overcompensation of inlet boundary-layer blockage were also incorporated into the redesigned dampered rotor (ref. 9) resulting in only a small gain in maximum flow.

SUMMARY OF RESULTS

The NASA two-stage fan was tested with a new first-stage rotor having an aspect ratio of 1.56, which eliminated the need for part span dampers. Detailed surveys of the flow conditions were made over the entire fan operating flow range at speeds from 50 to 100 percent of design. This investigation yielded the following principal results:

1. The fan achieved an overall adiabatic efficiency of 0.846 at design speed (design value, 0.849).

2. At design speed the low-aspect-ratio first-stage rotor achieved a peak efficiency of 0.906 (2 percentage points greater than design) at a total-pressure ratio of 1.686. At part speeds first-stage rotor efficiencies in excess of 0.91 were achieved.

3. At design speed the first stage achieved an efficiency of 0.870 (2.2 percentage points greater than design) at a total-pressure ratio of 1.655. At part speeds first-stage efficiencies in excess of 0.88 were achieved.

4. At design speed the first-stage stator opened 10° and the second stator closed 5° from their respective design settings, fan stall margin increased from 2 to 8 percent at design stator settings. However, fan overall adiabatic efficiency deteriorated 5 percentage points.

5. The casing treatment (circumferential grooves over the tips of both rotors) had no measurable effect on fan flow range and stall margin; thus it appears that the fan may be hub critical.

Lewis Research Center,
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APPENDIX A

SYMBOLS

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

A_f frontal area at rotor leading edge, m^2

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

D diffusion factor

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

i_{ss} suction-surface incidence angle, angle between inlet-air direction and line tangent to blade suction surface at leading edge, deg

N rotative speed, rpm

P total pressure, N/cm^2

p static pressure, N/cm^2

r radius, cm

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 first-stage 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)

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

δ^o	deviation angle, angle between exit-air direction and tangent to blade mean camber line at trailing edge, deg
η	efficiency
θ	ratio of rotor-inlet total temperature to standard temperature of 288.2 K
κ_{mc}	angle between blade-element mean camber line on the conical surface and meridional plane, deg
κ_{ss}	angle between blade-element suction-surface leading edge tangent line on conical surface and meridional plane, deg
σ	solidity, ratio of chord to spacing
φ	flow coefficient
ψ_D	head-rise coefficient
ψ_T	temperature-rise coefficient
$\bar{\omega}$	total-loss coefficient
$\bar{\omega}_p$	profile-loss coefficient
$\bar{\omega}_s$	shock-loss coefficient

Subscripts:

ad	adiabatic (temperature rise)
id	ideal
LE	blade leading edge
m	meridional direction
mom	momentum rise
p	polytropic
TE	blade trailing edge
z	axial direction
θ	tangential direction
1	instrumentation plane upstream of first rotor
2	instrumentation plane between first stator and second rotor
3	instrumentation plane downstream of second stator

Superscript:

'	relative to blade

APPENDIX B

EQUATIONS FOR CALCULATING OVERALL AND BLADE-ELEMENT PERFORMANCE PARAMETERS

Suction-surface incidence angle -

$$i_{ss} = (\beta_c')_{LE} - \kappa_{ss} \tag{B1}$$

Mean incidence angle -

$$i_{mc} = (\beta_c')_{LE} - (\kappa_{mc})_{LE} \tag{B2}$$

Deviation angle -

$$\delta^o = (\beta_c')_{TE} - (\kappa_{mc})_{TE} \tag{B3}$$

Diffusion factor -

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

Total-loss coefficient -

$$\bar{\omega} = \frac{(P_{id}')_{TE} - P_{TE}'}{P_{LE}' - p_{LE}} \tag{B5}$$

Profile-loss coefficient -

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

Total-loss parameter -

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

Profile-loss parameter -

$$\frac{\bar{\omega}_p \cos (\beta_m')_{TE}}{2\sigma} \tag{B8}$$

Adiabatic (temperature rise) efficiency -

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

Equivalent weight flow -

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

Equivalent rotative speed -

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

Weight flow per unit annulus area -

$$\frac{\frac{w\sqrt{\theta}}{\delta}}{A_{an}} \tag{B12}$$

Weight flow per unit frontal area -

$$\frac{\frac{w\sqrt{\theta}}{\delta}}{A_f} \tag{B13}$$

Head-rise coefficient -

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

Flow coefficient -

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

Temperature-rise coefficient -

$$\psi_T = \frac{C_p}{U_{tip}^2}(T_{TE} - T_{LE}) \tag{B16}$$

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 -

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

APPENDIX C

DEFINITIONS AND UNITS USED IN TABLES

ABS	absolute
AERO CHORD	aerodynamic chord, cm
BETAM	meridional air angle, deg
CHOKE MARGIN	ratio of flow area greater than critical area to critical area
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 by eq. (B2)), deg
KIC	angle between blade-element mean camber line on conical surface at leading edge and meridional plane, deg
KOC	angle between blade-element mean camber line on conical surface at trailing edge and meridional plane, deg
KTC	angle between blade-element mean camber line on conical surface at transition point and meridional plane, deg
LOSS COEFF	loss coefficient (total defined by eq. (B5) and profile by eq. (B6))
LOSS PARAM	loss parameter (total defined by eq. (B7) and profile 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 referenced to first-stage-rotor outlet
PHISS	suction-surface camber ahead of assumed shock location, deg
PRESS	pressure, N/cm^2

PROF	profile
RADII	radius, cm
REL	relative to blade
RI	inlet radius (leading edge of blade), cm
RO	outlet radius (trailing edge of blade), cm
RP	radial position
RPM	equivalent rotative speed, rpm
SETTING ANGLE	angle between blade-element aerodynamic chord on conical surface 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-element angles on mean camber lines, deg (KIC-KOC)
TURNING RATIO	ratio of mean camber line curvatures upstream and downstream of transition point
VEL	velocity, m/sec
WT FLOW	equivalent weight flow, kg/sec
ZI	axial distance to blade leading edge, cm
ZMC	axial distance to blade maximum thickness point, cm
ZO	axial distance to blade trailing edge, cm
ZTC	axial distance to transition point, cm

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TABLE I. - DESIGN OVERALL PARAMETERS

(a) Two-stage fan

FAN TOTAL PRESSURE RATIO	2.399
FAN TOTAL TEMPERATURE RATIO	1.334
FAN ADIATABIC EFFICIENCY	0.849
FAN POLYTROPIC EFFICIENCY	0.866
WT FLOW	33.248
RPM	16042.8

(b) First stage

ROTOR TOTAL PRESSURE RATIO	1.629
STAGE TOTAL PRESSURE RATIO	1.590
ROTOR TOTAL TEMPERATURE RATIO	1.167
STAGE TOTAL TEMPERATURE RATIO	1.167
ROTOR ADIABATIC EFFICIENCY	0.896
STAGE ADIABATIC EFFICIENCY	0.848
ROTOR POLYTROPIC EFFICIENCY	0.903
STAGE POLYTROPIC EFFICIENCY	0.857
ROTOR HEAD RISE COEFFICIENT	0.236
STAGE HEAD RISE COEFFICIENT	0.223
FLOW COEFFICIENT	0.429

EQUIVALENT VALUES BASED ON COMPRESSOR INLET

WT FLOW PER UNIT FRONTAL AREA	162.381
WT FLOW PER UNIT ANNULUS AREA	189.016
WT FLOW	33.248
RPM	16042.800
TIP SPEED	428.896

(c) Second stage

ROTOR TOTAL PRESSURE RATIO	1.537
STAGE TOTAL PRESSURE RATIO	1.509
ROTOR TOTAL TEMPERATURE RATIO	1.143
STAGE TOTAL TEMPERATURE RATIO	1.143
ROTOR ADIABATIC EFFICIENCY	0.911
STAGE ADIABATIC EFFICIENCY	0.870
ROTOR POLYTROPIC EFFICIENCY	0.917
STAGE POLYTROPIC EFFICIENCY	0.877
ROTOR HEAD RISE COEFFICIENT	0.269
STAGE HEAD RISE COEFFICIENT	0.256
FLOW COEFFICIENT	0.464

EQUIVALENT VALUES BASED ON COMPRESSOR INLET

WT FLOW PER UNIT FRONTAL AREA	181.801
WT FLOW PER UNIT ANNULUS AREA	261.018
WT FLOW	33.248
RPM	16042.800
TIP SPEED	405.341

EQUIVALENT VALUES BASED ON STAGE INLET

WT FLOW PER UNIT FRONTAL AREA	123.683
WT FLOW PER UNIT ANNULUS AREA	177.576
WT FLOW	22.620
RPM	14850.154
TIP SPEED	375.207

TABLE II. - DESIGN BLADE-ELEMENT PARAMETERS

(a) First-stage rotor

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
TIP	25.530	24.773	.0	45.3	69.3	62.2	288.2	1.208	9.70	1.699
1	24.880	24.125	.0	42.4	67.4	60.7	288.2	1.192	9.96	1.655
2	24.178	23.478	.0	40.5	65.8	59.1	288.2	1.182	10.13	1.627
3	22.753	22.184	.0	40.3	63.8	56.1	288.2	1.174	10.14	1.626
4	21.294	20.889	.C	40.6	62.1	52.8	288.2	1.168	10.14	1.627
5	19.810	19.595	.0	41.4	60.2	48.5	288.2	1.164	10.14	1.627
6	18.291	18.301	.0	42.5	58.3	43.2	288.2	1.162	10.14	1.627
7	16.723	17.006	.0	43.8	56.1	36.4	288.2	1.159	10.14	1.627
8	15.081	15.712	.0	45.1	53.7	27.9	288.2	1.158	10.14	1.627
9	13.349	14.418	.0	46.7	51.0	17.2	288.2	1.157	10.14	1.627
10	11.493	13.123	.0	48.5	48.0	4.6	288.2	1.157	10.13	1.628
11	10.503	12.476	.0	49.2	46.2	-2.0	288.2	1.156	10.12	1.630
HUB	9.583	11.829	.0	49.9	44.5	-8.4	288.2	1.156	10.10	1.632

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
TIP	161.7	203.4	458.4	306.9	161.7	143.0	.0	144.6	428.9	416.2
1	173.8	203.8	452.7	307.4	173.8	150.6	.0	137.4	418.0	405.3
2	182.9	205.2	445.5	304.1	182.9	156.0	.0	133.4	406.2	394.4
3	188.0	209.2	426.0	285.9	188.0	159.5	.0	135.4	382.2	372.7
4	189.3	212.8	404.7	266.7	189.3	161.4	.0	138.6	357.7	350.9
5	190.3	218.1	383.4	246.9	190.3	163.6	.0	144.3	332.8	329.2
6	190.0	224.9	361.3	227.1	190.0	165.7	.0	152.1	307.3	307.5
7	188.5	233.4	338.3	209.4	188.5	168.5	.0	161.4	280.9	285.7
8	185.8	244.0	314.2	194.7	185.8	172.1	.0	172.9	253.4	264.0
9	181.3	257.4	288.4	184.7	181.3	176.4	.0	187.5	224.3	242.2
10	174.0	274.8	259.9	182.8	174.0	182.2	.0	205.7	193.1	220.5
11	169.0	285.4	244.3	186.5	169.0	186.4	.0	216.1	176.4	209.6
HUB	164.0	296.4	229.8	192.9	164.0	190.9	.0	226.8	161.0	198.7

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	STREAMLINE SLOPE IN	STREAMLINE SLOPE OUT	MERID VEL R	PEAK SS MACH NO
TIP	.486	.561	1.379	.846	.486	.394	-8.52	-8.08	.885	1.535
1	.525	.566	1.367	.853	.525	.418	-7.26	-6.68	.866	1.540
2	.554	.573	1.349	.849	.554	.435	-6.10	-5.47	.853	1.541
3	.570	.587	1.292	.802	.570	.447	-4.40	-3.63	.848	1.525
4	.574	.599	1.228	.751	.574	.454	-2.66	-1.93	.853	1.491
5	.578	.616	1.164	.698	.578	.462	-.90	-.27	.860	1.462
6	.577	.638	1.097	.644	.577	.470	.90	1.38	.872	1.447
7	.572	.665	1.026	.596	.572	.480	2.81	3.00	.894	1.448
8	.563	.698	.952	.557	.563	.493	4.92	4.66	.927	1.423
9	.549	.741	.873	.532	.549	.508	7.38	6.18	.973	1.319
10	.525	.797	.785	.530	.525	.529	10.41	7.61	1.047	1.151
11	.509	.832	.736	.544	.509	.544	12.22	8.42	1.103	1.053
HUB	.494	.869	.692	.566	.494	.560	13.96	9.25	1.164	.959

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
TIP	.00	2.6	.3	8.0	.451	.787	.172	.088	.031	.016
1	5.00	2.7	.4	7.3	.434	.805	.151	.067	.028	.012
2	10.00	2.8	.4	6.5	.425	.822	.134	.053	.025	.010
3	20.00	2.9	.3	4.4	.437	.855	.111	.042	.021	.008
4	30.00	3.1	.3	4.4	.451	.888	.090	.036	.018	.007
5	40.00	3.4	.3	5.2	.470	.909	.077	.036	.015	.007
6	50.00	4.0	.2	6.5	.490	.923	.070	.039	.014	.008
7	60.00	4.7	.2	7.4	.506	.936	.063	.040	.013	.008
8	70.00	6.3	.1	8.4	.513	.946	.059	.046	.012	.010
9	80.00	7.3	-.0	9.6	.503	.951	.062	.059	.013	.012
10	90.00	6.6	.0	11.0	.455	.954	.069	.069	.013	.013
11	95.00	5.9	-.0	11.9	.403	.958	.071	.071	.012	.012
HUB	100.00	5.1	-.1	13.1	.336	.961	.072	.072	.011	.011

TABLE II. - Continued. DESIGN BLADE-ELEMENT PARAMETERS

(b) First-stage stator

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
TIP	24.384	24.384	41.7	.0	41.7	.0	348.2	1.001	16.49	.979
1	23.786	23.796	39.1	.0	39.1	.0	343.6	1.000	16.49	.980
2	23.209	23.251	37.4	.0	37.4	.0	340.5	1.000	16.49	.981
3	22.033	22.122	37.3	.0	37.3	.0	338.4	1.000	16.49	.982
4	20.848	20.983	37.7	.0	37.7	.0	336.6	1.000	16.49	.982
5	19.659	19.847	38.5	.0	38.5	.0	335.4	1.000	16.49	.982
6	18.460	18.712	39.8	.0	39.8	.0	334.7	1.000	16.49	.980
7	17.250	17.575	41.2	.0	41.2	.0	334.1	1.000	16.49	.977
8	16.021	16.432	43.0	.0	43.0	.0	333.6	1.000	16.49	.973
9	14.777	15.291	45.3	.0	45.3	.0	333.3	1.000	16.49	.965
10	13.519	14.157	48.2	.0	48.2	.0	333.3	1.000	16.49	.952
11	12.883	13.595	50.0	.0	50.0	.0	333.2	1.000	16.49	.943
HUB	12.189	12.931	51.9	.0	51.9	.0	333.2	1.000	16.49	.932

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
TIP	221.3	174.8	221.3	174.8	165.1	174.8	147.4	.0	.0	.0
1	221.2	174.1	221.2	174.1	171.7	174.1	139.4	.0	.0	.0
2	221.9	173.8	221.9	173.8	176.2	173.8	134.9	.0	.0	.0
3	224.9	174.3	224.9	174.3	178.8	174.3	136.3	.0	.0	.0
4	227.3	175.0	227.3	175.0	179.9	175.0	138.9	.0	.0	.0
5	231.0	175.4	231.0	175.4	180.8	175.4	143.8	.0	.0	.0
6	235.7	175.3	235.7	175.3	181.2	175.3	150.8	.0	.0	.0
7	241.6	174.7	241.6	174.7	181.7	174.7	159.2	.0	.0	.0
8	248.6	173.7	248.6	173.7	181.9	173.7	169.6	.0	.0	.0
9	257.4	171.7	257.4	171.7	181.1	171.7	182.9	.0	.0	.0
10	267.7	168.9	267.7	168.9	178.4	168.9	199.6	.0	.0	.0
11	273.3	167.6	273.3	167.6	175.8	167.6	209.2	.0	.0	.0
HUB	279.7	166.1	279.7	166.1	172.7	166.1	220.0	.0	.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	STREAMLINE SLOPE IN	STREAMLINE SLOPE OUT	MERID VEL R	PEAK SS MACH NO
TIP	.614	.478	.614	.478	.458	.478	-.96	.42	1.058	1.101
1	.618	.479	.618	.479	.480	.479	-.64	.50	1.014	1.043
2	.623	.481	.623	.481	.495	.481	-.34	.59	.987	1.009
3	.634	.484	.634	.484	.504	.484	.23	.83	.975	1.000
4	.643	.487	.643	.487	.509	.487	.88	1.22	.972	1.001
5	.656	.489	.656	.489	.513	.489	1.59	1.72	.970	1.013
6	.671	.489	.671	.489	.516	.489	2.38	2.31	.967	1.035
7	.690	.488	.690	.488	.519	.488	3.25	2.94	.961	1.064
8	.713	.485	.713	.485	.521	.485	4.18	3.57	.955	1.101
9	.741	.480	.741	.480	.521	.480	5.20	4.10	.948	1.151
10	.774	.472	.774	.472	.516	.472	6.21	4.35	.947	1.218
11	.792	.468	.792	.468	.510	.468	6.62	4.30	.953	1.258
HUB	.813	.464	.813	.464	.502	.464	7.05	4.21	.962	1.303

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
TIP	.00	2.9	-3.0	17.0	.472	.000	.102	.102	.040	.040
1	5.00	3.0	-3.0	14.1	.455	.000	.087	.087	.033	.033
2	10.00	3.0	-3.0	12.0	.444	.000	.081	.081	.030	.030
3	20.00	2.9	-3.0	10.1	.440	.000	.077	.077	.027	.027
4	30.00	2.8	-3.0	9.3	.436	.000	.073	.073	.025	.025
5	40.00	2.8	-3.0	8.9	.438	.000	.072	.072	.023	.023
6	50.00	2.7	-3.0	8.6	.447	.000	.076	.076	.023	.023
7	60.00	2.6	-3.0	8.7	.460	.000	.084	.084	.023	.023
8	70.00	2.4	-3.0	9.0	.477	.000	.094	.094	.024	.024
9	80.00	2.3	-3.0	9.7	.502	.000	.113	.113	.027	.027
10	90.00	2.1	-3.0	11.6	.531	.000	.146	.146	.032	.032
11	95.00	2.0	-3.0	13.1	.545	.000	.167	.167	.035	.035
HUB	100.00	1.8	-3.1	15.0	.560	.000	.192	.191	.039	.038

TABLE II. - Continued. DESIGN BLADE-ELEMENT PARAMETERS

(c) Second-stage rotor

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
TIP	24.127	23.719	.0	38.1	65.4	57.0	348.4	1.153	16.15	1.531
1	23.566	23.223	.0	38.4	64.5	56.8	343.6	1.150	16.17	1.530
2	23.051	22.767	.0	38.8	63.6	56.4	340.5	1.148	16.18	1.528
3	22.002	21.814	.0	39.5	62.2	54.8	338.4	1.145	16.19	1.527
4	20.957	20.856	.0	40.0	60.8	52.6	336.6	1.141	16.19	1.527
5	19.917	19.908	.0	40.9	59.5	49.9	335.4	1.139	16.19	1.527
6	18.878	18.968	.0	42.1	58.3	46.5	334.7	1.139	16.16	1.530
7	17.832	18.039	.0	43.3	57.3	42.3	334.1	1.139	16.11	1.535
8	16.769	17.123	.0	44.6	56.5	37.2	333.6	1.139	16.04	1.541
9	15.685	16.230	.0	46.6	56.0	30.7	333.3	1.142	15.92	1.553
10	14.558	15.366	.0	49.1	56.5	22.3	333.3	1.146	15.70	1.574
11	13.967	14.945	.0	50.4	57.4	17.3	333.2	1.149	15.56	1.589
HUB	13.292	14.453	.0	51.8	58.8	10.9	333.2	1.153	15.38	1.608

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
TIP	185.2	218.1	445.7	314.7	185.2	171.5	.0	134.7	405.3	398.5
1	189.0	214.6	438.7	306.8	189.0	168.1	.0	133.4	395.9	390.1
2	191.8	212.5	432.2	299.4	191.8	165.7	.0	133.0	387.3	382.5
3	195.2	211.9	418.0	283.6	195.2	163.6	.0	134.8	369.6	366.5
4	196.9	212.8	403.4	268.7	196.9	163.0	.0	136.8	352.1	350.4
5	197.1	215.4	388.3	252.9	197.1	162.9	.0	141.0	334.6	334.5
6	195.6	219.5	372.6	236.6	195.6	163.0	.0	147.1	317.1	318.7
7	192.3	224.9	356.0	221.2	192.3	163.7	.0	154.2	299.6	303.0
8	186.8	231.6	338.0	206.8	186.8	164.8	.0	162.7	281.7	287.7
9	177.5	240.3	317.7	192.2	177.5	165.2	.0	174.5	263.5	272.7
10	161.6	252.0	293.2	178.5	161.6	165.1	.0	190.3	244.6	258.2
11	149.8	259.3	278.4	173.2	149.8	165.4	.0	199.7	234.6	251.1
HUB	135.5	268.3	261.2	168.9	135.5	165.8	.0	210.9	223.3	242.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	STREAMLINE SLOPE IN	STREAMLINE SLOPE OUT	MERID VEL R	PEAK SS MACH NO
TIP	.508	.560	1.222	.808	.508	.440	-8.40	-6.29	.926	1.514
1	.523	.555	1.213	.794	.523	.435	-6.96	-5.15	.889	1.485
2	.534	.553	1.202	.779	.534	.431	-5.75	-4.20	.864	1.465
3	.545	.554	1.168	.741	.545	.427	-3.69	-2.61	.838	1.443
4	.552	.559	1.131	.705	.552	.428	-1.88	-1.16	.828	1.434
5	.553	.568	1.090	.666	.553	.429	-.21	.25	.826	1.433
6	.549	.580	1.047	.625	.549	.430	1.40	1.65	.833	1.441
7	.540	.596	1.000	.586	.540	.434	3.04	3.10	.851	1.465
8	.524	.615	.949	.549	.524	.438	4.79	4.67	.882	1.430
9	.497	.639	.890	.511	.497	.440	6.66	6.36	.930	1.387
10	.451	.672	.818	.476	.451	.440	8.65	8.22	1.022	1.329
11	.417	.692	.774	.463	.417	.442	9.70	9.23	1.104	1.293
HUB	.376	.718	.724	.452	.376	.444	10.89	10.44	1.224	1.252

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
TIP	.00	2.5	-.0	2.4	.410	.845	.115	.058	.024	.012
1	5.00	2.5	-.0	2.5	.415	.856	.107	.056	.022	.012
2	10.00	2.5	-.0	2.6	.421	.866	.099	.054	.020	.011
3	20.00	2.7	-.0	3.0	.436	.885	.087	.049	.018	.010
4	30.00	3.0	.0	3.4	.449	.906	.073	.041	.015	.008
5	40.00	3.6	.0	3.9	.466	.918	.066	.038	.014	.008
6	50.00	4.1	-.0	4.5	.486	.926	.063	.039	.013	.008
7	60.00	4.7	-.0	5.4	.505	.934	.060	.037	.013	.008
8	70.00	5.1	-.0	6.4	.522	.941	.058	.044	.013	.010
9	80.00	5.4	-.1	7.8	.539	.943	.062	.056	.014	.012
10	90.00	5.2	-.2	9.8	.551	.943	.073	.072	.016	.016
11	95.00	4.9	-.3	11.3	.549	.945	.079	.079	.017	.017
HUB	100.00	4.7	-.3	12.8	.539	.947	.087	.087	.019	.019

TABLE II. - Concluded. DESIGN BLADE-ELEMENT PARAMETERS

(d) Second-stage stator

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
TIP	23.622	23.622	38.3	.0	38.3	.0	401.5	1.000	24.73	.983
1	23.142	23.159	37.9	.0	37.9	.0	395.2	1.000	24.73	.984
2	22.698	22.731	37.7	.0	37.7	.0	390.9	1.000	24.73	.984
3	21.789	21.850	37.7	.0	37.7	.0	387.3	1.000	24.73	.985
4	20.888	20.972	37.8	.0	37.8	.0	384.1	1.000	24.73	.986
5	20.003	20.108	38.4	.0	38.4	.0	382.2	1.000	24.73	.985
6	19.129	19.258	39.4	.0	39.4	.0	381.2	1.000	24.73	.984
7	18.267	18.422	40.6	.0	40.6	.0	380.4	1.000	24.73	.982
8	17.415	17.599	42.1	.0	42.1	.0	380.0	1.000	24.73	.980
9	16.576	16.800	44.4	.0	44.4	.0	380.5	1.000	24.73	.975
10	15.751	16.036	47.8	.0	47.8	.0	382.0	1.000	24.73	.968
11	15.342	15.669	50.0	.0	50.0	.0	382.9	1.000	24.73	.964
HUB	14.872	15.240	52.5	.0	52.5	.0	384.1	1.000	24.73	.958

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
TIP	217.8	170.8	217.8	170.8	170.8	170.8	135.2	.0	.0	.0
1	217.7	170.2	217.7	170.2	171.7	170.2	133.9	.0	.0	.0
2	218.1	169.9	218.1	169.9	172.5	169.9	133.4	.0	.0	.0
3	220.4	169.8	220.4	169.8	174.2	169.8	134.9	.0	.0	.0
4	222.7	169.9	222.7	169.9	175.9	169.9	136.6	.0	.0	.0
5	225.8	169.8	225.8	169.8	176.9	169.8	140.4	.0	.0	.0
6	229.6	169.6	229.6	169.6	177.3	169.6	145.9	.0	.0	.0
7	233.9	169.2	233.9	169.2	177.5	169.2	152.3	.0	.0	.0
8	238.6	168.7	238.6	168.7	176.9	168.7	160.0	.0	.0	.0
9	244.1	167.6	244.1	167.6	174.4	167.6	170.8	.0	.0	.0
10	250.5	166.3	250.5	166.3	168.2	166.3	185.7	.0	.0	.0
11	254.0	165.8	254.0	165.8	163.4	165.8	194.5	.0	.0	.0
HUB	258.5	165.3	258.5	165.3	157.5	165.3	204.9	.0	.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	STREAMLINE SLOPE IN	STREAMLINE SLOPE OUT	MERID VEL R	PEAK SS MACH NO
TIP	.559	.433	.559	.433	.439	.433	-.10	-.03	1.000	.956
1	.564	.436	.564	.436	.445	.436	.16	.17	.991	.943
2	.568	.437	.568	.437	.449	.437	.38	.34	.985	.935
3	.577	.439	.577	.439	.456	.439	.75	.66	.974	.930
4	.587	.441	.587	.441	.463	.441	1.12	.92	.966	.930
5	.597	.442	.597	.442	.468	.442	1.50	1.15	.960	.941
6	.608	.442	.608	.442	.470	.442	1.92	1.34	.956	.961
7	.621	.441	.621	.441	.471	.441	2.38	1.51	.953	.984
8	.635	.440	.635	.440	.471	.440	2.90	1.65	.953	1.013
9	.651	.437	.651	.437	.465	.437	3.49	1.76	.961	1.057
10	.668	.433	.668	.433	.448	.433	4.22	1.85	.988	1.125
11	.677	.431	.677	.431	.436	.431	4.68	1.88	1.015	1.170
HUB	.689	.429	.689	.429	.420	.429	5.21	1.92	1.050	1.225

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
TIP	.00	2.8	-3.0	16.2	.464	.000	.090	.090	.036	.036
1	5.00	2.8	-3.0	14.2	.459	.000	.084	.084	.033	.033
2	10.00	2.7	-3.0	12.6	.456	.000	.079	.079	.030	.030
3	20.00	2.7	-3.0	10.5	.455	.000	.073	.073	.027	.027
4	30.00	2.6	-3.0	9.6	.454	.000	.069	.069	.024	.024
5	40.00	2.6	-3.0	9.2	.458	.000	.068	.068	.023	.023
6	50.00	2.5	-3.0	9.1	.467	.000	.072	.072	.023	.023
7	60.00	2.4	-3.0	9.2	.477	.000	.077	.077	.024	.024
8	70.00	2.3	-3.0	9.5	.490	.000	.085	.085	.025	.025
9	80.00	2.3	-3.0	10.4	.509	.000	.101	.101	.028	.028
10	90.00	2.1	-3.0	12.7	.533	.000	.125	.125	.033	.033
11	95.00	2.0	-3.0	14.7	.545	.000	.138	.138	.036	.036
HUB	100.00	1.9	-3.0	17.0	.559	.000	.154	.154	.039	.039

TABLE III. - BLADE GEOMETRY

(a) First-stage rotor

RP	PERCENT SPAN	RADII RI	RO	BLADE ANGLES KIC	KTC	KOC	DELTA INC	CONE ANGLE
TIP	0.	25.530	24.773	66.61	64.83	54.06	2.30	-10.639
1	5.	24.880	24.125	64.56	62.39	53.15	2.36	-9.797
2	10.	24.178	23.478	62.83	60.14	52.50	2.42	-8.542
3	20.	22.753	22.184	60.85	56.86	51.60	2.58	-6.433
4	30.	21.294	20.889	59.01	53.98	48.25	2.74	-4.239
5	40.	19.810	19.595	56.81	50.88	43.24	3.13	-2.073
6	50.	18.291	18.301	54.27	47.40	36.70	3.79	.086
7	60.	16.723	17.006	51.40	43.47	29.05	4.56	2.299
8	70.	15.081	15.712	47.44	39.04	19.53	6.24	4.679
9	80.	13.349	14.418	43.79	34.97	7.60	7.28	7.330
10	90.	11.493	13.123	41.40	31.81	-6.39	6.56	10.521
11	95.	10.503	12.476	40.30	30.59	-13.82	5.93	12.427
HUB	100.	9.583	11.829	39.35	29.60	-21.38	5.24	13.854

RP	BLADE THICKNESSES TI	TM	TO	AXIAL DIMENSIONS ZI	ZMC	ZTC	ZO
TIP	.033	.269	.033	2.578	4.987	5.238	6.607
1	.033	.272	.034	2.397	4.999	5.159	6.767
2	.034	.279	.035	2.236	5.002	5.064	6.896
3	.038	.309	.039	2.013	4.973	4.838	7.061
4	.044	.360	.046	1.798	4.921	4.562	7.250
5	.050	.423	.053	1.573	4.843	4.239	7.500
6	.057	.496	.061	1.335	4.732	3.867	7.806
7	.067	.574	.070	1.066	4.616	3.418	8.128
8	.075	.653	.078	.805	4.441	2.896	8.514
9	.082	.725	.084	.528	4.329	2.337	8.837
10	.089	.781	.088	.236	4.336	1.785	9.014
11	.091	.800	.090	.110	4.332	1.531	9.065
HUB	.092	.814	.092	-.000	4.329	1.305	9.104

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	TURNING RATIO	PHISS	CHOKE MARGIN
TIP	9.264	63.86	12.55	1.290	.065	4.26	.036
1	9.283	61.59	11.41	1.327	.107	4.69	.042
2	9.285	59.63	10.34	1.364	.197	5.21	.049
3	9.279	56.94	9.25	1.446	.512	6.39	.061
4	9.270	54.01	10.76	1.539	.745	7.07	.060
5	9.263	50.35	13.57	1.646	.828	7.82	.057
6	9.260	45.84	17.57	1.772	.854	8.86	.058
7	9.264	40.45	22.35	1.923	.934	10.02	.062
8	9.276	33.65	27.92	2.110	.984	11.67	.065
9	9.310	25.98	36.19	2.348	.993	12.27	.059
10	9.385	18.02	47.79	2.670	1.003	10.94	.051
11	9.448	14.02	54.12	2.879	1.003	9.85	.054
HUB	9.522	10.06	60.74	3.114	1.000	8.69	.059

TABLE III. - Continued. BLADE GEOMETRY

(b) First-stage stator

RP	PERCENT SPAN	RADII RI	RO	BLADE ANGLES KIC	KTC	KOC	DELTA INC	CONE ANGLE
TIP	0.	24.384	24.384	38.83	19.39	-16.98	5.92	.057
1	5.	23.796	23.796	36.11	19.51	-14.10	5.95	.102
2	10.	23.209	23.251	34.47	19.77	-12.04	5.96	.434
3	20.	22.033	22.122	34.40	20.75	-10.11	5.92	.907
4	30.	20.848	20.983	34.81	21.67	-9.34	5.85	1.379
5	40.	19.659	19.847	35.73	22.76	-8.86	5.76	1.932
6	50.	18.460	18.712	37.09	24.06	-8.63	5.67	2.592
7	60.	17.250	17.575	38.65	25.48	-8.73	5.56	3.360
8	70.	16.021	16.432	40.55	27.13	-8.95	5.44	4.268
9	80.	14.777	15.291	42.97	29.07	-9.68	5.30	5.353
10	90.	13.519	14.157	46.08	31.32	-11.60	5.12	6.664
11	95.	12.883	13.595	47.94	32.58	-13.12	5.01	7.439
HUB	100.	12.189	12.931	50.04	33.99	-15.04	4.89	7.759

RP	BLADE THICKNESSES TI	TM	TO	AXIAL DIMENSIONS ZI	ZMC	ZTC	ZO
TIP	.150	.460	.150	12.635	15.316	14.475	18.261
1	.146	.454	.146	12.626	15.320	14.375	18.251
2	.141	.448	.141	12.623	15.322	14.306	18.244
3	.132	.437	.131	12.636	15.323	14.260	18.241
4	.123	.426	.122	12.646	15.321	14.212	18.237
5	.114	.414	.112	12.661	15.320	14.176	18.235
6	.104	.402	.103	12.680	15.318	14.146	18.235
7	.095	.391	.094	12.699	15.313	14.108	18.233
8	.085	.379	.084	12.722	15.308	14.071	18.232
9	.076	.367	.074	12.750	15.302	14.034	18.233
10	.066	.355	.065	12.779	15.293	13.987	18.239
11	.061	.350	.060	12.794	15.288	13.960	18.246
HUB	.055	.344	.055	12.811	15.283	13.928	18.254

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	TURNING RATIO	PHISS	CHOKE MARGIN
TIP	5.728	10.97	55.81	1.271	1.000	23.57	.255
1	5.727	10.98	50.20	1.303	1.000	20.50	.221
2	5.728	11.23	46.51	1.334	1.000	18.44	.198
3	5.731	12.16	44.51	1.405	1.000	17.22	.182
4	5.730	12.75	44.16	1.483	1.000	16.56	.170
5	5.732	13.46	44.58	1.570	1.000	16.23	.158
6	5.735	14.27	45.72	1.670	1.000	16.15	.146
7	5.737	15.03	47.38	1.783	1.000	16.15	.134
8	5.741	15.90	49.50	1.915	1.000	16.22	.123
9	5.749	16.79	52.65	2.069	1.000	16.49	.112
10	5.760	17.47	57.68	2.252	1.000	17.09	.107
11	5.768	17.70	61.07	2.358	1.000	17.52	.109
HUB	5.768	17.84	65.07	2.485	1.000	18.01	.112

TABLE III. - Continued. BLADE GEOMETRY

(c) Second-stage rotor

RP	PERCENT SPAN	RADII RI	RADII RO	BLADE ANGLES KIC	BLADE ANGLES KTC	BLADE ANGLES KOC	DELTA INC	CONE ANGLE
TIP	0.	24.127	23.719	62.87	58.21	54.40	2.58	-8.877
1	5.	23.566	23.223	61.97	57.73	54.16	2.51	-7.289
2	10.	23.051	22.767	61.15	57.13	53.69	2.50	-5.915
3	20.	22.002	21.814	59.49	55.28	51.76	2.67	-3.720
4	30.	20.957	20.856	57.73	53.15	49.27	3.05	-1.889
5	40.	19.917	19.908	55.95	50.84	46.04	3.55	-.148
6	50.	18.878	18.968	54.22	48.39	41.93	4.12	1.506
7	60.	17.832	18.039	52.62	45.81	36.91	4.69	3.251
8	70.	16.769	17.123	51.29	43.21	30.77	5.17	5.240
9	80.	15.685	16.230	50.59	40.72	22.89	5.45	7.593
10	90.	14.558	15.366	51.20	38.64	12.36	5.40	10.614
11	95.	13.967	14.945	52.30	37.93	5.83	5.20	12.490
HUB	100.	13.292	14.453	53.75	37.20	-2.08	4.93	14.340

RP	BLADE THICKNESSES TI	BLADE THICKNESSES TM	BLADE THICKNESSES TO	AXIAL DIMENSIONS ZI	AXIAL DIMENSIONS ZMC	AXIAL DIMENSIONS ZTC	AXIAL DIMENSIONS ZO
TIP	.060	.173	.060	24.192	25.427	25.871	26.811
1	.065	.175	.065	24.162	25.432	25.836	26.840
2	.069	.178	.069	24.132	25.436	25.801	26.871
3	.078	.195	.079	24.064	25.441	25.717	26.955
4	.088	.221	.089	23.986	25.442	25.612	27.046
5	.097	.252	.099	23.903	25.441	25.489	27.147
6	.106	.287	.109	23.819	25.439	25.352	27.258
7	.115	.322	.119	23.731	25.435	25.201	27.379
8	.125	.356	.128	23.639	25.425	25.033	27.503
9	.135	.385	.138	23.547	25.412	24.858	27.634
10	.146	.406	.147	23.458	25.395	24.679	27.768
11	.152	.413	.152	23.414	25.381	24.587	27.831
HUB	.159	.419	.159	23.364	25.364	24.482	27.905

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	TURNING RATIO	PHISS	CHOKE MARGIN
TIP	5.109	59.14	8.47	1.292	.599	8.23	.054
1	5.105	58.49	7.81	1.320	.629	7.60	.039
2	5.103	57.77	7.46	1.347	.671	7.27	.031
3	5.097	55.83	7.73	1.407	.806	7.44	.033
4	5.095	53.57	8.46	1.474	.941	8.00	.035
5	5.095	51.00	9.91	1.548	1.003	8.78	.036
6	5.095	48.10	12.29	1.628	1.002	9.75	.038
7	5.099	44.80	15.71	1.719	1.000	10.88	.043
8	5.105	41.09	20.53	1.822	1.000	12.14	.051
9	5.118	36.85	27.71	1.940	1.000	13.69	.066
10	5.144	32.00	38.84	2.079	1.000	15.83	.104
11	5.169	29.36	46.48	2.162	1.000	17.24	.139
HUB	5.203	26.15	55.83	2.268	1.000	18.91	.184

TABLE III. - Concluded. BLADE GEOMETRY

(d) Second-stage stator

RP	PERCENT SPAN	RADII RI	RO	BLADE ANGLES KIC	KTC	KOC	DELTA INC	CONE ANGLE
TIP	0.	23.622	23.622	35.59	18.35	-16.16	5.76	.057
1	5.	23.142	23.159	35.19	18.92	-14.16	5.75	.230
2	10.	22.698	22.731	34.98	19.46	-12.58	5.74	.432
3	20.	21.789	21.850	35.05	20.50	-10.45	5.70	.803
4	30.	20.888	20.972	35.19	21.21	-9.56	5.64	1.111
5	40.	20.003	20.108	35.85	22.04	-9.23	5.57	1.400
6	50.	19.129	19.258	36.95	22.99	-9.11	5.50	1.725
7	60.	18.267	18.422	38.22	24.02	-9.23	5.42	2.068
8	70.	17.415	17.599	39.80	25.18	-9.52	5.33	2.469
9	80.	16.576	16.800	42.18	26.59	-10.40	5.23	3.016
10	90.	15.751	16.036	45.71	28.26	-12.74	5.09	3.844
11	95.	15.342	15.669	47.94	29.17	-14.66	5.01	4.412
HUB	100.	14.872	15.240	50.60	30.24	-17.04	4.91	4.971

RP	BLADE THICKNESSES TI	TM	TO	AXIAL DIMENSIONS ZI	ZMC	ZTC	ZO
TIP	.125	.356	.125	32.281	34.380	33.661	36.647
1	.121	.351	.121	32.288	34.379	33.648	36.643
2	.117	.346	.117	32.294	34.378	33.636	36.639
3	.109	.336	.109	32.306	34.377	33.611	36.634
4	.102	.327	.102	32.314	34.378	33.583	36.632
5	.095	.317	.094	32.321	34.376	33.557	36.630
6	.088	.308	.087	32.331	34.374	33.542	36.629
7	.080	.299	.079	32.344	34.373	33.527	36.631
8	.073	.290	.072	32.359	34.372	33.515	36.633
9	.066	.282	.065	32.379	34.368	33.513	36.636
10	.059	.273	.058	32.403	34.362	33.515	36.646
11	.055	.269	.055	32.415	34.359	33.514	36.654
HUB	.051	.264	.051	32.429	34.354	33.513	36.664

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	TURNING RATIO	PHISS	CHOKE MARGIN
TIP	4.427	9.72	51.74	1.253	1.000	21.08	.299
1	4.427	10.52	49.35	1.278	1.000	20.02	.285
2	4.427	11.20	47.56	1.303	1.000	19.21	.273
3	4.427	12.31	45.50	1.356	1.000	18.18	.256
4	4.427	12.83	44.75	1.414	1.000	17.45	.242
5	4.427	13.33	45.08	1.476	1.000	17.19	.230
6	4.427	13.94	46.06	1.542	1.000	17.23	.221
7	4.429	14.52	47.45	1.614	1.000	17.39	.212
8	4.430	15.18	49.31	1.691	1.000	17.72	.204
9	4.431	15.94	52.58	1.775	1.000	18.59	.201
10	4.434	16.57	58.45	1.865	1.000	20.35	.213
11	4.437	16.75	62.60	1.913	1.000	21.60	.227
HUB	4.441	16.94	67.64	1.972	1.000	23.11	.245

TABLE IV. - OVERALL PERFORMANCE AT 100 PERCENT OF DESIGN SPEED

(a) Two-stage fan

READING NUMBER	1283	1382	1393	1415	1426	1437	1461
TOTAL PRESSURE RATIO	2.471	1.888	2.089	2.343	2.406	2.439	2.477
TOTAL TEMPERATURE RATIO	1.347	1.276	1.293	1.327	1.337	1.342	1.350
ADIABATIC EFFICIENCY	.846	.721	.795	.839	.841	.843	.839
POLYTROPIC EFFICIENCY	.864	.745	.815	.857	.859	.861	.858
MASS FLOW	34.030	34.512	34.456	34.382	34.266	34.166	33.603
WHEEL SPEED, RPM	16083.8	16090.0	16056.0	16061.3	16087.1	16101.3	16073.0
PERCENT OF DESIGN SPEED	100.3	100.3	100.1	100.1	100.3	100.4	100.2
DELTA	.893	.913	.913	.910	.910	.909	.909
THETA	.933	.926	.925	.935	.933	.934	.931

(b) First stage

READING NUMBER	1283	1382	1393	1415	1426	1437	1461
ROTOR TOTAL PRESSURE RATIO	1.686	1.588	1.589	1.614	1.637	1.656	1.694
STAGE TOTAL PRESSURE RATIO	1.655	1.564	1.564	1.589	1.612	1.630	1.666
ROTOR TOTAL TEMPERATURE RATIO	1.178	1.159	1.159	1.163	1.168	1.172	1.180
STAGE TOTAL TEMPERATURE RATIO	1.178	1.159	1.159	1.163	1.168	1.172	1.181
ROTOR ADIABATIC EFFICIENCY	.906	.897	.891	.896	.899	.902	.902
STAGE ADIABATIC EFFICIENCY	.870	.855	.859	.865	.868	.870	.868
ROTOR POLYTROPIC EFFICIENCY	.913	.895	.898	.903	.906	.908	.909
STAGE POLYTROPIC EFFICIENCY	.879	.864	.868	.874	.876	.878	.877
ROTOR HEAD RISE COEFFICIENT	.268	.235	.236	.244	.251	.257	.271
STAGE HEAD RISE COEFFICIENT	.257	.226	.228	.236	.243	.249	.261
ROTOR TEMPERATURE RISE COEFFICIENT	.295	.265	.265	.273	.280	.285	.300
STAGE TEMPERATURE RISE COEFFICIENT	.296	.265	.265	.273	.280	.286	.301
FLOW COEFFICIENT	.443	.451	.451	.450	.446	.444	.434
EQUIVALENT VALUES BASED ON STAGE INLET							
MASS FLOW	34.03	34.51	34.46	34.38	34.27	34.17	33.60
MASS FLOW PER UNIT ANNULUS AREA	193.44	196.18	195.86	195.44	194.78	194.21	191.01
WHEEL SPEED, RPM	16083.8	16090.0	16056.0	16061.3	16087.1	16101.3	16073.0
TIP SPEED	430.0	430.2	429.2	429.4	430.1	430.5	429.7
PERCENT OF DESIGN SPEED	100.3	100.3	100.1	100.1	100.3	100.4	100.2

(c) Second stage

READING NUMBER	1283	1382	1393	1415	1426	1437	1461
ROTOR TOTAL PRESSURE RATIO	1.518	1.281	1.368	1.498	1.516	1.520	1.512
STAGE TOTAL PRESSURE RATIO	1.494	1.208	1.336	1.475	1.494	1.497	1.488
ROTOR TOTAL TEMPERATURE RATIO	1.144	1.100	1.116	1.140	1.145	1.145	1.144
STAGE TOTAL TEMPERATURE RATIO	1.144	1.100	1.116	1.140	1.145	1.145	1.144
ROTOR ADIABATIC EFFICIENCY	.877	.729	.802	.868	.868	.871	.867
STAGE ADIABATIC EFFICIENCY	.842	.552	.739	.834	.836	.836	.831
ROTOR POLYTROPIC EFFICIENCY	.864	.738	.810	.875	.876	.878	.874
STAGE POLYTROPIC EFFICIENCY	.851	.563	.749	.843	.845	.845	.841
ROTOR HEAD RISE COEFFICIENT	.270	.154	.197	.259	.267	.270	.269
STAGE HEAD RISE COEFFICIENT	.260	.117	.182	.249	.257	.259	.258
ROTOR TEMPERATURE RISE COEFFICIENT	.308	.211	.246	.298	.308	.310	.310
STAGE TEMPERATURE RISE COEFFICIENT	.308	.211	.246	.298	.308	.310	.310
FLOW COEFFICIENT	.461	.498	.497	.487	.477	.470	.453
EQUIVALENT VALUES BASED ON STAGE INLET							
MASS FLOW	22.32	23.76	23.71	23.34	22.98	22.69	21.92
MASS FLOW PER UNIT ANNULUS AREA	175.19	186.53	186.08	183.19	180.36	178.08	172.03
WHEEL SPEED, RPM	14821.7	14944.5	14916.5	14890.6	14883.9	14872.2	14792.0
TIP SPEED	374.5	377.6	376.9	376.2	376.1	375.8	373.7
PERCENT OF DESIGN SPEED	99.8	100.6	100.4	100.3	100.2	100.1	99.6
CUMULATIVE VALUES							
COMPRESSOR TOTAL PRESSURE RATIO	2.471	1.888	2.089	2.343	2.406	2.439	2.477
COMPRESSOR TOTAL TEMPERATURE RATIO	1.347	1.276	1.293	1.327	1.337	1.342	1.350
COMPRESSOR ADIABATIC EFFICIENCY	.846	.721	.795	.839	.841	.843	.839
COMPRESSOR POLYTROPIC EFFICIENCY	.864	.745	.815	.857	.859	.861	.858

TABLE V. - OVERALL PERFORMANCE AT 90 PERCENT OF DESIGN SPEED

(a) Two-stage fan

READING NUMBER	1310	1321	1332
TOTAL PRESSURE RATIO	1.805	2.079	2.132
TOTAL TEMPERATURE RATIO	1.229	1.269	1.286
ADIABATIC EFFICIENCY	.801	.862	.840
POLYTROPIC EFFICIENCY	.817	.876	.856
MASS FLOW	31.046	29.927	28.043
WHEEL SPEED, RPM	14488.2	14504.5	14505.3
PERCENT OF DESIGN SPEED	90.3	90.4	90.4
DELTA	.902	.905	.911
THETA	.910	.911	.911

(b) First stage

READING NUMBER	1310	1321	1332
ROTOR TOTAL PRESSURE RATIO	1.491	1.526	1.559
STAGE TOTAL PRESSURE RATIO	1.473	1.506	1.529
ROTOR TOTAL TEMPERATURE RATIO	1.133	1.142	1.152
STAGE TOTAL TEMPERATURE RATIO	1.133	1.142	1.152
ROTOR ADIABATIC EFFICIENCY	.909	.905	.891
STAGE ADIABATIC EFFICIENCY	.881	.877	.848
ROTOR POLYTROPIC EFFICIENCY	.914	.911	.897
STAGE POLYTROPIC EFFICIENCY	.887	.884	.857
ROTOR HEAD RISE COEFFICIENT	.248	.263	.276
STAGE HEAD RISE COEFFICIENT	.240	.254	.264
ROTOR TEMPERATURE RISE COEFFICIENT	.272	.290	.310
STAGE TEMPERATURE RISE COEFFICIENT	.272	.290	.311
FLOW COEFFICIENT	.431	.411	.378
EQUIVALENT VALUES BASED ON STAGE INLET			
MASS FLOW	31.05	29.93	28.04
MASS FLOW PER UNIT ANNULUS AREA	176.48	170.12	159.41
WHEEL SPEED, RPM	14488.2	14504.5	14505.3
TIP SPEED	387.3	387.8	387.8
PERCENT OF DESIGN SPEED	90.3	90.4	90.4

(c) Second stage

READING NUMBER	1310	1321	1332
ROTOR TOTAL PRESSURE RATIO	1.272	1.400	1.417
STAGE TOTAL PRESSURE RATIO	1.226	1.381	1.395
ROTOR TOTAL TEMPERATURE RATIO	1.085	1.111	1.117
STAGE TOTAL TEMPERATURE RATIO	1.085	1.111	1.116
ROTOR ADIABATIC EFFICIENCY	.838	.904	.894
STAGE ADIABATIC EFFICIENCY	.704	.864	.853
ROTOR POLYTROPIC EFFICIENCY	.843	.908	.899
STAGE POLYTROPIC EFFICIENCY	.712	.870	.860
ROTOR HEAD RISE COEFFICIENT	.180	.257	.269
STAGE HEAD RISE COEFFICIENT	.152	.246	.256
ROTOR TEMPERATURE RISE COEFFICIENT	.215	.285	.301
STAGE TEMPERATURE RISE COEFFICIENT	.215	.284	.300
FLOW COEFFICIENT	.501	.468	.429
EQUIVALENT VALUES BASED ON STAGE INLET			
MASS FLOW	22.43	21.23	19.68
MASS FLOW PER UNIT ANNULUS AREA	176.06	166.62	154.50
WHEEL SPEED, RPM	13612.2	13575.5	13515.2
TIP SPEED	343.9	343.0	341.5
PERCENT OF DESIGN SPEED	91.7	91.4	91.0
CUMULATIVE VALUES			
COMPRESSOR TOTAL PRESSURE RATIO	1.805	2.079	2.132
COMPRESSOR TOTAL TEMPERATURE RATIO	1.229	1.269	1.286
COMPRESSOR ADIABATIC EFFICIENCY	.801	.862	.840
COMPRESSOR POLYTROPIC EFFICIENCY	.817	.876	.856

TABLE VI. - OVERALL PERFORMANCE AT 80 PERCENT OF DESIGN SPEED

(a) Two-stage fan

READING NUMBER	1347	1358	1369	1544	1555
TOTAL PRESSURE RATIO	1.508	1.763	1.821	1.710	1.811
TOTAL TEMPERATURE RATIO	1.163	1.202	1.227	1.191	1.216
ADIABATIC EFFICIENCY	.763	.871	.819	.867	.852
POLYTROPIC EFFICIENCY	.776	.881	.834	.877	.864
MASS FLOW	27.185	25.381	22.625	26.511	24.511
WHEEL SPEED, RPM	12856.0	12834.8	12841.6	12849.5	1289[illegible].0
PERCENT OF DESIGN SPEED	80.1	80.0	80.0	80.1	80.4
DELTA	.928	.934	.943	.915	.921
THETA	.929	.929	.936	.947	.945

(b) First stage

READING NUMBER	1347	1358	1369	1544	1555
ROTOR TOTAL PRESSURE RATIO	1.360	1.395	1.421	1.376	1.410
STAGE TOTAL PRESSURE RATIO	1.349	1.380	1.393	1.363	1.392
ROTOR TOTAL TEMPERATURE RATIO	1.100	1.110	1.121	1.105	1.115
STAGE TOTAL TEMPERATURE RATIO	1.100	1.110	1.122	1.105	1.115
ROTOR ADIABATIC EFFICIENCY	.917	.909	.870	.912	.894
STAGE ADIABATIC EFFICIENCY	.890	.879	.815	.885	.857
ROTOR POLYTROPIC EFFICIENCY	.920	.914	.877	.916	.899
STAGE POLYTROPIC EFFICIENCY	.895	.884	.823	.890	.864
ROTOR HEAD RISE COEFFICIENT	.239	.261	.275	.249	.267
STAGE HEAD RISE COEFFICIENT	.232	.252	.259	.241	.256
ROTOR TEMPERATURE RISE COEFFICIENT	.261	.287	.316	.273	.298
STAGE TEMPERATURE RISE COEFFICIENT	.261	.287	.318	.273	.299
FLOW COEFFICIENT	.410	.379	.332	.398	.362
EQUIVALENT VALUES BASED ON STAGE INLET					
MASS FLOW	27.18	25.38	22.63	26.51	24.51
MASS FLOW PER UNIT ANNULUS AREA	154.53	144.27	128.61	150.70	139.33
WHEEL SPEED, RPM	12856.0	12834.8	12841.6	12849.5	12899.0
TIP SPEED	343.7	343.1	343.3	343.5	344.8
PERCENT OF DESIGN SPEED	80.1	80.0	80.0	80.1	80.4

(c) Second stage

READING NUMBER	1347	1358	1369	1544	1555
ROTOR TOTAL PRESSURE RATIO	1.173	1.294	1.326	1.275	1.319
STAGE TOTAL PRESSURE RATIO	1.118	1.278	1.308	1.255	1.302
ROTOR TOTAL TEMPERATURE RATIO	1.057	1.083	1.094	1.078	1.091
STAGE TOTAL TEMPERATURE RATIO	1.057	1.083	1.094	1.078	1.091
ROTOR ADIABATIC EFFICIENCY	.816	.921	.887	.921	.906
STAGE ADIABATIC EFFICIENCY	.568	.875	.844	.859	.863
ROTOR POLYTROPIC EFFICIENCY	.820	.923	.891	.923	.909
STAGE POLYTROPIC EFFICIENCY	.575	.880	.850	.863	.868
ROTOR HEAD RISE COEFFICIENT	.146	.242	.268	.226	.259
STAGE HEAD RISE COEFFICIENT	.101	.230	.254	.211	.246
ROTOR TEMPERATURE RISE COEFFICIENT	.178	.263	.302	.245	.286
STAGE TEMPERATURE RISE COEFFICIENT	.178	.262	.301	.245	.285
FLOW COEFFICIENT	.514	.463	.406	.493	.440
EQUIVALENT VALUES BASED ON STAGE INLET					
MASS FLOW	21.14	19.37	17.21	20.44	18.60
MASS FLOW PER UNIT ANNULUS AREA	165.94	152.06	135.06	160.45	146.02
WHEEL SPEED, RPM	12256.3	12183.7	12124.8	12225.9	12213.1
TIP SPEED	309.7	307.8	306.3	308.9	308.6
PERCENT OF DESIGN SPEED	82.5	82.0	81.6	82.3	82.2
CUMULATIVE VALUES					
COMPRESSOR TOTAL PRESSURE RATIO	1.508	1.763	1.821	1.710	1.811
COMPRESSOR TOTAL TEMPERATURE RATIO	1.163	1.202	1.227	1.191	1.216
COMPRESSOR ADIABATIC EFFICIENCY	.763	.871	.819	.867	.852
COMPRESSOR POLYTROPIC EFFICIENCY	.776	.881	.834	.877	.864

TABLE VII. - OVERALL PERFORMANCE AT 70 PERCENT OF DESIGN SPEED

(a) Two-stage fan

READING NUMBER	1475	1486	1497
TOTAL PRESSURE RATIO	1.395	1.540	1.579
TOTAL TEMPERATURE RATIO	1.124	1.152	1.169
ADIABATIC EFFICIENCY	.807	.863	.821
POLYTROPIC EFFICIENCY	.816	.871	.832
MASS FLOW	23.894	21.372	19.419
WHEEL SPEED, RPM	11251.7	11189.5	11191.0
PERCENT OF DESIGN SPEED	70.1	69.7	69.8
DELTA	.928	.935	.941
THETA	.947	.945	.947

(b) First stage

READING NUMBER	1475	1486	1497
ROTOR TOTAL PRESSURE RATIO	1.258	1.289	1.308
STAGE TOTAL PRESSURE RATIO	1.250	1.277	1.286
ROTOR TOTAL TEMPERATURE RATIO	1.074	1.084	1.092
STAGE TOTAL TEMPERATURE RATIO	1.074	1.084	1.092
ROTOR ADIABATIC EFFICIENCY	.918	.892	.870
STAGE ADIABATIC EFFICIENCY	.890	.857	.806
ROTOR POLYTROPIC EFFICIENCY	.921	.896	.875
STAGE POLYTROPIC EFFICIENCY	.894	.862	.813
ROTOR HEAD RISE COEFFICIENT	.230	.258	.274
STAGE HEAD RISE COEFFICIENT	.223	.248	.256
ROTOR TEMPERATURE RISE COEFFICIENT	.251	.289	.314
STAGE TEMPERATURE RISE COEFFICIENT	.251	.290	.318
FLOW COEFFICIENT	.402	.357	.321
EQUIVALENT VALUES BASED ON STAGE INLET			
MASS FLOW	23.89	21.37	19.42
MASS FLOW PER UNIT ANNULUS AREA	135.82	121.49	110.39
WHEEL SPEED, RPM	11251.7	11189.5	11191.0
TIP SPEED	300.8	299.1	299.2
PERCENT OF DESIGN SPEED	70.1	69.7	69.8

(c) Second stage

READING NUMBER	1475	1486	1497
ROTOR TOTAL PRESSURE RATIO	1.157	1.220	1.242
STAGE TOTAL PRESSURE RATIO	1.117	1.207	1.228
ROTOR TOTAL TEMPERATURE RATIO	1.046	1.062	1.071
STAGE TOTAL TEMPERATURE RATIO	1.046	1.062	1.070
ROTOR ADIABATIC EFFICIENCY	.916	.934	.903
STAGE ADIABATIC EFFICIENCY	.692	.884	.855
ROTOR POLYTROPIC EFFICIENCY	.918	.936	.906
STAGE POLYTROPIC EFFICIENCY	.696	.887	.859
ROTOR HEAD RISE COEFFICIENT	.169	.237	.261
STAGE HEAD RISE COEFFICIENT	.128	.224	.247
ROTOR TEMPERATURE RISE COEFFICIENT	.185	.254	.289
STAGE TEMPERATURE RISE COEFFICIENT	.185	.253	.289
FLOW COEFFICIENT	.536	.463	.415
EQUIVALENT VALUES BASED ON STAGE INLET			
MASS FLOW	19.81	17.43	15.78
MASS FLOW PER UNIT ANNULUS AREA	155.52	136.83	123.86
WHEEL SPEED, RPM	10857.7	10745.2	10706.9
TIP SPEED	274.3	271.5	270.5
PERCENT OF DESIGN SPEED	73.1	72.4	72.1
CUMULATIVE VALUES			
COMPRESSOR TOTAL PRESSURE RATIO	1.395	1.540	1.579
COMPRESSOR TOTAL TEMPERATURE RATIO	1.124	1.152	1.169
COMPRESSOR ADIABATIC EFFICIENCY	.807	.863	.821
COMPRESSOR POLYTROPIC EFFICIENCY	.816	.871	.832

TABLE VIII. - OVERALL PERFORMANCE AT 50 PERCENT OF DESIGN SPEED

(a) Two-stage fan

READING NUMBER	1510	1521	1533
TOTAL PRESSURE RATIO	1.181	1.238	1.261
TOTAL TEMPERATURE RATIO	1.059	1.072	1.082
ADIABATIC EFFICIENCY	.830	.875	.836
POLYTROPIC EFFICIENCY	.834	.878	.842
MASS FLOW	16.550	14.721	13.157
WHEEL SPEED, RPM	8031.0	8050.2	8017.2
PERCENT OF DESIGN SPEED	50.1	50.2	50.0
DELTA	.945	.948	.950
THETA	.948	.948	.948

(b) First stage

READING NUMBER	1510	1521	1533
ROTOR TOTAL PRESSURE RATIO	1.123	1.139	1.149
STAGE TOTAL PRESSURE RATIO	1.119	1.134	1.139
ROTOR TOTAL TEMPERATURE RATIO	1.037	1.043	1.047
STAGE TOTAL TEMPERATURE RATIO	1.037	1.043	1.047
ROTOR ADIABATIC EFFICIENCY	.914	.889	.866
STAGE ADIABATIC EFFICIENCY	.886	.854	.801
ROTOR POLYTROPIC EFFICIENCY	.916	.891	.869
STAGE POLYTROPIC EFFICIENCY	.888	.857	.804
ROTOR HEAD RISE COEFFICIENT	.225	.251	.271
STAGE HEAD RISE COEFFICIENT	.218	.242	.254
ROTOR TEMPERATURE RISE COEFFICIENT	.246	.283	.313
STAGE TEMPERATURE RISE COEFFICIENT	.246	.283	.317
FLOW COEFFICIENT	.377	.332	.297
EQUIVALENT VALUES BASED ON STAGE INLET			
MASS FLOW	16.55	14.72	13.16
MASS FLOW PER UNIT ANNULUS AREA	94.08	83.68	74.79
WHEEL SPEED, RPM	8031.0	8050.2	8017.2
TIP SPEED	214.7	215.2	214.3
PERCENT OF DESIGN SPEED	50.1	50.2	50.0

(c) Second stage

READING NUMBER	1510	1521	1533
ROTOR TOTAL PRESSURE RATIO	1.072	1.100	1.114
STAGE TOTAL PRESSURE RATIO	1.055	1.093	1.107
ROTOR TOTAL TEMPERATURE RATIO	1.021	1.028	1.033
STAGE TOTAL TEMPERATURE RATIO	1.021	1.028	1.033
ROTOR ADIABATIC EFFICIENCY	.962	.986	.950
STAGE ADIABATIC EFFICIENCY	.740	.913	.895
ROTOR POLYTROPIC EFFICIENCY	.962	.986	.951
STAGE POLYTROPIC EFFICIENCY	.742	.914	.897
ROTOR HEAD RISE COEFFICIENT	.152	.209	.240
STAGE HEAD RISE COEFFICIENT	.117	.193	.226
ROTOR TEMPERATURE RISE COEFFICIENT	.158	.212	.253
STAGE TEMPERATURE RISE COEFFICIENT	.158	.212	.252
FLOW COEFFICIENT	.536	.465	.414
EQUIVALENT VALUES BASED ON STAGE INLET			
MASS FLOW	15.06	13.26	11.82
MASS FLOW PER UNIT ANNULUS AREA	118.21	104.09	92.79
WHEEL SPEED, RPM	7886.8	7883.6	7833.8
TIP SPEED	199.3	199.2	197.9
PERCENT OF DESIGN SPEED	53.1	53.1	52.8
CUMULATIVE VALUES			
COMPRESSOR TOTAL PRESSURE RATIO	1.181	1.238	1.261
COMPRESSOR TOTAL TEMPERATURE RATIO	1.059	1.072	1.082
COMPRESSOR ADIABATIC EFFICIENCY	.830	.875	.836
COMPRESSOR POLYTROPIC EFFICIENCY	.834	.878	.842

TABLE IX. - BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(a) 100 Percent of design speed; reading 1283

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	168.8	140.5	.832	170.2	141.5	.831	3.3	155.2	-21.5	-16.5	170.2	210.0	449.2	288.2
2	24.178	23.477	184.6	154.3	.836	185.7	155.0	.835	2.1	149.7	-19.7	-14.8	185.7	215.5	445.7	290.5
3	22.753	22.184	196.0	169.2	.863	196.6	169.5	.862	.6	144.2	-15.1	-10.7	196.6	222.5	430.2	285.3
4	21.293	20.889	197.4	172.8	.875	197.7	172.9	.875	.3	147.7	-9.2	-5.8	197.7	227.4	409.2	267.5
5	19.809	19.596	198.1	171.8	.867	198.1	171.8	.867	-.6	151.7	-3.1	-.8	198.1	229.2	388.5	247.7
6	18.291	18.301	197.3	169.1	.857	197.3	169.1	.857	-.3	156.9	3.1	4.1	197.3	230.7	366.1	227.0
7	16.723	17.005	195.4	166.4	.852	195.6	166.6	.852	3.8	169.8	9.6	8.7	195.6	237.9	339.8	203.4
8	15.080	15.712	192.1	168.2	.876	192.8	168.8	.875	4.0	183.4	16.5	13.7	192.8	249.2	315.6	187.3
9	13.348	14.417	186.7	172.2	.922	188.3	173.2	.920	2.2	197.9	24.2	18.6	188.3	263.0	291.5	178.9
10	11.493	13.124	178.1	171.2	.961	181.1	172.7	.954	1.6	215.9	32.7	22.9	181.1	276.5	263.9	172.8
11	10.503	12.476	172.3	167.2	.971	176.3	169.1	.959	1.0	230.1	37.3	24.8	176.3	285.6	249.0	170.2

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.512	.578	1.351	.793	.508	.386	.512	.389	1.1	47.9	1.1	47.7	67.9	60.8	67.7	60.6
2	.562	.597	1.348	.805	.558	.428	.562	.430	.6	44.1	.6	44.0	65.5	57.9	65.4	57.8
3	.598	.623	1.307	.799	.596	.474	.598	.475	.2	40.4	.2	40.4	62.9	53.6	62.8	53.5
4	.601	.640	1.245	.753	.601	.486	.601	.487	.1	40.5	.1	40.5	61.1	49.8	61.1	49.7
5	.603	.647	1.183	.700	.603	.485	.603	.485	-.2	41.4	-.2	41.4	59.3	46.1	59.3	46.1
6	.601	.654	1.114	.643	.600	.479	.601	.479	-.1	42.9	-.1	42.9	57.4	41.8	57.4	41.8
7	.595	.677	1.034	.579	.594	.474	.595	.474	1.1	45.6	1.1	45.5	54.9	35.0	54.9	35.0
8	.586	.713	.959	.536	.584	.481	.586	.483	1.2	47.5	1.2	47.4	52.5	25.8	52.4	25.7
9	.571	.757	.885	.515	.567	.495	.571	.498	.7	49.0	.7	48.8	50.0	14.6	49.8	14.5
10	.549	.801	.799	.501	.539	.496	.549	.500	.5	51.6	.5	51.3	47.1	1.7	46.7	1.7
11	.533	.830	.753	.495	.521	.486	.533	.491	.3	54.0	.3	53.7	45.6	-6.8	44.9	-6.7

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.78	17.02	1.741	289.5	350.9	1.212	8.18	13.58	1.03587	1.43819	275.0	328.9	419.0	406.3
2	10.09	17.23	1.708	289.1	347.2	1.201	8.14	13.54	1.04372	1.45573	271.9	324.0	407.2	395.4
3	10.18	17.44	1.713	288.5	341.9	1.185	7.99	13.42	1.03444	1.47405	269.3	317.3	383.2	373.7
4	10.18	17.43	1.713	288.1	339.7	1.179	7.97	13.23	1.03359	1.46813	268.6	314.0	358.6	351.8
5	10.17	17.20	1.691	287.9	337.9	1.174	7.95	12.98	1.03273	1.45037	268.3	311.7	333.7	330.1
6	10.16	16.97	1.671	287.9	336.2	1.168	7.96	12.74	1.03284	1.43276	268.5	309.7	308.1	308.2
7	10.16	16.82	1.655	287.8	335.1	1.165	7.99	12.37	1.03664	1.40358	268.7	306.9	281.7	286.4
8	10.16	16.86	1.659	287.8	335.1	1.164	8.05	12.02	1.04176	1.37613	269.3	304.2	254.0	264.6
9	10.17	16.84	1.657	287.6	335.0	1.165	8.14	11.52	1.05121	1.33572	269.9	300.5	224.8	242.8
10	10.16	16.70	1.643	287.4	334.6	1.164	8.28	10.94	1.06453	1.28557	271.1	296.6	193.6	221.1
11	10.17	16.58	1.631	287.3	335.3	1.167	8.38	10.55	1.07364	1.24772	271.8	294.7	176.9	210.1

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.2	.8	7.5	.484	.809	.161	.080	.081	.030	.015	.015	1.540
2	10.0	2.5	.1	5.3	.468	.822	.145	.066	.079	.028	.013	.015	1.532
3	20.0	2.0	-.6	1.9	.451	.899	.082	.014	.068	.017	.003	.014	1.508
4	30.0	2.1	-.6	1.5	.462	.927	.061	.008	.053	.013	.002	.011	1.474
5	40.0	2.5	-.6	2.8	.481	.932	.060	.019	.040	.013	.004	.009	1.447
6	50.0	3.1	-.7	5.1	.501	.942	.053	.024	.030	.011	.005	.006	1.428
7	60.0	3.5	-1.1	5.9	.530	.940	.060	.041	.019	.013	.009	.004	1.407
8	70.0	4.9	-1.3	6.2	.544	.947	.060	.049	.011	.013	.010	.002	1.388
9	80.0	6.0	-1.3	6.9	.535	.942	.074	.072	.002	.015	.015	.000	1.299
10	90.0	5.5	-1.3	8.1	.507	.927	.110	.110	.000	.021	.021	.000	1.137
11	95.0	4.6	-1.3	7.1	.490	.898	.173	.173	.000	.030	.030	.000	1.043

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(b) 100 Percent of design speed; reading 1382

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	181.8	137.3	.755	183.3	138.2	.754	2.9	136.9	-23.2	-16.1	183.3	194.5	454.9	302.9
2	24.178	23.477	190.4	156.8	.824	191.5	157.5	.823	1.8	131.7	-20.3	-15.0	191.5	205.3	448.5	307.3
3	22.753	22.184	198.2	173.6	.876	198.8	173.9	.875	1.6	127.6	-15.3	-11.0	198.8	215.7	430.4	301.4
4	21.293	20.889	200.1	177.2	.885	200.4	177.3	.885	1.5	129.8	-9.3	-6.0	200.4	219.7	409.6	284.2
5	19.809	19.596	201.1	179.3	.891	201.1	179.3	.891	1.3	135.9	-3.2	-.8	201.1	224.9	388.6	264.4
6	18.291	18.301	200.6	181.3	.904	200.6	181.4	.904	-.2	142.6	3.2	4.4	200.6	230.7	367.8	245.7
7	16.723	17.005	198.6	183.9	.926	198.8	184.2	.926	-.2	151.6	9.7	9.6	198.8	238.5	345.0	228.3
8	15.080	15.712	195.2	187.8	.962	195.9	188.4	.962	-.1	166.7	16.8	15.3	195.9	251.6	320.9	212.4
9	13.348	14.417	189.5	192.0	1.013	191.1	193.1	1.010	-.2	185.0	24.6	20.8	191.1	267.4	295.3	201.6
10	11.493	13.124	180.7	189.0	1.046	183.7	190.7	1.038	-.1	203.3	33.2	25.2	183.7	278.7	267.0	191.5
11	10.503	12.476	174.7	180.8	1.035	178.8	182.8	1.022	.0	215.0	37.8	26.8	178.8	282.2	251.5	182.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.554	.539	1.375	.839	.550	.380	.554	.383	.9	44.9	.9	44.7	66.4	63.0	66.2	62.9
2	.580	.573	1.360	.858	.577	.438	.580	.440	.5	40.0	.5	39.9	64.9	59.3	64.7	59.2
3	.605	.609	1.309	.851	.603	.490	.605	.491	.5	36.3	.5	36.3	62.6	54.8	62.5	54.8
4	.610	.623	1.248	.806	.610	.503	.610	.503	.4	36.2	.4	36.2	60.7	51.4	60.7	51.4
5	.613	.640	1.184	.752	.613	.510	.613	.510	.4	37.2	.4	37.2	58.8	47.3	58.8	47.3
6	.611	.658	1.120	.701	.611	.517	.611	.518	-.0	38.2	-.0	38.2	57.0	42.4	57.0	42.4
7	.606	.684	1.051	.654	.605	.527	.606	.528	-.1	39.5	-.1	39.5	54.8	36.3	54.8	36.2
8	.596	.724	.976	.611	.594	.541	.596	.542	-.0	41.6	-.0	41.5	52.5	27.6	52.4	27.5
9	.581	.774	.897	.584	.576	.556	.581	.559	-.1	43.9	-.1	43.8	49.9	16.8	49.7	16.7
10	.557	.812	.810	.558	.548	.550	.557	.555	-.0	47.1	-.0	46.8	47.0	5.4	46.5	5.3
11	.541	.823	.761	.533	.529	.527	.541	.533	.0	49.9	.0	49.6	45.4	-1.5	44.7	-1.5

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.91	15.42	1.555	289.0	343.2	1.188	8.05	12.66	1.02981	1.35949	272.2	324.4	419.2	406.5
2	10.10	15.85	1.570	288.8	340.0	1.177	8.04	12.68	1.03495	1.38540	270.5	319.0	407.4	395.6
3	10.15	16.14	1.590	288.6	335.5	1.162	7.93	12.57	1.02760	1.40213	268.9	312.3	383.4	373.8
4	10.16	16.14	1.589	288.1	333.1	1.156	7.90	12.42	1.02622	1.39979	268.1	309.1	358.8	352.0
5	10.16	16.14	1.589	288.1	332.4	1.154	7.88	12.25	1.02506	1.38946	267.9	307.2	333.8	330.2
6	10.16	16.12	1.587	288.1	331.9	1.152	7.89	12.05	1.02590	1.37443	268.0	305.4	308.2	308.4
7	10.16	16.11	1.586	287.8	331.2	1.151	7.93	11.78	1.02990	1.35540	268.1	302.8	281.8	286.5
8	10.16	16.26	1.602	287.9	331.9	1.153	7.99	11.47	1.03531	1.33073	268.8	300.3	254.1	264.7
9	10.16	16.39	1.614	287.6	332.4	1.156	8.08	11.03	1.04516	1.29440	269.4	296.8	224.9	242.9
10	10.16	16.26	1.601	287.3	332.1	1.156	8.22	10.54	1.05940	1.25190	270.5	293.4	193.7	221.1
11	10.16	15.88	1.564	287.3	332.3	1.157	8.32	10.18	1.06816	1.21240	271.4	292.6	177.0	210.2

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	1.7	-.7	9.7	.443	.717	.209	.130	.079	.036	.022	.014	1.512
2	10.0	1.9	-.5	6.7	.420	.776	.162	.083	.079	.030	.016	.015	1.521
3	20.0	1.6	-.9	3.2	.399	.872	.092	.025	.066	.018	.005	.013	1.499
4	30.0	1.7	-1.0	3.2	.407	.906	.070	.019	.051	.014	.004	.010	1.463
5	40.0	2.0	-1.1	4.1	.424	.921	.062	.024	.038	.013	.005	.008	1.431
6	50.0	2.7	-1.1	5.7	.442	.927	.061	.032	.029	.013	.007	.006	1.418
7	60.0	3.4	-1.2	7.2	.454	.936	.058	.037	.021	.012	.008	.004	1.413
8	70.0	4.9	-1.3	8.0	.464	.943	.059	.044	.015	.012	.009	.003	1.413
9	80.0	5.9	-1.4	9.1	.456	.940	.072	.069	.003	.015	.014	.001	1.314
10	90.0	5.1	-1.4	11.7	.435	.923	.109	.109	.000	.020	.020	.000	1.148
11	95.0	4.4	-1.5	12.3	.434	.870	.203	.203	.000	.035	.035	.000	1.048

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(c) 100 Percent of design speed; reading 1393

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	24.879	24.125	181.0	139.4	.770	182.5	140.3	.769	2.7	136.2	-23.1	-16.3	182.5	195.6	453.9	303.8
2	24.178	23.477	189.9	156.7	.825	191.0	157.4	.824	2.5	132.1	-20.3	-15.0	191.0	205.5	446.9	306.3
3	22.753	22.184	197.8	172.9	.874	198.4	173.3	.873	1.3	127.2	-15.2	-11.0	198.4	215.0	429.8	300.8
4	21.293	20.889	199.7	176.9	.886	199.9	177.0	.886	1.5	130.0	-9.3	-6.0	199.9	219.6	408.7	283.3
5	19.809	19.596	200.6	178.8	.891	200.7	178.8	.891	.7	135.0	-3.2	-.8	200.7	224.1	388.2	264.2
6	18.291	18.301	200.1	180.4	.902	200.1	180.5	.902	-.4	141.6	3.1	4.3	200.1	229.4	367.3	245.3
7	16.723	17.005	198.1	182.7	.922	198.4	182.9	.922	-.3	151.0	9.7	9.6	198.4	237.2	344.4	227.3
8	15.080	15.712	194.6	186.4	.957	195.4	187.0	.957	-.1	166.4	16.8	15.2	195.4	250.3	320.2	211.0
9	13.348	14.417	189.1	190.3	1.006	190.7	191.4	1.004	-.2	185.3	24.5	20.6	190.7	266.4	294.7	199.8
10	11.493	13.124	180.4	186.6	1.034	183.4	188.2	1.026	-.3	203.0	33.1	24.9	183.4	276.8	266.6	189.0
11	10.503	12.476	174.3	177.1	1.016	178.3	179.0	1.004	.2	215.5	37.7	26.2	178.3	280.2	250.8	179.1

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.552	.542	1.372	.842	.547	.386	.552	.389	.9	44.3	.8	44.1	66.5	62.6	66.3	62.5
2	.579	.574	1.355	.856	.576	.438	.579	.440	.7	40.1	.7	40.0	64.8	59.2	64.7	59.1
3	.603	.606	1.306	.849	.601	.488	.603	.489	.4	36.3	.4	36.3	62.6	54.9	62.5	54.8
4	.609	.623	1.244	.804	.608	.502	.609	.502	.4	36.3	.4	36.3	60.7	51.4	60.7	51.3
5	.611	.638	1.182	.752	.611	.509	.611	.509	.2	37.1	.2	37.1	58.9	47.4	58.9	47.4
6	.610	.655	1.119	.700	.610	.515	.610	.515	-.1	38.1	-.1	38.1	57.0	42.6	57.0	42.6
7	.604	.680	1.049	.651	.603	.523	.604	.524	-.1	39.6	-.1	39.5	54.9	36.4	54.8	36.4
8	.594	.720	.974	.607	.592	.536	.594	.538	-.0	41.8	-.0	41.7	52.5	27.7	52.4	27.6
9	.579	.771	.895	.578	.574	.551	.579	.554	-.1	44.2	-.1	44.1	49.9	16.7	49.7	16.6
10	.556	.805	.808	.550	.547	.543	.556	.547	-.1	47.4	-.1	47.2	47.0	5.4	46.5	5.4
11	.540	.816	.759	.522	.527	.516	.540	.521	.1	50.6	.1	50.3	45.4	-1.9	44.7	-1.8

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	9.91	15.49	1.563	288.7	342.6	1.187	8.06	12.69	1.03178	1.36579	272.1	323.6	418.3	405.6
2	10.10	15.88	1.572	288.9	339.8	1.176	8.05	12.70	1.03586	1.38783	270.7	318.7	406.5	394.7
3	10.15	16.15	1.591	288.8	335.5	1.162	7.94	12.60	1.02774	1.40454	269.1	312.5	382.6	373.0
4	10.16	16.18	1.593	288.2	333.1	1.156	7.91	12.45	1.02703	1.40357	268.2	309.1	358.0	351.2
5	10.16	16.14	1.589	288.2	332.2	1.153	7.89	12.28	1.02587	1.39250	268.1	307.2	333.1	329.5
6	10.16	16.12	1.587	288.0	331.5	1.151	7.90	12.08	1.02701	1.37870	268.0	305.3	307.5	307.7
7	10.16	16.09	1.584	287.8	330.9	1.150	7.94	11.81	1.03088	1.35817	268.2	302.9	281.2	285.9
8	10.16	16.27	1.602	287.6	331.4	1.152	8.00	11.51	1.03706	1.33567	268.6	300.2	253.6	264.2
9	10.16	16.38	1.613	287.7	332.5	1.156	8.09	11.05	1.04564	1.29635	269.5	297.1	224.4	242.4
10	10.16	16.23	1.598	287.6	332.3	1.155	8.23	10.59	1.05922	1.25439	270.8	294.1	193.3	220.7
11	10.16	15.85	1.561	287.3	332.3	1.157	8.33	10.23	1.06914	1.21584	271.4	293.2	176.6	209.8

RP	PERCENT SPAN	INCIDENCE		DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS MACH NO
		MEAN	SS				TOT	PROF	SHOCK	TOT	PROF	SHOCK	
1	5.0	1.7	-.6	9.3	.440	.729	.200	.121	.079	.035	.021	.014	1.512
2	10.0	1.9	-.5	6.6	.419	.782	.157	.081	.077	.030	.015	.014	1.515
3	20.0	1.7	-.9	3.2	.400	.876	.089	.023	.066	.018	.005	.013	1.497
4	30.0	1.7	-1.0	3.1	.408	.912	.065	.015	.050	.013	.003	.010	1.460
5	40.0	2.1	-1.1	4.2	.424	.925	.059	.021	.038	.012	.004	.008	1.431
6	50.0	2.7	-1.1	5.9	.441	.933	.056	.028	.029	.012	.006	.006	1.417
7	60.0	3.4	-1.1	7.4	.455	.938	.056	.035	.021	.012	.007	.004	1.413
8	70.0	5.0	-1.3	8.1	.467	.946	.056	.042	.014	.012	.009	.003	1.411
9	80.0	5.9	-1.4	9.0	.461	.940	.072	.070	.003	.015	.014	.001	1.311
10	90.0	5.1	-1.4	11.7	.443	.922	.111	.111	.000	.021	.021	.000	1.146
11	95.0	4.4	-1.5	12.0	.448	.866	.211	.211	.000	.037	.037	.000	1.045

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(d) 100 Percent of design speed; reading 1415

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	24.879	24.125	180.8	141.3	.781	182.3	142.2	.780	2.5	141.0	-23.0	-16.5	182.3	200.2	454.1	300.6
2	24.178	23.477	189.3	156.2	.825	190.4	156.9	.824	4.9	139.4	-20.2	-15.0	190.4	209.8	444.6	299.8
3	22.753	22.184	197.1	171.1	.868	197.7	171.5	.867	3.2	133.9	-15.2	-10.9	197.7	217.6	427.9	294.3
4	21.293	20.889	199.0	175.4	.881	199.2	175.5	.881	2.6	136.6	-9.2	-5.9	199.2	222.4	407.6	277.3
5	19.809	19.596	200.0	177.1	.886	200.0	177.1	.886	1.5	140.4	-3.1	-.8	200.0	226.0	387.3	259.2
6	18.291	18.301	199.4	178.2	.894	199.4	178.3	.894	.6	146.0	3.1	4.3	199.4	230.4	366.1	240.8
7	16.723	17.005	197.4	179.8	.910	197.7	180.0	.911	.7	155.1	9.7	9.4	197.7	237.6	343.2	222.6
8	15.080	15.712	194.0	183.1	.944	194.7	183.7	.943	.8	169.6	16.7	14.9	194.7	250.0	319.1	206.7
9	13.348	14.417	188.5	186.3	.989	190.0	187.4	.986	-.1	187.6	24.4	20.2	190.0	265.2	294.2	195.3
10	11.493	13.124	179.7	181.4	1.009	182.7	183.0	1.002	.1	207.7	33.0	24.2	182.7	276.8	265.9	183.5
11	10.503	12.476	173.7	172.0	.990	177.7	173.9	.979	-.3	220.4	37.6	25.5	177.7	280.8	250.8	174.2

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.551	.554	1.373	.832	.547	.391	.551	.394	.8	44.9	.8	44.7	66.5	61.9	66.3	61.8
2	.577	.585	1.347	.836	.574	.435	.577	.437	1.5	41.7	1.5	41.6	64.8	58.6	64.6	58.5
3	.601	.613	1.300	.829	.599	.482	.601	.483	.9	38.0	.9	38.0	62.6	54.4	62.5	54.4
4	.606	.629	1.240	.785	.606	.496	.606	.497	.7	37.9	.7	37.9	60.8	50.8	60.7	50.7
5	.609	.642	1.179	.736	.609	.503	.609	.503	.4	38.4	.4	38.4	58.9	46.9	58.9	46.9
6	.607	.657	1.115	.687	.607	.508	.607	.508	.2	39.3	.2	39.3	57.0	42.2	57.0	42.2
7	.602	.680	1.045	.637	.601	.515	.602	.515	.2	40.8	.2	40.7	54.9	36.1	54.8	36.0
8	.592	.719	.971	.594	.590	.526	.592	.528	.2	42.8	.2	42.7	52.5	27.3	52.4	27.3
9	.577	.766	.893	.564	.572	.538	.577	.542	-.0	45.2	-.0	45.0	50.0	16.4	49.8	16.3
10	.554	.804	.806	.533	.545	.527	.554	.532	.0	48.9	.0	48.6	47.1	4.1	46.6	4.1
11	.538	.817	.759	.507	.526	.500	.538	.506	-.1	52.0	-.1	51.7	45.5	-3.5	44.9	-3.5

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	9.92	15.91	1.604	288.7	344.6	1.194	8.07	12.91	1.03306	1.38584	272.1	324.6	418.5	405.8
2	10.10	16.27	1.611	288.9	341.8	1.183	8.06	12.90	1.03659	1.40533	270.9	319.8	406.7	394.9
3	10.15	16.48	1.623	288.8	337.3	1.168	7.95	12.79	1.02896	1.42040	269.3	313.8	382.7	373.1
4	10.16	16.50	1.625	288.2	335.1	1.163	7.92	12.64	1.02799	1.41790	268.4	310.5	358.1	351.3
5	10.16	16.41	1.616	288.1	333.7	1.158	7.91	12.44	1.02723	1.40573	268.2	308.3	333.2	329.6
6	10.16	16.35	1.610	287.9	332.4	1.155	7.91	12.24	1.02874	1.39321	268.0	306.0	307.6	307.8
7	10.15	16.27	1.602	287.8	331.8	1.153	7.95	11.94	1.03211	1.36945	268.3	303.7	281.3	286.0
8	10.15	16.41	1.616	287.7	332.2	1.154	8.01	11.63	1.03785	1.34620	268.8	301.0	253.6	264.3
9	10.15	16.48	1.623	287.7	333.0	1.158	8.10	11.17	1.04673	1.30630	269.7	298.0	224.5	242.5
10	10.15	16.34	1.609	287.4	333.0	1.159	8.24	10.67	1.06097	1.26093	270.7	294.8	193.3	220.7
11	10.15	15.97	1.573	287.3	333.4	1.161	8.34	10.30	1.06993	1.22054	271.5	294.1	176.7	209.8

RP	PERCENT	INCIDENCE		DEVIA	D	EFFIC	LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS
	SPAN	MEAN	SS		FACTOR		TOT	PROF	SHOCK	TOT	PROF	SHOCK	MACH NO
1	5.0	1.8	-.6	8.6	.451	.746	.193	.114	.079	.034	.020	.014	1.514
2	10.0	1.8	-.6	6.0	.435	.798	.152	.078	.074	.029	.015	.014	1.506
3	20.0	1.6	-.9	2.8	.416	.883	.087	.023	.064	.017	.005	.013	1.490
4	30.0	1.7	-1.0	2.5	.425	.915	.066	.017	.049	.014	.003	.010	1.457
5	40.0	2.1	-1.0	3.7	.439	.928	.058	.021	.037	.012	.004	.008	1.430
6	50.0	2.7	-1.1	5.5	.454	.942	.050	.022	.028	.010	.005	.006	1.415
7	60.0	3.4	-1.1	7.0	.469	.943	.053	.032	.020	.011	.007	.004	1.411
8	70.0	5.0	-1.3	7.7	.480	.952	.051	.037	.014	.011	.008	.003	1.406
9	80.0	6.0	-1.3	8.7	.477	.942	.071	.068	.003	.015	.014	.001	1.312
10	90.0	5.2	-1.4	10.5	.466	.916	.122	.122	.000	.023	.023	.000	1.145
11	95.0	4.6	-1.4	10.3	.471	.861	.224	.224	.000	.039	.039	.000	1.050

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(e) 100 Percent of design speed; reading 1426

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	179.8	138.2	.769	181.3	139.2	.768	2.9	147.0	-22.9	-16.2	181.3	202.5	454.0	294.4
2	24.178	23.477	188.3	155.1	.824	189.4	155.8	.823	2.1	141.3	-20.1	-14.9	189.4	210.4	447.3	298.2
3	22.753	22.184	196.0	170.0	.867	196.6	170.3	.866	2.0	137.6	-15.1	-10.8	196.6	219.0	429.0	291.1
4	21.293	20.889	198.0	174.1	.880	198.2	174.2	.879	2.0	140.7	-9.2	-5.9	198.2	223.9	408.0	273.8
5	19.809	19.596	199.0	176.2	.885	199.0	176.2	.885	-.1	142.7	-3.1	-.8	199.0	226.7	388.6	257.2
6	18.291	18.301	198.4	175.9	.887	198.4	176.0	.887	-.2	148.3	3.1	4.2	198.4	230.2	366.7	237.8
7	16.723	17.005	196.4	176.8	.900	196.7	177.1	.900	-.3	156.7	9.6	9.3	196.7	236.4	343.8	219.5
8	15.080	15.712	193.0	179.7	.931	193.7	180.3	.931	-.4	171.0	16.6	14.6	193.7	248.5	319.8	203.2
9	13.348	14.417	187.5	181.5	.968	189.0	182.6	.966	-.6	189.5	24.3	19.7	189.0	263.1	294.2	190.2
10	11.493	13.124	178.8	175.6	.982	181.8	177.2	.975	-.3	210.2	32.8	23.5	181.8	274.9	265.8	177.5
11	10.503	12.476	172.8	165.2	.956	176.8	167.0	.945	-.5	224.5	37.4	24.5	176.8	279.8	250.5	167.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.548	.559	1.372	.812	.543	.382	.548	.384	.9	46.8	.9	46.6	66.6	61.9	66.5	61.8
2	.574	.585	1.355	.829	.571	.432	.574	.433	.6	42.3	.6	42.2	65.1	58.6	65.0	58.5
3	.598	.615	1.304	.818	.596	.478	.597	.479	.6	39.0	.6	38.9	62.8	54.2	62.7	54.2
4	.603	.633	1.241	.773	.602	.492	.603	.492	.6	38.9	.6	38.9	61.0	50.5	60.9	50.5
5	.606	.643	1.183	.729	.606	.499	.606	.499	-.0	39.0	-.0	39.0	59.2	46.8	59.2	46.8
6	.604	.655	1.116	.677	.604	.501	.604	.501	-.1	40.1	-.1	40.1	57.2	42.3	57.2	42.3
7	.598	.675	1.046	.627	.598	.505	.598	.506	-.1	41.5	-.1	41.5	55.1	36.3	55.1	36.2
8	.589	.713	.972	.583	.587	.516	.589	.517	-.1	43.6	-.1	43.5	52.8	27.6	52.7	27.5
9	.574	.759	.893	.549	.569	.523	.574	.526	-.2	46.2	-.2	46.1	50.3	16.4	50.0	16.3
10	.551	.797	.805	.514	.542	.509	.551	.513	-.1	50.1	-.1	49.9	47.3	3.5	46.9	3.5
11	.535	.812	.758	.486	.523	.479	.535	.485	-.2	53.7	-.2	53.4	45.8	-4.9	45.1	-4.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.92	16.26	1.639	288.8	347.1	1.202	8.09	13.15	1.03480	1.40299	272.4	326.7	419.1	406.4
2	10.10	16.58	1.642	288.8	343.6	1.190	8.08	13.15	1.03921	1.42498	270.9	321.5	407.3	395.5
3	10.15	16.78	1.653	288.6	339.0	1.175	7.97	12.99	1.03171	1.43676	269.3	315.1	383.3	373.7
4	10.16	16.81	1.655	288.2	336.8	1.169	7.94	12.83	1.03011	1.43410	268.6	311.8	358.7	351.9
5	10.16	16.70	1.644	288.2	335.1	1.163	7.93	12.65	1.02907	1.42382	268.4	309.5	333.7	330.1
6	10.15	16.55	1.629	288.0	333.6	1.158	7.93	12.40	1.03007	1.40662	268.4	307.2	308.1	308.3
7	10.16	16.44	1.619	287.9	332.7	1.156	7.97	12.11	1.03382	1.38438	268.6	304.8	281.7	286.5
8	10.15	16.57	1.632	287.8	333.0	1.157	8.03	11.81	1.03931	1.36101	269.1	302.2	254.0	264.7
9	10.15	16.58	1.633	287.6	333.6	1.160	8.12	11.32	1.04857	1.31856	269.8	299.1	224.9	242.9
10	10.15	16.45	1.620	287.6	333.9	1.161	8.26	10.83	1.06189	1.27345	271.1	296.2	193.6	221.1
11	10.15	16.13	1.588	287.4	334.5	1.164	8.36	10.45	1.07098	1.23261	271.8	295.5	176.9	210.2

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	1.9	-.4	8.6	.469	.751	.197	.117	.080	.035	.021	.014	1.517
2	10.0	2.1	-.3	6.0	.446	.801	.153	.075	.079	.029	.014	.015	1.524
3	20.0	1.9	-.7	2.6	.429	.883	.090	.024	.066	.018	.005	.013	1.502
4	30.0	1.9	-.8	2.2	.438	.918	.065	.015	.051	.014	.003	.010	1.465
5	40.0	2.4	-.7	3.5	.449	.937	.053	.013	.040	.011	.003	.008	1.442
6	50.0	3.0	-.8	5.6	.466	.945	.048	.019	.029	.010	.004	.006	1.424
7	60.0	3.7	-.8	7.2	.481	.949	.049	.027	.022	.010	.006	.005	1.421
8	70.0	5.3	-1.0	7.9	.494	.957	.046	.031	.015	.010	.007	.003	1.419
9	80.0	6.2	-1.1	8.7	.496	.941	.073	.070	.003	.015	.014	.001	1.319
10	90.0	5.5	-1.1	9.9	.490	.917	.121	.121	.000	.023	.023	.000	1.151
11	95.0	4.8	-1.1	8.9	.500	.863	.224	.224	.000	.039	.039	.000	1.054

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(f) 100 Percent of design speed; reading 1437

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	178.9	138.3	.773	180.4	139.3	.772	2.3	150.7	-22.8	-16.2	180.4	205.2	454.5	291.5
2	24.178	23.477	187.4	155.2	.828	188.5	155.9	.827	1.4	145.0	-20.0	-14.9	188.5	212.9	447.9	295.4
3	22.753	22.184	195.2	169.8	.870	195.7	170.1	.869	1.2	140.3	-15.0	-10.8	195.7	220.5	429.7	289.1
4	21.293	20.889	197.1	172.7	.876	197.4	172.8	.876	1.8	143.5	-9.2	-5.8	197.4	224.6	408.1	271.0
5	19.809	19.596	198.2	174.1	.878	198.2	174.1	.878	.3	146.0	-3.1	-.8	198.2	227.2	388.2	253.6
6	18.291	18.301	197.5	173.5	.878	197.5	173.5	.878	-.5	150.9	3.1	4.2	197.5	229.9	366.7	234.5
7	16.723	17.005	195.5	173.5	.887	195.8	173.8	.888	-.1	159.8	9.6	9.1	195.8	236.1	343.4	215.2
8	15.080	15.712	192.2	176.2	.917	192.9	176.8	.917	-.9	172.9	16.5	14.4	192.9	247.3	319.8	199.3
9	13.348	14.417	186.7	177.8	.952	188.2	178.8	.950	-.8	191.5	24.2	19.3	188.2	262.0	294.0	186.1
10	11.493	13.124	178.0	171.2	.962	181.0	172.7	.954	-.5	212.4	32.7	22.9	181.0	273.7	265.5	173.0
11	10.503	12.476	172.1	160.5	.932	176.1	162.3	.921	-.4	227.8	37.3	23.8	176.1	279.6	250.1	163.2

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.545	.565	1.373	.803	.541	.381	.545	.384	.7	47.4	.7	47.2	66.8	61.6	66.6	61.5
2	.571	.591	1.357	.820	.568	.431	.571	.433	.4	43.0	.4	42.9	65.2	58.3	65.1	58.1
3	.595	.618	1.305	.811	.593	.476	.595	.477	.3	39.6	.3	39.5	63.0	54.0	62.9	54.0
4	.600	.633	1.241	.764	.600	.487	.600	.487	.5	39.7	.5	39.7	61.1	50.4	61.1	50.4
5	.603	.643	1.181	.718	.603	.493	.603	.493	.1	40.0	.1	40.0	59.3	46.7	59.3	46.7
6	.601	.653	1.116	.666	.601	.493	.601	.493	-.2	41.0	-.2	41.0	57.4	42.3	57.4	42.3
7	.596	.673	1.045	.614	.595	.495	.596	.496	-.0	42.6	-.0	42.6	55.3	36.2	55.2	36.2
8	.586	.708	.972	.571	.584	.505	.586	.506	-.3	44.5	-.3	44.4	53.0	27.6	52.9	27.5
9	.571	.754	.892	.536	.566	.512	.571	.515	-.2	47.1	-.2	47.0	50.4	16.2	50.2	16.1
10	.548	.792	.804	.500	.539	.495	.548	.500	-.2	51.1	-.2	50.9	47.5	3.0	47.0	3.0
11	.533	.811	.756	.473	.521	.465	.533	.470	-.1	54.8	-.1	54.5	45.9	-6.2	45.2	-6.1

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.92	16.58	1.670	288.6	348.7	1.208	8.11	13.35	1.03692	1.41863	272.4	327.7	419.5	406.8
2	10.10	16.90	1.672	288.8	345.3	1.196	8.10	13.34	1.04082	1.43964	271.0	322.8	407.7	395.9
3	10.15	17.07	1.681	288.6	340.4	1.180	7.99	13.19	1.03325	1.45300	269.5	316.2	383.7	374.1
4	10.16	17.02	1.676	288.2	337.9	1.172	7.96	12.99	1.03174	1.44677	268.8	312.8	359.0	352.2
5	10.16	16.91	1.664	288.1	336.1	1.166	7.95	12.80	1.03086	1.43715	268.6	310.4	334.0	330.4
6	10.15	16.72	1.646	288.1	334.7	1.161	7.95	12.55	1.03128	1.41813	268.7	308.3	308.4	308.6
7	10.15	16.59	1.633	287.7	333.4	1.159	7.99	12.24	1.03579	1.39500	268.6	305.6	282.0	286.7
8	10.15	16.68	1.642	287.8	333.6	1.159	8.05	11.93	1.04110	1.37106	269.2	303.1	254.3	264.9
9	10.15	16.68	1.643	287.8	334.3	1.162	8.14	11.44	1.04934	1.32763	270.1	300.1	225.1	243.1
10	10.15	16.53	1.629	287.6	334.4	1.163	8.28	10.93	1.06306	1.28164	271.2	297.1	193.8	221.3
11	10.15	16.25	1.601	287.3	335.1	1.166	8.37	10.55	1.07252	1.24112	271.8	296.1	177.1	210.4

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.1	-.3	8.3	.480	.758	.195	.114	.081	.035	.021	.015	1.524
2	10.0	2.3	-.1	5.6	.456	.808	.152	.072	.080	.029	.014	.016	1.531
3	20.0	2.1	-.5	2.4	.438	.891	.085	.017	.068	.017	.004	.014	1.509
4	30.0	2.1	-.7	2.1	.448	.922	.064	.012	.051	.013	.003	.011	1.469
5	40.0	2.5	-.6	3.4	.460	.941	.050	.010	.040	.010	.002	.008	1.445
6	50.0	3.1	-.7	5.6	.477	.948	.046	.016	.030	.010	.003	.006	1.430
7	60.0	3.8	-.7	7.1	.495	.948	.050	.028	.022	.010	.006	.005	1.425
8	70.0	5.5	-.8	8.0	.508	.956	.048	.032	.016	.010	.007	.003	1.425
9	80.0	6.4	-.9	8.5	.511	.943	.072	.068	.003	.015	.014	.001	1.322
10	90.0	5.6	-.9	9.3	.509	.917	.124	.124	.000	.023	.023	.000	1.154
11	95.0	4.9	-1.0	7.7	.519	.865	.225	.225	.000	.039	.039	.000	1.055

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(g) 100 Percent of design speed; reading 1461

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	174.0	137.0	.787	175.4	137.9	.786	3.3	159.8	-22.2	-16.0	175.5	211.1	450.9	282.2
2	24.178	23.477	182.4	150.4	.824	183.5	151.1	.823	3.3	156.5	-19.5	-14.4	183.5	217.5	443.4	282.5
3	22.753	22.184	190.3	162.8	.855	190.8	163.1	.855	1.5	151.0	-14.6	-10.3	190.8	222.2	426.6	275.8
4	21.293	20.889	192.3	167.2	.869	192.5	167.3	.869	1.0	151.5	-8.9	-5.6	192.5	225.7	406.0	260.8
5	19.809	19.596	193.2	170.2	.881	193.3	170.2	.881	-.5	151.7	-3.0	-.8	193.3	228.0	385.8	246.4
6	18.291	18.301	192.7	169.7	.880	192.7	169.7	.881	-.8	156.8	3.0	4.1	192.7	231.1	363.9	227.3
7	16.723	17.005	191.0	169.1	.885	191.2	169.3	.886	-1.0	164.0	9.4	8.9	191.2	235.7	341.1	208.8
8	15.080	15.712	187.7	170.3	.907	188.4	170.9	.907	-1.0	179.2	16.2	13.9	188.4	247.6	316.9	191.0
9	13.348	14.417	182.3	170.2	.934	183.8	171.2	.931	-.8	196.8	23.6	18.4	183.8	260.9	290.9	177.3
10	11.493	13.124	173.9	162.6	.935	176.8	164.0	.928	-.9	216.7	31.9	21.7	176.8	271.8	262.7	164.1
11	10.503	12.476	168.1	151.8	.903	172.0	153.4	.892	-.8	232.3	36.4	22.5	172.0	278.4	247.3	155.0

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.529	.580	1.360	.775	.525	.376	.529	.379	1.1	49.4	1.1	49.2	67.3	60.9	67.1	60.8
2	.555	.601	1.341	.781	.552	.416	.555	.418	1.0	46.1	1.0	46.0	65.7	57.8	65.6	57.7
3	.579	.620	1.294	.770	.577	.454	.579	.455	.4	42.9	.4	42.8	63.5	53.8	63.4	53.7
4	.585	.634	1.233	.732	.584	.470	.585	.470	.3	42.2	.3	42.2	61.7	50.1	61.7	50.1
5	.587	.643	1.172	.695	.587	.480	.587	.480	-.1	41.7	-.1	41.7	59.9	46.3	59.9	46.3
6	.585	.655	1.105	.644	.585	.481	.585	.481	-.2	42.7	-.2	42.7	58.0	41.7	58.0	41.7
7	.580	.671	1.036	.594	.580	.481	.580	.482	-.3	44.1	-.3	44.1	55.9	35.9	55.9	35.8
8	.571	.707	.961	.546	.569	.487	.571	.488	-.3	46.5	-.3	46.4	53.6	26.6	53.5	26.5
9	.557	.749	.881	.509	.552	.489	.557	.492	-.2	49.1	-.2	49.0	51.0	15.1	50.8	15.0
10	.535	.785	.795	.474	.526	.469	.535	.474	-.3	53.1	-.3	52.9	48.2	1.5	47.7	1.5
11	.520	.805	.747	.448	.508	.439	.520	.444	-.3	56.8	-.3	56.6	46.6	-8.4	45.9	-8.3

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.93	17.25	1.738	288.6	351.9	1.219	8.20	13.73	1.04558	1.45146	273.3	329.7	418.8	406.1
2	10.10	17.47	1.730	288.8	349.1	1.209	8.19	13.69	1.04913	1.46486	272.0	325.5	407.0	395.2
3	10.15	17.50	1.723	288.5	344.1	1.193	8.09	13.50	1.04234	1.47176	270.4	319.5	383.0	373.4
4	10.16	17.42	1.714	288.1	340.8	1.183	8.06	13.29	1.04128	1.46769	269.6	315.4	358.4	351.6
5	10.16	17.32	1.705	288.2	338.2	1.173	8.04	13.11	1.03947	1.46239	269.6	312.3	333.4	329.8
6	10.15	17.09	1.683	288.1	336.4	1.168	8.05	12.81	1.04044	1.44074	269.5	309.8	307.9	308.0
7	10.15	16.90	1.665	288.0	335.0	1.163	8.08	12.50	1.04370	1.41743	269.7	307.3	281.5	286.2
8	10.15	16.96	1.671	287.8	335.3	1.165	8.14	12.15	1.04926	1.38880	270.1	304.7	253.8	264.5
9	10.15	16.91	1.665	287.8	335.5	1.166	8.22	11.65	1.05754	1.34556	270.9	301.6	224.7	242.7
10	10.15	16.67	1.642	287.5	335.3	1.166	8.36	11.10	1.07091	1.29555	271.9	298.5	193.5	220.9
11	10.15	16.42	1.617	287.3	336.0	1.170	8.45	10.71	1.07977	1.25492	272.5	297.4	176.8	210.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.5	.2	7.6	.503	.780	.187	.107	.080	.034	.020	.015	1.528
2	10.0	2.7	.3	5.2	.488	.813	.158	.080	.078	.031	.016	.015	1.531
3	20.0	2.6	-.0	2.1	.473	.873	.106	038	.068	.022	.008	.014	1.516
4	30.0	2.7	-.1	1.8	.477	.910	.077	.024	.053	.016	.005	.011	1.483
5	40.0	3.1	-.0	3.1	.481	.949	.045	.004	.041	.009	.001	.009	1.459
6	50.0	3.8	-.0	5.0	.498	.955	.042	.011	.031	.009	.002	.006	1.444
7	60.0	4.5	-.1	6.8	.515	.960	.040	.017	.024	.009	.004	.005	1.444
8	70.0	6.1	-.2	7.0	.535	.958	.048	.032	.015	.010	.007	.003	1.429
9	80.0	7.0	-.3	7.4	.541	.945	.071	.068	.003	.015	.014	.001	1.325
10	90.0	6.3	-.3	7.9	.541	.914	.133	.133	.000	.025	.025	.000	1.159
11	95.0	5.6	-.3	5.5	.551	.867	.229	.229	.000	.039	.039	.000	1.060

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(h) 90 Percent of design speed; reading 1310

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	150.5	131.5	.874	151.7	132.4	.872	.6	121.2	-19.2	-15.4	151.7	179.5	406.3	278.3
2	24.178	23.477	161.1	147.3	.914	162.0	148.0	.913	.1	117.7	-17.2	-14.1	162.0	189.1	400.9	280.7
3	22.753	22.184	170.2	159.6	.938	170.7	159.9	.937	-.9	114.1	-13.1	-10.1	170.7	196.5	385.9	274.0
4	21.293	20.889	172.4	161.2	.935	172.6	161.3	.935	-.8	116.4	-8.0	-5.4	172.6	198.9	367.0	257.4
5	19.809	19.596	173.7	161.8	.931	173.7	161.8	.931	-1.5	121.2	-2.7	-.8	173.7	202.2	348.5	239.1
6	18.291	18.301	173.5	161.5	.931	173.5	161.5	.931	-2.2	129.5	2.7	3.9	173.5	207.1	329.1	219.2
7	16.723	17.005	172.1	162.3	.943	172.3	162.5	.944	-1.9	139.9	8.4	8.5	172.3	214.5	308.2	200.9
8	15.080	15.712	169.2	166.5	.984	169.8	167.1	.984	-1.9	155.8	14.6	13.6	169.8	228.5	286.4	186.4
9	13.348	14.417	164.4	170.3	1.036	165.8	171.3	1.033	-2.4	174.3	21.3	18.4	165.8	244.4	263.5	177.0
10	11.493	13.124	156.9	166.9	1.064	159.6	168.4	1.055	-2.6	194.8	28.8	22.3	159.6	257.5	238.3	168.4
11	10.503	12.476	151.8	161.5	1.064	155.3	163.2	1.051	-2.5	206.8	32.9	23.9	155.3	263.5	224.3	164.2

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.453	.501	1.213	.778	.449	.367	.453	.370	.2	42.7	.2	42.5	68.2	61.8	68.1	61.6
2	.486	.532	1.201	.790	.483	.415	.486	.417	.0	38.6	.0	38.5	66.3	58.3	66.2	58.2
3	.514	.558	1.162	.779	.513	.454	.514	.454	-.3	35.6	-.3	35.5	63.8	54.3	63.7	54.3
4	.521	.568	1.107	.735	.520	.460	.521	.460	-.3	35.8	-.3	35.8	62.0	51.2	61.9	51.2
5	.524	.578	1.052	.684	.524	.463	.524	.463	-.5	36.8	-.5	36.8	60.1	47.4	60.1	47.4
6	.524	.594	.994	.628	.524	.463	.524	.463	-.7	38.7	-.7	38.7	58.2	42.5	58.2	42.5
7	.520	.617	.931	.578	.520	.467	.520	.467	-.6	40.8	-.6	40.7	56.1	36.0	56.0	36.0
8	.512	.659	.864	.538	.511	.480	.512	.482	-.6	43.1	-.6	43.0	53.7	26.4	53.6	26.3
9	.500	.708	.795	.513	.496	.494	.500	.497	-.8	45.7	-.8	45.5	51.3	14.6	51.0	14.5
10	.480	.750	.717	.491	.473	.486	.480	.491	-.9	49.4	-.9	49.2	48.4	1.5	48.0	1.5
11	.467	.769	.675	.479	.457	.471	.467	.477	-.9	52.0	-.9	51.7	46.8	-6.2	46.2	-6.1

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.88	14.70	1.487	290.6	334.6	1.151	8.59	12.38	1.07153	1.35392	279.2	318.6	377.5	366.0
2	10.07	15.03	1.493	290.0	331.7	1.144	8.57	12.39	1.07825	1.37560	276.9	313.9	366.8	356.2
3	10.14	15.15	1.494	288.7	327.3	1.134	8.47	12.26	1.07628	1.38688	274.1	308.0	345.2	336.6
4	10.16	15.13	1.490	288.1	325.1	1.129	8.44	12.16	1.07640	1.38684	273.2	305.4	323.1	316.9
5	10.16	15.08	1.483	287.8	324.2	1.126	8.42	12.02	1.07592	1.37775	272.8	303.9	300.6	297.3
6	10.17	15.04	1.480	287.6	324.0	1.127	8.43	11.85	1.07753	1.36448	272.5	302.6	277.5	277.7
7	10.17	15.02	1.478	287.4	323.9	1.127	8.45	11.62	1.08006	1.34541	272.6	301.0	253.7	258.0
8	10.17	15.22	1.497	287.4	324.8	1.130	8.50	11.37	1.08450	1.32548	273.0	298.8	228.8	238.4
9	10.17	15.39	1.514	287.3	325.8	1.134	8.57	11.01	1.09108	1.29599	273.6	296.0	202.5	218.7
10	10.17	15.30	1.505	287.0	326.1	1.136	8.68	10.53	1.10243	1.25213	274.3	293.0	174.4	199.1
11	10.17	15.11	1.487	287.0	326.4	1.137	8.75	10.22	1.10909	1.21970	274.9	291.8	159.4	189.3

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.5	1.2	8.5	.425	.794	.148	.108	.040	.027	.019	.007	1.425
2	10.0	3.3	.9	5.7	.406	.843	.111	.072	.039	.021	.014	.008	1.425
3	20.0	2.9	.3	2.7	.392	.909	.063	.031	.033	.013	.006	.007	1.413
4	30.0	2.9	.2	2.9	.402	.938	.045	.021	.024	.009	.004	.005	1.391
5	40.0	3.3	.2	4.2	.420	.944	.043	.025	.018	.009	.005	.004	1.383
6	50.0	3.9	.1	5.8	.447	.935	.054	.040	.014	.011	.008	.003	1.392
7	60.0	4.6	.1	6.9	.469	.931	.064	.058	.006	.013	.012	.001	1.339
8	70.0	6.2	-.0	6.8	.482	.938	.066	.065	.001	.014	.014	.000	1.289
9	80.0	7.2	-.1	6.9	.477	.940	.075	.075	.000	.015	.015	.000	1.200
10	90.0	6.6	-.0	7.9	.458	.910	.136	.136	.000	.025	.025	.000	1.052
11	95.0	5.9	-.1	7.7	.444	.874	.211	.211	.000	.037	.037	.000	.963

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(i) 90 Percent of design speed; reading 1321

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	142.1	133.9	.942	143.2	134.8	.941	-5.4	125.5	-18.1	-15.7	143.3	184.2	409.2	276.1
2	24.178	23.477	151.7	143.1	.943	152.6	143.8	.942	-4.9	123.5	-16.2	-13.7	152.6	189.5	402.2	273.9
3	22.753	22.184	161.0	149.6	.929	161.4	149.9	.928	.0	123.9	-12.4	-9.5	161.4	194.5	381.4	260.5
4	21.293	20.889	164.6	151.0	.918	164.8	151.1	.917	-1.2	124.1	-7.6	-5.1	164.8	195.5	364.0	245.3
5	19.809	19.596	166.2	152.1	.915	166.2	152.1	.915	-2.9	128.1	-2.6	-.7	166.2	198.9	346.3	227.8
6	18.291	18.301	165.9	151.6	.914	165.9	151.7	.914	-4.5	133.8	2.6	3.7	166.0	202.3	327.5	209.2
7	16.723	17.005	164.6	151.8	.922	164.8	152.0	.922	-4.4	145.9	8.1	8.0	164.8	210.7	306.5	189.0
8	15.080	15.712	161.8	155.2	.959	162.4	155.7	.959	-4.5	161.5	13.9	12.7	162.5	224.4	284.5	173.8
9	13.348	14.417	157.4	158.2	1.005	158.7	159.1	1.003	-4.4	178.0	20.4	17.1	158.8	238.7	260.9	164.3
10	11.493	13.124	150.3	152.3	1.013	152.8	153.7	1.006	-4.2	199.0	27.6	20.3	152.9	251.4	235.2	153.7
11	10.503	12.476	145.4	144.7	.995	148.8	146.3	.983	-4.2	213.5	31.5	21.4	148.9	258.8	221.2	148.3

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.427	.512	1.218	.768	.423	.372	.426	.375	-2.2	43.2	-2.2	43.0	69.7	60.9	69.5	60.8
2	.456	.530	1.201	.766	.453	.400	.456	.402	-1.8	40.8	-1.8	40.7	67.8	58.5	67.7	58.3
3	.484	.549	1.144	.736	.483	.422	.484	.423	.0	39.6	.0	39.6	65.0	54.9	65.0	54.9
4	.496	.555	1.096	.696	.495	.429	.496	.429	-.4	39.4	-.4	39.4	63.1	52.0	63.1	52.0
5	.501	.567	1.044	.649	.501	.433	.501	.433	-1.0	40.1	-1.0	40.1	61.3	48.1	61.3	48.1
6	.500	.577	.987	.597	.500	.433	.500	.433	-1.6	41.4	-1.6	41.4	59.6	43.5	59.6	43.5
7	.497	.603	.924	.541	.496	.434	.497	.435	-1.5	43.9	-1.5	43.8	57.5	36.5	57.5	36.5
8	.490	.644	.857	.499	.488	.446	.489	.447	-1.6	46.1	-1.6	46.0	55.3	26.4	55.2	26.4
9	.478	.689	.785	.474	.474	.457	.478	.459	-1.6	48.4	-1.6	48.2	52.8	14.5	52.5	14.5
10	.459	.729	.707	.446	.452	.442	.459	.446	-1.6	52.6	-1.6	52.3	50.0	.1	49.5	.1
11	.447	.752	.664	.431	.437	.421	.447	.425	-1.7	55.9	-1.6	55.6	48.4	-9.4	47.7	-9.3

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.88	15.41	1.559	290.7	338.6	1.165	8.72	12.88	1.08313	1.39510	280.5	321.7	377.9	366.4
2	10.04	15.55	1.549	290.5	336.2	1.157	8.71	12.85	1.08753	1.40628	278.9	318.3	367.2	356.6
3	10.11	15.56	1.539	289.2	330.8	1.144	8.61	12.68	1.08602	1.41573	276.2	312.0	345.6	337.0
4	10.17	15.50	1.525	288.1	327.7	1.138	8.59	12.57	1.09052	1.41921	274.5	308.6	323.4	317.3
5	10.17	15.44	1.517	287.4	326.3	1.135	8.57	12.41	1.09100	1.41090	273.6	306.6	300.9	297.6
6	10.18	15.34	1.508	287.4	325.7	1.133	8.57	12.24	1.09165	1.39630	273.7	305.3	277.8	278.0
7	10.17	15.34	1.507	287.2	325.9	1.135	8.59	11.99	1.09401	1.37550	273.7	303.8	254.0	258.3
8	10.18	15.49	1.522	287.2	326.6	1.137	8.64	11.71	1.09807	1.35332	274.0	301.5	229.1	238.7
9	10.17	15.60	1.533	287.2	326.9	1.138	8.70	11.35	1.10405	1.32530	274.6	298.5	202.7	219.0
10	10.17	15.45	1.519	287.1	327.4	1.140	8.80	10.85	1.11330	1.27751	275.5	295.9	174.6	199.3
11	10.17	15.32	1.505	287.1	328.0	1.143	8.87	10.53	1.11972	1.24455	276.0	294.7	159.5	189.5

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	5.0	2.6	7.6	.444	.821	.138	.087	.050	.025	.016	.009	1.479
2	10.0	4.9	2.5	5.8	.434	.848	.116	.068	.048	.022	.013	.009	1.478
3	20.0	4.1	1.5	3.3	.428	.912	.067	.032	.035	.013	.006	.007	1.441
4	30.0	4.1	1.3	3.7	.437	.931	.053	.026	.027	.011	.005	.005	1.423
5	40.0	4.5	1.4	4.9	.457	.935	.053	.031	.022	.011	.006	.004	1.421
6	50.0	5.3	1.5	6.8	.480	.933	.059	.042	.017	.012	.008	.004	1.429
7	60.0	6.1	1.5	7.4	.512	.923	.075	.067	.008	.016	.014	.002	1.374
8	70.0	7.7	1.5	6.8	.530	.929	.080	.078	.002	.017	.017	.000	1.322
9	80.0	8.7	1.5	6.9	.525	.939	.080	.080	.000	.016	.016	.000	1.227
10	90.0	8.1	1.5	6.5	.519	.905	.151	.151	.000	.028	.028	.000	1.073
11	95.0	7.4	1.5	4.5	.515	.868	.234	.234	.000	.040	.040	.000	.984

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(j) 90 Percent of design speed; reading 1332

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	24.879	24.125	128.5	128.4	.999	129.6	129.3	.998	-10.5	135.5	-16.4	-15.0	130.0	187.2	409.5	264.7
2	24.178	23.477	137.6	134.7	.979	138.3	135.3	.978	-8.5	134.5	-14.7	-12.9	138.6	190.8	400.4	260.1
3	22.753	22.184	147.0	137.7	.937	147.4	138.0	.936	-2.5	133.9	-11.3	-8.7	147.4	192.3	378.1	245.5
4	21.293	20.889	151.8	137.1	.904	151.9	137.2	.903	-1.4	132.5	-7.1	-4.6	151.9	190.7	358.6	230.2
5	19.809	19.596	154.0	136.8	.889	154.0	136.8	.889	-4.9	132.1	-2.4	-.6	154.1	190.2	342.4	214.8
6	18.291	18.301	153.7	137.2	.893	153.7	137.2	.893	-7.0	138.2	2.4	3.3	153.9	194.8	323.6	195.9
7	16.723	17.005	152.5	140.5	.921	152.6	140.7	.922	-6.9	152.6	7.5	7.4	152.8	207.5	302.3	176.0
8	15.080	15.712	150.0	144.4	.962	150.6	144.8	.962	-6.8	167.0	12.9	11.8	150.7	221.1	279.8	161.6
9	13.348	14.417	145.9	145.0	.994	147.2	145.8	.991	-6.7	180.9	18.9	15.7	147.3	232.4	255.9	150.7
10	11.493	13.124	139.4	135.8	.974	141.8	137.0	.966	-6.4	200.8	25.6	18.1	141.9	243.1	229.9	137.0
11	10.503	12.476	135.0	125.4	.929	138.1	126.8	.918	-6.1	215.2	29.2	18.6	138.3	249.7	215.7	129.4

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.385	.516	1.214	.730	.381	.354	.384	.356	-4.7	46.5	-4.6	46.3	71.7	60.9	71.6	60.8
2	.412	.529	1.190	.721	.409	.373	.411	.375	-3.5	45.0	-3.5	44.8	69.9	58.8	69.8	58.7
3	.440	.538	1.129	.688	.439	.386	.440	.386	-1.0	44.2	-1.0	44.1	67.1	55.9	67.1	55.8
4	.456	.538	1.075	.650	.455	.387	.456	.387	-.5	44.0	-.5	44.0	65.0	53.4	64.9	53.4
5	.463	.539	1.029	.608	.463	.388	.463	.388	-1.8	44.0	-1.8	44.0	63.3	50.4	63.3	50.4
6	.462	.553	.973	.556	.462	.390	.462	.390	-2.6	45.2	-2.6	45.2	61.6	45.5	61.6	45.5
7	.459	.591	.908	.501	.458	.400	.459	.401	-2.6	47.4	-2.6	47.3	59.7	37.0	59.7	36.9
8	.453	.632	.840	.462	.450	.413	.452	.414	-2.6	49.2	-2.6	49.1	57.5	26.4	57.4	26.3
9	.442	.668	.768	.433	.438	.417	.442	.419	-2.6	51.3	-2.6	51.1	55.1	14.7	54.9	14.6
10	.426	.702	.689	.396	.418	.392	.425	.396	-2.6	55.9	-2.6	55.7	52.4	-.6	51.9	-.6
11	.414	.723	.646	.374	.404	.363	.414	.367	-2.6	59.8	-2.5	59.5	50.8	-11.5	50.2	-11.4

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	9.89	16.05	1.623	291.3	344.7	1.183	8.92	13.38	1.09916	1.42469	282.9	327.3	377.9	366.5
2	10.02	16.12	1.609	291.0	341.9	1.175	8.91	13.32	1.10343	1.43335	281.4	323.7	367.3	356.6
3	10.08	16.00	1.586	289.8	335.6	1.158	8.83	13.13	1.10232	1.44230	279.0	317.2	345.6	337.0
4	10.17	15.81	1.556	288.0	330.3	1.147	8.82	12.98	1.11079	1.44857	276.5	312.2	323.4	317.3
5	10.18	15.63	1.535	287.3	328.0	1.142	8.79	12.83	1.11158	1.44179	275.5	309.9	300.9	297.7
6	10.18	15.52	1.524	287.1	327.3	1.140	8.79	12.61	1.11291	1.42422	275.3	308.4	277.8	278.0
7	10.18	15.71	1.543	287.0	328.0	1.143	8.81	12.40	1.11461	1.40946	275.4	306.5	254.0	258.3
8	10.18	15.80	1.552	287.1	328.4	1.144	8.85	12.07	1.11742	1.38322	275.8	304.0	229.1	238.7
9	10.18	15.79	1.550	287.0	327.8	1.142	8.90	11.70	1.12310	1.35483	276.1	300.9	202.8	219.0
10	10.18	15.55	1.527	286.6	327.6	1.143	8.99	11.19	1.13236	1.30718	276.6	298.2	174.6	199.4
11	10.18	15.38	1.511	286.6	328.2	1.145	9.05	10.86	1.13747	1.27362	277.1	297.2	159.5	189.5

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	7.0	4.6	7.6	.486	.809	.161	.099	.062	.030	.018	.011	1.545
2	10.0	7.0	4.5	6.2	.480	.831	.141	.083	.058	.027	.016	.011	1.540
3	20.0	6.2	3.6	4.2	.474	.891	.091	.048	.042	.018	.009	.008	1.501
4	30.0	5.9	3.2	5.2	.478	.915	.071	.039	.032	.014	.008	.006	1.474
5	40.0	6.5	3.3	7.2	.494	.921	.069	.041	.028	.013	.008	.005	1.432
6	50.0	7.4	3.6	8.8	.521	.914	.081	.059	.022	.016	.012	.004	1.477
7	60.0	8.3	3.7	7.9	.556	.924	.081	.071	.010	.017	.015	.002	1.419
8	70.0	10.0	3.8	6.8	.572	.931	.083	.080	.003	.018	.017	.001	1.361
9	80.0	11.1	3.8	7.0	.573	.938	.086	.086	.000	.018	.018	.000	1.261
10	90.0	10.5	4.0	5.8	.583	.899	.169	.169	.000	.032	.032	.000	1.104
11	95.0	9.9	3.9	2.4	.593	.862	.260	.260	.000	.044	.044	.000	1.010

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(k) 80 Percent of design speed; reading 1347

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	128.0	119.6	.934	129.0	120.4	.933	2.1	99.4	-16.3	-14.0	129.1	156.1	357.0	255.6
2	24.178	23.477	136.2	131.0	.962	136.9	131.6	.961	2.0	98.2	-14.6	-12.5	136.9	164.2	351.3	254.5
3	22.753	22.184	143.7	141.2	.983	144.1	141.5	.982	.5	94.1	-11.1	-9.0	144.1	169.9	338.1	248.7
4	21.293	20.889	145.5	143.9	.989	145.7	144.0	.988	-2.5	95.0	-6.8	-4.8	145.7	172.5	323.8	235.4
5	19.809	19.596	146.3	144.6	.988	146.3	144.6	.988	-2.2	102.6	-2.3	-.7	146.3	177.3	306.1	216.6
6	18.291	18.301	146.2	144.2	.987	146.2	144.3	987	-1.3	111.4	2.3	3.5	146.2	182.3	287.5	197.6
7	16.723	17.005	145.0	146.3	1.008	145.2	146.5	1.009	-1.1	121.9	7.1	7.7	145.2	190.5	268.9	181.4
8	15.080	15.712	142.7	151.7	1.063	143.2	152.2	1.062	-1.4	137.9	12.3	12.4	143.3	205.3	249.6	169.1
9	13.348	14.417	138.8	155.8	1.122	140.0	156.7	1.119	-1.3	155.5	18.0	16.9	140.0	220.8	228.8	161.3
10	11.493	13.124	132.5	153.3	1.157	134.7	154.6	1.148	-1.2	175.2	24.3	20.5	134.7	233.7	206.1	154.7
11	10.503	12.476	128.4	148.4	1.156	131.3	150.0	1.142	-1.1	185.7	27.8	22.0	131.3	238.7	193.8	151.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.383	.442	1.059	.724	.380	.339	.383	.341	1.0	39.7	.9	39.5	69.0	62.1	68.8	61.9
2	.408	.468	1.046	.725	.405	.373	.408	.375	.8	36.9	.8	36.7	67.2	59.0	67.1	58.9
3	.431	.488	1.011	.714	.430	.405	.431	.406	.2	33.7	.2	33.6	64.8	55.4	64.8	55.3
4	.436	.496	.970	.677	.436	.414	.436	.414	-1.0	33.4	-1.0	33.4	63.3	52.3	63.3	52.3
5	.439	.511	.918	.624	.439	.417	.439	.417	-.8	35.4	-.8	35.4	61.4	48.1	61.4	48.1
6	.438	.526	.861	.570	.438	.416	.438	.416	-.5	37.7	-.5	37.7	59.4	43.1	59.4	43.1
7	.435	.551	.806	.525	.435	.423	.435	.424	-.5	39.8	-.5	39.8	57.3	36.2	57.3	36.2
8	.429	.595	.747	.490	.427	.440	.427	.441	-.6	42.3	-.6	42.2	55.1	25.9	55.0	25.8
9	.419	.643	.685	.470	.415	.453	.419	.456	-.5	45.0	-.5	44.8	52.5	13.9	52.3	13.8
10	.403	.683	.616	.452	.396	.448	.403	.452	-.5	48.8	-.5	48.6	49.6	.6	49.2	.6
11	.392	.699	.579	.442	.383	.434	.392	.439	-.5	51.4	-.5	51.1	48.0	-6.8	47.3	-6.7

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.97	13.39	1.343	290.9	322.3	1.108	9.01	11.71	1.11118	1.31535	282.6	310.2	334.9	324.8
2	10.09	13.60	1.348	289.8	320.1	1.105	9.00	11.71	1.11811	1.33021	280.4	306.6	325.5	316.1
3	10.15	13.69	1.349	288.4	316.2	1.097	8.93	11.63	1.11923	1.34246	278.0	301.9	306.3	298.7
4	10.15	13.70	1.349	287.9	315.2	1.095	8.91	11.57	1.11931	1.34243	277.3	300.4	286.7	281.2
5	10.15	13.72	1.352	287.4	315.0	1.096	8.89	11.48	1.11938	1.33590	276.8	299.3	266.7	263.8
6	10.15	13.72	1.351	287.8	315.4	1.096	8.90	11.36	1.11854	1.32429	277.1	298.9	246.2	246.4
7	10.15	13.76	1.355	287.5	315.6	1.098	8.91	11.19	1.12081	1.31062	277.0	297.5	225.1	228.9
8	10.15	14.00	1.379	287.7	317.1	1.102	8.94	11.02	1.12295	1.29628	277.5	296.1	203.0	211.5
9	10.15	14.16	1.395	287.5	317.8	1.105	9.00	10.72	1.12855	1.27258	277.7	293.5	179.7	194.1
10	10.15	14.15	1.394	287.3	318.3	1.108	9.07	10.35	1.13639	1.23934	278.2	291.1	154.7	176.7
11	10.15	14.00	1.379	287.3	318.5	1.109	9.13	10.10	1.14095	1.21250	278.7	290.2	141.4	168.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.2	1.9	8.7	.385	.814	.119	.105	.014	.021	.019	.002	1.337
2	10.0	4.2	1.8	6.4	.374	.852	.094	.080	.014	.018	.015	.003	1.346
3	20.0	3.9	1.3	3.7	.359	.924	.047	.035	.012	.009	.007	.002	1.358
4	30.0	4.2	1.5	4.0	.370	.941	.039	.031	.008	.008	.006	.002	1.344
5	40.0	4.6	1.5	4.9	.396	.938	.044	.041	.003	.009	.008	.001	1.295
6	50.0	5.2	1.4	6.4	.423	.935	.052	.051	.000	.011	.011	.000	1.243
7	60.0	5.9	1.4	7.1	.445	.930	.063	.063	.000	.013	.013	.000	1.194
8	70.0	7.5	1.3	6.3	.458	.944	.060	.060	.000	.013	.013	.000	1.148
9	80.0	8.5	1.2	6.2	.446	.946	.069	.069	.000	.014	.014	.000	1.064
10	90.0	7.8	1.2	7.0	.420	.923	.121	.121	.000	.023	.023	.000	.930
11	95.0	7.0	1.1	7.1	.402	.885	.202	.202	.000	.035	.035	.000	.850

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(ℓ) 80 Percent of design speed; reading 1358

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	24.879	24.125	116.5	115.6	.993	117.4	116.4	.992	-1.3	111.6	-14.8	-13.5	117.4	161.3	335.7	242.4
2	24.178	23.477	124.3	123.0	.989	125.0	123.5	.988	-1.3	110.4	-13.3	-11.8	125.0	165.7	349.4	239.5
3	22.753	22.184	132.4	129.8	.980	132.8	130.1	.979	-1.1	106.2	-10.2	-8.2	132.8	167.9	334.4	231.9
4	21.293	20.889	134.6	131.2	.974	134.7	131.2	.974	-4.1	104.4	-6.3	-4.4	134.8	167.7	320.0	219.8
5	19.809	19.596	135.1	129.5	.959	135.1	129.5	.959	-4.2	110.1	-2.1	-.6	135.1	170.0	302.3	200.7
6	18.291	18.301	134.9	129.2	.958	134.9	129.3	.958	-2.7	118.2	2.1	3.1	134.9	175.2	282.8	181.7
7	16.723	17.005	133.8	133.3	.996	134.0	133.5	.996	-3.0	129.3	6.6	7.0	134.0	185.9	264.2	166.3
8	15.080	15.712	131.7	137.6	1.045	132.2	138.1	1.045	-2.9	144.9	11.3	11.2	132.2	200.1	244.4	153.2
9	13.348	14.417	128.2	140.2	1.094	129.2	141.0	1.091	-2.8	160.1	16.6	15.2	129.3	213.3	223.4	145.0
10	11.493	13.124	122.5	134.8	1.101	124.5	136.0	1.092	-2.6	178.4	22.5	18.0	124.6	224.3	200.4	136.0
11	10.503	12.476	118.5	126.9	1.070	121.3	128.2	1.058	-2.7	191.0	25.7	18.8	121.3	230.0	188.1	130.3

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.347	.453	1.052	.681	.344	.325	.347	.327	-.7	44.0	-.7	43.8	70.9	61.5	70.7	61.3
2	.371	.468	1.037	.676	.369	.347	.371	.349	-.6	41.9	-.6	41.8	69.1	59.1	69.0	58.9
3	.396	.479	.997	.661	.395	.370	.396	.371	-.5	39.3	-.5	39.2	66.7	55.9	66.6	55.9
4	.403	.480	.956	.629	.402	.375	.403	.375	-1.7	38.5	-1.7	38.5	65.1	53.4	65.1	53.4
5	.404	.487	.904	.575	.404	.371	.404	.371	-1.8	40.4	-1.8	40.4	63.5	49.8	63.5	49.8
6	.403	.503	.845	.522	.403	.371	.403	.371	-1.1	42.5	-1.1	42.5	61.5	44.7	61.5	44.7
7	.400	.535	.790	.479	.400	.384	.400	.384	-1.3	44.1	-1.3	44.1	59.6	36.7	59.5	36.6
8	.395	.578	.730	.442	.393	.397	.395	.399	-1.3	46.5	-1.3	46.4	57.4	25.7	57.3	25.7
9	.386	.618	.667	.420	.383	.406	.386	.409	-1.2	48.8	-1.2	48.6	54.9	13.5	54.7	13.4
10	.371	.652	.598	.396	.365	.392	.371	.396	-1.2	52.9	-1.2	52.7	52.1	-.9	51.6	-.8
11	.362	.670	.561	.380	.353	.370	.361	.374	-1.3	56.4	-1.3	56.1	50.5	-10.4	49.9	-10.3

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	9.97	14.08	1.412	291.4	327.9	1.125	9.17	12.23	1.12346	1.35290	284.5	314.9	334.4	324.3
2	10.08	14.17	1.406	290.2	325.4	1.121	9.16	12.20	1.13028	1.36309	282.5	311.7	325.0	315.5
3	10.15	14.16	1.395	288.4	320.3	1.111	9.11	12.11	1.13525	1.37765	279.6	306.2	305.8	298.2
4	10.16	14.07	1.385	287.7	318.1	1.106	9.09	12.02	1.13598	1.37754	278.6	304.1	286.2	280.8
5	10.15	14.01	1.380	287.5	317.5	1.104	9.07	11.91	1.13533	1.36949	278.4	303.1	266.3	263.4
6	10.15	13.97	1.376	287.6	317.2	1.103	9.07	11.75	1.13524	1.35601	278.5	301.9	245.8	246.0
7	10.15	14.14	1.393	287.4	317.5	1.105	9.09	11.63	1.13697	1.34960	278.4	300.3	224.8	228.6
8	10.15	14.26	1.405	287.5	318.6	1.108	9.11	11.37	1.13893	1.32646	278.8	298.6	202.7	211.2
9	10.15	14.38	1.416	287.4	318.8	1.109	9.16	11.11	1.14351	1.30690	279.0	296.1	179.4	193.8
10	10.15	14.25	1.404	287.4	319.1	1.111	9.23	10.71	1.14971	1.26857	279.6	294.0	154.5	176.4
11	10.15	14.12	1.391	287.2	319.5	1.112	9.27	10.45	1.15419	1.24176	279.9	293.2	141.2	167.7

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	6.2	3.8	8.1	.436	.827	.127	.107	.020	.023	.019	.004	1.401
2	10.0	6.2	3.8	6.4	.430	.845	.113	.093	.020	.021	.018	.004	1.411
3	20.0	5.7	3.2	4.3	.416	.903	.069	.052	.017	.013	.010	.003	1.416
4	30.0	6.1	3.4	5.1	.422	.924	.056	.045	.011	.011	.009	.002	1.386
5	40.0	6.7	3.5	6.6	.450	.924	.060	.055	.004	.012	.011	.001	1.338
6	50.0	7.2	3.4	8.0	.478	.927	.064	.063	.001	.013	.013	.000	1.279
7	60.0	8.1	3.6	7.6	.502	.948	.052	.052	.000	.011	.011	.000	1.230
8	70.0	9.8	3.6	6.1	.519	.944	.065	.065	.000	.014	.014	.000	1.178
9	80.0	10.9	3.6	5.8	.512	.957	.059	.059	.000	.012	.012	.000	1.089
10	90.0	10.2	3.6	5.5	.501	.922	.131	.131	.000	.025	.025	.000	.951
11	95.0	9.6	3.6	3.5	.501	.880	.228	.228	.000	.039	.039	.000	.871

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(m) 80 Percent of design speed; reading 1369

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	102.1	104.8	1.026	102.9	105.5	1.025	-2.2	125.4	-13.0	-12.3	103.0	163.9	352.1	225.2
2	24.178	23.477	108.7	105.0	.965	109.4	105.4	.964	-5.2	123.2	-11.6	-10.1	109.5	162.2	348.0	219.5
3	22.753	22.184	116.2	103.5	.891	116.5	103.7	.890	-3.7	126.4	-8.9	-6.6	116.6	163.5	330.9	200.8
4	21.293	20.889	118.3	105.4	.891	118.4	105.4	.891	-3.6	124.7	-5.5	-3.6	118.4	163.3	313.2	188.5
5	19.809	19.596	118.3	111.6	.944	118.3	111.6	.944	-3.5	124.0	-1.9	-.5	118.3	166.8	294.7	178.7
6	18.291	18.301	117.9	119.1	1.011	117.9	119.2	1.011	-2.5	128.2	1.9	2.9	117.9	175.0	275.0	167.7
7	16.723	17.005	117.0	126.2	1.079	117.2	126.4	1.079	-2.6	138.6	5.7	6.6	117.2	187.6	255.9	155.2
8	15.080	15.712	115.3	130.0	1.128	115.7	130.4	1.128	-2.7	152.1	9.9	10.6	115.7	200.4	235.8	143.3
9	13.348	14.417	112.2	130.1	1.159	113.1	130.8	1.157	-2.8	163.7	14.5	14.1	113.2	209.5	214.5	134.3
10	11.493	13.124	107.2	121.9	1.137	109.0	123.0	1.128	-2.4	179.6	19.7	16.3	109.0	217.7	191.1	123.0
11	10.503	12.476	103.7	112.0	1.080	106.1	113.2	1.067	-2.4	190.7	22.5	16.6	106.1	221.7	178.6	115.5

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.304	.458	1.038	.629	.301	.292	.303	.294	-1.2	50.1	-1.2	49.9	73.1	62.2	73.0	62.1
2	.324	.454	1.029	.614	.322	.294	.323	.295	-2.7	49.6	-2.7	49.4	71.8	61.4	71.7	61.3
3	.346	.460	.983	.565	.345	.291	.346	.292	-1.8	50.7	-1.8	50.6	69.4	58.9	69.4	58.9
4	.353	.463	.933	.534	.352	.298	.353	.299	-1.8	49.8	-1.7	49.8	67.8	56.0	67.8	56.0
5	.352	.475	.877	.509	.352	.318	.352	.318	-1.7	48.0	-1.7	48.0	66.3	51.3	66.3	51.3
6	.351	.501	.819	.480	.351	.341	.351	.341	-1.2	47.1	-1.2	47.1	64.6	44.7	64.6	44.7
7	.349	.538	.762	.445	.348	.362	.349	.363	-1.3	47.7	-1.3	47.6	62.8	35.5	62.7	35.5
8	.344	.577	.702	.413	.343	.374	.344	.376	-1.3	49.5	-1.3	49.4	60.7	24.5	60.6	24.4
9	.337	.606	.638	.388	.334	.376	.337	.378	-1.4	51.5	-1.4	51.4	58.4	13.1	58.2	13.0
10	.324	.632	.568	.357	.319	.354	.324	.357	-1.3	55.8	-1.3	55.6	55.7	-1.5	55.2	-1.5
11	.315	.644	.531	.335	.308	.325	.315	.329	-1.3	59.6	-1.3	59.3	54.2	-11.6	53.5	-11.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	10.01	14.61	1.459	291.5	332.7	1.142	9.39	12.65	1.14326	1.38052	286.2	319.3	334.6	324.4
2	10.09	14.49	1.436	290.4	330.9	1.139	9.38	12.58	1.14902	1.37904	284.5	317.8	325.1	315.7
3	10.15	14.39	1.418	288.6	327.3	1.134	9.34	12.45	1.15521	1.38127	281.8	314.0	306.0	298.3
4	10.16	14.25	1.403	287.4	323.4	1.125	9.32	12.31	1.15814	1.38305	280.4	310.1	286.3	280.9
5	10.15	14.25	1.404	287.5	321.0	1.116	9.31	12.21	1.15631	1.38511	280.5	307.1	266.4	263.5
6	10.14	14.29	1.409	287.3	319.4	1.112	9.31	12.04	1.15709	1.37928	280.4	304.1	246.0	246.1
7	10.14	14.48	1.428	287.5	319.7	1.112	9.32	11.89	1.15722	1.37073	280.7	302.2	224.9	228.7
8	10.14	14.55	1.434	287.5	320.1	1.113	9.34	11.61	1.15913	1.34803	280.8	300.1	202.8	211.3
9	10.14	14.50	1.429	287.4	319.5	1.112	9.38	11.31	1.16269	1.32409	281.0	297.6	179.5	193.9
10	10.14	14.28	1.408	287.2	319.2	1.111	9.43	10.92	1.16796	1.28661	281.3	295.6	154.6	176.5
11	10.14	14.09	1.389	287.3	319.5	1.112	9.47	10.66	1.17089	1.25924	281.6	295.0	141.2	167.8

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	8.4	6.1	8.9	.495	.805	.160	.133	.028	.028	.023	.005	1.473
2	10.0	8.9	6.4	8.8	.503	.782	.179	.148	.030	.031	.026	.005	1.498
3	20.0	8.5	6.0	7.3	.528	.782	.185	.161	.024	.033	.029	.004	1.489
4	30.0	8.8	6.0	7.7	.530	.813	.163	.149	.014	.030	.027	.002	1.437
5	40.0	9.5	6.4	8.1	.524	.875	.113	.107	.006	.021	.020	.001	1.385
6	50.0	10.3	6.6	8.0	.525	.922	.076	.075	.001	.015	.015	.000	1.326
7	60.0	11.3	6.8	6.4	.538	.957	.047	.047	.000	.010	.010	.000	1.269
8	70.0	13.2	6.9	4.9	.551	.959	.053	.053	.000	.011	.011	.000	1.212
9	80.0	14.4	7.1	5.4	.545	.961	.059	.059	.000	.012	.012	.000	1.119
10	90.0	13.8	7.3	4.9	.546	.923	.142	.142	.000	.027	.027	.000	.974
11	95.0	13.2	7.3	2.4	.557	.879	.253	.253	.000	.043	.043	.000	.890

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(n) 80 Percent of design speed; reading 1544

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	123.4	118.1	.957	124.4	118.9	.956	-1.5	103.5	-15.7	-13.8	124.4	157.7	358.6	251.1
2	24.178	23.477	131.7	129.3	.982	132.5	129.9	.980	.2	102.2	-14.1	-12.4	132.5	165.3	351.1	250.1
3	22.753	22.184	139.5	137.8	.988	139.9	138.1	.987	-.5	98.5	-10.7	-8.7	139.9	169.6	337.1	243.0
4	21.293	20.889	141.4	138.8	.981	141.6	138.9	.981	-3.4	99.2	-6.6	-4.7	141.6	170.7	322.6	228.8
5	19.809	19.596	142.1	138.3	.974	142.1	138.3	.974	-3.3	106.2	-2.2	-.7	142.1	174.4	305.0	209.6
6	18.291	18.301	141.8	137.9	.972	141.9	138.0	.973	-2.4	114.0	2.2	3.3	141.9	178.9	286.2	191.1
7	16.723	17.005	140.8	140.9	1.001	140.9	141.1	1.001	-2.4	124.9	6.9	7.4	140.9	188.4	267.5	175.2
8	15.080	15.712	138.5	145.8	1.053	139.0	146.3	1.052	-2.2	141.8	11.9	11.9	139.1	203.8	247.8	162.0
9	13.348	14.417	134.8	148.7	1.103	135.9	149.5	1.100	-2.5	157.9	17.5	16.1	135.9	217.5	227.3	153.8
10	11.493	13.124	128.8	144.9	1.125	130.9	146.1	1.116	-2.2	177.3	23.7	19.4	130.9	229.8	204.3	146.1
11	10.503	12.476	124.7	139.6	1.119	127.6	141.1	1.106	-2.2	189.3	27.0	20.7	127.6	236.1	192.0	142.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.369	.445	1.063	.709	.366	.333	.369	.336	-.7	41.2	-.7	41.0	69.8	61.9	69.7	61.7
2	.394	.469	1.044	.710	.392	.367	.394	.369	.1	38.3	.1	38.2	67.9	58.8	67.8	58.7
3	.418	.486	1.007	.696	.417	.394	.418	.395	-.2	35.6	-.2	35.5	65.5	55.4	65.5	55.4
4	.424	.490	.965	.657	.423	.398	.424	.399	-1.4	35.6	-1.4	35.5	64.0	52.7	64.0	52.6
5	.425	.501	.913	.602	.425	.397	.425	.397	-1.3	37.5	-1.3	37.5	62.2	48.7	62.2	48.7
6	.425	.515	.857	.550	.425	.397	.425	.397	-1.0	39.6	-1.0	39.6	60.3	43.8	60.3	43.8
7	.422	.544	.801	.506	.421	.406	.422	.407	-1.0	41.6	-1.0	41.5	58.2	36.4	58.2	36.4
8	.416	.590	.741	.469	.414	.422	.416	.423	-.9	44.2	-.9	44.1	56.0	25.5	55.9	25.4
9	.406	.632	.679	.447	.403	.432	.406	.434	-1.1	46.7	-1.1	46.6	53.5	13.6	53.3	13.6
10	.391	.670	.610	.426	.385	.422	.391	.426	-1.0	50.8	-1.0	50.5	50.6	-.3	50.2	-.3
11	.381	.690	.573	.417	.372	.408	.381	.412	-1.0	53.6	-1.0	53.3	49.0	-8.7	48.4	-8.6

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.97	13.68	1.372	290.7	324.6	1.117	9.08	11.94	1.11763	1.33259	282.9	312.3	334.8	324.6
2	10.09	13.88	1.376	290.0	322.1	1.111	9.06	11.94	1.12282	1.34821	281.3	308.5	325.3	315.9
3	10.15	13.91	1.370	288.4	317.9	1.102	9.00	11.83	1.12539	1.35833	278.6	303.5	306.2	298.5
4	10.16	13.87	1.365	287.7	316.5	1.100	8.98	11.77	1.12599	1.35764	277.7	302.0	286.5	281.1
5	10.15	13.85	1.364	287.7	316.5	1.100	8.96	11.66	1.12468	1.34857	277.6	301.3	266.6	263.7
6	10.15	13.82	1.362	287.6	316.1	1.099	8.96	11.53	1.12523	1.33814	277.6	300.2	246.1	246.3
7	10.15	13.91	1.371	287.6	316.6	1.101	8.98	11.38	1.12675	1.32658	277.6	298.9	225.0	228.8
8	10.15	14.13	1.393	287.6	317.9	1.105	9.01	11.17	1.12940	1.30950	277.9	297.2	202.9	211.4
9	10.15	14.24	1.403	287.5	318.5	1.108	9.06	10.89	1.13393	1.28580	278.3	295.0	179.6	194.0
10	10.15	14.18	1.397	287.4	318.9	1.110	9.13	10.50	1.14114	1.24968	278.8	292.6	154.7	176.6
11	10.15	14.08	1.387	287.3	319.3	1.111	9.18	10.24	1.14593	1.22356	279.2	291.5	141.3	167.9

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	5.1	2.8	8.6	.409	.809	.129	.112	.018	.023	.020	.003	1.371
2	10.0	5.0	2.6	6.2	.393	.863	.091	.075	.016	.017	.014	.003	1.372
3	20.0	4.6	2.1	3.8	.379	.921	.052	.038	.014	.010	.007	.003	1.382
4	30.0	5.0	2.2	4.4	.393	.931	.047	.038	.009	.009	.008	.002	1.362
5	40.0	5.4	2.3	5.5	.421	.928	.054	.051	.004	.011	.010	.001	1.314
6	50.0	6.0	2.2	7.1	.447	.929	.059	.058	.001	.012	.012	.000	1.261
7	60.0	6.8	2.3	7.3	.470	.936	.060	.060	.000	.013	.013	.000	1.211
8	70.0	8.4	2.2	5.9	.487	.941	.065	.065	.000	.014	.014	.000	1.161
9	80.0	9.5	2.2	6.0	.479	.943	.074	.074	.000	.015	.015	.000	1.078
10	90.0	8.8	2.2	6.1	.460	.914	.138	.138	.000	.026	.026	.000	.941
11	95.0	8.1	2.1	5.2	.444	.880	.218	.218	.000	.037	.037	.000	.861

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(o) 80 Percent of design speed; reading 1555

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	111.3	112.0	1.007	112.2	112.8	1.005	-2.2	117.6	-14.2	-13.1	112.2	162.9	356.4	236.9
2	24.178	23.477	119.0	117.3	.985	119.7	117.8	.984	-3.3	114.8	-12.7	-11.2	119.7	164.5	350.9	234.1
3	22 753	22.184	127.2	122.0	.959	127.5	122.2	.958	-2.2	112.6	-9.8	-7.7	127.6	166.2	334.8	223.4
4	21.293	20.889	129.4	122.8	.949	129.5	122.9	.949	-3.7	110.4	-6.0	-4.1	129.6	165.2	318.8	211.2
5	19.809	19.596	129.7	123.0	.948	129.8	123.0	.948	-4.3	115.0	-2.0	-.6	129.8	168.3	301.2	193.8
6	18.291	18.301	129.5	125.9	.972	129.6	125.9	.972	-3.4	123.0	2.0	3.0	129.6	176.0	282.0	176.9
7	16.723	17.005	128.6	130.4	1.014	128.7	130.6	1.014	-3.1	135.5	6.3	6.8	128.8	188.2	262.7	161.1
8	15.080	15.712	126.5	134.4	1.063	127.0	134.9	1.062	-2.9	150.1	10.9	11.0	127.0	201.8	242.5	148.5
9	13.348	14.417	123.0	136.1	1.106	124.1	136.9	1.103	-3.2	162.7	15.9	14.7	124.1	212.6	221.5	140.6
10	11.493	13.124	117.7	129.8	1.103	119.6	130.9	1.094	-3.0	180.9	21.6	17.3	119.7	223.3	198.4	131.0
11	10.503	12.476	114.1	122.8	1.076	116.8	124.1	1.063	-3.0	193.9	24.7	18.2	116.8	230.2	186.0	126.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.331	.456	1.052	.663	.329	.314	.331	.316	-1.2	46.4	-1.1	46.2	71.8	61.7	71.7	61.6
2	.355	.463	1.040	.659	.353	.330	.355	.331	-1.6	44.4	-1.6	44.3	70.2	59.9	70.1	59.8
3	.380	.472	.997	.634	.379	.346	.380	.347	-1.0	42.7	-1.0	42.7	67.7	56.9	67.6	56.8
4	.387	.471	.951	.602	.386	.350	.387	.350	-1.6	42.0	-1.6	41.9	66.1	54.4	66.0	54.4
5	.388	.481	.899	.554	.387	.351	.387	.351	-1.9	43.1	-1.9	43.1	64.5	50.6	64.5	50.6
6	.387	.504	.842	.507	.387	.361	.387	.361	-1.5	44.3	-1.5	44.3	62.7	44.6	62.7	44.6
7	.384	.540	.784	.463	.384	.375	.384	.375	-1.4	46.1	-1.4	46.0	60.7	35.9	60.7	35.8
8	.379	.581	.724	.428	.377	.387	.379	.389	-1.3	48.1	-1.3	48.1	58.5	24.8	58.4	24.8
9	.370	.615	.660	.407	.367	.394	.370	.396	-1.5	50.1	-1.5	49.9	56.2	13.2	55.9	13.2
10	.357	.649	.591	.380	.351	.377	.356	.380	-1.5	54.3	-1.4	54.1	53.4	-1.6	52.9	-1.6
11	.348	.670	.554	.369	.340	.357	.348	.361	-1.5	57.7	-1.5	57.4	51.8	-11.7	51.1	-11.5

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	9.98	14.33	1.436	291.6	330.5	1.133	9.25	12.42	1.12921	1.36400	285.3	317.3	336.1	325.9
2	10.08	14.33	1.422	290.4	327.7	1.129	9.24	12.37	1.13627	1.37198	283.2	314.2	326.6	317.1
3	10.15	14.29	1.407	288.5	322.8	1.119	9.19	12.27	1.14179	1.38309	280.4	309.0	307.3	299.7
4	10.16	14.18	1.395	287.6	319.7	1.112	9.16	12.10	1.14350	1.38623	279.2	306.1	287.6	282.2
5	10.15	14.11	1.390	287.4	318.8	1.109	9.15	12.04	1.14274	1.37687	279.0	304.7	267.6	264.7
6	10.15	14.18	1.397	287.5	318.6	1.108	9.15	11.92	1.14269	1.36977	279.1	303.1	247.1	247.2
7	10.15	14.33	1.412	287.5	319.2	1.110	9.17	11.74	1.14364	1.35690	279.2	301.5	225.9	229.7
8	10.15	14.45	1.424	287.5	319.8	1.112	9.19	11.49	1.14596	1.33678	279.4	299.5	203.7	212.2
9	10.15	14.47	1.426	287.4	319.6	1.112	9.23	11.20	1.14959	1.31390	279.8	297.1	180.3	194.7
10	10.15	14.31	1.410	287.3	319.7	1.113	9.29	10.79	1.15589	1.27456	280.1	294.8	155.3	177.3
11	10.15	14.22	1.401	287.2	320.2	1.115	9.34	10.52	1.15997	1.24813	280.4	293.8	141.9	168.5

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	7.1	4.7	8.4	.460	.816	.142	.118	.024	.025	.021	.004	1.433
2	10.0	7.2	4.8	7.3	.455	.823	.134	.110	.024	.025	.020	.005	1.448
3	20.0	6.8	4.2	5.2	.450	.863	.104	.084	.021	.020	.016	.004	1.450
4	30.0	7.0	4.3	6.2	.453	.895	.081	.069	.012	.015	.013	.002	1.409
5	40.0	7.7	4.5	7.4	.476	.902	.081	.076	.006	.016	.015	.001	1.363
6	50.0	8.4	4.6	7.9	.499	.926	.068	.067	.001	.014	.013	.000	1.307
7	60.0	9.3	4.7	6.8	.525	.939	.064	.064	.000	.013	.013	.000	1.251
8	70.0	11.0	4.7	5.2	.540	.945	.067	.067	.000	.014	.014	.000	1.196
9	80.0	12.1	4.9	5.6	.531	.954	.066	.066	.000	.014	.014	.000	1.107
10	90.0	11.5	5.0	4.8	.525	.915	.148	.148	.000	.028	.028	.000	.967
11	95.0	10.8	4.9	2.3	.518	.881	.236	.236	.000	.040	.040	.000	.884

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(p) 70 Percent of design speed; reading 1475

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	111.1	102.7	.925	112.0	103.4	.924	.7	81.6	-14.1	-12.0	112.0	131.8	313.2	227.5
2	24.178	23.477	117.6	115.2	.979	118.3	115.7	.978	1.0	80.8	-12.6	-11.0	118.3	141.2	307.6	227.4
3	22.753	22.184	123.0	125.0	1.016	123.4	125.2	1.015	1.0	78.2	-9.5	-7.9	123.4	147.6	294.3	221.9
4	21.293	20.889	124.4	126.8	1.019	124.5	126.9	1.019	-.3	80.7	-5.8	-4.3	124.5	150.4	280.3	208.5
5	19.809	19.596	125.4	128.6	1.026	125.4	128.6	1.026	-.8	86.2	-2.0	-.6	125.4	154.8	265.7	193.6
6	18.291	18.301	125.3	131.1	1.046	125.3	131.2	1.047	-.8	94.0	2.0	3.2	125.3	161.4	250.0	178.9
7	16.723	17.005	124.4	135.5	1.090	124.5	135.7	1.090	-1.0	103.0	6.1	7.1	124.5	170.4	234.0	167.0
8	15.080	15.712	122.4	140.4	1.147	122.9	140.9	1.147	-.8	117.0	10.5	11.4	122.9	183.1	216.7	156.5
9	13.348	14.417	119.1	143.9	1.208	120.1	144.8	1.205	-1.0	133.6	15.4	15.6	120.1	197.0	198.7	149.2
10	11.493	13.124	113.8	142.1	1.249	115.7	143.4	1.239	-.9	152.2	20.9	19.0	115.7	209.1	178.8	143.4
11	10.503	12.476	110.1	137.3	1.247	112.7	138.8	1.232	-1.0	162.6	23.9	20.3	112.7	213.8	168.1	139.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.332	.377	.928	.651	.329	.294	.332	.296	.3	38.5	.3	38.3	69.2	63.1	69.1	63.0
2	.352	.406	.914	.654	.350	.331	.351	.333	.5	35.1	.5	34.9	67.5	59.5	67.4	59.4
3	.367	.427	.876	.641	.366	.361	.367	.362	.4	32.0	.4	32.0	65.3	55.7	65.2	55.6
4	.371	.435	.835	.604	.370	.367	.371	.367	-.1	32.5	-.1	32.5	63.7	52.5	63.6	52.5
5	.374	.449	.792	.561	.374	.373	.374	.373	-.4	33.8	-.4	33.8	61.8	48.4	61.8	48.4
6	.374	.468	.745	.519	.373	.381	.374	.381	-.4	35.6	-.4	35.6	59.9	42.9	59.9	42.8
7	.371	.495	.697	.486	.371	.394	.371	.395	-.5	37.2	-.5	37.2	57.9	35.7	57.8	35.7
8	.366	.534	.645	.456	.365	.409	.366	.411	-.4	39.8	-.4	39.7	55.6	25.9	55.5	25.8
9	.358	.576	.591	.436	.355	.421	.358	.423	-.5	42.9	-.5	42.7	53.0	14.2	52.8	14.1
10	.344	.613	.532	.420	.339	.417	.344	.420	-.4	47.0	-.4	46.7	50.1	1.0	49.7	1.0
11	.335	.627	.500	.410	.327	.403	.335	.407	-.5	49.8	-.5	49.5	48.6	-6.5	47.9	-6.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	10.04	12.32	1.227	289.4	312.3	1.079	9.30	11.17	1.14452	1.28139	283.1	303.6	293.1	284.3
2	10.12	12.52	1.237	288.6	310.8	1.076	9.29	11.18	1.14890	1.29449	281.8	300.8	284.9	276.6
3	10.14	12.59	1.242	288.3	308.5	1.070	9.24	11.11	1.14623	1.30062	280.8	297.6	268.1	261.4
4	10.14	12.61	1.244	288.0	307.9	1.069	9.22	11.07	1.14601	1.30031	280.3	296.6	250.9	246.1
5	10.14	12.64	1.246	287.9	307.9	1.070	9.21	11.01	1.14574	1.29581	280.0	296.0	233.4	230.9
6	10.14	12.71	1.253	287.9	308.3	1.071	9.21	10.93	1.14573	1.28985	280.1	295.3	215.5	215.6
7	10.14	12.80	1.263	287.9	308.7	1.072	9.22	10.83	1.14678	1.28208	280.2	294.2	197.0	200.4
8	10.14	12.98	1.280	287.9	309.6	1.075	9.25	10.69	1.14880	1.27158	280.4	292.9	177.7	185.1
9	10.14	13.11	1.292	287.9	310.7	1.079	9.28	10.47	1.15235	1.25227	280.7	291.3	157.3	169.9
10	10.14	13.16	1.297	287.7	311.2	1.082	9.34	10.21	1.15848	1.22880	281.0	289.4	135.4	154.6
11	10.14	13.05	1.287	287.6	311.5	1.083	9.38	10.01	1.16221	1.20759	281.3	288.8	123.8	147.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.5	2.1	9.8	.369	.761	.137	.136	.001	.023	.023	.000	1.229
2	10.0	4.5	2.1	6.9	.354	.823	.101	.100	.001	.019	.019	.000	1.226
3	20.0	4.4	1.8	4.0	.336	.916	.047	.047	.000	.009	.009	.000	1.201
4	30.0	4.6	1.9	4.3	.349	.933	.040	.040	.000	.008	.008	.000	1.168
5	40.0	5.0	1.9	5.1	.370	.934	.044	.044	.000	.009	.009	.000	1.129
6	50.0	5.6	1.9	6.1	.391	.941	.044	.044	.000	.009	.009	.000	1.087
7	60.0	6.4	1.9	6.6	.403	.955	.038	.038	.000	.008	.008	.000	1.046
8	70.0	8.0	1.8	6.3	.409	.968	.032	.032	.000	.007	.007	.000	1.002
9	80.0	9.0	1.7	6.5	.399	.962	.047	.047	.000	.010	.010	.000	.929
10	90.0	8.3	1.7	7.4	.369	.913	.089	.089	.000	.017	.017	.000	.811
11	95.0	7.6	1.7	7.4	.352	.898	.179	.179	.000	.031	.031	.000	.743

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(q) 70 Percent of design speed; reading 1486

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	97.8	92.0	.940	98.6	92.6	.939	.1	101.9	-12.5	-10.8	98.6	137.7	307.7	203.1
2	24.178	23.477	103.7	98.3	.947	104.3	98.7	.946	.3	100.8	-11.1	-9.4	104.3	141.1	301.6	200.3
3	22.753	22.184	108.6	105.7	.973	108.9	105.9	.972	-.9	95.9	-8.4	-6.7	108.9	142.8	288.8	195.3
4	21.293	20.889	109.7	110.3	1.005	109.8	110.3	1.004	-1.0	95.3	-5.1	-3.7	109.8	145.8	273.5	185.8
5	19.809	19.596	110.5	113.9	1.031	110.5	113.9	1.031	-1.6	98.9	-1.7	-.5	110.5	150.8	258.5	173.4
6	18.291	18.301	110.4	116.9	1.059	110.4	116.9	1.059	-2.1	102.7	1.7	2.8	110.4	155.7	242.9	161.7
7	16.723	17.005	109.5	120.5	1.100	109.6	120.6	1.100	-2.1	112.8	5.4	6.3	109.7	165.1	226.3	148.4
8	15.080	15.712	107.8	124.8	1.157	108.2	125.2	1.157	-2.1	126.7	9.3	10.2	108.3	178.1	209.0	137.7
9	13.348	14.417	105.0	126.9	1.209	105.9	127.7	1.206	-2.1	140.8	13.6	13.7	105.9	190.1	190.6	130.7
10	11.493	13.124	100.4	122.6	1.221	102.1	123.7	1.211	-1.9	156.7	18.4	16.4	102.1	199.6	170.5	123.7
11	10.503	12.476	97.2	117.5	1.209	99.4	118.8	1.195	-1.7	167.5	21.0	17.4	99.5	205.4	159.6	120.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.292	.391	.910	.577	.289	.261	.292	.263	.0	47.9	.0	47.7	71.4	63.0	71.3	62.9
2	.309	.402	.894	.571	.307	.280	.309	.281	.2	45.7	.2	45.6	69.9	60.6	69.8	60.5
3	.323	.409	.857	.559	.322	.303	.323	.303	-.5	42.2	-.5	42.2	67.9	57.2	67.9	57.2
4	.326	.419	.812	.534	.326	.317	.326	.317	-.5	40.8	-.5	40.8	66.3	53.6	66.3	53.6
5	.328	.435	.768	.500	.328	.328	.328	.328	-.8	41.0	-.8	41.0	64.7	48.9	64.7	48.9
6	.328	.449	.721	.467	.328	.338	.328	.338	-1.1	41.3	-1.1	41.3	63.0	43.7	63.0	43.7
7	.326	.478	.672	.429	.325	.349	.326	.349	-1.1	43.1	-1.1	43.1	61.1	35.7	61.0	35.6
8	.321	.516	.621	.399	.320	.362	.321	.363	-1.1	45.4	-1.1	45.3	58.9	24.7	58.8	24.6
9	.314	.553	.566	.380	.312	.369	.314	.371	-1.1	48.0	-1.1	47.8	56.5	12.5	56.3	12.4
10	.303	.582	.506	.361	.298	.358	.303	.361	-1.1	52.0	-1.1	51.7	53.7	-1.4	53.2	-1.4
11	.295	.600	.473	.353	.288	.343	.295	.347	-1.0	55.0	-1.0	54.7	52.1	-10.3	51.5	-10.2

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	10.06	12.93	1.286	289.0	317.7	1.099	9.48	11.64	1.16249	1.31532	284.2	308.3	291.5	282.7
2	10.13	12.98	1.282	288.6	316.2	1.095	9.48	11.61	1.16572	1.32065	283.2	306.3	283.3	275.1
3	10.14	12.95	1.277	288.2	313.3	1.087	9.43	11.54	1.16399	1.32641	282.3	303.1	266.6	259.9
4	10.14	12.96	1.278	288.0	311.5	1.082	9.42	11.48	1.16363	1.32940	282.0	300.9	249.5	244.8
5	10.14	12.99	1.281	288.0	311.0	1.080	9.41	11.41	1.16291	1.32637	281.9	299.6	232.1	229.6
6	10.14	12.99	1.281	288.1	310.5	1.078	9.41	11.31	1.16269	1.32050	282.0	298.4	214.3	214.4
7	10.14	13.08	1.291	287.9	310.7	1.079	9.42	11.19	1.16389	1.31197	281.9	297.1	196.0	199.3
8	10.14	13.22	1.304	288.0	311.6	1.082	9.44	11.02	1.16537	1.29806	282.1	295.8	176.7	184.1
9	10.14	13.30	1.312	287.9	311.9	1.083	9.47	10.81	1.16853	1.28111	282.3	293.9	156.4	168.9
10	10.14	13.21	1.303	287.9	312.1	1.084	9.51	10.50	1.17266	1.25126	282.7	292.3	134.7	153.8
11	10.14	13.14	1.296	287.8	312.5	1.086	9.54	10.30	1.17545	1.23115	282.9	291.4	123.1	146.2

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	6.7	4.4	9.7	.463	.750	.180	.178	.002	.031	.031	.000	1.277
2	10.0	6.9	4.5	8.0	.456	.770	.165	.163	.002	.030	.029	.000	1.274
3	20.0	7.0	4.4	5.6	.438	.833	.119	.118	.001	.022	.022	.000	1.254
4	30.0	7.3	4.6	5.3	.434	.890	.080	.080	.000	.015	.015	.000	1.211
5	40.0	7.9	4.8	5.7	.447	.919	.064	.064	.000	.013	.013	.000	1.169
6	50.0	8.7	4.9	7.0	.456	.945	.049	.048	.000	.010	.010	.000	1.128
7	60.0	9.6	5.1	6.6	.477	.955	.044	.044	.000	.009	.009	.000	1.081
8	70.0	11.4	5.1	5.1	.490	.961	.046	.046	.000	.010	.010	.000	1.034
9	80.0	12.5	5.2	4.8	.480	.967	.046	.046	.000	.010	.010	.000	.955
10	90.0	11.8	5.3	5.0	.460	.931	.120	.120	.000	.022	.022	.000	.832
11	95.0	11.2	5.2	3.6	.443	.899	.202	.202	.000	.034	.034	.000	.761

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(r) 70 Percent of design speed; reading 1497

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	24.879	24.125	87.3	75.6	.866	88.0	76.2	.865	.9	118.7	-11.1	-8.9	88.0	141.0	303.7	180.9
2	24.178	23.477	93.1	81.5	.875	93.6	81.9	.874	-.1	116.5	-9.9	-7.8	93.6	142.4	298.5	178.5
3	22.753	22.184	97.7	88.0	.901	98.0	88.2	.900	-1.0	113.3	-7.5	-5.6	98.0	143.6	285.0	171.1
4	21.293	20.889	98.8	95.6	.967	99.0	95.6	.966	-1.7	108.7	-4.6	-3.2	99.0	144.8	270.1	166.3
5	19.809	19.596	99.5	104.3	1.048	99.5	104.3	1.048	-2.0	106.8	-1.6	-.5	99.6	149.3	254.4	161.2
6	18.291	18.301	99.5	110.8	1.114	99.5	110.8	1.114	-2.4	109.2	1.6	2.7	99.5	155.6	238.4	152.8
7	16.723	17.005	98.8	114.9	1.164	98.9	115.1	1.164	-2.2	119.5	4.8	6.0	98.9	165.9	221.5	140.0
8	15.080	15.712	97.1	118.3	1.218	97.5	118.7	1.217	-2.2	132.6	8.4	9.6	97.5	177.9	203.8	129.4
9	13.348	14.417	94.6	120.1	1.270	95.4	120.8	1.267	-2.1	143.6	12.2	13.0	95.4	187.6	185.0	123.5
10	11.493	13.124	90.5	114.3	1.263	92.0	115.3	1.254	-2.0	156.8	16.6	15.3	92.0	194.7	164.8	115.4
11	10.503	12.476	87.5	105.9	1.210	89.5	107.1	1.196	-2.1	167.8	18.9	15.7	89.6	199.0	153.9	109.2

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.260	.398	.897	.510	.258	.213	.260	.215	.6	57.5	.6	57.3	73.3	65.2	73.2	65.1
2	.277	.403	.883	.505	.275	.231	.277	.232	-.1	55.0	-.1	54.9	71.8	62.8	71.7	62.7
3	.290	.408	.844	.487	.290	.250	.290	.251	-.6	52.2	-.6	52.1	69.9	59.0	69.9	59.0
4	.293	.414	.800	.475	.293	.273	.293	.273	-1.0	48.7	-1.0	48.7	68.5	54.9	68.5	54.9
5	.295	.429	.754	.463	.295	.300	.295	.300	-1.1	45.7	-1.1	45.7	67.0	49.7	67.0	49.7
6	.295	.448	.707	.440	.295	.319	.295	.319	-1.4	44.6	-1.4	44.6	65.3	43.5	65.3	43.5
7	.293	.479	.657	.404	.293	.332	.293	.332	-1.3	46.1	-1.3	46.1	63.5	34.8	63.5	34.7
8	.289	.515	.604	.375	.288	.342	.289	.344	-1.3	48.3	-1.3	48.2	61.5	23.6	61.4	23.5
9	.283	.545	.548	.359	.280	.349	.283	.351	-1.3	50.1	-1.3	49.9	59.2	11.9	59.0	11.9
10	.273	.567	.488	.336	.268	.333	.272	.336	-1.3	53.9	-1.3	53.7	56.5	-1.5	56.1	-1.5
11	.265	.580	.455	.318	.259	.309	.265	.312	-1.4	57.7	-1.3	57.5	55.0	-11.5	54.4	-11.4

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	10.07	13.29	1.320	289.1	322.3	1.115	9.61	11.92	1.17335	1.32942	285.2	312.3	291.6	282.7
2	10.13	13.28	1.312	288.6	320.6	1.111	9.60	11.88	1.17656	1.33249	284.3	310.5	283.4	275.1
3	10.14	13.19	1.300	288.2	317.8	1.103	9.56	11.75	1.17533	1.33137	283.4	307.6	266.7	260.0
4	10.14	13.15	1.297	288.1	315.1	1.094	9.55	11.69	1.17473	1.33660	283.3	304.7	249.5	244.8
5	10.14	13.16	1.298	288.0	312.9	1.086	9.54	11.60	1.17461	1.33873	283.1	301.8	232.2	229.7
6	10.14	13.21	1.303	287.9	311.8	1.083	9.54	11.50	1.17479	1.33710	283.0	299.7	214.4	214.5
7	10.14	13.29	1.311	288.0	312.2	1.084	9.55	11.36	1.17541	1.32564	283.1	298.4	196.0	199.3
8	10.14	13.40	1.322	287.9	312.6	1.086	9.57	11.18	1.17693	1.31200	283.2	296.8	176.7	184.1
9	10.14	13.39	1.321	287.8	312.3	1.085	9.59	10.94	1.17947	1.29301	283.3	294.8	156.4	169.0
10	10.14	13.25	1.307	287.8	312.1	1.084	9.63	10.65	1.18288	1.26567	283.6	293.2	134.7	153.8
11	10.14	13.13	1.296	287.9	312.6	1.086	9.65	10.46	1.18481	1.24402	283.9	292.8	123.1	146.2

RP	PERCENT SPAN	INCIDENCE		DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS MACH NO
		MEAN	SS				TOT	PROF	SHOCK	TOT	PROF	SHOCK	
1	5.0	8.6	6.2	11.9	.548	.720	.233	.230	.003	.037	.036	.000	1.315
2	10.0	8.9	6.5	10.2	.543	.728	.225	.222	.003	.038	.037	.000	1.318
3	20.0	9.0	6.5	7.4	.537	.759	.201	.200	.001	.036	.036	.000	1.293
4	30.0	9.5	6.8	6.7	.516	.825	.148	.148	.000	.028	.028	.000	1.252
5	40.0	10.2	7.0	6.4	.496	.895	.092	.092	.000	.018	.018	.000	1.206
6	50.0	11.1	7.3	6.8	.491	.948	.049	.049	.000	.010	.010	.000	1.162
7	60.0	12.1	7.5	5.7	.512	.958	.046	.046	.000	.010	.010	.000	1.110
8	70.0	14.0	7.7	4.0	.525	.966	.043	.043	.000	.009	.009	.000	1.060
9	80.0	15.2	7.9	4.3	.507	.972	.042	.042	.000	.009	.009	.000	.977
10	90.0	14.7	8.1	4.9	.492	.941	.109	.109	.000	.020	.020	.000	.850
11	95.0	14.1	8.2	2.4	.498	.896	.224	.224	.000	.038	.038	.000	.778

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(s) 60 Percent of design speed; reading 1510

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	73.6	71.6	.973	74.2	72.1	.972	1.5	58.2	-9.4	-8.4	74.2	92.7	220.6	161.6
2	24.178	23.477	78.3	80.8	1.032	78.8	81.2	1.031	1.3	57.0	-8.4	-7.7	78.8	99.2	215.9	162.2
3	22.753	22.184	82.2	88.2	1.073	82.4	88.4	1.072	1.2	54.6	-6.3	-5.6	82.4	103.9	207.2	158.9
4	21.293	20.889	83.1	89.1	1.071	83.2	89.1	1.071	1.2	57.3	-3.9	-3.0	83.2	106.0	196.3	148.2
5	19.809	19.596	83.8	90.9	1.084	83.8	90.9	1.084	.9	61.8	-1.3	-.4	83.8	109.9	185.7	137.4
6	18.291	18.301	83.8	93.5	1.116	83.8	93.5	1.116	.5	66.5	1.3	2.3	83.8	114.8	174.7	128.0
7	16.723	17.005	83.2	96.5	1.159	83.3	96.6	1.160	.5	72.7	4.1	5.1	83.3	120.9	163.0	119.5
8	15.080	15.712	81.9	100.8	1.230	82.2	101.1	1.230	.3	82.9	7.1	8.2	82.2	130.7	150.9	112.5
9	13.348	14.417	79.7	103.9	1.304	80.4	104.5	1.301	.4	95.3	10.3	11.3	80.4	141.4	137.[illegible]	107.7
10	11.493	13.124	76.2	101.5	1.331	77.5	102.4	1.321	.3	109.9	14.0	13.6	77.5	150.2	123.7	102.4
11	10.503	12.476	74.0	96.7	1.307	75.7	97.8	1.292	.2	119.3	16.0	14.3	75.7	154.2	116.2	98.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.219	.268	.650	.468	.217	.207	.219	.209	1.1	39.1	1.1	38.9	70.5	63.7	70.4	63.5
2	.232	.288	.640	.471	.231	.235	.232	.236	.9	35.2	.9	35.1	68.8	60.1	68.7	60.0
3	.244	.303	.612	.463	.243	.257	.244	.258	.8	31.7	.8	31.7	66.6	56.2	66.6	56.2
4	.246	.309	.580	.432	.246	.260	.246	.260	.9	32.8	.9	32.7	64.9	53.0	64.9	53.0
5	.248	.321	.549	.401	.248	.265	.248	.265	.6	34.2	.6	34.2	63.2	48.6	63.2	48.6
6	.248	.335	.517	.374	.248	.273	.248	.273	.3	35.4	.3	35.4	61.3	43.1	61.3	43.1
7	.246	.354	.482	.349	.246	.282	.246	.282	.4	37.0	.4	37.0	59.3	36.1	59.3	36.0
8	.243	.383	.446	.329	.242	.295	.243	.296	.2	39.4	.2	39.3	57.1	26.1	57.0	26.0
9	.238	.415	.407	.316	.236	.305	.238	.306	.3	42.5	.3	42.4	54.5	14.0	54.3	13.9
10	.229	.441	.365	.300	.225	.298	.229	.300	.2	47.3	.2	47.0	51.7	.3	51.2	.3
11	.224	.453	.343	.290	.219	.284	.224	.287	.2	51.0	.2	50.7	50.0	-8.5	49.3	-8.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	10.09	11.16	1.107	289.1	300.6	1.040	9.76	10.62	1.18694	1.24819	286.4	296.3	209.2	202.9
2	10.13	11.25	1.111	288.6	299.6	1.038	9.75	10.62	1.18992	1.25552	285.5	294.7	203.3	197.4
3	10.14	11.29	1.114	288.4	298.3	1.034	9.73	10.60	1.18880	1.26009	285.0	293.0	191.4	186.6
4	10.14	11.29	1.114	288.1	298.0	1.034	9.72	10.57	1.18926	1.25937	284.7	292.4	179.1	175.7
5	10.14	11.32	1.117	287.9	297.9	1.035	9.71	10.54	1.18962	1.25812	284.4	291.9	166.6	164.8
6	10.14	11.36	1.121	287.8	297.9	1.035	9.71	10.51	1.19009	1.25694	284.3	291.4	153.8	153.9
7	10.14	11.39	1.124	287.9	298.2	1.036	9.72	10.45	1.19005	1.25138	284.5	290.9	140.6	143.0
8	10.14	11.50	1.134	287.9	298.7	1.038	9.73	10.39	1.19130	1.24758	284.5	290.2	126.8	132.1
9	10.14	11.58	1.142	287.9	299.3	1.040	9.75	10.29	1.19286	1.23838	284.6	289.4	112.3	121.2
10	10.14	11.60	1.144	287.8	299.9	1.042	9.77	10.15	1.19527	1.22505	284.8	288.7	96.7	110.4
11	10.14	11.56	1.141	287.9	300.3	1.043	9.79	10.05	1.19668	1.21318	285.0	288.5	88.3	104.9

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	5.8	3.4	10.4	.363	.740	.137	.137	.000	.023	.023	.000	.891
2	10.0	5.9	3.5	7.5	.345	.805	.101	.101	.000	.019	.019	.000	.889
3	20.0	5.7	3.1	4.6	.321	.912	.045	.045	.000	.009	.009	.000	.868
4	30.0	5.9	3.2	4.8	.337	.921	.044	.044	.000	.009	.009	.000	.838
5	40.0	6.4	3.2	5.4	.359	.924	.048	.048	.000	.010	.010	.000	.808
6	50.0	7.1	3.3	6.4	.374	.944	.040	.040	.000	.008	.008	.000	.779
7	60.0	7.9	3.3	7.0	.383	.951	.040	.040	.000	.008	.008	.000	.746
8	70.0	9.5	3.3	6.5	.387	.971	.029	.029	.000	.006	.006	.000	.715
9	80.0	10.5	3.2	6.3	.371	.972	.035	.035	.000	.007	.007	.000	.660
10	90.0	9.8	3.2	6.7	.349	.938	.100	.100	.000	.019	.019	.000	.576
11	95.0	9.0	3.1	5.5	.343	.887	.213	.213	.000	.037	.037	.000	.527

TABLE IX. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(t) 60 Percent of design speed; reading 1521

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	64.8	64.7	.999	65.3	65.1	.997	1.0	71.8	-8.3	-7.6	65.3	96.9	218.7	146.8
2	24.178	23.477	69.1	67.5	.977	69.5	67.8	.976	1.0	72.0	-7.4	-6.5	69.5	98.9	214.3	143.0
3	22.753	22.184	72.7	74.6	1.027	72.9	74.7	1.026	1.1	68.6	-5.6	-4.7	72.9	101.5	204.2	140.0
4	21.293	20.889	73.6	78.8	1.071	73.7	78.8	1.070	.7	67.8	-3.4	-2.7	73.7	104.0	193.4	133.9
5	19.809	19.596	74.1	80.3	1.084	74.1	80.3	1.084	.2	70.1	-1.2	-.4	74.1	106.6	182.5	124.5
6	18.291	18.301	74.1	82.9	1.118	74.1	82.9	1.119	-.1	73.6	1.2	2.0	74.1	110.9	171.2	115.7
7	16.723	17.005	73.6	86.9	1.181	73.7	87.0	1.181	-.1	80.7	3.6	4.6	73.7	118.7	159.2	107.2
8	15.080	15.712	72.4	91.2	1.260	72.7	91.5	1.259	-.2	90.5	6.2	7.4	72.7	128.7	146.6	100.7
9	13.348	14.417	70.6	92.9	1.317	71.2	93.5	1.314	-.2	101.2	9.1	10.1	71.2	137.7	133.3	95.7
10	11.493	13.124	67.5	87.8	1.301	68.6	88.5	1.291	-.1	115.3	12.4	11.7	68.6	145.4	118.8	88.7
11	10.503	12.476	65.3	83.0	1.271	66.8	83.9	1.256	-.2	122.7	14.1	12.3	66.8	148.6	111.0	85.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.192	.280	.644	.424	.191	.187	.192	.188	.9	48.0	.8	47.8	72.8	63.8	72.6	63.7
2	.205	.286	.632	.413	.204	.195	.205	.196	.9	46.9	.9	46.7	71.2	61.8	71.1	61.7
3	.215	.294	.602	.406	.214	.216	.215	.217	.8	42.6	.8	42.6	69.1	57.8	69.1	57.7
4	.217	.302	.571	.389	.217	.229	.217	.229	.5	40.7	.5	40.7	67.6	54.0	67.6	53.9
5	.219	.310	.539	.362	.219	.234	.219	.234	.2	41.1	.2	41.1	66.0	49.8	66.0	49.8
6	.219	.323	.506	.337	.219	.241	.219	.242	-.1	41.6	-.1	41.6	64.3	44.2	64.3	44.2
7	.218	.346	.470	.313	.217	.253	.218	.254	-.1	42.9	-.1	42.9	62.4	35.8	62.4	35.7
8	.215	.376	.433	.294	.214	.266	.215	.267	-.1	44.8	-.1	44.7	60.4	24.7	60.3	24.6
9	.210	.403	.394	.280	.208	.272	.210	.273	-.2	47.4	-.2	47.3	58.0	12.4	57.7	12.3
10	.202	.426	.351	.260	.199	.257	.202	.259	-.1	52.7	-.1	52.5	55.2	-3.1	54.7	-3.0
11	.197	.435	.328	.251	.193	.243	.197	.246	-.2	55.9	-.2	55.6	53.7	-11.9	53.0	-11.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	10.10	11.45	1.134	288.7	303.1	1.050	9.84	10.84	1.19583	1.26587	286.6	298.4	209.7	203.4
2	10.13	11.46	1.131	288.5	302.5	1.048	9.83	10.82	1.19762	1.26701	286.1	297.6	203.8	197.9
3	10.13	11.49	1.134	288.3	300.9	1.044	9.81	10.82	1.19677	1.27441	285.7	295.8	191.8	187.0
4	10.14	11.49	1.133	288.1	299.9	1.041	9.81	10.78	1.19734	1.27546	285.4	294.5	179.5	176.1
5	10.14	11.49	1.133	288.0	299.5	1.040	9.80	10.74	1.19708	1.27382	285.3	293.9	167.0	165.2
6	10.14	11.50	1.134	288.0	299.3	1.039	9.80	10.69	1.19733	1.27075	285.2	293.2	154.2	154.3
7	10.14	11.56	1.141	287.9	299.5	1.040	9.81	10.64	1.19781	1.26788	285.2	292.5	141.0	143.4
8	10.14	11.64	1.148	288.0	300.0	1.042	9.81	10.55	1.19830	1.26044	285.4	291.7	127.1	132.5
9	10.14	11.70	1.154	288.0	300.3	1.043	9.83	10.46	1.19965	1.25303	285.4	290.8	112.5	121.5
10	10.14	11.65	1.149	287.9	300.7	1.044	9.85	10.28	1.20157	1.23484	285.6	290.1	96.9	110.6
11	10.14	11.60	1.144	287.9	300.8	1.045	9.86	10.18	1.20289	1.22381	285.7	289.8	88.5	105.2

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	8.1	5.7	10.5	.449	.737	.174	.174	.000	.029	.029	.000	.934
2	10.0	8.3	5.8	9.2	.452	.740	.173	.173	.000	.030	.030	.000	.930
3	20.0	8.2	5.7	6.1	.427	.837	.108	.108	.000	.020	.020	.000	.907
4	30.0	8.6	5.9	5.7	.419	.890	.075	.075	.000	.014	.014	.000	.876
5	40.0	9.2	6.1	6.6	.434	.912	.066	.066	.000	.013	.013	.000	.845
6	50.0	10.1	6.3	7.5	.446	.931	.057	.057	.000	.012	.012	.000	.814
7	60.0	11.0	6.5	6.7	.460	.957	.041	.041	.000	.009	.009	.000	.778
8	70.0	12.8	6.6	5.1	.463	.968	.037	.037	.000	.008	.008	.000	.743
9	80.0	14.0	6.7	4.7	.450	.980	.029	.029	.000	.006	.006	.000	.684
10	90.0	13.3	6.8	3.3	.448	.918	.151	.151	.000	.028	.028	.000	.595
11	95.0	12.7	6.8	2.0	.437	.878	.259	.259	.000	.044	.044	.000	.544

TABLE IX. - Concluded. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE ROTOR

(u) 60 Percent of design speed; reading 1533

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	24.879	24.125	56.9	55.6	.977	57.4	56.0	.976	.7	84.3	-7.2	-6.5	57.4	101.2	215.9	130.9
2	24.178	23.477	61.3	57.4	.936	61.6	57.6	.935	.7	84.6	-6.5	-5.5	61.6	102.3	211.4	126.4
3	22.753	22.184	64.7	59.7	.922	64.9	59.8	.921	.5	82.6	-5.0	-3.8	64.9	102.0	201.3	119.7
4	21.293	20.889	65.5	65.1	.995	65.6	65.2	.994	.1	79.4	-3.0	-2.2	65.6	102.7	190.3	116.0
5	19.809	19.596	66.0	72.0	1.091	66.0	72.0	1.091	-.3	76.9	-1.0	-.3	66.0	105.3	179.2	113.5
6	18.291	18.301	66.0	77.3	1.171	66.0	77.3	1.171	-.7	78.5	1.0	1.9	66.0	110.2	167.8	107.8
7	16.723	17.005	65.6	82.3	1.255	65.6	82.4	1.256	-.7	85.5	3.2	4.3	65.6	118.7	155.6	100.4
8	15.080	15.712	64.6	85.9	1.331	64.8	86.2	1.330	-.8	95.0	5.6	7.0	64.8	128.3	142.9	93.8
9	13.348	14.417	62.9	85.9	1.365	63.4	86.4	1.362	-.7	103.6	8.1	9.3	63.4	134.9	129.3	88.1
10	11.493	13.124	60.1	80.3	1.336	61.1	81.0	1.325	-.7	114.7	11.0	10.7	61.1	140.5	114.8	81.2
11	10.503	12.476	58.2	74.9	1.287	59.5	75.7	1.272	-.7	122.8	12.6	11.1	59.5	144.3	107.0	77.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.169	.291	.635	.376	.167	.160	.169	.161	.7	56.6	.7	56.4	74.7	64.8	74.6	64.7
2	.182	.295	.623	.364	.180	.165	.181	.166	.7	55.8	.7	55.7	73.2	63.0	73.1	62.9
3	.191	.294	.593	.345	.191	.172	.191	.173	.4	54.2	.4	54.1	71.2	60.1	71.2	60.0
4	.193	.297	.561	.336	.193	.189	.193	.189	.1	50.6	.1	50.6	69.9	55.8	69.8	55.8
5	.195	.306	.529	.329	.195	.209	.195	.209	-.2	46.9	-.2	46.9	68.4	50.6	68.4	50.6
6	.195	.320	.495	.314	.195	.225	.195	.225	-.6	45.4	-.6	45.4	66.8	44.2	66.8	44.2
7	.194	.346	.459	.292	.193	.240	.194	.240	-.6	46.1	-.6	46.0	65.1	34.8	65.1	34.8
8	.191	.374	.422	.274	.190	.251	.191	.251	-.7	47.9	-.7	47.8	63.1	23.3	63.0	23.2
9	.187	.394	.381	.257	.186	.251	.187	.252	-.6	50.4	-.6	50.2	60.8	11.5	60.6	11.4
10	.180	.411	.339	.237	.177	.235	.180	.237	-.6	55.0	-.6	54.8	58.3	-3.2	57.8	-3.2
11	.175	.422	.315	.228	.172	.219	.175	.222	-.7	58.6	-.7	58.3	56.8	-13.6	56.2	-13.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	10.10	11.68	1.157	288.9	305.8	1.058	9.90	11.02	1.20068	1.27639	287.3	300.7	208.9	202.5
2	10.13	11.67	1.153	288.5	304.9	1.057	9.90	10.99	1.20314	1.27744	286.6	299.7	203.0	197.1
3	10.13	11.61	1.145	288.3	303.6	1.053	9.88	10.93	1.20243	1.27619	286.2	298.4	191.0	186.3
4	10.14	11.58	1.143	288.1	301.9	1.048	9.87	10.89	1.20315	1.27905	285.9	296.7	178.8	175.4
5	10.14	11.58	1.143	288.0	300.7	1.044	9.87	10.85	1.20306	1.28138	285.8	295.1	166.3	164.5
6	10.14	11.59	1.144	288.0	300.1	1.042	9.87	10.80	1.20303	1.27888	285.8	294.1	153.6	153.6
7	10.14	11.66	1.151	287.9	300.2	1.043	9.87	10.74	1.20367	1.27606	285.8	293.2	140.4	142.8
8	10.14	11.73	1.157	288.0	300.6	1.044	9.88	10.65	1.20400	1.26857	285.9	292.4	126.6	131.9
9	10.14	11.72	1.156	287.9	300.5	1.044	9.89	10.53	1.20528	1.25881	285.9	291.4	112.1	121.0
10	10.14	11.65	1.149	287.9	300.6	1.044	9.91	10.37	1.20666	1.24267	286.1	290.8	96.5	110.2
11	10.14	11.61	1.146	287.9	300.7	1.045	9.92	10.27	1.20798	1.23217	286.1	290.4	88.2	104.7

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	10.0	7.7	11.5	.538	.728	.213	.213	.000	.034	.034	.000	.963
2	10.0	10.2	7.8	10.4	.545	.726	.217	.217	.000	.036	.036	.000	.958
3	20.0	10.3	7.8	8.4	.545	.749	.203	.203	.000	.035	.035	.000	.935
4	30.0	10.8	8.1	7.6	.524	.808	.157	.157	.000	.029	.029	.000	.904
5	40.0	11.6	8.4	7.4	.497	.886	.096	.096	.000	.019	.019	.000	.871
6	50.0	12.6	8.8	7.5	.491	.930	.064	.064	.000	.013	.013	.000	.838
7	60.0	13.7	9.1	5.8	.500	.963	.040	.040	.000	.009	.009	.000	.801
8	70.0	15.6	9.4	3.7	.506	.974	.033	.033	.000	.007	.007	.000	.763
9	80.0	16.8	9.6	3.8	.497	.971	.045	.045	.000	.009	.009	.000	.701
10	90.0	16.4	9.9	3.2	.494	.923	.150	.150	.000	.028	.028	.000	.610
11	95.0	15.9	10.0	.4	.490	.885	.263	.263	.000	.044	.044	.000	.558

TABLE X. - BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(a) 100 Percent of design speed; reading 1283

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	163.9	168.2	1.026	164.0	168.2	1.026	157.4	6.0	-1.8	1.5	227.3	168.4	227.3	168.4
2	23.208	23.251	177.4	174.0	.981	177.4	174.0	.981	151.5	4.4	-1.1	1.8	233.3	174.1	233.3	174.1
3	22.032	22.121	191.9	181.1	.944	191.9	181.1	.944	145.2	5.3	.8	2.6	240.6	181.2	240.6	181.2
4	20.848	20.983	193.5	181.9	.940	193.6	182.0	.940	148.0	2.9	3.0	3.9	243.7	182.0	243.7	182.0
5	19.660	19.848	189.7	178.5	.941	189.8	178.6	.941	151.2	2.9	5.3	5.4	242.6	178.7	242.6	178.7
6	18.461	18.712	184.0	172.9	.940	184.1	173.1	.940	155.5	-.6	7.6	7.0	241.0	173.1	241.0	173.1
7	17.249	17.574	178.2	169.7	.953	178.5	170.0	.952	167.4	-.2	10.1	8.7	244.7	170.0	244.7	170.0
8	16.020	16.431	176.9	169.6	.959	177.4	169.9	.958	179.9	4.8	12.9	10.6	252.6	170.0	252.6	170.0
9	14.778	15.291	177.1	164.4	.929	177.8	164.9	.927	193.1	13.9	16.1	11.8	262.5	165.4	262.5	165.4
10	13.520	14.158	169.4	152.5	.901	170.4	153.0	.898	209.6	9.8	18.4	11.6	270.1	153.3	270.1	153.3
11	12.883	13.594	160.2	143.9	.898	161.3	144.3	.895	222.9	-11.4	18.6	10.8	275.1	144.8	275.1	144.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.629	.458	.629	.458	.453	.457	.454	.457	43.8	2.0	43.8	2.0	43.8	2.0	43.8	2.0
2	.650	.477	.650	.477	.495	.476	.495	.476	40.5	1.5	40.5	1.5	40.5	1.5	40.5	1.5
3	.678	.501	.678	.501	.541	.501	.541	.501	37.1	1.7	37.1	1.7	37.1	1.7	37.1	1.7
4	.690	.505	.690	.505	.548	.505	.548	.505	37.4	.9	37.4	.9	37.4	.9	37.4	.9
5	.689	.497	.689	.497	.539	.496	.539	.497	38.6	.9	38.5	.9	38.6	.9	38.5	.9
6	.686	.482	.686	.482	.524	.481	.524	.482	40.2	-.2	40.2	-.2	40.2	-.2	40.2	-.2
7	.699	.473	.699	.473	.509	.473	.509	.473	43.2	-.1	43.2	-.1	43.2	-.1	43.2	-.1
8	.724	.474	.724	.474	.507	.472	.508	.473	45.5	1.6	45.4	1.6	45.5	1.6	45.4	1.6
9	.755	.460	.755	.460	.509	.458	.512	.459	47.5	4.8	47.4	4.8	47.5	4.8	47.4	4.8
10	.780	.426	.780	.426	.489	.423	.492	.425	51.1	3.7	50.9	3.7	51.1	3.7	50.9	3.7
11	.795	.401	.795	.401	.463	.398	.466	.399	54.3	-4.5	54.1	-4.5	54.3	-4.5	54.1	-4.5

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	17.02	16.68	.980	350.9	350.9	1.000	13.04	14.45	1.39743	1.49469	325.2	336.8	.0	.0
2	17.23	16.88	.979	347.2	347.2	1.000	12.97	14.45	1.41155	1.51579	320.1	332.1	.0	.0
3	17.44	17.14	.983	341.9	341.9	1.000	12.82	14.44	1.42620	1.54549	313.1	325.6	.0	.0
4	17.43	17.14	.983	339.7	339.7	1.000	12.68	14.40	1.42402	1.55224	310.2	323.2	.0	.0
5	17.20	17.01	.989	337.9	337.9	1.000	12.52	14.37	1.41391	1.55483	308.6	322.0	.0	.0
6	16.97	16.77	.988	336.2	336.2	1.000	12.39	14.31	1.40481	1.55193	307.3	321.3	.0	.0
7	16.82	16.63	.989	335.1	335.1	1.000	12.14	14.27	1.38500	1.54958	305.3	320.8	.0	.0
8	16.86	16.64	.987	335.1	335.1	1.000	11.90	14.27	1.36653	1.55034	303.3	320.7	.0	.0
9	16.84	16.44	.976	335.0	335.0	1.000	11.54	14.21	1.33713	1.54087	300.6	321.3	.0	.0
10	16.70	15.97	.956	334.6	334.6	1.000	11.17	14.10	1.30455	1.52066	298.3	322.9	.0	.0
11	16.58	15.71	.947	335.3	335.3	1.000	10.92	14.06	1.27883	1.50809	297.6	324.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	8.3	2.3	16.7	.515	.000	.086	.086	.000	.033	.033	.000	1.178
2	10.0	6.6	.6	14.1	.490	.000	.083	.083	.000	.031	.031	.000	1.133
3	20.0	3.3	-2.7	12.3	.453	.000	.065	.065	.000	.023	.023	.000	1.078
4	30.0	3.1	-2.7	10.8	.453	.000	.061	.061	.000	.021	.021	.000	1.081
5	40.0	3.4	-2.4	10.4	.457	.000	.041	.041	.000	.013	.013	.000	1.078
6	50.0	3.6	-2.0	9.0	.475	.000	.043	.043	.000	.013	.013	.000	1.080
7	60.0	5.1	-.5	9.2	.496	.000	.039	.039	.000	.011	.011	.000	1.137
8	70.0	5.4	-.0	11.1	.506	.000	.044	.044	.000	.011	.011	.000	1.190
9	80.0	4.9	-.4	15.0	.531	.000	.076	.076	.000	.018	.018	.000	1.240
10	90.0	5.4	.2	15.8	.593	.000	.132	.132	.000	.029	.029	.000	1.313
11	95.0	6.7	1.7	9.2	.650	.000	.154	.152	.003	.033	.032	.001	1.391

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(b) 100 Percent of design speed; reading 1382

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	159.9	163.7	1.024	159.9	163.7	1.024	138.9	-3.7	-1.8	1.4	211.8	163.8	211.8	163.8
2	23.208	23.251	180.5	174.6	.968	180.5	174.7	.968	133.3	-3.5	-1.1	1.8	224.4	174.7	224.4	174.7
3	22.032	22.121	197.4	185.7	.940	197.4	185.7	.940	128.5	-4.5	.8	2.7	235.6	185.7	235.6	185.7
4	20.848	20.983	199.0	187.2	.941	199.0	187.2	.941	130.1	-7.7	3.1	4.0	237.8	187.4	237.8	187.4
5	19.660	19.848	198.8	187.7	.944	198.9	187.8	.944	135.4	-5.4	5.5	5.6	240.6	187.9	240.6	187.9
6	18.461	18.712	198.4	188.5	.950	198.6	188.7	.950	141.4	-5.7	8.2	7.6	243.8	188.8	243.8	188.8
7	17.249	17.574	198.3	189.7	.956	198.6	189.9	.956	149.4	-6.3	11.3	9.7	248.6	190.0	248.6	190.0
8	16.020	16.431	198.8	194.1	.977	199.3	194.5	.976	163.5	-4.8	14.5	12.1	257.8	194.5	257.8	194.5
9	14.778	15.291	198.3	198.0	.999	199.1	198.5	.997	180.5	1.1	18.0	14.2	268.7	198.5	268.7	198.5
10	13.520	14.158	187.0	187.1	1.000	188.2	187.6	.997	197.4	2.4	20.4	14.2	272.7	187.6	272.7	187.6
11	12.883	13.594	173.1	166.9	.964	174.3	167.4	.960	208.2	-11.4	20.1	12.5	271.5	167.8	271.5	167.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.590	.450	.590	.450	.445	.450	.445	.450	41.0	-1.3	41.0	-1.3	41.0	-1.3	41.0	-1.3
2	.631	.484	.631	.484	.507	.483	.507	.483	36.4	-1.1	36.4	-1.1	36.4	-1.1	36.4	-1.1
3	.670	.519	.670	.519	.561	.519	.561	.519	33.1	-1.4	33.1	-1.4	33.1	-1.4	33.1	-1.4
4	.679	.526	.679	.526	.568	.525	.568	.526	33.2	-2.4	33.2	-2.4	33.2	-2.4	33.2	-2.4
5	.689	.528	.689	.528	.569	.528	.569	.528	34.3	-1.6	34.3	-1.6	34.3	-1.6	34.3	-1.6
6	.699	.531	.699	.531	.569	.531	.570	.531	35.5	-1.7	35.4	-1.7	35.5	-1.7	35.4	-1.7
7	.715	.536	.715	.536	.571	.535	.572	.535	37.0	-1.9	37.0	-1.9	37.0	-1.9	37.0	-1.9
8	.744	.548	.744	.548	.574	.547	.575	.548	39.4	-1.4	39.4	-1.4	39.4	-1.4	39.4	-1.4
9	.778	.560	.778	.560	.574	.558	.577	.560	42.3	.3	42.2	.3	42.3	.3	42.2	.3
10	.792	.528	.792	.528	.543	.526	.546	.528	46.5	.7	46.4	.7	46.5	.7	46.4	.7
11	.788	.469	.788	.469	.502	.467	.506	.468	50.3	-3.9	50.1	-3.9	50.3	-3.9	50.1	-3.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.42	15.25	.989	343.2	343.2	1.000	12.19	13.27	1.32328	1.40198	320.9	329.9	.0	.0
2	15.85	15.58	.983	340.0	340.0	1.000	12.13	13.27	1.34160	1.42392	314.9	324.8	.0	.0
3	16.14	15.95	.988	335.5	335.5	1.000	11.95	13.27	1.35267	1.45303	307.8	318.3	.0	.0
4	16.14	15.94	.987	333.1	333.1	1.000	11.85	13.20	1.35377	1.45670	305.0	315.7	.0	.0
5	16.14	15.95	.988	332.4	332.4	1.000	11.75	13.19	1.34883	1.45994	303.5	314.8	.0	.0
6	16.12	15.95	.990	331.9	331.9	1.000	11.63	13.16	1.33996	1.45975	302.3	314.2	.0	.0
7	16.11	15.95	.990	331.2	331.2	1.000	11.45	13.12	1.32836	1.45933	300.4	313.2	.0	.0
8	16.26	16.05	.987	331.9	331.9	1.000	11.26	13.08	1.31345	1.45610	298.8	313.0	.0	.0
9	16.39	16.13	.984	332.4	332.4	1.000	10.98	13.04	1.29065	1.45196	296.4	312.8	.0	.0
10	16.26	15.63	.961	332.1	332.1	1.000	10.75	12.93	1.26969	1.43185	295.0	314.6	.0	.0
11	15.88	15.01	.945	332.3	332.3	1.000	10.55	12.91	1.24301	1.41254	295.6	318.3	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	5.2	-.7	13.1	.485	.000	.053	.053	.000	.020	.020	.000	1.042
2	10.0	2.3	-3.6	11.2	.450	.000	.074	.074	.000	.028	.028	.000	1.008
3	20.0	-1.0	-6.9	9.1	.412	.000	.045	.045	.000	.016	.016	.000	.968
4	30.0	-1.3	-7.1	7.3	.407	.000	.047	.047	.000	.016	.016	.000	.961
5	40.0	-1.1	-6.9	7.6	.405	.000	.043	.043	.000	.014	.014	.000	.973
6	50.0	-1.3	-7.0	7.2	.405	.000	.037	.037	.000	.011	.011	.000	.984
7	60.0	-1.3	-6.9	7.2	.410	.000	.035	.035	.000	.010	.010	.000	1.008
8	70.0	-.8	-6.3	7.9	.414	.000	.043	.043	.000	.011	.011	.000	1.066
9	80.0	-.4	-5.7	10.4	.420	.000	.049	.049	.000	.012	.012	.000	1.138
10	90.0	.6	-4.5	12.7	.467	.000	.115	.115	.000	.025	.025	.000	1.206
11	95.0	2.5	-2.5	9.6	.549	.000	.165	.165	.000	.035	.035	.000	1.263

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(c) 100 Percent of design speed; reading 1393

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	162.5	163.5	1.006	162.5	163.5	1.006	138.1	-3.5	-1.8	1.4	213.3	163.6	213.3	163.6
2	23.208	23.251	180.4	174.7	.968	180.4	174.7	.968	133.6	-3.6	-1.1	1.8	224.5	174.7	224.5	174.7
3	22.032	22.121	196.6	185.7	.944	196.6	185.7	.944	128.1	-4.3	.8	2.7	234.6	185.7	234.6	185.7
4	20.848	20.983	198.7	187.1	.942	198.7	187.2	.942	130.2	-7.3	3.1	4.0	237.6	187.3	237.6	187.3
5	19.660	19.848	198.2	187.3	.945	198.3	187.4	.945	134.6	-5.4	5.5	5.6	239.7	187.5	239.7	187.5
6	18.461	18.712	197.4	187.5	.950	197.6	187.7	.950	140.4	-5.5	8.2	7.6	242.4	187.7	242.4	187.7
7	17.249	17.574	196.9	188.5	.957	197.2	188.7	.957	148.9	-6.2	11.2	9.7	247.1	188.8	247.1	188.8
8	16.020	16.431	197.1	193.2	.980	197.7	193.5	.979	163.2	-4.8	14.4	12.1	256.3	193.6	256.3	193.6
9	14.778	15.291	196.5	197.0	1.003	197.3	197.5	1.001	180.8	1.1	17.9	14.1	267.6	197.5	267.6	197.5
10	13.520	14.158	184.7	185.4	1.004	185.8	185.9	1.001	197.1	2.2	20.1	14.1	270.8	185.9	270.8	185.9
11	12.883	13.594	169.7	164.2	.968	170.8	164.7	.964	208.7	-11.5	19.7	12.3	269.7	165.1	269.7	165.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.595	.450	.595	.450	.453	.449	.453	.449	40.4	-1.2	40.4	-1.2	40.4	-1.2	40.4	-1.2
2	.631	.484	.631	.484	.507	.484	.507	.484	36.5	-1.2	36.5	-1.2	36.5	-1.2	36.5	-1.2
3	.667	.519	.667	.519	.559	.519	.559	.519	33.1	-1.3	33.1	-1.3	33.1	-1.3	33.1	-1.3
4	.679	.526	.679	.526	.567	.525	.568	.525	33.2	-2.2	33.2	-2.2	33.2	-2.2	33.2	-2.2
5	.686	.527	.686	.527	.567	.527	.568	.527	34.2	-1.7	34.2	-1.7	34.2	-1.7	34.2	-1.7
6	.695	.528	.695	.528	.566	.528	.567	.528	35.4	-1.7	35.4	-1.7	35.4	-1.7	35.4	-1.7
7	.711	.532	.711	.532	.566	.531	.567	.532	37.1	-1.9	37.1	-1.9	37.1	-1.9	37.1	-1.9
8	.740	.546	.740	.546	.569	.545	.570	.546	39.6	-1.4	39.5	-1.4	39.6	-1.4	39.5	-1.4
9	.775	.557	.775	.557	.569	.556	.571	.557	42.6	.3	42.5	.3	42.6	.3	42.5	.3
10	.786	.522	.786	.522	.536	.521	.539	.522	46.9	.7	46.7	.7	46.9	.7	46.7	.7
11	.782	.461	.782	.461	.492	.459	.495	.460	50.9	-4.0	50.7	-4.0	50.9	-4.0	50.7	-4.0

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.49	15.28	.986	342.6	342.6	1.000	12.20	13.30	1.32804	1.40718	320.0	329.3	.0	.0
2	15.88	15.61	.983	339.8	339.8	1.000	12.14	13.30	1.34393	1.42785	314.7	324.6	.0	.0
3	16.15	15.98	.989	335.5	335.5	1.000	11.99	13.30	1.35559	1.45492	308.1	318.4	.0	.0
4	16.18	15.97	.987	333.1	333.1	1.000	11.88	13.22	1.35762	1.45975	305.0	315.6	.0	.0
5	16.14	15.97	.989	332.2	332.2	1.000	11.78	13.22	1.35208	1.46300	303.6	314.7	.0	.0
6	16.12	15.95	.989	331.5	331.5	1.000	11.67	13.18	1.34459	1.46284	302.3	314.0	.0	.0
7	16.09	15.93	.990	330.9	330.9	1.000	11.49	13.14	1.33166	1.46128	300.5	313.2	.0	.0
8	16.27	16.06	.987	331.4	331.4	1.000	11.31	13.11	1.31881	1.46025	298.7	312.8	.0	.0
9	16.38	16.12	.984	332.5	332.5	1.000	11.01	13.06	1.29296	1.45331	296.8	313.0	.0	.0
10	16.23	15.61	.962	332.3	332.3	1.000	10.80	12.96	1.27193	1.43322	295.7	315.0	.0	.0
11	15.85	14.98	.945	332.3	332.3	1.000	10.58	12.94	1.24571	1.41485	296.0	318.7	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.6	-1.3	13.2	.488	.000	.065	.065	.000	.025	.025	.000	1.038
2	10.0	2.4	-3.6	11.2	.451	.000	.071	.071	.000	.027	.027	.000	1.010
3	20.0	-1.0	-6.9	9.1	.409	.000	.042	.042	.000	.015	.015	.000	.964
4	30.0	-1.2	-7.1	7.5	.406	.000	.049	.049	.000	.017	.017	.000	.962
5	40.0	-1.2	-7.0	7.6	.403	.000	.040	.040	.000	.013	.013	.000	.967
6	50.0	-1.3	-7.0	7.3	.405	.000	.038	.038	.000	.011	.011	.000	.977
7	60.0	-1.2	-6.8	7.2	.410	.000	.035	.035	.000	.010	.010	.000	1.004
8	70.0	-.6	-6.1	7.9	.414	.000	.042	.042	.000	.011	.011	.000	1.065
9	80.0	-.1	-5.4	10.4	.421	.000	.048	.048	.000	.012	.012	.000	1.140
10	90.0	1.0	-4.1	12.6	.470	.000	.113	.113	.000	.025	.025	.000	1.206
11	95.0	3.1	-1.9	9.5	.557	.000	.166	.166	.000	.035	.035	.000	1.271

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(d) 100 Percent of design speed; reading 1415

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	164.9	165.2	1.002	164.9	165.2	1.002	143.0	-.8	-1.8	1.4	218.2	165.2	218.2	165.2
2	23.208	23.251	179.8	174.9	.973	179.8	174.9	.973	141.0	-1.2	-1.1	1.8	228.4	175.0	228.4	175.0
3	22.032	22.121	194.4	184.8	.951	194.4	184.8	.951	134.8	-1.7	.8	2.7	236.5	184.8	236.5	184.8
4	20.848	20.983	196.8	185.8	.944	196.8	185.9	.944	136.9	-4.0	3.0	4.0	239.7	185.9	239.7	185.9
5	19.660	19.848	196.1	184.9	.943	196.2	185.0	.943	139.9	-3.2	5.4	5.6	241.0	185.0	241.0	185.0
6	18.461	18.712	194.8	183.3	.941	194.9	183.4	.941	144.7	-4.4	8.1	7.4	242.8	183.5	242.8	183.5
7	17.249	17.574	193.5	182.9	.945	193.8	183.1	.945	152.9	-4.7	11.0	9.4	246.8	183.2	246.8	183.2
8	16.020	16.431	193.5	186.3	.963	194.0	186.6	.962	166.3	-2.7	14.1	11.6	255.5	186.7	255.5	186.7
9	14.778	15.291	192.2	188.3	.980	193.0	188.8	.978	183.0	3.9	17.5	13.5	266.0	188.8	266.0	188.8
10	13.520	14.158	179.5	176.1	.981	180.6	176.6	.978	201.7	4.5	19.5	13.4	270.7	176.7	270.7	176.7
11	12.883	13.594	164.9	156.2	.948	166.0	156.7	.944	213.5	-8.9	19.1	11.7	270.4	156.9	270.4	156.9

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.608	.453	.608	.453	.459	.453	.459	.453	40.9	-.3	40.9	-.3	40.9	-.3	40.9	-.3
2	.641	.483	.641	.483	.505	.483	.505	.483	38.1	-.4	38.1	-.4	38.1	-.4	38.1	-.4
3	.671	.515	.671	.515	.551	.515	.551	.515	34.7	-.5	34.7	-.5	34.7	-.5	34.7	-.5
4	.683	.520	.683	.520	.561	.520	.561	.520	34.8	-1.2	34.8	-1.2	34.8	-1.2	34.8	-1.2
5	.688	.519	.688	.519	.560	.518	.561	.519	35.5	-1.0	35.5	-1.0	35.5	-1.0	35.5	-1.0
6	.696	.515	.696	.515	.558	.515	.559	.515	36.6	-1.4	36.6	-1.4	36.6	-1.4	36.6	-1.4
7	.709	.515	.709	.515	.556	.514	.557	.515	38.3	-1.5	38.3	-1.5	38.3	-1.5	38.3	-1.5
8	.736	.525	.736	.525	.557	.524	.559	.525	40.7	-.8	40.6	-.8	40.7	-.8	40.6	-.8
9	.769	.531	.769	.531	.556	.529	.558	.530	43.6	1.2	43.5	1.2	43.6	1.2	43.5	1.2
10	.784	.495	.784	.495	.520	.493	.523	.495	48.3	1.4	48.2	1.4	48.3	1.4	48.2	1.4
11	.783	.437	.783	.437	.477	.435	.480	.436	52.3	-3.3	52.1	-3.3	52.3	-3.3	52.1	-3.3

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.91	15.68	.985	344.6	344.6	1.000	12.40	13.62	1.34622	1.43340	320.9	331.0	.0	.0
2	16.27	15.98	.982	341.8	341.8	1.000	12.34	13.62	1.36115	1.45313	315.8	326.5	.0	.0
3	16.48	16.32	.990	337.3	337.3	1.000	12.19	13.62	1.37239	1.48085	309.5	320.3	.0	.0
4	16.50	16.29	.987	335.1	335.1	1.000	12.08	13.55	1.37284	1.48468	306.5	317.9	.0	.0
5	16.41	16.26	.991	333.7	333.7	1.000	11.95	13.54	1.36635	1.48911	304.8	316.7	.0	.0
6	16.35	16.18	.989	332.4	332.4	1.000	11.83	13.50	1.36029	1.48962	303.1	315.7	.0	.0
7	16.27	16.11	.990	331.8	331.8	1.000	11.63	13.44	1.34448	1.48656	301.4	315.1	.0	.0
8	16.41	16.20	.987	332.2	332.2	1.000	11.44	13.43	1.33073	1.48641	299.6	314.8	.0	.0
9	16.48	16.20	.983	333.0	333.0	1.000	11.14	13.37	1.30397	1.47783	297.8	315.2	.0	.0
10	16.34	15.72	.962	333.0	333.0	1.000	10.88	13.30	1.27895	1.45913	296.5	317.5	.0	.0
11	15.97	15.14	.948	333.4	333.4	1.000	10.66	13.28	1.25021	1.44045	297.0	321.1	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.8	-1.1	13.9	.495	.000	.066	.066	.000	.026	.026	.000	1.066
2	10.0	3.7	-2.3	11.7	.467	.000	.075	.075	.000	.028	.028	.000	1.054
3	20.0	.4	-5.5	9.6	.424	.000	.038	.038	.000	.014	.014	.000	1.001
4	30.0	.0	-5.8	8.1	.422	.000	.048	.048	.000	.016	.016	.000	.997
5	40.0	-.2	-6.0	7.9	.421	.000	.034	.034	.000	.011	.011	.000	.994
6	50.0	-.5	-6.1	7.3	.427	.000	.039	.039	.000	.012	.012	.000	.998
7	60.0	-.4	-5.9	7.3	.435	.000	.035	.035	.000	.010	.010	.000	1.023
8	70.0	.1	-5.4	8.1	.440	.000	.042	.042	.000	.011	.011	.000	1.078
9	80.0	.5	-4.8	10.9	.450	.000	.053	.053	.000	.013	.013	.000	1.148
10	90.0	2.1	-3.0	13.1	.505	.000	.114	.114	.000	.025	.025	.000	1.234
11	95.0	4.2	-.8	9.9	.590	.000	.157	.157	.000	.033	.033	.000	1.302

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(e) 100 Percent of design speed; reading 1426

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	161.1	166.4	1.033	161.1	166.4	1.033	149.1	1.0	-1.8	1.5	219.5	166.4	219.5	166.4
2	23.208	23.251	178.5	174.4	.977	178.5	174.4	.977	143.0	-.1	-1.1	1.8	228.7	174.4	228.7	174.4
3	22.032	22.121	192.9	183.4	.951	192.9	183.5	.951	138.6	-.8	.8	2.7	237.5	183.5	237.5	183.5
4	20.848	20.983	195.2	184.6	.946	195.2	184.6	.946	141.0	-3.1	3.0	3.9	240.8	184.7	240.8	184.7
5	19.660	19.848	195.0	182.8	.938	195.0	182.9	.938	142.3	-2.2	5.4	5.5	241.4	182.9	241.4	182.9
6	18.461	18.712	192.0	179.7	.936	192.2	179.9	.936	147.1	-4.4	8.0	7.3	242.0	179.9	242.0	179.9
7	17.249	17.574	190.1	178.3	.938	190.4	178.5	.937	154.5	-4.0	10.8	9.2	245.2	178.5	245.2	178.5
8	16.020	16.431	189.7	180.3	.951	190.2	180.7	.950	167.7	-1.7	13.9	11.3	253.5	180.7	253.5	180.7
9	14.778	15.291	187.1	179.9	.962	187.8	180.3	.960	184.9	5.7	17.0	12.9	263.5	180.4	263.5	180.4
10	13.520	14.158	173.8	167.2	.962	174.8	167.7	.959	204.1	6.5	18.9	12.7	268.7	167.8	268.7	167.8
11	12.883	13.594	158.4	149.7	.945	159.5	150.2	.941	217.4	-9.1	18.4	11.3	269.6	150.4	269.6	150.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.609	.455	.609	.455	.447	.455	.447	.455	42.8	.3	42.8	.3	42.8	.3	42.8	.3
2	.640	.480	.640	.480	.500	.480	.500	.480	38.7	-.0	38.7	-.0	38.7	-.0	38.7	-.0
3	.672	.510	.672	.510	.546	.510	.546	.510	35.7	-.2	35.7	-.2	35.7	-.2	35.7	-.2
4	.685	.515	.685	.515	.555	.515	.555	.515	35.8	-1.0	35.8	-1.0	35.8	-1.0	35.8	-1.0
5	.688	.511	.688	.511	.556	.511	.556	.511	36.1	-.7	36.1	-.7	36.1	-.7	36.1	-.7
6	.692	.504	.692	.504	.549	.503	.549	.504	37.4	-1.4	37.4	-1.4	37.4	-1.4	37.4	-1.4
7	.703	.500	.703	.500	.545	.500	.546	.500	39.1	-1.3	39.1	-1.3	39.1	-1.3	39.1	-1.3
8	.729	.506	.729	.506	.545	.505	.547	.506	41.5	-.5	41.4	-.5	41.5	-.5	41.4	-.5
9	.760	.505	.760	.505	.540	.504	.542	.505	44.7	1.8	44.5	1.8	44.7	1.8	44.5	1.8
10	.777	.468	.777	.468	.502	.466	.505	.468	49.6	2.2	49.4	2.2	49.6	2.2	49.4	2.2
11	.779	.417	.779	.417	.458	.415	.461	.417	53.9	-3.5	53.7	-3.5	53.9	-3.5	53.7	-3.5

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.26	16.03	.986	347.1	347.1	1.000	12.66	13.91	1.36479	1.45378	323.1	333.3	.0	.0
2	16.58	16.28	.982	343.6	343.6	1.000	12.59	13.91	1.38113	1.47516	317.5	328.4	.0	.0
3	16.78	16.61	.990	339.0	339.0	1.000	12.40	13.91	1.38926	1.50401	310.9	322.2	.0	.0
4	16.81	16.60	.988	336.8	336.8	1.000	12.28	13.85	1.38969	1.50870	307.9	319.8	.0	.0
5	16.70	16.53	.990	335.1	335.1	1.000	12.17	13.83	1.38481	1.51309	306.1	318.5	.0	.0
6	16.55	16.39	.991	333.6	333.6	1.000	12.01	13.78	1.37497	1.51267	304.4	317.5	.0	.0
7	16.44	16.29	.991	332.7	332.7	1.000	11.82	13.73	1.36070	1.51026	302.7	316.8	.0	.0
8	16.57	16.36	.987	333.0	333.0	1.000	11.63	13.73	1.34675	1.51039	300.9	316.7	.0	.0
9	16.58	16.27	.981	333.6	333.6	1.000	11.30	13.66	1.31733	1.50006	299.0	317.4	.0	.0
10	16.45	15.79	.960	333.9	333.9	1.000	11.04	13.59	1.29158	1.48024	297.9	319.9	.0	.0
11	16.13	15.30	.949	334.5	334.5	1.000	10.80	13.57	1.26174	1.46290	298.3	323.2	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	6.7	.8	14.5	.501	.000	.065	.065	.000	.025	.025	.000	1.108
2	10.0	4.3	-1.7	12.1	.471	.000	.075	.075	.000	.028	.028	.000	1.065
3	20.0	1.3	-4.6	9.9	.436	.000	.038	.038	.000	.014	.014	.000	1.024
4	30.0	1.1	-4.8	8.4	.434	.000	.046	.046	.000	.016	.016	.000	1.023
5	40.0	.4	-5.3	8.2	.432	.000	.038	.038	.000	.012	.012	.000	1.008
6	50.0	.4	-5.3	7.3	.443	.000	.034	.034	.000	.010	.010	.000	1.013
7	60.0	.4	-5.1	7.5	.452	.000	.032	.032	.000	.009	.009	.000	1.033
8	70.0	.9	-4.6	8.4	.460	.000	.043	.043	.000	.011	.011	.000	1.087
9	80.0	1.6	-3.7	11.5	.477	.000	.059	.059	.000	.014	.014	.000	1.163
10	90.0	3.4	-1.8	13.9	.535	.000	.123	.123	.000	.027	.027	.000	1.255
11	95.0	5.8	.8	9.7	.616	.000	.155	.154	.001	.033	.033	.000	1.338

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(f) 100 Percent of design speed; reading 1437

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	161.3	168.6	1.045	161.3	168.6	1.045	152.8	2.8	-1.8	1.5	222.2	168.6	222.2	168.6
2	23.208	23.251	178.5	175.4	.982	178.6	175.4	.982	146.7	1.1	-1.1	1.8	231.1	175.4	231.1	175.4
3	22.032	22.121	192.6	182.9	.950	192.6	182.9	.950	141.2	.5	.8	2.6	238.8	182.9	238.8	182.9
4	20.948	20.983	193.4	183.1	.947	193.5	183.2	.947	143.8	-2.0	3.0	3.9	241.0	183.2	241.0	183.2
5	19.660	19.848	192.4	180.4	.938	192.5	180.5	.938	145.5	-1.8	5.3	5.4	241.3	180.5	241.3	180.5
6	18.461	18.712	189.1	176.7	.934	189.3	176.9	.934	149.6	-3.8	7.9	7.1	241.3	176.9	241.3	176.9
7	17.249	17.574	186.3	174.5	.936	186.6	174.7	.936	157.5	-3.8	10.6	9.0	244.2	174.8	244.2	174.8
8	16.020	16.431	185.8	175.2	.943	186.3	175.6	.942	169.6	-.6	13.6	10.9	251.9	175.6	251.9	175.6
9	14.778	15.291	183.1	172.7	.943	183.9	173.2	.942	186.8	7.1	16.7	12.4	262.1	173.3	262.1	173.3
10	13.520	14.158	169.4	159.6	.942	170.4	160.1	.939	206.1	7.5	18.4	12.1	267.5	160.3	267.5	160.3
11	12.883	13.594	154.0	144.7	.940	155.0	145.1	.936	220.6	-9.3	17.9	10.9	269.6	145.4	269.6	145.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.615	.460	.615	.460	.447	.460	.447	.460	43.5	1.0	43.5	1.0	43.5	1.0	43.5	1.0
2	.646	.482	.646	.482	.499	.482	.499	.482	39.4	.3	39.4	.3	39.4	.3	39.4	.3
3	.674	.507	.674	.507	.544	.507	.544	.507	36.3	.2	36.3	.2	36.3	.2	36.3	.2
4	.684	.510	.684	.510	.549	.510	.549	.510	36.6	-.6	36.6	-.6	36.6	-.6	36.6	-.6
5	.687	.504	.687	.504	.548	.503	.548	.504	37.1	-.6	37.1	-.6	37.1	-.6	37.1	-.6
6	.688	.494	.688	.494	.540	.493	.540	.494	38.3	-1.2	38.3	-1.2	38.3	-1.2	38.3	-1.2
7	.699	.489	.699	.489	.533	.488	.534	.489	40.2	-1.3	40.2	-1.3	40.2	-1.3	40.2	-1.3
8	.723	.491	.723	.491	.533	.490	.535	.491	42.4	-.2	42.3	-.2	42.4	-.2	42.3	-.2
9	.755	.484	.755	.484	.527	.482	.529	.483	45.6	2.4	45.5	2.4	45.6	2.4	45.5	2.4
10	.772	.446	.772	.446	.489	.444	.492	.445	50.6	2.7	50.4	2.7	50.6	2.7	50.4	2.7
11	.778	.403	.778	.403	.444	.401	.447	.402	55.1	-3.7	54.9	-3.7	55.1	-3.7	54.9	-3.7

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.58	16.35	.986	348.7	348.7	1.000	12.84	14.15	1.37990	1.47302	324.1	334.6	.0	.0
2	16.90	16.58	.981	345.3	345.3	1.000	12.77	14.14	1.39532	1.49321	318.7	330.0	.0	.0
3	17.07	16.86	.988	340.4	340.4	1.000	12.58	14.15	1.40529	1.52246	312.0	323.7	.0	.0
4	17.02	16.82	.988	337.9	337.9	1.000	12.44	14.09	1.40317	1.52788	309.0	321.2	.0	.0
5	16.91	16.72	.989	336.1	336.1	1.000	12.33	14.06	1.39932	1.53173	307.1	319.9	.0	.0
6	16.72	16.56	.991	334.7	334.7	1.000	12.18	14.02	1.38780	1.53046	305.7	319.1	.0	.0
7	16.59	16.45	.992	333.4	333.4	1.000	11.97	13.97	1.37286	1.52955	303.7	318.2	.0	.0
8	16.68	16.46	.987	333.6	333.6	1.000	11.77	13.96	1.35805	1.52841	302.0	318.3	.0	.0
9	16.68	16.32	.979	334.3	334.3	1.000	11.43	13.91	1.32728	1.51707	300.1	319.4	.0	.0
10	16.53	15.84	.958	334.4	334.4	1.000	11.15	13.82	1.29990	1.49678	298.8	321.7	.0	.0
11	16.25	15.43	.949	335.1	335.1	1.000	10.90	13.80	1.27008	1.48097	298.9	324.6	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	7.4	1.4	15.1	.500	.000	.060	.060	.000	.023	.023	.000	1.134
2	10.0	5.0	-1.0	12.4	.477	.000	.077	.077	.000	.029	.029	.000	1.089
3	20.0	1.9	-4.0	10.3	.443	.000	.046	.046	.000	.016	.016	.000	1.041
4	30.0	1.9	-4.0	8.7	.443	.000	.043	.043	.000	.015	.015	.000	1.041
5	40.0	1.4	-4.4	8.3	.445	.000	.042	.042	.000	.013	.013	.000	1.030
6	50.0	1.3	-4.4	7.4	.456	.000	.034	.034	.000	.010	.010	.000	1.029
7	60.0	1.6	-4.0	7.5	.468	.000	.030	.030	.000	.008	.008	.000	1.054
8	70.0	1.8	-3.6	8.8	.477	.000	.043	.043	.000	.011	.011	.000	1.101
9	80.0	2.5	-2.8	12.1	.501	.000	.068	.068	.000	.016	.016	.000	1.178
10	90.0	4.4	-.7	14.3	.562	.000	.129	.129	.000	.029	.029	.000	1.274
11	95.0	7.0	2.0	9.5	.637	.000	.154	.153	.001	.033	.032	.000	1.367

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(g) 100 Percent of design speed; reading 1461

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	159.6	169.8	1.064	159.6	169.8	1.064	162.1	5.6	-1.8	1.5	227.5	169.9	227.5	169.9
2	23.208	23.251	172.6	175.6	1.017	172.6	175.6	1.017	158.3	4.9	-1.0	1.8	234.2	175.7	234.2	175.7
3	22.032	22.121	183.9	179.8	.977	183.9	179.8	.977	152.0	4.3	.7	2.6	238.6	179.8	238.6	179.8
4	20.848	20.983	186.7	178.6	.957	186.8	178.7	.957	151.8	1.0	2.9	3.8	240.7	178.7	240.7	178.7
5	19.6[illegible]	19.848	187.8	175.3	.933	187.9	175.3	.933	151.2	-.5	5.2	5.3	241.1	175.3	241.1	175.3
6	18.461	18.712	184.7	169.8	.919	184.9	169.9	.919	155.5	-1.6	7.7	6.8	241.5	169.9	241.5	169.9
7	17.249	17.574	181.2	165.9	.916	181.5	166.2	.915	161.7	-.7	10.3	8.5	243.1	166.2	243.1	166.2
8	16.020	16.431	179.3	163.6	.913	179.7	163.9	.912	175.7	5.0	13.1	10.2	251.4	164.0	251.4	164.0
9	14.778	15.291	175.1	156.6	.894	175.8	157.0	.893	192.0	13.5	15.9	11.2	260.3	157.6	260.3	157.6
10	13.520	14.158	160.9	143.3	.891	161.9	143.7	.888	210.4	10.2	17.5	10.9	265.4	144.1	265.4	144.1
11	12.883	13.594	145.7	131.0	.899	146.7	131.4	.896	225.0	-8.9	16.9	9.9	268.6	131.7	268.6	131.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.628	.461	.628	.461	.441	.461	.441	.461	45.4	1.9	45.4	1.9	45.4	1.9	45.4	1.9
2	.651	.480	.651	.480	.480	.480	.480	.480	42.5	1.6	42.5	1.6	42.5	1.6	42.5	1.6
3	.670	.495	.670	.495	.516	.495	.516	.495	39.6	1.4	39.6	1.4	39.6	1.4	39.6	1.4
4	.680	.494	.680	.494	.527	.494	.527	.494	39.1	.3	39.1	.3	39.1	.3	39.1	.3
5	.684	.487	.684	.487	.533	.487	.533	.487	38.8	-.2	38.8	-.2	38.8	-.2	38.8	-.2
6	.687	.472	.687	.472	.525	.472	.526	.472	40.1	-.5	40.1	-.5	40.1	-.5	40.1	-.5
7	.694	.462	.694	.462	.517	.462	.518	.462	41.7	-.2	41.7	-.2	41.7	-.2	41.7	-.2
8	.719	.456	.719	.456	.513	.455	.514	.456	44.4	1.8	44.4	1.7	44.4	1.8	44.4	1.7
9	.748	.437	.748	.437	.503	.435	.505	.436	47.6	4.9	47.5	4.9	47.6	4.9	47.5	4.9
10	.764	.399	.764	.399	.463	.397	.466	.398	52.6	4.1	52.4	4.1	52.6	4.1	52.4	4.1
11	.773	.363	.773	.363	.420	.361	.422	.362	57.1	-3.9	56.9	-3.9	57.1	-3.9	56.9	-3.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	17.25	16.96	.983	351.9	351.9	1.000	13.22	14.66	1.41244	1.51296	326.1	337.5	.0	.0
2	17.47	17.16	.982	349.1	349.1	1.000	13.14	14.66	1.42300	1.53045	321.7	333.7	.0	.0
3	17.50	17.27	.987	344.1	344.1	1.000	12.95	14.61	1.42885	1.55143	315.7	328.0	.0	.0
4	17.42	17.23	.989	340.8	340.8	1.000	12.78	14.58	1.42764	1.56333	312.0	324.9	.0	.0
5	17.32	17.11	.988	338.2	338.2	1.000	12.66	14.55	1.42668	1.56967	309.2	322.8	.0	.0
6	17.09	16.89	.989	336.4	336.4	1.000	12.46	14.50	1.41233	1.56870	307.3	322.0	.0	.0
7	16.90	16.73	.990	335.0	335.0	1.000	12.25	14.45	1.39724	1.56662	305.6	321.2	.0	.0
8	16.96	16.68	.983	335.3	335.3	1.000	12.02	14.46	1.37811	1.56557	303.8	321.9	.0	.0
9	16.91	16.39	.970	335.5	335.5	1.000	11.67	14.37	1.34709	1.54953	301.7	323.1	.0	.0
10	16.67	15.99	.959	335.3	335.3	1.000	11.32	14.33	1.31411	1.53617	300.2	325.0	.0	.0
11	16.42	15.67	.955	336.0	336.0	1.000	11.05	14.31	1.28332	1.52288	300.1	327.4	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	9.3	3.3	15.9	.517	.000	.072	.072	.000	.028	.028	.000	1.199
2	10.0	8.0	2.1	13.6	.495	.000	.073	.073	.000	.027	.027	.000	1.167
3	20.0	5.1	-.8	11.4	.466	.000	.049	.049	.000	.017	.017	.000	1.107
4	30.0	4.3	-1.6	9.6	.468	.000	.040	.040	.000	.014	.014	.000	1.090
5	40.0	3.1	-2.7	8.7	.472	.000	.046	.046	.000	.015	.015	.000	1.063
6	50.0	2.9	-2.7	8.0	.490	.000	.042	.042	.000	.013	.013	.000	1.066
7	60.0	3.0	-2.6	8.5	.502	.000	.038	.038	.000	.011	.011	.000	1.080
8	70.0	3.8	-1.7	10.7	.522	.000	.057	.057	.000	.015	.015	.000	1.143
9	80.0	4.5	-.8	14.6	.557	.000	.098	.098	.000	.024	.024	.000	1.217
10	90.0	6.3	1.2	15.6	.620	.000	.127	.127	.000	.028	.028	.000	1.311
11	95.0	8.9	3.9	9.2	.690	.000	.138	.136	.003	.029	.029	.001	1.411

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(h) 90 Percent of design speed; reading 1310

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	152.7	151.8	.994	152.7	151.8	.994	122.9	6.8	-1.7	1.3	196.1	151.9	196.1	151.9
2	23.208	23.251	168.8	161.5	.957	168.8	161.5	.957	119.1	5.4	-1.0	1.7	206.6	161.6	206.6	161.6
3	22.032	22.121	180.2	170.2	.944	180.2	170.2	.944	114.9	2.1	.7	2.5	213.8	170.2	213.8	170.2
4	20.848	20.983	179.6	170.9	.951	179.8	170.9	.951	116.6	-4.0	2.8	3.6	214.3	171.0	214.3	171.0
5	19.660	19.848	178.1	170.2	.955	178.2	170.2	.955	120.9	-2.2	4.9	5.1	215.3	170.2	215.3	170.2
6	18.461	18.712	175.5	169.3	.964	175.7	169.4	.964	128.4	-3.3	7.3	6.8	217.6	169.5	217.6	169.5
7	17.249	17.574	174.0	170.5	.980	174.2	170.7	.980	138.0	-3.8	9.9	8.8	222.2	170.7	222.2	170.7
8	16.020	16.431	175.5	175.9	1.003	176.0	176.3	1.002	152.8	-1.6	12.8	11.0	233.1	176.3	233.1	176.3
9	14.778	15.291	175.6	182.4	1.039	176.3	182.9	1.037	170.1	4.1	16.0	13.1	245.0	183.0	245.0	183.0
10	13.520	14.158	165.6	176.1	1.064	166.5	176.6	1.060	189.1	3.1	18.0	13.4	252.0	176.6	252.0	176.6
11	12.883	13.594	155.3	157.9	1.017	156.3	158.4	1.013	200.3	-6.6	18.0	11.9	254.1	158.5	254.1	158.5

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.551	.422	.551	.422	.429	.421	.429	.421	38.8	2.6	38.8	2.6	38.8	2.6	38.8	2.6
2	.585	.452	.585	.452	.478	.451	.478	.451	35.2	1.9	35.2	1.9	35.2	1.9	35.2	1.9
3	.611	.480	.611	.480	.515	.480	.515	.480	32.5	.7	32.5	.7	32.5	.7	32.5	.7
4	.615	.484	.615	.484	.516	.484	.516	.484	33.0	-1.4	33.0	-1.4	33.0	-1.4	33.0	-1.4
5	.619	.482	.619	.482	.512	.482	.512	.482	34.2	-.8	34.1	-.8	34.2	-.8	34.1	-.8
6	.626	.480	.626	.480	.505	.480	.506	.480	36.2	-1.1	36.2	-1.1	36.2	-1.1	36.2	-1.1
7	.641	.484	.641	.484	.501	.483	.502	.484	38.4	-1.3	38.4	-1.3	38.4	-1.3	38.4	-1.3
8	.674	.500	.674	.500	.507	.499	.509	.500	41.1	-.5	41.0	-.5	41.1	-.5	41.0	-.5
9	.710	.519	.710	.519	.509	.518	.511	.519	44.1	1.3	44.0	1.3	44.1	1.3	44.0	1.3
10	.732	.500	.732	.500	.481	.498	.484	.500	48.8	1.0	48.6	1.0	48.8	1.0	48.6	1.0
11	.739	.446	.739	.446	.452	.445	.455	.446	52.2	-2.4	52.0	-2.4	52.2	-2.4	52.0	-2.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	14.70	14.53	.989	334.6	334.6	1.000	11.96	12.86	1.32122	1.38666	315.5	323.1	.0	.0
2	15.03	14.79	.984	331.7	331.7	1.000	11.92	12.86	1.33813	1.40608	310.4	318.7	.0	.0
3	15.15	15.01	.991	327.3	327.3	1.000	11.78	12.82	1.34752	1.42819	304.5	312.8	.0	.0
4	15.13	15.01	.992	325.1	325.1	1.000	11.72	12.79	1.35126	1.43468	302.2	310.5	.0	.0
5	15.08	14.97	.993	324.2	324.2	1.000	11.64	12.76	1.34706	1.43531	301.1	309.8	.0	.0
6	15.04	14.92	.992	324.0	324.0	1.000	11.55	12.74	1.33949	1.43321	300.4	309.7	.0	.0
7	15.02	14.90	.992	323.9	323.9	1.000	11.40	12.70	1.32667	1.42968	299.3	309.4	.0	.0
8	15.22	15.06	.989	324.8	324.8	1.000	11.23	12.69	1.31382	1.42948	297.8	309.3	.0	.0
9	15.39	15.18	.986	325.8	325.8	1.000	10.99	12.63	1.29453	1.42333	295.9	309.1	.0	.0
10	15.30	14.94	.977	326.1	326.1	1.000	10.71	12.60	1.26712	1.41309	294.4	310.6	.0	.0
11	15.11	14.41	.953	326.4	326.4	1.000	10.51	12.57	1.24513	1.39471	294.2	313.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.0	-2.9	17.0	.452	.000	.061	.061	.000	.023	.023	.000	.932
2	10.0	1.1	-4.9	14.3	.424	.000	.076	.076	.000	.029	.029	.000	.909
3	20.0	-1.5	-7.5	11.1	.391	.000	.041	.041	.000	.015	.015	.000	.871
4	30.0	-1.5	-7.4	8.3	.391	.000	.035	.035	.000	.012	.012	.000	.865
5	40.0	-1.3	-7.0	8.4	.391	.000	.032	.032	.000	.010	.010	.000	.871
6	50.0	-.6	-6.3	7.9	.401	.000	.036	.036	.000	.011	.011	.000	.896
7	60.0	.1	-5.5	7.8	.409	.000	.033	.033	.000	.009	.009	.000	.933
8	70.0	.8	-4.7	8.8	.414	.000	.041	.041	.000	.011	.011	.000	1.002
9	80.0	1.3	-4.0	11.3	.414	.000	.050	.050	.000	.012	.012	.000	1.080
10	90.0	2.9	-2.2	12.9	.459	.000	.078	.078	.000	.017	.017	.000	1.172
11	95.0	4.4	-.6	11.1	.544	.000	.154	.154	.000	.033	.033	.000	1.234

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(i) 90 Percent of design speed; reading 1321

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	155.7	150.6	.968	155.7	150.6	.968	127.3	10.8	-1.7	1.3	201.1	151.0	201.1	151.0
2	23.208	23.251	163.7	157.0	.959	163.7	157.0	.959	124.9	7.9	-1.0	1.6	205.9	157.2	205.9	157.2
3	22.032	22.121	168.1	162.1	.964	168.1	162.1	.964	124.8	4.9	.7	2.3	209.4	162.2	209.4	162.2
4	20.848	20.983	167.7	161.8	.965	167.7	161.9	.965	124.3	-2.8	2.6	3.4	208.7	161.9	208.7	161.9
5	19.660	19.848	166.8	159.9	.958	166.9	160.0	.958	127.7	-2.1	4.6	4.8	210.2	160.0	210.2	160.0
6	18.461	18.712	164.3	157.6	.959	164.4	157.7	.959	132.7	-2.8	6.8	6.4	211.3	157.7	211.3	157.7
7	17.249	17.574	162.1	158.3	.977	162.4	158.6	.976	143.9	-1.8	9.2	8.1	217.0	158.6	217.0	158.6
8	16.020	16.431	163.1	163.0	.999	163.6	163.4	.999	158.4	2.0	11.9	10.2	227.7	163.4	227.7	163.4
9	14.778	15.291	162.8	164.8	1.012	163.5	165.2	1.010	173.6	8.9	14.8	11.8	238.5	165.4	238.5	165.4
10	13.520	14.158	151.1	153.7	1.017	152.0	154.1	1.014	193.1	7.0	16.4	11.7	245.8	154.3	245.8	154.3
11	12.883	13.594	139.4	137.9	.989	140.3	138.3	.985	206.7	-5.0	16.2	10.4	249.9	138.3	249.9	138.3

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.562	.416	.562	.416	.435	.415	.435	.415	39.3	4.1	39.3	4.1	39.3	4.1	39.3	4.1
2	.579	.436	.579	.436	.460	.435	.460	.435	37.4	2.9	37.4	2.9	37.4	2.9	37.4	2.9
3	.594	.454	.594	.454	.477	.454	.477	.454	36.6	1.7	36.6	1.7	36.6	1.7	36.6	1.7
4	.595	.455	.595	.455	.478	.455	.478	.455	36.6	-1.0	36.6	-1.0	36.6	-1.0	36.6	-1.0
5	.601	.451	.601	.451	.477	.450	.477	.451	37.4	-.7	37.4	-.7	37.4	-.7	37.4	-.7
6	.605	.444	.605	.444	.470	.444	.471	.444	38.9	-1.0	38.9	-1.0	38.9	-1.0	38.9	-1.0
7	.622	.447	.622	.447	.465	.446	.466	.447	41.6	-.6	41.5	-.6	41.6	-.6	41.5	-.6
8	.655	.460	.655	.460	.469	.459	.470	.460	44.2	.7	44.1	.7	44.2	.7	44.1	.7
9	.688	.466	.688	.466	.470	.464	.472	.465	46.8	3.1	46.7	3.1	46.8	3.1	46.7	3.1
10	.711	.433	.711	.433	.437	.432	.440	.433	52.0	2.6	51.8	2.6	52.0	2.6	51.8	2.6
11	.723	.387	.723	.387	.404	.385	.406	.386	56.0	-2.1	55.8	-2.1	56.0	-2.1	55.8	-2.1

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.41	15.12	.982	338.6	338.6	1.000	12.43	13.42	1.36019	1.42892	318.4	327.2	.0	.0
2	15.55	15.29	.983	336.2	336.2	1.000	12.40	13.42	1.37095	1.44371	315.0	323.8	.0	.0
3	15.56	15.41	.990	330.8	330.8	1.000	12.26	13.38	1.38202	1.46700	309.0	317.7	.0	.0
4	15.50	15.39	.993	327.7	327.7	1.000	12.20	13.35	1.38889	1.47867	306.0	314.6	.0	.0
5	15.44	15.32	.992	326.3	326.3	1.000	12.09	13.33	1.38464	1.48093	304.3	313.5	.0	.0
6	15.34	15.23	.993	325.7	325.7	1.000	11.98	13.30	1.37525	1.47831	303.5	313.3	.0	.0
7	15.34	15.21	.992	325.9	325.9	1.000	11.81	13.26	1.36045	1.47424	302.5	313.4	.0	.0
8	15.49	15.34	.991	326.6	326.6	1.000	11.61	13.27	1.34489	1.47536	300.8	313.3	.0	.0
9	15.60	15.35	.984	326.9	326.9	1.000	11.36	13.23	1.32595	1.47095	298.5	313.2	.0	.0
10	15.45	14.98	.969	327.4	327.4	1.000	11.03	13.16	1.29257	1.45349	297.3	315.5	.0	.0
11	15.32	14.57	.951	328.0	328.0	1.000	10.81	13.14	1.26854	1.43782	296.9	318.5	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.5	-2.5	18.5	.471	.000	.096	.096	.000	.037	.037	.000	.960
2	10.0	3.2	-2.7	15.2	.450	.000	.084	.084	.000	.031	.031	.000	.942
3	20.0	2.5	-3.4	12.2	.429	.000	.046	.046	.000	.016	.016	.000	.929
4	30.0	2.1	-3.8	3.7	.429	.000	.032	.032	.000	.011	.011	.000	.910
5	40.0	2.0	-3.7	8.4	.435	.000	.035	.035	.000	.011	.011	.000	.913
6	50.0	2.1	-3.5	7.9	.444	.000	.034	.034	.000	.010	.010	.000	.922
7	60.0	3.2	-2.3	8.4	.456	.000	.036	.036	.000	.010	.010	.000	.973
8	70.0	3.9	-1.6	10.0	.459	.000	.037	.037	.000	.010	.010	.000	1.043
9	80.0	4.1	-1.2	13.1	.470	.000	.059	.059	.000	.014	.014	.000	1.111
10	90.0	6.0	.9	14.5	.536	.000	.108	.108	.000	.024	.024	.000	1.213
11	95.0	8.2	3.2	11.4	.621	.000	.165	.165	.000	.035	.035	.000	1.302

TABLE X. - *Continued.* BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(j) 90 Percent of design speed; reading 1332

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	148.9	152.6	1.025	148.9	152.7	1.025	137.4	11.3	-1.7	1.3	202.6	153.1	202.6	153.1
2	23.208	23.251	153.5	154.8	1.009	153.5	154.8	1.009	136.1	7.4	-.9	1.6	205.1	155.0	205.1	155.0
3	22.032	22.121	154.0	154.1	1.000	154.1	154.1	1.000	134.8	9.2	.6	2.2	204.7	154.4	204.7	154.4
4	20.848	20.983	151.5	150.0	.990	151.5	150.0	.990	132.8	-1.0	2.3	3.2	201.4	150.0	201.4	150.0
5	19.660	19.848	149.4	144.6	.968	149.4	144.7	.968	131.7	-2.3	4.1	4.3	199.2	144.7	199.2	144.7
6	18.461	18.712	148.1	141.8	.958	148.2	141.9	.958	137.0	-2.5	6.2	5.7	201.8	142.0	201.8	142.0
7	17.249	17.574	149.7	144.9	.968	149.9	145.1	.968	150.4	3.4	8.5	7.4	212.4	145.2	212.4	145.2
8	16.020	16.431	151.4	146.1	.965	151.8	146.4	.964	163.8	7.8	11.1	9.1	223.4	146.6	223.4	146.6
9	14.778	15.291	149.0	138.7	.931	149.6	139.1	.929	176.5	16.4	13.6	9.9	231.4	140.0	231.4	140.0
10	13.520	14.158	134.8	127.0	.942	135.6	127.4	.940	195.0	6.0	14.7	9.7	237.5	127.5	237.5	127.5
11	12.883	13.594	121.1	117.3	.969	121.9	117.6	.965	208.4	-14.3	14.0	8.8	241.4	118.5	241.4	118.5

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.561	.418	.561	.418	.412	.417	.413	.417	42.7	4.2	42.7	4.2	42.7	4.2	42.7	4.2
2	.571	.426	.571	.426	.427	.425	.427	.425	41.6	2.7	41.6	2.7	41.6	2.7	41.6	2.7
3	.575	.428	.575	.428	.433	.427	.433	.427	41.2	3.4	41.2	3.4	41.2	3.4	41.2	3.4
4	.570	.419	.570	.419	.429	.419	.429	.419	41.2	-.4	41.2	-.4	41.2	-.4	41.2	-.4
5	.566	.405	.566	.405	.424	.405	.425	.405	41.4	-.9	41.4	-.9	41.4	-.9	41.4	-.9
6	.574	.398	.574	.398	.421	.397	.422	.398	42.8	-1.0	42.8	-1.0	42.8	-1.0	42.8	-1.0
7	.606	.406	.606	.406	.427	.406	.428	.406	45.1	1.3	45.1	1.3	45.1	1.3	45.1	1.3
8	.639	.410	.639	.410	.433	.409	.435	.410	47.3	3.1	47.2	3.1	47.3	3.1	47.2	3.1
9	.665	.392	.665	.392	.428	.388	.430	.389	49.8	6.8	49.7	6.7	49.8	6.8	49.7	6.7
10	.684	.356	.684	.356	.388	.354	.391	.355	55.3	2.7	55.2	2.7	55.3	2.7	55.2	2.7
11	.696	.330	.696	.330	.349	.326	.351	.327	59.8	-7.0	59.7	-6.9	59.8	-7.0	59.7	-6.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.05	15.70	.978	344.7	344.7	1.000	12.96	13.92	1.39243	1.45632	324.3	333.1	.0	.0
2	16.12	15.77	.978	341.9	341.9	1.000	12.92	13.92	1.40229	1.47010	320.9	329.9	.0	.0
3	16.00	15.73	.984	335.6	335.6	1.000	12.78	13.87	1.41451	1.49262	314.8	323.8	.0	.0
4	15.81	15.63	.989	330.3	330.3	1.000	12.68	13.86	1.42449	1.51262	310.1	319.1	.0	.0
5	15.63	15.47	.990	328.0	328.0	1.000	12.58	13.82	1.42166	1.51637	308.2	317.5	.0	.0
6	15.52	15.36	.990	327.3	327.3	1.000	12.41	13.78	1.40821	1.51306	307.0	317.3	.0	.0
7	15.71	15.45	.983	328.0	328.0	1.000	12.26	13.79	1.39787	1.51296	305.5	317.5	.0	.0
8	15.80	15.50	.981	328.4	328.4	1.000	12.00	13.80	1.37753	1.51380	303.5	317.7	.0	.0
9	15.79	15.24	.965	327.8	327.8	1.000	11.73	13.71	1.35739	1.50190	301.1	318.0	.0	.0
10	15.55	14.95	.961	327.6	327.6	1.000	11.37	13.70	1.32206	1.49325	299.5	319.5	.0	.0
11	15.38	14.75	.959	328.2	328.2	1.000	11.13	13.68	1.29559	1.48330	299.2	321.3	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	6.9	.9	18.6	.483	.000	.112	.112	.000	.043	.043	.000	1.024
2	10.0	7.4	1.4	15.1	.479	.000	.108	.108	.000	.041	.041	.000	1.011
3	20.0	7.1	1.2	13.8	.464	.000	.082	.082	.000	.029	.029	.000	.990
4	30.0	6.7	.9	9.3	.479	.000	.057	.057	.000	.019	.019	.000	.962
5	40.0	6.0	.2	8.3	.487	.000	.051	.051	.000	.016	.016	.000	.936
6	50.0	6.0	.3	7.9	.502	.000	.050	.050	.000	.015	.015	.000	.950
7	60.0	6.8	1.2	10.4	.509	.000	.076	.076	.000	.021	.021	.000	1.020
8	70.0	6.9	1.5	12.3	.524	.000	.080	.080	.000	.021	.021	.000	1.085
9	80.0	7.1	1.8	16.7	.559	.000	.135	.135	.000	.032	.032	.000	1.140
10	90.0	9.4	4.3	14.6	.635	.000	.144	.144	.000	.032	.032	.000	1.247
11	95.0	12.0	7.0	6.5	.700	.000	.149	.149	.000	.031	.031	.000	1.346

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(k) 80 Percent of design speed; reading 1347

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.787	23.797	138.3	134.7	.974	138.3	134.7	.974	100.8	.1	-1.5	1.2	171.1	134.7	171.1	134.7
2	23.208	23.251	149.1	143.7	.964	149.1	143.7	.964	99.3	-2.8	-.9	1.5	179.2	143.8	179.2	143.8
3	22.032	22.121	158.3	150.8	.953	158.3	150.8	.953	94.8	-8.5	.6	2.2	184.5	151.1	184.5	151.1
4	20.848	20.983	159.4	152.0	.954	159.4	152.1	.954	95.2	-8.8	2.4	3.2	185.7	152.3	185.7	152.3
5	19.660	19.848	158.3	153.4	.969	158.4	153.5	.969	102.2	-5.5	4.4	4.6	188.5	153.6	188.5	153.6
6	18.461	18.712	156.1	154.2	.988	156.2	154.4	.988	110.4	-5.1	6.5	6.2	191.3	154.4	191.3	154.4
7	17.249	17.574	156.3	157.6	1.009	156.5	157.8	1.008	120.1	-4.5	8.9	8.1	197.3	157.9	197.3	157.9
8	16.020	16.431	159.6	165.2	1.035	160.0	165.5	1.035	135.2	-2.4	11.7	10.3	209.5	165.5	209.5	165.5
9	14.778	15.291	160.6	174.0	1.084	161.3	174.5	1.082	151.7	-1.1	14.6	12.5	221.4	174.5	221.4	174.5
10	13.520	14.158	152.4	170.9	1.121	153.3	171.4	1.117	170.0	-1.4	16.6	13.0	229.0	171.4	229.0	171.4
11	12.883	13.594	143.3	154.3	1.076	144.3	154.7	1.072	179.8	-8.8	16.6	11.6	230.6	154.9	230.6	154.9

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.487	.380	.487	.380	.393	.380	.393	.380	36.1	.1	36.1	.1	36.1	.1	36.1	.1
2	.513	.407	.513	.407	.427	.407	.427	.407	33.7	-1.1	33.7	-1.1	33.7	-1.1	33.7	-1.1
3	.532	.432	.532	.432	.456	.431	.456	.431	30.9	-3.2	30.9	-3.2	30.9	-3.2	30.9	-3.2
4	.536	.436	.536	.436	.461	.435	.461	.435	30.8	-3.3	30.8	-3.3	30.8	-3.3	30.8	-3.3
5	.545	.440	.545	.440	.458	.439	.458	.440	32.9	-2.0	32.8	-2.0	32.9	-2.0	32.8	-2.0
6	.553	.442	.553	.442	.452	.442	.452	.442	35.3	-1.9	35.3	-1.9	35.3	-1.9	35.3	-1.9
7	.572	.452	.572	.452	.453	.451	.454	.452	37.6	-1.6	37.5	-1.6	37.6	-1.6	37.5	-1.6
8	.608	.474	.608	.474	.463	.473	.464	.474	40.3	-.8	40.2	-.8	40.3	-.8	40.2	-.8
9	.645	.500	.645	.500	.468	.499	.470	.500	43.4	-.4	43.3	-.3	43.4	-.4	43.3	-.3
10	.668	.490	.668	.490	.445	.489	.447	.490	48.1	-.5	48.0	-.5	48.1	-.5	48.0	-.5
11	.673	.441	.673	.441	.418	.439	.421	.441	51.4	-3.3	51.3	-3.3	51.4	-3.3	51.3	-3.3

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	13.39	13.27	.991	322.3	322.3	1.000	11.39	12.02	1.28959	1.33645	307.7	313.3	.0	.0
2	13.60	13.47	.991	320.1	320.1	1.000	11.37	12.02	1.30258	1.35154	304.1	309.8	.0	.0
3	13.69	13.61	.994	316.2	316.2	1.000	11.29	11.98	1.31412	1.36845	299.3	304.9	.0	.0
4	13.70	13.61	.994	315.2	315.2	1.000	11.26	11.94	1.31633	1.37018	298.0	303.6	.0	.0
5	13.72	13.64	.994	315.0	315.0	1.000	11.21	11.94	1.31319	1.37198	297.3	303.2	.0	.0
6	13.72	13.62	.993	315.4	315.4	1.000	11.14	11.91	1.30576	1.36668	297.2	303.6	.0	.0
7	13.76	13.68	.994	315.6	315.6	1.000	11.02	11.89	1.29627	1.36606	296.2	303.2	.0	.0
8	14.00	13.86	.990	317.1	317.1	1.000	10.91	11.89	1.28694	1.36484	295.2	303.4	.0	.0
9	14.16	14.03	.991	317.8	317.8	1.000	10.70	11.83	1.27102	1.36145	293.4	302.6	.0	.0
10	14.15	13.93	.984	318.3	318.3	1.000	10.49	11.82	1.25087	1.35579	292.2	303.7	.0	.0
11	14.00	13.47	.962	318.5	318.5	1.000	10.33	11.78	1.23248	1.33884	292.1	306.6	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-.1	-6.1	14.0	.438	.000	.059	.059	.000	.023	.023	.000	.771
2	10.0	-.9	-6.9	10.8	.411	.000	.057	.057	.000	.022	.022	.000	.763
3	20.0	-3.6	-9.5	6.8	.380	.000	.032	.032	.000	.011	.011	.000	.721
4	30.0	-4.1	-9.9	5.9	.368	.000	.036	.036	.000	.012	.012	.000	.706
5	40.0	-3.0	-8.8	6.7	.367	.000	.031	.031	.000	.010	.010	.000	.734
6	50.0	-1.9	-7.6	6.6	.372	.000	.038	.038	.000	.011	.011	.000	.766
7	60.0	-1.3	-6.8	7.0	.376	.000	.029	.029	.000	.008	.008	.000	.808
8	70.0	-.5	-5.9	8.0	.379	.000	.044	.044	.000	.011	.011	.000	.879
9	80.0	.2	-5.1	9.2	.376	.000	.036	.036	.000	.009	.009	.000	.955
10	90.0	1.8	-3.4	11.0	.414	.000	.060	.060	.000	.013	.013	.000	1.043
11	95.0	3.2	-1.8	9.8	.497	.000	.144	.144	.000	.030	.030	.000	1.096

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(ℓ) 80 Percent of design speed; reading 1358

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	133.5	133.9	1.002	133.6	133.9	1.002	113.2	6.9	-1.5	1.2	175.1	134.1	175.1	134.1
2	23.208	23.251	139.6	138.0	.989	139.6	138.0	.989	111.7	3.4	-.8	1.4	178.8	138.0	178.8	138.0
3	22.032	22.121	144.9	141.3	.975	144.9	141.3	.975	106.9	-3.8	.6	2.0	180.1	141.4	180.1	141.4
4	20.848	20.983	144.7	139.1	.961	144.7	139.1	.961	104.6	-6.8	2.2	3.0	178.5	139.3	178.5	139.3
5	19.660	19.848	141.2	136.2	.964	141.2	136.2	.965	109.7	-3.9	3.9	4.1	178.8	136.3	178.8	136.3
6	18.461	18.712	139.3	136.0	.976	139.4	136.1	.976	117.2	-3.6	5.8	5.5	182.2	136.1	182.2	136.1
7	17.249	17.574	142.0	140.4	.989	142.2	140.6	.988	127.5	-.8	8.1	7.2	191.0	140.6	191.0	140.6
8	16.020	16.431	144.4	147.3	1.020	144.8	147.6	1.019	142.1	1.6	10.6	9.2	202.9	147.6	202.9	147.6
9	14.778	15.291	144.3	150.8	1.045	144.9	151.2	1.044	156.2	6.8	13.1	10.8	213.0	151.4	213.0	151.4
10	13.520	14.158	134.1	142.0	1.059	134.9	142.4	1.056	173.2	4.2	14.6	10.8	219.5	142.5	219.5	142.5
11	12.883	13.594	122.7	127.4	1.038	123.6	127.8	1.034	184.9	-5.4	14.2	9.6	222.4	127.9	222.4	127.9

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.494	.374	.494	.374	.377	.374	.377	.374	40.3	3.0	40.3	3.0	40.3	3.0	40.3	3.0
2	.507	.387	.507	.387	.396	.387	.396	.387	38.7	1.4	38.7	1.4	38.7	1.4	38.7	1.4
3	.515	.400	.515	.400	.415	.400	.415	.400	36.4	-1.6	36.4	-1.6	36.4	-1.6	36.4	-1.6
4	.512	.396	.512	.396	.415	.395	.415	.395	35.9	-2.8	35.9	-2.8	35.9	-2.8	35.9	-2.8
5	.514	.387	.514	.387	.405	.387	.406	.387	37.9	-1.6	37.9	-1.6	37.9	-1.6	37.9	-1.6
6	.524	.387	.524	.387	.401	.386	.401	.387	40.1	-1.5	40.1	-1.5	40.1	-1.5	40.1	-1.5
7	.551	.400	.551	.400	.409	.399	.410	.400	41.9	-.3	41.9	-.3	41.9	-.3	41.9	-.3
8	.586	.420	.586	.420	.417	.419	.418	.420	44.5	.6	44.5	.6	44.5	.6	44.5	.6
9	.617	.431	.617	.431	.418	.429	.420	.430	47.3	2.6	47.1	2.6	47.3	2.6	47.1	2.6
10	.637	.404	.637	.404	.389	.403	.392	.404	52.3	1.7	52.1	1.7	52.3	1.7	52.1	1.7
11	.646	.361	.646	.361	.356	.360	.359	.361	56.4	-2.4	56.3	-2.4	56.4	-2.4	56.3	-2.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	14.08	13.89	.987	327.9	327.9	1.000	11.92	12.61	1.32826	1.37754	312.6	318.9	.0	.0
2	14.17	13.98	.987	325.4	325.4	1.000	11.89	12.61	1.33967	1.39050	309.5	315.9	.0	.0
3	14.16	14.08	.994	320.3	320.3	1.000	11.82	12.61	1.35405	1.41527	304.1	310.3	.0	.0
4	14.07	13.99	.994	318.1	318.1	1.000	11.77	12.56	1.35644	1.41855	302.2	308.4	.0	.0
5	14.01	13.91	.993	317.5	317.5	1.000	11.70	12.55	1.35214	1.41819	301.5	308.2	.0	.0
6	13.97	13.87	.993	317.2	317.2	1.000	11.58	12.51	1.34213	1.41555	300.7	308.0	.0	.0
7	14.14	13.98	.989	317.5	317.5	1.000	11.50	12.52	1.33378	1.41758	299.3	307.7	.0	.0
8	14.26	14.12	.990	318.6	318.6	1.000	11.30	12.51	1.32038	1.41606	298.1	307.8	.0	.0
9	14.38	14.19	.987	318.8	318.8	1.000	11.12	12.49	1.30762	1.41556	296.2	307.4	.0	.0
10	14.25	13.92	.977	319.1	319.1	1.000	10.84	12.44	1.28008	1.40281	295.1	309.0	.0	.0
11	14.12	13.60	.963	319.5	319.5	1.000	10.66	12.42	1.25996	1.39003	294.9	311.4	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.1	-1.9	17.0	.467	.000	.087	.087	.000	.033	.033	.000	.853
2	10.0	4.1	-1.9	13.3	.455	.000	.082	.082	.000	.031	.031	.000	.840
3	20.0	1.9	-4.0	8.4	.433	.000	.037	.037	.000	.013	.013	.000	.795
4	30.0	.9	-4.9	6.4	.430	.000	.037	.037	.000	.012	.012	.000	.764
5	40.0	2.0	-3.8	7.1	.429	.000	.043	.043	.000	.014	.014	.000	.780
6	50.0	2.9	-2.8	7.0	.430	.000	.039	.039	.000	.012	.012	.000	.811
7	60.0	3.1	-2.4	8.3	.451	.000	.061	.061	.000	.017	.017	.000	.859
8	70.0	3.8	-1.6	9.4	.451	.000	.046	.046	.000	.012	.012	.000	.932
9	80.0	4.1	-1.2	12.1	.456	.000	.058	.058	.000	.014	.014	.000	.976
10	90.0	5.9	.8	13.2	.513	.000	.096	.096	.000	.021	.021	.000	1.055
11	95.0	8.2	3.2	10.6	.502	.000	.151	.151	.000	.032	.032	.000	1.163

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(m) 80 Percent of design speed; reading 1369

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.787	23.797	120.6	128.0	1.062	120.6	128.1	1.062	127.2	5.4	-1.3	1.1	175.3	128.2	175.3	128.2
2	23.208	23.251	118.6	125.5	1.058	118.6	125.5	1.058	124.6	.9	-.7	1.3	172.0	125.5	172.0	125.5
3	22.032	22.121	114.8	121.3	1.057	114.8	121.3	1.057	127.3	4.4	.5	1.8	171.4	121.4	171.4	121.4
4	20.848	20.983	115.5	119.8	1.037	115.5	119.8	1.037	124.9	.5	1.8	2.6	170.2	119.8	170.2	119.8
5	19.560	19.848	121.2	120.3	.992	121.2	120.3	.992	123.6	.9	3.4	3.6	173.1	120.3	173.1	120.3
6	18.461	18.712	128.2	122.6	.957	128.3	122.7	.957	127.1	-1.4	5.3	4.9	180.6	122.8	180.6	122.8
7	17.249	17.574	134.3	127.7	.951	134.5	127.9	.951	136.6	1.9	7.6	6.6	191.7	127.9	191.7	127.9
8	16.020	16.431	136.2	130.3	.956	136.6	130.6	.956	149.2	8.0	10.0	8.1	202.2	130.8	202.2	130.8
9	14.778	15.291	133.7	124.9	.934	134.3	125.2	.932	159.7	14.5	12.2	8.9	208.6	126.0	208.6	126.0
10	13.520	14.158	121.3	112.4	.927	122.0	112.7	.924	174.4	7.2	13.2	8.5	212.8	112.9	212.8	112.9
11	12.883	13.594	108.5	101.2	.933	109.2	101.5	.930	184.7	-10.1	12.6	7.6	214.5	102.0	214.5	102.0

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.491	.355	.491	.355	.338	.355	.338	.355	46.5	2.4	46.5	2.4	46.5	2.4	46.5	2.4
2	.483	.348	.483	.348	.333	.348	.333	.348	46.4	.4	46.4	.4	46.4	.4	46.4	.4
3	.484	.339	.484	.339	.324	.338	.324	.338	48.0	2.1	48.0	2.1	48.0	2.1	48.0	2.1
4	.483	.336	.483	.336	.328	.336	.328	.336	47.2	.2	47.2	.2	47.2	.2	47.2	.2
5	.494	.339	.494	.339	.346	.339	.346	.339	45.6	.4	45.6	.4	45.6	.4	45.6	.4
6	.517	.347	.517	.347	.367	.346	.367	.347	44.8	-.7	44.7	-.7	44.8	-.7	44.7	-.7
7	.551	.361	.551	.361	.386	.361	.386	.361	45.5	.9	45.5	.9	45.5	.9	45.5	.9
8	.583	.370	.583	.370	.393	.368	.394	.369	47.6	3.5	47.5	3.5	47.6	3.5	47.5	3.5
9	.603	.356	.603	.356	.387	.353	.388	.354	50.1	6.6	49.9	6.6	50.1	6.6	49.9	6.6
10	.616	.319	.616	.319	.351	.317	.353	.318	55.2	3.7	55.0	3.6	55.2	3.7	55.0	3.6
11	.621	.287	.621	.287	.314	.285	.316	.286	59.6	-5.7	59.4	-5.7	59.6	-5.7	59.4	-5.7

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	14.61	14.23	.974	332.7	332.7	1.000	12.39	13.04	1.35961	1.39984	317.4	324.5	.0	.0
2	14.49	14.18	.979	330.9	330.9	1.000	12.35	13.04	1.36134	1.40588	316.1	323.0	.0	.0
3	14.39	14.09	.979	327.3	327.3	1.000	12.27	13.01	1.36687	1.41718	312.6	319.9	.0	.0
4	14.25	14.06	.986	323.4	323.4	1.000	12.15	13.00	1.37036	1.43253	308.9	316.2	.0	.0
5	14.25	14.07	.987	321.0	321.0	1.000	12.06	12.99	1.37312	1.44282	306.0	313.8	.0	.0
6	14.29	14.10	.987	319.4	319.4	1.000	11.90	12.98	1.36822	1.44945	303.1	311.9	.0	.0
7	14.48	14.21	.981	319.7	319.7	1.000	11.78	12.98	1.36193	1.45159	301.4	311.5	.0	.0
8	14.55	14.27	.981	320.1	320.1	1.000	11.56	12.99	1.34377	1.45238	299.7	311.5	.0	.0
9	14.50	14.12	.974	319.5	319.5	1.000	11.34	12.94	1.32618	1.44635	297.8	311.6	.0	.0
10	14.28	13.85	.970	319.2	319.2	1.000	11.05	12.91	1.29803	1.43784	296.6	312.8	.0	.0
11	14.09	13.66	.970	319.5	319.5	1.000	10.86	12.90	1.27599	1.43043	296.5	314.3	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	10.3	4.4	16.4	.536	.000	.172	.172	.000	.066	.066	.000	.955
2	10.0	11.9	5.9	12.4	.540	.000	.146	.146	.000	.055	.055	.000	.930
3	20.0	13.4	7.5	12.1	.546	.000	.143	.143	.000	.051	.051	.000	.938
4	30.0	12.3	6.5	9.4	.542	.000	.093	.093	.000	.031	.031	.000	.908
5	40.0	9.7	4.0	9.2	.530	.000	.082	.082	.000	.026	.026	.000	.879
6	50.0	7.5	1.9	7.8	.532	.000	.079	.079	.000	.024	.024	.000	.883
7	60.0	6.7	1.1	9.5	.528	.000	.101	.101	.000	.028	.028	.000	.926
8	70.0	6.9	1.4	12.4	.533	.000	.092	.092	.000	.024	.024	.000	.987
9	80.0	6.9	1.6	16.2	.561	.000	.119	.119	.000	.028	.028	.000	1.030
10	90.0	8.8	3.7	15.1	.639	.000	.133	.133	.000	.029	.029	.000	1.111
11	95.0	11.4	6.3	7.3	.712	.000	.132	.132	.000	.028	.028	.000	1.186

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(n) 80 Percent of design speed; reading 1544

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	136.5	135.4	.992	136.5	135.4	.992	105.0	3.3	-1.5	1.2	172.2	135.4	172.2	135.4
2	23.208	23.251	147.1	141.5	.962	147.1	141.6	.962	103.4	-.4	-.9	1.5	179.8	141.6	179.8	141.6
3	22.032	22.121	154.2	147.1	.954	154.2	147.1	.954	99.2	-7.7	.6	2.1	183.4	147.3	183.4	147.3
4	20.848	20.983	153.5	147.3	.960	153.5	147.4	.960	99.4	-9.1	2.4	3.1	182.9	147.6	182.9	147.6
5	19.660	19.848	151.2	146.6	.970	151.2	146.6	.970	105.8	-5.9	4.2	4.4	184.6	146.7	184.6	146.7
6	18.461	18.712	149.0	146.4	.982	149.1	146.5	.982	113.0	-5.7	6.2	5.9	187.1	146.6	187.1	146.6
7	17.249	17.574	150.3	150.1	.999	150.6	150.3	.998	123.1	-4.3	8.5	7.7	194.5	150.4	194.5	150.4
8	16.020	16.431	153.2	158.0	1.031	153.6	158.3	1.030	139.1	-1.4	11.2	9.9	207.3	158.3	207.3	158.3
9	14.778	15.291	153.1	164.7	1.076	153.8	165.2	1.074	154.1	1.4	13.9	11.8	217.7	165.2	217.7	165.2
10	13.520	14.158	144.1	158.7	1.101	144.9	159.1	1.098	172.2	-.0	15.7	12.1	225.0	159.1	225.0	159.1
11	12.883	13.594	134.9	142.4	1.056	135.8	142.8	1.052	183.4	-8.6	15.7	10.7	228.2	143.1	228.2	143.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.488	.380	.488	.380	.387	.380	.387	.380	37.6	1.4	37.6	1.4	37.6	1.4	37.6	1.4
2	.513	.400	.513	.400	.419	.400	.419	.400	35.1	-.2	35.1	-.2	35.1	-.2	35.1	-.2
3	.527	.419	.527	.419	.443	.419	.443	.419	32.8	-3.0	32.8	-3.0	32.8	-3.0	32.8	-3.0
4	.527	.421	.527	.421	.442	.420	.442	.420	32.9	-3.5	32.9	-3.5	32.9	-3.5	32.9	-3.5
5	.532	.419	.532	.419	.436	.418	.436	.418	35.0	-2.3	35.0	-2.3	35.0	-2.3	35.0	-2.3
6	.540	.418	.540	.418	.430	.418	.430	.418	37.2	-2.2	37.1	-2.2	37.2	-2.2	37.1	-2.2
7	.562	.429	.562	.429	.435	.428	.435	.429	39.3	-1.7	39.3	-1.7	39.3	-1.7	39.3	-1.7
8	.600	.452	.600	.452	.444	.451	.445	.452	42.2	-.5	42.2	-.5	42.2	-.5	42.2	-.5
9	.632	.472	.632	.472	.445	.471	.447	.472	45.2	.5	45.1	.5	45.2	.5	45.1	.5
10	.655	.454	.655	.454	.419	.452	.422	.454	50.1	-.0	49.9	-.0	50.1	-.0	49.9	-.0
11	.665	.406	.665	.406	.393	.404	.396	.405	53.7	-3.5	53.5	-3.4	53.7	-3.5	53.5	-3.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	13.68	13.56	.991	324.6	324.6	1.000	11.63	12.27	1.30725	1.35527	309.9	315.5	.0	.0
2	13.88	13.70	.987	322.1	322.1	1.000	11.60	12.27	1.32111	1.36980	306.0	312.1	.0	.0
3	13.91	13.82	.994	317.9	317.9	1.000	11.51	12.25	1.33143	1.38964	301.1	307.0	.0	.0
4	13.87	13.80	.996	316.5	316.5	1.000	11.48	12.22	1.33363	1.39272	299.8	305.6	.0	.0
5	13.85	13.76	.994	316.5	316.5	1.000	11.42	12.20	1.32827	1.39026	299.5	305.7	.0	.0
6	13.82	13.73	.994	316.1	316.1	1.000	11.33	12.18	1.32166	1.38871	298.7	305.4	.0	.0
7	13.91	13.80	.991	316.6	316.6	1.000	11.23	12.15	1.31377	1.38697	297.7	305.3	.0	.0
8	14.13	13.99	.990	317.9	317.9	1.000	11.08	12.16	1.30165	1.38737	296.5	305.4	.0	.0
9	14.24	14.11	.991	318.5	318.5	1.000	10.88	12.11	1.28536	1.38408	294.9	304.9	.0	.0
10	14.18	13.92	.982	318.9	318.9	1.000	10.63	12.09	1.26125	1.37527	293.7	306.3	.0	.0
11	14.08	13.52	.960	319.3	319.3	1.000	10.47	12.07	1.24293	1.35995	293.4	309.1	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	1.6	-4.4	15.6	.440	.000	.059	.059	.000	.023	.023	.000	.801
2	10.0	.7	-5.2	12.0	.429	.000	.080	.080	.000	.030	.030	.000	.792
3	20.0	-1.5	-7.5	7.2	.404	.000	.035	.035	.000	.012	.012	.000	.752
4	30.0	-1.8	-7.6	5.9	.392	.000	.026	.026	.000	.009	.009	.000	.736
5	40.0	-.6	-6.4	6.7	.397	.000	.033	.033	.000	.011	.011	.000	.760
6	50.0	.2	-5.5	6.5	.405	.000	.034	.034	.000	.010	.010	.000	.787
7	60.0	.7	-4.8	7.2	.409	.000	.044	.044	.000	.012	.012	.000	.832
8	70.0	1.7	-3.7	8.5	.411	.000	.047	.047	.000	.012	.012	.000	.912
9	80.0	2.2	-3.1	10.3	.408	.000	.040	.040	.000	.010	.010	.000	.980
10	90.0	3.9	-1.2	11.7	.459	.000	.073	.073	.000	.016	.016	.000	1.071
11	95.0	5.6	.6	9.8	.547	.000	.155	.155	.000	.033	.033	.000	1.137

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(o) 80 Percent of design speed; reading 1555

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	129.2	134.6	1.042	129.2	134.6	1.042	119.2	6.0	-1.4	1.2	175.8	134.8	175.8	134.8
2	23.208	23.251	132.9	134.8	1.014	132.9	134.8	1.014	116.2	1.7	-.8	1.4	176.5	134.8	176.5	134.8
3	22.032	22.121	135.8	134.6	.991	135.8	134.6	.991	113.4	-2.2	.5	1.9	176.9	134.6	176.9	134.6
4	20.948	20.983	135.1	131.6	.973	135.2	131.6	.974	110.6	-7.2	2.1	2.8	174.7	131.8	174.7	131.8
5	19.660	19.848	133.9	129.2	.965	133.9	129.3	.965	114.6	-4.8	3.7	3.9	176.3	129.4	176.3	129.4
6	18.461	18.712	135.6	130.9	.965	135.7	131.0	.965	121.9	-4.1	5.6	5.3	182.4	131.0	182.4	131.0
7	17.249	17.574	138.8	136.2	.981	139.0	136.4	.981	133.5	-.6	7.9	7.0	192.8	136.4	192.8	136.4
8	16.020	16.431	140.9	141.7	1.005	141.3	141.9	1.004	147.2	2.6	10.3	8.8	204.0	142.0	204.0	142.0
9	14.778	15.291	140.0	139.7	.998	140.5	140.0	.996	158.8	9.2	12.7	10.0	212.0	140.3	212.0	140.3
10	13.520	14.158	129.1	128.6	.996	129.8	128.9	.993	175.6	6.3	14.0	9.8	218.4	129.1	218.4	129.1
11	12.883	13.594	118.8	120.7	1.016	119.6	121.1	1.012	187.7	-6.4	13.8	9.1	222.6	121.3	222.6	121.3

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.494	.375	.494	.375	.363	.375	.363	.375	42.7	2.5	42.7	2.5	42.7	2.5	42.7	2.5
2	.498	.377	.498	.377	.375	.377	.375	.377	41.2	.7	41.2	.7	41.2	.7	41.2	.7
3	.504	.379	.504	.379	.387	.379	.387	.379	39.9	-.9	39.9	-.9	39.9	-.9	39.9	-.9
4	.499	.373	.499	.373	.386	.372	.386	.372	39.3	-3.1	39.3	-3.1	39.3	-3.1	39.3	-3.1
5	.505	.366	.505	.366	.383	.366	.384	.366	40.6	-2.1	40.6	-2.1	40.6	-2.1	40.6	-2.1
6	.524	.371	.524	.371	.389	.371	.390	.371	42.0	-1.8	41.9	-1.8	42.0	-1.8	41.9	-1.8
7	.555	.386	.555	.386	.399	.386	.400	.386	43.9	-.3	43.8	-.3	43.9	-.3	43.8	-.3
8	.589	.402	.589	.402	.407	.401	.408	.402	46.2	1.1	46.2	1.1	46.2	1.1	46.2	1.1
9	.613	.398	.613	.398	.405	.396	.407	.397	48.6	3.8	48.5	3.7	48.6	3.8	48.5	3.7
10	.633	.365	.633	.365	.374	.363	.376	.364	53.7	2.8	53.5	2.8	53.7	2.8	53.5	2.8
11	.646	.342	.646	.342	.345	.341	.347	.341	57.7	-3.1	57.5	-3.0	57.7	-3.1	57.5	-3.0

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	14.33	14.14	.987	330.5	330.5	1.000	12.13	12.83	1.34073	1.39044	315.1	321.5	.0	.0
2	14.33	14.14	.987	327.7	327.7	1.000	12.10	12.82	1.34986	1.40215	312.2	318.7	.0	.0
3	14.29	14.18	.992	322.8	322.8	1.000	12.01	12.84	1.36263	1.42539	307.2	313.8	.0	.0
4	14.18	14.07	.993	319.7	319.7	1.000	11.96	12.79	1.36814	1.43228	304.5	311.0	.0	.0
5	14.11	14.02	.993	318.8	318.8	1.000	11.86	12.78	1.3616[illegible]	1.43365	303.4	310.5	.0	.0
6	14.18	14.03	.989	318.6	318.6	1.000	11.76	12.76	1.35686	1.43347	302.0	310.0	.0	.0
7	14.33	14.15	.987	319.2	319.2	1.000	11.62	12.76	1.34706	1.43453	300.7	309.9	.0	.0
8	14.45	14.26	.987	319.8	319.8	1.000	11.43	12.76	1.33164	1.43487	299.0	309.8	.0	.0
9	14.47	14.21	.982	319.6	319.6	1.000	11.22	12.74	1.31532	1.43277	297.2	309.8	.0	.0
10	14.31	13.87	.969	319.7	319.7	1.000	10.93	12.65	1.28628	1.41515	295.9	311.4	.0	.0
11	14.22	13.69	.963	320.2	320.2	1.000	10.74	12.63	1.26635	1.40601	295.5	312.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	6.7	.7	16.7	.481	.000	.087	.087	.000	.033	.033	.000	.898
2	10.0	6.8	.8	12.9	.479	.000	.084	.084	.000	.032	.032	.000	.872
3	20.0	5.6	-.4	9.3	.471	.000	.049	.049	.000	.017	.017	.000	.840
4	30.0	4.6	-1.3	6.3	.472	.000	.046	.046	.000	.016	.016	.000	.806
5	40.0	4.9	-.8	6.8	.481	.000	.041	.041	.000	.013	.013	.000	.817
6	50.0	4.9	-.7	6.9	.487	.000	.062	.062	.000	.018	.018	.000	.848
7	60.0	5.3	-.3	8.6	.486	.000	.067	.067	.000	.019	.019	.000	.906
8	70.0	5.7	.3	10.1	.487	.000	.062	.062	.000	.016	.016	.000	.974
9	80.0	5.6	.3	13.5	.505	.000	.080	.080	.000	.019	.019	.000	1.022
10	90.0	7.5	2.4	14.5	.577	.000	.132	.132	.000	.029	.029	.000	1.113
11	95.0	9.7	4.6	10.2	.636	.000	.152	.152	.000	.032	.032	.000	1.195

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(p) 70 Percent of design speed; reading 1475

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	118.1	116.9	.990	118.1	116.9	.990	82.8	-5.3	-1.3	1.0	144.3	117.0	144.3	117.0
2	23.208	23.251	130.5	127.2	.975	130.5	127.2	.975	81.8	-5.9	-.8	1.3	154.0	127.4	154.0	127.4
3	22.032	22.121	139.3	135.0	.969	139.3	135.0	.969	78.7	-10.6	.6	2.0	160.0	135.4	160.0	135.4
4	20.848	20.983	139.8	136.5	.977	139.8	136.6	.977	80.9	-10.4	2.1	2.9	161.5	137.0	161.5	137.0
5	19.660	19.848	140.2	139.0	.991	140.3	139.1	.991	86.0	-8.4	3.9	4.2	164.5	139.3	164.5	139.3
6	18.461	18.712	141.5	142.3	1.005	141.7	142.4	1.005	93.2	-7.3	5.9	5.7	169.6	142.6	169.6	142.6
7	17.249	17.574	144.6	147.2	1.018	144.8	147.3	1.018	101.6	-7.2	8.2	7.6	176.9	147.5	176.9	147.5
8	16.020	16.431	147.6	153.7	1.041	148.0	154.0	1.040	114.7	-6.1	10.8	9.6	187.3	154.1	187.3	154.1
9	14.778	15.291	148.4	162.6	1.095	149.1	163.0	1.094	130.3	-5.6	13.5	11.7	198.0	163.1	198.0	163.1
10	13.520	14.158	141.7	162.3	1.145	142.6	162.7	1.141	147.7	-6.2	15.4	12.3	205.3	162.8	205.3	162.8
11	12.883	13.594	133.1	147.3	1.106	134.0	147.7	1.102	157.5	-12.2	15.4	11.1	206.8	148.2	206.8	148.2

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.414	.334	.414	.334	.339	.334	.339	.334	35.0	-2.6	35.0	-2.6	35.0	-2.6	35.0	-2.6
2	.444	.365	.444	.365	.376	.365	.376	.365	32.1	-2.7	32.1	-2.7	32.1	-2.7	32.1	-2.7
3	.464	.390	.464	.390	.404	.389	.404	.389	29.5	-4.5	29.5	-4.5	29.5	-4.5	29.5	-4.5
4	.469	.395	.469	.395	.406	.394	.406	.394	30.1	-4.4	30.0	-4.4	30.1	-4.4	30.0	-4.4
5	.478	.402	.478	.402	.408	.401	.408	.402	31.5	-3.5	31.5	-3.5	31.5	-3.5	31.5	-3.5
6	.493	.412	.493	.412	.412	.411	.412	.411	33.4	-3.0	33.3	-3.0	33.4	-3.0	33.3	-3.0
7	.515	.426	.515	.426	.421	.425	.422	.426	35.1	-2.8	35.0	-2.8	35.1	-2.8	35.0	-2.8
8	.546	.445	.546	.445	.431	.444	.432	.445	37.8	-2.3	37.8	-2.3	37.8	-2.3	37.8	-2.3
9	.579	.472	.579	.472	.434	.470	.436	.471	41.3	-2.0	41.2	-2.0	41.3	-2.0	41.2	-2.0
10	.601	.470	.601	.470	.415	.469	.417	.470	46.2	-2.2	46.0	-2.2	46.2	-2.2	46.0	-2.2
11	.605	.426	.605	.426	.390	.424	.392	.425	49.8	-4.7	49.6	-4.7	49.8	-4.7	49.6	-4.7

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	12.32	12.25	.994	312.3	312.3	1.000	10.95	11.34	1.26336	1.29336	301.9	305.5	.0	.0
2	12.52	12.44	.993	310.8	310.8	1.000	10.94	11.34	1.27432	1.30535	299.0	302.7	.0	.0
3	12.59	12.54	.995	308.5	308.5	1.000	10.86	11.28	1.27997	1.31345	295.7	299.3	.0	.0
4	12.61	12.56	.996	307.9	307.9	1.000	10.85	11.27	1.28148	1.31558	294.9	298.6	.0	.0
5	12.64	12.58	.995	307.9	307.9	1.000	10.81	11.26	1.27901	1.31477	294.4	298.2	.0	.0
6	12.71	12.64	.995	308.3	308.3	1.000	10.76	11.25	1.27519	1.31463	294.0	298.1	.0	.0
7	12.80	12.73	.994	308.7	308.7	1.000	10.68	11.23	1.26990	1.31377	293.1	297.8	.0	.0
8	12.98	12.87	.991	309.6	309.6	1.000	10.59	11.23	1.26326	1.31366	292.2	297.8	.0	.0
9	13.11	13.00	.992	310.7	310.7	1.000	10.45	11.16	1.25011	1.30768	291.1	297.4	.0	.0
10	13.16	13.02	.990	311.2	311.2	1.000	10.31	11.19	1.23716	1.30797	290.2	298.0	.0	.0
11	13.05	12.64	.968	311.5	311.5	1.000	10.19	11.15	1.22300	1.29255	290.2	300.6	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-1.1	-7.0	11.5	.423	.000	.051	.051	.000	.019	.019	.000	.643
2	10.0	-2.4	-8.4	9.4	.386	.000	.054	.054	.000	.020	.020	.000	.638
3	20.0	-4.9	-10.9	5.6	.352	.000	.033	.033	.000	.012	.012	.000	.607
4	30.0	-4.8	-10.6	5.0	.342	.000	.031	.031	.000	.011	.011	.000	.606
5	40.0	-4.2	-10.0	5.4	.335	.000	.031	.031	.000	.010	.010	.000	.623
6	50.0	-3.8	-9.4	5.7	.335	.000	.032	.032	.000	.009	.009	.000	.651
7	60.0	-3.6	-9.2	5.9	.337	.000	.037	.037	.000	.010	.010	.000	.685
8	70.0	-2.8	-8.2	6.7	.344	.000	.047	.047	.000	.012	.012	.000	.746
9	80.0	-1.8	-7.1	7.7	.340	.000	.040	.040	.000	.010	.010	.000	.818
10	90.0	-.1	-5.2	9.4	.370	.000	.048	.048	.000	.011	.011	.000	.901
11	95.0	1.7	-3.4	8.4	.453	.000	.145	.145	.000	.031	.031	.000	.954

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(q) 70 Percent of design speed; reading 1486

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	105.5	114.4	1.085	105.5	114.4	1.085	103.4	2.4	-1.2	1.0	147.7	114.4	147.7	114.4
2	23.208	23.251	110.8	116.2	1.049	110.8	116.2	1.049	102.0	-.2	-.7	1.2	150.6	116.2	150.6	116.2
3	22.032	22.121	117.2	118.3	1.009	117.2	118.3	1.009	96.5	-4.5	.5	1.7	151.8	118.4	151.8	118.4
4	20.848	20.983	121.0	119.4	.987	121.0	119.4	.987	95.5	-7.2	1.9	2.5	154.2	119.6	154.2	119.6
5	19.660	19.848	123.8	120.5	.973	123.9	120.5	.973	98.6	-3.7	3.4	3.6	158.3	120.6	158.3	120.6
6	18.461	18.712	125.8	121.0	.962	125.9	121.1	.962	101.8	-4.8	5.2	4.9	161.9	121.2	161.9	121.2
7	17.249	17.574	128.1	124.7	.973	128.3	124.8	.973	111.2	-3.5	7.3	6.4	169.8	124.9	169.8	124.9
8	16.020	16.431	130.8	131.8	1.007	131.2	132.0	1.007	124.2	-.6	9.6	8.2	180.7	132.0	180.7	132.0
9	14.778	15.291	130.7	135.8	1.040	131.2	136.2	1.038	137.4	3.5	11.9	9.7	190.0	136.2	190.0	136.2
10	13.520	14.158	122.2	128.0	1.048	122.9	128.4	1.045	152.1	1.0	13.3	9.7	195.6	128.4	195.6	128.4
11	12.883	13.594	114.1	115.4	1.011	114.9	115.7	1.008	162.3	-7.3	13.2	8.7	198.8	115.9	198.8	115.9

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.421	.324	.421	.324	.300	.323	.300	.323	44.4	1.2	44.4	1.2	44.4	1.2	44.4	1.2
2	.430	.330	.430	.330	.317	.330	.317	.330	42.6	-.1	42.6	-.1	42.6	-.1	42.6	-.1
3	.436	.337	.436	.337	.336	.337	.336	.337	39.5	-2.2	39.5	-2.2	39.5	-2.2	39.5	-2.2
4	.444	.342	.444	.342	.349	.341	.349	.341	38.3	-3.4	38.3	-3.4	38.3	-3.4	38.3	-3.4
5	.457	.345	.457	.345	.357	.345	.358	.345	38.5	-1.8	38.5	-1.8	38.5	-1.8	38.5	-1.8
6	.468	.347	.468	.347	.364	.347	.364	.347	39.0	-2.3	39.0	-2.3	39.0	-2.3	39.0	-2.3
7	.492	.358	.492	.358	.371	.357	.372	.358	40.9	-1.6	40.9	-1.6	40.9	-1.6	40.9	-1.6
8	.524	.378	.524	.378	.380	.378	.381	.378	43.5	-.3	43.4	-.3	43.5	-.3	43.4	-.3
9	.553	.391	.553	.391	.380	.389	.382	.390	46.4	1.5	46.3	1.5	46.4	1.5	46.3	1.5
10	.570	.367	.570	.367	.356	.366	.358	.367	51.2	.5	51.1	.5	51.2	.5	51.1	.5
11	.579	.331	.579	.331	.333	.329	.335	.330	54.9	-3.6	54.7	-3.6	54.9	-3.6	54.7	-3.6

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	12.93	12.82	.991	317.7	317.7	1.000	11.45	11.93	1.30025	1.33502	306.9	311.2	.0	.0
2	12.98	12.85	.990	316.2	316.2	1.000	11.43	11.92	1.30583	1.34225	304.9	309.5	.0	.0
3	12.95	12.89	.995	313.3	313.3	1.000	11.37	11.91	1.31200	1.35498	301.8	306.3	.0	.0
4	12.96	12.89	.995	311.5	311.5	1.000	11.32	11.89	1.31562	1.36064	299.7	304.4	.0	.0
5	12.99	12.92	.994	311.0	311.0	1.000	11.26	11.89	1.31375	1.36429	298.5	303.7	.0	.0
6	12.99	12.89	.992	310.5	310.5	1.000	11.18	11.86	1.30956	1.36324	297.4	303.1	.0	.0
7	13.08	12.96	.990	310.7	310.7	1.000	11.09	11.86	1.30342	1.36390	296.4	303.0	.0	.0
8	13.22	13.09	.990	311.6	311.6	1.000	10.96	11.86	1.29300	1.36389	295.3	302.9	.0	.0
9	13.30	13.16	.989	311.9	311.9	1.000	10.81	11.85	1.28131	1.36395	293.9	302.6	.0	.0
10	13.21	12.96	.981	312.1	312.1	1.000	10.60	11.81	1.25979	1.35364	293.1	303.9	.0	.0
11	13.14	12.72	.968	312.5	312.5	1.000	10.46	11.79	1.24522	1.34364	292.8	305.8	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	8.3	2.4	15.4	.487	.000	.076	.076	.000	.029	.029	.000	.789
2	10.0	8.2	2.2	12.0	.482	.000	.080	.080	.000	.030	.030	.000	.773
3	20.0	5.1	-.8	8.0	.457	.000	.039	.039	.000	.014	.014	.000	.720
4	30.0	3.5	-2.4	5.9	.448	.000	.041	.041	.000	.014	.014	.000	.701
5	40.0	2.8	-2.9	7.1	.443	.000	.043	.043	.000	.014	.014	.000	.707
6	50.0	1.9	-3.8	6.4	.448	.000	.054	.054	.000	.016	.016	.000	.710
7	60.0	2.3	-3.3	7.2	.452	.000	.062	.062	.000	.017	.017	.000	.754
8	70.0	2.9	-2.5	8.7	.447	.000	.057	.057	.000	.015	.015	.000	.819
9	80.0	3.4	-1.9	11.2	.450	.000	.056	.056	.000	.014	.014	.000	.879
10	90.0	5.0	-.1	12.1	.511	.000	.094	.094	.000	.021	.021	.000	.953
11	95.0	6.8	1.8	9.5	.593	.000	.156	.156	.000	.033	.033	.000	1.015

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(r) 70 Percent of design speed; reading 1497

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	86.5	107.1	1.238	86.5	107.1	1.238	120.4	-4.9	-1.0	.9	148.2	107.2	148.2	107.2
2	23.208	23.251	91.6	107.1	1.169	91.6	107.1	1.169	117.8	-7.0	-.5	1.1	149.2	107.3	149.2	107.3
3	22.032	22.121	97.3	105.3	1.082	97.3	105.3	1.082	114.1	3.8	.4	1.5	150.0	105.4	150.0	105.4
4	20.848	20.983	104.6	106.3	1.016	104.6	106.3	1.016	109.0	1.9	1.6	2.3	151.0	106.3	151.0	106.3
5	19.660	19.848	113.2	108.2	.956	113.2	108.3	.956	106.5	.3	3.1	3.2	155.4	108.3	155.4	108.3
6	18.461	18.712	119.1	109.3	.918	119.2	109.4	.918	108.3	-4.0	4.9	4.4	161.0	109.5	161.0	109.5
7	17.249	17.574	122.1	114.4	.936	122.3	114.5	.936	117.8	-2.0	6.9	5.9	169.8	114.5	169.8	114.5
8	16.020	16.431	123.9	120.3	.971	124.2	120.6	.970	130.0	2.0	9.1	7.5	179.8	120.6	179.8	120.6
9	14.778	15.291	123.6	118.0	.955	124.1	118.3	.953	140.1	6.7	11.2	8.5	187.1	118.5	187.1	118.5
10	13.520	14.158	114.0	106.7	.936	114.7	107.0	.933	152.2	3.8	12.4	8.1	190.6	107.1	190.6	107.1
11	12.883	13.594	102.9	100.3	.975	103.6	100.6	.971	162.5	-8.0	11.9	7.5	192.7	100.9	192.7	100.9

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.419	.301	.419	.301	.244	.300	.244	.300	54.3	-2.6	54.3	-2.6	54.3	-2.6	54.3	-2.6
2	.423	.302	.423	.302	.260	.301	.260	.301	52.1	-3.8	52.1	-3.8	52.1	-3.8	52.1	-3.8
3	.427	.298	.427	.298	.277	.297	.277	.297	49.5	2.0	49.5	2.0	49.5	2.0	49.5	2.0
4	.432	.302	.432	.302	.299	.301	.299	.301	46.2	1.0	46.2	1.0	46.2	1.0	46.2	1.0
5	.447	.308	.447	.308	.325	.308	.326	.308	43.2	.2	43.2	.2	43.2	.2	43.2	.2
6	.465	.312	.465	.312	.343	.312	.344	.312	42.3	-2.1	42.3	-2.1	42.3	-2.1	42.3	-2.1
7	.491	.327	.491	.327	.353	.326	.354	.327	44.0	-1.0	43.9	-1.0	44.0	-1.0	43.9	-1.0
8	.521	.344	.521	.344	.359	.343	.360	.344	46.4	.9	46.3	.9	46.4	.9	46.3	.9
9	.544	.338	.544	.338	.359	.337	.360	.338	48.6	3.3	48.5	3.2	48.6	3.3	48.5	3.2
10	.554	.305	.554	.305	.332	.304	.334	.305	53.2	2.1	53.0	2.1	53.2	2.1	53.0	2.1
11	.560	.287	.560	.287	.299	.285	.301	.286	57.7	-4.5	57.5	-4.5	57.7	-4.5	57.5	-4.5

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	13.29	13.01	.979	322.3	322.3	1.000	11.78	12.22	1.31843	1.34535	311.3	316.5	.0	.0
2	13.28	13.02	.980	320.6	320.6	1.000	11.74	12.22	1.32182	1.35226	309.5	314.9	.0	.0
3	13.19	12.96	.983	317.8	317.8	1.000	11.63	12.18	1.32132	1.35920	306.6	312.3	.0	.0
4	13.15	12.98	.987	315.1	315.1	1.000	11.57	12.19	1.32654	1.37238	303.7	309.5	.0	.0
5	13.16	13.02	.989	312.9	312.9	1.000	11.47	12.19	1.32850	1.38307	300.9	307.1	.0	.0
6	13.21	13.01	.985	311.8	311.8	1.000	11.39	12.16	1.32762	1.38512	298.9	305.8	.0	.0
7	13.29	13.10	.986	312.2	312.2	1.000	11.27	12.17	1.31340	1.38712	297.8	305.6	.0	.0
8	13.40	13.21	.986	312.6	312.6	1.000	11.13	12.17	1.30326	1.38876	296.5	305.4	.0	.0
9	13.39	13.17	.983	312.3	312.3	1.000	10.95	12.16	1.29405	1.38798	294.9	305.3	.0	.0
10	13.25	12.90	.973	312.1	312.1	1.000	10.75	12.09	1.27414	1.37463	294.0	306.4	.0	.0
11	13.13	12.79	.974	312.6	312.6	1.000	10.61	12.08	1.25717	1.36830	294.1	307.5	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	18.5	12.5	11.8	.601	.000	.185	.185	.000	.071	.071	.000	.943
2	10.0	18.0	12.0	8.6	.594	.000	.172	.172	.000	.064	.064	.000	.910
3	20.0	15.4	9.5	12.5	.559	.000	.147	.147	.000	.052	.052	.000	.860
4	30.0	11.7	5.8	10.6	.534	.000	.105	.105	.000	.035	.035	.000	.803
5	40.0	7.8	2.0	9.3	.520	.000	.082	.082	.000	.026	.026	.000	.767
6	50.0	5.5	-.2	6.8	.527	.000	.108	.108	.000	.032	.032	.000	.760
7	60.0	5.6	.0	8.0	.522	.000	.092	.092	.000	.026	.026	.000	.807
8	70.0	6.1	.6	10.2	.513	.000	.081	.081	.000	.021	.021	.000	.868
9	80.0	5.8	.5	13.2	.536	.000	.092	.092	.000	.022	.022	.000	.909
10	90.0	7.2	2.1	14.0	.607	.000	.142	.142	.000	.031	.031	.000	.969
11	95.0	9.8	4.8	8.9	.659	.000	.137	.137	.000	.029	.029	.000	1.040

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(s) 60 Percent of design speed; reading 1510

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	81.7	82.6	1.011	81.7	82.6	1.011	59.1	-2.7	-.9	.7	100.8	82.7	100.8	82.7
2	23.208	23.251	90.7	90.0	.992	90.8	90.0	.992	57.7	-3.9	-.5	.9	107.5	90.1	107.5	90.1
3	22.032	22.121	97.5	95.7	.981	97.5	95.7	.981	54.9	-6.4	.4	1.4	111.9	95.9	111.9	95.9
4	20.848	20.983	97.4	97.1	.997	97.4	97.2	.997	57.4	-5.1	1.5	2.1	113.1	97.3	113.1	97.3
5	19.660	19.848	98.4	99.8	1.014	98.4	99.8	1.014	61.6	-3.7	2.7	3.0	116.1	99.9	116.1	99.9
6	18.461	18.712	100.3	102.7	1.024	100.4	102.8	1.024	65.9	-3.0	4.2	4.1	120.1	102.8	120.1	102.8
7	17.249	17.574	102.4	106.1	1.036	102.6	106.3	1.036	71.7	-3.0	5.8	5.5	125.1	106.3	125.1	106.3
8	16.020	16.431	105.6	111.2	1.053	105.9	111.4	1.052	81.3	-2.2	7.7	6.9	133.5	111.4	133.5	111.4
9	14.778	15.291	107.1	118.1	1.102	107.5	118.4	1.101	93.0	-2.0	9.7	8.5	142.2	118.4	142.2	118.4
10	13.520	14.158	101.5	118.0	1.162	102.1	118.3	1.159	106.6	-3.8	11.0	9.0	147.6	118.4	147.6	118.4
11	12.883	13.594	94.4	107.9	1.143	95.0	108.2	1.138	115.5	-7.8	11.0	8.1	149.6	108.4	149.6	108.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.292	.239	.292	.239	.237	.239	.237	.239	35.9	-1.9	35.9	-1.9	35.9	-1.9	35.9	-1.9
2	.313	.261	.313	.261	.264	.261	.264	.261	32.4	-2.5	32.4	-2.5	32.4	-2.5	32.4	-2.5
3	.327	.279	.327	.279	.285	.278	.285	.278	29.4	-3.8	29.4	-3.8	29.4	-3.8	29.4	-3.8
4	.330	.283	.330	.283	.284	.283	.285	.283	30.5	-3.0	30.5	-3.0	30.5	-3.0	30.5	-3.0
5	.339	.291	.339	.291	.288	.291	.288	.291	32.0	-2.1	32.0	-2.1	32.0	-2.1	32.0	-2.1
6	.351	.300	.351	.300	.293	.299	.294	.300	33.3	-1.7	33.3	-1.7	33.3	-1.7	33.3	-1.7
7	.366	.310	.366	.310	.300	.309	.300	.310	35.0	-1.6	35.0	-1.6	35.0	-1.6	35.0	-1.6
8	.391	.325	.391	.325	.309	.324	.310	.325	37.6	-1.1	37.5	-1.1	37.6	-1.1	37.5	-1.1
9	.417	.345	.417	.345	.314	.344	.315	.345	41.0	-1.0	40.8	-1.0	41.0	-1.0	40.8	-1.0
10	.433	.345	.433	.345	.298	.344	.300	.345	46.4	-1.8	46.2	-1.8	46.4	-1.8	46.2	-1.8
11	.439	.315	.439	.315	.277	.313	.279	.314	50.8	-4.1	50.6	-4.1	50.8	-4.1	50.6	-4.1

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	11.16	11.13	.997	300.6	300.6	1.000	10.52	10.69	1.23994	1.25345	295.5	297.2	.0	.0
2	11.25	11.21	.997	299.6	299.6	1.000	10.51	10.69	1.24641	1.26044	293.8	295.5	.0	.0
3	11.29	11.26	.997	298.3	298.3	1.000	10.49	10.66	1.25082	1.26479	292.1	293.7	.0	.0
4	11.29	11.27	.998	298.0	298.0	1.000	10.47	10.66	1.25103	1.26612	291.6	293.2	.0	.0
5	11.32	11.29	.998	297.9	297.9	1.000	10.45	10.65	1.25059	1.26639	291.2	293.0	.0	.0
6	11.36	11.34	.997	297.9	297.9	1.000	10.43	10.65	1.25022	1.26770	290.8	292.7	.0	.0
7	11.39	11.37	.998	298.2	298.2	1.000	10.39	10.63	1.24583	1.26612	290.4	292.6	.0	.0
8	11.50	11.45	.995	298.7	298.7	1.000	10.35	10.64	1.24371	1.26695	289.9	292.6	.0	.0
9	11.58	11.52	.995	299.3	299.3	1.000	10.27	10.61	1.23730	1.26418	289.3	292.3	.0	.0
10	11.60	11.54	.995	299.9	299.9	1.000	10.20	10.63	1.22900	1.26419	289.0	292.9	.0	.0
11	11.56	11.36	.983	300.3	300.3	1.000	10.13	10.61	1.22060	1.25499	289.2	294.5	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-.3	-6.2	12.2	.415	.000	.054	.054	.000	.021	.021	.000	.462
2	10.0	-2.1	-8.0	9.5	.376	.000	.051	.051	.000	.019	.019	.000	.453
3	20.0	-5.0	-10.9	6.3	.338	.000	.043	.043	.000	.015	.015	.000	.426
4	30.0	-4.3	-10.2	6.3	.326	.000	.029	.029	.000	.010	.010	.000	.432
5	40.0	-3.7	-9.5	6.7	.318	.000	.030	.030	.000	.010	.010	.000	.448
6	50.0	-3.8	-9.5	6.9	.315	.000	.031	.031	.000	.009	.009	.000	.463
7	60.0	-3.7	-9.3	7.1	.316	.000	.028	.028	.000	.008	.008	.000	.485
8	70.0	-3.1	-8.5	7.8	.326	.000	.045	.045	.000	.012	.012	.000	.530
9	80.0	-2.2	-7.5	8.7	.326	.000	.044	.044	.000	.011	.011	.000	.584
10	90.0	.1	-5.0	9.8	.361	.000	.042	.042	.000	.009	.009	.000	.653
11	95.0	2.6	-2.4	9.0	.446	.000	.140	.140	.000	.030	.030	.000	.706

TABLE X. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(t) 60 Percent of design speed; reading 1521

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.787	23.797	73.7	80.1	1.086	73.7	80.1	1.086	72.8	4.1	-.8	.7	103.7	80.2	103.7	80.2
2	23.208	23.251	75.6	81.7	1.080	75.6	81.7	1.080	72.8	1.6	-.4	.8	105.0	81.7	105.0	81.7
3	22.032	22.121	82.3	85.0	1.033	82.3	85.0	1.033	69.1	-2.0	.3	1.2	107.5	85.0	107.5	85.0
4	20.848	20.983	86.0	86.4	1.004	86.1	86.4	1.005	67.9	-3.3	1.3	1.8	109.6	86.5	109.6	86.5
5	19.660	19.848	86.8	86.7	.998	86.9	86.7	.998	69.9	-1.2	2.4	2.6	111.5	86.7	111.5	86.7
6	18.461	18.712	88.8	87.9	.990	88.9	88.0	.990	72.9	-1.6	3.7	3.5	115.0	88.0	115.0	88.0
7	17.249	17.574	92.1	91.6	.995	92.3	91.8	.994	79.6	-.7	5.2	4.7	121.8	91.8	121.8	91.8
8	16.020	16.431	95.5	97.2	1.018	95.7	97.4	1.017	88.8	1.2	7.0	6.1	130.6	97.4	130.6	97.4
9	14.778	15.291	95.7	101.4	1.059	96.1	101.6	1.058	98.7	3.2	8.7	7.3	137.8	101.7	137.8	101.7
10	13.520	14.158	87.8	95.9	1.093	88.3	96.2	1.089	112.0	.2	9.6	7.3	142.6	96.2	142.6	96.2
11	12.883	13.594	81.0	84.1	1.038	81.5	84.3	1.034	118.8	-4.9	9.4	6.3	144.1	84.4	144.1	84.4

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.300	.231	.300	.231	.213	.231	.213	.231	44.7	3.0	44.7	3.0	44.7	3.0	44.7	3.0
2	.304	.236	.304	.236	.219	.235	.219	.235	43.9	1.1	43.9	1.1	43.9	1.1	43.9	1.1
3	.312	.246	.312	.246	.239	.246	.239	.246	40.0	-1.4	40.0	-1.4	40.0	-1.4	40.0	-1.4
4	.319	.251	.319	.251	.250	.250	.250	.251	38.3	-2.2	38.3	-2.2	38.3	-2.2	38.3	-2.2
5	.325	.252	.325	.252	.253	.251	.253	.252	38.8	-.8	38.8	-.8	38.8	-.8	38.8	-.8
6	.335	.255	.335	.255	.259	.255	.259	.255	39.4	-1.0	39.4	-1.0	39.4	-1.0	39.4	-1.0
7	.356	.266	.356	.266	.269	.266	.269	.266	40.8	-.4	40.8	-.4	40.8	-.4	40.8	-.4
8	.381	.283	.381	.283	.279	.282	.280	.283	42.9	.7	42.8	.7	42.9	.7	42.8	.7
9	.403	.295	.403	.295	.280	.294	.281	.295	45.9	1.8	45.8	1.8	45.9	1.8	45.8	1.8
10	.417	.279	.417	.279	.257	.278	.258	.279	51.9	.1	51.7	.1	51.9	.1	51.7	.1
11	.422	.244	.422	.244	.237	.243	.239	.244	55.7	-3.4	55.5	-3.4	55.7	-3.4	55.5	-3.4

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	11.45	11.39	.995	303.1	303.1	1.000	10.76	10.98	1.25879	1.27542	297.8	299.9	.0	.0
2	11.46	11.41	.996	302.5	302.5	1.000	10.75	10.98	1.26042	1.27826	297.0	299.2	.0	.0
3	11.49	11.45	.997	300.9	300.9	1.000	10.74	10.98	1.26773	1.28657	295.2	297.3	.0	.0
4	11.49	11.46	.997	299.9	299.9	1.000	10.70	10.97	1.26898	1.29025	293.9	296.1	.0	.0
5	11.49	11.46	.997	299.5	299.5	1.000	10.68	10.96	1.26808	1.29118	293.3	295.8	.0	.0
6	11.50	11.46	.997	299.3	299.3	1.000	10.64	10.95	1.26574	1.29148	292.7	295.5	.0	.0
7	11.56	11.51	.995	299.5	299.5	1.000	10.60	10.95	1.26379	1.29207	292.1	295.3	.0	.0
8	11.64	11.57	.995	300.0	300.0	1.000	10.52	10.95	1.25788	1.29216	291.5	295.2	.0	.0
9	11.70	11.63	.994	300.3	300.3	1.000	10.46	10.94	1.25301	1.29193	290.8	295.1	.0	.0
10	11.65	11.55	.991	300.7	300.7	1.000	10.33	10.94	1.23913	1.28745	290.6	296.1	.0	.0
11	11.60	11.40	.983	300.8	300.8	1.000	10.26	10.93	1.23076	1.28157	290.5	297.2	.0	.0

RP	PERCENT	INCIDENCE			D		LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS
	SPAN	MEAN	SS	DEVIA	FACTOR	EFFIC	TOT	PROF	SHOCK	TOT	PROF	SHOCK	MACH NO
1	5.0	8.5	2.6	17.0	.481	.000	.080	.080	.000	.031	.031	.000	.564
2	10.0	9.4	3.5	13.2	.476	.000	.066	.066	.000	.025	.025	.000	.560
3	20.0	5.6	-.3	8.7	.444	.000	.052	.052	.000	.018	.018	.000	.521
4	30.0	3.5	-2.4	7.2	.429	.000	.037	.037	.000	.012	.012	.000	.503
5	40.0	3.1	-2.7	8.1	.424	.000	.038	.038	.000	.012	.012	.000	.505
6	50.0	2.3	-3.4	7.6	.427	.000	.040	.040	.000	.012	.012	.000	.512
7	60.0	2.1	-3.4	8.3	.430	.000	.061	.061	.000	.017	.017	.000	.543
8	70.0	2.3	-3.2	9.6	.427	.000	.054	.054	.000	.014	.014	.000	.587
9	80.0	2.8	-2.5	11.5	.426	.000	.057	.057	.000	.014	.014	.000	.632
10	90.0	5.6	.5	11.7	.495	.000	.077	.077	.000	.017	.017	.000	.707
11	95.0	7.6	2.6	9.7	.592	.000	.149	.149	.000	.031	.031	.000	.750

TABLE X. - Concluded. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR FIRST-STAGE STATOR

(u) 60 Percent of design speed; reading 1533

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.787	23.797	63.3	76.7	1.212	63.3	76.7	1.212	85.5	1.8	-.7	.7	106.4	76.8	106.4	76.8
2	23.208	23.251	64.2	76.7	1.195	64.2	76.8	1.195	85.5	-.5	-.4	.8	107.0	76.8	107.0	76.8
3	22.032	22.121	65.7	75.2	1.144	65.7	75.2	1.144	83.2	4.1	.3	1.1	106.0	75.3	106.0	75.3
4	20.848	20.983	71.0	75.3	1.060	71.0	75.3	1.060	79.5	1.5	1.1	1.6	106.6	75.3	106.6	75.3
5	19.660	19.848	77.8	76.3	.981	77.8	76.4	.981	76.6	1.0	2.2	2.3	109.2	76.4	109.2	76.4
6	18.461	18.712	82.8	77.8	.940	82.8	77.8	.940	77.8	-.5	3.4	3.1	113.7	77.8	113.7	77.8
7	17.249	17.574	87.2	82.0	.941	87.3	82.2	.941	84.3	.9	5.0	4.2	121.4	82.2	121.4	82.2
8	16.020	16.431	89.9	87.2	.971	90.1	87.4	.970	93.2	3.6	6.6	5.4	129.6	87.5	129.6	87.5
9	14.778	15.291	88.4	86.5	.979	88.8	86.7	.977	101.1	6.8	8.0	6.2	134.5	87.0	134.5	87.0
10	13.520	14.158	80.3	78.0	.971	80.8	78.2	.968	111.4	3.3	8.7	5.9	137.6	78.3	137.6	78.3
11	12.883	13.594	73.1	72.7	.995	73.6	73.0	.991	118.9	-2.5	8.5	5.5	139.9	73.0	139.9	73.0

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.306	.220	.306	.220	.182	.220	.182	.220	53.5	1.4	53.5	1.4	53.5	1.4	53.5	1.4
2	.308	.220	.308	.220	.185	.220	.185	.220	53.1	-.4	53.1	-.4	53.1	-.4	53.1	-.4
3	.306	.217	.306	.217	.190	.216	.190	.216	51.7	3.1	51.7	3.1	51.7	3.1	51.7	3.1
4	.309	.217	.309	.217	.206	.217	.206	.217	48.2	1.2	48.2	1.2	48.2	1.2	48.2	1.2
5	.317	.221	.317	.221	.226	.221	.226	.221	44.6	.8	44.6	.8	44.6	.8	44.6	.8
6	.331	.225	.331	.225	.241	.225	.241	.225	43.2	-.4	43.2	-.4	43.2	-.4	43.2	-.4
7	.354	.238	.354	.238	.254	.238	.255	.238	44.0	.6	44.0	.6	44.0	.6	44.0	.6
8	.378	.253	.378	.253	.262	.253	.263	.253	46.0	2.4	46.0	2.3	46.0	2.4	46.0	2.3
9	.393	.252	.393	.252	.258	.250	.259	.251	48.8	4.5	48.7	4.5	48.8	4.5	48.7	4.5
10	.402	.226	.402	.226	.235	.225	.236	.226	54.2	2.5	54.0	2.5	54.2	2.5	54.0	2.5
11	.409	.211	.409	.211	.214	.210	.215	.211	58.4	-2.0	58.2	-2.0	58.4	-2.0	58.2	-2.0

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	11.68	11.54	.987	305.8	305.8	1.000	10.95	11.15	1.27070	1.28318	300.1	302.8	.0	.0
2	11.67	11.54	.988	304.9	304.9	1.000	10.93	11.15	1.27230	1.28655	299.2	302.0	.0	.0
3	11.61	11.50	.991	303.6	303.6	1.000	10.88	11.13	1.27174	1.28948	298.0	300.8	.0	.0
4	11.58	11.51	.994	301.9	301.9	1.000	10.84	11.14	1.27466	1.29722	296.2	299.1	.0	.0
5	11.58	11.52	.994	300.7	300.7	1.000	10.80	11.13	1.27689	1.30240	294.7	297.7	.0	.0
6	11.59	11.52	.994	300.1	300.1	1.000	10.75	11.12	1.27469	1.30412	293.7	297.1	.0	.0
7	11.66	11.57	.992	300.2	300.2	1.000	10.70	11.12	1.27265	1.30550	292.9	296.8	.0	.0
8	11.73	11.63	.992	300.6	300.6	1.000	10.62	11.13	1.26670	1.30621	292.2	296.8	.0	.0
9	11.72	11.63	.992	300.5	300.5	1.000	10.54	11.13	1.25936	1.30637	291.5	296.7	.0	.0
10	11.65	11.49	.986	300.6	300.6	1.000	10.42	11.09	1.24690	1.29833	291.2	297.5	.0	.0
11	11.61	11.43	.985	300.7	300.7	1.000	10.35	11.08	1.23876	1.29524	291.0	298.1	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	17.3	11.4	15.5	.580	.000	.199	.199	.000	.076	.076	.000	.676
2	10.0	18.6	12.7	11.7	.584	.000	.184	.184	.000	.069	.069	.000	.671
3	20.0	17.3	11.4	13.2	.555	.000	.147	.147	.000	.052	.052	.000	.637
4	30.0	13.4	7.6	10.5	.540	.000	.097	.097	.000	.033	.033	.000	.593
5	40.0	8.8	3.1	9.6	.520	.000	.086	.086	.000	.027	.027	.000	.555
6	50.0	6.1	.4	8.2	.520	.000	.083	.083	.000	.025	.025	.000	.549
7	60.0	5.3	-.2	9.4	.514	.000	.098	.098	.000	.028	.028	.000	.579
8	70.0	5.4	-.0	11.3	.503	.000	.084	.084	.000	.022	.022	.000	.622
9	80.0	5.7	.4	14.1	.519	.000	.078	.078	.000	.019	.019	.000	.656
10	90.0	7.9	2.8	14.0	.601	.000	.129	.129	.000	.029	.029	.000	.713
11	95.0	10.3	5.3	11.1	.658	.000	.142	.142	.000	.030	.030	.000	.766

TABLE XI. - BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(a) 100 Percent of design speed; reading 1283

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	181.3	171.8	.948	182.6	172.5	.944	6.1	136.3	-22.1	-15.5	182.7	219.8	431.4	307.8
2	23.050	22.766	191.3	167.8	.877	192.2	168.2	.875	4.5	142.8	-19.3	-12.3	192.3	220.7	429.2	293.6
3	22.001	21.814	203.2	166.2	.818	203.6	166.4	.817	5.3	147.5	-13.1	-7.6	203.7	222.4	418.2	275.7
4	20.958	20.856	205.4	169.4	.825	205.5	169.4	.824	2.9	141.6	-6.7	-3.4	205.5	220.8	406.0	269.5
5	19.916	19.909	200.9	170.1	.847	200.9	170.1	.847	2.9	143.2	-.7	.7	200.9	222.3	388.5	256.6
6	18.877	18.969	192.7	169.3	.879	192.7	169.4	.879	-.6	146.6	4.7	4.9	192.7	224.0	372.3	242.0
7	17.831	18.039	186.4	166.9	.895	186.7	167.1	.895	-.2	152.4	9.9	9.0	186.7	226.2	353.8	225.5
8	16.769	17.122	181.9	160.1	.880	182.6	160.7	.880	4.7	166.2	15.2	13.1	182.6	231.1	332.4	201.9
9	15.684	16.231	169.3	149.6	.884	170.5	150.5	.883	13.5	191.5	19.8	16.7	171.0	243.6	303.1	171.4
10	14.559	15.367	145.1	154.8	1.067	146.8	156.4	1.066	9.5	205.8	22.1	22.4	147.1	258.5	277.7	165.2
11	13.967	14.945	128.1	172.7	1.348	130.0	175.0	1.346	-11.1	193.1	21.9	28.1	130.5	260.6	278.5	184.5

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.499	.565	1.177	.791	.495	.441	.498	.443	1.9	38.4	1.9	38.3	65.1	56.0	65.0	55.9
2	.529	.568	1.161	.756	.526	.432	.529	.433	1.3	40.4	1.3	40.3	63.5	55.1	63.4	55.0
3	.567	.578	1.164	.716	.565	.432	.567	.432	1.5	41.6	1.5	41.6	60.9	52.9	60.9	52.9
4	.574	.578	1.134	.705	.574	.443	.574	.443	.8	39.9	.8	39.9	59.6	51.1	59.6	51.1
5	.562	.585	1.087	.675	.562	.447	.562	.447	.8	40.1	.8	40.1	58.9	48.5	58.9	48.5
6	.539	.591	1.042	.638	.539	.447	.539	.447	-.2	40.9	-.2	40.9	58.8	45.6	58.8	45.6
7	.522	.598	.990	.597	.522	.442	.522	.442	-.1	42.4	-.1	42.4	58.2	42.2	58.2	42.2
8	.510	.612	.929	.535	.509	.424	.510	.426	1.5	46.1	1.5	46.0	56.8	37.4	56.7	37.3
9	.477	.646	.845	.455	.472	.397	.475	.399	4.6	52.0	4.5	51.8	56.0	28.7	55.8	28.5
10	.408	.688	.770	.439	.402	.412	.407	.416	3.7	53.0	3.7	52.8	58.4	18.9	58.1	18.7
11	.360	.693	.769	.490	.354	.459	.359	.465	-4.9	48.2	-4.9	47.8	62.5	18.7	62.2	18.5

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.68	25.48	1.527	350.9	401.4	1.144	14.08	20.52	1.46701	1.89442	334.3	377.4	396.9	391.1
2	16.88	25.59	1.516	347.2	399.8	1.152	13.95	20.56	1.47826	1.90690	328.8	375.6	388.2	383.4
3	17.14	25.65	1.496	341.9	393.8	1.152	13.79	20.46	1.49492	1.93086	321.3	369.2	370.6	367.4
4	17.14	25.70	1.499	339.7	388.1	1.142	13.71	20.50	1.49832	1.96294	318.7	363.9	353.0	351.3
5	17.01	25.58	1.504	337.9	384.6	1.138	13.73	20.29	1.50461	1.96348	317.8	360.1	335.4	335.3
6	16.77	25.51	1.521	336.2	382.9	1.139	13.76	20.14	1.50904	1.96030	317.7	358.0	317.9	319.5
7	16.63	25.34	1.523	335.1	381.2	1.137	13.81	19.89	1.51395	1.94813	317.8	355.8	300.3	303.8
8	16.64	25.14	1.511	335.1	381.4	1.138	13.93	19.53	1.52368	1.91701	318.5	354.6	282.4	288.4
9	16.44	25.26	1.537	335.0	383.4	1.145	14.07	19.08	1.52976	1.87826	320.4	353.9	264.2	273.4
10	15.97	25.15	1.575	334.6	385.2	1.151	14.24	18.34	1.53155	1.81488	323.9	352.0	245.2	258.8
11	15.71	24.89	1.585	335.3	386.1	1.152	14.36	18.07	1.53095	1.78595	326.8	352.4	235.3	251.7

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.0	.5	1.8	.400	.889	.082	.038	.044	.017	.008	.009	1.472
2	10.0	2.2	-.3	1.4	.435	.829	.131	.093	.039	.028	.020	.008	1.438
3	20.0	1.4	-1.3	1.1	.461	.801	.156	.125	.030	.033	.027	.007	1.395
4	30.0	1.9	-1.2	1.8	.452	.858	.110	.083	.027	.023	.018	.006	1.395
5	40.0	2.9	-.6	2.4	.456	.890	.088	.064	.024	.019	.014	.005	1.408
6	50.0	4.6	.5	3.7	.472	.912	.075	.050	.026	.016	.011	.006	1.456
7	60.0	5.5	.8	5.3	.489	.926	.067	.044	.024	.014	.009	.005	1.478
8	70.0	5.4	.2	6.5	.527	.903	.097	.087	.011	.021	.019	.002	1.407
9	80.0	5.2	-.3	5.6	.589	.900	.120	.119	.001	.027	.027	.000	1.310
10	90.0	6.9	1.5	6.4	.580	.914	.125	.125	.000	.028	.028	.000	1.295
11	95.0	9.9	4.7	12.7	.512	.923	.113	.111	.003	.025	.024	.001	1.414

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(b) 100 Percent of design speed; reading 1382

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.566	23.223	176.3	172.0	.976	177.6	172.7	.972	-3.8	64.8	-21.5	-15.5	177.6	184.4	438.4	369.4
2	23.050	22.766	192.1	184.4	.960	193.1	184.9	.958	-3.5	72.7	-19.3	-13.5	193.1	198.7	436.9	361.7
3	22.001	21.814	209.1	197.3	.944	209.5	197.5	.943	-4.5	76.9	-13.5	-9.0	209.6	212.0	429.8	351.4
4	20.958	20.856	212.3	198.8	.936	212.4	198.8	.936	-7.7	74.3	-7.0	-4.0	212.5	212.2	418.7	341.1
5	19.916	19.909	212.6	196.7	.925	212.6	196.7	.925	-5.3	80.5	-.8	.9	212.7	212.5	401.8	322.0
6	18.877	18.969	212.1	196.4	.926	212.1	196.5	.926	-5.6	91.3	5.2	5.7	212.2	216.7	387.0	301.2
7	17.831	18.039	210.5	205.9	.978	210.8	206.2	.978	-6.2	107.7	11.2	11.1	210.8	232.6	372.1	284.7
8	16.769	17.122	210.2	222.2	1.057	210.9	222.9	1.057	-4.7	130.0	17.6	18.1	210.9	258.1	356.4	273.5
9	15.684	16.231	205.0	234.7	1.145	206.4	236.2	1.144	1.1	158.9	23.9	26.2	206.4	284.6	334.4	262.5
10	14.559	15.367	177.1	233.1	1.316	179.1	235.5	1.315	2.3	171.8	26.9	33.7	179.1	291.5	301.9	251.1
11	13.967	14.945	147.6	216.5	1.467	149.7	219.4	1.465	-11.1	173.7	25.2	35.2	150.2	279.8	288.4	232.9

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.490	.490	1.208	.981	.486	.457	.489	.458	-1.2	20.6	-1.2	20.6	66.3	62.2	65.1	62.1
2	.537	.530	1.216	.965	.535	.492	.537	.493	-1.0	21.5	-1.0	21.5	63.9	59.3	63.8	59.3
3	.590	.571	1.211	.947	.589	.532	.590	.532	-1.2	21.3	-1.2	21.3	60.9	55.8	60.8	55.8
4	.602	.575	1.185	.924	.601	.538	.601	.538	-2.1	20.5	-2.1	20.5	59.5	54.4	59.5	54.3
5	.603	.576	1.139	.873	.602	.533	.602	.533	-1.4	22.2	-1.4	22.2	58.1	52.4	58.1	52.4
6	.602	.587	1.097	.816	.601	.532	.601	.532	-1.5	24.9	-1.5	24.9	56.8	49.3	56.8	49.3
7	.598	.631	1.056	.772	.597	.558	.598	.559	-1.7	27.6	-1.7	27.6	55.5	43.6	55.5	43.6
8	.598	.701	1.010	.743	.596	.604	.598	.606	-1.3	30.3	-1.3	30.3	53.8	35.5	53.7	35.4
9	.584	.776	.946	.716	.580	.640	.584	.644	.3	34.1	.3	33.9	52.1	26.0	51.9	25.9
10	.503	.796	.847	.686	.497	.637	.502	.643	.7	36.4	.7	36.1	53.9	20.5	53.6	20.3
11	.418	.758	.803	.631	.411	.586	.417	.594	-4.3	38.7	-4.2	38.4	59.1	19.8	58.7	19.6

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	15.25	18.11	1.188	343.2	369.9	1.078	12.95	15.37	1.37714	1.51738	327.5	353.0	397.1	391.3
2	15.58	18.76	1.204	340.0	369.1	1.086	12.80	15.49	1.38723	1.54442	321.4	349.5	388.4	383.6
3	15.95	19.55	1.225	335.5	365.2	1.089	12.60	15.67	1.40007	1.59197	313.6	342.9	370.7	367.5
4	15.94	19.69	1.235	333.1	361.8	1.086	12.48	15.74	1.39958	1.61548	310.6	339.4	353.1	351.4
5	15.95	19.67	1.233	332.4	361.0	1.086	12.48	15.71	1.40330	1.61667	309.8	338.5	335.6	335.4
6	15.95	19.79	1.241	331.9	362.7	1.093	12.49	15.68	1.40604	1.60915	309.5	339.4	318.1	319.6
7	15.95	20.30	1.273	331.2	365.6	1.104	12.52	15.53	1.41145	1.59803	309.0	338.6	300.4	303.9
8	16.05	21.74	1.354	331.9	370.5	1.116	12.60	15.66	1.41793	1.61726	309.7	337.4	282.6	288.5
9	16.13	22.64	1.404	332.4	375.3	1.129	12.81	15.21	1.43366	1.58194	311.2	335.0	264.3	273.5
10	15.63	22.61	1.447	332.1	375.8	1.131	13.15	14.89	1.44955	1.55552	316.1	333.5	245.3	258.9
11	15.01	21.16	1.410	332.3	378.4	1.139	13.31	14.47	1.44365	1.48462	321.1	339.5	235.3	251.8

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.1	1.6	8.0	.216	.646	.144	.084	.060	.025	.015	.011	1.537
2	10.0	2.6	.1	5.6	.237	.636	.161	.111	.050	.030	.021	.010	1.480
3	20.0	1.3	-1.3	4.0	.249	.671	.152	.111	.041	.030	.022	.008	1.432
4	30.0	1.8	-1.3	5.1	.252	.721	.129	.091	.038	.026	.018	.008	1.433
5	40.0	2.1	-1.4	6.3	.267	.715	.139	.109	.031	.027	.021	.006	1.416
6	50.0	2.5	-1.6	7.3	.299	.682	.173	.147	.026	.035	.030	.005	1.416
7	60.0	2.9	-1.8	6.7	.324	.686	.200	.177	.023	.042	.037	.005	1.422
8	70.0	2.4	-2.7	4.6	.337	.776	.169	.152	.018	.038	.034	.004	1.415
9	80.0	1.3	-4.1	3.0	.339	.787	.194	.187	.007	.045	.043	.002	1.342
10	90.0	2.4	-3.0	8.0	.307	.844	.171	.170	.001	.039	.038	.000	1.297
11	95.0	6.4	1.2	13.8	.345	.742	.319	.316	.002	.069	.069	.001	1.382

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(c) 100 Percent of design speed; reading 1393

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	176.0	163.5	.929	177.3	164.2	.926	-3.5	91.1	-21.5	-14.7	177.4	187.8	437.3	341.4
2	23.050	22.766	192.1	175.3	.912	193.1	175.7	.910	-3.6	96.9	-19.3	-12.9	193.2	200.7	436.2	335.6
3	22.001	21.814	209.1	184.3	.881	209.5	184.5	.880	-4.4	98.5	-13.5	-8.4	209.6	209.1	428.9	325.6
4	20.958	20.856	212.2	184.7	.871	212.3	184.8	.870	-7.3	94.1	-7.0	-3.7	212.5	207.4	417.7	316.2
5	19.916	19.909	212.1	182.9	.862	212.1	182.9	.862	-5.4	100.0	-.8	.8	212.2	208.5	401.0	297.6
6	18.877	18.969	210.8	183.7	.872	210.8	183.8	.872	-5.4	110.6	5.2	5.3	210.9	214.5	385.6	277.8
7	17.831	18.039	209.0	194.2	.929	209.3	194.5	.929	-6.1	123.3	11.1	10.5	209.4	230.3	370.7	265.0
8	16.769	17.122	209.1	208.5	.997	209.8	209.2	.997	-4.7	138.3	17.5	17.0	209.8	250.8	355.2	257.2
9	15.684	16.231	203.9	213.6	1.047	205.3	214.9	1.047	1.0	160.2	23.8	23.8	205.3	268.0	333.4	242.6
10	14.559	15.367	175.5	215.4	1.228	177.5	217.7	1.226	2.1	181.3	26.7	31.1	177.5	283.3	300.7	230.9
11	13.967	14.945	145.4	222.5	1.531	147.5	225.4	1.528	-11.2	177.9	24.8	36.2	147.9	287.1	286.9	237.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.489	.493	1.206	.896	.486	.429	.489	.431	-1.2	29.1	-1.1	29.0	66.2	61.4	66.1	61.3
2	.538	.529	1.214	.885	.535	.462	.537	.463	-1.1	28.9	-1.1	28.9	63.8	58.5	63.7	58.4
3	.590	.557	1.208	.867	.589	.491	.590	.491	-1.2	28.1	-1.2	28.1	60.8	55.5	60.8	55.5
4	.601	.555	1.182	.847	.601	.495	.601	.495	-2.0	27.0	-2.0	27.0	59.5	54.2	59.4	54.2
5	.601	.559	1.136	.799	.601	.491	.601	.491	-1.5	28.7	-1.5	28.7	58.1	52.1	58.1	52.1
6	.598	.576	1.093	.746	.598	.493	.598	.493	-1.5	31.1	-1.5	31.1	56.9	48.6	56.9	48.6
7	.594	.620	1.052	.713	.593	.523	.594	.524	-1.7	32.4	-1.7	32.4	55.7	42.8	55.6	42.8
8	.595	.678	1.007	.695	.593	.563	.595	.565	-1.3	33.6	-1.3	33.5	53.9	35.7	53.8	35.6
9	.580	.725	.942	.657	.576	.578	.580	.581	.3	36.9	.3	36.7	52.2	27.8	52.0	27.7
10	.498	.768	.843	.626	.492	.584	.498	.590	.7	40.1	.7	39.8	54.1	19.7	53.8	19.5
11	.412	.779	.798	.643	.404	.604	.410	.611	-4.4	38.6	-4.4	38.3	59.4	18.3	59.1	18.0

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.28	19.98	1.308	342.6	379.4	1.107	12.97	16.93	1.38228	1.62994	327.0	361.9	396.2	390.5
2	15.61	20.60	1.320	339.8	378.0	1.113	12.82	17.03	1.39101	1.65703	321.2	358.0	387.6	382.8
3	15.98	21.05	1.318	335.5	373.1	1.112	12.62	17.06	1.40192	1.69159	313.7	351.3	369.9	366.8
4	15.97	21.10	1.322	333.1	368.4	1.106	12.50	17.12	1.40256	1.71817	310.6	347.1	352.4	350.7
5	15.97	21.10	1.321	332.2	367.3	1.106	12.51	17.06	1.40655	1.71968	309.8	345.7	334.9	334.7
6	15.95	21.22	1.330	331.5	368.3	1.111	12.52	16.95	1.40987	1.70911	309.4	345.4	317.4	318.9
7	15.93	21.87	1.373	330.9	369.9	1.118	12.55	16.88	1.41427	1.71160	309.1	343.6	299.8	303.3
8	16.06	22.88	1.425	331.4	372.3	1.123	12.64	16.83	1.42248	1.71918	309.5	341.0	282.0	287.9
9	16.12	23.41	1.452	332.5	375.7	1.130	12.83	16.50	1.43528	1.69072	311.5	339.9	263.7	272.9
10	15.61	23.27	1.491	332.3	378.3	1.139	13.18	15.75	1.45048	1.62138	316.6	338.4	244.8	258.4
11	14.98	22.97	1.534	332.3	379.3	1.142	13.33	15.38	1.44478	1.58425	321.4	338.3	234.8	251.3

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.1	1.6	7.1	.301	.740	.142	.083	.059	.026	.015	.011	1.534
2	10.0	2.6	.1	4.7	.316	.730	.153	.104	.049	.030	.020	.010	1.478
3	20.0	1.3	-1.4	3.7	.326	.731	.154	.113	.040	.031	.023	.008	1.428
4	30.0	1.7	-1.3	5.0	.325	.779	.125	.087	.037	.025	.017	.007	1.427
5	40.0	2.1	-1.4	6.0	.343	.782	.129	.099	.030	.026	.020	.006	1.415
6	50.0	2.6	-1.5	6.6	.372	.764	.153	.127	.026	.031	.026	.005	1.417
7	60.0	3.0	-1.7	5.9	.387	.802	.144	.121	.023	.031	.026	.005	1.425
8	70.0	2.5	-2.7	4.8	.387	.861	.112	.094	.018	.025	.021	.004	1.418
9	80.0	1.4	-4.1	4.8	.397	.863	.127	.121	.006	.029	.028	.001	1.340
10	90.0	2.6	-2.8	7.1	.379	.869	.152	.151	.001	.034	.034	.000	1.297
11	95.0	6.8	1.6	12.2	.331	.915	.111	.108	.002	.024	.024	.001	1.384

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(d) 100 Percent of design speed; reading 1415

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.566	23.223	177.9	167.2	.940	179.3	167.9	.937	-.8	126.3	-21.7	-15.1	179.3	210.1	435.7	313.1
2	23.050	22.766	192.4	167.9	.872	193.4	168.3	.870	-1.2	131.0	-19.4	-12.3	193.4	213.3	434.4	303.0
3	22.001	21.814	207.9	170.3	.819	208.4	170.5	.818	-1.7	133.0	-13.4	-7.8	208.4	216.2	426.2	289.4
4	20.958	20.856	210.5	173.4	.824	210.6	173.4	.823	-4.0	130.3	-6.9	-3.5	210.6	216.9	414.0	280.5
5	19.916	19.909	209.0	175.0	.838	209.0	175.0	.838	-3.2	134.1	-.8	.8	209.0	220.5	397.5	266.3
6	18.877	18.969	205.5	176.6	.860	205.5	176.7	.860	-4.4	139.9	5.0	5.1	205.6	225.4	381.9	251.6
7	17.831	18.039	202.1	180.0	.891	202.4	180.3	.891	-4.6	145.4	10.7	9.7	202.5	231.6	365.6	239.7
8	16.769	17.122	201.0	180.3	.897	201.7	180.9	.897	-2.7	153.7	16.8	14.7	201.7	237.4	348.9	225.2
9	15.684	16.231	194.6	174.3	.896	195.9	175.4	.895	3.8	173.8	22.7	19.4	195.9	246.9	325.6	201.5
10	14.559	15.367	167.0	174.9	1.047	169.0	176.7	1.046	4.3	194.2	25.4	25.3	169.0	262.6	294.0	188.0
11	13.967	14.945	138.6	183.6	1.325	140.6	186.0	1.323	-8.7	190.5	23.7	29.8	140.9	266.2	281.3	195.7

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.493	.544	1.199	.810	.490	.433	.493	.434	-.3	37.1	-.3	37.0	65.9	57.7	65.7	57.6
2	.537	.554	1.205	.787	.534	.436	.537	.437	-.4	38.0	-.4	37.9	63.7	56.3	63.6	56.2
3	.585	.566	1.196	.758	.584	.446	.585	.446	-.5	38.0	-.5	38.0	60.8	53.9	60.7	53.9
4	.594	.572	1.167	.739	.593	.457	.594	.457	-1.1	36.9	-1.1	36.9	59.4	51.8	59.4	51.8
5	.590	.584	1.123	.705	.590	.463	.590	.463	-.9	37.5	-.9	37.5	58.3	48.9	58.3	48.9
6	.581	.599	1.080	.668	.581	.469	.581	.469	-1.2	38.4	-1.2	38.4	57.4	45.4	57.4	45.4
7	.572	.618	1.034	.639	.571	.480	.572	.481	-1.3	38.9	-1.3	38.9	56.4	41.3	56.4	41.2
8	.570	.634	.986	.602	.568	.482	.570	.483	-.8	40.5	-.8	40.4	54.8	36.7	54.7	36.6
9	.552	.660	.917	.538	.548	.466	.552	.469	1.1	44.9	1.1	44.7	53.2	29.6	53.0	29.5
10	.472	.703	.821	.503	.467	.468	.472	.473	1.5	48.0	1.5	47.7	55.2	20.2	54.9	20.0
11	.391	.712	.780	.524	.384	.491	.390	.498	-3.6	46.0	-3.5	45.7	60.4	18.4	60.0	18.1

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	FATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	15.68	23.54	1.501	344.6	393.9	1.143	13.28	19.25	1.40750	1.80336	328.6	372.0	396.4	390.6
2	15.98	23.77	1.488	341.8	392.1	1.147	13.13	19.30	1.41579	1.82038	323.1	369.5	387.7	382.9
3	16.32	23.97	1.469	337.3	386.4	1.145	12.94	19.28	1.42814	1.84979	315.7	363.2	370.1	366.9
4	16.29	24.07	1.477	335.1	381.9	1.140	12.83	19.29	1.42837	1.87432	313.0	358.5	352.5	350.8
5	16.26	24.15	1.485	333.7	379.4	1.137	12.84	19.18	1.43445	1.88077	312.0	355.2	335.0	334.8
6	16.18	24.23	1.498	332.4	378.1	1.137	12.87	19.02	1.43967	1.87750	311.4	352.9	317.5	319.0
7	16.11	24.37	1.513	331.8	377.0	1.136	12.90	18.84	1.44325	1.87401	311.4	350.3	299.9	303.4
8	16.20	24.37	1.504	332.2	376.9	1.135	13.00	18.59	1.45228	1.85665	311.9	348.9	282.0	288.0
9	16.20	24.28	1.499	333.0	379.1	1.139	13.17	18.13	1.46195	1.81090	313.9	348.8	263.8	273.0
10	15.72	24.35	1.549	333.0	381.8	1.147	13.49	17.51	1.47435	1.75553	318.8	347.5	244.9	258.5
11	15.14	24.13	1.594	333.4	383.0	1.149	13.62	17.21	1.46722	1.72385	323.5	347.7	234.9	251.4

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.7	1.2	3.4	.391	.857	.103	.049	.054	.021	.010	.011	1.515
2	10.0	2.4	-.1	2.6	.415	.814	.136	.090	.046	.028	.018	.009	1.464
3	20.0	1.2	-1.4	2.2	.433	.795	.150	.113	.037	.031	.024	.008	1.417
4	30.0	1.7	-1.4	2.6	.432	.842	.116	.082	.034	.024	.017	.007	1.415
5	40.0	2.3	-1.2	2.9	.441	.871	.098	.069	.028	.021	.015	.006	1.412
6	50.0	3.2	-.9	3.5	.457	.887	.092	.066	.026	.020	.014	.006	1.428
7	60.0	3.8	-.9	4.3	.464	.918	.070	.047	.023	.015	.010	.005	1.442
8	70.0	3.4	-1.8	5.8	.479	.915	.077	060	.017	.017	.013	.004	1.426
9	80.0	2.4	-3.0	6.6	.518	.882	.121	.117	.005	.027	.026	.001	1.336
10	90.0	3.7	-1.7	7.6	.520	.906	.120	.120	.001	.027	.027	.000	1.294
11	95.0	7.7	2.5	12.3	.473	.955	.064	.062	.002	.014	.014	.000	1.377

TABLE XI. - *Continued.* BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(e) 100 Percent of design speed; reading 1426

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	179.2	165.8	.925	180.6	166.4	.922	1.0	131.6	-21.9	-14.9	180.6	212.2	435.3	308.4
2	23.050	22.766	191.8	165.7	.864	192.8	166.2	.862	-.1	137.8	-19.3	-12.2	192.8	215.9	433.6	296.6
3	22.001	21.814	206.2	168.9	.819	206.6	169.1	.818	-.8	140.6	-13.3	-7.7	206.6	219.9	425.0	283.0
4	20.958	20.856	208.9	172.0	.824	209.0	172.0	.823	-3.1	137.3	-6.9	-3.5	209.0	220.1	412.9	274.6
5	19.916	19.909	206.3	172.6	.837	206.3	172.6	.837	-2.2	139.6	-.8	.8	206.3	222.0	395.7	261.0
6	18.877	18.969	201.1	174.3	.867	201.1	174.4	.867	-4.3	144.9	4.9	5.0	201.2	226.7	379.9	246.8
7	17.831	18.039	196.6	175.6	.895	196.8	176.1	.895	-4.0	150.7	10.4	9.5	196.9	231.8	362.5	233.4
8	16.769	17.122	194.1	172.6	.889	194.8	173.2	.889	-1.7	159.0	16.3	14.1	194.8	235.1	344.6	216.2
9	15.684	16.231	185.6	165.1	.890	186.9	166.1	.889	5.6	179.7	21.7	18.4	186.9	244.7	319.1	190.7
10	14.559	15.367	158.8	166.3	1.047	160.6	168.0	1.046	6.3	197.5	24.2	24.0	160.7	259.3	287.9	178.9
11	13.967	14.945	133.1	176.1	1.323	135.0	178.4	1.321	-8.9	190.1	22.8	28.6	135.3	260.7	279.0	188.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.495	.546	1.194	.794	.492	.427	.495	.429	.3	38.4	.3	38.3	65.7	57.4	65.5	57.3
2	.533	.558	1.200	.767	.531	.428	.533	.429	-.0	39.7	-.0	39.7	63.7	56.0	63.6	55.9
3	.578	.573	1.189	.738	.577	.440	.578	.441	-.2	39.8	-.2	39.7	61.0	53.3	60.9	53.3
4	.587	.578	1.161	.721	.587	.451	.587	.451	-.8	38.6	-.8	38.6	59.6	51.2	59.6	51.2
5	.581	.586	1.114	.688	.581	.455	.581	.455	-.6	39.0	-.6	39.0	58.6	48.6	58.6	48.6
6	.567	.600	1.070	.653	.566	.461	.567	.462	-1.2	39.7	-1.2	39.7	58.0	45.1	58.0	45.1
7	.555	.616	1.021	.620	.554	.467	.555	.468	-1.2	40.6	-1.2	40.6	57.1	41.1	57.1	41.0
8	.548	.626	.970	.576	.546	.460	.548	.461	-.5	42.6	-.5	42.6	55.7	36.9	55.6	36.8
9	.524	.652	.895	.508	.521	.440	.524	.442	1.7	47.4	1.7	47.3	54.3	29.6	54.2	29.4
10	.447	.692	.802	.477	.442	.444	.447	.448	2.3	49.9	2.3	49.6	56.4	20.3	56.1	20.1
11	.374	.695	.772	.503	.368	.470	.373	.476	-3.8	47.2	-3.8	46.8	61.4	19.3	61.1	19.1

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.03	24.30	1.516	347.1	397.8	1.146	13.55	19.84	1.42727	1.84071	330.8	375.4	397.0	391.2
2	16.28	24.55	1.508	343.6	396.1	1.153	13.42	19.87	1.43786	1.85668	325.1	372.9	388.3	383.5
3	16.61	24.81	1.494	339.0	390.6	1.152	13.24	19.86	1.45211	1.88753	317.7	366.6	370.6	367.5
4	16.60	24.89	1.499	336.8	385.7	1.145	13.14	19.85	1.45311	1.91240	315.0	361.7	353.1	351.3
5	16.53	24.82	1.501	335.1	382.4	1.141	13.16	19.68	1.45985	1.91577	313.9	357.9	335.5	335.4
6	16.39	24.92	1.520	333.6	380.9	1.142	13.18	19.54	1.46520	1.91552	313.5	355.4	318.0	319.6
7	16.29	24.98	1.533	332.7	379.3	1.140	13.22	19.34	1.46974	1.91093	313.4	352.6	300.4	303.9
8	16.36	24.75	1.513	333.0	379.0	1.138	13.33	19.01	1.47908	1.88408	314.1	351.5	282.5	288.4
9	16.27	24.70	1.519	333.6	380.9	1.142	13.49	18.57	1.48603	1.84257	316.2	351.1	264.2	273.4
10	15.79	24.68	1.563	333.9	383.1	1.147	13.76	17.93	1.49365	1.78588	321.0	349.7	245.3	258.9
11	15.30	24.36	1.592	334.5	384.1	1.148	13.89	17.64	1.48732	1.75417	325.4	350.3	235.3	251.8

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.5	1.0	3.2	.404	.860	.103	.052	.051	.021	.011	.010	1.503
2	10.0	2.5	-.0	2.2	.433	.811	.143	.098	.045	.030	.020	.009	1.461
3	20.0	1.4	-1.2	1.5	.452	.795	.157	.120	.037	.033	.025	.008	1.417
4	30.0	1.9	-1.2	1.9	.450	.840	.122	.089	.033	.026	.019	.007	1.415
5	40.0	2.6	-.9	2.6	.456	.870	.103	.075	.028	.022	.016	.006	1.417
6	50.0	3.8	-.3	3.1	.471	.892	.090	.063	.027	.020	.014	.006	1.443
7	60.0	4.5	-.2	4.1	.481	.922	.070	.045	.025	.015	.010	.005	1.462
8	70.0	4.3	-.9	6.0	.502	.905	.090	.074	.016	.020	.016	.004	1.433
9	80.0	3.6	-1.9	6.5	.545	.890	.119	.115	.004	.027	.026	.001	1.339
10	90.0	4.9	-.5	7.7	.543	.919	.108	.107	.000	.024	.024	.000	1.295
11	95.0	8.8	3.6	13.2	.493	.954	.066	.064	.002	.014	.014	.000	1.390

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(f) 100 Percent of design speed, reading 1437

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	181.7	167.6	.922	183.0	168.2	.919	2.9	134.9	-22.2	-15.1	183.1	215.6	434.9	306.9
2	23.050	22.766	192.9	166.2	.861	193.9	166.6	.859	1.1	140.3	-19.4	-12.2	193.9	217.8	433.4	295.1
3	22.001	21.814	205.5	166.8	.812	205.9	167.0	.811	.5	142.5	-13.3	-7.6	205.9	219.5	423.8	280.4
4	20.958	20.856	207.0	169.6	.820	207.1	169.7	.819	-2.0	137.1	-6.8	-3.4	207.1	218.1	411.3	273.5
5	19.916	19.909	203.3	171.1	.842	203.3	171.1	.842	-1.8	140.6	-.7	.7	203.3	221.4	394.1	259.5
6	18.877	18.969	197.3	172.5	.875	197.4	172.6	.875	-3.8	147.8	4.8	5.0	197.4	227.2	377.8	243.7
7	17.831	18.039	192.1	172.8	.900	192.3	173.0	.900	-3.8	154.1	10.2	9.4	192.4	231.7	360.1	229.0
8	16.769	17.122	188.3	167.8	.891	189.0	168.4	.891	-.6	161.7	15.8	13.7	189.0	233.4	340.6	210.9
9	15.684	16.231	178.0	158.2	.888	179.3	159.2	.888	6.9	182.4	20.8	17.6	179.4	242.1	313.8	183.5
10	14.559	15.367	151.8	159.5	1.051	153.5	161.2	1.050	7.3	199.5	23.1	23.0	153.7	256.5	283.4	171.9
11	13.967	14.945	128.8	172.0	1.336	130.7	174.3	1.334	-9.0	190.0	22.0	28.0	131.0	257.9	277.3	185.0

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.501	.554	1.191	.789	.497	.431	.501	.432	.9	38.8	.9	38.7	65.3	56.9	65.1	56.8
2	.535	.561	1.196	.761	.532	.428	.535	.430	.3	40.2	.3	40.1	63.5	55.7	63.4	55.6
3	.575	.571	1.183	.729	.574	.434	.575	.434	.1	40.5	.1	40.5	61.0	53.5	60.9	53.5
4	.581	.571	1.153	.717	.580	.444	.581	.444	-.6	38.9	-.6	38.9	59.8	51.7	59.8	51.7
5	.571	.583	1.107	.683	.571	.450	.571	.451	-.5	39.4	-.5	39.4	58.9	48.8	58.9	48.8
6	.555	.600	1.061	.644	.554	.456	.554	.456	-1.1	40.6	-1.1	40.6	58.5	44.9	58.5	44.9
7	.541	.614	1.012	.607	.540	.458	.541	.459	-1.1	41.7	-1.1	41.7	57.8	41.0	57.7	40.9
8	.530	.620	.956	.560	.529	.446	.530	.447	-.2	43.9	-.2	43.8	56.4	37.1	56.3	37.0
9	.502	.643	.877	.487	.498	.420	.501	.423	2.2	49.1	2.2	48.9	55.3	30.0	55.2	29.8
10	.427	.683	.787	.458	.421	.425	.426	.429	2.8	51.4	2.7	51.1	57.5	20.5	57.2	20.3
11	.362	.686	.765	.492	.356	.458	.361	.464	-4.0	47.8	-3.9	47.5	62.2	19.8	61.9	19.6

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.35	24.90	1.523	348.7	400.0	1.147	13.77	20.21	1.44535	1.86850	332.0	376.9	397.4	391.6
2	16.58	25.08	1.513	345.3	398.4	1.154	13.64	20.25	1.45511	1.88241	326.6	374.8	388.7	383.9
3	16.86	25.18	1.494	340.4	392.2	1.152	13.48	20.19	1.47072	1.91022	319.3	368.3	371.0	367.8
4	16.82	25.20	1.498	337.9	386.5	1.144	13.39	20.19	1.47328	1.93890	316.6	362.9	353.4	351.7
5	16.72	25.22	1.508	336.1	383.5	1.141	13.41	20.03	1.48021	1.94316	315.5	359.2	335.8	335.7
6	16.56	25.35	1.530	334.7	382.8	1.144	13.44	19.87	1.48506	1.93878	315.3	357.1	318.3	319.8
7	16.45	25.36	1.542	333.4	381.0	1.143	13.48	19.66	1.49116	1.93320	315.0	354.4	300.7	304.2
8	16.46	25.01	1.519	333.6	380.1	1.139	13.59	19.30	1.49937	1.90442	315.8	353.1	282.7	288.7
9	16.32	24.91	1.526	334.3	382.1	1.143	13.75	18.87	1.50447	1.86252	318.3	352.9	264.5	273.7
10	15.84	24.84	1.568	334.4	384.0	1.148	13.97	18.18	1.50879	1.80293	322.7	351.3	245.5	259.1
11	15.43	24.53	1.590	335.1	384.7	1.148	14.09	17.90	1.50370	1.77346	326.6	351.7	235.5	252.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.1	.6	2.6	.408	.864	.101	.053	.048	.021	.011	.010	1.488
2	10.0	2.3	-.2	1.9	.437	.814	.142	.099	.043	.030	.021	.009	1.452
3	20.0	1.4	-1.2	1.7	.457	.794	.159	.123	.035	.034	.026	.007	1.413
4	30.0	2.0	-1.0	2.4	.449	.848	.116	.084	.032	.024	.018	.007	1.416
5	40.0	3.0	-.6	2.7	.458	.878	.097	.069	.028	.021	.015	.006	1.424
6	50.0	4.3	.2	3.0	.478	.895	.090	.062	.028	.020	.014	.006	1.454
7	60.0	5.1	.4	4.0	.492	.917	.076	.050	.026	.017	.011	.006	1.480
8	70.0	5.0	-.2	6.3	.513	.906	.091	.076	.015	.020	.017	.003	1.436
9	80.0	4.6	-.9	6.9	.562	.896	.117	.114	.004	.026	.025	.001	1.342
10	90.0	6.0	.6	7.9	.561	.922	.108	.108	.000	.024	.024	.000	1.300
11	95.0	9.6	4.4	13.7	.504	.952	.070	.068	.002	.015	.015	.000	1.400

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(g) 100 Percent of design speed; reading 1461

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	183.0	170.9	.934	184.3	171.6	.931	5.7	136.5	-22.3	-15.4	184.4	219.3	432.3	306.8
2	23.050	22.766	193.0	169.1	.876	194.0	169.5	.874	4.9	142.0	-19.4	-12.4	194.1	221.1	429.4	294.9
3	22.001	21.814	201.5	167.3	.830	201.9	167.4	.829	4.3	144.5	-13.0	-7.6	201.9	221.2	418.0	278.6
4	20.958	20.856	201.2	168.6	.838	201.3	168.7	.838	1.0	139.8	-6.6	-3.4	201.3	219.1	405.3	270.3
5	19.916	19.909	196.8	169.9	.863	196.8	169.9	.863	-.5	142.5	-.7	.7	196.8	221.7	389.1	256.9
6	18.877	18.969	188.9	167.8	.888	189.0	167.9	.888	-1.6	148.8	4.6	4.8	189.0	224.4	371.0	239.2
7	17.831	18.039	182.0	161.0	.884	182.3	161.2	.885	-.7	156.4	9.7	8.7	182.3	224.6	351.7	218.3
8	16.769	17.122	175.2	151.8	.866	175.8	152.3	.866	4.9	168.4	14.7	12.4	175.9	227.1	328.4	193.8
9	15.684	16.231	161.1	142.6	.885	162.2	143.4	.884	13.2	191.4	18.8	15.9	162.7	239.2	298.7	165.1
10	14.559	15.367	136.5	149.2	1.093	138.1	150.8	1.092	9.9	202.8	20.8	21.6	138.4	252.7	272.7	160.8
11	13.967	14.945	117.0	165.6	1.415	118.7	167.8	1.413	-8.7	190.6	20.0	26.9	119.0	254.0	271.2	178.5

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.503	.562	1.178	.787	.499	.438	.502	.440	1.8	38.6	1.8	38.5	64.9	56.1	64.8	56.0
2	.533	.568	1.179	.758	.530	.435	.533	.436	1.5	40.0	1.5	39.9	63.3	55.0	63.1	54.9
3	.560	.573	1.159	.722	.558	.433	.560	.434	1.2	40.8	1.2	40.8	61.2	53.1	61.1	53.1
4	.561	.572	1.129	.706	.561	.440	.561	.440	.3	39.7	.3	39.7	60.2	51.4	60.2	51.4
5	.550	.582	1.087	.674	.550	.446	.550	.446	-.1	40.0	-.1	40.0	59.6	48.6	59.6	48.6
6	.528	.591	1.037	.630	.528	.442	.528	.442	-.5	41.6	-.5	41.6	59.4	45.4	59.4	45.4
7	.509	.593	.983	.576	.509	.425	.509	.426	-.2	44.2	-.2	44.1	58.8	42.4	58.8	42.4
8	.491	.600	.916	.512	.489	.401	.490	.403	1.6	48.0	1.6	47.9	57.7	38.3	57.6	38.2
9	.452	.633	.830	.437	.448	.377	.451	.380	4.7	53.3	4.7	53.2	57.3	29.8	57.1	29.7
10	.383	.671	.754	.427	.377	.396	.382	.400	4.1	53.7	4.1	53.4	59.9	20.5	59.6	20.3
11	.327	.674	.746	.474	.322	.440	.327	.445	-4.3	49.0	-4.2	48.6	64.4	20.2	64.0	20.0

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.96	25.63	1.512	351.9	402.6	1.144	14.27	20.68	1.48435	1.90283	334.9	378.7	396.7	390.9
2	17.16	25.80	1.504	349.1	401.1	1.149	14.14	20.73	1.49188	1.91615	330.3	376.9	388.0	383.2
3	17.27	25.77	1.492	344.1	395.2	1.149	13.96	20.63	1.50227	1.93748	323.8	370.9	370.3	367.2
4	17.23	25.74	1.494	340.8	389.2	1.142	13.92	20.62	1.51225	1.96664	320.6	365.4	352.7	351.0
5	17.11	25.73	1.504	338.2	385.7	1.141	13.93	20.46	1.52178	1.97294	318.9	361.3	335.2	335.1
6	16.89	25.72	1.523	336.4	384.1	1.142	13.97	20.31	1.52763	1.97083	318.6	359.1	317.7	319.3
7	16.73	25.33	1.515	335.0	382.3	1.141	14.01	19.97	1.53280	1.94780	318.5	357.3	300.1	303.6
8	16.68	25.04	1.501	335.3	382.1	1.140	14.15	19.63	1.54122	1.91829	319.9	356.5	282.3	288.2
9	16.39	25.11	1.532	335.5	384.0	1.144	14.24	19.17	1.53973	1.87892	322.3	355.5	264.0	273.2
10	15.99	25.03	1.566	335.3	385.0	1.148	14.45	18.52	1.54560	1.82615	325.8	353.2	245.1	258.7
11	15.67	24.74	1.578	336.0	385.6	1.148	14.55	18.25	1.54135	1.79834	328.9	353.6	235.1	251.6

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.8	.3	1.8	.404	.865	.100	.057	.043	.021	.012	.009	1.466
2	10.0	2.0	-.5	1.2	.431	.825	.133	.096	.037	.028	.021	.008	1.428
3	20.0	1.6	-1.0	1.3	.452	.812	.146	.115	.030	.031	.025	.007	1.400
4	30.0	2.5	-.6	2.1	.449	.852	.115	.085	.029	.024	.018	.006	1.413
5	40.0	3.7	.1	2.5	.459	.876	.100	.073	.028	.021	.016	.006	1.434
6	50.0	5.2	1.0	3.5	.480	.896	.090	.063	.028	.019	.014	.006	1.472
7	60.0	6.2	1.5	5.5	.510	.887	.106	.081	.024	.023	.017	.005	1.489
8	70.0	6.3	1.2	7.4	.548	.877	.126	.116	.010	.027	.025	.002	1.417
9	80.0	6.5	1.1	6.8	.604	.893	.131	.130	.001	.029	.029	.000	1.324
10	90.0	8.4	3.0	8.0	.586	.919	.120	.120	.000	.027	.027	.000	1.306
11	95.0	11.7	6.5	14.1	.517	.938	.093	.091	.002	.020	.020	.000	1.421

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(h) 90 Percent of design speed; reading 1310

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	163.0	151.0	.926	164.2	151.6	.923	6.8	71.6	-19.9	-13.6	164.3	167.6	387.2	319.1
2	23.050	22.766	176.9	163.2	.922	177.8	163.6	.920	5.5	76.9	-17.8	-12.0	177.9	180.8	387.5	314.4
3	22.001	21.814	190.2	172.8	.909	190.6	173.0	.908	2.1	78.6	-12.3	-7.9	190.6	190.0	382.6	306.0
4	20.958	20.856	192.1	175.5	.914	192.2	175.5	.913	-4.0	73.2	-6.3	-3.6	192.3	190.2	375.0	300.0
5	19.916	19.909	190.9	176.8	.926	190.9	176.8	.926	-2.2	79.7	-.7	.8	190.9	193.9	359.3	284.1
6	18.877	18.969	188.6	180.7	.958	188.6	180.8	.958	-3.2	89.0	4.6	5.2	188.7	201.5	345.6	268.7
7	17.831	18.039	187.5	190.8	1.018	187.8	191.1	1.018	-3.7	101.4	10.0	10.3	187.8	216.3	332.4	257.3
8	16.769	17.122	189.3	201.2	1.063	189.9	201.8	1.063	-1.5	114.8	15.9	16.4	190.0	232.2	318.7	248.5
9	15.684	16.231	188.4	208.6	1.107	189.7	209.9	1.107	4.0	139.8	22.0	23.3	189.7	252.2	301.2	235.3
10	14.559	15.367	167.0	212.5	1.273	168.9	214.7	1.271	3.0	157.1	25.4	30.7	168.9	266.1	275.6	227.8
11	13.967	14.945	140.0	211.5	1.510	142.0	214.2	1.508	-6.4	157.7	23.9	34.4	142.2	266.0	260.4	225.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.457	.451	1.078	.859	.454	.406	.457	.408	2.4	25.4	2.4	25.3	65.1	61.7	64.9	61.6
2	.499	.489	1.087	.851	.496	.441	.499	.443	1.8	25.2	1.8	25.2	62.8	58.7	62.7	58.6
3	.541	.518	1.085	.835	.539	.471	.541	.472	.6	24.5	.6	24.4	60.2	55.6	60.1	55.6
4	.548	.521	1.068	.822	.547	.481	.547	.481	-1.2	22.6	-1.2	22.6	59.2	54.2	59.2	54.2
5	.544	.532	1.024	.780	.544	.485	.544	.485	-.7	24.3	-.7	24.3	57.9	51.5	57.9	51.5
6	.538	.553	.985	.738	.537	.496	.538	.496	-1.0	26.2	-1.0	26.2	56.9	47.7	56.9	47.7
7	.535	.595	.947	.707	.534	.525	.535	.525	-1.1	28.0	-1.1	27.9	55.6	42.1	55.6	42.0
8	.541	.640	.908	.684	.539	.554	.541	.556	-.5	29.7	-.5	29.6	53.5	35.8	53.4	35.7
9	.539	.695	.856	.649	.535	.575	.539	.579	1.2	33.8	1.2	33.7	51.2	27.0	51.0	26.9
10	.477	.734	.778	.629	.472	.587	.477	.593	1.0	36.5	1.0	36.2	52.5	19.7	52.2	19.5
11	.399	.733	.730	.620	.393	.582	.398	.590	-2.6	36.7	-2.6	36.4	57.3	18.1	57.0	17.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	14.53	17.36	1.194	334.6	357.3	1.068	12.59	15.09	1.36589	1.53160	321.2	343.3	357.5	352.3
2	14.79	17.88	1.208	331.7	356.3	1.074	12.48	15.18	1.37602	1.55547	315.9	340.0	349.7	345.4
3	15.01	18.24	1.214	327.3	352.5	1.077	12.31	15.18	1.38679	1.58149	309.2	334.5	333.8	331.0
4	15.01	18.39	1.225	325.1	349.4	1.075	12.24	15.28	1.39065	1.60618	306.7	331.4	318.0	316.4
5	14.97	18.52	1.237	324.2	348.9	1.076	12.23	15.27	1.39263	1.61092	306.1	330.1	302.2	302.1
6	14.92	18.73	1.255	324.0	350.4	1.082	12.25	15.21	1.39394	1.60483	306.3	330.2	286.4	287.8
7	14.90	19.33	1.297	323.9	352.5	1.088	12.26	15.22	1.39473	1.61029	306.3	329.2	270.5	273.7
8	15.06	19.92	1.323	324.8	354.9	1.093	12.34	15.13	1.40092	1.60635	306.8	328.1	254.4	259.8
9	15.18	20.50	1.351	325.8	359.1	1.102	12.45	14.84	1.40898	1.57924	307.9	327.5	238.0	246.3
10	14.94	20.70	1.385	326.1	361.9	1.110	12.79	14.46	1.42824	1.54229	311.9	326.7	220.9	233.2
11	14.41	20.20	1.402	326.4	363.3	1.113	12.91	14.13	1.42202	1.50083	316.3	328.1	211.9	226.8

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.9	.4	7.5	.239	.766	.097	.075	.022	.017	.013	.004	1.399
2	10.0	1.5	-1.0	5.0	.257	.750	.111	.095	.017	.022	.018	.003	1.344
3	20.0	.6	-2.0	3.8	.271	.740	.121	.107	.013	.024	.022	.003	1.311
4	30.0	1.4	-1.6	4.9	.270	.796	.095	.081	.014	.019	.016	.003	1.335
5	40.0	2.0	-1.6	5.5	.283	.824	.088	.077	.012	.018	.015	.002	1.343
6	50.0	2.7	-1.4	5.8	.305	.821	.101	.091	.010	.021	.019	.002	1.357
7	60.0	3.0	-1.7	5.1	.318	.871	.083	.077	.006	.018	.017	.001	1.332
8	70.0	2.1	-3.0	4.9	.322	.897	.074	.072	.002	.017	.016	.000	1.274
9	80.0	.4	-5.1	4.0	.337	.876	.107	.107	.000	.024	.024	.000	1.187
10	90.0	1.0	-4.4	7.1	.312	.887	.120	.120	.000	.027	.027	.000	1.155
11	95.0	4.7	-.5	12.0	.286	.894	.129	.129	.000	.028	.028	.000	1.214

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(i) 90 Percent of design speed; reading 1321

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.566	23.223	161.6	147.0	.909	162.8	147.6	.906	10.9	115.2	-19.7	-13.2	163.2	187.2	383.4	279.6
2	23.050	22.766	171.6	152.0	.886	172.4	152.4	.884	7.9	117.2	-17.3	-11.2	172.6	192.2	383.2	274.8
3	22.001	21.814	180.4	155.5	.862	180.8	155.7	.861	4.9	119.1	-11.6	-7.1	180.9	196.0	375.6	263.2
4	20.958	20.856	181.0	158.1	.873	181.1	158.1	.873	-2.8	113.8	-5.9	-3.2	181.2	194.8	368.7	257.3
5	19.916	19.909	178.5	160.1	.897	178.5	160.1	.897	-2.1	117.9	-.7	.7	178.5	198.8	353.0	244.3
6	18.877	18.969	174.6	162.4	.930	174.7	162.5	.930	-2.8	123.9	4.3	4.7	174.7	204.3	338.1	231.0
7	17.831	18.039	173.3	167.1	.964	173.6	167.3	.964	-1.8	128.6	9.2	9.0	173.6	211.1	323.2	221.7
8	16.769	17.122	174.7	166.4	.952	175.3	166.9	.952	2.0	139.0	14.6	13.6	175.3	217.2	307.6	206.2
9	15.684	16.231	169.7	159.5	.940	170.8	160.5	.940	8.6	159.4	19.8	17.8	171.0	226.2	286.2	182.6
10	14.559	15.367	146.2	163.4	1.118	147.9	165.1	1.117	6.9	173.9	22.2	23.6	148.0	239.8	260.4	175.5
11	13.967	14.945	122.9	172.6	1.404	124.7	174.8	1.403	-4.9	168.3	21.0	28.0	124.8	242.7	250.3	184.5

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.451	.494	1.060	.738	.447	.388	.450	.389	3.8	38.1	3.8	38.0	65.0	58.3	64.9	58.1
2	.480	.509	1.066	.727	.477	.402	.480	.403	2.6	37.6	2.6	37.6	63.4	56.4	63.3	56.3
3	.509	.523	1.056	.703	.507	.415	.508	.416	1.6	37.4	1.6	37.4	61.3	53.8	61.2	53.7
4	.512	.523	1.042	.690	.512	.424	.512	.424	-.9	35.8	-.9	35.8	60.6	52.1	60.6	52.1
5	.505	.536	.999	.658	.505	.431	.505	.431	-.7	36.4	-.7	36.4	59.6	49.1	59.6	49.1
6	.494	.552	.957	.624	.494	.439	.494	.439	-.9	37.3	-.9	37.3	58.9	45.3	58.9	45.3
7	.491	.572	.914	.600	.490	.453	.491	.453	-.6	37.6	-.6	37.5	57.5	41.0	57.5	41.0
8	.496	.589	.869	.559	.494	.451	.496	.453	.7	39.9	.7	39.8	55.3	36.0	55.3	36.0
9	.483	.613	.808	.495	.479	.433	.482	.435	2.9	45.0	2.9	44.8	53.5	28.6	53.3	28.5
10	.415	.651	.730	.477	.410	.444	.415	.448	2.7	46.8	2.7	46.5	55.7	20.0	55.4	19.8
11	.348	.659	.698	.501	.342	.469	.347	.475	-2.3	44.3	-2.2	43.9	60.5	18.8	60.1	18.6

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	15.12	20.85	1.379	338.6	375.1	1.108	13.15	17.65	1.40823	1.71885	325.3	357.7	357.9	352.7
2	15.29	21.11	1.381	336.2	373.7	1.112	13.06	17.69	1.41565	1.73483	321.3	355.3	350.1	345.8
3	15.41	21.20	1.376	330.8	368.4	1.114	12.91	17.59	1.43053	1.75481	314.5	349.3	334.2	331.3
4	15.39	21.26	1.381	327.7	364.4	1.112	12.87	17.65	1.44030	1.77907	311.3	345.6	318.3	316.8
5	15.32	21.32	1.392	326.3	362.3	1.111	12.87	17.54	1.44439	1.78291	310.4	342.7	302.5	302.4
6	15.23	21.45	1.409	325.7	362.0	1.111	12.88	17.44	1.44546	1.78072	310.5	341.3	286.7	288.1
7	15.21	21.60	1.420	325.9	361.4	1.109	12.90	17.31	1.44520	1.77744	310.9	339.3	270.8	274.0
8	15.34	21.69	1.414	326.6	362.1	1.109	12.97	17.15	1.45180	1.76512	311.3	338.6	254.7	260.1
9	15.35	21.52	1.402	326.9	363.9	1.113	13.09	16.69	1.45990	1.71812	312.3	338.5	238.2	246.5
10	14.98	21.69	1.448	327.4	366.3	1.119	13.30	16.31	1.46437	1.68323	316.5	337.7	221.1	233.4
11	14.57	21.50	1.476	328.0	367.1	1.119	13.40	16.07	1.45797	1.65771	320.3	337.8	212.2	227.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.9	.4	4.0	.373	.887	.074	.054	.019	.015	.011	.004	1.387
2	10.0	2.1	-.4	2.6	.388	.862	.092	.076	.016	.019	.016	.003	1.352
3	20.0	1.7	-.9	2.0	.407	.838	.112	.098	.013	.023	.021	.003	1.333
4	30.0	2.8	-.2	2.8	.409	.859	.098	.082	.016	.020	.017	.003	1.371
5	40.0	3.7	.1	3.0	.418	.893	.078	.063	.015	.017	.013	.003	1.396
6	50.0	4.7	.6	3.4	.432	.920	.063	.052	.011	.014	.011	.002	1.383
7	60.0	4.9	.2	4.1	.432	.965	.029	.024	.005	.006	.005	.001	1.345
8	70.0	4.0	-1.2	5.2	.453	.955	.040	.039	.001	.009	.009	.000	1.275
9	80.0	2.9	-2.7	5.6	.500	.892	.112	.112	.000	.025	.025	.000	1.186
10	90.0	4.2	-1.2	7.5	.485	.937	.080	.080	.000	.018	.018	.000	1.162
11	95.0	7.8	2.6	12.7	.428	.986	.020	.020	.000	.004	.004	.000	1.234

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(j) 90 Percent of design speed; reading 1332

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	163.8	151.2	.923	165.0	151.8	.920	11.4	117.8	-20.0	-13.6	165.4	192.2	383.9	279.8
2	23.050	22.766	169.0	151.5	.897	169.9	152.0	.894	7.5	119.0	-17.0	-11.1	170.1	193.0	382.5	273.0
3	22.001	21.814	170.9	147.4	.862	171.2	147.5	.862	9.3	129.1	-11.0	-6.7	171.5	196.0	367.3	250.3
4	20.958	20.856	166.9	147.6	.884	167.0	147.6	.884	-1.0	126.4	-5.5	-3.0	167.0	194.3	360.4	240.9
5	19.916	19.909	160.5	149.9	.934	160.5	149.9	.934	-2.3	129.5	-.6	.7	160.5	198.1	344.5	228.8
6	18.877	18.969	156.3	148.2	.948	156.3	148.3	.948	-2.5	133.4	3.8	4.3	156.3	199.5	328.7	214.3
7	17.831	18.039	158.0	144.4	.914	158.2	144.6	.914	3.3	139.5	8.4	7.8	158.2	200.9	310.8	197.5
8	16.769	17.122	155.9	138.9	.891	156.4	139.3	.891	7.7	151.0	13.1	11.3	156.6	205.5	292.4	177.0
9	15.684	16.231	142.5	132.6	.931	143.4	133.4	.930	16.0	174.8	16.6	14.8	144.3	219.9	264.5	151.5
10	14.559	15.367	121.1	144.2	1.190	122.5	145.7	1.189	5.8	181.0	18.4	20.8	122.7	232.4	247.8	154.8
11	13.967	14.945	105.0	161.0	1.534	106.5	163.1	1.532	-13.9	168.6	17.9	26.2	107.4	234.6	249.9	173.3

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.453	.503	1.052	.732	.449	.396	.452	.397	4.0	37.9	3.9	37.8	64.7	57.2	64.5	57.1
2	.469	.506	1.054	.716	.466	.398	.468	.399	2.5	38.1	2.5	38.1	63.7	56.2	63.6	56.2
3	.477	.518	1.023	.662	.476	.390	.477	.390	3.1	41.2	3.1	41.2	62.3	53.9	62.2	53.9
4	.468	.517	1.011	.641	.468	.393	.468	.393	-.3	40.6	-.3	40.6	62.4	52.2	62.4	52.2
5	.451	.530	.968	.612	.451	.401	.451	.401	-.8	40.8	-.8	40.8	62.2	49.1	62.2	49.1
6	.439	.535	.924	.574	.439	.397	.439	.397	-.9	42.0	-.9	42.0	61.6	46.2	61.6	46.2
7	.444	.540	.873	.530	.444	.388	.444	.388	1.2	44.0	1.2	44.0	59.4	43.0	59.4	42.9
8	.439	.552	.820	.476	.437	.373	.439	.375	2.8	47.4	2.8	47.3	57.8	38.2	57.7	38.1
9	.404	.593	.741	.408	.399	.357	.402	.360	6.4	52.8	6.4	52.7	57.3	28.4	57.2	28.3
10	.342	.627	.691	.418	.338	.389	.342	.393	2.7	51.5	2.7	51.2	60.6	20.0	60.4	19.8
11	.298	.633	.694	.468	.292	.434	.296	.440	-7.6	46.3	-7.4	45.9	65.1	20.0	64.8	19.7

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.70	21.95	1.398	344.7	382.0	1.108	13.64	18.47	1.43500	1.76969	331.1	363.6	358.0	352.8
2	15.77	22.05	1.399	341.9	380.2	1.112	13.56	18.51	1.44315	1.78343	327.5	361.7	350.1	345.8
3	15.73	22.01	1.399	335.6	375.1	1.118	13.46	18.33	1.46092	1.79350	321.0	356.0	334.2	331.3
4	15.63	22.05	1.411	330.3	370.5	1.122	13.45	18.38	1.48105	1.82070	316.4	351.7	318.3	316.8
5	15.47	22.07	1.426	328.0	367.6	1.121	13.46	18.23	1.48793	1.82446	315.1	348.1	302.5	302.4
6	15.36	22.03	1.434	327.3	366.2	1.119	13.46	18.13	1.48774	1.82375	315.1	346.4	286.7	288.1
7	15.45	21.78	1.410	328.0	365.1	1.113	13.49	17.86	1.48957	1.80365	315.5	345.1	270.9	274.0
8	15.50	21.76	1.404	328.4	365.5	1.113	13.58	17.69	1.49586	1.78879	316.2	344.5	254.7	260.1
9	15.24	21.87	1.435	327.8	366.8	1.119	13.62	17.25	1.49475	1.75279	317.4	342.8	238.2	246.5
10	14.95	21.94	1.468	327.6	368.4	1.124	13.79	16.83	1.50030	1.71721	320.1	341.5	221.2	233.4
11	14.75	21.77	1.476	328.2	369.2	1.125	13.86	16.62	1.49770	1.69396	322.5	341.9	212.2	227.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.6	.1	3.0	.375	.926	.049	.033	.017	.010	.007	.003	1.372
2	10.0	2.5	-.0	2.5	.394	.895	.072	.057	.015	.015	.012	.003	1.358
3	20.0	2.7	.1	2.1	.434	.853	.108	.096	.013	.023	.020	.003	1.353
4	30.0	4.7	1.6	2.9	.451	.847	.119	.100	.019	.025	.021	.004	1.423
5	40.0	6.3	2.7	3.0	.459	.880	.099	.082	.017	.021	.017	.004	1.439
6	50.0	7.4	3.3	4.3	.475	.909	.080	.069	.011	.017	.015	.002	1.420
7	60.0	6.8	2.1	6.0	.493	.908	.084	.081	.003	.018	.017	.001	1.340
8	70.0	6.4	1.2	7.3	.531	.898	.102	.102	.000	.022	.022	.000	1.270
9	80.0	6.6	1.1	5.4	.585	.909	.112	.112	.000	.025	.025	.000	1.183
10	90.0	9.2	3.8	7.4	.550	.929	.103	.103	.000	.023	.023	.000	1.216
11	95.0	12.5	7.3	13.9	.480	.939	.088	.088	.000	.019	.019	.000	1.341

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(k) 80 Percent of design speed; reading 1347

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	144.1	141.0	.978	145.2	141.6	.975	.1	36.6	-17.6	-12.7	145.2	146.2	348.8	310.2
2	23.050	22.766	156.6	152.9	.976	157.4	153.3	.974	-2.8	38.9	-15.8	-11.2	157.4	158.2	350.5	308.4
3	22.001	21.814	167.3	163.7	.979	167.6	163.9	.978	-8.5	39.4	-10.8	-7.5	167.9	168.6	347.8	302.5
4	20.958	20.856	169.6	166.3	.981	169.7	166.3	.980	-8.8	41.1	-5.6	-3.4	169.9	171.3	336.8	291.7
5	19.916	19.909	171.0	169.9	.994	171.0	169.9	.994	-5.4	51.3	-.6	.7	171.1	177.5	322.5	275.4
6	18.877	18.969	170.8	177.3	1.038	170.9	177.3	1.038	-5.0	63.6	4.2	5.1	171.0	188.4	310.4	261.2
7	17.831	18.039	172.6	187.4	1.086	172.9	187.7	1.086	-4.4	77.0	9.2	10.2	172.9	202.9	299.4	250.5
8	16.769	17.122	177.2	196.0	1.106	177.9	196.6	1.105	-2.4	90.6	14.9	16.0	177.9	216.5	289.3	241.3
9	15.684	16.231	179.5	207.3	1.155	180.7	208.6	1.154	-1.0	111.4	21.0	23.1	180.7	236.5	279.7	234.5
10	14.559	15.367	162.1	212.2	1.309	164.0	214.4	1.308	-1.4	126.1	24.7	30.7	164.0	248.8	256.6	229.1
11	13.967	14.945	136.8	198.5	1.451	138.8	201.1	1.449	-8.6	133.5	23.4	32.3	139.1	241.4	240.7	212.2

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.410	.406	.985	.861	.407	.391	.410	.393	.1	14.6	.1	14.5	65.6	62.9	65.4	62.8
2	.448	.441	.996	.859	.445	.426	.448	.427	-1.0	14.3	-1.0	14.3	63.4	60.3	63.3	60.2
3	.482	.473	.998	.849	.480	.459	.481	.460	-2.9	13.5	-2.9	13.5	61.2	57.2	61.2	57.2
4	.489	.482	.969	.821	.488	.468	.488	.468	-3.0	13.9	-3.0	13.9	59.8	55.3	59.7	55.2
5	.492	.499	.928	.775	.492	.478	.492	.478	-1.8	16.8	-1.8	16.8	58.0	51.9	58.0	51.9
6	.492	.529	.893	.734	.491	.498	.491	.498	-1.7	19.7	-1.7	19.7	56.6	47.2	56.6	47.2
7	.497	.570	.861	.704	.497	.527	.497	.528	-1.5	22.3	-1.5	22.3	54.8	41.5	54.7	41.5
8	.511	.608	.831	.678	.509	.551	.511	.552	-.8	24.8	-.8	24.7	52.2	35.5	52.1	35.4
9	.519	.665	.801	.660	.516	.583	.519	.587	-.3	28.3	-.3	28.1	49.8	27.3	49.6	27.2
10	.468	.701	.733	.645	.463	.598	.468	.604	-.5	30.7	-.5	30.5	50.6	20.8	50.3	20.6
11	.395	.675	.683	.594	.388	.555	.394	.563	-3.6	33.9	-3.5	33.6	55.2	18.8	54.8	18.6

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	13.27	14.46	1.089	322.3	333.7	1.035	11.82	12.91	1.32093	1.39221	311.8	323.0	317.3	312.7
2	13.47	14.84	1.101	320.1	332.8	1.040	11.74	12.98	1.32932	1.41185	307.7	320.4	310.3	306.5
3	13.61	15.22	1.119	316.2	330.3	1.044	11.61	13.06	1.33874	1.43943	302.2	316.1	296.2	293.7
4	13.61	15.37	1.130	315.2	329.1	1.044	11.56	13.11	1.33859	1.45263	300.8	314.5	282.1	280.8
5	13.64	15.58	1.142	315.0	330.1	1.048	11.56	13.14	1.34027	1.45564	300.4	314.4	268.1	268.0
6	13.62	15.95	1.171	315.4	332.9	1.055	11.54	13.18	1.33676	1.45623	300.9	315.2	254.1	255.4
7	13.68	16.41	1.200	315.6	335.3	1.062	11.55	13.16	1.33830	1.45681	300.7	314.8	240.1	242.9
8	13.86	16.88	1.218	317.1	338.4	1.067	11.60	13.15	1.34129	1.45397	301.3	315.1	225.8	230.5
9	14.03	17.29	1.232	317.8	342.3	1.077	11.68	12.85	1.34903	1.42337	301.5	314.4	211.2	218.5
10	13.93	17.86	1.282	318.3	344.6	1.083	11.99	12.87	1.36963	1.42868	304.9	313.7	196.0	206.9
11	13.47	17.06	1.267	318.5	346.9	1.089	12.10	12.57	1.36434	1.37755	308.9	317.9	188.0	201.2

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.4	.9	8.7	.150	.701	.075	.064	.011	.013	.011	.002	1.363
2	10.0	2.2	-.3	6.5	.164	.700	.084	.075	.008	.015	.014	.002	1.323
3	20.0	1.7	-1.0	5.4	.179	.732	.083	.076	.007	.016	.015	.001	1.308
4	30.0	2.0	-1.0	6.0	.184	.800	.065	.060	.005	.012	.012	.001	1.287
5	40.0	2.0	-1.5	5.9	.203	.805	.073	.071	.002	.014	.014	.000	1.244
6	50.0	2.4	-1.7	5.3	.227	.832	.076	.075	.001	.016	.016	.000	1.219
7	60.0	2.1	-2.6	4.6	.243	.856	.077	.077	.000	.017	.017	.000	1.185
8	70.0	.8	-4.4	4.7	.255	.860	.085	.085	.000	.019	.019	.000	1.127
9	80.0	-1.0	-6.5	4.3	.264	.797	.147	.147	.000	.034	.034	.000	1.071
10	90.0	-.9	-6.3	8.3	.230	.890	.099	.099	.000	.022	.022	.000	1.040
11	95.0	2.5	-2.7	12.8	.259	.785	.231	.231	.000	.051	.051	.000	1.085

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(ℓ) 80 Percent of design speed; reading 1358

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	143.2	132.7	.927	144.2	133.2	.924	7.0	86.8	-17.5	-12.0	144.4	159.0	341.7	261.8
2	23.050	22.766	150.1	137.4	.916	150.8	137.8	.914	3.4	88.1	-15.1	-10.1	150.9	163.5	341.5	257.8
3	22.001	21.814	156.2	141.6	.907	156.5	141.8	.906	-3.8	90.5	-10.1	-6.5	156.5	168.2	338.0	247.4
4	20.958	20.856	154.4	143.5	.930	154.5	143.5	.929	-6.8	89.0	-5.1	-2.9	154.6	168.9	327.3	239.2
5	19.916	19.909	150.8	145.5	.965	150.8	145.5	.965	-3.8	93.9	-.6	.6	150.8	173.2	310.6	226.6
6	18.877	18.969	149.6	146.9	.981	149.7	146.9	.981	-3.5	99.2	3.7	4.2	149.7	177.3	297.6	214.1
7	17.831	18.039	152.9	150.7	.986	153.1	150.9	.986	-.8	105.2	8.1	8.2	153.1	184.0	285.1	204.0
8	16.769	17.122	157.3	155.3	.987	157.8	155.8	.987	1.5	113.0	13.2	12.7	157.8	192.5	273.9	194.9
9	15.684	16.231	155.1	154.4	.995	156.2	155.4	.995	6.6	132.9	18.1	17.2	156.3	204.5	257.1	177.2
10	14.559	15.367	135.2	160.2	1.185	136.8	161.8	1.183	4.0	147.9	20.6	23.1	136.8	219.3	235.4	172.1
11	13.967	14.945	113.8	172.0	1.512	115.4	174.3	1.510	-5.2	146.2	19.4	28.0	115.6	227.5	224.9	182.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.404	.430	.956	.708	.401	.359	.404	.360	2.8	33.2	2.8	33.1	65.2	59.5	65.0	59.4
2	.425	.444	.961	.700	.422	.373	.425	.374	1.3	32.7	1.3	32.6	63.9	57.8	63.8	57.7
3	.445	.459	.960	.676	.444	.387	.445	.387	-1.4	32.6	-1.4	32.5	62.5	55.1	62.4	55.0
4	.441	.463	.933	.656	.440	.394	.440	.394	-2.5	31.8	-2.5	31.8	61.9	53.1	61.8	53.1
5	.430	.477	.885	.624	.430	.401	.430	.401	-1.5	32.8	-1.5	32.8	61.0	50.0	61.0	50.0
6	.427	.489	.849	.590	.427	.405	.427	.405	-1.3	34.0	-1.3	34.0	59.8	46.7	59.8	46.7
7	.437	.508	.813	.564	.436	.416	.437	.417	-.3	34.9	-.3	34.9	57.6	42.3	57.5	42.3
8	.450	.532	.781	.539	.448	.429	.450	.431	.6	36.0	.6	36.0	54.9	37.0	54.8	36.9
9	.445	.565	.732	.490	.442	.427	.445	.430	2.4	40.7	2.4	40.5	52.8	28.9	52.6	28.8
10	.388	.607	.667	.476	.383	.443	.388	.448	1.7	42.7	1.7	42.4	54.8	20.1	54.5	19.9
11	.326	.630	.634	.506	.321	.477	.326	.483	-2.6	40.4	-2.6	40.0	59.5	17.6	59.1	17.4

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	13.89	17.49	1.259	327.9	352.7	1.076	12.41	15.40	1.36211	1.57747	317.5	340.1	316.7	312.1
2	13.98	17.68	1.264	325.4	351.2	1.079	12.35	15.44	1.37030	1.59208	314.1	337.8	309.8	306.0
3	14.08	17.84	1.267	320.3	347.8	1.086	12.29	15.44	1.38979	1.61172	308.1	333.7	295.7	293.2
4	13.99	17.89	1.279	318.1	344.8	1.084	12.24	15.44	1.39295	1.62703	306.2	330.6	281.7	280.3
5	13.91	18.02	1.295	317.5	343.5	1.082	12.25	15.42	1.39442	1.63531	306.1	328.6	267.7	267.6
6	13.87	18.07	1.302	317.2	343.3	1.082	12.24	15.35	1.39340	1.63229	306.0	327.6	253.7	255.0
7	13.98	18.19	1.301	317.5	343.1	1.081	12.26	15.25	1.39652	1.62855	305.8	326.3	239.7	242.5
8	14.12	18.41	1.304	318.6	344.1	1.080	12.29	15.18	1.39823	1.62401	306.2	325.7	225.4	230.1
9	14.19	18.55	1.307	318.8	346.3	1.086	12.38	14.93	1.40684	1.59827	306.6	325.5	210.8	218.1
10	13.92	18.67	1.341	319.1	348.7	1.093	12.55	14.56	1.41171	1.56158	309.8	324.8	195.7	206.5
11	13.60	18.78	1.381	319.5	349.7	1.095	12.63	14.37	1.40675	1.54519	312.9	324.0	187.7	200.9

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.1	.6	5.2	.322	.898	.055	.050	.005	.011	.010	.001	1.311
2	10.0	2.6	.1	4.0	.336	.873	.071	.067	.005	.014	.013	.001	1.292
3	20.0	2.9	.3	3.3	.367	.813	.113	.108	.005	.023	.022	.001	1.301
4	30.0	4.1	1.1	3.9	.368	.864	.085	.080	.004	.017	.016	.001	1.308
5	40.0	5.0	1.5	4.0	.372	.933	.044	.042	.002	.009	.009	.000	1.278
6	50.0	5.6	1.5	4.7	.387	.953	.033	.033	.000	.007	.007	.000	1.253
7	60.0	4.9	.2	5.4	.393	.969	.023	.023	.000	.005	.005	.000	1.197
8	70.0	3.5	-1.6	6.2	.401	.981	.015	.015	.000	.003	.003	.000	1.133
9	80.0	2.0	-3.4	5.9	.440	.922	.073	.073	.000	.017	.017	.000	1.057
10	90.0	3.3	-2.1	7.5	.420	.940	.070	.070	.000	.016	.016	.000	1.042
11	95.0	6.8	1.6	11.6	.348	1.021	-.027	-.027	.000	-.006	-.006	.000	1.100

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(m) 80 Percent of design speed; reading 1369

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	136.8	128.2	.937	137.8	128.7	.934	5.5	105.3	-16.7	-11.6	137.9	166.3	340.6	243.7
2	23.050	22.766	136.0	128.1	.942	136.7	128.4	.939	.9	105.0	-13.7	-9.4	136.7	165.9	337.9	238.7
3	22.001	21.814	133.3	126.9	.953	133.5	127.1	.952	4.4	113.4	-8.6	-5.8	133.6	170.3	320.6	220.3
4	20.958	20.856	132.1	126.3	.956	132.2	126.3	.955	.5	114.0	-4.3	-2.6	132.2	170.2	310.9	208.9
5	19.916	19.909	132.6	127.3	.960	132.6	127.3	.960	.9	117.0	-.5	.6	132.6	172.9	298.0	197.3
6	18.877	18.969	134.5	130.1	.967	134.5	130.1	.967	-1.4	116.6	3.3	3.7	134.5	174.7	288.6	190.0
7	17.831	18.039	138.7	131.3	.947	138.9	131.5	.947	1.9	119.9	7.4	7.1	138.9	177.9	275.4	179.8
8	16.769	17.122	138.6	128.8	.929	139.1	129.3	.929	7.9	130.7	11.6	10.5	139.4	183.8	258.3	163.2
9	15.684	16.231	128.1	124.9	.975	129.0	125.7	.975	14.1	151.7	15.0	13.9	129.8	197.1	235.3	142.2
10	14.559	15.367	107.3	131.9	1.230	108.5	133.3	1.228	7.0	160.6	16.3	19.1	108.8	208.7	217.8	141.0
11	13.967	14.945	90.9	143.3	1.578	92.2	145.2	1.575	-9.8	150.5	15.5	23.3	92.7	209.1	218.1	153.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.383	.443	.945	.650	.379	.342	.382	.343	2.3	39.4	2.3	39.3	66.3	58.2	66.1	58.1
2	.380	.443	.940	.637	.378	.342	.380	.343	.4	39.3	.4	39.3	66.2	57.5	66.1	57.5
3	.374	.458	.896	.592	.373	.341	.373	.341	1.9	41.8	1.9	41.8	65.4	54.8	65.4	54.8
4	.372	.460	.874	.565	.372	.341	.372	.341	.2	42.1	.2	42.1	64.8	52.8	64.8	52.8
5	.374	.470	.841	.536	.374	.346	.374	.346	.4	42.6	.4	42.6	63.6	49.8	63.6	49.8
6	.381	.477	.817	.519	.381	.355	.381	.355	.6	41.9	-.6	41.9	62.2	46.8	62.2	46.8
7	.393	.487	.780	.492	.393	.359	.393	.360	.8	42.4	.8	42.4	59.8	43.1	59.7	43.0
8	.395	.504	.731	.447	.393	.353	.394	.354	3.2	45.4	3.2	45.3	57.5	37.7	57.4	37.6
9	.367	.541	.665	.391	.362	.343	.365	.345	6.3	50.5	6.3	50.4	56.9	28.0	56.8	27.9
10	.307	.574	.614	.388	.302	.363	.306	.367	3.7	50.6	3.7	50.3	60.4	19.2	60.1	19.1
11	.260	.575	.613	.422	.255	.394	.259	.399	-6.2	46.4	-6.1	46.0	65.3	19.4	65.0	19.2

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS. IN	STATIC PRESS. OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	14.23	18.59	1.307	332.7	363.7	1.093	12.86	16.24	1.38601	1.61703	323.3	350.0	316.9	312.3
2	14.18	18.61	1.312	330.9	362.6	1.096	12.83	16.26	1.39002	1.62382	321.6	348.9	310.0	306.2
3	14.09	18.70	1.328	327.3	359.1	1.097	12.80	16.20	1.40010	1.63773	318.4	344.7	295.9	293.3
4	14.06	18.71	1.331	323.4	355.1	1.098	12.78	16.19	1.41497	1.65535	314.7	340.6	281.8	280.5
5	14.07	18.68	1.328	321.0	351.9	1.096	12.77	16.06	1.42519	1.66015	312.2	337.0	267.8	267.7
6	14.10	18.71	1.327	319.4	349.3	1.094	12.76	16.02	1.43197	1.66996	310.4	334.1	253.9	255.1
7	14.21	18.66	1.314	319.7	348.2	1.089	12.77	15.87	1.43467	1.66338	310.1	332.4	239.8	242.6
8	14.27	18.69	1.309	320.1	348.2	1.088	12.82	15.71	1.43902	1.65192	310.4	331.4	225.5	230.3
9	14.12	18.85	1.335	319.5	349.5	1.094	12.87	15.45	1.44083	1.62979	311.1	330.2	210.9	218.3
10	13.85	18.89	1.364	319.2	350.8	1.099	12.98	15.11	1.44314	1.59947	313.3	329.2	195.8	206.7
11	13.66	18.71	1.369	319.5	351.4	1.100	13.03	14.95	1.44075	1.58059	315.2	329.6	187.8	201.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.2	1.7	4.0	.394	.851	.099	.093	.006	.020	.019	.001	1.331
2	10.0	5.0	2.5	3.8	.407	.842	.109	.102	.006	.022	.020	.001	1.341
3	20.0	5.9	3.2	3.0	.433	.866	.100	.098	.003	.021	.020	.001	1.306
4	30.0	7.1	4.1	3.5	.452	.867	.105	.102	.002	.021	.021	.000	1.315
5	40.0	7.6	4.1	3.8	.464	.874	.103	.102	.001	.022	.021	.000	1.289
6	50.0	8.0	3.9	4.8	.467	.896	.087	.087	.000	.018	.018	.000	1.273
7	60.0	7.1	2.4	6.1	.472	.908	.079	.079	.000	.017	.017	.000	1.207
8	70.0	6.1	1.0	6.8	.500	.907	.088	.088	.000	.019	.019	.000	1.126
9	80.0	6.2	.7	5.0	.549	.915	.101	.101	.000	.023	.023	.000	1.054
10	90.0	8.9	3.5	6.7	.527	.933	.096	.096	.000	.022	.022	.000	1.075
11	95.0	12.7	7.5	13.3	.470	.938	.090	.090	.000	.020	.020	.000	1.189

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(n) 80 Percent of design speed; reading 1544

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	144.9	131.1	.905	145.9	131.6	.902	3.4	76.4	-17.7	-11.8	146.0	152.2	346.0	270.3
2	23.050	22.766	154.1	142.4	.924	154.9	142.8	.922	-.4	79.1	-15.5	-10.5	154.9	163.2	347.1	268.3
3	22.001	21.814	162.9	151.2	.928	163.2	151.4	.928	-7.8	77.6	-10.5	-6.9	163.4	170.1	344.9	263.7
4	20.958	20.856	164.0	153.5	.936	164.1	153.5	.935	-9.1	75.8	-5.4	-3.1	164.4	171.2	334.2	256.0
5	19.916	19.909	162.9	154.6	.949	162.9	154.6	.949	-5.9	82.8	-.6	.7	163.0	175.4	318.7	241.2
6	18.877	18.969	161.7	156.8	.970	161.7	156.9	.970	-5.7	90.5	4.0	4.5	161.8	181.1	305.9	227.5
7	17.831	18.039	164.0	162.3	.990	164.2	162.5	.990	-4.3	96.3	8.7	8.8	164.3	189.0	294.3	218.7
8	16.769	17.122	169.1	169.6	1.003	169.7	170.2	1.003	-1.4	104.3	14.2	13.9	169.7	199.6	283.5	211.8
9	15.684	16.231	169.7	175.1	1.032	170.9	176.2	1.031	1.4	123.1	19.8	19.5	170.9	214.9	270.5	200.3
10	14.559	15.367	150.8	180.0	1.193	152.5	181.8	1.192	-.0	141.6	22.9	26.0	152.5	230.4	248.3	193.2
11	13.967	14.945	126.8	184.5	1.455	128.6	186.9	1.454	-8.4	141.5	21.7	30.0	128.9	234.4	234.7	196.2

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.411	.414	.974	.736	.408	.357	.411	.358	1.3	30.2	1.3	30.1	65.2	61.0	65.1	60.9
2	.439	.446	.983	.733	.436	.389	.439	.390	-.2	29.1	-.2	29.0	63.6	57.9	63.5	57.9
3	.467	.468	.986	.726	.466	.416	.467	.417	-2.7	27.2	-2.7	27.1	61.8	55.0	61.8	55.0
4	.471	.473	.957	.708	.470	.424	.470	.424	-3.2	26.3	-3.2	26.3	60.6	53.2	60.6	53.2
5	.467	.486	.913	.668	.467	.428	.467	.428	-2.1	28.2	-2.1	28.2	59.3	50.1	59.3	50.1
6	.464	.502	.876	.630	.463	.435	.463	.435	-2.0	30.0	-2.0	30.0	58.1	46.4	58.1	46.4
7	.471	.524	.843	.607	.470	.450	.470	.451	-1.5	30.7	-1.5	30.7	56.1	42.0	56.1	42.0
8	.486	.555	.811	.589	.484	.471	.486	.473	-.5	31.6	-.5	31.5	53.3	36.6	53.2	36.5
9	.489	.598	.774	.557	.486	.487	.489	.490	.5	35.1	.5	34.9	51.0	28.6	50.8	28.4
10	.434	.641	.706	.537	.429	.501	.434	.506	-.0	38.2	-.0	37.9	52.4	19.9	52.1	19.7
11	.364	.652	.664	.546	.359	.513	.364	.520	-3.8	37.5	-3.7	37.1	57.2	17.9	56.8	17.7

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	13.56	16.61	1.224	324.6	347.3	1.070	12.07	14.76	1.33948	1.53080	314.0	335.8	317.1	312.5
2	13.70	16.98	1.239	322.1	346.4	1.075	12.00	14.81	1.34832	1.54919	310.2	333.1	310.2	306.3
3	13.82	17.19	1.244	317.9	342.8	1.079	11.90	14.79	1.36160	1.56910	304.5	328.4	296.1	293.5
4	13.80	17.32	1.255	316.5	340.2	1.075	11.86	14.86	1.36336	1.58952	303.0	325.6	282.0	280.6
5	13.76	17.40	1.264	316.5	340.1	1.075	11.85	14.81	1.36199	1.58887	303.2	324.8	268.0	267.9
6	13.73	17.56	1.278	316.1	340.6	1.077	11.85	14.78	1.36234	1.58842	303.1	324.2	254.0	255.2
7	13.80	17.74	1.286	316.6	340.8	1.077	11.85	14.71	1.36237	1.58635	303.1	323.1	239.9	242.7
8	13.99	18.03	1.289	317.9	342.1	1.076	11.90	14.63	1.36628	1.58156	303.6	322.3	225.6	230.4
9	14.11	18.40	1.304	318.5	345.0	1.083	11.98	14.45	1.37328	1.56375	304.0	322.0	211.1	218.4
10	13.92	18.59	1.335	318.9	348.1	1.091	12.23	14.10	1.38679	1.52776	307.3	321.6	195.9	206.8
11	13.52	18.47	1.367	319.3	349.2	1.094	12.33	13.89	1.38124	1.50314	311.0	321.8	187.9	201.1

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.1	.6	6.7	.298	.851	.073	.065	.008	.013	.012	.001	1.336
2	10.0	2.3	-.2	4.2	.311	.839	.084	.077	.007	.017	.015	.001	1.311
3	20.0	2.3	-.4	3.2	.323	.817	.098	.091	.007	.020	.019	.001	1.312
4	30.0	2.9	-.2	3.9	.320	.892	.058	.053	.005	.012	.011	.001	1.301
5	40.0	3.3	-.2	4.1	.333	.927	.043	.041	.002	.009	.008	.000	1.264
6	50.0	3.9	-.3	4.5	.353	.940	.038	.038	.001	.008	.008	.000	1.242
7	60.0	3.5	-1.2	5.1	.357	.970	.020	.020	.000	.004	.004	.000	1.200
8	70.0	1.9	-3.2	5.8	.356	.985	.011	.011	.000	.002	.002	.000	1.134
9	80.0	.2	-5.2	5.5	.377	.947	.044	.044	.000	.010	.010	.000	1.069
10	90.0	.9	-4.5	7.4	.363	.942	.061	.061	.000	.014	.014	.000	1.046
11	95.0	4.5	-.7	11.9	.316	.996	.004	.004	.000	.001	.001	.000	1.099

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(o) 80 Percent of design speed; reading 1555

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	144.0	135.0	.938	145.1	135.6	.935	6.0	96.2	-17.6	-12.2	145.2	166.2	344.4	256.3
2	23.050	22.766	146.4	134.9	.921	147.2	135.3	.919	1.7	97.1	-14.7	-9.9	147.2	166.5	342.8	250.2
3	22.001	21.814	148.4	135.1	.911	148.7	135.3	.910	-2.2	101.0	-9.6	-6.2	148.7	168.8	334.3	236.2
4	20.958	20.856	145.6	136.0	.934	145.7	136.0	.933	-7.2	100.7	-4.8	-2.8	145.9	169.2	324.8	226.4
5	19.916	19.909	142.8	137.6	.964	142.8	137.6	.964	-4.8	105.0	-.5	.6	142.8	173.1	308.8	214.0
6	18.877	18.969	143.8	140.2	.975	143.9	140.3	.975	-4.1	109.5	3.5	4.0	143.9	178.0	296.3	202.9
7	17.831	18.039	148.2	144.1	.972	148.4	144.3	.972	-.6	114.5	7.9	7.8	148.4	184.2	283.4	193.7
8	16.769	17.122	151.1	144.5	.957	151.6	145.0	.956	2.6	122.0	12.7	11.8	151.6	189.5	270.4	181.6
9	15.684	16.231	143.5	140.4	.979	144.5	141.3	.978	8.9	143.5	16.8	15.7	144.7	201.4	249.1	160.3
10	14.559	15.367	122.6	146.7	1.196	124.0	148.2	1.195	6.1	157.2	18.6	21.2	124.1	216.0	227.3	156.5
11	13.967	14.945	108.0	157.8	1.461	109.6	159.8	1.459	-6.3	150.5	18.5	25.6	109.7	219.5	223.6	167.9

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.405	.447	.960	.688	.402	.363	.404	.364	2.4	35.5	2.4	35.4	65.2	58.2	65.1	58.1
2	.412	.448	.961	.674	.410	.363	.412	.364	.7	35.7	.7	35.7	64.7	57.3	64.6	57.3
3	.420	.458	.944	.640	.419	.366	.420	.367	-.8	36.8	-.8	36.7	63.6	55.1	63.6	55.1
4	.414	.461	.922	.617	.413	.370	.413	.370	-2.8	36.5	-2.8	36.5	63.4	53.1	63.3	53.1
5	.406	.473	.877	.585	.405	.376	.405	.376	-1.9	37.4	-1.9	37.4	62.5	50.0	62.5	50.0
6	.409	.487	.842	.556	.409	.384	.409	.384	-1.6	38.0	-1.6	38.0	61.0	46.3	61.0	46.3
7	.422	.506	.805	.532	.421	.396	.422	.396	-.2	38.5	-.2	38.4	58.5	41.9	58.4	41.8
8	.431	.521	.768	.499	.429	.397	.431	.398	1.0	40.2	1.0	40.1	56.0	37.1	55.9	37.0
9	.411	.554	.707	.441	.407	.386	.410	.389	3.6	45.6	3.5	45.4	54.7	28.3	54.6	28.2
10	.351	.595	.642	.431	.346	.404	.350	.408	2.9	47.0	2.8	46.7	57.2	18.9	56.9	18.8
11	.309	.605	.629	.463	.304	.435	.308	.441	-3.3	43.6	-3.3	43.3	61.0	18.0	60.7	17.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	14.14	18.28	1.293	330.5	358.6	1.085	12.63	15.94	1.37481	1.61069	320.0	344.9	318.3	313.7
2	14.14	18.34	1.296	327.7	356.9	1.089	12.58	15.97	1.38311	1.62202	316.9	343.1	311.4	307.5
3	14.18	18.44	1.301	322.8	353.0	1.094	12.55	15.97	1.40292	1.64229	311.8	338.8	297.2	294.7
4	14.07	18.45	1.311	319.7	349.9	1.095	12.51	15.95	1.40994	1.65527	309.1	335.7	283.1	281.7
5	14.02	18.54	1.322	318.8	348.2	1.092	12.52	15.90	1.41266	1.66214	308.7	333.3	269.0	268.9
6	14.03	18.61	1.326	318.6	347.5	1.091	12.50	15.82	1.41318	1.66071	308.3	331.8	255.0	256.2
7	14.15	18.72	1.324	319.2	347.1	1.087	12.52	15.73	1.41490	1.65921	308.2	330.2	240.9	243.7
8	14.26	18.77	1.316	319.8	347.3	1.086	12.56	15.60	1.41860	1.64975	308.3	329.4	226.5	231.3
9	14.21	18.85	1.327	319.6	349.0	1.092	12.65	15.30	1.42555	1.62140	309.2	328.8	211.9	219.2
10	13.87	19.03	1.372	319.7	351.0	1.098	12.74	14.98	1.42223	1.59198	312.0	327.7	196.7	207.6
11	13.69	18.95	1.384	320.2	351.6	1.098	12.81	14.80	1.42094	1.57370	314.2	327.6	188.7	201.9

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.1	.6	3.9	.354	.894	.063	.057	.006	.013	.012	.001	1.318
2	10.0	3.4	.9	3.6	.373	.863	.085	.079	.006	.017	.016	.001	1.318
3	20.0	4.1	1.4	3.3	.402	.831	.113	.108	.005	.023	.022	.001	1.318
4	30.0	5.6	2.6	3.8	.415	.848	.107	.102	.005	.022	.021	.001	1.340
5	40.0	6.5	3.0	3.9	.422	.900	.075	.072	.002	.015	.015	.000	1.310
6	50.0	6.7	2.6	4.4	.433	.922	.061	.060	.001	.013	.013	.000	1.276
7	60.0	5.8	1.1	4.9	.435	.953	.038	.038	.000	.008	.008	.000	1.210
8	70.0	4.6	-.6	6.2	.451	.947	.046	.046	.000	.010	.010	.000	1.144
9	80.0	4.0	-1.5	5.3	.498	.913	.092	.092	.000	.021	.021	.000	1.067
10	90.0	5.7	.3	6.4	.476	.966	.045	.045	.000	.010	.010	.000	1.056
11	95.0	8.4	3.2	12.0	.416	.991	.013	.013	.000	.003	.003	.000	1.125

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(p) 70 Percent of design speed; reading 1475

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.566	23.223	124.7	125.1	1.003	125.6	125.6	1.000	-5.4	31.4	-15.2	-11.3	125.7	129.4	309.7	272.9
2	23.050	22.766	138.1	138.7	1.005	138.8	139.1	1.002	-6.0	35.5	-13.9	-10.2	138.9	143.6	310.3	271.1
3	22.001	21.814	149.0	149.0	1.001	149.3	149.2	.999	-10.7	33.8	-9.6	-6.8	149.7	153.0	308.4	268.5
4	20.958	20.856	151.5	151.0	.997	151.6	151.1	.997	-10.4	36.4	-5.0	-3.1	151.9	155.4	298.7	258.2
5	19.916	19.909	154.2	153.9	.998	154.2	153.9	.998	-8.4	44.3	-.6	.7	154.4	160.2	287.8	244.7
6	18.877	18.969	157.0	160.5	1.022	157.1	160.6	1.022	-7.3	52.7	3.8	4.6	157.3	169.0	278.3	234.4
7	17.831	18.039	160.7	168.7	1.050	160.9	168.9	1.050	-7.1	63.8	8.5	9.1	161.1	180.6	270.3	225.1
8	16.769	17.122	164.4	176.0	1.070	165.0	176.6	1.070	-6.0	75.5	13.8	14.4	165.1	192.1	262.1	217.1
9	15.684	16.231	167.5	185.5	1.108	168.6	186.7	1.107	-5.5	92.0	19.6	20.7	168.7	208.1	254.3	211.4
10	14.559	15.367	154.1	193.3	1.25[illegible]	155.8	195.3	1.253	-6.0	109.6	23.4	27.9	156.0	223.9	236.2	207.9
11	13.967	14.945	130.8	192.6	1.472	132.7	195.1	1.470	-11.9	114.3	22.4	31.3	133.3	226.1	220.8	204.7

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.359	.364	.885	.768	.356	.352	.359	.354	-2.5	14.1	-2.5	14.0	66.2	62.7	66.1	62.6
2	.399	.406	.892	.766	.397	.392	.399	.393	-2.5	14.4	-2.5	14.3	63.5	59.2	63.4	59.1
3	.433	.435	.892	.763	.431	.423	.432	.424	-4.1	12.8	-4.1	12.8	61.1	56.3	61.1	56.2
4	.440	.442	.865	.735	.439	.430	.439	.430	-3.9	13.5	-3.9	13.5	59.5	54.2	59.5	54.2
5	.448	.456	.834	.696	.447	.438	.447	.438	-3.1	16.1	-3.1	16.1	57.6	51.0	57.6	51.0
6	.456	.481	.807	.667	.455	.457	.455	.457	-2.7	18.2	-2.7	18.2	55.6	46.8	55.6	46.8
7	.467	.514	.784	.640	.466	.480	.467	.481	-2.5	20.7	-2.5	20.7	53.5	41.4	53.5	41.4
8	.479	.546	.760	.617	.477	.501	.478	.502	-2.1	23.2	-2.1	23.1	51.1	35.7	51.0	35.6
9	.489	.592	.737	.601	.485	.528	.488	.531	-1.9	26.4	-1.9	26.2	48.6	28.1	48.5	28.0
10	.450	.637	.681	.592	.444	.550	.449	.556	-2.2	29.6	-2.2	29.3	49.0	20.3	48.7	20.1
11	.382	.643	.633	.582	.375	.547	.380	.555	-5.2	30.7	-5.1	30.4	53.4	17.8	53.1	17.6

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	12.25	13.45	1.098	312.3	322.3	1.032	11.20	12.27	1.28226	1.36171	304.4	314.0	277.7	273.6
2	12.44	13.81	1.111	310.8	321.9	1.036	11.14	12.33	1.28892	1.37896	301.2	311.6	271.6	268.2
3	12.54	14.06	1.121	308.5	319.9	1.037	11.02	12.34	1.29137	1.39541	297.3	308.2	259.2	257.0
4	12.56	14.20	1.131	307.9	319.4	1.037	10.99	12.42	1.29198	1.40777	296.4	307.3	246.9	245.7
5	12.58	14.31	1.137	307.9	320.2	1.040	10.97	12.41	1.29064	1.40598	296.0	307.5	234.7	234.6
6	12.64	14.59	1.154	308.3	321.6	1.043	10.96	12.45	1.29067	1.41127	296.0	307.4	222.4	223.5
7	12.73	14.90	1.171	308.7	323.7	1.049	10.96	12.45	1.29091	1.41049	295.7	307.4	210.1	212.6
8	12.87	15.18	1.179	309.6	326.0	1.053	11.00	12.39	1.29447	1.40319	296.1	307.6	197.5	201.7
9	13.00	15.54	1.195	310.7	329.2	1.060	11.04	12.26	1.29751	1.38823	296.5	307.6	184.8	191.2
10	13.02	15.92	1.223	311.2	332.0	1.067	11.33	12.11	1.31998	1.37425	299.1	307.1	171.5	181.1
11	12.64	15.71	1.244	311.5	333.5	1.071	11.43	11.90	1.31516	1.34609	302.7	308.1	164.6	176.1

RP	PERCENT SPAN	INCIDENCE		DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS MACH NO
		MEAN	SS				TOT	PROF	SHOCK	TOT	PROF	SHOCK	
1	5.0	4.1	1.6	8.4	.163	.842	.042	.041	.001	.007	.007	.000	1.246
2	10.0	2.3	-.2	5.4	.176	.853	.043	.043	.000	.008	.008	.000	1.188
3	20.0	1.6	-1.1	4.5	.181	.899	.031	.031	.000	.006	.006	.000	1.165
4	30.0	1.8	-1.3	4.9	.189	.962	.012	.012	.000	.002	.002	.000	1.142
5	40.0	1.7	-1.9	5.0	.209	.933	.024	.024	.000	.005	.005	.000	1.106
6	50.0	1.4	-2.7	4.8	.224	.962	.016	.016	.000	.003	.003	.000	1.074
7	60.0	.8	-3.9	4.4	.244	.949	.025	.025	.000	.005	.005	.000	1.043
8	70.0	-.3	-5.5	4.8	.258	.914	.048	.048	.000	.011	.011	.000	1.001
9	80.0	-2.1	-7.6	5.1	.269	.875	.082	.082	.000	.019	.019	.000	.956
10	90.0	-2.5	-7.9	7.7	.240	.885	.095	.095	.000	.022	.022	.000	.929
11	95.0	.8	-4.4	11.8	.209	.910	.089	.089	.000	.020	.020	.000	.968

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(q) 70 Percent of design speed; reading 1486

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	121.9	115.1	.944	122.8	115.6	.941	2.5	70.8	-14.9	-10.4	122.9	135.5	300.0	232.2
2	23.050	22.766	125.8	121.6	.966	126.5	121.9	.964	-.2	72.9	-12.7	-8.9	126.5	142.0	298.4	229.0
3	22.001	21.814	129.9	126.6	.975	130.2	126.7	.974	-4.5	72.6	-8.4	-5.8	130.2	146.1	292.8	222.6
4	20.958	20.856	131.8	127.7	.969	131.9	127.7	.969	-7.2	71.1	-4.3	-2.6	132.1	146.2	285.1	215.3
5	19.916	19.909	132.8	129.4	.974	132.8	129.4	.974	-3.7	77.1	-.5	.6	132.9	150.6	271.8	202.9
6	18.877	18.969	132.7	132.6	.999	132.8	132.7	.999	-4.8	81.8	3.2	3.8	132.8	155.8	262.1	193.3
7	17.831	18.039	135.3	137.9	1.019	135.5	138.1	1.019	-3.4	86.8	7.2	7.5	135.5	163.1	251.9	186.0
8	16.769	17.122	140.3	143.2	1.021	140.8	143.7	1.020	-.6	94.0	11.8	11.7	140.8	171.7	242.2	178.9
9	15.684	16.231	139.5	146.2	1.048	140.5	147.1	1.047	3.4	110.9	16.3	16.3	140.5	184.2	228.6	167.1
10	14.559	15.367	122.1	150.7	1.234	123.5	152.2	1.233	1.0	124.8	18.6	21.8	123.5	196.9	209.8	161.9
11	13.967	14.945	103.3	156.3	1.513	104.8	158.3	1.511	-7.1	123.1	17.7	25.4	105.0	200.5	200.3	166.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.348	.374	.850	.640	.345	.318	.348	.319	1.2	31.6	1.1	31.5	66.0	60.2	65.8	60.1
2	.359	.393	.848	.633	.357	.336	.359	.337	-.1	30.9	-.1	30.9	65.0	57.9	64.9	57.8
3	.372	.406	.837	.618	.371	.352	.372	.352	-2.0	29.9	-2.0	29.8	63.7	55.3	63.6	55.3
4	.379	.408	.817	.600	.378	.356	.378	.356	-3.1	29.1	-3.1	29.1	62.5	53.6	62.4	53.6
5	.381	.421	.780	.567	.381	.362	.381	.362	-1.6	30.8	-1.6	30.8	60.7	50.4	60.7	50.4
6	.381	.436	.753	.541	.381	.371	.381	.371	-2.1	31.7	-2.1	31.6	59.6	46.7	59.6	46.6
7	.389	.457	.724	.522	.389	.387	.389	.387	-1.4	32.2	-1.4	32.2	57.5	42.1	57.5	42.1
8	.404	.482	.695	.502	.403	.402	.404	.403	-.2	33.3	-.2	33.2	54.5	36.7	54.5	36.6
9	.403	.517	.656	.469	.400	.411	.403	.413	1.4	37.2	1.4	37.0	52.3	28.5	52.1	28.3
10	.353	.553	.600	.455	.349	.423	.353	.428	.5	39.6	.5	39.4	54.3	20.1	53.9	19.9
11	.299	.564	.570	.468	.294	.439	.298	.445	-3.9	38.2	-3.9	37.9	58.8	18.4	58.5	18.2

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	12.82	15.22	1.187	317.7	336.2	1.058	11.79	13.82	1.32435	1.47189	310.2	327.1	276.1	272.1
2	12.85	15.41	1.198	316.2	335.6	1.061	11.76	13.85	1.32892	1.48229	308.2	325.6	270.1	266.8
3	12.89	15.51	1.203	313.3	332.9	1.063	11.71	13.84	1.33879	1.49648	304.8	322.3	257.8	255.6
4	12.89	15.54	1.205	311.5	330.6	1.061	11.68	13.86	1.34333	1.50895	302.8	319.9	245.6	244.4
5	12.92	15.63	1.210	311.0	329.7	1.060	11.68	13.84	1.34692	1.51376	302.2	318.5	233.4	233.3
6	12.89	15.73	1.220	310.5	329.6	1.062	11.66	13.80	1.34677	1.51472	301.7	317.5	221.2	222.3
7	12.96	15.88	1.226	310.7	329.7	1.061	11.67	13.76	1.34839	1.51494	301.6	316.5	208.9	211.4
8	13.09	16.05	1.226	311.6	330.5	1.061	11.70	13.69	1.35054	1.50996	301.7	315.8	196.5	200.6
9	13.16	16.27	1.236	311.9	332.3	1.065	11.77	13.55	1.35731	1.49693	302.1	315.4	183.8	190.2
10	12.96	16.38	1.263	312.1	334.3	1.071	11.89	13.30	1.36052	1.47104	304.5	315.0	170.6	180.1
11	12.72	16.32	1.283	312.5	335.1	1.072	11.96	13.16	1.35688	1.45513	307.0	315.1	163.7	175.1

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.9	1.3	6.0	.312	.861	.070	.070	.000	.013	.013	.000	1.188
2	10.0	3.8	1.3	4.1	.323	.864	.072	.072	.000	.014	.014	.000	1.174
3	20.0	4.1	1.5	3.5	.333	.864	.075	.075	.000	.015	.015	.000	1.168
4	30.0	4.7	1.7	4.3	.338	.895	.059	.059	.000	.012	.012	.000	1.163
5	40.0	4.8	1.2	4.3	.350	.928	.043	.043	.000	.009	.009	.000	1.120
6	50.0	5.4	1.2	4.7	.364	.948	.034	.034	.000	.007	.007	.000	1.105
7	60.0	4.8	.1	5.1	.366	.980	.014	.014	.000	.003	.003	.000	1.064
8	70.0	3.2	-2.0	5.8	.370	.987	.010	.010	.000	.002	.002	.000	1.001
9	80.0	1.5	-3.9	5.4	.393	.953	.041	.041	.000	.009	.009	.000	.936
10	90.0	2.7	-2.7	7.6	.374	.970	.033	.033	.000	.007	.007	.000	.925
11	95.0	6.2	1.0	12.4	.323	1.020	-.024	-.024	.000	-.005	-.005	.000	.977

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(r) 70 Percent of design speed; reading 1497

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	114.0	112.3	.985	114.9	112.8	.982	-5.0	78.0	-13.9	-10.1	115.0	137.1	303.7	224.5
2	23.050	22.766	115.7	114.4	.989	116.3	114.7	.986	-7.1	79.2	-11.6	-8.4	116.5	139.4	300.6	219.9
3	22.001	21.814	115.3	111.7	.969	115.6	111.8	.968	3.8	94.5	-7.4	-5.1	115.6	146.4	279.1	196.1
4	20.958	20.856	117.0	110.7	.947	117.0	110.8	.946	1.9	96.2	-3.8	-2.2	117.0	146.7	270.4	185.0
5	19.916	19.909	119.0	115.1	.968	119.0	115.1	.968	.3	97.6	-.4	.5	119.0	150.9	261.7	178.0
6	18.877	18.969	119.6	120.5	1.008	119.6	120.6	1.008	-4.0	95.7	2.9	3.5	119.7	153.9	255.0	174.9
7	17.831	18.039	123.9	125.6	1.014	124.0	125.8	1.014	-2.0	97.7	6.6	6.8	124.1	159.3	244.7	169.6
8	16.769	17.122	127.9	127.1	.994	128.3	127.5	.993	2.0	104.7	10.7	10.4	128.3	164.9	233.1	159.6
9	15.684	16.231	121.0	124.3	1.027	121.8	125.0	1.026	6.5	122.0	14.1	13.9	122.0	174.7	215.1	142.4
10	14.559	15.367	101.9	128.6	1.261	103.1	129.9	1.260	3.7	134.6	15.5	18.6	103.2	187.0	196.2	137.6
11	13.967	14.945	90.0	136.5	1.517	91.3	138.3	1.515	-7.7	128.1	15.4	22.2	91.6	188.5	194.2	146.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.323	.374	.853	.612	.320	.306	.322	.307	-2.5	34.8	-2.5	34.7	67.9	59.9	67.8	59.8
2	.328	.380	.846	.600	.326	.312	.327	.313	-3.5	34.7	-3.5	34.6	67.3	58.6	67.2	58.6
3	.327	.402	.789	.538	.326	.307	.327	.307	1.9	40.2	1.9	40.2	65.6	55.3	65.5	55.2
4	.333	.405	.768	.510	.332	.305	.332	.305	.9	41.0	.9	41.0	64.4	53.2	64.4	53.2
5	.339	.418	.746	.493	.339	.319	.339	.319	.2	40.3	.2	40.3	63.0	49.7	63.0	49.7
6	.342	.428	.729	.486	.342	.335	.342	.335	-1.9	38.4	-1.9	38.4	62.0	46.4	62.0	46.4
7	.355	.444	.699	.473	.354	.350	.355	.351	-.9	37.9	-.9	37.8	59.6	42.2	59.5	42.1
8	.367	.460	.666	.445	.366	.355	.367	.356	.9	39.5	.9	39.4	56.7	37.1	56.6	37.0
9	.349	.488	.614	.398	.346	.347	.348	.349	3.1	44.5	3.1	44.3	55.7	28.8	55.5	28.6
10	.294	.523	.559	.385	.290	.360	.294	.363	2.1	46.3	2.1	46.0	58.6	19.5	58.3	19.3
11	.260	.527	.552	.408	.256	.382	.259	.387	-4.9	43.2	-4.8	42.8	62.3	19.0	62.0	18.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	13.01	15.88	1.220	322.3	344.8	1.070	12.11	14.42	1.33625	1.49759	315.7	335.4	276.2	272.2
2	13.02	15.96	1.226	320.6	343.5	1.072	12.08	14.44	1.34131	1.50706	313.8	333.9	270.1	266.8
3	12.96	16.06	1.239	317.8	340.9	1.073	12.03	14.37	1.34699	1.51561	311.2	330.3	257.8	255.6
4	12.98	16.08	1.238	315.1	338.1	1.073	12.03	14.37	1.35924	1.52899	308.3	327.3	245.6	244.4
5	13.02	16.14	1.239	312.9	335.5	1.072	12.02	14.31	1.36946	1.53785	305.9	324.1	233.4	233.3
6	13.01	16.19	1.245	311.8	333.8	1.071	12.00	14.28	1.37199	1.54473	304.7	322.1	221.2	222.3
7	13.10	16.25	1.240	312.2	333.1	1.067	12.01	14.20	1.37433	1.54326	304.5	320.5	209.0	211.4
8	13.21	16.34	1.237	312.6	333.1	1.066	12.04	14.13	1.37788	1.54052	304.4	319.6	196.5	200.7
9	13.17	16.38	1.244	312.3	334.2	1.070	12.11	13.92	1.38318	1.52023	304.9	319.0	183.8	190.2
10	12.90	16.51	1.280	312.1	335.6	1.075	12.15	13.70	1.37924	1.50016	306.8	318.2	170.6	180.1
11	12.79	16.41	1.283	312.6	336.2	1.075	12.20	13.58	1.37819	1.48547	308.4	318.5	163.7	175.1

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	5.8	3.3	5.7	.364	.836	.097	.097	.000	.018	.018	.000	1.250
2	10.0	6.1	3.6	4.9	.374	.837	.100	.100	.000	.019	.019	.000	1.240
3	20.0	6.0	3.4	3.5	.412	.870	.090	.090	.000	.018	.018	.000	1.154
4	30.0	6.6	3.6	4.0	.434	.864	.099	.099	.000	.020	.020	.000	1.143
5	40.0	7.0	3.5	3.7	.440	.875	.094	.094	.000	.020	.020	.000	1.128
6	50.0	7.8	3.7	4.5	.435	.912	.068	.068	.000	.014	.014	.000	1.131
7	60.0	6.9	2.2	5.2	.426	.944	.044	.044	.000	.010	.010	.000	1.078
8	70.0	5.3	.1	6.2	.438	.952	.040	.040	.000	.009	.009	.000	1.008
9	80.0	4.9	-.5	5.7	.479	.918	.085	.085	.000	.019	.019	.000	.946
10	90.0	7.1	1.7	7.0	.463	.970	.039	.039	.000	.009	.009	.000	.944
11	95.0	9.7	4.5	13.0	.414	.977	.031	.031	.000	.007	.007	.000	1.012

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(s) 60 Percent of design speed; reading 1510

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	87.7	90.7	1.033	88.4	91.0	1.030	-2.7	17.2	-10.7	-8.2	88.4	92.6	219.5	200.1
2	23.050	22.766	97.1	102.1	1.052	97.5	102.4	1.049	-4.0	20.1	-9.8	-7.5	97.6	104.3	220.6	199.6
3	22.001	21.814	104.6	108.8	1.040	104.9	108.9	1.039	-6.4	19.0	-6.7	-5.0	105.1	110.6	218.3	197.2
4	20.958	20.856	106.8	110.9	1.039	106.8	110.9	1.038	-5.1	21.0	-3.5	-2.2	106.9	112.9	210.5	190.1
5	19.916	19.909	109.6	114.9	1.048	109.6	114.9	1.048	-3.7	25.5	-.4	.5	109.7	117.7	203.2	182.6
6	18.877	18.969	112.3	119.7	1.066	112.3	119.8	1.067	-3.0	32.0	2.7	3.4	112.3	124.0	196.9	174.9
7	17.831	18.039	114.8	126.5	1.102	115.0	126.7	1.102	-3.0	40.2	6.1	6.9	115.0	132.9	191.3	168.8
8	16.769	17.122	118.0	132.3	1.121	118.4	132.8	1.121	-2.1	48.4	9.9	10.8	118.5	141.3	185.8	163.6
9	15.684	16.231	121.1	138.4	1.143	121.9	139.2	1.142	-2.0	60.4	14.1	15.4	122.0	151.8	181.1	158.7
10	14.559	15.367	112.5	148.1	1.316	113.8	149.7	1.315	-3.7	74.0	17.1	21.4	113.9	167.0	169.9	159.6
11	13.967	14.945	96.6	154.0	1.594	98.0	156.1	1.592	-7.6	78.2	16.5	25.0	98.3	174.6	158.9	163.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.256	.267	.636	.576	.254	.261	.256	.262	-1.8	10.7	-1.8	10.7	66.4	63.0	66.3	62.9
2	.284	.301	.641	.576	.282	.295	.283	.295	-2.3	11.1	-2.3	11.1	63.9	59.2	63.8	59.1
3	.306	.320	.636	.571	.305	.315	.306	.315	-3.5	9.9	-3.5	9.9	61.3	56.5	61.3	56.5
4	.312	.327	.614	.551	.311	.321	.312	.321	-2.7	10.7	-2.7	10.7	59.5	54.3	59.5	54.3
5	.320	.341	.593	.529	.320	.333	.320	.333	-1.9	12.5	-1.9	12.5	57.4	51.0	57.4	51.0
6	.328	.360	.575	.507	.328	.347	.328	.347	-1.5	15.0	-1.5	15.0	55.2	46.8	55.2	46.8
7	.336	.385	.559	.489	.335	.367	.336	.367	-1.5	17.6	-1.5	17.6	53.1	41.4	53.1	41.3
8	.346	.410	.543	.474	.345	.384	.346	.385	-1.0	20.1	-1.0	20.0	50.5	35.9	50.4	35.8
9	.356	.440	.529	.460	.354	.401	.356	.403	-.9	23.6	-.9	23.4	47.9	28.8	47.7	28.7
10	.332	.484	.495	.463	.328	.429	.331	.434	-1.9	26.5	-1.8	26.3	48.3	20.5	47.9	20.3
11	.285	.506	.461	.473	.280	.447	.284	.453	-4.5	26.9	-4.4	26.6	52.3	17.1	51.9	16.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	11.13	11.56	1.039	300.6	304.5	1.013	10.63	11.00	1.24829	1.27672	296.7	300.2	198.2	195.3
2	11.21	11.75	1.048	299.6	304.2	1.015	10.60	11.03	1.25297	1.28651	294.8	298.8	193.9	191.5
3	11.26	11.82	1.050	298.3	303.0	1.016	10.55	11.01	1.25496	1.29208	292.8	296.9	185.0	183.5
4	11.27	11.90	1.056	298.0	302.5	1.015	10.53	11.05	1.25558	1.29971	292.3	296.2	176.3	175.4
5	11.29	12.00	1.062	297.9	302.8	1.016	10.52	11.07	1.25543	1.30325	291.9	295.9	167.5	167.4
6	11.34	12.10	1.067	297.9	303.5	1.019	10.52	11.07	1.25673	1.30301	291.7	295.9	158.8	159.5
7	11.37	12.28	1.080	298.2	304.8	1.022	10.51	11.08	1.25576	1.30435	291.6	296.0	150.0	151.7
8	11.45	12.41	1.084	298.7	306.0	1.024	10.54	11.06	1.25825	1.30121	291.7	296.0	141.0	144.0
9	11.52	12.54	1.089	299.3	307.8	1.028	10.55	10.98	1.25956	1.29133	291.9	296.3	131.9	136.5
10	11.54	12.80	1.109	299.9	309.9	1.033	10.69	10.90	1.26976	1.28358	293.4	296.0	122.4	129.2
11	11.36	12.88	1.133	300.3	311.0	1.036	10.74	10.81	1.26611	1.27283	295.5	295.8	117.5	125.7

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.3	1.8	8.8	.123	.848	.028	.028	.000	.005	.005	.000	.898
2	10.0	2.6	.1	5.5	.135	.875	.027	.027	.000	.005	.005	.000	.861
3	20.0	1.8	-.9	4.7	.138	.901	.022	.022	.000	.004	.004	.000	.836
4	30.0	1.8	-1.3	5.0	.139	1.024	-.006	-.006	.000	-.001	-.001	.000	.811
5	40.0	1.4	-2.1	5.0	.148	1.066	-.018	-.018	.000	-.004	-.004	.000	.782
6	50.0	1.0	-3.1	4.9	.166	1.008	-.003	-.003	.000	-.001	-.001	.000	.757
7	60.0	.4	-4.2	4.4	.184	1.017	-.007	-.007	.000	-.001	-.001	.000	.736
8	70.0	-.9	-6.1	5.0	.195	.965	.016	.016	.000	.004	.004	.000	.704
9	80.0	-2.9	-8.4	5.8	.214	.870	.072	.072	.000	.016	.016	.000	.671
10	90.0	-3.3	-8.7	7.9	.173	.904	.071	.071	.000	.016	.016	.000	.661
11	95.0	-.4	-5.6	11.1	.102	1.021	-.019	-.019	.000	-.004	-.004	.000	.687

TABLE XI. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(t) 60 Percent of design speed; reading 1521

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.566	23.223	85.0	82.2	.968	85.6	82.6	.964	4.2	39.9	-10.4	-7.4	85.7	91.7	212.5	176.4
2	23.050	22.766	87.9	90.2	1.026	88.4	90.5	1.024	1.6	40.7	-8.9	-6.6	88.4	99.2	212.0	176.2
3	22.001	21.814	92.8	95.2	1.026	93.0	95.3	1.025	-2.0	41.7	-6.0	-4.3	93.0	104.0	209.3	171.2
4	20.958	20.856	94.8	95.9	1.012	94.8	95.9	1.011	-3.3	42.4	-3.1	-1.9	94.9	104.9	203.4	164.3
5	19.916	19.909	95.0	97.7	1.028	95.0	97.7	1.028	-1.2	46.8	-.3	.4	95.0	108.3	193.9	155.5
6	18.877	18.969	95.8	100.7	1.050	95.9	100.7	1.051	-1.6	50.5	2.3	2.9	95.9	112.6	187.1	148.7
7	17.831	18.039	98.9	106.5	1.077	99.1	106.7	1.077	-.7	54.9	5.3	5.8	99.1	120.0	180.6	144.3
8	16.769	17.122	103.0	112.4	1.092	103.3	112.8	1.091	1.1	60.8	8.6	9.2	103.3	128.1	174.2	140.4
9	15.684	16.231	103.9	117.6	1.132	104.6	118.3	1.131	3.1	72.1	12.1	13.1	104.6	138.5	166.2	134.9
10	14.559	15.367	91.7	123.5	1.347	92.7	124.8	1.346	.2	80.9	13.9	17.8	92.7	148.7	153.7	134.0
11	13.967	14.945	75.6	125.3	1.658	76.7	127.0	1.656	-4.8	81.9	12.9	20.4	76.8	151.1	144.6	134.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.247	.261	.612	.503	.245	.235	.247	.235	2.8	25.9	2.8	25.8	66.4	62.2	66.2	62.1
2	.255	.283	.612	.503	.254	.258	.255	.258	1.1	24.3	1.1	24.2	65.5	59.2	65.4	59.1
3	.269	.298	.606	.490	.269	.273	.269	.273	-1.3	23.7	-1.3	23.6	63.7	56.2	63.6	56.2
4	.275	.301	.590	.471	.275	.275	.275	.275	-2.0	23.9	-2.0	23.9	62.2	54.3	62.2	54.3
5	.276	.311	.563	.447	.276	.280	.276	.280	-.7	25.6	-.7	25.6	60.7	51.1	60.7	51.1
6	.279	.324	.544	.427	.278	.289	.279	.289	-.9	26.6	-.9	26.6	59.2	47.4	59.2	47.4
7	.288	.345	.525	.415	.287	.306	.288	.307	-.4	27.3	-.4	27.2	56.8	42.4	56.7	42.3
8	.300	.369	.506	.404	.299	.323	.300	.325	.6	28.4	.6	28.3	53.7	36.6	53.6	36.5
9	.304	.399	.483	.388	.302	.339	.304	.341	1.7	31.5	1.7	31.3	51.2	28.8	51.0	28.7
10	.269	.428	.445	.386	.266	.356	.269	.359	.1	33.2	.1	33.0	53.2	21.5	52.9	21.3
11	.222	.435	.418	.387	.218	.361	.222	.365	-3.6	33.2	-3.6	32.8	58.3	19.4	58.0	19.2

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	11.39	12.26	1.076	303.1	310.1	1.023	10.92	11.69	1.27055	1.33156	299.4	305.9	198.7	195.8
2	11.41	12.38	1.085	302.5	310.0	1.025	10.90	11.71	1.27220	1.33738	298.6	305.1	194.3	191.9
3	11.45	12.44	1.086	300.9	308.9	1.027	10.89	11.70	1.27895	1.34267	296.6	303.5	185.5	183.9
4	11.46	12.47	1.088	299.9	307.9	1.027	10.87	11.71	1.28202	1.34935	295.4	302.4	176.7	175.8
5	11.46	12.52	1.093	299.5	307.5	1.027	10.87	11.71	1.28306	1.35237	295.0	301.7	167.9	167.8
6	11.46	12.58	1.098	299.3	307.6	1.028	10.86	11.70	1.28362	1.35284	294.7	301.3	159.1	159.9
7	11.51	12.69	1.103	299.5	307.9	1.028	10.86	11.69	1.28450	1.35378	294.6	300.7	150.3	152.1
8	11.57	12.82	1.108	300.0	308.5	1.029	10.87	11.67	1.28565	1.35412	294.6	300.4	141.4	144.3
9	11.63	12.93	1.112	300.3	309.7	1.031	10.90	11.59	1.28861	1.34524	294.8	300.1	132.2	136.8
10	11.55	13.08	1.133	300.7	311.1	1.035	10.98	11.53	1.29101	1.33893	296.4	300.1	122.7	129.5
11	11.40	13.05	1.145	300.8	311.6	1.036	11.01	11.46	1.28816	1.32921	297.9	300.3	117.7	126.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.3	1.8	7.9	.233	.922	.027	.027	.000	.005	.005	.000	.865
2	10.0	4.2	1.7	5.4	.237	.958	.016	.016	.000	.003	.003	.000	.856
3	20.0	4.1	1.5	4.4	.256	.899	.041	.041	.000	.008	.008	.000	.847
4	30.0	4.5	1.4	5.0	.268	.918	.035	.035	.000	.007	.007	.000	.835
5	40.0	4.7	1.2	5.1	.278	.964	.017	.017	.000	.003	.003	.000	.807
6	50.0	5.0	.8	5.5	.291	.974	.013	.013	.000	.003	.003	.000	.791
7	60.0	4.1	-.6	5.4	.291	1.011	-.006	-.006	.000	-.001	-.001	.000	.758
8	70.0	2.3	-2.8	5.8	.289	1.039	-.024	-.024	.000	-.005	-.005	.000	.714
9	80.0	.4	-5.0	5.8	.297	.985	.011	.011	.000	.003	.003	.000	.670
10	90.0	1.7	-3.7	8.9	.258	1.047	-.044	-.044	.000	-.010	-.010	.000	.671
11	95.0	5.7	.5	13.3	.213	1.091	-.100	-.100	.000	-.022	-.022	.000	.709

TABLE XI. - Concluded. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE ROTOR

(u) 60 Percent of design speed; reading 1533

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.566	23.223	81.4	82.9	1.019	82.0	83.3	1.015	1.9	49.0	-9.9	-7.5	82.0	96.6	212.5	168.0
2	23.050	22.766	82.6	84.3	1.021	83.0	84.5	1.019	-.5	49.9	-8.3	-6.2	83.0	98.2	211.0	164.6
3	22.001	21.814	82.0	84.5	1.032	82.1	84.6	1.031	4.1	58.8	-5.3	-3.9	82.2	103.0	198.4	150.4
4	20.958	20.856	82.4	84.8	1.029	82.4	84.8	1.029	1.5	59.7	-2.7	-1.7	82.5	103.7	192.9	143.2
5	19.916	19.909	83.5	86.2	1.033	83.5	86.2	1.033	1.0	62.1	-.3	.4	83.5	106.3	186.0	135.9
6	18.877	18.969	84.7	89.1	1.052	84.7	89.1	1.052	-.5	62.2	2.1	2.6	84.7	108.7	180.1	131.8
7	17.831	18.039	88.5	93.8	1.061	88.6	94.0	1.061	.9	64.7	4.7	5.1	88.6	114.1	173.2	127.9
8	16.769	17.122	92.3	97.2	1.052	92.7	97.5	1.052	3.5	70.4	7.7	7.9	92.7	120.3	165.6	122.0
9	15.684	16.231	88.6	97.4	1.100	89.2	98.0	1.099	6.6	82.3	10.3	10.9	89.4	128.0	153.6	111.9
10	14.559	15.367	74.6	100.7	1.350	75.5	101.7	1.349	3.3	90.4	11.3	14.5	75.5	136.1	140.9	108.8
11	13.967	14.945	65.5	105.0	1.603	66.5	106.4	1.601	-2.5	90.5	11.2	17.1	66.5	139.7	136.9	112.0

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.235	.274	.609	.476	.234	.235	.235	.236	1.3	30.6	1.3	30.5	67.4	60.4	67.3	60.3
2	.238	.278	.606	.467	.237	.239	.238	.240	-.3	30.6	-.3	30.5	66.9	59.2	66.8	59.1
3	.237	.293	.571	.427	.236	.240	.236	.240	2.9	34.8	2.9	34.8	65.6	55.8	65.6	55.8
4	.238	.295	.557	.408	.238	.241	.238	.242	1.1	35.2	1.1	35.1	64.7	53.7	64.7	53.7
5	.242	.303	.538	.388	.242	.246	.242	.246	.7	35.8	.7	35.8	63.3	50.6	63.3	50.6
6	.245	.311	.522	.377	.245	.255	.245	.255	-.3	34.9	-.3	34.9	62.0	47.5	62.0	47.5
7	.257	.327	.502	.366	.256	.269	.257	.269	.6	34.6	.6	34.6	59.3	42.7	59.2	42.7
8	.269	.345	.480	.350	.268	.278	.269	.279	2.2	35.9	2.2	35.9	56.1	37.0	56.0	36.9
9	.259	.367	.445	.321	.257	.279	.258	.281	4.3	40.2	4.2	40.0	54.7	29.0	54.5	28.8
10	.218	.390	.407	.312	.216	.289	.218	.292	2.5	41.9	2.5	41.6	57.9	21.0	57.6	20.8
11	.192	.401	.395	.321	.189	.301	.192	.305	-2.2	40.8	-2.1	40.4	61.3	18.4	61.0	18.2

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	11.54	12.68	1.099	305.8	314.9	1.030	11.10	12.03	1.27876	1.35126	302.4	310.3	197.9	195.0
2	11.54	12.71	1.102	304.9	314.5	1.031	11.09	12.05	1.28126	1.35504	301.5	309.7	193.5	191.1
3	11.50	12.77	1.110	303.6	313.6	1.033	11.06	12.03	1.28367	1.35957	300.2	308.3	184.7	183.1
4	11.51	12.79	1.112	301.9	312.1	1.034	11.06	12.04	1.29113	1.36765	298.5	306.7	176.0	175.1
5	11.52	12.80	1.112	300.7	310.8	1.034	11.06	12.01	1.29620	1.37111	297.2	305.2	167.2	167.1
6	11.52	12.83	1.114	300.1	310.1	1.033	11.05	12.00	1.29805	1.37458	296.6	304.2	158.5	159.3
7	11.57	12.89	1.114	300.2	309.8	1.032	11.05	11.97	1.29951	1.37476	296.3	303.3	149.7	151.4
8	11.63	12.98	1.115	300.6	310.2	1.032	11.06	11.95	1.30104	1.37452	296.3	303.0	140.8	143.8
9	11.63	13.01	1.119	300.5	310.8	1.034	11.10	11.86	1.30402	1.36517	296.5	302.6	131.7	136.3
10	11.49	13.08	1.138	300.6	311.8	1.037	11.12	11.77	1.30063	1.35550	297.8	302.6	122.2	129.0
11	11.43	13.08	1.144	300.7	312.3	1.039	11.14	11.71	1.30015	1.34827	298.5	302.6	117.3	125.5

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	5.3	2.8	6.1	.292	.912	.040	.040	.000	.008	.008	.000	.883
2	10.0	5.7	3.2	5.4	.308	.894	.051	.051	.000	.010	.010	.000	.879
3	20.0	6.1	3.4	4.0	.339	.922	.044	.044	.000	.009	.009	.000	.836
4	30.0	7.0	3.9	4.4	.360	.912	.052	.052	.000	.010	.010	.000	.836
5	40.0	7.4	3.8	4.6	.375	.909	.058	.058	.000	.012	.012	.000	.820
6	50.0	7.7	3.6	5.5	.376	.944	.037	.037	.000	.008	.008	.000	.809
7	60.0	6.6	1.9	5.8	.370	.976	.016	.016	.000	.004	.004	.000	.768
8	70.0	4.7	-.5	6.2	.376	.993	.005	.005	.000	.001	.001	.000	.716
9	80.0	3.9	-1.5	6.0	.401	.954	.042	.042	.000	.010	.010	.000	.671
10	90.0	6.4	1.0	8.4	.380	1.008	-.009	-.009	.000	-.002	-.002	.000	.679
11	95.0	8.7	3.5	12.4	.345	1.017	-.022	-.022	.000	-.005	-.005	.000	.711

TABLE XII. - BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(a) 100 Percent of design speed; reading 1283

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	176.2	164.1	.931	176.2	164.1	.931	136.7	14.8	.5	.5	223.1	164.7	223.1	164.7
2	22.697	22.730	175.1	170.7	.975	175.1	170.7	.975	143.2	17.7	1.2	1.0	226.2	171.6	226.2	171.6
3	21.788	21.849	177.2	177.9	1.004	177.2	177.9	1.004	147.7	10.9	2.3	2.0	230.7	178.2	230.7	178.2
4	20.889	20.973	183.1	178.4	.974	183.1	178.4	.974	141.4	7.8	3.6	2.9	231.4	178.6	231.4	178.6
5	20.002	20.109	185.0	176.5	.954	185.1	176.5	.954	142.6	7.4	4.8	3.5	233.6	176.7	233.6	176.7
6	19.129	19.258	184.5	174.7	.946	184.6	174.7	.946	145.4	8.1	6.2	4.1	235.0	174.9	235.0	174.9
7	18.268	18.423	181.2	170.7	.942	181.4	170.8	.941	150.5	6.6	7.5	4.5	235.7	170.9	235.7	170.9
8	17.414	17.600	172.1	168.3	.978	172.3	168.4	.977	163.4	8.0	8.7	4.8	237.5	168.6	237.5	168.6
9	16.576	16.800	158.1	163.8	1.036	158.4	163.8	1.034	187.5	13.6	9.6	5.0	245.5	164.4	245.5	164.4
10	15.751	16.035	158.8	147.1	.926	159.2	147.2	.924	200.7	12.2	11.7	4.8	256.2	147.7	256.2	147.7
11	15.342	15.669	172.5	136.4	.791	173.1	136.5	.788	188.2	8.5	14.1	4.5	255.7	136.7	255.7	136.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.574	.417	.574	.417	.453	.416	.453	.416	37.8	5.2	37.8	5.2	37.8	5.2	37.8	5.2
2	.584	.436	.584	.436	.452	.434	.452	.434	39.3	5.9	39.3	5.9	39.3	5.9	39.3	5.9
3	.601	.458	.601	.458	.461	.457	.461	.457	39.8	3.5	39.8	3.5	39.8	3.5	39.8	3.5
4	.607	.462	.607	.462	.480	.461	.481	.461	37.7	2.5	37.7	2.5	37.7	2.5	37.7	2.5
5	.617	.459	.617	.459	.488	.459	.489	.459	37.6	2.4	37.6	2.4	37.6	2.4	37.6	2.4
6	.622	.455	.622	.455	.489	.455	.489	.455	38.2	2.6	38.2	2.6	38.2	2.6	38.2	2.6
7	.626	.445	.626	.445	.481	.445	.481	.445	39.7	2.2	39.7	2.2	39.7	2.2	39.7	2.2
8	.630	.439	.630	.439	.457	.438	.458	.439	43.5	2.7	43.5	2.7	43.5	2.7	43.5	2.7
9	.652	.427	.652	.427	.420	.425	.420	.425	49.9	4.8	49.8	4.8	49.9	4.8	49.8	4.8
10	.681	.381	.681	.381	.422	.380	.423	.380	51.7	4.7	51.6	4.7	51.7	4.7	51.6	4.7
11	.679	.352	.679	.352	.458	.351	.459	.351	47.5	3.6	47.4	3.5	47.5	3.6	47.4	3.5

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	25.48	24.81	.974	401.4	401.4	1.000	20.39	22.01	1.88541	1.97647	376.7	388.0	.0	.0
2	25.59	25.09	.981	399.8	399.8	1.000	20.32	22.02	1.89116	1.99124	374.4	385.2	.0	.0
3	25.65	25.40	.990	393.8	393.8	1.000	20.10	22.01	1.90630	2.02825	367.4	378.0	.0	.0
4	25.70	25.44	.990	388.1	388.1	1.000	20.04	21.98	1.93113	2.05696	361.5	372.3	.0	.0
5	25.58	25.34	.991	384.6	384.6	1.000	19.79	21.94	1.92875	2.07038	357.5	369.1	.0	.0
6	25.51	25.28	.991	382.9	382.9	1.000	19.65	21.93	1.92611	2.07783	355.5	367.7	.0	.0
7	25.34	25.08	.990	381.2	381.2	1.000	19.47	21.89	1.91832	2.08007	353.6	366.7	.0	.0
8	25.14	24.87	.989	381.4	381.4	1.000	19.24	21.79	1.89712	2.06649	353.4	367.3	.0	.0
9	25.26	24.80	.982	383.4	383.4	1.000	18.99	21.88	1.87221	2.06065	353.5	370.0	.0	.0
10	25.15	23.96	.953	385.2	385.2	1.000	18.44	21.68	1.82233	2.01761	352.6	374.4	.0	.0
11	24.89	23.59	.948	386.1	386.1	1.000	18.29	21.66	1.80202	2.00267	353.7	376.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.7	-3.0	19.4	.475	.000	.131	.131	.000	.051	.051	.000	.958
2	10.0	4.4	-1.4	18.6	.454	.000	.095	.095	.000	.036	.036	.000	.992
3	20.0	4.8	-.9	14.1	.446	.000	.045	.045	.000	.016	.016	.000	1.011
4	30.0	2.6	-3.1	12.1	.432	.000	.047	.047	.000	.016	.016	.000	.961
5	40.0	1.8	-3.7	11.7	.439	.000	.040	.040	.000	.014	.014	.000	.957
6	50.0	1.3	-4.2	11.8	.445	.000	.039	.039	.000	.013	.013	.000	.957
7	60.0	1.5	-3.9	11.5	.463	.000	.043	.043	.000	.013	.013	.000	.972
8	70.0	3.8	-1.6	12.3	.483	.000	.047	.047	.000	.014	.014	.000	1.035
9	80.0	7.7	2.5	15.2	.528	.000	.074	.074	.000	.021	.021	.000	1.180
10	90.0	6.0	.9	17.5	.619	.000	.177	.177	.000	.047	.047	.000	1.236
11	95.0	-.5	-5.5	18.3	.647	.000	.197	.197	.000	.051	.051	.000	1.114

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(b) 100 Percent of design speed; reading 1382

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.142	23.160	176.4	192.4	1.091	176.4	192.4	1.091	65.0	-16.6	.5	.6	188.0	193.2	188.0	193.2
2	22.697	22.730	193.0	212.0	1.098	193.0	212.0	1.098	73.0	-11.1	1.3	1.3	206.4	212.2	206.4	212.2
3	21.788	21.849	212.4	226.0	1.064	212.5	226.0	1.064	77.0	-4.6	2.8	2.6	226.0	226.0	226.0	226.0
4	20.889	20.973	217.5	225.6	1.037	217.5	225.6	1.037	74.1	-4.0	4.3	3.6	229.8	225.7	229.8	225.7
5	20.002	20.109	216.7	227.6	1.050	216.8	227.7	1.050	80.1	-4.1	5.7	4.6	231.1	227.7	231.1	227.7
6	19.129	19.258	216.9	234.9	1.083	217.1	235.0	1.083	90.6	-5.1	7.3	5.5	235.2	235.0	235.2	235.0
7	18.268	18.423	227.7	251.0	1.102	227.9	251.1	1.101	106.3	-6.9	9.5	6.6	251.5	251.2	251.5	251.2
8	17.414	17.600	245.4	275.2	1.122	245.7	275.4	1.121	127.9	-10.6	12.4	7.9	277.0	275.6	277.0	275.6
9	16.576	16.800	255.4	283.9	1.112	255.8	284.0	1.110	155.6	-8.6	15.6	8.7	299.4	284.1	299.4	284.1
10	15.751	16.035	241.7	266.9	1.105	242.3	267.1	1.102	167.6	3.0	17.8	8.6	294.6	267.1	294.6	267.1
11	15.342	15.669	216.2	259.5	1.200	217.0	259.6	1.197	169.3	-3.7	17.7	8.5	275.2	259.6	275.2	259.6

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.500	.514	.500	.514	.469	.512	.469	.512	20.2	-4.9	20.2	-4.9	20.2	-4.9	20.2	-4.9
2	.552	.569	.552	.569	.516	.568	.516	.568	20.7	-3.0	20.7	-3.0	20.7	-3.0	20.7	-3.0
3	.612	.612	.612	.612	.575	.612	.575	.612	19.9	-1.2	19.9	-1.2	19.9	-1.2	19.9	-1.2
4	.626	.614	.626	.614	.592	.614	.593	.614	18.8	-1.0	18.8	-1.0	18.8	-1.0	18.8	-1.0
5	.630	.620	.630	.620	.591	.620	.591	.620	20.3	-1.0	20.3	-1.0	20.3	-1.0	20.3	-1.0
6	.641	.640	.641	.640	.591	.640	.591	.640	22.7	-1.2	22.6	-1.2	22.7	-1.2	22.6	-1.2
7	.687	.685	.687	.685	.622	.685	.622	.685	25.0	-1.6	25.0	-1.6	25.0	-1.6	25.0	-1.6
8	.758	.754	.758	.754	.672	.753	.672	.753	27.5	-2.2	27.5	-2.2	27.5	-2.2	27.5	-2.2
9	.821	.774	.821	.774	.701	.774	.702	.774	31.3	-1.7	31.3	-1.7	31.3	-1.7	31.3	-1.7
10	.806	.722	.806	.722	.661	.722	.663	.722	34.7	.7	34.7	.7	34.7	.7	34.7	.7
11	.744	.698	.744	.698	.584	.697	.586	.697	38.1	-.8	38.0	-.8	38.1	-.8	38.0	-.8

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	18.11	17.45	.963	369.9	369.9	1.000	15.27	14.57	1.51020	1.44449	352.3	351.4	.0	.0
2	18.76	18.19	.970	369.1	369.1	1.000	15.25	14.61	1.52739	1.46822	347.9	346.7	.0	.0
3	19.55	18.71	.957	365.2	365.2	1.000	15.19	14.53	1.55676	1.48981	339.8	339.8	.0	.0
4	19.69	18.60	.945	361.8	361.8	1.000	15.12	14.43	1.56980	1.49365	335.5	336.5	.0	.0
5	19.67	18.73	.952	361.0	361.0	1.000	15.05	14.45	1.56810	1.50164	334.4	335.2	.0	.0
6	19.79	18.90	.955	362.7	362.7	1.000	15.01	14.35	1.56029	1.49089	335.2	335.3	.0	.0
7	20.30	19.58	.965	365.6	365.6	1.000	14.81	14.30	1.54479	1.49099	334.1	334.2	.0	.0
8	21.74	20.63	.949	370.5	370.5	1.000	14.86	14.16	1.55768	1.48237	332.3	332.7	.0	.0
9	22.64	21.02	.928	375.3	375.3	1.000	14.54	14.14	1.53171	1.46993	330.7	335.2	.0	.0
10	22.61	19.24	.851	375.8	375.8	1.000	14.75	13.59	1.54483	1.39166	332.6	340.3	.0	.0
11	21.16	18.70	.884	378.4	378.4	1.000	14.66	13.51	1.49876	1.36487	340.8	344.9	.0	.0

RP	PERCENT	INCIDENCE		DEVIA	D	EFFIC	LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS
	SPAN	MEAN	SS		FACTOR		TOT	PROF	SHOCK	TOT	PROF	SHOCK	MACH NO
1	5.0	-15.0	-20.8	9.2	.142	.000	.235	.235	.000	.092	.092	.000	.500
2	10.0	-14.3	-20.1	9.6	.128	.000	.162	.162	.000	.062	.062	.000	.552
3	20.0	-15.2	-20.9	9.2	.133	.000	.192	.192	.000	.071	.071	.000	.612
4	30.0	-16.4	-22.0	8.5	.138	.000	.238	.238	.000	.084	.084	.000	.626
5	40.0	-15.6	-21.2	8.2	.138	.000	.204	.204	.000	.069	.069	.000	.630
6	50.0	-14.3	-19.8	7.8	.132	.000	.185	.185	.000	.060	.060	.000	.641
7	60.0	-13.2	-18.7	7.6	.140	.000	.131	.131	.000	.041	.041	.000	.687
8	70.0	-12.3	-17.7	7.3	.152	.000	.162	.162	.000	.048	.048	.000	.766
9	80.0	-10.9	-16.1	8.6	.205	.000	.201	.201	.000	.057	.057	.000	.947
10	90.0	-11.1	-16.2	13.4	.242	.000	.429	.429	.000	.115	.115	.000	.987
11	95.0	-10.0	-15.0	13.8	.219	.000	.379	.379	.000	.099	.099	.000	.977

...MENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(c) 100 Percent of design speed; reading 1393

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	167.7	166.4	.992	167.7	166.4	.992	91.4	-8.6	.5	.5	191.0	166.6	191.0	166.6
2	22.697	22.730	183.2	181.4	.990	183.2	181.4	.990	97.2	-4.5	1.2	1.1	207.4	181.4	207.4	181.4
3	21.788	21.849	197.5	194.5	.985	197.5	194.5	.985	98.6	-2.2	2.6	2.2	220.8	194.6	220.8	194.6
4	20.889	20.973	200.9	195.9	.975	200.9	196.0	.975	94.0	-6.2	3.9	3.1	221.8	196.1	221.8	196.1
5	20.002	20.109	200.1	196.7	.983	200.2	196.8	.983	99.5	-7.0	5.2	3.9	223.6	196.9	223.6	196.9
6	19.129	19.258	201.5	202.8	1.006	201.7	202.9	1.006	109.7	-7.8	6.8	4.7	229.6	203.1	229.6	203.1
7	18.268	18.423	213.4	217.5	1.020	213.5	217.6	1.019	121.8	-7.7	8.9	5.7	245.8	217.8	245.8	217.8
8	17.414	17.600	228.2	238.1	1.043	228.5	238.2	1.042	136.0	-6.0	11.6	6.9	265.9	238.2	265.9	238.2
9	16.576	16.800	229.8	249.7	1.087	230.2	249.8	1.085	156.9	.7	14.0	7.7	278.6	249.8	278.6	249.8
10	15.751	16.035	222.5	237.3	1.066	223.1	237.4	1.064	176.9	10.8	16.4	7.7	284.7	237.6	284.7	237.6
11	15.342	15.669	222.0	219.6	.989	222.8	219.7	.986	173.3	7.0	18.2	7.2	282.2	219.8	282.2	219.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.501	.435	.501	.435	.440	.434	.440	.434	28.6	-3.0	28.6	-3.0	28.6	-3.0	28.6	-3.0
2	.548	.476	.548	.476	.484	.476	.484	.476	28.0	-1.4	28.0	-1.4	28.0	-1.4	28.0	-1.4
3	.590	.516	.590	.516	.528	.516	.528	.516	26.5	-.6	26.5	-.6	26.5	-.6	26.5	-.6
4	.597	.523	.597	.523	.540	.523	.540	.523	25.1	-1.8	25.1	-1.8	25.1	-1.8	25.1	-1.8
5	.603	.527	.603	.527	.540	.526	.540	.526	26.4	-2.0	26.4	-2.0	26.4	-2.0	26.4	-2.0
6	.619	.543	.619	.543	.544	.543	.544	.543	28.6	-2.2	28.6	-2.2	28.6	-2.2	28.6	-2.2
7	.665	.584	.665	.584	.577	.583	.578	.583	29.7	-2.0	29.7	-2.0	29.7	-2.0	29.7	-2.0
8	.723	.641	.723	.641	.620	.640	.621	.641	30.8	-1.4	30.8	-1.4	30.8	-1.4	30.8	-1.4
9	.757	.672	.757	.672	.624	.671	.626	.672	34.3	.2	34.3	.2	34.3	.2	34.3	.2
10	.773	.634	.773	.634	.604	.633	.606	.633	38.5	2.6	38.4	2.6	38.5	2.6	38.4	2.6
11	.764	.582	.764	.582	.601	.581	.603	.582	38.0	1.8	37.9	1.8	38.0	1.8	37.9	1.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	19.98	19.65	.983	379.4	379.4	1.000	16.83	17.26	1.62313	1.64465	361.3	365.6	.0	.0
2	20.60	20.18	.980	378.0	378.0	1.000	16.80	17.28	1.64136	1.66487	356.7	361.7	.0	.0
3	21.05	20.66	.981	373.1	373.1	1.000	16.64	17.23	1.66176	1.69456	348.8	354.2	.0	.0
4	21.10	20.72	.982	368.4	368.4	1.000	16.59	17.19	1.68030	1.71446	344.0	349.3	.0	.0
5	21.10	20.72	.982	367.3	367.3	1.000	16.51	17.15	1.67948	1.71699	342.4	348.0	.0	.0
6	21.22	20.91	.986	368.3	368.3	1.000	16.38	17.11	1.66825	1.71353	342.1	347.8	.0	.0
7	21.87	21.48	.982	369.9	369.9	1.000	16.25	17.06	1.66616	1.71550	339.9	346.4	.0	.0
8	22.88	22.40	.979	372.3	372.3	1.000	16.17	16.99	1.67052	1.72062	337.2	344.1	.0	.0
9	23.41	22.88	.977	375.7	375.7	1.000	16.01	16.91	1.65531	1.70957	337.1	344.6	.0	.0
10	23.27	21.88	.940	378.3	378.3	1.000	15.68	16.70	1.61648	1.66090	338.0	350.2	.0	.0
11	22.97	20.96	.913	379.3	379.3	1.000	15.61	16.67	1.60064	1.63418	339.7	355.3	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-6.3	-12.1	11.5	.332	.000	.105	.105	.000	.041	.041	.000	.684
2	10.0	-6.7	-12.5	11.4	.313	.000	.111	.111	.000	.043	.043	.000	.723
3	20.0	-8.2	-13.9	10.1	.287	.000	.090	.090	.000	.033	.033	.000	.724
4	30.0	-9.8	-15.5	8.0	.275	.000	.085	.085	.000	.030	.030	.000	.675
5	40.0	-9.1	-14.7	7.5	.280	.000	.084	.084	.000	.028	.028	.000	.696
6	50.0	-8.1	-13.6	7.2	.281	.000	.064	.064	.000	.021	.021	.000	.744
7	60.0	-8.2	-13.7	7.5	.277	.000	.069	.069	.000	.021	.021	.000	.803
8	70.0	-8.8	-14.1	8.4	.261	.000	.072	.072	.000	.021	.021	.000	.869
9	80.0	-7.6	-12.9	10.8	.260	.000	.072	.072	.000	.020	.020	.000	.972
10	90.0	-7.0	-12.1	15.6	.320	.000	.184	.184	.000	.049	.049	.000	1.061
11	95.0	-9.8	-14.8	16.8	.373	.000	.273	.273	.000	.071	.071	.000	1.011

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(d) 100 Percent of design speed; reading 1415

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.142	23.160	171.5	162.9	.950	171.5	162.9	.950	126.7	2.0	.5	.5	213.3	162.9	213.3	162.9
2	22.697	22.730	175.3	170.6	.973	175.3	170.6	.973	131.4	6.5	1.2	1.0	219.1	170.7	219.1	170.7
3	21.788	21.849	181.8	178.5	.982	181.8	178.5	.982	133.2	5.1	2.4	2.1	225.4	178.5	225.4	178.5
4	20.889	20.973	187.6	181.1	.965	187.7	181.1	.965	130.1	2.2	3.7	2.9	228.3	181.1	228.3	181.1
5	20.002	20.109	190.8	182.6	.957	190.8	182.6	.957	133.4	1.4	5.0	3.7	232.9	182.6	232.9	182.6
6	19.129	19.258	193.0	185.6	.962	193.1	185.7	.961	138.8	.4	6.5	4.3	237.8	185.7	237.8	185.7
7	18.268	18.423	196.4	189.5	.965	196.6	189.5	.964	143.6	.7	8.2	5.0	243.4	189.5	243.4	189.5
8	17.414	17.600	194.9	191.6	.983	195.2	191.7	.982	151.2	-.3	9.9	5.5	246.8	191.7	246.8	191.7
9	16.576	16.800	185.2	189.2	1.021	185.6	189.3	1.020	170.2	7.2	11.3	5.8	251.8	189.4	251.8	189.4
10	15.751	16.035	179.7	176.1	.980	180.2	176.2	.978	189.5	13.0	13.3	5.7	261.5	176.7	261.5	176.7
11	15.342	15.669	183.4	163.2	.890	184.0	163.2	.887	185.5	9.7	15.0	5.4	261.3	163.5	261.3	163.5

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.552	.417	.552	.417	.444	.417	.444	.417	36.5	.7	36.5	.7	36.5	.7	36.5	.7
2	.570	.438	.570	.438	.456	.438	.456	.438	36.9	2.2	36.9	2.2	36.9	2.2	36.9	2.2
3	.592	.463	.592	.463	.477	.463	.477	.463	36.2	1.6	36.2	1.6	36.2	1.6	36.2	1.6
4	.604	.473	.604	.473	.496	.473	.496	.473	34.7	.7	34.7	.7	34.7	.7	34.7	.7
5	.619	.479	.619	.479	.507	.478	.507	.479	35.0	.4	35.0	.4	35.0	.4	35.0	.4
6	.634	.488	.634	.488	.515	.488	.515	.488	35.7	.1	35.7	.1	35.7	.1	35.7	.1
7	.652	.499	.652	.499	.526	.499	.526	.499	36.2	.2	36.2	.2	36.2	.2	36.2	.2
8	.662	.505	.662	.505	.522	.505	.523	.505	37.8	-.1	37.8	-.1	37.8	-.1	37.8	-.1
9	.674	.497	.674	.497	.496	.497	.497	.497	42.6	2.2	42.5	2.2	42.6	2.2	42.5	2.2
10	.700	.461	.700	.461	.481	.459	.482	.459	46.5	4.2	46.4	4.2	46.5	4.2	46.4	4.2
11	.698	.425	.698	.425	.490	.424	.492	.424	45.3	3.4	45.2	3.4	45.3	3.4	45.2	3.4

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.54	23.09	.981	393.9	393.9	1.000	19.13	20.49	1.79527	1.87502	371.3	380.7	.0	.0
2	23.77	23.39	.984	392.1	392.1	1.000	19.08	20.50	1.80516	1.89161	368.2	377.6	.0	.0
3	23.97	23.68	.988	386.4	386.4	1.000	18.91	20.45	1.82431	1.92229	361.2	370.6	.0	.0
4	24.07	23.84	.990	381.9	381.9	1.000	18.81	20.46	1.84131	1.94934	356.0	365.6	.0	.0
5	24.15	23.86	.988	379.4	379.4	1.000	18.65	20.40	1.84395	1.95925	352.4	362.8	.0	.0
6	24.23	23.98	.990	378.1	378.1	1.000	18.48	20.39	1.83961	1.96740	350.0	361.0	.0	.0
7	24.37	24.14	.990	377.0	377.0	1.000	18.32	20.36	1.83687	1.97521	347.5	359.1	.0	.0
8	24.37	24.15	.991	376.9	376.9	1.000	18.17	20.29	1.82639	1.97117	346.6	358.6	.0	.0
9	24.28	23.97	.987	379.1	379.1	1.000	17.91	20.24	1.79527	1.95181	347.6	361.3	.0	.0
10	24.35	23.32	.958	381.8	381.8	1.000	17.56	20.16	1.75905	1.91774	347.8	366.3	.0	.0
11	24.13	22.78	.944	383.0	383.0	1.000	17.43	20.13	1.73988	1.89719	349.0	369.7	.0	.0

RP	PERCENT	INCIDENCE		DEVIA	D	EFFIC	LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS
	SPAN	MEAN	SS		FACTOR		TOT	PROF	SHOCK	TOT	PROF	SHOCK	MACH NO
1	5.0	1.5	-4.2	15.1	.465	.000	.102	.102	.000	.040	.040	.000	.900
2	10.0	2.1	-3.6	15.0	.439	.000	.081	.081	.000	.031	.031	.000	.925
3	20.0	1.4	-4.3	12.3	.417	.000	.057	.057	.000	.021	.021	.000	.927
4	30.0	-.2	-5.9	10.5	.404	.000	.044	.044	.000	.016	.016	.000	.899
5	40.0	-.7	-6.2	9.9	.407	.000	.052	.052	.000	.018	.018	.000	.908
6	50.0	-1.0	-6.5	9.5	.407	.000	.043	.043	.000	.014	.014	.000	.925
7	60.0	-1.8	-7.3	9.7	.402	.000	.039	.039	.000	.012	.012	.000	.938
8	70.0	-1.8	-7.1	9.7	.404	.000	.036	.036	.000	.011	.011	.000	.962
9	80.0	.6	-4.7	12.8	.429	.000	.049	.049	.000	.014	.014	.000	1.057
10	90.0	1.0	-4.1	17.2	.504	.000	.152	.152	.000	.041	.041	.000	1.151
11	95.0	-2.5	-7.5	18.3	.548	.000	.201	.201	.000	.052	.052	.000	1.099

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(e) 100 Percent of design speed; reading 1426

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.142	23.160	170.0	162.2	.954	170.0	162.2	.954	132.0	4.3	.5	.5	215.3	162.3	215.3	162.3
2	22.697	22.730	173.0	169.3	.979	173.0	169.3	.979	138.2	8.5	1.1	1.0	221.4	169.5	221.4	169.5
3	21.788	21.849	180.3	177.5	.985	180.3	177.5	.984	140.7	6.3	2.4	2.0	228.7	177.6	228.7	177.6
4	20.889	20.973	186.0	179.6	.965	186.1	179.6	.965	137.1	3.0	3.6	2.9	231.1	179.7	231.1	179.7
5	20.002	20.109	188.0	179.6	.955	188.0	179.6	.955	139.0	2.2	4.9	3.6	233.8	179.6	233.8	179.6
6	19.129	19.258	190.3	182.0	.956	190.4	182.0	.956	143.7	1.9	6.4	4.3	238.5	182.0	238.5	182.0
7	18.268	18.423	191.5	183.1	.956	191.7	183.2	.956	148.8	1.9	8.0	4.9	242.6	183.2	242.6	183.2
8	17.414	17.600	186.2	181.1	.973	186.4	181.2	.972	156.3	1.0	9.4	5.2	243.3	181.2	243.3	181.2
9	16.576	16.800	175.1	177.2	1.012	175.4	177.2	1.011	176.0	9.4	10.7	5.4	248.4	177.5	248.4	177.5
10	15.751	16.035	170.7	162.4	.951	171.2	162.5	.949	192.7	11.4	12.6	5.2	257.7	162.9	257.7	162.9
11	15.342	15.669	176.0	147.9	.840	176.6	147.9	.838	185.2	8.4	14.4	4.9	255.9	148.2	255.9	148.2

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.555	.413	.555	.413	.438	.413	.438	.413	37.8	1.5	37.8	1.5	37.8	1.5	37.8	1.5
2	.573	.433	.573	.433	.448	.432	.448	.432	38.6	2.9	38.6	2.9	38.6	2.9	38.6	2.9
3	.598	.458	.598	.458	.471	.457	.471	.457	38.0	2.0	38.0	2.0	38.0	2.0	38.0	2.0
4	.609	.466	.609	.466	.490	.466	.490	.466	36.4	1.0	36.4	1.0	36.4	1.0	36.4	1.0
5	.619	.468	.619	.468	.498	.468	.498	.468	36.5	.7	36.5	.7	36.5	.7	36.5	.7
6	.634	.476	.634	.476	.506	.476	.506	.476	37.1	.6	37.0	.6	37.1	.6	37.0	.6
7	.647	.480	.647	.480	.511	.480	.511	.480	37.9	.6	37.8	.6	37.9	.6	37.8	.6
8	.649	.475	.649	.475	.497	.475	.498	.475	40.0	.3	40.0	.3	40.0	.3	40.0	.3
9	.662	.464	.662	.464	.467	.463	.468	.463	45.2	3.0	45.1	3.0	45.2	3.0	45.1	3.0
10	.687	.423	.687	.423	.455	.421	.457	.422	48.5	4.0	48.4	4.0	48.5	4.0	48.4	4.0
11	.681	.383	.681	.383	.468	.382	.470	.382	46.5	3.2	46.4	3.2	46.5	3.2	46.4	3.2

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	24.30	23.87	.982	397.8	397.8	1.000	19.71	21.23	1.83263	1.92257	374.8	384.7	.0	.0
2	24.55	24.16	.984	396.1	396.1	1.000	19.65	21.24	1.84172	1.93795	371.7	381.8	.0	.0
3	24.81	24.48	.987	390.6	390.6	1.000	19.49	21.21	1.86232	1.97060	364.6	374.9	.0	.0
4	24.89	24.62	.989	385.7	385.7	1.000	19.38	21.22	1.87985	1.99928	359.2	369.7	.0	.0
5	24.82	24.56	.990	382.4	382.4	1.000	19.17	21.14	1.88014	2.01024	355.2	366.4	.0	.0
6	24.92	24.68	.990	380.9	380.9	1.000	19.02	21.14	1.87887	2.02093	352.7	364.5	.0	.0
7	24.98	24.75	.991	379.3	379.3	1.000	18.85	21.14	1.87630	2.03085	350.1	362.7	.0	.0
8	24.75	24.51	.990	379.0	379.0	1.000	18.64	21.01	1.85808	2.01797	349.6	362.7	.0	.0
9	24.70	24.37	.986	380.9	380.9	1.000	18.40	21.03	1.83066	2.00620	350.2	365.3	.0	.0
10	24.68	23.68	.959	383.1	383.1	1.000	18.00	20.94	1.79091	1.97229	350.1	370.0	.0	.0
11	24.36	23.15	.950	384.1	384.1	1.000	17.86	20.92	1.76981	1.95337	351.5	373.2	.0	.0

RP	PERCENT SPAN	INCIDENCE		DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT			LOSS PARAMETER			PEAK SS MACH NO
		MEAN	SS				TOT	PROF	SHOCK	TOT	PROF	SHOCK	
1	5.0	2.9	-2.9	15.9	.478	.000	.093	.093	.000	.036	.036	.000	.930
2	10.0	3.9	-1.9	15.7	.459	.000	.080	.080	.000	.031	.031	.000	.965
3	20.0	3.2	-2.5	12.7	.440	.000	.062	.062	.000	.023	.023	.000	.972
4	30.0	1.4	-4.2	10.8	.427	.000	.048	.048	.000	.017	.017	.000	.940
5	40.0	.9	-4.7	10.2	.429	.000	.045	.045	.000	.015	.015	.000	.940
6	50.0	.3	-5.2	9.9	.429	.000	.040	.040	.000	.013	.013	.000	.953
7	60.0	-.2	-5.6	10.1	.432	.000	.038	.038	.000	.012	.012	.000	.968
8	70.0	.4	-4.9	10.1	.443	.000	.039	.039	.000	.011	.011	.000	.993
9	80.0	3.1	-2.1	13.7	.473	.000	.053	.053	.000	.015	.015	.000	1.096
10	90.0	2.9	-2.2	17.0	.555	.000	.150	.150	.000	.040	.040	.000	1.176
11	95.0	-1.3	-6.4	18.1	.599	.000	.186	.186	.000	.049	.049	.000	1.098

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(f) 100 Percent of design speed; reading 1437

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	171.9	163.2	.949	171.9	163.2	.949	135.3	5.6	.5	.5	218.8	163.3	218.8	163.3
2	22.697	22.730	173.4	169.7	.978	173.4	169.7	.978	140.7	9.4	1.2	1.0	223.3	170.0	223.3	170.0
3	21.788	21.849	177.9	176.1	.990	177.9	176.1	.990	142.7	6.3	2.3	2.0	228.1	178.2	228.1	176.2
4	20.889	20.973	183.4	176.6	.963	183.4	176.6	.963	136.9	3.1	3.6	2.8	228.8	176.6	228.8	176.6
5	20.002	20.109	186.2	177.2	.952	186.3	177.2	.951	139.9	2.6	4.9	3.6	232.9	177.2	232.9	177.2
6	19.129	19.258	188.2	180.9	.961	188.3	181.0	.961	146.5	2.8	6.3	4.2	238.6	181.0	238.6	181.0
7	18.268	18.423	188.0	180.2	.959	188.1	180.3	.958	152.2	2.8	7.8	4.8	242.0	180.3	242.0	180.3
8	17.414	17.600	180.7	174.7	.967	181.0	174.8	.966	159.0	2.6	9.2	5.0	240.9	174.8	240.9	174.8
9	16.576	16.800	167.5	169.7	1.013	167.8	169.8	1.012	178.6	10.8	10.2	5.2	245.1	170.2	245.1	170.2
10	15.751	16.035	163.7	155.9	.952	164.2	155.9	.950	194.7	13.8	12.1	5.0	254.7	156.5	254.7	156.5
11	15.342	15.669	171.9	143.3	.833	172.5	143.3	.831	185.1	9.8	14.1	4.7	253.0	143.7	253.0	143.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.563	.414	.563	.414	.442	.414	.442	.414	38.2	2.0	38.2	2.0	38.2	2.0	38.2	2.0
2	.577	.433	.577	.433	.448	.432	.448	.432	39.0	3.2	39.0	3.2	39.0	3.2	39.0	3.2
3	.595	.453	.595	.453	.464	.453	.464	.453	38.7	2.1	38.7	2.1	38.7	2.1	38.7	2.1
4	.602	.458	.602	.458	.482	.458	.482	.458	36.7	1.0	36.7	1.0	36.7	1.0	36.7	1.0
5	.616	.461	.616	.461	.492	.461	.492	.461	36.9	.8	36.9	.8	36.9	.8	36.9	.8
6	.632	.472	.632	.472	.499	.472	.499	.472	37.9	.9	37.9	.9	37.9	.9	37.9	.9
7	.644	.471	.644	.471	.500	.471	.500	.471	39.0	.9	39.0	.9	39.0	.9	39.0	.9
8	.641	.457	.641	.457	.481	.457	.482	.457	41.3	.8	41.3	.8	41.3	.8	41.3	.8
9	.652	.443	.652	.443	.445	.442	.446	.442	46.8	3.6	46.8	3.6	46.8	3.6	46.8	3.6
10	.678	.405	.678	.405	.436	.403	.437	.404	49.9	5.1	49.9	5.1	49.9	5.1	49.9	5.1
11	.672	.371	.672	.371	.457	.370	.458	.370	47.1	3.9	47.0	3.9	47.1	3.9	47.0	3.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	24.90	24.34	.978	400.0	400.0	1.000	20.09	21.63	1.86010	1.94854	376.2	386.8	.0	.0
2	25.08	24.61	.981	398.4	398.4	1.000	20.02	21.64	1.86721	1 96309	373.6	384.0	.0	.0
3	25.18	24.88	.988	392.2	392.2	1.000	19.83	21.62	1.88565	1.99860	366.4	376.8	.0	.0
4	25.20	24.92	.989	386.5	386.5	1.000	19.73	21.59	1.90721	2.02759	360.5	371.0	.0	.0
5	25.22	24.92	.988	383.5	383.5	1.000	19.53	21.54	1.90807	2.03969	356.6	367.9	.0	.0
6	25.35	25.09	.990	382.8	382.8	1.000	19.36	21.55	1.90308	2.04811	354.5	366.5	.0	.0
7	25.36	25.10	.990	381.0	381.0	1.000	19.20	21.57	1.90039	2.05910	352.0	364.9	.0	.0
8	25.01	24.66	.986	380.1	380.1	1.000	18.97	21.37	1.88080	2.04029	351.3	365.0	.0	.0
9	24.91	24.56	.986	382.1	382.1	1.000	18.73	21.47	1.85302	2.03384	352.2	367.7	.0	.0
10	24.84	23.88	.962	384.0	394.0	1.000	18.26	21.33	1.80397	1.99871	351.8	371.8	.0	.0
11	24.53	23.43	.955	384.7	384.7	1.000	18.12	21.31	1.78893	1.98239	352.9	374.5	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.3	-2.5	16.4	.486	.000	.116	.116	.000	.045	.045	.000	.951
2	10.0	4.3	-1.4	16.0	.464	.000	.093	.093	.000	.036	.036	.000	.979
3	20.0	3.9	-1.8	12.7	.448	.000	.056	.056	.000	.021	.021	.000	.982
4	30.0	1.8	-3.9	10.8	.434	.000	.050	.050	.000	.018	.018	.000	.936
5	40.0	1.3	-4.3	10.3	.438	.000	.052	.052	.000	.018	.018	.000	.944
6	50.0	1.2	-4.3	10.2	.436	.000	.042	.042	.000	.014	.014	.000	.969
7	60.0	1.0	-4.4	10.4	.445	.000	.042	.042	.000	.013	.013	.000	.988
8	70.0	1.7	-3.6	10.6	.465	.000	.058	.058	.000	.017	.017	.000	1.010
9	80.0	4.8	-.4	14.3	.497	.000	.058	.058	.000	.016	.016	.000	1.116
10	90.0	4.4	-.7	18.0	.574	.000	.145	.145	.000	.039	.039	.000	1.193
11	95.0	-.7	-5.7	18.8	.611	.000	.172	.172	.000	.045	.045	.000	1.098

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(g) 100 Percent of design speed; reading 1461

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	175.3	164.9	.941	175.3	164.9	.941	137.0	3.3	.5	.5	222.5	165.0	222.5	165.0
2	22.697	22.730	176.5	170.9	.968	176.5	170.9	.968	142.4	7.1	1.2	1.0	226.8	171.1	226.8	171.1
3	21.788	21.849	178.4	176.0	.987	178.4	176.0	.987	144.7	5.0	2.3	2.0	229.7	176.1	229.7	176.1
4	20.889	20.973	182.2	176.0	.966	182.2	176.0	.966	139.6	2.5	3.6	2.8	229.6	176.0	229.6	176.0
5	20.002	20.109	184.8	175.6	.950	184.9	175.7	.950	141.8	2.3	4.8	3.5	233.0	175.7	233.0	175.7
6	19.129	19.258	182.8	174.3	.953	182.9	174.3	.953	147.6	3.5	6.1	4.1	235.0	174.3	235.0	174.3
7	18.268	18.423	174.5	166.9	.957	174.7	167.0	.956	154.4	2.7	7.3	4.4	233.1	167.0	233.1	167.0
8	17.414	17.600	162.9	160.2	.984	163.1	160.3	.983	165.6	3.3	8.3	4.6	232.4	160.3	232.4	160.3
9	16.576	16.800	150.5	156.0	1.037	150.8	156.1	1.035	187.4	10.5	9.2	4.8	240.6	156.5	240.6	156.5
10	15.751	16.035	153.0	143.5	.938	153.4	143.6	.936	197.8	13.2	11.3	4.6	250.4	144.2	250.4	144.2
11	15.342	15.669	165.6	134.0	.809	166.1	134.1	.807	185.7	8.6	13.6	4.4	249.2	134.4	249.2	134.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.571	.417	.571	.417	.450	.417	.450	.417	38.0	1.2	38.0	1.2	38.0	1.2	38.0	1.2
2	.584	.434	.584	.434	.455	.434	.455	.434	38.9	2.4	38.9	2.4	38.9	2.4	38.9	2.4
3	.597	.451	.597	.451	.463	.451	.463	.451	39.1	1.6	39.0	1.6	39.1	1.6	39.0	1.6
4	.601	.454	.601	.454	.477	.454	.477	.454	37.5	.8	37.5	.8	37.5	.8	37.5	.8
5	.614	.456	.614	.456	.487	.456	.487	.456	37.5	.7	37.5	.7	37.5	.7	37.5	.7
6	.621	.453	.621	.453	.483	.453	.483	.453	38.9	1.1	38.9	1.1	38.9	1.1	38.9	1.1
7	.617	.434	.617	.434	.462	.434	.462	.434	41.5	.9	41.5	.9	41.5	.9	41.5	.9
8	.615	.416	.615	.416	.431	.416	.432	.416	45.5	1.2	45.4	1.2	45.5	1.2	45.4	1.2
9	.637	.405	.637	.405	.399	.404	.399	.404	51.2	3.8	51.2	3.8	51.2	3.8	51.2	3.8
10	.664	.372	.664	.372	.406	.370	.407	.370	52.3	5.2	52.2	5.2	52.3	5.2	52.2	5.2
11	.660	.346	.660	.346	.439	.345	.440	.345	48.3	3.7	48.2	3.7	48.3	3.7	48.2	3.7

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	25.63	25.00	.975	402.6	402.6	1.000	20.55	22.18	1.89391	1.98561	378.0	389.1	.0	.0
2	25.80	25.25	.979	401.1	401.1	1.000	20.49	22.18	1.90011	1.99905	375.6	386.6	.0	.0
3	25.77	25.44	.987	395.2	395.2	1.000	20.26	22.13	1.91260	2.02970	369.0	379.8	.0	.0
4	25.74	25.50	.991	389.2	389.2	1.000	20.17	22.14	1.93529	2.06317	363.0	373.8	.0	.0
5	25.73	25.43	.988	385.7	385.7	1.000	19.96	22.06	1.93827	2.07512	358.7	370.4	.0	.0
6	25.72	25.47	.990	384.1	384.1	1.000	19.83	22.12	1.93755	2.08894	356.6	369.0	.0	.0
7	25.33	25.07	.989	382.3	382.3	1.000	19.60	22.02	1.92138	2.08229	355.3	368.5	.0	.0
8	25.04	24.72	.988	382.1	382.1	1.000	19.39	21.95	1.90192	2.07027	355.2	369.3	.0	.0
9	25.11	24.64	.981	384.0	384.0	1.000	19.11	22.01	1.87464	2.06215	355.2	371.8	.0	.0
10	25.03	24.06	.961	385.0	385.0	1.000	18.62	21.87	1.83365	2.03403	353.8	374.6	.0	.0
11	24.74	23.73	.959	385.6	385.6	1.000	18.47	21.85	1.81366	2.02095	354.8	376.7	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	3.2	-2.5	15.8	.493	.000	.125	.125	.000	.049	.049	.000	.964
2	10.0	4.3	-1.4	15.4	.474	.000	.104	.104	.000	.040	.040	.000	.992
3	20.0	4.4	-1.3	12.5	.457	.000	.060	.060	.000	.022	.022	.000	.996
4	30.0	2.7	-2.9	10.8	.444	.000	.043	.043	.000	.015	.015	.000	.954
5	40.0	2.1	-3.5	10.4	.448	.000	.052	.052	.000	.018	.018	.000	.957
6	50.0	2.4	-3.1	10.7	.456	.000	.044	.044	.000	.014	.014	.000	.978
7	60.0	3.7	-1.7	10.6	.484	.000	.047	.047	.000	.014	.014	.000	1.004
8	70.0	6.1	.7	11.1	.516	.000	.055	.055	.000	.016	.016	.000	1.059
9	80.0	9.4	4.2	14.7	.555	.000	.079	.079	.000	.022	.022	.000	1.191
10	90.0	6.9	1.8	18.4	.620	.000	.151	.151	.000	.040	.040	.000	1.228
11	95.0	.7	-4.3	18.8	.644	.000	.161	.161	.000	.042	.042	.000	1.109

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(h) 90 Percent of design speed; reading 1310

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.142	23.160	154.7	162.5	1.051	154.7	162.5	1.051	71.8	-6.8	.4	.5	170.6	162.7	170.6	162.7
2	22.697	22.730	170.3	181.1	1.063	170.3	181.1	1.063	77.2	-2.4	1.1	1.1	187.0	181.1	187.0	181.1
3	21.788	21.849	184.8	193.0	1.044	184.9	193.0	1.044	78.7	.1	2.4	2.2	200.9	193.0	200.9	193.0
4	20.889	20.973	190.5	192.5	1.011	190.5	192.6	1.011	73.1	-3.7	3.7	3.1	204.1	192.6	204.1	192.6
5	20.002	20.109	193.4	196.0	1.013	193.4	196.0	1.013	79.3	-2.9	5.1	3.9	209.1	196.0	209.1	196.0
6	19.129	19.258	198.4	205.7	1.037	198.5	205.8	1.036	88.3	-1.9	6.7	4.8	217.3	205.8	217.3	205.8
7	18.268	18.423	209.8	220.7	1.052	210.0	220.7	1.051	100.1	.2	8.7	5.8	232.6	220.7	232.6	220.7
8	17.414	17.600	220.1	237.7	1.080	220.4	237.8	1.079	112.9	-.5	11.1	6.8	247.6	237.8	247.6	237.8
9	16.576	16.800	224.6	249.5	1.111	225.1	249.6	1.109	136.9	6.3	13.7	7.7	263.4	249.7	263.4	249.7
10	15.751	16.035	220.0	240.2	1.092	220.6	240.3	1.090	153.3	17.4	16.2	7.8	268.6	240.9	268.6	240.9
11	15.342	15.669	211.5	221.6	1.048	212.2	221.7	1.045	153.6	13.8	17.3	7.3	261.9	222.2	261.9	222.2

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.460	.437	.460	.437	.417	.437	.417	.437	24.9	-2.4	24.9	-2.4	24.9	-2.4	24.9	-2.4
2	.507	.490	.507	.490	.462	.490	.462	.490	24.4	-.7	24.4	-.7	24.4	-.7	24.4	-.7
3	.550	.527	.550	.527	.506	.527	.506	.527	23.1	.0	23.1	.0	23.1	.0	23.1	.0
4	.561	.528	.561	.528	.524	.528	.524	.528	21.0	-1.1	21.0	-1.1	21.0	-1.1	21.0	-1.1
5	.577	.539	.577	.539	.533	.538	.534	.538	22.3	-.9	22.3	-.9	22.3	-.9	22.3	-.9
6	.599	.566	.599	.566	.547	.565	.548	.566	24.0	-.5	24.0	-.5	24.0	-.5	24.0	-.5
7	.643	.608	.643	.608	.580	.608	.581	.608	25.5	.1	25.5	.1	25.5	.1	25.5	.1
8	.686	.656	.686	.656	.610	.656	.610	.656	27.2	-.1	27.1	-.1	27.2	-.1	27.1	-.1
9	.729	.688	.729	.688	.622	.687	.623	.688	31.4	1.4	31.3	1.4	31.4	1.4	31.3	1.4
10	.742	.659	.742	.659	.608	.657	.609	.657	34.9	4.1	34.8	4.1	34.9	4.1	34.8	4.1
11	.720	.602	.720	.602	.581	.601	.583	.601	36.0	3.6	35.9	3.6	36.0	3.6	35.9	3.6

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	17.36	16.87	.972	357.3	357.3	1.000	15.02	14.79	1.52608	1.49736	342.8	344.1	.0	.0
2	17.88	17.47	.977	356.3	356.3	1.000	15.00	14.82	1.54249	1.51918	338.8	339.9	.0	.0
3	18.24	17.78	.975	352.5	352.5	1.000	14.85	14.71	1.55652	1.53497	332.4	333.9	.0	.0
4	18.39	17.73	.964	349.4	349.4	1.000	14.85	14.66	1.57340	1.54314	328.7	331.0	.0	.0
5	18.52	17.86	.964	348.9	348.9	1.000	14.78	14.66	1.57418	1.54889	327.1	329.7	.0	.0
6	18.73	18.15	.969	350.4	350.4	1.000	14.69	14.61	1.56526	1.54512	326.9	329.3	.0	.0
7	19.33	18.74	.969	352.5	352.5	1.000	14.64	14.60	1.56610	1.54951	325.6	328.3	.0	.0
8	19.92	19.34	.971	354.9	354.9	1.000	14.54	14.48	1.56175	1.54412	324.4	326.8	.0	.0
9	20.50	19.75	.964	359.1	359.1	1.000	14.39	14.40	1.54472	1.52886	324.6	328.1	.0	.0
10	20.70	19.07	.921	361.9	361.9	1.000	14.36	14.25	1.53432	1.49115	326.0	333.0	.0	.0
11	20.20	18.18	.900	363.3	363.3	1.000	14.30	14.23	1.51309	1.46336	329.2	338.8	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-10.6	-16.4	11.4	.226	.000	.209	.209	.000	.082	.082	.000	.553
2	10.0	-10.9	-16.7	11.5	.195	.000	.143	.143	.000	.055	.055	.000	.586
3	20.0	-12.3	-18.0	10.1	.183	.000	.136	.136	.000	.050	.050	.000	.563
4	30.0	-14.5	-20.2	8.1	.189	.000	.186	.186	.000	.066	.066	.000	.561
5	40.0	-13.9	-19.4	8.1	.195	.000	.176	.176	.000	.060	.060	.000	.577
6	50.0	-13.3	-18.8	8.3	.187	.000	.143	.143	.000	.046	.046	.000	.599
7	60.0	-13.1	-18.5	9.0	.184	.000	.127	.127	.000	.039	.039	.000	.643
8	70.0	-13.0	-18.3	9.1	.174	.000	.108	.108	.000	.032	.032	.000	.686
9	80.0	-11.2	-16.4	11.5	.191	.000	.122	.122	.000	.034	.034	.000	.832
10	90.0	-11.2	-16.3	16.6	.237	.000	.256	.256	.000	.069	.069	.000	.905
11	95.0	-12.4	-17.4	17.9	.290	.000	.342	.342	.000	.089	.089	.000	.884

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(i) 90 Percent of design speed; reading 1321

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	150.6	148.5	.986	150.6	148.5	.986	115.6	.8	.4	.4	189.9	148.5	189.9	148.5
2	22.697	22.730	158.4	157.7	.996	158.4	157.7	.996	117.5	5.7	1.1	.9	197.3	157.8	197.3	157.8
3	21.788	21.849	165.7	164.6	.993	165.7	164.6	.993	119.2	2.5	2.2	1.9	204.1	164.6	204.1	164.6
4	20.889	20.973	170.6	166.1	.974	170.6	166.2	.974	113.7	-1.2	3.3	2.7	205.0	166.2	205.0	166.2
5	20.002	20.109	173.9	168.3	.968	174.0	168.3	.968	117.3	-2.1	4.6	3.4	209.8	168.3	209.8	168.3
6	19.129	19.258	176.9	171.6	.970	177.0	171.6	.970	122.9	-2.1	5.9	4.0	215.5	171.6	215.5	171.6
7	18.268	18.423	181.8	176.1	.969	182.0	176.1	.968	127.0	-1.4	7.6	4.6	221.9	176.1	221.9	176.1
8	17.414	17.600	179.4	179.6	1.001	179.6	179.6	1.000	136.7	-2.3	9.1	5.2	225.7	179.6	225.7	179.6
9	16.576	16.800	169.2	177.9	1.051	169.5	178.0	1.050	156.1	2.0	10.3	5.5	230.4	178.0	230.4	178.0
10	15.751	16.035	168.1	166.9	.993	168.6	167.0	.991	169.7	8.8	12.4	5.4	239.2	167.2	239.2	167.2
11	15.342	15.669	172.7	157.1	.909	173.3	157.2	.907	163.9	6.0	14.1	5.2	238.5	157.3	238.5	157.3

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.501	.388	.501	.388	.398	.388	.398	.388	37.5	.3	37.5	.3	37.5	.3	37.5	.3
2	.523	.414	.523	.414	.420	.414	.420	.414	36.6	2.1	36.6	2.1	36.6	2.1	36.6	2.1
3	.546	.436	.546	.436	.443	.436	.443	.436	35.7	.9	35.7	.9	35.7	.9	35.7	.9
4	.552	.443	.552	.443	.459	.443	.459	.443	33.7	-.4	33.7	-.4	33.7	-.4	33.7	-.4
5	.567	.450	.567	.450	.470	.450	.470	.450	34.0	-.7	34.0	-.7	34.0	-.7	34.0	-.7
6	.584	.459	.584	.459	.479	.459	.480	.459	34.8	-.7	34.8	-.7	34.8	-.7	34.8	-.7
7	.603	.472	.603	.472	.494	.472	.495	.472	34.9	-.4	34.9	-.4	34.9	-.4	34.9	-.4
8	.614	.482	.614	.482	.488	.482	.488	.482	37.3	-.7	37.3	-.7	37.3	-.7	37.3	-.7
9	.626	.476	.626	.476	.460	.476	.460	.476	42.7	.6	42.6	.6	42.7	.6	42.6	.6
10	.649	.445	.649	.445	.456	.444	.458	.444	45.3	3.0	45.2	3.0	45.3	3.0	45.2	3.0
11	.647	.417	.647	.417	.468	.416	.470	.416	43.5	2.2	43.4	2.2	43.5	2.2	43.4	2.2

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	20.85	20.50	.983	375.1	375.1	1.000	17.56	18.48	1.71290	1.76759	357.2	364.2	.0	.0
2	21.11	20.81	.986	373.7	373.7	1.000	17.52	18.49	1.72295	1.78292	354.3	361.3	.0	.0
3	21.20	20.97	.989	368.4	368.4	1.000	17.31	18.40	1.73464	1.80624	347.7	355.0	.0	.0
4	21.26	21.07	.991	364.4	364.4	1.000	17.29	18.42	1.75316	1.82939	343.5	350.7	.0	.0
5	21.32	21.12	.991	362.3	362.3	1.000	17.14	18.38	1.75387	1.83892	340.4	348.3	.0	.0
6	21.45	21.23	.990	362.0	362.0	1.000	17.03	18.37	1.75048	1.84213	338.9	347.4	.0	.0
7	21.60	21.37	.989	361.4	361.4	1.000	16.90	18.34	1.74700	1.84639	336.9	346.0	.0	.0
8	21.69	21.45	.989	362.1	362.1	1.000	16.82	18.30	1.74075	1.84282	336.7	346.0	.0	.0
9	21.52	21.31	.990	363.9	363.9	1.000	16.53	18.25	1.70590	1.82622	337.5	348.2	.0	.0
10	21.69	20.81	.960	366.3	366.3	1.000	16.34	18.17	1.68516	1.79669	337.8	352.4	.0	.0
11	21.50	20.44	.950	367.1	367.1	1.000	16.24	18.14	1.66983	1.78122	338.7	354.8	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.6	-3.2	14.7	.454	.000	.106	.106	.000	.041	.041	.000	.835
2	10.0	1.8	-3.9	14.9	.417	.000	.085	.085	.000	.032	.032	.000	.844
3	20.0	.9	-4.8	11.6	.404	.000	.060	.060	.000	.022	.022	.000	.847
4	30.0	-1.3	-6.9	9.4	.387	.000	.048	.048	.000	.017	.017	.000	.802
5	40.0	-1.6	-7.2	8.8	.390	.000	.047	.047	.000	.016	.016	.000	.814
6	50.0	-1.9	-7.4	8.7	.391	.000	.051	.051	.000	.016	.016	.000	.834
7	60.0	-3.1	-8.5	9.0	.385	.000	.050	.050	.000	.016	.016	.000	.843
8	70.0	-2.3	-7.6	9.0	.385	.000	.049	.049	.000	.015	.015	.000	.883
9	80.0	.7	-4.5	11.3	.415	.000	.041	.041	.000	.012	.012	.000	.984
10	90.0	-.3	-5.4	16.0	.479	.000	.164	.164	.000	.044	.044	.000	1.041
11	95.0	-4.3	-9.3	17.1	.512	.000	.203	.203	.000	.053	.053	.000	.978

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(j) 90 Percent of design speed; reading 1332

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.142	23.160	155.0	145.7	.940	155.0	145.7	.940	118.2	4.2	.4	.4	194.9	145.8	194.9	145.8
2	22.697	22.730	157.9	151.1	.956	157.9	151.1	.956	119.4	7.7	1.0	.9	198.0	151.3	198.0	151.3
3	21.788	21.849	156.7	156.3	.998	156.7	156.4	.998	129.3	6.2	2.1	1.8	203.1	156.5	203.1	156.5
4	20.889	20.973	158.8	157.8	.994	158.8	157.9	.994	126.2	3.7	3.1	2.5	202.9	157.9	202.9	157.9
5	20.002	20.109	162.3	158.7	.978	162.4	158.8	.978	128.9	3.0	4.3	3.2	207.3	158.8	207.3	158.8
6	19.129	19.258	160.8	157.4	.979	160.9	157.4	.979	132.3	2.9	5.4	3.7	208.3	157.5	208.3	157.5
7	18.268	18.423	156.1	152.6	.978	156.2	152.7	.977	137.8	1.7	6.5	4.0	208.3	152.7	208.3	152.7
8	17.414	17.600	148.8	151.0	1.015	149.0	151.0	1.014	148.5	2.5	7.5	4.3	210.3	151.1	210.3	151.1
9	16.576	16.800	140.0	149.9	1.071	140.2	150.0	1.070	171.2	9.9	8.5	4.6	221.3	150.3	221.3	150.3
10	15.751	16.035	148.1	139.6	.943	148.5	139.7	.941	176.6	11.2	10.9	4.5	230.7	140.1	230.7	140.1
11	15.342	15.669	161.2	131.7	.817	161.8	131.8	.815	164.2	6.3	13.2	4.3	230.5	131.9	230.5	131.9

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.510	.377	.510	.377	.406	.377	.406	.377	37.3	1.7	37.3	1.7	37.3	1.7	37.3	1.7
2	.520	.393	.520	.393	.415	.393	.415	.393	37.1	2.9	37.1	2.9	37.1	2.9	37.1	2.9
3	.538	.410	.538	.410	.415	.410	.415	.410	39.5	2.3	39.5	2.3	39.5	2.3	39.5	2.3
4	.541	.416	.541	.416	.423	.416	.424	.416	38.5	1.3	38.5	1.3	38.5	1.3	38.5	1.3
5	.556	.420	.556	.420	.435	.420	.435	.420	38.5	1.1	38.4	1.1	38.5	1.1	38.4	1.1
6	.560	.418	.560	.418	.432	.417	.432	.418	39.4	1.0	39.4	1.0	39.4	1.0	39.4	1.0
7	.561	.405	.561	.405	.420	.405	.420	.405	41.4	.7	41.4	.7	41.4	.7	41.4	.7
8	.566	.401	.566	.401	.401	.400	.401	.400	44.9	1.0	44.9	1.0	44.9	1.0	44.9	1.0
9	.597	.398	.597	.398	.377	.397	.378	.397	50.7	3.8	50.7	3.8	50.7	3.8	50.7	3.8
10	.623	.369	.623	.369	.400	.368	.401	.368	50.0	4.6	49.9	4.6	50.0	4.6	49.9	4.6
11	.621	.347	.621	.347	.434	.346	.436	.346	45.5	2.7	45.4	2.7	45.5	2.7	45.4	2.7

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	21.95	21.40	.975	382.0	382.0	1.000	18.38	19.40	1.76327	1.81957	363.1	371.4	.0	.0
2	22.05	21.58	.979	380.2	380.2	1.000	18.34	19.40	1.77154	1.83282	360.7	368.8	.0	.0
3	22.01	21.75	.988	375.1	375.1	1.000	18.07	19.38	1.77578	1.86018	354.6	362.9	.0	.0
4	22.05	21.82	.989	370.5	370.5	1.000	18.07	19.36	1.79893	1.88400	350.0	358.1	.0	.0
5	22.07	21.85	.990	367.6	367.6	1.000	17.89	19.35	1.80009	1.89857	346.2	355.1	.0	.0
6	22.03	21.82	.990	366.2	366.2	1.000	17.81	19.35	1.80027	1.90502	344.6	353.9	.0	.0
7	21.78	21.61	.992	365.1	365.1	1.000	17.59	19.30	1.78411	1.90153	343.6	353.5	.0	.0
8	21.76	21.48	.987	365.5	365.5	1.000	17.51	19.24	1.77574	1.89245	343.5	354.2	.0	.0
9	21.87	21.51	.984	366.8	366.8	1.000	17.19	19.29	1.74893	1.88991	342.5	355.6	.0	.0
10	21.94	21.05	.959	368.4	368.4	1.000	16.90	19.16	1.72195	1.86129	341.9	358.6	.0	.0
11	21.77	20.80	.955	369.2	369.2	1.000	16.78	19.14	1.70566	1.84908	342.8	360.6	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	2.5	-3.2	16.2	.481	.000	.153	.153	.000	.060	.060	.000	.850
2	10.0	2.5	-3.2	15.9	.452	.000	.127	.127	.000	.049	.049	.000	.852
3	20.0	4.9	-.8	13.1	.453	.000	.066	.066	.000	.024	.024	.000	.906
4	30.0	3.7	-1.9	11.3	.435	.000	.060	.060	.000	.021	.021	.000	.877
5	40.0	3.0	-2.6	10.7	.439	.000	.052	.052	.000	.017	.017	.000	.885
6	50.0	2.9	-2.6	10.6	.445	.000	.050	.050	.000	.016	.016	.000	.891
7	60.0	3.6	-1.8	10.3	.468	.000	.041	.041	.000	.013	.013	.000	.910
8	70.0	5.5	.2	10.9	.486	.000	.065	.065	.000	.019	.019	.000	.964
9	80.0	8.9	3.7	14.6	.524	.000	.077	.077	.000	.022	.022	.000	1.105
10	90.0	4.6	-.4	17.7	.583	.000	.178	.178	.000	.047	.047	.000	1.102
11	95.0	-2.1	-7.1	17.8	.605	.000	.195	.195	.000	.051	.051	.000	.986

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(k) 80 Percent of design speed; reading 1347

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	144.4	160.3	1.110	144.4	160.3	1.110	36.7	-12.0	.4	.5	149.0	160.7	149.0	160.7
2	22.697	22.730	159.5	178.5	1.119	159.5	178.5	1.119	39.1	-8.4	1.1	1.1	164.2	178.7	164.2	178.7
3	21.788	21.849	175.0	188.1	1.075	175.0	188.2	1.075	39.5	-7.2	2.3	2.2	179.4	188.3	179.4	188.3
4	20.889	20.973	180.2	189.0	1.049	180.3	189.1	1.049	41.0	-8.3	3.5	3.0	184.9	189.2	184.9	189.2
5	20.002	20.109	185.7	197.3	1.063	185.8	197.3	1.062	51.0	-5.9	4.9	4.0	192.7	197.4	192.7	197.4
6	19.129	19.258	194.7	208.9	1.073	194.8	208.9	1.072	63.1	-5.1	6.5	4.9	204.8	209.0	204.8	209.0
7	18.268	18.423	206.3	222.9	1.080	206.5	222.9	1.080	76.0	-4.7	8.6	5.9	220.0	223.0	220.0	223.0
8	17.414	17.600	214.4	241.8	1.128	214.7	241.9	1.127	89.1	-6.4	10.9	7.0	232.5	242.0	232.5	242.0
9	16.576	16.800	223.9	255.4	1.141	224.3	255.5	1.139	109.1	-1.6	13.7	7.8	249.4	255.5	249.4	255.5
10	15.751	16.035	220.3	247.3	1.122	220.9	247.5	1.120	123.1	11.1	16.3	8.0	252.9	247.7	252.9	247.7
11	15.342	15.669	199.0	233.9	1.175	199.6	234.0	1.172	130.1	4.9	16.3	7.7	238.3	234.0	238.3	234.0

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.414	.448	.414	.448	.401	.446	.401	.446	14.3	-4.3	14.3	-4.3	14.3	-4.3	14.3	-4.3
2	.458	.501	.458	.501	.445	.500	.445	.500	13.8	-2.7	13.8	-2.7	13.8	-2.7	13.8	-2.7
3	.505	.531	.505	.531	.492	.531	.492	.531	12.7	-2.2	12.7	-2.2	12.7	-2.2	12.7	-2.2
4	.522	.535	.522	.535	.509	.534	.509	.534	12.8	-2.5	12.8	-2.5	12.8	-2.5	12.8	-2.5
5	.544	.559	.544	.559	.525	.558	.525	.558	15.4	-1.7	15.4	-1.7	15.4	-1.7	15.4	-1.7
6	.578	.591	.578	.591	.550	.591	.550	.591	18.0	-1.4	17.9	-1.4	18.0	-1.4	17.9	-1.4
7	.622	.631	.622	.631	.583	.631	.584	.631	20.2	-1.2	20.2	-1.2	20.2	-1.2	20.2	-1.2
8	.657	.686	.657	.686	.606	.686	.607	.686	22.6	-1.5	22.5	-1.5	22.6	-1.5	22.5	-1.5
9	.705	.724	.705	.724	.633	.724	.634	.724	26.0	-.4	25.9	-.4	26.0	-.4	25.9	-.4
10	.713	.697	.713	.697	.622	.696	.623	.697	29.2	2.6	29.1	2.6	29.2	2.6	29.1	2.6
11	.666	.653	.666	.653	.556	.652	.558	.653	33.2	1.2	33.1	1.2	33.2	1.2	33.1	1.2

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	14.46	13.98	.967	333.7	333.7	1.000	12.85	12.18	1.38777	1.32265	322.6	320.8	.0	.0
2	14.84	14.49	.977	332.8	332.8	1.000	12.85	12.21	1.40123	1.34220	319.4	316.9	.0	.0
3	15.22	14.62	.960	330.3	330.3	1.000	12.79	12.06	1.41828	1.34434	314.3	312.6	.0	.0
4	15.37	14.62	.951	329.1	329.1	1.000	12.77	12.03	1.42507	1.34683	312.1	311.3	.0	.0
5	15.58	14.90	.957	330.1	330.1	1.000	12.73	12.06	1.42358	1.35169	311.6	310.7	.0	.0
6	15.95	15.22	.954	332.9	332.9	1.000	12.71	12.01	1.41945	1.34525	312.0	311.1	.0	.0
7	16.41	15.67	.955	335.3	335.3	1.000	12.64	11.98	1.41544	1.34425	311.1	310.5	.0	.0
8	16.88	16.26	.963	338.4	338.4	1.000	12.63	11.86	1.41311	1.33615	311.5	309.3	.0	.0
9	17.29	16.77	.970	342.3	342.3	1.000	12.40	11.83	1.38815	1.33060	311.3	309.7	.0	.0
10	17.86	16.00	.896	344.6	344.6	1.000	12.72	11.57	1.41698	1.28326	312.7	314.0	.0	.0
11	17.06	15.36	.900	346.9	346.9	1.000	12.67	11.53	1.38569	1.25680	318.6	319.6	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-20.7	-26.5	10.1	.049	.000	.301	.301	.000	.117	.117	.000	.414
2	10.0	-21.0	-26.8	10.1	.023	.000	.174	.174	.000	.067	.067	.000	.458
3	20.0	-22.1	-27.8	8.5	.046	.000	.249	.249	.000	.092	.092	.000	.505
4	30.0	-22.2	-27.8	7.3	.070	.000	.287	.287	.000	.102	.102	.000	.522
5	40.0	-20.3	-25.9	7.7	.075	.000	.238	.238	.000	.081	.081	.000	.544
6	50.0	-18.8	-24.3	7.9	.087	.000	.225	.225	.000	.073	.073	.000	.578
7	60.0	-17.8	-23.2	8.2	.100	.000	.197	.197	.000	.061	.061	.000	.622
8	70.0	-17.1	-22.4	8.2	.080	.000	.148	.148	.000	.044	.044	.000	.657
9	80.0	-16.0	-21.3	10.3	.100	.000	.105	.105	.000	.030	.030	.000	.705
10	90.0	-16.4	-21.5	15.5	.138	.000	.360	.360	.000	.097	.097	.000	.713
11	95.0	-14.7	-19.7	16.1	.153	.000	.389	.389	.000	.102	.102	.000	.752

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(ℓ) 80 Percent of design speed; reading 1358

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	135.9	133.6	.983	135.9	133.6	.983	87.1	.1	.4	.4	161.4	133.6	161.4	133.6
2	22.697	22.730	143.1	143.0	.999	143.1	143.0	.999	88.3	3.4	.9	.8	168.2	143.1	168.2	143.1
3	21.788	21.849	150.5	150.6	1.001	150.6	150.7	1.001	90.6	.2	2.0	1.7	175.7	150.7	175.7	150.7
4	20.889	20.973	154.5	153.1	.991	154.5	153.1	.991	88.9	-2.6	3.0	2.5	178.2	153.1	178.2	153.1
5	20.002	20.109	157.7	155.9	.989	157.7	155.9	.988	93.4	-2.0	4.1	3.1	183.3	155.9	183.3	155.9
6	19.129	19.258	159.5	158.6	.995	159.6	158.7	.994	98.4	-1.5	5.3	3.7	187.5	158.7	187.5	158.7
7	18.268	18.423	163.5	164.1	1.004	163.6	164.1	1.003	103.8	-1.3	6.8	4.3	193.8	164.1	193.8	164.1
8	17.414	17.600	167.3	172.1	1.029	167.5	172.2	1.028	111.1	-1.9	8.5	5.0	201.0	172.2	201.0	172.2
9	16.576	16.800	164.0	177.6	1.083	164.3	177.7	1.082	130.1	2.1	10.0	5.5	209.6	177.7	209.6	177.7
10	15.751	16.035	165.0	173.0	1.049	165.5	173.1	1.046	144.3	11.0	12.2	5.6	219.6	173.5	219.6	173.5
11	15.342	15.669	172.4	164.9	.956	173.0	165.0	.954	142.4	9.0	14.1	5.4	224.1	165.2	224.1	165.2

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.437	.359	.437	.359	.368	.359	.368	.359	32.7	.1	32.7	.1	32.7	.1	32.7	.1
2	.457	.386	.457	.386	.389	.386	.389	.386	31.7	1.4	31.7	1.4	31.7	1.4	31.7	1.4
3	.481	.410	.481	.410	.412	.410	.412	.410	31.0	.1	31.0	.1	31.0	.1	31.0	.1
4	.490	.419	.490	.419	.425	.418	.425	.419	29.9	-1.0	29.9	-1.0	29.9	-1.0	29.9	-1.0
5	.506	.427	.506	.427	.435	.427	.435	.427	30.7	-.7	30.6	-.7	30.7	-.7	30.6	-.7
6	.518	.435	.518	.435	.441	.435	.441	.435	31.7	-.5	31.6	-.5	31.7	-.5	31.6	-.5
7	.537	.451	.537	.451	.453	.451	.453	.451	32.4	-.5	32.4	-.5	32.4	-.5	32.4	-.5
8	.557	.473	.557	.473	.464	.473	.464	.473	33.6	-.6	33.6	-.6	33.6	-.6	33.6	-.6
9	.580	.488	.580	.488	.454	.487	.455	.488	38.4	.7	38.4	.7	38.4	.7	38.4	.7
10	.608	.474	.608	.474	.457	.473	.458	.473	41.2	3.6	41.1	3.6	41.2	3.6	41.1	3.6
11	.620	.450	.620	.450	.477	.449	.479	.449	39.6	3.1	39.5	3.1	39.6	3.1	39.5	3.1

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	17.49	17.26	.987	352.7	352.7	1.000	15.34	15.79	1.57306	1.59983	339.7	343.8	.0	.0
2	17.68	17.51	.991	351.2	351.2	1.000	15.32	15.80	1.58312	1.61410	337.1	341.0	.0	.0
3	17.84	17.67	.991	347.8	347.8	1.000	15.23	15.74	1.59620	1.63006	332.4	336.5	.0	.0
4	17.89	17.75	.992	344.8	344.8	1.000	15.18	15.73	1.60727	1.64534	329.0	333.1	.0	.0
5	18.02	17.84	.990	343.5	343.5	1.000	15.13	15.74	1.61300	1.65439	326.8	331.4	.0	.0
6	18.07	17.88	.989	343.3	343.3	1.000	15.05	15.70	1.60932	1.65363	325.8	330.7	.0	.0
7	18.19	18.03	.991	343.1	343.1	1.000	14.95	15.68	1.60559	1.65694	324.4	329.7	.0	.0
8	18.41	18.25	.991	344.1	344.1	1.000	14.91	15.65	1.60321	1.65525	324.0	329.4	.0	.0
9	18.55	18.36	.990	346.3	346.3	1.000	14.76	15.61	1.58534	1.64478	324.4	330.5	.0	.0
10	18.67	18.12	.970	348.7	348.7	1.000	14.55	15.54	1.56076	1.62177	324.7	333.8	.0	.0
11	18.78	17.80	.948	349.7	349.7	1.000	14.49	15.50	1.55435	1.60592	324.7	336.2	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-2.2	-8.0	14.5	.383	.000	.105	.105	.000	.041	.041	.000	.658
2	10.0	-3.0	-8.7	14.3	.343	.000	.069	.069	.000	.027	.027	.000	.663
3	20.0	-3.7	-9.4	10.8	.332	.000	.064	.064	.000	.024	.024	.000	.669
4	30.0	-5.0	-10.6	8.9	.322	.000	.051	.051	.000	.018	.018	.000	.649
5	40.0	-4.9	-10.5	8.8	.325	.000	.061	.061	.000	.021	.021	.000	.668
6	50.0	-5.0	-10.5	8.9	.326	.000	.063	.063	.000	.020	.020	.000	.684
7	60.0	-5.5	-10.9	9.1	.321	.000	.050	.050	.000	.015	.015	.000	.704
8	70.0	-5.9	-11.3	9.2	.309	.000	.047	.047	.000	.014	.014	.000	.730
9	80.0	-3.5	-8.7	11.4	.323	.000	.049	.049	.000	.014	.014	.000	.831
10	90.0	-4.3	-9.4	16.7	.371	.000	.134	.134	.000	.036	.036	.000	.892
11	95.0	-8.2	-13.2	18.1	.416	.000	.229	.229	.000	.060	.060	.000	.856

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(m) 80 Percent of design speed; reading 1369

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	131.2	129.3	.985	131.2	129.3	.985	105.7	5.7	.4	.4	168.5	129.4	168.5	129.4
2	22.697	22.730	133.2	131.0	.984	133.2	131.1	.984	105.3	7.5	.9	.8	169.8	131.3	169.8	131.3
3	21.788	21.849	134.6	134.7	1.001	134.6	134.7	1.001	113.5	6.8	1.8	1.6	176.1	134.9	176.1	134.9
4	20.889	20.973	135.4	136.1	1.005	135.5	136.1	1.005	113.8	4.3	2.6	2.2	176.9	136.2	176.9	136.2
5	20.002	20.109	137.3	136.3	.993	137.3	136.4	.993	116.4	2.8	3.6	2.7	180.0	136.4	180.0	136.4
6	19.129	19.258	140.7	137.5	.976	140.7	137.6	.977	115.6	.6	4.7	3.2	182.2	137.6	182.2	137.6
7	18.268	18.423	141.7	138.2	.975	141.8	138.2	.975	118.4	-1.0	5.9	3.6	184.7	138.2	184.7	138.2
8	17.414	17.600	138.0	140.2	1.016	138.1	140.2	1.015	128.5	-.0	7.0	4.0	188.6	140.2	188.6	140.2
9	16.576	16.800	132.0	141.1	1.069	132.2	141.2	1.068	148.6	6.1	8.0	4.3	198.9	141.3	198.9	141.3
10	15.751	16.035	135.6	131.8	.972	136.0	131.9	.970	156.7	8.3	10.0	4.3	207.5	132.1	207.5	132.1
11	15.342	15.669	143.7	122.5	.852	144.2	122.6	.850	146.6	3.5	11.8	4.0	205.6	122.6	205.6	122.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.450	.343	.450	.343	.350	.342	.350	.342	38.8	2.5	38.8	2.5	38.8	2.5	38.8	2.5
2	.454	.348	.454	.348	.356	.348	.356	.348	38.3	3.3	38.3	3.3	38.3	3.3	38.3	3.3
3	.474	.360	.474	.360	.362	.359	.362	.359	40.1	2.9	40.1	2.9	40.1	2.9	40.1	2.9
4	.479	.365	.479	.365	.367	.365	.367	.365	40.1	1.8	40.0	1.8	40.1	1.8	40.0	1.8
5	.490	.368	.490	.368	.374	.368	.374	.368	40.3	1.2	40.3	1.2	40.3	1.2	40.3	1.2
6	.498	.372	.498	.372	.385	.372	.385	.372	39.4	.2	39.4	.2	39.4	.2	39.4	.2
7	.506	.375	.506	.375	.388	.375	.389	.375	39.9	-.4	39.9	-.4	39.9	-.4	39.9	-.4
8	.518	.380	.518	.380	.379	.380	.379	.380	43.0	-.0	42.9	-.0	43.0	-.0	42.9	-.0
9	.546	.383	.546	.383	.363	.382	.363	.382	48.4	2.5	48.3	2.5	48.4	2.5	48.3	2.5
10	.570	.356	.570	.356	.373	.356	.374	.356	49.1	3.6	49.0	3.6	49.1	3.6	49.0	3.6
11	.564	.330	.564	.330	.394	.330	.396	.330	45.6	1.6	45.5	1.6	45.6	1.6	45.5	1.6

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	18.59	18.30	.984	363.7	363.7	1.000	16.18	16.87	1.61280	1.65385	349.6	355.4	.0	.0
2	18.61	18.34	.986	362.6	362.6	1.000	16.15	16.87	1.61617	1.66011	348.2	354.0	.0	.0
3	18.70	18.46	.987	359.1	359.1	1.000	16.04	16.88	1.62589	1.68021	343.7	350.0	.0	.0
4	18.71	18.50	.989	355.1	355.1	1.000	15.99	16.87	1.64115	1.69935	339.5	345.8	.0	.0
5	18.68	18.50	.990	351.9	351.9	1.000	15.85	16.85	1.64465	1.71315	335.8	342.6	.0	.0
6	18.71	18.54	.991	349.3	349.3	1.000	15.80	16.85	1.65352	1.72664	332.8	339.9	.0	.0
7	18.66	18.55	.994	348.2	348.2	1.000	15.67	16.83	1.64805	1.73156	331.2	338.7	.0	.0
8	18.69	18.54	.992	348.2	348.2	1.000	15.57	16.78	1.64074	1.72700	330.5	338.5	.0	.0
9	18.85	18.60	.987	349.5	349.5	1.000	15.39	16.81	1.62533	1.72464	329.8	339.6	.0	.0
10	18.89	18.26	.967	350.8	350.8	1.000	15.15	16.73	1.60265	1.70334	329.4	342.2	.0	.0
11	18.71	18.02	.963	351.4	351.4	1.000	15.07	16.71	1.58925	1.69304	330.4	343.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	4.0	-1.8	17.0	.464	.000	.122	.122	.000	.048	.048	.000	.771
2	10.0	3.7	-2.1	16.2	.448	.000	.108	.108	.000	.041	.041	.000	.761
3	20.0	5.4	-.3	13.7	.457	.000	.092	.092	.000	.034	.034	.000	.807
4	30.0	5.2	-.5	11.7	.449	.000	.079	.079	.000	.028	.028	.000	.801
5	40.0	4.8	-.8	10.8	.456	.000	.065	.065	.000	.022	.022	.000	.809
6	50.0	2.8	-2.7	9.7	.449	.000	.061	.061	.000	.020	.020	.000	.791
7	60.0	2.0	-3.5	9.2	.451	.000	.040	.040	.000	.012	.012	.000	.794
8	70.0	3.5	-1.9	9.8	.457	.000	.048	.048	.000	.014	.014	.000	.845
9	80.0	6.5	1.3	13.2	.490	.000	.073	.073	.000	.021	.021	.000	.967
10	90.0	3.7	-1.4	16.7	.553	.000	.168	.168	.000	.045	.045	.000	.991
11	95.0	-2.1	-7.1	16.6	.584	.000	.189	.189	.000	.049	.049	.000	.895

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(n) 80 Percent of design speed; reading 1544

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	134.2	139.5	1.039	134.2	139.5	1.039	76.7	-4.1	.4	.4	154.6	139.5	154.6	139.5
2	22.697	22.730	148.3	150.5	1.015	148.3	150.5	1.015	79.4	-1.5	1.0	.9	168.2	150.5	168.2	150.5
3	21.788	21.849	161.1	160.4	.996	161.1	160.4	.996	77.7	-4.6	2.1	1.8	178.9	160.5	178.9	160.5
4	20.889	20.973	165.6	164.4	.993	165.6	164.5	.993	75.7	-7.2	3.2	2.6	182.1	164.6	182.1	164.6
5	20.002	20.109	168.0	169.2	1.007	168.1	169.3	1.007	82.4	-5.5	4.4	3.4	187.2	169.4	187.2	169.4
6	19.129	19.258	170.9	174.3	1.020	171.0	174.4	1.020	89.7	-4.9	5.7	4.1	193.1	174.4	193.1	174.4
7	18.268	18.423	176.7	180.4	1.021	176.8	180.4	1.020	95.1	-6.1	7.3	4.8	200.8	180.6	200.8	180.6
8	17.414	17.600	183.6	189.9	1.035	183.8	190.0	1.034	102.6	-7.6	9.3	5.5	210.5	190.2	210.5	190.2
9	16.576	16.800	186.9	200.6	1.073	187.2	200.7	1.072	120.5	-2.2	11.4	6.2	222.7	200.7	222.7	200.7
10	15.751	16.035	185.8	196.4	1.057	186.3	196.5	1.055	138.1	8.7	13.7	6.3	231.9	196.7	231.9	196.7
11	15.342	15.669	184.9	182.2	.985	185.5	182.3	.983	137.9	6.0	15.1	6.0	231.1	182.4	231.1	182.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.421	.379	.421	.379	.366	.379	.366	.379	29.7	-1.7	29.7	-1.7	29.7	-1.7	29.7	-1.7
2	.460	.410	.460	.410	.406	.410	.406	.410	28.2	-.6	28.2	-.6	28.2	-.6	28.2	-.6
3	.493	.441	.493	.441	.444	.440	.445	.441	25.7	-1.7	25.7	-1.7	25.7	-1.7	25.7	-1.7
4	.505	.454	.505	.454	.459	.454	.459	.454	24.6	-2.5	24.6	-2.5	24.6	-2.5	24.6	-2.5
5	.520	.468	.520	.468	.467	.468	.467	.468	26.1	-1.9	26.1	-1.9	26.1	-1.9	26.1	-1.9
6	.537	.482	.537	.482	.475	.482	.475	.482	27.7	-1.6	27.7	-1.6	27.7	-1.6	27.7	-1.6
7	.559	.500	.559	.500	.492	.499	.493	.500	28.3	-1.9	28.3	-1.9	28.3	-1.9	28.3	-1.9
8	.587	.527	.587	.527	.512	.526	.513	.527	29.2	-2.3	29.2	-2.3	29.2	-2.3	29.2	-2.3
9	.621	.555	.621	.555	.521	.555	.522	.555	32.8	-.6	32.8	-.6	32.8	-.6	32.8	-.6
10	.645	.541	.645	.541	.517	.540	.519	.541	36.6	2.6	36.5	2.5	36.6	2.6	36.5	2.5
11	.642	.499	.642	.499	.514	.498	.515	.499	36.7	1.9	36.6	1.9	36.7	1.9	36.6	1.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	16.61	16.46	.991	347.3	347.3	1.000	14.70	14.90	1.52665	1.53779	335.5	337.7	.0	.0
2	16.98	16.75	.986	346.4	346.4	1.000	14.68	14.92	1.53964	1.55100	332.3	335.1	.0	.0
3	17.19	16.98	.988	342.8	342.8	1.000	14.55	14.86	1.55107	1.56861	326.9	330.0	.0	.0
4	17.32	17.11	.988	340.2	340.2	1.000	14.55	14.85	1.56621	1.58368	323.7	326.7	.0	.0
5	17.40	17.25	.991	340.1	340.1	1.000	14.48	14.84	1.56305	1.58724	322.7	325.8	.0	.0
6	17.56	17.38	.990	340.6	340.6	1.000	14.43	14.82	1.56130	1.58659	322.0	325.4	.0	.0
7	17.74	17.54	.989	340.8	340.8	1.000	14.35	14.79	1.55827	1.58734	320.8	324.6	.0	.0
8	18.03	17.79	.986	342.1	342.1	1.000	14.28	14.72	1.55451	1.58231	320.1	324.1	.0	.0
9	18.40	18.11	.984	345.0	345.0	1.000	14.19	14.68	1.54335	1.57431	320.3	325.0	.0	.0
10	18.59	17.86	.961	348.1	348.1	1.000	14.05	14.64	1.52370	1.55078	321.3	328.8	.0	.0
11	18.47	17.31	.937	349.2	349.2	1.000	14.00	14.60	1.51212	1.52923	322.6	332.6	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-5.2	-11.0	12.7	.302	.000	.079	.079	.000	.031	.031	.000	.590
2	10.0	-6.6	-12.3	12.2	.289	.000	.100	.100	.000	.038	.038	.000	.610
3	20.0	-9.1	-14.8	9.0	.272	.000	.080	.080	.000	.030	.030	.000	.589
4	30.0	-10.4	-16.0	7.3	.257	.000	.075	.075	.000	.027	.027	.000	.557
5	40.0	-9.5	-15.1	7.6	.254	.000	.053	.053	.000	.018	.018	.000	.592
6	50.0	-9.0	-14.5	7.7	.255	.000	.057	.057	.000	.019	.019	.000	.625
7	60.0	-9.7	-15.1	7.5	.256	.000	.059	.059	.000	.018	.018	.000	.640
8	70.0	-10.4	-15.7	7.5	.251	.000	.066	.066	.000	.019	.019	.000	.664
9	80.0	-9.2	-14.4	10.0	.253	.000	.070	.070	.000	.020	.020	.000	.760
10	90.0	-8.9	-14.0	15.5	.300	.000	.161	.161	.000	.043	.043	.000	.843
11	95.0	-11.1	-16.1	16.8	.358	.000	.261	.261	.000	.068	.068	.000	.819

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(o) 80 Percent of design speed; reading 1555

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	138.3	132.9	.961	138.3	132.9	.961	96.6	-2.5	.4	.4	168.7	133.0	168.7	133.0
2	22.697	22.730	140.4	137.6	.980	140.4	137.6	.980	97.4	1.6	.9	.8	170.9	137.6	170.9	137.6
3	21.788	21.849	143.5	142.8	.995	143.5	142.8	.995	101.1	.1	1.9	1.6	175.5	142.8	175.5	142.8
4	20.889	20.973	146.1	145.3	.994	146.2	145.3	.994	100.5	-2.5	2.9	2.3	177.4	145.3	177.4	145.3
5	20.002	20.109	148.8	147.4	.991	148.9	147.5	.991	104.6	-2.5	3.9	3.0	181.9	147.5	181.9	147.5
6	19.129	19.258	152.0	150.9	.993	152.1	150.9	.992	108.6	-2.2	5.1	3.5	186.9	150.9	186.9	150.9
7	18.268	18.423	155.9	154.9	.993	156.1	155.0	.993	113.1	-2.1	6.5	4.1	192.7	155.0	192.7	155.0
8	17.414	17.600	155.2	159.2	1.026	155.4	159.3	1.025	119.9	-3.6	7.9	4.6	196.3	159.3	196.3	159.3
9	16.576	16.800	148.7	161.8	1.088	149.0	161.8	1.086	140.5	1.0	9.1	5.0	204.8	161.8	204.8	161.8
10	15.751	16.035	150.9	154.4	1.023	151.3	154.5	1.021	153.4	6.2	11.1	5.0	215.4	154.6	215.4	154.6
11	15.342	15.669	158.1	144.3	.913	158.7	144.4	.910	146.6	2.1	12.9	4.7	216.0	144.4	216.0	144.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.453	.355	.453	.355	.372	.355	.372	.355	34.9	-1.1	34.9	-1.1	34.9	-1.1	34.9	-1.1
2	.461	.368	.461	.368	.379	.368	.379	.368	34.7	.7	34.7	.7	34.7	.7	34.7	.7
3	.477	.385	.477	.385	.390	.385	.390	.385	35.2	.1	35.2	.1	35.2	.1	35.2	.1
4	.484	.394	.484	.394	.399	.393	.399	.393	34.5	-1.0	34.5	-1.0	34.5	-1.0	34.5	-1.0
5	.498	.401	.498	.401	.408	.400	.408	.401	35.1	-1.0	35.1	-1.0	35.1	-1.0	35.1	-1.0
6	.513	.411	.513	.411	.417	.411	.418	.411	35.6	-.8	35.5	-.8	35.6	-.8	35.5	-.8
7	.530	.422	.530	.422	.429	.422	.430	.422	35.9	-.8	35.9	-.8	35.9	-.8	35.9	-.8
8	.541	.435	.541	.435	.428	.434	.428	.434	37.7	-1.3	37.7	-1.3	37.7	-1.3	37.7	-1.3
9	.564	.441	.564	.441	.409	.440	.410	.441	43.4	.4	43.3	.4	43.4	.4	43.3	.4
10	.594	.419	.594	.419	.416	.418	.417	.419	45.5	2.3	45.4	2.3	45.5	2.3	45.4	2.3
11	.595	.390	.595	.390	.435	.390	.437	.390	42.8	.8	42.7	.8	42.8	.8	42.7	.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	18.28	17.97	.983	358.6	358.6	1.000	15.88	16.47	1.60601	1.64020	344.5	349.8	.0	.0
2	18.34	18.09	.987	356.9	356.9	1.000	15.85	16.47	1.61336	1.65174	342.4	347.5	.0	.0
3	18.44	18.22	.988	353.0	353.0	1.000	15.78	16.45	1.62835	1.67191	337.7	342.9	.0	.0
4	18.45	18.30	.992	349.9	349.9	1.000	15.72	16.45	1.63798	1.68864	334.3	339.4	.0	.0
5	18.54	18.35	.990	348.2	348.2	1.000	15.64	16.43	1.64289	1.69662	331.8	337.4	.0	.0
6	18.61	18.44	.991	347.5	347.5	1.000	15.55	16.42	1.64053	1.70146	330.2	336.2	.0	.0
7	18.72	18.55	.991	347.1	347.1	1.000	15.46	16.41	1.63915	1.70573	328.6	335.1	.0	.0
8	18.77	18.62	.992	347.3	347.3	1.000	15.38	16.36	1.63330	1.70279	328.1	334.6	.0	.0
9	18.85	18.67	.991	349.0	349.0	1.000	15.19	16.34	1.61295	1.69482	328.1	336.0	.0	.0
10	19.03	18.38	.966	351.0	351.0	1.000	15.00	16.29	1.59355	1.67366	327.9	339.1	.0	.0
11	18.95	18.06	.953	351.6	351.6	1.000	14.92	16.26	1.58285	1.66052	328.4	341.2	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	.1	-5.7	13.5	.441	.000	.132	.132	.000	.052	.052	.000	.718
2	10.0	.1	-5.6	13.6	.410	.000	.099	.099	.000	.038	.038	.000	.717
3	20.0	.5	-5.2	10.9	.398	.000	.081	.081	.000	.030	.030	.000	.732
4	30.0	-.3	-6.0	9.0	.386	.000	.052	.052	.000	.019	.019	.000	.719
5	40.0	-.4	-6.0	8.6	.388	.000	.064	.064	.000	.022	.022	.000	.736
6	50.0	-1.0	-6.5	8.6	.384	.000	.054	.054	.000	.017	.017	.000	.748
7	60.0	-1.9	-7.4	8.8	.380	.000	.054	.054	.000	.017	.017	.000	.762
8	70.0	-1.8	-7.1	8.6	.374	.000	.043	.043	.000	.013	.013	.000	.787
9	80.0	1.5	-3.7	11.1	.400	.000	.049	.049	.000	.014	.014	.000	.902
10	90.0	.1	-5.0	15.4	.464	.000	.162	.162	.000	.043	.043	.000	.959
11	95.0	-4.8	-9.9	15.9	.504	.000	.220	.220	.000	.058	.058	.000	.889

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(p) 70 Percent of design speed; reading 1475

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	128.0	142.2	1.111	128.0	142.2	1.111	31.5	-8.6	.4	.4	131.9	142.5	131.9	142.5
2	22.697	22.730	144.5	159.2	1.102	144.5	159.2	1.102	35.6	-6.5	1.0	.9	148.8	159.3	148.8	159.3
3	21.788	21.849	158.8	166.8	1.051	158.8	166.8	1.051	33.8	-7.2	2.1	1.9	162.4	167.0	162.4	167.0
4	20.889	20.973	163.1	169.0	1.036	163.1	169.0	1.036	36.3	-7.7	3.2	2.7	167.1	169.2	167.1	169.2
5	20.002	20.109	167.4	176.7	1.056	167.5	176.8	1.056	44.1	-5.7	4.4	3.5	173.2	176.9	173.2	176.9
6	19.129	19.258	175.4	185.5	1.058	175.5	185.5	1.057	52.2	-5.8	5.9	4.3	183.1	185.6	183.1	185.6
7	18.268	18.423	184.4	196.9	1.068	184.6	197.0	1.067	63.0	-6.0	7.7	5.2	195.0	197.0	195.0	197.0
8	17.414	17.600	191.3	209.4	1.095	191.5	209.5	1.094	74.2	-7.6	9.7	6.0	205.4	209.6	205.4	209.6
9	16.576	16.800	199.1	224.2	1.126	199.5	224.3	1.125	90.1	-2.4	12.1	6.9	218.9	224.4	218.9	224.4
10	15.751	16.035	200.3	224.8	1.122	200.9	224.9	1.120	107.0	13.1	14.8	7.3	227.6	225.3	227.6	225.3
11	15.342	15.669	193.3	208.0	1.076	193.9	208.2	1.073	111.3	10.9	15.8	6.8	223.6	208.4	223.6	208.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.371	.402	.371	.402	.361	.401	.361	.401	13.8	-3.5	13.8	-3.5	13.8	-3.5	13.8	-3.5
2	.421	.452	.421	.452	.409	.451	.409	.452	13.8	-2.4	13.8	-2.4	13.8	-2.4	13.8	-2.4
3	.462	.476	.462	.476	.452	.476	.452	.476	12.0	-2.5	12.0	-2.5	12.0	-2.5	12.0	-2.5
4	.477	.483	.477	.483	.465	.483	.465	.483	12.6	-2.6	12.6	-2.6	12.6	-2.6	12.6	-2.6
5	.494	.505	.494	.505	.478	.505	.478	.505	14.8	-1.9	14.8	-1.9	14.8	-1.9	14.8	-1.9
6	.523	.531	.523	.531	.501	.530	.501	.530	16.6	-1.8	16.6	-1.8	16.6	-1.8	16.6	-1.8
7	.557	.563	.557	.563	.527	.563	.527	.563	18.9	-1.8	18.9	-1.8	18.9	-1.8	18.9	-1.8
8	.587	.600	.587	.600	.546	.599	.547	.599	21.2	-2.1	21.2	-2.1	21.2	-2.1	21.2	-2.1
9	.625	.642	.625	.642	.568	.641	.569	.642	24.3	-.6	24.3	-.6	24.3	-.6	24.3	-.6
10	.649	.642	.649	.642	.571	.640	.573	.641	28.1	3.3	28.0	3.3	28.1	3.3	28.0	3.3
11	.635	.589	.635	.589	.549	.588	.551	.588	29.9	3.0	29.9	3.0	29.9	3.0	29.9	3.0

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	13.45	13.17	.979	322.3	322.3	1.000	12.23	11.78	1.35832	1.31470	313.7	312.2	.0	.0
2	13.81	13.58	.983	321.9	321.9	1.000	12.23	11.81	1.37050	1.33034	310.8	309.2	.0	.0
3	14.06	13.5[illegible]	.967	319.9	319.9	1.000	12.14	11.63	1.37877	1.32451	306.7	306.0	.0	.0
4	14.20	13.68	.963	319.4	319.4	1.000	12.16	11.66	1.38635	1.33115	305.5	305.1	.0	.0
5	14.31	13.89	.971	320.2	320.2	1.000	12.11	11.67	1.38144	1.33407	305.3	304.7	.0	.0
6	14.[illegible]	14.07	.965	321.6	321.6	1.000	12.11	11.61	1.38312	1.32905	304.9	304.5	.0	.0
7	14.90	14.41	.967	323.7	323.7	1.000	12.07	11.62	1.37974	1.33014	304.7	304.3	.0	.0
8	15.18	14.71	.969	326.0	326.0	1.000	12.02	11.54	1.37325	1.32183	305.0	304.1	.0	.0
9	15.54	15.07	.970	329.2	329.2	1.000	11.94	11.42	1.36258	1.30872	305.3	304.1	.0	.0
10	15.92	15.08	.947	332.0	332.0	1.000	12.00	11.43	1.36507	1.29861	306.2	306.8	.0	.0
11	15.71	14.42	.917	333.5	333.5	1.000	11.98	11.40	1.35223	1.27355	308.6	311.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-21.2	-26.9	10.9	.038	.000	.229	.229	.000	.090	.090	.000	.371
2	10.0	-20.9	-26.7	10.4	.038	.000	.145	.145	.000	.056	.056	.000	.421
3	20.0	-22.8	-28.5	8.2	.065	.000	.245	.245	.000	.090	.090	.000	.462
4	30.0	-22.4	-28.1	7.2	.081	.000	.257	.257	.000	.091	.091	.000	.477
5	40.0	-20.9	-26.4	7.6	.076	.000	.190	.190	.000	.064	.064	.000	.494
6	50.0	-20.2	-25.7	7.5	.089	.000	.208	.208	.000	.067	.067	.000	.523
7	60.0	-19.2	-24.6	7.7	.099	.000	.173	.173	.000	.053	.053	.000	.557
8	70.0	-18.4	-23.7	7.7	.097	.000	.147	.147	.000	.043	.043	.000	.587
9	80.0	-17.7	-22.9	10.0	.093	.000	.130	.130	.000	.037	.037	.000	.625
10	90.0	-17.5	-22.6	16.3	.119	.000	.214	.214	.000	.057	.057	.000	.649
11	95.0	-17.9	-22.9	17.9	.184	.000	.348	.348	.000	.091	.091	.000	.635

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(q) 70 Percent of design speed; reading 1486

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	117.8	119.4	1.014	117.8	119.4	1.014	71.0	-2.2	.3	.4	137.5	119.4	137.5	119.4
2	22.697	22.730	126.4	128.2	1.014	126.4	128.2	1.014	73.1	.7	.8	.8	146.0	128.2	146.0	128.2
3	21.788	21.849	134.3	135.1	1.006	134.3	135.1	1.006	72.7	-2.7	1.8	1.6	152.7	135.1	152.7	135.1
4	20.889	20.973	137.1	137.9	1.006	137.1	137.9	1.006	71.0	-5.1	2.7	2.2	154.4	138.0	154.4	138.0
5	20.002	20.109	139.8	141.5	1.012	139.8	141.5	1.012	76.7	-4.3	3.7	2.8	159.5	141.6	159.5	141.6
6	19.129	19.258	143.7	145.4	1.012	143.7	145.4	1.012	81.1	-4.3	4.8	3.4	165.0	145.5	165.0	145.5
7	18.268	18.423	149.2	151.4	1.014	149.4	151.4	1.014	85.7	-5.0	6.2	4.0	172.2	151.5	172.2	151.5
8	17.414	17.600	154.0	159.8	1.037	154.2	159.9	1.036	92.4	-5.7	7.8	4.6	179.8	160.0	179.8	160.0
9	16.576	16.800	155.2	167.7	1.080	155.5	167.7	1.079	108.6	-1.6	9.5	5.2	189.7	167.7	189.7	167.7
10	15.751	16.035	155.4	162.7	1.047	155.8	162.8	1.045	121.8	7.3	11.5	5.3	197.7	162.9	197.7	162.9
11	15.342	15.669	156.9	150.2	.957	157.4	150.3	.955	119.9	4.8	12.8	4.9	197.9	150.3	197.9	150.3

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.380	.328	.380	.328	.325	.328	.325	.328	31.1	-1.0	31.1	-1.0	31.1	-1.0	31.1	-1.0
2	.404	.353	.404	.353	.350	.353	.350	.353	30.0	.3	30.0	.3	30.0	.3	30.0	.3
3	.425	.375	.425	.375	.374	.374	.374	.374	28.4	-1.1	28.4	-1.1	28.4	-1.1	28.4	-1.1
4	.431	.384	.431	.384	.383	.384	.383	.384	27.4	-2.1	27.4	-2.1	27.4	-2.1	27.4	-2.1
5	.447	.395	.447	.395	.392	.395	.392	.395	28.8	-1.7	28.7	-1.7	28.8	-1.7	28.7	-1.7
6	.463	.406	.463	.406	.403	.406	.403	.406	29.4	-1.7	29.4	-1.7	29.4	-1.7	29.4	-1.7
7	.484	.424	.484	.424	.419	.423	.420	.423	29.9	-1.9	29.8	-1.9	29.9	-1.9	29.8	-1.9
8	.506	.448	.506	.448	.433	.447	.434	.447	31.0	-2.0	30.9	-2.0	31.0	-2.0	30.9	-2.0
9	.534	.469	.534	.469	.437	.469	.437	.469	35.0	-.5	34.9	-.5	35.0	-.5	34.9	-.5
10	.556	.454	.556	.454	.437	.453	.438	.453	38.1	2.6	38.0	2.6	38.1	2.6	38.0	2.6
11	.556	.417	.556	.417	.441	.416	.442	.417	37.4	1.8	37.3	1.8	37.4	1.8	37.3	1.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.22	15.08	.991	336.2	336.2	1.000	13.78	14.00	1.46881	1.48181	326.8	329.1	.0	.0
2	15.41	15.27	.991	335.6	335.6	1.000	13.77	14.01	1.47576	1.49046	325.0	327.4	.0	.0
3	15.51	15.38	.992	332.9	332.9	1.000	13.70	13.96	1.48498	1.50157	321.3	323.8	.0	.0
4	15.54	15.45	.994	330.6	330.6	1.000	13.67	13.96	1.49449	1.51426	318.7	321.1	.0	.0
5	15.63	15.54	.994	329.7	329.7	1.000	13.63	13.96	1.49753	1.52083	317.1	319.8	.0	.0
6	15.73	15.60	.992	329.6	329.6	1.000	13.58	13.93	1.49727	1.52058	316.0	319.1	.0	.0
7	15.88	15.75	.992	329.7	329.7	1.000	13.53	13.92	1.49682	1.52419	314.9	318.3	.0	.0
8	16.05	15.92	.992	330.5	330.5	1.000	13.47	13.88	1.49305	1.52147	314.4	317.8	.0	.0
9	16.27	16.11	.991	332.3	332.3	1.000	13.40	13.86	1.48489	1.51690	314.4	318.3	.0	.0
10	16.38	15.93	.973	334.3	334.3	1.000	13.28	13.83	1.46903	1.50084	314.9	321.1	.0	.0
11	16.32	15.56	.953	335.1	335.1	1.000	13.24	13.81	1.46122	1.48565	315.6	323.8	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-3.8	-9.5	13.4	.340	.000	.093	.093	.000	.036	.036	.000	.551
2	10.0	-4.6	-10.4	13.2	.312	.000	.082	.082	.000	.032	.032	.000	.564
3	20.0	-6.3	-12.0	9.6	.297	.000	.072	.072	.000	.027	.027	.000	.553
4	30.0	-7.5	-13.1	7.8	.280	.000	.046	.046	.000	.016	.016	.000	.531
5	40.0	-6.8	-12.4	7.8	.284	.000	.044	.044	.000	.015	.015	.000	.559
6	50.0	-7.2	-12.7	7.7	.286	.000	.061	.061	.000	.020	.020	.000	.573
7	60.0	-8.0	-13.5	7.6	.283	.000	.055	.055	.000	.017	.017	.000	.588
8	70.0	-8.5	-13.9	7.8	.271	.000	.048	.048	.000	.014	.014	.000	.613
9	80.0	-6.9	-12.2	10.2	.278	.000	.054	.054	.000	.015	.015	.000	.699
10	90.0	-7.4	-12.5	15.6	.330	.000	.144	.144	.000	.039	.039	.000	.757
11	95.0	-10.3	-15.3	16.8	.391	.000	.247	.247	.000	.065	.065	.000	.725

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(r) 70 Percent of design speed; reading 1497

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	114.9	112.7	.981	114.9	112.7	.981	78.3	-2.1	.3	.3	139.1	112.8	139.1	112.8
2	22.697	22.730	118.9	116.8	.983	118.9	116.8	.983	79.4	.3	.8	.7	142.9	116.8	142.9	116.8
3	21.788	21.849	118.3	121.8	1.029	118.3	121.8	1.029	94.7	1.0	1.5	1.4	151.5	121.8	151.5	121.8
4	20.889	20.973	118.5	123.7	1.043	118.6	123.7	1.043	96.0	.5	2.3	2.0	152.6	123.7	152.6	123.7
5	20.002	20.109	124.0	125.4	1.011	124.1	125.4	1.011	97.1	-.6	3.2	2.5	157.5	125.4	157.5	125.4
6	19.129	19.258	130.2	128.9	.990	130.3	128.9	.990	94.9	-2.6	4.4	3.0	161.2	129.0	161.2	129.0
7	18.268	18.423	135.6	133.6	.985	135.7	133.6	.985	96.5	-2.9	5.6	3.5	166.5	133.7	166.5	133.7
8	17.414	17.600	136.2	138.5	1.017	136.4	138.6	1.016	102.9	-3.3	6.9	4.0	170.8	138.6	170.8	138.6
9	16.576	16.800	131.5	140.7	1.070	131.7	140.8	1.069	119.4	1.3	8.0	4.3	177.8	140.8	177.8	140.8
10	15.751	16.035	132.3	133.8	1.011	132.7	133.8	1.009	131.3	5.1	9.8	4.3	186.7	133.9	186.7	133.9
11	15.342	15.669	137.0	125.3	.915	137.5	125.4	.912	124.8	1.8	11.2	4.1	185.7	125.4	185.7	125.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.379	.306	.379	.306	.313	.306	.313	.306	34.3	-1.1	34.3	-1.1	34.3	-1.1	34.3	-1.1
2	.391	.318	.391	.318	.325	.318	.325	.318	33.7	.2	33.7	.2	33.7	.2	33.7	.2
3	.416	.333	.416	.333	.325	.333	.325	.333	38.7	.5	38.7	.5	38.7	.5	38.7	.5
4	.421	.339	.421	.339	.327	.339	.327	.339	39.0	.2	39.0	.2	39.0	.2	39.0	.2
5	.437	.346	.437	.346	.344	.346	.344	.346	38.1	-.3	38.1	-.3	38.1	-.3	38.1	-.3
6	.449	.357	.449	.357	.363	.356	.363	.357	36.1	-1.1	36.1	-1.1	36.1	-1.1	36.1	-1.1
7	.465	.370	.465	.370	.378	.370	.379	.370	35.4	-1.3	35.4	-1.3	35.4	-1.3	35.4	-1.3
8	.477	.384	.477	.384	.381	.384	.381	.384	37.1	-1.4	37.0	-1.4	37.1	-1.4	37.0	-1.4
9	.497	.390	.497	.390	.367	.390	.368	.390	42.3	.5	42.2	.5	42.3	.5	42.2	.5
10	.522	.370	.522	.370	.370	.369	.371	.369	44.8	2.2	44.7	2.2	44.8	2.2	44.7	2.2
11	.519	.345	.519	.345	.383	.345	.384	.345	42.3	.8	42.2	.8	42.3	.8	42.2	.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	15.88	15.71	.989	344.8	344.8	1.000	14.38	14.72	1.49465	1.51542	335.1	338.4	.0	.0
2	15.96	15.79	.989	343.5	343.5	1.000	14.37	14.72	1.50138	1.52322	333.4	336.7	.0	.0
3	16.06	15.89	.990	340.9	340.9	1.000	14.25	14.72	1.50701	1.53749	329.5	333.6	.0	.0
4	16.08	15.93	.991	338.1	338.1	1.000	14.23	14.71	1.51879	1.55081	326.5	330.4	.0	.0
5	16.14	15.97	.989	335.5	335.5	1.000	14.15	14.70	1.52580	1.56298	323.1	327.7	.0	.0
6	16.19	16.04	.990	333.8	333.8	1.000	14.10	14.69	1.53114	1.57197	320.9	325.6	.0	.0
7	16.25	16.14	.993	333.1	333.1	1.000	14.02	14.68	1.52925	1.57780	319.3	324.2	.0	.0
8	16.34	16.23	.993	333.1	333.1	1.000	13.98	14.65	1.52867	1.57767	318.6	323.6	.0	.0
9	16.38	16.27	.993	334.2	334.2	1.000	13.84	14.65	1.51373	1.57320	318.5	324.3	.0	.0
10	16.51	16.05	.972	335.6	335.6	1.000	13.71	14.60	1.50099	1.55711	318.3	326.7	.0	.0
11	16.41	15.84	.965	336.2	336.2	1.000	13.66	14.58	1.49159	1.54730	319.0	328.3	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-.5	-6.3	13.5	.415	.000	.113	.113	.000	.044	.044	.000	.592
2	10.0	-.8	-6.6	13.2	.395	.000	.107	.107	.000	.041	.041	.000	.596
3	20.0	4.0	-1.7	11.3	.424	.000	.093	.093	.000	.034	.034	.000	.689
4	30.0	4.2	-1.4	10.2	.410	.000	.081	.081	.000	.029	.029	.000	.691
5	40.0	2.6	-3.0	9.4	.413	.000	.086	.086	.000	.029	.029	.000	.690
6	50.0	-.5	-6.0	8.4	.395	.000	.074	.074	.000	.024	.024	.000	.663
7	60.0	-2.4	-7.8	8.4	.381	.000	.049	.049	.000	.015	.015	.000	.660
8	70.0	-2.3	-7.7	8.6	.371	.000	.049	.049	.000	.014	.014	.000	.686
9	80.0	.4	-4.8	11.3	.394	.000	.046	.046	.000	.013	.013	.000	.777
10	90.0	-.6	-5.7	15.3	.462	.000	.166	.166	.000	.044	.044	.000	.831
11	95.0	-5.3	-10.3	15.9	.496	.000	.208	.208	.000	.054	.054	.000	.767

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(s) 60 Percent of design speed; reading 1510

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	92.7	100.4	1.083	92.7	100.4	1.083	17.2	-5.1	.3	.3	94.3	100.5	94.3	100.5
2	22.697	22.730	106.0	113.3	1.068	106.0	113.3	1.068	20.2	-3.8	.7	.7	107.9	113.3	107.9	113.3
3	21.788	21.849	115.2	119.1	1.034	115.2	119.1	1.034	19.1	-4.1	1.5	1.4	116.8	119.2	116.8	119.2
4	20.889	20.973	118.8	120.9	1.018	118.8	120.9	1.018	21.0	-4.3	2.3	1.9	120.7	121.0	120.7	121.0
5	20.002	20.109	123.9	127.2	1.027	123.9	127.2	1.027	25.4	-3.3	3.2	2.6	126.5	127.3	126.5	127.3
6	19.129	19.258	129.5	134.5	1.038	129.6	134.5	1.038	31.8	-3.1	4.3	3.1	133.4	134.5	133.4	134.5
7	18.268	18.423	136.8	143.0	1.045	137.0	143.1	1.045	39.7	-4.3	5.7	3.8	142.6	143.1	142.6	143.1
8	17.414	17.600	142.3	151.2	1.062	142.5	151.2	1.061	47.6	-5.6	7.2	4.4	150.2	151.3	150.2	151.3
9	16.576	16.800	147.1	163.1	1.109	147.4	163.2	1.107	59.1	-4.4	9.0	5.0	158.8	163.3	158.8	163.3
10	15.751	16.035	153.1	169.5	1.107	153.6	169.6	1.104	72.2	6.4	11.3	5.5	169.7	169.7	169.7	169.7
11	15.342	15.669	155.0	162.1	1.046	155.5	162.2	1.043	76.2	8.2	12.7	5.3	173.2	162.4	173.2	162.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.271	.290	.271	.290	.267	.289	.267	.289	10.5	-2.9	10.5	-2.9	10.5	-2.9	10.5	-2.9
2	.312	.328	.312	.328	.306	.327	.306	.327	10.8	-1.9	10.8	-1.9	10.8	-1.9	10.8	-1.9
3	.338	.346	.338	.346	.334	.345	.334	.345	9.4	-2.0	9.4	-2.0	9.4	-2.0	9.4	-2.0
4	.350	.351	.350	.351	.345	.351	.345	.351	10.0	-2.0	10.0	-2.0	10.0	-2.0	10.0	-2.0
5	.367	.370	.367	.370	.360	.370	.360	.370	11.6	-1.5	11.6	-1.5	11.6	-1.5	11.6	-1.5
6	.388	.391	.388	.391	.376	.391	.377	.391	13.8	-1.3	13.8	-1.3	13.8	-1.3	13.8	-1.3
7	.414	.416	.414	.416	.398	.416	.398	.416	16.2	-1.7	16.2	-1.7	16.2	-1.7	16.2	-1.7
8	.436	.440	.436	.440	.413	.439	.414	.439	18.5	-2.1	18.5	-2.1	18.5	-2.1	18.5	-2.1
9	.461	.475	.461	.475	.427	.474	.428	.474	21.9	-1.5	21.9	-1.5	21.9	-1.5	21.9	-1.5
10	.492	.492	.492	.492	.444	.492	.446	.492	25.2	2.1	25.2	2.1	25.2	2.1	25.2	2.1
11	.502	.469	.502	.469	.449	.468	.451	.469	26.2	2.9	26.1	2.9	26.2	2.9	26.1	2.9

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	11.56	11.45	.991	304.5	304.5	1.000	10.98	10.80	1.27509	1.25710	300.0	299.4	.0	.0
2	11.75	11.65	.992	304.2	304.2	1.000	10.98	10.82	1.28241	1.26556	298.4	297.8	.0	.0
3	11.82	11.64	.985	303.0	303.0	1.000	10.92	10.72	1.28442	1.26204	296.2	295.9	.0	.0
4	11.90	11.70	.983	302.5	302.5	1.000	10.93	10.74	1.28981	1.26792	295.3	295.2	.0	.0
5	12.00	11.80	.983	302.8	302.8	1.000	10.93	10.74	1.29147	1.26904	294.8	294.7	.0	.0
6	12.10	11.92	.985	303.5	303.5	1.000	10.91	10.73	1.28973	1.26898	294.6	294.5	.0	.0
7	12.28	12.07	.984	304.8	304.8	1.000	10.91	10.72	1.28983	1.26776	294.6	294.5	.0	.0
8	12.41	12.22	.984	306.0	306.0	1.000	10.89	10.70	1.28708	1.26530	294.7	294.6	.0	.0
9	12.54	12.39	.987	307.8	307.8	1.000	10.84	10.61	1.27952	1.25565	295.2	294.5	.0	.0
10	12.80	12.59	.983	309.9	309.9	1.000	10.85	10.67	1.27867	1.25746	295.5	295.5	.0	.0
11	12.88	12.36	.960	311.0	311.0	1.000	10.84	10.63	1.27545	1.24268	296.1	297.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-24.5	-30.2	11.4	.027	.000	.183	.183	.000	.072	.072	.000	.271
2	10.0	-24.0	-29.8	10.8	.035	.000	.126	.126	.000	.048	.048	.000	.312
3	20.0	-25.5	-31.2	8.6	.053	.000	.198	.198	.000	.073	.073	.000	.338
4	30.0	-25.0	-30.7	7.7	.071	.000	.205	.205	.000	.072	.072	.000	.350
5	40.0	-24.1	-29.7	7.9	.071	.000	.186	.186	.000	.063	.063	.000	.367
6	50.0	-23.0	-28.5	8.0	.076	.000	.151	.151	.000	.049	.049	.000	.388
7	60.0	-21.9	-27.3	7.7	.091	.000	.148	.148	.000	.046	.046	.000	.414
8	70.0	-21.2	-26.5	7.6	.097	.000	.126	.126	.000	.037	.037	.000	.436
9	80.0	-20.2	-25.4	9.0	.084	.000	.093	.093	.000	.026	.026	.000	.461
10	90.0	-20.4	-25.5	15.1	.103	.000	.108	.108	.000	.029	.029	.000	.492
11	95.0	-21.7	-26.7	17.7	.164	.000	.255	.255	.000	.067	.067	.000	.502

TABLE XII. - Continued. BLADE-ELEMENT PERFORMANCE AT BLADE EDGES FOR SECOND-STAGE STATOR

(t) 60 Percent of design speed; reading 1521

RP	RADII IN	RADII OUT	AXIAL VELOCITY IN	AXIAL VELOCITY OUT	AXIAL VELOCITY RATIO	MERIDIONAL VELOCITY IN	MERIDIONAL VELOCITY OUT	MERIDIONAL VELOCITY RATIO	TANG VEL IN	TANG VEL OUT	RADIAL VEL IN	RADIAL VEL OUT	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT
1	23.142	23.160	84.1	86.4	1.028	84.1	86.4	1.028	40.0	-3.3	.2	.3	93.1	86.4	93.1	86.4
2	22.697	22.730	93.6	95.3	1.018	93.6	95.3	1.018	40.9	-2.2	.6	.6	102.2	95.3	102.2	95.3
3	21.788	21.849	100.7	102.0	1.013	100.7	102.0	1.013	41.8	-3.5	1.3	1.2	109.0	102.0	109.0	102.0
4	20.889	20.973	102.5	104.7	1.021	102.5	104.7	1.021	42.3	-4.4	2.0	1.7	110.9	104.8	110.9	104.8
5	20.002	20.109	105.0	108.4	1.032	105.1	108.4	1.032	46.6	-3.5	2.7	2.2	114.9	108.5	114.9	108.5
6	19.129	19.258	108.5	112.9	1.041	108.6	113.0	1.040	50.0	-3.4	3.6	2.6	119.6	113.0	119.6	113.0
7	18.268	18.423	114.8	119.1	1.038	114.8	119.1	1.037	54.2	-3.8	4.8	3.1	127.0	119.2	127.0	119.2
8	17.414	17.600	120.4	126.0	1.046	120.5	126.0	1.046	59.7	-4.7	6.1	3.6	134.5	126.1	134.5	126.1
9	16.576	16.800	124.6	134.7	1.082	124.8	134.8	1.080	70.6	-2.4	7.6	4.1	143.4	134.8	143.4	134.8
10	15.751	16.035	127.4	134.7	1.057	127.8	134.8	1.055	78.9	5.1	9.4	4.4	150.2	134.9	150.2	134.9
11	15.342	15.669	126.1	124.6	.988	126.5	124.6	.985	79.8	3.9	10.3	4.1	149.6	124.7	149.6	124.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	AXIAL MACH NO IN	AXIAL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	ABS BETAZ IN	ABS BETAZ OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAZ IN	REL BETAZ OUT	REL BETAM IN	REL BETAM OUT
1	.266	.246	.266	.246	.240	.246	.240	.246	25.5	-2.2	25.5	-2.2	25.5	-2.2	25.5	-2.2
2	.292	.272	.292	.272	.268	.272	.268	.272	23.6	-1.3	23.6	-1.3	23.6	-1.3	23.6	-1.3
3	.312	.292	.312	.292	.288	.292	.288	.292	22.5	-2.0	22.5	-2.0	22.5	-2.0	22.5	-2.0
4	.318	.301	.318	.301	.294	.300	.294	.300	22.4	-2.4	22.4	-2.4	22.4	-2.4	22.4	-2.4
5	.330	.312	.330	.312	.302	.311	.302	.311	23.9	-1.8	23.9	-1.8	23.9	-1.8	23.9	-1.8
6	.344	.325	.344	.325	.312	.325	.312	.325	24.8	-1.7	24.7	-1.7	24.8	-1.7	24.7	-1.7
7	.366	.343	.366	.343	.331	.342	.331	.343	25.3	-1.8	25.3	-1.8	25.3	-1.8	25.3	-1.8
8	.388	.363	.388	.363	.347	.362	.347	.363	26.4	-2.1	26.4	-2.1	26.4	-2.1	26.4	-2.1
9	.413	.388	.413	.388	.359	.388	.360	.388	29.5	-1.0	29.5	-1.0	29.5	-1.0	29.5	-1.0
10	.433	.387	.433	.387	.367	.387	.368	.387	31.8	2.2	31.7	2.2	31.8	2.2	31.7	2.2
11	.430	.357	.430	.357	.363	.356	.364	.357	32.3	1.8	32.2	1.8	32.3	1.8	32.2	1.8

RP	TOTAL PRESSURE IN	TOTAL PRESSURE OUT	TOTAL PRESSURE RATIO	TOTAL TEMPERATURE IN	TOTAL TEMPERATURE OUT	TOTAL TEMPERATURE RATIO	STATIC PRESS IN	STATIC PRESS OUT	STATIC DENSITY IN	STATIC DENSITY OUT	STATIC TEMP IN	STATIC TEMP OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	12.26	12.19	.994	310.1	310.1	1.000	11.67	11.69	1.33015	1.32912	305.7	306.3	.0	.0
2	12.38	12.31	.994	310.0	310.0	1.000	11.67	11.69	1.33415	1.33367	304.8	305.4	.0	.0
3	12.44	12.37	.994	308.9	308.9	1.000	11.63	11.66	1.33686	1.33685	303.0	303.7	.0	.0
4	12.47	12.41	.995	307.9	307.9	1.000	11.62	11.66	1.34211	1.34329	301.7	302.4	.0	.0
5	12.52	12.47	.996	307.5	307.5	1.000	11.61	11.66	1.34415	1.34628	301.0	301.7	.0	.0
6	12.58	12.53	.996	307.6	307.6	1.000	11.59	11.64	1.34390	1.34654	300.5	301.2	.0	.0
7	12.69	12.63	.995	307.9	307.9	1.000	11.57	11.64	1.34411	1.34852	299.9	300.8	.0	.0
8	12.82	12.73	.992	308.5	308.5	1.000	11.56	11.62	1.34466	1.34671	299.5	300.6	.0	.0
9	12.93	12.86	.994	309.7	309.7	1.000	11.50	11.59	1.33766	1.34303	299.4	300.6	.0	.0
10	13.08	12.88	.985	311.1	311.1	1.000	11.50	11.62	1.33651	1.33989	299.9	302.0	.0	.0
11	13.05	12.66	.971	311.6	311.6	1.000	11.49	11.60	1.33170	1.32949	300.5	303.9	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-9.5	-15.3	12.2	.253	.000	.117	.117	.000	.046	.046	.000	.331
2	10.0	-11.2	-17.0	11.4	.229	.000	.102	.102	.000	.039	.039	.000	.334
3	20.0	-12.3	-18.0	8.7	.217	.000	.092	.092	.000	.034	.034	.000	.319
4	30.0	-12.6	-18.2	7.3	.204	.000	.067	.067	.000	.024	.024	.000	.318
5	40.0	-11.8	-17.3	7.6	.203	.000	.059	.059	.000	.020	.020	.000	.330
6	50.0	-12.0	-17.5	7.6	.199	.000	.055	.055	.000	.018	.018	.000	.344
7	60.0	-12.8	-18.2	7.6	.203	.000	.053	.053	.000	.016	.016	.000	.366
8	70.0	-13.2	-18.6	7.6	.203	.000	.077	.077	.000	.023	.023	.000	.388
9	80.0	-12.5	-17.7	9.6	.202	.000	.053	.053	.000	.015	.015	.000	.444
10	90.0	-13.8	-18.9	15.1	.233	.000	.128	.128	.000	.034	.034	.000	.478
11	95.0	-15.5	-20.5	16.7	.297	.000	.245	.245	.000	.064	.064	.000	.467

TABLE XII. - Concluded. BLADE-ELEMENT PERFORMANCES AT BLADE EDGES FOR SECOND-STAGE STATOR

(u) 60 Percent of design speed; reading 1533

RP	RADII		AXIAL VELOCITY			MERIDIONAL VELOCITY			TANG VEL		RADIAL VEL		ABS VEL		REL VEL	
	IN	OUT	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	23.142	23.160	84.8	83.8	.988	84.8	83.8	.988	49.2	-2.9	.2	.2	98.0	83.8	98.0	83.8
2	22.697	22.730	87.5	87.9	1.005	87.5	87.9	1.005	50.0	-1.2	.6	.5	100.8	87.9	100.8	87.9
3	21.788	21.849	89.3	91.9	1.029	89.3	91.9	1.029	58.9	-.5	1.2	1.1	107.0	91.9	107.0	91.9
4	20.889	20.973	90.5	93.0	1.027	90.5	93.0	1.027	59.6	-1.3	1.8	1.5	108.4	93.0	108.4	93.0
5	20.002	20.109	92.6	94.5	1.020	92.6	94.5	1.020	61.8	-1.5	2.4	1.9	111.3	94.5	111.3	94.5
6	19.129	19.258	95.8	97.7	1.020	95.9	97.8	1.019	61.7	-2.5	3.2	2.3	114.0	97.8	114.0	97.8
7	18.268	18.423	100.9	102.9	1.020	100.9	102.9	1.020	63.9	-2.5	4.2	2.7	119.5	103.0	119.5	103.0
8	17.414	17.600	103.8	108.3	1.043	104.0	108.4	1.042	69.3	-2.3	5.3	3.1	124.9	108.4	124.9	108.4
9	16.576	16.800	102.9	111.8	1.087	103.1	111.9	1.085	80.6	.3	6.3	3.4	130.9	111.9	130.9	111.9
10	15.751	16.035	103.7	108.8	1.049	104.0	108.8	1.046	88.2	4.8	7.7	3.5	136.4	108.9	136.4	108.9
11	15.342	15.669	105.6	102.5	.970	106.0	102.5	.967	88.2	3.0	8.6	3.4	137.9	102.6	137.9	102.6

RP	ABS MACH NO		REL MACH NO		AXIAL MACH NO		MERID MACH NO		ABS BETAZ		ABS BETAM		REL BETAZ		REL BETAM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	.278	.237	.278	.237	.240	.237	.240	.237	30.1	-2.0	30.1	-2.0	30.1	-2.0	30.1	-2.0
2	.286	.249	.286	.249	.248	.249	.248	.249	29.8	-.8	29.8	-.8	29.8	-.8	29.8	-.8
3	.304	.261	.304	.261	.254	.261	.254	.261	33.4	-.3	33.4	-.3	33.4	-.3	33.4	-.3
4	.309	.264	.309	.264	.258	.264	.258	.264	33.4	-.8	33.4	-.8	33.4	-.8	33.4	-.8
5	.318	.269	.318	.269	.265	.269	.265	.269	33.7	-.9	33.7	-.9	33.7	-.9	33.7	-.9
6	.326	.279	.326	.279	.274	.279	.275	.279	32.8	-1.5	32.7	-1.5	32.8	-1.5	32.7	-1.5
7	.343	.294	.343	.294	.289	.294	.289	.294	32.4	-1.4	32.3	-1.4	32.4	-1.4	32.3	-1.4
8	.358	.310	.358	.310	.298	.310	.298	.310	33.7	-1.2	33.7	-1.2	33.7	-1.2	33.7	-1.2
9	.375	.320	.375	.320	.295	.320	.296	.320	38.1	.2	38.0	.2	38.1	.2	38.0	.2
10	.391	.311	.391	.311	.297	.310	.298	.310	40.4	2.6	40.3	2.6	40.4	2.6	40.3	2.6
11	.395	.292	.395	.292	.303	.292	.304	.292	39.9	1.7	39.8	1.7	39.9	1.7	39.8	1.7

RP	TOTAL PRESSURE			TOTAL TEMPERATURE			STATIC PRESS		STATIC DENSITY		STATIC TEMP		WHEEL SPEED	
	IN	OUT	RATIO	IN	OUT	RATIO	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	12.68	12.60	.994	314.9	314.9	1.000	12.02	12.12	1.34980	1.35578	310.1	311.4	.0	.0
2	12.71	12.65	.995	314.5	314.5	1.000	12.01	12.12	1.35222	1.35920	309.5	310.7	.0	.0
3	12.77	12.70	.995	313.6	313.6	1.000	11.97	12.11	1.35506	1.36407	307.9	309.4	.0	.0
4	12.79	12.71	.994	312.1	312.1	1.000	11.97	12.11	1.36215	1.37070	306.2	307.7	.0	.0
5	12.80	12.73	.994	310.8	310.8	1.000	11.94	12.10	1.36495	1.37625	304.7	306.4	.0	.0
6	12.83	12.77	.995	310.1	310.1	1.000	11.92	12.1C	1.36789	1.38046	303.6	305.3	.0	.0
7	12.89	12.84	.996	309.8	309.8	1.000	11.88	12.09	1.36769	1.38337	302.7	304.5	.0	.0
8	12.98	12.92	.995	310.2	310.2	1.000	11.87	12.09	1.36810	1.38363	302.4	304.3	.0	.0
9	13.01	12.95	.995	310.8	310.8	1.000	11.81	12.07	1.36098	1.38033	302.3	304.6	.0	.0
10	13.08	12.90	.986	311.8	311.8	1.000	11.77	12.06	1.35509	1.37354	302.6	305.9	.0	.0
11	13.08	12.78	.977	312.3	312.3	1.000	11.75	12.05	1.35104	1.36669	302.9	307.1	.0	.0

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEVIA	D FACTOR	EFFIC	LOSS COEFFICIENT TOT	LOSS COEFFICIENT PROF	LOSS COEFFICIENT SHOCK	LOSS PARAMETER TOT	LOSS PARAMETER PROF	LOSS PARAMETER SHOCK	PEAK SS MACH NO
1	5.0	-4.8	-10.6	12.4	.353	.000	.113	.113	.000	.044	.044	.000	.393
2	10.0	-5.0	-10.7	12.0	.322	.000	.083	.083	.000	.032	.032	.000	.395
3	20.0	-1.4	-7.1	10.3	.346	.000	.088	.088	.000	.032	.032	.000	.447
4	30.0	-1.6	-7.2	9.0	.341	.000	.098	.098	.000	.035	.035	.000	.446
5	40.0	-1.9	-7.5	8.5	.344	.000	.086	.086	.000	.029	.029	.000	.454
6	50.0	-4.0	-9.5	7.9	.324	.000	.069	.069	.000	.022	.022	.000	.443
7	60.0	-5.6	-11.1	8.1	.310	.000	.047	.047	.000	.015	.015	.000	.447
8	70.0	-5.9	-11.2	8.5	.301	.000	.053	.053	.000	.016	.016	.000	.470
9	80.0	-3.9	-9.2	10.8	.316	.000	.051	.051	.000	.014	.014	.000	.531
10	90.0	-5.2	-10.3	15.5	.363	.000	.139	.139	.000	.037	.037	.000	.562
11	95.0	-7.9	-13.0	16.5	.416	.000	.224	.224	.000	.059	.059	.000	.549

Flow path coordinates

Axial distance, Z, cm	Radius, r, cm	
	Outer	Inner
-13.093	25.654	8.994
-8.016	25.654	8.903
-2.936	25.654	9.093
-.203	25.651	9.543
2.144	25.570	10.160
4.684	25.128	10.973
7.224	24.681	11.565
9.764	24.460	11.902
12.304	24.384	12.139
14.844		12.438
17.384		12.822
19.924		13.025
20.803	↓	13.038
22.464	24.328	13.152
25.004	23.993	13.627
27.544	23.655	14.371
30.084	23.622	14.699
32.177		14.849
36.754		15.237
38.850		15.240
42.784	↓	15.240

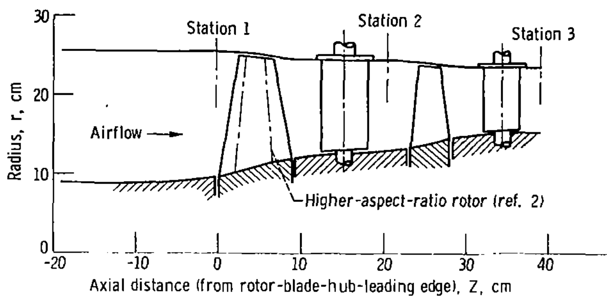

Figure 1. - Flow path of low-aspect-ratio two-stage fan.

Figure 2. - Two-stage fan with low-aspect-ratio, first-stage rotor.

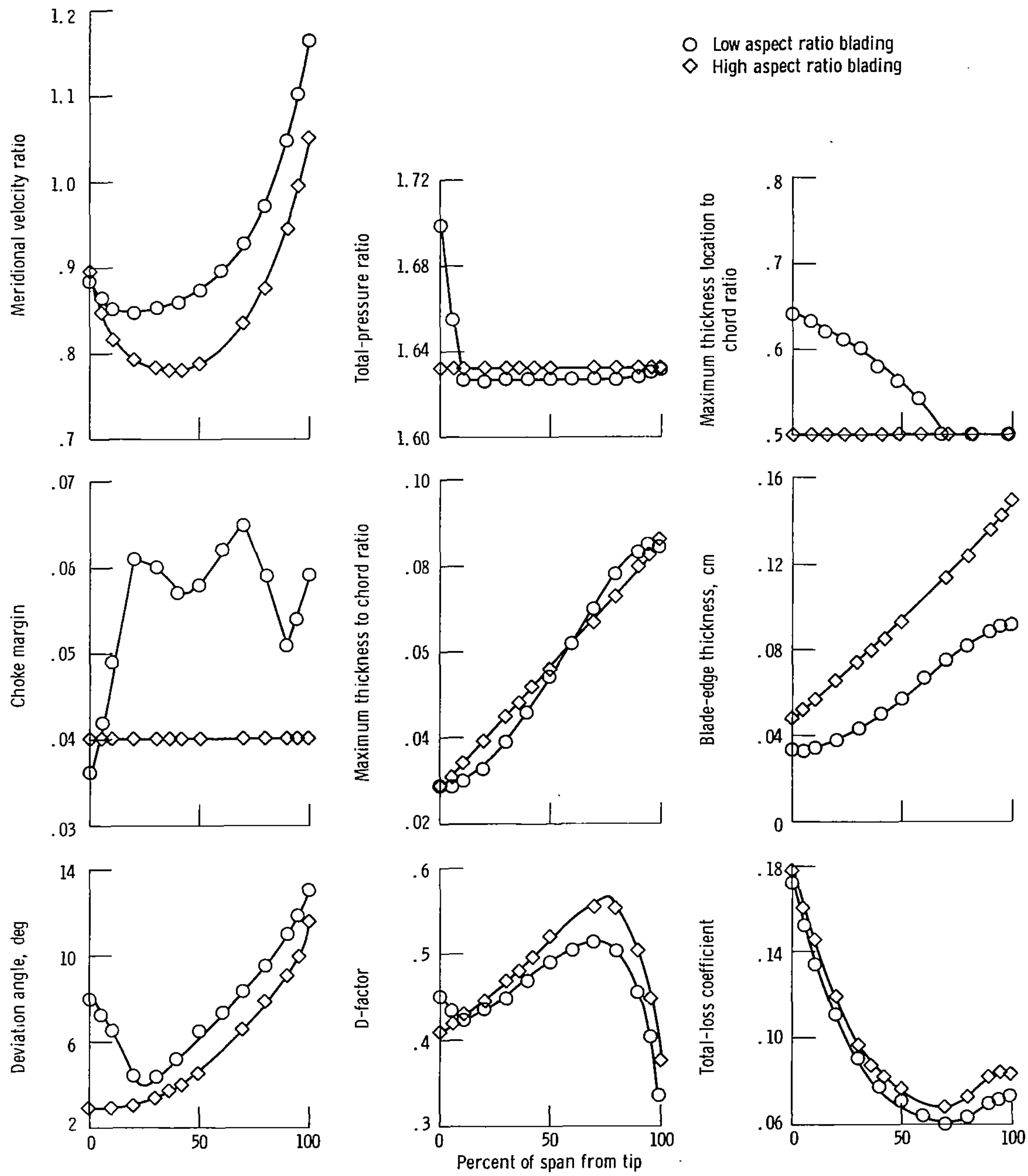

Figure 3. - Radial distributions of several design parameters of first-stage rotor.

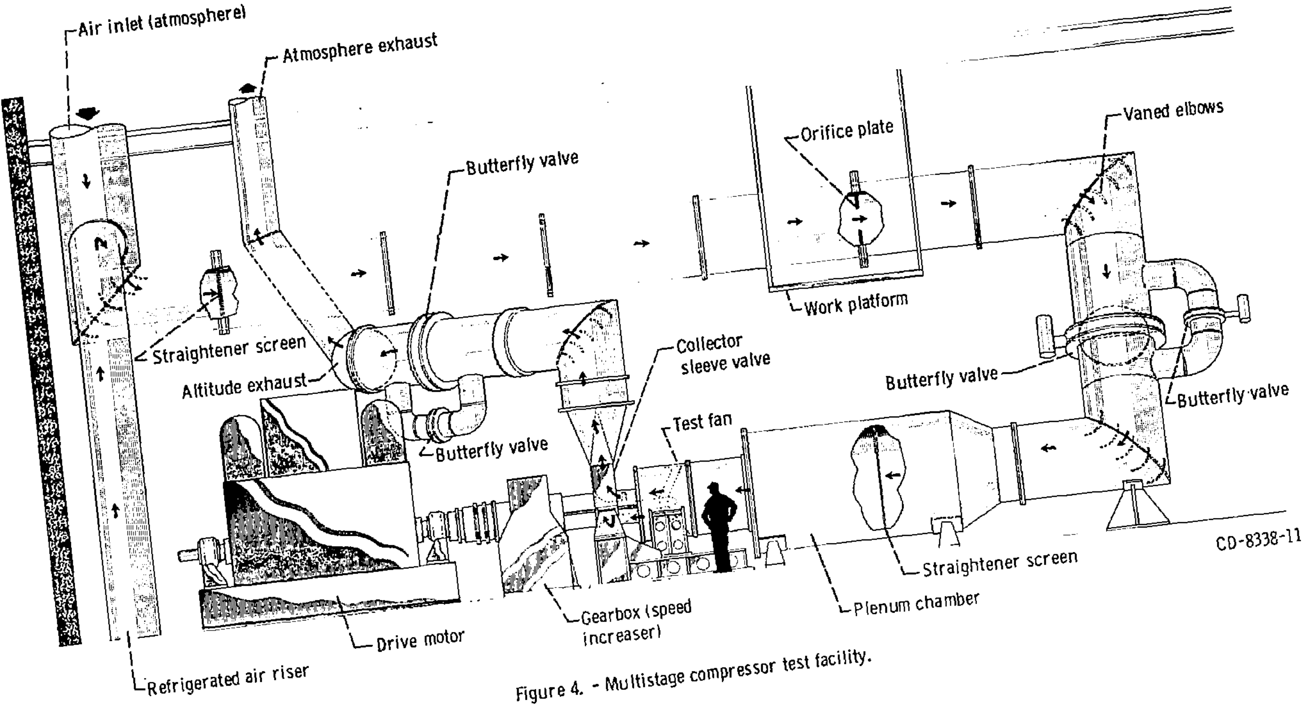

Figure 4. - Multistage compressor test facility.

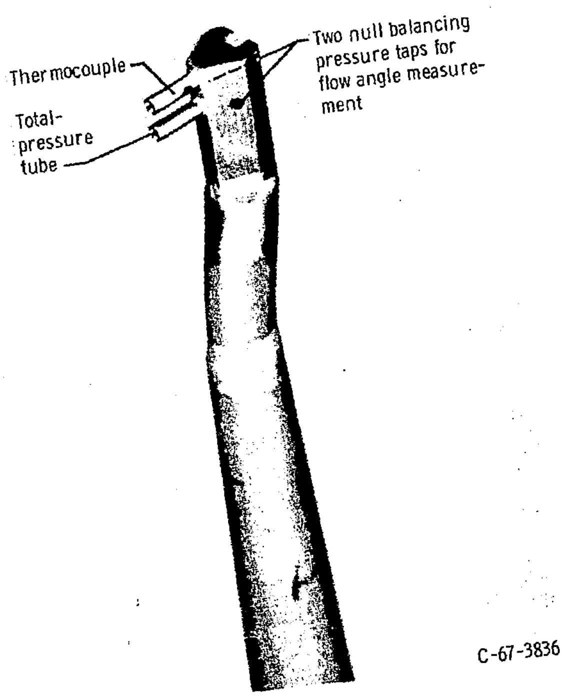

Figure 5. - Survey probe.

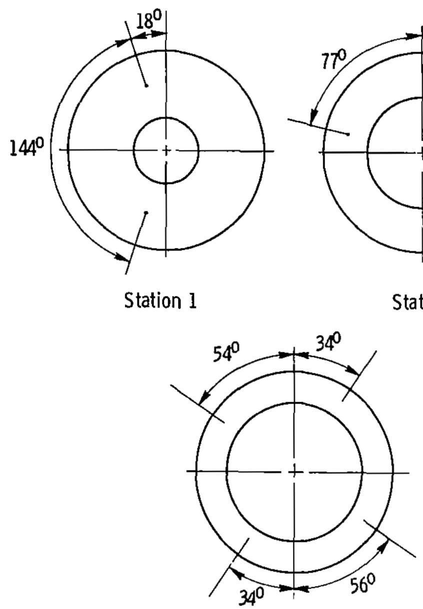

Figure 6. - Circumferential locations of combination probes (looking downstream; clockwise rotation).

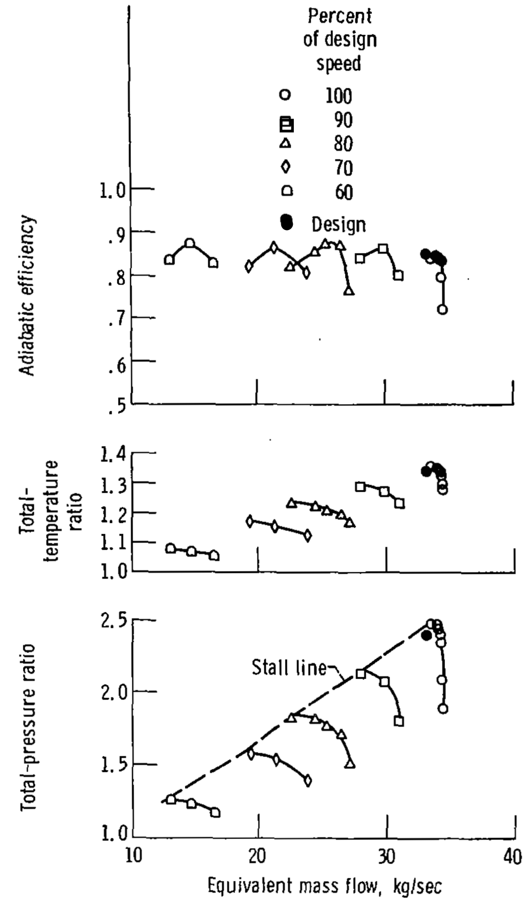

Figure 7. - Overall performance of two-stage, low-aspect-ratio fan.

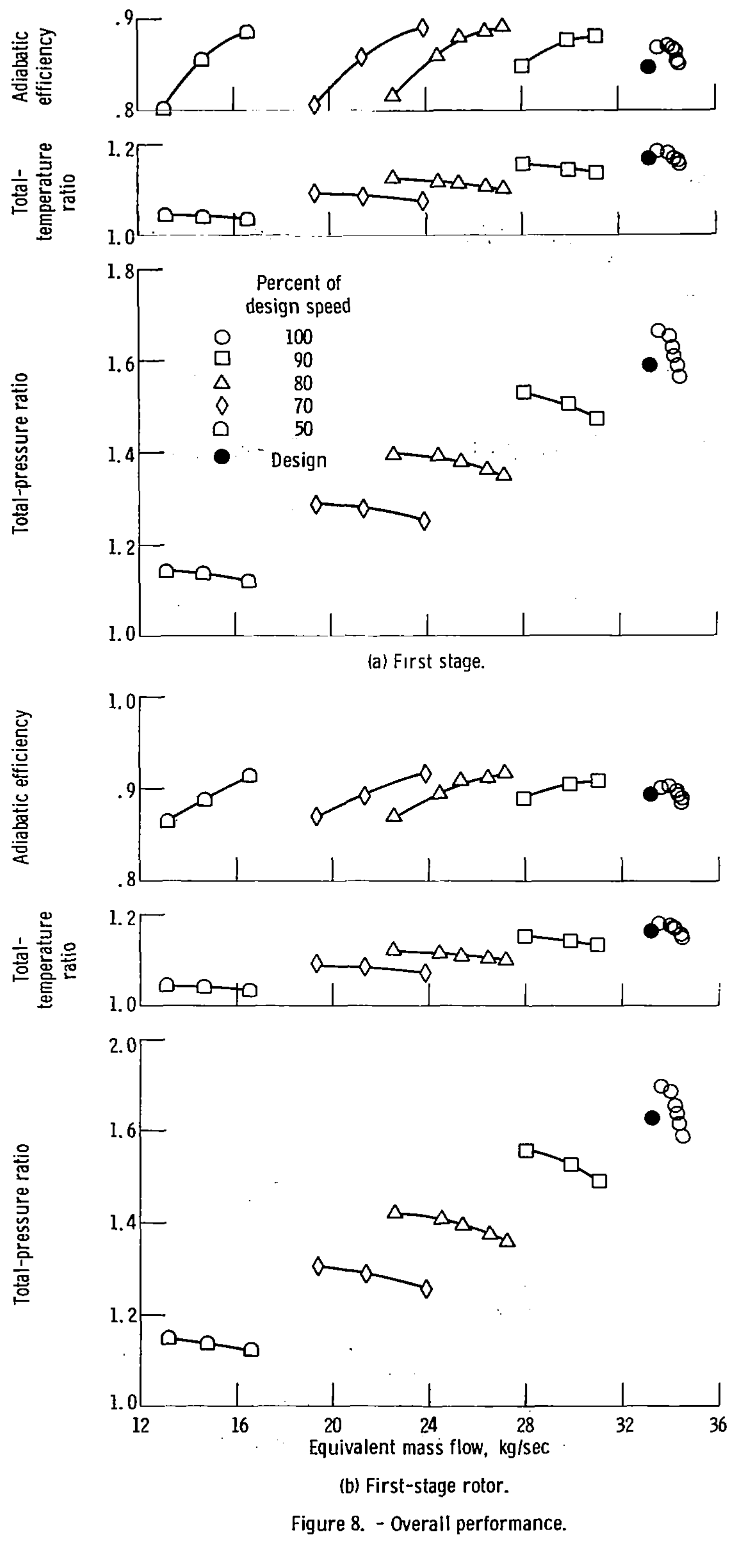

Figure 8. - Overall performance.

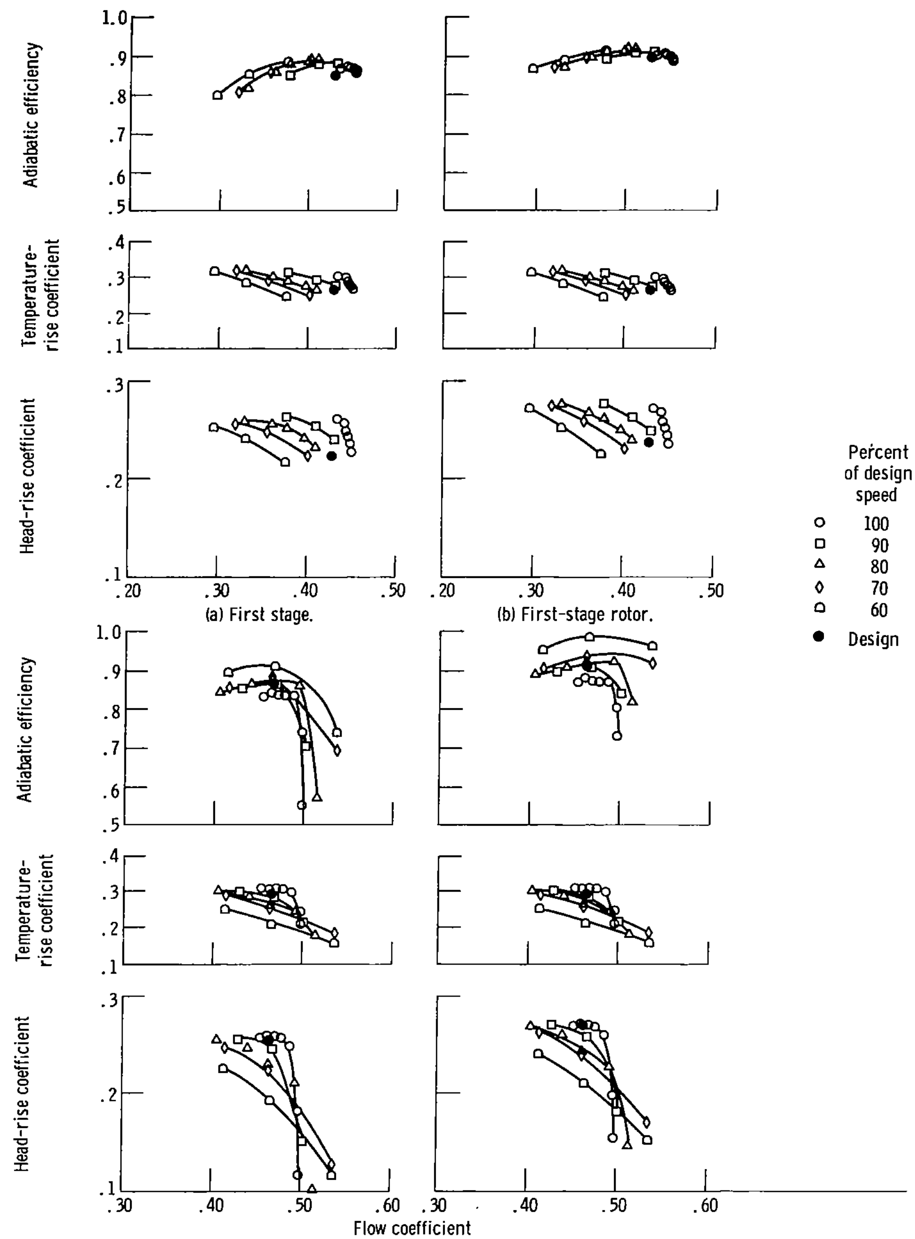

Figure 9. - Dimensionless overall performance.

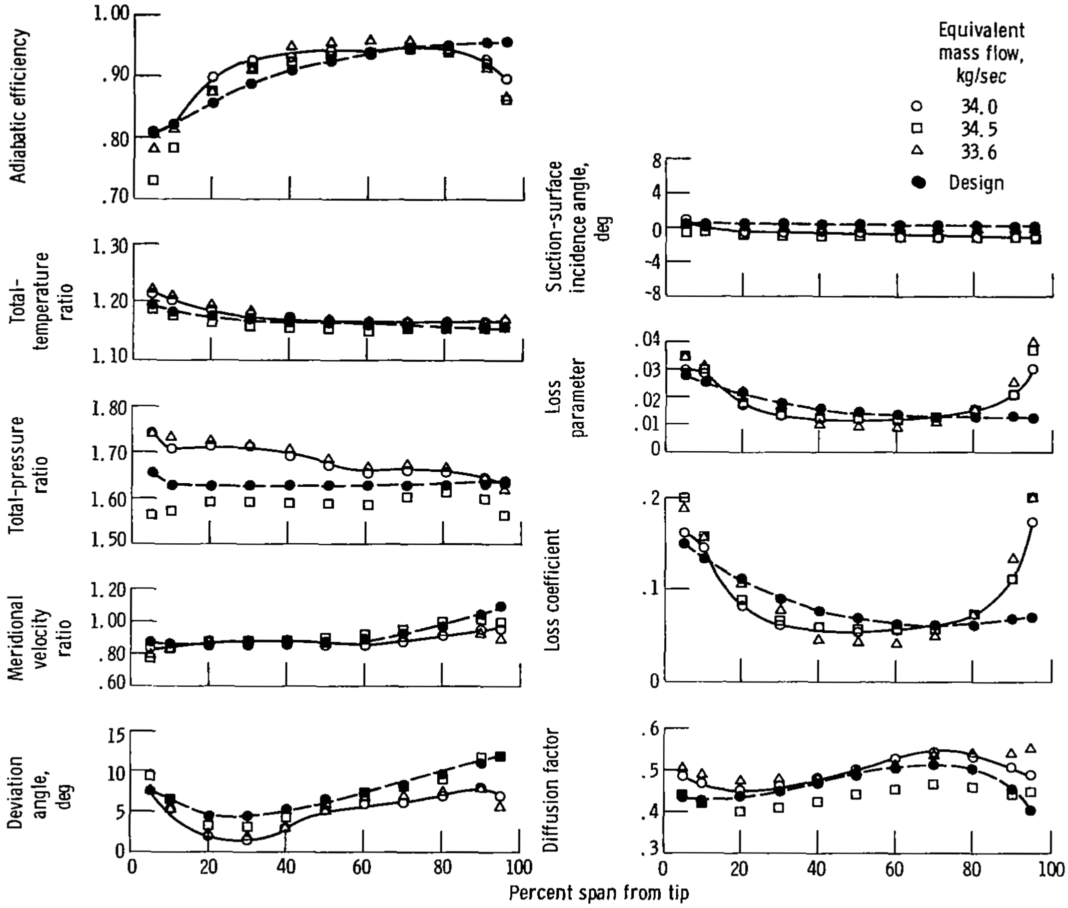

Figure 10. - Radial distributions of first-stage rotor.

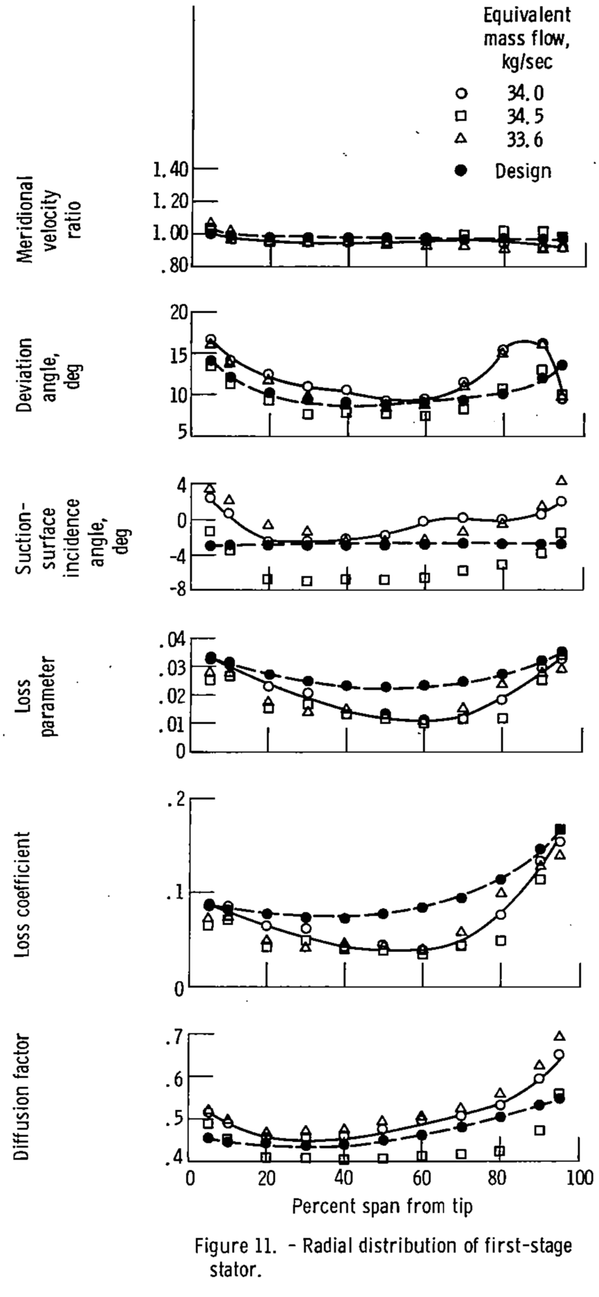

Figure 11. - Radial distribution of first-stage stator.

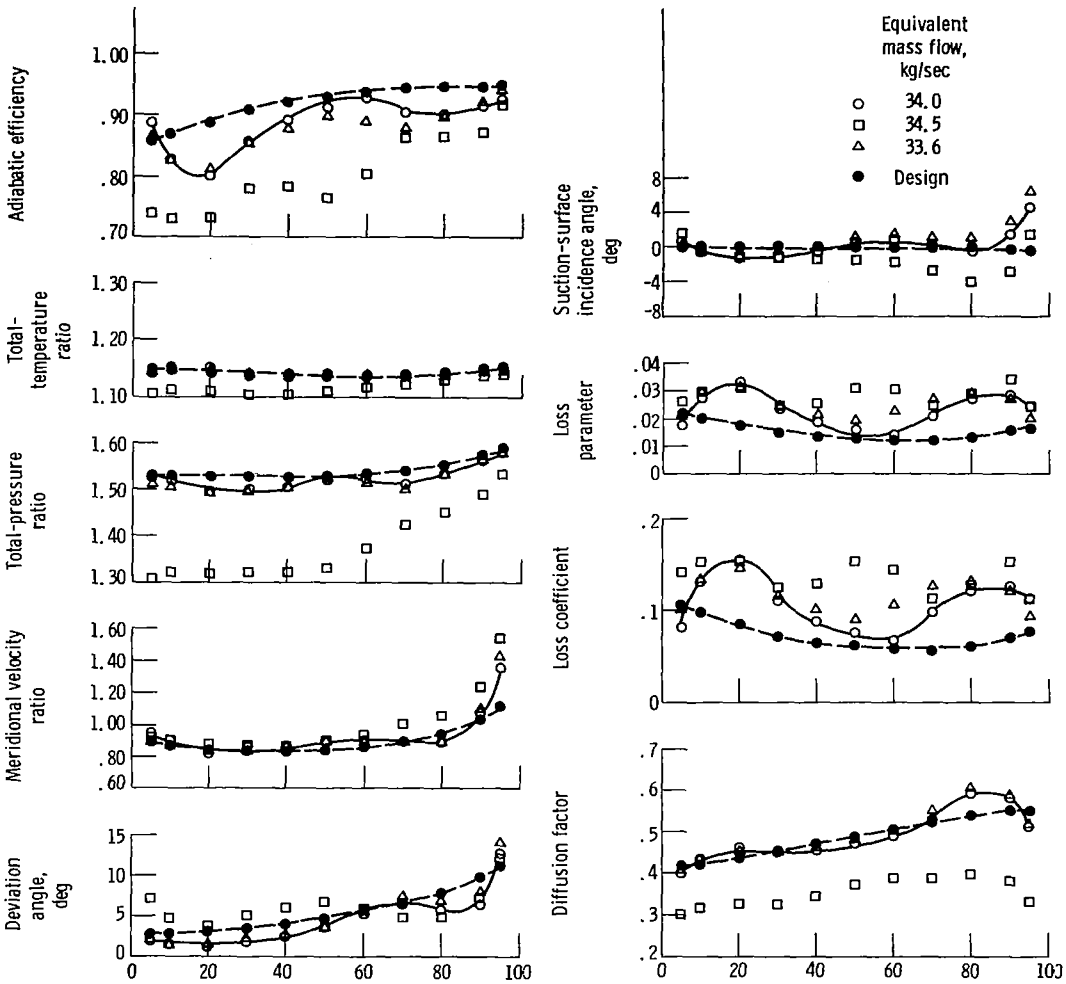

Figure 12. - Radial distribution of second-stage rotor.

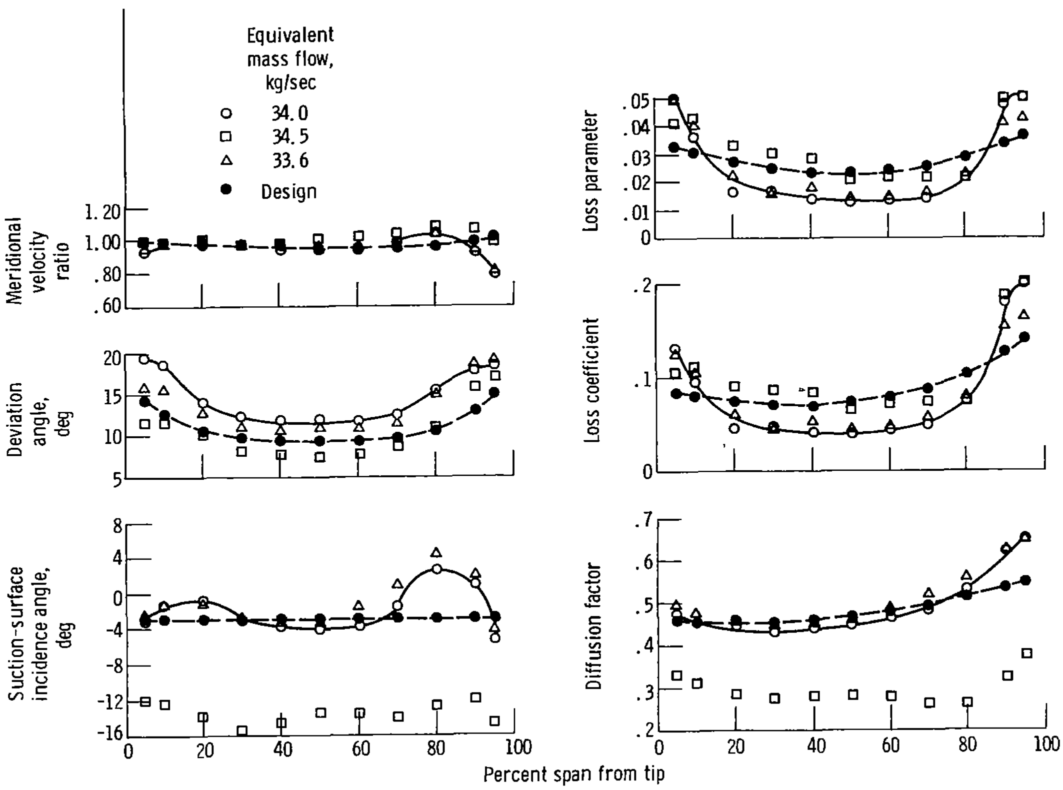

Figure 13. - Radial distributions of second-stage stator.

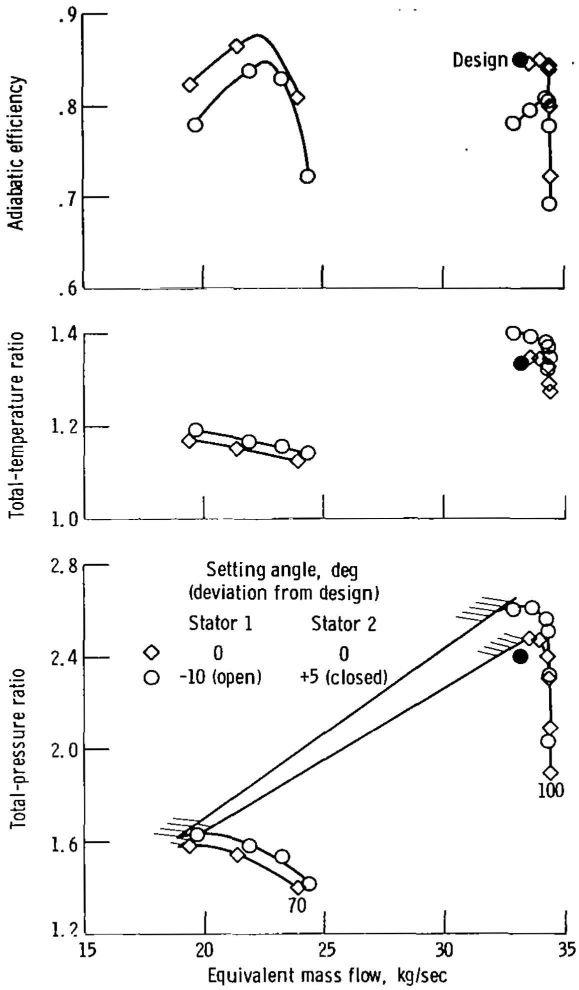

Figure 14. - Comparison of overall performance of low-aspect-ratio two-stage fan at design and off-design stator blade setting angles.

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15. Supplementary Notes

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16. Abstract

The NASA two-stage fan was tested with a low-aspect-ratio first-stage rotor having no midspan dampers. At design speed the fan achieved an adiabatic design efficiency of 0.846, and peak efficiencies for the first stage and rotor of 0.870 and 0.906, respectively. Peak efficiency occurred very close to the stall line. In an attempt to improve stall margin, the fan was retested with circumferentially grooved casing treatment and with a series of stator-blade resets. Results showed no improvement in stall margin with casing treatment but increased to 8 percent with stator-blade reset.

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