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MASTER

ISOTHERMAL HYDRAULIC MEASUREMENTS
IN FUEL ELEMENTS IN ATR CORE

M. L. Griebenow

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BY

M. L. Griebenow

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SUMMARY

The coolant velocities in Channels 1 through 18 are within 2% of the computed values used for thermal hydraulics and safety analysis [1, 2]. The velocities in Channels 19 and 20 are 5 and 20% low, respectively. Two standard deviations about the measured mean are 17, 9, 6, 6, 7, 6, 9, and 36% for Channels 1, 2, 3, 9, 10, 18, 19, and 20, respectively.

The fuel element entrance and exit conditions are different than was anticipated resulting in approximately a 6 psi increase in the pressure at any point within the fuel element (at the design core pressure drop). The optimum data fit, at 100 psi core differential, requires a 0.2 entrance coefficient and a 6 psi drop through the flow distribution tank.

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I. INTRODUCTION

The ATR was designed as the clover leaf, multi-flux trap reactor shown in Figures 1, 2, and 3 to meet the demands of experimenters. The design develops a relatively long (four feet) region with an intense thermal neutron flux. The high power density required to produce the design fluxes necessitates a maximum of heat transfer area and coolant velocity within the fuel assembly. A thermal hydraulics optimization, within the limits set by corrosion rates and mechanical strength, resulted in a fuel assembly containing 19 fuel plates (0.050 inch thick) separated by 0.078-inch coolant channels (Figure 4). The channel spacing tolerance is very critical not only because of the heat transfer considerations but because of the hydraulically induced forces acting on a fuel plate separating two coolant channels which are unequal in thickness.

The two external coolant channels, Nos. 1 and 20, are bounded on one side by fuel plates and on the other side by the flux trap baffle, in the case of Channel 1, and either the neck shim housing or the beryllium reflector, in the case of Channel 20. The core components are arranged to give a nominal 0.108-inch Channel 1 and 0.113-inch Channel 20. Because of the tolerances involved in positioning the assemblies, within the fuel annulus, these external channels vary considerably. Prior to reactor construction, a statistical evaluation of the tolerances involved indicated that Channel 20, the more critical of the two due to its greater unrestrained span, had a 2σ maximum thickness of 0.175 inch. To withstand the hydraulic forces developed across the external fuel plates, the thickness of Plate 1 was increased to 0.080 inch, and Plate 19 was increased to 0.100 inch.

Isothermal hydraulics tests of the first ATR fuel assemblies indicated that, even with the thicker external fuel plates and the tightest possible fabrication tolerances, the lateral pressures developed between coolant channels were excessive. To relieve these pressures, it has been necessary to vent the fuel assembly side plates at various locations along the axis. The vents, shown in Figure 9, allow the coolant from one channel to enter another channel, equalizing the pressures at this location. The cross flow between channels, permitted at each vent, together with the uneven bulk temperature rise in the critical coolant channels, Nos. 19 and 20 (Channel 20 is heated from only one side), and the subsequent axial dependence of the heat split have made hand solutions of the fuel assembly thermal hydraulics impractical and have increased the uncertainty of computer solutions. The thermal hydraulic design performance^[1] and the safety analysis^[2] of the ATR have been performed using the MACABRE^[3] code and the hot-spot hot-channel factors shown in Table I. As part of the startup program, the validity of the assumptions and the magnitude of the deviations involved in the calculations are to be evaluated. Only the isothermal hydraulics will be discussed in this report (the heat transfer testing program is reported in Reference 4).

The design of the ATR primary coolant system and the complexity of the core arrangement suggest a possible position-dependent coolant flow rate. The primary coolant enters the reactor vessel from two inlet leaders (Figure 1) and flows up through two annuli, one formed by the pressure vessel and the thermal shield and the second formed by the thermal shield and the inlet flow baffle (the inlet symmetry is interrupted on the north side by the fuel and experiment drop tube), to the reactor upper plenum. The coolant enters the plenum at a significant velocity (4 to 6 ft/sec) and generates large eddies within the plenum. The coolant then passes down through the active core into the quadrant divider tank. The quadrant divider

FIG. 1 REACTOR VESSEL ASSEMBLY.

FIG. 2 CORE-REFLECTOR TANK ASSEMBLY.

FIG. 3 SCHEMATIC CROSS SECTION AT CORE MIDPLANE.

FIG. 4 FUEL ASSEMBLY AND DETAILS.

tank separates the coolant from the 40 fuel assemblies, safety rods, etc, into four sections. The coolant from each discharge quadrant exits from the reactor and is eventually recombined prior to reaching the heat exchangers. The quadrants have some direct communication (approximately 15 square inches) within the discharge tank complicating the analysis of the effect of unequal quadrant flow.

In addition to the possibility of unequal quadrant flow rates, there is a potential for unequal coolant flow for assemblies within the same quadrant. The coolant inlet to Positions 1, 10, 11, 20, 21, 30, 31, and 40 (Figure 3) is obstructed by the experimental tubes and the safety rods. The discharge from these positions is adjacent to the discharge-tank, quadrant-flow divider plates and out through a rectangular orifice formed by the guide tubes and the support plates.

TABLE I

2 σ HOT-SPOT HOT-CHANNEL FACTORS

<u>HOT FLUX FACTORS</u>	
Power Measurement and Control	1.05
Fuel Content -- Local	1.08
Fuel Core Area	1.04
ATR-ATRC Correspondence	<u>1.05</u>
	1.238
<u>HOT CHANNEL FACTORS</u>	
Coolant Channel Geometry	1.084
Fuel Content -- Hot Track	1.03
Flow Distribution -- External Effects	1.05
Power Measurement and Control	1.05
Fuel Per Plate	1.01
Transverse Velocity Variation	1.00
ATR-ATRC Correspondence	<u>1.05</u>
	1.305
<u>HEAT TRANSFER COEFFICIENT FACTORS</u>	
Safety Factor	0.8
Velocity and Hydraulic Diameter Effect ^[a]	<u>0.897</u>
	0.718

[a] 0.073-inch channel average with dimple to 0.080 inch at the hot spot.

II. OBJECTIVES

A total of 13 dummy (depleted fuel) fuel assemblies were instrumented to measure the coolant flow rate and both axial and lateral pressure gradients within the reactor. The principal objectives were:

- (1) The evaluation of local coolant flow rates and the dependence of any observed irregularities on quadrant flow imbalance, intra-quadrant flow restrictions, and intra-assembly flow restrictions.
- (2) The direct measurement of lateral pressures acting across the fuel plates and the change in the thickness of Channels 19 and 20 caused by these pressures.
- (3) The measurement of the entrance, exit, and frictional losses within the fuel assemblies.

III. INSTRUMENTATION

The 13 instrumented fuel assemblies each contained some combination of pitot tube, static tube, or eddy current gage positioned to read one or more of the basic parameters of interest. The instrumented assemblies were of the following four types:

- (1) Hot spot velocity measuring assemblies -- DA-7-B, DA-18-A, DA-19-A, and DA-24-A were instrumented to measure the coolant velocity in Channels 1, 2, 3, 9, 10, 18, 19, and 20, 12 inches above the bottom edge of the fuel plates. This is in the region between the fourth and fifth set of side plate slots near the axial location of the predicted hot spot [1, 2].
- (2) Axial velocity variation measuring assembly -- DA-11-A was instrumented with three pitot tubes in Channel 20. They were located axially so as to measure the velocity variation produced in Channel 20 by hydraulic communication between the fuel assembly and the external annulus in the center flux trap. The physical description and the analytical solution to the problem are presented in Reference 1.
- (3) Lateral pressure gradient measuring assemblies -- DA-2-B, DA-18-B, DA-11-C, and DA-25-C were instrumented with pitot tubes in Channels 1 and 20 and with static taps in Channels 2, 18, and 19. All taps were located 34 inches above the lower edge of the fuel plates. This is the axial location shown, both analytically and experimentally, to have the most severe lateral pressure gradients. In addition to the hydraulic taps, DA-18-B and DA-25-C each had an eddy gage positioned in Channel 20 at this elevation. DA-2-B and DA-11-C had eddy gages in both Channels 19 and 20 at this elevation.
- (4) Entrance, exit, and frictional loss measuring assemblies -- DA-4-B, DA-10-C, DA-12-C, and DA-13-C were instrumented with static taps immediately above and below the fuel plates, two inches below the top edge of the fuel plates and two inches above the bottom edge of the fuel plates in Channels 1, 10, and 20.

The pitot and static tubes were in all cases formed from 0.042-inch-OD by 0.006-inch-wall, full hard 304L stainless tubing. The impact tubes were formed by turning the open end of the tubing into the coolant stream and bracing the bend to prevent directional changes as a result of hydraulic loading. A typical pitot installation is shown in Figure 5. Static taps were formed by plugging the ends of the 0.042-inch tubing and drilling a hole in the side of the tubing. The static tap holes were always drilled in the opposite side of the tubing from the lead wire or the dynamic tube to prevent reading a transverse velocity component developed by the other member. Typical static tap installations are shown in Figures 5, 6, and 7.

All 0.042-inch sensing tubes were fastened at both the top and bottom comb by adapter brackets.

FIG. 5 TYPICAL PITOT TUBE INSTALLATION,

FIG. 6 TYPICAL STATIC TAP INSTALLATION.

The eddy current gage consisted of a printed circuit probe, a probe oscillator circuit, and a frequency discriminator [5]. A coil in the probe was used as part of the tuning inductance in the probe circuit. Any change in channel thickness altered the inductance of the probe and changed the probe circuit frequency. By comparing the frequencies of both circuits, the discriminator generated a signal which was read out as channel thickness.

The system was adjusted to provide a measurement range of ± 0.050 inch from the calibration set point with an accuracy of 0.001 inch.

The eddy current gages were securely epoxied to the fuel plates with "Epoxy-Seal" and screwed to the fuel plates at each of the four corners. A typical installation is shown in Figure 8.

FIG. 7 TYPICAL STATIC TAP INSTALLATION.

FIG. 8 TYPICAL EDDY GAGE INSTALLATION.

The pressure lines were manifolded (Figure 32) so that they could be read out on any of the following instrument systems:

- (1) dPT-1: A Statham PM280TC±15-350 unbonded strain gage sensor read out on a Honeywell Class 15 potentiometric receiver (dPR-1) ranged -15 to +15 psid.
- (2) dPT-5: A Statham PL280TC-50-350 unbonded strain gage sensor read out on a Honeywell Class 15 potentiometric receiver (dPR-5) ranged 0 to 50 psid. This is a two-pen receiver and handles both dPT-5 and -6 (dPT-5 and -6 are ranged the same, one serving as a backup).
- (3) dPT-6: A Honeywell 30300 current type transmitter, utilizing a Barton Model 199 meter body, with a 4 to 20 mA output signal read out on the same receiver as dPT-5.
- (4) dPT-7: A Honeywell 30300 current type transmitter, utilizing a Barton Model 224 meter body, with a 4 to 20 mA output signal read out on a Honeywell Class 15 potentiometric receiver (dPR-7) ranged 0 to 300 psid.
- (5) PRT-1: A Statham PG 132TC-300-350 transmitter read out on a Honeywell Class 15 potentiometric receiver ranged 0 to 300 psig.

Item (3) has an instrument repeatability of $\pm 0.6\%$ of full scale; all other instruments are good to within $\pm 0.25\%$. The combined uncertainty due to instrument repeatability and operator judgment is 0.15 psid for dPT-1 and dPT-5, 0.34 psid for dPT-6, and 1.25 units for dPT-7 and PRT-1.

The bridge excitation for the unbonded strain gage sensors was supplied from B & F Industries adjustable voltage strain gage power supplies. The 42-volt DC required by the Honeywell instruments was supplied from a Honeywell 33901 power supply.

A Bristol pneumatic transmitter was used as a precursor sensing system. The instrument provided a 3 to 15 psig proportional pneumatic output signal that was read out on a 3 to 15 psi gage graduated 0 to 300 psid. A pressure differential, of unknown magnitude, was first measured on this instrument to allow the console operator to select the properly ranged read out system.

Whitey Model 1KS4 valves were used throughout the manifolding. These valves have a Kel-F stem to minimize seat galling and subsequent leakage. The system was subjected to a mass spectrometer helium leak test and verified as leak tight.

The instrumentation in DA-7-B, DA-18-A, and DA-19-A was identical. An overall photograph of one of these assemblies is shown in Figure 9. A section of tubing, extending below the pitot tube, was securely fastened to a special bracket which, in turn, is fastened to the lower comb (Figure 10). A similar bracket supported the tubing at the upper comb (Figure 11). The 0.042-inch tubing was silver soldered into 0.125-inch OD x 0.035-inch wall tubing in the region between the top T-bar and the upper comb (Figure 11). The 0.125-inch tubing was supported at the top of the upper end fitting by the bracket shown in Figure 12. When the

FIG. 9 HOT-SPOT VELOCITY MEASURING ASSEMBLY.

FIG. 10 LOWER COMB SUPPORT BRACKET FOR HOT-SPOT VELOCITY MEASURING ASSEMBLY.

FIG. 11 UPPER COMB SUPPORT BRACKET FOR HOT-SPOT VELOCITY MEASURING ASSEMBLY.

FIG. 12 0.125-INCH TUBING SUPPORT BRACKET FOR HOT-SPOT VELOCITY MEASURING ASSEMBLY.

tubing was in position in the reactor, it continued on into the reactor upper plenum.

The instrumentation in DA-24-A was similar to that in the above assemblies. However, the dynamic tubes were positioned approximately 0.200 inch from the inside edge of the side plate (the azimuthal location of the hot spot). An overall view of this assembly is shown in Figure 13. The pitot installation is shown in Figure 14. The static tap was oriented radially to minimize the effect of the side plate proximity. The side-mounted pitot tubes required different lower (Figure 15) and upper supports (Figures 16 and 17) than the above assemblies.

DA-11-A was instrumented with three pitot tubes in Channel 20, positioned 12-1/2, 18-1/2, and 28-1/2 inches from the lower edge of the fuel plates and 3/8 inch from the inside edge of the side plates. The axial positioning with respect to the fuel element side plate vents and the slots in the neck shim housing is shown in Figure 18. The radial positioning is in line with the axis of the neck shim housing vents. Views of the instrumented assembly are shown in Figures 19 and 20. The lower support is somewhat different from those previously described. To reduce the flow obstruction in Channel 20, the dynamic tubes were bent just above the lower end fitting and returned to the upper end through internal channels. The bend and support are shown in Figure 21. The upper support and 0.125-inch tubing support are shown in Figures 22 and 23, respectively.

The installation and tubing support for the lateral pressure gradient measuring assemblies was identical to that used in the hot-spot velocity measuring assemblies (Figures 10, 11, and 12). An overall view of one of the assemblies is shown in Figure 24, and a detailed shot of the installed eddy gage is shown in Figure 8.

The entrance, exit, and frictional loss measuring assemblies (Figure 25) employed tubing supports similar to the hot-spot velocity measuring assemblies (Figures 10, 11, and 12). The lower channel static tap is shown in Figure 6, and the upper channel tap is shown in Figure 26. The tap below the fuel plates was offset (Figure 27) to reduce the effect of the lower comb and the lower comb support bracket.

FIG. 13 DA-24-A INSTRUMENTATION.

FIG. 14 DA-24-A PITOT TUBE
INSTALLATION.

FIG. 15 DA-24-A LOWER SUPPORT.

FIG. 16 DA-24-A UPPER SUPPORT.

FIG. 17 DA-24-A 0.125-INCH TUBING SUPPORT.

Neck Shim Housing Detail

Fuel Element Side Plate Detail

FIG. 18 NECK SHIM HOUSING SLOTS AND SIDEPLATE VENT LOCATIONS.

FIG. 19 DA-II-A INSTRUMENTATION.

FIG. 20 DA-II-A PITOT TUBE INSTALLATION.

FIG. 21 DA-II-A LOWER SUPPORTS.

FIG. 22 DA-II-A UPPER SUPPORT.

FIG. 23 DA-II-A 0.125-INCH TUBING SUPPORT.

FIG. 24 LATERAL PRESSURE GRADIENT MEASURING ASSEMBLY.

FIG. 26 UPPER, CHANNEL STATIC TAP IN ENTRANCE, EXIT, AND FRICTION LOSS MEASURING ASSEMBLY.

FIG. 25 ENTRANCE, EXIT, AND FRICTION LOSS MEASURING ASSEMBLY.

FIG. 27 LOWER PLENUM TAP IN ENTRANCE, EXIT, AND FRICTION LOSS MEASURING ASSEMBLY.

IV. PROCEDURE

To measure the hydraulic pressure and flow limits (allowable by the fuel element tolerance specifications), the elements to be instrumented were carefully chosen from the available dummies, and where necessary, the tolerances were adjusted by building up critical areas (T bars, lower side plate rails, etc) with weld metal and/or machining off excess material. DA-11-A, DA-2-B, DA-4-B, and DA-18-B had minimum or near minimum No. 20 channels while DA-11-C, DA-12-C, and DA-25-C had maximized No. 20 channels. DA-10-C had a maximum Channel 1 and DA-13-C had a minimum Channel 1. The coolant channel thickness for each assembly is shown in Appendix A. These measurements were taken after the instrumentation had been installed and the instrumented assembly had been proof tested at 140 psid, 150°F for eight hours in the ATR hydraulic facility. The measurements reported for Channels 1 and 20 were taken in a fuel element gage and are only relative.

The ATR fuel annulus was measured by inserting a master fuel assembly (spring loaded to assure a maximum No. 20 channel) into each of the 40 reactor positions and measuring channels 1 and 20. A portable instrument with the sensing mechanism described on page 10 was used for the measurements. The sensing head was held against the side of the coolant channel by two silicon bronze leaf springs. The coolant channels were traversed along the full 49-1/2 inch length at three azimuthal positions in Channel No. 20 and two positions in Channel No. 1. The minimum and maximum channel thickness along each traverse was measured to within ± 0.001 inch. These measurements were used for comparative purposes only and there was no attempt to determine the three dimension shape of the coolant channels (for shape determination see Figure 34 through 65). The minimum and maximum readings are recorded in Figure 28.

Because of the geometric arrangement (experimental tubes, safety rods, etc) Positions 1, 10, 11, 20, 21, 30, 31, and 40 were classified as internal positions, ie, those positions felt most likely to have reduced coolant flow due to plenum conditions. DA-4-B, DA-11-A, and DA-2-B were inserted into Positions 40, 1, and 10, respectively, since these positions exhibited the smallest No. 20 channels of the above eight positions when measured with the master fuel assembly, and DA-11-C was inserted into Position 31 since it had the largest Channel 20. DA-13-C was inserted into Position 30 since it had the smallest Channel 1 of the above eight positions, when measured with the master fuel assembly.

Again because of the geometric arrangement, Positions 4-7, 14-17, 24-27, and 34-37 were classified as external positions, ie, those positions felt most likely to have the maximum coolant flows and minimum entrance and exit losses. DA-18-B was inserted into Position 15, the external position with the minimum Channel 20. DA-12-C and DA-25-C were inserted into Positions 14 and 36 since these positions had the maximum external No. 20 channels. DA-10-C was inserted into Position 17 since it had the largest external Channel 1.

To measure any intraquadrant flow variation, DA-18-A, DA-19-A, DA-7-B, and DA-24-A were inserted into Positions 16, 18, 19, and 20, respectively.

The 0.125-inch lead tubes from the instrumented assemblies were strapped together using stainless hose clamps for rigidity and fastened into bulkhead fittings mounted on the experimental tubes (Figures 29 and 30). The bulkhead fittings provided the transition from 0.125-inch-stainless to 0.25-inch-nylon

FIG. 28 MASTER FUEL ASSEMBLY CHANNEL MEASUREMENTS AND INITIAL POSITIONING OF INSTRUMENTED ASSEMBLIES.

FIG. 29 REACTOR INSTALLATION.

FIG. 30 REACTOR INSTALLATION.

FIG. 31 EXIT NOZZLE FLANGE.

FIG. 32 CONTROL PANEL AND MANIFOLD BANK.

tubing. The nylon tubing exited from the reactor through the southern nozzle flanges (Figure 31) where a seal was provided by Conax fittings. The nylon tubing terminated in a manifold bank (Figure 32) where, by proper valving, the signal could be sensed and read on any of the appropriate instrument systems.

Coolant Channels 1 and 20 were measured in each instrumented assembly prior to testing and again after completion of the test sequence, prior to removal of the assembly. Initially, two traverses were made in Channel 1 and three in Channel 20 (along the approximate positions shown in Figure 33). However, as the testing progressed and the initial data were reduced, the measurements were increased (shown as B1 and B2, Figure 33), and at three vertical elevations the assembly was moved inward and outward in an attempt to measure the extremes due to hydraulic positioning. These measurements are shown in Figures 34 through 66.

After collecting the necessary data in the above fuel element position, DA-25-C was moved from Position 36 to 39, DA-11-C from Position 31 to 32, DA-24-A from Position 20 to 18, and DA-19-A from Position 18 to 20. DA-25-C and DA-11-C were moved to allow measuring the pressure acting directly across the neck shim housing. DA-19-A and DA-24-A were interchanged to allow a better separation of intraquadrant and intra-element flow variations.

After collecting the data in the above positions and because we had heavily instrumented the southeast lobe to the exclusion of the other lobes, DA-19-A was moved from Position 20 to 23, DA-18-A from Position 16 to 7, and DA-7-B from Position 19 to 39 (requiring DA-25-C to be relocated to Position 40). During this move the pitot tubes in DA-19-A -- Channel 1, DA-18-A -- Channel 20, and DA-7-B -- Channel 19 were broken. In addition to recording the regular velocity head and lateral pressure differential measurements, during this test the velocity head in each instrumented channel in DA-25-C (Position 40) and DA-7-B (Position 39) was continuously monitored as the north safety rod was withdrawn. This was done to give a direct measurement of the effect of rod position on the coolant flow in adjacent fuel elements.

Upon completion of the above test, all instrumented elements, with the exception of DA-19-A and DA-24-A, were removed. DA-24-A was installed in Position 40 and DA-19-A in Position 31. The flow in these elements was measured with fuel element Position 32 plugged and again with both Positions 32 and 33 plugged. This was done to determine the effect of a quadrant flow unbalance.

The reactor positions in which the various parameters were measured are summarized in Table II.

FIG. 33 EXTERNAL CHANNEL (NO. 1 AND NO. 20) MEASURING STATIONS.

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FIG. 34 DA-II-A, POSITION I, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 35. DA-2-B, POSITION 10, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 36 DA-12-C, POSITION 14, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 37 DA-18-B, POSITION 15, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 38 DA-18-A, POSITION 16, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 39 DA-18-A, POSITION 7, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 40 DA-18-A, POSITION 7, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 41 DA-10-C, POSITION 17, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 42 DA-19-A, POSITION 18, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 43 DA-19-A, POSITION 20, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 44 DA-19-A, POSITION 23, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 45 DA-19-A, POSITION 23, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 46 DA-19-A, POSITION 31, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 47 DA-19-A, POSITION 31, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 48 DA-7-B, POSITION 19, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 49 DA-7-B, POSITION 39, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 50 DA-7-B, POSITION 39, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 51 DA-24-A, POSITION 20, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 52 DA-24-A, POSITION 18, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 53 DA-24-A, POSITION 18, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 54 DA-24-A, POSITION 40, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 55 DA-24-A, POSITION 40, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 56 DA-13-C, POSTION 30, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 57 DA-11-C, POSITION 31, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 58 DA-11-C, POSITION 32, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 59 DA-11-C, POSITION 32, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 60 DA-25-C, POSITION 36, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 61 DA-25-C, POSITION 39, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 62 DA-25-C, POSITION 39, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 63 DA-25-C, POSITION 40, PREOPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 64 DA-25-C, POSITION 40, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 65 DA-4-B, POSITION 40, POST-OPERATION, EXTERNAL CHANNEL MEASUREMENT.

FIG. 66 VELOCITY MEASUREMENT DURING SAFETY ROD WITHDRAWAL.

TABLE II

REACTOR POSITIONS AND MEASUREMENTS

Reactor Position	Measurement	Instrumented Assembly
1	Axial velocity variation due to side plate vents and neck shim housing slots.	DA-11-A ^[c]
7	Interchannel velocity variation.	DA-18-A
10	Lateral pressure drop and change in thickness in Channels 19 and 20.	DA-2-B ^[c]
14	Entrance, exit, and friction loss.	DA-12-C ^[a]
15	Lateral pressure drop and change in thickness in Channel 20.	DA-18-B ^[c]
16	Interchannel velocity variation.	DA-18-A
17	Entrance, exit, and friction loss.	DA-10-C ^[b]
18	Interchannel velocity variation.	DA-19-A
	Inter and intrachannel velocity variation.	DA-24-A
19	Interchannel velocity variation.	DA-7-B
20	Interchannel velocity variation.	DA-19-A
	Inter and intrachannel velocity variation.	DA-24-A
23	Interchannel velocity variation.	DA-19-A
30	Entrance, exit, and friction loss.	DA-13-C ^[d]
31	Lateral pressure drop and change in thickness in Channels 19 and 20.	DA-11-C ^[a]
	Interchannel velocity variation.	DA-19-A
32	Lateral pressure drop and change in thickness in Channels 19 and 20.	DA-11-C
36	Lateral pressure drop and change in thickness in Channel 20.	DA-25-C ^[a]
39	Interchannel velocity variation.	DA-7-B
	Lateral pressure drop and change in thickness in Channel 20.	DA-25-C
40	Lateral pressure drop and change in thickness in Channel 20.	DA-25-C
	Entrance, exit, and friction loss.	DA-4-B ^[c]
	Inter and intrachannel velocity variation.	DA-24-A

[a] Maximized Channel 20 thickness. [c] Minimized Channel 20 thickness.

[b] Maximized Channel 1 thickness. [d] Minimized Channel 1 thickness.

V. EXPERIMENTAL RESULTS

1. COOLANT VELOCITY MEASUREMENTS

The experimental velocity data are listed in Appendix B. The measured ΔP listed is the value actually recorded by the read out instrumentation. The instrumentation was calibrated five times during the test sequence, and the calibration correction listed in the tables in Appendix B corrects the data for error in instrument zero and/or span as determined by the calibration preceeding the given test.

TABLE III

INTERNAL CHANNELS

Fuel Assembly	Channel No.	Average Channel Spacing (in.)	Average Channel Spacing Between Vents (in.)	Average Channel Spacing Between Vents Along Axis of Instrument (in.)	Local Channel Spacing (in.)
DA-18-A	2	0.0724	0.0705	0.0629	0.066
	3	0.0802	0.0798	0.0800	0.080
	9	0.0808	0.0806	0.0816	0.081
	10	0.0784	0.0797	0.0800	0.080
	18	0.0797	0.0790	0.0814	0.081
	19	0.0768	0.0763	0.0873	0.088
DA-19-A	2	0.0787	0.0788	0.0765	0.078
	3	0.0788	0.0789	0.0793	0.078
	9	0.0830	0.0817	0.0790	0.078
	10	0.0754	0.0757	0.0780	0.078
	18	0.0789	0.0787	0.0798	0.080
	19	0.0800	0.0797	0.0878	0.088
DA-7-B	2	0.0769	0.0771	0.0768	0.077
	3	0.0776	0.0777	0.0773	0.077
	9	0.0792	0.0794	0.0795	0.080
	10	0.0783	0.0783	0.0791	0.079
	18	0.0785	0.0792	0.0811	0.081
	19	0.0798	0.0812	0.0848	0.085
DA-24-A	2 ^[a]	0.0775	0.0763	0.0796	0.079
	3 ^[a]	0.0785	0.0791	0.078	0.078
	9	0.0768	0.0775	0.0765	0.076
	10	0.0779	0.0791	0.0796	0.080
	18	0.0785	0.0789	0.0778	0.077
	19	0.0834	0.0827	0.0823	0.080
DA-12-C	10	0.0780			
DA-10-C	10	0.0803			
DA-13-C	10	0.0770			
DA-4-B	10	0.0785			

[a] Only plane A and B measurements available; plane C was blocked by instrumentation.

The reduced velocity data are listed in Appendix C. In analyzing the data it was necessary to separate the internal and the external factors affecting the coolant velocity since the internal effects are dependent on the particular fuel assembly and the external effects would be position-dependent. In order to effect this separation, the coolant velocities were adjusted from the measured value to the value that would have been present in a nominal 0.108-inch Channel 1, 0.078-inch internal channels, and 0.113-inch Channel 20. This correction was determined assuming the pressure differentials between adjacent side plate vents were equal for all channels and were proportional to $V^{1.8}/D^{1.2}$ (V is the coolant velocity in ft/sec and D is twice the channel thickness). The average of the channel gap measurements in the instrumented section of the assembly (between adjacent vents), along the axis of the instrumentation, was used for "correcting" the coolant velocity in the internal channels. These values are listed in Table III. The effective channel gap, during operation, in Channels 1 and 20 was rather difficult to ascertain because of the play in the assemblies (as shown in Figures 34 through 65). In the ATR development work, a number of highly instrumented assemblies have been hydraulically tested, and during the test, the hydraulic forces have invariably shifted the assembly toward the outside (tending to reduce Channel 20 while enlarging Channel 1). On this assumption the initial data reduction was performed assuming that Channel 20 was the minimum measured by forcing the assembly over and that Channel 1 was a maximum (Table IV). This gave a very poor data fit; ie, the standard deviation of the corrected velocities was very large. The values reported assume the assembly centered itself, equalizing these two channels. The data fit is still not good. It is quite probable that the external channels were tapered causing this irregularity.

To determine any effect of the withdrawal or insertion of the safety rods on the coolant flow in adjacent elements, channels, 1,2,3,9,10,18 and 20 in position 39 (DA-7-B) and channels 1 and 20 in position 40 (DA-25-C) were continuously monitored as the north safety rod was withdrawn (raised) and scrambled (inserted). Figure 66 is a section from the strip chart recording the differential pressure from pitot tubes in each of the above channels. The coolant velocity (in ft/sec) at each location is $12.2\sqrt{\Delta P}$ psid. There is no discernable effect of rod position on coolant velocity.

DA-24-A had the pitot tubes along the side plate (Figures 13 and 14). This type of installation tends to produce large discrepancies in the velocities read in the various channels, probably due to a significant radial velocity. The readings for a given installation are generally reproducible. Therefore, DA-24-A was inserted with the intention of measuring relative rather than absolute velocities. This was done to determine any reduction in Position 20 (or any of Positions 10, 20, 30, or 40) due to the experimental tubes, the quadrant divided plate, etc. Figure 67 shows the percent deviation of the average of all velocity (at 100 psi core differential) measurements, for each of the internal channels, for each assembly, from the average for all assemblies. The standard deviation about the mean for all assemblies is also shown. The readings from DA-24-A did not deviate excessively; however, it was felt that DA-24-A should not be analyzed with DA-7-B, DA-18-A, and DA-19-A in evaluating the external effects on coolant velocity, but should be analyzed by itself. Figure 68 shows the deviation about the average velocity for each channel in DA-24-A, measured in the reactor at 85°F, the point values measured in the hydraulic facility at 150°F, and the computed 85 to 150°F bias. Figure 69 shows the velocities measured in each channel in DA-24-A as a function of reactor position and the standard deviation about the average for all positions. It is especially important to notice that Position 18

TABLE IV
EXTERNAL CHANNELS

<u>Fuel Assembly</u>	<u>Position</u>	<u>Channel No.</u>	<u>Spacing with Minimum Channel 20</u>	<u>Average of Channels 1 and 20</u>
DA-24-A	20	1 20	0.135 0.120	0.128
DA-24-A	18	1 20	0.140 0.095	0.118
DA-24-A	40	1 20	0.120 0.070	0.095
DA-7-B	19	1 20	0.115 0.085	0.100
DA-7-B	39	1 20	0.124 0.084	0.104
DA-19-A	18	1 20	0.129 0.075	0.102
DA-19-A	20	1 20	0.123 0.090	0.107
DA-19-A	23	1 20	0.157 0.090	0.124
DA-19-A	31	1 20	0.120 0.102	0.111
DA-18-A	16	1 20	0.125 0.095	0.110
DA-18-A	7	1 20	0.150 0.082	0.116
DA-25-C	36	1 20	0.102 0.105	0.104
DA-25-C	39	1 20	0.105 0.104	0.105
DA-25-C	40	1 20	0.122 0.090	0.106
DA-18-B	15	1 20	0.155 0.083	0.119
DA-2-B	10	1 20	0.133 0.083	0.108
DA-11-C	31	1 20	0.105 0.093	0.099
DA-11-C	32	1 20	0.091 0.082	0.087
DA-11-A	1	20	0.072	0.096

FIG. 67 PERCENT DEVIATION OF VELOCITY IN EACH ASSEMBLY FROM AVERAGE OF ALL (100 LB.) IN.² CORE DIFFERENTIAL) VELOCITY DATA.

was one of the positions in which DA-24-A operated. The comparison of reactor data as a function of position and a comparison with the hydraulic facility data indicates that the velocity along the side plate is not significantly reduced in Positions 20 or 40, below that in other positions.

The actual measured velocities, uncorrected for channel spacing variation, are shown in Figure 70. The figure shows the average, maximum, minimum, and standard deviation about the average for velocities in each channel for DA-7-B, DA-18-A, and DA-19-A. Figure 71 shows the fuel element dependent-variation of the measured velocities, corrected to a nominal channel thickness, and Figure 72 shows the reactor position dependent-variation.

The relative deviation of the average velocity (corrected to a nominal channel gap) for each channel about that computed by the MACABRE code is shown in Figure 73.

FIG. 68 PERCENT DEVIATION -- ATRH DATA FROM AVERAGE OF REACTOR DATA -- OF VELOCITIES IN DA-24-A.

As a check on the effect of unbalanced quadrant flow, the reactor was operated with Position 32 plugged and again with both Positions 32 and 33 plugged. During this test, DA-19-A was in Position 31 and DA-24-A was in Position 40. The data taken from these assemblies at core pressure drop of 100 psi are shown in Figures 69 and 72.

FIG. 69 POSITION DEPENDENT VELOCITIES FOR DA-24-A.

FIG. 70 MEASURED VELOCITIES -- AVERAGE, STANDARD DEVIATION, MINIMUM AND MAXIMUM VELOCITIES -- FOR ALL ASSEMBLIES EXCEPT DA-24-A.

FIG. 71 PERCENT DEVIATION OF THE AVERAGE VELOCITY IN EACH CHANNEL IN DA-7-B, DA-18-A, AND DA-19-A FROM THE AVERAGE OF ALL THREE ASSEMBLIES.

FIG. 72 POSITION-DEPENDENT VELOCITIES FOR DA-7-B, DA-18-A, AND DA-19-A.

FIG. 73 PERCENT DEVIATION OF VELOCITIES ABOUT MACABRE COMPUTED VELOCITIES FOR DA-7-B, DA-18-A, AND DA-19-A.

2. LATERAL PRESSURE DROP MEASUREMENTS

The pressures measured between channels at three axial positions are shown in Figures 74 through 78.

The maximum pressure acting across the northwest neck shim housing (as measured between Channels 20 in Positions 32 and 39) was 0.6 psid with 115 psi core pressure drop.

The channel spacing, as measured by the eddy gages, is shown in Figures 79 through 82. After completion of the tests, gages 1 (DA-18-B, Channel 20), 4 (DA-11-C, Channel 20), 5 (DA-2-B, Channel 20), and 6 (DA-25-C, Channel 20) were removed from the assemblies and recalibrated. The calibration on gages 1, 5, and 6 had changed somewhat, and the shaded area shown in the figures represents the region between the pretest and post-test calibration results. The leads on gage 4 failed during the test but the gage was recovered for recalibration. The gages (2 and 3) in the No. 19 channels could not be recovered for a post-test

FIG. 74 LATERAL ΔP 'S AT 25 PSI CORE DIFFERENTIAL.

FIG. 75 LATERAL ΔP 'S AT 50 PSI CORE DIFFERENTIAL.

FIG. 76 LATERAL ΔP 'S AT 75 PSI CORE DIFFERENTIAL.

FIG. 77 LATERAL ΔP 'S AT 100 PSI CORE DIFFERENTIAL.

FIG. 78 LATERAL ΔP 'S AT 115 PSI CORE DIFFERENTIAL.

calibration. The fuel assemblies were all remeasured after completion of the tests, and neither Channel 19 in DA-2-B nor in DA-11-C had changed significantly; the final values for the two gages agreed within 0.005 inch of the initial values, indicating that any change in calibration must have been small.

No correlation is discernible between the measured change in thickness of Channels 19 and 20 in the same assembly, and it is felt that the large changes measured in the No. 19 channels are a result of instrument malfunction.

There appears to be no preferential orientation of the fuel assembly within the available annulus; ie, the assembly does not always shift to either a minimum or maximum Channel 20 and remain in that position. It appears likely that the positioning is more a function of alignment of the fuel plate, T bar, and T bar slot axis than an inherent feature of the hydraulic diameters of the external channels.

FIG. 79 CHANNEL-20 THICKNESS MEASUREMENTS IN DA-25-C.

FIG. 80 CHANNEL THICKNESS MEASUREMENTS IN DA-18-B.

FIG. 82 CHANNEL THICKNESS MEASUREMENTS IN DA-2-B.

3. ENTRANCE, EXIT, AND FRICTION DROP MEASUREMENTS

The entrance, exit, and friction drop measurements are shown in Figures 83 through 87. The pressures predicted by the MACABRE Code for nominal channels are shown for comparison.

FIG. 83 AXIAL PRESSURE DISTRIBUTION AT 25 PSI CORE DIFFERENTIAL.

FIG. 84 AXIAL PRESSURE DISTRIBUTION AT 50 PSI CORE DIFFERENTIAL.

FIG. 85 AXIAL PRESSURE DISTRIBUTION AT 75 PSI CORE DIFFERENTIAL.

FIG. 86 AXIAL PRESSURE DISTRIBUTION AT 100 PSI CORE DIFFERENTIAL.

FIG. 87 AXIAL PRESSURE DISTRIBUTION AT 115 PSI CORE DIFFERENTIAL.

VI. CONCLUSIONS

The pressures acting across the fuel plates are low, well within the acceptable limit, and should not adversely affect any fuel assembly that is properly constructed.

The pre- and post-test fuel annulus measurements, reported in Figures 28, did not indicate any displacement of the core components as a result of the hydraulic forces. The differences in pre- and post-test measurements seem to be a result of the relatively loose radial positioning tolerances of the fuel elements. Measurements, reported in Figures 34 through 65, show the large changes in the external coolant channels that result from manually pivoting the element about the T bars. These measurements were taken with all 40 fuel elements in place and indicate the poor tolerance control and the wide variation in the size and shape of the external coolant channels that can be expected in the operational fuel element.

The coolant velocities are not a function of either the quadrant or the position within the quadrant, and the average velocities measured in Channels 1 through 18 (at 100 psi core differential and corrected for measured channel variation) agree within 2% of the values predicted for nominal coolant channels. However, the average velocities for Channels 19 and 20 are 5 and 20% low, respectively (Figure 73). The average velocity actually measured in Channel 19 (Figure 70) agrees with the predicted value, but the channel measurements show that the channels are large and the correction to the velocity in a nominal channel results in low values (Figures 72 and 73). The velocities measured in Channel 20 are systematically low. This can result from channel spacings lower than those measured, tapered channels (narrow at the top), or a flow resistance not accounted for in the analytical solutions. Doubt is cast on the first hypothesis by both the eddy gages and the fact that the data correlated better when it was assumed that the element centered itself rather than shifting toward a minimum Channel 20. The time-dependent decrease in velocity in Channel 20 (DA-18-B, Position 15) indicates a possible hydraulic positioning or bowing while the change in velocity in Channel 20 of DA-25-C, when the assembly was moved from Position 36 to Positions 39 and 40, indicates a position-dependent geometry effect that could be the tolerance in the T bar slots (since the measured channels are approximately equal).

No change in the size of Channel 20 in DA-18-B can be verified from the eddy gage data because of the difference between pre-test and post-test calibration. The change in size of Channel 20 in DA-25-C is very apparent in the eddy gage data. The MACABRE code as currently used [1,2,3] assumes that the vents are frictionless. This is a good assumption for internal channels because they have a very small velocity change at each vent. No amount of cross flow resistance can account for the discrepancy between measured and computed velocities in Channel 20 because even the solutions for the unvented case are too high.

The 1.05 value used as the σ level for velocity variation [1, 2] resulting from external effects appears to be low. Figure 73 indicates that the respective values for Channels 1, 2, 3, 9, 10, 18, 19, and 20 should be 1.17, 1.09, 1.06, 1.06, 1.07, 1.06, 1.09, and 1.36. The external channels (1 and 20) are larger than the internal channels (0.078 inch) resulting in nominal computed velocities greater than the internal channels. This coupled with the fact that these channels are heated from only one side minimizes the effect of the large velocity variations.

The measured velocities and velocity variations will result in an increase in the computed hot-spot temperature in the Mark IV fuel assembly [1, 2] (occurring in Plate 19) and will produce some increase in the maximum thermal stress (Plate 18). These results will enhance the desirability of the 7-F fuel composition [1] in which Plates 5 and 15 contain the hot spot and the maximum thermal stress, respectively.

The pressures and pressure losses measured within the fuel elements did not agree well with the anticipated values. The hydraulic constants (entrance and exit loss coefficients) measured in the ATR hydraulic facility and incorporated in the MACABRE calculations (Figures 73 and 83 through 87) are different from those observed in the reactor. Figures 83 through 87 indicate (a) a reduced entrance loss and (b) a significant pressure loss between the bottom of the fuel element and the flow distribution tank taps that has not been incorporated in prior analysis. This pressure loss was not measured directly during the test but was evaluated by subtracting the sum of the channel entrance loss, the frictional loss, and the channel exit loss (to the tap immediately below the fuel element) from the total quadrant pressure differential as measured by the reactor control instrumentation. To measure this pressure loss directly, and therefore more accurately, DA-10-C was reinstalled in reactor Position 17. The measured pressure loss as a function of quadrant ΔP is shown in Figure 88.

FIG. 88 DISCHARGE PRESSURE LOSS BETWEEN THE BOTTOM OF THE FUEL ASSEMBLY AND THE FLOW DISTRIBUTION TANK TAP.

The average pressures and the deviations about the averages are shown in Figure 89 for the 100 psid data. The pressure below the fuel element is shown in Figure 89 as evaluated (a) by summing the entrance, frictional, and exit losses and (b) by subtracting the measured loss, through the flow distribution tank, from the quadrant ΔP . The difference between the pressure determined by the two approaches indicates a bias in the measuring devices.

Curve 1 of Figure 89 is the best fit of the data taken in the same, instrumented fuel elements (DA-4-B, -10-C, -12-C, and -13-C) in the ATR hydraulic

FIG. 89 RELATIVE PRESSURE DATA TAKEN AT 100 PSI CORE DIFFERENTIAL.

FIG. 20 PERCENT DEVIATION OF VELOCITIES
 (MEASURED AT 100 PSI CORE DIFFERENTIAL
 AND CORRECTED TO NOMINAL CHANNEL
 SPACING) ABOUT MACABRE RESULTS WITH
 KENTRANCE ≈ 0.2 AND 94 PSI CORE DIFFER-
 ENTIAL.

facility (at 150°F). Curves 2 and 3 (Figure 89) are the pressures predicted by the MACABRE code, using constants derived from the numerous fuel elements tested in the ATR hydraulic facility, at 150 and 85°F, respectively. Curve 4 is pressure predicted by the MACABRE code using the entrance and exit coefficients that gave the best overall fit of the pressures and velocities measured in the reactor. Because of the relative thermal hydraulic importance, the data fitting process emphasized the accuracy of the velocity calculations rather than the local pressures. The friction factor for high-aspect-ratio fuel element coolant channels in which the coolant channels are bound by roll fabricated, aluminum fuel plates has been evaluated as

$$f = 0.0024 + 0.358 \left(\frac{1}{N_{re}} \right)^{0.437}$$

The applicability of this friction factor has been demonstrated by numerous isothermal, ex-reactor hydraulic measurements by Idaho Nuclear Corporation personnel and was not changed in the data fitting process.

The best overall data fit (curve 4) averages the results of the two methods used to measure the pressure at the fuel element discharge and results in a local uncertainty of approximately 5 psi. Figure 90 shows the fit of the velocity data. This "best fit" was generated with an entrance coefficient of 0.2 [as opposed to the 0.5 value measured in the ATR hydraulic facility] assuming a 6 psi loss through the flow distribution tank.

VII. RECOMMENDATIONS

Thermal hydraulic analysis of a system composed of numerous parallel coolant channels communicating at discrete locations is greatly simplified by the use of the MACABRE II [3] COMPUTER CODE. ATR fuel element performance can best be evaluated by the use of the code with:

- (1) The entrance coefficient specified as 0.2
- (2) The exit coefficient specified as 0.7 for channels 2 through 19 and 0.9 for channels 1 and 20
- (3) The full flow core pressure drop specified as 94 psid (rather than the 100 psid measured between the inlet plenum and the quadrant discharge tank)
- (4) The effective coolant flow in channels 19 and 20 reduced by 5% and 20% respectively, through usage of the "MULH" and "CONB" terms.

The systematic negative bias in the coolant flow rates through channels No. 19 and No. 20 will increase the maximum operating temperature in the ATR MARK IV fuel elements. The effect of the flow reduction on fuel element performance must be analytically evaluated in conjunction with the results of measurements taken during Core I testing.

An ex-reactor experimental program is in progress to determine the cause of the observed flow reduction. Methods to increase the coolant flow through these channels or to compensate for the flow reduction will be considered. This program should be continued until thermal hydraulics analyses, based on the results of the Core I measurements, indicate that the present fuel element configuration or some demonstrated modification will provide adequate margins of safety at the design operating condition of 250 MW in the 40-50-60 MW unbalanced condition.

VIII. REFERENCES

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APPENDIX A
COOLANT CHANNEL THICKNESS

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APPENDIX A

COOLANT CHANNEL THICKNESS

The following tables list the thickness of the various coolant channels in the instrumented assemblies. A mechanical gage was used for the measurements. The gage employed a spring loaded wedge that forced two flat feeler gages apart until the travel was limited by contact with both of the adjacent fuel plates. The travel of the wedge was indicated by a dial indicator calibrated to read the separation of the feeler gages. Periodic calibration checks and careful orientation results in an accuracy of ± 0.001 inch except in the immediate vicinity of a side plate vent. Near the vents the fuel plates are relatively unsupported and the load applied to the plates, by the measuring device, may cause as much as a 0.005 inch increase in separation.

Channels No. 1 and No. 20 were measured with the fuel element in an envelope gage. The envelope was built to the minimum reactor fuel annulus dimensions, allowed by the assembly tolerances, and the channels formed by the envelope should be representative of the minimum the element would encounter within the reactor.

Post Proof Test Measurements

ATR FUEL ELEMENT INSPECTION SHEET

Element probed thru lower while in envelope gage.

Sheet no. 2

Date 5-11-67

Element no. DA 11 A

Inspector RF/BA

		Elev. Screw Withdrawn				Elev. Screw Inserted				Element no. DA 11 A																												Inspector		RF/BA	
		Min Ch 1				Max Ch 1				0.074 - 0.033		Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7									
Inches From Top of Fuel Plate	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane									
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c						
0												75	79	80		30	89	79		82	76	78		75	78	82		87	82	81		75	73	76							
2	104		114									72	76	77		30	88	78		82	77	80		75	76	80		86	82	82		76	73	73							
4	108		123									72	69	75		78	87	79		83	79	81		75	76	78		85	80	81		77	77	78							
6	117		125									71	67	71		77	84	79		84	79	81		76	79	80		82	79	77		80	82	80							
8	114		118									76	64	67		78	83	78		84	78	81		77	80	82		82	78	77		80	82	80							
8 1/2 *				114											76																										
9 *				114											76																										
9 1/2 *				112											75																										
10	112		121									75	71	74		76	52	79																							
12	117		118									72	66	69		75	52	79																							
12 1/2 *																																									
13 *				117																																					
13 1/2 *				117																																					
14	110		112									74	70	73		75	52	80																							
16	108		117									76	69	72		75	53	82																							
18	110		114									78	69	72		75	54	82																							
20	110		114									76	70	72		74	53	81																							
22	112		114									75	68	71		74	53	81																							
22 1/2 *				112											78																										
23 *				112											79																										
23 1/2 *				112											77																										
24	112		117									76	66	65		74	83	81																							
26	112		117									73	65	67		74	83	81																							
26 1/2 *																																									
27 *				118																																					
27 1/2 *				117																																					
28	112		118									74	55-60	66		75	83	83																							
30	114		121									75	55-60	68		75	85	84																							
32	117		123									77	55-60	64		76	85	84																							
34	118		123									75	55-60	65		76	85	84																							
36	123		130									76	55-60	63		76	86	83																							
38	125		130									73	55-60	63		76	86	84																							
40	121		123									74	55-60	65		76	86	83																							
42	118		127									74	55-60	70		76	86	83																							
42 1/2 *				118											79																										
43 *				118											78																										
43 1/2 *				117											77																										
44	114		117									76	68	73		75	85	82																							
46	118		117									75	70	75		77	85	81																							
48	121		114									73	68	73		75	84	80																							
49	114		114									76	74	75		75	85	79																							
Σ																																									
Σ/26																																									
Min																																									
Max																																									

* Designates Window Location Ch. #1 electronically probed thru upper end

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5-11-67

Element no. DA 11 A

Inspector RF/BA

0.074-0.083

Inches From Top of Fuel Plate	Ch 8			Ch 9			Ch 10			Ch 11			Ch 12			Ch 13			Ch 14			Ch 15		
	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
0	76	78	80	76	77	76	79	79	79	83	83	81	76	81	81	79	78	76	80	83	79	77	75	79
2	76	76	78	76	79	79	79	82	76	84	85	83	76	82	82	79	79	76	80	84	78	77	74	78
4	76	75	78	78	80	79	79	84	77	83	85	79	76	81	82	80	82	78	80	82	77	77	74	79
6	76	77	78	77	78	79	79	84	78	82	82	79	77	82	81	81	83	79	79	81	78	78	74	79
8	77	78	78	77	78	79	80	83	76	82	82	81	79	84	81	81	81	79	78	81	78	78	74	80
8 1/2 *				79			80			77			86			85			80					81
9 *				79			81			77			85			82			80					81
9 1/2 *				78			81			76			83			80			79					80
10	77	79	78	77	79	80	80	83	75	81	80	81	79	85	82	80	79	79	78	81	78	78	75	80
12	76	78	79	77	80	81	79	83	74	82	78	82	76	89	82	80	77	79	78	79	78	79	77	80
12 1/2 *				77					80				83			84								83
13 *				77					80				84			85			80			79		86
13 1/2 *				76			78		79				83			84			80			78		82
14	77	78	79	77	81	82	80	76	74	82	81	82	76	90	82	80	82	79	78	80	77	78	80	80
16	77	78	79	78	83	83	80	76	74	82	81	82	77	93	82	80	76	79	78	81	78	78	78	80
18	77	78	78	78	84	84	79	83	72	82	81	83	78	90	82	80	78	77	78	83	79	78	75	81
20	77	78	79	78	84	84	80	82	72	82	82	84	77	84	81	80	79	77	78	82	79	78	74	82
22	77	78	79	77	84	84	80	82	73	82	82	84	76	80	81	80	79	78	78	82	78	78	75	82
22 1/2 *				80			85			72			83			81								83
23 *				80			86			73			85			81			85			79		84
23 1/2 *				80			84			73			82			80			82			79		83
24	77	79	80	77	82	82	80	84	73	82	81	85	78	81	81	79	77	78	79	83	78	77	74	82
26	77	79	80	79	81	81	80	85	74	82	81	84	78	80	80	79	77	78	78	83	78	78	74	82
26 1/2 *				77			86			75			85			81			79			79		83
27 *				76			85			77			85			82			80			30		84
27 1/2 *				76			80			78			85			82			80			79		81
28	76	79	80	78	80	81	80	84	74	82	82	85	77	80	81	80	78	79	79	82	79	78	74	82
30	78	79	80	77	80	81	80	78	75	81	82	83	77	80	81	80	78	79	79	81	79	77	77	80
32	78	81	80	77	78	79	80	75	78	81	80	80	76	86	79	81	82	81	80	80	79	77	77	79
34	78	81	80	78	79	80	80	76	78	82	76	79	75	83	78	81	83	81	80	80	80	77	78	78
36	78	80	79	78	79	80	80	81	77	82	74	81	75	80	77	81	82	81	79	78	80	77	78	78
38	77	80	79	78	79	80	79	80	77	82	74	80	75	80	77	81	82	81	79	77	80	77	77	78
40	77	79	79	78	79	79	79	80	77	82	74	80	75	80	77	81	79	80	79	77	81	77	78	77
42	77	79	78	79	79	78	79	80	78	82	74	80	76	80	77	81	78	80	79	78	81	77	79	77
42 1/2 *				78			79			78			85			83								77
43 *				78			79			78			88			85			80					78
43 1/2 *				78			79			78			86			85			81					78
44	76	78	77	79	79	78	79	81	79	82	74	81	74	80	75	81	79	81	80	77	80	77	80	77
46	77	79	77	78	78	78	79	81	79	81	74	81	75	81	76	81	79	81	79	77	79	77	80	79
48	77	79	78	79	77	77	79	81	78	81	77	81	74	81	78	81	78	79	79	79	80	78	79	78
49	77	80	79	79	78	77	79	80	78	82	81	85	77	82	78	80	79	79	80	81	84	79	80	77
Σ																								
Σ/26																								
Min																								
Max																								

* Designates Window Location

PPC-C-6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 11 A

Inspector RF/BA

Date 5-11-67

0.074 - 0.083

Inches From Top of Fuel Plate	Ch 16				Ch 17				Ch 18				Ch 19				Elev. Screw Withdrawn Max Ch 20				Elev. Screw Inserted Min Ch 20			
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane	
	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a
0	79	79	77		78	79	83		80	92	70		72	86	84		87	50-55	60-62					
2	80	82	80		77	80	78		80	92	77		73	88	83		87							
4	79	82	77		77	79	78		80	87	82		75	94	79		86							
6	78	80	78		77	79	77		79	85	85		77	95	75		86							
8	78	81	78		77	79	73		79	85	85		77	91	73		87	50-55	60-62					
8 1/2 *				79				79				86				74				60-62				
9 *				79				79				87				73				60-62				
9 1/2 *				79				78				85				73								
10	79	81	78		77	80	77		77	84	83		77	89	73		88	55-61	60-62					
12	79	80	78		77	81	77		79	85	81		76	88	75		88							
12 1/2 *				84			75				82				73					87				
13 *				86			76				84				69					85				
13 1/2 *				83			78				81									86				
14	79	80	77		78	82	78		81	86	80		68	85	75		86		60-62					
16	78	80	78		78	82	78		81	86	79		66	85	75		86		61					
18	79	80	77		78	81	77		81	86	78		67	81	75		86		62					
20	79	81	77		78	81	78		81	86	78		67	80	76		87		64					
22	80	81	77		78	80	78		80	81	80		67	81	75		87		66					
22 1/2 *				78				78				81				76				66				
23 *				78				79				83				75				66				
23 1/2 *				78				78				82				75				66				
24	81	82	78		77	80	78		80	87	81		67	81	75		86		65					
26	81	82	76		77	80	79		80	87	79		67	82	75		86		66					
26 1/2 *				32			80				81				68					85				
27 *				33			81				84				67					85				
27 1/2 *				30			78				83				67					85				
28	81	81	76		77	81	80		81	86	78		67	83	76		85		66					
30	81	81	76		77	81	80		80	84	79		67	86	76		85		68					
32	81	81	77		77	80	80		77	80	81		74	88	73		85		69					
34	81	81	77		77	81	80		76	82	83		73	87	58		84		70					
36	81	81	77		78	81	80		77	80	81		72	88	57		83		72					
38	81	81	77		78	82	82		74	82	82		75	88	59		81		71					
40	81	81	78		79	83	82		73	81	82		76	88	59		79	55-61	71					
42	80	78	79		79	86	80		73	81	84		74	92	68		79	62	73					
42 1/2 *				80				80				85				68				74				
43 *				83				79				87				68				74				
43 1/2 *				83				78				87				69				75				
44	81	75	32		79	82	77		75	86	85		74	91	67		79	62	75					
46	81	75	34		79	71	75		76	89	82		71	87	66		79	63	76					
48	81	79	36		76	78	78		79	89	82		69	82	62		78	63	78					
49	81	83	87		78	78	75		79	89	80		70	81	64		78	62	78					
Σ																								
Σ/26																								
Min																								
Max																								

* Designates Window Location

PPCo-C-E319

a Plane - along side plate with pads at Plate No. 1 edge
 b Plane - from upper end, left side of comb
 c Plane - along side plate with pads at Plate No. 19 edge

Element probed from lower end while in envelope gage.

Post Proof Test Measurements

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5-11-67

Element no. DA 18 A

Inspector VV/BA

Inches From Top of Fuel Plate	Elev. Screw Withdrawn			Elev. Screw Inserted			Ch 2		Ch 3		Ch 4		Ch 5		Ch 6		Ch 7	
	Min Ch 1			Max Ch 1			Ch 2		Ch 3		Ch 4		Ch 5		Ch 6		Ch 7	
	Plane	Window Plane		Plane	Window Plane		Plane	Window Plane	Plane	Window Plane	Plane	Window Plane	Plane	Window Plane	Plane	Window Plane	Plane	Window Plane
	a	b	c	a	b	c	a	b	a	b	a	b	a	b	a	b	a	b
0							79	76	83	81	70	78	78	81	83	80	80	77
2	88	110					78	71	82	83	74	78	79	84	81	81	79	82
4	91	110					78	71	80	80	76	80	78	83	83	81	76	81
6	94	112					76	72	80	80	76	81	77	81	82	82	78	80
8	97	114					75	71	80	80	78	81	75	80	82	82	79	80
8 1/2 *			97							80						85		81
9 *			97							81						86		82
9 1/2 *			97							79						84		
10	99	117					73	73	79	81	78	82	75	80	81	83	80	82
12	101	117					74	71	79	80	78	83	75	79	81	83	79	81
12 1/2 *			117															
13 *			117															
13 1/2 *			117															
14	99	117					74	72	78	81	77	84	75	79	82	84	79	81
16	99	117					75	69	78	80	77	85	75	78	82	84	80	80
18	97	117					78	71	78	80	78	85	74	78	82	84	80	80
20	99	114					75	72	78	80	78	86	74	78	84	84	80	80
22	99	112					75	60	78	81	78	87	74	78	84	85	81	80
22 1/2 *			97							79								80
23 *			97							80								79
23 1/2 *			97							79								79
24	97	114					75	75	78	81	78	86	74	78	84	84	80	79
26	99	114					75	75	78	81	77	87	74	79	84	84	79	78
26 1/2 *			114															
27 *			114															
27 1/2 *			114															
28	99	123					76	76	77	81	77	87	75	79	85	84	79	79
30	104	123					76	76	78	81	78	87	74	79	84	85	79	79
32	112	130					73	60	78	81	78	86	74	78	83	85	79	79
34	114	130					72	61	78	80	78	86	74	78	82	85	79	79
36	106	125					76	66	78	80	78	86	74	79	82	85	79	79
38	106	125					76	66	78	80	78	85	74	79	83	85	79	79
40	110	125					72	65	78	81	78	83	74	79	82	85	80	79
42	102	123					76	65	78	83	78	81	75	80	82	84	80	78
42 1/2 *			104							80								78
43 *			104							81								80
43 1/2 *			102							80								80
44	102	118					74	64	78	84	78	79	75	80	82	86	81	79
46	99	114					77	67	79	85	77	78	76	80	84	84	81	76
48	95	104					75	71	79	84	75	78	77	82	85	84	81	74
49	97	106					75	75	79	83	74	78	79	82	84	84	81	78
Σ																		
2/26																		
Min																		
Max																		

* Designates Window Location Ch. 1 probed with eddy current probe thru upper end.

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5-11-67

Element no. DA 18 A

Inspector VW/BA

0.074 - 0.033

Inches From Top of Fuel Plate	Ch 8			Ch 9			Ch 10			Ch 11			Ch 12			Ch 13			Ch 14			Ch 15			
	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c
0	75	79	74			76	80	80			75	74	78			79	82	83			74	74	75		
2	76	79	76			78	81	80			74	75	78			83	83	77			76	73	72		
4	78	79	76			78	82	82			75	75	77			82	82	78			78	75	76		
6	78	79	77			78	82	81			76	76	79			82	81	79			78	78	79		
8	78	79	78			78	82	81			78	76	78			81	83	81			78	75	77		
8 1/2 *				79					82		78			83					82				79		79
9 *				80					84		77			84					80				81		80
9 1/2 *				80					85		77			83					78				77		79
10	78	79	79			78	83	34			78	76	78			81	82	81			76	74	77		
12	79	78	76			78	82	33			79	80	80			81	81	80			76	74	77		
12 1/2 *				80					80		77			79					81		77				
13 *				84					80		76			82					75		77				
13 1/2 *				78					80		77			81					81		75				
14	77	78	76			77	82	34			78	80	79			81	81	84			76	73	78		
16	77	77	76			77	83	35			78	80	79			81	82	80			76	73	77		
18	77	77	76			77	83	33			79	79	80			81	81	79			76	73	78		
20	77	77	76			76	84	80			80	77	79			81	81	79			75	72	78		
22	78	78	76			77	84	80			79	77	80			80	80	79			75	73	77		
22 1/2 *				76					80		79			82					79						
23 *				78					82		79			84					79						
23 1/2 *				82					83		79			81					77						
24	77	79	82			77	83	82			79	78	80			73	80	79			75	73	77		
26	78	79	80			77	83	82			79	78	80			81	80	80			75	73	77		
26 1/2 *				79					80		79			80					80		76				
27 *				80					79		79			81					81		77				
27 1/2 *				81					77		79			83					77		77				
28	77	79	77			77	84	82			79	78	79			81	80	83			75	73	77		
30	77	79	77			78	84	83			80	78	78			81	80	82			75	73	76		
32	76	76	77			78	81	82			80	81	78			81	80	81			76	75	75		
34	76	77	78			78	81	83			80	82	80			80	80	82			76	75	74		
36	76	77	77			78	80	82			80	81	80			80	80	81			76	75	75		
38	76	76	76			78	81	81			80	80	80			79	80	81			77	75	75		
40	76	76	76			78	81	82			80	80	79			80	80	82			76	75	75		
42	76	76	77			80	81	82			80	80	80			80	80	80			78	75	75		
42 1/2 *				77					83		80			82					82						
43 *				84					81		79			83					82						
43 1/2 *				84					82		78			82					79						
44	76	76	80			81	82	84			79	79	78			80	81	81			76	75	77		
46	77	75	76			82	82	82			79	77	78			79	83	77			77	74	77		
48	76	76	76			83	82	80			76	75	78			80	86	80			78	74	84		
49	76	79	78			84	82	80			76	77	77			80	81	79			80	79	80		
Σ																									
Σ/26																									
Min																									
Max																									

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 18 A

Inspector RF/BA

Date

0.074 - 0.083

Inches From Top of Fuel Plate	Ch 16				Ch 17				Ch 18				Ch 19				Max Ch 20				Min Ch 20				
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c
0	76	82	82			77	79	79			79	81	74			72	89	73			95	68	74		
2	78	86	81			77	75	81			79	82	73			74	91	76			92	68	72		
4	79	87	82			78	70	73			79	87	81			75	88	74			90	72	72		
6	80	83	81			78	72	72			79	87	84			75	89	73			91	73	73		
8	80	81	82			78	77	75			80	85	80			75	88	73			92	75	74		
8 1/2 *				37					72					82					74						
9 *				38					74					84					74						
9 1/2 *				35					76					82					74						
10	80	81	81			79	77	76			79	84	79			74	86	74			92	77	74		
12	82	82	81			79	78	76			79	83	78			74	84	73			91	78	73		
12 1/2 *				87					78					81		74					91				
13 *				89					75					84					74						
13 1/2 *				88					75					81					74						
14	82	81	82			79	79	76			79	82	78			73	82	73			90	78	73		
16	80	82	85			79	79	75			80	83	78			80	83	78			88	77	71		
18	80	82	84			78	81	76			77	85	79			74	80	73			88	77	71		
20	80	81	83			78	85	77			76	85	80			76	76	72			88	77	72		
22	82	70	87			78	89	74			78	87	81			74	80	72			88	78	72		
22 1/2 *				30					73					82					73						
23 *				32					73					81					72						
23 1/2 *				30					74					81					72						
24	81	71	89			78	86	72			78	87	80			73	84	72			88	76	82		
26	81	74	87			78	83	73			79	84	78			73	85	72			86	74	72		
26 1/2 *				84					79					79					73						
27 *				88					78					80					73						
27 1/2 *				86					77					78					73						
28	81	77	86			78	81	73			78	83	79			72	86	71			86	74	72		
30	81	77	80			78	80	76			78	83	80			72	87	70			86	73	73		
32	80	78	84			79	79	74			77	81	79			72	86	70			87	74	74		
34	80	78	86			79	80	76			78	81	76			72	88	70			87	73	76		
36	80	78	87			79	80	76			77	81	76			73	89	69			87	73	77		
38	81	77	86			77	80	76			78	81	78			72	88	67			87	73	78		
40	81	77	84			76	80	76			79	81	78			72	87	69			87	76	80		
42	80	78	88			76	80	76			78	80	75			72	87	70			88	79	81		
42 1/2 *				31					74					75					72						
43 *				32					74					75					70						
43 1/2 *				30					75					75					70						
44	79	77	88			76	80	76			77	79	75			73	88	71			88	80	81		
46	79	77	85			79	79	78			77	81	76			73	86	72			88	83	82		
48	78	77	85			77	80	77			78	83	77			74	85	69			89	84	86		
49	78	73	91			76	86	78			80	76	76			75	83	67			90	84	90		
Σ																									
Σ/26																									
Min																									
Max																									

* Designates Window Location

PPCo-C-6349

Post Proof Test Measurements

ATR FUEL ELEMENT INSPECTION SHEET

Element probed from lower end while in envelope gage

Sheet no. 2

Date 5-16-67

Element no. DA 19 A

Inspector RF/VW

Elev. Screw Withdrawn				Elev. Screw Inserted				0.074 - 0.083																												Inspector				RF/VW			
Min Ch 1				Max Ch 1				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7															
Inches From Top of Fuel Plate	Plane			Window Plane	Plane	Window Plane			Plane	Window Plane			Plane	Window Plane			Plane	Window Plane			Plane	Window Plane			Plane	Window Plane			Plane	Window Plane													
	a	b	c	a		c	a	b		c	a	c		a	b	c		a	c	a		b	c	a		c	a	b		c	a	c	a	b	c	a	c						
0									83	81	82		76	74	77		78	80	77		76	77	73		86	86	89		77	69	75												
2	96		112						80	77	78		77	74	77		78	80	78		76	78	73		85	86	86		78	73	78												
4	96		108						80	77	78		78	78	79		78	79	78		76	79	73		83	81	85		79	75	78												
6	98		108						80	75	76		79	78	79		78	79	78		78	79	71		81	81	86		80	77	79												
8	100		109						81	75	76		82	78	78		79	79	78		79	80	72		81	80	86		80	78	81												
8 1/2 *				100							82				82							80						83				82											
9 *				100							78				83							81						82				82											
9 1/2 *				100							78				81							78						82				80											
10	99		108						79	75	77		80	79	79		75	78	78		78	80	71		82	80	87		81	78	80												
12	99		109						79	75	77		80	79	79		75	78	78		79	80	72		81	79	85		83	78	80												
12 1/2 *				110							79										80							86				85											
13 *				110							78										80							87				85											
13 1/2 *				110							79										80							86				82											
14	98		108						79	77	79		80	79	78		75	78	78		78	79	70		81	79	87		81	78	78												
16	96		106						81	77	80		80	80	79		75	77	77		79	78	70		81	78	86		82	78	79												
18	96		107						79	77	81		80	80	79		74	78	78		80	77	69		80	78	86		82	78	78												
20	96		107						78	76	79		81	81	80		73	79	79		80	77	70		80	77	86		82	79	78												
22	96		106						77	76	80		85	79	78		69	79	78		86	77	72		80	76	85		81	79	78												
22 1/2 *				95							78				96													82				78											
23 *				94							79				93													85				79											
23 1/2 *				94							79				88													81				80											
24	95		106						78	77	80		83	78	77		72	78	78		83	78	71		79	78	85		83	80	79												
26	95		107						78	76	80		82	80	79		72	76	76		83	78	72		79	78	86		83	80	78												
26 1/2 *				107							80																	86				87											
27 *				107							82																	86				86											
27 1/2 *				107							82																	86				85											
28	96		107						78	76	81		82	82	79		73	77	76		82	78	73		80	78	86		82	79	76												
30	99		110						78	75	81		82	80	77		74	78	78		82	78	73		79	79	86		81	78	76												
32	102		112						79	76	81		81	81	78		74	78	77		83	78	79		79	79	86		81	79	77												
34	106		<78						80	75	81		81	80	77		73	76	77		82	78	73		79	78	85		81	78	77												
36	105		117						79	73	81		80	79	77		74	77	77		83	78	70		78	78	86		80	80	78												
38	105		**						75	73	81		79	78	77		74	79	78		82	78	71		80	78	85		80	80	77												
40	104		▲						80	77	80		79	77	76		75	79	79		81	78	73		79	78	84		80	79	77												
42	105								80	75	80		78	77	77		75	78	78		82	79	73		79	77	83		80	79	80												
42 1/2 *				105							83				78													78				81											
43 *				104							85				78													82				80											
43 1/2 *				103							83				79													86				82											
44	103								8-	75	80		79	77	77		80	76	78		85	79	75		81	78	83		79	80	80												
46	102								80	75	80		79	76	76		75	76	76		83	80	77		79	77	83		79	77	76												
48	93								80	75	82		78	77	77		75	76	76		83	78	76		81	79	84		79	78	76												
49	101		**						80	80	82		78	82	81		76	76	78		84	79	72		82	81	86		79	81	78												
Σ																																											
Σ/26																																											
Min																																											
Max																																											

** Probe would not go in this area.

* Designates Window Location

Ch. 1 probed with eddy current probe thru upper end.

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5-16-67

Element no. DA 19 A

Inspector FR/VW

0.074-0.083

Inches From Top of Fuel Plate	Ch 8			Ch 9			Ch 10			Ch 11			Ch 12			Ch 13			Ch 14			Ch 15		
	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
0	79	87	80	80	74	82	79	84	76	75	76	80	82	82	79	77	77	78	78	82	79	82	78	81
2	78	86	78	84	77	85	78	82	75	78	76	79	78	84	79	78	77	79	78	83	79	82	78	80
4	78	83	77	86	80	86	75	82	74	79	80	82	77	82	78	79	77	80	78	82	80	81	78	80
6	77	81	76	85	82	89	76	79	70	79	80	81	79	83	78	78	78	80	78	82	78	81	78	80
8	77	82	76	85	84	91	76	77	67	80	81	82	80	83	78	78	78	81	78	80	77	80	78	82
8 1/2 *				78			92			66		82			80			81			81			84
9 *				78			91			67		86			79			82			82			84
9 1/2 *				77			91			67		81			79			80			80			82
10	77	82	76	86	83	89	75	76	68	79	82	83	79	83	78	79	78	80	78	79	77	81	78	81
12	77	82	77	87	82	88	74	77	69	80	82	85	78	82	77	79	78	79	79	79	79	81	78	79
12 1/2 *			78			88			74				86			79					80			84
13 *			78			88			74				86			79					79			85
13 1/2 *			77			86			74				86			77					77			83
14	76	82	77	84	81	88	75	77	68	80	82	84	79	82	78	79	79	81	78	79	76	81	78	80
16	76	81	76	83	81	87	75	76	69	80	82	83	79	81	78	79	79	80	78	79	76	81	78	81
18	76	82	76	82	80	84	77	76	72	80	82	84	79	82	79	79	79	81	78	80	76	81	78	81
20	76	82	77	81	80	83	77	76	71	80	82	84	79	82	79	79	79	81	78	79	77	81	78	79
22	76	82	77	83	80	86	76	76	68	81	83	85	80	82	80	80	79	82	77	80	78	81	78	81
22 1/2 *			80				87			66		84			81			81			80			81
23 *			78				87			67		85			81			82			80			81
23 1/2 *			76				86			67		83			79			81			79			81
24	76	32	76	83	80	84	76	76	69	81	84	85	79	82	80	79	79	80	79	79	77	80	78	80
26	76	33	78	83	80	84	77	77	69	80	83	85	79	81	78	80	78	81	78	80	78	80	79	80
26 1/2 *			76			85			75				85			78					79			83
27 *			76			86			75				83			76					81			85
27 1/2 *			75			85			75				83			75					80			81
28	75	34	77	83	79	85	76	78	69	79	83	85	79	80	78	80	78	82	79	81	80	80	78	78
30	76	34	77	83	79	85	77	78	70	79	81	81	79	81	79	79	78	82	78	81	80	81	78	77
32	76	34	77	83	79	81	76	78	74	79	81	81	79	82	79	80	78	81	78	80	79	81	78	77
34	77	84	76	81	79	83	77	78	74	79	81	81	79	82	79	79	78	82	79	80	79	80	79	75
36	77	83	76	80	78	84	79	78	74	79	82	82	79	82	79	79	78	81	80	79	80	79	78	76
38	77	84	76	81	78	83	78	78	72	80	82	83	79	82	79	79	78	81	81	80	80	78	78	77
40	77	83	76	82	79	85	78	78	70	78	82	84	79	82	79	78	77	81	81	80	80	78	78	76
42	77	82	74	84	81	86	78	78	71	78	82	82	79	81	78	78	75	80	81	81	81	79	79	80
42 1/2 *			75				85			72		78			80			80			79			81
43 *			73				85			73		79			81			81			79			82
43 1/2 *			73				85			73		80			81			82			81			81
44	77	80	74	84	31	85	79	80	75	78	82	81	80	81	78	82	76	80	80	82	82	81	79	79
46	77	81	76	83	34	86	79	78	75	76	79	79	78	81	78	80	76	80	79	82	82	80	80	74
48	77	83	76	81	34	87	81	77	72	76	81	82	78	80	78	79	76	80	83	83	81	80	80	74
49	79	80	74	77	86	91	83	77	67	75	79	86	79	80	76	78	80	84	85	85	81	82	78	78
Σ																								
Σ/26																								
Min																								
Max																								

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 19 A

Inspector RF/VW

Date

0.074 - 0.083

Date _____		0.074 - 0.083												Elev. Screw Withdrawn				Elev. Screw Inserted							
		Ch 16				Ch 17				Ch 18				Ch 19				Max Ch 20				Min Ch 20			
Inches From Top of Fuel Plate	Plane	Window Plane		Plane	Window Plane		Plane	Window Plane		Plane	Window Plane		Plane	Window Plane		Plane	Window Plane		Plane	Window Plane		Plane	Window Plane		
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	b	c	a	c	a	b	c	a	b	c	a
0	75	80	75			80	76	79			80	85	78			74	89	79			90	70	66		
2	76	78	75			79	77	78			79	84	73			76	89	79			89	67	67		
4	76	78	75			79	78	77			73	81	73			77	90	81			88	69	68		
6	77	80	76			79	78	79			79	79	77			76	85	80			88	72	72		
8	79	80	75			79	78	81			73	79	78			75	89	78			89	76	73		
8 1/2 *				78					82					79					79					74	
9 *				78					82					79					79					74	
9 1/2 *				77					81					78					76					75	
10	79	81	77			79	79	80			78	79	77			74	90	78			90	75	75		
12	80	80	76			80	79	80			79	80	78			75	90	79			89	76	74		
12 1/2 *				82					81					84					73						
13 *									81					86					72						
13 1/2 *									79					82					74						
14	30	80	76			79	79	78			78	79	78			75	90	81			88	75	73		
16	30	80	76			79	79	79			78	78	78			76	91	82			87	76	72		
18	80	80	76			79	79	79			78	77	77			76	92	83			88	75	73		
20	80	80	76			79	78	79			77	78	76			76	92	83			88	75	74		
22	80	79	75			79	78	80			78	79	78			75	92	82			89	75	74		
22 1/2 *				77					80					80					82					75	
23 *				77					79					80					81					75	
23 1/2 *				77					80					79					81					75	
24	79	79	76			80	78	79			78	80	78			74	90	80			88	77	76		
26	80	79	77			80	77	79			78	80	77			75	86	76			87	78	78		
26 1/2 *				82					82					81					75						
27 *				80					84					82					74						
27 1/2 *				82					83					80					75						
28	80	79	78			80	77	79			78	79	75			74	87	75			86	77	78		
30	79	80	78			79	77	78			79	79	77			74	88	77			87	75	78		
32	80	79	78			79	78	78			78	80	78			74	88	80			87	74	77		
34	79	80	79			79	79	81			79	80	79			74	88	78			86	74	77		
36	80	80	78			79	78	80			79	80	78			73	88	79			86	74	77		
38	80	80	76			79	78	79			79	80	78			73	83	79			85	74	77		
40	80	80	78			78	78	78			79	80	78			72	83	80			75	76	78		
42	79	79	76			79	78	79			79	80	78			71	87	77			86	77	78		
42 1/2 *				77					79					79					75					79	
43 *				77					78					79					75					79	
43 1/2 *				77					78					78					75					79	
44	78	80	78			78	78	78			80	79	78			70	87	74			87	78	79		
46	79	80	82			79	78	77			80	80	79			70	86	75			86	79	81		
48	79	80	81			80	73	80			79	83	79			70	83	72			87	77	84		
49	79	81	81			80	80	80			80	86	82			72	78	75			88	77	88		
Σ																									
Σ/26																									
Min																									
Max																									

* Designates Window Location

PPCo-C-6319

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5-17-67

Element no. DA 24 A

Inspector RF/VW

0.074 - 0.083

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15				
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		
	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a
0	87	77	76							71	80	75		84	83	86		76	71	71		79	82	76		76	87	84		80	75	77	
2	86	75	82							71	77	72		88	88	86		76	71	72		80	84	76		78	84	92		78	73	72	
4	84	77	79							73	75	73		89	89	85		78	70	76		81	83	79		78	81	89		75	75	73	
6	83	76	79							72	79	76		89	80	84		78	72	77		83	84	76		80	79	90		74	79	74	
8	82	75	78							74	81	78		88	76	82		78	75	79		84	82	79		81	80	86		73	82	73	
8 1/2 *								79					79			88					80			85								75	
9 *								80					80			88					82			86								75	
9 1/2 *								79					79			88					81			84								73	
10	82	75	78							74	82	79		87	76	83		79	76	79		92	81	81		85	80	86		73	83	72	
12	81	74	78							74	82	78		88	75	82		79	74	79		80	81	79		84	82	87		74	83	73	
12 1/2 *				82													85							79								74	
13 *																	85							80								76	
13 1/2 *				82													85							80								76	
14	81	75	77							75	79	76		86	79	84		79	75	80		80	83	78		85	81	88		74	83	73	
16	81	76	77							76	76	76		84	81	84		79	75	79		81	82	79		84	81	89		72	82	72	
18	82	77	78							74	83	77		86	77	82		78	74	80		84	80	79		81	81	88		72	85	72	
20	81	77	78							76	83	78		81	76	82		80	73	78		86	80	78		80	81	88		70	84	74	
22	83	76	78							76	81	78		83	76	84		80	74	78		86	81	79		80	81	87		70	86	72	
22 1/2 *								78																86								73	
23 *								79									84							81								74	
23 1/2 *								78									86							83								73	
24	84	74	78							77	80	78		82	75	84		82	78	79		84	78	79		82	80	87		72	86	71	
26	84	74	77							74	84	78		83	75	82		79	79	78		83	77	80		85	80	88		71	88	70	
26 1/2 *				84													82															71	
27 *																																72	
27 1/2 *				86																												72	
28	85	74	78							78	79	78		84	74	82																	
30	86	75	78							79	79	78		82	75	82		82	78	79		80	81	81		86	79	86		70	87	70	
32	85	76	78							79	79	79		85	76	82		79	79	79		81	81	82		86	79	83		71	85	72	
34	86	76	78							74	82	76		86	76	83		77	79	78		82	80	82		84	77	82		70	87	73	
36	88	76	77							72	83	76		84	78	82		80	79	79		79	79	80		86	77	82		70	75	73	
38	86	76	78							73	82	76		84	78	82		81	80	80		79	79	81		87	76	82		71	85	73	
40	86	76	77							74	81	76		83	80	82		81	80	78		79	78	82		87	77	82		72	84	72	
42	84	78	78							78	79	81		80	84	82		82	80	78		80	76	82		87	77	82		72	84	71	
42 1/2 *								75																81								72	
43 *								76																84								74	
43 1/2 *								76																82								76	
44	84	77	76							73	79	80		80	83	82		84	79	80		81	76	81		84	81	79		73	80	76	
46	86	83	79							79	77	81		79	82	80		83	78	78		81	78	80		87	84	84		73	79	72	
48	84	83	78							79	75	83		78	82	79		83	76	77		82	79	80		89	86	84		73	80	72	
49	83	79	80							74	79	82		78	81	78		83	77	80		84	81	77		90	78	86		72	80	71	
Σ																																	
Σ/26																																	
Min																																	
Max																																	

* Designates Window Location

PPC-C-6318

Post Proof Test Measurements

ATR FUEL ELEMENT INSPECTION SHEET

a Plane - Along side plate with pads at Plate No. 1 edge.
 b Plane - From upper end, left side of comb.
 c Plane - Along side plate with pads at Plate No. 19 edge.

Element probed from lower end while in envelope gage.
 Sheet no. 2

Date 5-17-67

Element no. DA 2L A

Inspector RF/VW

(The element is tight in the envelope gage - the lower box is binding.)

** Instrument tubing in this plane

		Elev. Screw Withdrawn				Elev. Screw Inserted				Element no. DA 24 A		Inspector RF/VW																							
		Min Ch 1				Max Ch 1				0.074 - 0.083																									
Inches From Top of Fuel Plate	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane	Plane		Window Plane														
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c														
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c														
0										33	79	**		79	82	**		74	77	74		78	78	78		80	81	79		79	77	84			
2	98		100							32	77	▲		79	78	▲		80	79	76		78	77	79		83	90	85		78	74	80			
4	100		100							32	78			78	79			82	78	81		78	78	79		83	86	83		76	74	75			
6	107		105							79	74			78	80			82	79	78		78	78	80		82	84	80		77	75	78			
8	118		113							76	66			77	81			82	78	78		78	79	80		82	82	79		77	76	80			
8 1/2 *				122								79				79					83		79			82							81		
9 *				119								82				80					84		79			84							81		
9 1/2 *				117								81				79					84		79			82							80		
10	110		110							80	71			77	78			82	77	80		78	80	80		82	81	79		79	77	80			
12	107		106							80	77			77	79			82	77	80		78	79	80		81	81	79		78	78	80			
12 1/2 *				110																	81				80								80		
13 *				110																	81				81								80		
13 1/2 *				109																	81				81								80		
14	106		104							81	77			77	80			32	78	80		78	79	81		81	80	78		80	76	79			
16	106		105							82	80			77	78			32	78	80		77	79	80		80	80	78		82	76	80			
18	105		105							82	80			77	78			32	78	80		76	79	79		80	80	78		82	74	80			
20	105		106							84	80			77	78			33	79	81		78	79	78		82	81	78		82	74	80			
22	104		104							82	79			76	78			34	79	81		78	81	79		82	82	81		82	76	80			
22 1/2 *				109								32				77					84		78			82							79		
23 *				110								34				79					84		79			83							79		
23 1/2 *				110								34				79					83		78			84							79		
24	103		103							82	77			78	78			32	79	81		78	80	80		82	84	82		83	76	80			
26	104		104							81	78			77	79			82	78	80		77	79	80		83	84	82		80	77	78			
26 1/2 *				110																	80				80								81		
27 *				110																	80				80								83		
27 1/2 *				110																	81				81								83		
28	104		104							81	76			78	80			82	79	81		77	79	80		83	82	82		81	77	78			
30	103		110							81	74			78	81			81	79	80		77	80	80		82	80	82		78	77	76			
32	111		113							81	74			79	80			80	79	78		77	80	80		84	80	82		78	76	76			
34	113		113							78	73			78	80			82	80	79		76	79	80		81	80	82		78	76	76			
36	113		115							78	71			72	80			82	81	80		77	79	79		81	79	82		78	76	75			
38	112		113							79	72			77	80			81	80	80		78	79	80		81	80	81		78	75	76			
40	110		111							79	72			77	80			84	81	79		78	80	81		81	79	80		78	76	75			
42	106		108							80	72			78	80			83	82	80		78	80	80		80	79	80		78	77	76			
42 1/2 *				114								80				79					84		79			81							74		
43 *				114								80				80					85		79			81							76		
43 1/2 *				113								79				80					84		79			81							76		
44	104		106							72	71			73	81			84	82	80		78	80	81		79	80	80		79	77	76			
46	105		106							75	70			79	81			82	81	79		77	78	81		80	78	79		80	77	78			
48	102		108							73	71	▼		77	77	▼		82	81	80		78	79	79		81	76	79		80	78	77			
49	103		110							72	76	**		77	75	**		81	79	80		79	80	80		84	80	81		82	79	78			
Σ																																			
Σ/26																																			
Min																																			
Max																																			

* Designates Window Location Ch. 1 probed with eddy current probe thru upper end.

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 24 A

Inspector RF/VW

Date 5-17-67

0.074 - 0.083

Date 5-17-67		0.074 - 0.083												Elev. Screw Withdrawn				Elev. Screw Inserted							
Inches From Top of Fuel Plate	Ch 16			Ch 17			Ch 18			Ch 19			Max Ch 20				Min Ch 20								
	Plane			Window Plane			Plane			Window Plane			Plane			Window Plane			Plane			Window Plane			
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	
0	80	78	78		80	81	75		76	82	89		78	89	75		66	73							
2	80	81	78		82	81	77		77	80	86		79	86	81		64	71							
4	80	83	84		82	79	80		78	83	84		81	84	81		69	71							
6	80	83	81		80	73	80		78	83	81		84	81	87		70	72							
8	82	80	80		78	77	80		79	82	78		85	84	88		69	71							
8 1/2 *				80				81				78				89				72					
9 *				81				82				78				89				72					
9 1/2 *				81				81				78				89				72					
10	80	80	81		78	78	80		78	80	77		88	82	89		69	72							
12	80	79	80		78	80	82		80	79	75		88	81	86		68	71							
12 1/2 *				82			79					80				88				55					
13 *				83			80					82				89				55					
13 1/2 *				82			80					81				90				55					
14	80	79	80		79	80	82		78	78	75		89	81	84		66	70							
16	79	78	79		79	80	83		76	77	77		90	82	82		66	68							
18	78	77	78		80	80	82		76	78	76		91	80	84		64	66	66						
20	80	77	78		82	80	82		74	77	76		89	78	84		65	68	62						
22	79	76	80		80	79	82		77	78	75		89	77	83		66	71	64						
22 1/2 *				81				84				75				81				66					
23 *				81				85				74				82				64					
23 1/2 *				81				85				76				82				63					
24	79	77	80		78	78	84		79	79	76		88	77	81		66	70	62						
26	80	77	80		78	79	83		79	80	77		88	76	81		66	68	61						
26 1/2 *				81			79					79				89				66					
27 *				81			81					79				88				66					
27 1/2 *				81			82					79				88				66					
28	80	77	80		80	79	83		79	77	78		86	77	78		65	67	60						
30	80	76	78		78	79	84		78	80	77		88	77	80		66	67	55						
32	80	76	78		79	79	82		78	80	80		87	78	80		67	67	55						
34	80	77	78		80	80	85		78	81	79		89	78	84		67	66	55						
36	80	78	79		79	80	86		78	82	78		89	78	84		68	67	55						
38	78	77	79		79	79	85		80	83	77		89	74	80		70	72	62						
40	78	76	79		79	82	76		78	79	85		89	77	84		70	70	61						
42	78	77	78		81	79	84		76	79	77		90	80	88		72	73	62						
42 1/2 *				78				83				77				88				62					
43 *				78				84				78				88				63					
43 1/2 *				78				82				79				87				62					
44	78	76	77		82	78	82		72	79	78		90	79	87		75	75	63						
46	75	77	80		79	78	82		75	79	76		87	80	88		78	73	62						
48	73	76	80		76	78	85		76	83	75		85	80	87		80	72	65						
49	74	78	82		77	75	87		77	81	74		83	80	84		82	69	66						
Σ																									
Σ/26																									
Min																									
Max																									

* Designates Window Location

PPCo-C-6319

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5 / 16 / 1967

DA18B

Element no. DA18BInspector RF / vv

Inches From Top of Fuel Plate	Elev. Screw Withdrawn				Elev. Screw Inserted				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7			
	Min Ch 1				Max Ch 1				Cr 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7			
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane	
	a	b	c	a	b	c	a	c	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a
0									78	80	73		78	79	79		79	80	79		79	80	79		78	79	79		79	80	79	
2	089		095						78	79	73		78	79	79		78	80	79		78	80	79		78	79	78		79	80	80	
4	093		101						79	79	73		78	79	79		78	80	79		78	80	79		78	79	78		79	80	79	
6	097		103						79	79	73		78	79	79		79	80	79		78	79	79		78	79	78		79	80	79	
8	102		104						79	79	73		78	79	79		79	80	79		79	79	79		78	79	78		79	80	79	
8 1/2 *				103								79			81				80				81				79					81
9 *				104								82			82				82				83				80					82
9 1/2 *				104								81			80				81				82				79					81
10	104		106						79	78	78		78	78	79		78	80	79		78	79	79		78	79	78		79	80	79	
12	107		107						78	79	78		78	79	79		78	80	79		78	79	79		78	78	78		79	80	79	
12 1/2 *				107								79			81				80				82				80					80
13 *				107								79			81				82				80				81					81
13 1/2 *				107								79			80				80				81				82					81
14	107		107						78	79	75		78	79	79		78	79	79		78	78	78		78	78	79		78	80	79	
16	107		107						78	78	75		78	79	79		78	79	78		78	78	78		78	78	78		78	79	79	
18	108		107						78	78	75		78	79	79		78	79	78		78	78	78		78	78	78		78	79	78	
20	108		108						78	78	75		78	79	78		78	79	78		78	78	78		78	78	78		78	79	78	
22	107		107						78	78	77		78	79	78		78	80	78		78	78	78		78	79	78		78	79	78	
22 1/2 *				107								79			81				79				80				79					83
23 *				107								80			83				81				81				79					82
23 1/2 *				107								80			81				80				81				79					80
24	108		107						78	77	78		79	79	78		78	79	78		73	78	78		78	79	78		78	79	78	
26	107		107						78	78	78		78	79	78		78	79	78		77	78	78		78	78	78		78	79	78	
26 1/2 *				109								78			80				80				80				79					79
27 *				109								80			81				82				83				80					80
27 1/2 *				109								79			80				81				82				79					80
28	109		109						78	77	78		78	80	78		78	79	78		77	78	78		78	78	78		79	79	78	
30	111		110						77	73	78		78	78	78		78	79	78		77	78	78		77	78	77		78	78	78	
32	115		114						78	73	78		78	78	78		78	78	78		77	78	78		77	78	77		78	78	78	
34	116		114						78	73	78		78	79	78		78	78	78		77	78	78		77	77	77		78	78	78	
36	116		114						78	78	78		78	78	78		78	78	78		77	78	78		77	78	77		78	78	78	
38	116		114						78	77	78		78	78	78		78	78	78		77	78	77		77	77	77		78	79	78	
40	114		113						78	78	77		77	78	78		77	78	77		77	78	77		77	77	77		78	78	78	
42	112		110						78	78	77		77	78	77		77	78	78		77	78	77		77	78	77		78	79	78	
42 1/2 *				112								79			80				79				79				78					79
43 *				112								81			81				80				80				78					80
43 1/2 *				111								80			80				80				80				78					79
44	110		109						78	77	76		78	78	77		78	78	78		78	78	77		77	78	77		78	79	78	
46	107		104						78	77	77		77	78	77		77	78	78		77	78	77		77	78	77		78	79	78	
48	101		100						77	78	77		77	78	77		77	78	78		77	78	77		77	78	77		78	79	78	
49	095		095						77	77	77		77	78	77		77	73	78		77	78	78		78	78	78		78	79	78	
Σ																																
Σ/26																																
Min																																
Max																																

* Designates Window Location Ch. 1 probed with eddy current probe thru upper end.

PPCo-C-6316

POST PROOF TEST MEASUREMENTS

- * Plane - along side plate with pads at Plate No. 1 edge.
- b Plane - from upper end, left side of comb.
- c Plane - along side plate with pads at plate No. 19 edge

Element probed from lower end while in envelope gage.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5 / 16 / 1967

Element no. DA18B

Inspector RF. vw

DA18B
O.C74-0.083

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15			
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane					
	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	
0	78	80	79		78	80	78		78	80	79		78	79	79		78	82	79		78	80	79		78	81	80		78	81	80	
2	78	80	79		78	80	78		78	80	78		78	80	79		78	80	78		78	83	79		78	80	79		78	81	79	
4	78	79	78		78	81	78		78	80	78		78	80	78		78	80	78		78	84	78		78	80	79		78	82	79	
6	78	79	78		78	81	78		78	80	78		78	80	78		77	80	78		78	83	79		78	82	79		78	82	79	
8	78	79	78		78	81	79		77	80	79		78	80	78		79	80	78		78	83	79		77	83	79		78	82	79	
8 1/2 *				78				83				79			80				88				76				76				81	
9 *				78				88				80			81				85				79				79				81	
9 1/2 *				79				82				79			79				81				80				79				80	
10	78	79	78		78	81	79		77	80	78		78	80	78		78	80	78		78	82	79		79	82	79		78	82	79	
12	78	79	78		78	80	78		78	80	78		77	79	78		78	80	78		78	81	79		78	82	78		78	82	79	
12 1/2 *				80				79				78				80				80				81							80	
13 *				81				80				79				81				80				81							81	
13 1/2 *				82				79				78				80				80				81							81	
14	77	78	78		79	80	78		78	80	78		77	80	78		78	80	78		78	80	78		78	82	78		78	82	78	
16	77	78	78		78	80	78		78	80	78		77	80	78		78	80	78		78	80	78		78	82	78		78	81	78	
18	77	78	78		78	80	78		78	79	78		77	80	78		78	79	78		78	80	78		78	81	78		78	81	78	
20	77	78	78		78	80	78		78	80	78		77	79	77		78	79	78		78	81	78		78	81	79		78	82	78	
22	77	79	78		78	80	78		78	80	80		77	79	78		79	79	78		78	81	78		78	81	79		78	81	78	
22 1/2 *				76				81				81			78				80				79				79				81	
23 *				78				82				83			79				80				84				80				82	
23 1/2 *				79				79				80			79				78				80				80				81	
24	77	78	78		78	80	78		77	79	78		78	79	77		78	79	78		78	80	78		78	80	79		78	80	79	
26	77	78	77		78	79	78		77	79	77		78	78	77		77	79	78		78	80	77		78	81	79		78	80	78	
26 1/2 *				80				78				78				78				82				78							79	
27 *				81				79				79				81				85				76							81	
27 1/2 *				83				77				78				81				77				81							81	
28	80	78	78		76	79	78		77	79	77		77	78	78		77	79	78		78	80	77		78	82	79		78	80	78	
30	77	78	77		78	80	78		77	79	77		77	78	77		77	80	77		78	80	78		78	81	78		78	81	78	
32	77	78	77		78	80	78		78	79	77		77	79	77		77	80	77		78	80	78		78	82	78		78	80	78	
34	77	78	77		78	79	78		77	78	77		77	78	77		77	79	77		78	80	78		78	82	78		77	80	78	
36	77	78	77		78	79	78		77	78	77		77	78	77		77	79	77		78	79	78		78	81	78		78	80	78	
38	77	78	77		78	79	78		77	78	77		77	78	77		77	80	77		78	78	77		78	81	78		78	80	78	
40	77	78	77		77	79	78		77	78	77		77	79	77		77	80	77		78	78	77		78	82	78		78	80	78	
42	77	78	77		77	79	78		77	78	77		77	79	77		77	79	77		77	79	77		78	82	78		78	80	78	
42 1/2 *				80				79				78			77				78				72								80	
43 *				80				80				78			77				80				79								80	
43 1/2 *				79				80				78			79				80				79								79	
44	77	78	77		77	79	78		77	78	77		78	78	77		77	79	77		78	79	77		78	81	78		77	80	78	
46	77	78	77		77	79	78		77	78	77		76	79	77		76	79	77		77	79	77		78	81	77		77	80	78	
48	77	78	77		77	79	78		77	78	77		76	79	77		76	79	77		77	78	77		78	79	78		77	79	78	
49	77	78	78		78	78	78		77	78	77		77	78	77		76	79	77		78	78	78		78	79	79		78	80	78	
Σ																																
Σ/26																																
Min																																
Max																																

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 18B

Inspector RF, VW

Date 5/16/67

0.074 - 0.083

Element No. DA 188										Inspector: _____				Elev. Screw Withdrawn				Elev. Screw Inserted						
Date 5/16/67										0.074 - 0.083				Max Ch 20				Min Ch 20						
Inches From Top of Fuel Plate	Ch 16			Ch 17			Ch 18			Ch 19			Plane			Window Plane			Plane			Window Plane		
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	b	c	a	b	c	a	b	c		
0	78	80	79			79	82	80			78	85	80			79	84	80			81	81	84	
2	78	84	79			79	82	80			75	84	80			79	83	80			88	75	80	
4	79	84	79			79	82	80			75	83	80			79	82	80			83	71	78	
6	79	84	79			79	82	80			75	83	80			80	81	80			79	69	77	
8	73	83	79			78	82	80			75	83	80			80	81	81			77	58	77	
8 1/2 *				81					83				82						82		77			
9 *				83					84				84						83		77			
9 1/2 *				81					83				81						82		77			
10	78	83	79			79	83	80			79	82	79			80	83	80			75	66	77	
12	79	84	79			78	81	80			79	81	79			80	82	80			72	65	77	
12 1/2 *				81					81				80						81					
13 *				82					82				81						81					
13 1/2 *				81					81				81						80					
14	78	84	78			79	82	30			79	81	79			80	82	80			70	65	76	
16	78	84	78			78	82	30			79	81	79			80	82	80			68	64	75	
18	78	83	78			79	84	31			79	82	79			80	81	79			67	64	74	
20	78	84	79			79	82	81			79	31	79			79	80	79			67	64	74	
22	78	83	79			79	82	81			79	80	79			79	82	79			67	64	75	
22 1/2 *				81					82				81						80		75			
23 *				83					82				84						79		75			
23 1/2 *				82					82				84						79		75			
24	78	82	79			79	82	81			78	80	79			80	85	78			67	62	75	
26	78	82	78			78	32	81			78	80	79			79	85	79			66	62	74	
26 1/2 *				80					79				80						81					
27 *				83					80				81						82		66			
27 1/2 *				81					80				81						81		66			
28	78	82	78			78	32	81			79	31	79			80	83	79			65	61	74	
30	78	83	78			78	31	81			78	81	79			79	83	79			65	61	73	
32	78	83	79			79	82	81			79	80	79			79	82	79			66	62	73	
34	78	84	79			79	82	81			79	80	79			79	82	79			67	62	73	
36	78	83	79			78	82	81			79	81	79			79	81	79			66	63	74	
38	78	83	79			79	81	80			79	81	78			79	82	79			65	62	73	
40	78	83	78			79	81	80			79	80	78			79	80	79			66	64	74	
42	78	82	79			79	83	80			78	81	79			79	80	79			67	65	75	
42 1/2 *				81					81				80						80		77			
43 *				82					82				82						80		77			
43 1/2 *				81					82				82						79		78			
44	77	82	79			79	80	81			78	81	80			79	75	78			69	67	78	
46	77	82	78			79	80	80			78	81	79			79	80	78			73	69	80	
48	77	81	78			79	80	80			78	80	78			79	81	78			77	75	84	
49	77	80	78			80	79	79			78	84	78			79	83	80			81	83	87	
Σ																								
Σ/26																								
Min																								
Max																								

* Designates Window Location

PPCo-C-6319

POST PROOF TEST MEASUREMENTS

a Plane - along side plate with pads at Plate #1 edge
 b Plane - from upper end box left of comb.
 c Plane - along side plate with pads at Plate #19 edge. } ELEMENT PROBED THRU LOWER END WHILE IN ENVELOPE GAGE.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5/16/1967

Element no. DA2B

Inspector VW / RF

Inches From Top of Fuel Plate	Elev. Screw Withdrawn				Elev. Screw Inserted				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7			
	Min Ch 1				Max Ch 1				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7			
	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window	Plane	Window
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	c
0									80	79	80		80	79	79		80	79	80		30	80	80		80	80	80		80	81	80	
2	104		108						80	80	80		80	79	80		80	79	80		30	80	80		80	80	80		80	80	80	
4	108		110						81	80	79		80	80	80		80	80	80		30	80	80		80	80	80		80	81	80	
6	108		110						81	80	80		80	80	80		81	80	80		31	80	80		80	80	80		80	80	81	
8	110		111						81	80	80		80	80	80		81	80	80		31	80	80		80	80	80		80	80	80	
8 1/2 *				110								84			83				83				84					83				81
9 *				110								84			82				85				86				85					81
9 1/2 *				110								83			82				82				84				82					81
10	110		111						81	81	80		80	80	80		80	80	80		31	80	80		80	80	80		80	80	80	
12	110		110						81	81	80		80	80	80		80	80	80		30	80	79		80	80	80		80	80	80	
12 1/2 *				110								82				81			80				80				80					82
13 *				110								83				81			81				81				81					84
13 1/2 *				110								82				81			80				81				81					83
14	109		110						81	81	80		80	80	80		80	80	79		30	80	80		80	80	80		80	80	80	
16	109		109						80	81	80		80	80	80		80	80	80		30	80	80		80	80	80		80	80	80	
18	110		109						80	80	80		80	80	80		80	80	80		30	80	79		80	80	80		80	80	79	
20	112		109						80	80	80		80	80	80		80	80	80		30	80	79		80	80	79		80	80	79	
22	110		108						80	80	80		80	80	79		80	80	79		30	80	79		80	80	79		80	80	78	
22 1/2 *				110								82				81			83				82				81					80
23 *				111								84				84			84				84				81					80
23 1/2 *				111								83				81			83				82				81					81
24	111		109						80	79	78		80	80	80		80	80	80		30	79	79		80	80	79		80	79	80	
26	111		110						80	79	79		80	79	79		80	80	80		30	79	79		80	80	79		80	80	80	
26 1/2 *				110								82				78			80				80				80					81
27 *				110								83				78			82				80				81					82
27 1/2 *				110								82				79			82				80				80					80
28	111		110						80	80	79		80	79	79		80	80	80		30	79	80		80	80	79		80	79	80	
30	112		113						80	80	79		80	79	79		80	80	80		30	80	79		79	80	79		80	79	79	
32	114		115						80	80	78		80	80	80		80	81	79		30	80	79		79	80	79		80	79	79	
34	115		116						80	79	78		80	80	80		80	80	80		30	80	79		79	80	79		79	79	79	
36	114		116						80	80	79		80	80	79		80	80	80		79	80	78		79	80	79		80	79	79	
38	114		116						80	79	80		79	80	79		79	80	79		30	79	78		79	80	78		80	79	78	
40	114		115						80	79	79		80	79	79		79	79	79		30	79	78		79	79	78		80	79	79	
42	113		115						80	79	79		80	79	79		80	79	79		30	79	78		78	80	78		80	79	79	
42 1/2 *				113								82				79			81				81				81					80
43 *				113								87				78			82				86				83					80
43 1/2 *				112								82				78			81				85				82					80
44	112		114						80	79	78		79	79	79		79	79	79		80	79	78		79	79	79		80	78	79	
46	110		113						80	79	78		79	79	79		79	79	79		79	78	78		79	78	78		79	78	79	
48	104		107						79	79	78		79	78	79		79	78	79		79	78	78		79	79	78		79	78	78	
49	105		108						79	78	78		79	78	79		79	79	79		79	78	78		80	79	79		80	80	79	
Σ																																
Σ/26																																
Min																																
Max																																

* Designates Window Location Ch #1 electronically probed from upper end.

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5 / 16 / 1967

Element no. DA2B

Inspector vw / RP

DA2B
0.074-0.083

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15				
	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane					
	a	b	c	a c	a	b	c	a c	a	b	c	a c	a	b	c	a c	a	b	c	a c	a	b	c	a c	a	b	c	a c					
0	80	80	80		79	79	79		79	80	80		79	80	80		80	80	80		80	80	80		79	80	80		80	82	80		
2	80	80	80		79	79	79		79	80	80		79	80	80		80	80	80		80	80	80		80	81	80		80	81	80		
4	80	80	80		80	80	30		79	80	80		79	79	79		80	80	80		80	80	80		80	81	80		80	80	80		
6	80	80	80		80	80	79		80	80	80		79	80	80		80	81	80		80	80	80		80	81	80		80	81	80		
8	80	80	80		80	80	30		80	81	80		79	80	80		81	81	80		80	81	80		80	81	80		80	81	80		
8 1/2 *				80				84				80			81				84				82				80					81	
9 *				80				84				80			81				83				84				82					83	
9 1/2 *				81				82				80			80				82				81				82					82	
10	80	80	80		80	80	30		80	81	80		80	80	79		80	81	80		80	81	80		80	81	80		80	81	80		
12	80	81	80		80	80	30		80	81	80		80	80	80		80	81	81		80	81	80		80	81	80		81	81	80		
12 1/2 *				82				82				82								82				82				81				82	
13 *				84				84				83								82				84				80				82	
13 1/2 *				85				81				80								82				84				79				82	
14	80	81	80		80	80	30		80	81	80		80	80	79		80	81	80		80	80	83		80	81	79		81	80	80		
16	80	80	80		80	80	30		80	80	80		79	80	79		80	81	80		80	80	80		80	80	80		81	80	80		
18	80	80	80		80	80	30		80	80	80		79	80	78		80	80	80		80	80	80		80	80	80		81	80	80		
20	80	80	80		80	80	30		80	80	80		79	80	79		80	80	80		80	80	79		80	79	80		81	80	80		
22	80	80	80		80	80	30		80	80	80		79	80	79		80	80	80		82	80	80		79	80	80		81	80	80		
22 1/2 *				80				80				80			80					82				85				78				80	
23 *				81				81				80			81					86				85				78				81	
23 1/2 *				80				81				80			81					84				82				80				81	
24	80	80	80		80	80	79		80	80	80		80	80	78		81	80	80		81	81	80		80	80	80		81	80	80		
26	80	80	80		79	80	79		79	80	80		79	80	80		80	81	80		80	81	80		80	80	79		81	80	80		
26 1/2 *				82				79				80								82				81				80				82	
27 *				84				81				81								81				83				82				84	
27 1/2 *				84				81				82								84				82				80				82	
28	81	80	80		80	80	30		79	80	80		79	80	80		80	80	82		80	80	80		80	80	80		81	80	80		
30	80	80	80		79	80	79		80	80	80		79	80	79		80	80	80		80	80	79		80	80	79		80	80	80		
32	80	80	80		80	80	78		80	80	79		80	80	79		80	80	80		80	80	79		80	79	79		80	80	80		
34	80	80	79		80	79	79		80	80	79		79	80	79		80	80	80		80	81	79		80	80	78		80	80	80		
36	80	79	79		79	79	79		80	80	79		79	80	79		80	80	80		80	80	79		80	80	79		80	81	80		
38	80	79	80		80	79	78		80	80	78		79	80	79		80	80	80		80	81	79		80	79	79		80	81	80		
40	80	79	79		80	79	78		80	80	79		79	80	79		80	80	80		80	80	79		80	80	78		80	81	80		
42	79	79	79		80	79	78		80	79	78		80	80	79		79	80	80		80	80	79		80	80	79		80	81	80		
42 1/2 *				80				79				79			81					78				84				80				81	
43 *				80				80				80			81					81				83				81				82	
43 1/2 *				80				80				80			80					82				81				80				82	
44	79	79	79		79	79	79		80	79	79		80	80	79		80	80	79		80	80	78		80	80	79		80	80	80		
46	79	79	78		80	79	78		79	79	79		79	79	79		80	80	79		80	79	79		80	80	79		80	80	79		
48	79	79	78		80	79	78		79	79	79		79	79	79		80	79	79		80	79	79		80	80	79		80	80	79		
49	80	79	78		80	78	78		79	79	79		80	81	79		80	81	80		80	79	79		80	80	80		80	81	80		
Σ																																	
Σ/26																																	
Min																																	
Max																																	

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA2B

Inspector yy/ RF

Date 5 / 16 / 1967

DA2B

0.074 - 0.083

Inches From Top of Fuel Plate	Ch 16				Ch 17				Ch 18				Ch 19				Elev. Screw Withdrawn Max Ch 20			Elev. Screw Inserted Min Ch 20			
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane			Plane			
	a	b	c	a	c	a	b	c	a	c	a	c	a	b	c	a	c	a	a	b	c	a	c
0	80	81	81			80	80	80	80	82	80		80	81	80			74	74	71			
2	80	81	80			80	80	79		80	81	80		80	80	80			72	67	69		
4	80	81	80			80	80	79		80	81	80		80	81	80			68	66	67		
6	80	81	80			80	80	79		80	81	80		80	81	80			66	65	66		
8	80	82	80			80	81	80		80	82	81		80	83	81			66	64	66		
8 1/2 *				80					83				82				82		66				
9 *				82					81				82				82		67				
9 1/2 *				81					81				82				81		67				
10	80	83	80			80	81	80		80	81	81		80	83	81			66	64	67		
12	80	83	80			80	82	80		80	81	81		80	82	80			66	64	67		
12 1/2 *				82					82				82										
13 *				83					83				83						66				
13 1/2 *				82					83				81						66				
14	80	82	80			80	81	79		80	81	80		80	83	79			64	64	66		
16	80	82	80			80	81	80		81	81	81		80	85	78			63	64	65		
18	80	82	80			80	80	80		80	80	80		78	86	78			63	64	65		
20	80	82	79			80	80	79		80	80	80		77	88	80			64	64	64		
22	80	81	80			80	80	79		80	81	81		76	80	82			64	62	64		
22 1/2 *				83					79				84				84		64				
23 *				83					79				82				86		64				
23 1/2 *				83					80				82				86		64				
24	80	81	81			80	79	80		81	82	81		78	89	82			63	62	64		
26	80	80	80			80	79	80		80	81	81		84	88	80			62	62	64		
26 1/2 *				81					82				78				86						
27 *				82					83				78				88		62				
27 1/2 *				82					32				80				86		62				
28	81	80	80			80	79	80		81	81	80		81	91	82			62	61	62		
30	80	80	80			80	80	80		81	80	80		77	90	82			64	62	62		
32	80	81	80			80	80	80		81	80	80		76	87	81			66	62	64		
34	80	80	80			79	80	80		81	80	80		79	87	82			64	62	64		
36	80	80	80			79	80	80		81	80	80		82	89	82			64	62	64		
38	80	81	80			80	80	80		82	81	80		82	86	82			62	61	63		
40	80	81	79			79	80	80		81	80	79		82	85	82			62	60	64		
42	79	81	80			79	81	80		80	80	79		81	83	81			63	60	66		
42 1/2 *				80					81				80				81		66				
43 *				82					80				80				82		66				
43 1/2 *				81					80				80				81		66				
44	79	81	80			79	80	80		80	80	79		80	81	80			64	63	66		
46	79	80	79			79	80	80		80	80	79		80	81	80			66	65	68		
48	79	80	79			78	80	80		80	80	79		80	81	80			67	67	70		
49	81	80	80			80	82	80		81	80	78		80	85	80			69	68	72		
Σ																							
Σ/26																							
Min																							
Max																							

* Designates Window Location

PPCo-C-6319

a Plane - along side plate with pads at Plate No. 1 edge
 b Plane - from upper end, left side of comb.
 c Plane - along side plate with pads at plate No. 19 edge

Element probed from lower end while in envelope gage.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5 / 17 / 1967

Element no. DALLC

Inspector vw / RF

This element lacks 3/4" of sliding completely into the envelope cage.

		Elev. Screw Withdrawn				Elev. Screw Inserted				DALLC 3.074 - 0.083				Element no.				DALLC				Inspector				vw / RF								
		Min Ch 1				Max Ch 1				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7				
Inches From Top of Fuel Plate	P	ane			Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane	Plane	ane	Window Plane		
		a	b	c																														
0										81	79	80		78	78	80		76	77	76		80	79	79		79	76	77		76	77	77		
2		101		104						81	79	81		77	77	80		76	76	75		79	78	79		79	76	76		77	77	77		
4		101		108						76	80	81		77	75	78		78	75	74		78	77	79		79	75	77		76	78	77		
6		103		106						81	79	80		76	75	78		76	74	74		78	76	79		79	74	77		77	78	77		
8		105		106						80	77	79		76	74	78		76	74	74		77	77	80		79	75	77		77	78	78		
8 1/2 *					104								82				77			79				77				77				77		
9 *					104								85				76							78				76				79		
9 1/2 *					104								81				77							80				76				78		
10		104		107						75	77	79		77	74	78		79	73	74		77	76	80		78	74	78		79	78	77		
12		104		107						78	76	79		77	75	78		78	73	73		78	78	80		79	74	78		80	78	78		
12 1/2 *					107								80																				79	
13 *					107								80																				81	
13 1/2 *					107								79																				81	
14		102		106						78	75	78		77	76	78		75	73	74		78	78	80		79	75	78		78	78	79		
16		101		104						78	76	79		77	76	79		76	74	74		78	77	80		79	74	76		78	78	77		
18		102		104						78	77	80		77	77	78		76	75	75		78	77	80		78	74	77		78	76	77		
20		103		103						79	76	80		77	77	78		76	75	75		79	77	80		78	74	77		77	75	77		
22		102		103						80	77	80		77	76	78		76	74	74		79	79	81		78	75	76		78	76	77		
22 1/2 *					101								85				77				78			78				74					79	
23 *					101								86				77							80				73					80	
23 1/2 *					101								83				76							81				74					79	
24		101		101						80	77	80		76	75	78		76	74	74		80	79	80		77	76	78		80	76	78		
26		103		101						79	75	78		76	76	78		76	74	75		79	80	81		78	76	76		77	76	82		
26 1/2 *					103								79																				79	
27 *					103								79																				80	
27 1/2 *					101								79																				80	
28		104		104						79	75	78		77	76	79		76	75	75		78	79	80		78	76	76		77	75	82		
30		107		107						79	75	79		77	76	78		76	75	75		78	78	79		78	75	77		77	75	77		
32		110		109						79	76	79		76	75	78		77	74	74		78	78	79		78	74	76		76	75	77		
34		110		110						80	76	79		76	76	78		77	74	74		78	77	78		78	75	77		76	74	77		
36		110		109						80	77	80		76	77	78		76	75	74		77	77	78		78	75	77		76	75	77		
38		110		109						80	77	80		76	78	79		78	75	75		78	77	78		77	74	78		76	75	76		
40		109		109						80	78	80		77	78	79		78	74	75		78	77	78		77	72	76		76	74	77		
42		110		108						81	77	78		78	76	78		76	74	75		77	78	78		77	73	76		77	74	76		
42 1/2 *					109								84				78																76	
43 *					109								83				79																77	
43 1/2 *					109								82				77																77	
44		109		109						80	76	79		77	76	78																		
46		110		110						80	75	79		77	76	78		78	75	76		77	77	77		75	74	79		81	74	76		
48		113		112						80	77	80		77	77	78		78	74	76		77	78	76		77	75	78		76	75	77		
49		129		110						81	82	82		77	79	78		78	74	77		78	81	79		80	78	80		76	75	77		
Σ																																		
Σ/26																																		
Min																																		
Max																																		

* Designates Window Location Ch. 1 probed with eddy current probe thru upper end.

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5/17/1967

DALLC

Element no. DALLC

Inspector vw / RF

0.074-0.083

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15				
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane						
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c			
0						78	79	77			81	78	78			77	81	87			73	80	77			78	78	80			79	79	75
2						77	83	77			80	78	78			76	84	85			79	78	76			76	77	79			79	79	77
4						77	80	76			79	80	81			78	86	84			80	78	76			76	77	80			79	79	77
6						76	79	76			79	80	80			78	87	84			80	78	77			74	77	80			80	79	76
8						76	79	74			79	79	78			77	85	86			80	79	78			76	79	79			80	79	78
8 1/2 *					80					74					78				79				78						76				78
9 *					82					75					78				82				78						72				78
9 1/2 *					82					75					78				81				80						71				78
10	79	80	80			77	79	74			78	78	78			80	84	87			78	78	78			79	78	77			81	78	76
12	78	82	80			75	78	75			76	78	80			82	85	82			80	77	76			76	81	80			78	80	79
12 1/2 *				78					76					75						84					76								78
13 *					78				76					75						85				77									78
13 1/2 *									75					75						85				77									78
14	77	80	80			74	78	76			79	78	80			82	86	83			80	77	76			78	82	82			76	78	78
16	78	79	79			76	79	76			78	80	80			78	86	82			80	77	77			80	77	77			77	78	77
18	78	79	79			77	79	76			80	82	80			76	83	81			80	78	77			81	78	78			78	78	77
20	78	81	80			77	78	77			80	81	80			77	85	81			79	79	76			82	77	78			78	79	76
22	78	81	80			77	78	76			80	77	77			77	85	86			79	80	76			80	77	77			78	79	77
22 1/2 *				81					74					76					79				79						73				78
23 *				83					75					74					82				79						73				79
23 1/2 *				82					75					74					80				78						72				78
24	79	82	80			77	78	74			81	77	76			78	84	89			78	81	76			78	76	78			81	78	76
26	78	84	81			76	78	77			78	75	76			81	86	82			78	80	75			81	78	77			79	78	79
26 1/2 *				77					76					75						83					75								80
27 *				79					77					73						84					77								81
27 1/2 *				78					76					74						82					77								80
28	78	83	82			74	78	78			77	77	79			86	84	81			77	79	76			81	78	75			78	77	85
30	78	81	80			77	78	76			80	80	80			78	86	84			77	77	75			81	78	77			79	78	78
32	79	81	80			77	77	77			81	82	81			76	83	82			77	78	76			81	78	78			80	77	77
34	79	82	80			77	77	76			80	82	81			76	81	81			78	80	76			81	77	77			80	77	78
36	79	82	80			78	77	76			79	81	80			76	81	81			78	80	76			82	77	76			80	77	78
38	79	80	79			77	77	76			79	81	81			76	82	80			77	80	76			82	76	77			80	78	78
40	79	80	79			77	77	77			80	82	81			76	83	80			77	80	76			82	77	78			79	77	79
42	78	80	78			77	77	76			80	81	81			78	82	82			76	81	77			80	78	79			81	77	79
42 1/2 *				78					76					80					79				76						76				79
43 *				78					76					80					80				77						74				79
43 1/2 *				79					76					80					80				76						74				78
44	78	80	78			78	78	76			80	81	82			77	84	84			76	80	77			80	78	79			87	77	78
46	78	79	78			78	77	78			78	79	80			78	86	81			77	80	76			84	78	78			79	76	78
48	78	77	77			78	76	78			77	81	80			80	83	79			76	83	76			82	76	78			78	74	79
49	79	77	78			76	78	78			77	77	80			81	81	79			76	81	76			80	80	80			79	74	78
Σ																																	
Σ/26																																	
Min																																	
Max																																	

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DALLC

Inspector yx/ RF

Date 5 / 17 / 1967

DALLC

0.074 - 0.083

		Elev. Screw Withdrawn										Elev. Screw Inserted																																							
		Max Ch 20					Min Ch 20																																												
		Plane		Window Plane			Plane		Window Plane			Plane		Window Plane			Plane		Window Plane			Plane		Window Plane																											
		a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c																									
Date	5 / 17 / 1967																																																		
		Ch 16										Ch 17										Ch 18										Ch 19										Ch 20									
Inches From Top of Fuel Plate		Plane					Window Plane					Plane					Window Plane					Plane					Window Plane					Plane					Window Plane					Plane					Window Plane				
		a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c															
0		80	78	79			76	81	76			76	87	76			71	77	78			72	73	72																											
2		80	79	78			78	79	75			78	88	77			71	75	78			72	74	72																											
4		80	80	79			78	78	74			76	83	76			74	76	78			73	76	73																											
6		79	79	80			78	80	76			75	80	75			76	78	80			73	77	74																											
8		80	79	80			78	80	76			76	78	76			75	78	80			74	78	75																											
8 1/2 *					84					78					77					50					76																										
9 *					84					79					77					50					76																										
9 1/2 *					83					79					76					50					77																										
10		80	79	81			79	80	78			76	78	75			75	78	79			76	80	77																											
12		80	79	81			78	79	76			76	78	75			76	79	80			76	80	77																											
12 1/2 *					80				75					75						76				77																											
13 *					81				79					75						77				77																											
13 1/2 *					82				78					75						78				77																											
14		80	79	81			76	73	76			77	77	76			78	81	80			76	78	77																											
16		79	79	81			76	73	76			76	78	76			75	83	80			75	76	76																											
18		80	79	82			76	73	76			75	78	75			76	80	80			78	77	76																											
20		80	80	82			76	83	76			76	78	74			74	77	78			78	79	78																											
22		80	81	82			76	83	76			75	78	76			73	76	78			79	81	80																											
22 1/2 *					82				75					75						73				81																											
23 *					83				75					75						79				82																											
23 1/2 *					83				77					74						79				82																											
24		80	81	82			77	79	75			75	78	74			74	75	77			79	82	83																											
26		79	81	83			75	79	76			78	79	74			73	74	77			79	82	81																											
26 1/2 *					79				76					76						73				80																											
27 *					80				76					76						74				80																											
27 1/2 *					78				76					77						74				79																											
28		77	81	82			75	79	77			78	80	74			74	74	77			78	80	80																											
30		78	81	79			77	77	76			78	80	76			74	75	77			77	81	82																											
32		78	82	79			77	77	77			78	80	76			75	76	76			77	81	83																											
34		78	82	79			73	78	78			78	80	78			75	77	76			77	80	82																											
36		78	81	78			79	79	78			77	80	77			77	77	76			76	80	82																											
38		78	81	78			78	78	78			78	80	76			77	77	76			76	80	82																											
40		77	81	78			79	79	78			77	80	76			76	77	76			76	80	81																											
42		76	81	77			83	80	77			76	78	79			76	77	75			76	80	81																											
42 1/2 *					78					77				80						74				84																											
43 *					79					77				80						74				86																											
43 1/2 *					78					77				80						74				85																											
44		77	83	78			36	80	76			74	73	81			75	76	74			76	80	82																											
46		76	84	77			35	80	78			73	79	78			75	76	75			75	78	78																											
48		77	86	77			32	79	79			71	79	78			75	76	74			75	75	75																											
49		77	81	77			81	83	80			70	77	79			75	78	73			75	72	73																											
Σ																																																			
Σ/26																																																			
Min																																																			
Max																																																			

* Designates Window Location

PPCo-C-6319

Post Proof Test Measurements

- a Plane - along side plate with pads at plate #1 edge.
 b Plane - from upper end box-left of comb.
 c Plane - along side plate with pads at plate #19 edge.

ELEMENT probed thru lower while in envelope gage.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5/15/67

DA 12 C

Element no. DA 12 C

Inspector DS 1RF

				Elev. Screw Withdrawn				Elev. Screw Inserted				Element No. DA 12-0				Inspector DS IRF												
				Min Ch 1				Max Ch 1				0074 - 0.083																
				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7				
Inches From Top of Fuel Plate	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	
0																												
2	096		099																									
4	097		098																									
6	098		099																									
8	101		101																									
8 1/2 *				101																								
9 *				101																								
9 1/2 *				101																								
10	101		102																									
12	101		103																									
12 1/2 *				102																								
13 *				102																								
13 1/2 *				102																								
14	101		101																									
16	099		101																									
18	099		101																									
20	100		103																									
22	100		101																									
22 1/2 *				100																								
23 *				100																								
23 1/2 *				100																								
24	100		102																									
26	101		103																									
26 1/2 *				104																								
27 *				104																								
27 1/2 *				104																								
28	102		105																									
30	105		106																									
32	107		109																									
34	109		110																									
36	103		110																									
38	103		110																									
40	107		109																									
42	107		107																									
42 1/2 *				108																								
43 *				108																								
43 1/2 *				108																								
44	107		108																									
46	108		109																									
48	106		109																									
49	100		101																									
Σ																												
Σ/26																												
Min																												
Max																												

* Designates Window Location Ch. #1 electronically probed thru upper end

PPC-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5/15/67

DA 12 C

Element no. DA 12 C

Inspector DS 1 RF

0.074-0.033

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15			
	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane				
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c		
0	76	76	78		79	81	74		77	81	79		80	80	80	75	79	76		77	82	77		79	80	77		77	77	77		
2	76	76	79		79	82	74		77	78	78		79	85	80		75	79	76		77	84	78		78	81	76		78	78	88	
4	76	76	79		78	82	73		78	78	78		79	87	80		77	77	77		77	84	78		79	84	76		79	78	78	
6	76	76	78		78	82	74		78	78	78		79	88	79		76	77	77		77	83	77		76	84	77		79	78	78	
8	76	75	77		78	81	75		80	76	77		82	87	82		76	78	76		76	84	78		77	83	78		81	79	78	
8 1/2 *				78					76				85						75												78	
9 *				78					75				85						76												77	
9 1/2 *				78					76				80						75												77	
10	77	76	73		77	81	75		77	75	78		79	88	83		77	77	74		77	83	77		77	85	78		79	77	79	
12	78	76	73		77	81	74		76	77	79		82	87	82		77	78	73		77	82	76		80	85	79		77	75	78	
12 1/2 *								78				74																				77
13 *				80								74																				77
13 1/2 *				78								76																				77
14	78	76	77		77	78	74		78	76	78		79	86	82		77	78	73		77	82	75			76	85	78		78	74	78
15	77	77	73		77	79	74		79	75	78		79	87	82		76	78	74		77	82	77			76	82	76		78	75	77
17	77	78	73		77	78	75		79	76	78		79	87	82		76	79	74		77	84	77			77	79	77		78	76	77
20	77	78	73		77	77	74		79	77	78		79	87	84		76	78	73		77	85	77			77	79	77		78	76	77
22	77	79	73		77	75	74		81	77	78		78	86	84		77	80	74		76	85	77			78	80	79		79	76	77
22 1/2 *				79								74																				77
23 *				81								72																				77
23 1/2 *				80								74																				77
24	78	80	30		76	76	74		80	74	77		79	87	85		74	81	75		76	85	76			78	81	80		79	76	76
26	79	82	79		77	76	75		79	73	77		82	87	84		75	80	71		77	85	76			79	81	79		77	76	80
26 1/2 *				8C								73																				77
27 *				8C								72																				78
27 1/2 *				79								75																				77
28	77	80	73		77	76	75		79	77	81		80	85	85		75	81	68		77	85	77			79	80	78		78	76	79
30	77	81	73		78	74	74		79	73	81		79	86	86		75	79	70		78	83	78			78	80	78		78	75	77
32	77	81	73		78	76	75		79	77	79		78	86	87		75	80	70		77	83	78			78	79	77		78	75	76
34	77	81	73		77	76	75		79	77	78		79	87	86		75	80	73		77	83	78			78	77	76		79	77	78
36	78	81	73		77	74	75		79	77	79		79	87	85		74	80	74		77	82	78			78	77	76		79	77	78
38	78	80	73		77	75	75		79	73	79		79	87	85		74	81	74		77	83	79			78	77	76		79	77	78
40	78	79	73		77	76	76		78	73	79		79	87	85		74	81	73		77	83	80			78	76	76		79	77	78
42	79	79	77		77	76	75		78	73	79		80	88	88		73	81	73		75	82	80			78	77	78		81	77	78
42 1/2 *				79								75																				78
43 *				80								76																				78
43 1/2 *				80								76																				78
44	79	80	79		77	75	75		80	73	79		83	86	88		71	81	72		77	81	80			80	77	77		84	78	78
46	79	80	79		79	74	76		78	77	78		82	85	87		72	83	72		78	81	80			79	76	76		79	78	78
48	80	80	79		79	74	75		77	77	77		82	86	86		72	83	71		78	80	79			80	75	77		79	78	78
49	81	81	80		80	74	76		77	77	78		81	82	86		68	83	72		30	79	82			81	77	81		79	78	77
Σ																																
Σ/26																																
Min																																
Max																																

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 12 C

Inspector DS 1 RF

Date 5/15/67

DA 12 C

0.074 - 0.083

Date 5/15/67	Inches From Top of Fuel Plate	Ch 16				Ch 17				Ch 18				Ch 19				Elev. Screw Withdrawn Max Ch 20				Elev. Screw Inserted Min Ch 20				
		Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	
		a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c
0	79	75	81			77	75	74			78	79	79			74	86	76			79	86	79			
2	79	73	79			77	74	75			79	78	79			75	85	76			78	87	79			
4	79	71	78			77	74	75			79	78	79			75	82	76			79	88	78			
6	79	73	78			77	75	76			79	77	79			75	82	76			80	90	79			
8	79	73	79			77	76	76			79	77	79			76	84	78			80	90	81			
8 1/2 *					81					76					81					78					82	
9 *					81					77					82					78					82	
9 1/2 *					79					76					81					77					83	
10	80	74	79			77	76	76			79	77	79			76	85	78			81	90	83			
12	82	75	79			77	75	75			80	79	79			76	84	78			81	90	82			
12 1/2 *					84					77					82					76					81	
13 *					84					76					82					76					80	
13 1/2 *					81					75					80					77						
14	80	76	79			75	73	75			79	79	79			77	84	79			80	88	82			
16	79	76	78			76	74	75			79	78	78			76	84	79			79	88	80			
18	79	76	79			76	74	74			79	77	79			76	84	79			78	89	79			
20	79	77	80			76	74	74			79	76	79			77	82	77			78	91	80			
22	79	77	82			76	74	74			80	78	81			76	81	77			78	92	82			
22 1/2 *					83					74					82					75					82	
23 *					81					74					83					74					83	
23 1/2 *					82					74					81					73					84	
24	79	76	82			76	73	74			80	78	80			76	79	71			78	93	84			
26	79	76	81			76	74	73			81	78	80			76	79	74			77	93	85			
26 1/2 *					82					76					84					74					77	
27 *					83					76					84					74					76	
27 1/2 *					81					76					83					74					76	
28	79	77	81			76	73	74			80	78	79			76	79	74			75	93	82			
30	78	77	80			76	72	74			80	77	79			77	80	76			75	96	83			
32	78	76	80			76	72	74			80	78	79			78	81	76			76	65	85			
34	78	74	78			77	73	74			80	79	80			78	83	78			76	93	85			
36	78	74	78			76	74	73			80	79	81			77	84	77			76	93	83			
38	78	75	78			77	73	73			80	79	80			76	84	76			75	93	83			
40	78	75	77			77	74	73			79	78	80			75	81	76			75	95	83			
42	77	74	76			77	75	74			80	78	82			75	81	76			75	93	83			
42 1/2 *					77					74					86					75					82	
43 *					77					74					77					74					82	
43 1/2 *					77					75					85					74					82	
44	77	75	77			78	74	74			79	77	83			75	81	76			76	92	81			
46	76	75	77			78	74	75			80	77	82			74	82	75			75	89	80			
48	76	75	76			77	74	73			81	78	82			75	86	77			74	84	74			
49	76	74	77			77	75	74			81	80	83			76	88	76			76	83	72			
Σ																										
Σ/26																										
Min																										
Max																										

* Designates Window Location

PPCo-C-6319

Post Proof Test Measurements.

a Plane - along side plate with pads at Plate # 1 edge.
 b Plane - from upper end - left of comb.
 c Plane - along side plate with pads at Plate # 19 edge.

ELEMENT probed thru lower while in envelope gage.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5/15/67

DA 13 C

Element no. DA 13 C

Inspector VW 1 RF

				Elev. Screw Withdrawn				Elev. Screw Inserted				0.074 - 0.083																				Inspector				VW 1 RF							
				Min Ch 1				Max Ch 1				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7											
Inches From Top of Fuel Plate				Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane									
				a	b	c	a	c	a	b	c	a	c	a	b	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	b	c	a	b	c	a	b	c					
0				75	74	81								78	77	78	77	75	77	78	78	78	78	78	76	78	77	76	74	75	77	80											
2				90	89	79								79	78	78	76	76	77	78	78	78	78	78	76	78	78	75	74	75	76	79											
4				88	87	85								79	80	79	76	77	78	77	75	77	77	76	78	78	77	75	75	75	78												
6				88	86	86								79	80	78	76	78	78	77	75	76	77	74	78	78	77	76	75	75	78												
8				88	87	87								77	79	78	78	76	78	77	75	76	76	75	78	78	77	76	78	77	76	78	76	78									
8 1/2 *							88									73																											
9 *							88									80																											
9 1/2 *							87									77																											
10				87	86	88								77	78	78	76	75	77	76	75	76	77	75	78	78	75	78	79	77	76	79											
12				86	85	86								78	79	78	76	74	76	77	76	77	76	78	77	76	78	77	76	78	76	79											
12 1/2 *							85									79																											
13 *							85									79																											
13 1/2 *							84									80																											
14				82	82	83								78	79	78	76	74	76	77	76	77	78	75	79	78	78	76	75	76	78												
16				80	77	78								78	79	78	76	77	78	77	76	77	77	76	78	78	77	76	76	74	77												
18				79	79	80								78	80	79	77	77	78	77	76	77	77	75	78	78	77	76	76	74	77												
20				78	78	79								78	79	78	77	77	76	78	77	77	78	74	78	78	77	76	75	74	77												
22				75	77	79								77	79	78	76	76	77	77	76	76	78	75	78	78	75	78	77	79	77												
22 1/2 *							74									77																											
23 *							73									77																											
23 1/2 *							72									77																											
24				72	74	76								77	79	78	76	76	78	77	75	78	78	74	78	78	79	78	78	77	75												
25				72	75	76								78	78	78	77	75	78	78	78	78	78	78	78	78	77	75	75	75	79												
25 1/2 *							76									78																											
27 *							77									78																											
27 1/2 *							77									78																											
28				73	75	77								78	79	78	76	75	78	77	75	78	77	75	78	78	78	76	75	75	79												
30				77	77	80								78	80	79	76	77	78	77	76	77	77	76	78	78	78	76	75	74	77												
32				79	81	85								78	80	79	77	74	76	77	75	77	77	75	77	78	77	76	75	75	78												
34				80	82	85								78	80	80	77	79	79	76	74	76	76	75	77	78	75	76	75	76	78												
36				82	83	87								79	80	80	76	78	78	77	75	76	76	74	76	78	75	77	75	77	78												
38				84	85	89								79	80	80	76	75	78	77	75	76	76	75	76	78	75	76	75	77	77												
40				84	86	89								78	80	79	77	78	78	77	76	76	76	74	76	78	73	76	75	77	78												
42				82	86	89								76	78	78	78	76	76	76	76	76	76	74	76	78	73	76	75	74	76	76	77	78									
42 1/2 *							82									75																											
43 *							83									75																											
43 1/2 *							84									75																											
44				84	87	83								76	78	78	77	79	77	77	78	78	76	75	76	78	73	76	77	76	77	77											
46				85	88	84								77	79	77	77	78	78	77	75	76	76	74	76	78	73	76	77	75	78												
48				88	89	84								78	80	79	77	78	78	77	76	76	76	74	77	78	73	76	77	75	78												
49				89	89	84								78	80	79	77	78	78	77	76	76	76	74	77	78	73	76	77	75	78												
Σ																																											
Σ/26																																											
Min																																											
Max																																											

* Designates Window Location

Ch. # 1 electronically probed thru upper end.

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5/15/67

DA 13 C

Element no. DA 13 C

Inspector RF

0.074-0.083

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15			
	Plane		Window Plane	a c	Plane		Window Plane	a c	Plane		Window Plane	a c	Plane		Window Plane	a c	Plane		Window Plane	a c	Plane		Window Plane	a c	Plane		Window Plane	a c				
	a b c	a c	a b c		a c	a b c	a c		a b c	a c	a b c		a c	a b c	a c		a b c	a c	a b c		a c	a b c	a c		a b c	a c	a b c		a c	a b c	a c	
0	78	80	76		77	77	78		76	76	77		79	79	81		78	78	77		75	76	76		78	77	79		76	82	76	
2	78	80	77		76	76	77		77	76	76		79	80	81		78	77	77		74	76	75		79	78	78		76	80	76	
4	78	80	77		75	75	76		77	76	76		80	80	81		79	79	77		74	75	75		78	77	79		76	79	76	
6	79	80	77		75	74	75		78	76	77		78	81	80		78	80	76		75	74	75		77	78	80		77	79	75	
8	79	79	77		75	75	75		78	77	77		78	79	81		77	80	77		75	75	75		78	79	80		80	78	75	
8 1/2 *				77				77				77				82			78				73				79				76	
9 *				78				78				76				83			78				74				79				76	
9 1/2 *				78				77				76				82			78				74				78				76	
10	79	79	78		75	74	75		78	76	77		79	79	80		77	79	77		76	76	76		79	79	80		78	78	75	
12	78	81	78		74	74	75		77	77	78		79	78	80		78	79	75		76	76	76		80	78	80		76	77	78	
12 1/2 *				80				75				76				80				75				75							76	
13 *				80				75				75				80				75				76							76	
13 1/2 *				79				74				76				80				76				76							76	
14	78	80	78		75	74	76		78	77	78		78	77	80		78	86	76		76	76	76		78	77	81		76	77	76	
16	78	81	78		75	73	75		78	77	78		79	79	81		78	80	76		76	76	75		77	77	80		76	77	75	
18	78	81	77		75	73	74		78	77	78		78	78	81		78	79	76		76	77	75		77	77	80		77	77	75	
20	78	80	79		75	73	75		78	76	77		78	79	82		77	79	76		75	77	75		78	76	80		76	78	75	
22	78	80	78		77	74	75		78	75	77		79	77	84		77	79	77		74	78	74		78	77	81		78	79	75	
22 1/2 *				78				76				74				82			77				74				76				76	
23 *				78				76				73				82			78				74				75				76	
23 1/2 *				78				76				74				81			77				74				76				75	
24	78	80	77		76	75	75		79	75	76		78	75	84		76	78	76		74	79	74		79	77	84		77	79	74	
26	78	83	78		76	75	76		79	76	78		79	76	80		77	77	76		76	79	73		80	77	82		76	79	79	
26 1/2 *				79				77				76				80				74				74							74	
27 *				79				77				75				80				73				73							74	
27 1/2 *				78				76				75				80				73				73							74	
28	78	82	78		76	75	76		78	76	79		79	77	80		77	78	73		76	79	73		80	77	81		76	79	78	
30	78	81	78		76	74	75		79	75	79		78	79	82		76	77	74		75	79	75		78	77	80		77	80	76	
32	79	81	78		76	73	76		79	76	79		79	79	82		76	77	74		75	78	74		77	78	80		78	80	76	
34	79	80	78		76	74	76		79	76	79		79	80	82		76	77	74		75	78	75		77	78	79		78	79	77	
36	79	80	77		75	72	76		79	75	78		79	81	82		76	78	74		76	78	74		77	78	80		78	78	77	
38	79	79	77		75	72	76		79	75	78		79	81	82		76	78	74		76	78	75		77	77	79		79	77	77	
40	79	78	76		74	71	77		80	75	78		79	82	82		76	78	74		76	78	75		77	77	79		78	76	77	
42	79	79	76		74	74	77		80	75	78		79	80	84		74	78	74		75	78	75		78	78	79		80	75	76	
42 1/2 *				76				77				77				80			74				76				77				76	
43 *				76				78				77				80			73				76				76				77	
43 1/2 *				75				78				76				79			73				76				77				77	
44	78	79	75		75	74	78		80	74	77		79	80	83		73	78	74		76	78	76		79	77	80		79	75	77	
46	78	80	76		75	73	78		80	71	76		79	80	81		74	78	73		77	79	76		78	76	78		78	74	78	
48	78	83	77		74	72	77		80	68	76		78	79	81		73	79	73		78	80	76		79	73	78		78	72	78	
49	80	82	78		75	73	78		79	69	76		80	80	82		73	80	73		79	78	78		81	75	81		80	75	78	
Σ																																
Σ/26																																
Min																																
Max																																

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 13 C

Inspector RF

Date 5/15/67

0.074 - 0.083

Inches From Top of Fuel Plate	Ch 16				Ch 17				Ch 18				Ch 19				Elev. Screw Withdrawn Max Ch 20				Elev. Screw Inserted Min Ch 20			
	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane
	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a	a	b	c	a
0	79	79	78		74	74	75		78	76	80		75	86	76									
2	79	81	78		75	73	75		77	75	80		76	86	76									
4	79	82	78		75	73	76		77	77	81		77	85	76									
6	78	81	78		76	74	76		78	78	81		76	81	75									
8	79	82	79		76	75	76		78	78	81		76	79	76									
8 1/2 *				80				76				85				76								
9 *				81				76				86				74								
9 1/2 *				80				76				84				74								
10	79	83	30		76	75	76		77	78	81		76	79	76									
12	78	84	30		76	75	76		80	77	80		77	80	76									
12 1/2 *				79				76				85				77								
13 *				79				76				86				76								
13 1/2 *				78				75				84				76								
14	78	84	79		75	75	76		79	76	81		77	81	75									
16	79	83	79		76	77	76		77	75	80		77	82	75									
18	78	83	79		75	77	76		78	73	80		78	82	76									
20	78	83	79		75	77	76		78	72	80		77	81	76									
22	79	81	78		74	75	76		79	73	83		77	81	74									
22 1/2 *				78				75				86				72								
23 *				78				75				86				72								
23 1/2 *				78				75				86				72								
24	78	81	78		75	76	75		78	73	84		76	80	72									
26	77	81	78		76	76	75		80	73	83		77	79	73									
26 1/2 *				77				76				84				75								
27 *				78				76				85				74								
27 1/2 *				78				76				83				74								
28	77	80	78		75	76	74		80	74	84		76	78	74									
30	77	78	78		75	75	74		79	73	85		77	77	74									
32	77	78	77		74	75	74		80	73	84		77	77	74									
34	78	78	78		75	75	73		79	74	82		77	78	76									
36	77	79	78		76	75	75		79	74	84		77	76	74									
38	77	80	78		76	75	74		79	72	82		76	75	73									
40	78	82	78		77	75	74		79	72	82		76	75	74									
42	78	82	77		77	76	74		79	72	84		75	75	74									
42 1/2 *				77				74				86				72								
43 *				77				73				87				73								
43 1/2 *				77				74				87				73								
44	77	83	76		77	75	74		80	71	74		76	76	72									
46	76	85	77		76	75	74		81	70	74		74	76	70									
48	76	87	76		75	75	74		81	70	74		73	76	74									
49	76	84	76		74	75	74		82	75	74		74	75	74									
Σ																								
Σ/26																								
Min																								
Max																								

* Designates Window Location

PPCo-C-6349

PROOF TEST MEASUREMENTS

a Plane--Along side Plate with pads at Plate No. 1 edge.
b Plane--From upper end, left side of comb.
c Plane--Along side Plate with pads at Plate 19 edge.

Element probed from lower end while in envelope gage.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5-17-67

Element no. DA 10C

Inspector s VM/RF

		Elev. Screw Withdrawn				Elev. Screw Inserted				DA 10C 0.074 - 0.083		Ch 3		Ch 4		Ch 5		Ch 6		Ch 7						
		Min Ch 1				Max Ch 1				Ch 2		Ch 3		Ch 4		Ch 5		Ch 6		Ch 7						
Inches From Top of Fuel Plate	Plane			Window Plane	Plane	Window Plane			Plane	Window Plane	Plane	Window Plane	Plane	Window Plane	Plane	Window Plane	Plane	Window Plane	Plane	Window Plane	Plane	Window Plane				
	a	b	c	a		b	c	a		b		c		a		b		c		a		b	c	a	b	c
0									78	74	76			78	79	78			79	76	78			78	78	79
2	114		111						78	76	76			77	75	76			79	78	78			78	78	79
4	119		112						79	76	77			77	76	76			79	78	79			78	77	78
6	119		114						78	76	76			77	76	77			79	79	79			78	75	77
8	119		116						77	75	75			78	76	77			79	79	79			76	76	77
8 1/2 *				119							77					79					80					
9 *				119							77					79					80					
9 1/2 *				119							77					78					79					
10	119		113						77	75	75			77	76	76			78	78	78			78	77	77
12	119		109						78	77	77			77	76	77			79	78	78			78	76	76
12 1/2 *				103							78					77					80					
13 *				103							79					78					80					
13 1/2 *				103							79					77					80					
14	118		108						79	78	77			77	76	77			79	79	79			78	76	77
16	115		110						77	78	78			78	76	76			79	78	78			78	76	78
18	115		110						78	78	78			76	76	77			79	78	78			78	77	78
20	113		110						79	77	77			76	76	77			79	77	77			79	78	79
22	110		107						79	78	78			76	77	77			79	77	77			78	79	79
22 1/2 *				108							81					76										
23 *				106							84					76										
23 1/2 *				106							83					75										
24	109		108						80	77	77			75	76	76			79	79	79			79	81	81
26	105		110						78	76	75			76	76	77			79	78	79			79	78	79
26 1/2 *				110							76					78										
27 *				110							76					79										
27 1/2 *				110							76					77										
28	106		110						79	76	76			76	76	76			78	78	78			79	77	78
30	107		112						79	78	78			76	77	77			78	77	77			78	75	77
32	108		115						79	78	78			77	77	77			79	78	78			77	74	77
34	107		117						78	78	78			77	77	77			78	78	78			77	74	76
36	109		118						79	77	77			77	78	78			78	78	78			78	78	78
38	108		119						79	77	76			77	77	77			78	78	78			78	74	77
40	109		119						79	77	77			77	76	77			79	78	78			78	73	76
42	110		121						79	76	76			77	77	77			78	77	76			77	72	76
42 1/2 *				111							81					78										
43 *				112							81					78										
43 1/2 *				111							79					78										
44	111		121						78	75	75			77	77	77			78	78	78			78	74	77
46	110		119						78	76	76			77	77	78			79	78	78			77	75	76
48	108		121						80	79	79			78	77	78			79	78	78			77	74	76
49	109		123						82	82	83			78	77	78			80	79	81			79	75	76
Σ																										
Σ/26																										
Min																										
Max																										

* Designates Window Location

PPC-C-6316

ATF FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5-17-67Element no. DA 10 CInspector VW/RPDA 10C
0.074-0.0E3

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15			
	Plane			Window Plane	Flare			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c		
0	77	73	77		78	77	81		83	78	79		77	77	82		79	79	76		78	85	77		81	75	81		75	77	77	
2	77	75	77		77	78	81		81	80	78		78	81	81		79	76	76		77	86	76		80	78	83		75	74	76	
4	77	77	76		77	78	81		81	80	79		79	80	81		78	76	76		76	86	75		79	78	83		75	75	76	
6	77	73	77		77	77	80		81	81	30		79	80	81		78	80	77		77	80	74		79	77	83		78	75	76	
8	77	73	77		77	79	79		81	82	30		79	79	86		78	80	77		77	80	74		80	78	85		79	74	76	
8 1/2 *				78				79				75			81				80				77				77				75	
9 *				78				80				75			82				80				77				78				74	
9 1/2 *				77				79				75			81				78				76				78				73	
10	77	73	77		77	80	79		81	82	80		80	80	85		73	79	78		76	80	73		80	78	85		78	74	75	
12	78	79	78		75	79	80		81	82	80		85	78	81		73	81	77		77	80	73		82	78	85		75	75	83	
12 1/2 *				79				77				79				83				83				75								75
13 *				79				77				79				85				85			75									75
13 1/2 *				78				76				81				85				74			72									74
14	76	80	78		76	78	80		81	82	80		82	73	82		73	81	75		76	79	72		82	79	83		74	76	83	
16	77	80	77		76	79	80		81	81	83		81	81	83		73	82	77		77	79	73		82	77	81		76	77	78	
18	77	79	77		77	79	80		81	82	81		80	81	81		78	81	79		77	80	74		82	77	80		76	77	79	
20	77	78	77		77	79	82		81	84	79		80	79	80		78	82	78		77	79	74		82	76	80		78	77	80	
22	78	80	77		78	80	81		82	83	78		80	78	82		76	85	78		77	79	74		81	76	80		77	78	78	
22 1/2 *				77				81				75			82				76				78				79				78	
23 *				77				80				73			82				76				78				78				79	
23 1/2 *				76				80				73			81				76				77				79				79	
24	77	80	76		78	80	81		81	82	79		80	78	84		75	84	78		76	80	75		80	76	81		81	80	79	
26	76	79	77		76	78	83		81	83	79		84	76	79		77	81	77		77	81	73		82	78	80		77	79	86	
26 1/2 *				77				77				79				82				82				76								77
27 *				77				78				73				84				77				73								78
27 1/2 *				76				77				79				82				76				71								77
28	76	78	77		76	78	83		80	82	79		80	78	80		77	84	76		78	78	74		82	77	80		76	77	85	
30	77	80	77		77	78	81		80	81	78		80	81	81		77	84	78		77	78	74		82	76	80		76	76	78	
32	77	80	77		76	76	80		79	80	79		80	83	81		77	82	80		78	78	73		81	76	81		76	74	77	
34	77	81	78		75	85	80		80	85	79		81	82	80		77	82	81		79	78	74		80	76	79		76	73	77	
36	77	80	78		75	85	80		80	85	79		79	80	79		78	84	82		78	78	73		81	76	83		76	74	76	
38	77	78	77		75	85	80		80	85	79		78	81	79		80	77	73		80	77	73		80	78	83		76	74	76	
40	76	78	76		75	85	80		81	85	79		78	84	79		78	82	80		80	78	73		80	78	86		77	73	76	
42	76	78	75		77	77	79		81	85	78		78	84	83		76	81	79		79	78	71		80	78	83		77	73	74	
42 1/2 *				76				79				77			79				76				79				77				74	
43 *				77				79				78			80				76				79				78				73	
43 1/2 *				76				79				79			78				75				78				78				73	
44	76	78	76		77	77	79		82	81	80		77	83	83		75	81	80		79	78	73		80	78	82		84	76	74	
46	75	78	76		75	76	79		81	77	80		77	81	80		77	84	80		81	77	73		81	78	83		78	75	76	
48	76	78	76		76	76	78		82	80	81		75	78	76		78	86	81		82	77	75		81	79	83		78	74	76	
49	76	75	77		77	76	79		82	73	81		73	80	76		79	84	83		86	80	77		82	76	85		78	78	75	
Σ																																
Σ/26																																
Min																																
Max																																

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA 10 C

Inspector VW/RF

Date 5-17-67

0.074 - 0.083

Inches From Top of Fuel Plate	Ch 16				Ch 17				Ch 18				Ch 19				Max Ch 20				Min Ch 20				
	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c
0	77	75	77			78	75	76			76	72	76			78	79	75							
2	76	73	76			76	76	76			75	69	77			78	74	75							
4	76	72	76			76	74	77			76	68	78			77	76	73							
6	75	74	78			76	74	76			74	72	78			79	72	73							
8	78	77	78			78	76	77			75	75	79			78	78	75							
8 1/2 *					80					78					81					75					
9 *					80					80					80					74					
9 1/2 *					80					78					81					74					
10	78	78	79			78	78	75			75	77	80			77	78	74							
12	77	77	79			78	77	76			76	77	79			78	80	74							
12 1/2 *				78					80					76					78						
13 *				79					81					78					78						
13 1/2 *				78					80					78					78						
14	77	77	78			78	77	76			76	78	80			79	83	75							
16	77	76	78			77	78	76			76	77	80			78	86	74							
18	76	74	77			77	78	76			76	77	80			78	84	74							
20	76	74	77			77	76	76			76	77	79			78	82	75							
22	77	74	77			78	77	75			76	76	80			77	81	75							
22 1/2 *				79					77					83					74						
23 *				79					78					84					75						
23 1/2 *				77					76					83					74						
24	77	74	76			78	77	75			76	75	80			77	82	75							
26	78	74	78			79	76	77			76	75	78			77	82	74							
26 1/2 *				79					80					77					77						
27 *				79					79					78					77						
27 1/2 *				78					78					77					78						
28	78	76	79			78	76	76			76	75	79			78	80	75							
30	78	77	80			78	75	74			77	74	79			76	82	76							
32	78	77	80			78	76	74			78	75	79			76	82	76							
34	78	77	81			78	76	73			78	77	79			76	84	76							
36	78	77	81			78	75	72			78	78	79			77	80	76							
38	78	78	81			78	74	72			78	78	79			78	82	77							
40	78	78	81			77	76	73			77	77	79			77	83	77							
42	78	78	81			77	76	74			77	77	80			77	81	78							
42 1/2 *				83					74					81					76						
43 *				84					75					82					73						
43 1/2 *				82					74					81					73						
44	78	78	81			78	74	73			77	76	80			77	80	74							
46	78	79	81			78	74	75			76	76	78			76	79	73							
48	78	79	80			77	75	75			76	76	79			73	82	72							
49	78	82	83			76	76	76			76	77	79			72	78	73							
Σ																									
Σ/26																									
Min																									
Max																									

* Designates Window Location

PPC-C-6319

a Plane - Along side plate with pads at Plate No.1 edge.)
 b Plane - From upper end left side of comb.
 c Plane - Along side plate with pads at Plate No. 19 edge)

Element probed lower end while in the envelope cage.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5/15/67

Element no. DALE

Inspector R.F. VW

Elev. Screw Withdrawn										Elev. Screw Inserted										Element no. DATA										Inspector R.F. V.W																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Min Ch 1										Max Ch 1										Ch 2										Ch 3										Ch 4										Ch 5										Ch 6										Ch 7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Plane										Window Plane										Plane										Window Plane										Plane										Window Plane										Plane										Window Plane										Plane										Window Plane										Plane										Window Plane																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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* Designates Window Location

PPCo-C-6316

Sheet no. 3

Element no. D A I, B

Inspector R. F. V. W.

PPCo - C - 6318

	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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* Designates Window Location

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DALB

Inspector R.F. V.W.

Date 5/18/67

O.C74 - 0.083

Element No. DATA														Elev. Screw Withdrawn				Elev. Screw Inserted																	
Date 5/18/67														Max Ch 20				Min Ch 20																	
Inches From Top of Fuel Plate	Ch 16			Ch 17			Ch 18			Ch 19			Plane			Window Plane			Plane			Window Plane													
	Plane			Window Plane			Plane			Window Plane			Plane			Window Plane			Plane			Window Plane													
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c											
0	77	78	77				77	78	78				77	81	77				79	80	78				70	<50	77								
2	77	80	78				77	80	78				77	79	78				79	80	78				67	<50	73								
4	78	80	78				77	80	78				77	79	77				79	81	79				67	<50	69								
6	78	81	78				77	80	77				77	80	78				79	80	79				66	<50	68								
8	78	81	79				78	79	77				75	80	78				86	80	79				67	>60	67								
8 1/2 *							79						78																						
9 *							80						80																						
9 1/2 *							77						86																						
10	78	81	78				80	78	77				76	80	78				80	82	80				68	>60	69								
12	76	80	78				77	79	77				76	80	78				79	83	80				69	>60	68								
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13 1/2 *																																			
14	78	80	78				77	79	77				77	80	78				79	82	80				69	>60	68								
16	77	80	78				78	79	77				78	80	78				79	82	80				68	>60	67								
18	77	80	78				78	79	77				77	80	78				78	82	79				68	>60	67								
20	76	81	78				78	80	78				77	80	78				79	84	79				69	>60	68								
22	77	78	78				78	80	80				78	80	77				79	86	79				70	>60	68								
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30	78	80	78				79	80	79				78	80	78				79	87	80				69	<60	66								
32	78	80	78				79	80	79				78	81	78				79	85	80				69	<60	67								
34	78	80	78				79	80	79				78	80	78				79	84	80				68	<60	65								
36	78	80	78				79	81	79				78	80	78				79	84	80				66	<50	62								
38	78	80	78				79	80	79				78	81	78				79	84	80				65	<50	60								
40	78	80	78				78	81	79				78	80	78				79	83	80				64	<50	>55								
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46	78	79	77				79	81	79				78	80	79				79	81	79				66	>50	61								
48	78	79	78				79	82	79				73	80	78				79	80	79				69	>50	62								
49	79	81	78				79	80	79				79	82	79				80	84	80				73	>50	67								
Σ																																			
Σ/26																																			
Min																																			
Max																																			

* Designates Window Location

PPCo-C-6349

Post Proof Test Measurements

a Plane - Along side plate with pads at Plate #1 edge
b Plane - From upper end box - Left of comb
c Plane - Along side plate with pads at Plate #19 edge

Element proved thru lower
while in envelope gage.

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 2

Date 5-10-67

Element no. 25-C

Inspector _____

Elev. Screw Withdrawn				Elev. Screw Inserted				C.074 - 0.083																															
Min Ch 1				Max Ch 1				Ch 2				Ch 3				Ch 4				Ch 5				Ch 6				Ch 7											
Inches From Top of Fuel Plate	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane							
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c									
0	XXXXX	XXXXX	XXXXX						78	73	76			78	80	78		78	80	78		82	75	80		77	77	76		76	80	78							
2	90	100							77	73	76			78	78	77		78	77	77		80	74	80		78	79	75		75	80	79							
4	92	101							76	75	77			78	77	79		78	77	79		75	74	79		78	76	76		76	80	79							
6	94	101							78	75	78			77	76	76		78	76	79		75	73	79		78	76	76		76	80	78							
8	95	102							79	74	78			79	76	76		78	76	78		81	75	77		78	76	77		78	79	77							
8 1/2 *				96							80					80					79			83				74				79							
9 *				96							80					80					80			82			75					80							
9 1/2 *				97							78					78					78			79			76					79							
10	97	104							78	75	78			76	74	76		78	75	78		79	74	79		79	76	77		78	79	78							
12	99	104							79	75	78			76	75	76		78	75	78		79	74	80		79	80	76		75	80	80							
12 1/2 *				104							80										79											76							
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13 1/2 *				104							80					77					79											76							
14	98	104							79	75	76			77	76	76		76	74	77		79	74	80		79	81	77		76	80	80							
16	98	102							80	78	80			76	75	76		77	76	78		80	74	80		78	79	77		77	79	78							
18	98	104							80	80	81			76	75	76		77	75	78		80	75	72		78	76	77		77	79	78							
20	100	103							80	78	81			76	75	75		76	74	77		80	73	79		78	81	77		77	80	78							
22	99	103							80	78	81			77	75	76		76	74	78		83	74	80		77	84	77		77	77	78							
22 1/2 *				98							86					79					78			88								78							
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23 1/2 *				98							84					78					77			85								78							
24	98	102							80	77	80			78	75	76		77	74	78		82	74	80		78	85	79		77	76	77							
26	100	104							79	75	78			77	77	77		77	74	78		80	73	80		80	85	77		77	79	80							
26 1/2 *				103							79										78											76							
27 *				103							80					81					81											75							
27 1/2 *				103							79					81					81											76							
28	100	103							79	74	77			77	77	78		78	75	79		79	72	80		79	85	75		76	78	85							
30	102	104							79	75	80			77	76	76		78	75	78		79	71	80		78	84	76		76	76	78							
32	103	106							79	76	80			77	76	76		78	76	78		79	72	79		77	83	76		76	76	78							
34	103	106							79	78	80			76	75	76		78	75	78		78	73	78		77	79	77		76	74	77							
36	102	105							79	77	80			76	75	76		78	75	78		78	74	77		77	78	77		76	75	77							
38	101	104							76	76	79			77	75	76		78	76	76		77	74	77		77	78	77		76	76	77							
40	95	102							78	75	78			77	75	76		78	77	78		77	73	77		77	78	77		76	76	77							
42	96	100							78	75	78			78	74	76		76	77	78		75	74	77		77	77	77		80	75	77							
42 1/2 *				95							81					79					78			78								77							
43 *				95							82					79					79			78								75							
43 1/2 *				94							79					79					77			77															
44	83	96							78	75	78			78	75	77		78	76	78		77	72	77		77	79	77		79	75	77							
46	86	94							78	74	78			78	74	77		78	76	78		77	72	77		77	80	76		77	76	78							
48	87	85							79	77	79			78	72	77		78	77	76		73	71	76		77	81	76		75	77	78							
49	84	78							80	78	80			79	76	76		79	77	78		73	72	79		78	80	76		78	77	79							
Σ																																							
Σ/26																																							
Min																																							
Max																																							

* Designates Window Location

PPCo-C-6316

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5-10-67

Element no. DA250

Inspector RF/BA

0.074-0.083

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15					
	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane						
	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac						
0	77	78	78		77	80	78		77	77	77		80	79	79		76	77	83		76	82	74		77	77	80		78	81	76			
2	78	78	76		77	81	78		78	79	78		78	81	79		76	75	82		76	84	74		76	79	80		78	80	77			
4	78	79	79		77	81	78		78	76	77		78	85	79		76	75	80		76	82	75		77	78	79		77	80	76			
6	79	78	79		77	81	76		77	78	77		79	87	80		76	73	77		76	79	75		76	80	79		77	79	78			
8	79	80	80		77	81	77		78	78	78		79	85	81		75	72	77		76	79	76		76	81	79		82	79	76			
8 1/2 *				80				77				77				82			75				77									77		
9 *				81				79				76				82			74				77									77		
9 1/2 *				80				78				76				79			74				77									77		
10	78	80	79		78	81	77		77	76	77		80	84	81		74	76	73		77	80	77		76	81	79		79	78	76			
12	79	80	80		75	80	77		76	76	77		85	85	78		76	78	74		76	80	73		76	81	83		77	78	80			
12 1/2 *				80				76				73				80				77			75										76	
13 *				80				75				73				82				77			75										78	
13 1/2 *				76				75				76				82				75			73										76	
14	78	80	80		77	80	77		76	74	77		83	85	80		76	79	75		76	76	74		77	82	81		77	77	79			
16	78	80	79		78	80	78		76	76	77		80	87	80		76	79	76		76	75	76		76	80	89		77	77	77			
18	78	80	79		79	80	78		76	77	77		79	85	79		76	80	76		76	76	76		75	80	79		77	76	77			
20	78	81	80		78	80	78		77	76	77		81	85	79		76	79	76		76	76	76		75	79	79		76	75	77			
22	79	81	80		78	80	77		79	76	77		80	85	82		74	80	76		77	76	76		76	79	79		83	75	75			
22 1/2 *				81				76				75				81			75				75										76	
23 *				83				77				72				82			77				75										76	
23 1/2 *				82				76				73				80			75				75										75	
24	79	83	80		79	80	76		77	74	75		81	86	84		74	79	75		76	77	76		76	80	81		76	75	75			
26	79	82	80		77	78	78		76	74	77		80	85	79		76	80	73		77	78	76		76	80	79		76	75	83			
26 1/2 *				80				77				72				81				74			75										77	
27 *				80				77				72				81				75			75										77	
27 1/2 *				79				76				76				81				75			75										76	
28	78	83	80		78	74	76		77	76	79		81	84	79		76	80	73		77	75	75		76	81	79		76	76	81			
30	78	83	79		78	76	78		77	77	78		77	85	80		75	80	74		78	75	75		75	79	76		76	76	76			
32	79	82	79		78	78	77		77	79	78		77	83	79		75	80	75		78	72	77		74	80	78		78	77	79			
34	79	83	79		78	78	78		77	76	78		77	82	76		76	81	75		77	74	76		75	80	77		78	77	79			
36	78	82	79		76	79	76		77	78	76		78	82	76		76	81	75		77	74	76		75	79	77		79	79	79			
38	78	80	78		76	80	78		77	78	78		79	83	77		76	81	75		77	74	76		77	79	77		79	79	79			
40	79	79	76		77	80	79		77	79	76		79	81	77		76	81	76		77	75	75		76	79	76		76	78	79			
42	80	82	75		78	78	78		78	79	78		79	80	76		74	81	75		75	77	77		77	80	76		81	77	75			
42 1/2 *				79				78				77				78			74				76										77	
43 *				80				79				77				78			74				75										77	
43 1/2 *				79				79				78				77			74				74										76	
44	80	82	77		75	76	78		78	79	79		75	82	82		74	80	76		76	77	76		79	76	79		82	76	76			
46	80	80	73		76	81	79		77	75	78		77	83	78		75	79	75		79	77	73		76	78	78		76	75	77			
48	81	76	73		76	80	79		78	73	76		75	82	78		76	81	75		78	77	76		77	78	79		76	75	76			
49	82	82	79		78	70	79		79	80	79		77	79	78		76	82	77		81	75	76		76	76	80		80	80	76			
Σ																																		
Σ/26																																		
Min																																		
Max																																		

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA25C

Inspector RF/BA

Date 5-10-57

0.074 - 0.083

Date 5-10-87		0.074 - 0.083												Elev. Screw Withdrawn				Elev. Screw Inserted							
		Ch 16				Ch 17				Ch 18				Ch 19				Max Ch 20				Min Ch 20			
Inches From Top of Fuel Plate	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	Plane			Window Plane	
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c
0	80	73	84			76	79	74			74	82	76			76	79	87	82	76					
2	80	74	82			76	76	74			74	84	76			77	85	81	86	81	75				
4	81	75	81			76	75	74			74	84	71			77	83	80	84	83	75				
6	81	74	81			77	77	75			73	82	76			77	81	79	84	86	76				
8	82	73	81			77	78	74			73	82	77			77	81	81	85	87	77				
8 1/2 *				85					76					79		80						79			
9 *				85					77					81		80						79			
9 1/2 *				80					76					79		80						78			
10	81	73	80			76	77	75			74	81	77			77	83	80	85	87	76				
12	82	72	80			76	75	75			75	81	76			77	85	79	83	86	74				
12 1/2 *				85					77					77								83			
13 *				65					76					77								82			
13 1/2 *				83					75					75								81			
14	82	72	80			75	75	75			74	80	76			80	89	80	79	80	72				
16	84	72	80			75	76	75			74	76	76			79	90	80	76	76	69				
18	83	74	79			75	77	75			74	78	76			78	88	81	76	76	69				
20	83	74	79			75	77	75			74	77	76			78	86	80	79	61	70				
22	82	74	79			74	76	773			74	84	82			77	84	82	62	84	72				
22 1/2 *				79					74					82		82						73			
23 *				78					75					85		79						74			
23 1/2 *				79					74					84		79						74			
24	81	73	78			74	76	73			74	78	80			76	81	79	83	89	74				
26	81	74	78			74	74	74			76	81	77			73	76	78	85	91	74				
26 1/2 *				82					74					80								86			
27 *				64					74					80								87			
27 1/2 *				81					74					78								85			
28	80	74	78			74	75	74			77	84	77			75	74	77	34	92	76				
30	80	73	77			75	76	75			76	85	77			74	72	77	84	94	76				
32	78	74	77			76	77	76			76	85	78			75	71	76	85	83	78				
34	77	72	77			77	76	76			75	84	78			75	72	78	87	91	81				
36	78	73	77			77	78	75			75	84	78			75	71	77	87	91	82				
38	77	74	77			77	78	76			74	83	78			76	69	78	86	91	83				
40	76	74	77			78	78	76			74	84	76			76	68	78	85	91	84				
42	77	76	77			77	76	76			75	85	83			75	61	77	66	91	87				
42 1/2 *				79					76					86								90			
43 *				82					76					85								90			
43 1/2 *				88					75													92			
44	78	77	77			78	76	75			75	84	84			75	60	75	88	91	90				
46	77	78	76			78	75	75			75	84				75	69	76	90	91	91				
48	80	78	76			74	76	75			76	83	76			75	72	73	92	91	93				
49	82	75	76			72	80	76			75	81	71			74	78	76	95	91	92				
Σ																									
Σ/26																									
Min																									
Max																									

* Designates Window Location

PPCo-C-6319

Inspector VW / RF

PPCo-C-6346

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 3

Date 5/18/67

Element no. DA 7B

Inspector VW /RF

0.074 - 0.083

Inches From Top of Fuel Plate	Ch 8				Ch 9				Ch 10				Ch 11				Ch 12				Ch 13				Ch 14				Ch 15				
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		
	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	a	b	c	ac	
0	78	77	77		78	79	78		78	77	77		78	78	77		77	78	77		77	78	77		78	77	78		78	77	78		
2	78	77	78		79	79	78		78	78	78		78	77	77		78	78	77		78	79	77		78	79	78		78	79	78		
4	78	78	78		79	79	78		78	78	78		78	78	78		78	79	78		78	79	78		78	79	78		78	79	78		
6	78	78	77		79	79	78		78	79	78		77	78	78		78	79	77		78	79	77		78	80	78		78	80	78		
8	79	78	78		79	79	79		78	80	78		78	78	77		78	79	78		78	79	78		77	78	77		78	79	78		
8 1/2 *				79				80				79				80				82				81				77				78	
9 *				79				81				79				81				84				84				80				78	
9 1/2 *				79				80				79				80				81				80				78				78	
10	78	78	78		79	79	79		78	79	78		78	78	77		78	79	78		78	79	78		77	78	77		78	79	78		
12	78	77	77		79	80	79		78	79	78		77	78	77		78	79	78		78	79	78		77	78	77		78	79	78		
12 1/2 *				80				82				80				82				78				79				78				80	
13 *				81				83				82				82				78				80				78				80	
13 1/2 *				79				82				82				78				79				80				78				80	
14	78	78	77		80	79	79		78	79	78		77	77	76		78	79	78		78	79	78		77	77	77		78	79	78		
16	78	77	77		79	79	79		78	79	78		78	77	76		78	78	76		78	78	78		77	77	76		78	78	78		
18	78	77	77		79	78	79		78	79	78		77	77	77		78	78	77		78	78	78		78	77	76		78	78	78		
20	78	77	77		79	79	79		78	78	78		78	78	77		78	78	77		78	78	77		77	77	77		78	78	78		
22	78	78	78		79	79	78		78	79	78		78	77	76		81	78	77		77	78	78		76	77	77		78	78	77		
22 1/2 *				78				79				78				79				78				79				76				78	
23 *				79				79				78				80				78				80				80				78	
23 1/2 *				78				80				78				80				78				80				79				78	
24	78	78	78		79	79	79		78	78	78		78	77	76		78	78	77		78	78	76		78	78	76		78	78	78		
26	78	78	78		79	79	79		78	79	78		77	78	78		78	78	77		78	78	78		77	78	77		78	78	78		
26 1/2 *				81				81				80				78				78				79				77				79	
27 *				84				85				81				78				78				79				78				80	
27 1/2 *				82				84				81				78				78				79				78				80	
28	78	78	78		82	79	79		78	79	78		77	78	78		78	78	78		78	78	78		77	78	77		78	78	78		
30	78	77	78		79	79	79		78	79	78		78	78	77		78	78	78		78	78	78		77	78	77		78	79	78		
32	78	77	77		79	79	79		78	78	78		78	78	77		78	78	77		78	78	77		78	78	77		78	79	78		
34	78	77	78		79	80	79		78	79	78		78	78	77		78	78	78		78	79	78		77	79	78		78	79	78		
36	78	78	78		79	80	79		78	79	78		78	78	78		78	79	78		78	79	78		77	79	78		78	80	78		
38	78	78	78		80	80	79		78	79	78		78	78	78		78	79	78		78	80	78		78	79	78		78	80	79		
40	78	78	78		80	80	79		78	80	78		78	78	78		78	79	78		78	79	78		78	80	78		78	81	79		
42	78	79	80		80	79	79		78	80	77		78	79	78		78	79	78		78	79	78		77	80	78		78	81	79		
42 1/2 *				81				79				78				80				80				80				78				79	
43 *				81				81				78				81				81				82				80				80	
43 1/2 *				81				80				78				80				82				80				80				80	
44	78	78	78		80	80	80		78	79	78		78	79	78		79	79	78		78	80	78		78	80	78		78	81	79		
46	78	78	78		80	80	79		78	79	78		78	79	78		78	80	78		78	80	78		77	80	78		78	81	78		
48	78	79	78		80	80	79		79	79	77		78	79	78		78	79	78		78	79	78		78	79	78		78	81	78		
49	80	79	79		80	81	79		79	79	78		78	79	78		78	80	78		78	79	79		78	80	79		78	82	80		
Σ																																	
Σ/26																																	
Min																																	
Max																																	

* Designates Window Location

PPCo - C - 6318

ATR FUEL ELEMENT INSPECTION SHEET

Sheet no. 4

Element no. DA7B

Inspector VJ/HF

Date 5-18-67

O.C74 - 0.083

Inches From Top of Fuel Plate	Ch 16				Ch 17				Ch 18				Ch 19				Elev. Screw Withdrawn Max Ch 20				Elev. Screw Inserted Min Ch 20				
	Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		Plane		Window Plane		
	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c	a	b	c	a	c
0	77	78	78			77	78	78			77	80	76			77	80	84							
2	78	79	78			77	78	79			77	79	77			75	78	80			73	76	80		
4	78	80	78			77	78	78			77	79	76			75	76	81			77	74	75		
6	78	79	78			77	79	79			77	79	78			75	74	81			74	74	72		
8	78	79	78			77	78	78			77	78	77			74	75	83			74	72	72		
8 1/2 *				67					79				76					84							
9 *				67					79				79					84							
9 1/2 *				80					78				78					84							
10	78	79	78			77	78	78			77	77	78			75	76	82			72	73	73		
12	77	79	78			77	78	78			77	78	77			75	79	81			72	71	74		
12 1/2 *				79				78					79					77							
13 *				81				81					81					79							
13 1/2 *				80				81					80					79							
14	77	79	78			76	77	78			77	78	78			75	77	80			68	75	74		
16	77	78	78			77	78	78			77	75	77			73	77	81			69	76	74		
18	77	77	77			76	78	78			77	75	78			71	84	84			70	72	73		
20	76	77	77			76	78	78			76	75	78			71	85	85			71	69	70		
22	76	77	77			76	78	78			76	80	78			73	85	84			70	68	72		
22 1/2 *				78					72				78					84							
23 *				78					72				79					84							
23 1/2 *				78					73				78					84							
24	76	77	78			75	78	78			76	80	78			75	85	82			59	68	72		
26	77	78	77			77	78	78			76	80	78			75	86	81			56	66	71		
26 1/2 *				79				78					81					76							
27 *				80				79					82					78							
27 1/2 *				79				78					80					78							
28	79	76	77			77	78	78			78	80	78			75	85	81			65	55	69		
30	79	77	77			77	79	78			78	82	78			75	83	81			66	67	67		
32	79	77	77			77	79	78			78	82	78			75	85	82			66	65	66		
34	79	77	77			77	79	79			78	81	78			75	85	82			65	55	67		
36	79	78	78			77	79	78			78	81	79			77	86	82			4		66		
38	78	79	78			77	80	78			78	81	79			77	85	84			55		64		
40	78	80	78			77	80	79			78	81	79			75	84	83							
42	78	80	78			77	80	78			78	81	79			78	84	83							
42 1/2 *				79					72				80					82							
43 *				80					72				81					83							
43 1/2 *				80					72				80					83							
44	78	80	80			80	80	78			79	81	79			75	84	82							
46	78	80	78			80	81	78			79	81	79			75	83	80							
48	78	79	77			80	81	76			79	81	79			75	82	79							
49	78	80	78			80	81	79			78	83	78			80	82	80			55	55	68		
Σ																									
Σ/26																									
Min																									
Max																									

* Designates Window Location

PPCo-C-6349

APPENDIX B

EXPERIMENTAL VELOCITY MEASUREMENT DATA

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APPENDIX B

EXPERIMENTAL VELOCITY MEASUREMENT DATA

The following tables list the pitot tube velocity head data. All of the raw data is tabulated as well as the instrument calibration error at the level of the reading. The listed error, as determined from the calibration preceding the measurement, was applied to the raw data and the corrected velocity head is reported.

Fuel Assembly	Reactor Position	Channel No.	Reactor ΔP - 25 psi			Reactor ΔP - 25 psi			Reactor ΔP - 25 psi			Reactor ΔP - 25 psi			Reactor ΔP - 25 psi		
			Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head
DA 11 A	1	20(12-1/2 in)	2.60	-0.16	2.44	2.49	-0.15	2.34	2.25	-0.07	2.18	2.30	-0.07	2.23	2.10	0	2.10
DA 11 A	1	20(18-1/2 in)	2.80	-0.17	2.63	2.76	-0.17	2.59	2.49	-0.08	2.41	2.50	-0.08	2.42	2.40	0	2.40
DA 11 A	1	20(24-1/2 in)	3.10	-0.19	2.91	3.05	-0.18	2.88	2.70	-0.09	2.61	2.70	-0.09	2.61	2.70	0	2.70
DA 18 A	7	1	5.40	-0.26	5.14	5.40	-0.26	5.14									
DA 18 A	7	2	2.30	-0.15	2.15	2.34	-0.15	2.19									
DA 18 A	7	3	3.20	-0.19	3.01	3.27	-0.19	3.08									
DA 18 A	7	9	3.00	-0.18	2.82	3.00	-0.18	2.82									
DA 18 A	7	10	3.00	-0.18	2.82	3.03	-0.18	2.85									
DA 18 A	7	18	2.50	-0.16	2.34	2.49	-0.17	2.34									
DA 18 A	7	19	3.30	-0.20	3.10	3.30	-0.19	3.11									
DA 18 A	16	1							4.56	-0.12	4.44	4.70	-0.13	4.57	4.05	0	4.05
DA 18 A	16	2							2.25	-0.07	2.18	2.30	-0.07	2.23	1.98	0	1.98
DA 18 A	16	3							3.03	-0.10	2.93	3.10	-0.10	3.00	2.91	0	2.91
DA 18 A	16	9							2.94	-0.08	2.86	2.80	-0.09	2.71	2.40	0	2.40
DA 18 A	16	10							2.85	-0.09	2.76	3.00	-0.09	2.90	2.70	0	2.70
DA 18 A	16	18							2.85	-0.09	2.76	2.70	-0.09	2.61	2.67	0	2.67
DA 18 A	16	19							3.06	-0.10	2.96	3.40	-0.10	3.30	2.85	0	2.85
DA 18 A	16	20							2.25	-0.07	2.18	2.40	-0.08	2.32	2.07	0	2.07
DA 2 B	10	1	4.90	-0.25	4.65	4.89	-0.25	4.64	4.20	-0.12	4.08	4.30	-0.12	4.18	3.45	0	3.45
DA 2 B	10	2	2.60	-0.16	2.44	2.76	-0.17	2.59	3.12	-0.10	3.02	3.20	-0.10	3.10	3.15	0	3.15
DA 18 B	15	1	16.90	0.00	16.90	3.75	-0.21	3.54	1.44	-0.10	1.34	1.50	-0.10	1.40	1.95	0	1.95
DA 18 B	15	20	4.10	-0.23	3.87	4.20	-0.10	4.10	1.09	-0.05	1.04	1.30	-0.05	1.25	3.45	0	3.45
DA 24 A	18	1	4.00	-0.22	3.78	4.08	-0.23	3.85	4.59	-0.13	4.46	4.20	-0.11	4.09			
DA 24 A	18	2	2.70	-0.17	2.53	2.64	-0.16	2.48	2.47	-0.09	2.38	2.70	-0.09	2.61			
DA 24 A	18	3	2.50	-0.16	2.34	2.16	-0.15	2.01	2.16	-0.06	2.10	2.70	-0.09	2.61			
DA 24 A	18	9	2.10	-0.15	1.95	2.08	-0.15	1.93	2.16	-0.06	2.10	2.30	-0.07	2.23			
DA 24 A	18	10	2.40	-0.15	2.25	2.40	-0.15	2.25	2.25	-0.07	2.18	2.30	-0.07	2.23			
DA 24 A	18	18	2.30	-0.15	2.15	2.31	-0.15	2.16	2.25	-0.06	2.19	2.20	-0.06	2.14			
DA 24 A	18	19	2.90	-0.18	2.72	2.94	-0.18	2.76	2.70	-0.09	2.61	2.80	-0.09	2.71			
DA 24 A	18	20	3.50	-0.20	3.30	3.54	-0.20	3.34	2.28	-0.07	2.21	3.40	-0.10	3.30			
DA 24 A	20	1													3.00	0	3.00
DA 24 A	20	2													2.25	0	2.25
DA 24 A	20	3													1.50	0	1.50
DA 24 A	20	9													1.95	0	1.95
DA 24 A	20	10													1.83	0	1.83
DA 24 A	20	18													1.83	0	1.83
DA 24 A	20	19													2.40	0	2.40
DA 24 A	20	20													2.34	0	2.34
DA 19 A	18	1													3.75	0	3.75
DA 19 A	18	2													2.70	0	2.70
DA 19 A	18	3													2.64	0	2.64
DA 19 A	18	9													2.70	0	2.70
DA 19 A	18	10													2.73	0	2.73
DA 19 A	18	18													2.70	0	2.70
DA 19 A	18	19													2.55	0	2.55
DA 19 A	18	20													4.65	0	4.65
DA 19 A	20	1							3.89	-0.10	3.79	3.80	-0.10	3.70			
DA 19 A	20	2							2.85	-0.09	2.76	2.90	-0.10	2.80			
DA 19 A	20	3							2.85	-0.09	2.76	3.00	-0.10	2.90			
DA 19 A	20	9							2.54	-0.10	2.44	2.90	-0.10	2.80			
DA 19 A	20	10							2.79	-0.10	2.69	3.00	-0.10	2.90			
DA 19 A	20	18							2.11	-0.10	2.01	2.10	-0.10	2.00			
DA 19 A	20	19							3.95	-0.11	3.84	4.10	-0.11	3.99			
DA 19 A	23	1															
DA 19 A	23	2															
DA 19 A	23	3	3.10	-0.19	2.91	3.09	-0.20	2.89									
DA 19 A	23	9	2.90	-0.18	2.72	2.91	-0.18	2.73									
DA 19 A	23	10	3.00	-0.18	2.82	3.09	-0.19	2.90									
DA 19 A	23	18	2.50	-0.16	2.34	2.46	-0.15	2.31									
DA 19 A	23	19	2.06	-0.17	1.89	2.13	-0.17	1.96									
DA 19 A	23	20	4.20	-0.24	3.96	4.29	-0.24	4.05									
DA 7 B	19	1															
DA 7 B	19	2															
DA 7 B	19	3															
DA 7 B	19	9															
DA 7 B	19	10															
DA 7 B	19	18															
DA 7 B	19	19															
DA 7 B	19	20															
DA 7 B	39	1	6.10	-0.28	5.82	6.03	-0.28	5.75									
DA 7 B	39	2	2.40	-0.15	2.25	2.43	-0.15	2.28									
DA 7 B	39	3	2.70	-0.17	2.53	2.70	-0.16	2.54									
DA 7 B	39	9	2.80	-0.17	2.63	2.76	-0.17	2.59									
DA 7 B	39	10	2.70	-0.17	2.53	2.76	-0.17	2.59									
DA 7 B	39	18	2.80	-0.17	2.63	2.76	-0.17	2.59									
DA 7 B	39	20	3.10	-0.19	2.91	3.21	-0.19	3.02									
DA 11 C	31	1															
DA 11 C	31	20															
DA 11 C	32	1	4.60	-0.24	4.36	4.65	-0.24	4.41	4.32	-0.12	4.20	4.40	-0.12	4.28	4.05	0	4.05
DA 11 C	32	20	2.10	-0.15	1.95	2.12	-0.15	2.04	2.10	-0.06	2.04	2.10	-0.06	2.04	1.74	0	1.74
DA 25 C	36	1															
DA 25 C	36	20															
DA 25 C	39	1							4.29	-0.12	4.17	4.40	-0.12	4.28	4.35	0	4.35
DA 25 C	39	20							3.30	-0.10	3.20	3.20	-0.10	3.10	2.64	0	2.64
DA 25 C	40	1	4.30	-0.23	4.07	4.35	-0.23	4.12									
DA 25 C	40	20	3.60	-0.20	3.40	3.60	-0.20	3.40									

Fuel Assembly	Reactor Position	Channel No.	Reactor AP - 50 psi			Reactor AP - 50 psi			Reactor AP - 50 psi			Reactor AP - 50 psi			Reactor AP - 50 psi			Reactor AP - 50 psi		
			Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head
DA 11 A	1	20(12-1/2 in)	4.90	-0.25	4.65	5.19	-0.25	4.94	4.95	-0.14	4.81	3.00	-0.03	2.97	4.80	-0.03	4.77	5.25	-0.14	5.11
DA 11 A	1	20(18-1/2 in)	5.30	-0.26	5.04	5.70	-0.27	5.43	5.55	-0.15	5.40	3.40	-0.03	3.37	5.25	-0.03	5.22	5.70	-0.15	5.55
DA 11 A	1	20(28-1/2 in)	5.80	-0.28	5.52	6.00	-0.28	5.72	5.70	-0.15	5.55	4.00	-0.03	3.97	5.75	-0.03	5.72	5.70	-0.15	5.55
DA 18 A	7	1	10.80	-0.25	10.55	11.10	-0.25	10.85												
DA 18 A	7	2	4.90	-0.25	4.65	5.07	-0.25	4.82												
DA 18 A	7	3	6.00	-0.29	5.71	6.29	-0.29	5.99												
DA 18 A	7	9	6.50	-0.29	6.21	6.66	-0.29	6.37												
DA 18 A	7	10	6.40	-0.28	6.12	6.54	-0.29	6.25												
DA 18 A	7	18	5.30	-0.26	5.04	5.46	-0.26	5.20												
DA 18 A	7	19	7.10	-0.30	6.80	7.29	-0.30	6.99												
DA 18 A	16	1							10.05	-0.14	9.91	8.80	+0.02	8.82	8.64	+0.02	8.66	9.96	-0.15	9.81
DA 18 A	16	2							5.04	-0.15	4.89	4.80	-0.03	4.77	4.95	-0.03	4.92	4.95	-0.14	4.81
DA 18 A	16	3							6.93	-0.15	6.78	6.70	-0.03	6.67	6.60	-0.03	6.57	6.90	-0.15	6.75
DA 18 A	16	9							6.03	-0.15	5.88	5.50	-0.03	5.47	5.43	-0.03	5.40	5.85	-0.15	5.70
DA 18 A	16	10							6.45	-0.15	6.30	6.10	-0.02	6.08	6.09	-0.02	6.07	6.45	-0.15	6.30
DA 18 A	16	18							6.60	-0.15	6.45	6.20	-0.02	6.18	6.15	-0.02	6.13	6.50	-0.15	6.35
DA 18 A	16	19							7.05	-0.15	6.90	6.70	-0.03	6.67	6.61	-0.03	6.58	7.11	-0.15	6.96
DA 18 A	16	20							5.28	-0.14	5.14	5.00	-0.03	4.97	4.85	-0.02	4.83	5.25	-0.14	5.11
DA 2 B	10	1	9.50	-0.29	9.21	9.90	-0.28	9.62	9.99	-0.14	9.85	9.70	+0.05	9.75	9.45	+0.04	9.49	9.84	-0.15	9.69
DA 2 B	10	20	6.20	-0.26	5.94	6.60	-0.27	6.33	6.15	-0.12	6.03	5.60	-0.02	5.58	5.45	-0.02	5.43	6.04	-0.15	5.89
DA 18 B	15	1	18.90	0.00	18.90	8.25	-0.30	7.95	9.10	-0.15	8.95	7.70	0.00	7.70	7.80	0.00	7.80	7.95	-0.15	7.80
DA 18 B	15	20	5.10	-0.25	4.85	5.40	-0.15	5.25	4.05	-0.11	3.94	4.20	-0.03	4.17	3.60	-0.03	3.57	2.95	-0.09	2.86
DA 24 A	18	1	8.30	-0.30	8.00	8.70	-0.30	8.40	9.90	-0.14	9.76							9.06	-0.15	8.91
DA 24 A	18	2	5.60	-0.27	5.33	5.79	-0.27	5.52	5.50	-0.15	5.35							5.85	-0.15	5.70
DA 24 A	18	3	4.95	-0.25	4.70	4.99	-0.25	4.74	5.04	-0.14	4.90							5.25	-0.14	5.11
DA 24 A	18	9	4.80	-0.25	4.55	4.89	-0.25	4.64	5.04	-0.13	4.91							5.04	-0.14	4.90
DA 24 A	18	10	5.00	-0.25	4.75	5.22	-0.25	4.97	5.10	-0.15	4.95							5.19	-0.14	5.05
DA 24 A	18	18	4.90	-0.25	4.65	5.01	-0.25	4.76	4.92	-0.14	4.78							4.89	-0.13	4.76
DA 24 A	18	19	6.40	-0.28	6.12	6.60	-0.29	6.31	6.49	-0.15	6.34							6.45	-0.15	6.30
DA 24 A	18	20	7.40	-0.30	7.10	7.50	-0.30	7.20	5.88	-0.15	5.73							6.45	-0.15	6.30
DA 24 A	20	1										7.00	-0.01	6.99	6.45	-0.02	6.43			
DA 24 A	20	2										5.30	+0.03	5.27	5.25	-0.03	5.22			
DA 24 A	20	3										3.70	+0.03	3.67	3.49	-0.03	3.46			
DA 24 A	20	9										4.70	-0.03	4.67	4.53	-0.03	4.50			
DA 24 A	20	10										4.70	-0.03	4.67	4.56	-0.03	4.53			
DA 24 A	20	18										4.40	-0.03	4.37	4.44	-0.03	4.41			
DA 24 A	20	19										5.00	-0.03	4.97	5.10	-0.03	5.07			
DA 24 A	20	20										5.20	-0.03	5.17	5.10	-0.03	5.07			
DA 19 A	18	1							8.50	+0.02	8.52	8.40	0.00	8.40						
DA 19 A	18	2							6.30	+0.04	6.34	6.24	-0.02	6.22						
DA 19 A	18	3							6.30	-0.02	6.28	6.39	-0.02	6.37						
DA 19 A	18	9							6.20	-0.02	6.18	6.24	-0.02	6.22						
DA 19 A	18	10							6.40	-0.02	6.38	6.60	-0.01	6.59						
DA 19 A	18	18							6.20	-0.02	6.18	6.15	-0.02	6.13						
DA 19 A	18	19							5.90	-0.03	5.87	5.94	-0.03	5.91						
DA 19 A	18	20							9.80	+0.05	9.85	9.90	+0.05	9.95				8.19	-0.15	8.04
DA 19 A	20	1							8.49	-0.15	8.34							6.39	-0.15	6.24
DA 19 A	20	2							6.39	-0.15	6.24							6.60	-0.15	6.45
DA 19 A	20	3							6.60	-0.15	6.45							6.45	-0.15	6.30
DA 19 A	20	9							6.39	-0.15	6.24							6.75	-0.15	6.60
DA 19 A	20	10							6.75	-0.15	6.60							6.39	-0.15	6.24
DA 19 A	20	18							6.33	-0.15	6.18							6.30	-0.15	6.15
DA 19 A	20	19							6.00	-0.15	5.85							8.94	-0.15	8.79
DA 19 A	20	20							8.70	-0.15	8.55									
DA 19 A	23	2	6.10	-0.28	5.82	6.30	-0.28	6.02												
DA 19 A	23	3	6.50	-0.29	6.21	6.75	-0.29	6.46												
DA 19 A	23	9	6.15	-0.28	5.87	6.30	-0.28	6.02												
DA 19 A	23	10	6.50	-0.29	6.21	6.69	-0.29	6.40												
DA 19 A	23	18	6.50	-0.26	6.24	6.70	-0.27	6.43												
DA 19 A	23	19	5.85	-0.27	5.58	6.00	-0.28	5.72												
DA 19 A	23	20	9.45	-0.29	9.16	9.55	-0.30	9.25												
DA 7 B	19	1							10.60	-0.11	10.49	10.40	+0.10	10.50	10.44	+0.10	10.54	10.65	-0.11	10.54
DA 7 B	19	2							5.54	-0.15	5.39	5.10	-0.03	5.07	4.95	-0.03	4.92	5.34	-0.14	5.20
DA 7 B	19	3							6.09	-0.15	5.94	5.80	-0.03	5.77	5.70	-0.03	5.67	6.15	-0.15	6.00
DA 7 B	19	9							6.81	-0.15	6.66	6.30	-0.02	6.28	6.24	-0.02	6.22	6.75	-0.15	6.60
DA 7 B	19	10							6.15	-0.15	6.00	5.80	-0.03	5.77	5.70	-0.03	5.67	6.45	-0.15	6.30
DA 7 B	19	18							6.30	-0.15	6.15	6.10	-0.02	6.08	6.00	-0.03	5.97	6.00	-0.15	5.85
DA 7 B	19	19							6.81	-0.15	6.66	6.20	-0.02	6.18	6.00	-0.01	5.99	6.95	-0.15	6.80
DA 7 B	19	20							7.80	-0.15	7.65	8.80	+0.03	8.83	8.40	0.00	8.40	8.40	-0.15	8.25
DA 7 B	39	1	11.50	-0.23	11.27	11.40	-0.43	10.97												
DA 7 B	39	2	5.20	-0.25	4.95	5.19	-0.25	4.94												
DA 7 B	39	3	5.60	-0.26	5.34	5.70	-0.27	5.43												
DA 7 B	39	9	5.80	-0.27	5.53	6.00	-0.28	5.72												
DA 7 B	39	10	5.70	-0.27	5.43	5.85	-0.27	5.58												
DA 7 B	39	18	5.90	-0.28	5.62	6.00	-0.28	5.72												
DA 7 B	39	20	7.40	-0.30	7.10	7.50	-0.30	7.20												
DA 11 C	31	1										8.80	+0.03	8.83	8.70	+0.01	8.71			
DA 11 C	31	20							4.10	-0.03	4.07									
DA 11 C	32	1	9.80	-0.28	9.52	10.11	-0.27	9.84	9.90	-0.13	9.77							9.75	-0.15	9.60
DA 11 C	32	20	4.60	-0.24	4.36	4.75	-0.24	4.50	5.01	-0.14	4.87							4.80	-0.15	4.65
DA 25 C	39	1							9.75	-0.18	9.61							9.66	-0.15	9.51
DA 25 C	39	20																		

			Reactor AP - 75 psi			Reactor AP - 75 psi			Reactor AP - 75 psi			Reactor AP - 75 psi			Reactor AP - 75 psi			Reactor AP - 75 psi		
Pucl Assembly	Reactor Position	Channel No.	Measured Velocity Read	Calibration Correction	Corrected Velocity Read	Measured Velocity Read	Calibration Correction	Corrected Velocity Read	Measured Velocity Read	Calibration Correction	Corrected Velocity Read	Measured Velocity Read	Calibration Correction	Corrected Velocity Read	Measured Velocity Read	Calibration Correction	Corrected Velocity Read	Measured Velocity Read	Calibration Correction	Corrected Velocity Read
DA 11 A	1	20(12-1/2 in)	6.90	-0.01	6.89	7.60	-0.30	7.30	7.71	-0.30	7.41	6.93	-0.01	6.92	7.50	-0.28	7.22	7.20	-0.15	7.05
DA 11 A	1	20(18-1/2 in)	7.65	0	7.65	8.40	-0.30	8.10	8.46	-0.30	8.16	7.62	0	7.62	8.20	-0.30	7.90	8.25	-0.15	8.10
DA 11 A	1	20(24-1/2 in)	7.86	0	7.86	8.30	-0.30	8.00	8.40	-0.30	8.10	7.72	0	7.72	8.20	-0.30	7.90	8.10	-0.15	7.95
DA 18 A	7	1																		
DA 18 A	7	2				7.60	-0.30	7.30	7.70	-0.30	7.40	16.10	0.00	16.10						
DA 18 A	7	3				7.00	-0.30	6.70	7.00	-0.30	6.70	7.00	-0.30	6.70						
DA 18 A	7	9				10.50	-0.27	10.23	10.10	-0.27	9.83									
DA 18 A	7	10				9.90	-0.28	9.62	9.60	-0.29	9.31									
DA 18 A	7	18				9.90	-0.28	9.62	9.40	-0.30	9.10									
DA 18 A	7	19				8.20	-0.30	7.90	8.00	-0.30	7.70									
DA 18 A	7	19				11.30	-0.23	11.07	10.90	-0.25	10.65									
DA 18 A	16	1	12.90	+0.30	13.20															
DA 18 A	16	2	7.23	-0.01	7.22							12.99	+0.30	13.29	14.30	-0.35	14.15	14.70	+0.11	14.81
DA 18 A	16	3	10.08	+0.09	10.17							7.20	-0.01	7.19	7.60	-0.28	7.32	7.60	-0.15	7.45
DA 18 A	16	9	8.49	0.00	8.49							10.14	+0.09	10.23	10.50	-0.31	10.19	10.40	-0.12	10.28
DA 18 A	16	10	9.39	+0.04	9.43							8.49	0.00	8.49	8.80	-0.30	8.50	9.10	-0.15	8.95
DA 18 A	16	18	9.42	+0.04	9.46							---	---	---	9.80	-0.30	9.50	9.80	-0.15	9.65
DA 18 A	16	19	9.87	+0.06	9.93							9.30	+0.04	9.34	9.90	-0.30	9.60	10.00	-0.15	9.85
DA 18 A	16	20	8.11	0.00	8.11							9.90	+0.06	9.96	11.30	-0.30	11.00	11.20	-0.10	11.10
DA 2 B	10	1	14.64	+0.53	15.17	15.40	0.00	15.40	15.10	0.00	15.10	8.13	0.00	8.13	11.30	-0.30	11.00	11.20	-0.10	11.10
DA 2 B	10	2	9.90	+0.06	9.96	9.70	-0.29	9.41	9.20	-0.30	8.90	14.70	+0.73	15.43	15.20	-0.35	14.85	15.20	-0.15	14.95
DA 18 B	15	1	11.85	+0.19	12.04	12.50	-0.17	12.33	12.20	-0.19	12.01	9.66	+0.05	9.71	9.90	-0.30	9.60	10.00	-0.15	9.85
DA 18 B	15	2	6.35	-0.02	6.33	12.50	-0.17	12.33	12.20	-0.19	12.01	11.85	+0.19	12.04	12.00	-0.30	11.70	12.00	-0.15	11.85
DA 24 A	18	1				12.70	-0.23	12.47	12.50	-0.17	12.33	8.15	-0.02	8.13	13.10	-0.35	12.75	13.20	-0.15	13.05
DA 24 A	18	3				8.90	-0.30	8.60	8.40	-0.30	8.10				9.00	-0.30	8.70	9.00	-0.15	8.85
DA 24 A	18	9				8.20	-0.30	7.90	7.80	-0.30	7.50				8.40	-0.30	8.10	8.30	-0.15	8.15
DA 24 A	18	10				7.60	-0.30	7.30	7.10	-0.30	6.80				7.30	-0.30	7.00	7.20	-0.15	7.05
DA 24 A	18	18				6.00	-0.30	5.70	5.60	-0.30	5.30				6.00	-0.29	5.71	6.00	-0.15	5.85
DA 24 A	18	19				7.60	-0.27	7.33	7.20	-0.28	6.92				7.60	-0.28	7.32	7.60	-0.15	7.45
DA 24 A	18	20				10.30	-0.27	10.03	9.90	-0.28	9.62				10.00	-0.30	9.70	10.10	-0.15	9.95
DA 24 A	20	1	11.10	+0.14	11.24	11.50	-0.23	11.27	11.20	-0.24	10.96	11.10	+0.14	11.24	12.00	-0.33	11.67	12.10	-0.15	11.95
DA 24 A	20	2	8.10	0.00	8.10							8.43	+0.00	8.43						
DA 24 A	20	3	8.55	0.00	8.55							8.58	+0.01	8.59						
DA 24 A	20	9	7.05	-0.01	7.04							8.58	+0.01	8.59						
DA 24 A	20	10	6.90	-0.01	6.89							7.05	-0.01	7.04						
DA 24 A	20	18	6.75	-0.01	6.74							6.66	-0.01	6.65						
DA 24 A	20	19	9.15	+0.03	9.18							9.15	-0.01	9.14						
DA 24 A	20	20	7.80	0.00	7.80							9.15	+0.03	9.18						
DA 19 A	18	1	13.55	+0.23	13.78	13.45	-0.23	13.22	13.45	-0.23	13.22	13.25	+0.23	13.48						
DA 19 A	18	2	9.60	+0.05	9.65							9.60	+0.05	9.65						
DA 19 A	18	3	9.54	+0.05	9.59							9.51	+0.05	9.56						
DA 19 A	18	9	9.50	+0.05	9.55							9.51	+0.05	9.56						
DA 19 A	18	10	9.69	+0.05	9.74							9.70	+0.05	9.75						
DA 19 A	18	18	9.51	+0.05	9.56							9.48	+0.05	9.53						
DA 19 A	18	19	9.05	+0.03	9.08							9.06	+0.03	9.09						
DA 19 A	18	20	14.40	+0.50	14.90							14.46	+0.50	14.96						
DA 19 A	20	1													12.00	-0.15	11.85	12.30	-0.05	12.25
DA 19 A	20	2													9.60	-0.30	9.30	9.60	-0.15	9.45
DA 19 A	20	3													10.00	-0.30	9.70	10.10	-0.15	9.95
DA 19 A	20	10													10.20	-0.31	9.89	10.30	-0.15	10.15
DA 19 A	20	18													9.50	-0.30	9.20	9.60	-0.15	9.45
DA 19 A	20	19													9.60	-0.30	9.30	9.70	-0.15	9.55
DA 19 A	20	20													13.30	-0.38	12.92	13.00	0.00	13.00
DA 19 A	23	2				9.60	-0.29	9.31	9.20	-0.30	8.90									
DA 19 A	23	3				10.10	-0.28	9.82	9.70	-0.29	9.41									
DA 19 A	23	9				9.30	-0.29	9.01	9.10	-0.30	8.80									
DA 19 A	23	10				10.20	-0.27	9.93	9.80	-0.29	9.51									
DA 19 A	23	18				8.80	-0.30	8.50	8.40	-0.30	8.10									
DA 19 A	23	19				9.00	-0.30	8.70	8.60	-0.30	8.30									
DA 7 B	19	1	15.68	+0.10	15.78	15.90	+0.05	15.95	15.70	0.00	15.70	15.65	+0.10	15.75	15.80	-0.35	15.45	15.60	+0.15	15.75
DA 7 B	19	2	7.80	0.00	7.80							7.80	0.00	7.80	8.20	-0.30	7.90	8.10	-0.15	7.95
DA 7 B	19	3	8.70	+0.02	8.72							8.70	+0.02	8.72	9.20	-0.30	8.90	9.20	-0.15	9.05
DA 7 B	19	9	9.60	+0.05	9.65							9.60	+0.05	9.65	10.20	-0.30	9.90	10.30	-0.15	10.15
DA 7 B	19	10	8.85	+0.03	8.88							8.85	+0.03	8.88	9.80	-0.31	9.49	9.80	-0.15	9.64
DA 7 B	19	18	9.21	+0.04	9.25							9.20	+0.04	9.24	9.60	-0.30	9.30	9.60	-0.15	9.45
DA 7 B	19	19	9.60	+0.05	9.65							9.60	+0.05	9.65	10.30	-0.31	9.99	10.30	-0.15	10.14
DA 7 B	19	20	12.90	+0.30	13.20							12.90	+0.30	13.20	12.50	-0.35	12.15	12.40	-0.08	12.32
DA 7 B	39	1				18.60	0.00	18.60	19.10	0.00	19.10									
DA 7 B	39	2				8.00	-0.30	7.70	7.60	-0.30	7.30									
DA 7 B	39	3				8.50	-0.30	8.20	8.10	-0.30	7.80									
DA 7 B	39	10				5.14	+0.12	5.26	5.10	+0.10	5.20									
DA 7 B	39	18				8.80	-0.30	8.50	8.40	-0.30	8.10									
DA 7 B	39	19				9.15	-0.29	8.86	8.70	-0.30	8.40									
DA 7 B	39	20				11.30	-0.23	11.07	10.90	-0.25	10.65									
DA 11 C	31	1	13.26	+0.09	13.35							13.26	+0.09	13.35						
DA 11 C	31	2	6.45	-0.02	6.43							6.45	-0.02	6.43						
DA 11 C	32	1				16.10	0.00	16.10	15.20	0.00	15.20				15.00	-0.35	14.65	14.80	+0.12	14.92
DA 11 C	32	2				7.10	-0.30	6.80	6.80	-0.29	6.51				7.10	-0.26	6.84	7.20	-0.15	7.05
DA 25 C	36	1	14.88	+0.55	15.43							14.82	+0.55	15.37						
DA 25 C	36	2	4.65	-0.03	4.62							4.62	-0.03	4.59						
DA 25 C	39	1				13.50	-0.11	13.39	13.											

Fuel Assembly	Reactor Position	Channel No.	Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi			Reactor AP - 100 psi		
			Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head			
DA 11 A	1	20(12-1/2 in)	9.20	0.05	9.25	9.20	0.05	9.25	9.20	0.05	9.25	10.05	0.08	10.13	10.20	-0.09	10.11	9.50	-0.15	9.35	9.50	-0.15	9.35	9.78	-0.30	9.48	10.50	-0.26	10.24	10.10	-0.27	9.83			
DA 11 A	1	20(18-1/2 in)	10.10	0.07	10.17	10.10	0.07	10.17	10.10	0.07	10.17	10.65	0.10	10.75	11.00	-0.10	10.90	10.60	-0.11	10.49	10.60	-0.11	10.49	10.74	-0.32	10.42	11.28	-0.24	11.04	11.00	-0.25	10.75			
DA 11 A	1	20(28-1/2 in)	10.50	0.10	10.60	10.50	0.10	10.60	10.70	0.10	10.80	10.65	0.10	10.75	-0.10	-0.10	11.00	10.40	-0.12	10.28	10.40	-0.12	10.28	10.65	-0.31	10.34	11.10	-0.25	10.85	11.00	-0.25	10.75			
DA 2 B	10	1	20.90	+0.05	20.95	20.90	+0.05	20.95	19.35	+0.08	19.43	19.70	+0.08	19.78	20.30	+0.02	20.32	19.60	-0.18	19.42	19.60	-0.18	19.42	20.80	-0.39	20.41	20.50	+0.02	20.52	20.60	+0.02	20.62			
DA 2 B	10	20	12.80	+0.30	13.10	12.80	+0.30	13.10	12.70	+0.26	12.96	12.60	+0.26	12.86	13.10	-0.10	13.00	12.80	-0.01	12.79	12.80	-0.01	12.79	13.00	-0.25	12.75	12.60	-0.17	12.43	12.50	-0.18	12.32			
DA 7 B	19	1	21.00	+0.05	21.05	20.90	+0.05	20.95	20.95	+0.07	21.02	20.20	+0.08	20.28	20.90	+0.01	20.91	19.90	-0.18	19.72	20.00	-0.17	19.83	21.00	-0.40	20.60	20.60	-0.40	20.20	20.60	-0.40	20.20			
DA 7 B	19	2	10.70	+0.10	10.80	10.60	+0.20	10.80	10.50	+0.10	10.60	10.50	+0.10	10.60	10.80	-0.10	10.70	10.80	-0.10	10.70	10.70	-0.11	10.59	11.00	-0.32	10.68	11.00	-0.32	10.68	11.00	-0.32	10.68			
DA 7 B	19	3	11.90	+0.20	12.10	12.00	+0.21	12.21	11.80	+0.20	12.00	12.00	+0.21	12.21	12.40	-0.10	12.30	12.40	-0.03	12.37	12.60	-0.03	12.57	12.60	-0.35	12.25	12.60	-0.35	12.25	12.60	-0.35	12.25			
DA 7 B	19	9	13.00	+0.30	13.30	13.00	+0.30	13.30	12.90	+0.30	13.20	13.10	+0.31	13.41	13.50	-0.10	13.40	13.40	-0.12	13.28	13.50	-0.11	13.39	13.50	-0.35	13.15	13.50	-0.35	13.15	13.50	-0.35	13.15			
DA 7 B	19	10	12.00	+0.21	12.21	12.00	+0.21	12.21	11.90	+0.20	12.10	12.60	+0.10	12.70	11.00	-0.10	10.90	12.60	-0.02	12.58	12.70	-0.01	12.69	13.90	-0.35	13.55	12.70	-0.01	12.69	13.90	-0.35	13.55			
DA 7 B	19	10	12.50	+0.25	12.75	12.50	+0.25	12.75	12.50	+0.25	12.75	12.60	+0.26	12.86	13.20	-0.10	13.10	12.60	-0.01	12.59	12.90	-0.01	12.89	13.90	-0.35	13.55	12.90	-0.01	12.89	13.90	-0.35	13.55			
DA 7 B	19	19	13.10	+0.31	13.41	13.10	+0.31	13.41	13.10	+0.31	13.41	13.50	+0.36	13.86	13.80	-0.10	13.70	13.60	+0.07	13.67	13.60	+0.07	13.67	13.90	-0.35	13.55	13.60	+0.07	13.67	13.90	-0.35	13.55			
DA 7 B	19	20	17.60	+0.09	17.69	17.60	+0.09	17.69	17.10	+0.10	17.20	18.20	+0.46	18.66	18.80	-0.10	18.70	18.40	-0.20	18.20	18.60	-0.20	18.40	17.10	-0.35	16.75	18.60	-0.20	18.40	17.10	-0.35	16.75			
DA 7 B	39	1																																	
DA 7 B	39	2																																	
DA 7 B	39	3																																	
DA 7 B	39	9																																	
DA 7 B	39	10																																	
DA 7 B	39	18																																	
DA 7 B	39	20																																	
DA 11 C	31	1	18.60	+0.08	18.68	18.50	+0.08	18.58	18.55	+0.09	18.64	19.00	+0.09	19.09	19.70	0.00	19.70	19.60	-0.18	19.42	19.70	-0.18	19.52	20.40	-0.39	20.01	21.20	+0.05	21.25	21.00	+0.05	21.05			
DA 11 C	31	20	8.70	+0.01	8.71	8.70	+0.01	8.71	8.60	+0.01	8.61	8.80	+0.02	8.82	9.10	-0.05	9.05	9.50	-0.15	9.35	9.40	-0.15	9.25	9.50	-0.30	9.20	9.40	-0.29	9.11	9.20	-0.30	8.90			
DA 11 C	32	1																																	
DA 11 C	32	20																																	
DA 18 A	7	1																																	
DA 18 A	7	2																																	
DA 18 A	7	3																																	
DA 18 A	7	9																																	
DA 18 A	7	10																																	
DA 18 A	7	18																																	
DA 18 A	7	19																																	
DA 18 A	16	1	17.80	+0.09	17.89	17.80	+0.09	17.89	17.90	+0.09	17.99	17.50	+0.09	17.59	18.20	-0.02	18.18	18.40	-0.19	18.21	18.40	-0.19	18.21	19.00	-0.38	18.62	18.40	-0.19	18.21	19.00	-0.38	18.62			
DA 18 A	16	2	9.80	+0.07	9.87	9.80	+0.07	9.87	9.90	+0.07	9.97	10.05	+0.08	10.13	10.40	-0.10	10.30	10.00	-0.13	9.87	10.10	-0.13	9.97	10.30	-0.30	10.00	10.00	-0.28	9.72	10.00	-0.28	9.72			
DA 18 A	16	3	13.60	+0.10	13.70	13.60	+0.10	13.70	13.70	+0.10	13.80	13.80	+0.10	13.90	14.40	-0.10	14.30	14.70	-0.07	14.63	14.80	-0.06	14.74	15.10	-0.35	14.75	14.80	-0.35	14.45	15.10	-0.35	14.45			
DA 18 A	16	9	11.50	+0.17	11.67	11.60	+0.17	11.77	11.60	+0.17	11.77	11.85	+0.18	12.03	12.30	-0.10	12.20	11.90	-0.05	11.85	11.90	-0.05	11.85	12.00	-0.33	11.67	11.90	-0.33	11.57	12.00	-0.33	11.67			
DA 18 A	16	10	12.60	+0.26	12.86	12.60	+0.26	12.86	12.70	+0.26	12.96	12.90	+0.30	13.20	13.30	-0.10	13.20	13.30	-0.15	13.15	13.20	-0.15	13.05	13.30	-0.35	12.95	13.30	-0.35	13.05	13.30	-0.35	13.05			
DA 18 A	16	18	12.60	+0.29	12.89	12.80	+0.29	13.09	12.80	+0.29	13.09	13.05	+0.31	13.36	13.60	-0.10	13.50	13.10	+0.01	13.11	13.10	+0.01	13.11	13.60	-0.35	13.25	13.60	-0.35	13.25	13.60	-0.35	13.25			
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Fuel Assembly	Reactor Position	Channel No.	Reactor AP - 115 psi			Reactor AP - 115 psi			Reactor AP - 115 psi			Reactor AP - 115 psi			Reactor AP - 115 psi			Reactor AP - 115 psi			Reactor AP - 115 psi		
			Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head	Measured Velocity Head	Calibration Correction	Corrected Velocity Head
DA 2 B	10	1	13.60	-0.09	13.51	23.00	+0.10	23.10	23.60	-0.44	23.16	22.80	+0.02	22.82	23.50	0.00	23.50	-0.43	22.77	23.00	-0.41	-0.41	22.59
DA 2 B	10	20	15.00	-0.03	13.95	14.10	-0.05	14.05	14.60	-0.35	14.25	14.40	0.00	14.40	14.30	0.00	14.30	14.70	-0.35	14.35	14.80	-0.35	14.45
DA 7 B	19	1							23.60	-0.43	23.17	23.50	+0.01	23.51	24.10	0.00	24.10	23.60	-0.41	23.16	23.10	-0.43	22.97
DA 7 B	19	2							12.50	-0.33	12.17	12.10	+0.10	12.20	12.60	+0.10	12.70	12.50	-0.34	12.16	12.50	-0.34	12.16
DA 7 B	19	3							14.50	-0.35	14.15	14.30	+0.10	14.40	14.50	+0.10	14.60	14.50	-0.35	14.15	14.50	-0.35	14.15
DA 7 B	19	9							6.20	-0.12	6.08	15.10	+0.10	15.20	15.80	+0.10	15.90	15.80	-0.35	15.40	15.80	-0.35	15.45
DA 7 B	19	10							15.20	-0.35	14.85	12.30	+0.10	12.40	12.90	+0.10	13.00	14.90	-0.35	14.55	14.80	-0.35	14.45
DA 7 B	19	18							15.10	-0.35	14.75	14.80	+0.10	14.90	15.10	+0.10	15.20	15.10	-0.35	14.75	15.00	-0.35	14.65
DA 7 B	19	19							15.70	-0.35	15.35	15.50	+0.10	15.60	16.20	+0.10	16.30	15.90	-0.35	15.55	15.90	-0.35	15.55
DA 7 B	19	20							19.60	-0.39	19.21	16.30	+0.10	16.40	17.20	+0.10	17.30	16.30	-0.37	15.93	16.40	-0.35	16.03
DA 7 B	39	1																					
DA 7 B	39	2																					
DA 7 B	39	3																					
DA 7 B	39	9																					
DA 7 B	39	10																					
DA 7 B	39	18																					
DA 7 B	39	20																					
DA 11 A	1	20(10-1/2 in)	11.70	+0.02	11.72	26.30	+0.05	26.35	11.70	+0.02	11.72	11.80	+0.02	11.82	11.70	+0.02	11.72	11.70	+0.02	11.72	11.70	+0.02	11.72
DA 11 A	1	20(18-1/2 in)	12.90	-0.15	12.75	12.70			12.90	-0.15	12.75	12.70			12.90	-0.15	12.75	12.70			12.90	-0.15	12.75
DA 11 A	1	20(28-1/2 in)	12.60	-0.17	12.43	12.60	-0.17	12.43	12.60	-0.17	12.43	12.60	-0.17	12.43	12.60	-0.17	12.43	12.60	-0.17	12.43	12.60	-0.17	12.43
DA 11 C	31	20																					
DA 11 C	32	1	24.30	+0.10	24.40	23.80	+0.10	23.90	24.30	+0.10	24.40												
DA 11 C	32	20	11.10	-0.25	10.85	10.90	-0.25	10.65	10.80	-0.31	10.49												
DA 18 A	7	1	23.80	-0.22	23.58	24.20	-0.22	23.98	24.20	-0.22	23.98	24.20	-0.22	23.98	24.20	-0.22	23.98	24.20	-0.22	23.98	24.20	-0.22	23.98
DA 18 A	7	2	11.70	-0.22	11.48	11.80	-0.22	11.58	11.80	-0.22	11.58												
DA 18 A	7	3	16.00	0.00	16.00	16.00	0.00	16.00	16.00	0.00	16.00												
DA 18 A	7	9	15.20	0.00	15.20	15.40	0.00	15.40	15.40	0.00	15.40												
DA 18 A	7	10	15.30	0.00	15.30	15.40	0.00	15.40	15.40	0.00	15.40												
DA 18 A	7	18	13.00	-0.15	12.85	13.10	-0.13	12.97	13.10	-0.13	12.97												
DA 18 A	7	19	17.70	0.00	17.70	17.80	0.00	17.80	17.80	0.00	17.80												
DA 18 A	16	1							23.60	-0.40	23.20	20.50	+0.07	20.57	21.00	+0.04	21.04	21.50	-0.40	21.10	21.50	-0.40	21.10
DA 18 A	16	2							11.80	-0.32	11.48	11.50	+0.10	11.60	12.00	+0.10	12.10	11.60	-0.32	11.28	11.60	-0.32	11.28
DA 18 A	16	3							16.20	-0.35	15.85	16.30	+0.10	16.40	16.80	+0.10	16.90	16.30	-0.35	15.95	16.30	-0.35	15.95
DA 18 A	16	9							13.80	-0.35	13.45	13.80	+0.10	13.90	14.30	+0.10	14.40	14.00	-0.35	13.65	13.90	-0.35	13.55
DA 18 A	16	10							15.20	-0.35	14.85	15.00	+0.10	15.10	15.50	+0.10	15.60	15.00	-0.31	14.69	15.00	-0.31	14.69
DA 18 A	16	18							15.40	-0.35	15.05	15.20	+0.10	15.30	15.80	+0.10	15.90	15.40	-0.33	15.07	15.40	-0.35	15.05
DA 18 A	16	19							17.60	-0.35	17.25	15.10	+0.10	15.20	15.60	+0.10	15.70	17.80	-0.36	17.44	17.70	-0.35	17.35
DA 18 A	16	20							13.40	-0.35	13.05	15.00	+0.10	15.10	15.70	+0.10	15.80	13.20	-0.33	12.85	13.15	-0.35	12.80
DA 18 B	15	1	19.20	0.00	19.20	3.70	-0.20	3.50	19.10	-0.38	18.72	19.10	+0.09	19.19	19.60	+0.08	19.68	18.90	-0.38	18.42	18.90	-0.38	18.42
DA 18 B	15	20	5.10	-0.25	4.85	1.40	-0.10	1.30	5.00	-0.20	4.80	7.00	0.00	7.00	7.60	0.00	7.60	5.70	-0.15	5.55	5.80	-0.20	5.20
DA 19 A	10	1							15.20	+0.10	15.30	15.80	+0.10	15.90	16.20	+0.10	16.30	15.80	-0.35	15.45	15.80	-0.35	15.45
DA 19 A	10	3							15.70	+0.10	15.80	16.30	+0.10	16.40	16.80	+0.10	16.90	16.30	-0.35	15.95	16.30	-0.35	15.95
DA 19 A	10	9							15.00	+0.10	15.10	15.60	+0.10	15.70	16.00	+0.10	16.10	15.60	-0.35	15.25	15.60	-0.35	15.25
DA 19 A	10	18							15.40	+0.10	15.50	15.80	+0.10	15.90	16.20	+0.10	16.30	15.80	-0.35	15.45	15.80	-0.35	15.45
DA 19 A	10	19							15.50	+0.10	15.60	15.90	+0.10	16.00	16.30	+0.10	16.40	15.90	-0.35	15.55	15.90	-0.35	15.55
DA 19 A	10	20							14.70	+0.10	14.80	15.10	+0.10	15.20	15.50	+0.10	15.60	15.10	-0.35	14.75	15.10	-0.35	14.75
DA 19 A	18	1							18.20	-0.35	17.85	17.85	0.00	17.85	18.20	-0.35	17.85	18.20	-0.35	17.85	18.20	-0.35	17.85
DA 19 A	18	2							14.60	-0.35	14.25	14.25	0.00	14.25	14.60	-0.35	14.25	14.60	-0.35	14.25	14.60	-0.35	14.25
DA 19 A	18	3							15.20	-0.35	14.85	14.85	0.00	14.85	15.20	-0.35	14.85	15.20	-0.35	14.85	15.20	-0.35	14.85
DA 19 A	18	9							15.80	-0.35	15.45	15.45	0.00	15.45	15.80	-0.35	15.45	15.80	-0.35	15.45	15.80	-0.35	15.45
DA 19 A	18	10							14.60	-0.35	14.25	14.25	0.00	14.25	14.60	-0.35	14.25	14.60	-0.35	14.25	14.60	-0.35	14.25
DA 19 A	18	19							14.30	-0.35	13.95	13.95	0.00	13.95	14.30	-0.35	13.95	14.30	-0.35	13.95	14.30	-0.35	13.95
DA 19 A	18	20							20.60	0.40	20.20	20.20	0.00	20.20	20.60	0.40	20.20	20.20	0.00	20.20	20.60	0.40	20.20
DA 19 A	20	1							13.40	-0.35	13.05	13.05	0.00	13.05	13.40	-0.35	13.05	13.40	-0.35	13.05	13.40	-0.35	13.05
DA 19 A	20	3							15.80	-0.35	15.45	15.45	0.00	15.45	15.80	-0.35	15.45	15.80	-0.35	15.45	15.80	-0.35	15.45
DA 19 A	20	9							14.30	-0.35	13.95	13.95	0.00	13.95	14.30	-0.35	13.95	14.30	-0.35	13.95	14.30	-0.35	13.95
DA 19 A	20	10							15.80	-0.35	15.45	15.45	0.00	15.45	15.80	-0.35	15.45	15.80	-0.35	15.45	15.80	-0.35	15.45
DA 19 A	20	18							14.60	-0.35	14.25	14.25	0.00	14.25	14.60	-0.35	14.25	14.60	-0.35	14.25	14.60	-0.35	14.25
DA 19 A	20	19							14.30	-0.35	13.95	13.95	0.00	13.95	14.30	-0.35	13.95	14.30	-0.35	13.95	14.30	-0.35	13.95
DA 19 A	20	20							20.60	0.40	20.20	20.20	0.00	20.20	20.60	0.40	20.20	20.20	0.00	20.20	20.60	0.40	20.20
DA 19 A	20	2	14.40	-0.02	14.38	14.30	-0.02	14.28	14.30	-0.02	14.28	14.30	-0.02	14.28	14.30	-0.02	14.28	14.30	-0.02	14.28	14.30	-0.02	14.28
DA 19 A	20	3	15.40	-0.02	15.38	15.30	-0.02	15.28	15.30	-0.02	15.28	15.30	-0.02	15.28	15.30	-0.02	15.28	15.30	-0.02	15.28	15.30	-0.02	15.28
DA 19 A	20	9	16.60	0.00	16.60	16.60	0.00	16.60	16.60	0.00	16.60	16.60	0.00	16.60	16.60	0.00	16.60	16.60	0.00	16.60	16.60	0.00	16.60
DA 19 A	20	10	13.30	-0.10	13.20	13.20	-0.10	13.10	13.30	-0.10	13.20	13.30	-0.10	13.20	13.30	-0.10	13.20	13.30	-0.10	13.20	13.30	-0.10	13.20
DA 19 A	20	18	13.60	-0.10	13.50	13.50	-0.10</																

APPENDIX C
DATA REDUCTION

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APPENDIX C

DATA REDUCTION

The following tables list the velocity as computed directly from the corrected data of Appendix B. The velocity, corrected for variation in the coolant channel thickness, is also tabulated (corrected to the velocity that would have been present had the channel not deviated from the nominal.)

25PSID--REACTOR PRESSURE DROP

REACTOR POSITION CHANNEL NO. MEASURED VELOCITY CORRECTED VELOCITY CHANNEL THICKNESS WATER TEMP.

24A 20	1	21.14	18.89	.1280	84.0
24A 20	2	18.32	18.08	.0796	84.0
24A 20	3	14.96	14.96	.0780	84.0
24A 20	9	17.06	17.28	.0765	84.0
24A 20	10	16.52	16.30	.0796	84.0
24A 20	18	16.52	16.55	.0778	84.0
24A 20	19	18.92	18.26	.0823	84.0
24A 20	20	18.69	17.20	.1280	84.0
24A 18	1	24.70	23.29	.1180	83.0
24A 18	2	19.73	19.47	.0796	83.0
24A 18	3	18.24	18.24	.0780	83.0
24A 18	9	18.24	18.48	.0765	83.0
24A 18	10	18.24	18.00	.0796	83.0
24A 18	18	17.87	17.90	.0778	83.0
24A 18	19	20.11	19.40	.0823	83.0
24A 18	20	22.19	21.56	.1180	83.0
24A 18	1	25.79	24.31	.1180	80.0
24A 18	2	19.19	18.93	.0796	80.0
24A 18	3	17.69	17.69	.0780	80.0
24A 18	9	17.69	17.93	.0765	80.0
24A 18	10	18.03	17.79	.0796	80.0
24A 18	18	17.69	17.72	.0778	80.0
24A 18	19	19.73	19.03	.0823	80.0
24A 18	20	18.11	17.60	.1180	80.0
24A 18	1	23.97	22.59	.1180	85.0
24A 18	2	19.24	18.98	.0796	85.0
24A 18	3	17.32	17.32	.0780	85.0
24A 18	9	17.83	18.06	.0765	85.0
24A 18	10	18.32	18.08	.0796	85.0
24A 18	18	17.95	17.98	.0778	85.0
24A 18	19	20.29	19.58	.0823	85.0
24A 18	20	22.32	21.69	.1180	85.0
24A 18	1	23.74	22.38	.1180	82.0
24A 18	2	19.42	19.16	.0796	82.0
24A 18	3	18.68	18.68	.0780	82.0
24A 18	9	17.90	18.14	.0765	82.0
24A 18	10	18.32	18.07	.0796	82.0
24A 18	18	17.90	17.93	.0778	82.0
24A 18	19	20.14	19.43	.0823	82.0
24A 18	20	22.18	21.55	.1180	82.0
19A 18	1	23.65	24.47	.1020	84.0
19A 18	2	20.07	20.33	.0765	84.0
19A 18	3	19.85	19.63	.0793	84.0
19A 18	9	20.07	19.90	.0790	84.0
19A 18	10	20.18	20.18	.0780	84.0
19A 18	18	20.07	19.77	.0798	84.0
19A 18	19	19.51	18.03	.0878	84.0
19A 18	20	26.34	28.20	.1020	84.0
19A 20	1	23.50	23.64	.1070	83.0
19A 20	2	20.44	20.71	.0765	83.0
19A 20	3	20.80	20.97	.0793	83.0
19A 20	9	20.44	20.27	.0790	83.0
19A 20	10	20.80	20.80	.0780	83.0
19A 20	18	20.44	20.13	.0798	83.0
19A 20	19	20.44	18.89	.0878	83.0
19A 20	20	24.40	25.30	.1070	83.0
19A 20	1	23.77	23.92	.1070	80.0
19A 20	2	20.29	20.55	.0765	80.0
19A 20	3	20.29	20.06	.0793	80.0
19A 20	9	20.29	20.11	.0790	80.0
19A 20	10	20.58	20.58	.0780	80.0
19A 20	18	20.03	19.72	.0798	80.0
19A 20	19	19.73	18.23	.0878	80.0
19A 20	20	23.93	24.81	.1070	80.0
19A 23	2	20.14	20.40	.0765	82.0
19A 23	3	20.83	20.60	.0793	82.0
19A 23	9	20.14	19.97	.0790	82.0
19A 23	10	20.50	20.50	.0780	82.0
19A 23	18	18.68	18.40	.0798	82.0
19A 23	19	19.80	18.30	.0878	82.0
19A 23	20	25.20	23.69	.1240	82.0
19A 23	2	20.40	20.67	.0765	85.0
19A 23	3	20.77	20.54	.0793	85.0
19A 23	9	20.18	20.01	.0790	85.0
19A 23	10	20.80	20.80	.0780	85.0
19A 23	18	18.57	18.29	.0798	85.0
19A 23	19	20.40	18.85	.0878	85.0
19A 23	20	26.17	24.60	.1240	85.0
18A 7	1	27.69	26.40	.1160	85.0
18A 7	2	18.08	20.87	.0629	85.0
18A 7	3	21.44	21.08	.0800	85.0
18A 7	9	20.51	19.90	.0816	85.0

18A 7	10	20.62	20.28	.0800	85.0
18A 7	18	18.69	18.16	.0814	85.0
18A 7	19	21.54	19.98	.0873	85.0
18A 7	1	27.69	26.40	.1160	85.0
18A 7	2	17.91	20.68	.0629	85.0
18A 7	3	21.19	20.84	.0800	85.0
18A 7	9	20.51	19.90	.0816	85.0
18A 7	10	20.51	20.17	.0800	85.0
18A 7	18	18.69	18.16	.0814	85.0
18A 7	19	21.54	19.98	.0873	85.0
18A 16	1	25.73	25.42	.1100	80.0
18A 16	2	18.03	20.81	.0629	80.0
18A 16	3	20.90	20.55	.0800	80.0
18A 16	9	19.54	18.96	.0816	80.0
18A 16	10	20.29	19.95	.0800	80.0
18A 16	18	20.29	19.72	.0814	80.0
18A 16	19	21.01	19.49	.0873	80.0
18A 16	20	18.03	18.35	.1100	80.0
18A 16	1	26.11	25.80	.1100	83.0
18A 16	2	18.24	21.06	.0629	83.0
18A 16	3	21.16	20.80	.0800	83.0
18A 16	9	20.11	19.51	.0816	83.0
18A 16	10	20.80	20.45	.0800	83.0
18A 16	18	19.73	19.18	.0814	83.0
18A 16	19	22.19	20.58	.0873	83.0
18A 16	20	18.61	18.94	.1100	83.0
18A 16	1	24.58	24.28	.1100	84.0
18A 16	2	17.19	19.84	.0629	84.0
18A 16	3	20.84	20.49	.0800	84.0
18A 16	9	18.92	18.36	.0816	84.0
18A 16	10	20.07	19.74	.0800	84.0
18A 16	18	19.96	19.40	.0814	84.0
18A 16	19	20.62	19.13	.0873	84.0
18A 16	20	17.57	17.89	.1100	84.0
7R 19	1	27.48	28.92	.1000	83.0
7R 19	2	18.61	18.80	.0768	83.0
7R 19	3	20.11	20.23	.0773	83.0
7R 19	9	21.14	20.89	.0795	83.0
7R 19	10	20.44	20.25	.0791	83.0
7R 19	18	19.73	19.23	.0811	83.0
7R 19	19	21.14	20.01	.0848	83.0
7R 19	20	24.09	26.14	.1000	83.0
7R 19	1	26.95	28.37	.1000	80.0
7R 19	2	18.60	18.79	.0768	80.0
7R 19	3	19.73	19.85	.0773	80.0
7R 19	9	20.97	20.71	.0795	80.0
7R 19	10	19.73	19.54	.0791	80.0
7R 19	18	19.73	19.22	.0811	80.0
7R 19	19	20.79	19.67	.0848	80.0
7R 19	20	22.15	24.03	.1000	80.0
7R 19	1	27.59	29.04	.1000	84.0
7R 19	2	18.08	18.26	.0768	84.0
7R 19	3	18.92	19.04	.0773	84.0
7R 19	9	20.07	19.82	.0795	84.0
7R 19	10	19.28	19.10	.0791	84.0
7R 19	18	19.51	19.01	.0811	84.0
7R 19	19	20.07	18.98	.0848	84.0
7R 19	20	24.58	26.67	.1000	84.0
7R 39	1	29.29	30.04	.1040	85.0
7R 39	2	18.44	18.64	.0768	85.0
7R 39	3	19.47	19.59	.0773	85.0
7R 39	9	19.66	19.41	.0795	85.0
7R 39	10	19.66	19.48	.0791	85.0
7R 39	18	19.66	19.15	.0811	85.0
7R 39	20	21.23	22.44	.1040	85.0
7R 39	1	29.47	30.22	.1040	85.0
7R 39	2	18.32	18.51	.0768	82.0
7R 39	3	19.42	19.54	.0773	82.0
7R 39	9	19.80	19.55	.0795	82.0
7R 39	10	19.42	19.24	.0791	82.0
7R 39	18	19.80	19.29	.0811	82.0
7R 39	20	20.83	22.01	.1040	82.0
11A 1	20	18.03	20.10	.0960	80.0
11A 1	20	18.96	21.13	.0960	80.0
11A 1	20	19.73	21.99	.0960	80.0
11A 1	20	19.07	21.26	.0960	82.0
11A 1	20	19.80	22.08	.0960	82.0
11A 1	20	20.83	23.22	.0960	82.0
11A 1	20	18.24	20.34	.0960	83.0
11A 1	20	19.00	21.19	.0960	83.0
11A 1	20	19.73	22.00	.0960	83.0
11A 1	20	17.79	19.74	.0960	84.0
11A 1	20	18.92	21.10	.0960	84.0
11A 1	20	20.07	22.38	.0960	84.0
11A 1	20	18.69	20.83	.0960	85.0
11A 1	20	19.66	21.92	.0960	85.0
11A 1	20	20.73	23.11	.0960	85.0
2R 10	1	24.64	24.66	.1080	80.0

2P 10	20	21.32	21.98	.1080	80.0
2P 10	1	26.30	26.30	.1080	82.0
2P 10	20	19.07	19.46	.1080	82.0
2P 10	1	24.97	24.97	.1080	83.0
2P 10	20	21.51	22.17	.1080	83.0
2P 10	1	25.03	25.03	.1080	84.0
2P 10	20	21.16	21.81	.1080	84.0
2P 10	1	26.31	26.31	.1080	85.0
2P 10	20	19.66	20.26	.1080	85.0
18A 15	1	22.45	21.04	.1190	80.0
18A 15	20	16.54	16.00	.1190	80.0
18A 15	1	50.20	47.05	.1190	82.0
18A 15	20	24.02	23.21	.1190	82.0
18A 15	1	22.52	21.11	.1190	83.0
18A 15	20	13.66	13.19	.1190	83.0
18A 15	1	22.69	21.27	.1190	84.0
18A 15	20	17.06	16.48	.1190	84.0
18A 15	1	22.98	21.54	.1190	85.0
18A 15	20	12.81	12.38	.1190	85.0
11C 31	1	24.58	26.05	.0990	84.0
11C 31	20	16.11	17.60	.0990	84.0
11C 32	1	25.38	29.32	.0870	80.0
11C 32	20	17.44	20.76	.0870	80.0
11C 32	1	25.50	29.45	.0870	82.0
11C 32	20	17.05	20.30	.0870	82.0
11C 32	1	25.27	29.19	.0870	83.0
11C 32	20	17.45	20.77	.0870	83.0
11C 32	1	25.65	29.63	.0870	85.0
11C 32	20	17.45	20.77	.0870	85.0
25C 36	1	25.48	26.13	.1040	84.0
25C 36	20	19.85	20.98	.1040	84.0
25C 39	1	24.93	25.41	.1050	80.0
25C 39	20	21.84	23.09	.1040	80.0
25C 39	1	25.27	25.75	.1050	83.0
25C 39	20	21.51	22.73	.1040	83.0
25C 40	1	24.63	24.94	.1060	82.0
25C 40	20	22.51	23.50	.1060	82.0
25C 40	1	24.79	25.11	.1060	85.0
25C 40	20	22.52	23.51	.1060	85.0

50PSID--REACTOR PRESSURE DROP

REACTOR POSITION CHANNEL NO. MEASURED VELOCITY CORRECTED VELOCITY CHANNEL THICKNESS WATER TEMP.

24A 20	1	32.28	28.82	.1280	82.0
24A 20	2	28.03	27.65	.0796	82.0
24A 20	9	26.39	26.73	.0765	82.0
24A 20	10	26.39	26.03	.0796	82.0
24A 20	18	25.53	25.57	.0778	82.0
24A 20	19	29.33	28.30	.0823	82.0
24A 20	20	27.76	25.55	.1280	82.0
24A 20	1	30.96	27.65	.1280	82.0
24A 20	2	27.90	27.52	.0796	82.0
24A 20	3	28.53	28.53	.0780	82.0
24A 20	9	25.90	26.24	.0765	82.0
24A 20	10	25.99	25.64	.0796	82.0
24A 20	19	29.08	28.05	.0823	82.0
24A 20	20	29.08	26.76	.1280	82.0
24A 18	1	35.40	33.37	.1180	85.0
24A 18	2	28.70	28.31	.0796	85.0
24A 18	3	27.29	27.29	.0780	85.0
24A 18	9	26.31	26.66	.0765	85.0
24A 18	10	27.23	26.87	.0796	85.0
24A 18	18	26.65	26.70	.0778	85.0
24A 18	19	30.68	29.61	.0823	85.0
24A 18	20	32.78	31.84	.1180	85.0
24A 18	1	34.54	32.56	.1180	82.0
24A 18	2	28.19	27.81	.0796	82.0
24A 18	3	27.17	27.17	.0780	82.0
24A 18	9	26.05	26.39	.0765	82.0
24A 18	10	26.61	26.25	.0796	82.0
24A 18	18	26.33	26.38	.0778	82.0
24A 18	19	30.21	29.14	.0823	82.0
24A 18	20	32.54	31.61	.1180	82.0
24A 18	1	38.15	35.96	.1180	82.0
24A 18	2	29.15	28.76	.0796	82.0
24A 18	3	27.03	27.03	.0780	82.0
24A 18	9	26.64	26.99	.0765	82.0
24A 18	10	27.17	26.80	.0796	82.0
24A 18	18	26.70	26.74	.0778	82.0
24A 18	19	30.74	29.66	.0823	82.0
24A 18	20	29.23	28.40	.1180	82.0
24A 18	1	36.45	34.36	.1180	82.0
24A 18	2	29.15	28.76	.0796	82.0
24A 18	3	27.60	27.60	.0780	82.0
24A 18	9	27.03	27.38	.0765	82.0
24A 18	10	27.44	27.07	.0796	82.0
24A 18	18	26.64	26.69	.0778	82.0
24A 18	19	30.65	29.57	.0823	82.0
24A 18	20	30.65	29.78	.1180	82.0
19A 18	1	36.26	37.67	.1020	82.0
19A 18	2	30.60	31.00	.0765	82.0
19A 18	3	30.60	30.26	.0793	82.0
19A 18	9	30.35	30.10	.0790	82.0
19A 18	10	30.84	30.84	.0780	82.0
19A 18	18	30.35	29.90	.0798	82.0
19A 18	19	29.58	27.34	.0878	82.0
19A 18	20	38.32	41.03	.1020	82.0
19A 18	1	35.39	36.76	.1020	82.0
19A 18	2	30.45	30.85	.0765	82.0
19A 18	3	30.82	30.48	.0793	82.0
19A 18	9	30.45	30.19	.0790	82.0
19A 18	10	31.35	31.35	.0780	82.0
19A 18	18	30.23	29.77	.0798	82.0
19A 18	19	29.68	27.43	.0878	82.0
19A 18	20	38.52	41.24	.1020	82.0
19A 20	1	35.26	35.48	.1070	82.0
19A 20	2	30.50	30.90	.0765	82.0
19A 20	3	31.01	30.67	.0793	82.0
19A 20	9	30.50	30.24	.0790	82.0
19A 20	10	31.37	31.37	.0780	82.0
19A 20	18	30.35	29.90	.0798	82.0
19A 20	19	29.53	27.29	.0878	82.0
19A 20	20	35.70	37.03	.1070	82.0
19A 20	1	34.62	34.84	.1070	82.0
19A 20	2	30.50	30.90	.0765	82.0
19A 20	3	31.01	30.67	.0793	82.0
19A 20	9	30.65	30.39	.0790	82.0
19A 20	10	31.37	31.37	.0780	82.0
19A 20	18	30.50	30.04	.0798	82.0
19A 20	19	30.28	27.98	.0878	82.0
19A 20	20	36.20	37.54	.1070	82.0
19A 23	2	29.97	30.36	.0765	85.0
19A 23	3	31.05	30.71	.0793	85.0
19A 23	9	29.97	29.72	.0790	85.0

19A 23	10	30.90	30.90	.0780	85.0
19A 23	18	28.44	28.03	.0798	85.0
19A 23	19	29.21	27.00	.0878	85.0
19A 23	20	36.95	34.73	.1240	85.0
19A 23	2	29.44	29.84	.0765	82.0
19A 23	3	30.43	30.09	.0793	82.0
19A 23	9	29.58	29.33	.0790	82.0
19A 23	10	30.43	30.43	.0780	82.0
19A 23	18	27.95	27.53	.0798	82.0
19A 23	19	29.10	26.89	.0878	82.0
19A 23	20	36.96	34.74	.1240	82.0
18A 7	1	39.66	37.81	.1160	82.0
18A 7	2	26.33	30.39	.0629	82.0
18A 7	3	31.15	30.63	.0800	82.0
18A 7	9	30.43	29.53	.0816	82.0
18A 7	10	30.21	29.70	.0800	82.0
18A 7	18	27.41	26.64	.0814	82.0
18A 7	19	31.84	29.54	.0873	82.0
18A 7	1	40.24	38.36	.1160	85.0
18A 7	2	26.82	30.96	.0629	85.0
18A 7	3	31.59	31.07	.0800	85.0
18A 7	9	30.83	29.92	.0816	85.0
18A 7	10	30.54	30.03	.0800	85.0
18A 7	18	27.86	27.07	.0814	85.0
18A 7	19	32.30	29.96	.0873	85.0
18A 16	1	38.44	37.97	.1100	82.0
18A 16	2	27.00	31.17	.0629	82.0
18A 16	3	31.79	31.26	.0800	82.0
18A 16	9	29.61	28.73	.0816	82.0
18A 16	10	30.65	30.13	.0800	82.0
18A 16	18	31.01	30.14	.0814	82.0
18A 16	19	32.07	29.75	.0873	82.0
18A 16	20	27.68	28.18	.1100	82.0
18A 16	1	38.24	37.78	.1100	82.0
18A 16	2	26.78	30.91	.0629	82.0
18A 16	3	31.72	31.19	.0800	82.0
18A 16	9	29.15	28.29	.0816	82.0
18A 16	10	30.65	30.13	.0800	82.0
18A 16	18	31.01	30.14	.0814	82.0
18A 16	19	32.90	30.92	.0873	82.0
18A 16	20	27.60	28.10	.1100	82.0
18A 16	1	36.24	35.82	.1100	82.0
18A 16	2	26.67	30.78	.0629	82.0
18A 16	9	28.56	27.71	.0816	82.0
18A 16	10	30.11	29.60	.0800	82.0
18A 16	18	30.35	29.50	.0814	82.0
18A 16	19	31.58	29.30	.0873	82.0
18A 16	20	27.22	27.71	.1100	82.0
18A 16	1	35.93	35.50	.1100	82.0
18A 16	2	27.08	31.26	.0629	82.0
18A 16	3	31.35	30.82	.0800	82.0
18A 16	9	28.37	27.53	.0816	82.0
18A 16	10	30.08	29.58	.0800	82.0
18A 16	18	30.23	29.38	.0814	82.0
18A 16	19	31.20	28.94	.0873	82.0
18A 16	20	30.96	31.52	.1100	82.0
7R 19	1	39.64	41.73	.1000	82.0
7R 19	2	27.84	28.13	.0768	82.0
7R 19	3	29.91	30.09	.0773	82.0
7R 19	9	31.37	30.97	.0795	82.0
7R 19	10	30.65	30.36	.0791	82.0
7R 19	18	29.53	28.78	.0811	82.0
7R 19	19	31.37	29.67	.0848	82.0
7R 19	20	35.07	38.05	.1000	82.0
7R 19	1	39.70	41.79	.1000	82.0
7R 19	2	28.35	28.64	.0768	82.0
7R 19	3	29.74	29.94	.0773	82.0
7R 19	9	31.51	31.11	.0795	82.0
7R 19	10	29.91	29.63	.0791	82.0
7R 19	18	30.28	29.50	.0811	82.0
7R 19	19	31.51	29.80	.0848	82.0
7R 19	20	33.77	36.64	.1000	82.0
7R 19	1	39.57	41.65	.1000	82.0
7R 19	2	27.49	27.78	.0768	82.0
7R 19	3	29.33	29.51	.0773	82.0
7R 19	9	30.60	30.21	.0795	82.0
7R 19	10	29.33	29.06	.0791	82.0
7R 19	18	30.11	29.34	.0811	82.0
7R 19	19	30.35	28.71	.0848	82.0
7R 19	20	36.28	39.37	.1000	82.0
7R 19	1	39.64	41.73	.1000	82.0
7R 19	2	27.08	27.37	.0768	82.0
7R 19	3	28.69	28.86	.0773	82.0
7R 19	9	30.45	30.07	.0795	82.0
7R 19	10	29.30	29.03	.0791	82.0
7R 19	18	29.83	29.07	.0811	82.0
7R 19	19	31.35	29.65	.0848	82.0

7R 19	20	35.39	38.39	.1000	82.0
7R 39	1	40.46	41.49	.1040	85.0
7R 39	2	27.15	27.43	.0768	85.0
7R 39	3	28.46	28.64	.0773	85.0
7R 39	9	29.21	28.85	.0795	85.0
7R 39	10	28.85	28.59	.0791	85.0
7R 39	18	29.21	28.47	.0811	85.0
7R 39	20	32.78	34.64	.1040	85.0
7R 39	1	40.99	42.04	.1040	82.0
7R 39	2	27.17	27.45	.0768	82.0
7R 39	3	28.22	28.39	.0773	82.0
7R 39	9	28.71	28.35	.0795	82.0
7R 39	10	28.45	28.19	.0791	82.0
7R 39	18	28.95	28.20	.0811	82.0
7R 39	20	32.54	34.39	.1040	82.0
11A 1	20	27.15	30.27	.0960	85.0
11A 1	20	28.46	31.73	.0960	85.0
11A 1	20	29.21	32.57	.0960	85.0
11A 1	20	26.33	29.36	.0960	82.0
11A 1	20	27.41	30.56	.0960	82.0
11A 1	20	28.69	31.98	.0960	82.0
11A 1	20	27.60	30.77	.0960	82.0
11A 1	20	28.77	32.07	.0960	82.0
11A 1	20	28.77	32.07	.0960	82.0
11A 1	20	26.78	29.86	.0960	82.0
11A 1	20	28.37	31.63	.0960	82.0
11A 1	20	28.77	32.07	.0960	82.0
11A 1	20	21.04	23.46	.0960	82.0
11A 1	20	22.42	24.99	.0960	82.0
11A 1	20	24.33	27.12	.0960	82.0
11A 1	20	26.67	29.73	.0960	82.0
11A 1	20	27.90	31.10	.0960	82.0
11A 1	20	29.23	32.59	.0960	82.0
2R 10	1	37.89	37.89	.1080	85.0
2R 10	20	30.68	31.62	.1080	85.0
2R 10	1	37.06	37.06	.1080	82.0
2R 10	20	29.71	30.62	.1080	82.0
2R 10	1	38.01	38.01	.1080	82.0
2R 10	20	31.58	32.55	.1080	82.0
2R 10	1	38.32	38.32	.1080	82.0
2R 10	20	31.37	32.33	.1080	82.0
2R 10	1	38.13	38.13	.1080	82.0
2R 10	20	31.32	32.28	.1080	82.0
2R 10	1	37.62	37.62	.1080	82.0
2R 10	20	30.96	31.91	.1080	82.0
18R 15	1	34.44	32.28	.1190	85.0
18R 15	20	18.32	17.70	.1190	85.0
18R 15	1	53.08	49.76	.1190	82.0
18R 15	20	26.89	25.98	.1190	82.0
18R 15	1	34.10	31.97	.1190	82.0
18R 15	20	20.65	19.95	.1190	82.0
18R 15	1	34.43	32.27	.1190	82.0
18R 15	20	24.24	23.41	.1190	82.0
18R 15	1	33.88	31.76	.1190	82.0
18R 15	20	24.93	24.09	.1190	82.0
18R 15	1	34.10	31.97	.1190	82.0
18R 15	20	23.07	22.29	.1190	82.0
11C 31	1	36.28	38.45	.0990	82.0
11C 31	20	24.63	26.91	.0990	82.0
11C 31	1	36.04	38.19	.0990	82.0
11C 31	20	24.84	27.14	.0990	82.0
11C 32	1	37.83	43.70	.0870	82.0
11C 32	20	26.39	31.41	.0870	82.0
11C 32	1	38.17	44.09	.0870	82.0
11C 32	20	26.95	32.08	.0870	82.0
11C 32	1	37.67	43.52	.0870	82.0
11C 32	20	25.50	30.35	.0870	82.0
11C 32	1	38.32	44.26	.0870	85.0
11C 32	20	25.91	30.85	.0870	85.0
25C 36	1	38.52	39.90	.1040	82.0
25C 36	20	22.42	23.49	.1040	82.0
25C 36	1	37.00	37.94	.1040	82.0
25C 36	20	27.49	29.06	.1040	82.0
25C 39	1	37.65	38.37	.1050	82.0
25C 39	20	29.91	31.61	.1040	82.0
25C 39	1	37.85	38.57	.1050	82.0
25C 39	20	31.01	32.78	.1040	82.0
25C 40	1	35.81	36.26	.1060	82.0
25C 40	20	32.54	33.95	.1060	82.0
25C 40	1	36.34	36.80	.1060	85.0
25C 40	20	32.78	34.21	.1060	85.0

75PS10--REACTOR PRESSURE DROP

REACTOR POSITION CHANNEL NO. MEASURED VELOCITY CORRECTED VELOCITY CHANNEL THICKNESS WATER TEMP.

24A 20	1	40.94	36.55	.1280	82.0
24A 20	2	34.82	34.35	.0796	82.0
24A 20	3	35.79	35.79	.0780	82.0
24A 20	9	32.05	32.47	.0765	82.0
24A 20	10	32.40	31.96	.0796	82.0
24A 20	18	31.49	31.54	.0778	82.0
24A 20	19	37.00	35.69	.0823	82.0
24A 20	20	34.10	31.38	.1280	82.0
24A 20	1	40.94	36.55	.1280	82.0
24A 20	2	34.75	34.28	.0796	82.0
24A 20	3	35.70	35.70	.0780	82.0
24A 20	9	32.40	32.82	.0765	82.0
24A 20	10	32.74	32.30	.0796	82.0
24A 20	18	31.70	31.75	.0778	82.0
24A 20	19	37.00	35.69	.0823	82.0
24A 20	20	34.10	31.38	.1280	82.0
24A 18	1	46.30	43.65	.1180	81.0
24A 18	2	36.12	35.63	.0796	81.0
24A 18	3	34.86	34.86	.0780	81.0
24A 18	9	33.77	34.21	.0765	81.0
24A 18	10	34.21	33.75	.0796	81.0
24A 18	18	33.33	33.38	.0778	81.0
24A 18	19	38.55	37.20	.0823	81.0
24A 18	20	37.54	36.47	.1180	81.0
24A 18	1	43.15	40.68	.1180	82.0
24A 18	2	35.81	35.33	.0796	82.0
24A 18	3	34.32	34.32	.0780	82.0
24A 18	9	32.99	33.42	.0765	82.0
24A 18	10	33.88	33.43	.0796	82.0
24A 18	18	32.99	33.05	.0778	82.0
24A 18	19	38.67	37.31	.0823	82.0
24A 18	20	40.99	39.82	.1180	82.0
24A 18	1	43.62	41.12	.1180	84.0
24A 18	2	36.03	35.55	.0796	84.0
24A 18	3	34.77	34.77	.0780	84.0
24A 18	9	33.50	33.93	.0765	84.0
24A 18	10	33.92	33.46	.0796	84.0
24A 18	18	33.05	33.11	.0778	84.0
24A 18	19	38.04	36.71	.0823	84.0
24A 18	20	41.73	40.54	.1180	84.0
24A 18	1	42.89	40.43	.1180	85.0
24A 18	2	34.77	34.30	.0796	85.0
24A 18	3	33.45	33.46	.0780	85.0
24A 18	9	31.85	32.27	.0765	85.0
24A 18	10	33.00	32.56	.0796	85.0
24A 18	18	32.09	32.14	.0778	85.0
24A 18	19	37.89	36.55	.0823	85.0
24A 18	20	40.44	39.29	.1180	85.0
19A 18	1	44.85	46.59	.1020	82.0
19A 18	2	37.93	38.43	.0765	82.0
19A 18	3	37.75	37.34	.0793	82.0
19A 18	9	37.73	37.41	.0790	82.0
19A 18	10	38.13	38.13	.0780	82.0
19A 18	18	37.69	37.13	.0798	82.0
19A 18	19	36.81	34.02	.0878	82.0
19A 18	20	47.23	50.57	.1020	82.0
19A 18	1	44.80	46.54	.1020	82.0
19A 18	2	37.93	38.43	.0765	82.0
19A 18	3	37.81	37.40	.0793	82.0
19A 18	9	37.93	37.61	.0790	82.0
19A 18	10	38.11	38.11	.0780	82.0
19A 18	18	37.75	37.18	.0798	82.0
19A 18	19	36.79	34.00	.0878	82.0
19A 18	20	47.13	50.46	.1020	82.0
19A 20	1	43.08	43.35	.1070	81.0
19A 20	2	37.54	38.03	.0765	81.0
19A 20	3	38.55	38.13	.0793	81.0
19A 20	9	37.54	37.22	.0790	81.0
19A 20	10	38.96	38.96	.0780	81.0
19A 20	18	37.54	36.97	.0798	81.0
19A 20	19	36.53	33.76	.0878	81.0
19A 20	20	44.03	45.66	.1070	81.0
19A 20	1	41.73	41.99	.1070	84.0
19A 20	2	37.25	37.74	.0765	84.0
19A 20	3	38.04	37.63	.0793	84.0
19A 20	9	37.65	37.33	.0790	84.0
19A 20	10	38.42	38.42	.0780	84.0
19A 20	18	37.05	36.49	.0798	84.0
19A 20	19	37.25	34.42	.0878	84.0
19A 20	20	43.98	45.60	.1070	84.0
19A 23	2	37.24	37.74	.0765	82.0
19A 23	3	38.26	37.84	.0793	82.0

19A 23	9	37.06	36.74	.0790	82.0
19A 23	10	38.48	38.48	.0780	82.0
19A 23	18	35.60	35.06	.0798	82.0
19A 23	19	36.02	33.28	.0878	82.0
19A 23	20	47.21	44.38	.1240	82.0
19A 23	2	36.44	36.92	.0765	85.0
19A 23	3	37.47	37.06	.0793	85.0
19A 23	9	36.03	35.73	.0790	85.0
19A 23	10	37.67	37.67	.0780	85.0
19A 23	18	34.55	34.03	.0798	85.0
19A 23	19	35.19	32.52	.0878	85.0
19A 23	20	46.83	44.02	.1240	85.0
18A 7	2	32.99	38.08	.0629	82.0
18A 7	3	39.05	38.40	.0800	82.0
18A 7	9	37.87	36.75	.0816	82.0
18A 7	10	37.87	37.24	.0800	82.0
18A 7	18	34.32	33.36	.0814	82.0
18A 7	19	40.63	37.69	.0873	82.0
18A 7	1	49.01	46.73	.1160	85.0
18A 7	2	32.32	37.31	.0629	85.0
18A 7	3	38.30	37.66	.0800	85.0
18A 7	9	37.27	36.17	.0816	85.0
18A 7	10	36.85	36.23	.0800	85.0
18A 7	18	33.90	32.95	.0814	85.0
18A 7	19	39.86	36.98	.0873	85.0
18A 16	1	46.99	46.42	.1100	81.0
18A 16	2	33.33	38.47	.0629	81.0
18A 16	3	39.15	38.49	.0800	81.0
18A 16	9	36.53	35.45	.0816	81.0
18A 16	10	37.93	37.30	.0800	81.0
18A 16	18	38.32	37.25	.0814	81.0
18A 16	19	40.68	37.74	.0873	81.0
18A 16	20	34.43	35.05	.1100	81.0
18A 16	1	44.51	43.97	.1100	82.0
18A 16	2	32.74	37.79	.0629	82.0
18A 16	3	39.05	38.40	.0800	82.0
18A 16	9	35.58	34.52	.0816	82.0
18A 16	18	37.50	36.44	.0814	82.0
18A 16	19	38.54	35.75	.0873	82.0
18A 16	20	34.82	35.45	.1100	82.0
18A 16	1	44.36	43.82	.1100	82.0
18A 16	2	32.81	37.87	.0629	82.0
18A 16	3	38.94	38.29	.0800	82.0
18A 16	9	35.58	34.52	.0816	82.0
18A 16	10	37.50	36.87	.0800	82.0
18A 16	18	37.56	36.50	.0814	82.0
18A 16	19	38.48	35.69	.0873	82.0
18A 16	20	34.82	35.45	.1100	82.0
18A 16	1	45.95	45.39	.1100	84.0
18A 16	2	33.05	34.15	.0629	84.0
18A 16	3	38.99	38.34	.0800	84.0
18A 16	9	35.61	34.56	.0816	84.0
18A 16	10	37.65	37.02	.0800	84.0
18A 16	18	37.85	36.79	.0814	84.0
18A 16	19	40.48	37.55	.0873	84.0
18A 16	20	34.33	34.96	.1100	84.0
7R 19	1	48.46	51.01	.1000	81.0
7R 19	2	34.43	34.79	.0768	81.0
7R 19	3	36.73	36.95	.0773	81.0
7R 19	10	37.54	37.19	.0791	81.0
7R 19	18	38.32	37.34	.0811	81.0
7R 19	19	38.96	36.85	.0848	81.0
7R 19	20	41.08	44.57	.1000	81.0
7R 19	1	48.46	51.01	.1000	82.0
7R 19	2	34.10	34.46	.0768	82.0
7R 19	3	36.06	36.27	.0773	82.0
7R 19	9	37.93	37.45	.0795	82.0
7R 19	10	36.39	36.05	.0791	82.0
7R 19	18	37.14	36.18	.0811	82.0
7R 19	19	37.93	35.87	.0848	82.0
7R 19	20	44.36	48.13	.1000	82.0
7R 19	1	48.01	50.54	.1000	84.0
7R 19	2	34.33	34.69	.0768	84.0
7R 19	3	36.65	36.87	.0773	84.0
7R 19	9	38.42	37.93	.0795	84.0
7R 19	10	37.65	37.30	.0791	84.0
7R 19	18	37.25	36.30	.0811	84.0
7R 19	19	38.61	36.52	.0848	84.0
7R 19	20	42.58	46.20	.1000	84.0
7R 39	1	52.66	54.00	.1040	82.0

7B 39	2	33.88	34.23	.0768	82.0
7B 39	3	35.18	35.39	.0773	82.0
7B 39	9	36.24	35.78	.0795	82.0
7B 39	10	35.60	35.27	.0791	82.0
7B 39	18	36.35	35.41	.0811	82.0
7B 39	20	40.63	42.94	.1040	82.0
7B 39	1	53.39	54.75	.1040	85.0
7B 39	2	33.00	33.35	.0768	85.0
7B 39	3	34.12	34.32	.0773	85.0
7B 39	9	35.40	34.96	.0795	85.0
7B 39	10	34.77	34.44	.0791	85.0
7B 39	18	35.40	34.49	.0811	85.0
7B 39	20	39.86	42.13	.1040	85.0
11A 1	20	32.42	36.15	.0960	81.0
11A 1	20	34.75	38.74	.0960	81.0
11A 1	20	34.43	38.38	.0960	81.0
11A 1	20	32.99	36.78	.0960	82.0
11A 1	20	34.75	38.74	.0960	82.0
11A 1	20	34.54	38.50	.0960	82.0
11A 1	20	32.12	35.81	.0960	82.0
11A 1	20	33.71	37.58	.0960	82.0
11A 1	20	34.36	38.31	.0960	82.0
11A 1	20	32.05	35.73	.0960	82.0
11A 1	20	33.77	37.65	.0960	82.0
11A 1	20	34.23	38.17	.0960	82.0
11A 1	20	32.82	36.59	.0960	84.0
11A 1	20	34.33	38.28	.0960	84.0
11A 1	20	34.33	38.28	.0960	84.0
11A 1	20	33.25	37.07	.0960	85.0
11A 1	20	34.89	38.90	.0960	85.0
11A 1	20	34.77	38.76	.0960	85.0
2B 10	1	47.84	47.84	.1080	81.0
2B 10	20	38.32	39.50	.1080	81.0
2B 10	1	47.92	47.92	.1080	82.0
2B 10	20	37.46	38.60	.1080	82.0
2B 10	1	47.65	47.65	.1080	82.0
2B 10	20	38.05	39.21	.1080	82.0
2B 10	1	47.56	47.56	.1080	82.0
2B 10	20	38.54	39.72	.1080	82.0
2B 10	1	47.07	47.07	.1080	84.0
2B 10	20	37.85	39.01	.1080	84.0
2B 10	1	47.47	47.47	.1080	85.0
2B 10	20	36.65	37.77	.1080	85.0
18B 15	1	47.53	44.55	.1190	81.0
18B 15	20	27.98	27.03	.1190	81.0
18B 15	1	42.88	40.19	.1190	82.0
18B 15	20	22.51	21.75	.1190	82.0
18B 15	1	42.37	39.71	.1190	82.0
18B 15	20	30.23	29.21	.1190	82.0
18B 15	1	42.37	39.71	.1190	82.0
18B 15	20	30.23	29.21	.1190	82.0
18B 15	1	42.24	39.60	.1190	84.0
18B 15	20	23.24	22.45	.1190	84.0
18B 15	1	42.33	39.68	.1190	85.0
18B 15	20	21.19	20.47	.1190	85.0
11C 31	1	44.61	47.26	.0990	82.0
11C 31	20	30.96	33.82	.0990	82.0
11C 31	1	44.61	47.28	.0990	82.0
11C 31	20	30.96	33.82	.0990	82.0
11C 32	1	47.16	54.48	.0870	81.0
11C 32	20	32.42	38.60	.0870	81.0
11C 32	1	48.99	56.59	.0870	82.0
11C 32	20	31.84	37.91	.0870	82.0
11C 32	1	46.75	54.01	.0870	84.0
11C 32	20	31.97	38.06	.0870	84.0
11C 32	1	47.62	55.01	.0870	85.0
11C 32	20	31.17	37.11	.0870	85.0
25C 36	1	47.87	49.09	.1040	82.0
25C 36	20	26.16	27.65	.1040	82.0
25C 36	1	47.96	49.19	.1040	82.0
25C 36	20	26.33	27.83	.1040	82.0
25C 39	1	46.99	47.88	.1050	81.0
25C 39	20	36.53	38.61	.1040	81.0
25C 39	1	46.27	47.15	.1050	84.0
25C 39	20	35.40	37.42	.1040	84.0
25C 40	1	41.21	41.73	.1060	82.0
25C 40	20	40.63	42.40	.1060	82.0
25C 40	1	44.53	45.09	.1060	85.0
25C 40	20	39.62	41.35	.1060	85.0

100PSID--REACTOR PRESSURE DROP

 REACTOR POSITION CHANNEL NO. MEASURED VELOCITY CORRECTED VELOCITY CHANNEL THICKNESS WATER TEMP.

24A 20	1	45.72	40.83	.1280	89.0
24A 20	2	41.53	40.97	.0796	89.0
24A 20	3	42.68	42.68	.0780	89.0
24A 20	9	38.35	38.85	.0765	89.0
24A 20	10	38.74	38.22	.0796	89.0
24A 20	18	37.76	37.83	.0778	89.0
24A 20	19	44.23	42.67	.0823	89.0
24A 20	20	41.71	38.38	.1280	89.0
24A 20	1	45.89	40.97	.1280	89.0
24A 20	2	42.16	41.59	.0796	89.0
24A 20	3	42.68	42.68	.0780	89.0
24A 20	9	38.55	39.05	.0765	89.0
24A 20	10	38.93	38.41	.0796	89.0
24A 20	18	37.57	37.63	.0778	89.0
24A 20	19	44.40	42.84	.0823	89.0
24A 20	20	41.71	38.38	.1280	89.0
24A 20	1	44.98	40.16	.1280	88.0
24A 20	2	42.33	41.76	.0796	88.0
24A 20	3	42.94	42.94	.0780	88.0
24A 20	9	38.55	39.05	.0765	88.0
24A 20	10	38.84	38.31	.0796	88.0
24A 20	18	37.76	37.83	.0778	88.0
24A 20	19	44.23	42.67	.0823	88.0
24A 20	20	42.86	39.44	.1280	88.0
24A 20	1	45.54	40.66	.1280	85.0
24A 20	3	42.14	42.14	.0780	85.0
24A 20	9	38.63	39.13	.0765	85.0
24A 20	10	39.20	38.68	.0796	85.0
24A 20	18	38.43	38.50	.0778	85.0
24A 20	19	44.88	43.30	.0823	85.0
24A 20	20	43.19	39.74	.1280	85.0
24A 20	1	45.21	40.37	.1280	85.0
24A 20	3	41.51	41.51	.0780	85.0
24A 20	9	37.95	38.44	.0765	85.0
24A 20	10	38.82	38.30	.0796	85.0
24A 20	18	37.55	37.62	.0778	85.0
24A 20	19	44.63	43.06	.0823	85.0
24A 20	20	42.93	39.50	.1280	85.0
24A 18	1	50.93	48.01	.1180	82.0
24A 18	2	42.21	41.64	.0796	82.0
24A 18	3	42.03	42.03	.0780	82.0
24A 18	9	39.19	39.70	.0765	82.0
24A 18	10	39.38	38.85	.0796	82.0
24A 18	18	39.00	39.06	.0778	82.0
24A 18	19	46.09	44.47	.0823	82.0
24A 18	20	46.09	44.78	.1180	82.0
24A 18	1	50.79	47.87	.1180	82.0
24A 18	2	42.39	41.82	.0796	82.0
24A 18	3	42.39	42.39	.0780	82.0
24A 18	9	39.38	39.89	.0765	82.0
24A 18	10	39.57	39.03	.0796	82.0
24A 18	18	39.00	39.06	.0778	82.0
24A 18	19	46.09	44.47	.0823	82.0
24A 18	20	46.09	44.78	.1180	82.0
24A 18	1	50.07	47.20	.1180	87.0
24A 18	2	42.58	42.01	.0796	87.0
24A 18	3	43.19	43.19	.0780	87.0
24A 18	9	39.77	40.29	.0765	87.0
24A 18	10	39.96	39.42	.0796	87.0
24A 18	18	39.20	39.27	.0778	87.0
24A 18	19	46.83	45.19	.0823	87.0
24A 18	20	49.77	48.35	.1180	87.0
24A 18	1	49.75	46.90	.1180	82.0
24A 18	2	41.50	40.94	.0796	82.0
24A 18	3	41.94	41.94	.0780	82.0
24A 18	9	39.38	39.89	.0765	82.0
24A 18	10	39.38	38.85	.0796	82.0
24A 18	18	38.52	38.58	.0778	82.0
24A 18	19	46.82	45.17	.0823	82.0
24A 18	20	46.97	45.64	.1180	82.0
24A 18	1	48.84	46.06	.1180	85.0
24A 18	2	41.60	41.04	.0796	85.0
24A 18	3	42.23	42.23	.0780	85.0
24A 18	9	38.34	38.84	.0765	85.0
24A 18	10	39.30	38.77	.0796	85.0
24A 18	18	38.34	38.40	.0778	85.0
24A 18	19	46.67	45.03	.0823	85.0
24A 18	20	49.01	47.62	.1180	85.0
24A 40	1	38.72	42.18	.0950	85.0
24A 40	2	42.75	42.18	.0796	85.0
24A 40	3	44.04	44.04	.0780	85.0
24A 40	9	37.95	38.44	.0765	85.0

24A 40	10	38.72	38.20	,0796	85.0
24A 40	18	38.34	38.40	,0778	85.0
24A 40	19	47.47	45.80	,0823	85.0
24A 40	20	44.21	49.64	,0950	85.0
24A 40	1	38.72	42.18	,0950	85.0
24A 40	2	42.75	42.18	,0796	85.0
24A 40	3	44.04	44.04	,0780	85.0
24A 40	9	37.75	38.24	,0765	85.0
24A 40	10	38.72	38.20	,0796	85.0
24A 40	18	38.34	38.40	,0778	85.0
24A 40	19	47.39	45.72	,0823	85.0
24A 40	20	44.04	49.45	,0950	85.0
24A 40	1	39.09	42.58	,0950	82.0
24A 40	2	42.91	42.33	,0796	82.0
24A 40	3	44.36	44.36	,0780	82.0
24A 40	9	37.93	38.43	,0765	82.0
24A 40	10	38.32	37.81	,0796	82.0
24A 40	18	38.32	38.39	,0778	82.0
24A 40	19	47.29	45.63	,0823	82.0
24A 40	20	43.34	48.66	,0950	82.0
24A 40	1	39.09	42.58	,0950	82.0
24A 40	2	42.74	42.16	,0796	82.0
24A 40	3	44.36	44.36	,0780	82.0
24A 40	9	37.73	38.23	,0765	82.0
24A 40	10	38.32	37.81	,0796	82.0
24A 40	18	38.32	38.39	,0778	82.0
24A 40	19	47.29	45.63	,0823	82.0
24A 40	20	43.51	48.85	,0950	82.0
19A 18	1	52.70	54.75	,1020	89.0
19A 18	2	44.40	44.98	,0765	89.0
19A 18	3	44.40	43.91	,0793	89.0
19A 18	9	44.40	44.02	,0790	89.0
19A 18	10	44.57	44.57	,0780	89.0
19A 18	18	44.23	43.56	,0798	89.0
19A 18	19	43.29	40.01	,0878	89.0
19A 18	20	55.46	59.35	,1020	89.0
19A 18	1	52.70	54.75	,1020	89.0
19A 18	2	44.57	45.15	,0765	89.0
19A 18	3	45.72	45.22	,0793	89.0
19A 18	9	44.40	44.02	,0790	89.0
19A 18	10	44.40	44.40	,0780	89.0
19A 18	18	44.23	43.56	,0798	89.0
19A 18	19	43.29	40.01	,0878	89.0
19A 18	20	55.46	59.35	,1020	89.0
19A 18	1	53.06	55.12	,1020	88.0
19A 18	2	44.57	45.15	,0765	88.0
19A 18	3	44.98	44.49	,0793	88.0
19A 18	9	44.15	43.77	,0790	88.0
19A 18	10	44.57	44.57	,0780	88.0
19A 18	18	44.23	43.56	,0798	88.0
19A 18	19	43.46	40.16	,0878	88.0
19A 18	20	55.04	58.95	,1020	88.0
19A 18	1	53.52	55.68	,1020	85.0
19A 18	2	44.88	45.47	,0765	85.0
19A 18	3	45.38	44.88	,0793	85.0
19A 18	9	44.72	44.34	,0790	85.0
19A 18	10	45.05	45.05	,0780	85.0
19A 18	18	45.38	44.69	,0798	85.0
19A 18	19	43.87	40.54	,0878	85.0
19A 18	20	55.98	58.95	,1020	85.0
19A 18	1	52.82	54.88	,1020	85.0
19A 18	2	44.63	45.21	,0765	85.0
19A 18	3	45.21	44.72	,0793	85.0
19A 18	9	44.38	44.00	,0790	85.0
19A 18	10	44.88	44.88	,0780	85.0
19A 18	18	45.21	44.53	,0798	85.0
19A 18	19	43.53	40.23	,0878	85.0
19A 18	20	55.17	58.87	,1020	85.0
19A 20	1	48.54	48.84	,1070	82.0
19A 20	2	43.17	43.73	,0765	82.0
19A 20	3	44.36	43.88	,0793	82.0
19A 20	9	43.88	43.48	,0790	82.0
19A 20	10	44.53	44.53	,0780	82.0
19A 20	18	43.17	42.52	,0798	82.0
19A 20	19	42.82	39.57	,0878	82.0
19A 20	20	50.05	54.90	,1070	82.0
19A 20	1	48.84	49.15	,1070	82.0
19A 20	2	43.34	43.91	,0765	82.0
19A 20	3	44.53	44.04	,0793	82.0
19A 20	9	44.03	43.65	,0790	82.0
19A 20	10	44.95	44.95	,0780	82.0
19A 20	18	43.34	42.69	,0798	82.0
19A 20	19	42.82	39.57	,0878	82.0
19A 20	20	50.20	52.06	,1070	82.0
19A 20	1	48.55	48.86	,1070	87.0
19A 20	2	44.04	44.62	,0765	87.0
19A 20	3	44.96	44.47	,0793	87.0
19A 20	9	44.38	44.00	,0790	87.0

19A 20	10	45.46	45.46	,0780	87.0
19A 20	18	43.70	43.04	,0798	87.0
19A 20	19	43.70	46.39	,0878	87.0
19A 20	20	51.83	53.75	,1070	87.0
19A 23	2	43.34	43.91	,0745	82.0
19A 23	3	44.78	44.29	,0793	82.0
19A 23	9	43.00	42.63	,0790	82.0
19A 23	10	44.95	44.95	,0780	82.0
19A 23	18	41.50	40.87	,0798	82.0
19A 23	19	41.86	38.68	,0878	82.0
19A 23	20	53.78	50.55	,1240	82.0
19A 23	2	43.27	43.84	,0765	85.0
19A 23	3	44.88	44.39	,0793	85.0
19A 23	9	43.27	42.91	,0790	85.0
19A 23	10	45.13	45.13	,0780	85.0
19A 23	18	41.42	40.80	,0798	85.0
19A 23	19	41.87	38.69	,0878	85.0
19A 23	20	54.76	51.47	,1240	85.0
19A 31	2	44.04	44.62	,0765	85.0
19A 31	3	43.87	43.39	,0793	85.0
19A 31	9	44.04	43.67	,0790	85.0
19A 31	10	44.88	44.88	,0780	85.0
19A 31	19	41.42	38.28	,0878	85.0
19A 31	20	48.25	48.82	,1110	85.0
19A 31	2	44.04	44.62	,0765	85.0
19A 31	3	43.70	43.22	,0793	85.0
19A 31	9	44.04	43.67	,0790	85.0
19A 31	10	44.88	44.88	,0780	85.0
19A 31	19	41.51	38.36	,0878	85.0
19A 31	20	48.40	48.98	,1110	85.0
19A 31	2	43.69	44.25	,0765	82.0
19A 31	3	43.69	43.21	,0793	82.0
19A 31	9	44.19	43.82	,0790	82.0
19A 31	10	44.86	44.86	,0780	82.0
19A 31	19	41.68	38.51	,0878	82.0
19A 31	20	48.54	49.12	,1110	82.0
19A 31	2	43.69	44.25	,0765	82.0
19A 31	3	43.86	43.37	,0793	82.0
19A 31	9	44.03	43.65	,0790	82.0
19A 31	10	44.86	44.86	,0780	82.0
19A 31	19	41.50	38.35	,0878	82.0
19A 31	20	48.38	48.96	,1110	82.0
18A 16	1	51.70	51.07	,1100	89.0
18A 16	2	38.35	44.27	,0629	89.0
18A 16	3	45.72	44.96	,0800	89.0
18A 16	9	41.71	40.47	,0816	89.0
18A 16	10	43.81	43.07	,0800	89.0
18A 16	18	44.23	42.99	,0814	89.0
18A 16	19	44.40	41.18	,0873	89.0
18A 16	20	52.70	53.68	,1100	89.0
18A 16	1	51.70	51.07	,1100	89.0
18A 16	2	38.35	44.27	,0629	89.0
18A 16	3	45.72	44.96	,0800	89.0
18A 16	9	41.89	40.65	,0816	89.0
18A 16	10	43.81	43.07	,0800	89.0
18A 16	18	44.23	42.99	,0814	89.0
18A 16	19	44.40	41.18	,0873	89.0
18A 16	20	44.57	45.37	,1100	89.0
18A 16	1	51.85	51.72	,1100	88.0
18A 16	2	38.55	44.50	,0629	88.0
18A 16	3	45.89	45.12	,0800	88.0
18A 16	9	41.98	40.73	,0816	88.0
18A 16	10	44.06	43.32	,0800	88.0
18A 16	18	44.23	42.99	,0814	88.0
18A 16	19	44.40	41.18	,0873	88.0
18A 16	20	44.57	45.37	,1100	88.0
18A 16	1	52.11	52.28	,1100	85.0
18A 16	2	39.20	45.25	,0629	85.0
18A 16	3	46.19	45.42	,0800	85.0
18A 16	9	42.67	41.40	,0816	85.0
18A 16	10	44.38	43.64	,0800	85.0
18A 16	18	44.88	43.62	,0814	85.0
18A 16	19	44.88	41.63	,0873	85.0
18A 16	20	44.72	45.53	,1100	85.0
18A 16	1	51.25	50.62	,1100	85.0
18A 16	2	38.92	44.92	,0629	85.0
18A 16	3	46.03	45.76	,0800	85.0
18A 16	9	42.40	41.15	,0816	85.0
18A 16	10	44.38	43.64	,0800	85.0
18A 16	18	44.63	43.38	,0814	85.0
18A 16	19	44.63	41.40	,0873	85.0
18A 16	20	44.38	45.18	,1100	85.0
18A 16	1	52.09	51.46	,1100	82.0
18A 16	2	38.32	44.24	,0629	82.0
18A 16	3	41.68	40.98	,0800	82.0
18A 16	9	42.03	40.79	,0816	82.0
18A 16	18	44.19	42.95	,0814	82.0
18A 16	19	47.29	43.87	,0873	82.0

18A 16	20	40.68	41.42	.1100	82.0
18A 16	1	52.09	51.44	.1100	82.0
18A 16	2	38.52	44.46	.0629	82.0
18A 16	3	41.86	41.15	.0800	82.0
18A 16	9	42.03	40.79	.0816	82.0
18A 16	18	44.19	42.95	.0814	82.0
18A 16	19	47.60	44.16	.0873	82.0
18A 16	20	40.86	41.60	.1100	82.0
18A 16	1	52.96	52.32	.1100	87.0
18A 16	2	39.01	45.03	.0629	87.0
18A 16	3	45.95	45.18	.0800	87.0
18A 16	9	42.23	40.97	.0816	87.0
18A 16	10	44.55	43.80	.0800	87.0
18A 16	18	45.13	43.86	.0814	87.0
18A 16	19	47.78	44.32	.0873	87.0
18A 16	20	41.51	42.27	.1100	87.0
18A 7	1	56.75	54.44	.1160	82.0
18A 7	2	38.32	44.24	.0629	82.0
18A 7	3	45.61	44.84	.0800	82.0
18A 7	9	44.36	43.05	.0816	82.0
18A 7	10	44.53	43.78	.0800	82.0
18A 7	18	40.13	39.00	.0814	82.0
18A 7	19	47.29	43.87	.0873	82.0
18A 7	1	56.64	54.00	.1160	85.0
18A 7	2	38.34	44.25	.0629	85.0
18A 7	3	45.79	45.02	.0800	85.0
18A 7	9	44.38	43.06	.0816	85.0
18A 7	10	44.55	43.80	.0800	85.0
18A 7	18	40.88	39.73	.0814	85.0
18A 7	19	47.47	44.03	.0873	85.0
7B 19	1	56.13	50.89	.1000	89.0
7B 19	2	40.16	40.58	.0768	89.0
7B 19	3	42.51	42.76	.0773	89.0
7B 19	9	44.57	44.00	.0795	89.0
7B 19	10	42.68	42.29	.0791	89.0
7B 19	18	43.63	42.52	.0811	89.0
7B 19	19	44.73	42.31	.0848	89.0
7B 19	20	51.41	55.78	.1000	89.0
7B 19	1	56.00	58.95	.1000	89.0
7B 19	2	39.97	40.39	.0768	89.0
7B 19	3	42.68	42.94	.0773	89.0
7B 19	9	44.57	44.00	.0795	89.0
7B 19	10	42.68	42.29	.0791	89.0
7B 19	18	43.63	42.52	.0811	89.0
7B 19	19	44.73	42.31	.0848	89.0
7B 19	20	51.41	55.78	.1000	89.0
7B 19	1	56.07	59.82	.1000	88.0
7B 19	2	39.79	40.20	.0768	88.0
7B 19	3	42.33	42.59	.0773	88.0
7B 19	9	44.06	43.50	.0795	88.0
7B 19	10	42.51	42.11	.0791	88.0
7B 19	18	43.81	42.68	.0811	88.0
7B 19	19	44.73	42.31	.0848	88.0
7B 19	20	50.68	54.00	.1000	88.0
7B 19	1	55.84	58.79	.1000	85.0
7B 19	2	39.98	40.37	.0768	85.0
7B 19	3	42.84	43.10	.0773	85.0
7B 19	9	44.72	44.15	.0795	85.0
7B 19	10	40.33	39.95	.0791	85.0
7B 19	18	44.21	43.08	.0811	85.0
7B 19	19	45.21	42.76	.0848	85.0
7B 19	20	46.99	50.98	.1000	85.0
7B 19	1	55.17	58.88	.1000	85.0
7B 19	2	39.77	40.18	.0768	85.0
7B 19	3	42.67	42.92	.0773	85.0
7B 19	9	44.72	44.15	.0795	85.0
7B 19	10	40.05	39.68	.0791	85.0
7B 19	18	43.79	42.66	.0811	85.0
7B 19	19	45.21	42.76	.0848	85.0
7B 19	20	46.75	50.78	.1000	85.0
7B 19	1	53.85	56.60	.1000	82.0
7B 19	2	39.94	40.36	.0768	82.0
7B 19	3	43.08	43.26	.0773	82.0
7B 19	10	43.34	42.94	.0791	82.0
7B 19	18	43.69	42.56	.0811	82.0
7B 19	19	45.11	42.67	.0848	82.0
7B 19	20	47.60	51.69	.1000	82.0
7B 19	1	54.40	57.27	.1000	82.0
7B 19	2	39.75	40.17	.0768	82.0
7B 19	3	43.00	43.26	.0773	82.0
7B 19	10	43.51	43.11	.0791	82.0
7B 19	18	43.86	42.73	.0811	82.0
7B 19	19	45.11	42.67	.0848	82.0
7B 19	20	47.92	51.99	.1000	82.0
7B 19	1	55.84	58.79	.1000	87.0
7B 19	2	40.33	40.75	.0768	87.0
7B 19	3	43.36	43.62	.0773	87.0
7B 19	9	45.62	45.05	.0795	87.0
7B 19	10	45.62	45.20	.0791	87.0

7B 19	18	43.36	42.25	.0811	87.0
7B 19	19	45.62	43.15	.0848	87.0
7B 19	20	50.22	54.48	.1000	87.0
7B 39	1	60.31	61.88	.1040	82.0
7B 39	2	39.19	39.59	.0768	82.0
7B 39	3	40.68	40.93	.0773	82.0
7B 39	9	42.87	42.28	.0795	82.0
7B 39	10	41.68	41.29	.0791	82.0
7B 39	18	42.21	41.13	.0811	82.0
7B 39	20	43.34	45.81	.1040	82.0
7B 39	1	61.68	63.28	.1040	85.0
7B 39	2	38.92	39.32	.0768	85.0
7B 39	3	40.51	40.76	.0773	85.0
7B 39	9	42.58	42.04	.0795	85.0
7B 39	10	41.42	41.04	.0791	85.0
7B 39	18	42.23	41.14	.0811	85.0
7B 39	20	46.99	49.67	.1040	85.0
11A 1	20	37.07	41.32	.0960	89.0
11A 1	20	38.93	43.41	.0960	89.0
11A 1	20	39.79	44.36	.0960	89.0
11A 1	20	37.07	41.32	.0960	89.0
11A 1	20	38.93	43.41	.0960	89.0
11A 1	20	39.79	44.36	.0960	89.0
11A 1	20	37.37	41.66	.0960	88.0
11A 1	20	38.93	43.41	.0960	88.0
11A 1	20	40.16	44.77	.0960	88.0
11A 1	20	38.82	43.28	.0960	85.0
11A 1	20	40.33	44.96	.0960	85.0
11A 1	20	40.51	45.17	.0960	85.0
11A 1	20	38.92	43.39	.0960	85.0
11A 1	20	40.05	44.65	.0960	85.0
11A 1	20	40.05	44.65	.0960	85.0
11A 1	20	37.34	41.63	.0960	82.0
11A 1	20	39.57	44.11	.0960	82.0
11A 1	20	39.19	43.69	.0960	82.0
11A 1	20	37.34	41.63	.0960	82.0
11A 1	20	39.57	44.11	.0960	82.0
11A 1	20	39.19	43.69	.0960	82.0
11A 1	20	37.91	42.26	.0960	87.0
11A 1	20	39.85	44.42	.0960	87.0
11A 1	20	39.68	44.23	.0960	87.0
11A 1	20	38.52	42.94	.0960	82.0
11A 1	20	40.31	44.94	.0960	82.0
11A 1	20	40.31	44.94	.0960	82.0
11A 1	20	39.30	43.81	.0960	85.0
11A 1	20	40.84	45.54	.0960	85.0
11A 1	20	40.51	45.17	.0960	85.0
2B 10	1	56.00	56.00	.1080	89.0
2B 10	20	44.23	45.59	.1080	89.0
2B 10	1	56.00	56.00	.1080	89.0
2B 10	20	44.23	45.59	.1080	89.0
2B 10	1	53.89	53.89	.1080	88.0
2B 10	20	44.04	45.41	.1080	88.0
2B 10	1	55.04	55.04	.1080	85.0
2B 10	20	44.04	45.39	.1080	85.0
2B 10	1	54.35	54.35	.1080	85.0
2B 10	20	43.79	45.13	.1080	85.0
2B 10	1	53.85	53.85	.1080	82.0
2B 10	20	43.69	45.02	.1080	82.0
2B 10	1	53.85	53.85	.1080	82.0
2B 10	20	43.69	45.02	.1080	82.0
2B 10	1	55.58	55.58	.1080	87.0
2B 10	20	44.04	45.39	.1080	87.0
2B 10	1	55.28	55.28	.1080	82.0
2B 10	20	43.17	44.49	.1080	82.0
2B 10	1	55.17	55.17	.1080	85.0
2B 10	20	43.27	44.60	.1080	85.0
18B 15	1	49.79	46.67	.1190	89.0
18B 15	20	32.33	31.23	.1190	89.0
18B 15	1	49.79	46.67	.1190	89.0
18B 15	20	32.79	31.68	.1190	89.0
18B 15	1	49.79	46.67	.1190	88.0
18B 15	20	31.63	30.56	.1190	88.0
18B 15	1	50.22	47.07	.1190	85.0
18B 15	20	31.85	30.77	.1190	85.0
18B 15	1	49.32	46.23	.1190	85.0
18B 15	20	31.38	30.32	.1190	85.0
18B 15	1	48.54	45.49	.1190	82.0
18B 15	20	27.71	26.77	.1190	82.0
18B 15	1	48.54	45.49	.1190	82.0
18B 15	20	26.89	25.98	.1190	82.0
18B 15	1	49.45	46.35	.1190	82.0
18B 15	20	25.32	24.46	.1190	82.0
18B 15	1	49.90	46.77	.1190	82.0
18B 15	20	24.42	23.59	.1190	82.0
18B 15	1	49.92	46.79	.1190	85.0
18B 15	20	24.88	24.04	.1190	85.0
11C 31	1	52.84	56.00	.0990	89.0

11C 31	20	36.04	39.37	.0990	89.0
11C 31	1	52.70	55.85	.0990	89.0
11C 31	20	36.04	39.37	.0990	89.0
11C 31	1	52.77	55.93	.0990	88.0
11C 31	20	35.84	39.14	.0990	88.0
11C 31	1	54.22	57.46	.0990	85.0
11C 31	20	36.85	40.25	.0990	85.0
11C 31	1	53.39	56.58	.0990	85.0
11C 31	20	36.24	39.58	.0990	85.0
11C 32	1	53.85	62.20	.0870	82.0
11C 32	20	37.34	44.45	.0870	82.0
11C 32	1	53.99	62.36	.0870	82.0
11C 32	20	37.14	44.21	.0870	82.0
11C 32	1	55.04	63.57	.0870	87.0
11C 32	20	37.35	44.47	.0870	87.0
25C 36	1	55.87	57.29	.1040	89.0
25C 36	20	28.66	30.29	.1040	89.0
25C 36	1	55.73	57.15	.1040	89.0
25C 36	20	28.66	30.29	.1040	89.0
25C 36	1	56.20	57.63	.1040	88.0
25C 36	20	27.60	29.17	.1040	88.0
25C 36	1	56.24	57.68	.1040	85.0
25C 36	20	30.66	32.41	.1040	85.0
25C 36	1	55.44	56.86	.1040	85.0
25C 36	20	29.92	31.62	.1040	85.0
25C 39	1	53.15	54.16	.1050	82.0
25C 39	20	41.32	43.67	.1040	82.0
25C 39	1	53.29	54.30	.1050	82.0
25C 39	20	41.50	43.86	.1040	82.0
25C 39	1	54.22	55.25	.1050	87.0
25C 39	20	40.33	42.62	.1040	87.0
25C 40	1	51.80	52.45	.1060	82.0
25C 40	20	47.37	49.43	.1060	82.0
25C 40	1	51.83	52.48	.1060	85.0
25C 40	20	46.83	48.87	.1060	85.0

115PSID--REACTOR PRESSURE DROP

REACTOR POSITION CHANNEL NO. MEASURED VELOCITY CORRECTED VELOCITY CHANNEL THICKNESS WATER TEMP.

REACTOR POSITION	CHANNEL NO.	MEASURED VELOCITY	CORRECTED VELOCITY	CHANNEL THICKNESS	WATER TEMP.
24A 18	1	51.97	48.99	.1180	85.0
24A 18	2	44.90	44.29	.0796	85.0
24A 18	3	45.08	45.08	.0780	85.0
24A 18	9	41.59	42.13	.0765	85.0
24A 18	10	42.31	41.75	.0796	85.0
24A 18	18	41.39	41.46	.0778	85.0
24A 18	19	50.22	48.45	.0823	85.0
24A 18	20	52.40	50.91	.1180	85.0
24A 18	1	53.82	50.73	.1180	86.0
24A 18	2	45.38	44.77	.0796	86.0
24A 18	3	45.79	45.79	.0780	86.0
24A 18	9	42.24	42.80	.0765	86.0
24A 18	10	42.60	42.02	.0796	86.0
24A 18	18	41.93	42.00	.0778	86.0
24A 18	19	49.84	48.09	.0823	86.0
24A 18	20	50.29	48.86	.1180	86.0
24A 18	1	53.82	50.73	.1180	86.0
24A 18	2	45.46	44.85	.0796	86.0
24A 18	3	45.79	45.79	.0780	86.0
24A 18	9	42.24	42.80	.0765	86.0
24A 18	10	42.77	42.20	.0796	86.0
24A 18	18	41.76	41.84	.0778	86.0
24A 18	19	49.84	48.09	.0823	86.0
24A 18	20	50.44	49.00	.1180	86.0
24A 18	1	53.01	49.97	.1180	87.5
24A 18	2	44.98	44.38	.0796	87.5
24A 18	3	45.64	45.64	.0780	87.5
24A 18	9	42.10	42.65	.0765	87.5
24A 18	10	42.26	41.69	.0796	87.5
24A 18	18	41.58	41.66	.0778	87.5
24A 18	19	49.71	47.97	.0823	87.5
24A 18	20	53.01	51.50	.1180	87.5
24A 18	1	52.39	49.37	.1180	82.0
24A 18	2	45.23	44.62	.0796	82.0
24A 18	3	46.34	46.34	.0780	82.0
24A 18	9	42.86	43.42	.0765	82.0
24A 18	10	42.68	42.11	.0796	82.0
24A 18	18	42.12	42.19	.0778	82.0
24A 18	19	50.20	48.43	.0823	82.0
24A 18	20	51.23	49.77	.1180	82.0
24A 20	1	48.09	42.94	.1280	84.0
24A 20	3	46.19	46.19	.0780	84.0
24A 20	9	41.60	42.15	.0765	84.0
24A 20	10	41.78	41.22	.0796	84.0
24A 20	18	40.88	40.95	.0778	84.0
24A 20	19	48.40	46.70	.0823	84.0
24A 20	20	46.03	42.36	.1280	84.0
24A 20	1	49.32	44.03	.1280	84.0
24A 20	3	46.19	46.19	.0780	84.0
24A 20	9	42.49	43.04	.0765	84.0
24A 20	10	42.49	41.92	.0796	84.0
24A 20	18	41.96	42.03	.0778	84.0
24A 20	19	49.17	47.44	.0823	84.0
24A 20	20	46.83	43.10	.1280	84.0
19A 18	1	57.32	59.55	.1020	84.0
19A 18	2	47.78	48.40	.0765	84.0
19A 18	3	48.55	48.02	.0793	84.0
19A 18	9	47.47	47.07	.0790	84.0
19A 18	10	48.09	48.09	.0780	84.0
19A 18	18	48.25	47.52	.0798	84.0
19A 18	19	46.99	43.43	.0878	84.0
19A 18	20	59.34	63.54	.1020	84.0
19A 18	1	57.96	60.21	.1020	84.0
19A 18	2	48.71	49.34	.0765	84.0
19A 18	3	49.32	48.78	.0793	84.0
19A 18	9	49.01	48.60	.0790	84.0
19A 18	10	48.86	48.86	.0780	84.0
19A 18	18	47.47	46.75	.0798	84.0
19A 18	19	47.62	44.01	.0878	84.0
19A 18	20	60.33	64.59	.1020	84.0
19A 20	1	52.28	52.61	.1070	86.0
19A 20	2	46.11	46.71	.0765	86.0
19A 20	3	47.39	46.87	.0793	86.0
19A 20	9	47.07	46.67	.0790	86.0
19A 20	10	47.86	47.86	.0780	86.0
19A 20	18	45.95	45.26	.0798	86.0
19A 20	19	46.27	42.76	.0878	86.0
19A 20	20	53.82	55.81	.1070	86.0
19A 20	1	52.28	52.61	.1070	86.0
19A 20	2	46.11	46.71	.0765	86.0
19A 20	3	47.39	46.87	.0793	86.0
19A 20	9	47.07	46.67	.0790	86.0

19A 20	10	48.01	48.01	.0780	86.0
19A 20	18	46.27	45.57	.0798	86.0
19A 20	19	46.27	42.76	.0878	86.0
19A 20	20	53.82	55.81	.1070	86.0
19A 20	1	51.63	51.95	.1070	87.5
19A 20	2	46.13	46.73	.0765	87.5
19A 20	3	47.25	46.73	.0793	87.5
19A 20	9	47.09	46.69	.0790	87.5
19A 20	10	48.03	48.03	.0780	87.5
19A 20	18	46.13	45.43	.0798	87.5
19A 20	19	45.64	42.18	.0878	87.5
19A 20	20	54.92	56.96	.1070	87.5
19A 23	2	47.21	47.83	.0765	82.0
19A 23	3	48.23	47.70	.0793	82.0
19A 23	9	47.45	47.05	.0790	82.0
19A 23	10	48.23	48.23	.0780	82.0
19A 23	18	44.70	44.02	.0798	82.0
19A 23	19	45.05	41.63	.0878	82.0
19A 23	20	58.29	54.79	.1240	82.0
19A 23	2	46.32	46.93	.0765	85.0
19A 23	3	47.94	47.41	.0793	85.0
19A 23	9	47.20	46.80	.0790	85.0
19A 23	10	49.77	49.77	.0780	85.0
19A 23	18	44.70	44.02	.0798	85.0
19A 23	19	44.88	41.48	.0878	85.0
19A 23	20	56.60	53.20	.1240	85.0
18A 7	1	60.19	57.39	.1160	82.0
18A 7	2	41.55	47.96	.0629	82.0
18A 7	3	48.84	48.02	.0800	82.0
18A 7	9	47.92	46.50	.0816	82.0
18A 7	10	47.92	47.11	.0800	82.0
18A 7	18	43.97	42.74	.0814	82.0
18A 7	19	50.64	46.97	.0873	82.0
18A 7	1	59.72	56.94	.1160	85.0
18A 7	2	41.39	47.78	.0629	85.0
18A 7	3	48.86	48.04	.0800	85.0
18A 7	9	47.62	46.21	.0816	85.0
18A 7	10	47.78	46.98	.0800	85.0
18A 7	18	43.79	42.56	.0814	85.0
18A 7	19	51.39	47.67	.0873	85.0
18A 16	1	55.40	54.73	.1100	84.0
18A 16	2	41.60	48.02	.0629	84.0
18A 16	3	49.47	48.64	.0800	84.0
18A 16	9	45.54	44.19	.0816	84.0
18A 16	10	47.47	46.67	.0800	84.0
18A 16	18	47.78	46.44	.0814	84.0
18A 16	19	47.62	44.18	.0873	84.0
18A 16	20	47.47	48.33	.1100	84.0
18A 16	1	56.03	55.35	.1100	84.0
18A 16	2	42.49	49.05	.0629	84.0
18A 16	3	50.22	49.38	.0800	84.0
18A 16	9	46.33	44.98	.0816	84.0
18A 16	10	48.25	47.44	.0800	84.0
18A 16	18	48.71	47.34	.0814	84.0
18A 16	19	48.40	44.90	.0873	84.0
18A 16	20	48.55	49.43	.1100	84.0
18A 16	1	56.11	55.43	.1100	86.0
18A 16	2	41.03	47.36	.0629	86.0
18A 16	3	43.96	43.22	.0800	86.0
18A 16	9	45.13	43.79	.0816	86.0
18A 16	18	47.42	46.09	.0814	86.0
18A 16	19	51.01	47.30	.0873	86.0
18A 16	20	43.79	44.58	.1100	86.0
18A 16	1	56.11	55.43	.1100	86.0
18A 16	2	41.03	47.36	.0629	86.0
18A 16	3	44.46	43.72	.0800	86.0
18A 16	9	44.96	43.63	.0816	86.0
18A 16	18	47.39	46.06	.0814	86.0
18A 16	19	50.88	47.20	.0873	86.0
18A 16	20	43.70	44.49	.1100	86.0
18A 16	1	56.27	55.58	.1100	87.5
18A 16	2	41.40	47.79	.0629	87.5
18A 16	3	48.65	47.84	.0800	87.5
18A 16	9	44.82	43.49	.0816	87.5
18A 16	10	47.09	46.30	.0800	87.5
18A 16	18	47.41	46.08	.0814	87.5
18A 16	19	51.05	47.35	.0873	87.5
18A 16	20	44.15	44.94	.1100	87.5
7R 19	1	59.23	62.35	.1000	84.0
7R 19	2	42.67	43.11	.0768	84.0
7R 19	3	45.71	45.98	.0773	84.0
7R 19	9	47.62	47.02	.0795	84.0
7R 19	10	43.01	42.61	.0791	84.0
7R 19	18	47.15	45.94	.0811	84.0
7R 19	19	48.25	45.63	.0948	84.0
7R 19	20	49.47	53.67	.1000	84.0
7R 19	1	59.97	63.13	.1000	84.0

7R 19	2	43.53	43.98	.0768	84.0
7R 19	3	46.51	46.79	.0773	84.0
7R 19	9	48.71	48.09	.0795	84.0
7R 19	10	44.04	43.63	.0791	84.0
7R 19	18	48.09	46.86	.0811	84.0
7R 19	19	49.32	46.64	.0848	84.0
7R 19	20	50.81	55.12	.1000	94.0
7R 19	1	58.79	61.88	.1000	86.0
7R 19	2	42.60	43.04	.0768	86.0
7R 19	3	45.95	46.23	.0773	86.0
7R 19	10	46.59	46.16	.0791	86.0
7R 19	18	46.91	45.71	.0811	86.0
7R 19	19	48.17	45.56	.0848	86.0
7R 19	20	54.53	59.16	.1000	86.0
7R 19	1	58.54	61.63	.1000	86.0
7R 19	2	42.60	43.04	.0768	86.0
7R 19	3	45.95	46.23	.0773	86.0
7R 19	9	48.01	47.41	.0795	86.0
7R 19	10	46.43	46.00	.0791	86.0
7R 19	18	46.75	45.55	.0811	86.0
7R 19	19	48.17	45.56	.0848	86.0
7R 19	20	51.87	56.27	.1000	86.0
7R 19	1	58.82	61.92	.1000	87.5
7R 19	2	42.63	43.07	.0768	87.5
7R 19	3	45.97	46.25	.0773	87.5
7R 19	10	47.09	46.65	.0791	87.5
7R 19	18	46.93	45.73	.0811	87.5
7R 19	19	47.88	45.28	.0848	87.5
7R 19	20	53.56	58.11	.1000	87.5
7R 39	1	62.68	64.28	.1040	82.0
7R 39	2	42.49	42.93	.0768	82.0
7R 39	3	43.96	44.22	.0773	82.0
7R 39	9	46.50	45.91	.0795	82.0
7R 39	10	44.70	44.28	.0791	82.0
7R 39	18	47.01	45.80	.0811	82.0
7R 39	20	50.34	53.21	.1040	82.0
7R 39	1	63.61	65.24	.1040	85.0
7R 39	2	42.14	42.58	.0768	85.0
7R 39	3	43.26	43.52	.0773	85.0
7R 39	9	45.62	45.05	.0795	85.0
7R 39	10	44.35	43.93	.0791	85.0
7R 39	18	45.26	44.10	.0811	85.0
7R 39	20	50.36	53.23	.1040	85.0
11A 1	20	41.62	46.40	.0960	82.0
11A 1	20	43.24	48.21	.0960	82.0
11A 1	20	43.05	47.99	.0960	82.0
11A 1	20	41.55	46.32	.0960	84.0
11A 1	20	43.07	48.01	.0960	84.0
11A 1	20	43.43	48.42	.0960	84.0
11A 1	20	41.33	46.08	.0960	84.0
11A 1	20	43.07	48.01	.0960	84.0
11A 1	20	43.62	48.63	.0960	84.0
11A 1	20	41.59	46.36	.0960	85.0
11A 1	20	43.62	48.63	.0960	85.0
11A 1	20	43.07	48.01	.0960	85.0
11A 1	20	39.75	44.32	.0960	86.0
11A 1	20	41.93	46.74	.0960	86.0
11A 1	20	41.75	46.54	.0960	86.0
11A 1	20	39.75	44.32	.0960	86.0
11A 1	20	41.93	46.74	.0960	86.0
11A 1	20	41.75	46.54	.0960	86.0
11A 1	20	38.24	42.63	.0960	87.5
11A 1	20	41.76	46.56	.0960	87.5
11A 1	20	41.76	46.56	.0960	87.5
2R 10	1	58.69	58.69	.1080	82.0
2R 10	20	45.77	47.17	.1080	82.0
2R 10	1	58.35	58.35	.1080	84.0
2R 10	20	46.35	47.77	.1080	84.0
2R 10	1	59.22	59.22	.1080	84.0
2R 10	20	47.15	48.60	.1080	84.0
2R 10	1	44.90	44.90	.1080	85.0
2R 10	20	45.62	47.02	.1080	85.0
2R 10	1	58.29	58.29	.1080	86.0
2R 10	20	46.27	47.69	.1080	86.0
2R 10	1	58.06	58.06	.1080	86.0
2R 10	20	46.43	47.86	.1080	86.0
2R 10	1	58.81	58.81	.1080	87.5
2R 10	20	46.13	47.54	.1080	87.5
18R 15	1	22.84	21.41	.1190	82.0
18R 15	20	12.81	12.37	.1190	82.0
18R 15	1	53.51	50.16	.1190	84.0
18R 15	20	32.32	31.22	.1190	84.0
18R 15	1	54.19	50.79	.1190	84.0
18R 15	20	33.68	32.53	.1190	84.0
18R 15	1	53.52	50.17	.1190	85.0
18R 15	20	26.90	25.99	.1190	85.0
18R 15	1	52.43	49.14	.1190	86.0

18R 15	20	28.78	27.80	.1190	86.0
18R 15	1	52.43	49.14	.1190	86.0
18H 15	20	27.86	26.91	.1190	86.0
18R 15	1	52.87	49.56	.1190	87.5
18R 15	20	26.77	25.87	.1190	87.5
11C 31	1	57.71	61.16	.0990	84.0
11C 31	20	38.97	42.57	.0990	84.0
11C 31	1	58.34	61.83	.0990	84.0
11C 31	20	39.94	43.62	.0990	84.0
11C 32	1	59.69	68.95	.0870	82.0
11C 32	20	39.85	47.44	.0870	82.0
11C 32	1	60.34	69.70	.0870	85.0
11C 32	20	40.24	47.90	.0870	85.0
11C 32	1	58.54	67.63	.0870	86.0
11C 32	20	39.94	47.55	.0870	86.0
11C 32	1	58.67	67.77	.0870	86.0
11C 32	20	39.85	47.44	.0870	86.0
11C 32	1	58.57	67.65	.0870	87.5
11C 32	20	39.58	47.12	.0870	87.5
25C 36	1	59.73	61.25	.1040	84.0
25C 36	20	31.85	33.67	.1040	84.0
25C 36	1	60.59	62.13	.1040	84.0
25C 36	20	33.27	35.17	.1040	84.0
25C 39	1	57.80	58.90	.1050	86.0
25C 39	20	43.45	45.92	.1040	86.0
25C 39	1	57.80	58.90	.1050	86.0
25C 39	20	43.45	45.92	.1040	86.0
25C 39	1	57.82	58.92	.1050	87.5
25C 39	20	42.63	45.06	.1040	87.5
25C 40	1	55.33	56.02	.1060	82.0
25C 40	20	50.20	52.38	.1060	82.0
25C 40	1	57.27	57.99	.1060	85.0
25C 40	20	50.07	52.25	.1060	85.0