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EXPERIMENT DATA OF ROSA-III INTEGRAL

TEST RUN 913

(15% SPLIT BREAK WITHOUT HPCS ACTUATION)

September 1989

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This report presents the experimental data of RUN 913, a 15% split break test at the recirculation pump suction line. The ROSA-III test facility is a volumetrically scaled (1/424) model for the BWR/6. The facility has the electrically heated core, the break simulator and the scaled ECCS (Emergency Core Cooling System). The MSIV closure and the ECCS actuation are tripped by the liquid level in the upper downcomer as well as the BWR. The test was conducted successfully and important data base was obtained to assess the predictability of the LOCA analysis code.

Keywords: BWR, LOCA, ECCS, Integral Test, ROSA-III Program, 15% split Break, PCT, Fuel Assembly No. 4, Data Report

ROSA - III 総合実験 Run 913 実験データ
(HPCS 不作動 15 % スプリット破断)

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本報は、再循環ポンプ入口配管における 15 % 破断実験 Run 913 の実験結果について述べるものである。ROSA - III 装置は、BWR/6 の体積比 1/424 の模擬装置である。本装置は、電気加熱炉心、破断模擬装置、及び緊急炉心冷却系 (ECCS) を有している。MSIV の閉止及び ECCS の作動は BWR と同様に上部アッパーダウンカマーの水位信号によりトリップされる。実験は成功し LOCA 解析コードの予測性能を評価するための重要なデータが得られた。

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ABBREVIATIONS

| | |
|----------|---|
| ADS | Automatic Depressurization System |
| AT | Air Tank |
| AV | Air Actuation Valve |
| (2)B | (2) inches pipe of Schedule 80 |
| BN | Boron Nitride |
| BWR | Boiling Water Reactor |
| CA | Chromel-Alumel |
| CCFL | Counter Current Flow Limiting |
| CHV | Check Valve |
| CP | Conductivity Probe |
| CV | Control Valve |
| CWT | Cooling Water Tank |
| D | Differential Pressure |
| d | Diameter |
| DF | Density of Fluid |
| DL(+100) | Elevation (+100 mm) from the bottom of PV |
| ECCS | Emergency Core Cooling System |
| ESF | Engineered Safety Features |
| EX | Heat Exchanger |
| F | Flow Rate |
| Fig. | Figure |
| FS | Full Scale |
| FW | Feedwater |
| FWLF | Feedwater Line Flashing |
| FWP | Feedwater Pump |
| FWT | Feedwater Tank |
| HPCS | High Pressure Core Spray |
| HPCSP | High Pressure Core Spray Pump |
| HPCST | High Pressure Core Spray Tank |
| HPWP | High Pressure Water Pump |
| ID | Inner diameter |
| INC 600 | Inconel 600 |
| JP | Jet Pump |
| K | Kelvin |
| kg | Kilogram |

| | |
|-------|-------------------------------------|
| kPa | Kilopascal |
| kW | Kilowatt |
| L | Liter |
| LB | Liquid Level in Channel Box |
| LBWR | Large Boiling Water Reactor |
| LL | Liquid Level |
| LOCA | Loss-of-Coolant Accident |
| LOCE | Loss-of-Coolant Experiment |
| LP | Lower Plenum |
| LPCI | Low Pressure Coolant Injection |
| LPCIP | Low Pressure Coolant Injection Pump |
| LPCIT | Low Pressure Coolant Injection Tank |
| LPCS | Low Pressure Core Spray |
| LPCSP | Low Pressure Core Spray Pump |
| LPCST | Low Pressure Core Spray Tank |
| LPF | Lower Plenum Flashing |
| LTP | Lower Tie Plate |
| M | Momentum Flux |
| m | Meter |
| mm | Milimeter |
| MLHR | Maximum Linear Heat Rate |
| MPa | Megapascal |
| MRP | Main Recirculation Pump |
| MSIV | Main Steam Isolation Valve |
| MSL | Main Steam Line |
| MW | Megawatt |
| N | Rotation Speed |
| OR | Orifice |
| P | Pressure |
| | Power |
| PCT | Peak Cladding Temperature |
| PV | Pressure Vessel |
| PWT | Pure Water Tank |
| QOBV | Quick Opening Blowdown Valve |
| QSV | Quick Shut-off Valve |
| RCN | Rapid Condenser |
| ROSA | Rig of Safety Assessment |

| | |
|-----|-----------------------------------|
| rpm | Revolution per Minute |
| S | Signal |
| s | Second |
| Sch | Schedule |
| SUS | Stainless Steel |
| T | Temperature |
| T/C | Thermocouple |
| TC | Temperature of Fluid |
| TF | Temperature of Fuel |
| TS | Temperature of Structure Material |
| UTP | Upper Tie Plate |
| V | Valve |
| VF | Void Fraction |
| W | Watt |
| WL | Water Level |
| WSP | Water Supply Pump |

1. Introduction

The Rig of Safety Assessment (ROSA)-III program was initiated in 1976 to study the thermal-hydraulic behavior of a Boiling Water Reactor (BWR) during a postulated Loss of Coolant Accident (LOCA) with the Emergency Core Cooling System (ECCS) actuation and to provide the data base to evaluate the predictability of computer codes developed for reactor safety analysis. The ROSA-III test facility was fabricated in 1978 and consisted of the volumetrically scaled (1/424) primary system of a 3800 MW BWR/6-251 with the electrically heated core, the break simulator and the scaled ECCS⁽¹⁾.

Special emphasis is made on the following objectives in the ROSA-III program :

- (1) To obtain the system data required to improve and evaluate the analytical methods currently used to predict the LOCA response of large BWRs. The performance of the Engineered Safety Features (ESFs), with particular emphasis on ECCSs, and the quantitative margins of safety inherent in performance of the ESFs are of primary interest.
- (2) To identify and investigate any unexpected event(s) or threshold(s) in the response of either the plant or the ESFs and develop analytical techniques that adequately describe and account for such unexpected behavior.

The information acquired from Loss of Coolant Experiments (LOCEx) is thus used for evaluation and development of LOCA analytical methods and assessment for the qualitative margins of safety of ESFs in response to a LOCA.

RUN 913, conducted on May 28, 1981, simulated a 15% split break at the recirculation pump suction line with the assumption of a single failure of HPCS. The break configuration was a sharp-edged orifice.

The specific objectives of RUN 913 are as follows :

- (1) To obtain test data of a 15% split break test at the recirculation pump suction line without HPCS actuation.
- (2) To investigate effects of break flow area.
- (3) To investigate effects of a break geometry difference between the two

extream cases, a sharp-edged orifice and a long throat nozzle.

In this report, all the data obtained in RUN 913 are presented. The processed data like mass inventory in the pressure vessel are also given. Detailed discussions about test results including effects of the break geometry difference are available in the reference⁽⁶⁾.

2. ROSA-III Test Facility

The ROSA-III test facility is a volumetrically scaled (1/424) BWR system with an electrically heated core designed to study the response of the primary system, the core and the ECCS during the postulated LOCA. The test facility is instrumented such that various thermal-hydraulic parameters are measured and recorded during the test. Details of the instrumentation are described in Section 3.

The test facility consists of four subsystems. These subsystems are : (a) the pressure vessel, (b) the steam line and the feedwater line, (c) the recirculation loops and (d) the ECCS. Figures 2.1 through 2.3 illustrate configuration of the test facility, the pressure vessel internals and the piping schematics, respectively. Table 2.1 compares the major dimensions of the ROSA-III test facility to the corresponding dimensions of the reference BWR system.

The ROSA-III pressure vessel includes various components in it simulating the internal structures of the reactor vessel in the BWR system as shown in Fig. 2.4. The interior of the vessel is divided into the core, the lower plenum, the upper plenum, the downcomer annulus, the steam separator, the steam dome and the steam dryer. The core is consisted of four model fuel assemblies of half length and a control rod simulator. Each fuel assembly contains 62 heater rods (Fig. 2.5) and 2 water rods spaced in a 8 x 8 square array and supported by spacers and upper and lower tie plates. The heater rod is heated electrically with chopped cosine power distribution along the axis as shown in Fig. 2.6. The effective heated length is 1880 mm, one half of the active length of a BWR fuel rod. The electric power supplied to the model fuel assembly "A" is 1.4 times larger than the power supplied to each of the other assemblies. The heater rods in each assembly are divided into three groups in terms of heat generation rate as shown in Fig. 2.7. The relative power generation rate of a heater rod in each group is 1.1, 1.0, and 0.875 respectively. The orifice plates are inserted at the core inlet to control the core inlet flow⁽¹⁾.

The steam line is connected to the steam dome of the pressure vessel. A control valve is installed in the steam line to control the steam dome pressure in steady state before the initiation of the tests. The steam line has a branch in which the Automatic Depressurization System (ADS) is

installed. The operation of valves in the steam line is described in Sec. 4. The feedwater is supplied from the feedwater tank (FWT) through the feedwater line and the feedwater sparger below the steam separator.

Figure 2.8 shows the recirculation lines consisted of two loops. Each line is furnished with a pump and two jet pumps. The jet pumps are installed outside the pressure vessel to simulate the relative volume and the relative height to the core. Two break simulators and a Quick Shut-off Valve (QSV) are installed in one of these loops to simulate the various break conditions. Each break simulator consists of a nozzle or a orifice to determine the break size and a Quick Opening Blowdown Valve (QOBV) to initiate the test. The break mode (double-ended or split), the break size and the break location can be changed. The diameter of the largest nozzle and orifice available is 26.2 mm. Figure 2.8 shows two QOBVs, a QSV and flow nozzles installed upstream of the QOBVs. Several flow nozzles and orifices of different size are prepared to vary the break size.

The ROSA-III test facility is furnished with all kinds of the ECCS available in the BWR system, i.e., the High Pressure Core Spray (HPCS), the Low Pressure Core Spray (LPCS), the Low Pressure Coolant Injection (LPCI), and the Automatic Depressurization System (ADS). The HPCS and the LPCS provide the cooling water from the top of the core. The LPCI injects the cooling water into the core bypass. Each ECCS consists of a pump, a tank, piping, and a control system.

Reference (1) serves more detailed information on the facility.

3. Instrumentation

The instrumentation of the ROSA-III is designed to obtain thermal-hydraulic data during the simulated BWR LOCA. The data obtained from the experiments will contribute to the assessment of the analytical computer code. Table 3.1 summarizes instrumentation used in RUN 913.

Tables 3.2 and 3.3 show the measurement list of RUN 913 and the core instrumentation list, respectively. Instrumentation locations are shown in Fig. 3.1 through Fig. 3.7.

Typical measured parameters in the ROSA-III are pressure, differential pressure, flow rate, electric power, pump speed, fluid and metal temperatures, collapsed liquid level, two-phase mixture level, coolant fluid density, on-off type signals and so on.

Pressure and differential pressure transducers are two-wire, direct-current type which convert diaphragm displacement to electric capacitance. The pressure lead pipes are either the standard single, cylindrical pipes used in conjunction with condensate pots, or dual concentric cylinders capable of the circulation of cooling water to prevent flashing of the fluid.

The flow rate is measured either by an orifice or a venturi type flow meter depending on the fluid condition and measurement location.

The temperatures of the fluid, structural material and fuel rod cladding are measured with chromel-alumel thermocouples (CA T/C) of 1.6 or 0.5 mm \varnothing .

Liquid levels are measured by either differential pressure transducers, described above or needle type electrical conductivity probes (CP) developed in the ROSA-III program. The probes are distributed along the vessel height to detect the existence of water or vapor at different levels.

The electric power supplied to the simulated fuel rods is controlled to follow the predetermined function of time and measured by a fast response electric power meter.

Pump speed is measured by a pulse generator integral of the pump. On-off signals such as selected valve positions, decay heat and pump coast-down simulation initiations and so on are detected in order to record the exact actuation time.

Fluid density in the pipe is measured by means of gamma densitometers. Preliminary studies indicate that a three-beam densitometer should be used to determine the flow regime. Figures 3.7 and 3.8

show the beam directions of the three-beam and the two-beam gamma densitometers, respectively. The gamma-ray source is ^{137}Cs and the detector is a water cooled NaI(Tl) scintillation counter.

Momentum flux is measured by a drag disk as shown in Fig. 3.9. The combination of signals from a drag disk and a gamma densitometer is used to determine the two-phase flow rate as shown in Fig. 3.10.

The data acquisition system (DATAC 2000B, Iwasaki Tsushinki Co.) scans all the 700 channels of signals with the frequency up to 30 Hz. The data recorded on magnetic tape are processed by the FACOM M200 system computer at JAERI by off-line control. After evaluation, for example by comparing the initial and final pressure values with standard values, the data is reprocessed using the correct conversion factors as determined from the consistency examination.

More detailed information on the instrumentation and the data processing procedure are available in reference (2).

4. Test Conditions and Procedure

RUN 913 was a 15% split break test at the recirculation pump suction in the recirculation line. The break area was determined by inserting a sharp-edged orifice upstream of the QOBV as shown in Figs. 4.1 and 3.9. Blowdown was initiated by opening the QOBV. The initial conditions of the test were as follows: the steam dome pressure was 7.39 MPa, the lower plenum temperature was 551 K giving the subcooling of 11 K, the core inlet flow rate was 16.1 kg/s, the core heat generating rate was 3.978 MW. The estimated quality at the core outlet was 12.2%. The detailed conditions are summarized in Table 4.1.

To conduct the test, makeup water (pure water) was pumped into the primary system of the test facility and electric power was supplied to the core to heat the water in the system and to achieve the saturation condition in the upper portion of the pressure vessel. The core power was 3.978 MW before the break initiation and was 44% of the steady state power 9 MW based on the conservation of the power to volume ratio in the reference BWR. The core power was changed during the transient after the break initiation as shown in Fig. 4.2. The power was kept constant for the first 9.0 seconds and reduced along the curve shown in the figure which simulated the total heat transfer rate in the core of the reference BWR (the delayed neutron fission power, the decay power of fission products and actinides and the stored heat in the nuclear fuel) neglecting the stored heat of ROSA-III heater rod⁽³⁾. The maximum linear heat rate of the peak power rod was 16.5 kw/m before the break initiation.

The schematics of the main steam line and the feedwater line are shown in Figs. 4.3 and 4.4. The main steam line of the ROSA-III has three branches: (1) steady flow branch, (2) ADS branch and (3) transient branch. Before the break initiation CV-130 in the steady flow branch controlled the steam flow to maintain the steam dome pressure constant and CV-1 and CV-2 were opened to provide steam to the heat exchanger to heat the feedwater. At the break initiation, the steam flow was switched to the transient branch by closing AV-168, CV-1 and CV-2 and opening AV-165 for RUN 913. Then the MSIV was simulated by AV-165 in the transient branch. The steam flow before MSIV closure was limited by an orifice OR-5 of 16.8 mm ID (inner diameter) installed upstream of AV-165. Tables 4.2 and 4.3 show the characteristics and the control sequence of steam discharge line valves in the present test, respectively.

The details of the feedwater line is shown in Fig. 4.5. The feedwater was terminated at 2 s after the break by closing AV-112 in the feedwater line. However, the feedwater remained in the piping between the valve AV-112 and the feedwater sparger below the steam separator in the pressure vessel.

The coolant recirculation pumps were tripped to start coasting down at the break initiation.

The liquid level signal in the downcomer was used to actuate the ECCS and to close the MSIV. The downcomer level in the steady state operation was set at the scram level L3 (5.00 meters above the bottom of the pressure vessel) and L1 and L2 levels are 4.25 meters and 4.76 meters, respectively. The L2 level signal was used to close the MSIV with a time delay of 3 s and to actuate HPCS with time delay of 27 s. The L1 level signal was used to actuate LPSC, LPCI and ADS with time delay of 40 s, 40 s and 120 s, respectively. The above lag times of 3 s, 27 s, 40 s and 120 s were used in a safety analysis of the reference BWR⁽⁴⁾. LPSC and LPCI could inject cooling water after the primary system pressure was reduced below 2.16 MPa and 1.57 MPa, respectively. Specified system pressures for actuating LPSC and LPCI were decided from the pump characteristics used in the safety analysis of the reference BWR⁽⁵⁾. The test was terminated after all the core was quenched.

5. Data Processing

The data acquisition by DATAC 2000B was started before the break initiation and terminated after the break initiation. The data acquisition frequency was 10 Hz. The test data was processed and reduced to 1000 data points for computer plotting. The time span and interval of the reduced data for plotting were 700 s and 0.7 s, respectively.

The test data are shown in Figs. 5.1 through 5.201. In these figures, the measured quantity is identified by the channel number and the alphabetic characters (ref. Table 3.2).

The major test sequences and events observed in RUN 913 are summarized in Table 5.1.

Figures 5.1 through 5.6 show the pressure data in the pressure vessel and in the recirculation loop. Figures 5.7 through 5.36 show differential pressure data between various positions in the pressure vessel and the recirculation loop. Figures 5.37 and 5.38 show the liquid levels in the pressure vessel and in the tanks. Figures 5.39 through 5.45 show the flow rates. Differential pressures across orifices and venturies shown in Figs. 5.46 through 5.56 are useful to check out the flow rate instrumentation. Figure 5.57 shows the power supplies to the core with the maximum capacities of 2100 and 3150 kW. The revolution speeds of the recirculation pumps are shown in Fig. 5.58. On-off signals such as the break initiation signal and the valve positioning signals are shown in Figs. 5.59, 5.60 and 5.61. Figures 5.62 through 5.71 show the fluid densities measured by the gamma densitometer. Figures 5.72 through 5.75 show momentum fluxes measured by drag disks. Figures 5.76 through 5.84 show the fluid temperatures at various positions in the loops. The fuel rod cladding temperature and the surface temperatures of the water rods and the channel boxes measured at positions 1 through 7 are given in Figs. 5.85 through 5.112. Figures 5.113 through 5.159 show the fuel rod cladding temperatures in a different manner. Figures 5.160 through 5.162 show the fluid temperatures at the inlet and outlet of the channel box. Figures 5.163 through 171 show the fluid temperatures at the upper tie plate. The surface temperatures of the channel box are shown in Figs. 5.172 through 5.178, comparing the data at the same elevation. The fluid temperatures in the lower plenum are shown in Figs. 5.179 and 5.180. The liquid level signals in the core, the upper and lower plena, the guide tube and the downcomer are shown in Fig. 5.181 through 5.201. The Peak Cladding Temperature (PCT) distribu-

tion in the core is given in Table 5.2

Quantities obtained from reduction of the test data are shown in Fig. 5.202 through 5.228.

Figures 5.202 and 5.203 show the average density calculated from the data measured by the two-beam gamma densitometers. The beam configurations of gamma densitometers installed in the ROSA-III facility are shown in Figs. 3.7 and 3.8. The average density is calculated as an arithmetic mean of the densities in multi directions with the weight of the cord length.

For the three beam densitometer at the jet pump outlet spool piece,

$$\rho_{av} = 0.3221\rho_A + 0.43\rho_B + 0.2479\rho_C \quad (5.1)$$

where,

ρ_{av} : average density obtained from the three-beam gamma densitometer,

ρ_A : density measured by beam A (bottom),

ρ_B : density measured by beam B (middle),

ρ_C : density measured by beam C (top).

For the two-beam densitometer at the break spool piece,

$$\rho_{av} = 0.5863\rho_A + 0.4137\rho_B \quad (5.2)$$

where,

ρ_{av} : average density obtained from the two-beam gamma densitometer,

ρ_A : density measured by beam A (bottom),

ρ_B : density measured by beam B (top).

Figures 5.204 through 5.207 show the flow rates upstream of the break in the recirculation loop. The flow rate is computed from the drag disk data and the gamma densitometer data using the following equation,

$$G = C_D \cdot A \cdot \sqrt{\rho_{av} \cdot \rho v^2} \quad (5.3)$$

where,

G : mass flow rate,

C_D : drag coefficient ($= 1.13$),

A : flow area ($= 1.923 \times 10^{-3} \text{ m}^2$),

ρ_{av} : average density from gamma densitometer,

ρv^2 : momentum flux from drag disk.

The break flow is derived from the flow rate in the recirculation loop as follows,

$$G_B = G_P - G_V \quad (5.4)$$

where,

G_B : break flow,

G_P : flow rate at the pump side of the break,

G_V : flow rate at the vessel side of the break,

The break flow rates based on the low range and the high range drag disk data are shown in Figs. 5.208 and 5.209.

Figures 5.210 through 5.220 show the fluid flow rates at the main steam line, the channel inlet orifices, the bypass hole and the jet pump outlets. The fluid flow rates are calculated from the test data of the pressure drop across the orifices or venturi flow meters and the liquid density obtained from the measured temperature and the pressure condition. The equation used for the calculation is as follows :

$$G = C_D \cdot A \cdot \sqrt{2g \cdot \rho_l \cdot \Delta P} \quad (5.5)$$

where,

G : flow rate,

ΔP : pressure drop across the orifice,

C_D : discharge coefficient,

= 0.6552 (the orifice to measure the steam discharge flow rate)

= 0.4761 (the channel inlet orifice)

= 0.8032 (the bypass hole)

= 0.7383 (the orifice to measure the jet pump outlet flow rate)

= 1.1260 (the venturi tube to measure the jet pump outlet flow rate)

A : flow area (m^2)

= 2.875×10^{-3} (the orifice to measure the steam discharge flow rate)

= 1.521×10^{-3} (the channel inlet orifice)

= 1.758×10^{-4} (the bypass hole)

$$\begin{aligned}
 &= 1.133 \times 10^{-3} \text{ (the orifice to measure the jet pump outlet flow rate)} \\
 &= 9.095 \times 10^{-4} \text{ (the venturi tube to measure the jet pump outlet flow rate)} \\
 g &: \text{gravitational acceleration } (= 9.807 \text{ m/s}^2), \\
 \rho_l &: \text{density of the single-phase liquid } (\text{kg/m}^3),
 \end{aligned}$$

This calculation method is not applicable for two-phase flow condition after the LPF initiation at the channel inlet orifice, the bypass hole and the jet pump outlet. The calculated value shows only a trend in two-phase flow condition. Total channel inlet flow rate presents the sum of four channel inlet flow rates.

Figure 5.221 and 5.222 show the collapsed water levels outside and inside the shroud. The collapsed water level is obtained from the differential pressure in the pressure vessel. The differential pressure may include the flow resistance effect, however, the flow resistance becomes negligible after completion of the recirculation pump coastdown.

Figures 5.223, 5.224 and 5.225 show the fluid mass inventories in the pressure vessel. The fluid mass inventory is determined from the density and the volumes of liquid outside and inside the shroud,

$$M = \rho_l \cdot Q \quad (5.6)$$

where,

$$\begin{aligned}
 M &: \text{fluid inventory}, \\
 \rho_l &: \text{liquid density estimated from the saturation temperature and/or pressure}, \\
 Q &: \text{liquid volume calculated from the liquid level}.
 \end{aligned}$$

The volume Q (m^3) outside the shroud is given below as a function of height.

$$\begin{aligned}
 Q &= 0.0 && (L \leq 0.494) \\
 Q &= 0.0225L - 0.0111 && (0.494 < L \leq 1.384) \\
 Q &= 0.0697L - 0.0769 && (1.384 < L \leq 1.519) \\
 Q &= 0.0225L - 0.0048 && (1.519 < L \leq 3.355) \\
 Q &= 0.0801L - 0.1980 && (3.355 < L \leq 4.250) \\
 Q &= 0.2443L - 0.8959 && (4.250 < L \leq 4.413) \\
 Q &= 0.2611L - 0.9700 && (4.413 < L \leq 4.578)
 \end{aligned}$$

$$\begin{aligned}
 Q &= 0.2504L - 0.9211 & (4.578 < L \leq 4.654) \\
 Q &= 0.2375L - 0.8610 & (4.654 < L \leq 4.815) \\
 Q &= 0.2866L - 1.0974 & (4.815 < L \leq 4.915) \\
 Q &= 0.3396L - 1.3580 & (4.915 < L \leq 5.143) \\
 Q &= 0.3607L - 1.4665 & (5.143 < L \leq 5.365) \\
 Q &= 0.3848L - 1.5960 & (5.365 < L \leq 5.955) \\
 Q &= 0.7111 & (5.955 < L)
 \end{aligned} \tag{5.7}$$

The volume Q (m^3) inside the shroud is given below as a function of height.

$$\begin{aligned}
 Q &= 0.0 & (L \leq 0.0) \\
 Q &= 0.2350L & (0.0 < L \leq 0.497) \\
 Q &= 0.1245L + 0.0549 & (0.497 < L \leq 1.354) \\
 Q &= 0.0698L + 0.1290 & (1.354 < L \leq 3.589) \\
 Q &= 0.1648L - 0.2120 & (3.589 < L \leq 3.744) \\
 Q &= 0.1963L - 0.3299 & (3.744 < L \leq 4.243) \\
 Q &= 0.0196L + 0.4199 & (4.243 < L \leq 4.578) \\
 Q &= 0.0186L + 0.4244 & (4.578 < L \leq 4.654) \\
 Q &= 0.0410L + 0.3201 & (4.654 < L \leq 5.099) \\
 Q &= 0.0196L + 0.4292 & (5.099 < L \leq 5.365) \\
 Q &= 0.5344 & (5.365 < L)
 \end{aligned} \tag{5.8}$$

The total fluid mass inventory in the pressure vessel is obtained as the summation of the mass inventory outside and inside the shroud. The initial mass inventory before the break initiation is estimated as 640 kg.

Figure 5.226 shows the mass decrease by the fluid discharge from the break and the fluid mass recovery by the ECCS water and the feedwater injections. The variation of fluid mass inventory with time is calculated by the following equation,

$$M = \int_0^t \{ G + \rho_1 \cdot (W_H + W_L + W_I) + \rho_2 \cdot W_F \} dt \tag{5.9}$$

where,

M : mass accumulation,

G : steam discharge flow rate,

ρ_1 : density of saturated liquid at 315 K,

ρ_2 : density of saturated liquid at 489 K,

W_H : volumetric flow rate of the HPCS,
 W_L : volumetric flow rate of the LPCS,
 W_I : volumetric flow rate of the LPCI,
 W_F : volumetric flow rate of the feedwater.

Figure 5.227 shows the fluid mass discharged from the break. The fluid mass discharge M_B is calculated as follows neglecting the change of the fluid mass inventory in the loops,

$$M_B = (M_P)_i - M_P + M_F \quad (5.10)$$

where,

M_B : fluid mass discharged from the break,
 $(M_P)_i$: fluid mass inventory in the pressure vessel ($= 640 \text{ kg}$),
 M_P : fluid mass inventory in the pressure vessel,
 M_F : net fluid mass increase by the ECCS, the feedwater flow and the steam discharge flow.

Figure 5.228 shows the break flow calculated from the fluid mass inventory in the pressure vessel. The break flow is estimated from the mass inventory as follows,

$$G_B = \frac{d}{dt} M_B \quad (5.11)$$

where,

G_B : break flow,
 M_B : fluid mass discharged from the break.

6. Conclusions

In this report, all the available test data obtained for the test RUN 913 were presented with information on the ROSA-III test facility, instrumentation and the test procedure. RUN 913 was a 15% split break test at the pump suction with the assumption of a single failure of HPCS. The ROSA-III test facility and its instrumentation worked well through the test. Important data base was obtained to assess the predictability of the LOCA analysis code.

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Table 2.1 Primary Characteristics of ROSA-III and BWR/6

| | BWR * | ROSA-III | BWR/ROSA-III |
|---------------------------|--------------------|----------|--------------|
| Number of Recirc. Loops | 2 | 2 | 1 |
| Number of Jet Pumps | 24 | 4 | 6 |
| Number of Separators | 251 | 1 | 251 |
| Number of Fuel Assemblies | 848 | 4 | 212 |
| Active Fuel Length (m) | 3.76 | 1.88 | 2 |
| Total Volume (m^3) | 621 | 1.42 | 437 |
| Power (MW) | 3,800 | 4.40 | 864 |
| Pressure (MPa) | 7.23 | 7.23 | 1 |
| Core Flow (kg/s) | 1.54×10^4 | 36.4 | 424 |
| Recirculation Flow (l/s) | 2,970 | 7.01 | 424 |
| Feedwater Flow (kg/s) | 2,060 | 4.86 | 424 |
| Feedwater Temp. (K) | 489 | 489 | 1 |

* BWR/6-251

Table 3.1 ROSA-III Instrumentation Summary List

| ITEM | SENSOR | NUMBER | NOTE |
|--------------------------|--|-------------|---|
| Pressure | Pressure Transducer | 20 | |
| Differential Pressure | DP Cell | 60 | PV and Loop 44 Level Measurement 5 Flow Meter 11 |
| Fluid Temperature | CA Thermocouple | 129 | Primary Loop 23 DTT 4 Tie Rod 28 Upper Plenum 10 Lower Plenum 10 Tie Plate 40 Bypass 14 |
| Fuel Rod Temperature | CA Thermocouple | 213 | |
| Slab Surface Temperature | CA Thermocouple | 70 | Core Barrel 24 Pressure Vessel 3 Channel Box 35 Shroud Support 8 |
| Slab Inner Temperature | CA Thermocouple | 9 | JP Diffuser 4 PV Wall 5 |
| Volumetric Flow Rate | Turbine Flow Meter Venturi Flow Meter Orifice Flow Meter | 3 4 6 | ECCS Loop 3 Primary Loop 10 |
| Mass Flow Rate | Turbine Flow Meter Orifice Flow Meter | 4 3 | Recirculation Loop 4 Main Steam Line 3 |
| Liquid Level | Conductivity Probe Capacitance Probe | 138 2 | |
| Density | Gamma Densitometer | 10 | 2 Beam GD 2 3 Beam GD 2 |
| Momentum Flux | Drag Disk | 4 | JP Spool Piece 2 Break Spool Piece 4 Break Orifice 1 |
| Signal | ON/OFF Switch | 14 | |
| Pump Speed | Revolution Counter | 2 | |
| Electric Core Power | VA Meter | 2 | |
| TOTAL | | 693 | |

Table 3.2 Measurement List for RUN 913

| Ch. | Item | Symbol | ID. | Location | Fig.-No. | Range | Unit | Accuracy |
|-----|---------|--------|-----|----------|-----------------------|--------|------|----------|
| 1 | Press. | P- | 1 | PA | Fig.5. 1 | 0.100 | MPa | 1.08%FS |
| 2 | Press. | P- | 2 | PA | Fig.5. 1 | 0.100 | MPa | 1.08%FS |
| 3 | Press. | P- | 3 | PA | Fig.5. 1 | 0.100 | MPa | 1.08%FS |
| 4 | Press. | P- | 4 | PA | Fig.5. 1 | 0.100 | MPa | 1.08%FS |
| 5 | Press. | P- | 5 | PA | Fig.5. 2 | 0.100 | MPa | 1.08%FS |
| 6 | Press. | P- | 6 | PA | Fig.5. 2 | 0.100 | MPa | 1.08%FS |
| 7 | Press. | P- | 7 | PA | Fig.5. 2 | 0.100 | MPa | 1.08%FS |
| 8 | Press. | P- | 8 | PA | Fig.5. 2 | 0.100 | MPa | 1.08%FS |
| 9 | Press. | P- | 9 | PA | Fig.5. 3 | 0.100 | MPa | 1.08%FS |
| 10 | Press. | P- | 10 | PA | Fig.5. 3 | 0.100 | MPa | 1.08%FS |
| 11 | Press. | P- | 11 | PA | Fig.5. 3 | 0.100 | MPa | 1.08%FS |
| 12 | Press. | P- | 12 | PA | Fig.5. 4 | 0.100 | MPa | 1.08%FS |
| 13 | Press. | P- | 13 | PA | Fig.5. 4 | 0.100 | MPa | 1.08%FS |
| 14 | Press. | P- | 14 | PA | Fig.5. 5 | 0.100 | MPa | 1.08%FS |
| 15 | Press. | P- | 15 | PA | Fig.5. 5 | 0.100 | MPa | 1.08%FS |
| 16 | Press. | P- | 16 | PA | Fig.5. 6 | 0.100 | MPa | 1.08%FS |
| 17 | Press. | P- | 17 | PA | Not Measured | 0.100 | MPa | 1.08%FS |
| 18 | Press. | P- | 18 | PA | Not Measured | 0.100 | MPa | 1.08%FS |
| 19 | Press. | P- | 19 | PA | Fig.5. 4 | 0.100 | MPa | 1.08%FS |
| 20 | Press. | P- | 30 | PA | Fig.5. 5 | 0.100 | MPa | 1.08%FS |
| 21 | Diff.P. | D- | 1 | PD | Fig.5. 7 | -50.0 | kPa | 0.63%FS |
| 22 | Diff.P. | D- | 2 | PD | Fig.5. 8 | -10.0 | kPa | 0.63%FS |
| 23 | Diff.P. | D- | 3 | PD | Not Measured | 90.0 | kPa | |
| 24 | Diff.P. | D- | 4 | PD | Fig.5. 9 | 0.0 | MPa | 0.63%FS |
| 25 | Diff.P. | D- | 5 | PD | Fig.5. 10 | -100. | kPa | 0.63%FS |
| 26 | Diff.P. | D- | 6 | PD | Fig.5. 11 | -100. | kPa | 0.63%FS |
| 27 | Diff.P. | D- | 7 | PD | Fig.5. 12 | 0.0 | MPa | 0.63%FS |
| 28 | Diff.P. | D- | 8 | PD | Fig.5. 11 | -100. | kPa | 0.63%FS |
| 29 | Diff.P. | D- | 9 | PD | Fig.5. 12 | 0.0 | MPa | 0.63%FS |
| 30 | Diff.P. | D- | 10 | PD | Fig.5. 13 | -100. | kPa | 0.63%FS |
| 31 | Diff.P. | D- | 11 | PD | Fig.5. 14 | -4.00 | MPa | 0.63%FS |
| 32 | Diff.P. | D- | 12 | PD | Fig.5. 13 | -100. | kPa | 0.63%FS |
| 33 | Diff.P. | D- | 13 | PD | Fig.5. 14 | -4.00 | MPa | 0.63%FS |
| 34 | Diff.P. | D- | 14 | PD | Fig.5. 15 | -0.100 | MPa | 0.63%FS |
| 35 | Diff.P. | D- | 15 | PD | Fig.5. 15 | -0.100 | MPa | 0.63%FS |
| 36 | Diff.P. | D- | 16 | PD | DC Bottom-MRP-1 Suc. | -50.0 | MPa | 0.63%FS |
| 37 | Diff.P. | D- | 17 | PD | MRP1 Deliv.-JP1 Drive | 0.0 | kPa | 0.63%FS |
| 38 | Diff.P. | D- | 18 | PD | MRP1 Deliv.-JP2 Drive | 0.0 | kPa | 0.63%FS |
| 39 | Diff.P. | D- | 19 | PD | DC Middle-JP1 Suction | 0.0 | kPa | 0.63%FS |
| 40 | Diff.P. | D- | 20 | PD | DC Middle-JP2 Suction | 0.0 | kPa | 0.63%FS |
| 41 | Diff.P. | D- | 21 | PD | JP1 Disch.-Lower PL. | -100. | kPa | 0.63%FS |
| 42 | Diff.P. | D- | 22 | PD | JP2 Disch.-Lower PL. | -100. | kPa | 0.63%FS |
| 43 | Diff.P. | D- | 23 | PD | DC Bottom-Break B | -60.0 | MPa | 0.63%FS |
| 44 | Diff.P. | D- | 24 | PD | Break B-Break A | 0.0 | MPa | 0.63%FS |
| 45 | Diff.P. | D- | 25 | PD | Break A-MRP2 Suction | -50.0 | MPa | 0.63%FS |
| 46 | Diff.P. | D- | 26 | PD | MRP2 Deliv.-JP3 Drive | -500. | kPa | 0.63%FS |
| 47 | Diff.P. | D- | 27 | PD | MRP2 Deliv.-JP4 Drive | -500. | kPa | 0.63%FS |
| 48 | Diff.P. | D- | 28 | PD | DC Middle-JP3 Suction | -250. | kPa | 0.63%FS |
| 49 | Diff.P. | D- | 29 | PD | DC Middle-JP4 Suction | -250. | kPa | 0.63%FS |
| 50 | Diff.P. | D- | 30 | PD | JP3 Disch.-Confluence | -100. | 100. | 0.63%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.No. | Range | Unit | Accuracy |
|-----|---------|--------|-----|----------|-------------------------|--------------|-------------------|-----------|
| 51 | Diff.P. | D-31 | PD | S1 | Fig.5.25 | -100. | kPa | 0.63%FS |
| 52 | Diff.P. | D-32 | PD | S2 | Fig.5.26 | -50.0 | kPa | 0.63%FS |
| 53 | Diff.P. | D-33 | PD | S3 | Lower Pl.-DC Middle | -250. | kPa | 0.63%FS |
| 54 | Diff.P. | D-34 | PD | S4 | Lower Pl.-DC Bottom | -250. | kPa | 0.63%FS |
| 55 | Diff.P. | D-35 | PD | S5 | DC Bottom-DC Middle | -50.0 | kPa | 0.63%FS |
| 56 | Diff.P. | D-36 | PD | S6 | DC Middle-Stream Dome | -50.0 | kPa | 0.63%FS |
| 57 | Diff.P. | D-37 | PD | S7 | Lower Pl.-Mid-Upper Pl. | - | | |
| 58 | Diff.P. | D-38 | PD | S8 | Lower Pl.-Bottom-Mid. | - | | |
| 59 | Diff.P. | D-39 | PD | S9 | Upper Plenum Head | -20.0 | kPa | 0.63%FS |
| 60 | Diff.P. | D-40 | PD | S0 | Channel Orifice A | -50.0 | kPa | 0.63%FS |
| 61 | Diff.P. | D-41 | PD | S1 | Channel Orifice B | -50.0 | kPa | 0.63%FS |
| 62 | Diff.P. | D-42 | PD | S2 | Channel Orifice C | -25.0 | kPa | 0.63%FS |
| 63 | Diff.P. | D-43 | PD | S3 | Channel Orifice D | -50.0 | kPa | 0.63%FS |
| 64 | Diff.P. | D-44 | PD | S4 | Lower Plenum Head | -100. | kPa | 0.63%FS |
| 65 | Level | WL-1 | LM | S5 | HPCS Tank | 0.0 | m | 1.00%FS |
| 66 | Level | WL-2 | LM | S6 | LPCS Tank | 0.0 | m | 1.00%FS |
| 67 | Level | WL-3 | LM | S7 | LPCI Tank | 0.0 | m | 1.00%FS |
| 68 | Level | WL-4 | LM | S8 | Upper Downcomer | 3.90 | m | 1.00%FS |
| 69 | Level | WL-5 | LM | S9 | Lower Downcomer | 0.938 | m | 1.00%FS |
| 70 | Mass.F. | F-1 | FM | S0 | Steam Line (Low Range) | 0.0 | kg/s | 0.92%FS |
| 71 | Mass.F. | F-2 | FM | S1 | Steam Line(High Range) | 0.0 | kg/s | 0.92%FS |
| 72 | Mass.F. | F-3 | FM | S2 | Steam Line (Mid Range) | 0.0 | kg/s | 1.40%FS |
| 73 | Vol.F. | F-7 | FV | S3 | HPCS (Upper Plenum) | Not Used | m ³ /s | 0.79%FS |
| 74 | Vol.F. | F-9 | FV | S4 | LPCS (Upper Plenum) | 0.0 | m ³ /s | 0.79%FS |
| 75 | Vol.F. | F-11 | FV | S5 | LPCI (Core Bypass) | 0.0 | m ³ /s | 0.79%FS |
| 76 | Vol.F. | F-15 | FV | S6 | Feedwater | Fig.5.41 | 0.0 | 0.79%FS |
| 77 | Vol.F. | F-16 | FV | S7 | HPWP Suction Flow | Not Measured | 0.420E-02 | M3/S |
| 78 | Vol.F. | F-17 | FV | S8 | JP1 Discharge | Fig.5.42 | 0.0 | 0.170E-01 |
| 79 | Vol.F. | F-18 | FV | S9 | JP2 Discharge | Fig.5.42 | 0.0 | 0.170E-01 |
| 80 | Vol.F. | F-19 | FV | S0 | JP3 Disch. Positive | Fig.5.43 | 0.0 | 0.170E-01 |
| 81 | Vol.F. | F-20 | FV | S1 | JP3 Disch. Negative | Fig.5.44 | 0.0 | 0.170E-01 |
| 82 | Vol.F. | F-21 | FV | S2 | JP4 Disch. Positive | Fig.5.43 | 0.0 | 0.500E-02 |
| 83 | Vol.F. | F-22 | FV | S3 | JP4 Disch. Negative | Fig.5.44 | 0.0 | 0.170E-01 |
| 84 | Mass.F. | F-23 | FM | S4 | JP1/2 Outlet Spool | Not Measured | 0.0 | 0.500E-02 |
| 85 | Mass.F. | F-24 | FM | S5 | JP3/4 Outlet Spool | Not Measured | 0.0 | 0.170E-01 |
| 86 | Mass.F. | F-25 | FM | S6 | Break A Spool Piece | Not Measured | 0.0 | 0.120E-01 |
| 87 | Mass.F. | F-26 | FM | S7 | Break B Spool Piece | Not Measured | 0.0 | 0.120E-01 |
| 88 | Vol.F. | F-27 | FV | S8 | MRP-1 | Fig.5.45 | 0.0 | 0.120E-01 |
| 89 | Vol.F. | F-28 | FV | S9 | MRP-2 | Fig.5.45 | 0.0 | 0.120E-01 |
| 90 | Diff.P. | D-F1 | PD | S0 | F1 Orifice | Fig.5.46 | 0.0 | 4.90 |
| 91 | Diff.P. | D-F2 | PD | S1 | F2 Orifice | Fig.5.47 | 0.0 | 34.9 |
| 92 | Diff.P. | D-F3 | PD | S2 | F3 Orifice | Fig.5.48 | 0.0 | 14.6 |
| 93 | Diff.P. | D-F17 | PD | S3 | F17 Venturi | Fig.5.49 | 0.0 | 98.1 |
| 94 | Diff.P. | D-F18 | PD | S4 | F18 Venturi | Fig.5.50 | 0.0 | 98.1 |
| 95 | Diff.P. | D-F19 | PD | S5 | F19 Orifice | Fig.5.51 | 0.0 | 147. |
| 96 | Diff.P. | D-F20 | PD | S6 | F20 Orifice | Fig.5.52 | 0.0 | 13.2 |
| 97 | Diff.P. | D-F21 | PD | S7 | F21 Orifice | Fig.5.53 | 0.0 | 147. |
| 98 | Diff.P. | D-F22 | PD | S8 | F22 Orifice | Fig.5.54 | 0.0 | 13.2 |
| 99 | Diff.P. | D-F27 | PD | S9 | F27 Venturi | Fig.5.55 | 0.0 | 200. |
| 100 | Diff.P. | D-F28 | PD | S0 | F28 Venturi | Fig.5.56 | 0.0 | 200. |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.-No. | Range | Unit | Accuracy |
|-----|----------|--------|--------|------------------------|--------------|-------|------|------------------------------|
| 101 | Power | W- 1 | WE 101 | 2100 kW Power Supplier | Fig.5.57 | 0.0 | - | 1.00%FS |
| 102 | Power | W- 2 | WE 102 | 3150 kW Power Supplier | Fig.5.57 | 0.0 | - | 1.00%FS |
| 103 | | | | | | | | |
| 104 | Rev. | N- 1 | SR 104 | MRP-1 Revolution | Fig.5.58 | 0.0 | - | 1.08%FS |
| 105 | Rev. | N- 2 | SR 105 | MRP-2 Revolution | Fig.5.58 | 0.0 | - | 1.08%FS |
| 106 | Signal | S- 1 | EV 106 | Break Signal A | Fig.5.59 | | | |
| 107 | Signal | S- 2 | EV 107 | Break Signal B | Fig.5.59 | | | |
| 108 | Signal | S- 3 | EV 108 | QSV Signal | Fig.5.59 | | | |
| 109 | Signal | S- 6 | EV 109 | HPCS Valve | Fig.5.60 | | | |
| 110 | Signal | S- 7 | EV 110 | LPCS Valve | Fig.5.60 | | | |
| 111 | Signal | S- 8 | EV 111 | LPCI Valve | Fig.5.60 | | | |
| 112 | Signal | S- 9 | EV 112 | Feedwater Control | Fig.5.59 | | | |
| 113 | Signal | S-10 | EV 113 | MSIV Signal | Fig.5.59 | | | |
| 114 | Signal | S-11 | EV 114 | Steam Line Valve | Fig.5.59 | | | |
| 115 | Signal | S-12 | EV 115 | ADS Valve | Fig.5.60 | | | |
| 116 | Signal | S-13 | EV 116 | MRP-1 Power OFF | Fig.5.61 | | | |
| 117 | Signal | S-14 | EV 117 | MRP-2 Power OFF | Fig.5.61 | | | |
| 118 | Signal | RD- 1 | EV 118 | MRP-1 Rev. Direction | Fig.5.61 | | | |
| 119 | Signal | RD- 2 | EV 119 | MRP-2 Rev. Direction | Fig.5.61 | | | |
| 120 | Density | DF- 1 | DE 120 | JP1/2 Outlet Beam A | Fig.5.62 | 0.0 | - | 1.00%FS |
| 121 | Density | DF- 2 | DE 121 | JP1/2 Outlet Beam B | Fig.5.63 | 0.0 | - | 1.00%FS |
| 122 | Density | DF- 3 | DE 122 | JP1/2 Outlet Beam C | Fig.5.64 | 0.0 | - | 1.00%FS |
| 123 | Density | DF- 4 | DE 123 | JP3/4 Outlet Beam A | Fig.5.65 | 0.0 | - | 1.00%FS |
| 124 | Density | DF- 5 | DE 124 | JP3/4 Outlet Beam B | Fig.5.66 | 0.0 | - | 1.00%FS |
| 125 | Density | DF- 6 | DE 125 | JP3/4 Outlet Beam C | Fig.5.67 | 0.0 | - | 1.00%FS |
| 126 | Density | DF- 7 | DE 126 | Break A Beam A | Fig.5.68 | 0.0 | - | 1.00%FS |
| 127 | Density | DF- 8 | DE 127 | Break A Beam B | Fig.5.69 | 0.0 | - | 1.00%FS |
| 128 | Density | DF- 9 | DE 128 | Break B Beam A | Fig.5.70 | 0.0 | - | 1.00%FS |
| 129 | Density | DF-10 | DE 129 | Break B Beam B | Fig.5.71 | 0.0 | - | 1.00%FS |
| 130 | Mo.-Flux | M- 1 | MF 130 | JP1/2 Outlet Spool | Not Measured | 0.0 | - | 0.220E+05 kg/ms ² |
| 131 | Mo.-Flux | M- 2 | MF 131 | JP3/4 Outlet Spool | Not Measured | 0.0 | - | 0.220E+05 kg/ms ² |
| 132 | Mo.-Flux | M- 3 | MF 132 | Break A (Low Range) | Fig.5.72 | 0.0 | - | 1.00%FS |
| 133 | Mo.-Flux | M- 4 | MF 133 | Break B (Low Range) | Fig.5.73 | 0.0 | - | 1.00%FS |
| 134 | Mo.-Flux | M- 5 | MF 134 | Break A (High Range) | Fig.5.74 | 0.0 | - | 1.00%FS |
| 135 | Mo.-Flux | M- 6 | MF 135 | Break B (High Range) | Fig.5.75 | 0.0 | - | 1.00%FS |
| 136 | Mo.-Flux | M- 7 | MF 136 | Break Orifice | Not Measured | 0.0 | - | 0.220E+05 kg/ms ² |
| 137 | | | | | | | | 1.00%FS |
| 138 | Fluid T. | T- 1 | TE 138 | Lower Plenum | Fig.5.76 | 273. | - | 0.64%FS |
| 139 | Fluid T. | T- 2 | TE 139 | Upper Plenum | Fig.5.76 | 273. | - | 0.64%FS |
| 140 | Fluid T. | T- 3 | TE 140 | Steam Dome | Fig.5.77 | 273. | - | 0.64%FS |
| 141 | Fluid T. | T- 4 | TE 141 | Upper Downcomer | Fig.5.78 | 273. | - | 0.64%FS |
| 142 | Fluid T. | T- 5 | TE 142 | Lower Downcomer | Fig.5.78 | 273. | - | 0.64%FS |
| 143 | Fluid T. | T- 6 | TE 143 | JP-1 Drive | Fig.5.79 | 273. | - | 0.64%FS |
| 144 | Fluid T. | T- 7 | TE 144 | JP-2 Drive | Fig.5.79 | 273. | - | 0.64%FS |
| 145 | Fluid T. | T- 8 | TE 145 | JP-3 Drive | not measured | 273. | - | 0.64%FS |
| 146 | Fluid T. | T- 9 | TE 146 | JP-4 Drive | Fig.5.80 | 273. | - | 0.64%FS |
| 147 | Fluid T. | T-10 | TE 147 | JP-1 Discharge | Fig.5.81 | 273. | - | 0.64%FS |
| 148 | Fluid T. | T-11 | TE 148 | JP-2 Discharge | Fig.5.81 | 273. | - | 0.64%FS |
| 149 | Fluid T. | T-12 | TE 149 | JP-3 Discharge | Fig.5.82 | 273. | - | 0.64%FS |
| 150 | Fluid T. | T-13 | TE 150 | JP-4 Discharge | Fig.5.82 | 273. | - | 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.No. | Range | Unit | Accuracy |
|-----|----------|--------|--------|-----------------------|--------------|-------|------|----------|
| 151 | Fluid T. | T-14 | TE 151 | MRP-1 Suction | Fig.5.79 | 673. | K | 0.64%FS |
| 152 | Fluid T. | T-15 | TE 152 | MRP-1 Delivery | Fig.5.79 | 673. | K | 0.64%FS |
| 153 | Fluid T. | T-16 | TE 153 | MRP-2 Suction | Fig.5.80 | 673. | K | 0.64%FS |
| 154 | Fluid T. | T-17 | TE 154 | MRP-2 Delivery | Fig.5.80 | 673. | K | 0.64%FS |
| 155 | Fluid T. | T-18 | TE 155 | Break A Upstream | Fig.5.83 | 673. | K | 0.64%FS |
| 156 | Fluid T. | T-19 | TE 156 | Break B Upstream | Fig.5.83 | 673. | K | 0.64%FS |
| 157 | Fluid T. | T-20 | TE 157 | RCN A Condensed Water | Not Used | 698. | K | 0.64%FS |
| 158 | Fluid T. | T-21 | TE 158 | RCN B Condensed Water | Not Used | 698. | K | 0.64%FS |
| 159 | Fluid T. | T-22 | TE 159 | Discharged Steam | Fig.5.77 | 673. | K | 0.64%FS |
| 160 | Fluid T. | T-24 | TE 160 | JP-1/2 Outlet Spool | Fig.5.81 | 673. | K | 0.64%FS |
| 161 | Fluid T. | T-25 | TE 161 | JP-3/4 Outlet Spool | Fig.5.82 | 763. | K | 0.64%FS |
| 162 | Fluid T. | T-26 | TE 162 | Break A Spool Piece | Fig.5.83 | 763. | K | 0.64%FS |
| 163 | Fluid T. | T-37 | TE 163 | Break B Spool Piece | Fig.5.83 | 763. | K | 0.64%FS |
| 164 | Fluid T. | T-38 | TE 164 | Feedwater | Fig.5.84 | 673. | K | 0.64%FS |
| 165 | Slab T. | TS-1 | TE 165 | Break Orifice Top | Not Measured | 673. | K | 0.64%FS |
| 166 | Slab T. | TS-2 | TE 166 | Break Orifice Bottom | Not Measured | 673. | K | 0.64%FS |
| 167 | Slab T. | TS-3 | TE 167 | Core Barrel C Pos.3 | Not Measured | 673. | K | 0.64%FS |
| 168 | Slab T. | TS-4 | TE 168 | Core Barrel C Pos.4 | Not Measured | 673. | K | 0.64%FS |
| 169 | Slab T. | TS-5 | TE 169 | Core Barrel C Pos.5 | Not Measured | 673. | K | 0.64%FS |
| 170 | Slab T. | TS-6 | TE 170 | Core Barrel C Pos.6 | Not Measured | 673. | K | 0.64%FS |
| 171 | Slab T. | TS-7 | TE 171 | Core Barrel A Pos.1 | Not Measured | 673. | K | 0.64%FS |
| 172 | Slab T. | TS-8 | TE 172 | Core Barrel A Pos.2 | Not Measured | 673. | K | 0.64%FS |
| 173 | Slab T. | TS-9 | TE 173 | Core Barrel A Pos.3 | Not Measured | 673. | K | 0.64%FS |
| 174 | Slab T. | TS-10 | TE 174 | Core Barrel A Pos.4 | Not Measured | 673. | K | 0.64%FS |
| 175 | Slab T. | TS-11 | TE 175 | Core Barrel A Pos.5 | Not Measured | 673. | K | 0.64%FS |
| 176 | Slab T. | TS-12 | TE 176 | Core Barrel A Pos.6 | Not Measured | 673. | K | 0.64%FS |
| 177 | Slab T. | TS-13 | TE 177 | Filler Block C Pos.1 | Not Measured | 673. | K | 0.64%FS |
| 178 | Slab T. | TS-14 | TE 178 | Filler Block C Pos.2 | Not Measured | 673. | K | 0.64%FS |
| 179 | Slab T. | TS-15 | TE 179 | Filler Block C Pos.3 | Not Measured | 673. | K | 0.64%FS |
| 180 | Slab T. | TS-16 | TE 180 | Filler Block C Pos.4 | Not Measured | 673. | K | 0.64%FS |
| 181 | Slab T. | TS-17 | TE 181 | Filler Block C Pos.5 | Not Measured | 673. | K | 0.64%FS |
| 182 | Slab T. | TS-18 | TE 182 | Filler Block C Pos.6 | Not Measured | 673. | K | 0.64%FS |
| 183 | Slab T. | TS-19 | TE 183 | Filler Block A Pos.1 | Not Measured | 673. | K | 0.64%FS |
| 184 | Slab T. | TS-20 | TE 184 | Filler Block A Pos.2 | Not Measured | 673. | K | 0.64%FS |
| 185 | Slab T. | TS-21 | TE 185 | Filler Block A Pos.3 | Not Measured | 673. | K | 0.64%FS |
| 186 | Slab T. | TS-22 | TE 186 | Filler Block A Pos.4 | Not Measured | 673. | K | 0.64%FS |
| 187 | Slab T. | TS-23 | TE 187 | Filler Block A Pos.5 | Not Measured | 673. | K | 0.64%FS |
| 188 | Slab T. | TS-24 | TE 188 | Filler Block A Pos.6 | Not Measured | 673. | K | 0.64%FS |
| 189 | Slab T. | TS-25 | TE 189 | JP-1 Diffuser Wall | Not Measured | 673. | K | 0.64%FS |
| 190 | Slab T. | TS-26 | TE 190 | JP-2 Diffuser Wall | Not Measured | 673. | K | 0.64%FS |
| 191 | Slab T. | TS-27 | TE 191 | JP-3 Diffuser Wall | Not Measured | 673. | K | 0.64%FS |
| 192 | Slab T. | TS-28 | TE 192 | JP-4 Diffuser Wall | Not Measured | 673. | K | 0.64%FS |
| 193 | Slab T. | TS-29 | TE 193 | PV Wall Inside 1-1 | Not Measured | 673. | K | 0.64%FS |
| 194 | Slab T. | TS-30 | TE 194 | PV Inner Surface 1-2 | Not Measured | 673. | K | 0.64%FS |
| 195 | Slab T. | TS-31 | TE 195 | PV Inner Surface 1-3 | Not Measured | 673. | K | 0.64%FS |
| 196 | Slab T. | TS-32 | TE 196 | PV Wall Inside 2 | Not Measured | 673. | K | 0.64%FS |
| 197 | Slab T. | TS-33 | TE 197 | PV Wall Inside 3 | Not Measured | 673. | K | 0.64%FS |
| 198 | Slab T. | TS-34 | TE 198 | PV Wall Inside 4 | Not Measured | 673. | K | 0.64%FS |
| 199 | Slab T. | TS-35 | TE 199 | L.P. Inner Surface | Not Measured | 673. | K | 0.64%FS |
| 200 | Slab T. | TS-36 | TE 200 | L.P. Wall Inside | Not Measured | 673. | K | 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig. No. | Range | Unit | Accuracy |
|-----|-------|--------|-----|----------|----------|-------|----------------|----------|
| 201 | Temp. | TF- | 1 | TE | 201 | A11 | Fuel Rod Pos.1 | 0.64%FS |
| 202 | Temp. | TF- | 2 | TE | 202 | A11 | Fuel Rod Pos.2 | 0.64%FS |
| 203 | Temp. | TF- | 3 | TE | 203 | A11 | Fuel Rod Pos.3 | 0.64%FS |
| 204 | Temp. | TF- | 4 | TE | 204 | A11 | Fuel Rod Pos.4 | 0.64%FS |
| 205 | Temp. | TF- | 5 | TE | 205 | A11 | Fuel Rod Pos.5 | 0.64%FS |
| 206 | Temp. | TF- | 6 | TE | 206 | A11 | Fuel Rod Pos.6 | 0.64%FS |
| 207 | Temp. | TF- | 7 | TE | 207 | A11 | Fuel Rod Pos.7 | 0.64%FS |
| 208 | Temp. | TF- | 8 | TE | 208 | A12 | Fuel Rod Pos.1 | 0.64%FS |
| 209 | Temp. | TF- | 9 | TE | 209 | A12 | Fuel Rod Pos.2 | 0.64%FS |
| 210 | Temp. | TF- | 10 | TE | 210 | A12 | Fuel Rod Pos.3 | 0.64%FS |
| 211 | Temp. | TF- | 11 | TE | 211 | A12 | Fuel Rod Pos.4 | 0.64%FS |
| 212 | Temp. | TF- | 12 | TE | 212 | A12 | Fuel Rod Pos.5 | 0.64%FS |
| 213 | Temp. | TF- | 13 | TE | 213 | A12 | Fuel Rod Pos.6 | 0.64%FS |
| 214 | Temp. | TF- | 14 | TE | 214 | A12 | Fuel Rod Pos.7 | 0.64%FS |
| 215 | Temp. | TF- | 15 | TE | 215 | A13 | Fuel Rod Pos.1 | 0.64%FS |
| 216 | Temp. | TF- | 16 | TE | 216 | A13 | Fuel Rod Pos.2 | 0.64%FS |
| 217 | Temp. | TF- | 17 | TE | 217 | A13 | Fuel Rod Pos.3 | 0.64%FS |
| 218 | Temp. | TF- | 18 | TE | 218 | A13 | Fuel Rod Pos.4 | 0.64%FS |
| 219 | Temp. | TF- | 19 | TE | 219 | A13 | Fuel Rod Pos.5 | 0.64%FS |
| 220 | Temp. | TF- | 20 | TE | 220 | A13 | Fuel Rod Pos.6 | 0.64%FS |
| 221 | Temp. | TF- | 21 | TE | 221 | A13 | Fuel Rod Pos.7 | 0.64%FS |
| 222 | Temp. | TF- | 22 | TE | 222 | A14 | Fuel Rod Pos.1 | 0.64%FS |
| 223 | Temp. | TF- | 23 | TE | 223 | A14 | Fuel Rod Pos.2 | 0.64%FS |
| 224 | Temp. | TF- | 24 | TE | 224 | A14 | Fuel Rod Pos.3 | 0.64%FS |
| 225 | Temp. | TF- | 25 | TE | 225 | A14 | Fuel Rod Pos.4 | 0.64%FS |
| 226 | Temp. | TF- | 26 | TE | 226 | A14 | Fuel Rod Pos.5 | 0.64%FS |
| 227 | Temp. | TF- | 27 | TE | 227 | A14 | Fuel Rod Pos.6 | 0.64%FS |
| 228 | Temp. | TF- | 28 | TE | 228 | A14 | Fuel Rod Pos.7 | 0.64%FS |
| 229 | Temp. | TF- | 29 | TE | 229 | A15 | Fuel Rod Pos.1 | 0.64%FS |
| 230 | Temp. | TF- | 30 | TE | 230 | A15 | Fuel Rod Pos.2 | 0.64%FS |
| 231 | Temp. | TF- | 31 | TE | 231 | A17 | Fuel Rod Pos.3 | 0.64%FS |
| 232 | Temp. | TF- | 32 | TE | 232 | A17 | Fuel Rod Pos.4 | 0.64%FS |
| 233 | Temp. | TF- | 33 | TE | 233 | A22 | Fuel Rod Pos.1 | 0.64%FS |
| 234 | Temp. | TF- | 34 | TE | 234 | A22 | Fuel Rod Pos.2 | 0.64%FS |
| 235 | Temp. | TF- | 35 | TE | 235 | A22 | Fuel Rod Pos.3 | 0.64%FS |
| 236 | Temp. | TF- | 36 | TE | 236 | A22 | Fuel Rod Pos.4 | 0.64%FS |
| 237 | Temp. | TF- | 37 | TE | 237 | A22 | Fuel Rod Pos.5 | 0.64%FS |
| 238 | Temp. | TF- | 38 | TE | 238 | A22 | Fuel Rod Pos.6 | 0.64%FS |
| 239 | Temp. | TF- | 39 | TE | 239 | A22 | Fuel Rod Pos.7 | 0.64%FS |
| 240 | Temp. | TF- | 40 | TE | 240 | A24 | Fuel Rod Pos.1 | 0.64%FS |
| 241 | Temp. | TF- | 41 | TE | 241 | A24 | Fuel Rod Pos.2 | 0.64%FS |
| 242 | Temp. | TF- | 42 | TE | 242 | A24 | Fuel Rod Pos.3 | 0.64%FS |
| 243 | Temp. | TF- | 43 | TE | 243 | A24 | Fuel Rod Pos.4 | 0.64%FS |
| 244 | Temp. | TF- | 44 | TE | 244 | A24 | Fuel Rod Pos.5 | 0.64%FS |
| 245 | Temp. | TF- | 45 | TE | 245 | A24 | Fuel Rod Pos.6 | 0.64%FS |
| 246 | Temp. | TF- | 46 | TE | 246 | A24 | Fuel Rod Pos.7 | 0.64%FS |
| 247 | Temp. | TF- | 47 | TE | 247 | A26 | Fuel Rod Pos.1 | 0.64%FS |
| 248 | Temp. | TF- | 48 | TE | 248 | A26 | FUEL Rod POS.4 | 0.64%FS |
| 249 | Temp. | TF- | 49 | TE | 249 | A28 | Fuel Rod Pos.1 | 0.64%FS |
| 250 | Temp. | TF- | 50 | TE | 250 | A28 | Fuel Rod Pos.4 | 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.No. | Range | Unit | Accuracy |
|-----|-------|--------|-----|----------|---------|----------------|----------------|----------|
| 251 | Temp. | TF- | 51 | TE | 251 | A31 | Fuel Rod Pos.1 | 0.64%FS |
| 252 | Temp. | TF- | 52 | TE | 252 | A31 | Fuel Rod Pos.4 | 0.64%FS |
| 253 | Temp. | TF- | 53 | TE | 253 | A33 | Fuel Rod Pos.1 | 0.64%FS |
| 254 | Temp. | TF- | 54 | TE | 254 | A33 | Fuel Rod Pos.2 | 0.64%FS |
| 255 | Temp. | TF- | 55 | TE | 255 | A33 | Fuel Rod Pos.3 | 0.64%FS |
| 256 | Temp. | TF- | 56 | TE | 256 | A33 | Fuel Rod Pos.4 | 0.64%FS |
| 257 | Temp. | TF- | 57 | TE | 257 | A33 | Fuel Rod Pos.5 | 0.64%FS |
| 258 | Temp. | TF- | 58 | TE | 258 | A33 | Fuel Rod Pos.6 | 0.64%FS |
| 259 | Temp. | TF- | 59 | TE | 259 | A33 | Fuel Rod Pos.7 | 0.64%FS |
| 260 | Temp. | TF- | 60 | TE | 260 | A34 | Fuel Rod Pos.1 | 0.64%FS |
| 261 | Temp. | TF- | 61 | TE | 261 | A34 | Fuel Rod Pos.2 | 0.64%FS |
| 262 | Temp. | TF- | 62 | TE | 262 | A34 | Fuel Rod Pos.3 | 0.64%FS |
| 263 | Temp. | TF- | 63 | TE | 263 | A34 | Fuel Rod Pos.4 | 0.64%FS |
| 264 | Temp. | TF- | 64 | TE | 264 | A34 | Fuel Rod Pos.5 | 0.64%FS |
| 265 | Temp. | TF- | 65 | TE | 265 | A34 | Fuel Rod Pos.6 | 0.64%FS |
| 266 | Temp. | TF- | 66 | TE | 266 | A34 | Fuel Rod Pos.7 | 0.64%FS |
| 267 | Temp. | TF- | 67 | TE | 267 | A37 | Fuel Rod Pos.1 | 0.64%FS |
| 268 | Temp. | TF- | 68 | TE | 268 | A37 | Fuel Rod Pos.4 | 0.64%FS |
| 269 | Temp. | TF- | 69 | TE | 269 | A42 | Fuel Rod Pos.1 | 0.64%FS |
| 270 | Temp. | TF- | 70 | TE | 270 | A42 | Fuel Rod Pos.4 | 0.64%FS |
| 271 | Temp. | TF- | 71 | TE | 271 | A44 | Fuel Rod Pos.1 | 0.64%FS |
| 272 | Temp. | TF- | 72 | TE | 272 | A44 | Fuel Rod Pos.2 | 0.64%FS |
| 273 | Temp. | TF- | 73 | TE | 273 | A44 | Fuel Rod Pos.3 | 0.64%FS |
| 274 | Temp. | TF- | 74 | TE | 274 | A44 | Fuel Rod Pos.4 | 0.64%FS |
| 275 | Temp. | TF- | 75 | TE | 275 | A44 | Fuel Rod Pos.5 | 0.64%FS |
| 276 | Temp. | TF- | 76 | TE | 276 | A44 | Fuel Rod Pos.6 | 0.64%FS |
| 277 | Temp. | TF- | 77 | TE | 277 | A44 | Fuel Rod Pos.7 | 0.64%FS |
| 278 | Temp. | TF- | 78 | TE | 278 | A48 | Fuel Rod Pos.1 | 0.64%FS |
| 279 | Temp. | TF- | 79 | TE | 279 | A48 | Fuel Rod Pos.4 | 0.64%FS |
| 280 | Temp. | TF- | 80 | TE | 280 | A51 | Fuel Rod Pos.1 | 0.64%FS |
| 281 | Temp. | TF- | 81 | TE | 281 | A51 | Fuel Rod Pos.4 | 0.64%FS |
| 282 | Temp. | TF- | 82 | TE | 282 | A53 | Fuel Rod Pos.1 | 0.64%FS |
| 283 | Temp. | TF- | 83 | TE | 283 | A53 | Fuel Rod Pos.4 | 0.64%FS |
| 284 | Temp. | TF- | 84 | TE | 284 | A57 | Fuel Rod Pos.1 | 0.64%FS |
| 285 | Temp. | TF- | 85 | TE | 285 | A57 | Fuel Rod Pos.4 | 0.64%FS |
| 286 | Temp. | TF- | 86 | TE | 286 | A62 | Fuel Rod Pos.1 | 0.64%FS |
| 287 | Temp. | TF- | 87 | TE | 287 | A62 | Fuel Rod Pos.4 | 0.64%FS |
| 288 | Temp. | TF- | 88 | TE | 288 | A66 | Fuel Rod Pos.1 | 0.64%FS |
| 289 | Temp. | TF- | 89 | TE | 289 | A66 | Fuel Rod Pos.4 | 0.64%FS |
| 290 | Temp. | TF- | 90 | TE | 290 | A68 | Fuel Rod Pos.1 | 0.64%FS |
| 291 | Temp. | TF- | 91 | TE | 291 | A68 | Fuel Rod Pos.4 | 0.64%FS |
| 292 | Temp. | TF- | 92 | TE | 292 | A71 | Fuel Rod Pos.1 | 0.64%FS |
| 293 | Temp. | TF- | 93 | TE | 293 | A71 | Fuel Rod Pos.4 | 0.64%FS |
| 294 | Temp. | TF- | 94 | TE | 294 | A73 | Fuel Rod Pos.1 | 0.64%FS |
| 295 | Temp. | TF- | 95 | TE | 295 | A73 | Fuel Rod Pos.4 | 0.64%FS |
| 296 | Temp. | TF- | 96 | TE | 296 | A75 | Fuel Rod Pos.1 | 0.64%FS |
| 297 | Temp. | TF- | 97 | TE | 297 | A75 | Fuel Rod Pos.4 | 0.64%FS |
| 298 | Temp. | TF- | 98 | TE | 298 | A77 | Fuel Rod Pos.1 | 0.64%FS |
| 299 | Temp. | TF- | 99 | TE | 299 | A77 | Fuel Rod Pos.2 | 0.64%FS |
| 300 | Temp. | TF-100 | TE | 300 | A77 | Fuel Rod Pos.3 | 0.64%FS | |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.-No. | Range | Unit | Accuracy |
|-----|-------|--------|--------|--------------------|---------------|-------|------|----------|
| 301 | Temp. | TF-101 | TE 301 | A77 Fuel Rod Pos.4 | Fig.5.94, 156 | 273. | - | 0.64%FS |
| 302 | Temp. | TF-102 | TE 302 | A77 Fuel Rod Pos.5 | Fig.5.94, | 273. | - | 0.64%FS |
| 303 | Temp. | TF-103 | TE 303 | A77 Fuel Rod Pos.6 | Fig.5.94, | 273. | - | 0.64%FS |
| 304 | Temp. | TF-104 | TE 304 | A77 Fuel Rod Pos.7 | not measured | 273. | - | 0.64%FS |
| 305 | Temp. | TF-105 | TE 305 | A82 Fuel Rod Pos.1 | Fig.5.130 | 273. | - | 0.64%FS |
| 306 | Temp. | TF-106 | TE 306 | A82 Fuel Rod Pos.4 | Fig.5.130 | 273. | - | 0.64%FS |
| 307 | Temp. | TF-107 | TE 307 | A84 Fuel Rod Pos.1 | Fig.5.131 | 273. | - | 0.64%FS |
| 308 | Temp. | TF-108 | TE 308 | A84 Fuel Rod Pos.4 | Fig.5.131 | 273. | - | 0.64%FS |
| 309 | Temp. | TF-109 | TE 309 | A85 Fuel Rod Pos.1 | Fig.5.95 | 273. | - | 0.64%FS |
| 310 | Temp. | TF-110 | TE 310 | A85 Fuel Rod Pos.2 | Fig.5.95 | 273. | - | 0.64%FS |
| 311 | Temp. | TF-111 | TE 311 | A85 Fuel Rod Pos.3 | Fig.5.95 | 273. | - | 0.64%FS |
| 312 | Temp. | TF-112 | TE 312 | A85 Fuel Rod Pos.4 | Fig.5.95 | 273. | - | 0.64%FS |
| 313 | Temp. | TF-113 | TE 313 | A85 Fuel Rod Pos.5 | Fig.5.95 | 273. | - | 0.64%FS |
| 314 | Temp. | TF-114 | TE 314 | A85 Fuel Rod Pos.6 | Fig.5.95 | 273. | - | 0.64%FS |
| 315 | Temp. | TF-115 | TE 315 | A85 Fuel Rod Pos.7 | Fig.5.95 | 273. | - | 0.64%FS |
| 316 | Temp. | TF-116 | TE 316 | A87 Fuel Rod Pos.1 | Fig.5.96, | 273. | - | 0.64%FS |
| 317 | Temp. | TF-117 | TE 317 | A87 Fuel Rod Pos.2 | Fig.5.96 | 273. | - | 0.64%FS |
| 318 | Temp. | TF-118 | TE 318 | A87 Fuel Rod Pos.3 | Fig.5.96 | 273. | - | 0.64%FS |
| 319 | Temp. | TF-119 | TE 319 | A87 Fuel Rod Pos.4 | Fig.5.96 | 273. | - | 0.64%FS |
| 320 | Temp. | TF-120 | TE 320 | A87 Fuel Rod Pos.5 | Fig.5.96 | 273. | - | 0.64%FS |
| 321 | Temp. | TF-121 | TE 321 | A87 Fuel Rod Pos.6 | Fig.5.96 | 273. | - | 0.64%FS |
| 322 | Temp. | TF-122 | TE 322 | A87 Fuel Rod Pos.7 | Fig.5.96 | 273. | - | 0.64%FS |
| 323 | Temp. | TF-123 | TE 323 | A88 Fuel Rod Pos.1 | Fig.5.97 | 273. | - | 0.64%FS |
| 324 | Temp. | TF-124 | TE 324 | A88 Fuel Rod Pos.2 | Fig.5.97 | 273. | - | 0.64%FS |
| 325 | Temp. | TF-125 | TE 325 | A88 Fuel Rod Pos.3 | Fig.5.97 | 273. | - | 0.64%FS |
| 326 | Temp. | TF-126 | TE 326 | A88 Fuel Rod Pos.4 | Fig.5.97 | 273. | - | 0.64%FS |
| 327 | Temp. | TF-127 | TE 327 | A88 Fuel Rod Pos.5 | Fig.5.97 | 273. | - | 0.64%FS |
| 328 | Temp. | TF-128 | TE 328 | A88 Fuel Rod Pos.6 | Fig.5.97 | 273. | - | 0.64%FS |
| 329 | Temp. | TF-129 | TE 329 | A88 Fuel Rod Pos.7 | Fig.5.97 | 273. | - | 0.64%FS |
| 330 | Temp. | TF-130 | TE 330 | B11 Fuel Rod Pos.1 | Not Measured | 273. | - | 0.64%FS |
| 331 | Temp. | TF-131 | TE 331 | B11 Fuel Rod Pos.2 | Not Measured | 273. | - | 0.64%FS |
| 332 | Temp. | TF-132 | TE 332 | B11 Fuel Rod Pos.3 | Not Measured | 273. | - | 0.64%FS |
| 333 | Temp. | TF-133 | TE 333 | B11 Fuel Rod Pos.4 | Not Measured | 273. | - | 0.64%FS |
| 334 | Temp. | TF-134 | TE 334 | B11 Fuel Rod Pos.5 | Not Measured | 273. | - | 0.64%FS |
| 335 | Temp. | TF-135 | TE 335 | B11 Fuel Rod Pos.6 | Not Measured | 273. | - | 0.64%FS |
| 336 | Temp. | TF-136 | TE 336 | B11 Fuel Rod Pos.7 | Not Measured | 273. | - | 0.64%FS |
| 337 | Temp. | TF-137 | TE 337 | B13 Fuel Rod Pos.4 | Fig.5.132 | 273. | - | 0.64%FS |
| 338 | Temp. | TF-138 | TE 338 | B22 Fuel Rod Pos.1 | Fig.5.98 | 273. | - | 0.64%FS |
| 339 | Temp. | TF-139 | TE 339 | B22 Fuel Rod Pos.2 | Fig.5.98 | 273. | - | 0.64%FS |
| 340 | Temp. | TF-140 | TE 340 | B22 Fuel Rod Pos.3 | Fig.5.98 | 273. | - | 0.64%FS |
| 341 | Temp. | TF-141 | TE 341 | B22 Fuel Rod Pos.4 | Fig.5.98 | 273. | - | 0.64%FS |
| 342 | Temp. | TF-142 | TE 342 | B22 Fuel Rod Pos.5 | Fig.5.98 | 273. | - | 0.64%FS |
| 343 | Temp. | TF-143 | TE 343 | B22 Fuel Rod Pos.6 | Fig.5.98 | 273. | - | 0.64%FS |
| 344 | Temp. | TF-144 | TE 344 | B22 Fuel Rod Pos.7 | Fig.5.98 | 273. | - | 0.64%FS |
| 345 | Temp. | TF-145 | TE 345 | B31 Fuel Rod Pos.4 | Fig.5.132 | 273. | - | 0.64%FS |
| 346 | Temp. | TF-146 | TE 346 | B33 Fuel Rod Pos.4 | Fig.5.133 | 273. | - | 0.64%FS |
| 347 | Temp. | TF-147 | TE 347 | B51 Fuel Rod Pos.4 | Fig.5.134 | 273. | - | 0.64%FS |
| 348 | Temp. | TF-148 | TE 348 | B53 Fuel Rod Pos.4 | Fig.5.133 | 273. | - | 0.64%FS |
| 349 | Temp. | TF-149 | TE 349 | B66 Fuel Rod Pos.4 | Fig.5.133 | 273. | - | 0.64%FS |
| 350 | Temp. | TF-150 | TE 350 | B77 Fuel Rod Pos.1 | Not Measured | 273. | - | 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig. No. | Range | Unit | Accuracy |
|-----|-------|--------|-----|----------|----------|----------------|-----------|-----------|
| 351 | Temp. | TF-151 | TE | 351 | B77 | Fuel Rod Pos.2 | 0.125E+04 | K 0.64%FS |
| 352 | Temp. | TF-152 | TE | 352 | B77 | Fuel Rod Pos.3 | 0.125E+04 | K 0.64%FS |
| 353 | Temp. | TF-153 | TE | 353 | B77 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 354 | Temp. | TF-154 | TE | 354 | B77 | Fuel Rod Pos.5 | 0.125E+04 | K 0.64%FS |
| 355 | Temp. | TF-155 | TE | 355 | B77 | Fuel Rod Pos.6 | 0.125E+04 | K 0.64%FS |
| 356 | Temp. | TF-156 | TE | 356 | B77 | Fuel Rod Pos.7 | 0.125E+04 | K 0.64%FS |
| 357 | Temp. | TF-157 | TE | 357 | B86 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 358 | Temp. | TF-158 | TE | 358 | C11 | Fuel Rod Pos.1 | 0.125E+04 | K 0.64%FS |
| 359 | Temp. | TF-159 | TE | 359 | C11 | Fuel Rod Pos.2 | 0.125E+04 | K 0.64%FS |
| 360 | Temp. | TF-160 | TE | 360 | C11 | Fuel Rod Pos.3 | 0.125E+04 | K 0.64%FS |
| 361 | Temp. | TF-161 | TE | 361 | C11 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 362 | Temp. | TF-162 | TE | 362 | C11 | Fuel Rod Pos.5 | 0.125E+04 | K 0.64%FS |
| 363 | Temp. | TF-163 | TE | 363 | C11 | Fuel Rod Pos.6 | 0.125E+04 | K 0.64%FS |
| 364 | Temp. | TF-164 | TE | 364 | C11 | Fuel Rod Pos.7 | 0.125E+04 | K 0.64%FS |
| 365 | Temp. | TF-165 | TE | 365 | C13 | Fuel Rod Pos.1 | 0.125E+04 | K 0.64%FS |
| 366 | Temp. | TF-166 | TE | 366 | C13 | Fuel Rod Pos.2 | 0.125E+04 | K 0.64%FS |
| 367 | Temp. | TF-167 | TE | 367 | C13 | Fuel Rod Pos.3 | 0.125E+04 | K 0.64%FS |
| 368 | Temp. | TF-168 | TE | 368 | C13 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 369 | Temp. | TF-169 | TE | 369 | C13 | Fuel Rod Pos.5 | 0.125E+04 | K 0.64%FS |
| 370 | Temp. | TF-170 | TE | 370 | C13 | Fuel Rod Pos.6 | 0.125E+04 | K 0.64%FS |
| 371 | Temp. | TF-171 | TE | 371 | C13 | Fuel Rod Pos.7 | 0.125E+04 | K 0.64%FS |
| 372 | Temp. | TF-172 | TE | 372 | C15 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 373 | Temp. | TF-173 | TE | 373 | C22 | Fuel Rod Pos.1 | 0.125E+04 | K 0.64%FS |
| 374 | Temp. | TF-174 | TE | 374 | C22 | Fuel Rod Pos.2 | 0.125E+04 | K 0.64%FS |
| 375 | Temp. | TF-175 | TE | 375 | C22 | Fuel Rod Pos.3 | 0.125E+04 | K 0.64%FS |
| 376 | Temp. | TF-176 | TE | 376 | C22 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 377 | Temp. | TF-177 | TE | 377 | C22 | Fuel Rod Pos.5 | 0.125E+04 | K 0.64%FS |
| 378 | Temp. | TF-178 | TE | 378 | C22 | Fuel Rod Pos.6 | 0.125E+04 | K 0.64%FS |
| 379 | Temp. | TF-179 | TE | 379 | C22 | Fuel Rod Pos.7 | 0.125E+04 | K 0.64%FS |
| 380 | Temp. | TF-180 | TE | 380 | C31 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 381 | Temp. | TF-181 | TE | 381 | C33 | Fuel Rod Pos.1 | 0.125E+04 | K 0.64%FS |
| 382 | Temp. | TF-182 | TE | 382 | C33 | Fuel Rod Pos.2 | 0.125E+04 | K 0.64%FS |
| 383 | Temp. | TF-183 | TE | 383 | C33 | Fuel Rod Pos.3 | 0.125E+04 | K 0.64%FS |
| 384 | Temp. | TF-184 | TE | 384 | C33 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 385 | Temp. | TF-185 | TE | 385 | C33 | Fuel Rod Pos.5 | 0.125E+04 | K 0.64%FS |
| 386 | Temp. | TF-186 | TE | 386 | C33 | Fuel Rod Pos.6 | 0.125E+04 | K 0.64%FS |
| 387 | Temp. | TF-187 | TE | 387 | C33 | Fuel Rod Pos.7 | 0.125E+04 | K 0.64%FS |
| 388 | Temp. | TF-188 | TE | 388 | C35 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 389 | Temp. | TF-189 | TE | 389 | C66 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 390 | Temp. | TF-190 | TE | 390 | C68 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 391 | Temp. | TF-191 | TE | 391 | C77 | Fuel Rod Pos.1 | 0.125E+04 | K 0.64%FS |
| 392 | Temp. | TF-192 | TE | 392 | C77 | Fuel Rod Pos.2 | 0.125E+04 | K 0.64%FS |
| 393 | Temp. | TF-193 | TE | 393 | C77 | Fuel Rod Pos.3 | 0.125E+04 | K 0.64%FS |
| 394 | Temp. | TF-194 | TE | 394 | C77 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 395 | Temp. | TF-195 | TE | 395 | C77 | Fuel Rod Pos.5 | 0.125E+04 | K 0.64%FS |
| 396 | Temp. | TF-196 | TE | 396 | C77 | Fuel Rod Pos.6 | 0.125E+04 | K 0.64%FS |
| 397 | Temp. | TF-197 | TE | 397 | C77 | Fuel Rod Pos.7 | 0.125E+04 | K 0.64%FS |
| 398 | Temp. | TF-198 | TE | 398 | D11 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 399 | Temp. | TF-199 | TE | 399 | D13 | Fuel Rod Pos.4 | 0.125E+04 | K 0.64%FS |
| 400 | Temp. | TF-200 | TE | 400 | D22 | Fuel Rod Pos.1 | 0.125E+04 | K 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig. No. | Range | Unit | Accuracy |
|-----|----------|--------|--------|------------------------|--------------|-------|------|-------------|
| 401 | Temp. | TF-201 | TE 401 | D22 Fuel Rod Pos.2 | Fig.5.104, | 147 | - | 0.64%FS |
| 402 | Temp. | TF-202 | TE 402 | D22 Fuel Rod Pos.3 | Fig.5.104, | 148 | - | 0.64%FS |
| 403 | Temp. | TF-203 | TE 403 | D22 Fuel Rod Pos.4 | Fig.5.104, | 149 | - | 0.64%FS |
| 404 | Temp. | TF-204 | TE 404 | D22 Fuel Rod Pos.5 | Fig.5.104, | 150 | - | 0.64%FS |
| 405 | Temp. | TF-205 | TE 405 | D22 Fuel Rod Pos.6 | Fig.5.104, | 151 | - | 0.64%FS |
| 406 | Temp. | TF-206 | TE 406 | D22 Fuel Rod Pos.7 | Fig.5.104, | 152 | - | 0.64%FS |
| 407 | Temp. | TF-207 | TE 407 | D31 Fuel Rod Pos.4 | Fig.5.137 | 273. | - | 0.125E+04 K |
| 408 | Temp. | TF-208 | TE 408 | D33 Fuel Rod Pos.4 | Fig.5.138 | 273. | - | 0.125E+04 K |
| 409 | Temp. | TF-209 | TE 409 | D51 Fuel Rod Pos.4 | Fig.5.134 | 273. | - | 0.125E+04 K |
| 410 | Temp. | TF-210 | TE 410 | D53 Fuel Rod Pos.4 | Fig.5.138 | 273. | - | 0.125E+04 K |
| 411 | Temp. | TF-211 | TE 411 | D66 Fuel Rod Pos.4 | Fig.5.138 | 273. | - | 0.125E+04 K |
| 412 | Temp. | TF-212 | TE 412 | D77 Fuel Rod Pos.4 | Fig.5.149 | 273. | - | 0.125E+04 K |
| 413 | Temp. | TF-213 | TE 413 | D86 Fuel Rod Pos.4 | Fig.5.137 | 273. | - | 0.125E+04 K |
| 414 | Fluid T. | TW-1 | TE 414 | A45 Tie Rod Pos.1 | Fig.5.105 | 273. | - | 0.125E+04 K |
| 415 | Fluid T. | TW-2 | TE 415 | A45 Tie Rod Pos.2 | Fig.5.105 | 273. | - | 0.125E+04 K |
| 416 | Fluid T. | TW-3 | TE 416 | A45 Tie Rod Pos.3 | Fig.5.105 | 273. | - | 0.125E+04 K |
| 417 | Fluid T. | TW-4 | TE 417 | A45 Tie Rod Pos.4 | Fig.5.105 | 273. | - | 0.125E+04 K |
| 418 | Fluid T. | TW-5 | TE 418 | A45 Tie Rod Pos.5 | Fig.5.105 | 273. | - | 0.125E+04 K |
| 419 | Fluid T. | TW-6 | TE 419 | A45 Tie Rod Pos.6 | Fig.5.105 | 273. | - | 0.125E+04 K |
| 420 | Fluid T. | TW-7 | TE 420 | A45 Tie Rod Pos.7 | Fig.5.105 | 273. | - | 0.125E+04 K |
| 421 | Fluid T. | TW-8 | TE 421 | B45 Tie Rod Pos.1 | Not Measured | 273. | - | 0.64%FS |
| 422 | Fluid T. | TW-9 | TE 422 | B45 Tie Rod Pos.2 | Not Measured | 273. | - | 0.64%FS |
| 423 | Fluid T. | TW-10 | TE 423 | B45 Tie Rod Pos.3 | Not Measured | 273. | - | 0.64%FS |
| 424 | Fluid T. | TW-11 | TE 424 | B45 Tie Rod Pos.4 | Not Measured | 273. | - | 0.64%FS |
| 425 | Fluid T. | TW-12 | TE 425 | B45 Tie Rod Pos.5 | Not Measured | 273. | - | 0.64%FS |
| 426 | Fluid T. | TW-13 | TE 426 | B45 Tie Rod Pos.6 | Not Measured | 273. | - | 0.64%FS |
| 427 | Fluid T. | TW-14 | TE 427 | B45 Tie Rod Pos.7 | Not Measured | 273. | - | 0.64%FS |
| 428 | Fluid T. | TW-15 | TE 428 | C45 Tie Rod Pos.1 | Fig.5.106 | 273. | - | 0.125E+04 K |
| 429 | Fluid T. | TW-16 | TE 429 | C45 Tie Rod Pos.2 | Fig.5.106 | 273. | - | 0.125E+04 K |
| 430 | Fluid T. | TW-17 | TE 430 | C45 Tie Rod Pos.3 | Fig.5.106 | 273. | - | 0.125E+04 K |
| 431 | Fluid T. | TW-18 | TE 431 | C45 Tie Rod Pos.4 | Fig.5.106 | 273. | - | 0.125E+04 K |
| 432 | Fluid T. | TW-19 | TE 432 | C45 Tie Rod Pos.5 | Fig.5.106 | 273. | - | 0.125E+04 K |
| 433 | Fluid T. | TW-20 | TE 433 | C45 Tie Rod Pos.6 | Fig.5.106 | 273. | - | 0.125E+04 K |
| 434 | Fluid T. | TW-21 | TE 434 | C45 Tie Rod Pos.7 | Fig.5.106 | 273. | - | 0.125E+04 K |
| 435 | Fluid T. | TW-22 | TE 435 | D45 Tie Rod Pos.1 | Not Measured | 273. | - | 0.64%FS |
| 436 | Fluid T. | TW-23 | TE 436 | D45 Tie Rod Pos.2 | Not Measured | 273. | - | 0.64%FS |
| 437 | Fluid T. | TW-24 | TE 437 | D45 Tie Rod Pos.3 | Not Measured | 273. | - | 0.64%FS |
| 438 | Fluid T. | TW-25 | TE 438 | D45 Tie Rod Pos.4 | Not Measured | 273. | - | 0.64%FS |
| 439 | Fluid T. | TW-26 | TE 439 | D45 Tie Rod Pos.5 | Not Measured | 273. | - | 0.64%FS |
| 440 | Fluid T. | TW-27 | TE 440 | D45 Tie Rod Pos.6 | Not Measured | 273. | - | 0.64%FS |
| 441 | Fluid T. | TW-28 | TE 441 | D45 Tie Rod Pos.7 | Not Measured | 273. | - | 0.125E+04 K |
| 442 | Fluid T. | TC-1 | TE 442 | Channel Box A Inlet | Fig.5.160 | 273. | - | 0.125E+04 K |
| 443 | Fluid T. | TC-2 | TE 443 | Channel Box B Inlet | Fig.5.160 | 273. | - | 0.125E+04 K |
| 444 | Fluid T. | TC-3 | TE 444 | Channel Box C Inlet | Fig.5.160 | 273. | - | 0.125E+04 K |
| 445 | Fluid T. | TC-4 | TE 445 | Channel Box D Inlet | Fig.5.160 | 273. | - | 0.125E+04 K |
| 446 | Fluid T. | TC-5 | TE 446 | Channel Box Outlet A-1 | Fig.5.161 | 273. | - | 0.64%FS |
| 447 | Fluid T. | TC-6 | TE 447 | Channel Box Outlet A-2 | Fig.5.161 | 273. | - | 0.125E+04 K |
| 448 | Fluid T. | TC-7 | TE 448 | Channel Box Outlet A-3 | Fig.5.161 | 273. | - | 0.64%FS |
| 449 | Fluid T. | TC-8 | TE 449 | Channel Box Outlet A-4 | Fig.5.161 | 273. | - | 0.64%FS |
| 450 | Fluid T. | TC-9 | TE 450 | Channel Box Outlet A-6 | Fig.5.161 | 273. | - | 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.No. | Range | Unit | Accuracy |
|-----|----------|--------|--------|------------------------|----------------|-------|------|----------|
| 451 | Fluid T. | TC-10 | TE 451 | Channel Box Outlet C-1 | Fig.5-162 | 273. | - | 0.64%FS |
| 452 | Fluid T. | TC-11 | TE 452 | Channel Box Outlet C-2 | Fig.5-162 | 273. | - | 0.64%FS |
| 453 | Fluid T. | TC-12 | TE 453 | Channel Box Outlet C-3 | Fig.5-162 | 273. | - | 0.64%FS |
| 454 | Fluid T. | TC-13 | TE 454 | Channel Box Outlet C-4 | Fig.5-162 | 273. | - | 0.64%FS |
| 455 | Fluid T. | TC-14 | TE 455 | Channel Box Outlet C-6 | Fig.5-162 | 273. | - | 0.64%FS |
| 456 | Fluid T. | TG-1 | TE 456 | Upper Tieplate A Up-1 | Fig.5-163, 167 | 273. | - | 0.64%FS |
| 457 | Fluid T. | TG-2 | TE 457 | Upper Tieplate A Up-2 | Not Measured | 273. | - | 0.64%FS |
| 458 | Fluid T. | TG-3 | TE 458 | Upper Tieplate A Up-3 | Not Measured | 273. | - | 0.64%FS |
| 459 | Fluid T. | TG-4 | TE 459 | Upper Tieplate A Up-4 | Fig.5-163, 168 | 273. | - | 0.64%FS |
| 460 | Fluid T. | TG-5 | TE 460 | Upper Tieplate A Up-5 | Fig.5-163, 169 | 273. | - | 0.64%FS |
| 461 | Fluid T. | TG-6 | TE 461 | Upper Tieplate A Up-6 | Not Measured | 273. | - | 0.64%FS |
| 462 | Fluid T. | TG-7 | TE 462 | Upper Tieplate A Up-7 | Not Measured | 273. | - | 0.64%FS |
| 463 | Fluid T. | TG-8 | TE 463 | Upper Tieplate A Up-8 | Fig.5-164, 170 | 273. | - | 0.64%FS |
| 464 | Fluid T. | TG-9 | TE 464 | Upper Tieplate A Up-9 | Not Measured | 273. | - | 0.64%FS |
| 465 | Fluid T. | TG-10 | TE 465 | Upper Tieplate A Up-10 | Fig.5-164, 171 | 273. | - | 0.64%FS |
| 466 | Fluid T. | TG-11 | TE 466 | Upper Tieplate A Lo-1 | Fig.5-165, 167 | 273. | - | 0.64%FS |
| 467 | Fluid T. | TG-12 | TE 467 | Upper Tieplate A Lo-2 | Not Measured | 273. | - | 0.64%FS |
| 468 | Fluid T. | TG-13 | TE 468 | Upper Tieplate A Lo-3 | Not Measured | 273. | - | 0.64%FS |
| 469 | Fluid T. | TG-14 | TE 469 | Upper Tieplate A Lo-4 | Fig.5-165, 168 | 273. | - | 0.64%FS |
| 470 | Fluid T. | TG-15 | TE 470 | Upper Tieplate A Lo-5 | Fig.5-165, 169 | 273. | - | 0.64%FS |
| 471 | Fluid T. | TG-16 | TE 471 | Upper Tieplate A Lo-6 | Not Measured | 273. | - | 0.64%FS |
| 472 | Fluid T. | TG-17 | TE 472 | Upper Tieplate A Lo-7 | Not Measured | 273. | - | 0.64%FS |
| 473 | Fluid T. | TG-18 | TE 473 | Upper Tieplate A Lo-8 | Fig.5-166, 170 | 273. | - | 0.64%FS |
| 474 | Fluid T. | TG-19 | TE 474 | Upper Tieplate A Lo-9 | Not Measured | 273. | - | 0.64%FS |
| 475 | Fluid T. | TG-20 | TE 475 | Upper Tieplate A Lo-10 | Fig.5-166, 171 | 273. | - | 0.64%FS |
| 476 | Fluid T. | TG-21 | TE 476 | Upper Tieplate C Up-1 | Not Measured | 273. | - | 0.64%FS |
| 477 | Fluid T. | TG-22 | TE 477 | Upper Tieplate C Up-2 | Not Measured | 273. | - | 0.64%FS |
| 478 | Fluid T. | TG-23 | TE 478 | Upper Tieplate C Up-3 | Not Measured | 273. | - | 0.64%FS |
| 479 | Fluid T. | TG-24 | TE 479 | Upper Tieplate C Up-4 | Not Measured | 273. | - | 0.64%FS |
| 480 | Fluid T. | TG-25 | TE 480 | Upper Tieplate C Up-5 | Not Measured | 273. | - | 0.64%FS |
| 481 | Fluid T. | TG-26 | TE 481 | Upper Tieplate C Up-6 | Not Measured | 273. | - | 0.64%FS |
| 482 | Fluid T. | TG-27 | TE 482 | Upper Tieplate C Up-7 | Not Measured | 273. | - | 0.64%FS |
| 483 | Fluid T. | TG-28 | TE 483 | Upper Tieplate C Up-8 | Not Measured | 273. | - | 0.64%FS |
| 484 | Fluid T. | TG-29 | TE 484 | Upper Tieplate C Up-9 | Not Measured | 273. | - | 0.64%FS |
| 485 | Fluid T. | TG-30 | TE 485 | Upper Tieplate C Up-10 | Not Measured | 273. | - | 0.64%FS |
| 486 | Fluid T. | TG-31 | TE 486 | Upper Tieplate C Lo-1 | Not Measured | 273. | - | 0.64%FS |
| 487 | Fluid T. | TG-32 | TE 487 | Upper Tieplate C Lo-2 | Not Measured | 273. | - | 0.64%FS |
| 488 | Fluid T. | TG-33 | TE 488 | Upper Tieplate C Lo-3 | Not Measured | 273. | - | 0.64%FS |
| 489 | Fluid T. | TG-34 | TE 489 | Upper Tieplate C Lo-4 | Not Measured | 273. | - | 0.64%FS |
| 490 | Fluid T. | TG-35 | TE 490 | Upper Tieplate C Lo-5 | Not Measured | 273. | - | 0.64%FS |
| 491 | Fluid T. | TG-36 | TE 491 | Upper Tieplate C Lo-6 | Not Measured | 273. | - | 0.64%FS |
| 492 | Fluid T. | TG-37 | TE 492 | Upper Tieplate C Lo-7 | Not Measured | 273. | - | 0.64%FS |
| 493 | Fluid T. | TG-38 | TE 493 | Upper Tieplate C Lo-8 | Not Measured | 273. | - | 0.64%FS |
| 494 | Fluid T. | TG-39 | TE 494 | Upper Tieplate C Lo-9 | Not Measured | 273. | - | 0.64%FS |
| 495 | Fluid T. | TG-40 | TE 495 | Upper Tieplate C Lo-10 | Not Measured | 273. | - | 0.64%FS |
| 496 | Slab T. | TB-1 | TE 496 | C-B. A1 Inner Pos.1 | Fig.5-107, 172 | 273. | - | 0.64%FS |
| 497 | Slab T. | TB-2 | TE 497 | C-B. A1 Inner Pos.2 | Fig.5-107, 173 | 273. | - | 0.64%FS |
| 498 | Slab T. | TB-3 | TE 498 | C-B. A1 Inner Pos.3 | Fig.5-107, 174 | 273. | - | 0.64%FS |
| 499 | Slab T. | TB-4 | TE 499 | C-B. A1 Inner Pos.4 | Fig.5-107, 175 | 273. | - | 0.64%FS |
| 500 | Slab T. | TB-5 | TE 500 | C-B. A1 Inner Pos.5 | Fig.5-107, 176 | 273. | - | 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig. No. | Fig. No. | Range | Unit | Accuracy |
|-----|----------|--------|-----|---------------------|--------------|----------|-------|------|----------|
| 501 | Slab T. | TB-6 | TE | C-B. A1 Inner Pos.6 | Fig.5.107, | 177 | 273. | - | 0.64%FS |
| 502 | Slab T. | TB-7 | TE | C-B. A1 Inner Pos.7 | Fig.5.107, | 178 | 273. | - | 0.64%FS |
| 503 | Slab T. | TB-8 | TE | C-B. A2 Inner Pos.1 | Fig.5.108, | 172 | 273. | - | 0.64%FS |
| 504 | Slab T. | TB-9 | TE | C-B. A2 Inner Pos.2 | Fig.5.108, | 173 | 273. | - | 0.64%FS |
| 505 | Slab T. | TB-10 | TE | C-B. A2 Inner Pos.3 | Fig.5.108, | 174 | 273. | - | 0.64%FS |
| 506 | Slab T. | TB-11 | TE | C-B. A2 Inner Pos.4 | Fig.5.108, | 175 | 273. | - | 0.64%FS |
| 507 | Slab T. | TB-12 | TE | C-B. A2 Inner Pos.5 | Fig.5.108, | 176 | 273. | - | 0.64%FS |
| 508 | Slab T. | TB-13 | TE | C-B. A2 Inner Pos.6 | Fig.5.108, | 177 | 273. | - | 0.64%FS |
| 509 | Slab T. | TB-14 | TE | C-B. A2 Inner Pos.7 | Fig.5.108, | 178 | 273. | - | 0.64%FS |
| 510 | Slab T. | TB-15 | TE | C-B. B Inner Pos.1 | Fig.5.109 | - | 273. | - | 0.64%FS |
| 511 | Slab T. | TB-16 | TE | C-B. B Inner Pos.2 | Not Measured | - | 273. | - | 0.64%FS |
| 512 | Slab T. | TB-17 | TE | C-B. B Inner Pos.3 | Not Measured | - | 273. | - | 0.64%FS |
| 513 | Slab T. | TB-18 | TE | C-B. B Inner Pos.4 | Not Measured | - | 273. | - | 0.64%FS |
| 514 | Slab T. | TB-19 | TE | C-B. B Inner Pos.5 | Not Measured | - | 273. | - | 0.64%FS |
| 515 | Slab T. | TB-20 | TE | C-B. B Inner Pos.6 | Not Measured | - | 273. | - | 0.64%FS |
| 516 | Slab T. | TB-21 | TE | C-B. B Inner Pos.7 | Not Measured | - | 273. | - | 0.64%FS |
| 517 | Slab T. | TB-22 | TE | C-B. C Inner Pos.1 | Fig.5.110, | 172 | 273. | - | 0.64%FS |
| 518 | Slab T. | TB-23 | TE | C-B. C Inner Pos.2 | Fig.5.110, | 173 | 273. | - | 0.64%FS |
| 519 | Slab T. | TB-24 | TE | C-B. C Inner Pos.3 | Fig.5.110, | 174 | 273. | - | 0.64%FS |
| 520 | Slab T. | TB-25 | TE | C-B. C Inner Pos.4 | Fig.5.110, | 175 | 273. | - | 0.64%FS |
| 521 | Slab T. | TB-26 | TE | C-B. C Inner Pos.5 | Fig.5.110, | 176 | 273. | - | 0.64%FS |
| 522 | Slab T. | TB-27 | TE | C-B. C Inner Pos.6 | Fig.5.110, | 177 | 273. | - | 0.64%FS |
| 523 | Slab T. | TB-28 | TE | C-B. C Inner Pos.7 | Fig.5.110, | 178 | 273. | - | 0.64%FS |
| 524 | Slab T. | TB-29 | TE | C-B. D Inner Pos.1 | Not Measured | - | 273. | - | 0.64%FS |
| 525 | Slab T. | TB-30 | TE | C-B. D Inner Pos.2 | Not Measured | - | 273. | - | 0.64%FS |
| 526 | Slab T. | TB-31 | TE | C-B. D Inner Pos.3 | Not Measured | - | 273. | - | 0.64%FS |
| 527 | Slab T. | TB-32 | TE | C-B. D Inner Pos.4 | Not Measured | - | 273. | - | 0.64%FS |
| 528 | Slab T. | TB-33 | TE | C-B. D Inner Pos.5 | Not Measured | - | 273. | - | 0.64%FS |
| 529 | Slab T. | TB-34 | TE | C-B. D Inner Pos.6 | Not Measured | - | 273. | - | 0.64%FS |
| 530 | Slab T. | TB-35 | TE | C-B. D Inner Pos.7 | Not Measured | - | 273. | - | 0.64%FS |
| 531 | Fluid T. | TB-36 | TE | C-B. A Outer Pos.1 | Fig.5.111, | 172 | 273. | - | 0.64%FS |
| 532 | Fluid T. | TB-37 | TE | C-B. A Outer Pos.2 | Fig.5.111, | 173 | 273. | - | 0.64%FS |
| 533 | Fluid T. | TB-38 | TE | C-B. A Outer Pos.3 | Fig.5.111, | 174 | 273. | - | 0.64%FS |
| 534 | Fluid T. | TB-39 | TE | C-B. A Outer Pos.4 | Fig.5.111, | 175 | 273. | - | 0.64%FS |
| 535 | Fluid T. | TB-40 | TE | C-B. A Outer Pos.5 | Fig.5.111, | 176 | 273. | - | 0.64%FS |
| 536 | Fluid T. | TB-41 | TE | C-B. A Outer Pos.6 | Fig.5.111, | 177 | 273. | - | 0.64%FS |
| 537 | Fluid T. | TB-42 | TE | C-B. A Outer Pos.7 | Fig.5.111, | 178 | 273. | - | 0.64%FS |
| 538 | Fluid T. | TB-43 | TE | C-B. C Outer Pos.1 | Fig.5.112, | 172 | 273. | - | 0.64%FS |
| 539 | Fluid T. | TB-44 | TE | C-B. C Outer Pos.2 | Fig.5.112, | 173 | 273. | - | 0.64%FS |
| 540 | Fluid T. | TB-45 | TE | C-B. C Outer Pos.3 | Fig.5.112, | 174 | 273. | - | 0.64%FS |
| 541 | Fluid T. | TB-46 | TE | C-B. C Outer Pos.4 | Fig.5.112, | 175 | 273. | - | 0.64%FS |
| 542 | Fluid T. | TB-47 | TE | C-B. C Outer Pos.5 | Fig.5.112, | 176 | 273. | - | 0.64%FS |
| 543 | Fluid T. | TB-48 | TE | C-B. C Outer Pos.6 | Fig.5.112, | 177 | 273. | - | 0.64%FS |
| 544 | Fluid T. | TB-49 | TE | C-B. C Outer Pos.7 | Fig.5.112, | 178 | 273. | - | 0.64%FS |
| 545 | Fluid T. | TP-1 | TE | Lower PL. Center 1 | Fig.5.179 | - | 273. | - | 0.64%FS |
| 546 | Fluid T. | TP-2 | TE | Lower PL. Center 2 | Fig.5.179 | - | 273. | - | 0.64%FS |
| 547 | Fluid T. | TP-3 | TE | Lower PL. Center 3 | Fig.5.179 | - | 273. | - | 0.64%FS |
| 548 | Fluid T. | TP-4 | TE | Lower PL. Center 4 | Fig.5.179 | - | 273. | - | 0.64%FS |
| 549 | Fluid T. | TP-5 | TE | Lower PL. Center 5 | Fig.5.179 | - | 273. | - | 0.64%FS |
| 550 | Fluid T. | TP-6 | TE | Lower PL. Center 7 | Fig.5.179 | - | 273. | - | 0.64%FS |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig-No. | Range | Unit | Accuracy |
|-----|---------|--------|-----|------------------------|--------------|-----------|------|----------|
| 551 | Slab T. | TP- 7 | TE | 551 Lower Pt. North | fig.5.180 | 273. | - | 0.64%FS |
| 552 | Slab T. | TP- 8 | TE | 552 Lower Pt. North | Not Measured | 273. | - | 0.64%FS |
| 553 | Slab T. | TP- 9 | TE | 553 Lower Pt. North | Not Measured | 273. | - | 0.64%FS |
| 554 | Slab T. | TP-10 | TE | 554 Lower Pt. North | Not Measured | 273. | - | 0.64%FS |
| 555 | Slab T. | TP-11 | TE | 555 Lower Pt. South | Not Measured | 273. | - | 0.64%FS |
| 556 | Slab T. | TP-12 | TE | 556 Lower Pt. South | Not Measured | 273. | - | 0.64%FS |
| 557 | Slab T. | TP-13 | TE | 557 Lower Pt. South | Not Measured | 273. | - | 0.64%FS |
| 558 | Slab T. | TP-14 | TE | 558 Lower Pt. South | Not Measured | 273. | - | 0.64%FS |
| 559 | Level | LB- 1 | LM | 559 C.B.-Liquid Level | A1-1 | 273. | - | 0.64%FS |
| 560 | Level | LB- 2 | LM | 560 C.B.-Liquid Level | A1-2 | 273. | - | 0.64%FS |
| 561 | Level | LB- 3 | LM | 561 C.B.-Liquid Level | A1-3 | 273. | - | 0.64%FS |
| 562 | Level | LB- 4 | LM | 562 C.B.-Liquid Level | A1-4 | 273. | - | 0.64%FS |
| 563 | Level | LB- 5 | LM | 563 C.B.-Liquid Level | A1-5 | 273. | - | 0.64%FS |
| 564 | Level | LB- 6 | LM | 564 C.B.-Liquid Level | A1-6 | 273. | - | 0.64%FS |
| 565 | Level | LB- 7 | LM | 565 C.B.-Liquid Level | A1-7 | 273. | - | 0.64%FS |
| 566 | Level | LB- 8 | LM | 566 C.B.-Liquid Level | A2-1 | 273. | - | 0.64%FS |
| 567 | Level | LB- 9 | LM | 567 C.B.-Liquid Level | A2-2 | 273. | - | 0.64%FS |
| 568 | Level | LB-10 | LM | 568 C.B.-Liquid Level | A2-3 | 273. | - | 0.64%FS |
| 569 | Level | LB-11 | LM | 569 C.B.-Liquid Level | A2-4 | 273. | - | 0.64%FS |
| 570 | Level | LB-12 | LM | 570 C.B.-Liquid Level | A2-5 | 273. | - | 0.64%FS |
| 571 | Level | LB-13 | LM | 571 C.B.-Liquid Level | A2-6 | 273. | - | 0.64%FS |
| 572 | Level | LB-14 | LM | 572 C.B.-Liquid Level | A2-7 | 273. | - | 0.64%FS |
| 573 | Level | LB-15 | LM | 573 C.B.-Liquid Level | B-1 | Fig.5.183 | | |
| 574 | Level | LB-16 | LM | 574 C.B.-Liquid Level | B-2 | Fig.5.183 | | |
| 575 | Level | LB-17 | LM | 575 C.B.-Liquid Level | B-3 | Fig.5.183 | | |
| 576 | Level | LB-18 | LM | 576 C.B.-Liquid Level | B-4 | Fig.5.183 | | |
| 577 | Level | LB-19 | LM | 577 C.B.-Liquid Level | B-5 | Fig.5.183 | | |
| 578 | Level | LB-20 | LM | 578 C.B.-Liquid Level | B-6 | Fig.5.183 | | |
| 579 | Level | LB-21 | LM | 579 C.B.-Liquid Level | B-7 | Fig.5.183 | | |
| 580 | Level | LB-22 | LM | 580 C.B.-Liquid Level | C-1 | Fig.5.184 | | |
| 581 | Level | LB-23 | LM | 581 C.B.-Liquid Level | C-2 | Fig.5.184 | | |
| 582 | Level | LB-24 | LM | 582 C.B.-Liquid Level | C-3 | Fig.5.184 | | |
| 583 | Level | LB-25 | LM | 583 C.B.-Liquid Level | C-4 | Fig.5.184 | | |
| 584 | Level | LB-26 | LM | 584 C.B.-Liquid Level | C-5 | Fig.5.184 | | |
| 585 | Level | LB-27 | LM | 585 C.B.-Liquid Level | C-6 | Fig.5.184 | | |
| 586 | Level | LB-28 | LM | 586 C.B.-Liquid Level | C-7 | Fig.5.184 | | |
| 587 | Level | LB-29 | LM | 587 C.B.-Liquid Level | D-1 | Fig.5.185 | | |
| 588 | Level | LB-30 | LM | 588 C.B.-Liquid Level | D-2 | Fig.5.185 | | |
| 589 | Level | LB-31 | LM | 589 C.B.-Liquid Level | D-3 | Fig.5.185 | | |
| 590 | Level | LB-32 | LM | 590 C.B.-Liquid Level | D-4 | Fig.5.185 | | |
| 591 | Level | LB-33 | LM | 591 C.B.-Liquid Level | D-5 | Fig.5.185 | | |
| 592 | Level | LB-34 | LM | 592 C.B.-Liquid Level | D-6 | Fig.5.185 | | |
| 593 | Level | LB-35 | LM | 593 C.B.-Liquid Level | D-7 | Fig.5.185 | | |
| 594 | Level | LL- 1 | LM | 594 Ch.Box Outlet A1-5 | not measured | Fig.5.186 | | |
| 595 | Level | LL- 2 | LM | 595 Ch.Box Outlet A1-6 | not measured | Fig.5.186 | | |
| 596 | Level | LL- 3 | LM | 596 Ch.Box Outlet A1-7 | not measured | Fig.5.186 | | |
| 597 | Level | LL- 4 | LM | 597 Ch.Box Outlet A2-5 | Fig.5.187 | | | |
| 598 | Level | LL- 5 | LM | 598 Ch.Box Outlet A2-6 | Fig.5.187 | | | |
| 599 | Level | LL- 6 | LM | 599 Ch.Box Outlet A2-7 | Fig.5.187 | | | |
| 600 | Level | LL- 7 | LM | 600 Ch.Box Outlet A1-1 | Fig.5.188 | | | |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.No. | Range | Unit | Accuracy |
|-----|-------|--------|-----|-------------------|-------------|--------------|------|----------|
| 601 | Level | LL- 8 | LM | 601 Ch.Box | Outlet A-2 | not measured | | |
| 602 | Level | LL- 9 | LM | 602 Ch.Box | Outlet A-3 | Fig.5.188 | | |
| 603 | Level | LL-10 | LM | 603 Ch.Box | Outlet A-4 | Fig.5.188 | | |
| 604 | Level | LL-11 | LM | 604 Ch.Box | Outlet A-6 | Fig.5.188 | | |
| 605 | Level | LL-12 | LM | 605 Ch.Box | Outlet C1-5 | Fig.5.189 | | |
| 606 | Level | LL-13 | LM | 606 Ch.Box | Outlet C1-6 | Fig.5.189 | | |
| 607 | Level | LL-14 | LM | 607 Ch.Box | Outlet C1-7 | Fig.5.189 | | |
| 608 | Level | LL-15 | LM | 608 Ch.Box | Outlet C2-5 | Fig.5.190 | | |
| 609 | Level | LL-16 | LM | 609 Ch.Box | Outlet C2-6 | Fig.5.190 | | |
| 610 | Level | LL-17 | LM | 610 Ch.Box | Outlet C2-7 | Fig.5.190 | | |
| 611 | Level | LL-18 | LM | 611 Ch.Box | Outlet C-1 | Fig.5.191 | | |
| 612 | Level | LL-19 | LM | 612 Ch.Box | Outlet C-2 | Fig.5.191 | | |
| 613 | Level | LL-20 | LM | 613 Ch.Box | Outlet C-3 | Fig.5.191 | | |
| 614 | Level | LL-21 | LM | 614 Ch.Box | Outlet C-4 | Fig.5.191 | | |
| 615 | Level | LL-22 | LM | 615 Ch.Box | Outlet C-6 | Fig.5.191 | | |
| 616 | Level | LL-23 | LM | 616 Ch.Box | Inlet A-1 | Fig.5.191 | | |
| 617 | Level | LL-24 | LM | 617 Ch.Box | Inlet A-2 | Fig.5.192 | | |
| 618 | Level | LL-25 | LM | 618 Ch.Box | Inlet B-1 | Fig.5.193 | | |
| 619 | Level | LL-26 | LM | 619 Ch.Box | Inlet B-2 | Fig.5.193 | | |
| 620 | Level | LL-27 | LM | 620 Ch.Box | Inlet C-1 | Fig.5.194 | | |
| 621 | Level | LL-28 | LM | 621 Ch.Box | Inlet C-2 | Fig.5.194 | | |
| 622 | Level | LL-29 | LM | 622 Ch.Box | Inlet D-1 | Fig.5.195 | | |
| 623 | Level | LL-30 | LM | 623 Ch.Box | Inlet D-2 | Fig.5.195 | | |
| 624 | Level | LL-31 | LM | 624 Lower PL. | North 1 | Fig.5.196 | | |
| 625 | Level | LL-32 | LM | 625 Lower PL. | North 2 | Fig.5.196 | | |
| 626 | Level | LL-33 | LM | 626 Lower PL. | North 3 | Fig.5.196 | | |
| 627 | Level | LL-34 | LM | 627 Lower PL. | North 4 | Fig.5.196 | | |
| 628 | Level | LL-35 | LM | 628 Lower PL. | North 5 | Fig.5.196 | | |
| 629 | Level | LL-36 | LM | 629 Lower PL. | North 6 | Fig.5.196 | | |
| 630 | Level | LL-37 | LM | 630 Lower PL. | South 1 | Fig.5.197 | | |
| 631 | Level | LL-38 | LM | 631 Lower PL. | South 2 | Fig.5.197 | | |
| 632 | Level | LL-39 | LM | 632 Lower PL. | South 3 | Fig.5.197 | | |
| 633 | Level | LL-40 | LM | 633 Lower PL. | South 4 | Fig.5.197 | | |
| 634 | Level | LL-41 | LM | 634 Lower PL. | South 5 | Fig.5.197 | | |
| 635 | Level | LL-42 | LM | 635 Lower PL. | South 6 | Fig.5.197 | | |
| 636 | Level | LL-43 | LM | 636 Guide Tube | North 0 | Fig.5.198 | | |
| 637 | Level | LL-44 | LM | 637 Guide Tube | North 1 | Fig.5.198 | | |
| 638 | Level | LL-45 | LM | 638 Guide Tube | North 3 | Fig.5.198 | | |
| 639 | Level | LL-46 | LM | 639 Guide Tube | North 6 | Fig.5.198 | | |
| 640 | Level | LL-47 | LM | 640 Downcomer | South 0 | Fig.5.199 | | |
| 641 | Level | LL-48 | LM | 641 Downcomer | South 1 | Fig.5.199 | | |
| 642 | Level | LL-49 | LM | 642 Downcomer | South 3 | Fig.5.199 | | |
| 643 | Level | LL-50 | LM | 643 Downcomer | South 6 | Fig.5.199 | | |
| 644 | Level | L- 1 | LM | 644 Downcomer | D-Side 1 | Fig.5.200 | | |
| 645 | Level | L- 2 | LM | 645 Downcomer | D-Side 2 | Fig.5.200 | | |
| 646 | Level | L- 3 | LM | 646 Downcomer | D-Side 3 | Fig.5.200 | | |
| 647 | Level | L- 4 | LM | 647 Downcomer | D-Side 4 | Fig.5.200 | | |
| 648 | Level | L- 5 | LM | 648 Downcomer | D-Side 5 | Fig.5.200 | | |
| 649 | Level | L- 6 | LM | 649 Downcomer | B-Side 1 | Fig.5.201 | | |
| 650 | Level | L- 7 | LM | 650 Downcomer | B-Side 2 | Fig.5.201 | | |

Table 3.2 Measurement List for RUN 913 (Continued)

| Ch. | Item | Symbol | ID. | Location | Fig.No. | Range | Unit | Accuracy |
|-----|-------|--------|-----|----------|-----------------------|--------------|-----------|----------|
| 651 | Level | L- | 8 | LM | 651 | Dowcomer | B-Side | 3 |
| 652 | Level | L- | 9 | LM | 652 | Dowcomer | B-Side | 4 |
| 653 | Level | L-10 | LM | 653 | Dowcomer | B-Side | 5 | |
| 654 | Void | VF-1 | VD | 654 | A54 Tie Rod Pos.1 | Not Measured | Fig.5.201 | 1.00 |
| 655 | Void | VF-2 | VD | 655 | A54 Tie Rod Pos.2 | Not Measured | Fig.5.201 | 1.00 |
| 656 | Void | VF-3 | VD | 656 | A54 Tie Rod Pos.3 | Not Measured | Fig.5.201 | 1.00 |
| 657 | Void | VF-4 | VD | 657 | A54 Tie Rod Pos.4 | Not Measured | Fig.5.201 | 1.00 |
| 658 | Void | VF-5 | VD | 658 | A54 Tie Rod Pos.5 | Not Measured | Fig.5.201 | 1.00 |
| 659 | Void | VF-6 | VD | 659 | A54 Tie Rod Pos.6 | Not Measured | Fig.5.201 | 1.00 |
| 660 | Void | VF-7 | VD | 660 | A54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 661 | Void | VF-8 | VD | 661 | B54 Tie Rod Pos.1 | Not Measured | Fig.5.201 | 1.00 |
| 662 | Void | VF-9 | VD | 662 | B54 Tie Rod Pos.2 | Not Measured | Fig.5.201 | 1.00 |
| 663 | Void | VF-10 | VD | 663 | B54 Tie Rod Pos.3 | Not Measured | Fig.5.201 | 1.00 |
| 664 | Void | VF-11 | VD | 664 | B54 Tie Rod Pos.4 | Not Measured | Fig.5.201 | 1.00 |
| 665 | Void | VF-12 | VD | 665 | B54 Tie Rod Pos.5 | Not Measured | Fig.5.201 | 1.00 |
| 666 | Void | VF-13 | VD | 666 | B54 Tie Rod Pos.6 | Not Measured | Fig.5.201 | 1.00 |
| 667 | Void | VF-14 | VD | 667 | B54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 668 | Void | VF-15 | VD | 668 | C54 Tie Rod Pos.1 | Not Measured | Fig.5.201 | 1.00 |
| 669 | Void | VF-16 | VD | 669 | C54 Tie Rod Pos.2 | Not Measured | Fig.5.201 | 1.00 |
| 670 | Void | VF-17 | VD | 670 | C54 Tie Rod Pos.3 | Not Measured | Fig.5.201 | 1.00 |
| 671 | Void | VF-18 | VD | 671 | C54 Tie Rod Pos.4 | Not Measured | Fig.5.201 | 1.00 |
| 672 | Void | VF-19 | VD | 672 | C54 Tie Rod Pos.5 | Not Measured | Fig.5.201 | 1.00 |
| 673 | Void | VF-20 | VD | 673 | C54 Tie Rod Pos.6 | Not Measured | Fig.5.201 | 1.00 |
| 674 | Void | VF-21 | VD | 674 | C54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 675 | Void | VF-22 | VD | 675 | D54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 676 | Void | VF-23 | VD | 676 | D54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 677 | Void | VF-24 | VD | 677 | D54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 678 | Void | VF-25 | VD | 678 | D54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 679 | Void | VF-26 | VD | 679 | D54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 680 | Void | VF-27 | VD | 680 | D54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 681 | Void | VF-28 | VD | 681 | D54 Tie Rod Pos.7 | Not Measured | Fig.5.201 | 1.00 |
| 682 | Void | VE-1 | VD | 682 | Channel A Outlet 1 | Not Measured | Fig.5.201 | 1.00 |
| 683 | Void | VE-2 | VD | 683 | Channel A Outlet 2 | Not Measured | Fig.5.201 | 1.00 |
| 684 | Void | VE-3 | VD | 684 | Channel A Outlet 3 | Not Measured | Fig.5.201 | 1.00 |
| 685 | Void | VE-4 | VD | 685 | Channel B Outlet 1 | Not Measured | Fig.5.201 | 1.00 |
| 686 | Void | VE-5 | VD | 686 | Channel B Outlet 2 | Not Measured | Fig.5.201 | 1.00 |
| 687 | Void | VE-6 | VD | 687 | Channel B Outlet 3 | Not Measured | Fig.5.201 | 1.00 |
| 688 | Void | VE-7 | VD | 688 | Channel C Outlet 1 | Not Measured | Fig.5.201 | 1.00 |
| 689 | Void | VE-8 | VD | 689 | Channel C Outlet 2 | Not Measured | Fig.5.201 | 1.00 |
| 690 | Void | VE-9 | VD | 690 | Channel C Outlet 3 | Not Measured | Fig.5.201 | 1.00 |
| 691 | Void | VE-10 | VD | 691 | Channel D Outlet 1 | Not Measured | Fig.5.201 | 1.00 |
| 692 | Void | VE-11 | VD | 692 | Channel D Outlet 2 | Not Measured | Fig.5.201 | 1.00 |
| 693 | Void | VE-12 | VD | 693 | Channel D Outlet 3 | Not Measured | Fig.5.201 | 1.00 |
| 694 | Void | VE-13 | VD | 694 | Lower Plenum Bottom 1 | Not Measured | Fig.5.201 | 1.00 |
| 695 | Void | VE-14 | VD | 695 | Lower Plenum Bottom 2 | Not Measured | Fig.5.201 | 1.00 |
| 696 | Void | VE-15 | VD | 696 | Lower Plenum Bottom 3 | Not Measured | Fig.5.201 | 1.00 |
| 697 | Void | VP-1 | VD | 697 | Lower Plenum Inlet | Not Measured | Fig.5.201 | 1.00 |
| 698 | Void | VP-2 | VD | 698 | Lower Plenum Inlet | Not Measured | Fig.5.201 | 1.00 |

Table 3.3 Core Instrumentation Map

| Item | Pos. DL Rod No. | Core Outlet | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 | Core Inlet |
|---------------|--------------------------|----------------|-------|--------|--------|-------|--------|--------|-------|---------------|
| | | 3660 | 3417 | 3114.5 | 2879.5 | 2527 | 2174.5 | 1939.5 | 1637 | 1454 |
| Surface Temp. | A11 | | TF 1 | TF 2 | TF 3 | TF 4 | TF 5 | TF 6 | TF 7 | |
| | A12 | | TF 8 | TF 9 | TF 10 | TF 11 | TF 12 | TF 13 | TF 14 | |
| | A13 | | TF 15 | TF 16 | TF 17 | TF 18 | TF 19 | TF 20 | TF 21 | |
| | A14 | | TF 22 | TF 23 | TF 24 | TF 25 | TF 26 | TF 27 | TF 28 | |
| | A15 | | TF 29 | | | TF 30 | | | | |
| | A17 | | TF 31 | | | TF 32 | | | | |
| | A22 | | TF 33 | TF 34 | TF 35 | TF 36 | TF 37 | TF 38 | TF 39 | |
| | A23 | | TF 40 | TF 41 | TF 42 | TF 43 | TF 44 | TF 45 | TF 46 | |
| | A24 | | TF 47 | TF 48 | TF 49 | TF 50 | TF 51 | TF 52 | TF 53 | |
| | A26 | | TF 54 | | | TF 55 | | | | |
| | A28 | | TF 56 | | | TF 57 | | | | |
| | A31 | | TF 58 | | | TF 59 | | | | |
| | A33 | | TF 60 | TF 61 | TF 62 | TF 63 | TF 64 | TF 65 | TF 66 | |
| | A34 | | TF 67 | TF 68 | TF 69 | TF 70 | TF 71 | TF 72 | TF 73 | |
| | A35 | | TF 74 | | | TF 75 | | | | |
| | A37 | | TF 76 | | | TF 77 | | | | |
| | A42 | | TF 78 | | | TF 79 | | | | |
| Fluid Temp. | A44 | TC 1 | TF180 | TF181 | TF182 | TF183 | TF184 | TF185 | TF186 | TC 2 |
| Surface Temp. | A45 | | TF 80 | | | TF 81 | | | | |
| | A46 | | TF 82 | | | TF 83 | | | | |
| | A48 | | TF 84 | | | TF 85 | | | | |
| | A51 | | TF 86 | | | TF 87 | | | | |
| | A53 | | TF 88 | | | TF 89 | | | | |
| | A54 | | TF 90 | | | | | | | |
| | A57 | | TF 91 | | | TF 92 | | | | |
| | A62 | | TF 93 | | | TF 94 | | | | |
| | A64 | | TF 95 | | | TF 96 | | | | |
| | A66 | | TF 97 | | | TF 98 | | | | |
| | A68 | | TF 99 | | | TF100 | | | | |
| | A71 | | TF101 | | | TF102 | | | | |
| | A73 | | TF103 | | | TF104 | | | | |
| | A75 | | TF105 | | | TF106 | | | | |
| | A77 | | TF107 | | | TF108 | | | | |

Table 3.3 Core Instrumentation Map (Continued)

| Item | Pos. Rod NO. | Core Outlet | Pos. 1 | Pos. 2 | Pos. 3 | Pos. 4 | Pos. 5 | Pos. 6 | Pos. 7 | Core Inlet |
|---------------|--------------------|----------------|--------|--------|--------|--------|--------|--------|--------|---------------|
| | | | DL | 3660 | 3417 | 3114.5 | 2879.5 | 2527 | 2174.5 | 1939.5 |
| Surface Temp. | A82 | | TF109 | | | TF110 | | | | |
| | A84 | | TF111 | | | TF112 | | | | |
| | A86 | | TF113 | | | TF114 | | | | |
| | A88 | | TF115 | | | TF116 | | | | |
| | B11 | | | | | TF117 | | | | |
| | B13 | | | | | TF118 | | | | |
| | B15 | | TF119 | TF120 | TF121 | TF122 | TF123 | TF124 | TF125 | |
| | B31 | | | | | TF126 | | | | |
| | B33 | | | | | TF127 | | | | |
| | B35 | | | | | TF128 | | | | |
| Fluid Temp. | B44 | TC 3 | TF187 | TF188 | TF189 | TF190 | TF191 | TF192 | TF193 | TC 4 |
| Surface Temp. | B51 | | | | | TF129 | | | | |
| | B53 | | | | | TF130 | | | | |
| | B85 | | TF131 | TF132 | TF133 | TF134 | TF135 | TF136 | TF137 | |
| | C11 | | | | | TF138 | | | | |
| | C13 | | | | | TF139 | | | | |
| | C15 | | | | | TF140 | | | | |
| | C31 | | | | | TF141 | | | | |
| | C33 | | TF142 | TF143 | TF144 | TF145 | TF146 | TF147 | TF148 | |
| | C35 | | | | | TF149 | | | | |
| Fluid Temp. | C44 | TC 5 | TF194 | TF195 | TF196 | TF197 | TF198 | TF199 | TF200 | TC 6 |
| Surface Temp. | C51 | | | | | TF150 | | | | |
| | C53 | | | | | TF151 | | | | |
| | C77 | | TF152 | TF153 | TF154 | TF155 | TF156 | TF157 | TF158 | |
| | D11 | | | | | TF159 | | | | |
| | D13 | | | | | TF160 | | | | |
| | D27 | | TF161 | TF162 | TF163 | TF164 | TF165 | TF166 | TF167 | |
| | D31 | | | | | TF168 | | | | |
| | D33 | | | | | TF169 | | | | |
| | D35 | | | | | TF170 | | | | |
| Fluid Temp. | D44 | TC 7 | TF201 | TF202 | TF203 | TF204 | TF205 | TF206 | TF207 | TC 8 |
| Surface Temp. | D51 | | | | | TF171 | | | | |
| | D53 | | | | | TF172 | | | | |
| | D88 | | TF173 | TF174 | TF175 | TF176 | TF177 | TF178 | TF179 | |

Table 3.3 Core Instrumentation Map (Continued)

| Item | Pos. Rod NO. | Core Outlet DL | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 | Core Inlet |
|---|--------------------|----------------------|-------|-------|--------|--------|-------|--------|--------|---------------|
| | | | 3660 | 3417 | 3114.5 | 2879.5 | 2527 | 2174.5 | 1939.5 | 1454 |
| Void | A55 | | VF 1 | VF 2 | VF 3 | VF 4 | VF 5 | VF 6 | VF 7 | |
| | B55 | | VF 8 | VF 9 | VF 10 | VF 11 | VF 12 | VF 13 | VF 14 | |
| | C55 | | VF 15 | VF 16 | VF 17 | VF 18 | VF 19 | VF 20 | VF 21 | |
| | D55 | | VF 22 | VF 23 | VF 24 | VF 25 | VF 26 | VF 27 | VF 28 | |
| Channel Box Surface Temp. | A1* | | TB 1 | TB 2 | TB 3 | TB 4 | TB 5 | TB 6 | TB 7 | |
| | A2* | | TB 8 | TB 9 | TB 10 | TB 11 | TB 12 | TB 13 | TB 14 | |
| | B* | | TB 15 | TB 16 | TB 17 | TB 18 | TB 19 | TB 20 | TB 21 | |
| | C* | | TB 22 | TB 23 | TB 24 | TB 25 | TB 26 | TB 27 | TB 28 | |
| | D* | | TB 29 | TB 30 | TB 31 | TB 32 | TB 33 | TB 34 | TB 35 | |
| Liquid Level in the Channel Box | A1* | | LB 1 | LB 2 | LB 3 | LB 4 | LB 5 | LB 6 | LB 7 | |
| | A2* | | LB 8 | LB 9 | LB 10 | LB 11 | LB 12 | LB 13 | LB 14 | |
| | B* | | LB 15 | LB 16 | LB 17 | LB 18 | LB 19 | LB 20 | LB 21 | |
| | C* | | LB 22 | LB 23 | LB 24 | LB 25 | LB 26 | LB 27 | LB 28 | |
| | D* | | LB 29 | LB 30 | LB 31 | LB 32 | LB 33 | LB 34 | LB 35 | |

Table 4.1 Test Conditions of RUN 913

| Parameter | Specified Value | Measured Value |
|----------------------------------|-----------------|--------------------|
| Break Conditions | | |
| Location | MRP suction | MRP suction |
| Type | Split | Split |
| Break Orifice Diameter (mm) | 10.1 | 10.1 |
| Initial System Conditions | | |
| Steam Dome Pressure (MPa) | 7.35 | 7.39 |
| Lower Plenum Temperature (K) | 551.7 | 551 |
| Lower Plenum Subcooling (K) | 10.5 | 11.0 |
| Core Inlet Flow Rate (kg/s) | 16.0 | 16.4 |
| Core Outlet Quality (%) | 13.8** | 12.2 |
| Power Level (kW) | 1260 + 2700 | 1264 + 2714 |
| Maximum Linear Heat Rate(kW/m) | | |
| Channel A P.F.=1.1 | 16.65 | 16.73 |
| Channel P.F.=1.0 | 15.13 | 15.20 |
| P.F.=0.875 | 13.24 | 13.30 |
| Channel B-D P.F.=1.1 | 11.89 | 11.94 |
| P.F.=1.0 | 10.81 | 10.86 |
| P.F.=0.875 | 9.46 | 9.50 |
| Water Level in PV* (m) | 5.0 | 5.0 |
| Feedwater Conditions | | |
| Temperature (K) | 489 | 489 |
| Flow Rate (kg/s) | 2.39 | 2.03 (cf.Fig.5.41) |
| Initiation of Line Closure(s) | 2.0 | 2.0 |

* note, L3 Level for Scram : 5.0 m from PV Bottom

** not include core bypass flow

core bypass flow is assumed to be 0.8 kg/s

Table 4.1 Test Conditions of RUN 913 (continued)

| Parameter | Specified Value | Measured Value |
|---|--|--------------------------------------|
| Steam Discharge Conditions | | |
| Steady State Flow Rate(kg/s) | 2.39 | 2.05 |
| Transient Flow Rate (kg/s) | keep steady value | Fig. 5.39 |
| Orifice Diameter (mm) | 18.0 | 18.0 |
| Initiation of Line Closure(s) | $L_2^* + 3 \text{ (s) or } P \leq 6.67 \text{ (MPa)}^{**}$ | 18.0 s (by level trip signal) |
| Safety Relief Valve | | |
| Setting Pressure (MPa) | $P = 8.14$ | not operated |
| ECCS Conditions | | |
| HPCS | not-used | not-used |
| LPCS | | |
| Injection Location | Upper Plenum | Upper Plenum |
| Initiation Conditions | $L_1^* + 40 \text{ (s) and } \leq 2.16 \text{ (MPa)}$ | 249 (s) at PV Pressure 2.25 (MPa) |
| Coolant Temperature (K) | 313 | 313 |
| Injection Flow Rate(m^3/s) | 1.13×10^{-3} | Fig. 5.40 |
| LPCI | | |
| Injection Location | Top of Core Bypass | Top of Core Bypass |
| Initiation Conditions | $L_1^* + 40 \text{ (s) and } \leq 1.57 \text{ (MPa)}$ | 326 (s) at PV Pressure 1.68 (MPa) |
| Coolant Temperature (K) | 313 | 313 |
| Injection Flow Rate (m^3/s) | 3.50×10^{-3} | Fig. 5.40 |
| ADS Conditions | | |
| Initiation Time (s) | $L_1^* + 120 \text{ (s)}$ | 143 (s) |
| Flow Rate | Scaled Flow of BWR | Fig. 5.39 |
| Orifice Diameter (mm) | 15.5 | 15.5 |

* note : Each trip level is as follows;

L3 Level for Scram : 5.0 m from PV Bottom

L2 Level for MSIV and HPCS : 4.76 from PV Bottom

L1 Level for LPCS, LPCI and ADS : 4.25 from PV Bottom

** note : System pressure is controlled to maintain at 6.67 MPa
before MSIV closure by low level signal ($L_2 + 3\text{s}$).

Table 4.2 Characteristics of Steam Discharge Line Valves

| Valve | Close to Open (sec) | Open to Close (sec) |
|-------|---------------------|---------------------|
| AV165 | Not Used | Not Used |
| AV168 | - | 0.1 |
| AV169 | 0.3 | 2.0 |

| Orifice | Diameter (mm) | Area (mm ²) |
|---------|------------------|-------------------------|
| OR3 | 18.0 | 254.5 |
| OR4 | 15.5 | 188.7 |
| OR5 | Not Used (Blind) | Not Used (Blind) |

Table 4.3 Control Sequence for Steam Discharge Line Valves

| Time | $t < 0$ s | $t = 0$ s (Break) | $P \leq 6.67\text{MPa}$ | $L_2 + 3$ s | --- | $P \geq 8.14\text{MPa}$ | --- | $L_1 + 120$ s |
|------------------------|--|----------------------|---|-------------------|---|-------------------------|---|-----------------|
| CV-1 | Open | Close (Manual) | Closed | Closed | | Closed | | Closed |
| CV-2 (see Fig. 2.3) | Open | Close (Manual) | Closed | Closed | | Closed | | Closed |
| CV-130 | Control to maintain steady state pressure | Open (Manual) | Control to maintain system pressure at 6.67MPa (Auto) | Close (Manual) | Control to maintain system pressure at 8.14MPa (Auto) | Closed | Control to maintain system pressure at 8.14MPa (Auto) | Closed |
| AV-168 | Open | Open | Open | Open | Open | Open | Open | Close (Auto) |
| AV-169 (ADS Line) | Closed | Closed | Closed | Closed | Closed | Closed | Closed | Open (Auto) |

$t = 0$ s : Break
 $t = L_2 + 3$ s : MSIV closure
 $t = L_1 + 120$ s : ADS valve opening

Table 5.1 Sequence of Events in RUN 913

| Time after Break (s) | Events |
|-------------------------|--|
| 0.0 | Break |
| | Initiate core power control |
| | Terminate intact loop recirculation pump power (simple coastdown) |
| | Terminate broken loop recirculation pump power (simple coastdown) |
| 2.0 | Initiation of feedwater line valve closure |
| 3.0 | Closure of feedwater line |
| 9.0 | Initiation of core power curve reduction |
| 13.0 | Liquid level in downcomer decreased to L2 level |
| 18.0 | Initiation of steam discharge line valve closure |
| 23.0 | Liquid level in downcomer decreased to L1 level |
| 35.0 | Liquid level in downcomer decreased to jet pump suction nozzle |
| 49.0 | Liquid level in downcomer decreased to recirculation pump suction line |
| 115.0 | Initiation of lower plenum flashing (LPF) |
| 143.0 | ADS initiation |
| 249.0 | LPCS initiation |
| 326.0 | LPCI initiation |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913

| | | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 |
|------|-----|--------|--------|--------|--------|--------|--------|--------|
| A-11 | rod | TE 201 | TE 202 | TE 203 | TE 204 | TE 205 | TE 206 | TE 207 |
| PCT | (K) | 653.5 | 727.9 | 784.3 | 827.5 | 781.9 | 681.1 | 572.6 |
| Time | (s) | 181.3 | 257.6 | 265.3 | 331.8 | 331.8 | 325.5 | 266.7 |
| A-12 | rod | TE 208 | TE 209 | TE 210 | TE 211 | TE 212 | TE 213 | TE 214 |
| PCT | (K) | 646.3 | 718.3 | 771.1 | 795.1 | 751.9 | 669.1 | 565.9 |
| Time | (s) | 186.2 | 264.6 | 263.2 | 297.5 | 318.5 | 316.4 | 29.4 |
| A-13 | rod | TE 215 | TE 216 | TE 217 | TE 218 | TE 219 | TE 220 | TE 221 |
| PCT | (K) | 653.5 | 717.1 | 769.9 | 796.3 | 750.7 | 667.9 | 567.1 |
| Time | (s) | 190.4 | 258.3 | 262.5 | 296.1 | 329.0 | 314.3 | 50.4 |
| A-14 | rod | TE 222 | TE 223 | TE 224 | TE 225 | TE 226 | TE 227 | TE 228 |
| PCT | (K) | 651.1 | 706.3 | 757.9 | 784.3 | 741.1 | 652.3 | 567.1 |
| Time | (s) | 187.6 | 258.3 | 280.0 | 312.2 | 333.9 | 309.4 | 36.4 |
| A-15 | rod | TE 229 | TE 224 | TE 225 | TE 230 | TE 231 | TE 232 | TE 233 |
| PCT | (K) | 652.3 | 706.3 | 757.9 | 784.3 | 741.1 | 652.3 | 567.1 |
| Time | (s) | 198.1 | 258.3 | 280.0 | 312.2 | 333.9 | 309.4 | 36.4 |
| A-17 | rod | TE 231 | TE 232 | TE 233 | TE 234 | TE 235 | TE 236 | TE 237 |
| PCT | (K) | 679.9 | 795.1 | 804.7 | 820.3 | 831.1 | 841.1 | 851.7 |
| Time | (s) | 256.2 | 314.3 | 314.3 | 314.3 | 314.3 | 314.3 | 314.3 |
| A-22 | rod | TE 233 | TE 234 | TE 235 | TE 236 | TE 237 | TE 238 | TE 239 |
| PCT | (K) | 670.3 | 732.7 | 777.1 | 791.9 | 750.6 | 677.1 | 567.2 |
| Time | (s) | 251.3 | 261.8 | 264.6 | 289.8 | 314.3 | 324.1 | 355.7 |
| A-24 | rod | TE 240 | TE 241 | TE 242 | TE 243 | TE 244 | TE 245 | TE 246 |
| PCT | (K) | 655.2 | 719.5 | 762.8 | 783.5 | 740.3 | 656.2 | 567.2 |
| Time | (s) | 194.6 | 259.0 | 274.4 | 297.5 | 324.1 | 311.5 | 42.7 |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| | | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 |
|------|-----|--------|--------|--------|--------|--------|--------|--------|
| A-26 | rod | TE 247 | | | | TE 248 | | |
| PCT | (K) | 690.3 | | | | 808.8 | | |
| Time | (s) | 254.1 | | | | 333.2 | | |
| A-28 | rod | TE 249 | | | | TE 250 | | |
| PCT | (K) | 699.7 | | | | 819.1 | | |
| Time | (s) | 255.5 | | | | 322.7 | | |
| A-31 | rod | TE 251 | | | | TE 252 | | |
| PCT | (K) | 671.2 | | | | 808.1 | | |
| Time | (s) | 201.6 | | | | 297.5 | | |
| A-33 | rod | TE 253 | TE 254 | TE 255 | TE 256 | TE 257 | TE 258 | TE 259 |
| PCT | (K) | 643.8 | 700.7 | 738.4 | 749.7 | 687.5 | 627.6 | 566.2 |
| Time | (s) | 204.4 | 258.3 | 265.3 | 277.9 | 266.7 | 270.2 | 29.4 |
| A-34 | rod | TE 260 | TE 261 | TE 262 | TE 263 | TE 264 | TE 265 | TE 266 |
| PCT | (K) | 656.2 | 699.7 | 738.4 | 756.2 | 706.4 | 636.2 | 566.2 |
| Time | (s) | 254.1 | 259.0 | 269.5 | 299.6 | 331.8 | 289.8 | 32.9 |
| A-37 | rod | TE 267 | | | | TE 268 | | |
| PCT | (K) | 698.8 | | | | 693.1 | | |
| Time | (s) | 257.6 | | | | 256.2 | | |
| A-42 | rod | TE 269 | | | | TE 270 | | |
| PCT | (K) | 822.9 | | | | 798.5 | | |
| Time | (s) | 331.8 | | | | 296.1 | | |
| A-44 | rod | TE 271 | TE 272 | TE 273 | TE 274 | TE 275 | TE 276 | TE 277 |
| PCT | (K) | 649.5 | 693.1 | 734.6 | 753.4 | 698.8 | 628.6 | 566.2 |
| Time | (s) | 252.7 | 259.0 | 282.1 | 308.7 | 324.8 | 288.4 | 45.5 |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 |
|----------|--------|-------|-------|-------|--------|-------|-------|
| A-48 rod | TE 278 | | | | TE 279 | | |
| PCT (K) | 692.2 | | | | 807.9 | | |
| Time (s) | 256.9 | | | | 329.7 | | |
| A-51 rod | TE 280 | | | | TE 281 | | |
| PCT (K) | 692.2 | | | | 818.2 | | |
| Time (s) | 256.9 | | | | 333.9 | | |
| A-53 rod | TE 282 | | | | TE 283 | | |
| PCT (K) | 673.3 | | | | 761.9 | | |
| Time (s) | 256.2 | | | | 304.5 | | |
| A-57 rod | TE 284 | | | | TE 285 | | |
| PCT (K) | 701.6 | | | | 821.0 | | |
| Time (s) | 272.3 | | | | 330.4 | | |
| A-62 rod | TE 286 | | | | TE 287 | | |
| PCT (K) | 707.3 | | | | 817.2 | | |
| Time (s) | 256.2 | | | | 317.1 | | |
| A-66 rod | TE 288 | | | | TE 289 | | |
| PCT (K) | 683.7 | | | | 792.8 | | |
| Time (s) | 271.6 | | | | 332.5 | | |
| A-68 rod | TE 290 | | | | TE 291 | | |
| PCT (K) | 709.2 | | | | 821.9 | | |
| Time (s) | 266.7 | | | | 331.8 | | |
| A-71 rod | TE 292 | | | | TE 293 | | |
| PCT (K) | 709.2 | | | | 831.3 | | |
| Time (s) | 256.2 | | | | 323.4 | | |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| | | Pos. 1 | Pos. 2 | Pos. 3 | Pos. 4 | Pos. 5 | Pos. 6 | Pos. 7 |
|------|-----|--------|--------|--------|--------|--------|--------|--------|
| A-73 | rod | TE 294 | | | | TE 295 | | |
| PCT | (K) | 712.0 | | | | 834.1 | | |
| Time | (s) | 260.4 | | | | 336.0 | | |
| A-75 | rod | TE 296 | | | | TE 297 | | |
| PCT | (K) | 704.5 | | | | 815.4 | | |
| Time | (s) | 273.0 | | | | 336.0 | | |
| A-77 | rod | TE 298 | | | | TE 300 | | |
| PCT | (K) | 708.2 | | | | 785.4 | | |
| Time | (s) | 266.0 | | | | 287.7 | | |
| A-82 | rod | TE 305 | | | | TE 302 | | |
| PCT | (K) | 718.6 | | | | 812.5 | | |
| Time | (s) | 262.5 | | | | 328.3 | | |
| A-84 | rod | TE 307 | | | | TE 306 | | |
| PCT | (K) | 709.2 | | | | 841.6 | | |
| Time | (s) | 261.8 | | | | 335.3 | | |
| A-85 | rod | TE 309 | | | | TE 308 | | |
| PCT | (K) | 707.3 | | | | 824.7 | | |
| Time | (s) | 268.8 | | | | 333.9 | | |
| A-87 | rod | TE 316 | | | | TE 312 | | |
| PCT | (K) | 707.3 | | | | 813.5 | | |
| Time | (s) | 265.3 | | | | 329.7 | | |
| A-88 | rod | TE 323 | | | | TE 319 | | |
| PCT | (K) | 702.6 | | | | 789.1 | | |
| Time | (s) | 263.2 | | | | 304.5 | | |
| | | | | | | TE 313 | | |
| | | | | | | 762.8 | | |
| | | | | | | 333.2 | | |
| | | | | | | 326.9 | | |
| | | | | | | 321.3 | | |
| | | | | | | 273.7 | | |
| | | | | | | 44.1 | | |
| | | | | | | TE 314 | | |
| | | | | | | 666.6 | | |
| | | | | | | 568.1 | | |
| | | | | | | 566.2 | | |
| | | | | | | 321.3 | | |
| | | | | | | 273.7 | | |
| | | | | | | 44.1 | | |
| | | | | | | TE 321 | | |
| | | | | | | 672.3 | | |
| | | | | | | 321.3 | | |
| | | | | | | 273.7 | | |
| | | | | | | 44.1 | | |
| | | | | | | TE 322 | | |
| | | | | | | 770.3 | | |
| | | | | | | 334.6 | | |
| | | | | | | 321.3 | | |
| | | | | | | 273.7 | | |
| | | | | | | 44.1 | | |
| | | | | | | TE 328 | | |
| | | | | | | 671.4 | | |
| | | | | | | 569.1 | | |
| | | | | | | 273.7 | | |
| | | | | | | 322.0 | | |
| | | | | | | 331.8 | | |
| | | | | | | 315.7 | | |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 |
|----------|--------|--------|--------|--------|--------|--------|--------|
| B-11 rod | TE 330 | TE 331 | TE 332 | TE 333 | TE 334 | TE 335 | TE 336 |
| PCT (K) | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Time (s) | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| B-13 rod | | | | TE 337 | | | |
| PCT (K) | | | | 730.8 | | | |
| Time (s) | | | | 284.9 | | | |
| B-22 rod | TE 338 | TE 339 | TE 340 | TE 341 | TE 342 | TE 343 | TE 344 |
| PCT (K) | 645.7 | 688.4 | 713.0 | 722.4 | 672.3 | 619.0 | 566.2 |
| Time (s) | 250.6 | 256.2 | 259.7 | 283.5 | 284.9 | 288.4 | 37.1 |
| B-31 rod | | | | TE 345 | | | |
| PCT (K) | | | | 719.5 | | | |
| Time (s) | | | | 282.8 | | | |
| B-33 rod | | | | TE 346 | | | |
| PCT (K) | | | | 686.5 | | | |
| Time (s) | | | | 272.3 | | | |
| B-51 rod | | | | TE 347 | | | |
| PCT (K) | | | | 704.5 | | | |
| Time (s) | | | | 282.1 | | | |
| B-53 rod | | | | TE 348 | | | |
| PCT (K) | | | | 681.8 | | | |
| Time (s) | | | | 275.8 | | | |
| B-66 rod | | | | TE 349 | | | |
| PCT (K) | | | | 704.5 | | | |
| Time (s) | | | | 324.1 | | | |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 |
|----------|--------|--------|--------|--------|--------|--------|--------|
| B-77 rod | TE 350 | TE 351 | TE 352 | TE 353 | TE 354 | TE 355 | TE 356 |
| PCT (K) | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Time (s) | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| B-86 rod | | | | TE 357 | | | |
| PCT (K) | | | | 761.9 | | | |
| Time (s) | | | | 326.2 | | | |
| C-11 rod | TE 358 | TE 359 | TE 360 | TE 361 | TE 362 | TE 363 | TE 364 |
| PCT (K) | 628.6 | 678.0 | 706.4 | 727.1 | 683.7 | 620.9 | 567.2 |
| Time (s) | 174.3 | 142.1 | 262.5 | 284.2 | 299.6 | 295.4 | 35.0 |
| C-13 rod | TE 365 | TE 366 | TE 367 | TE 368 | TE 369 | TE 370 | TE 371 |
| PCT (K) | 629.5 | 692.2 | 710.1 | 723.3 | 677.1 | 621.9 | 567.2 |
| Time (s) | 175.7 | 253.4 | 262.5 | 272.3 | 283.5 | 283.5 | 35.7 |
| C-15 rod | | | | TE 372 | | | |
| PCT (K) | | | | 720.5 | | | |
| Time (s) | | | | 284.9 | | | |
| C-22 rod | TE 373 | TE 374 | TE 375 | TE 376 | TE 377 | TE 378 | TE 379 |
| PCT (K) | 630.5 | 685.6 | 701.6 | 716.7 | 670.4 | 615.2 | 567.2 |
| Time (s) | 179.2 | 250.6 | 262.5 | 274.4 | 284.9 | 282.8 | 37.8 |
| C-31 rod | | | | TE 380 | | | |
| PCT (K) | | | | 727.1 | | | |
| Time (s) | | | | 277.2 | | | |
| C-33 rod | TE 381 | TE 382 | TE 383 | TE 384 | TE 385 | TE 386 | TE 387 |
| PCT (K) | 619.0 | 675.2 | 676.1 | 680.8 | 641.0 | 597.0 | 565.3 |
| Time (s) | 179.9 | 251.3 | 261.8 | 271.6 | 267.4 | 273.0 | 31.5 |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 |
|----------|--------|--------|--------|--------|--------|-------|--------|
| C-35 rod | | | | TE 388 | | | |
| PCT (K) | | | | 698.8 | | | |
| Time (s) | | | | 282.1 | | | |
| C-66 rod | | | | TE 389 | | | |
| PCT (K) | | | | 708.2 | | | |
| Time (s) | | | | 328.3 | | | |
| C-68 rod | | | | TE 390 | | | |
| PCT (K) | | | | 764.7 | | | |
| Time (s) | | | | 329.7 | | | |
| C-77 rod | TE 391 | | TE 392 | | TE 393 | | TE 396 |
| PCT (K) | 692.2 | | 738.4 | | 746.8 | | 747.9 |
| Time (s) | 308.7 | | 348.6 | | 329.0 | | 619.0 |
| D-11 rod | | | | TE 394 | | | TE 397 |
| PCT (K) | | | | 747.8 | | | 566.2 |
| Time (s) | | | | 326.9 | | | 330.4 |
| D-13 rod | | | | TE 395 | | | TE 398 |
| PCT (K) | | | | 697.9 | | | 740.3 |
| Time (s) | | | | 321.3 | | | 296.1 |
| D-22 rod | | TE 400 | TE 401 | | TE 403 | | TE 404 |
| PCT (K) | 643.8 | 684.6 | 710.1 | | 724.3 | | 684.6 |
| Time (s) | 234.5 | 263.2 | 261.8 | | 280.7 | | 291.9 |
| D-31 rod | | | | TE 407 | | | TE 406 |
| PCT (K) | | | | 732.7 | | | 623.8 |
| Time (s) | | | | 278.6 | | | 567.2 |
| | | | | | | | 39.2 |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| | Pos.1 | Pos.2 | Pos.3 | Pos.4 | Pos.5 | Pos.6 | Pos.7 |
|----------|-------|-------|-------|--------|-------|-------|-------|
| D-33 rod | | | | | | | |
| PCT (K) | | | | | | | |
| Time (s) | | | | | | | |
| | | | | TE 408 | | | |
| | | | | 679.9 | | | |
| | | | | 268.1 | | | |
| D-51 rod | | | | | | | |
| PCT (K) | | | | | | | |
| Time (s) | | | | | | | |
| | | | | TE 409 | | | |
| | | | | 714.8 | | | |
| | | | | 281.4 | | | |
| D-53 rod | | | | | | | |
| PCT (K) | | | | | | | |
| Time (s) | | | | | | | |
| | | | | TE 410 | | | |
| | | | | 700.7 | | | |
| | | | | 299.6 | | | |
| D-66 rod | | | | | | | |
| PCT (K) | | | | | | | |
| Time (s) | | | | | | | |
| | | | | TE 411 | | | |
| | | | | 702.7 | | | |
| | | | | 327.6 | | | |
| D-77 rod | | | | | | | |
| PCT (K) | | | | | | | |
| Time (s) | | | | | | | |
| | | | | TE 412 | | | |
| | | | | 744.7 | | | |
| | | | | 324.1 | | | |
| D-86 rod | | | | | | | |
| PCT (K) | | | | | | | |
| Time (s) | | | | | | | |
| | | | | TE 413 | | | |
| | | | | 753.4 | | | |
| | | | | 327.6 | | | |

Table 5.2 Maximum Cladding Temperature Distribution in the Core of RUN 913 (Continued)

| ** Order of PCT (RUN 913) ** | | | | | | |
|------------------------------|----------|--------|-------|-----------|--------|-----------|
| No. 1 | A-82 rod | Pos. 4 | PCT = | 841.6 (K) | Time = | 335.3 (s) |
| No. 2 | A-73 rod | Pos. 4 | PCT = | 834.1 (K) | Time = | 336.0 (s) |
| No. 3 | A-71 rod | Pos. 4 | PCT = | 831.3 (K) | Time = | 323.4 (s) |
| No. 4 | A-11 rod | Pos. 4 | PCT = | 827.5 (K) | Time = | 331.8 (s) |
| No. 5 | A-84 rod | Pos. 4 | PCT = | 824.7 (K) | Time = | 333.9 (s) |
| No. 6 | A-42 rod | Pos. 1 | PCT = | 822.9 (K) | Time = | 331.8 (s) |
| No. 7 | A-68 rod | Pos. 4 | PCT = | 821.9 (K) | Time = | 331.8 (s) |
| No. 8 | A-57 rod | Pos. 4 | PCT = | 821.0 (K) | Time = | 330.4 (s) |
| No. 9 | A-28 rod | Pos. 4 | PCT = | 819.1 (K) | Time = | 322.7 (s) |
| No. 10 | A-51 rod | Pos. 4 | PCT = | 818.2 (K) | Time = | 333.9 (s) |

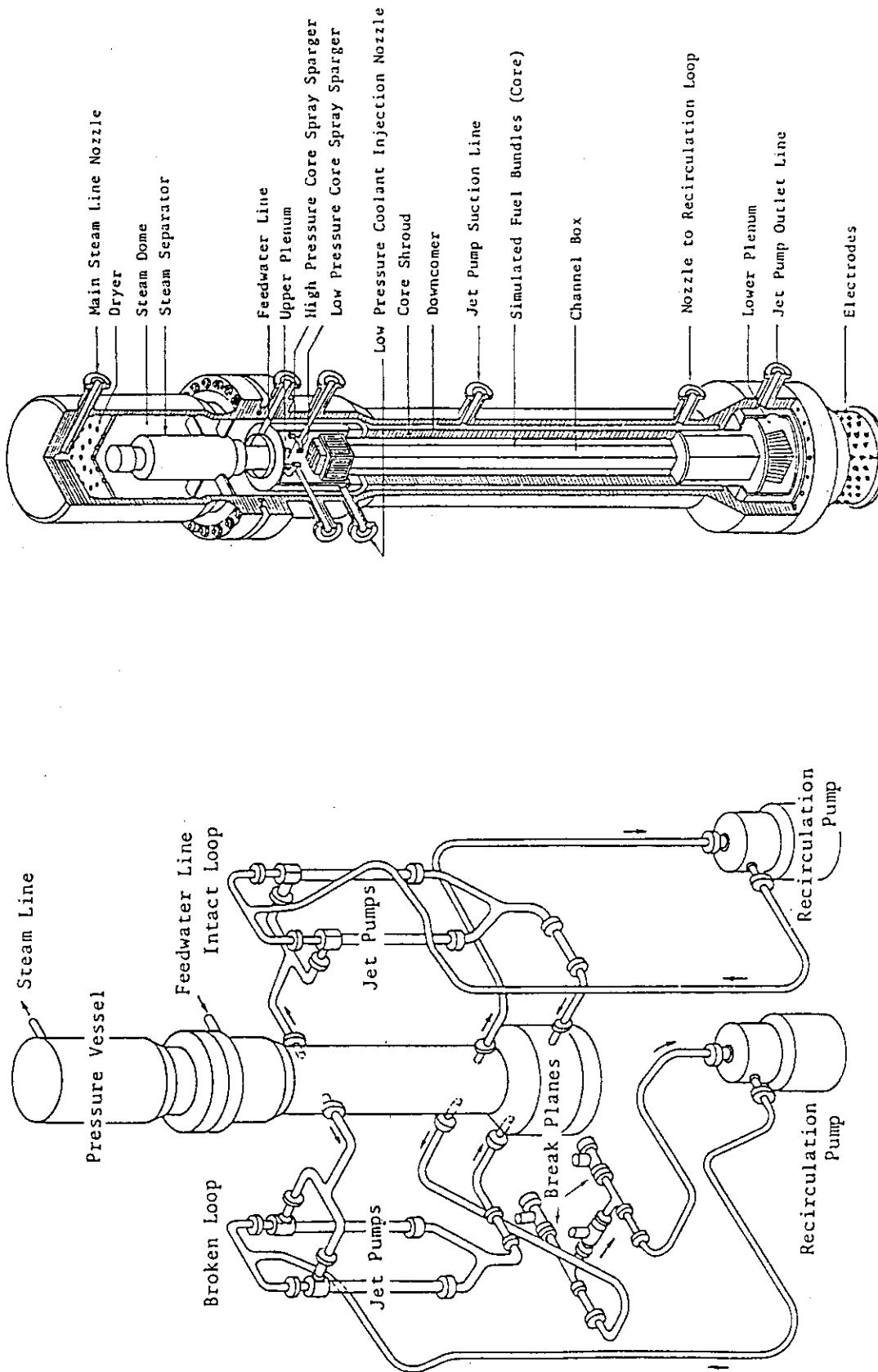


Fig. 2.1 Schematic Diagram of ROSA-III Test Facility
Fig. 2.2 Internal Structure of Pressure Vessel of ROSA-III

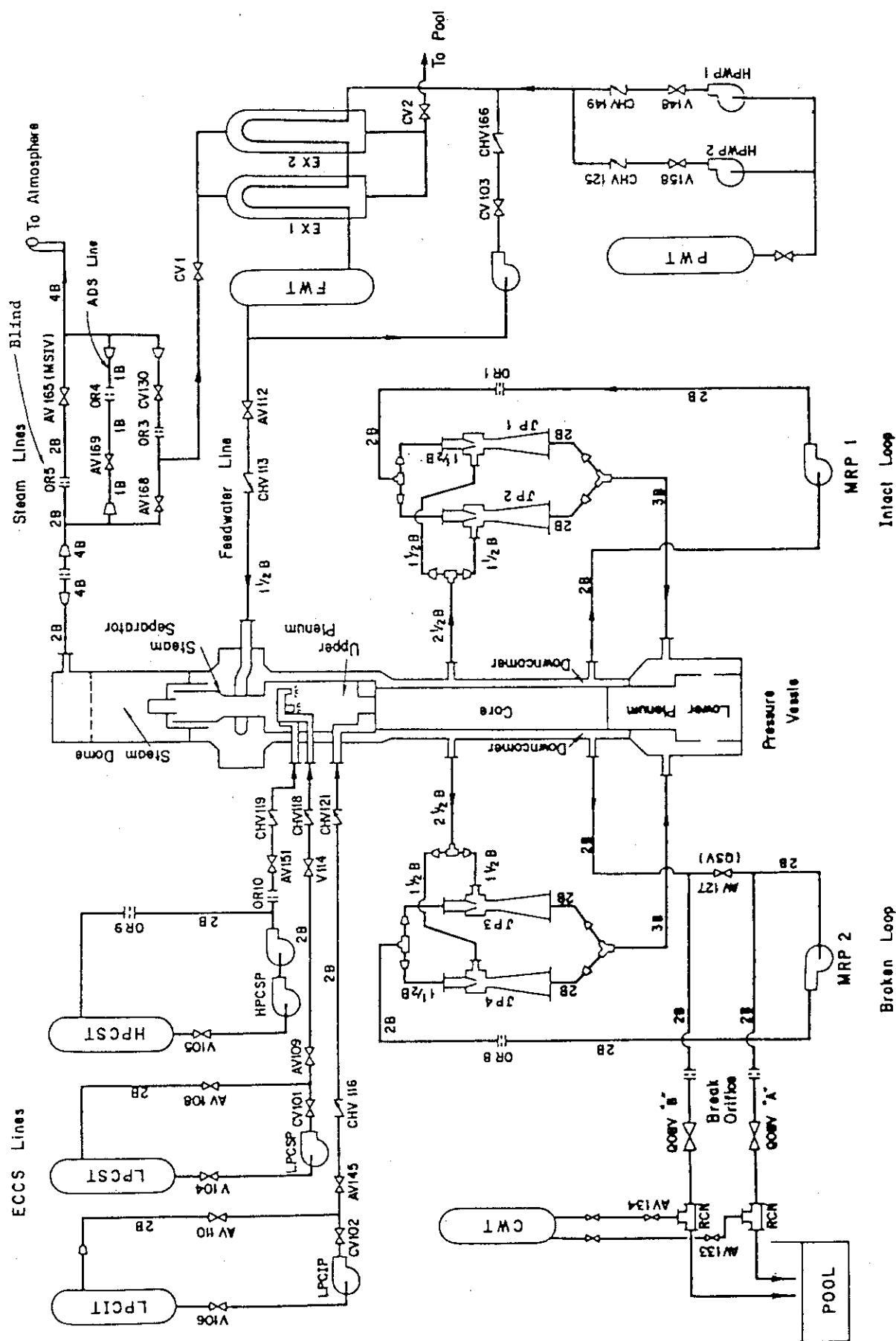


Fig. 2.3 ROSA-III Piping Schematics

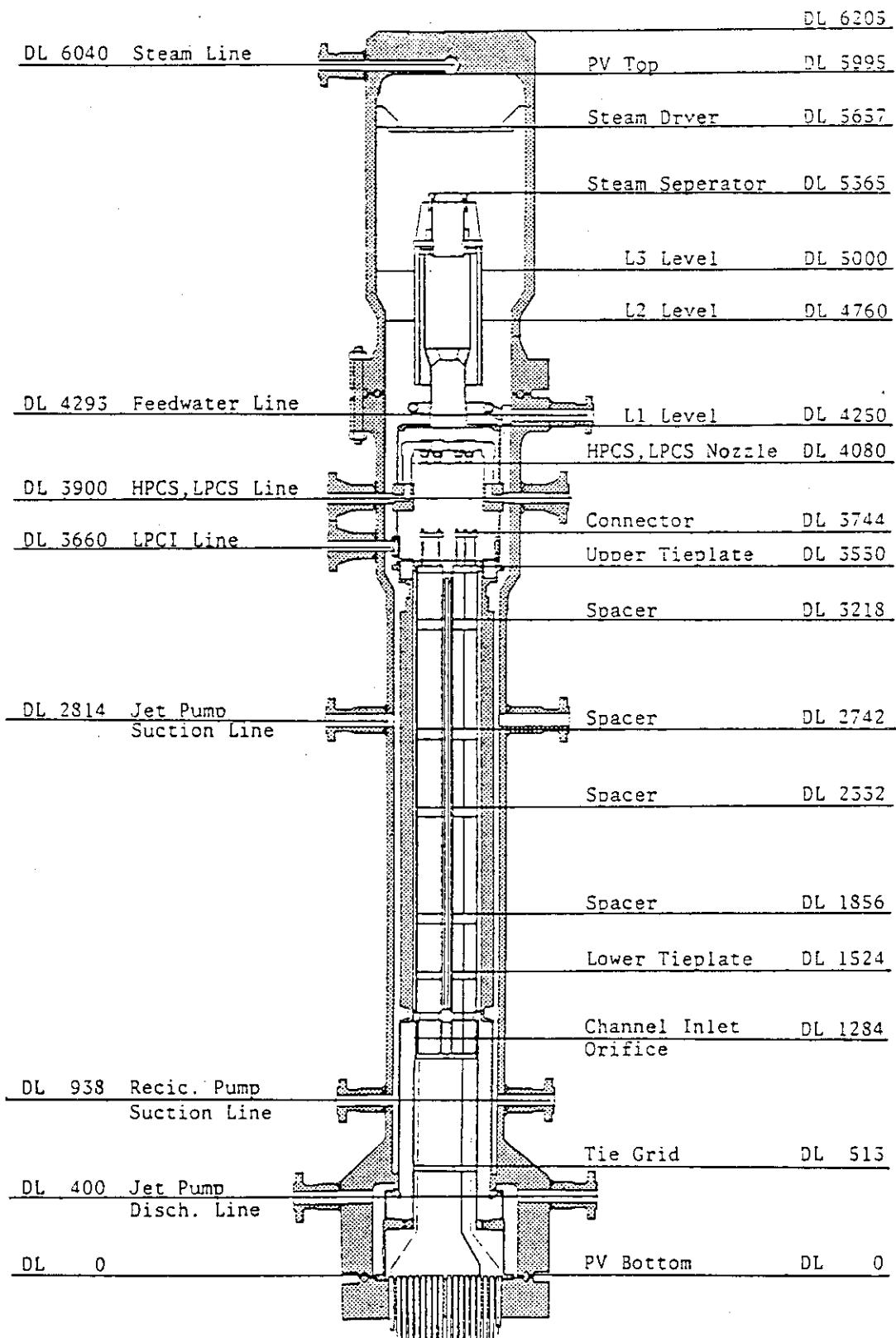


Fig. 2.4 Pressure Vessel Internals Arrangement

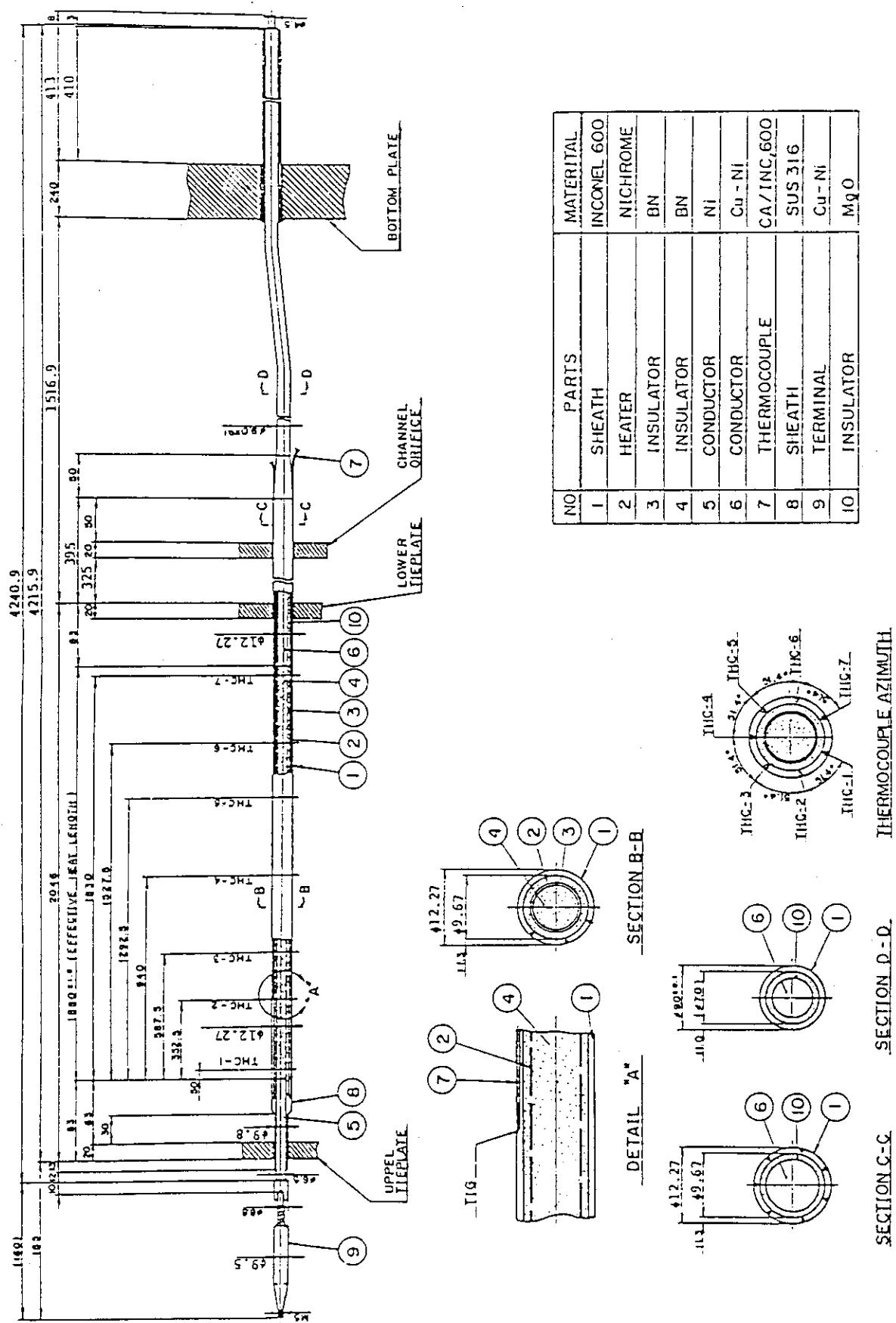
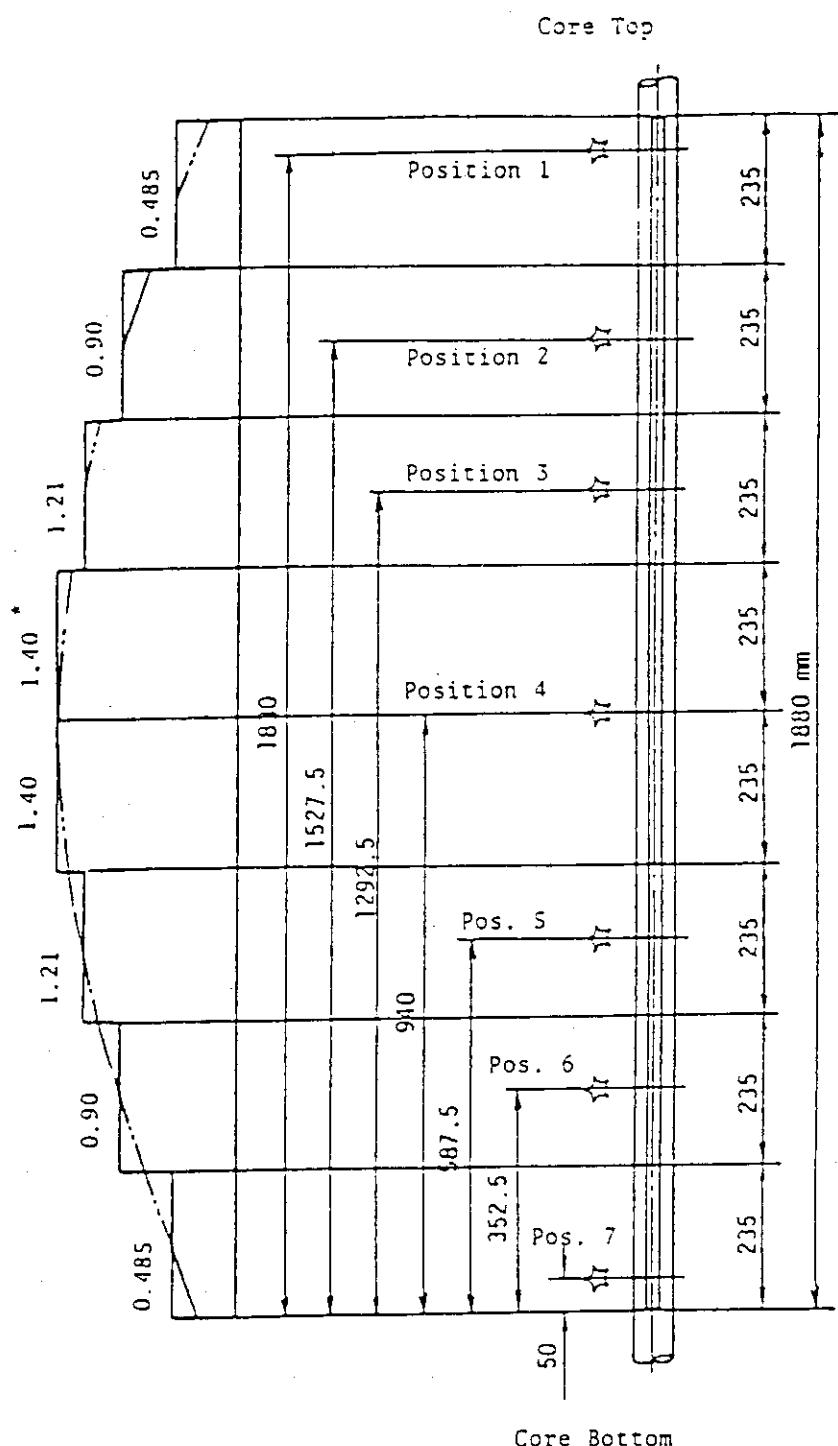
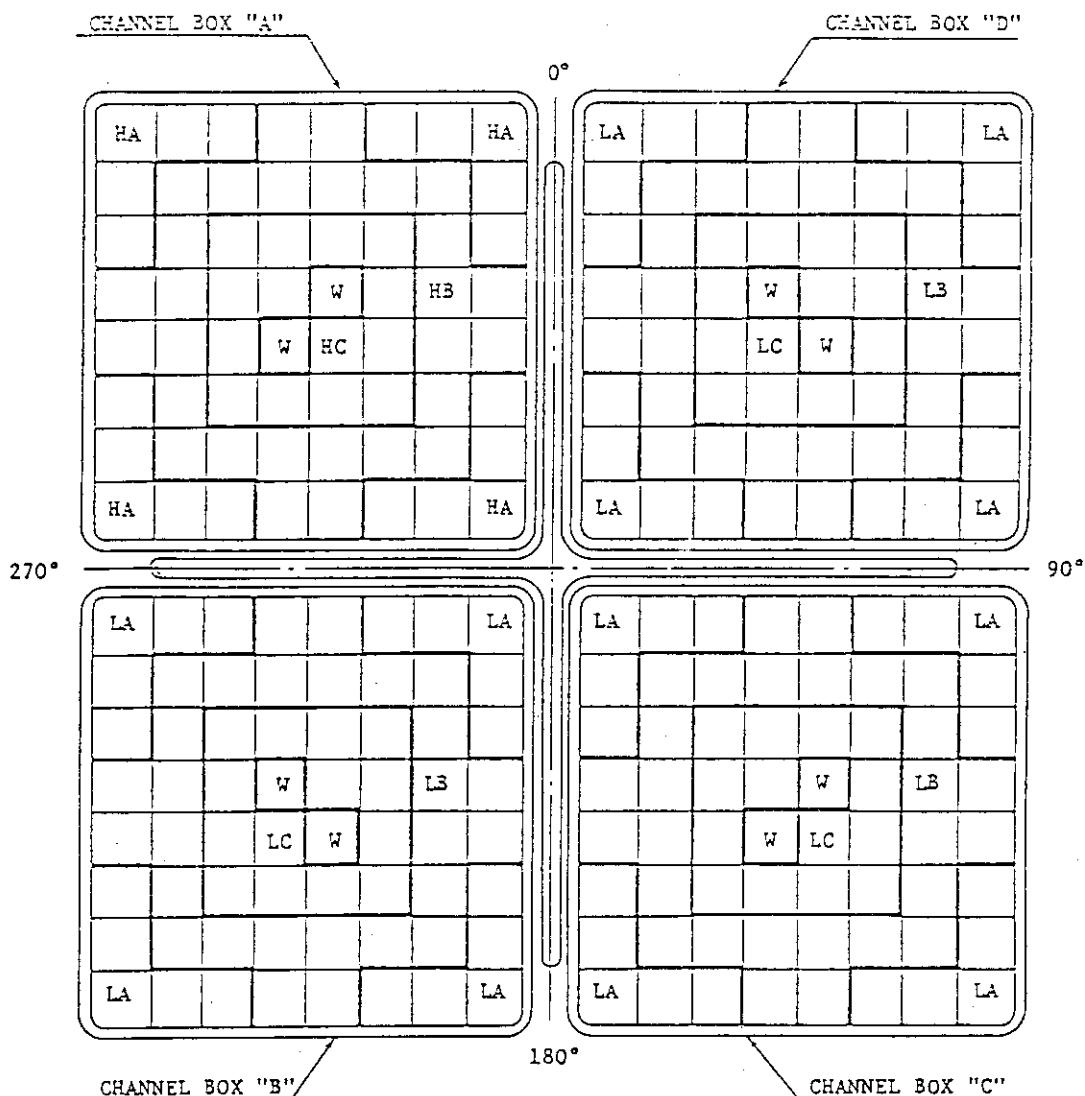


Fig. 2.5 Simulated Fuel Rod of ROSA-III



☆ indicates position of thermocouple. * Axial Peaking Factor

Fig.2.6 Axial Power Distribution of Heater Rod



| Region | HA | HB | HC | LA | LB | LC | W |
|-------------------------|------|-------|-------|-------|-------|-------|-----|
| Linear Heat Rate (kW/m) | 18.5 | 16.81 | 14.41 | 13.21 | 12.01 | 10.29 | 0.0 |
| Local peaking factor | 1.1 | 1.0 | 0.875 | 1.1 | 1.0 | 0.875 | 0.0 |
| No. of Rods | 20 | 28 | 14 | 60 | 84 | 42 | 8 |

* note : Radial peaking factor is 1.4

Fig. 2.7 Radial Power Distribution of Core

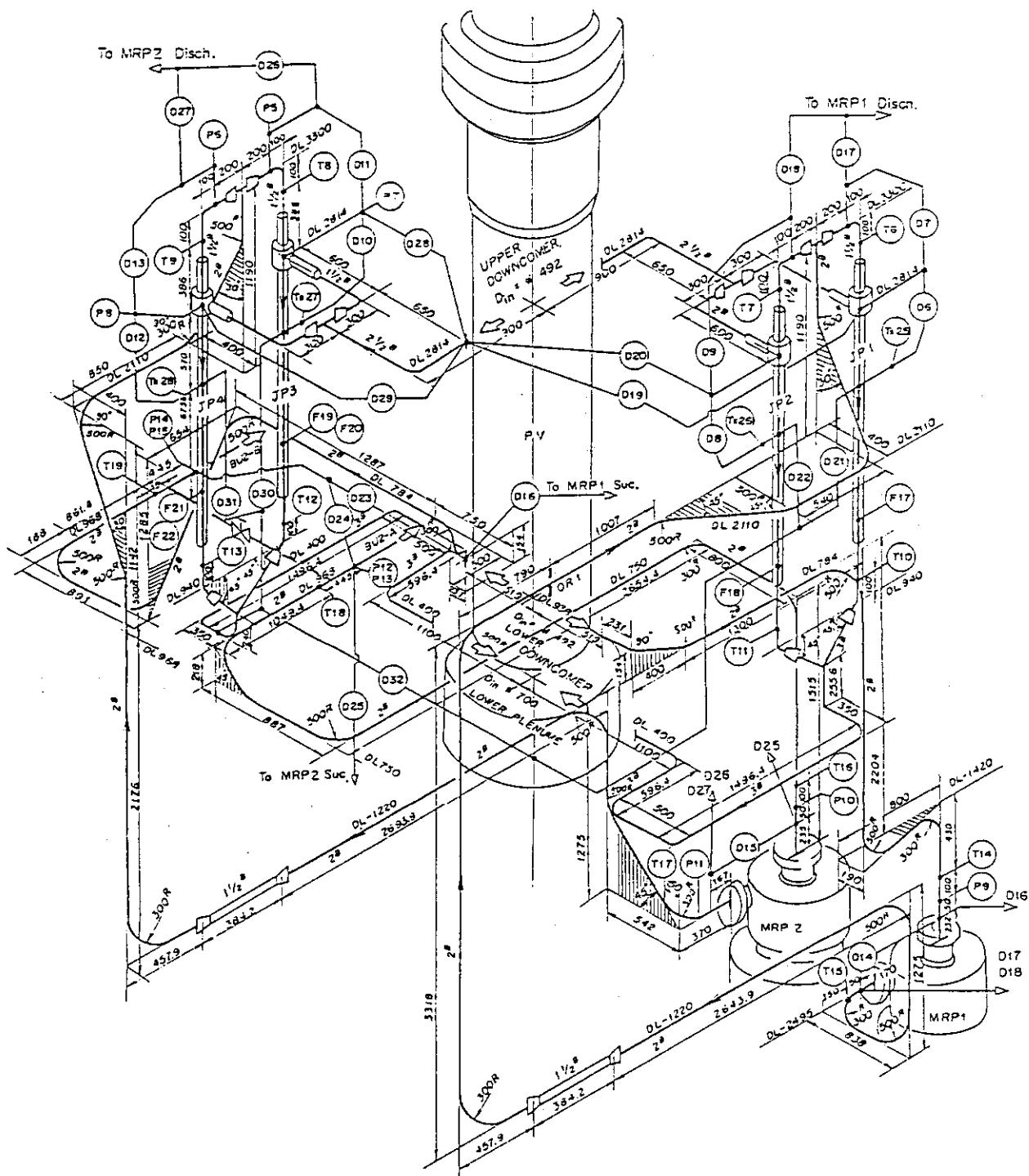


Fig. 2.8 Piping Layout of Recirculation Loops and Jet Pumps

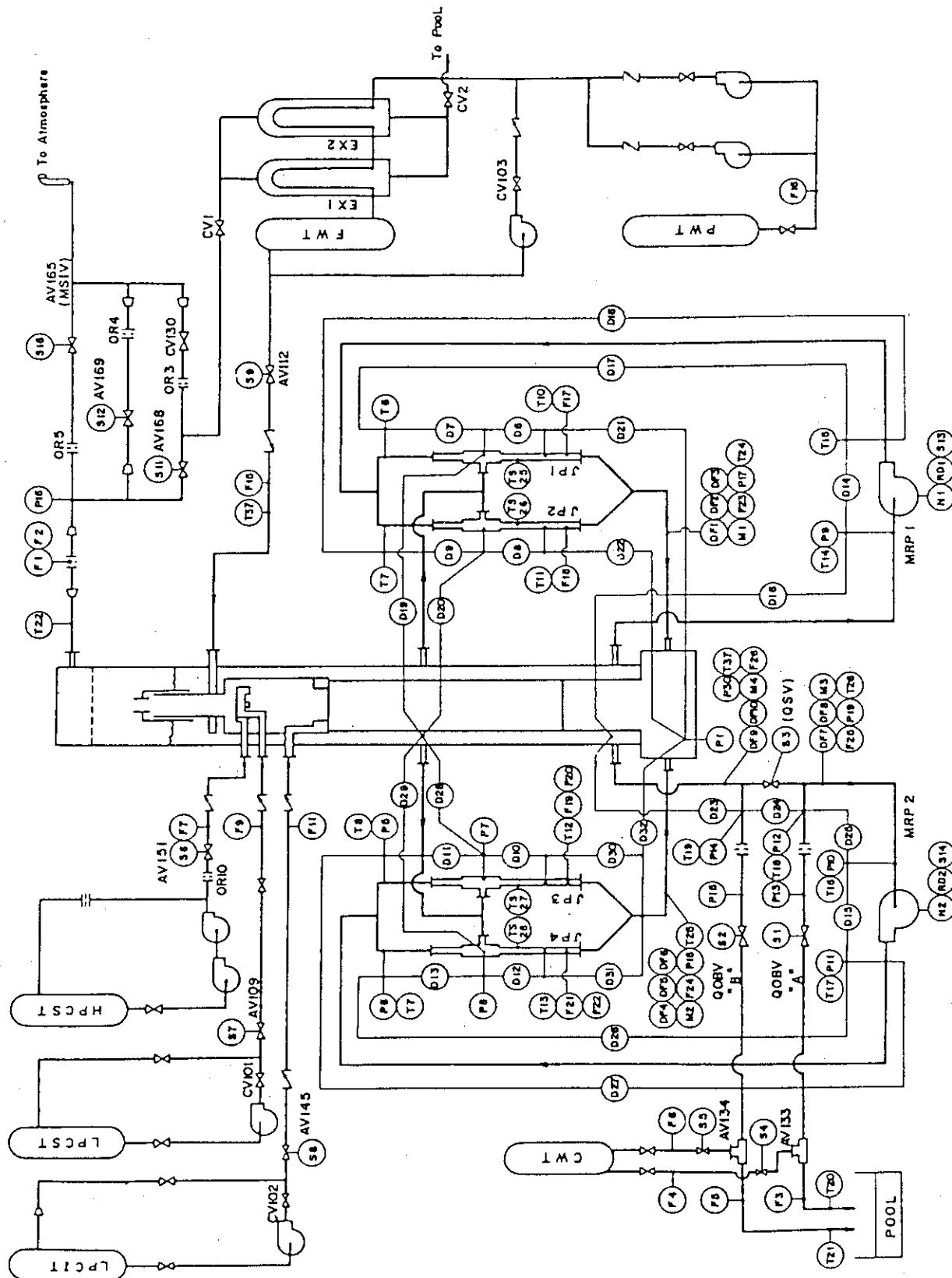


Fig. 3.1. Instrumentation Location of ROSA-III Test Facility

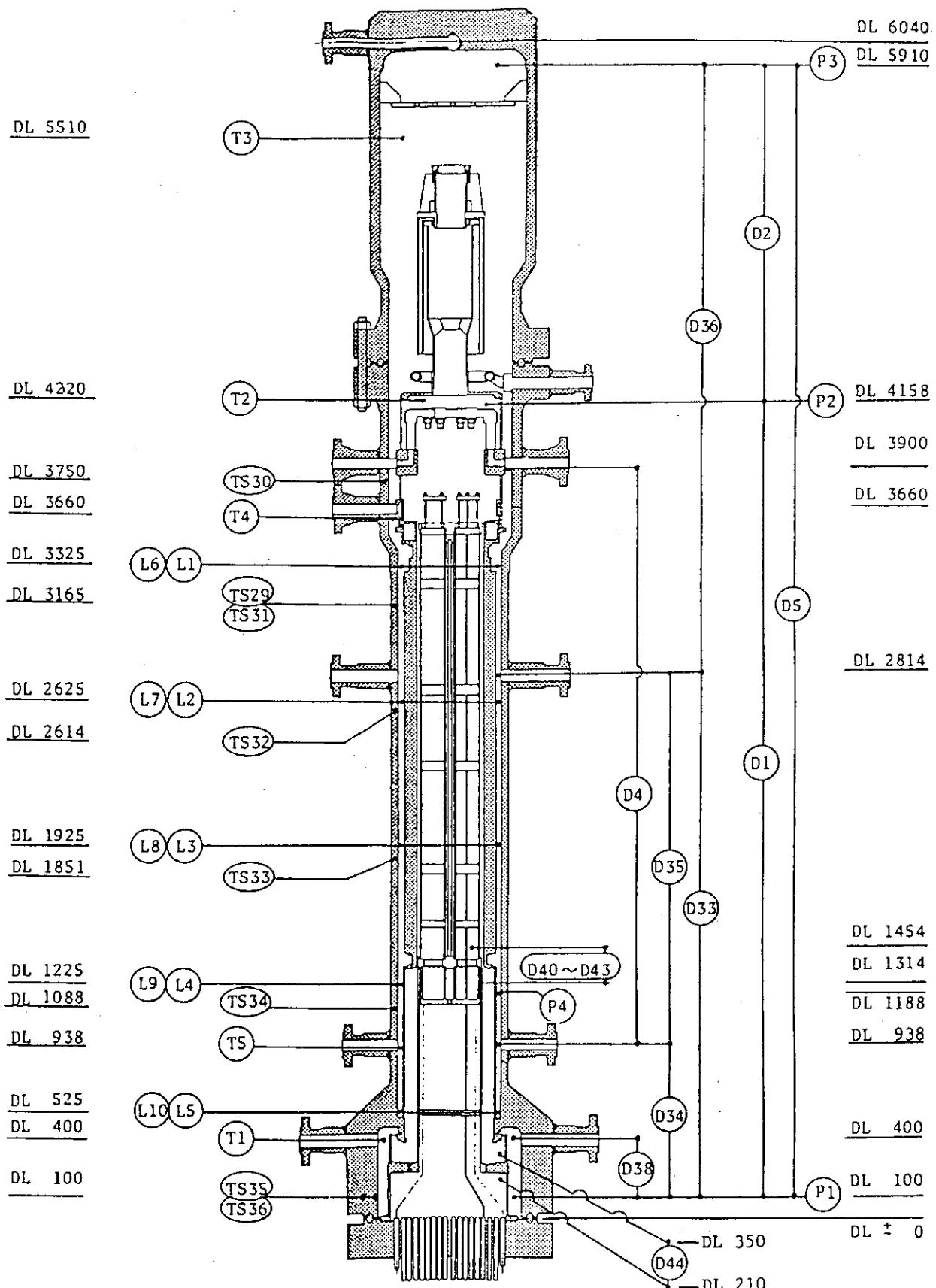


Fig. 3.2 Instrumentation Location in Pressure Vessel

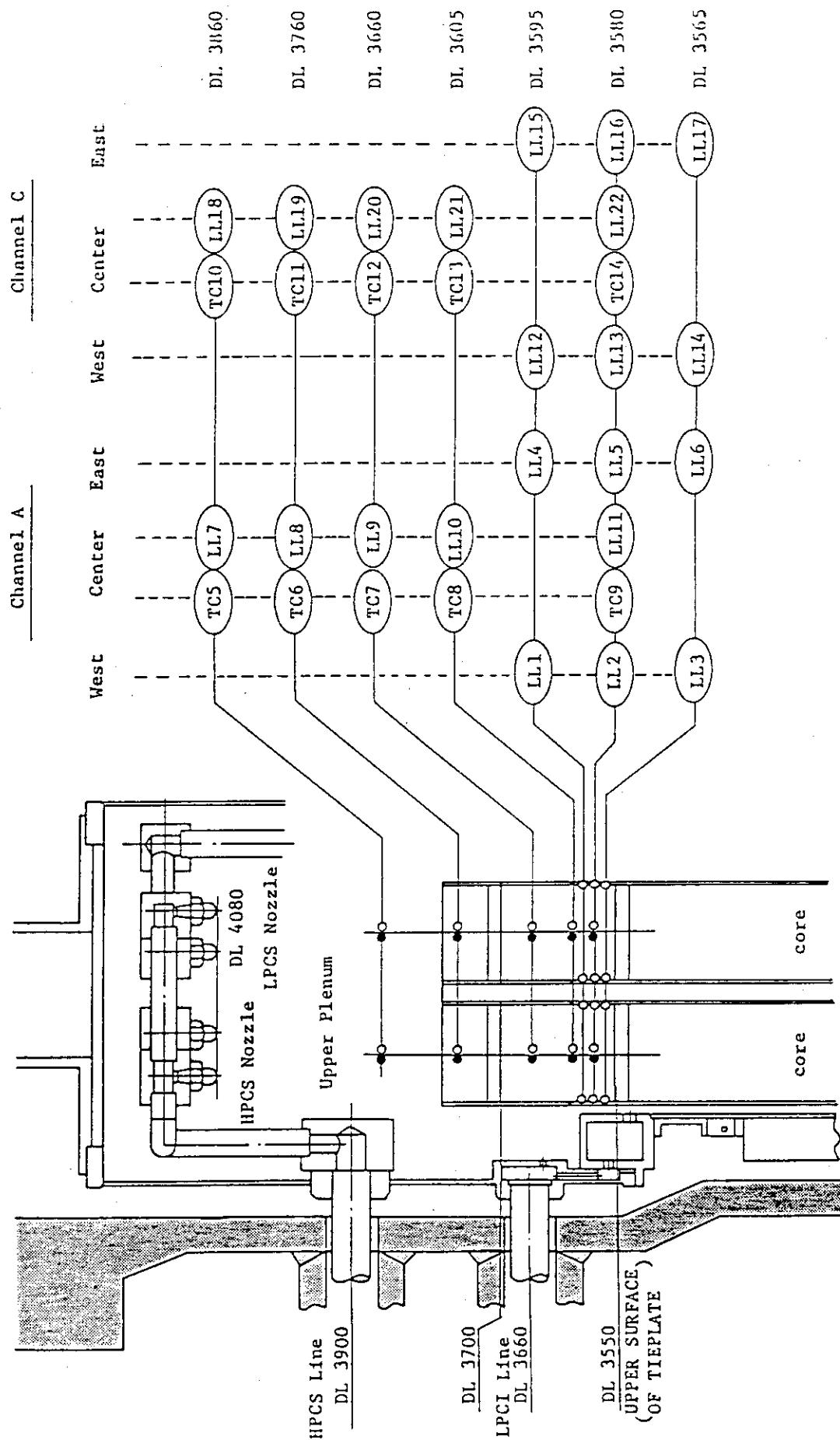


Fig. 3.3 Upper Plenum Instrumentation

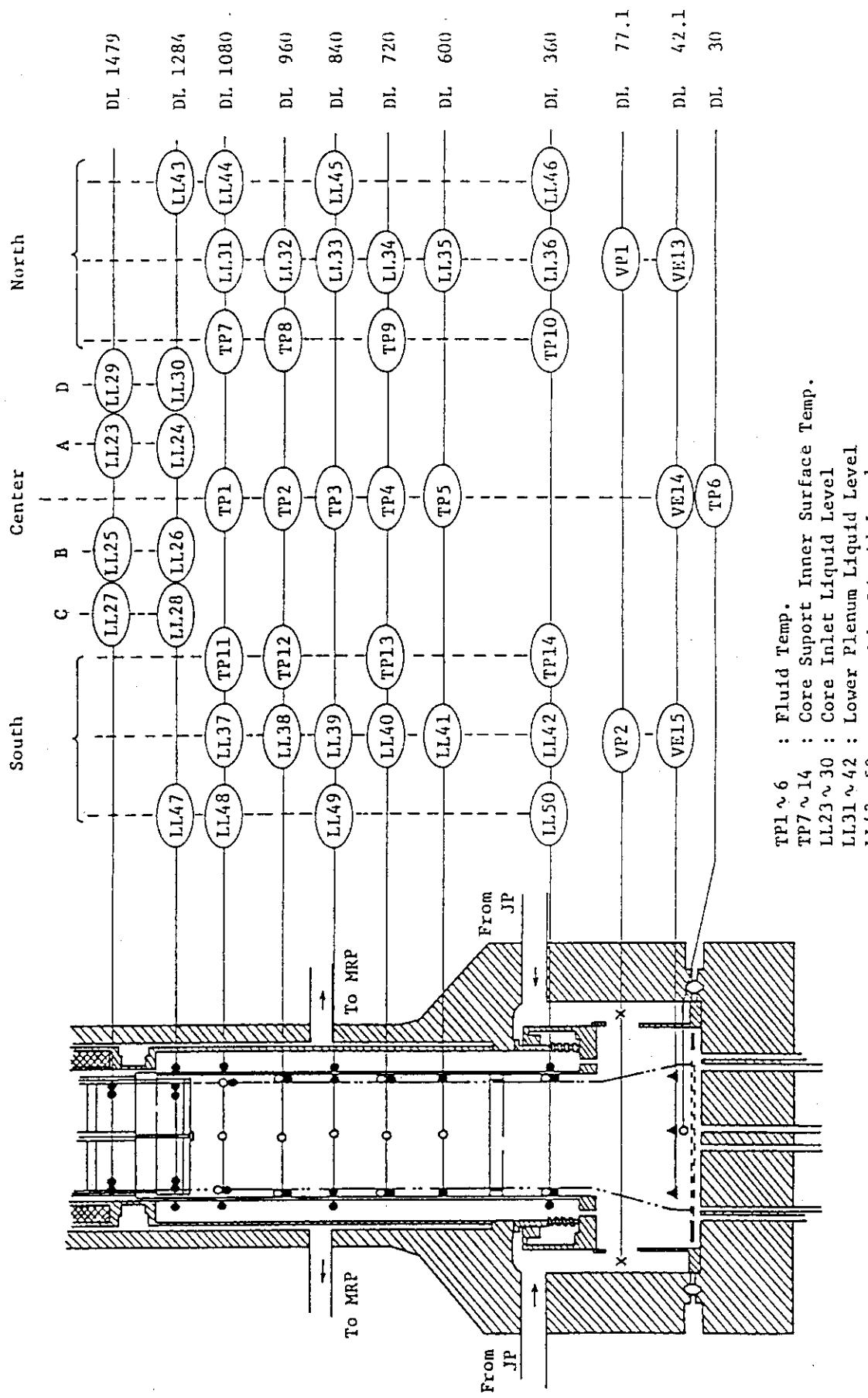
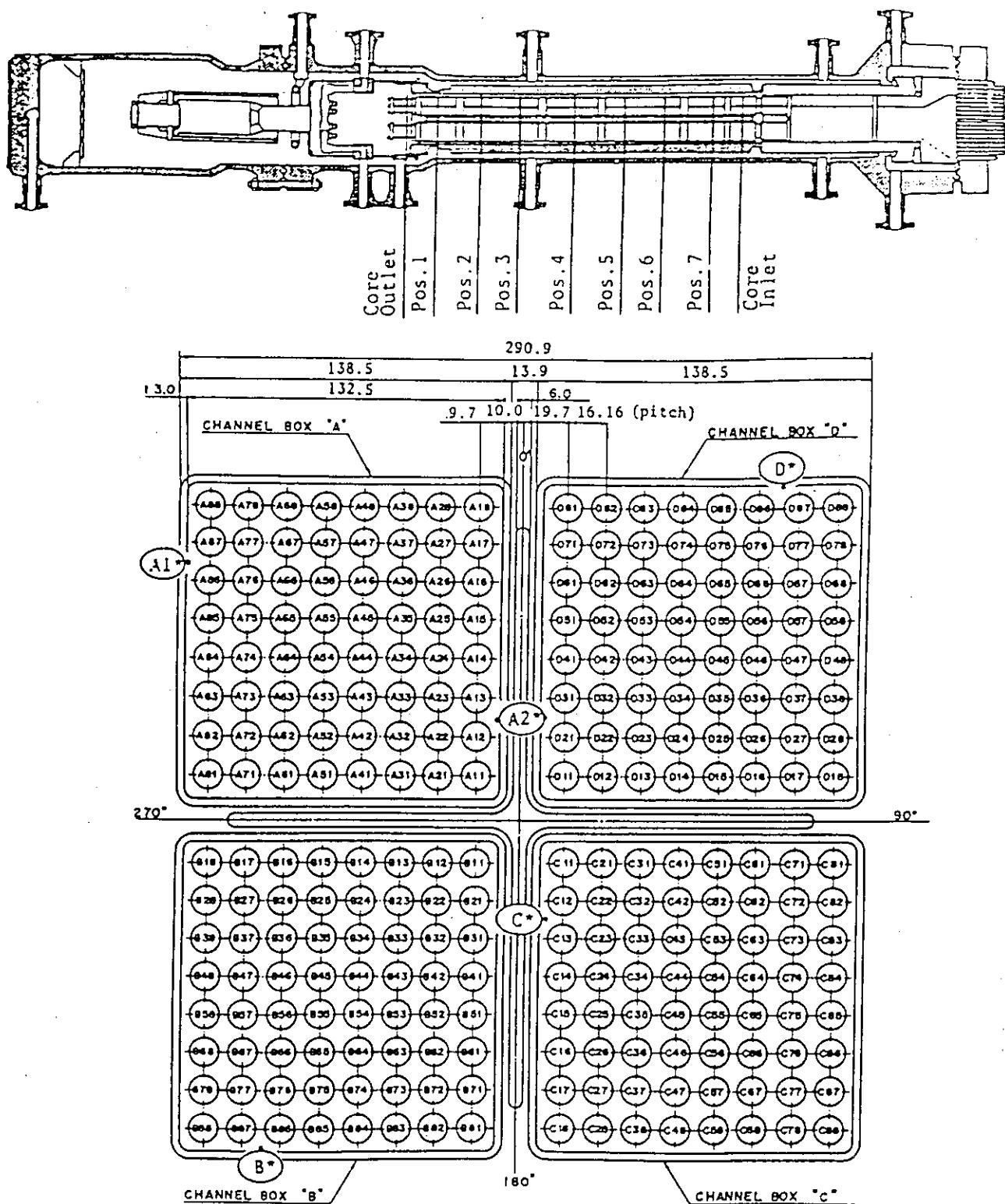


Fig. 3.4 Lower Plenum Instrumentation



Heater rod O.D. is 12.27mm

A54, B54, C54 and D54 are water rod simulators with void probes,
O.D. = 15.01mm

A45, B45, C45 and D45 are water rod simulators with thermocouples,
O.D. = 15.01mm

Fig. 3.5 Core Instrumentation (cf. Table 3.3)

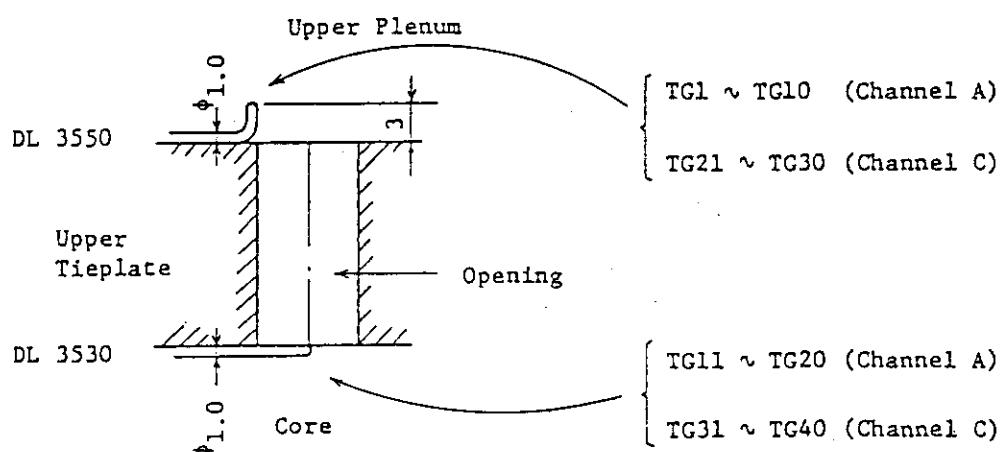
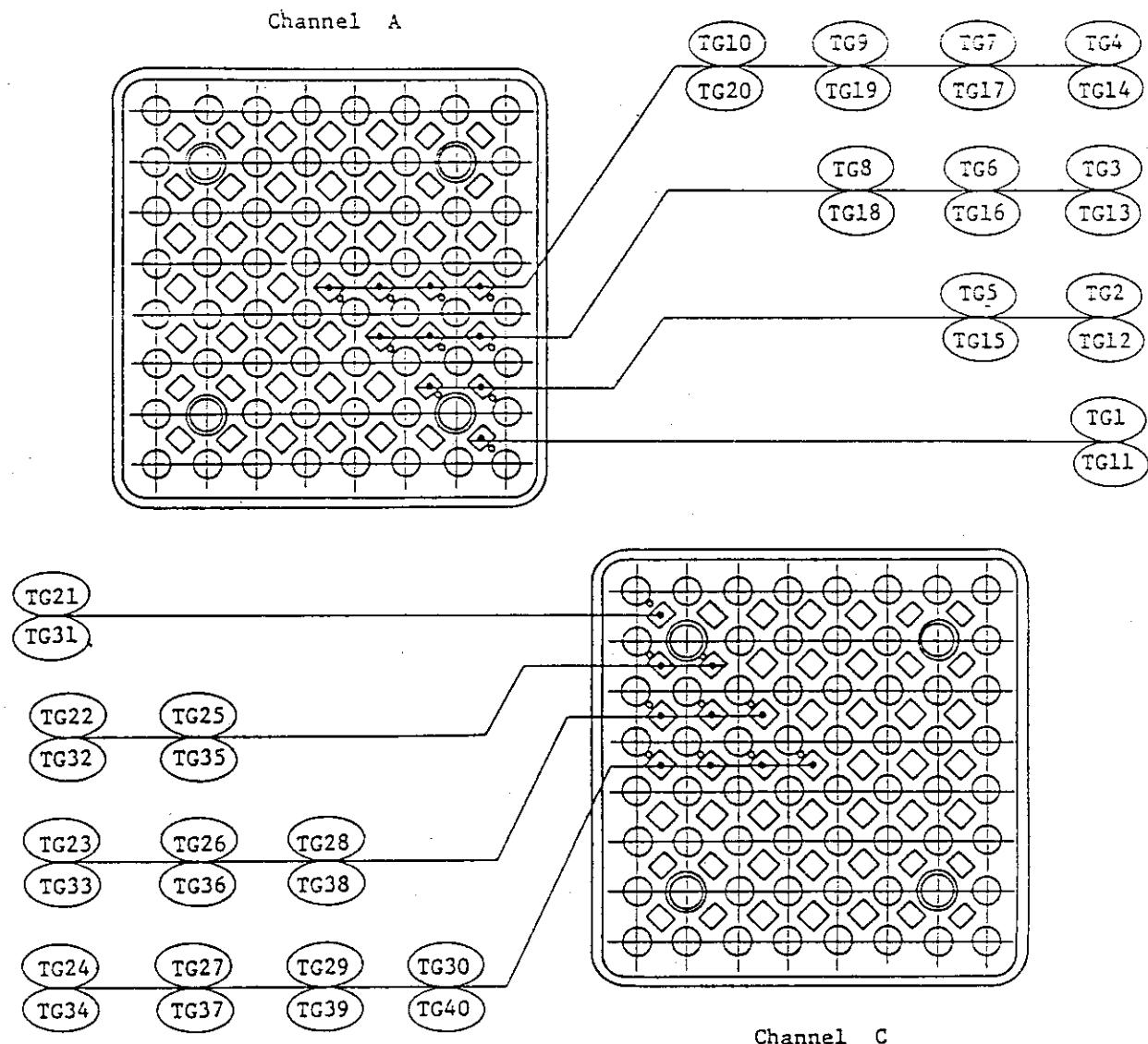


Fig. 3.6 Upper Tieplate Instrumentation

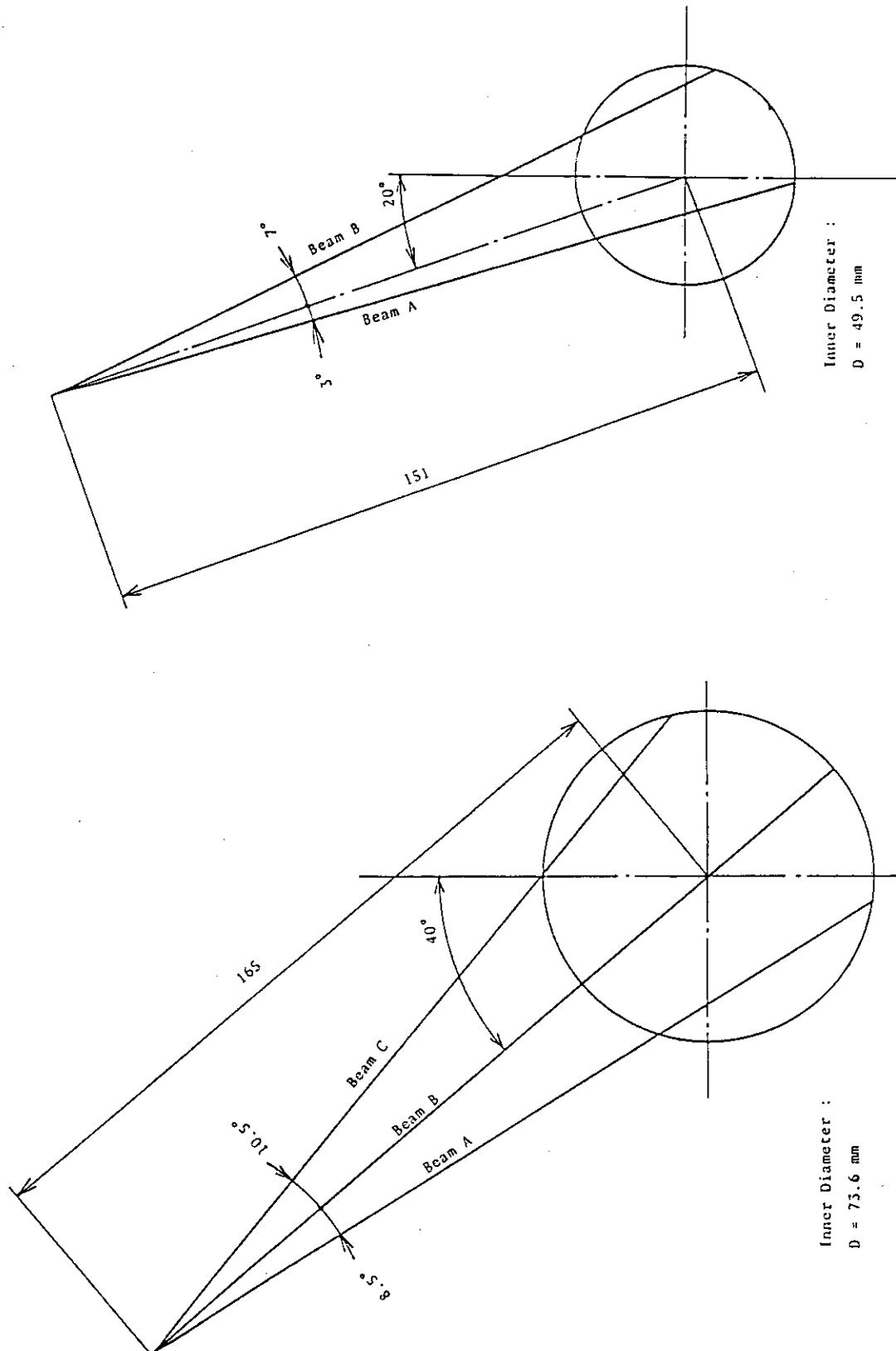
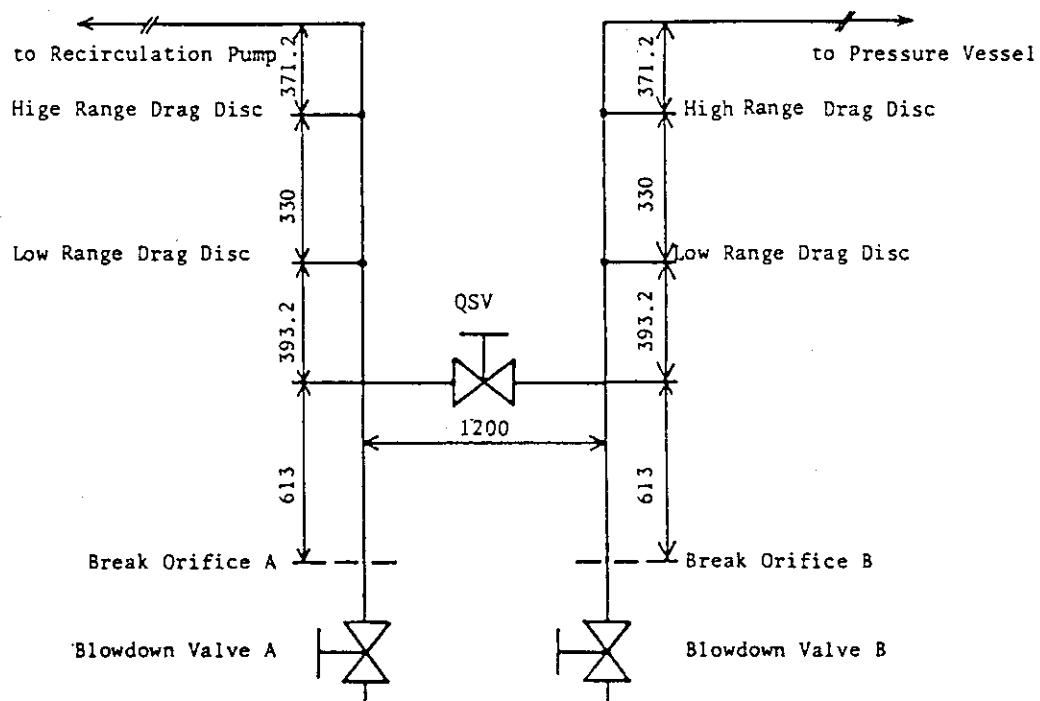
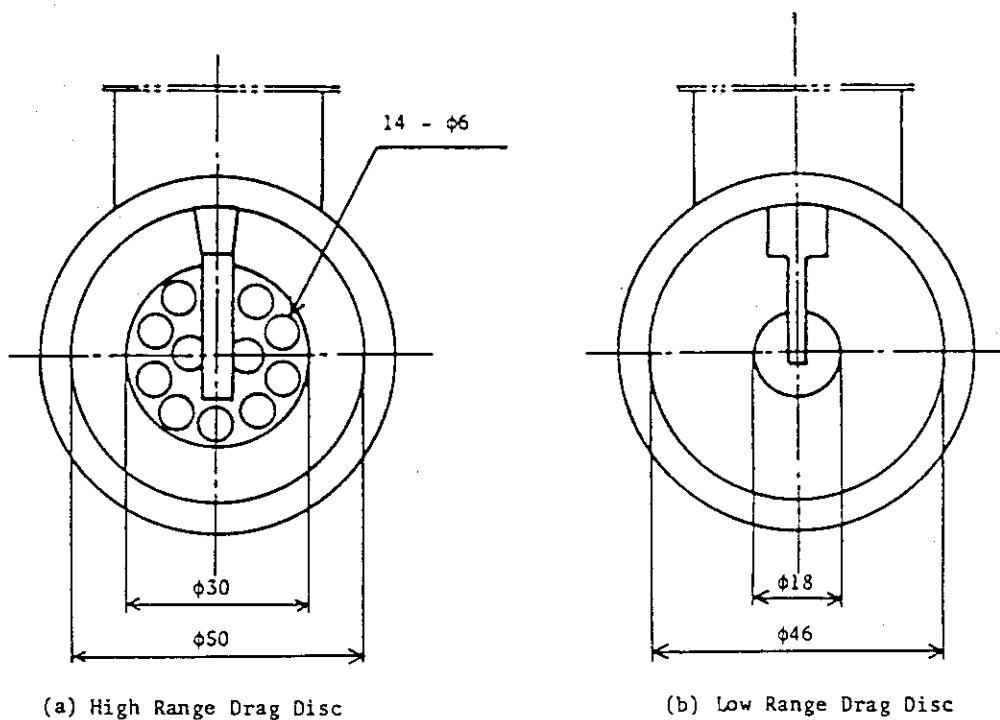


Fig. 3.7 Beam Directions of Three-Beam
Gamma Densitometer

Fig. 3.8 Beam Directions of Two-Beam
Gamma Densitometer



(c) Location of Drag Discs

Fig. 3.9 Arrangement and Location of Drag Disks

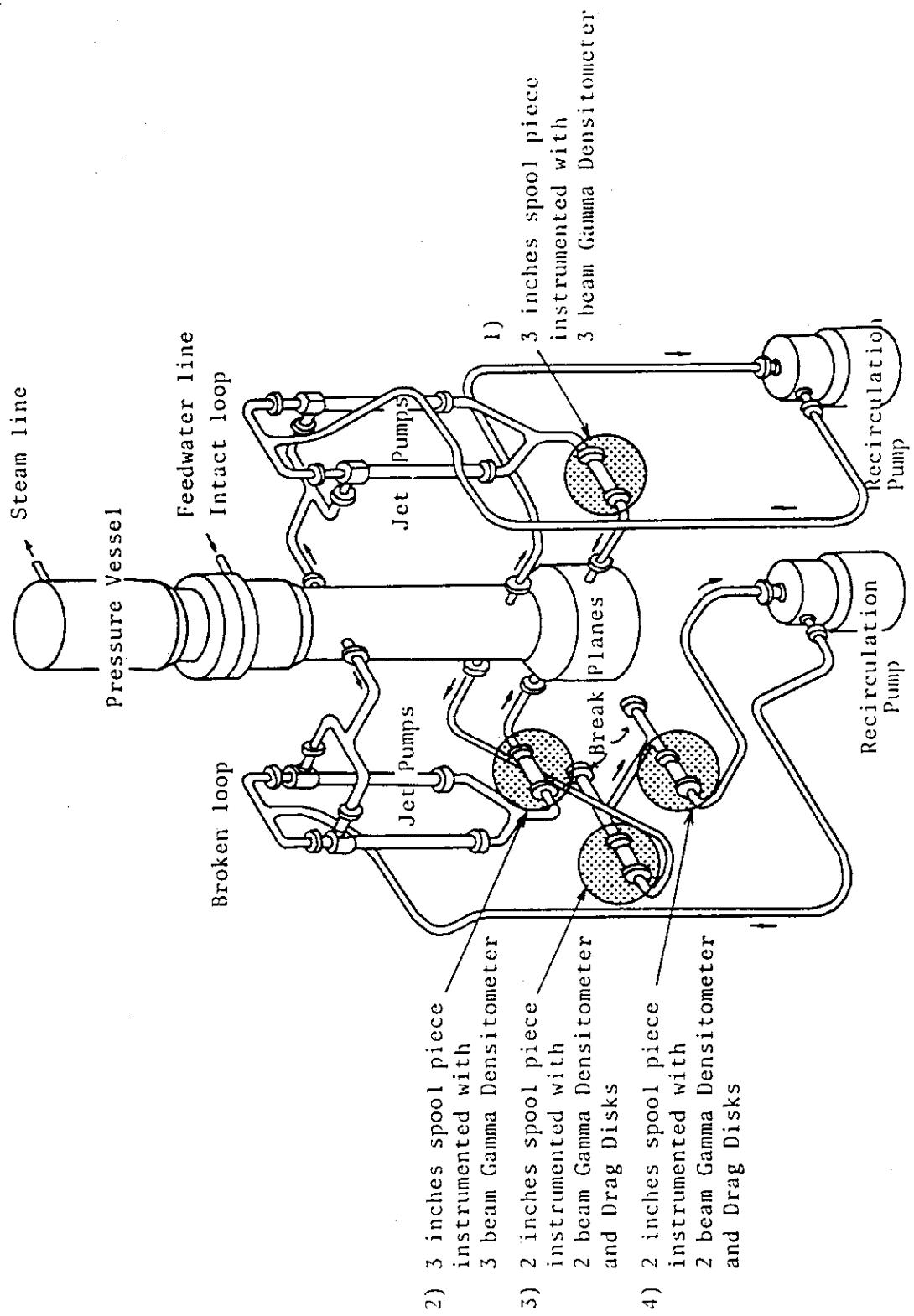


Fig. 3.10 Location of Two-Phase Flow Measurement Spool Pieces

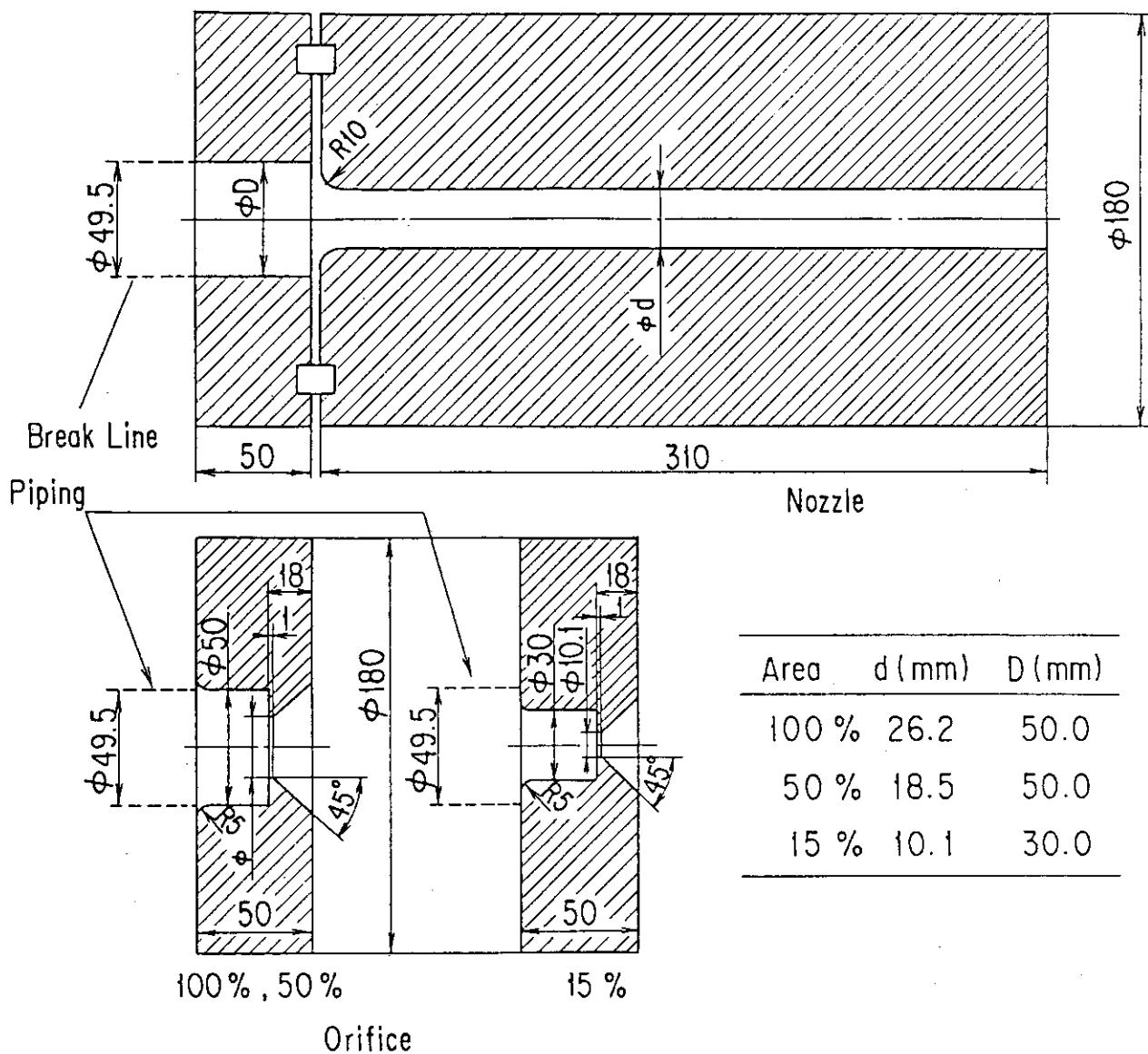


Fig. 4.1 Break configuration details

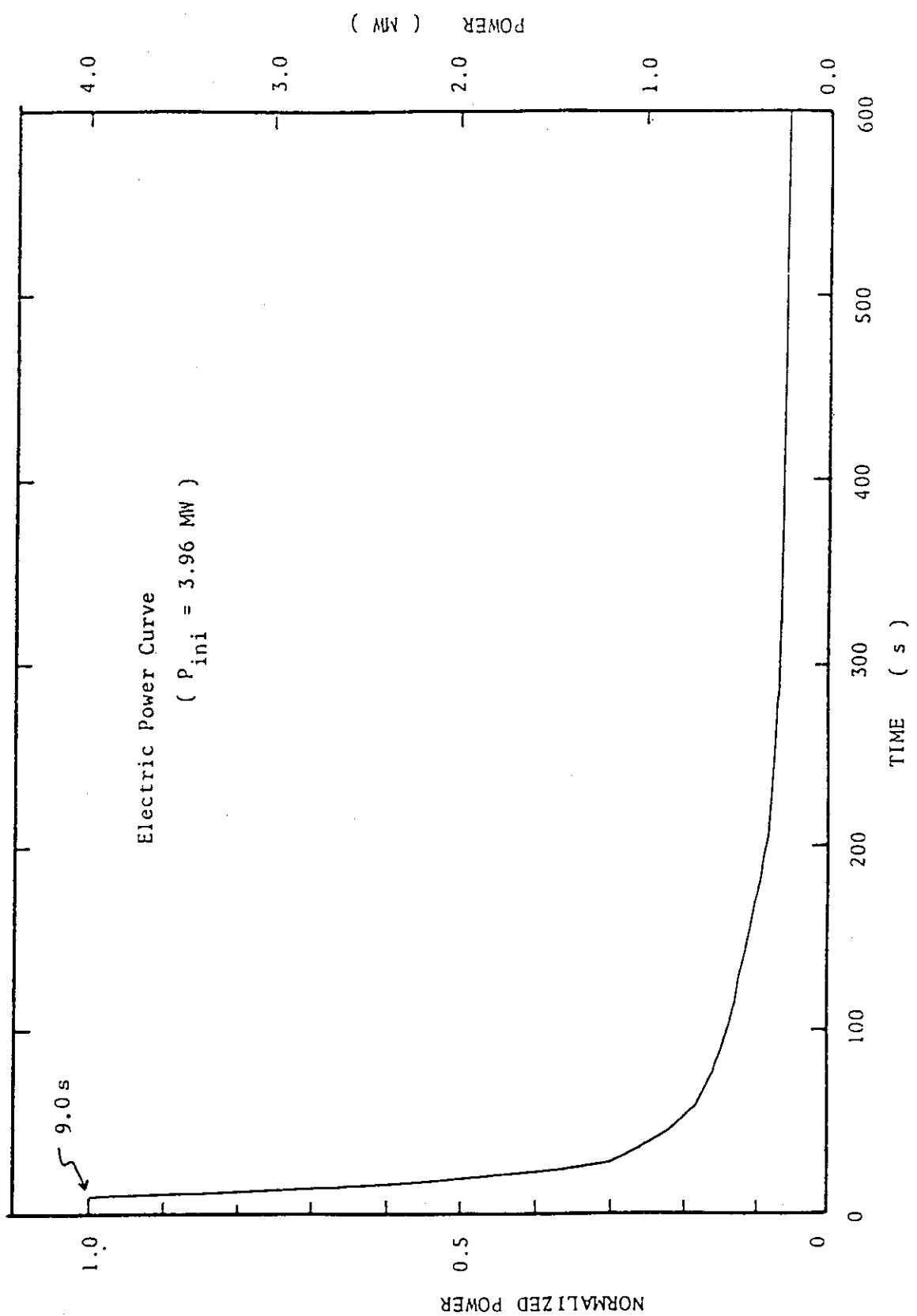


Fig. 4.2 Normalized Power Transient for ROSA-III Test

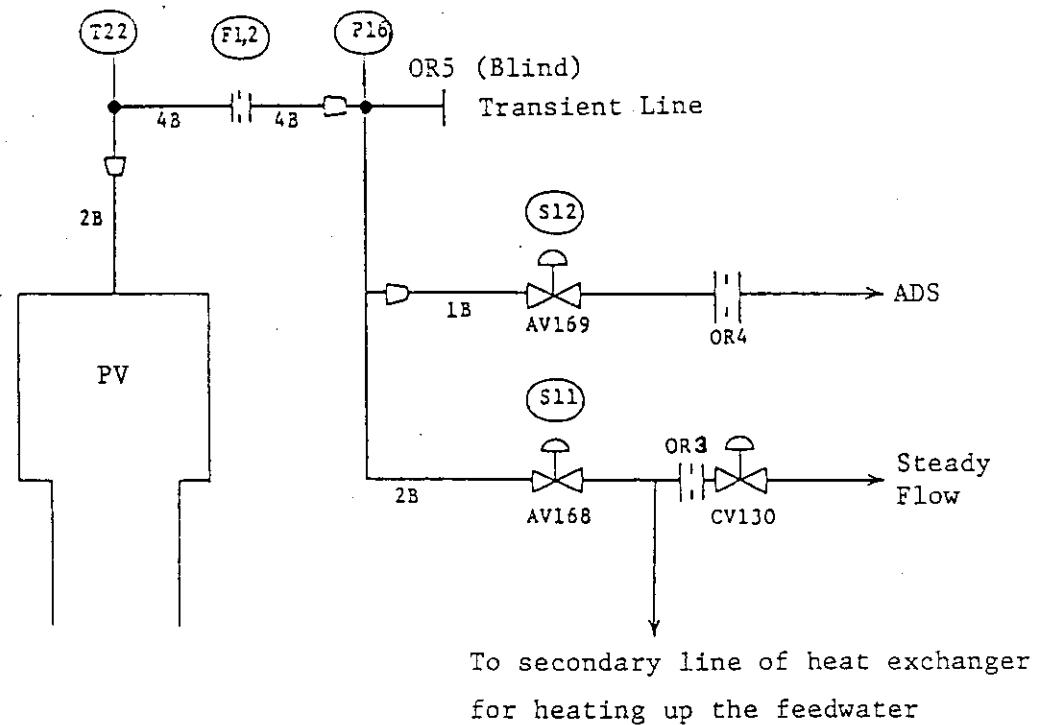


Fig. 4.3 Main Steam Line Schematic

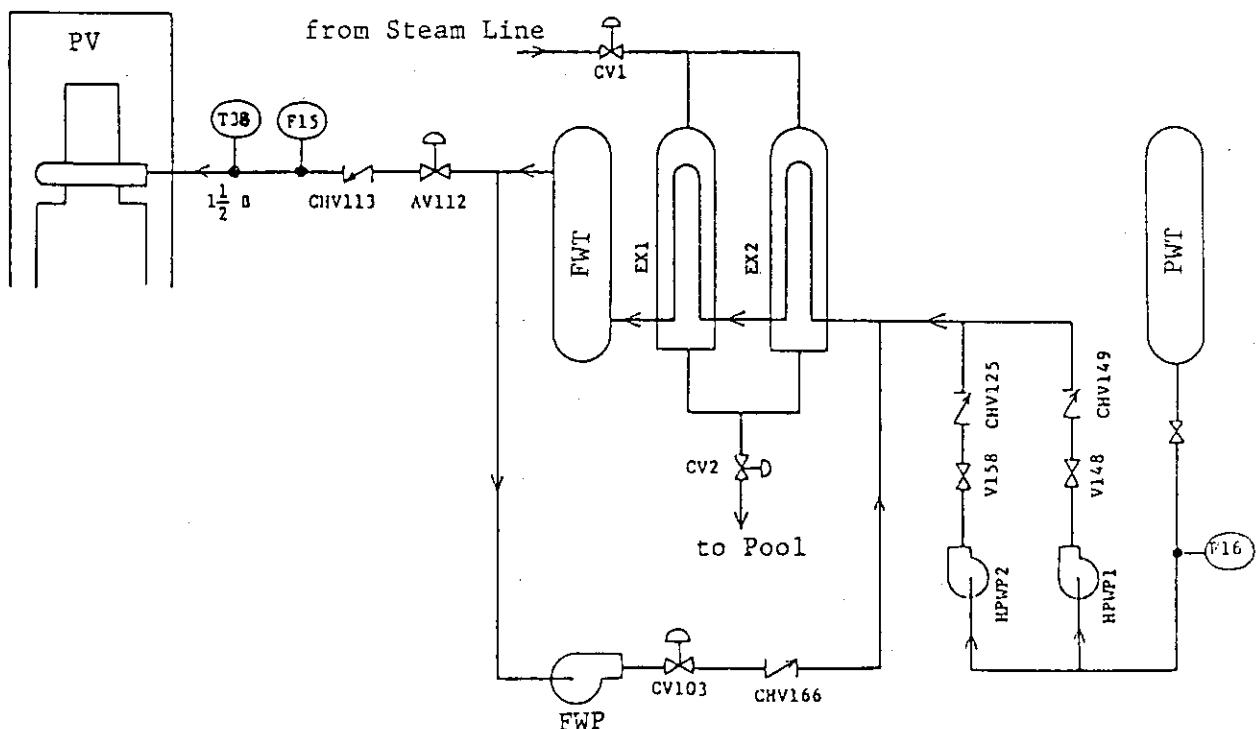


Fig. 4.4 Feedwater Line Schematic

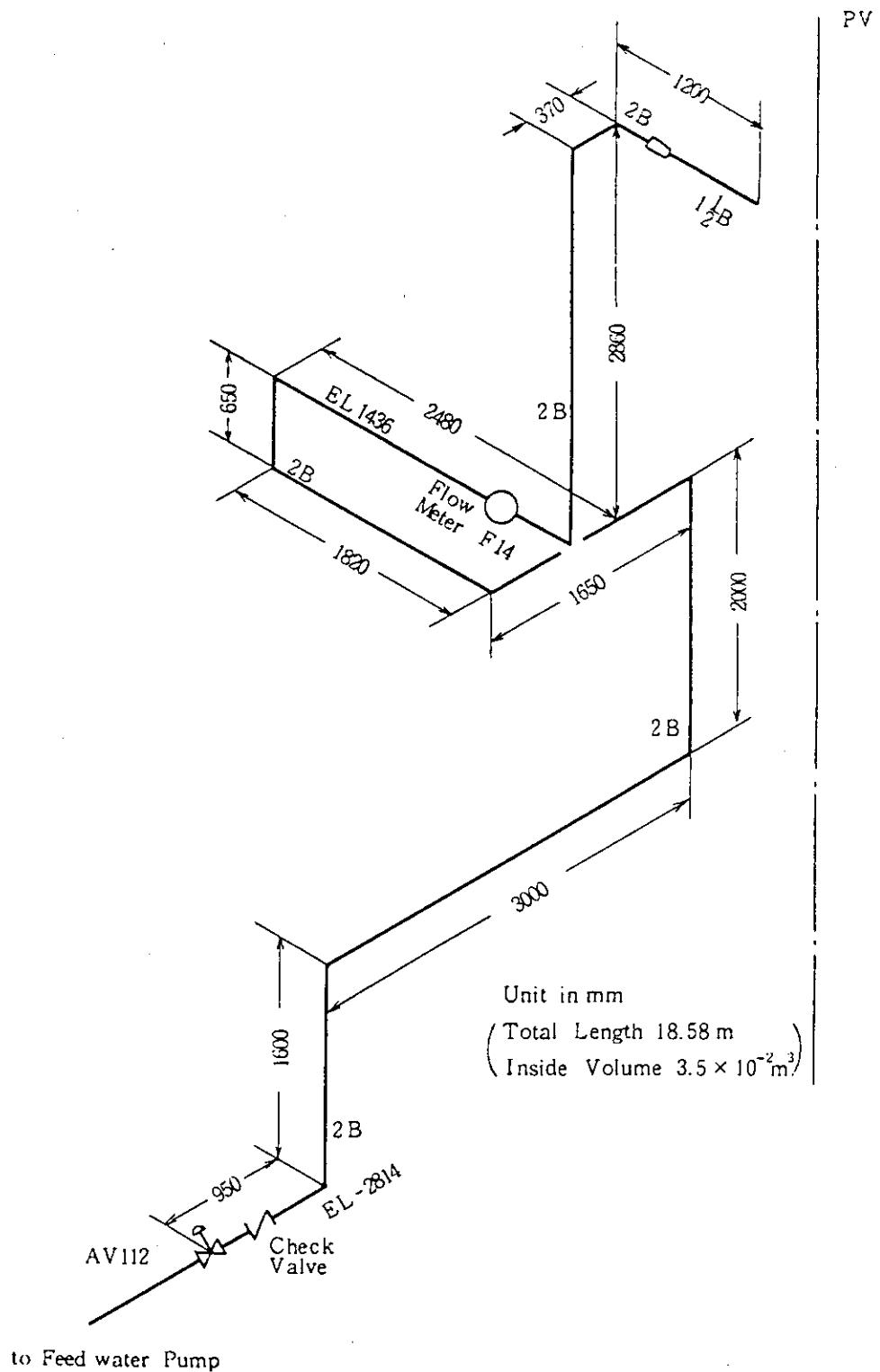


Fig. 4.5 Feedwater Line between Valve AV-112 and Pressure Vessel

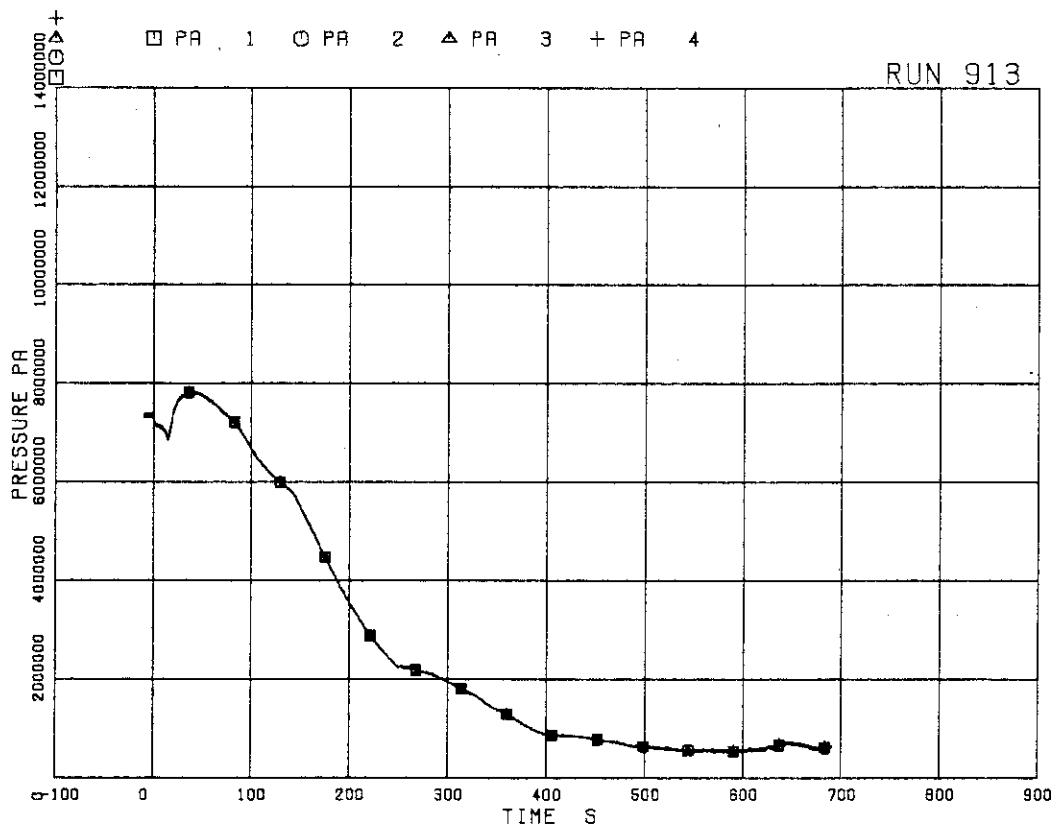


FIG.5. 1 PRESSURE IN PV (PRESSURE VESSEL)

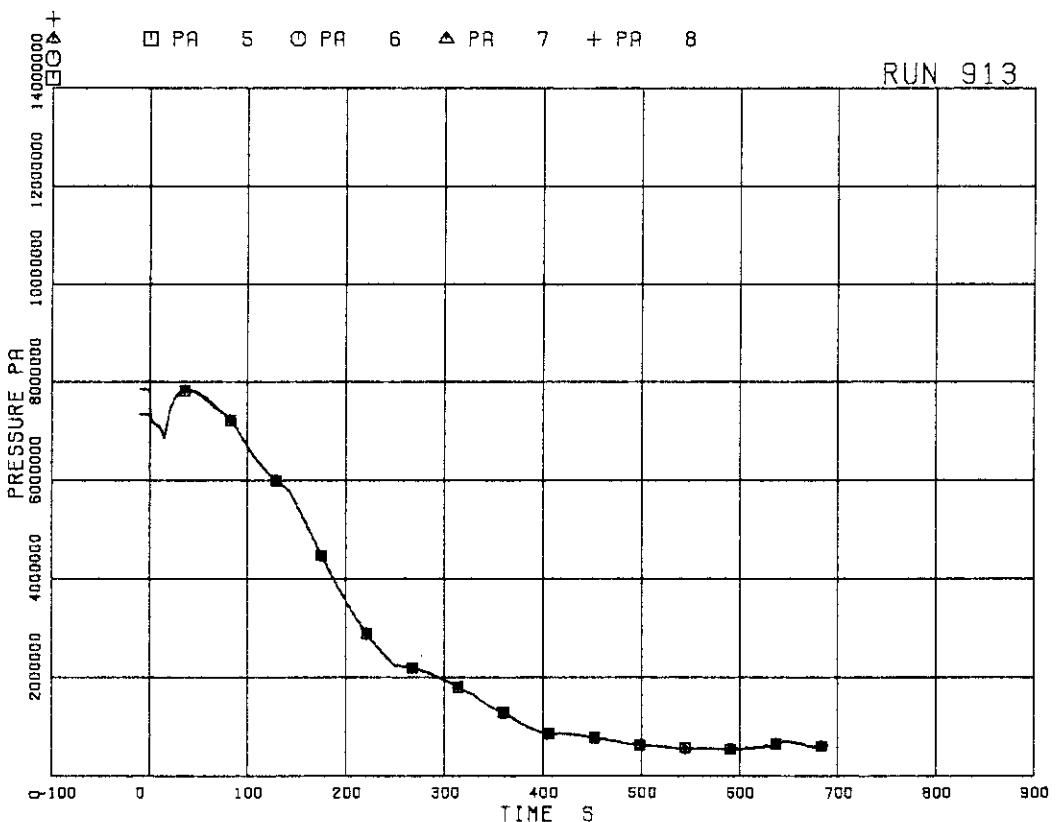


FIG.5. 2 PRESSURE IN BROKEN LOOP JP (JET PUMP)

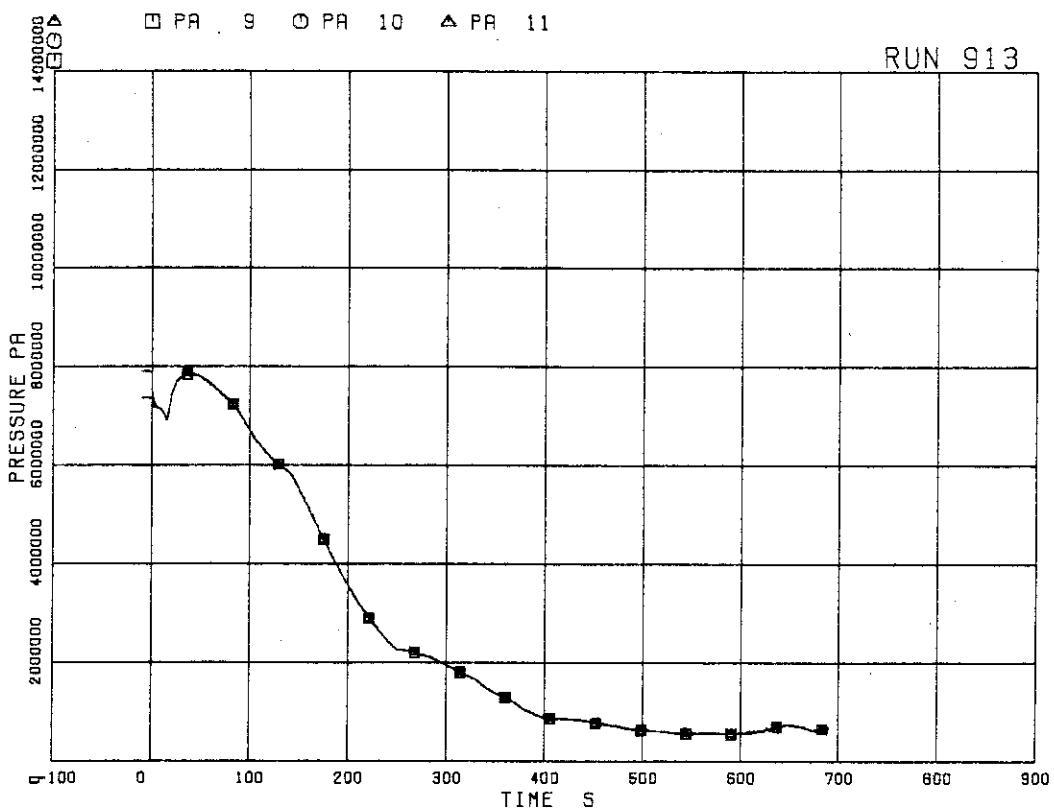


FIG. 5. 3 PRESSURE NEAR MRP
(MAIN RECIRCULATION PUMP)

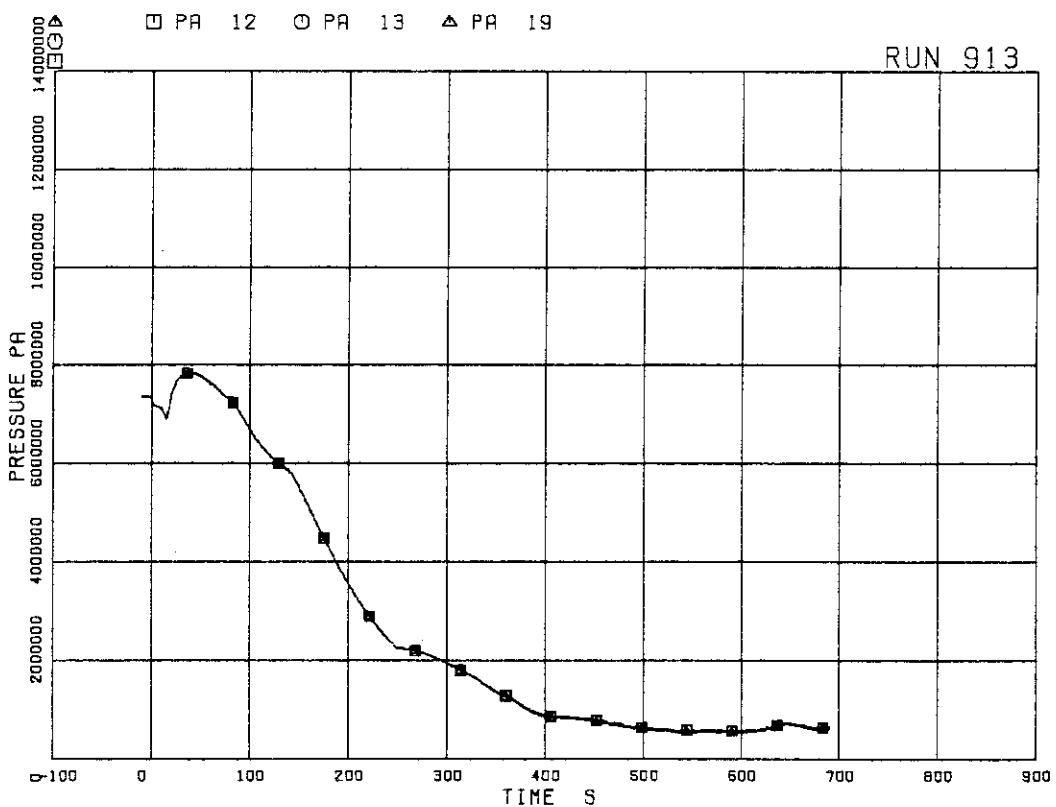


FIG. 5. 4 PRESSURE AT MRP SIDE OF BREAK

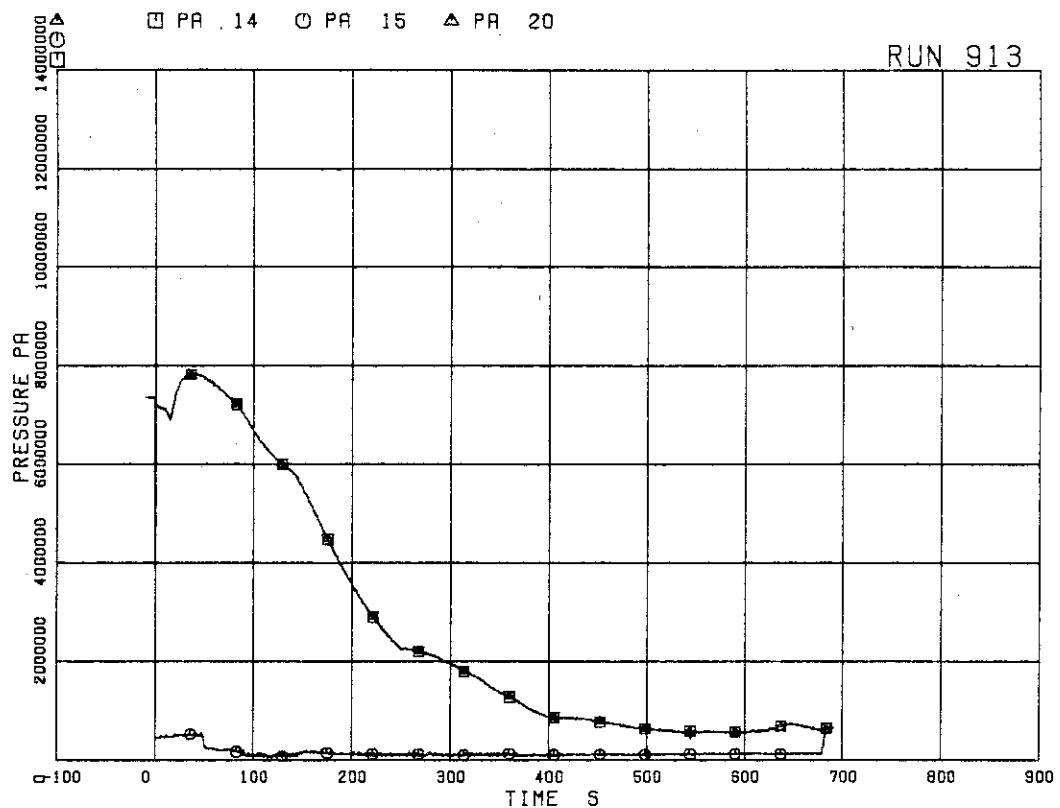


FIG. 5. 5 PRESSURE AT PV SIDE OF BREAK

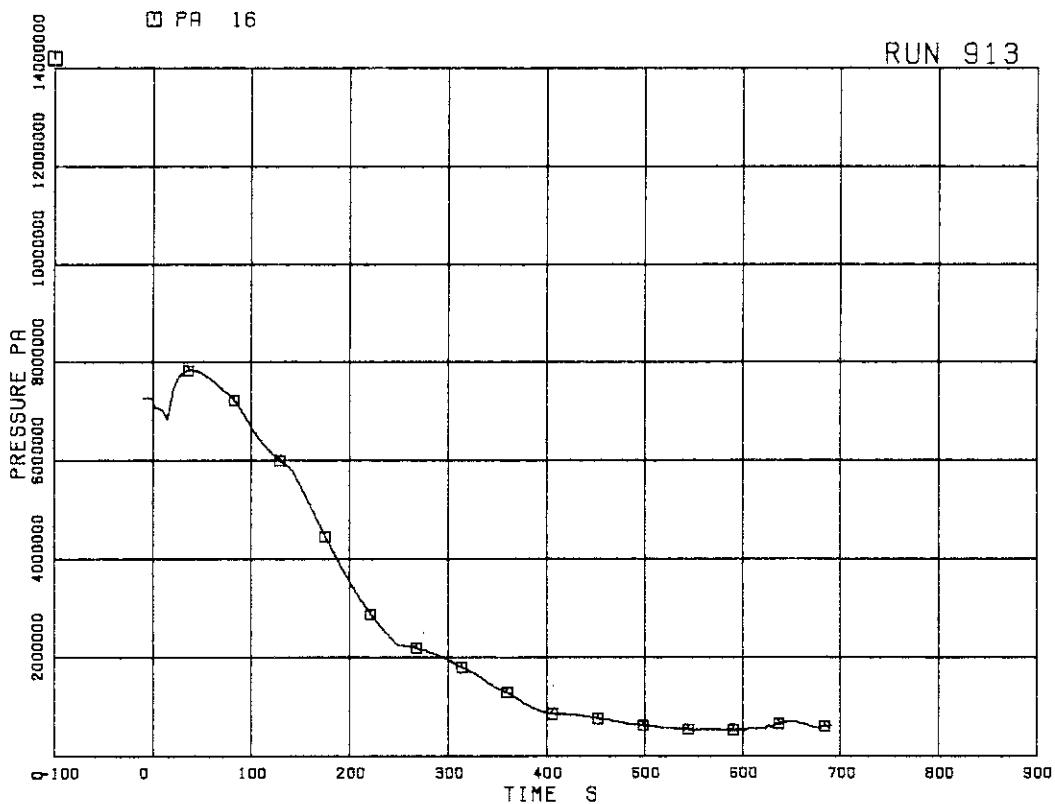


FIG. 5. 6 PRESSURE IN MSL (MAIN STEAM LINE)

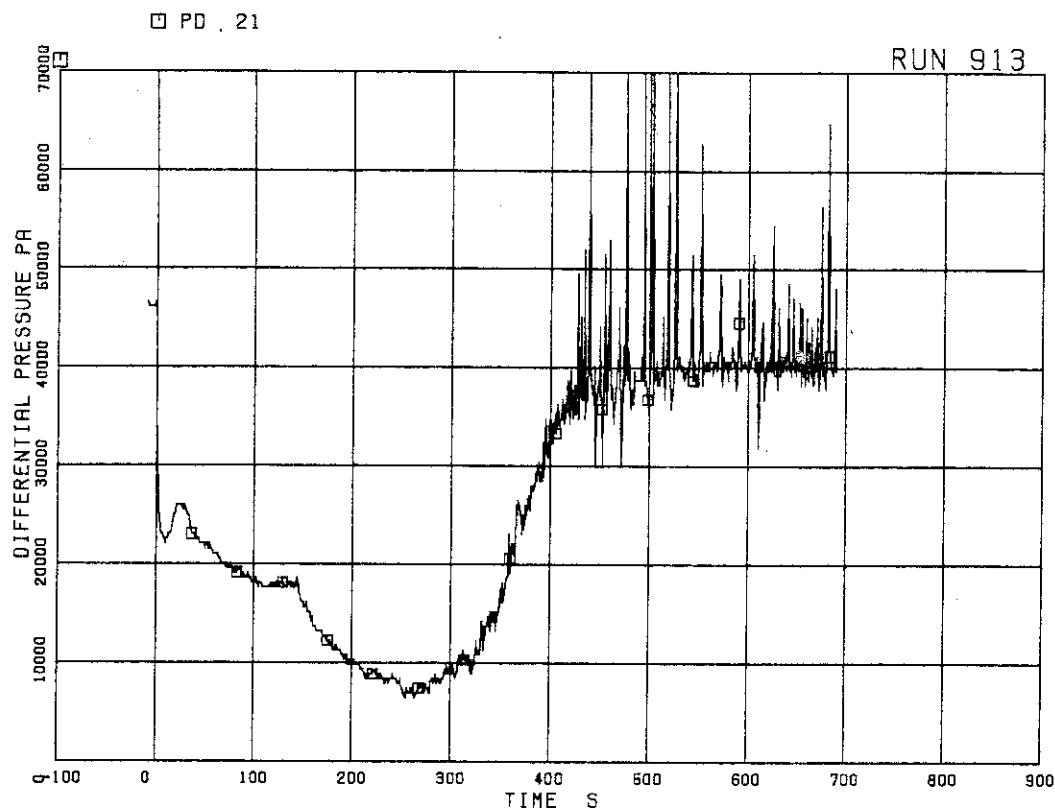


FIG. 5. 7 DIFFERENTIAL PRESSURE BETWEEN LOWER PLENUM AND UPPER PLENUM

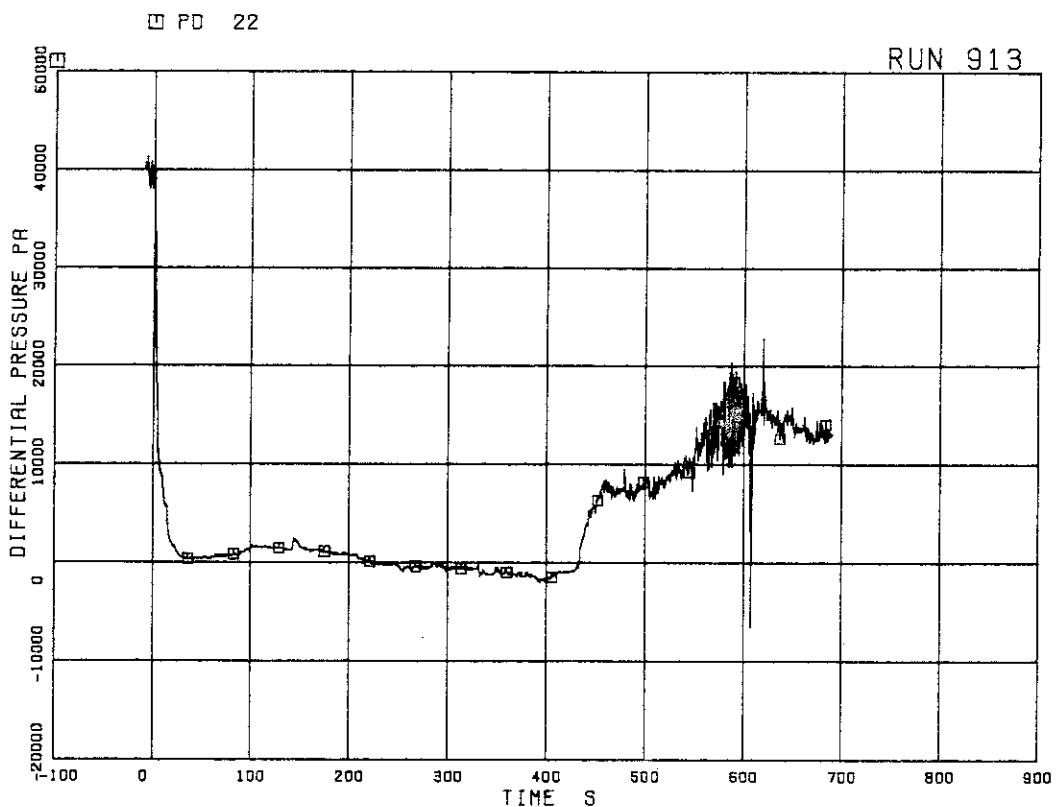


FIG. 5. 8 DIFFERENTIAL PRESSURE BETWEEN UPPER PLENUM AND STEAM DOME

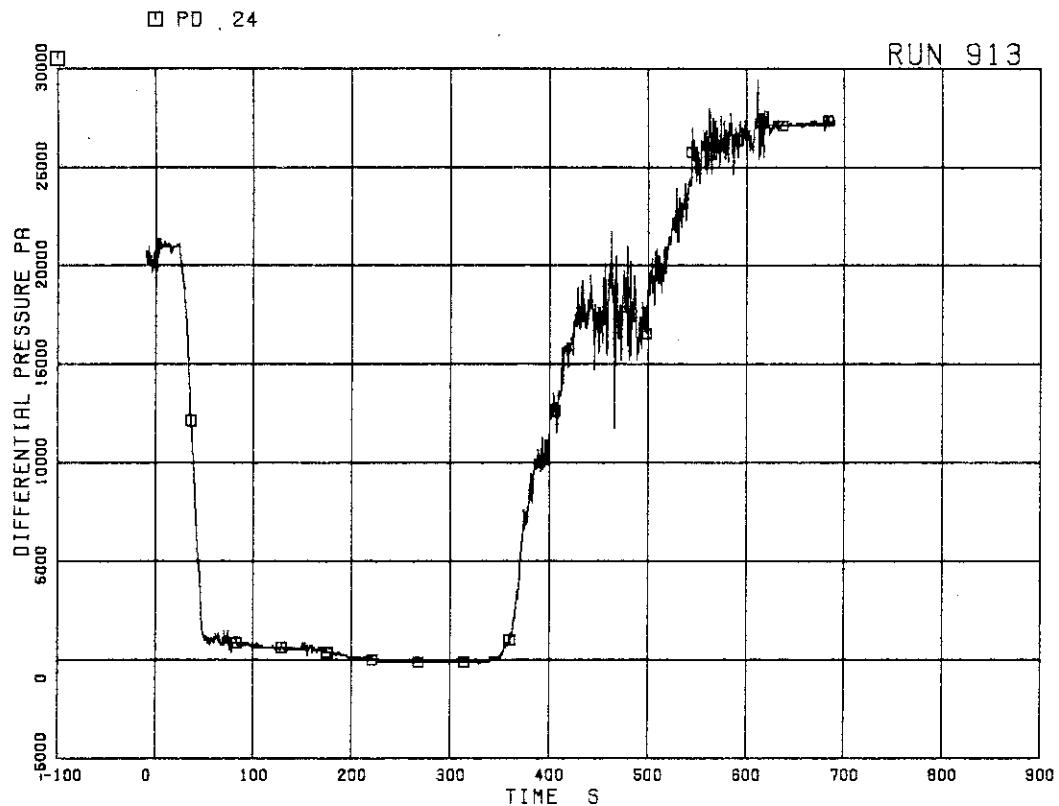
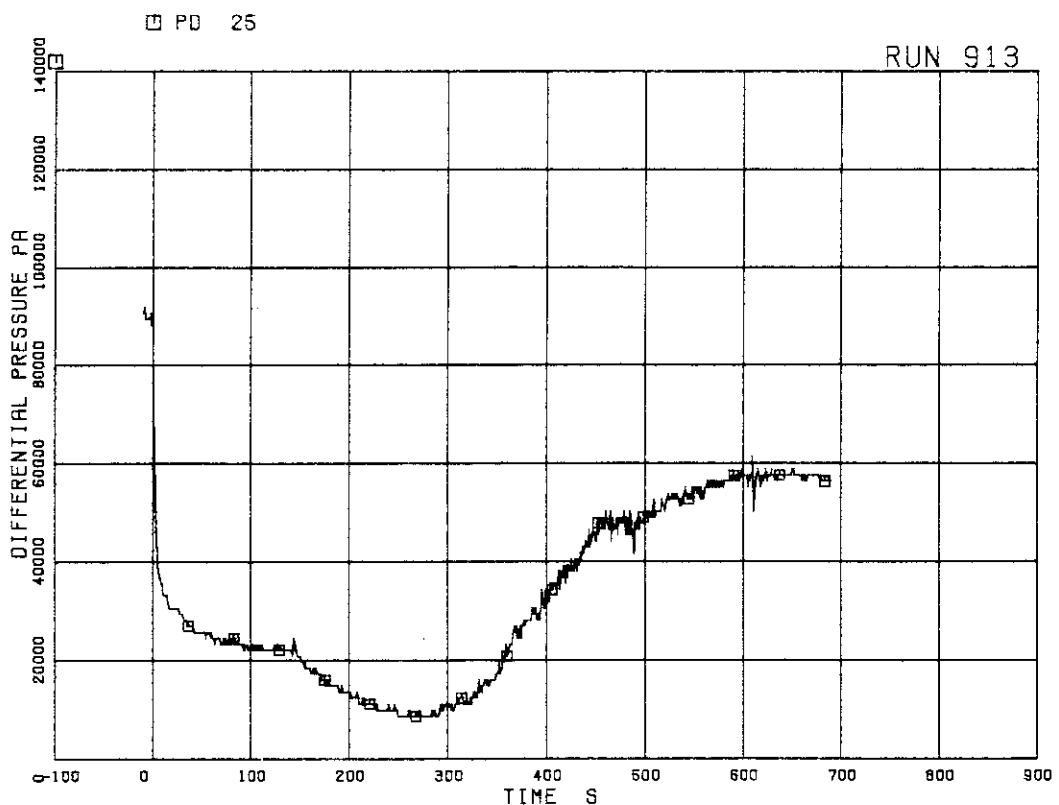


FIG. 5. 9 DC (DOWNCOMER) HEAD

FIG. 5. 10 DIFFERENTIAL PRESSURE BETWEEN
PV BOTTOM AND TOP

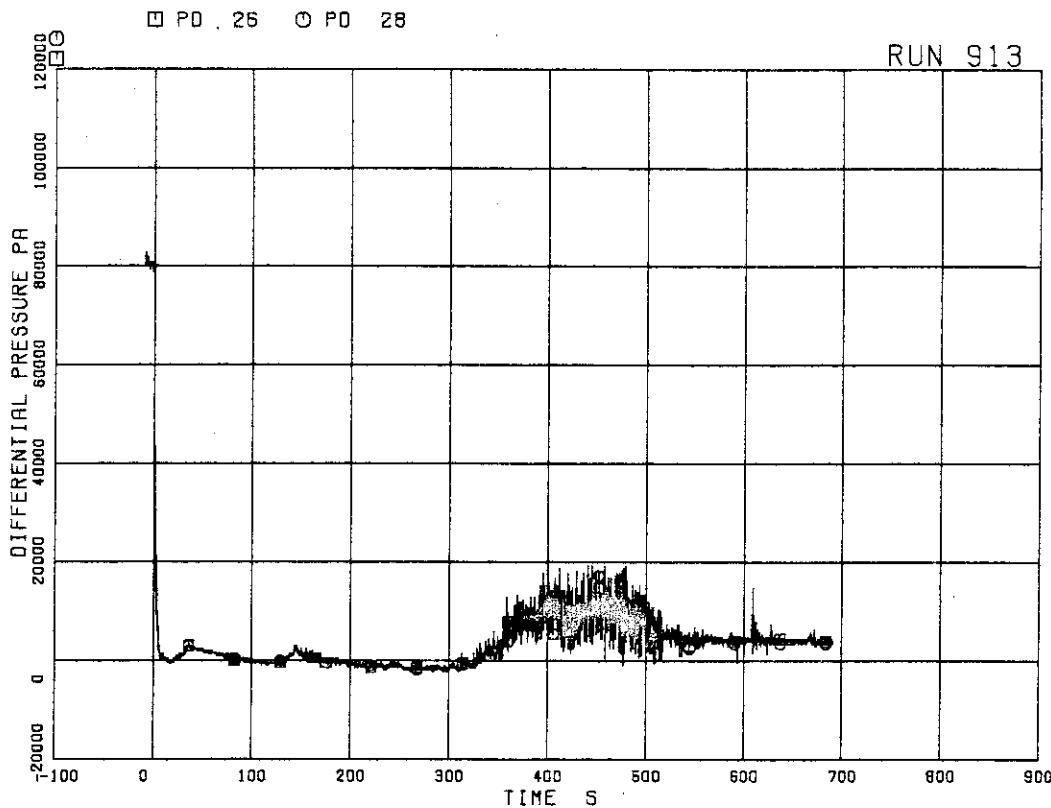


FIG. 5. 11 DIFFERENTIAL PRESSURE BETWEEN
JP-1,2 DISCHARGE AND SUCTION

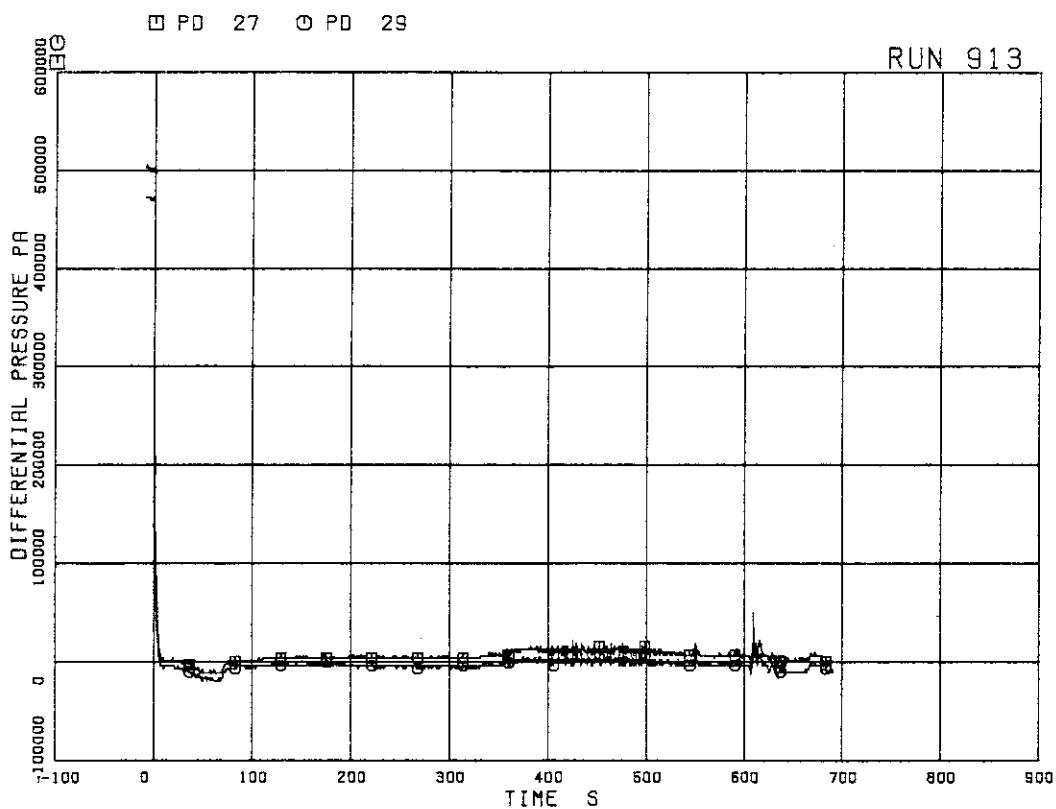


FIG. 5. 12 DIFFERENTIAL PRESSURE BETWEEN
JP-1,2 DRIVE AND SUCTION

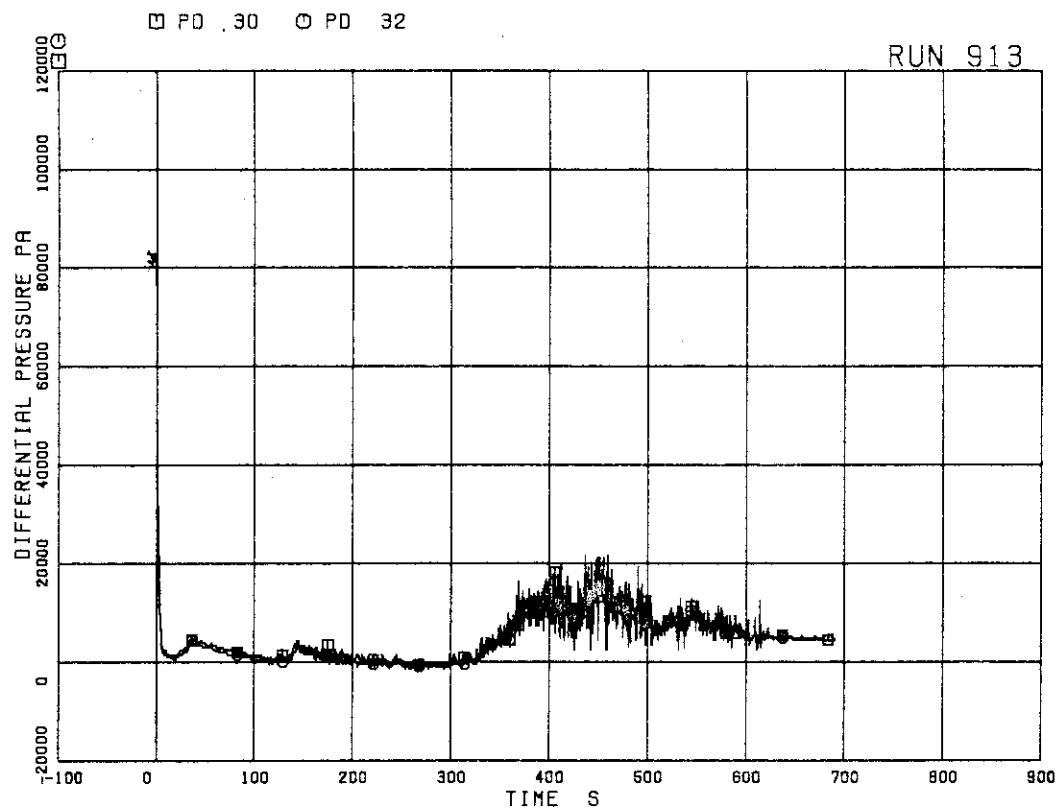


FIG. 5. 13 DIFFERENTIAL PRESSURE BETWEEN
JP-3,4 DISCHARGE AND SUCTION

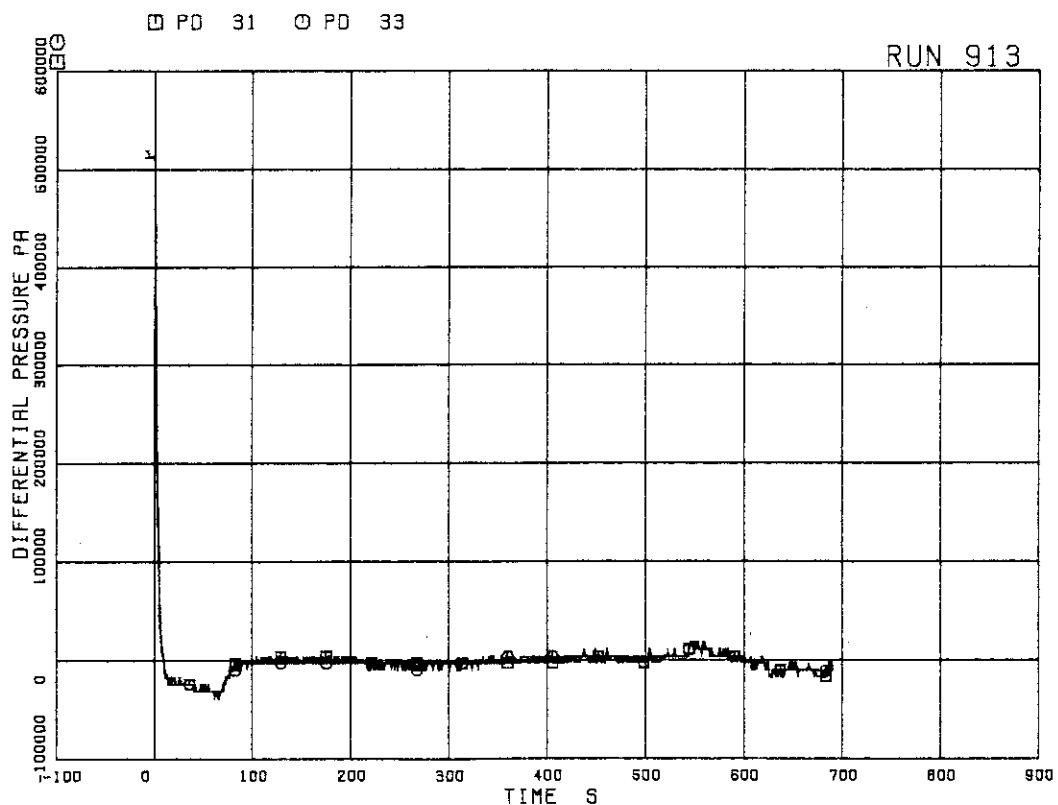
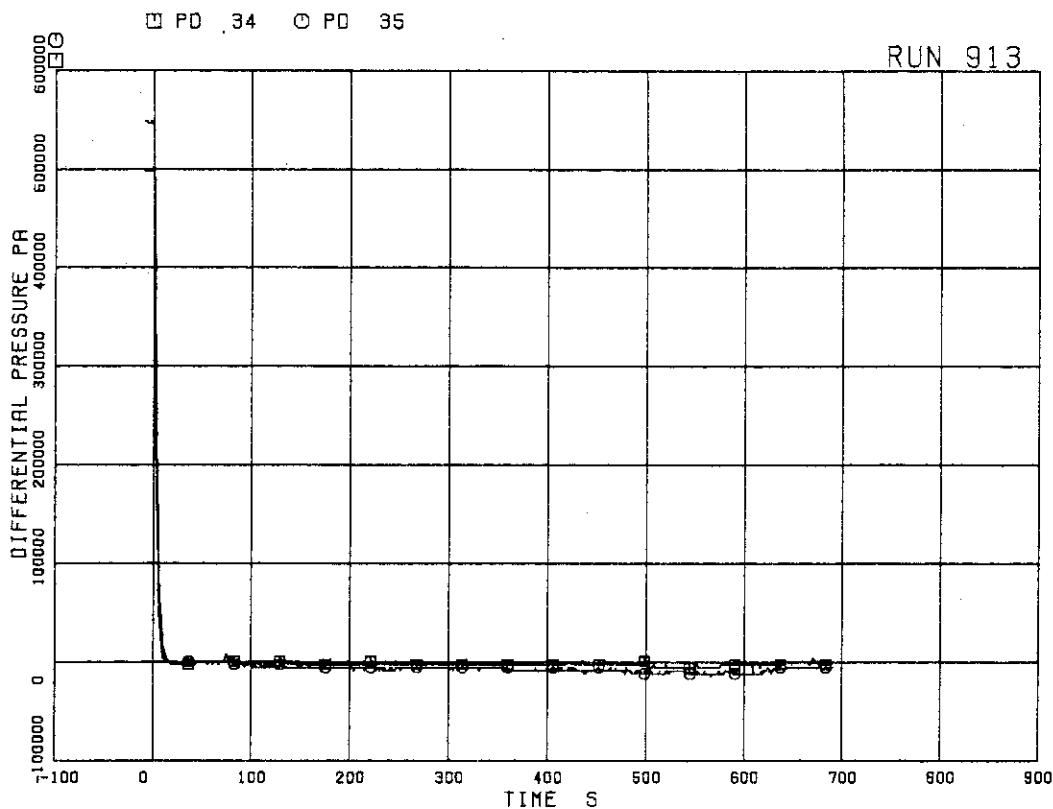
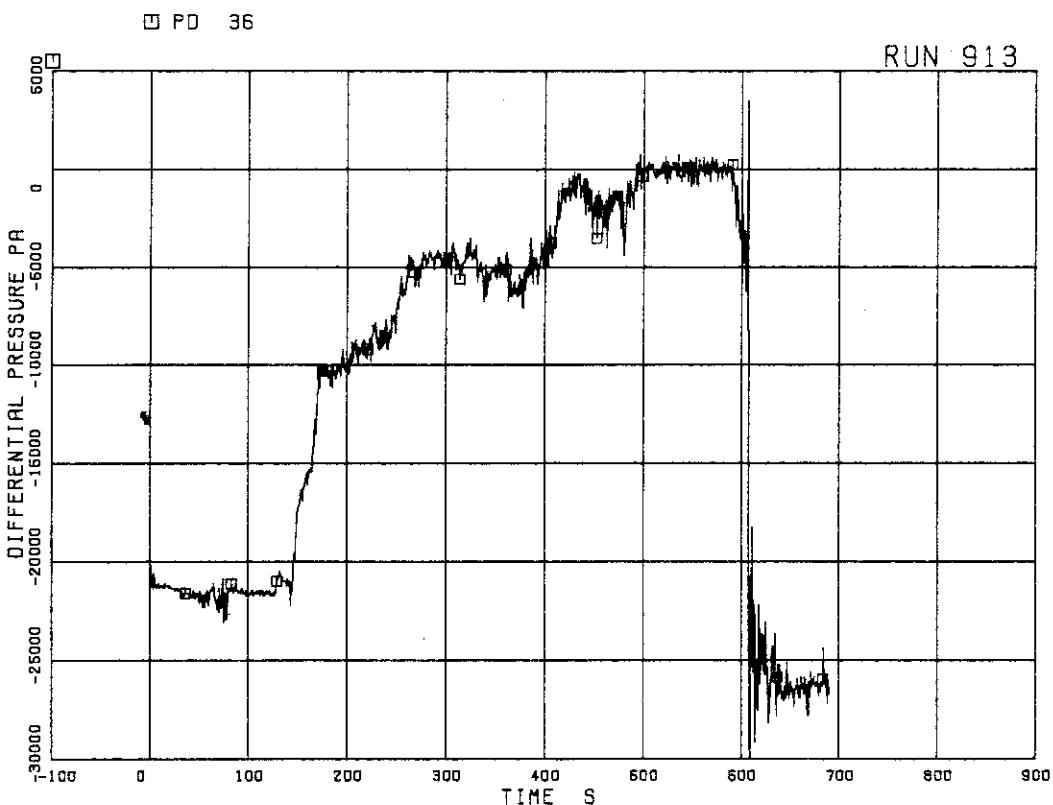


FIG. 5. 14 DIFFERENTIAL PRESSURE BETWEEN
JP-3,4 DRIVE AND SUCTION

FIG. 5. 15 DIFFERENTIAL PRESSURE BETWEEN
MRP DELIVERY AND SUCTIONFIG. 5. 16 DIFFERENTIAL PRESSURE BETWEEN
DOWNCOMER BOTTOM AND MRP1 SUCTION

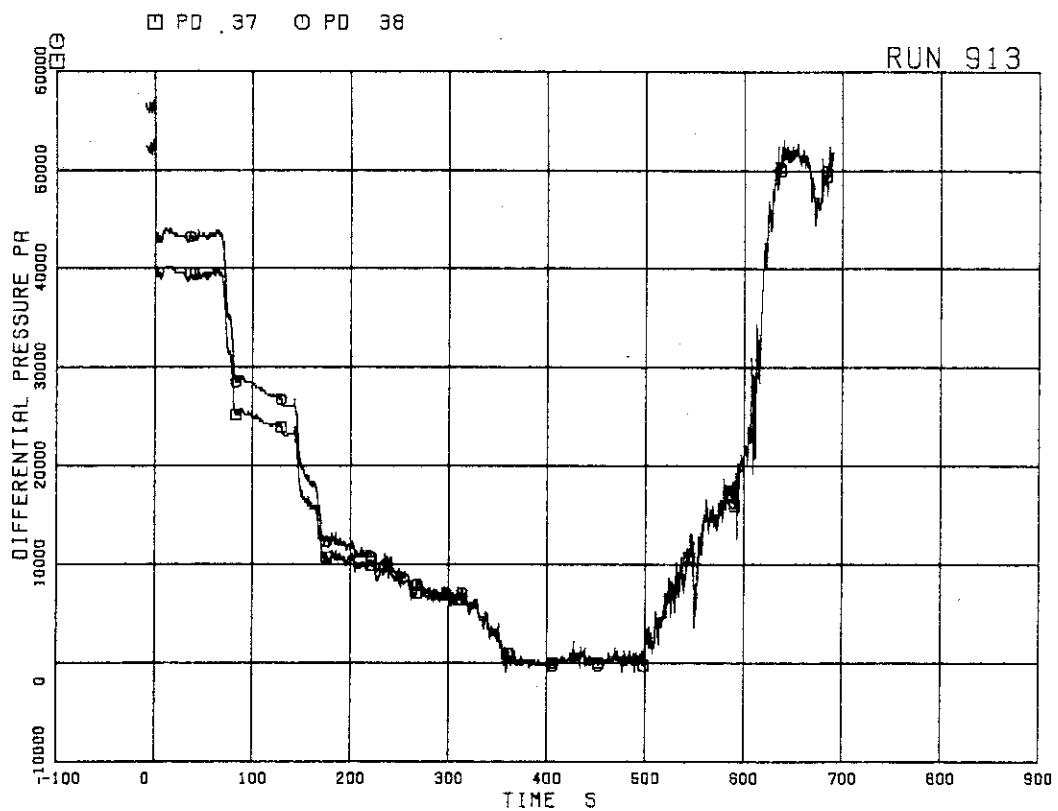


FIG. 5. 17 DIFFERENTIAL PRESSURE BETWEEN
MRP DELIVERY AND JP-1,2 SUCTION

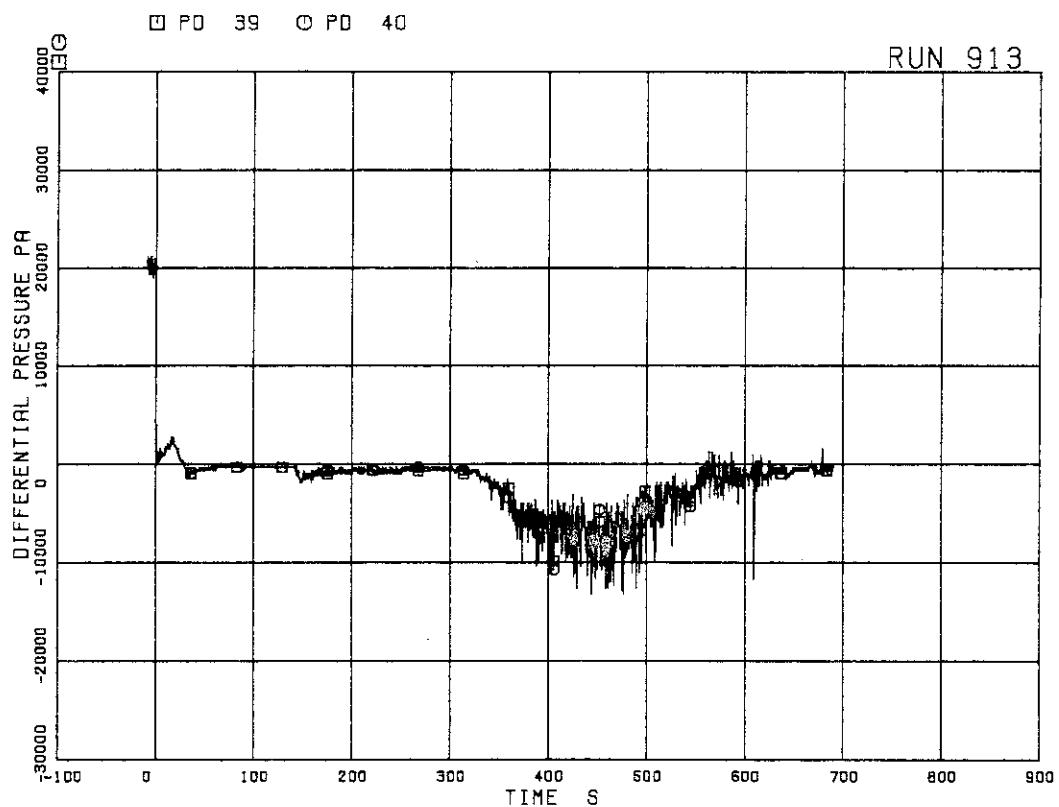


FIG. 5. 18 DIFFERENTIAL PRESSURE BETWEEN
DOWNCOMER MIDDLE AND JP-1,2 SUCTION

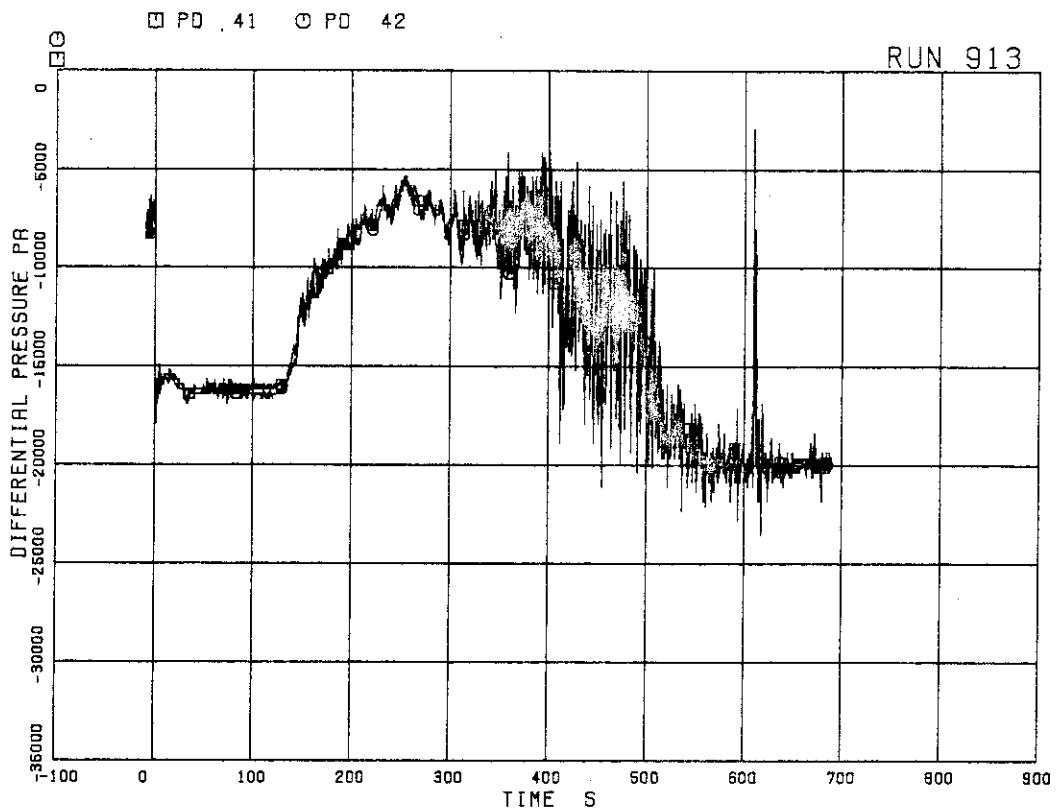


FIG. 5. 19 DIFFERENTIAL PRESSURE BETWEEN
JP-1,2 DISCHARGE AND LOWER PLENUM

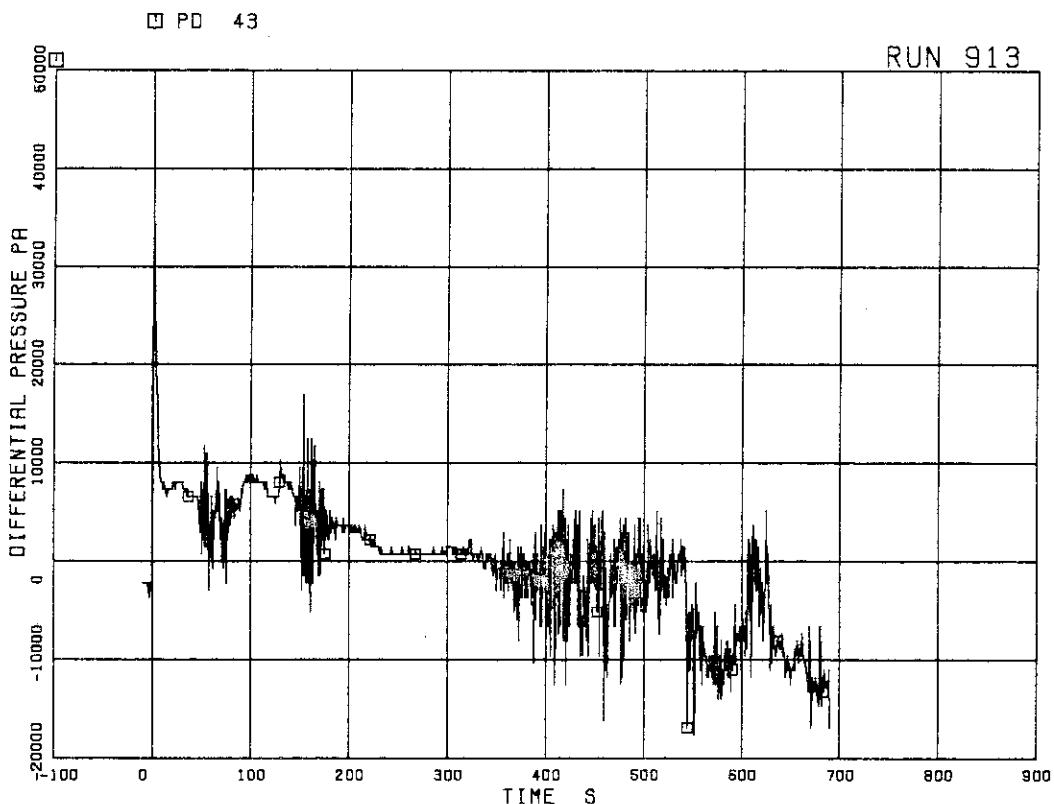


FIG. 5. 20 DIFFERENTIAL PRESSURE BETWEEN
DOWNCOMER BOTTOM AND BREAK B

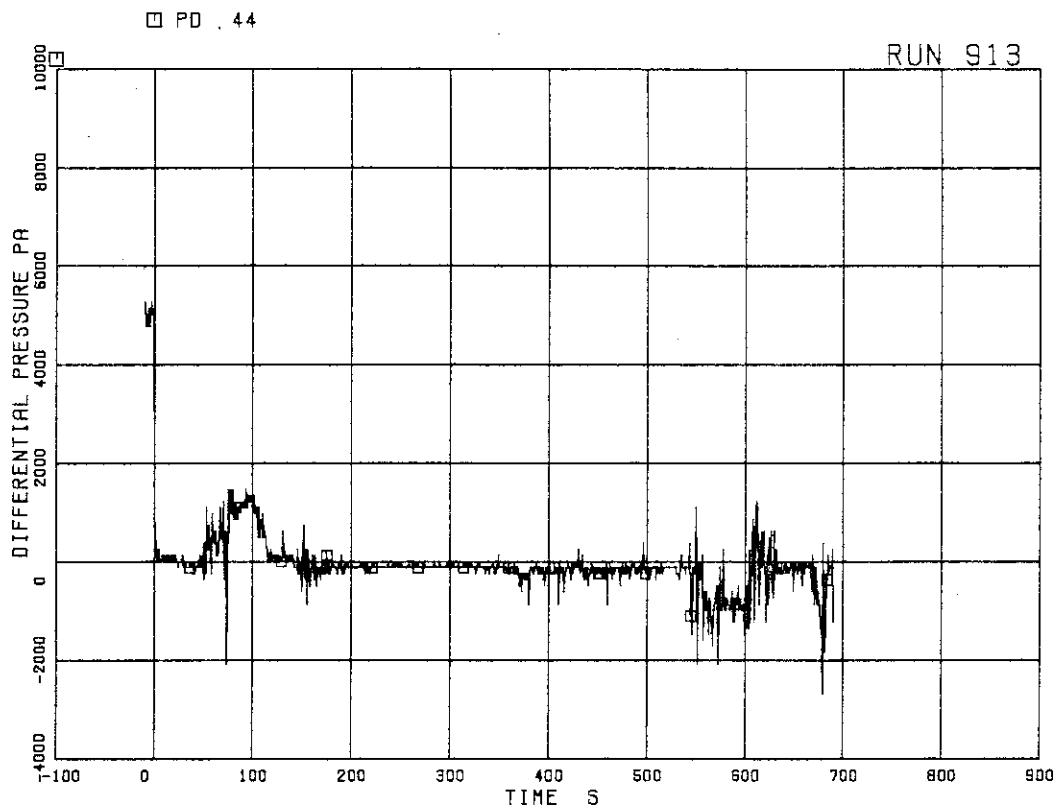


FIG. 5. 21 DIFFERENTIAL PRESSURE BETWEEN
BREAKS A AND B

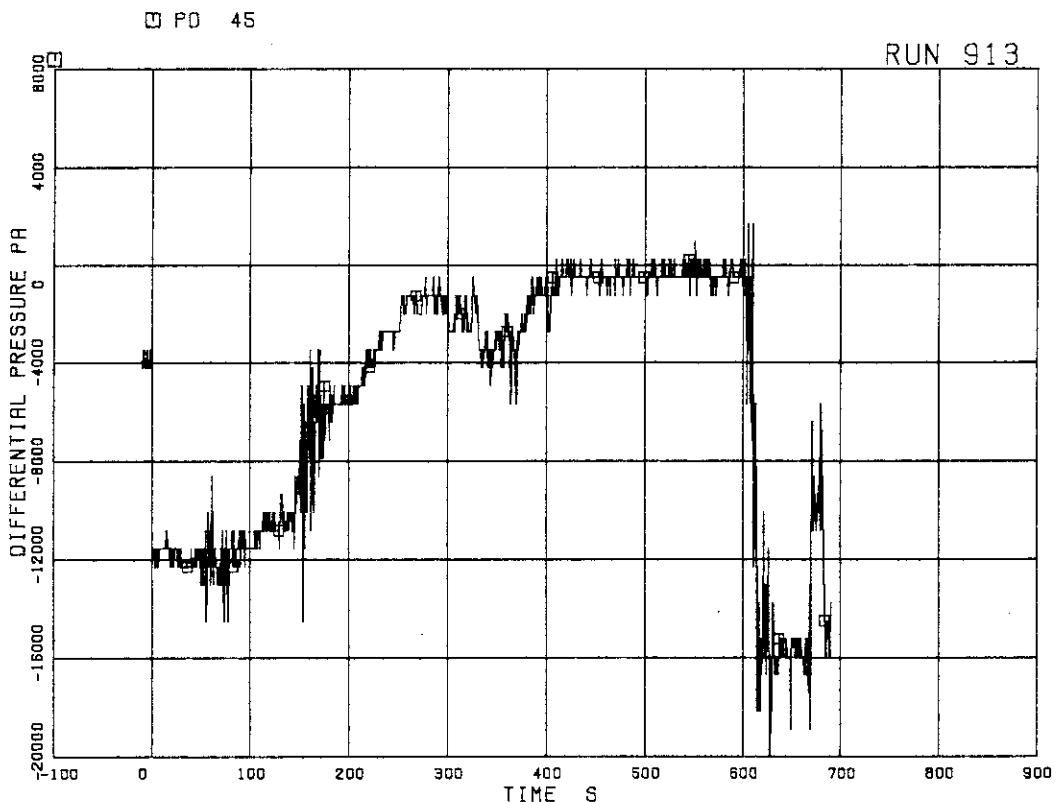


FIG. 5. 22 DIFFERENTIAL PRESSURE BETWEEN
BREAK A AND MRP2 SUCTION

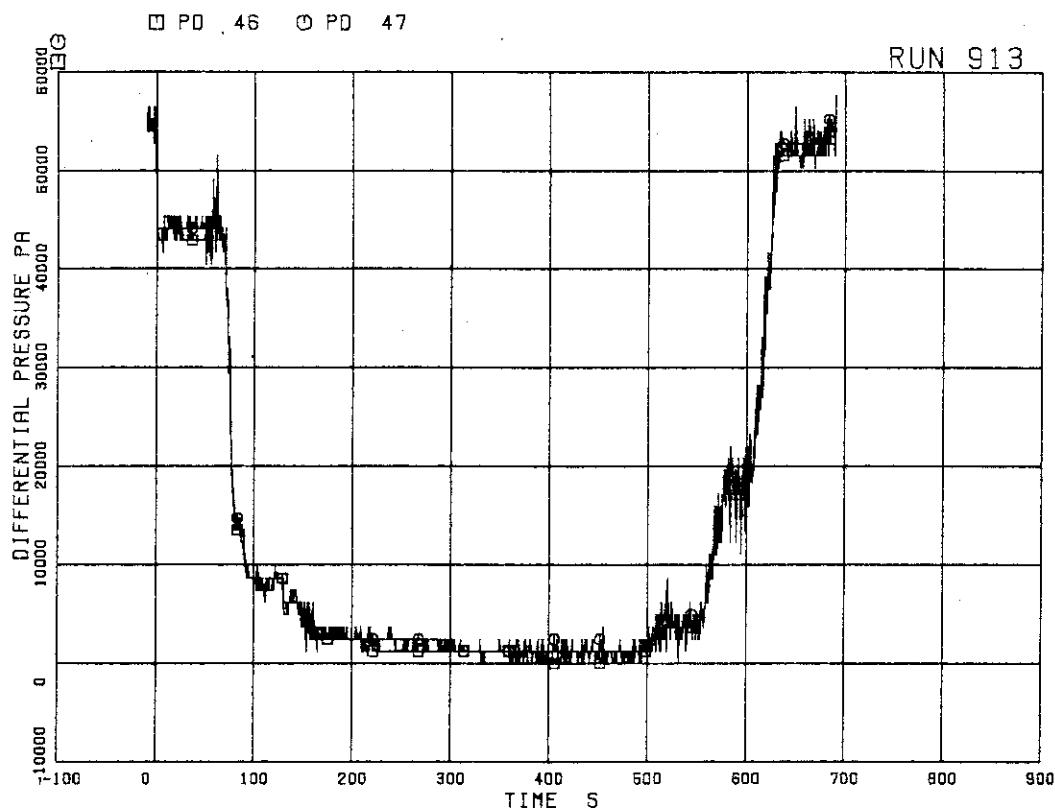


FIG. 5. 23 DIFFERENTIAL PRESSURE BETWEEN
MRP DELIVERY AND JP-3,4 DRIVE

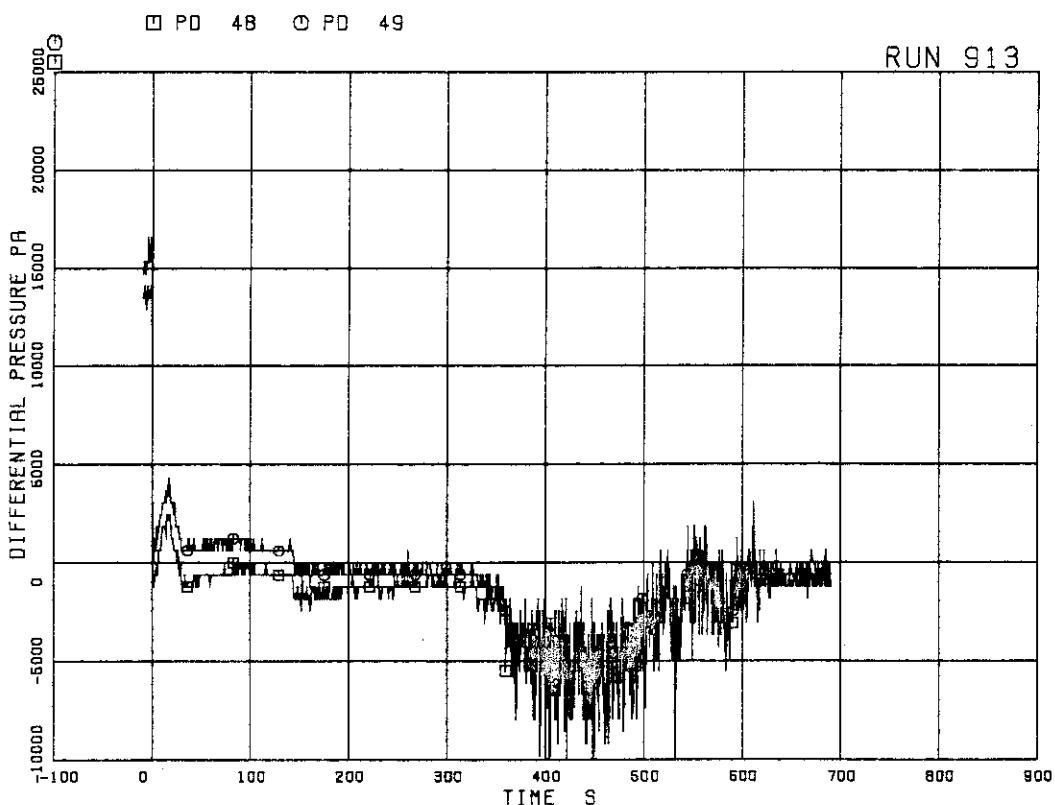


FIG. 5. 24 DIFFERENTIAL PRESSURE BETWEEN
DOWNCOMER MIDDLE AND JP-3,4 SUCTION

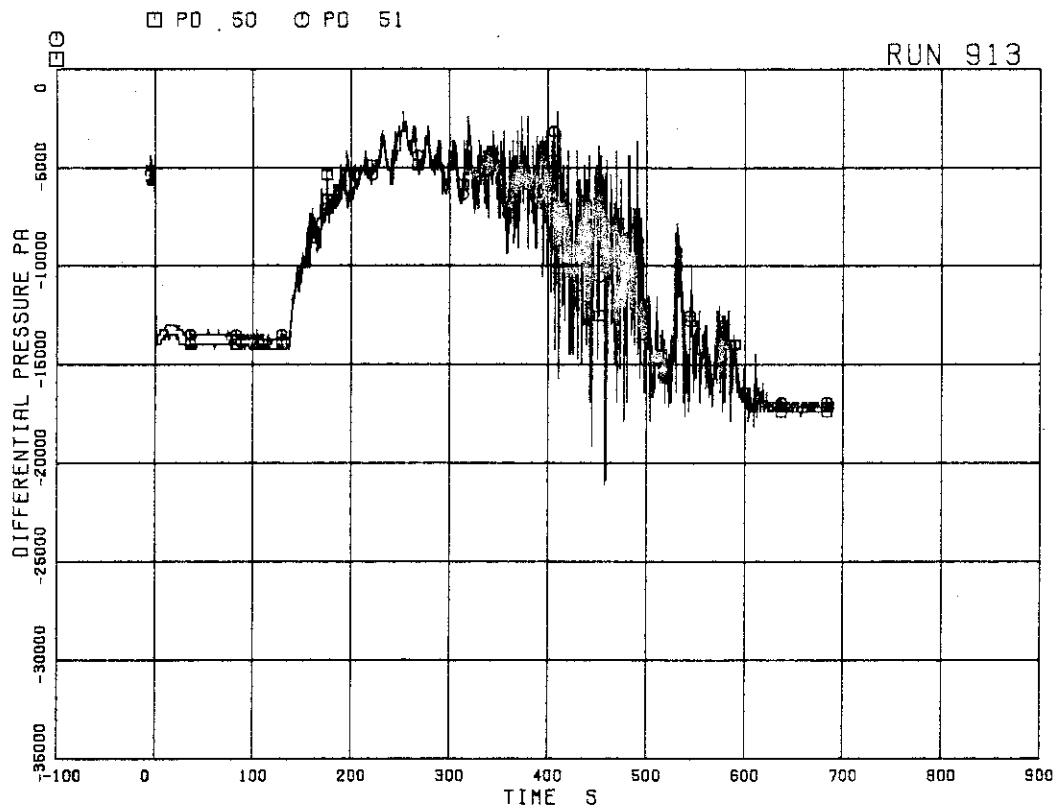


FIG. 5. 25 DIFFERENTIAL PRESSURE BETWEEN
JP-3,4 DISCHARGE AND CONFLURNC

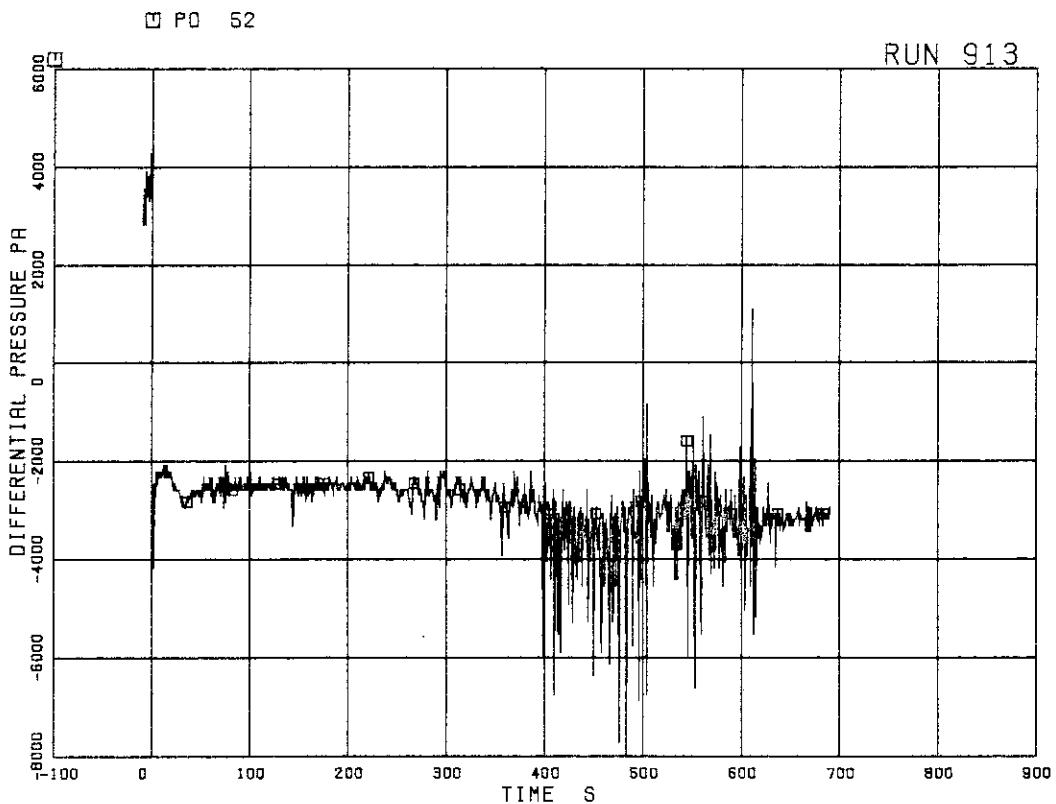


FIG. 5. 26 DIFFERENTIAL PRESSURE BETWEEN
JP-3,4 CONFLUENCE IN BROKEN LOOP AND LP

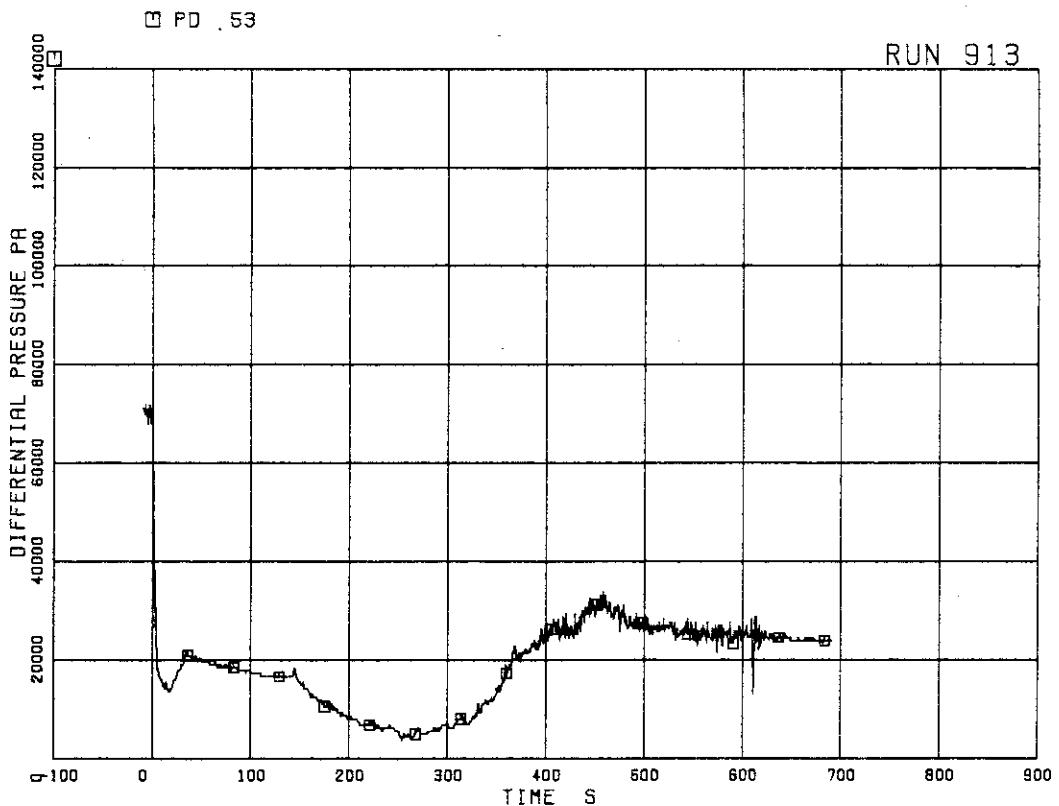


FIG. 5. 27 DIFFERENTIAL PRESSURE BETWEEN
LOWER PLENUM AND DOWNCOMER MIDDLE

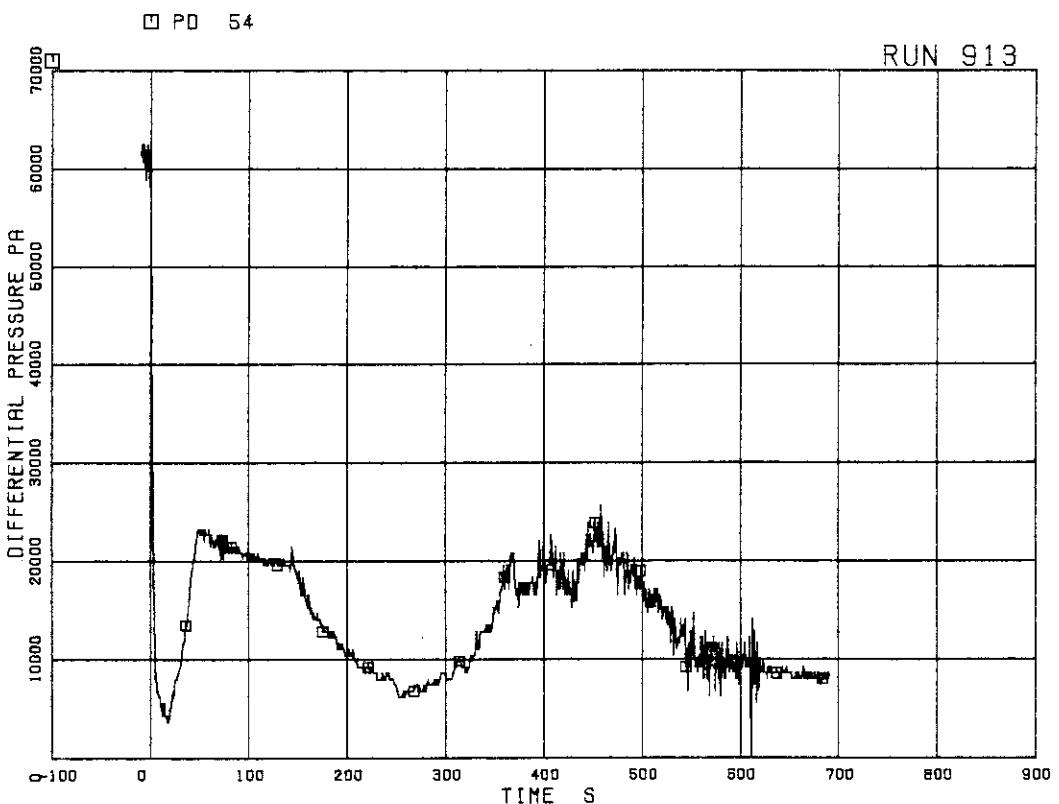


FIG. 5. 28 DIFFERENTIAL PRESSURE BETWEEN
LOWER PLENUM AND DOWNCOMER BOTTOM

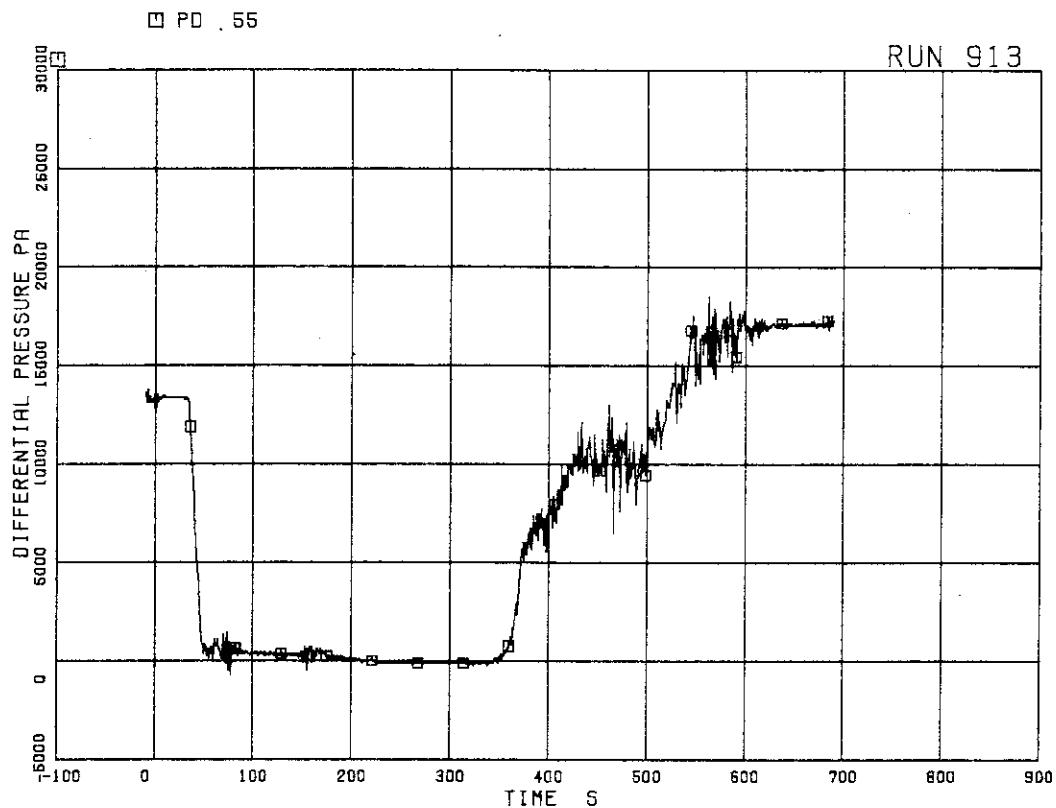


FIG. 5. 29 DIFFERENTIAL PRESSURE BETWEEN
DOWNCOMER BOTTOM AND DOWNCOMER MIDDLE

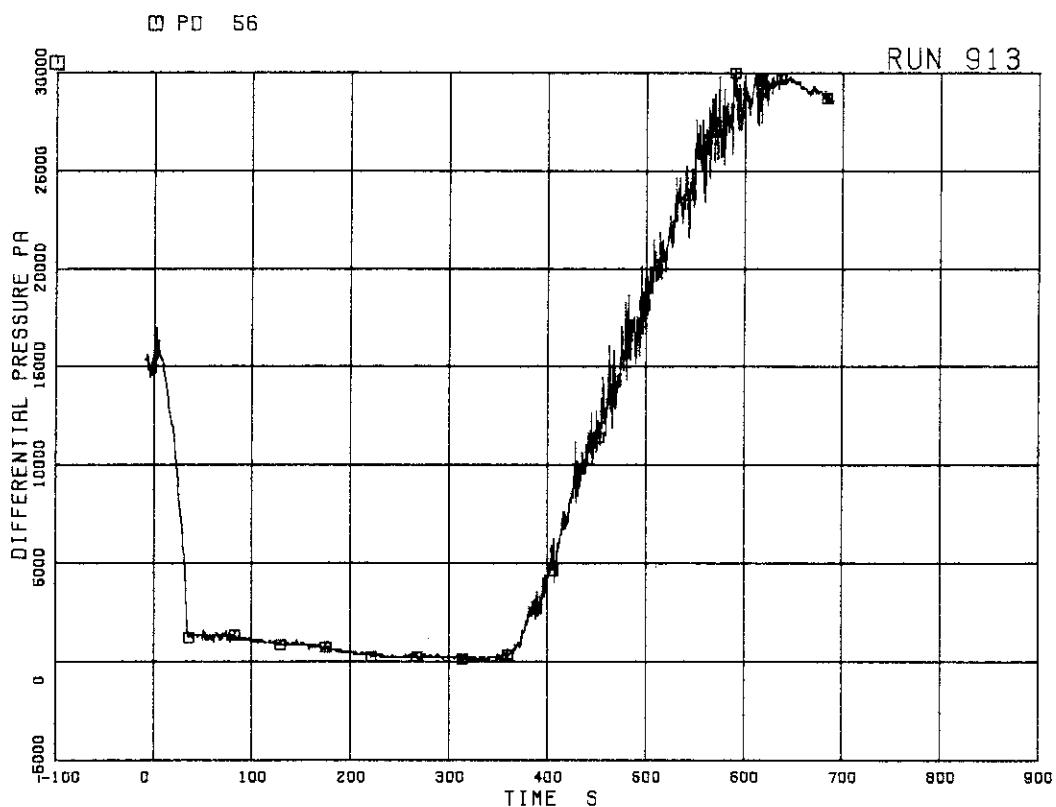


FIG. 5. 30 DIFFERENTIAL PRESSURE BETWEEN
DOWNCOMER MIDDLE AND STEAM DOME

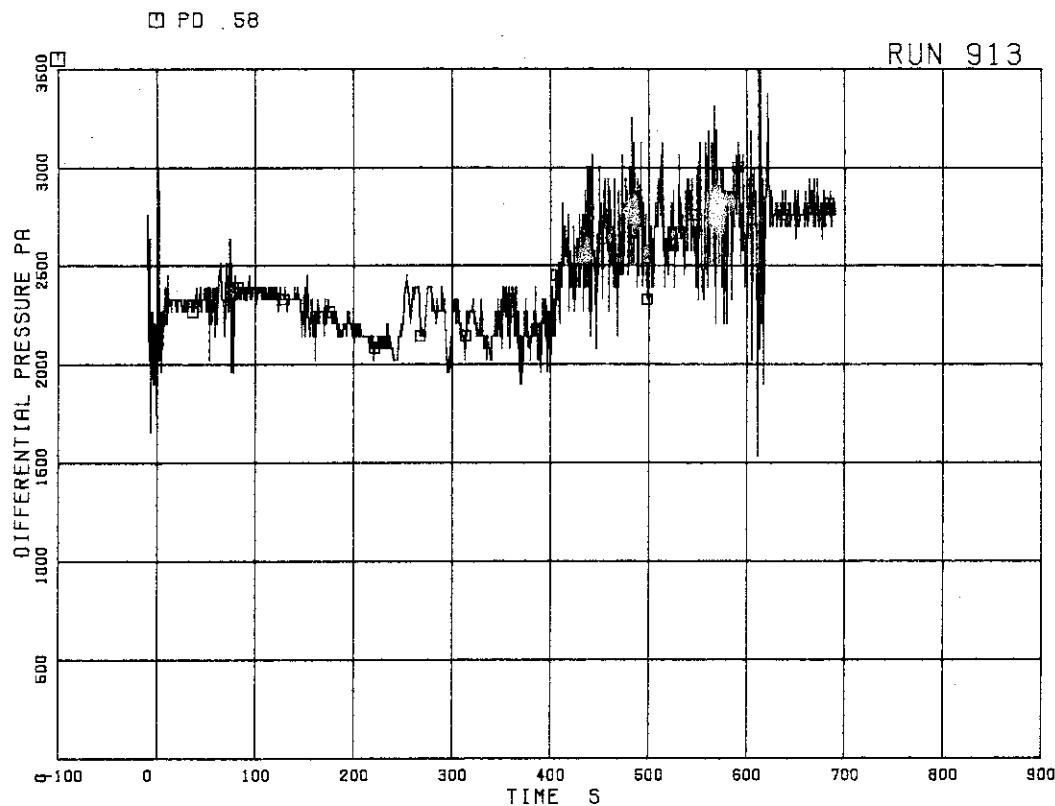


FIG.5. 31 DIFFERENTIAL PRESSURE BETWEEN LP BOTTOM AND LP MIDDLE

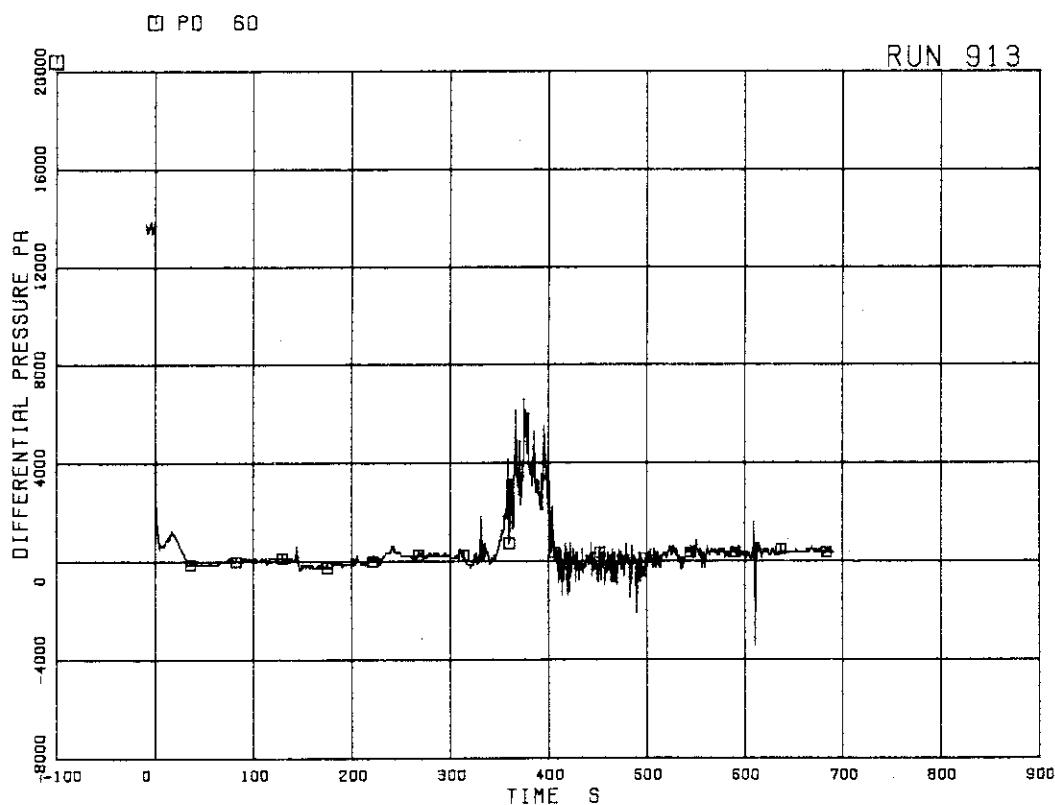


FIG.5. 32 DIFFERENTIAL PRESSURE ACROSS CHANNEL INLET ORIFICE A

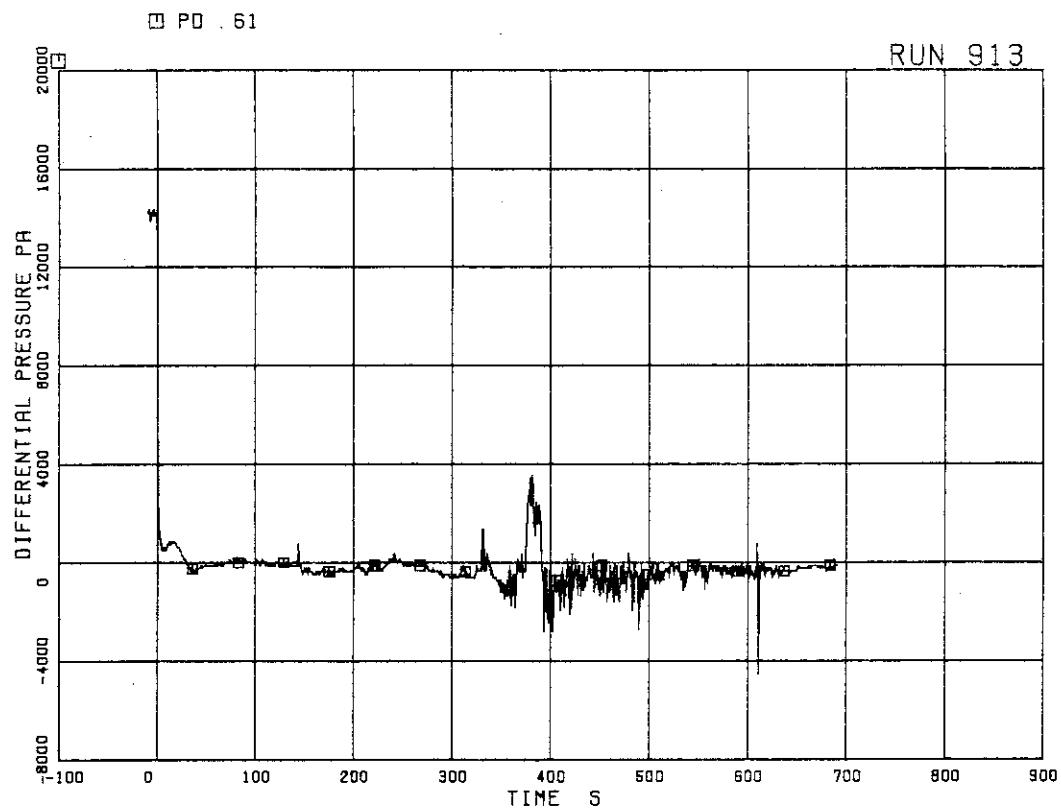


FIG. 5. 33 DIFFERENTIAL PRESSURE ACROSS CHANNEL INLET ORIFICE B

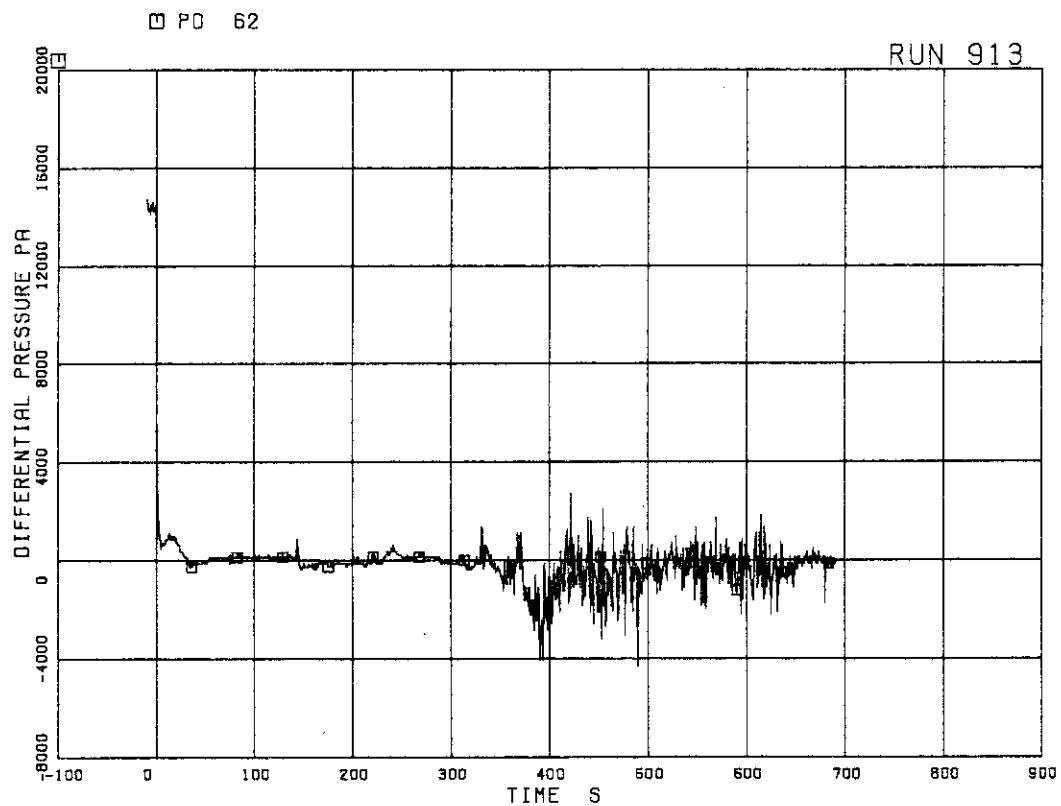


FIG. 5. 34 DIFFERENTIAL PRESSURE ACROSS CHANNEL INLET ORIFICE C

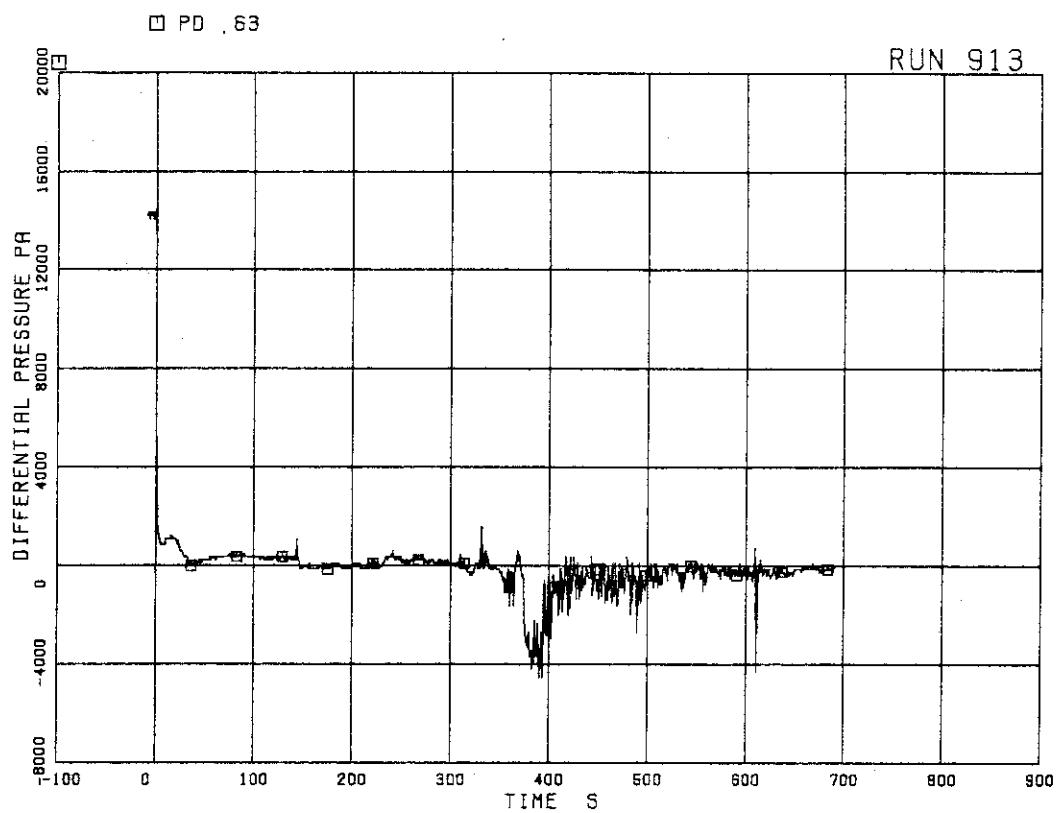


FIG. 5. 35 DIFFERENTIAL PRESSURE ACROSS
CHANNEL INLET ORIFICE D

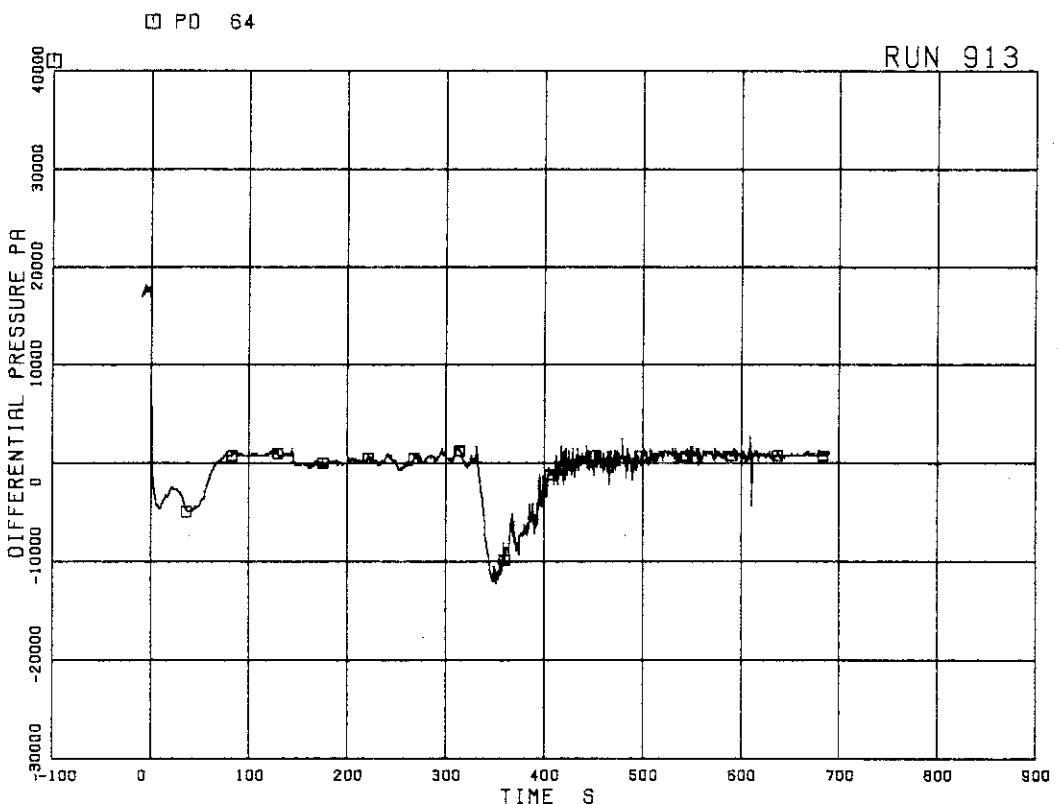


FIG. 5. 36 DIFFERENTIAL PRESSURE ACROSS
BYPASS HOLE

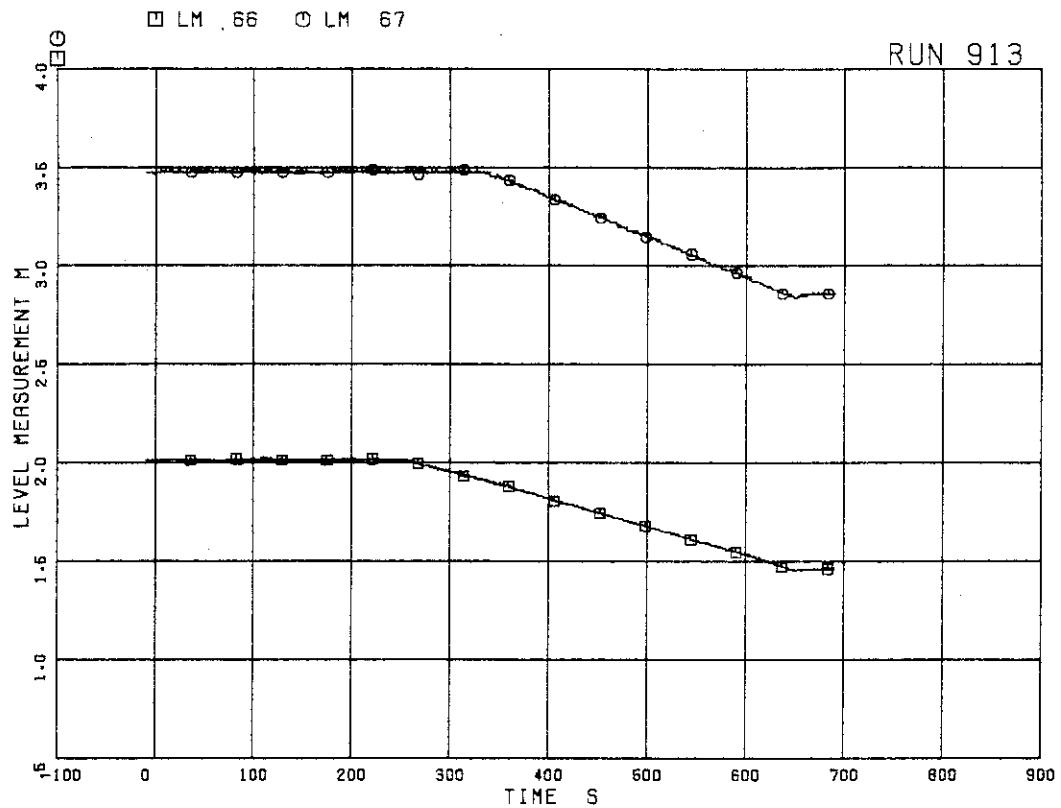


FIG. 5. 37 LIQUID LEVEL IN ECCS TANKS

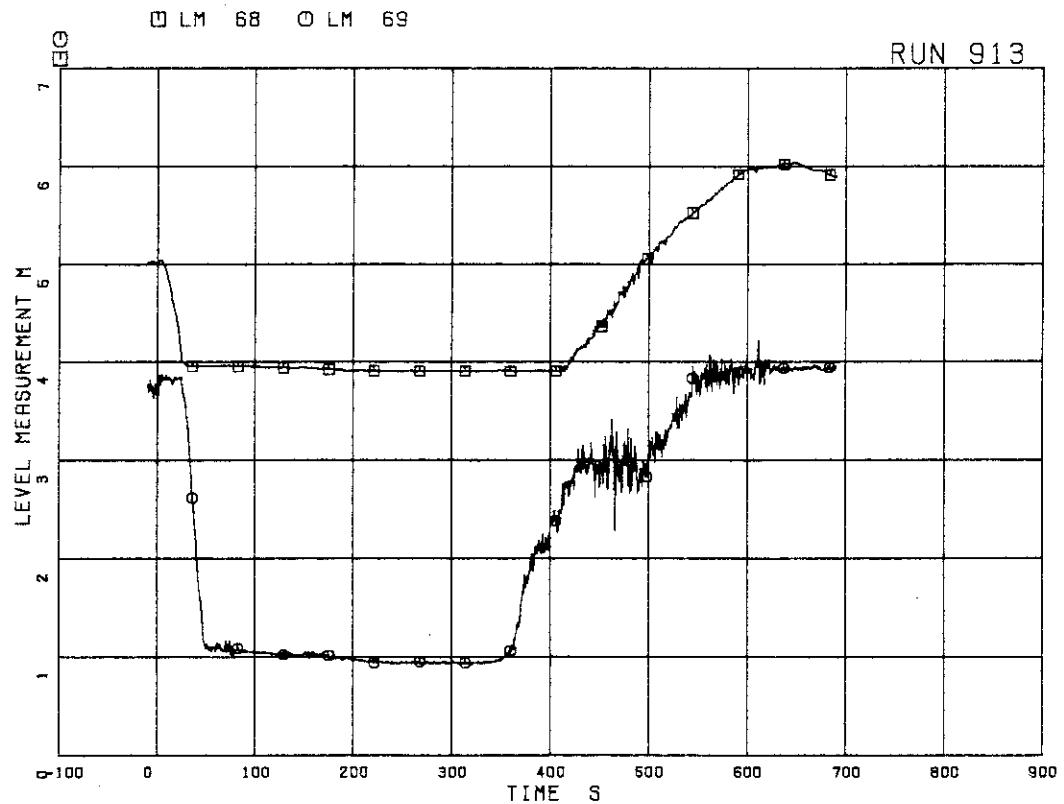


FIG. 5. 38 LIQUID LEVEL IN DOWNCOMER

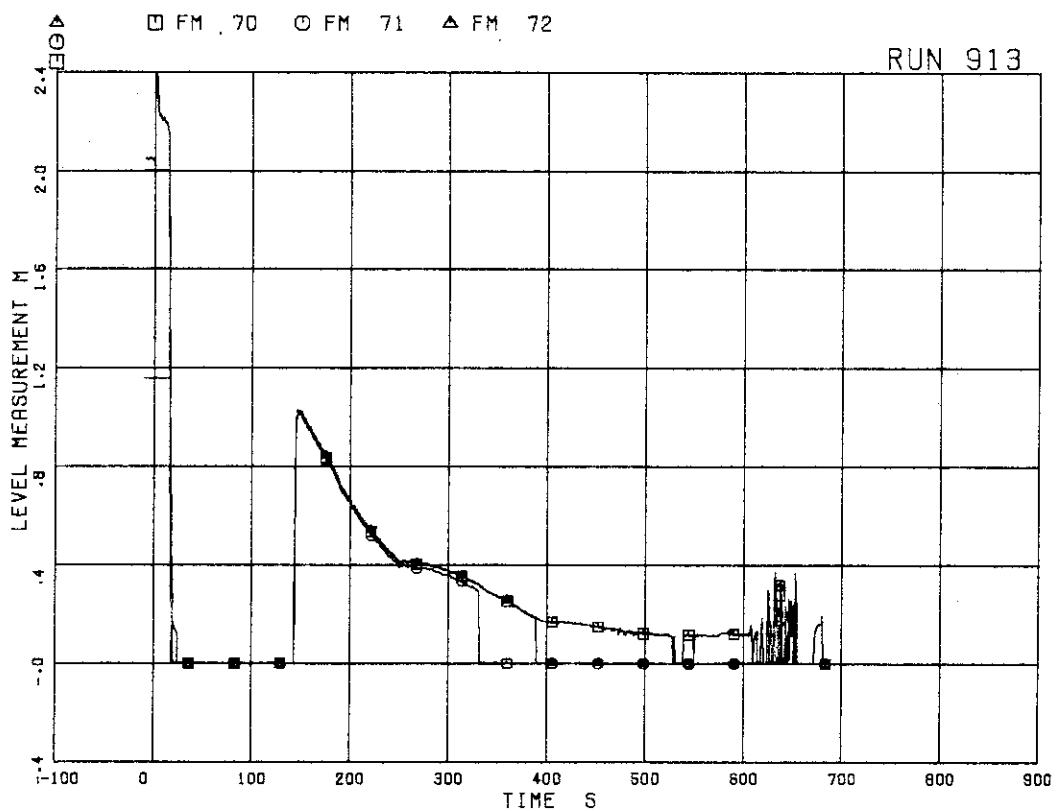


FIG. 5. 39 MASS FLOW RATE IN MSL

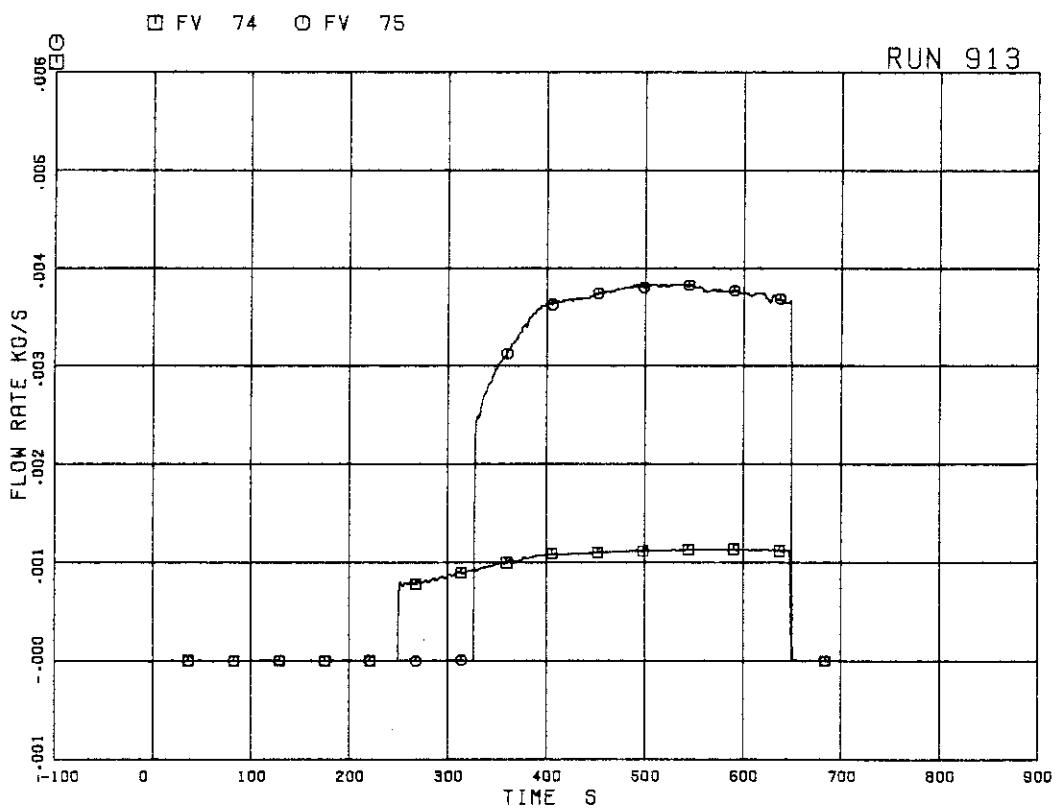


FIG. 5. 40 ECC INJECTION FLOW RATE

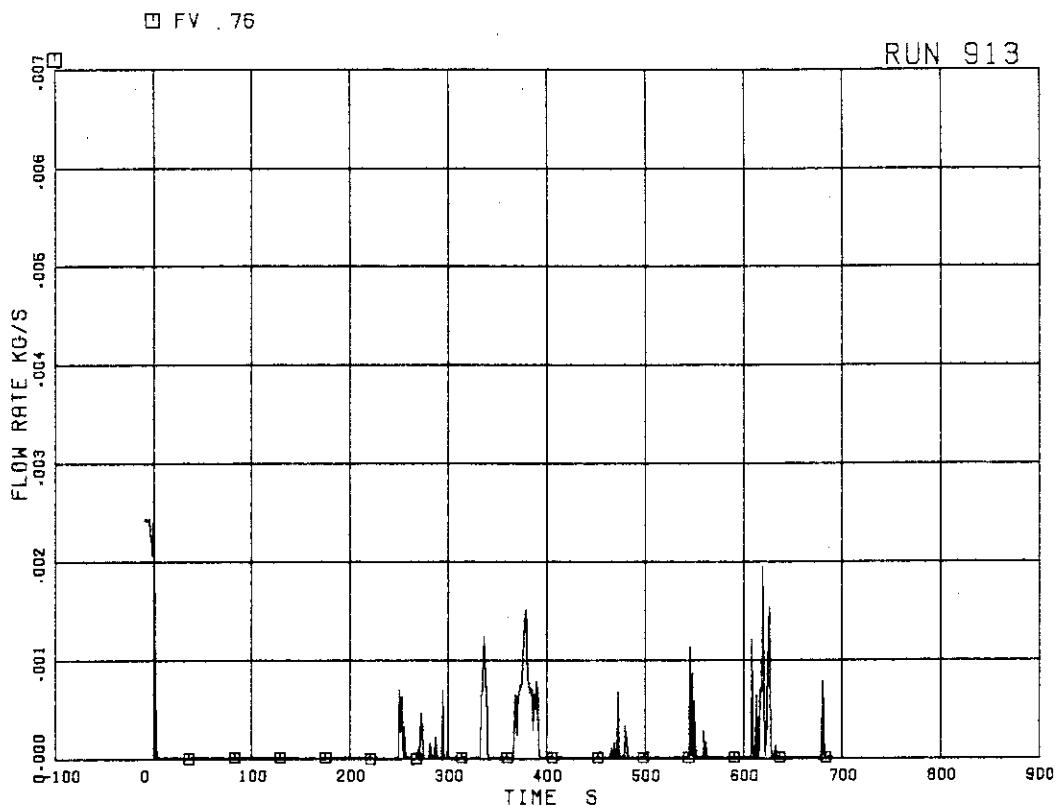


FIG. 5. 41 FEEDWATER FLOW RATE

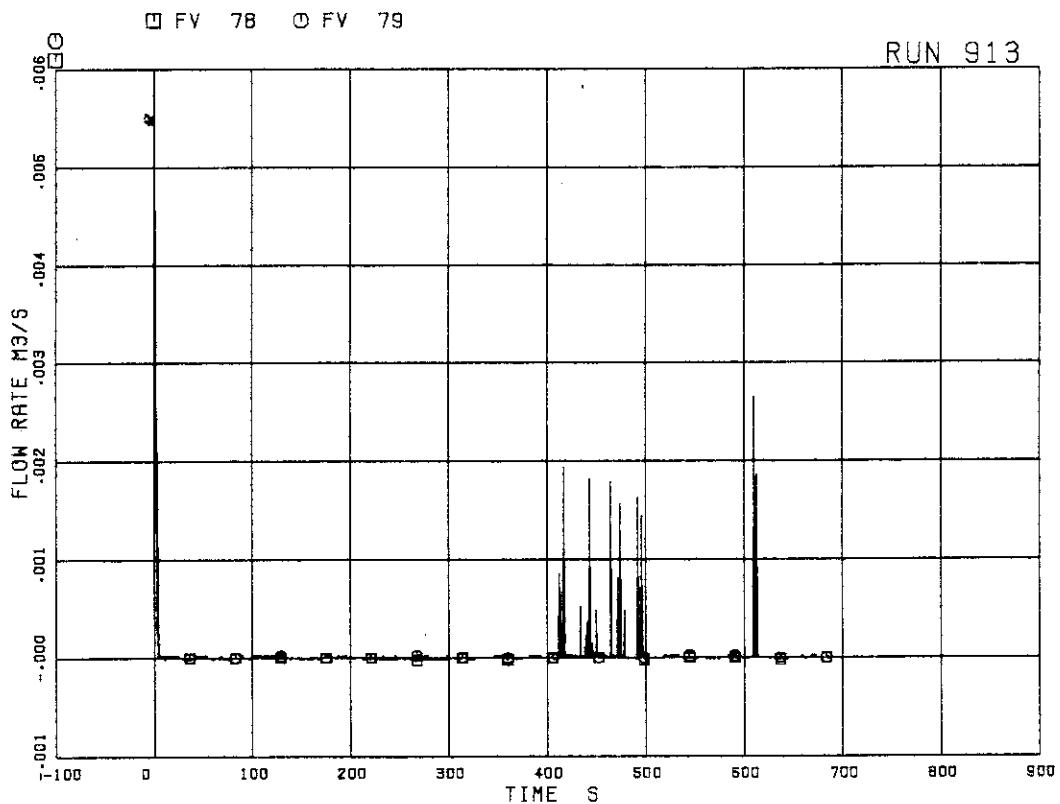


FIG. 5. 42 JP-1,2 DISCHARGE FLOW RATE (HIGH RANGE)

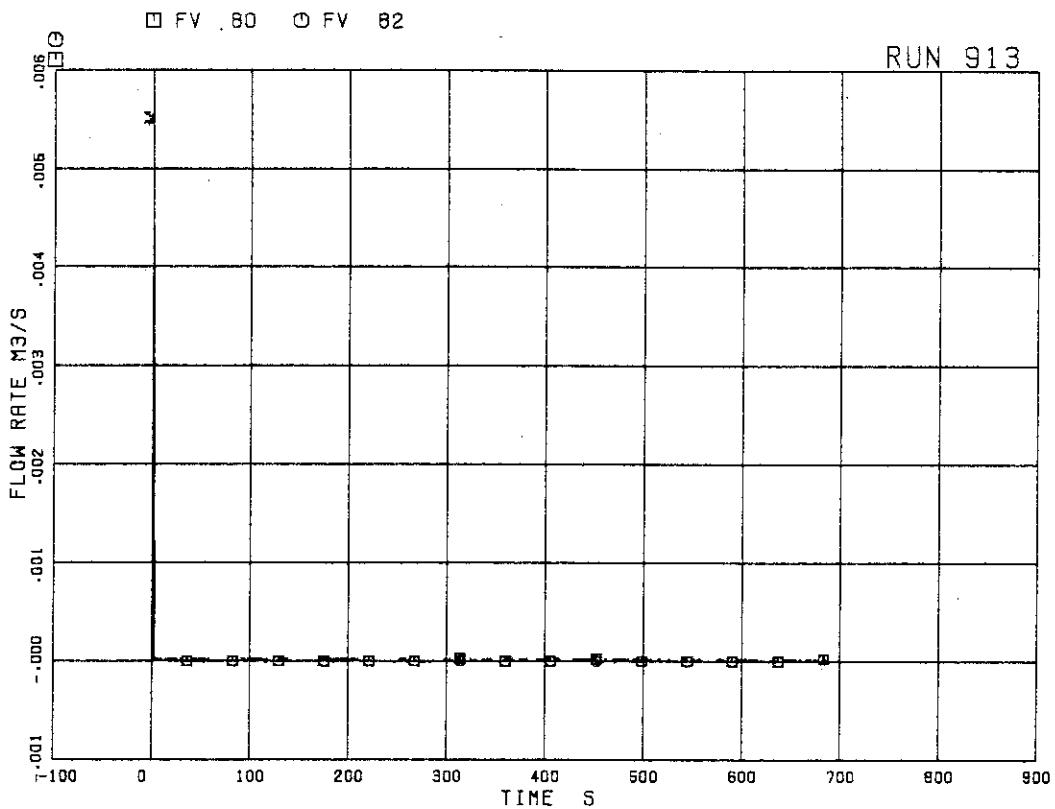


FIG. 5. 43 JP-3,4 DISCHARGE FLOW RATE (HIGH RANGE)

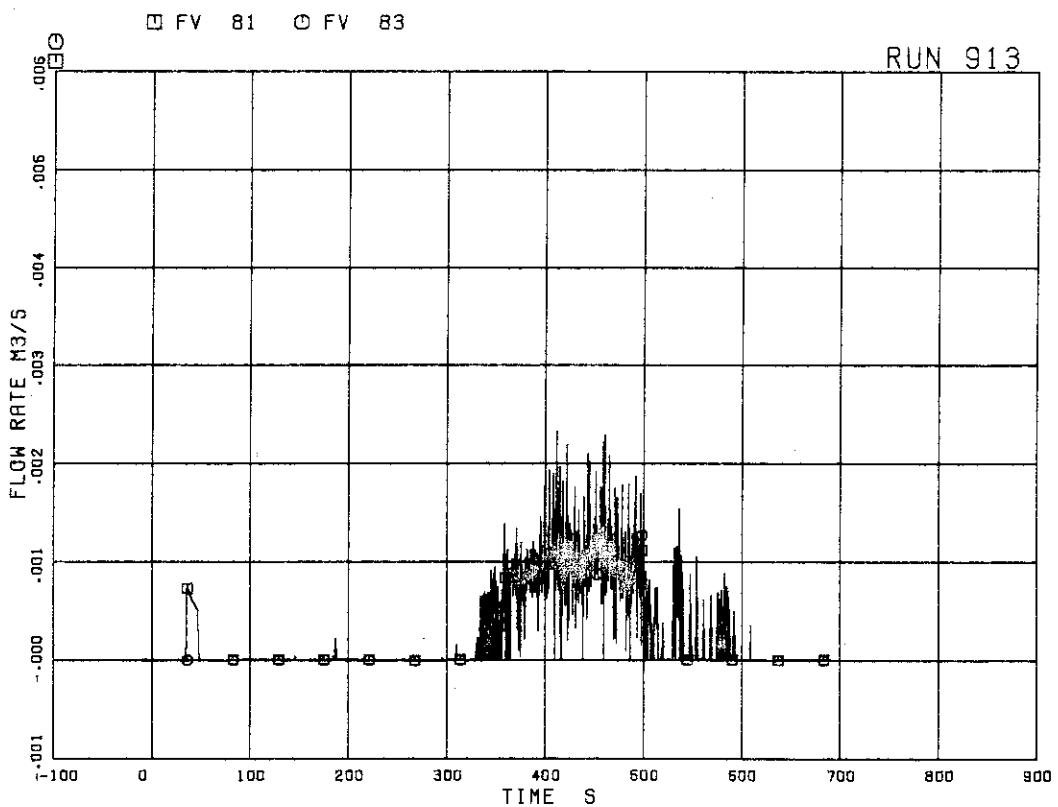


FIG. 5. 44 JP-3,4 DISCHARGE FLOW RATE (LOW RANGE)

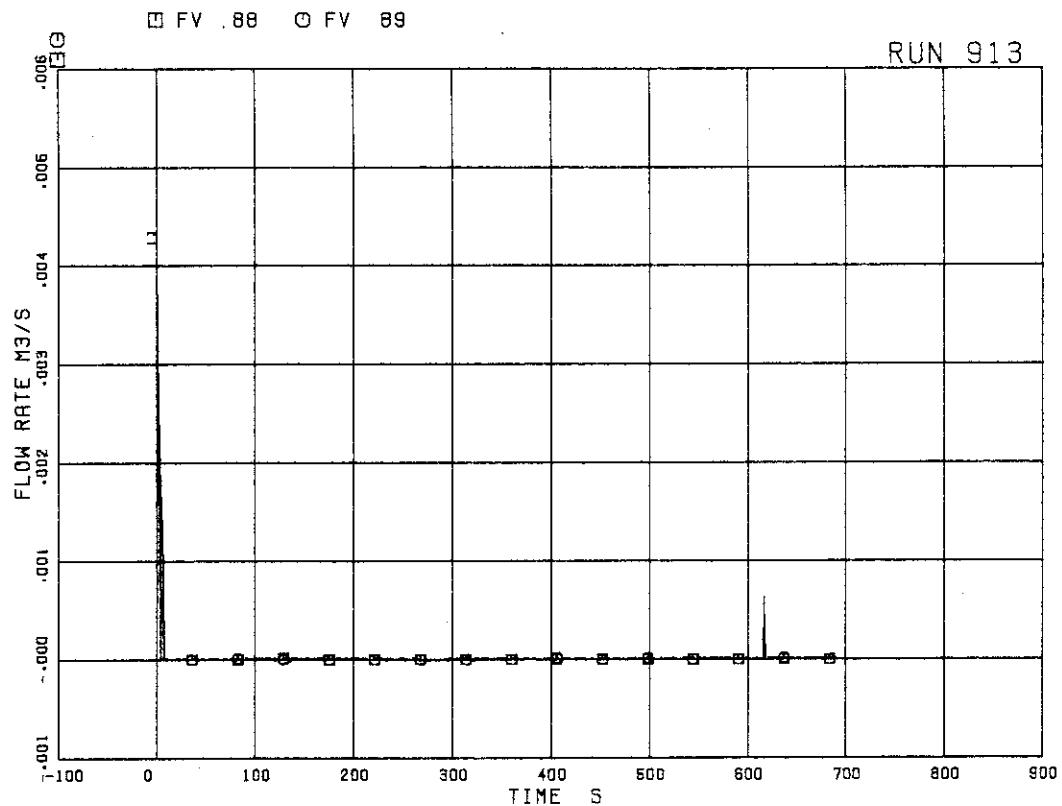
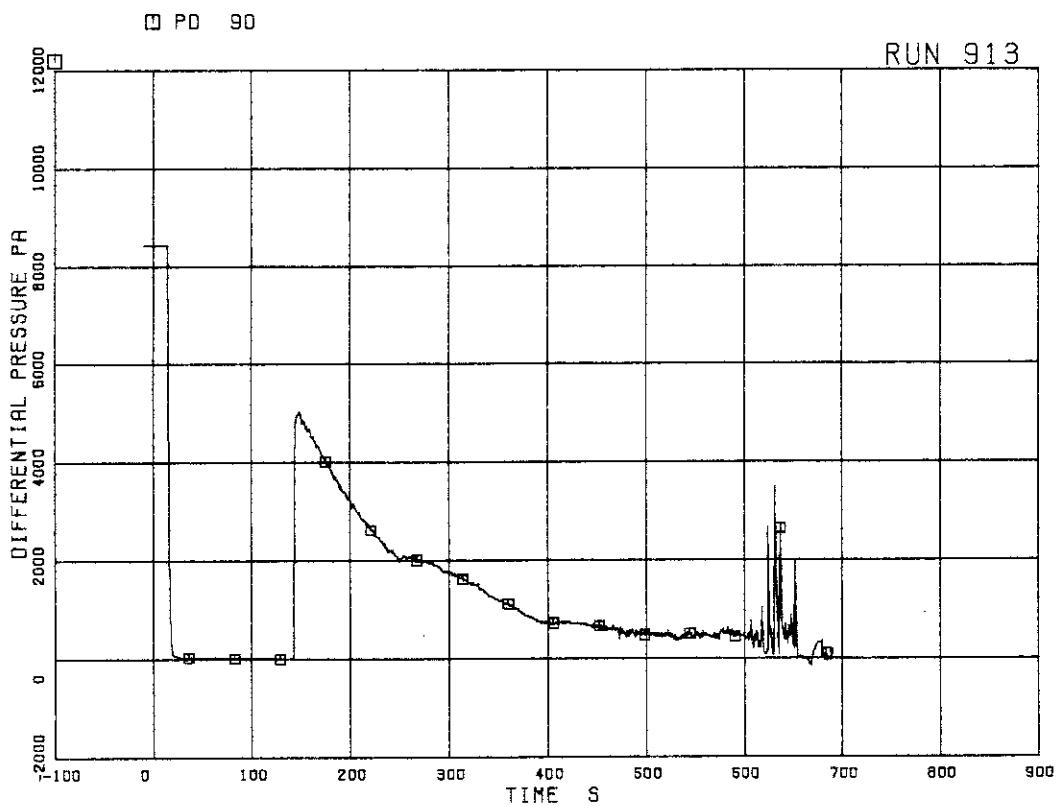
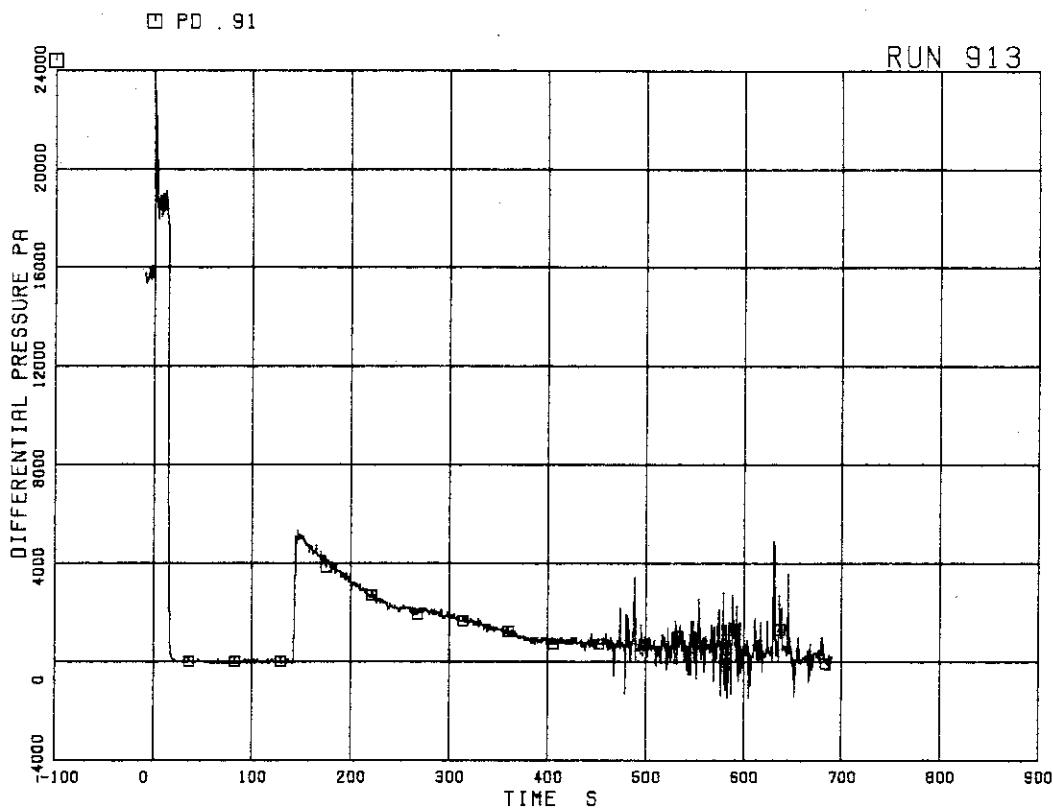
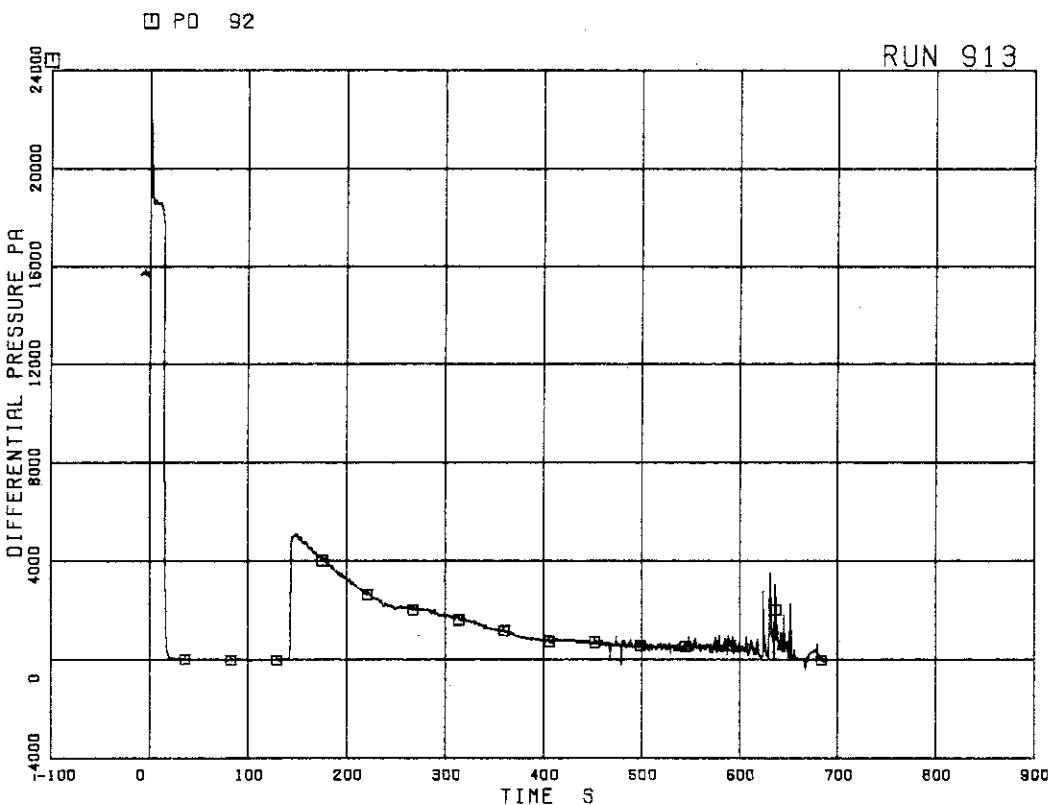


FIG. 5. 45 MRP DISCHARGE FLOW RATE

FIG. 5. 46 DIFFERENTIAL PRESSURE ACROSS
ORIFICE FLOWMETER F-1

FIG. 5. 47 DIFFERENTIAL PRESSURE ACROSS
ORIFICE FLOWMETER F-2FIG. 5. 48 DIFFERENTIAL PRESSURE ACROSS
ORIFICE FLOWMETER F-3

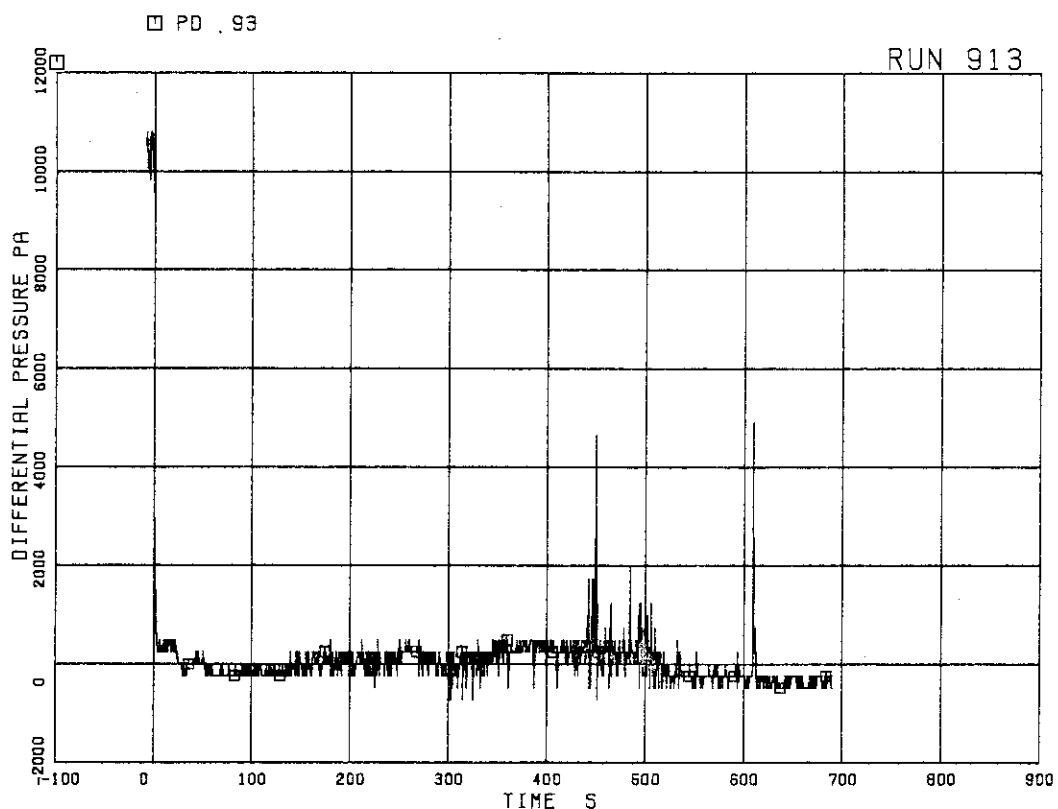


FIG. 5. 49 DIFFERENTIAL PRESSURE ACROSS VENTURI FLOWMETER F-17

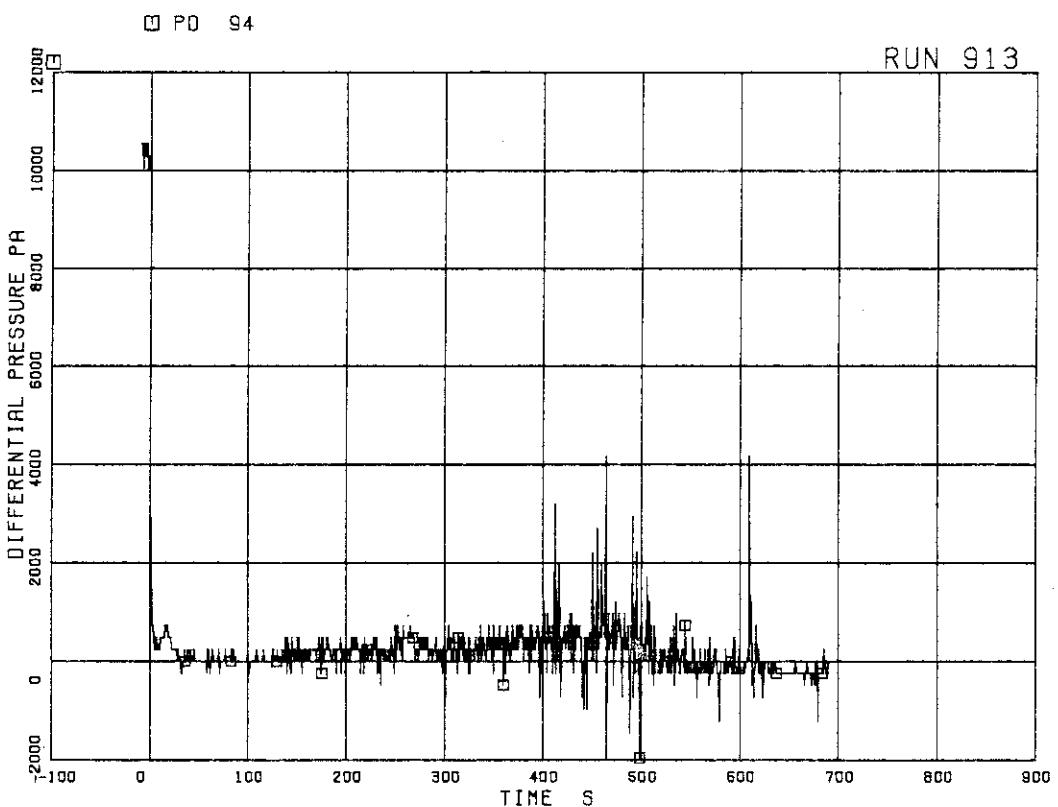
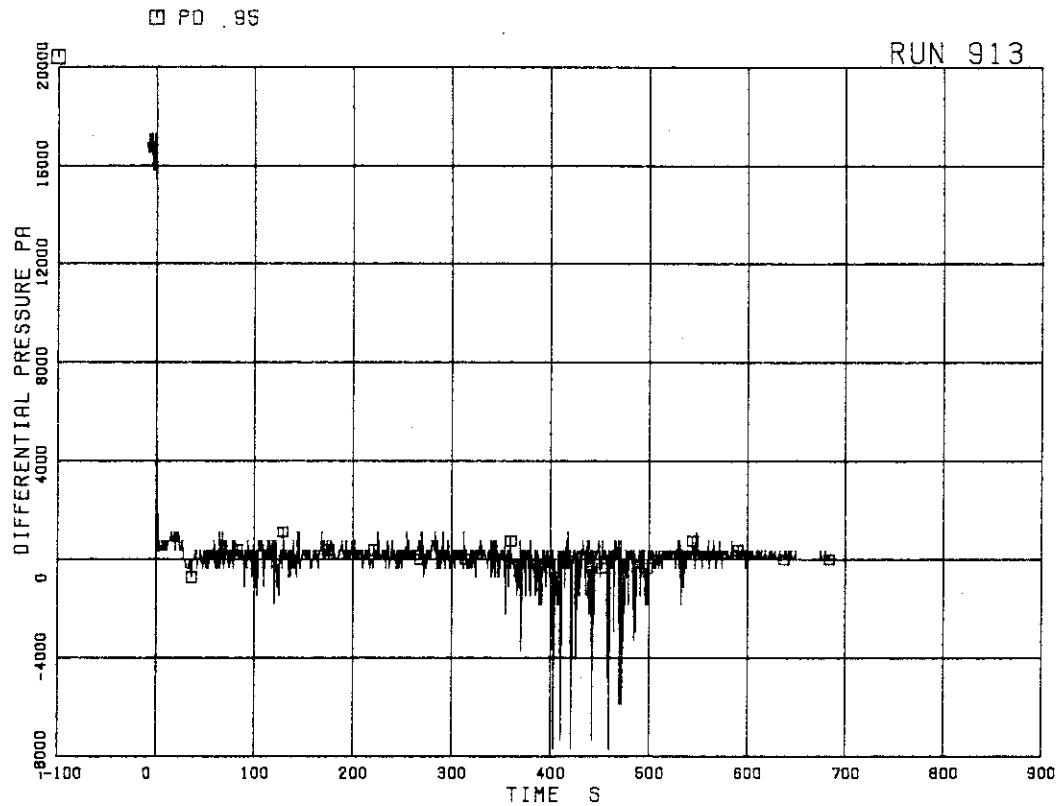
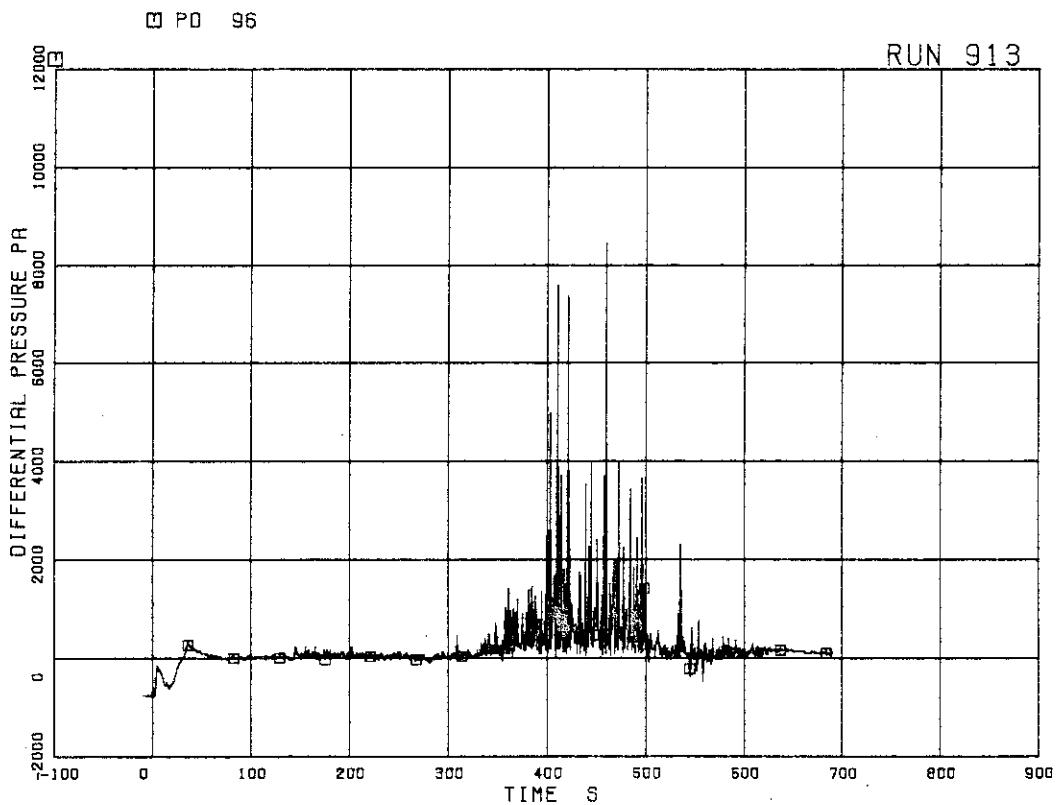
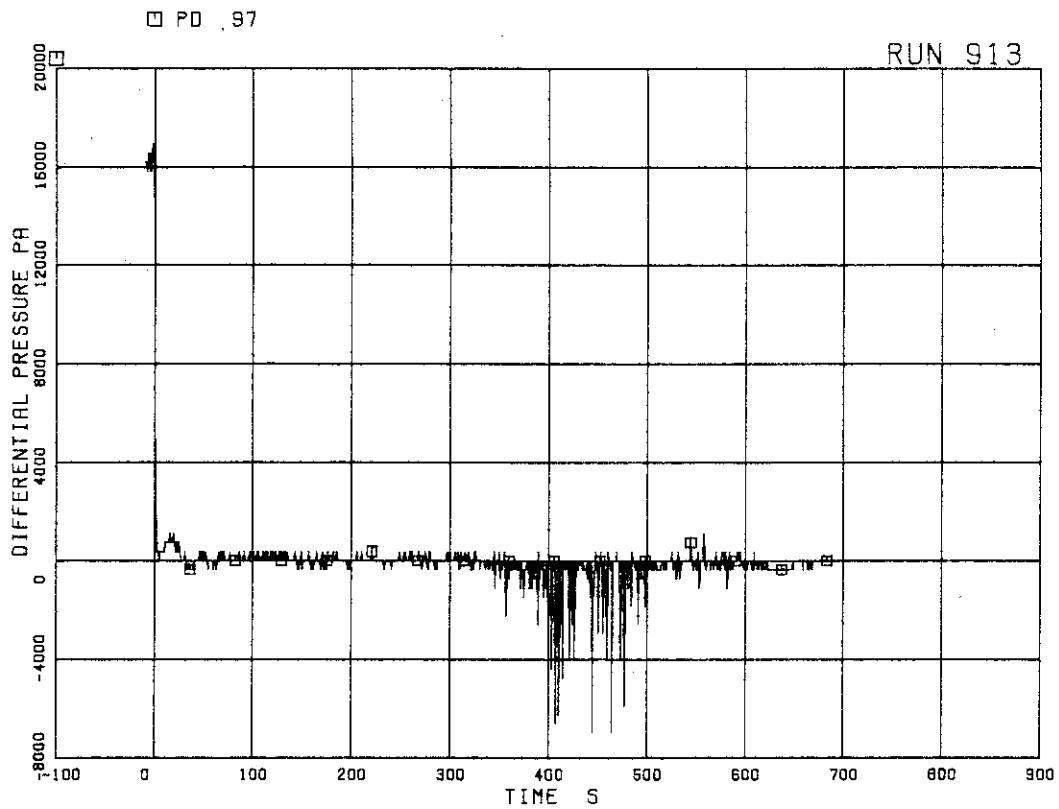
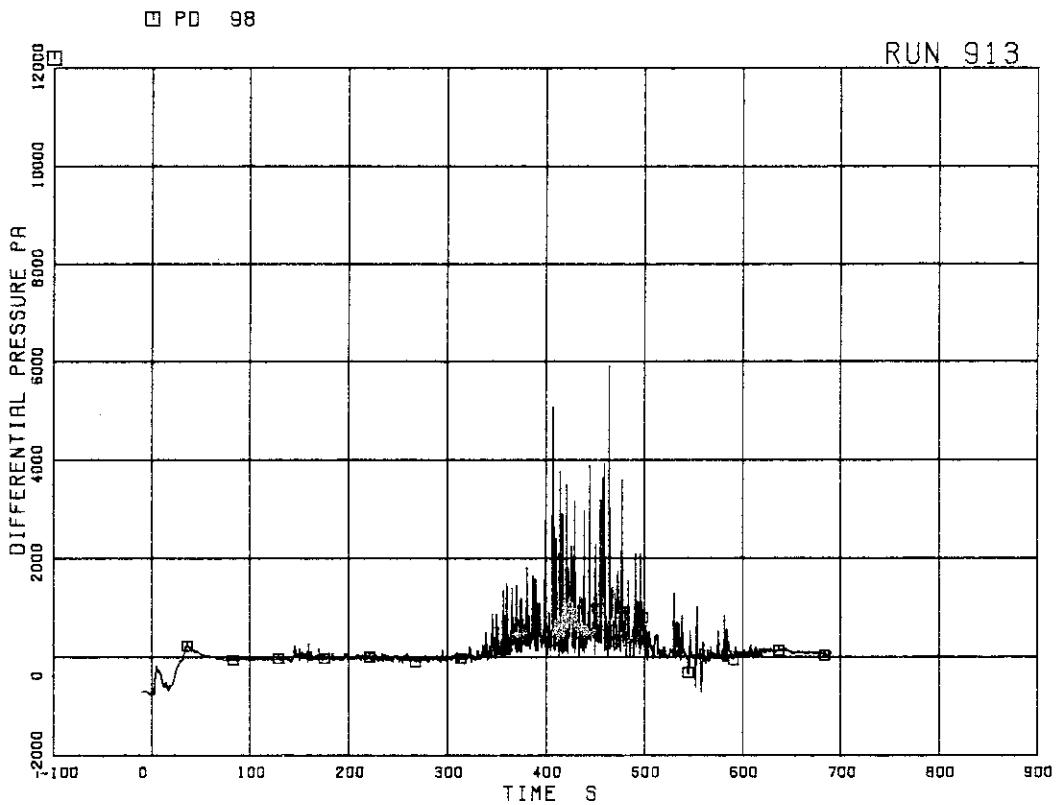


FIG. 5. 50 DIFFERENTIAL PRESSURE ACROSS VENTURI FLOWMETER F-18

FIG. 5. 51 DIFFERENTIAL PRESSURE ACROSS
ORIFICE FLOWMETER F-19FIG. 5. 52 DIFFERENTIAL PRESSURE ACROSS
ORIFICE FLOWMETER F-20

FIG. 5. 53 DIFFERENTIAL PRESSURE ACROSS
ORIFICE FLOWMETER F-21FIG. 5. 54 DIFFERENTIAL PRESSURE ACROSS
ORIFICE FLOWMETER F-22

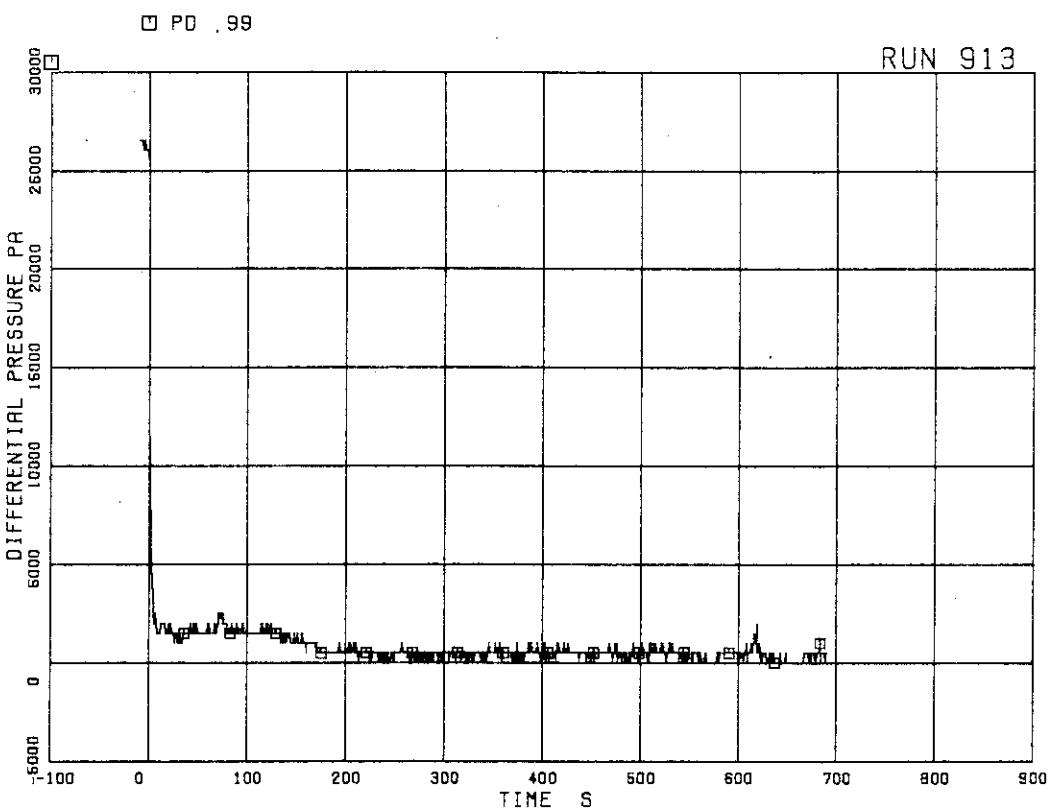


FIG. 5. 55 DIFFERENTIAL PRESSURE ACROSS VENTURI FLOWMETER F-27

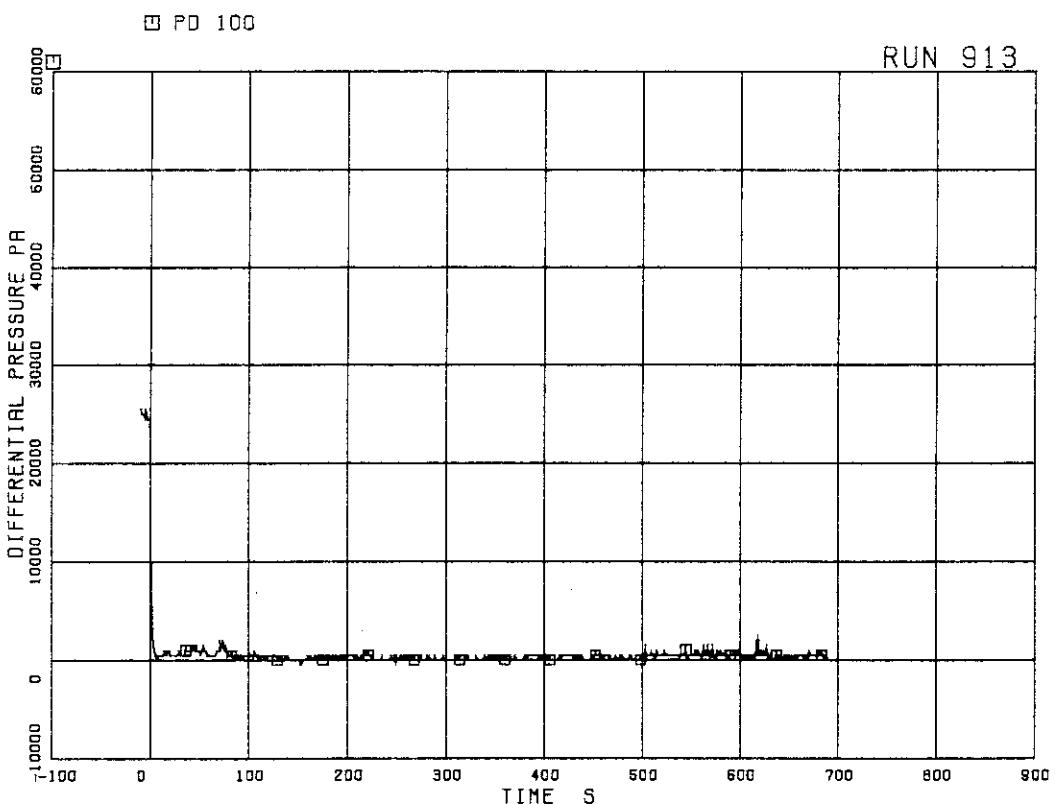


FIG. 5. 56 DIFFERENTIAL PRESSURE ACROSS VENTURI FLOWMETER F-28

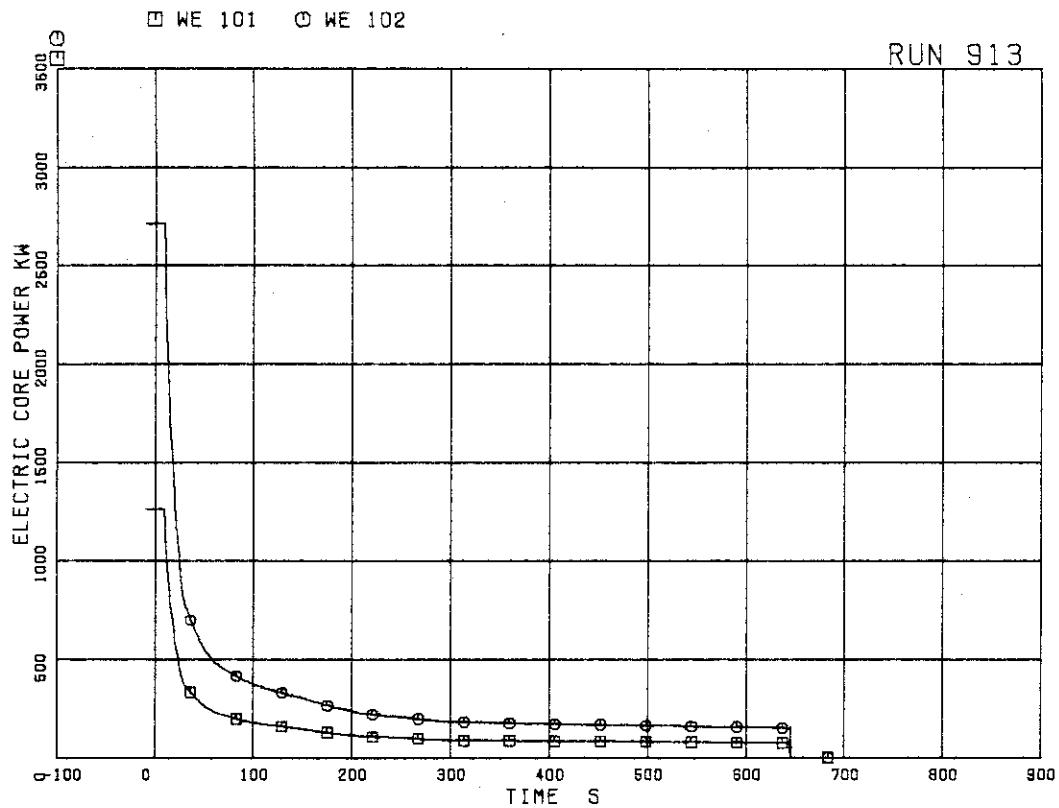


FIG. 57 ELECTRIC CORE POWER

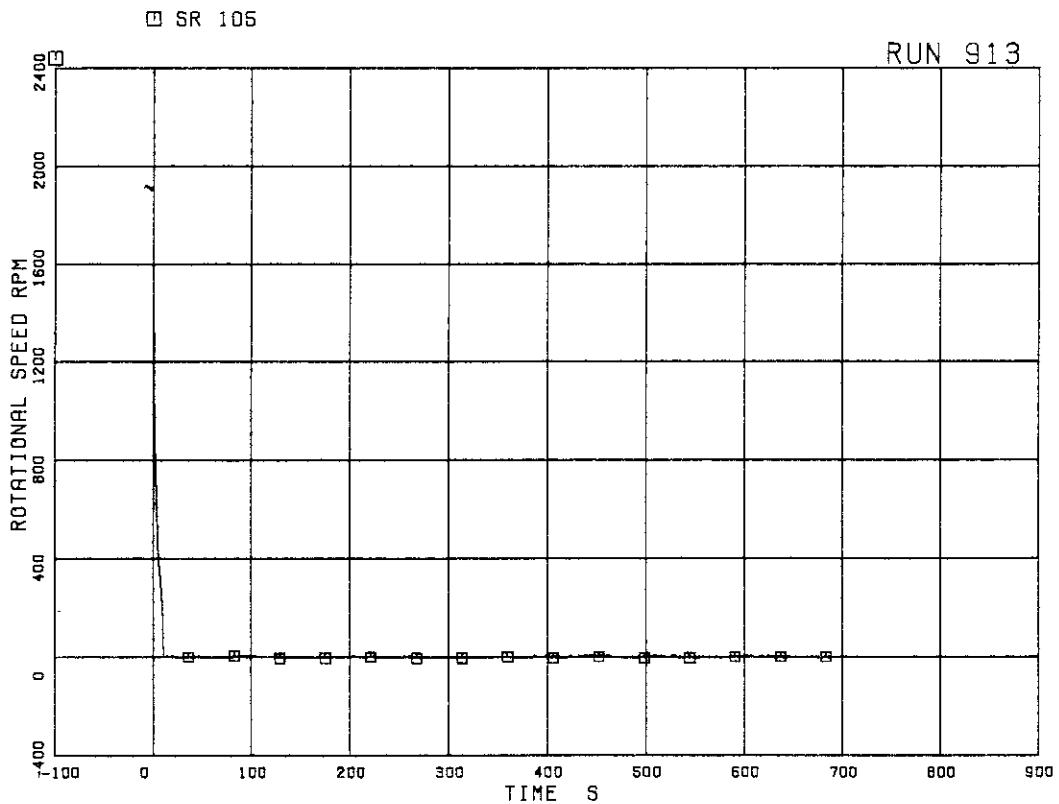


FIG. 58 MRP REVOLUTION

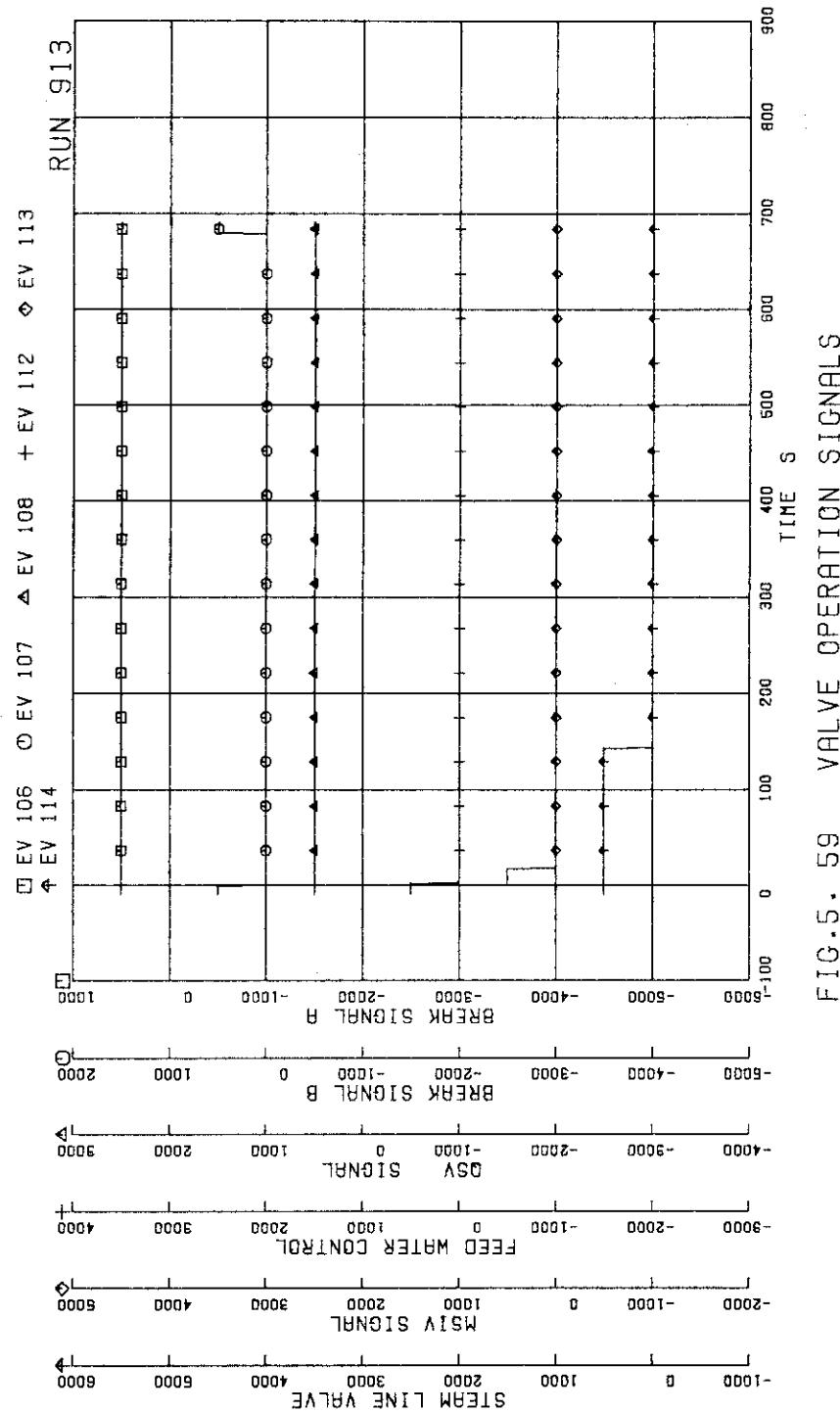


FIG. 5.59 VALVE OPERATION SIGNALS

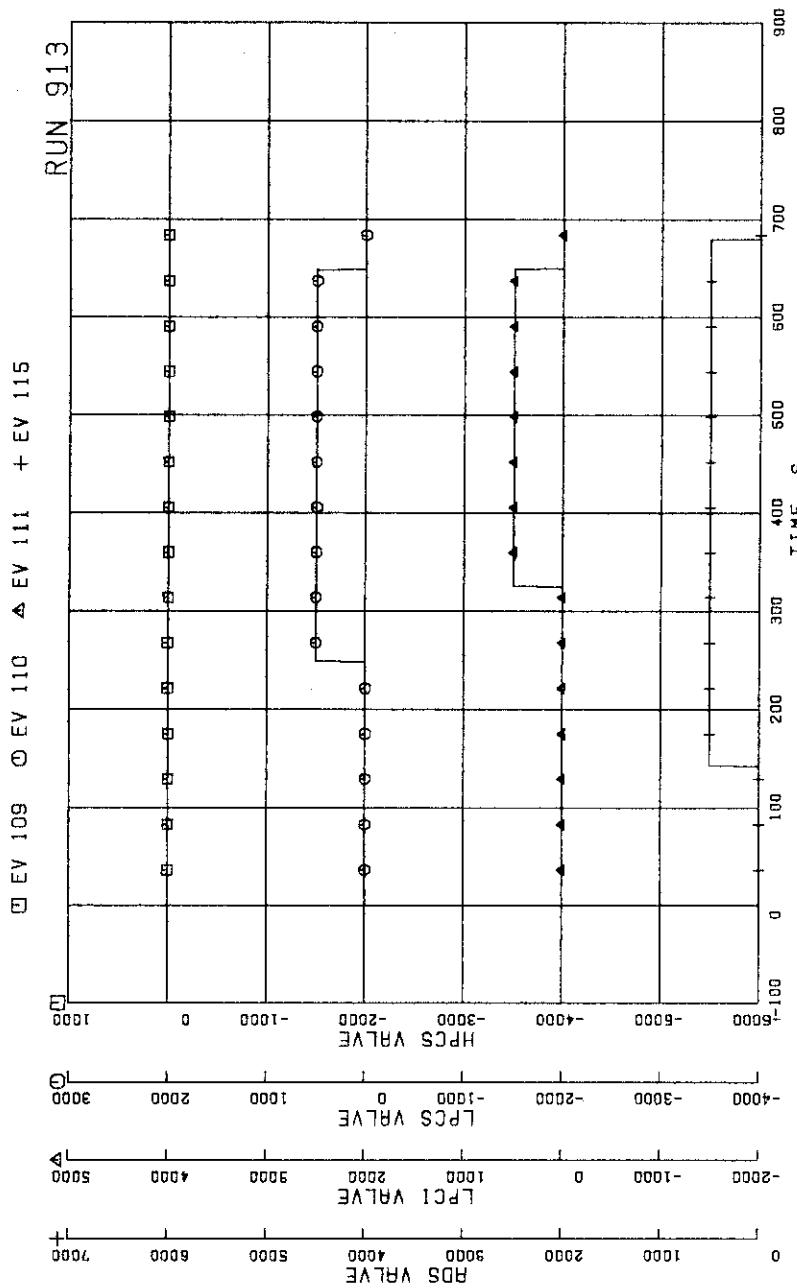


FIG. 5. 60 EPCS OPERATION SIGNALS

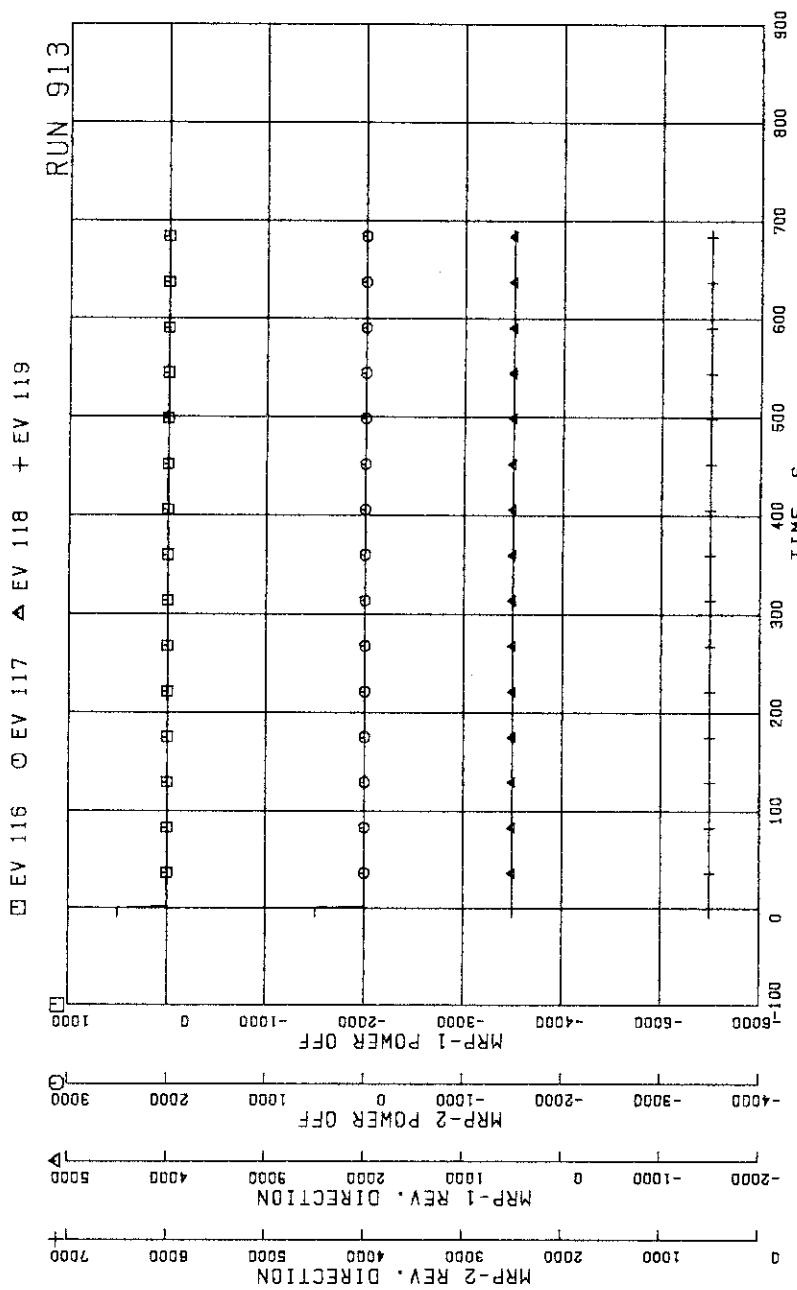


FIG.5-61 MRP OPERATION SIGNALS

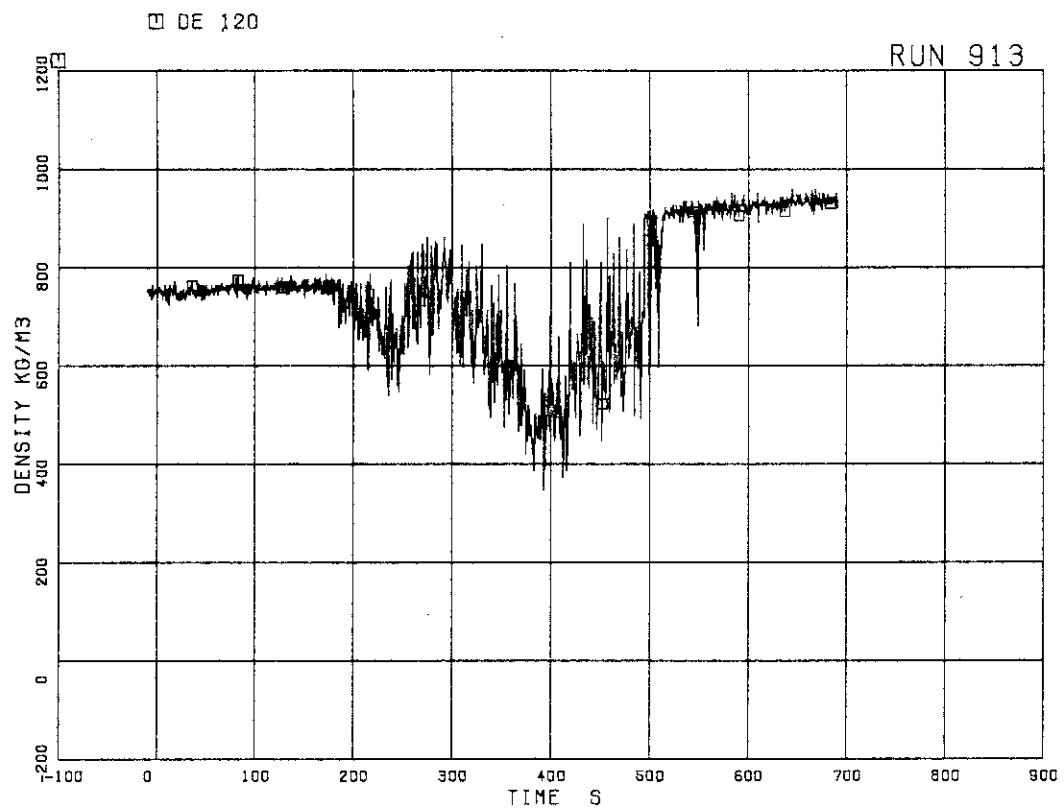


FIG. 5. 62 FLUID DENSITY AT JP-1,2 OUTLET, BEAM A

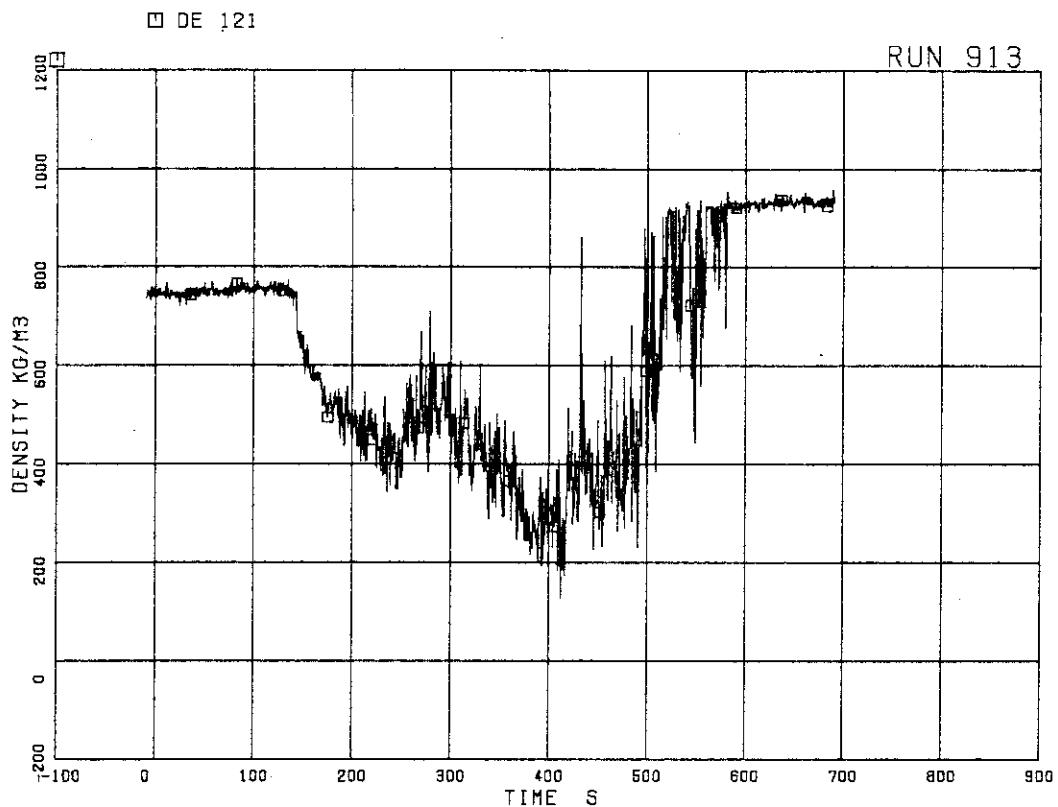


FIG. 5. 63 FLUID DENSITY AT JP-1,2 OUTLET, BEAM B

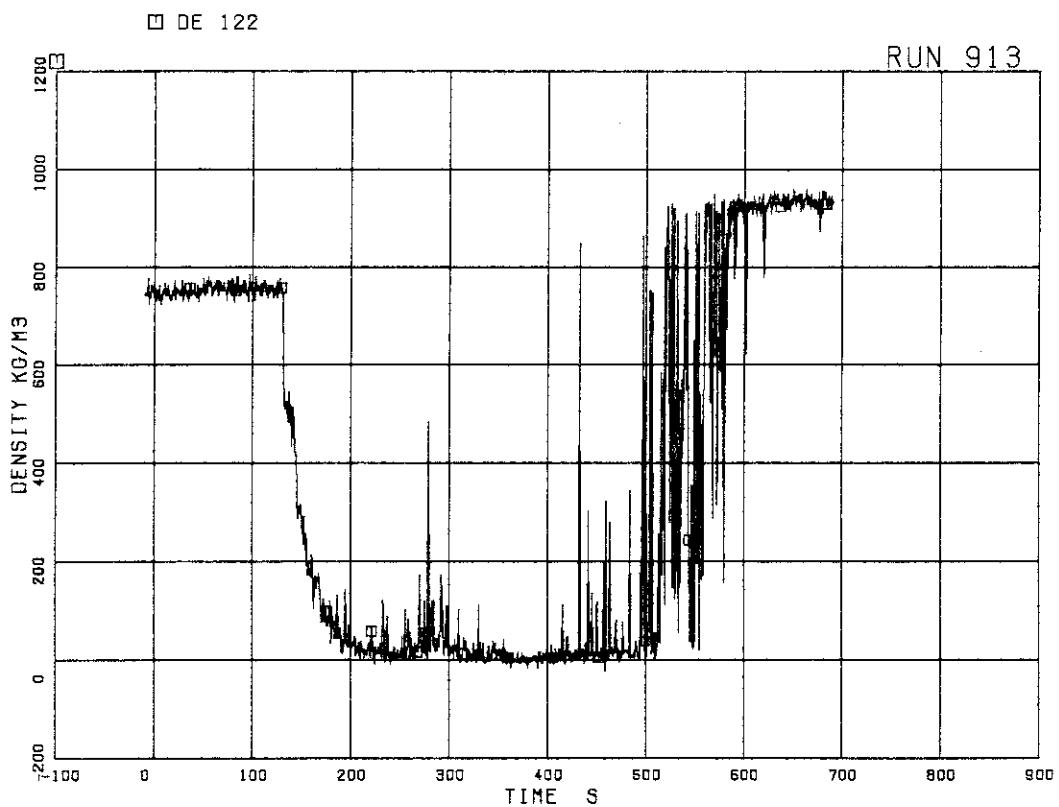


FIG. 5. 64 FLUID DENSITY AT JP-1,2 OUTLET, BEAM C

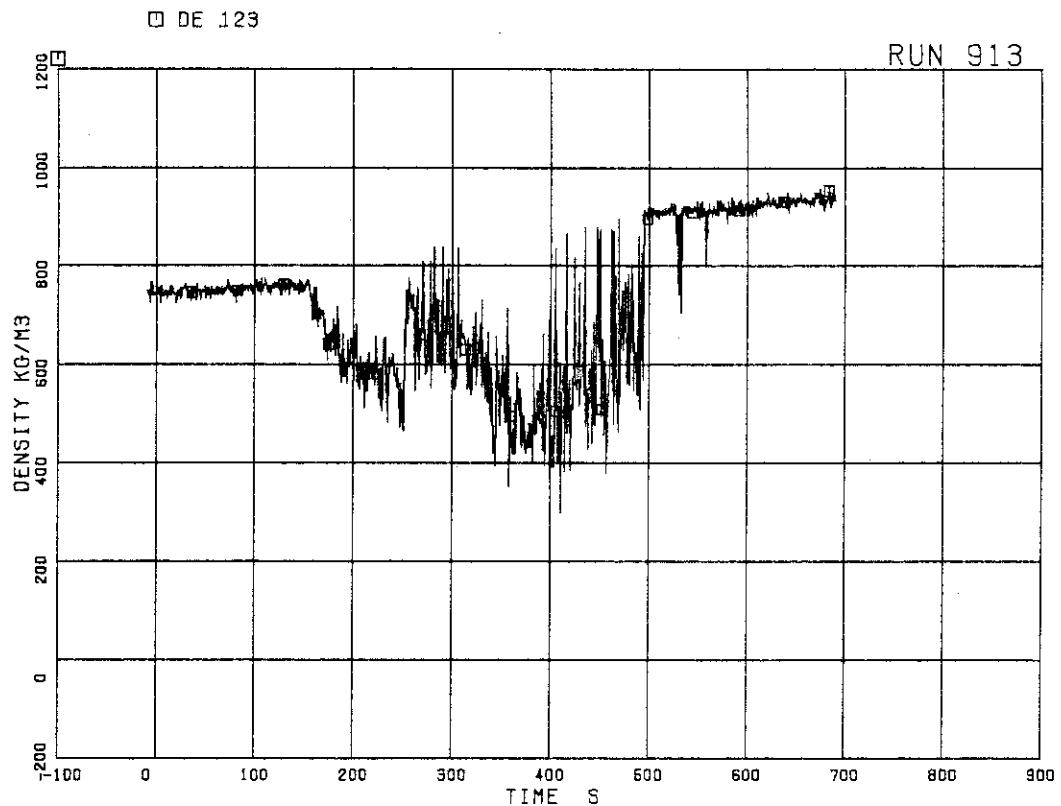


FIG. 5. 65 FLUID DENSITY AT JP-3,4 OUTLET, BEAM A

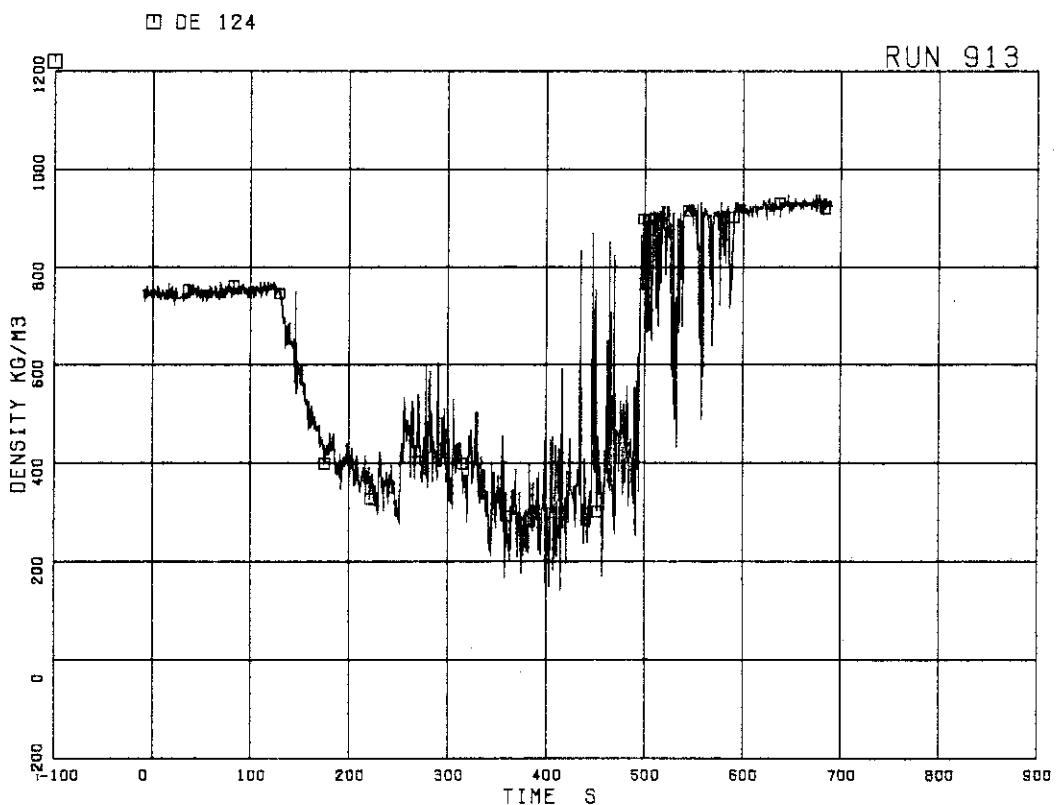


FIG. 5. 66 FLUID DENSITY AT JP-3,4 OUTLET, BEAM B

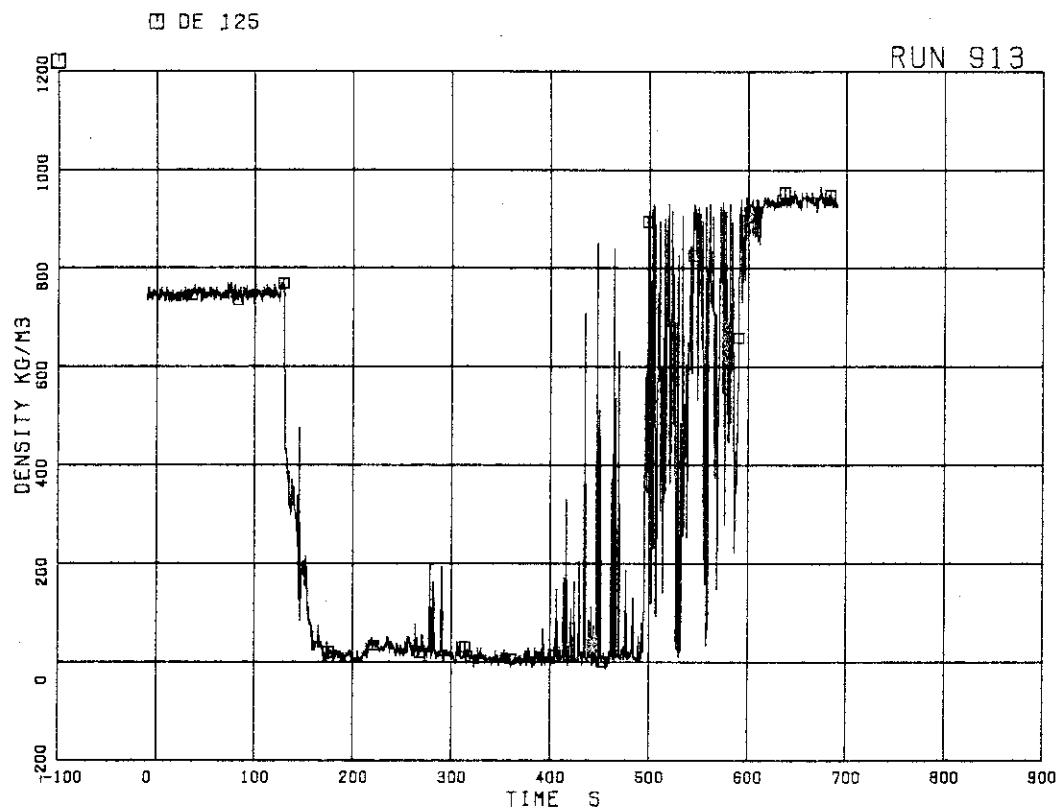
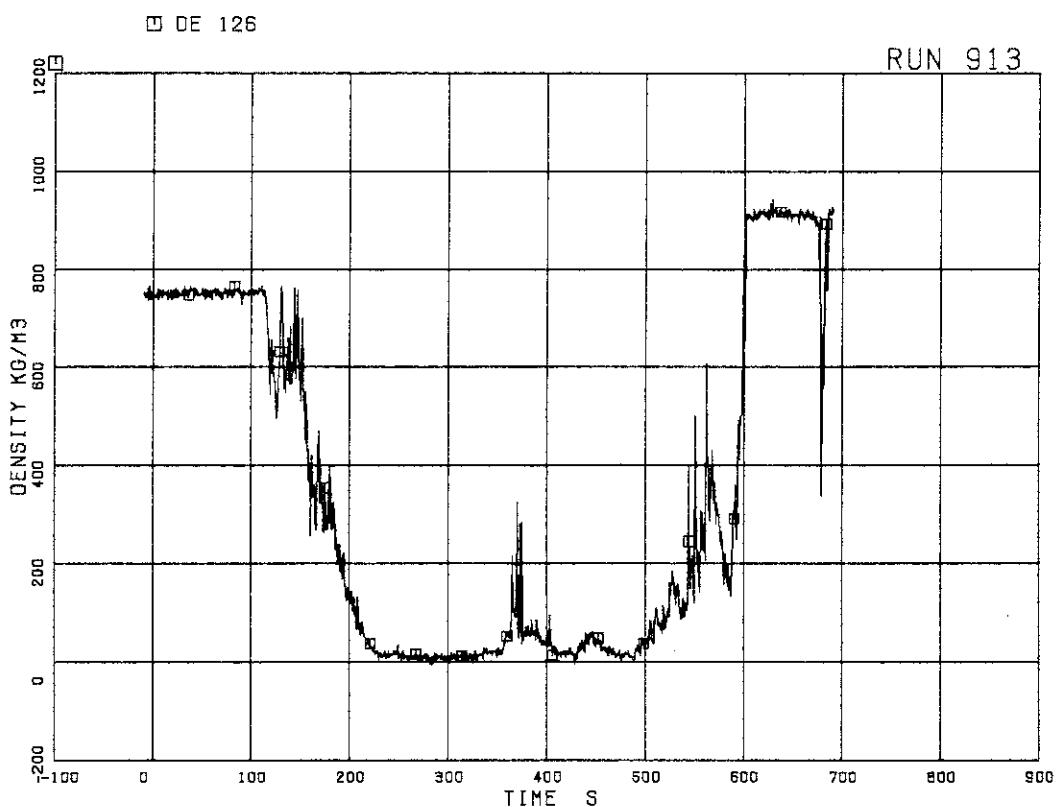


FIG.5. 67 FLUID DENSITY AT JP-3,4 OUTLET, BEAM C

FIG.5. 68 FLUID DENSITY AT MRP SIDE OF BREAK,
BEAM A

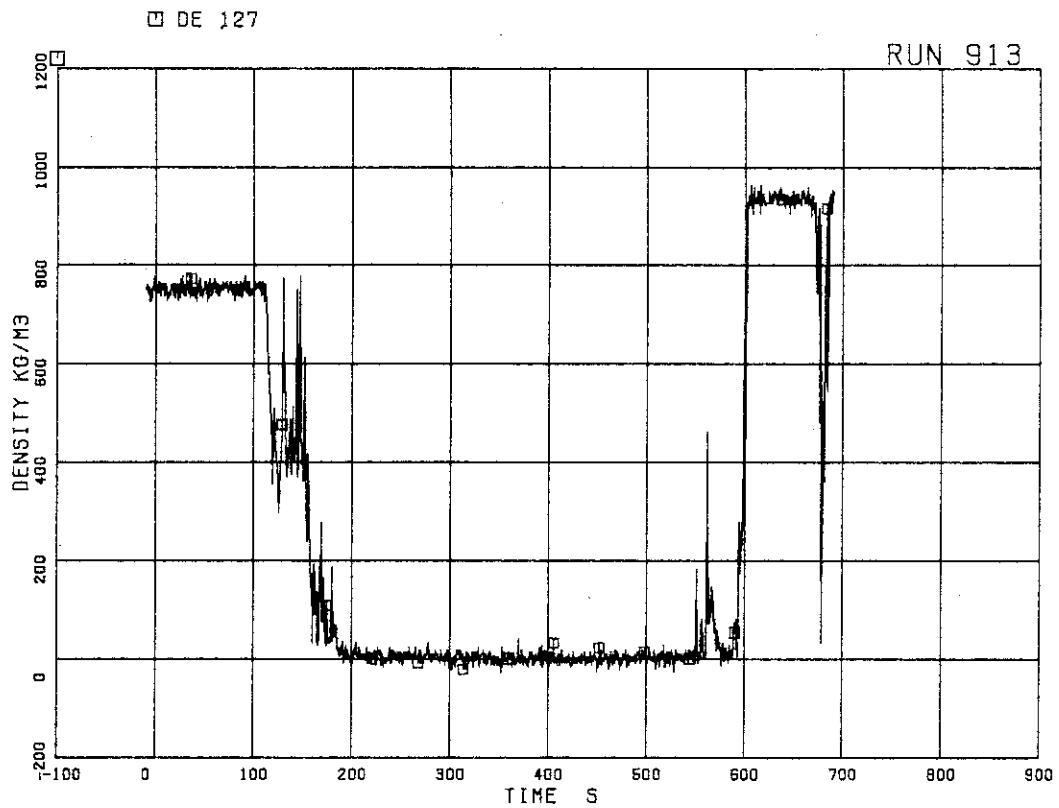


FIG.5. 69 FLUID DENSITY AT MRP SIDE OF BREAK,
BEAM B

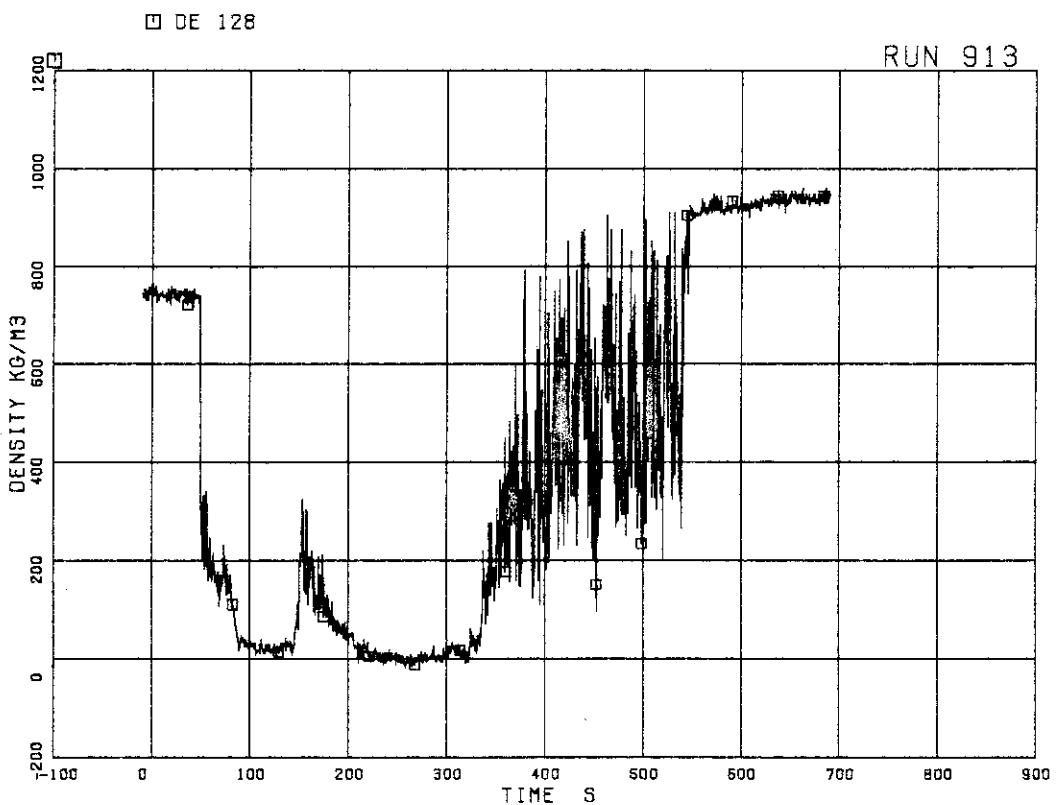


FIG.5. 70 FLUID DENSITY AT PV SIDE OF BREAK,
BEAM A

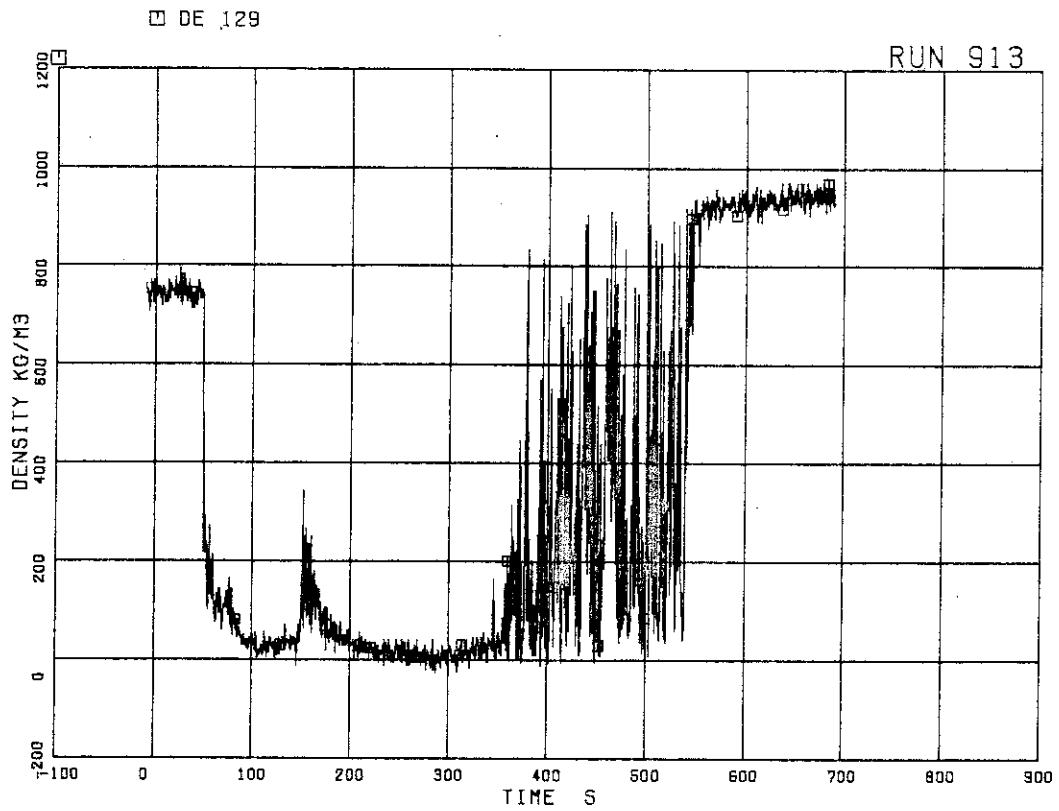


FIG. 5. 71 FLUID DENSITY AT PV SIDE OF BREAK,
BEAM B

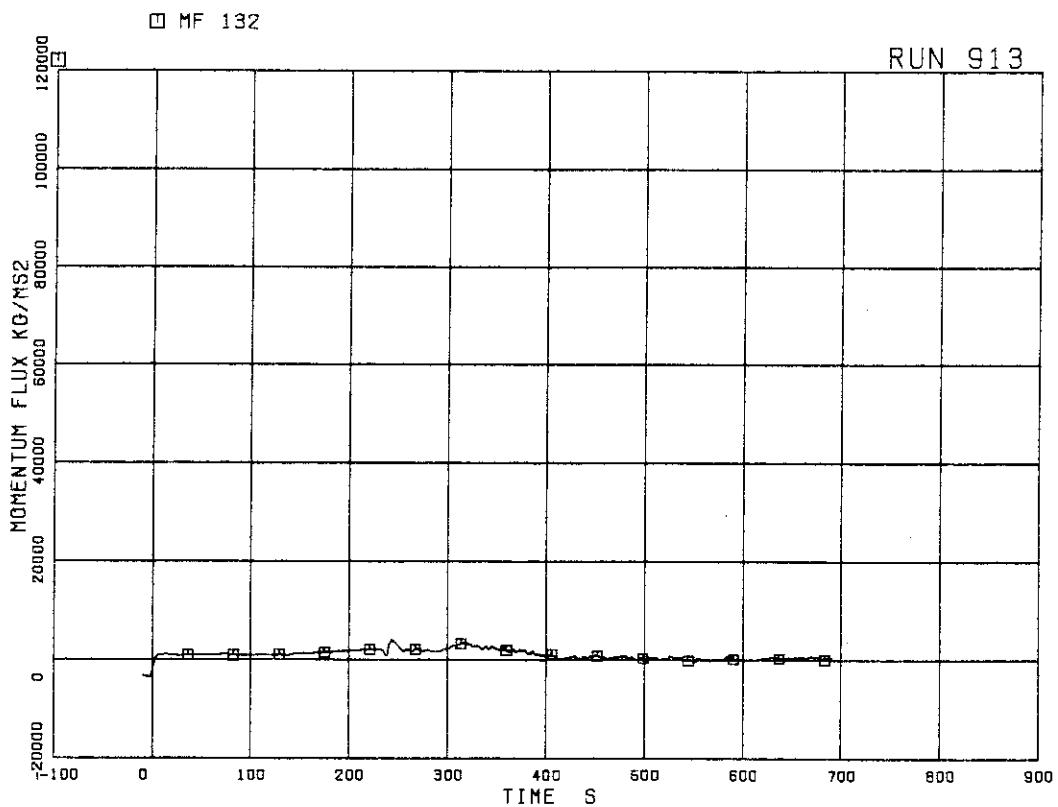


FIG. 5. 72 MOMENTUM FLUX AT BREAK A SPOOL PIECE
(LOW RANGE)

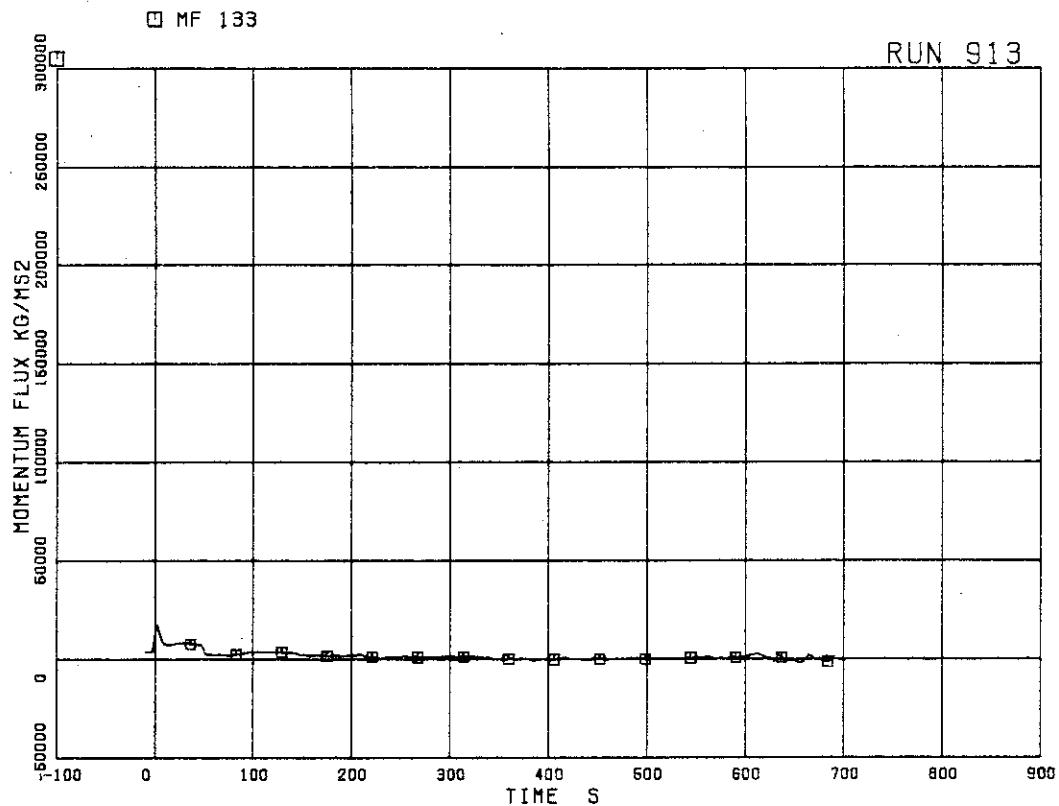


FIG.5. 73 MOMENTUM FLUX AT BREAK B SPOOL PIECE
(LOW RANGE)

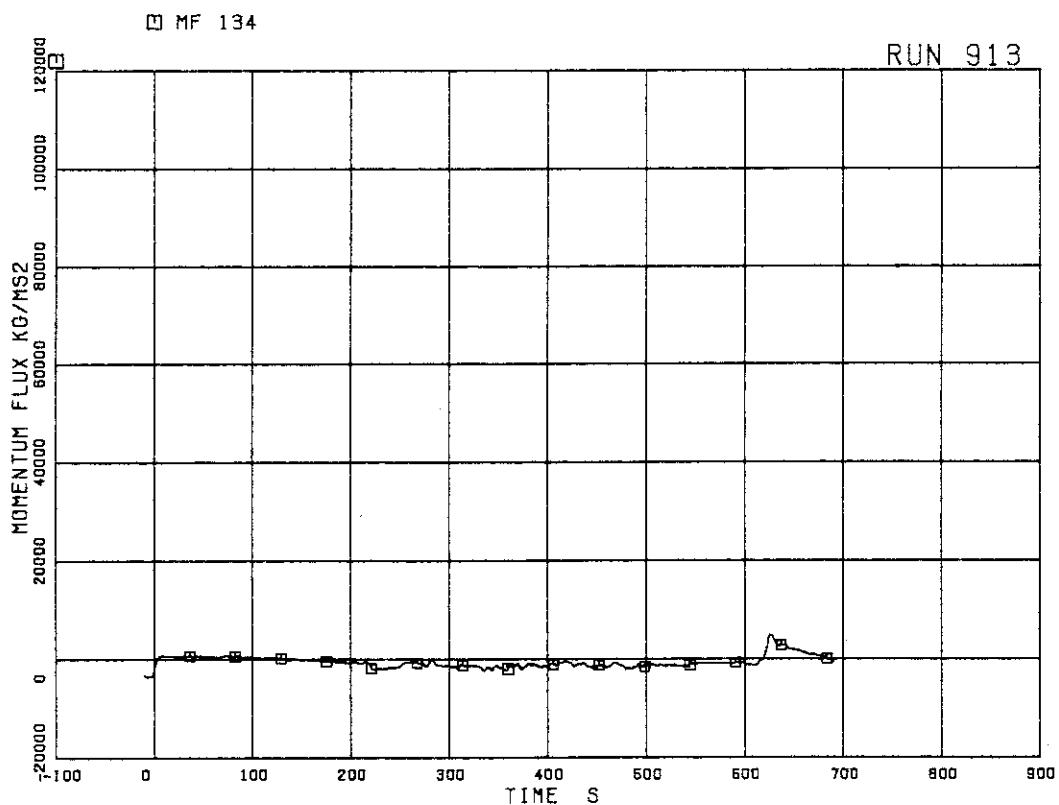


FIG.5. 74 MOMENTUM FLUX AT BREAK A SPOOL PIECE
(HIGH RANGE)

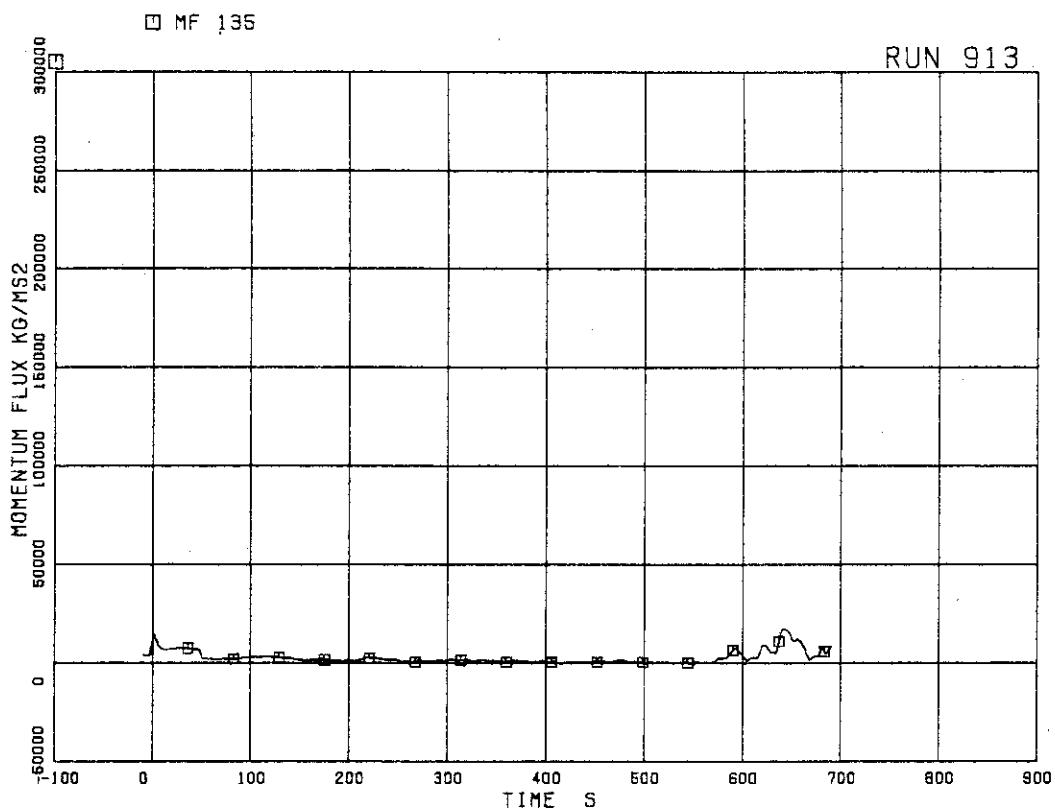


FIG. 5. 75 MOMENTUM FLUX AT BREAK B SPOOL PIECE
(HIGH RANGE)

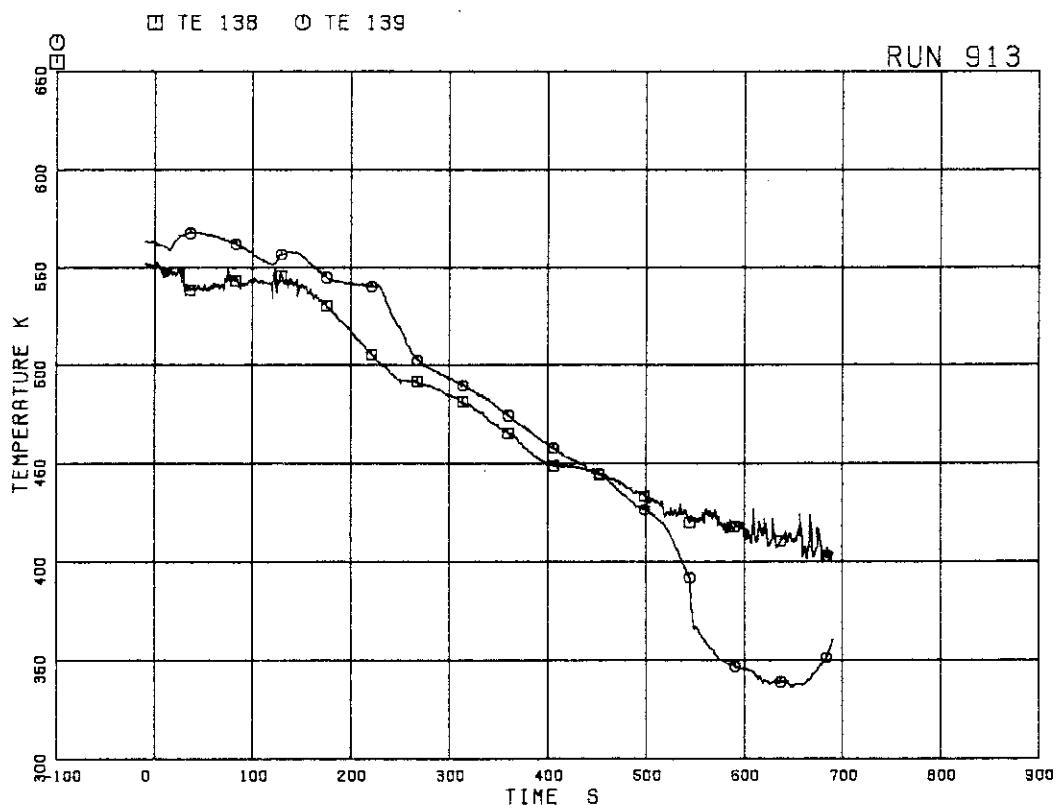


FIG. 5. 76 FLUID TEMPERATURES IN
LOWER PLENUM AND UPPER PLENUM

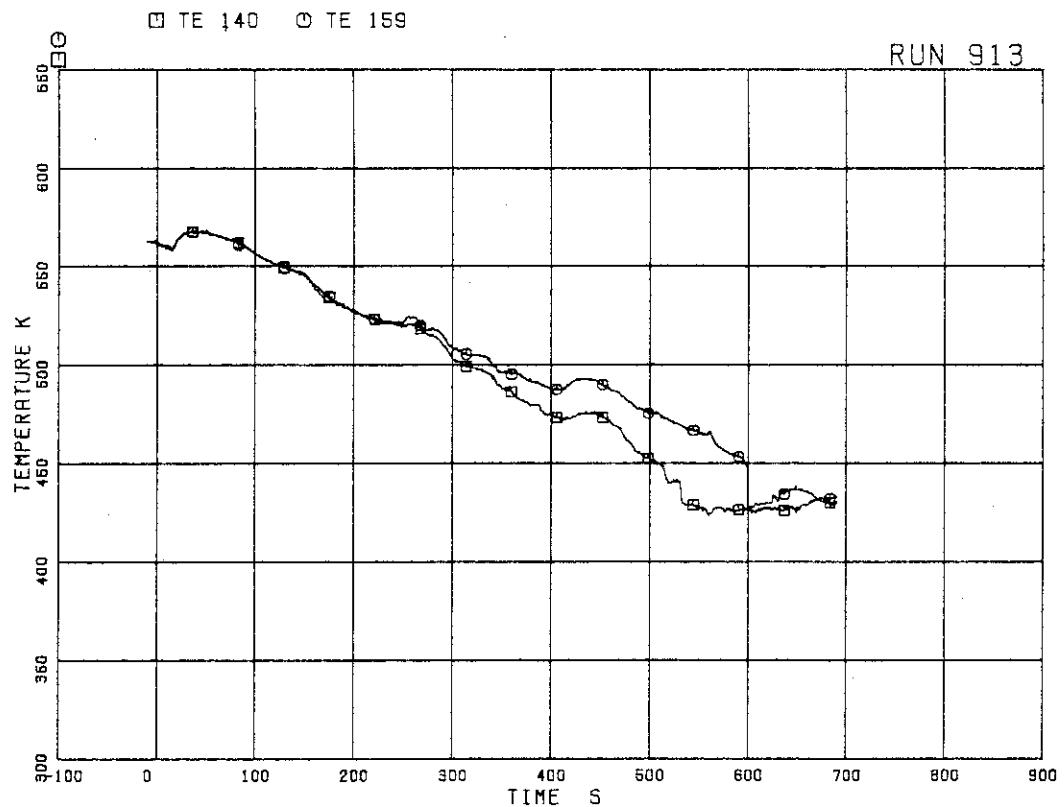


FIG.5. 77 FLUID TEMPERATURES IN STEAM DOME AND MSL

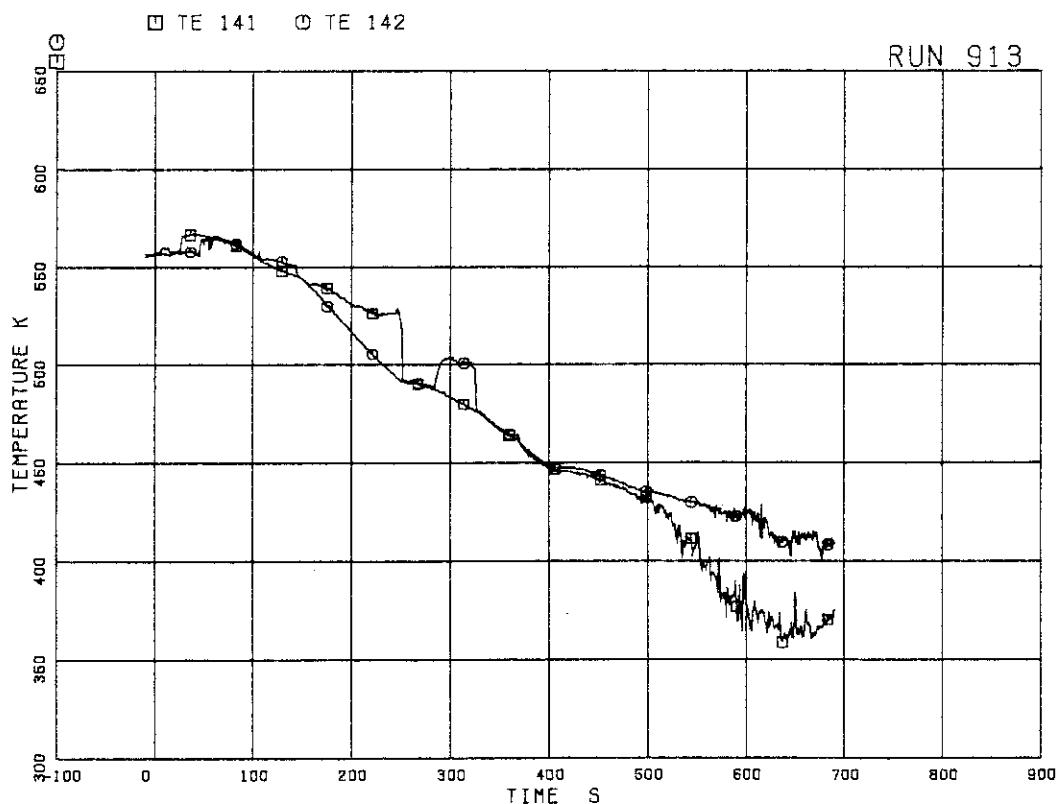
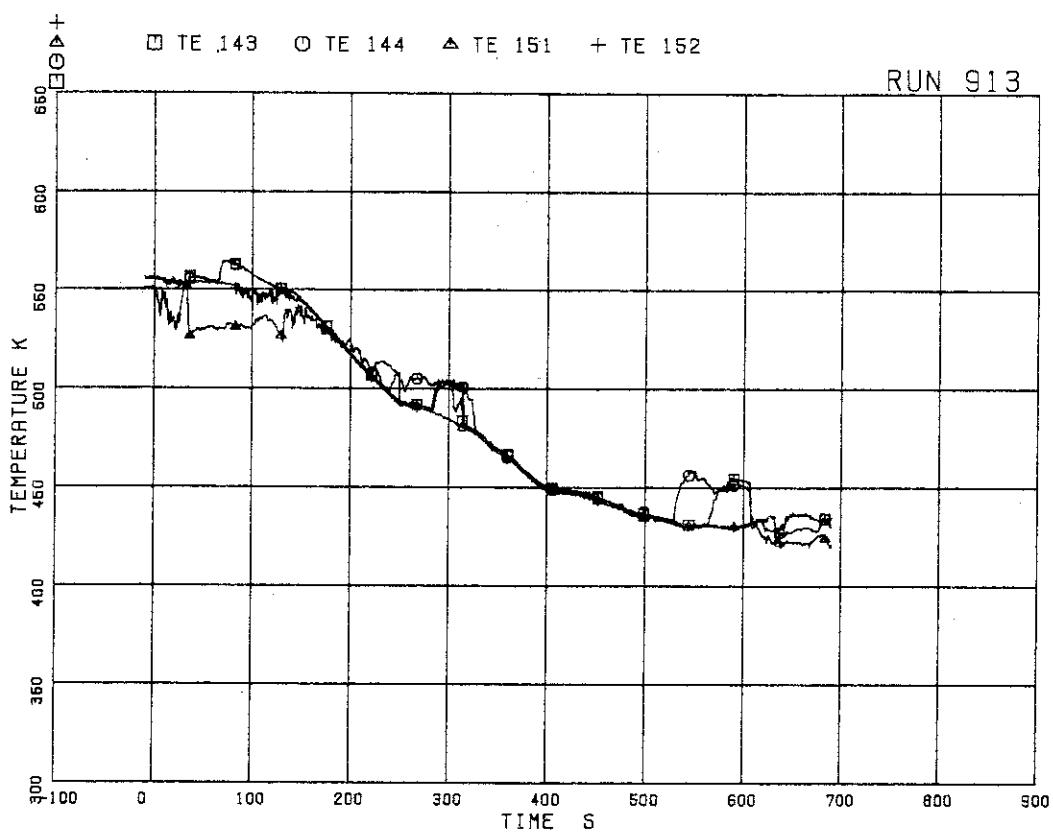
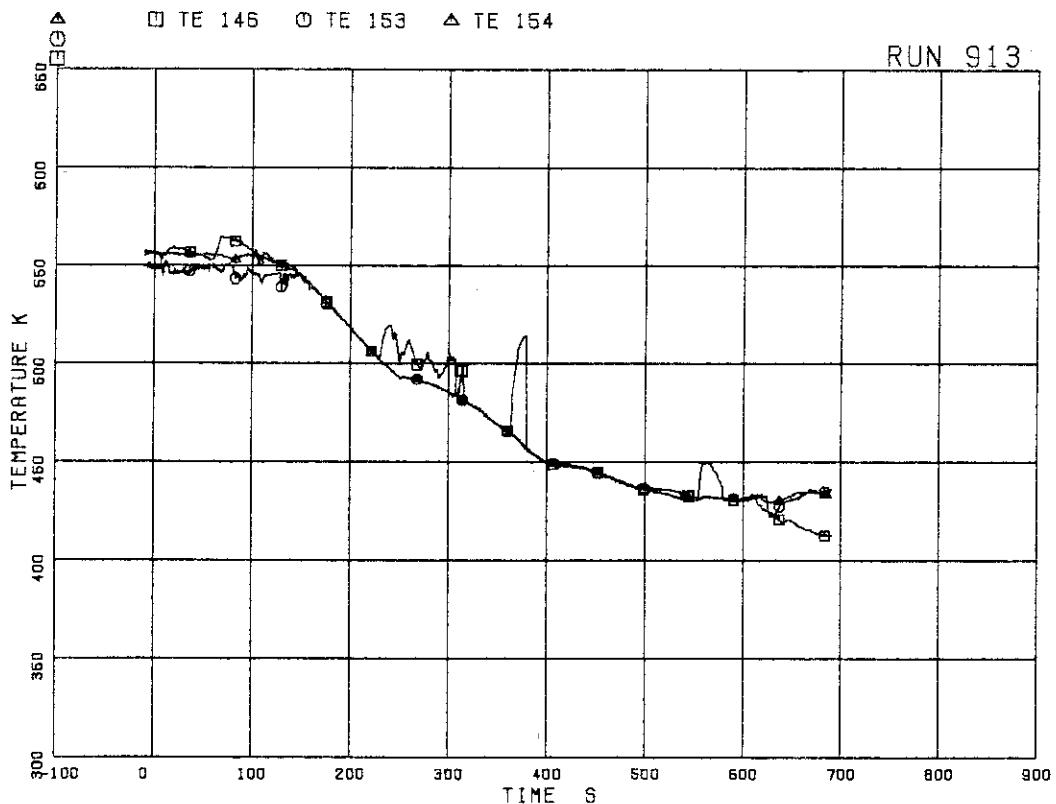


FIG.5. 78 FLUID TEMPERATURES IN DOWNCOMER

FIG. 5. 79 FLUID TEMPERATURES IN
INTACT RECIRCULATION LOOPFIG. 5. 80 FLUID TEMPERATURES IN
BROKEN RECIRCULATION LOOP

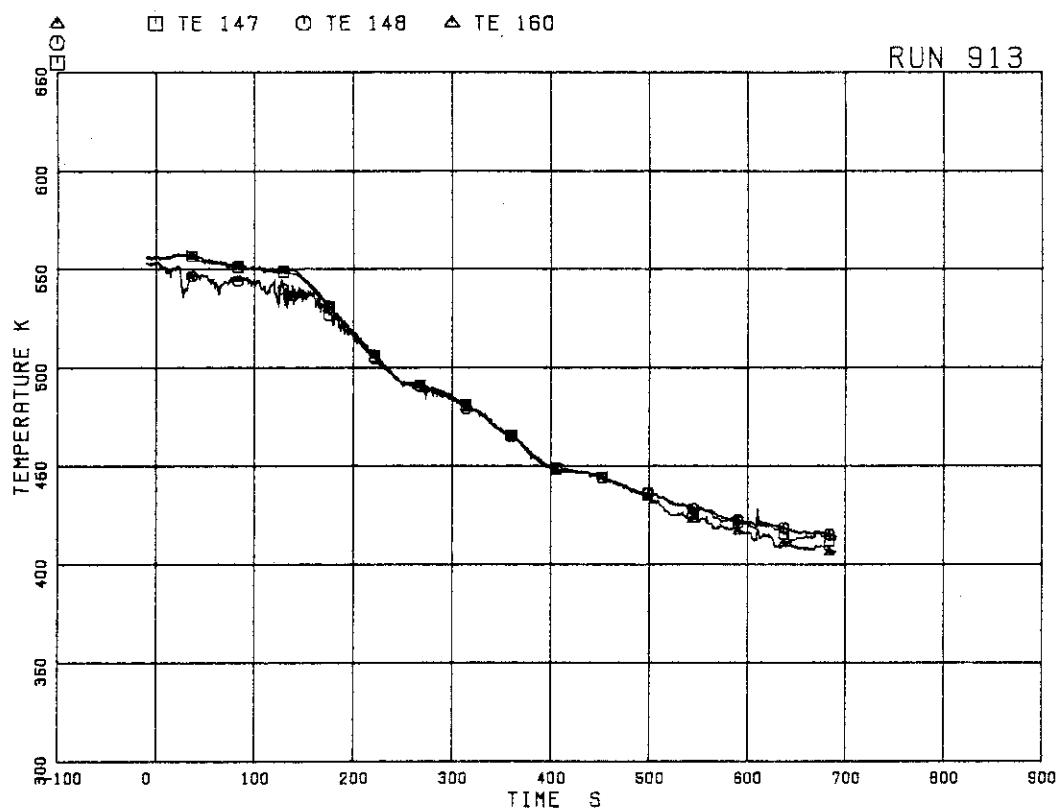


FIG.5. 81 FLUID TEMPERATURES AT JP-1,2 OUTLET

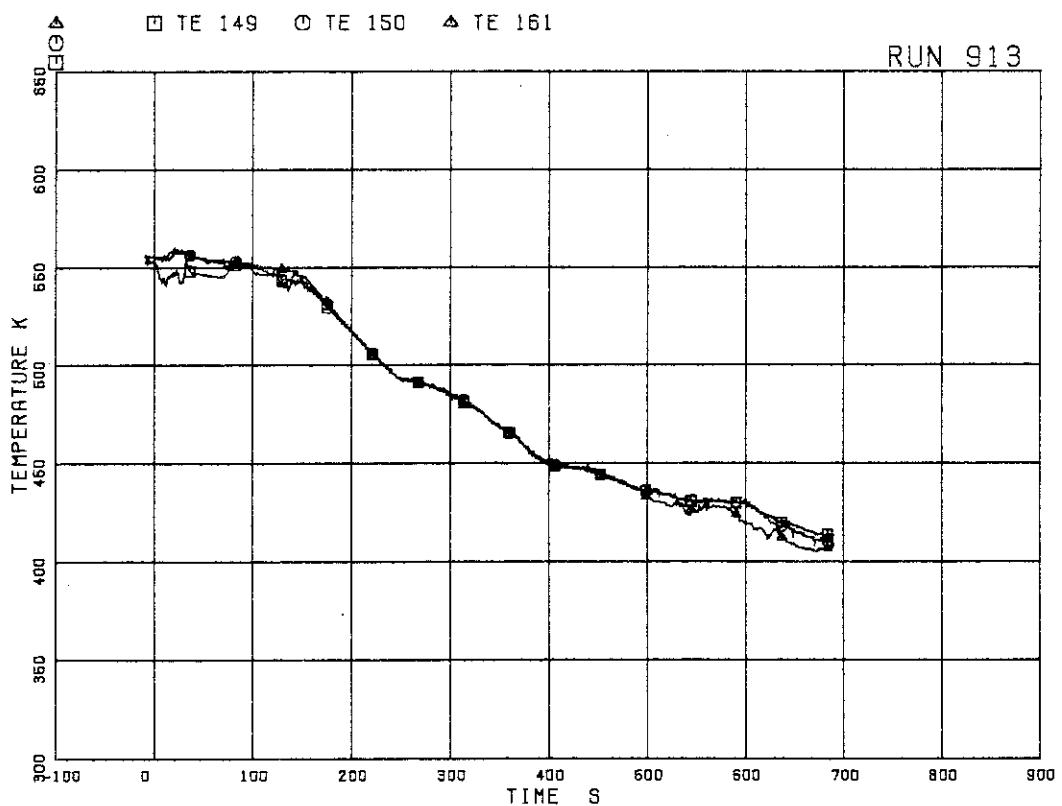


FIG.5. 82 FLUID TEMPERATURES AT JP-3,4 OUTLET

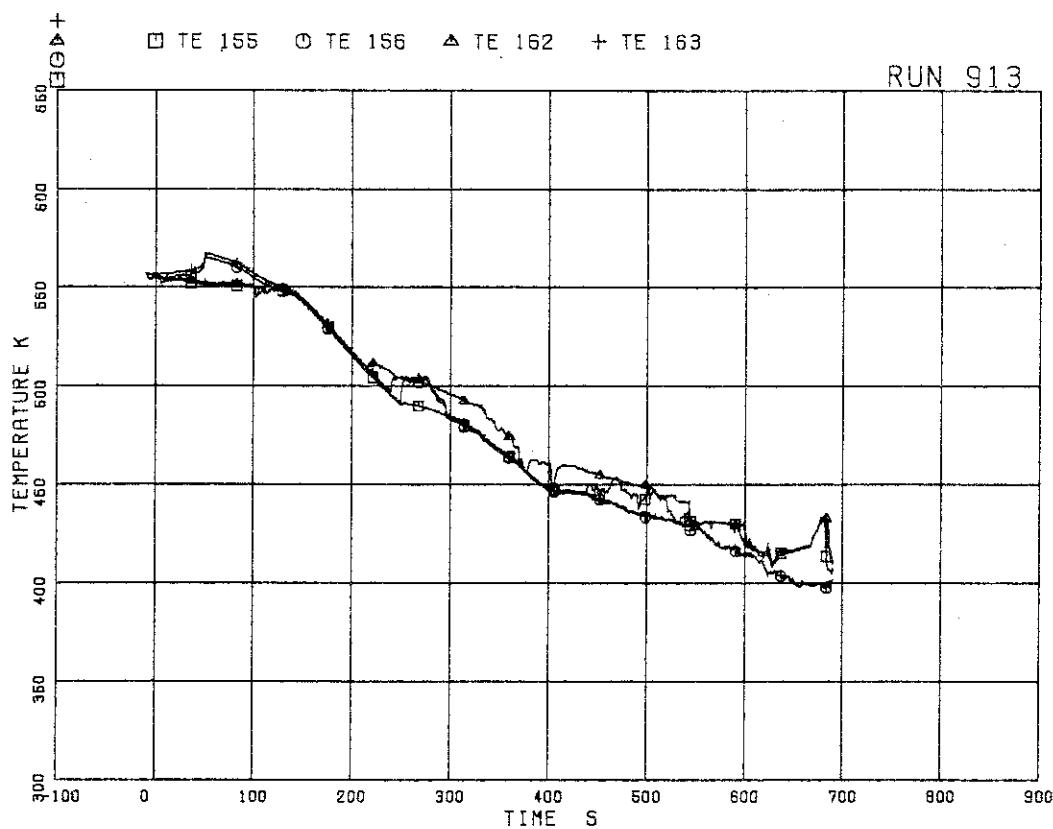


FIG. 5. 83 FLUID TEMPERATURES NEAR BREAKS A AND B

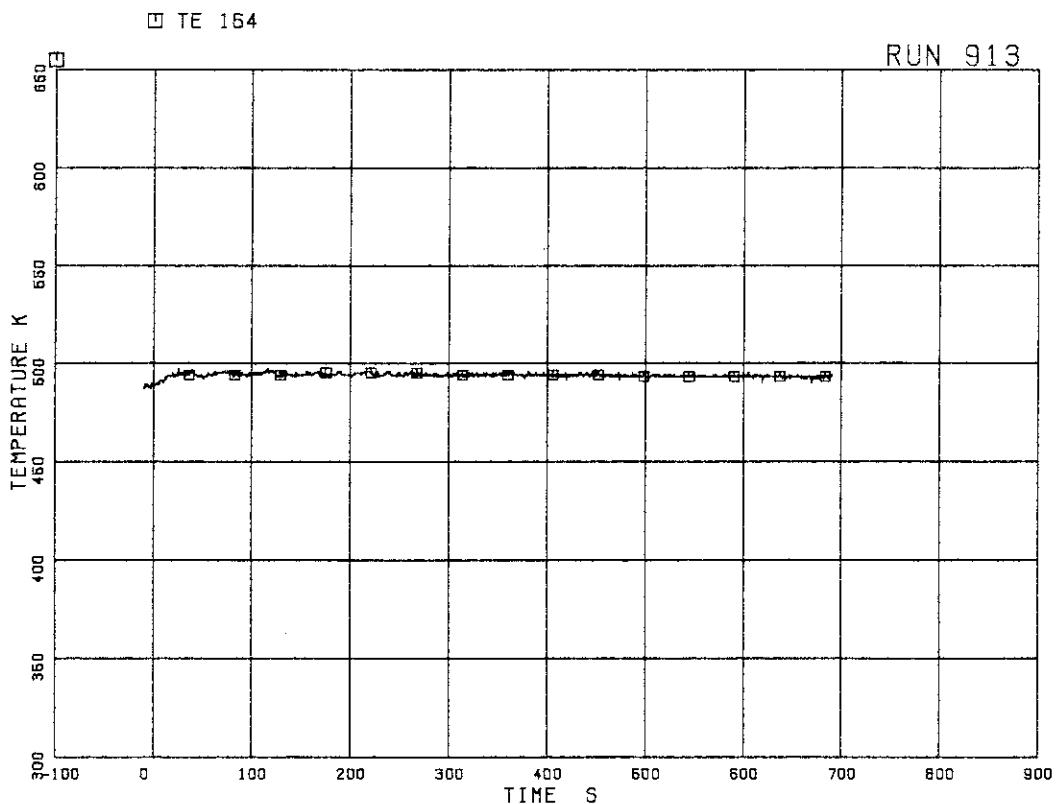


FIG. 5. 84 FEEDWATER TEMPERATURE

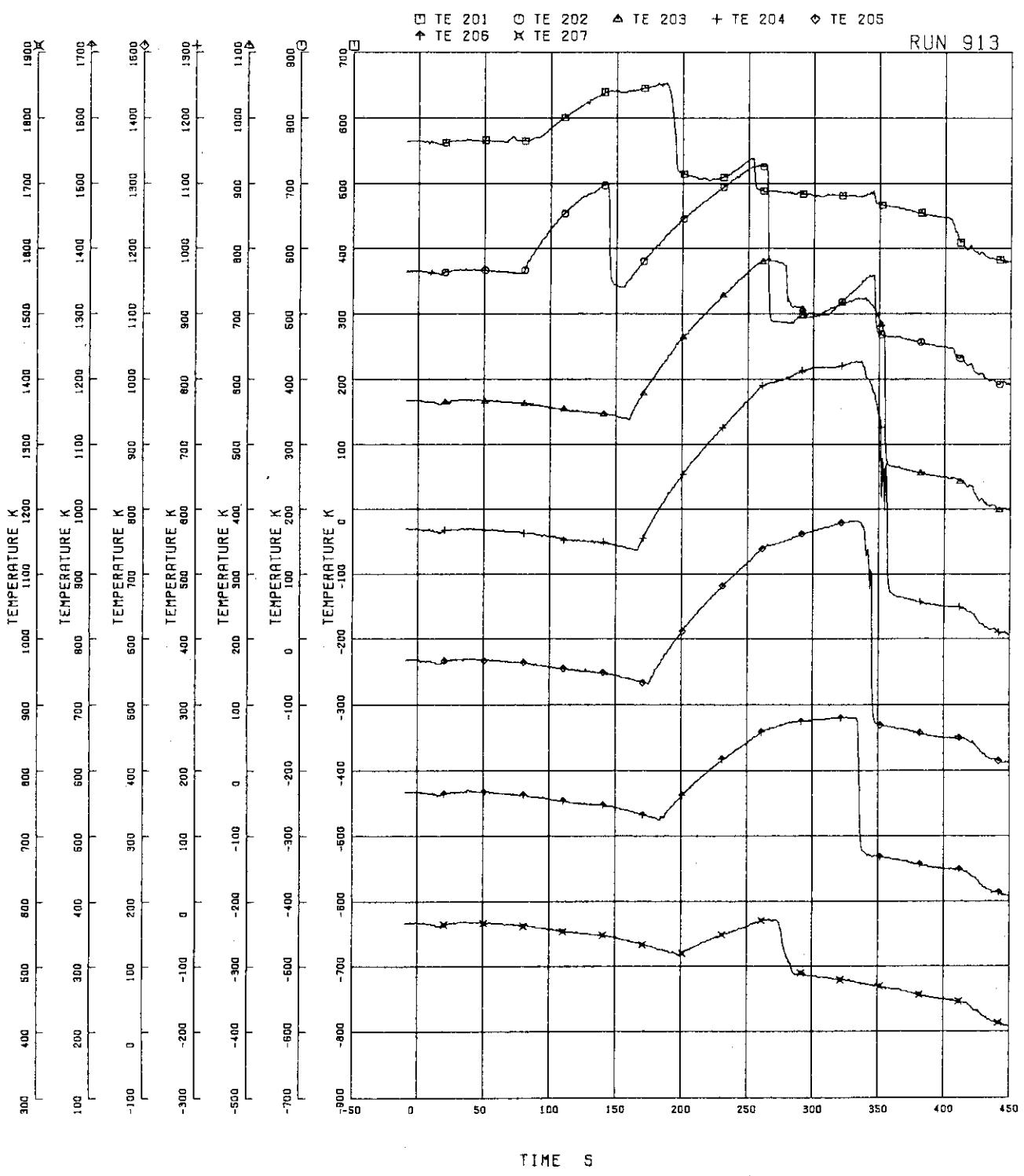


FIG. 5. 85 SURFACE TEMPERATURES OF FUEL ROD A11

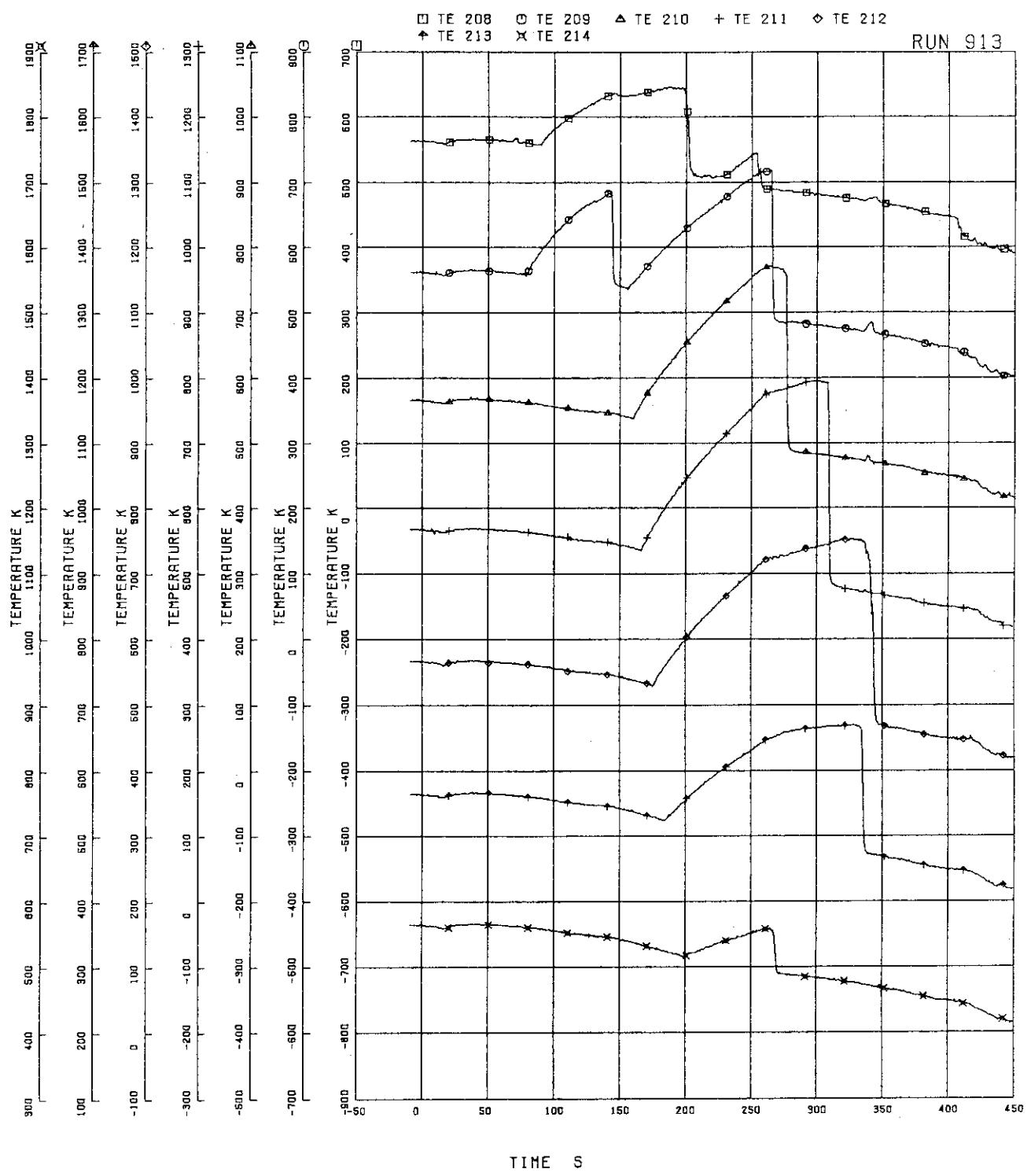
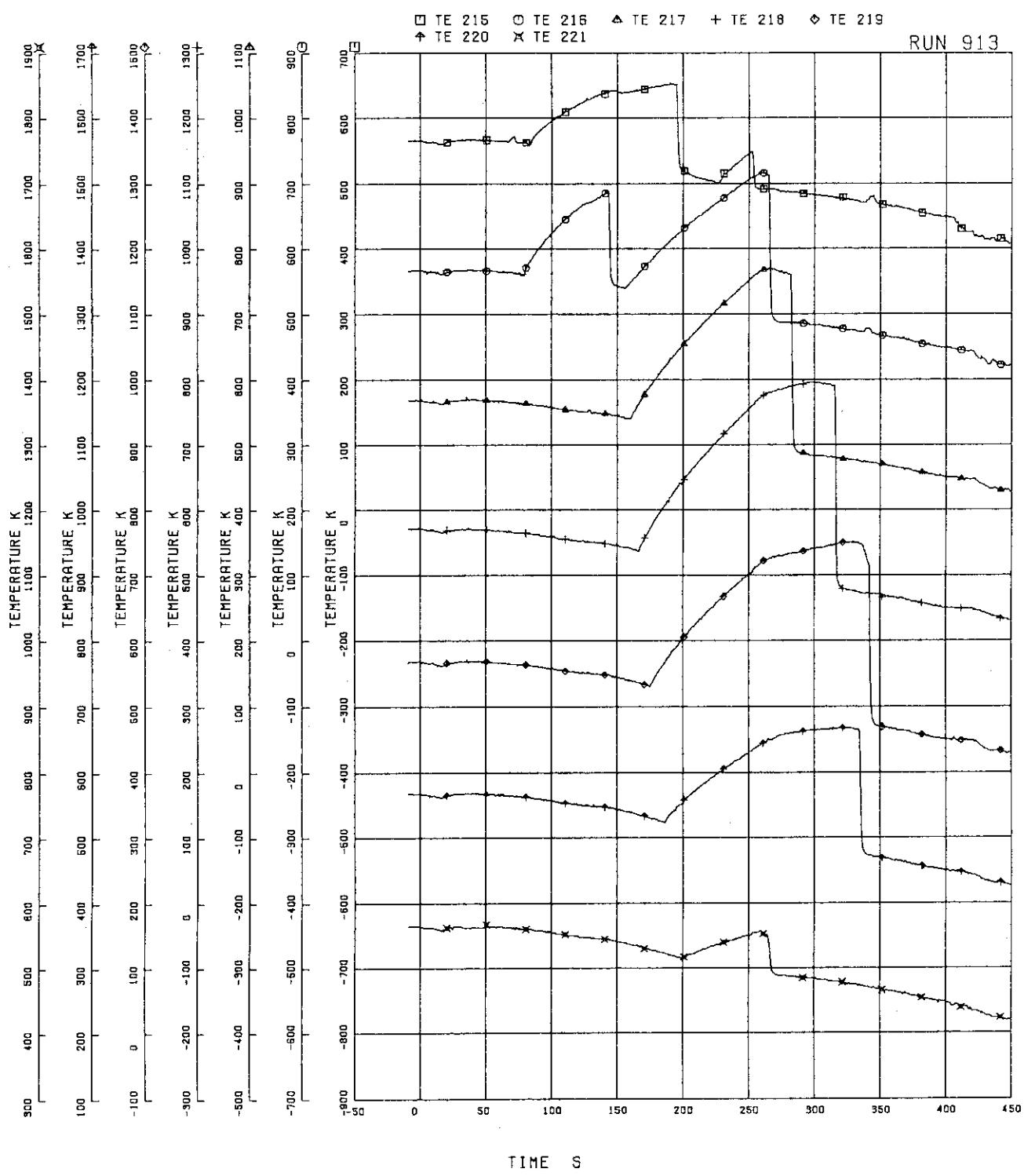


FIG. 5. 86 SURFACE TEMPERATURES OF FUEL ROD A12



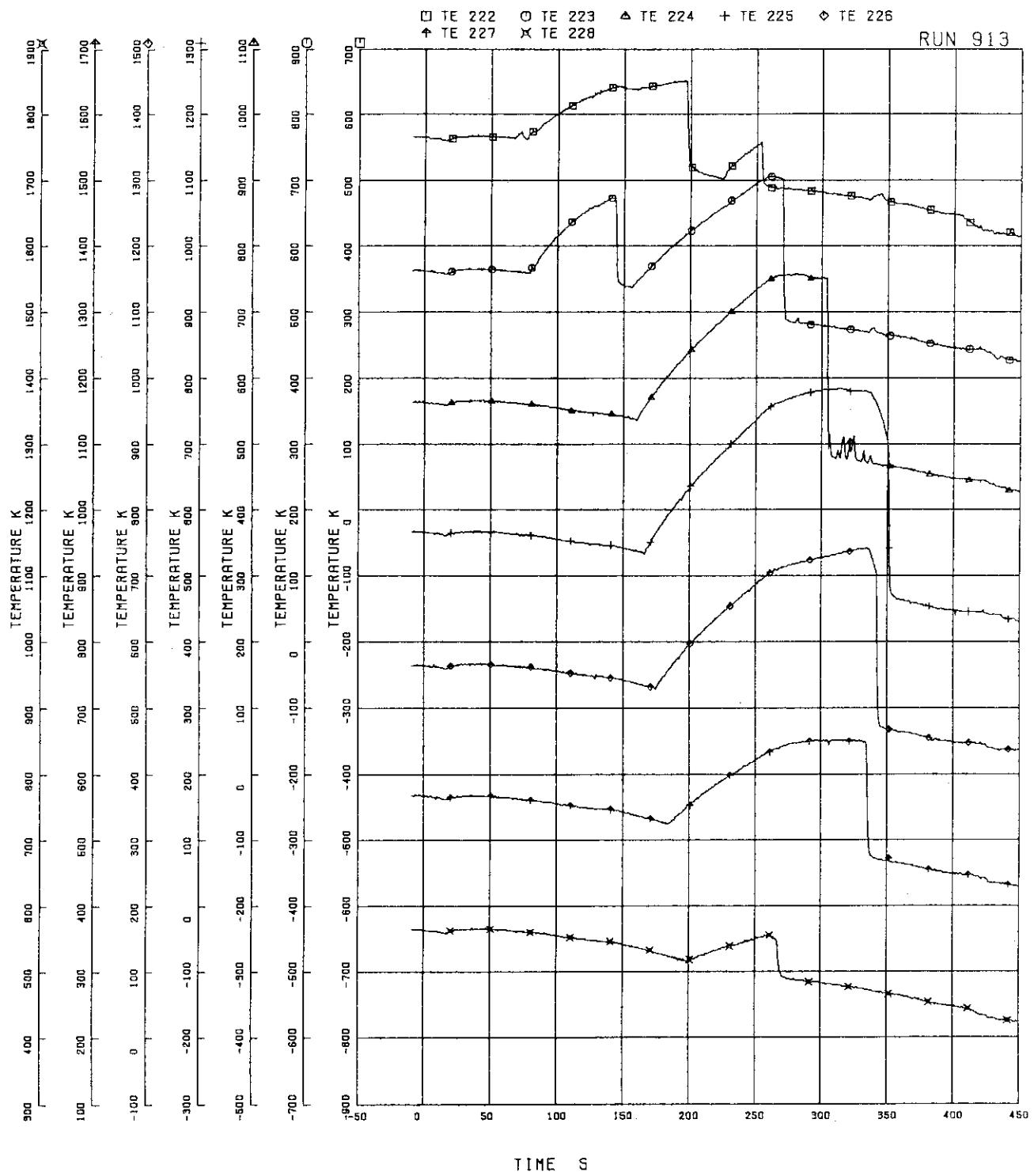


FIG. 5. 88 SURFACE TEMPERATURES OF FUEL ROD A14

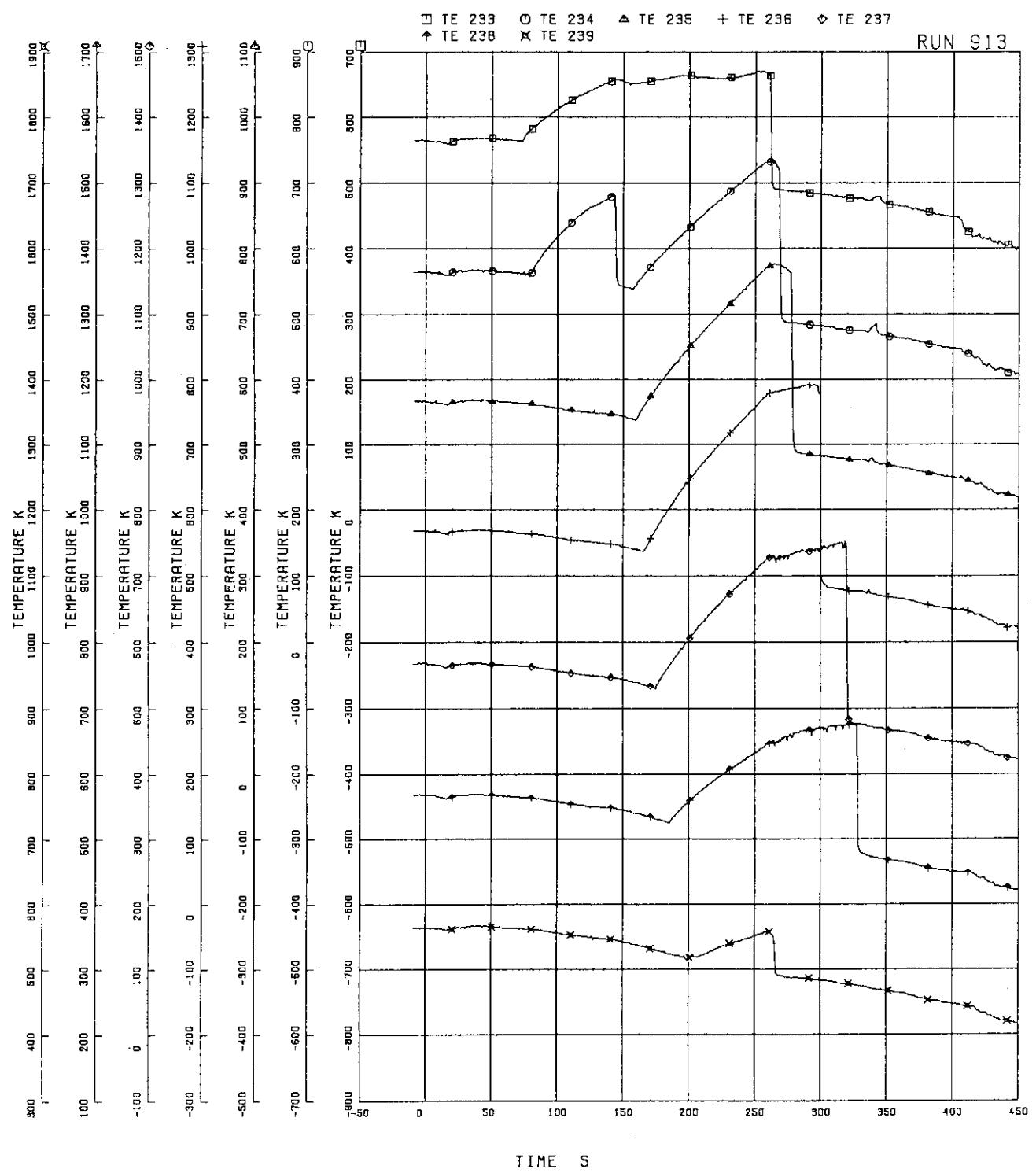


FIG. 5. 89 SURFACE TEMPERATURES OF FUEL ROD A22

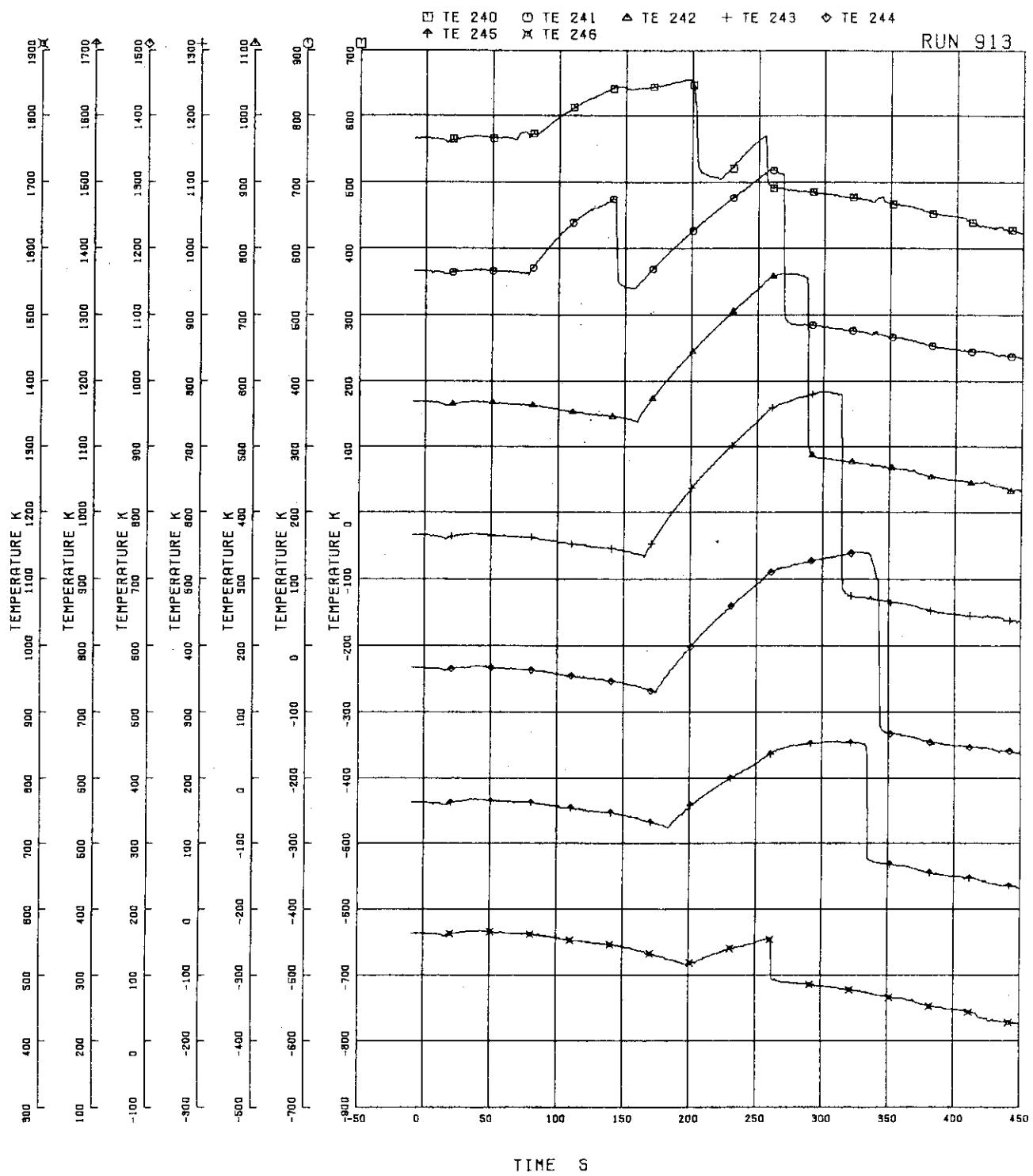


FIG. 5. 90 SURFACE TEMPERATURES OF FUEL ROD A24

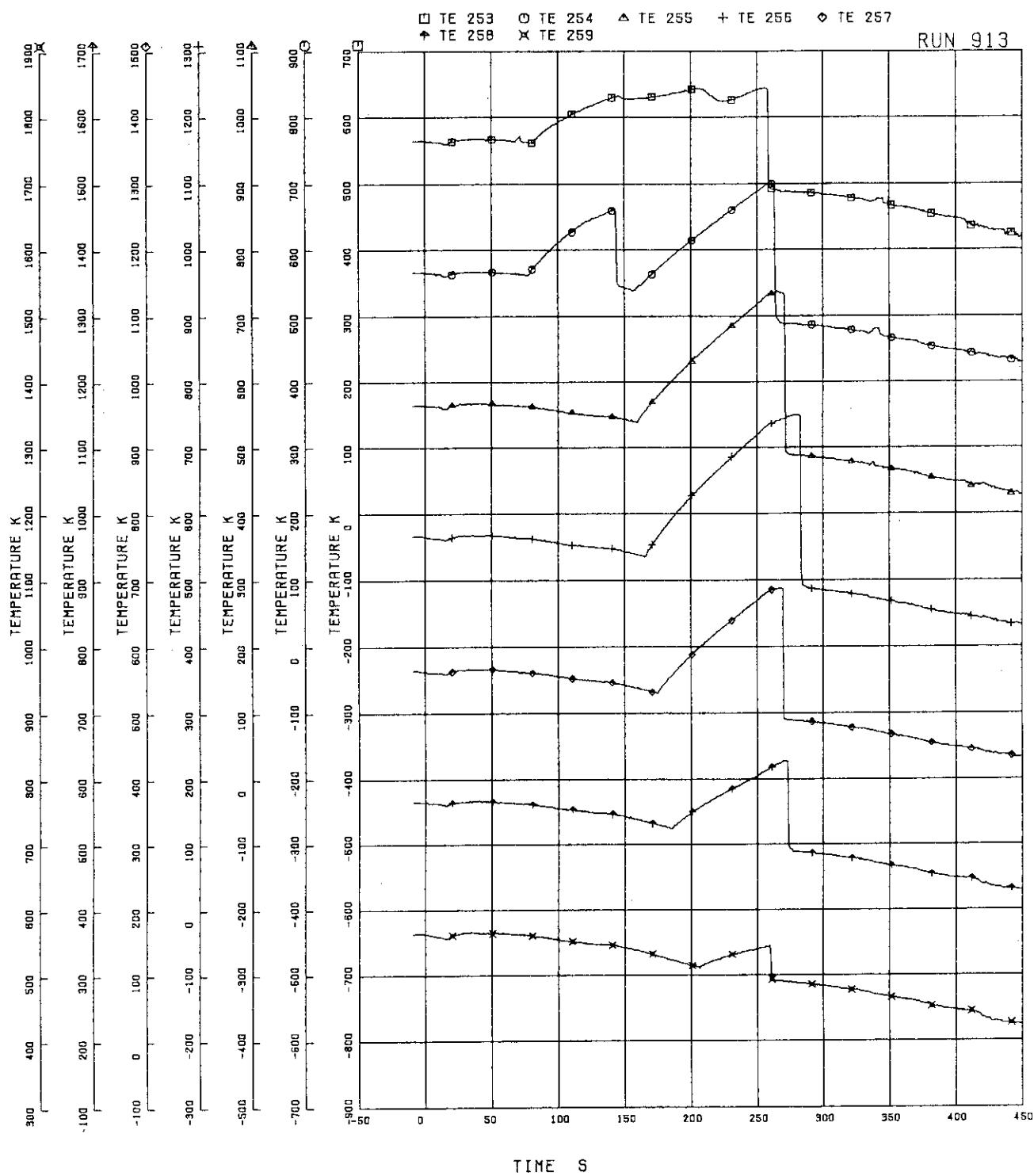


FIG. 5. 91 SURFACE TEMPERATURES OF FUEL ROD A33

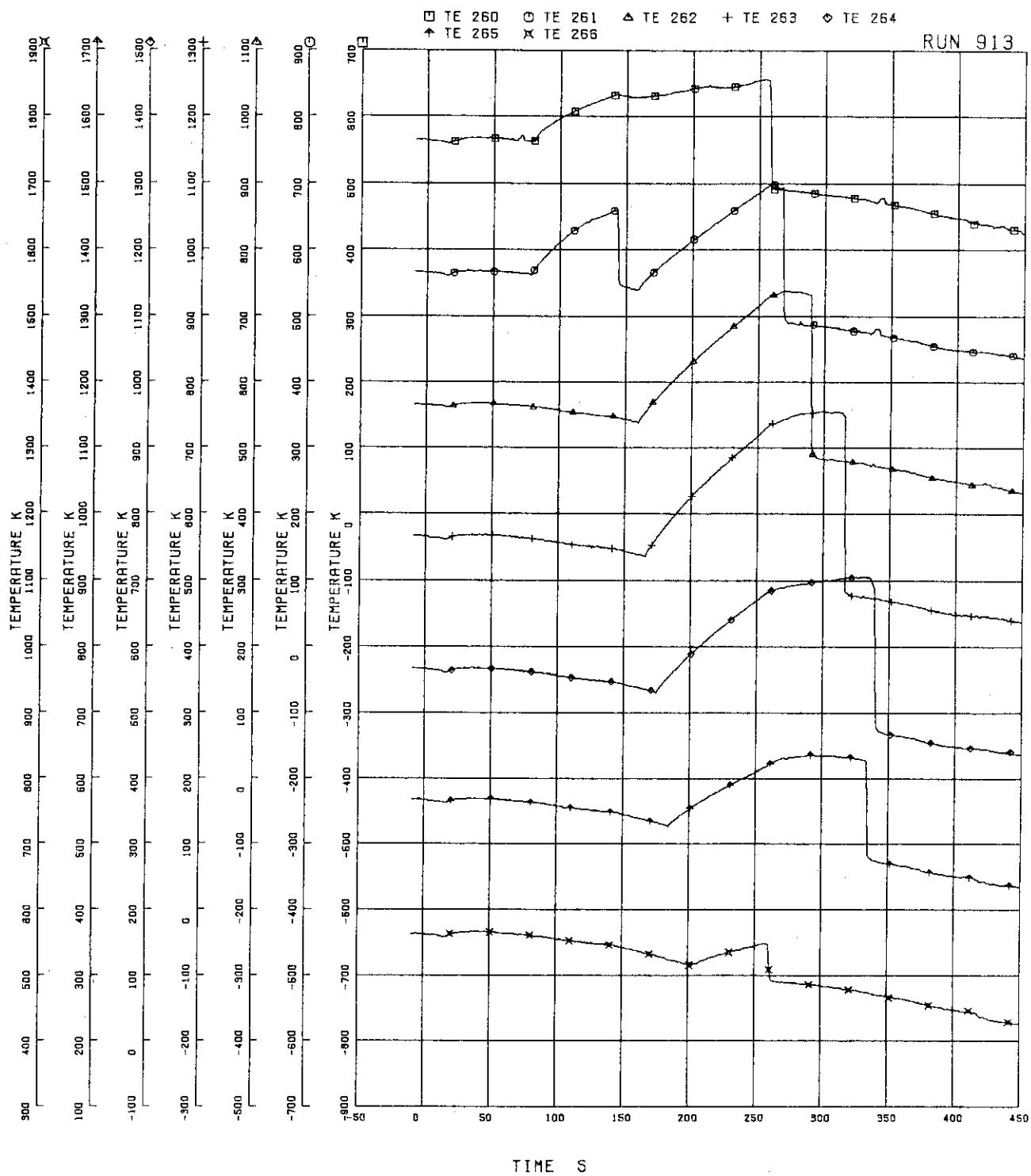


FIG. 5. 92 SURFACE TEMPERATURES OF FUEL ROD A34

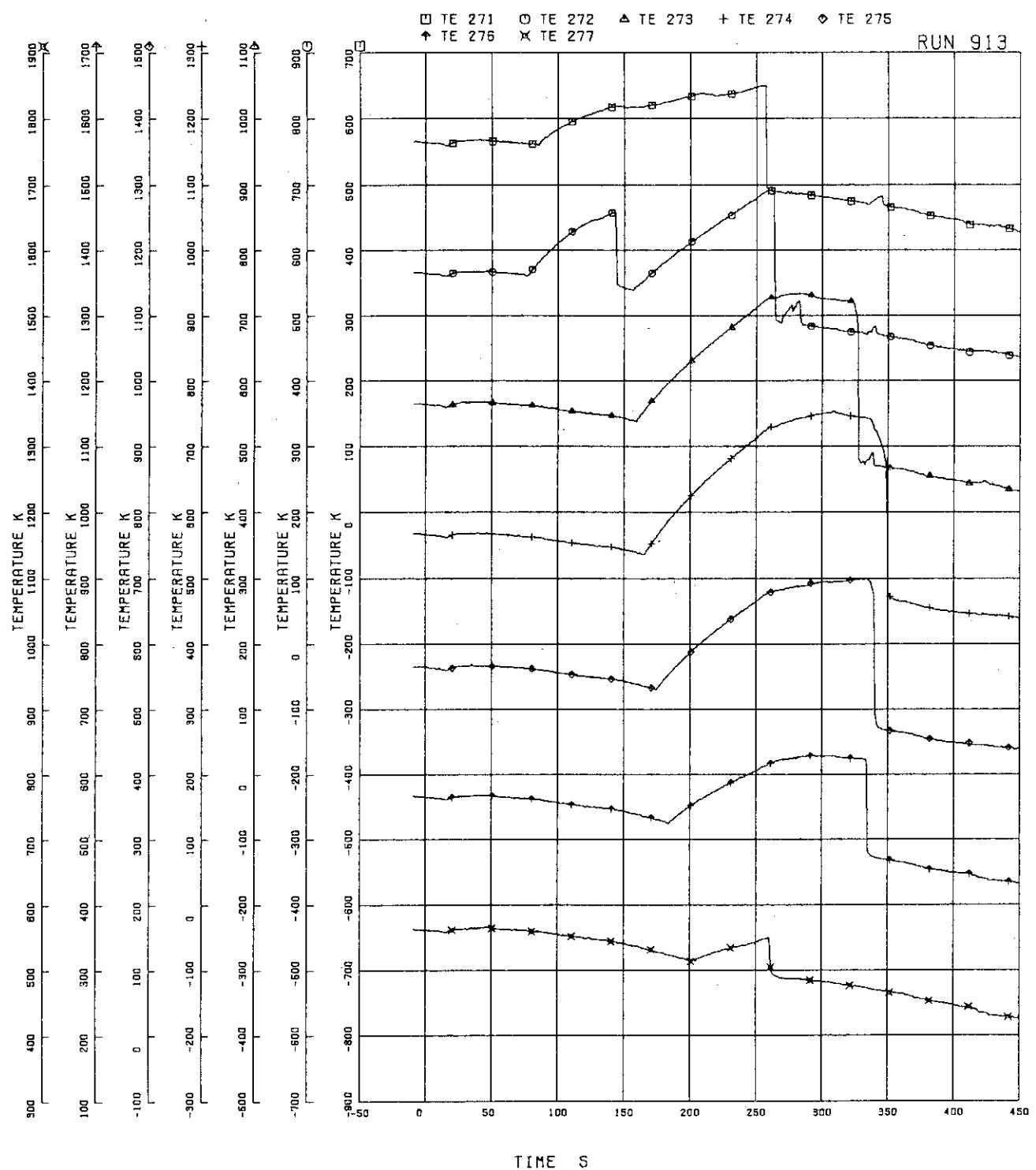
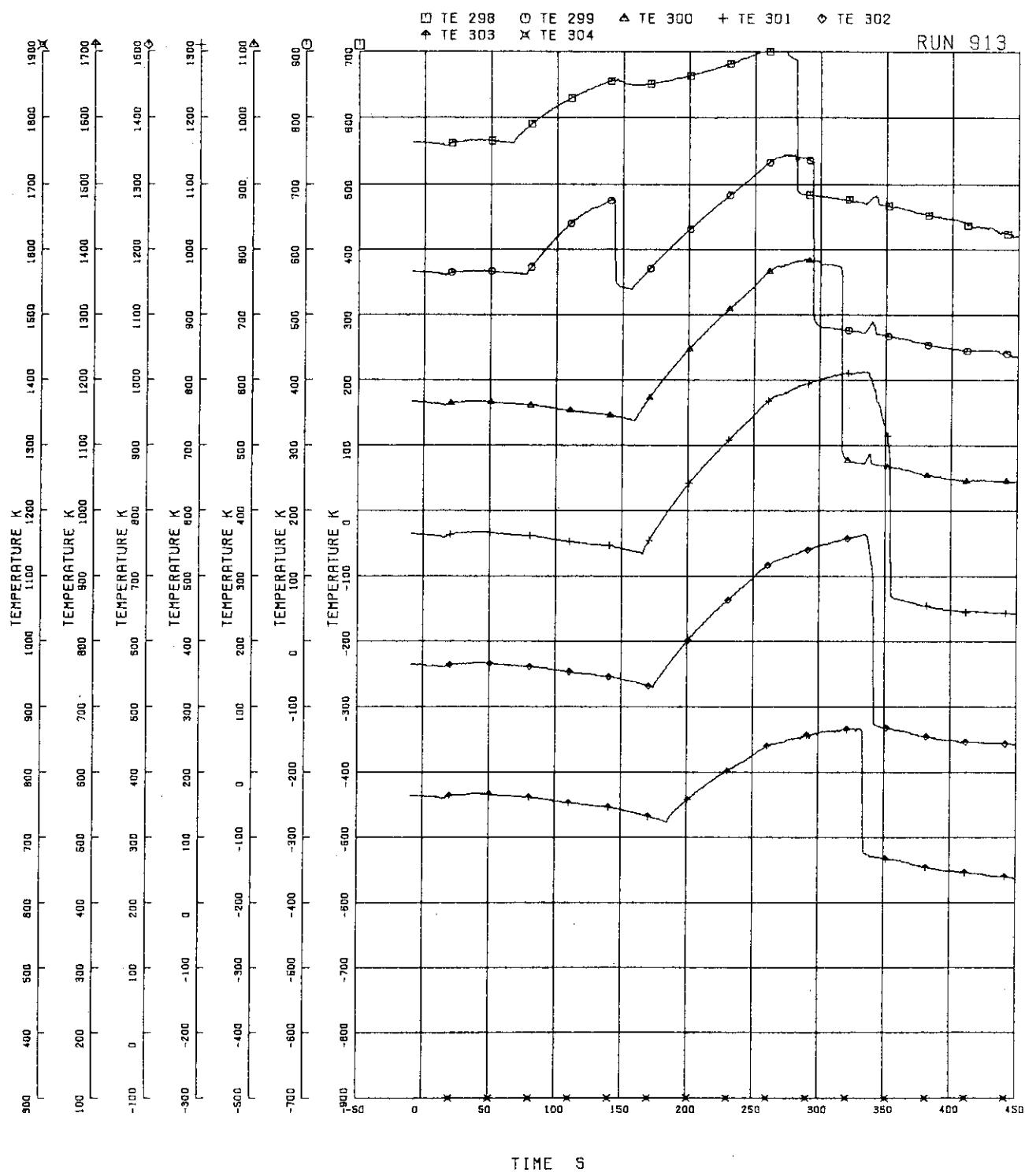


FIG. 5. 93 SURFACE TEMPERATURES OF FUEL ROD A44



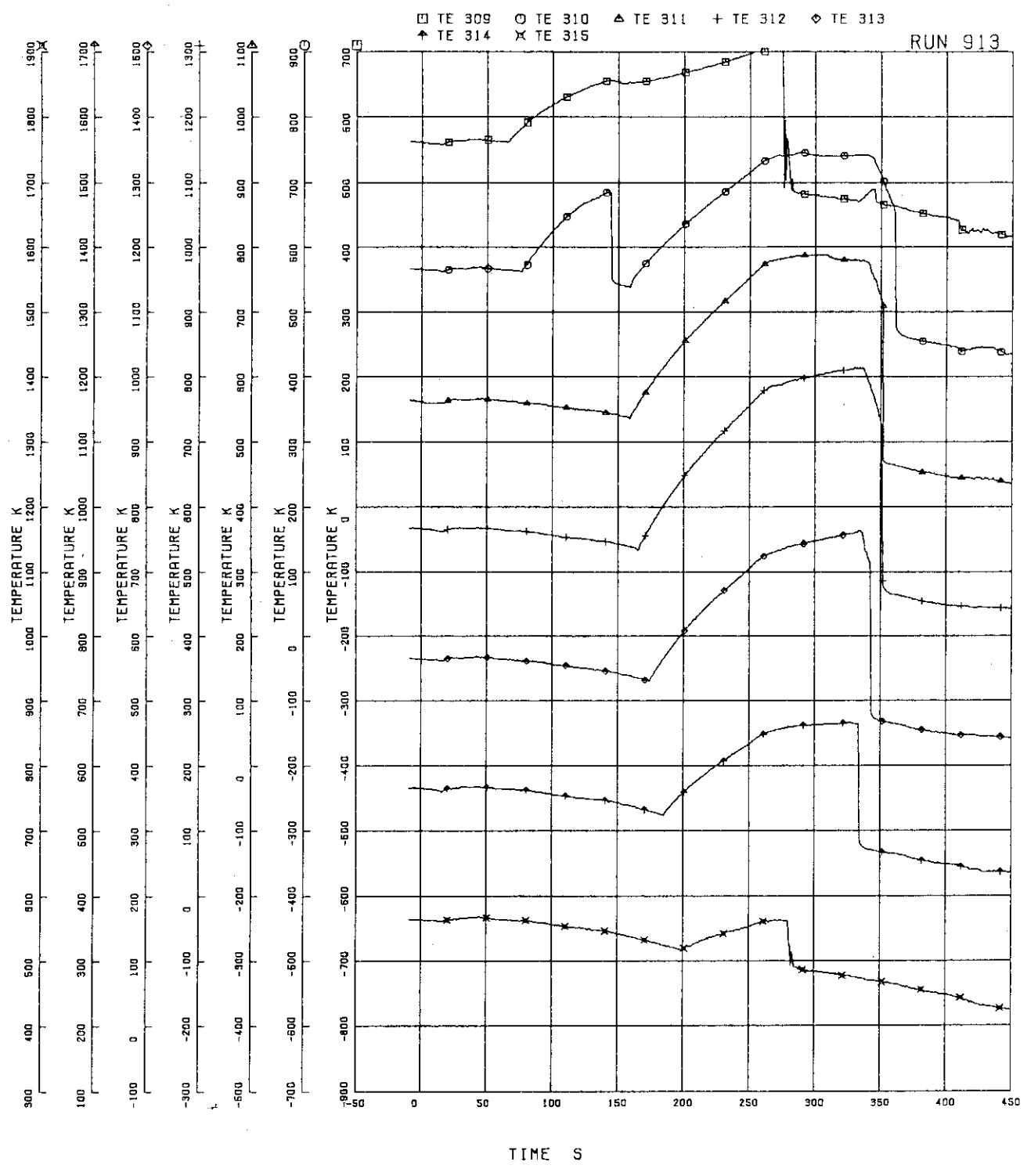


FIG. 5. 95 SURFACE TEMPERATURES OF FUEL ROD A85

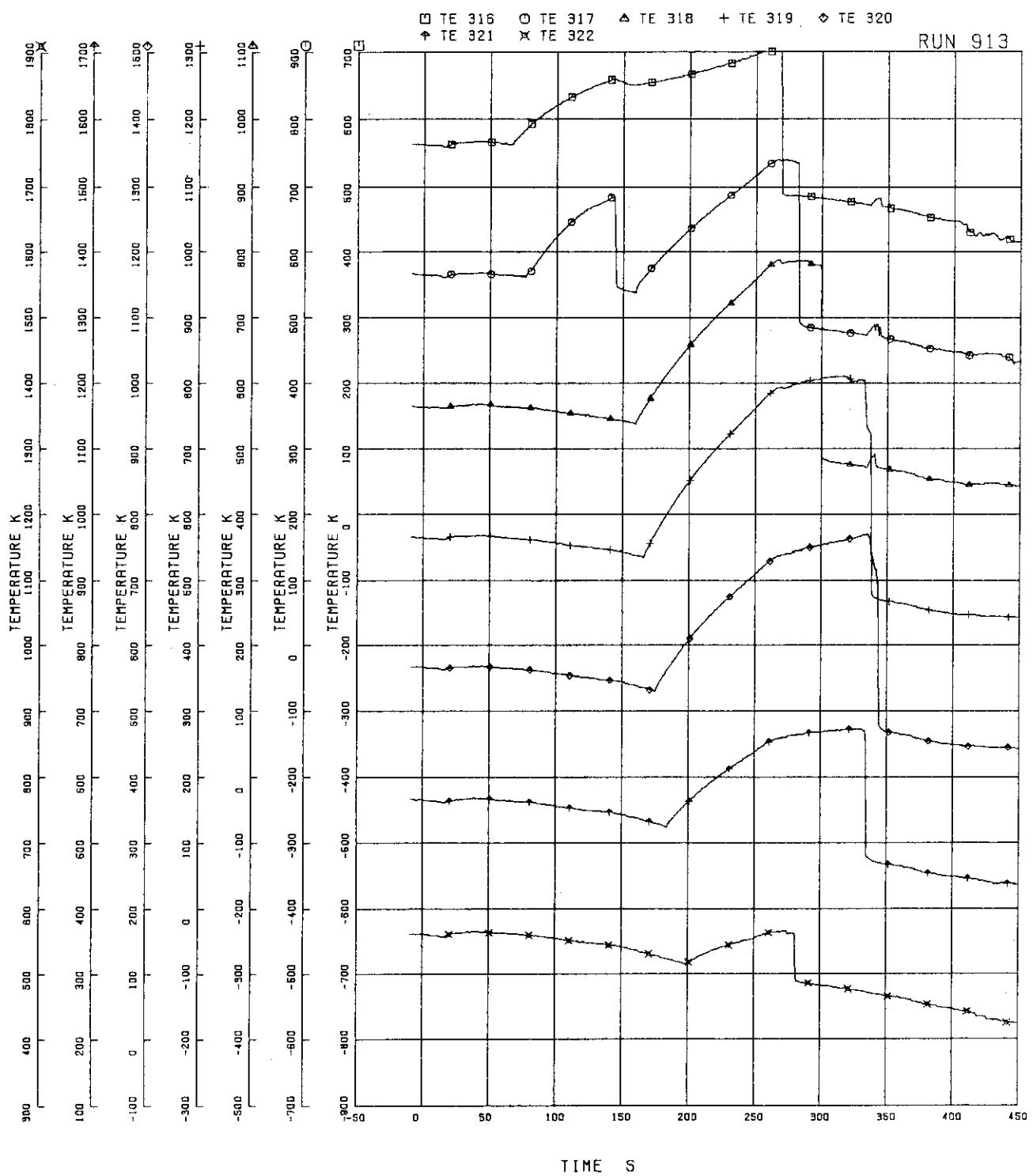


FIG. 5. 96 SURFACE TEMPERATURES OF FUEL ROD A87

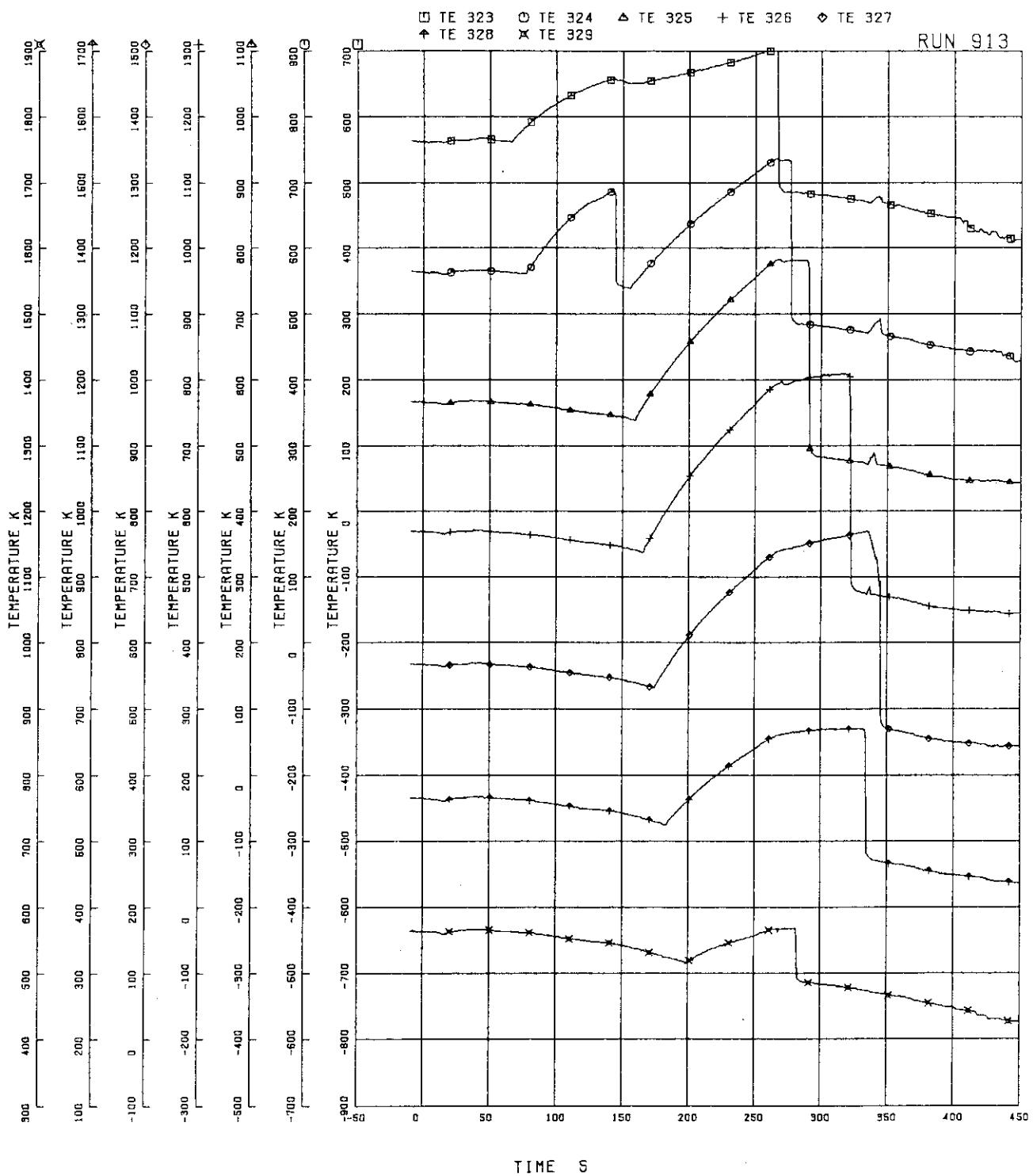


FIG. 5. 97 SURFACE TEMPERATURES OF FUEL ROD A88

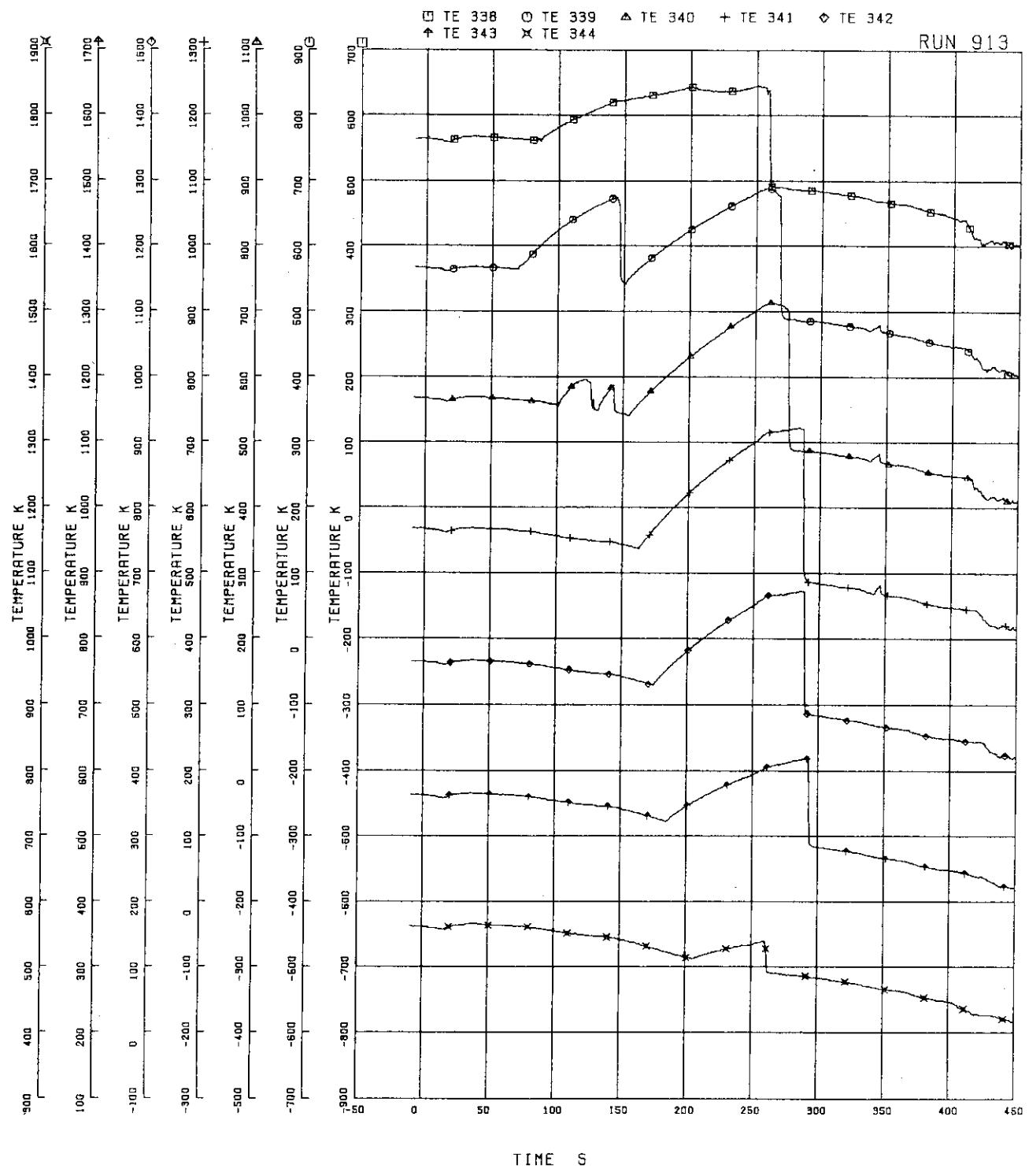


FIG. 5. 98 SURFACE TEMPERATURES OF FUEL ROD B22

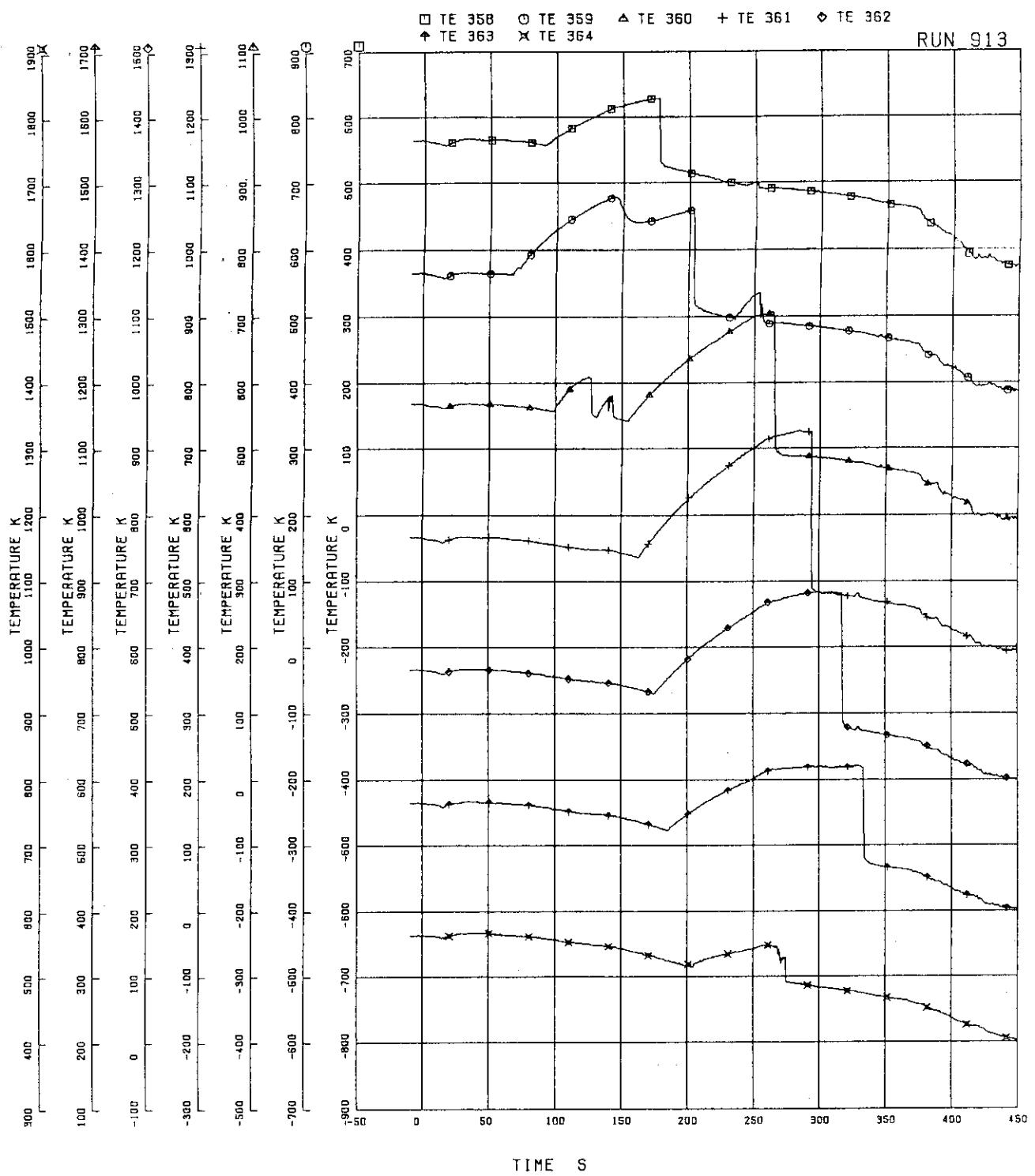


FIG. 5. 99 SURFACE TEMPERATURES OF FUEL ROD C11

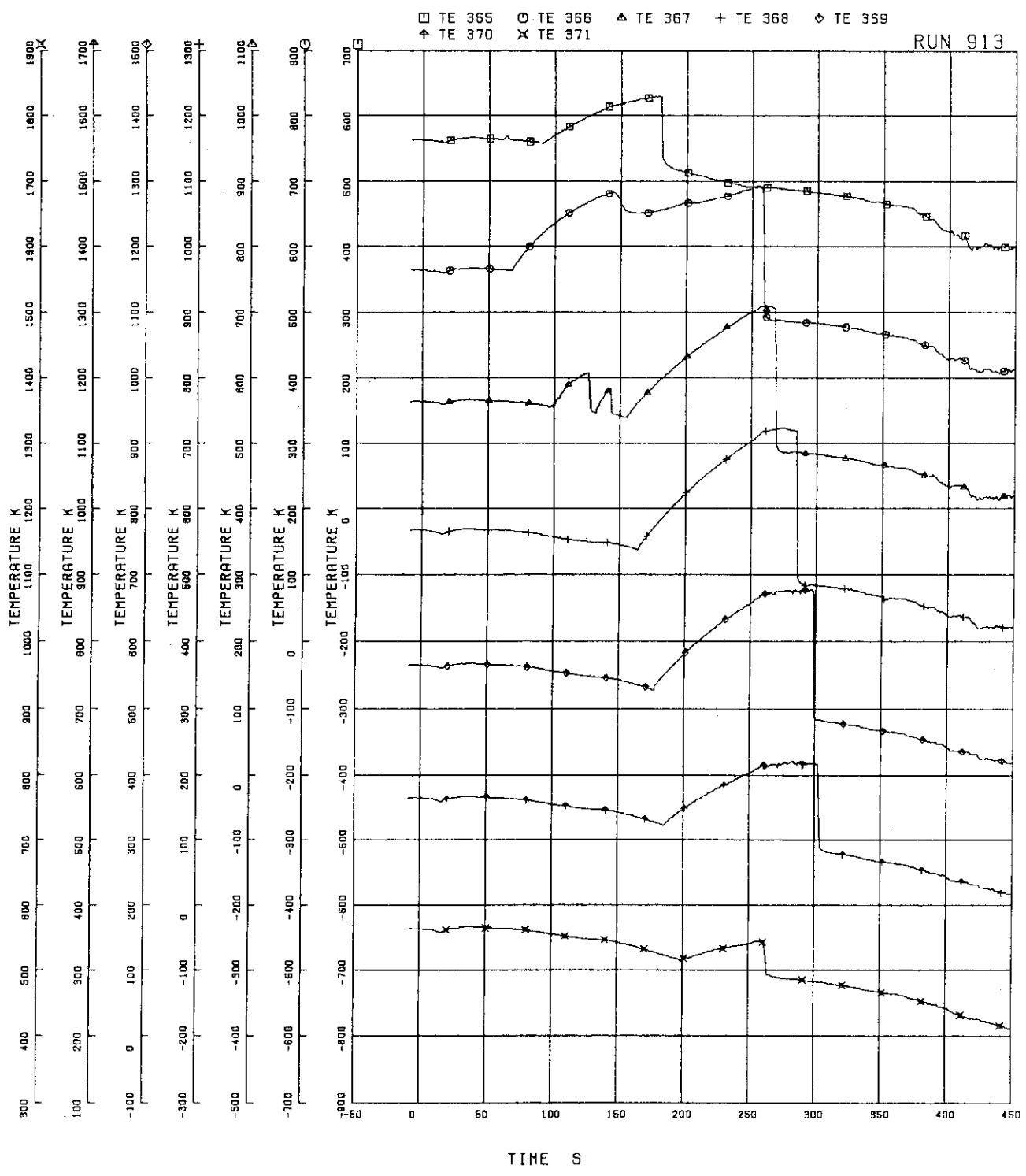


FIG.5.100 SURFACE TEMPERATURES OF FUEL ROD C13

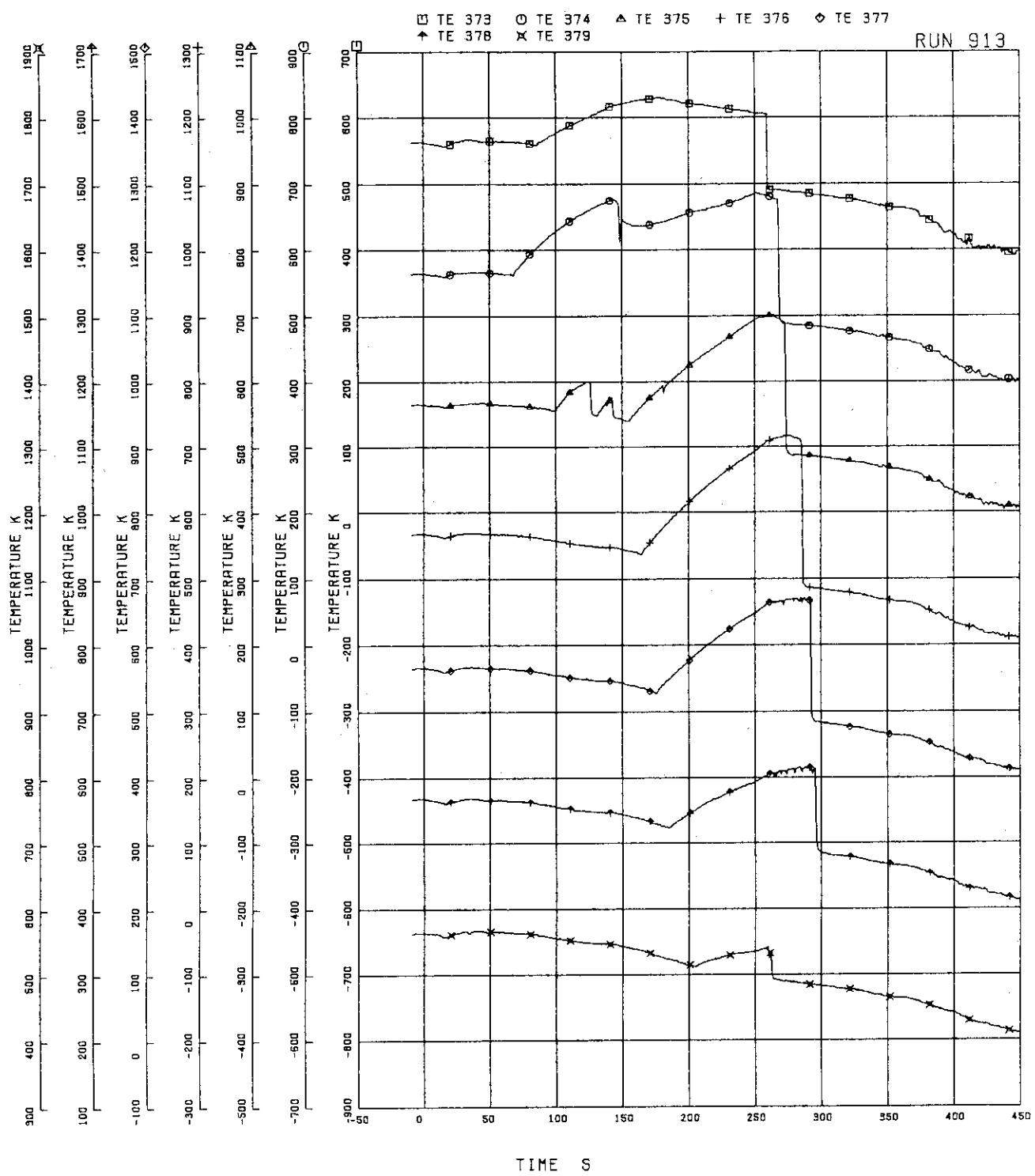


FIG.5.101 SURFACE TEMPERATURES OF FUEL ROD C22

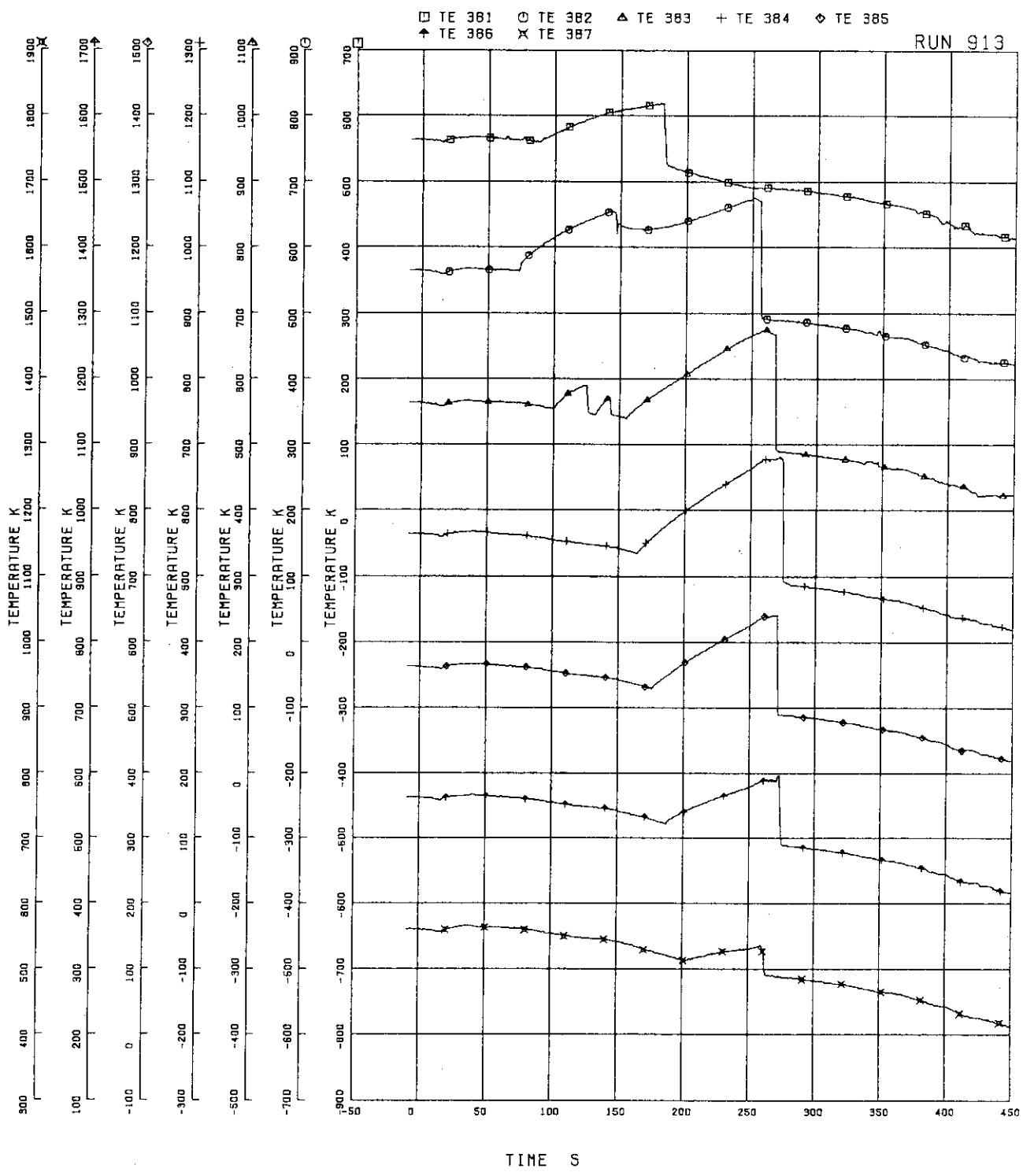


FIG. 5.102 SURFACE TEMPERATURES OF FUEL ROD C33

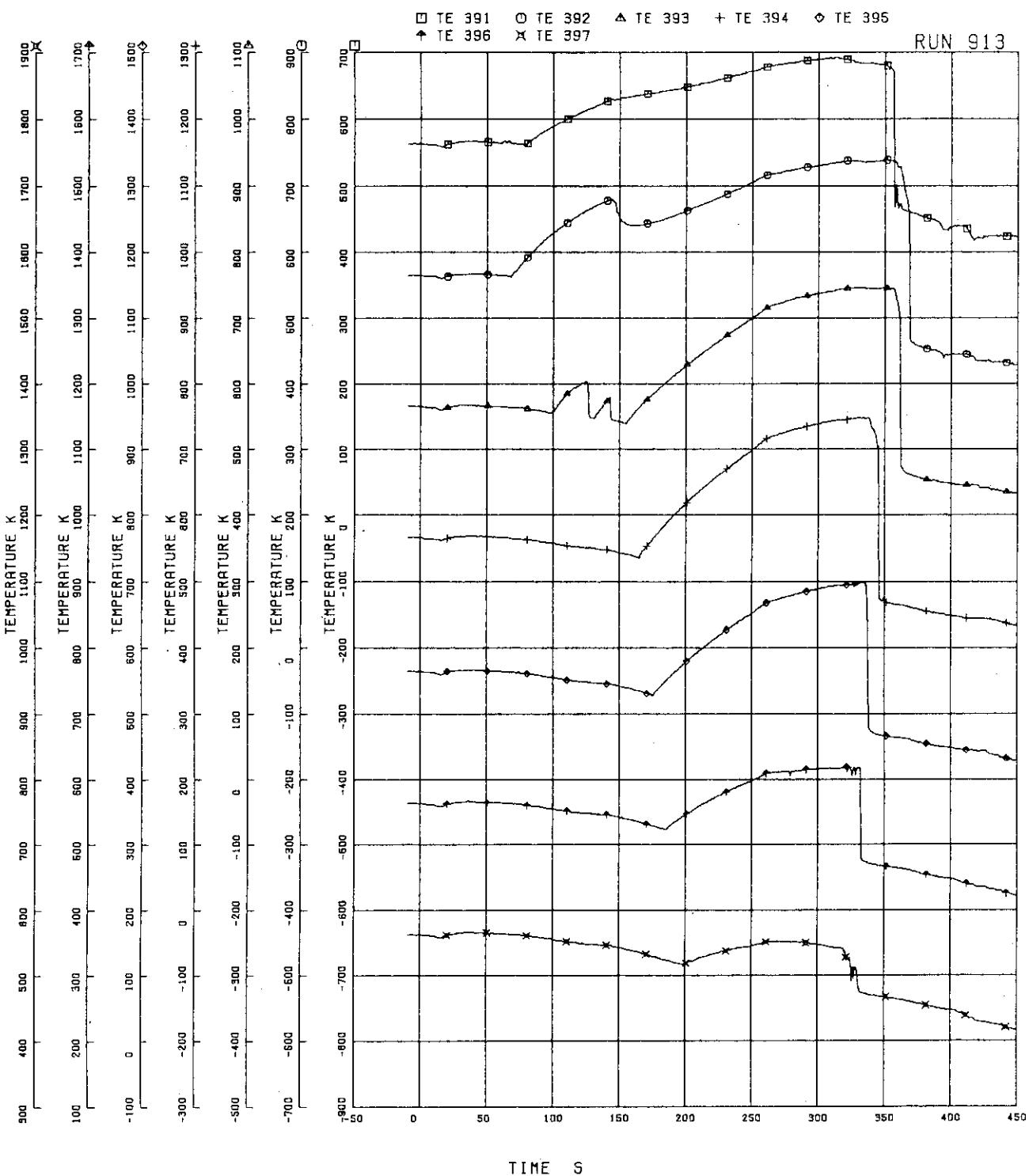


FIG.5.103 SURFACE TEMPERATURES OF FUEL ROD C77

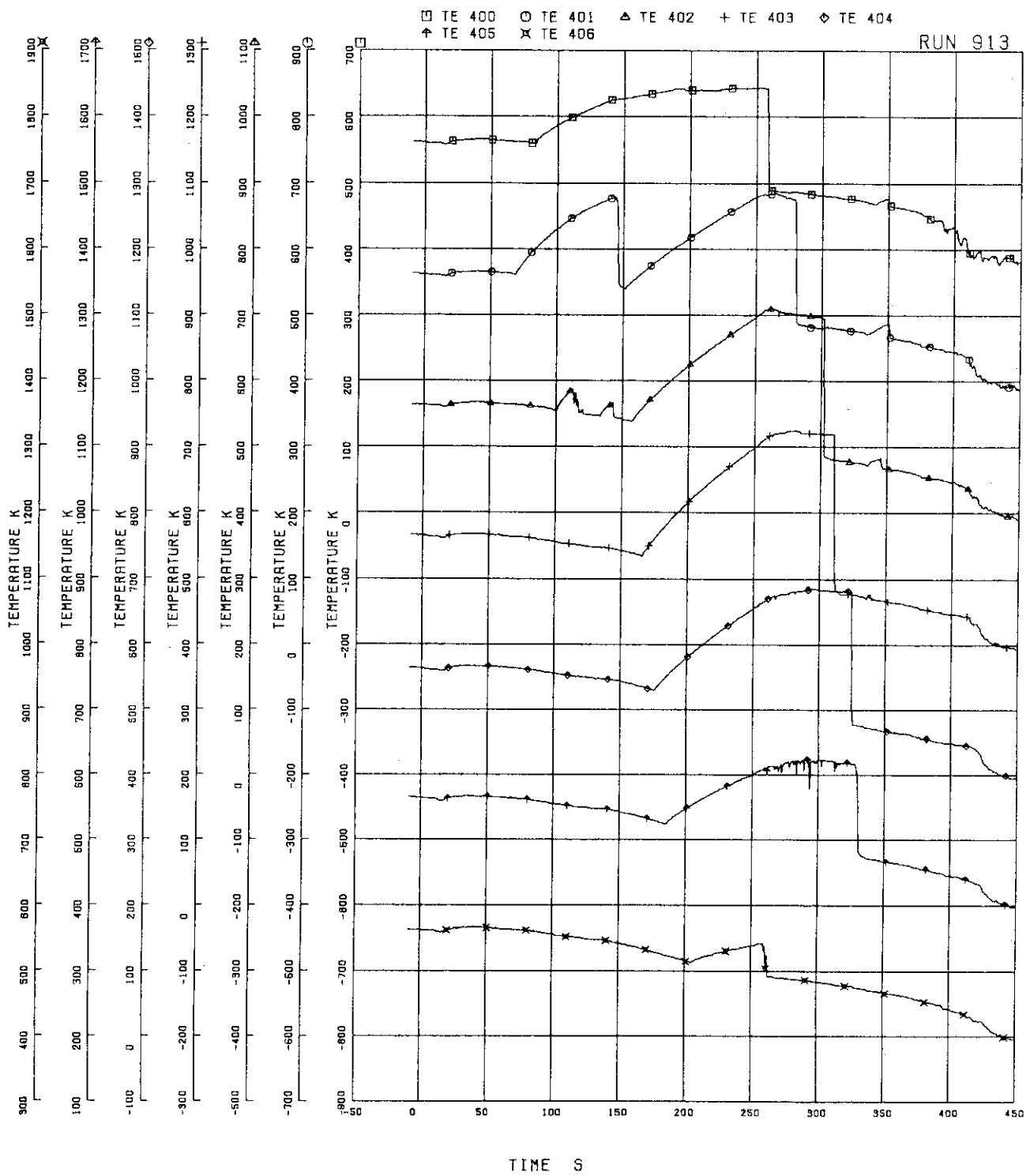


FIG. 5.104 SURFACE TEMPERATURES OF FUEL ROD D22

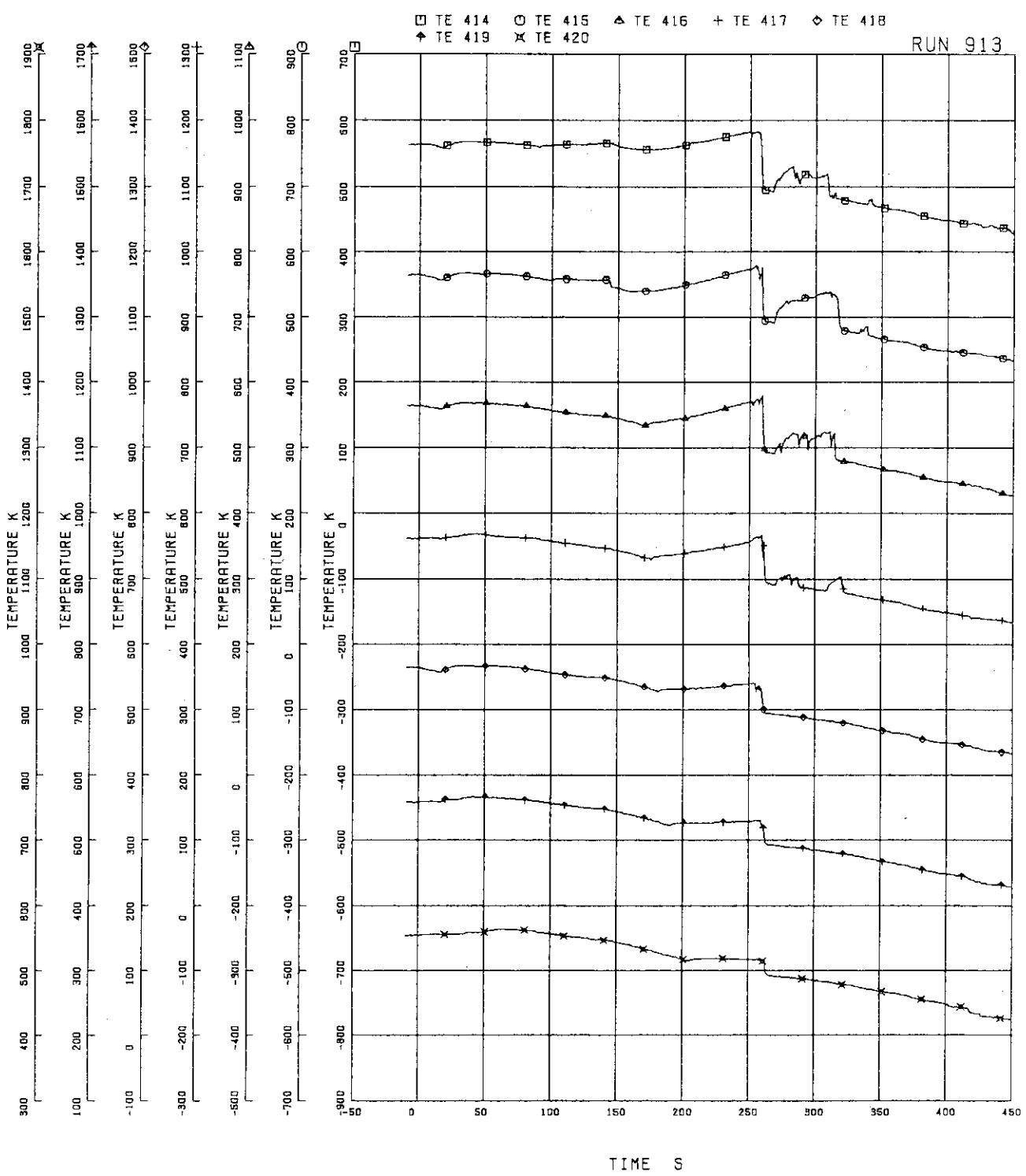


FIG.5.105 SURFACE TEMPERATURES OF
WATER ROD SIMULATOR A45

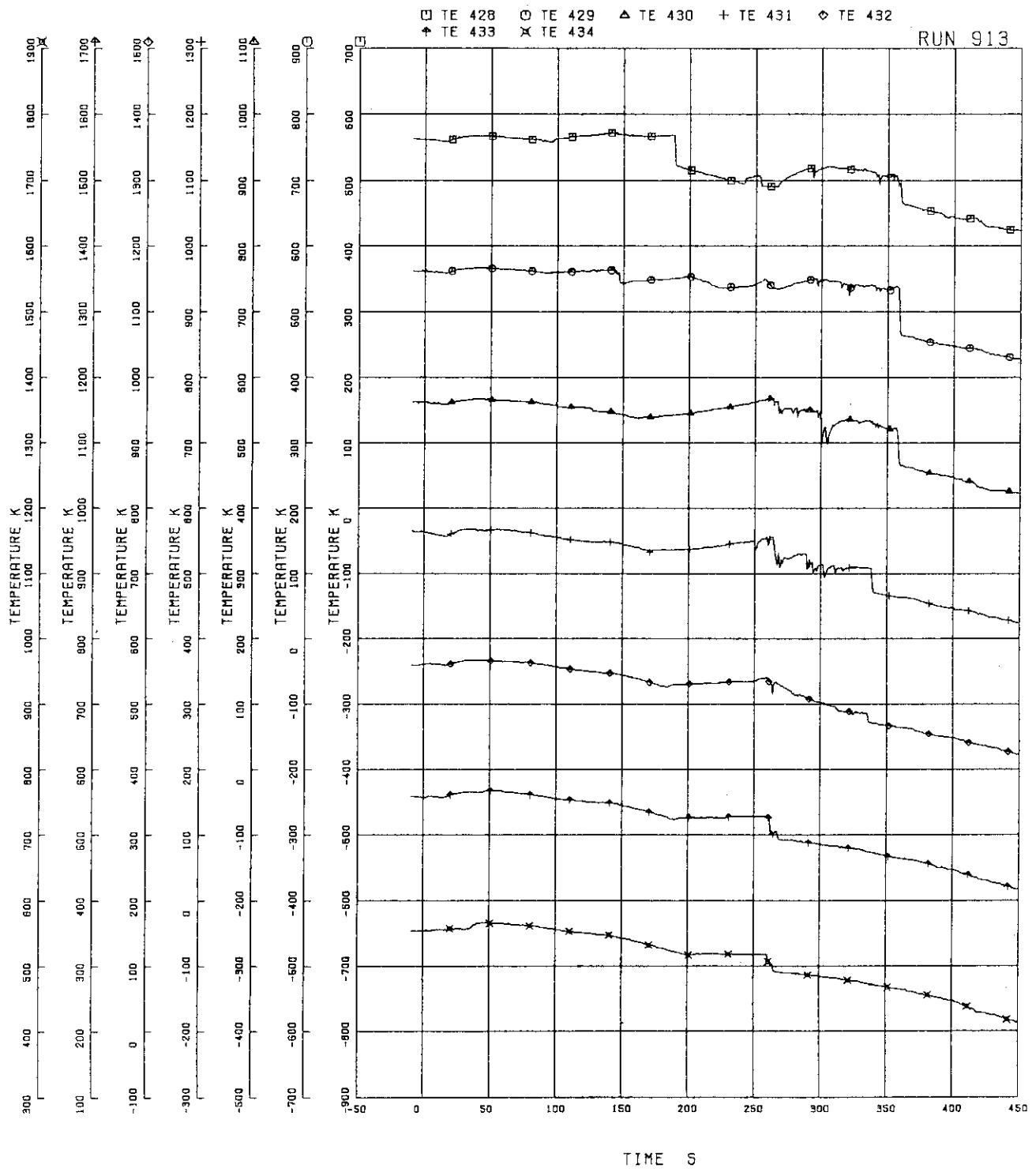


FIG. 5-106 SURFACE TEMPERATURES OF
WATER ROD SIMULATOR C45

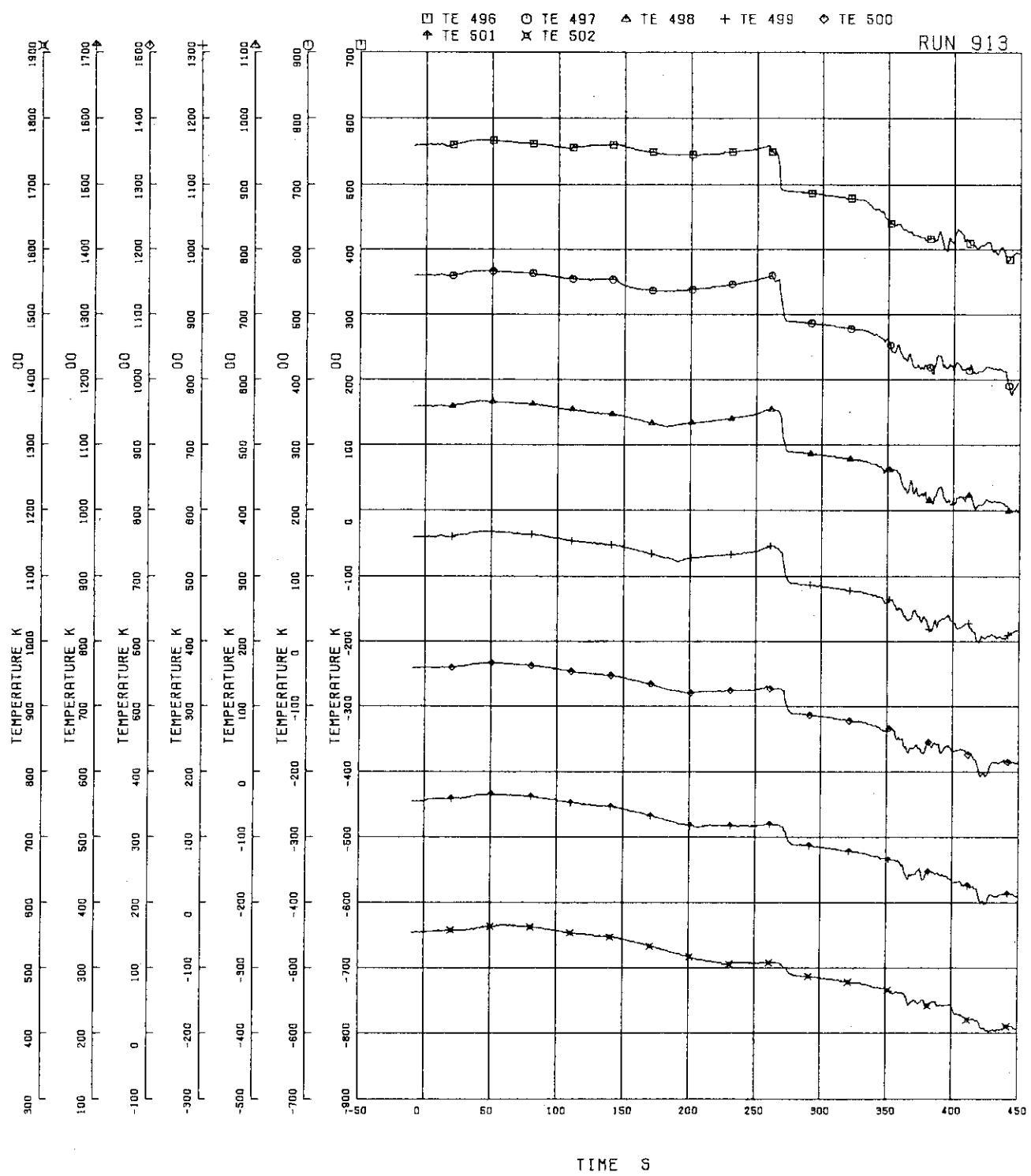


FIG.5.107 INNER SURFACE TEMPERATURES OF
CHANNEL BOX A, LOCATION A1

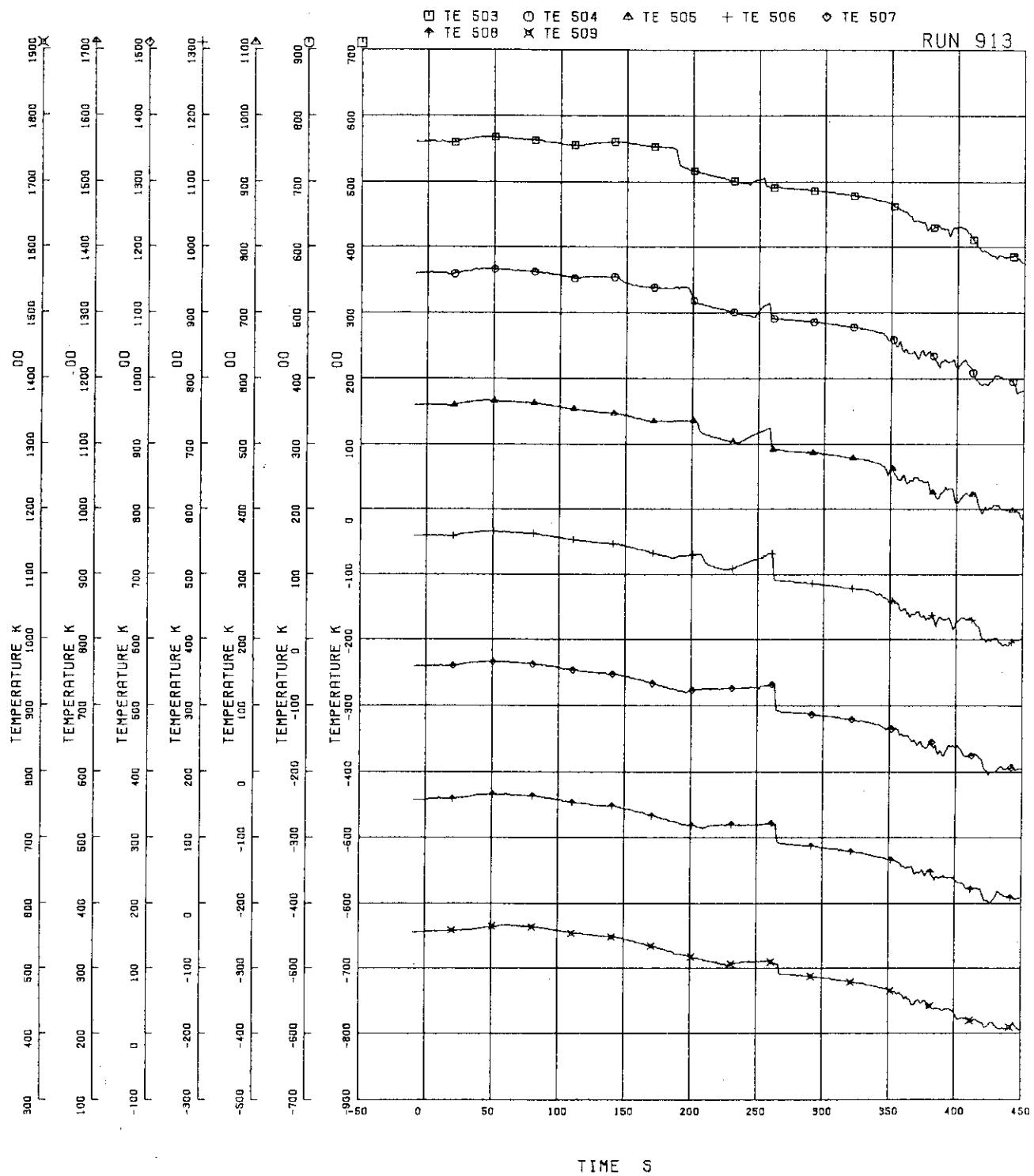


FIG. 5.108 INNER SURFACE TEMPERATURES OF CHANNEL BOX A, LOCATION A2

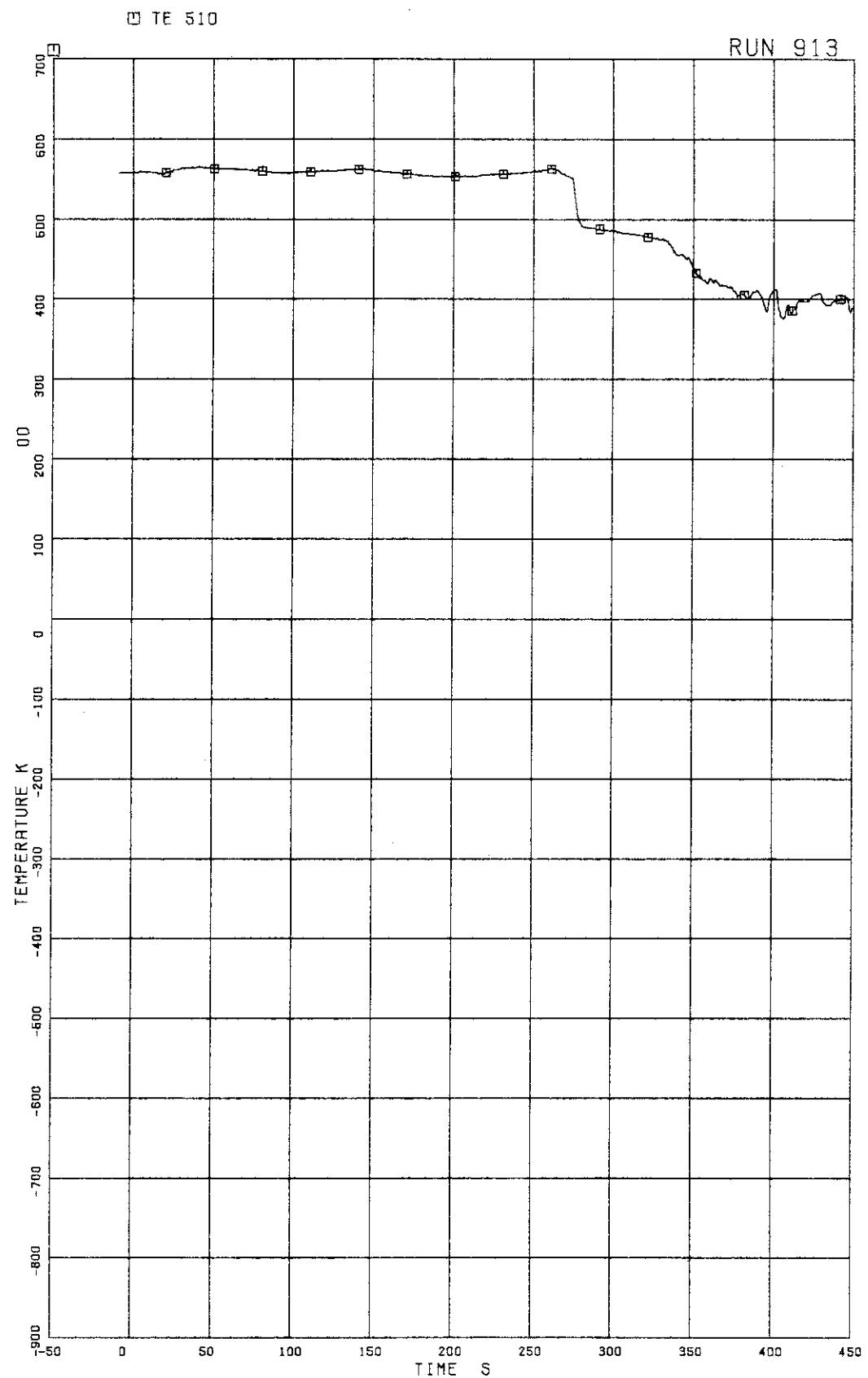


FIG. 5.109 INNER SURFACE TEMPERATURE OF CHANNEL BOX B (POSITION 1)

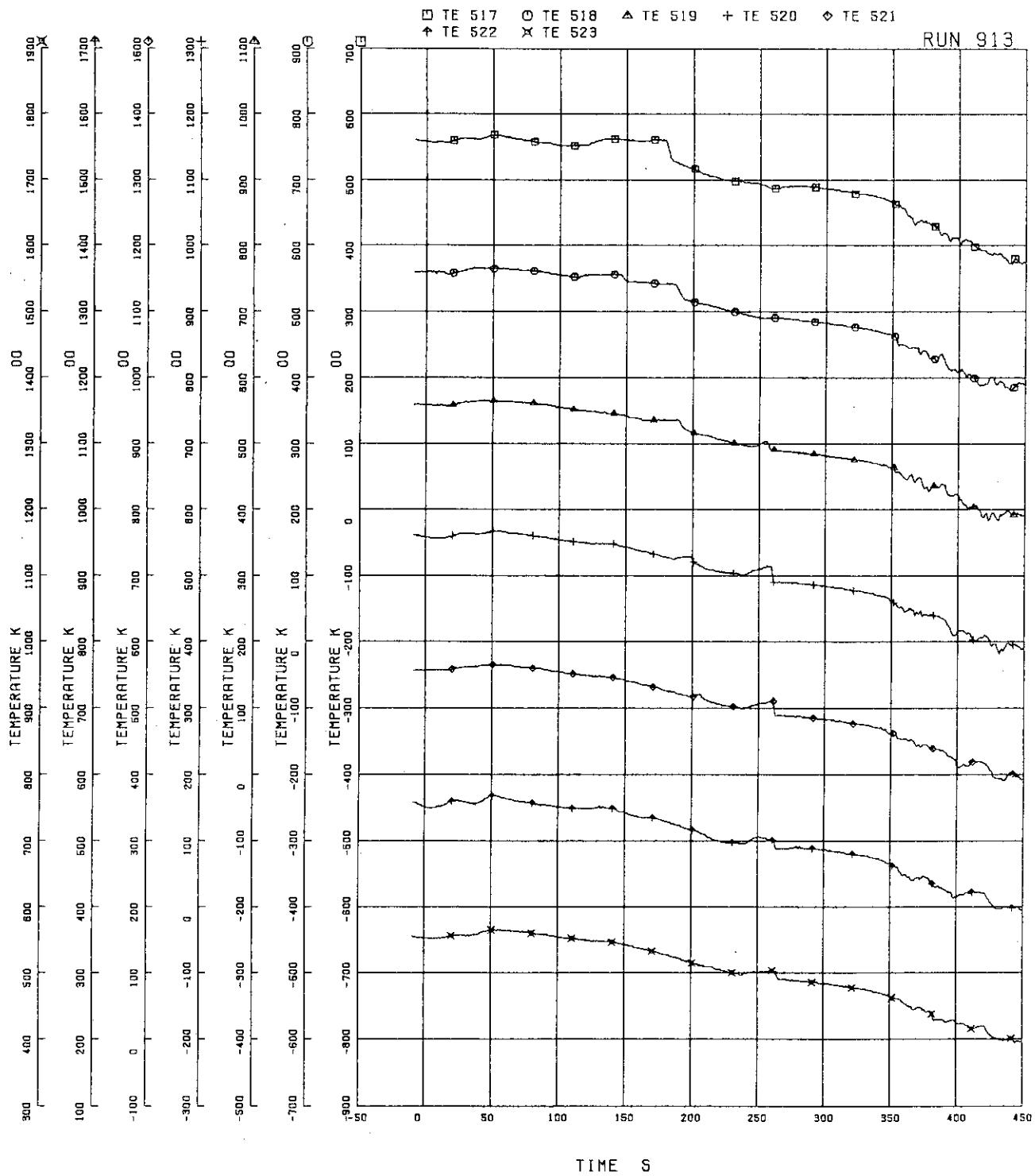


FIG. 5.110 INNER SURFACE TEMPERATURES OF CHANNEL BOX C

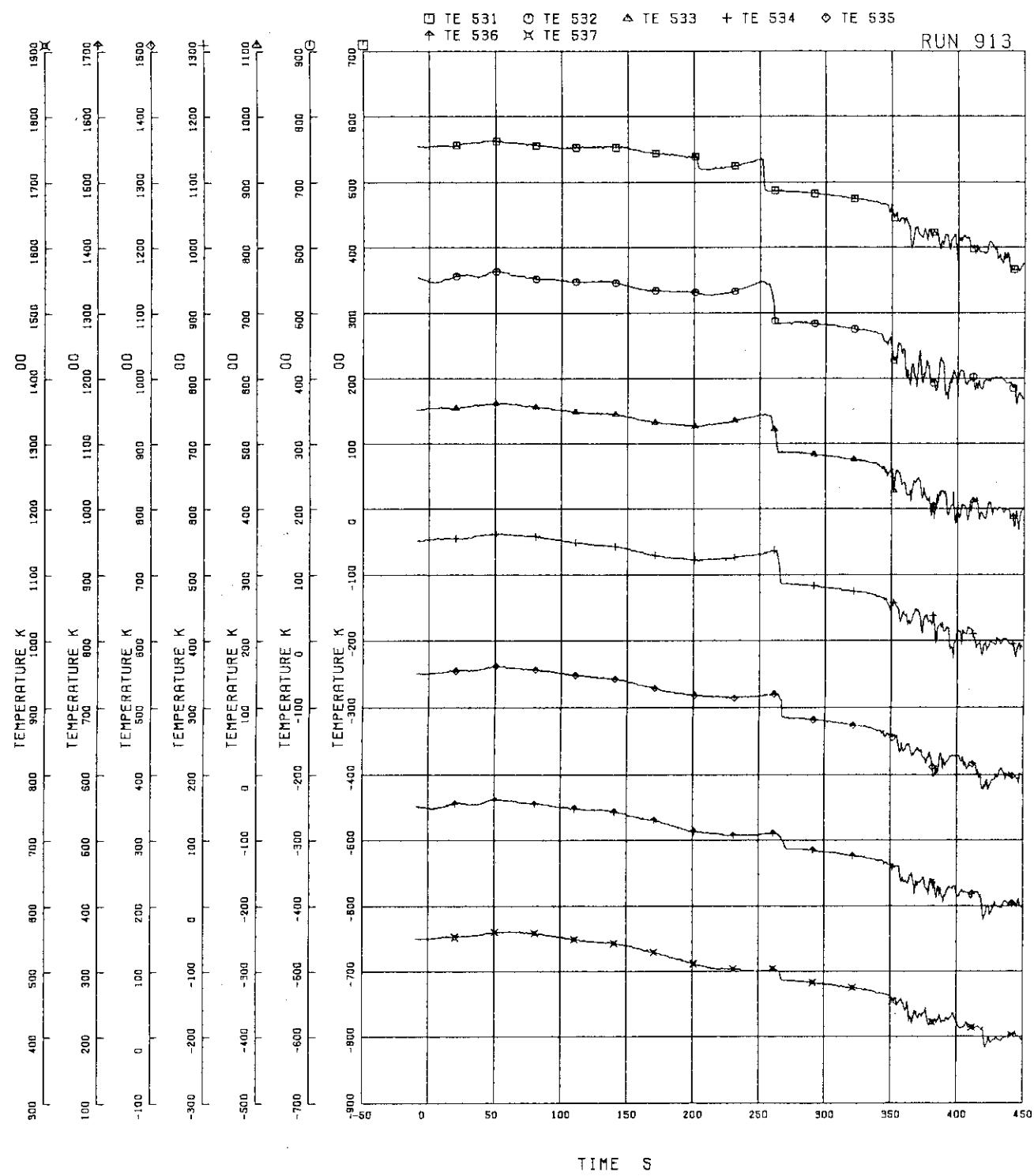


FIG. 5.111 OUTER SURFACE TEMPERATURES OF CHANNEL BOX A

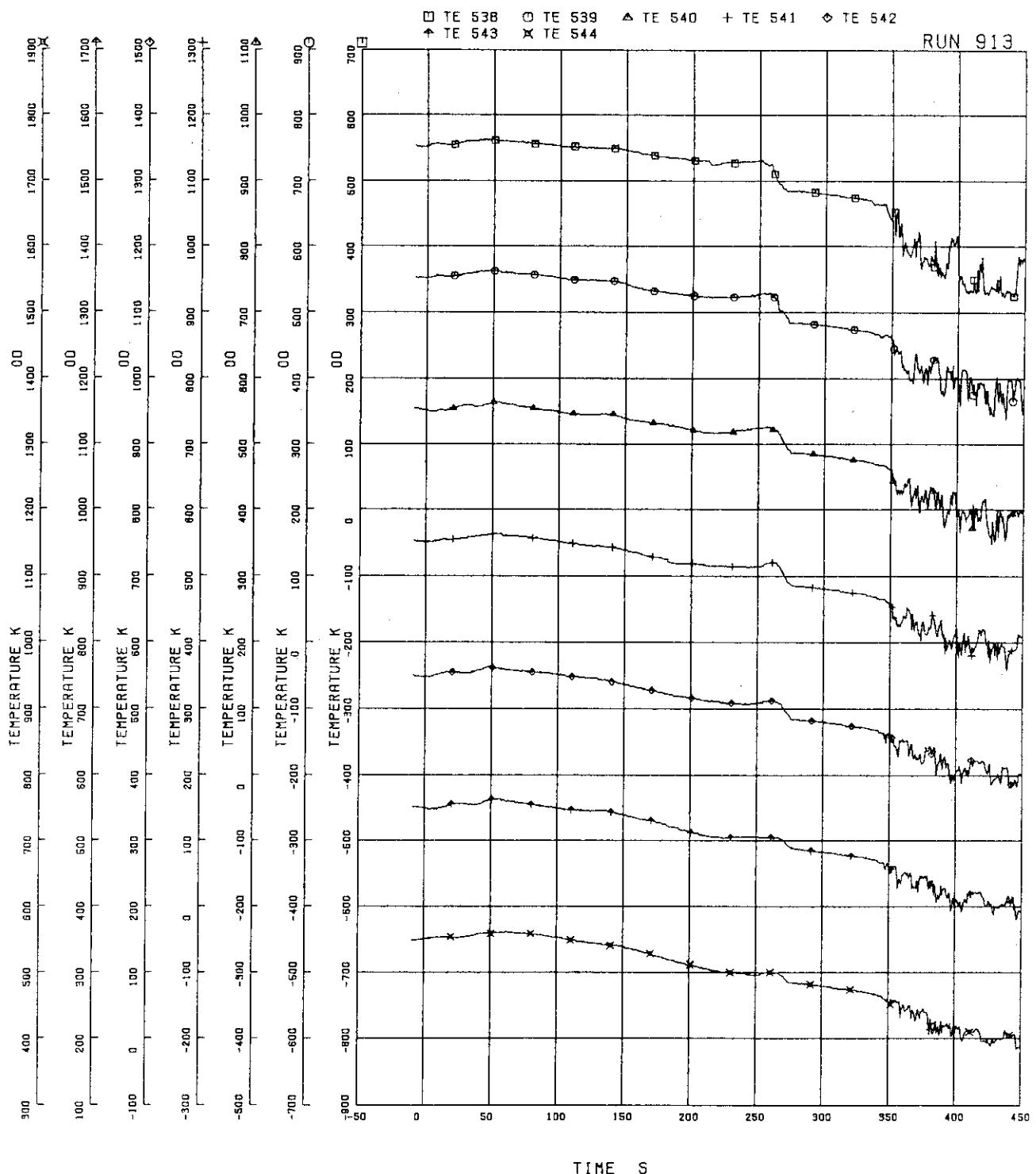


FIG. 5.112 OUTER SURFACE TEMPERATURES OF CHANNEL BOX C

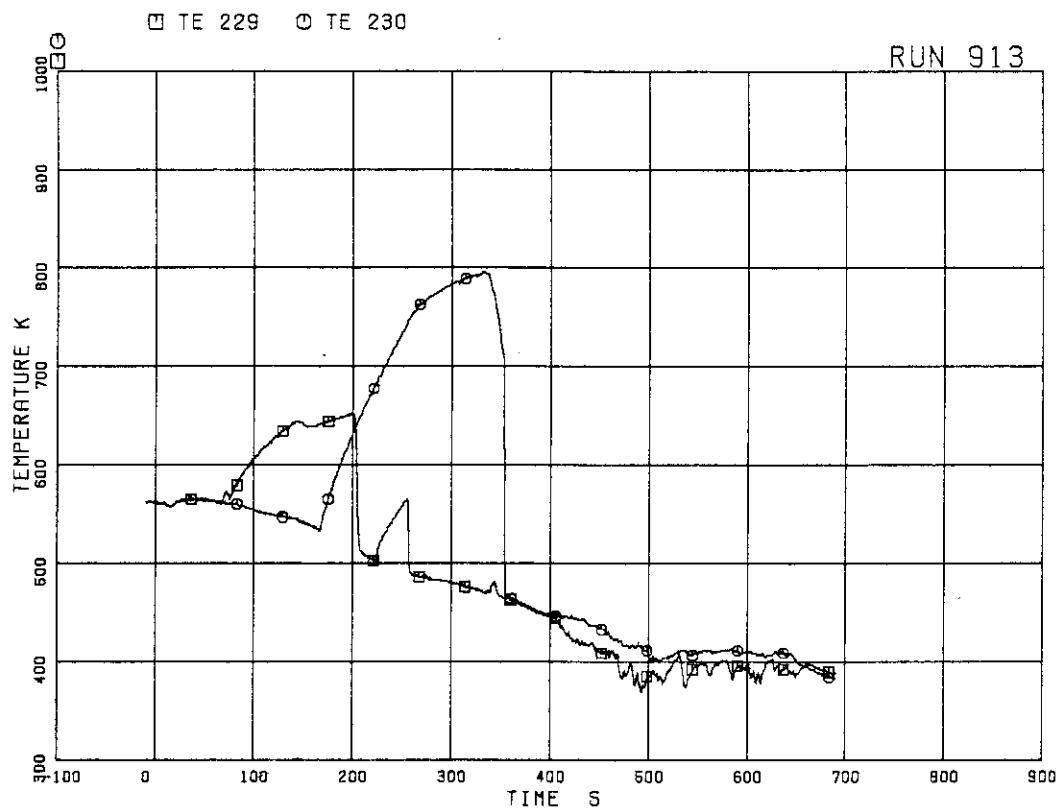


FIG.5.113 SURFACE TEMPERATURES OF FUEL ROD A15
AT POSITIONS 1 AND 4

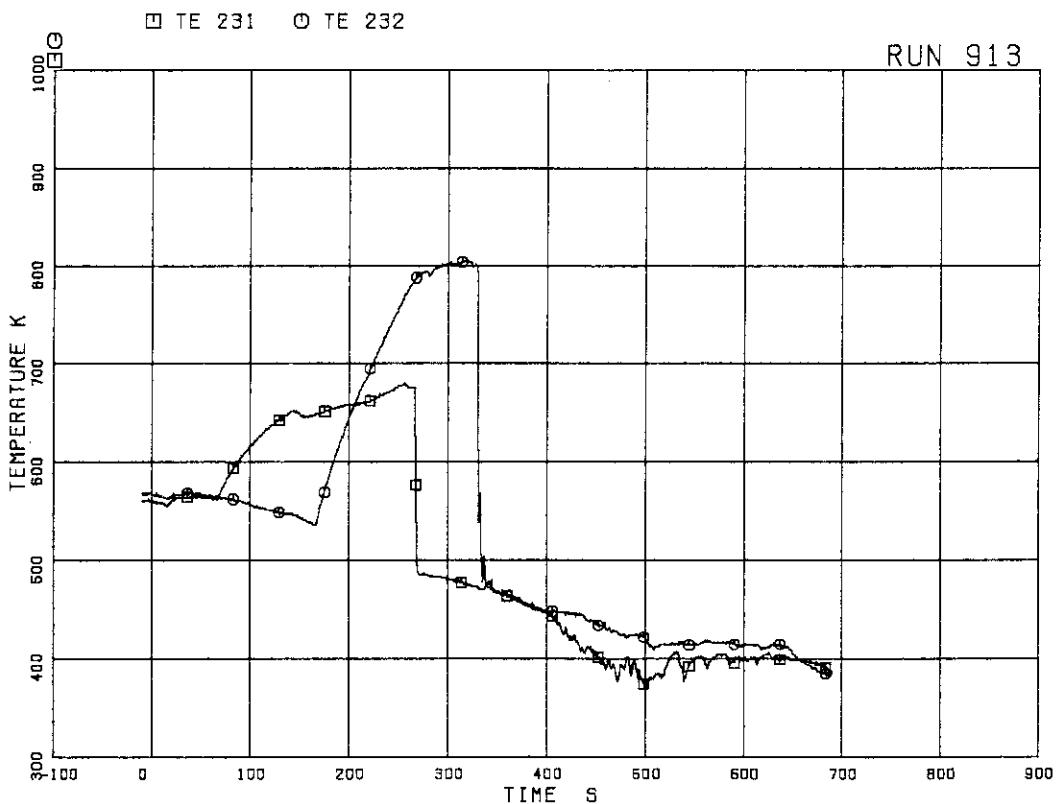


FIG.5.114 SURFACE TEMPERATURES OF FUEL ROD A17
AT POSITIONS 1 AND 4

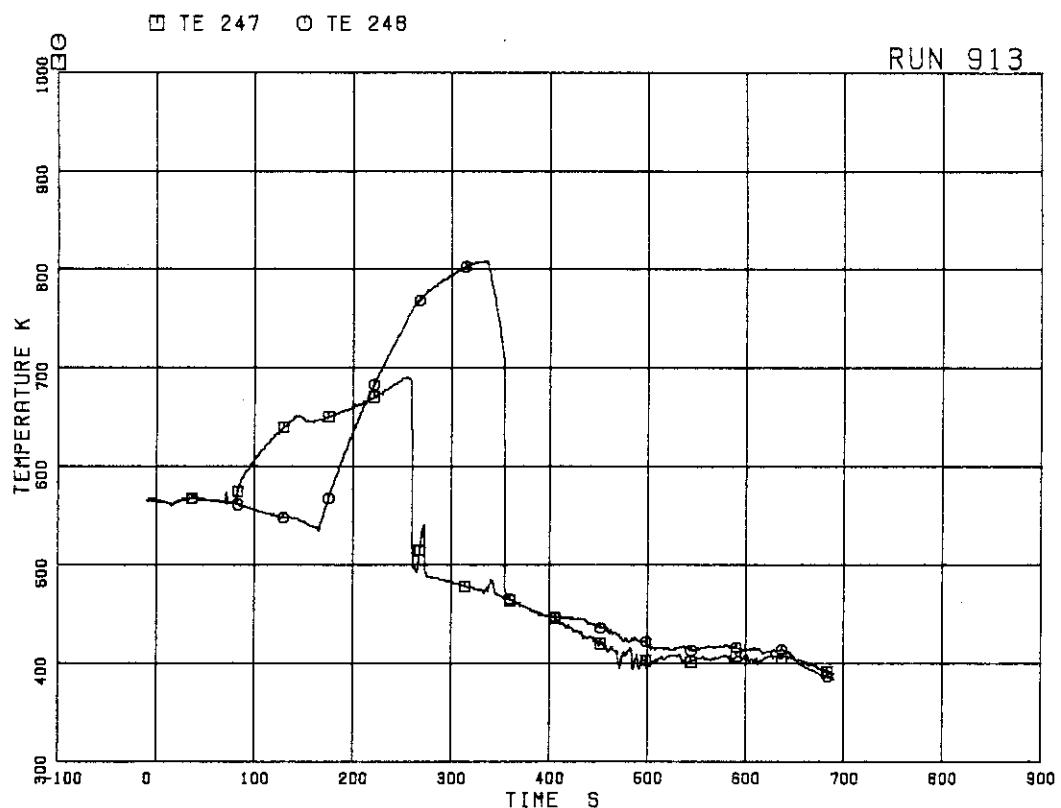


FIG.5.115 SURFACE TEMPERATURES OF FUEL ROD A26
AT POSITIONS 1 AND 4

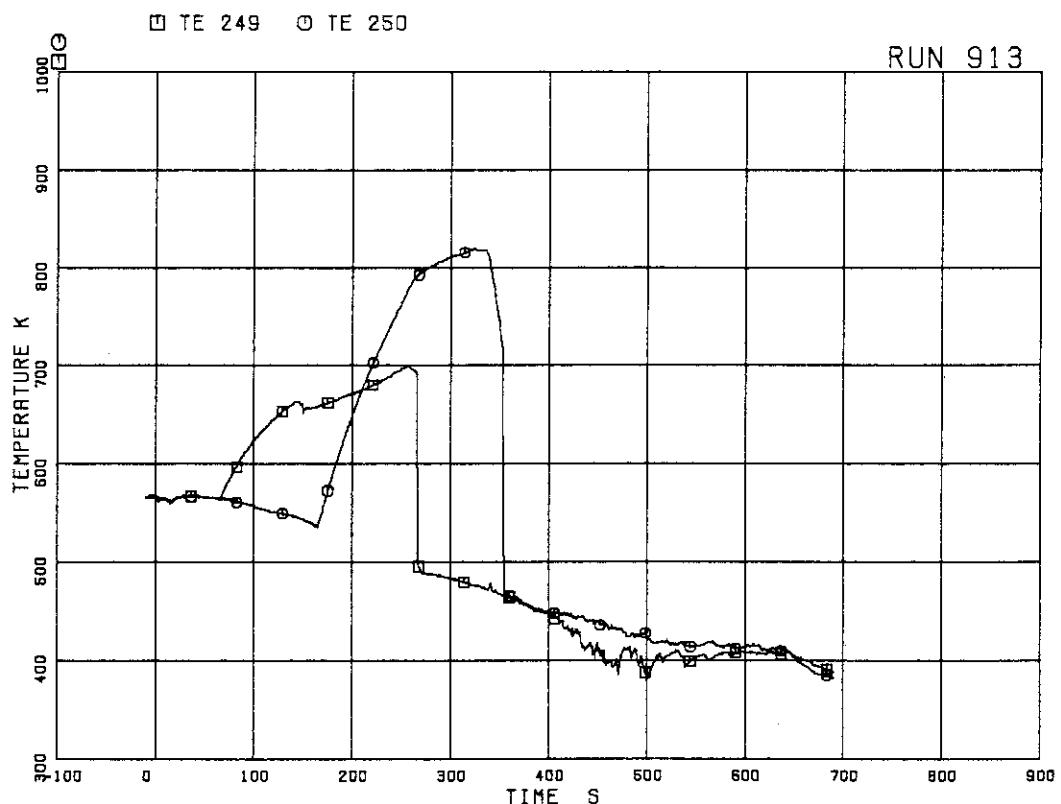


FIG.5.116 SURFACE TEMPERATURES OF FUEL ROD A28
AT POSITIONS 1 AND 4

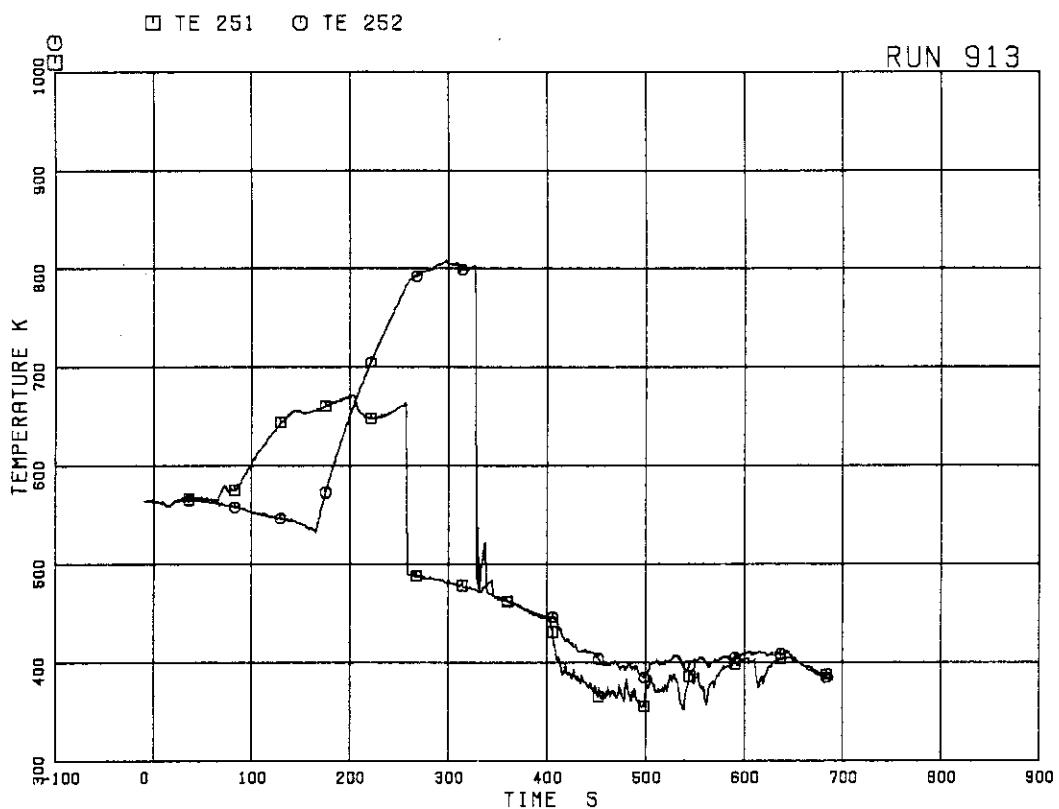


FIG.5.117 SURFACE TEMPERATURES OF FUEL ROD A31
AT POSITIONS 1 AND 4

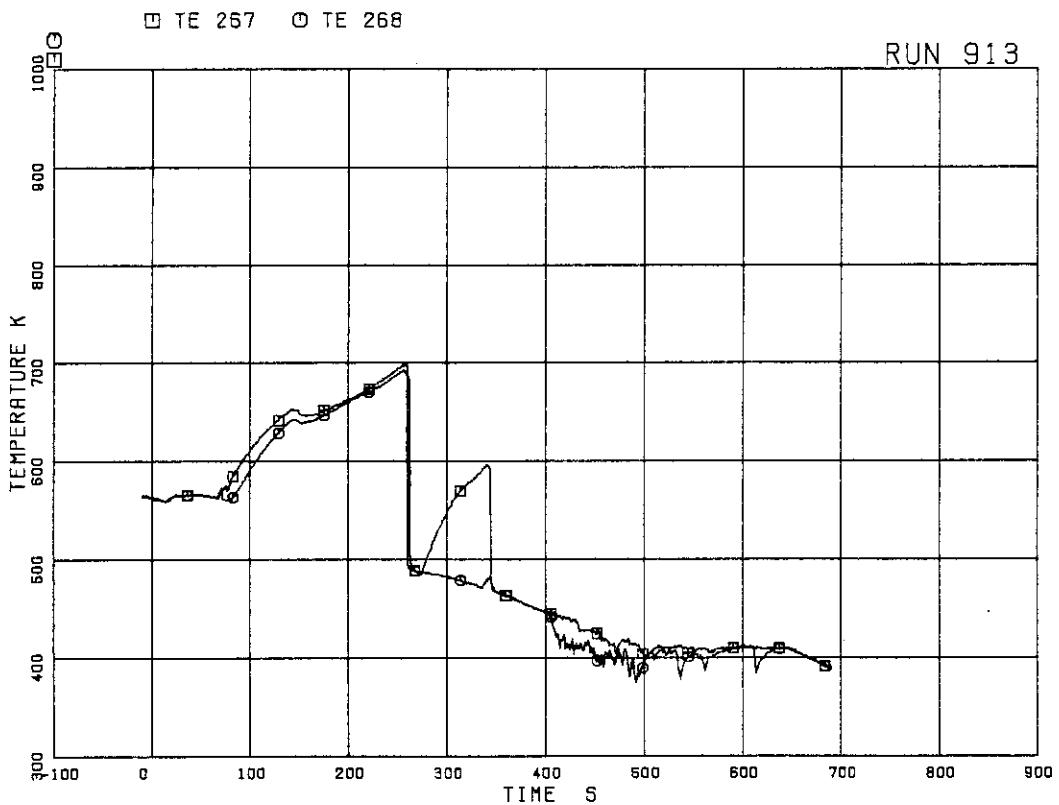


FIG.5.118 SURFACE TEMPERATURES OF FUEL ROD A37
AT POSITIONS 1 AND 4

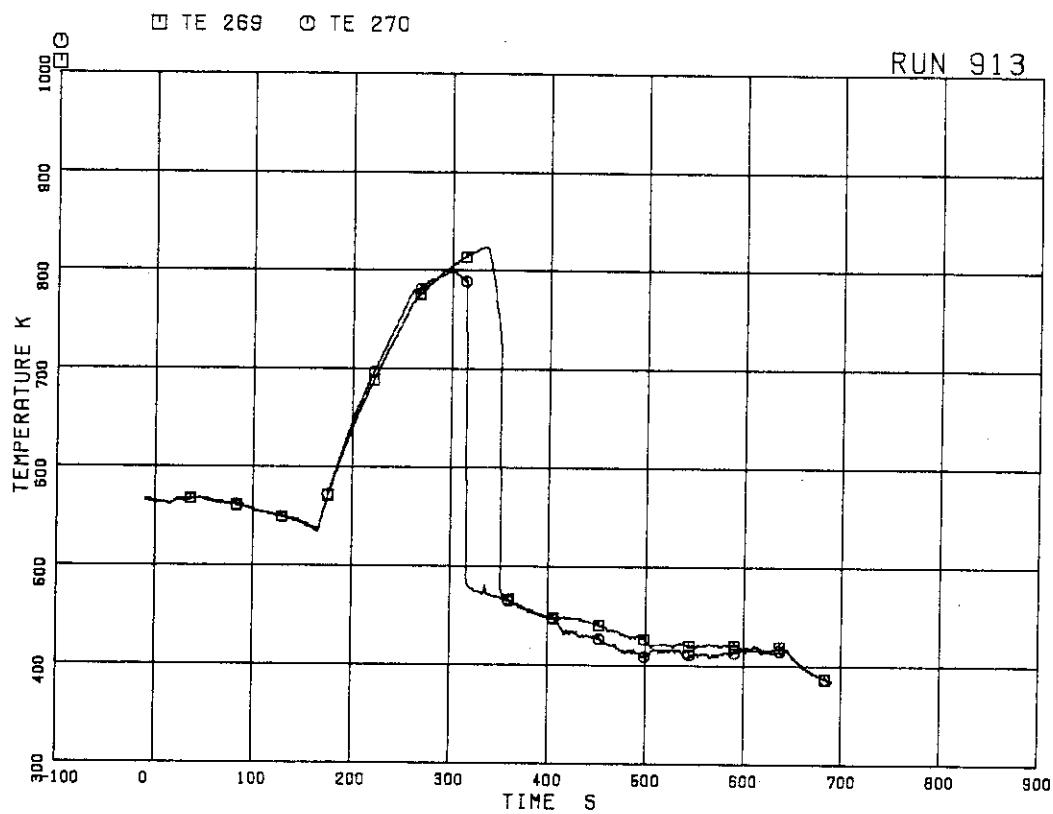


FIG.5.119 SURFACE TEMPERATURES OF FUEL ROD A42
AT POSITIONS 1 AND 4

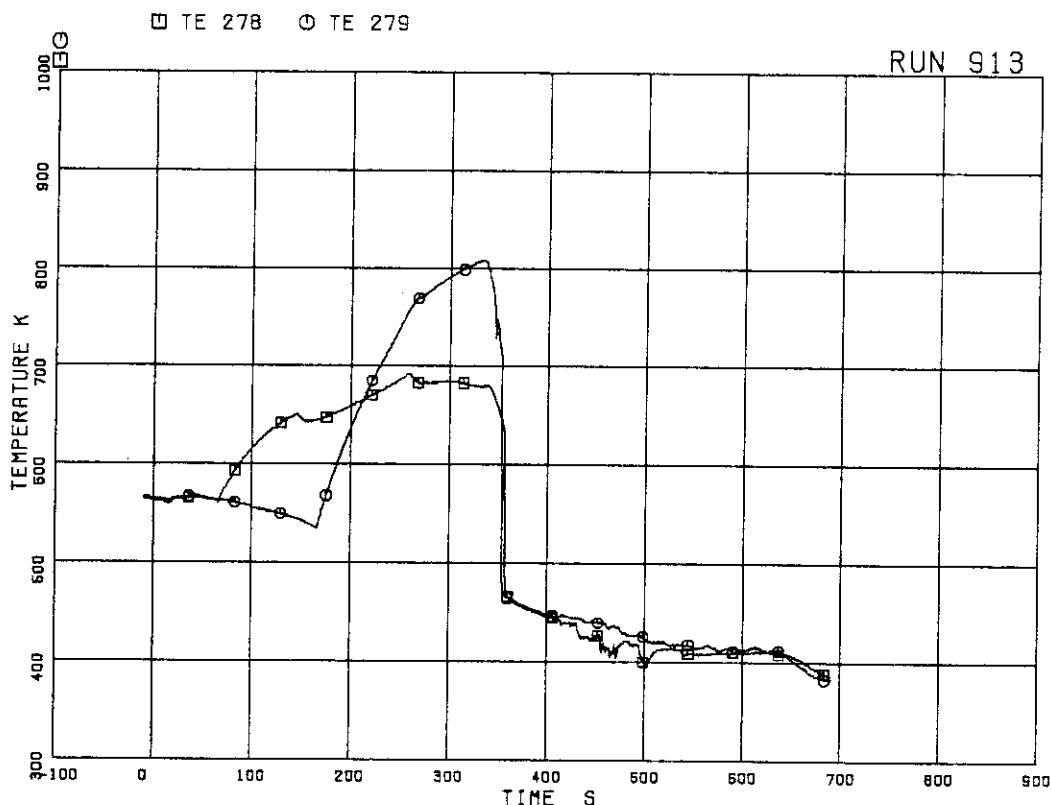


FIG.5.120 SURFACE TEMPERATURES OF FUEL ROD A48
AT POSITIONS 1 AND 4

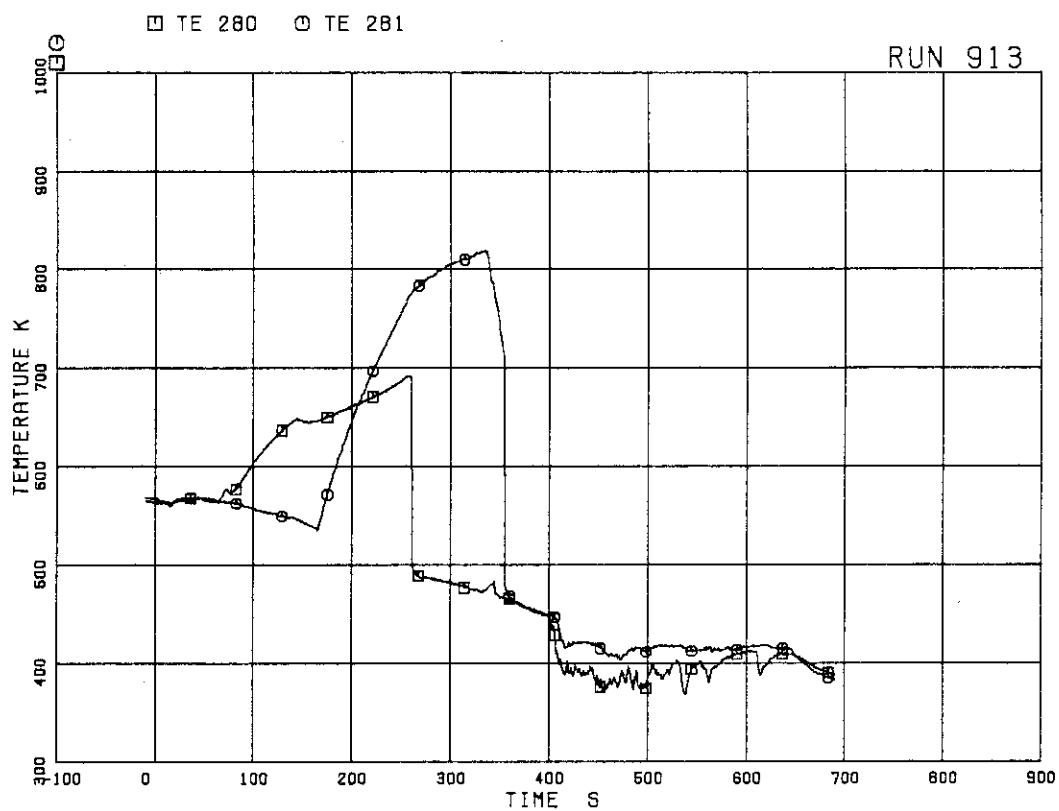


FIG.5.121 SURFACE TEMPERATURES OF FUEL ROD A51
AT POSITIONS 1 AND 4

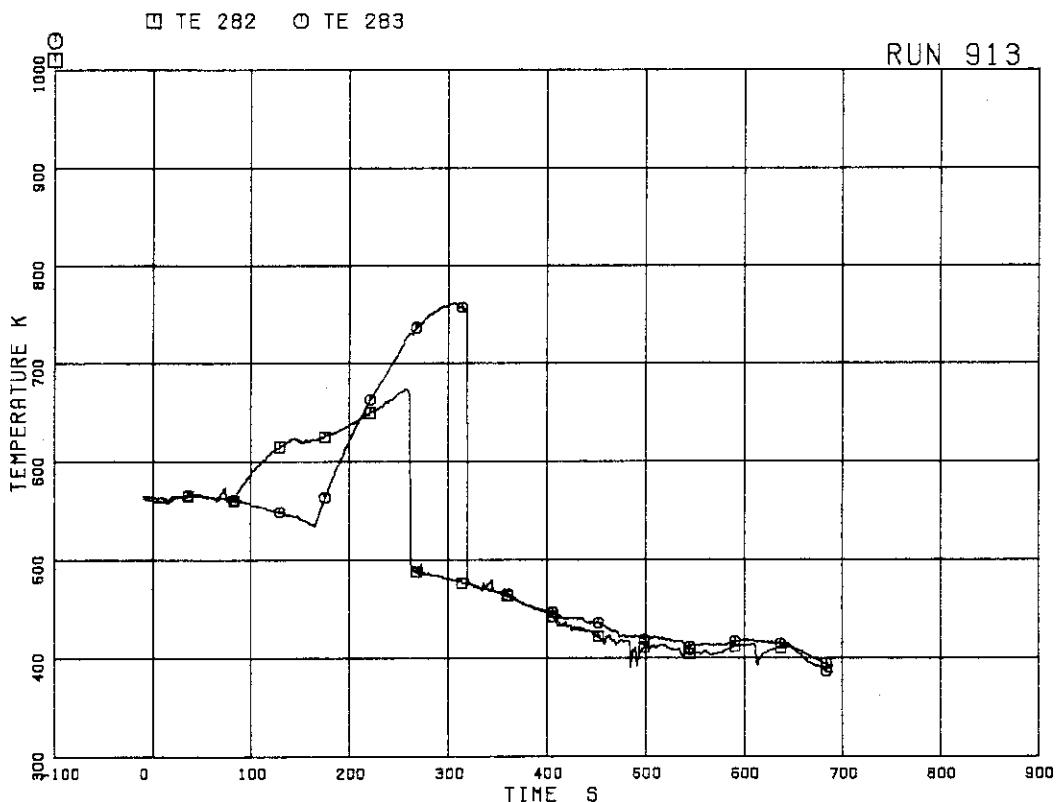


FIG.5.122 SURFACE TEMPERATURES OF FUEL ROD A53
AT POSITIONS 1 AND 4

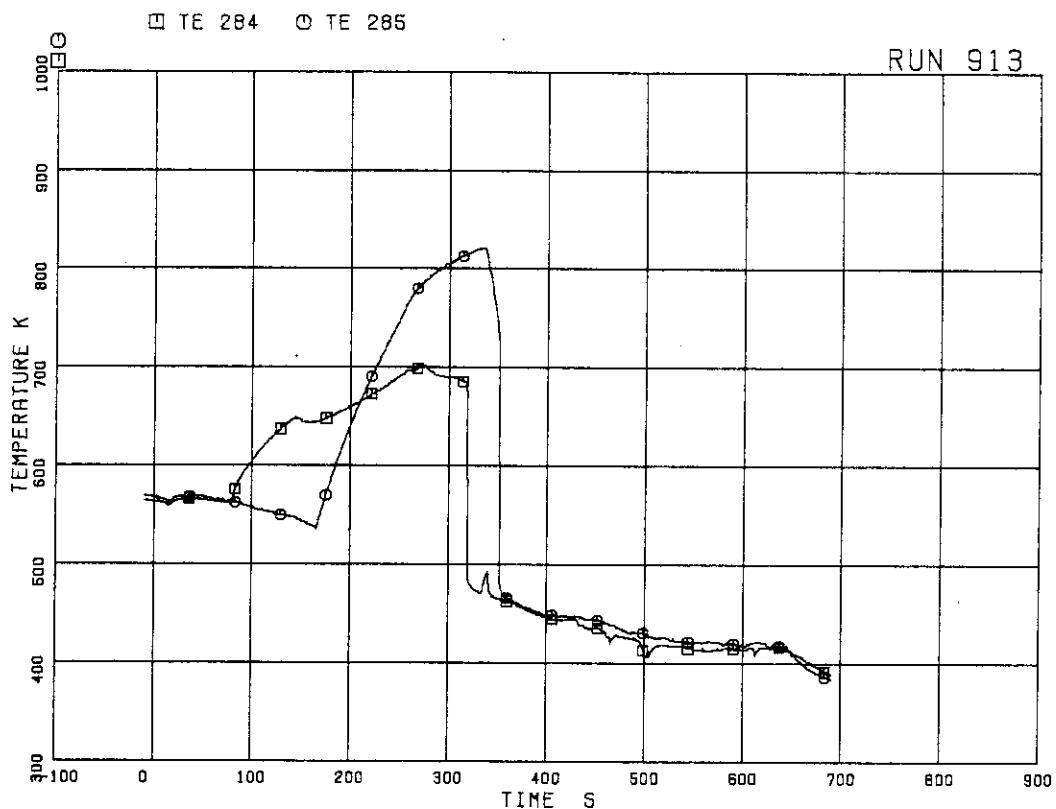


FIG.5.123 SURFACE TEMPERATURES OF FUEL ROD A57
AT POSITIONS 1 AND 4

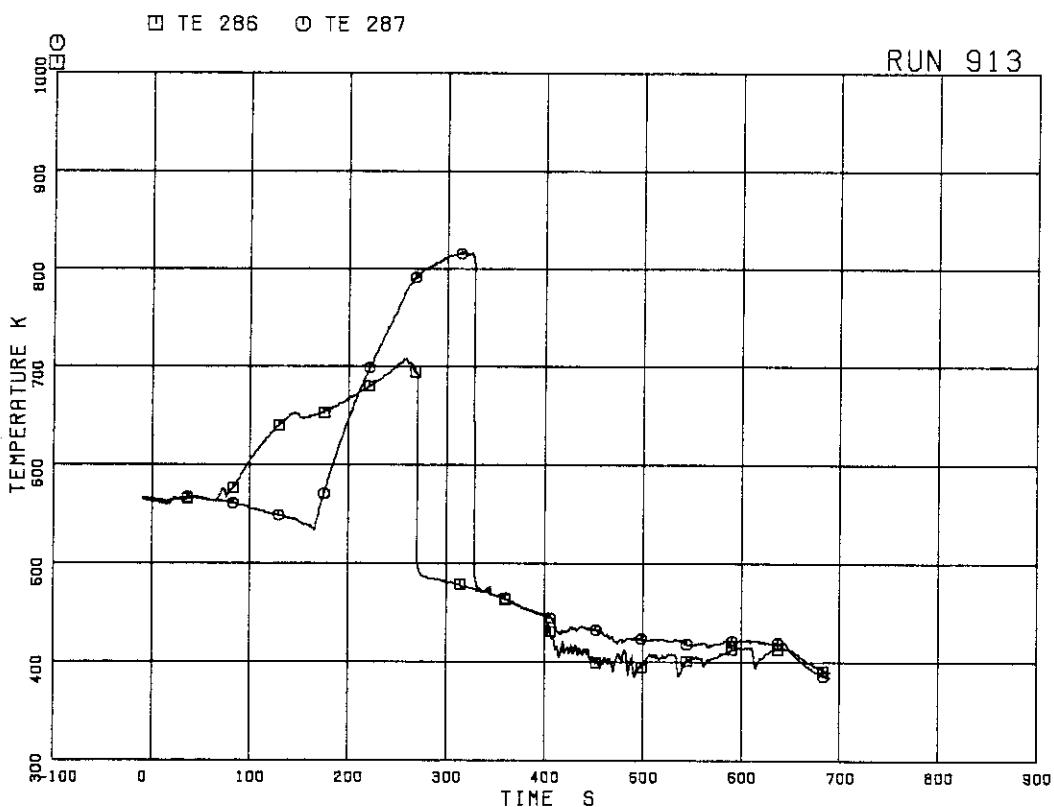


FIG.5.124 SURFACE TEMPERATURES OF FUEL ROD A62
AT POSITIONS 1 AND 4

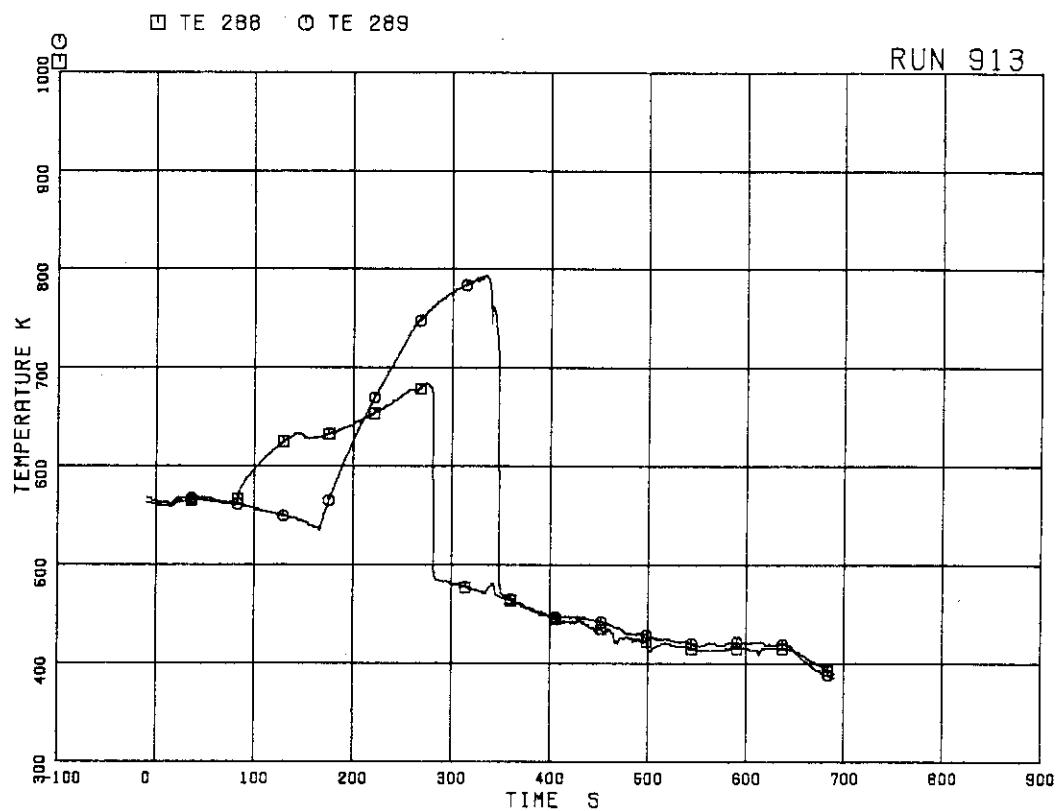


FIG.5.125 SURFACE TEMPERATURES OF FUEL ROD A66
AT POSITIONS 1 AND 4

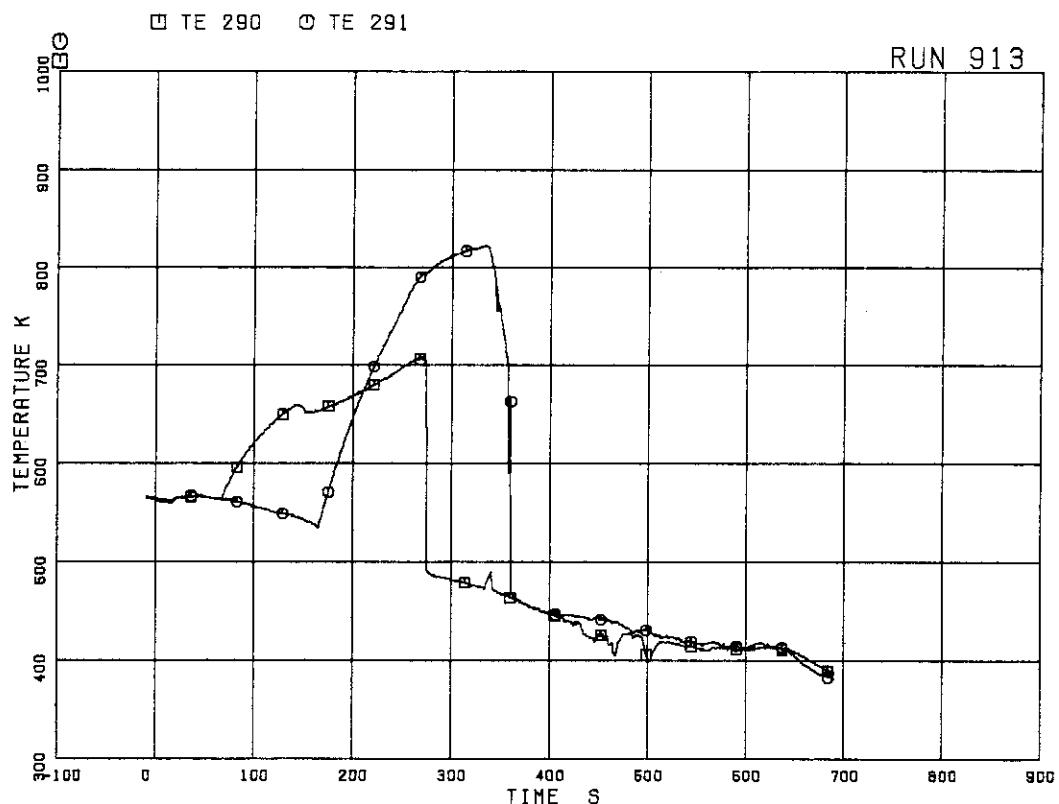


FIG.5.126 SURFACE TEMPERATURES OF FUEL ROD A68
AT POSITIONS 1 AND 4

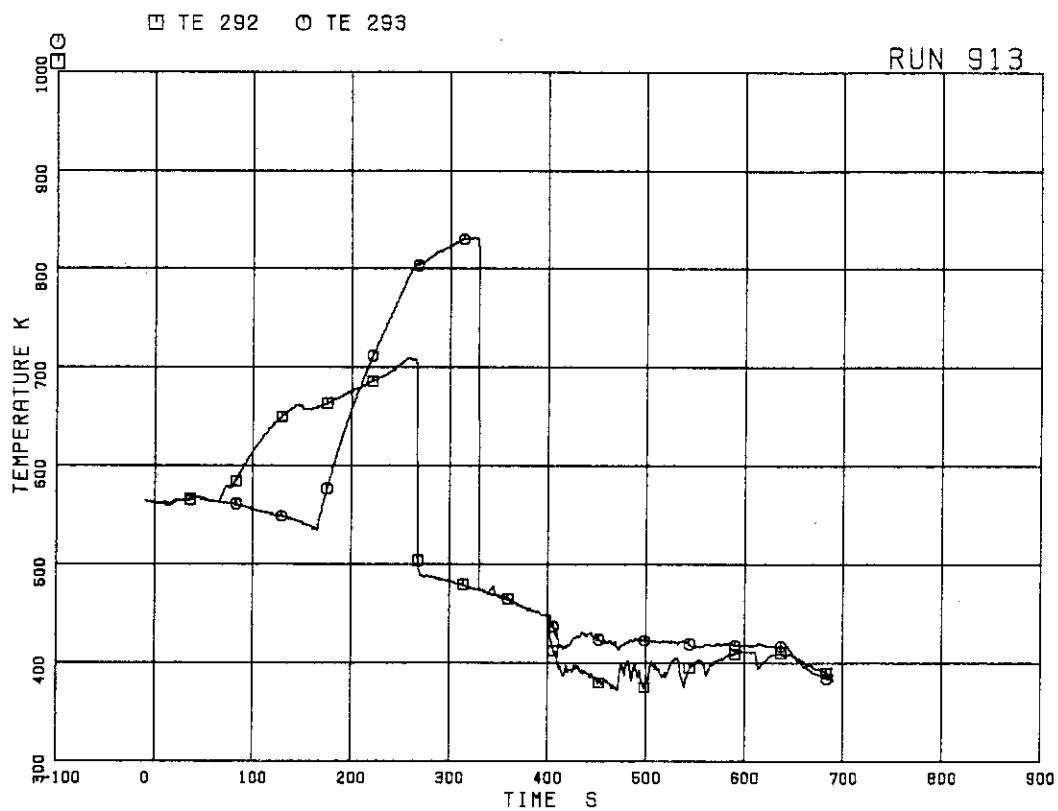


FIG. 5.127 SURFACE TEMPERATURES OF FUEL ROD A71
AT POSITIONS 1 AND 4

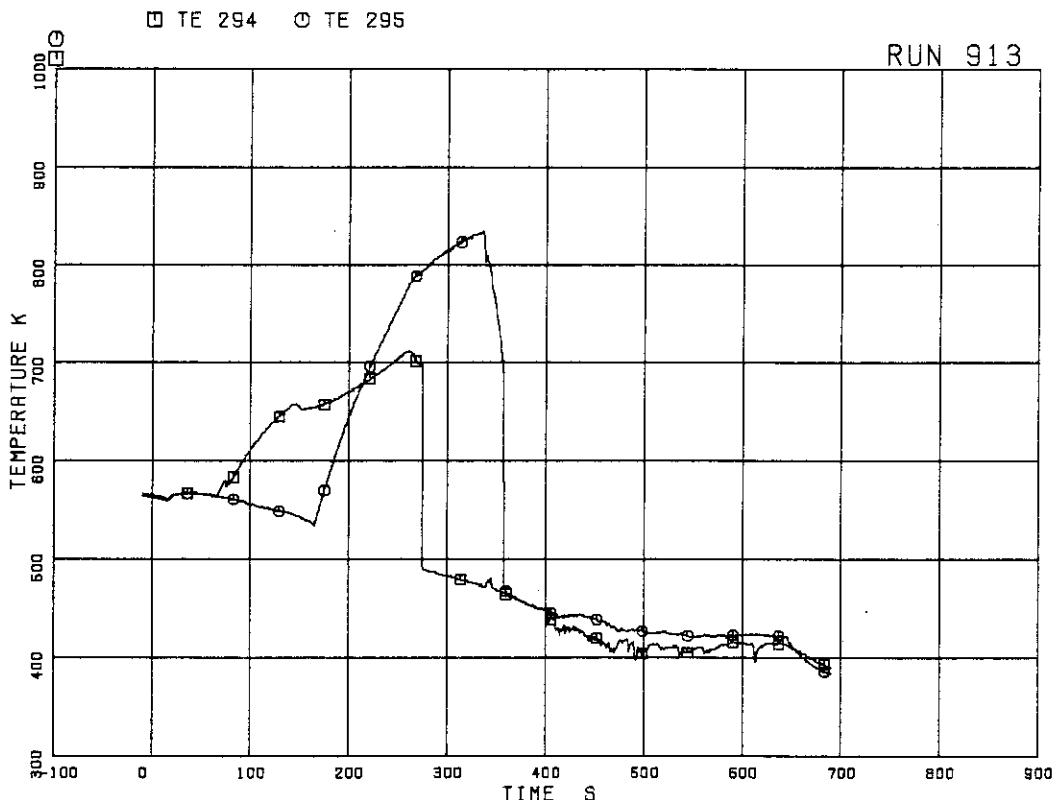


FIG. 5.128 SURFACE TEMPERATURES OF FUEL ROD A73
AT POSITIONS 1 AND 4

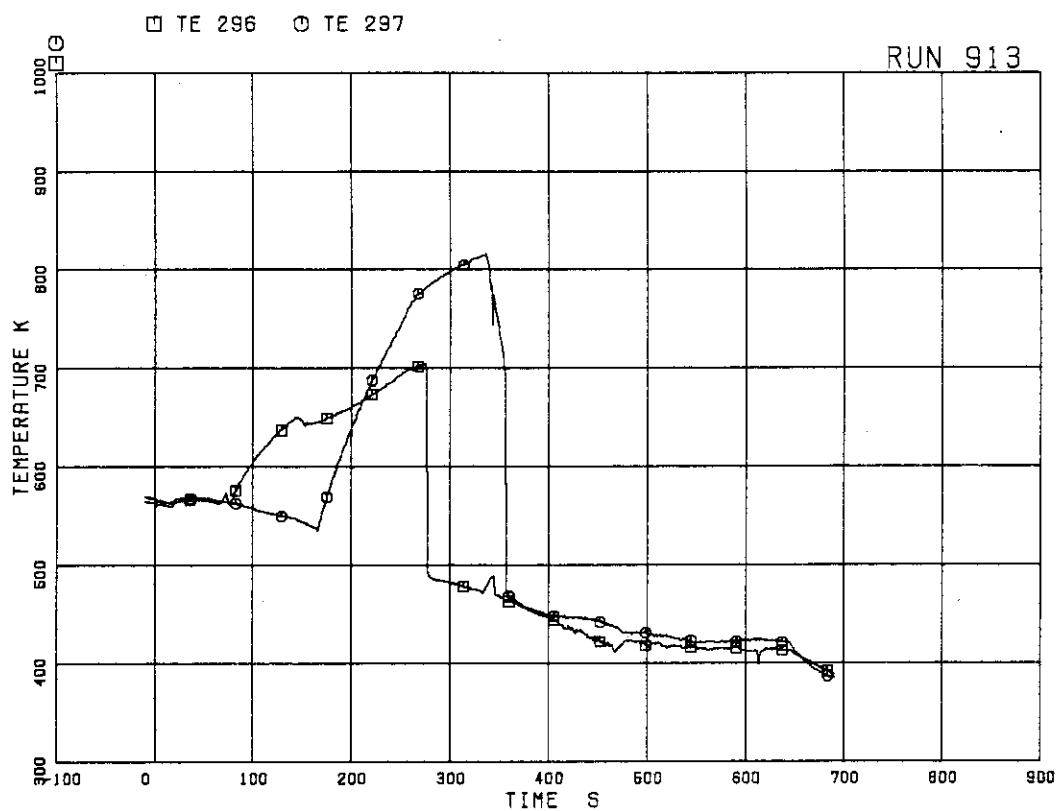


FIG.5.129 SURFACE TEMPERATURES OF FUEL ROD A75 AT POSITIONS 1 AND 4

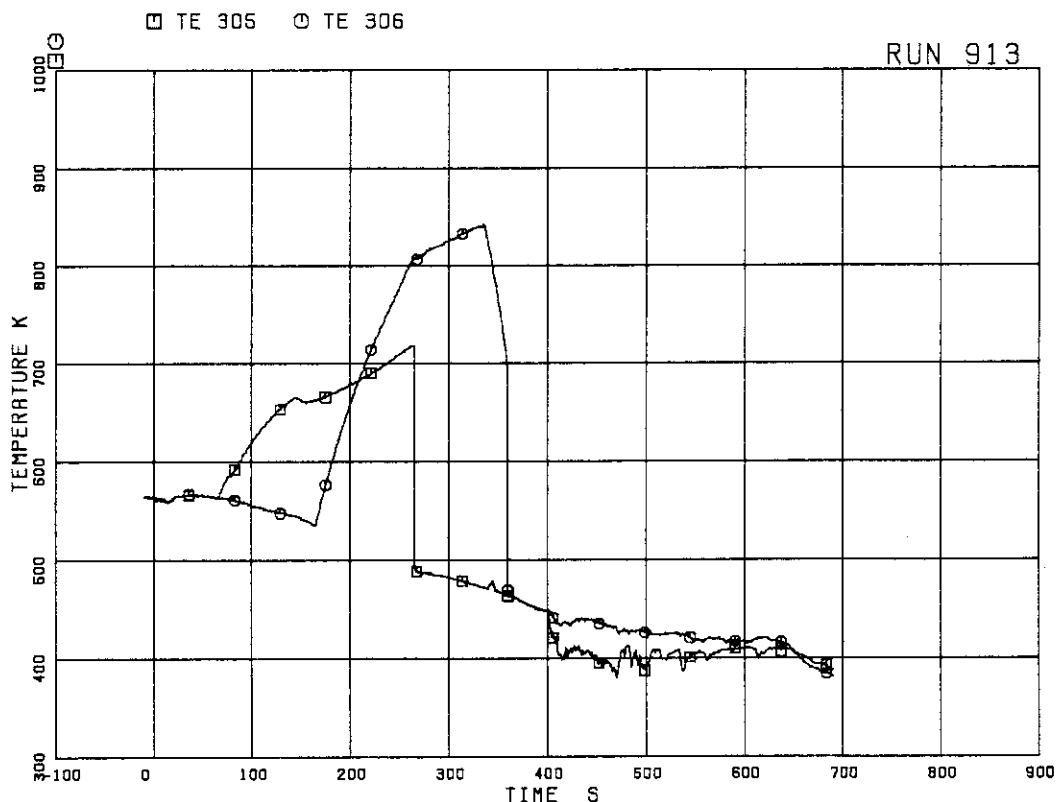


FIG.5.130 SURFACE TEMPERATURES OF FUEL ROD A82 AT POSITIONS 1 AND 4

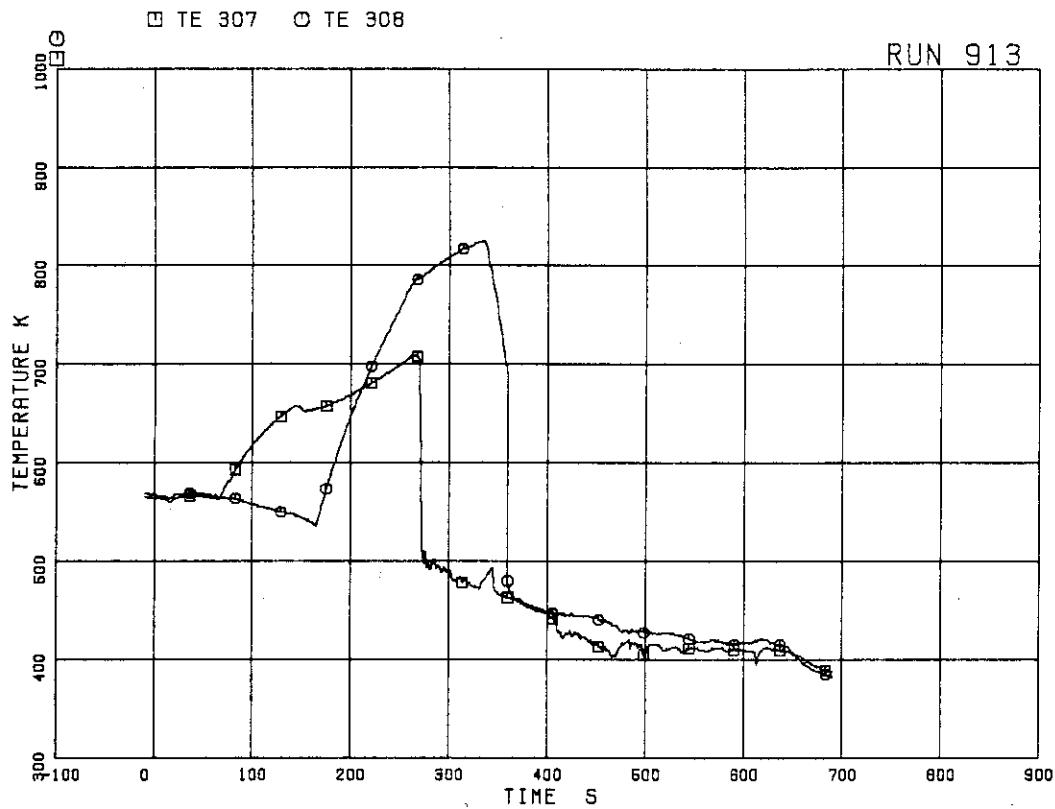


FIG.5.131 SURFACE TEMPERATURES OF FUEL ROD A84
AT POSITIONS 1 AND 4

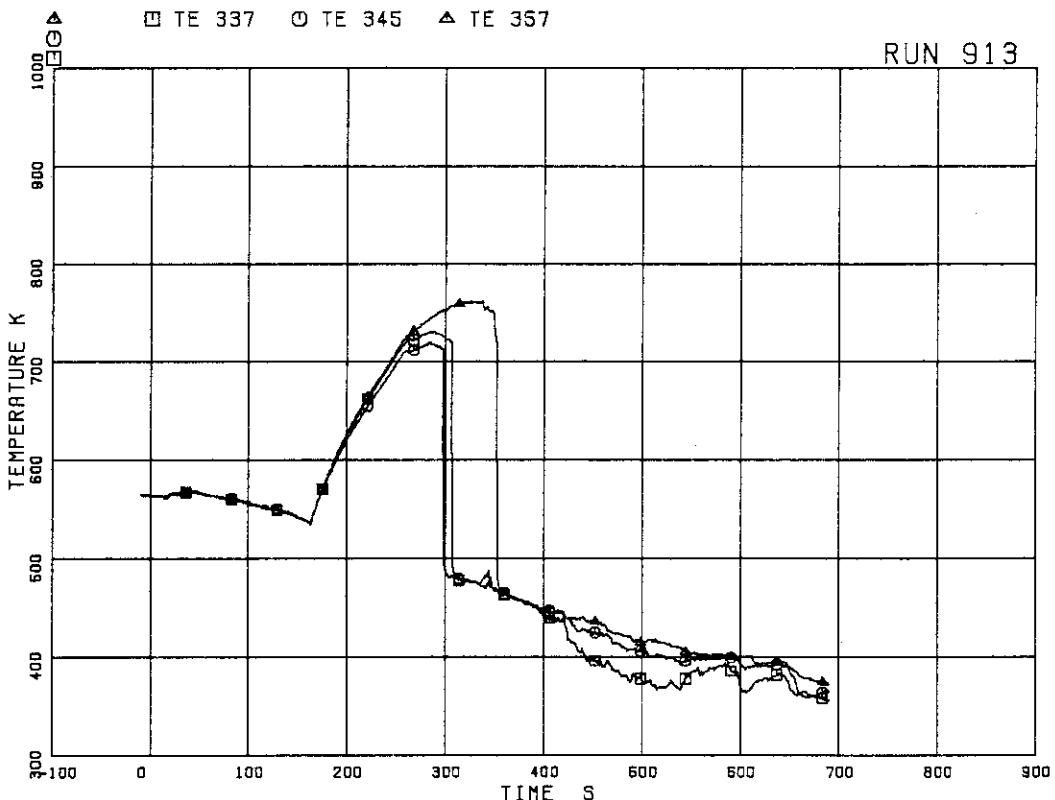


FIG.5.132 SURFACE TEMPERATURES OF FUEL RODS
B13,B31,B86 AT POSITION 4

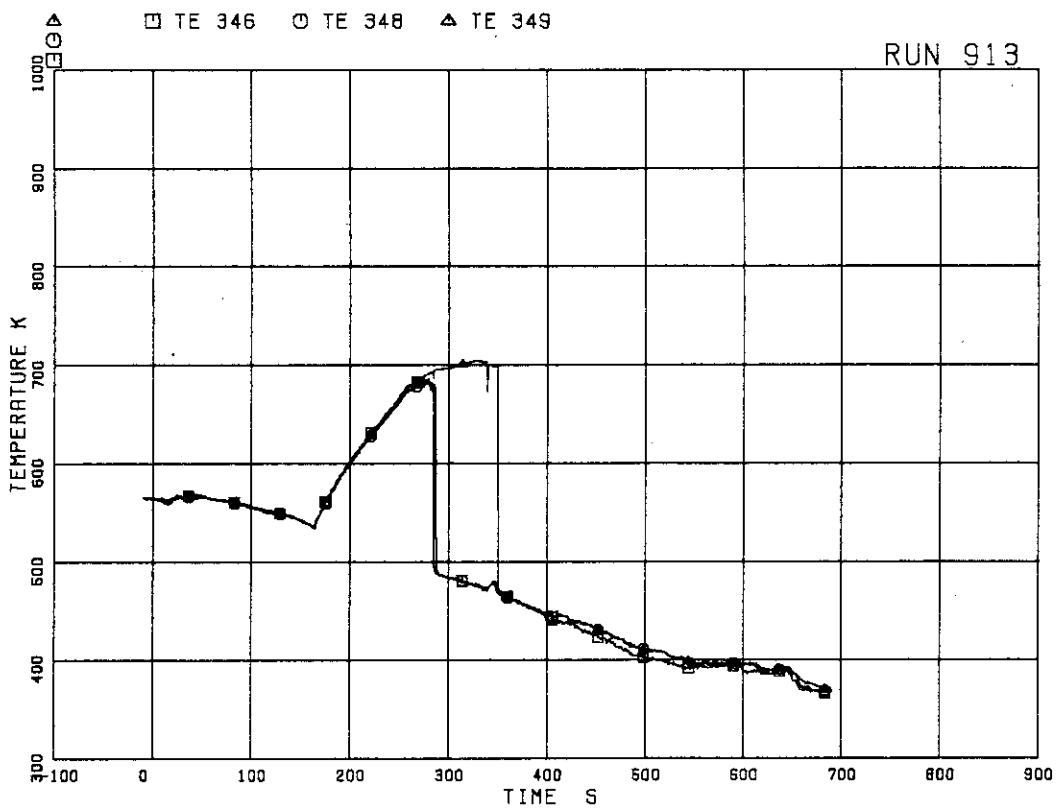


FIG. 5.133 SURFACE TEMPERATURES OF FUEL RODS
B33,B53,B66 AT POSITION 4

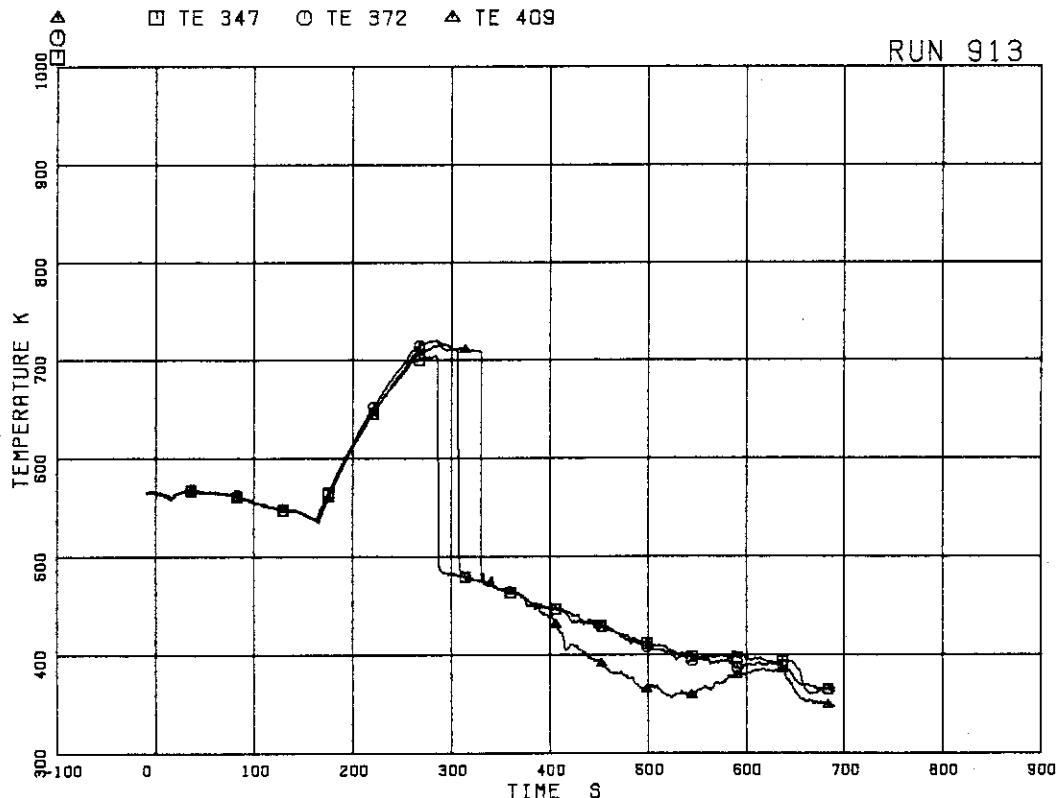


FIG. 5.134 SURFACE TEMPERATURES OF FUEL RODS
B51,C15,D51 AT POSITION 4

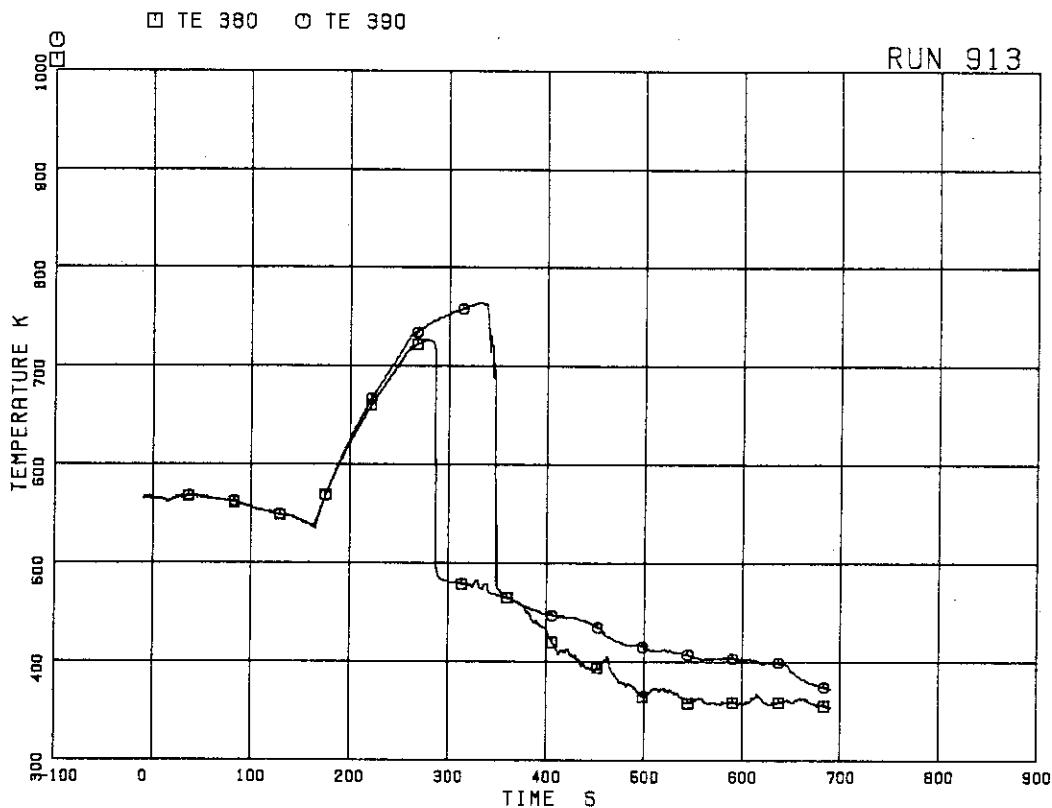


FIG. 5.135 SURFACE TEMPERATURES OF FUEL RODS
C31,C68 AT POSITION 4

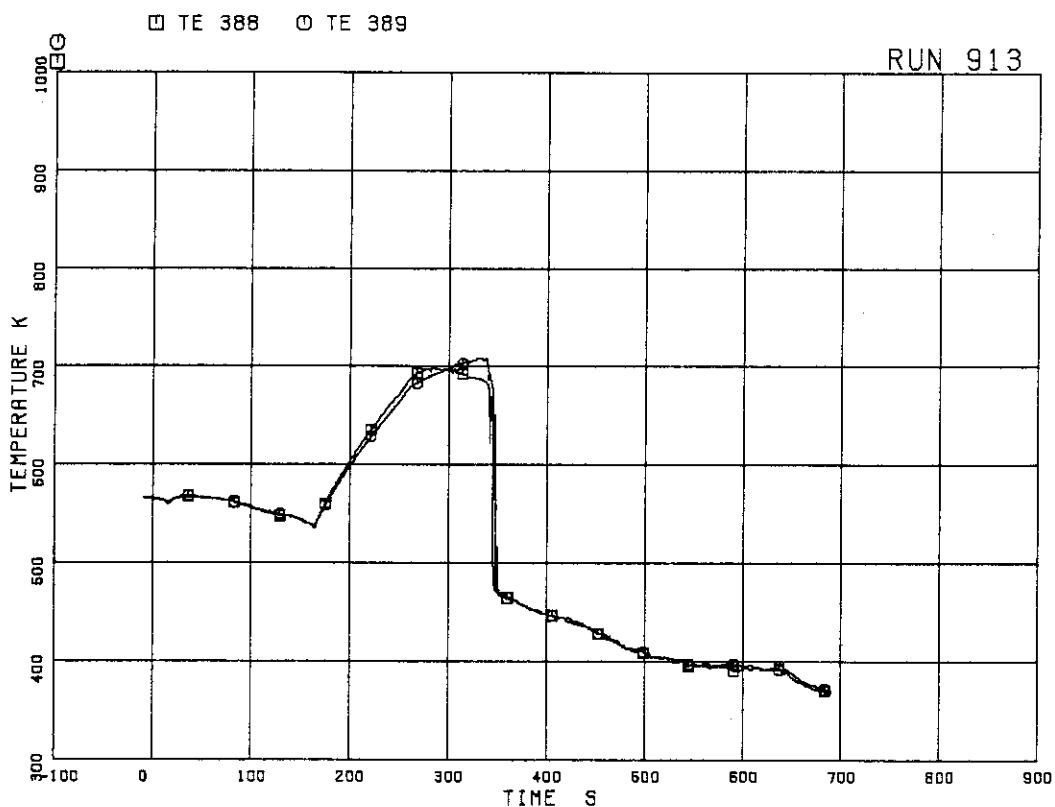


FIG. 5.136 SURFACE TEMPERATURES OF FUEL RODS
C35,C66 AT POSITION 4

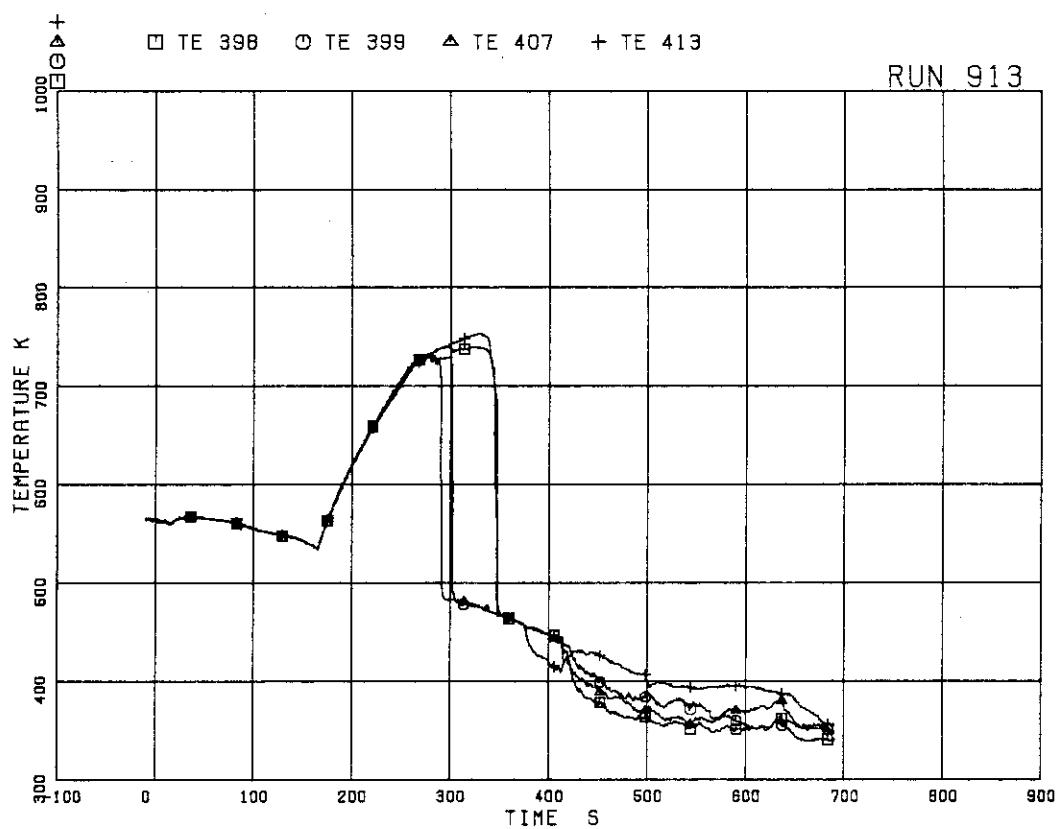


FIG.5.137 SURFACE TEMPERATURES OF FUEL RODS
D11,D13,D31,D86 AT POSITION 4

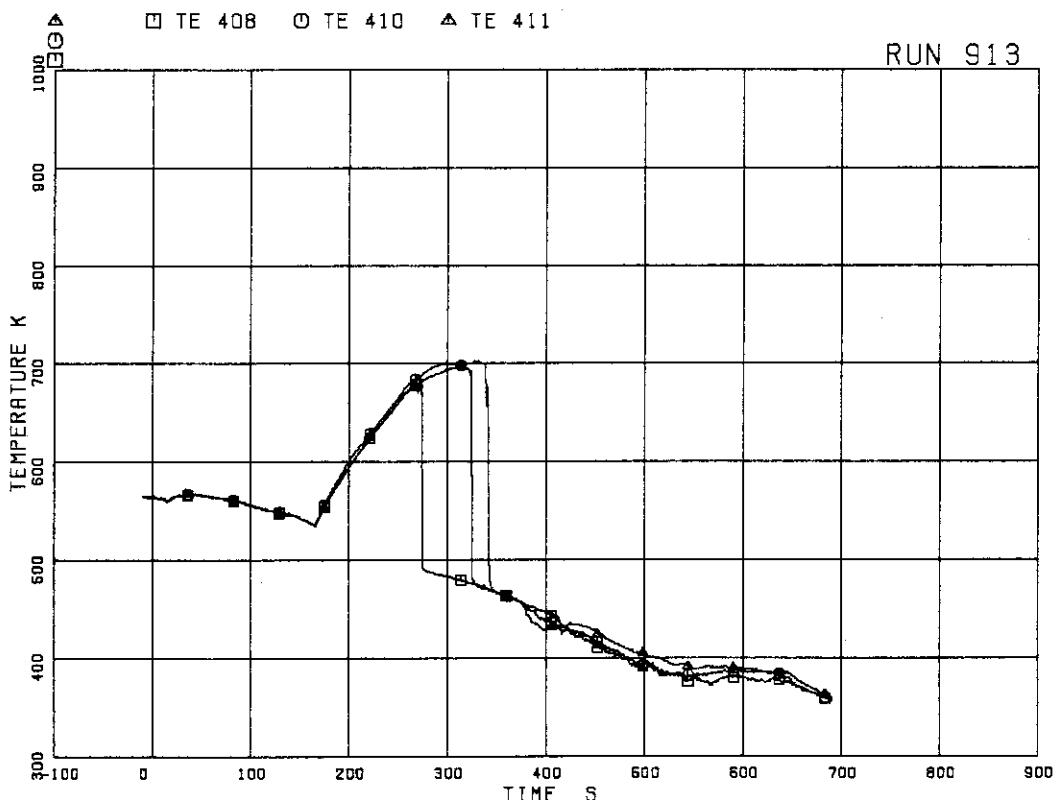


FIG.5.138 SURFACE TEMPERATURES OF FUEL RODS
D33,D53,D66 AT POSITION 4

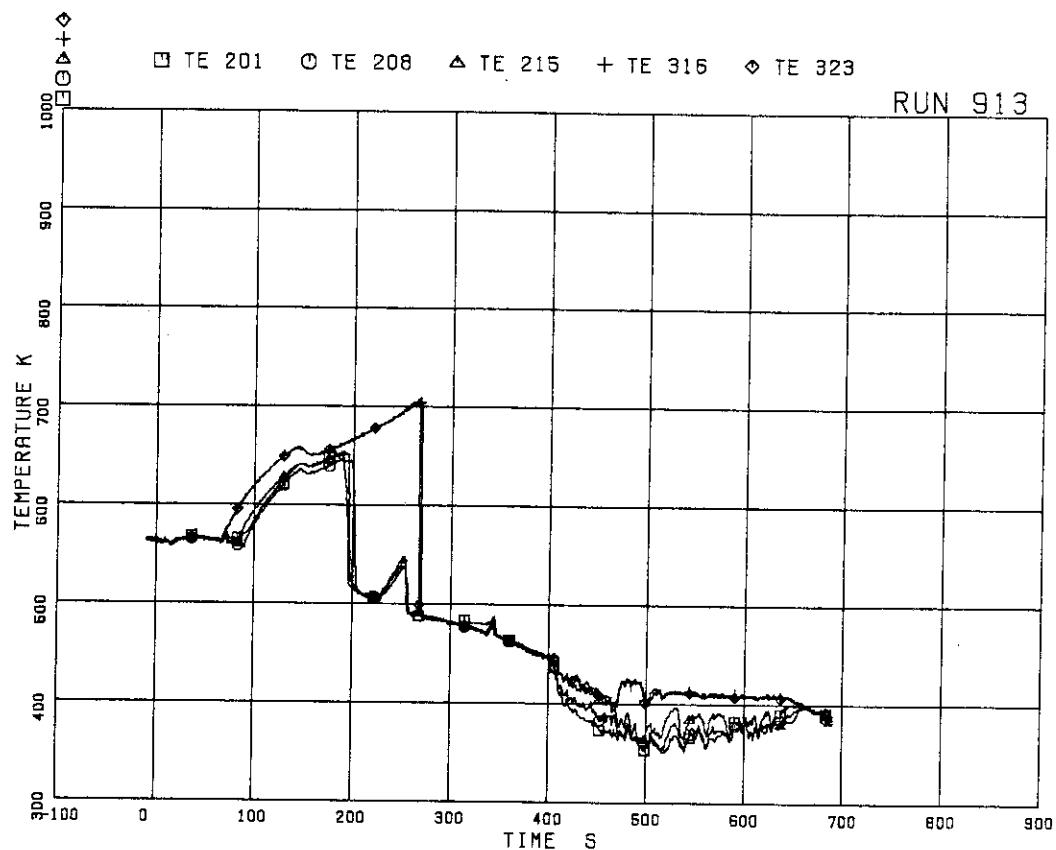


FIG.5.139 SURFACE TEMPERATURES OF FUEL RODS
A11,A12,A13,A87,A88 AT POSITION 1

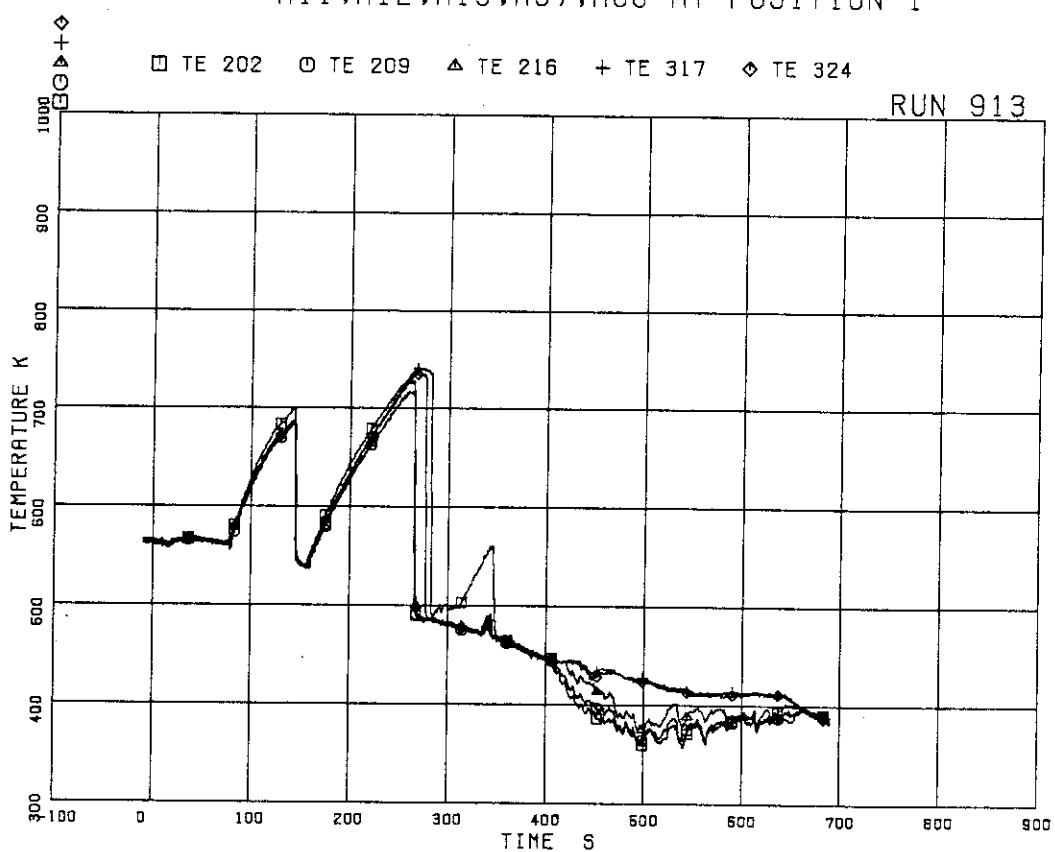


FIG.5.140 SURFACE TEMPERATURES OF FUEL RODS
A11,A12,A13,A87,A88 AT POSITION 2

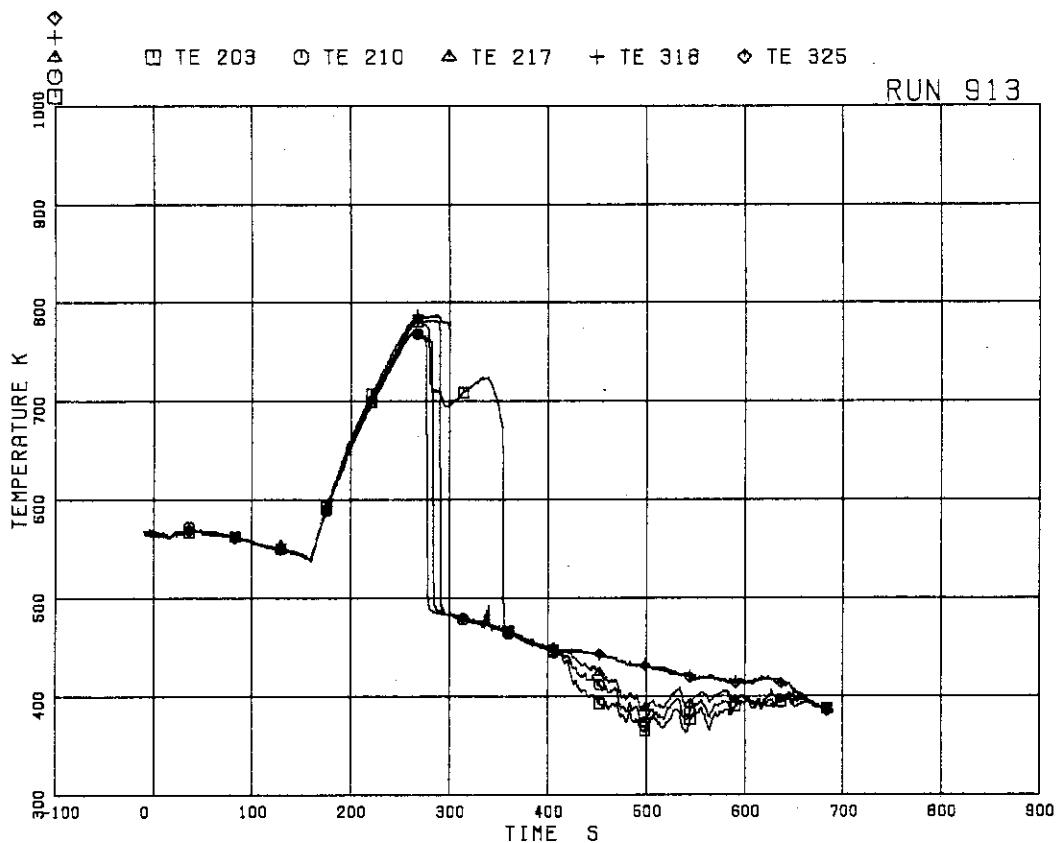


FIG.5.141 SURFACE TEMPERATURES OF FUEL RODS
A11,A12,A13,A87,A88 AT POSITION 3

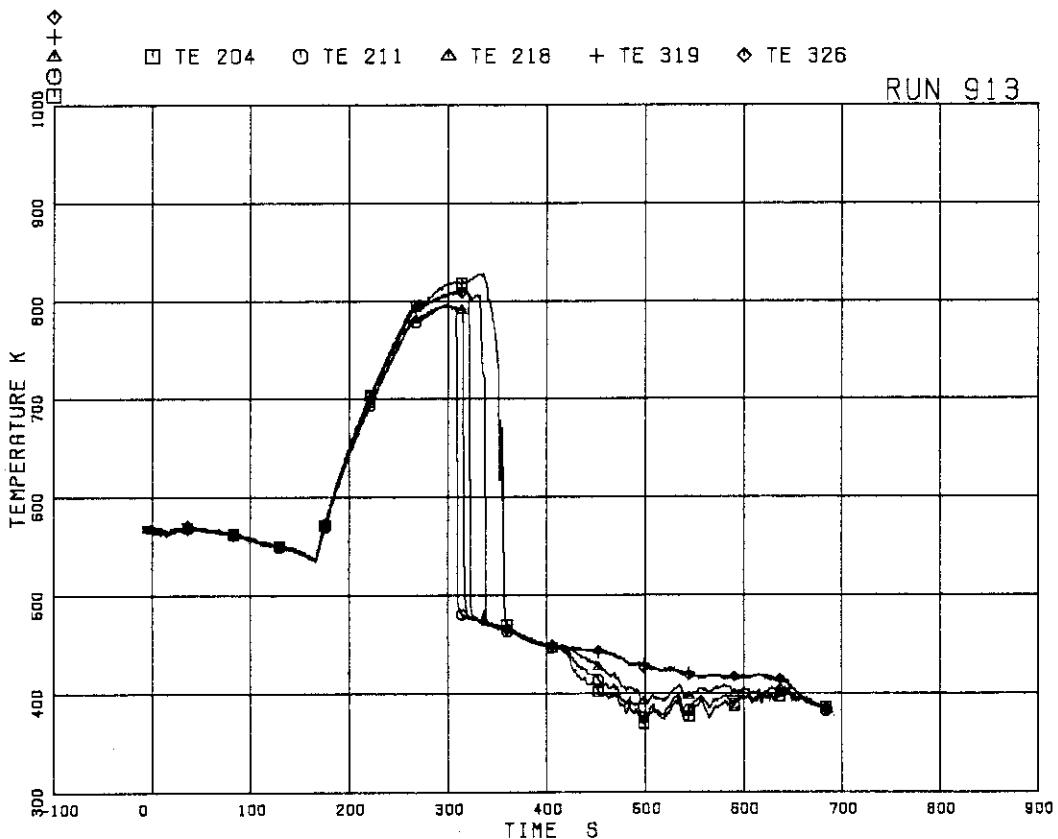


FIG.5.142 SURFACE TEMPERATURES OF FUEL RODS
A11,A12,A13,A87,A88 AT POSITION 4

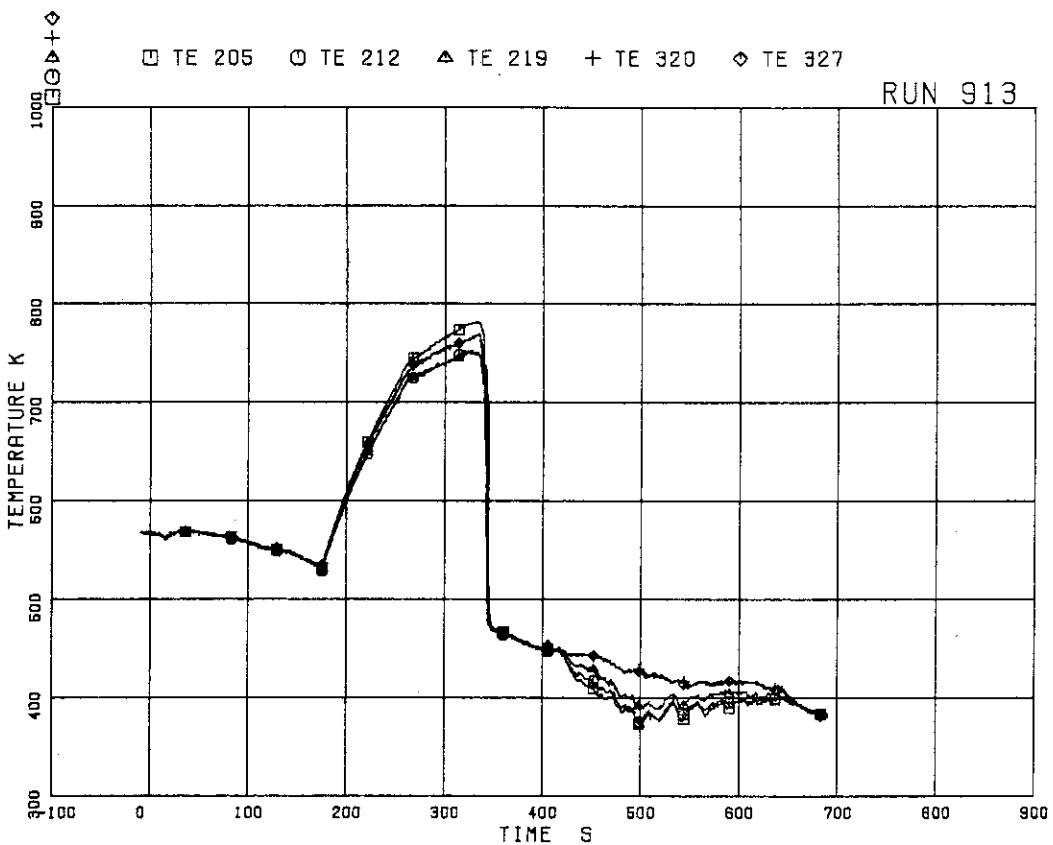


FIG.5.143 SURFACE TEMPERATURE OF FUEL RODS
A11,A12,A13,A87,A88 AT POSITION 5

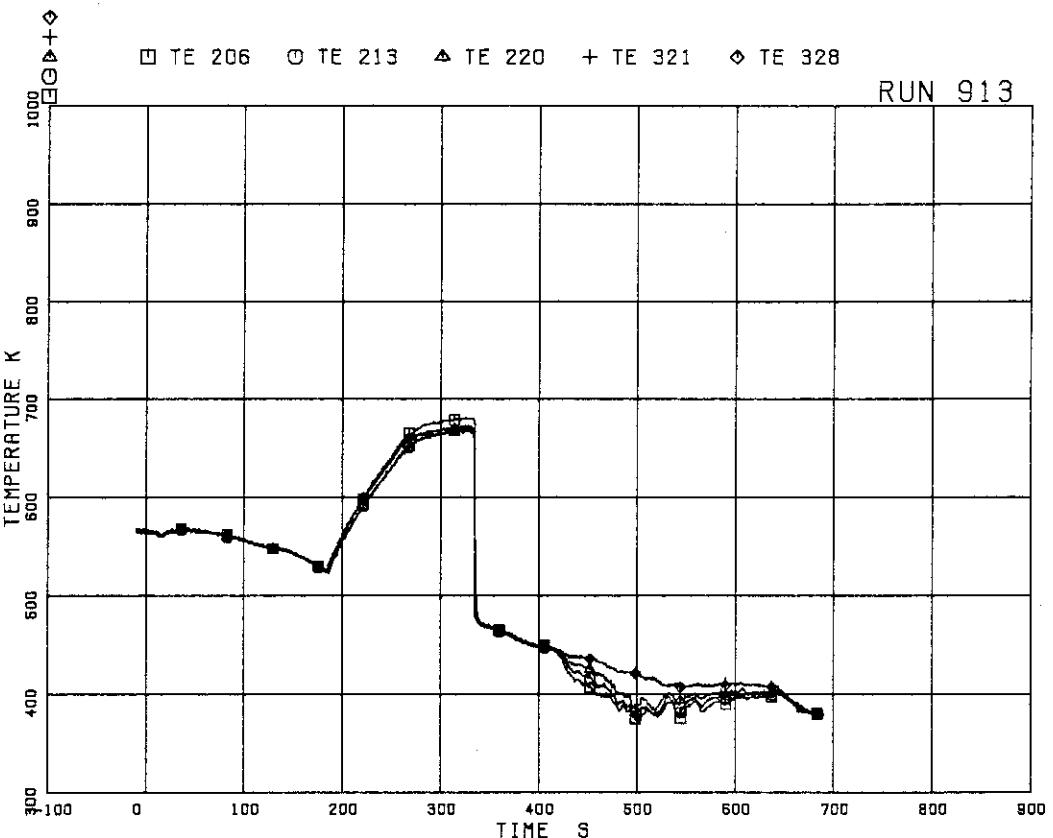


FIG.5.144 SURFACE TEMPERATURES OF FUEL RODS
A11,A12,A13,A87,A88 AT POSITION 6

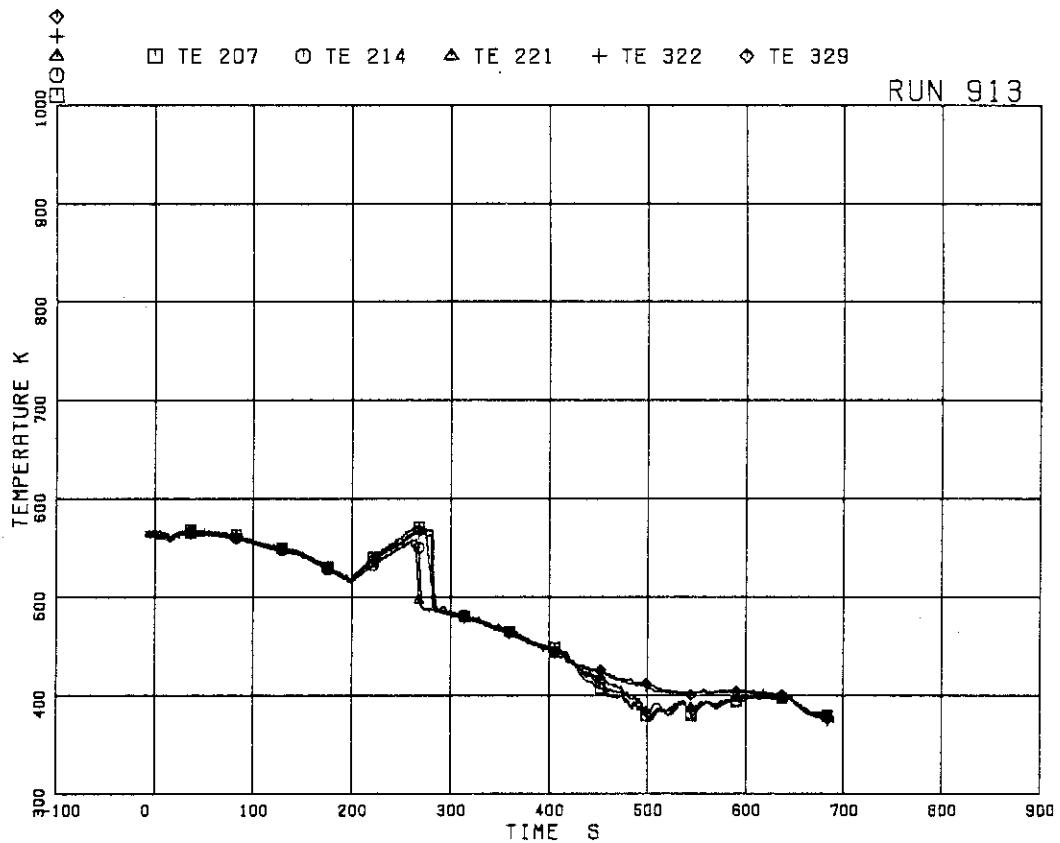


FIG.5.145 SURFACE TEMPERATURES OF FUEL RODS
A11,A12,A13,A87,A88 AT POSITION 7

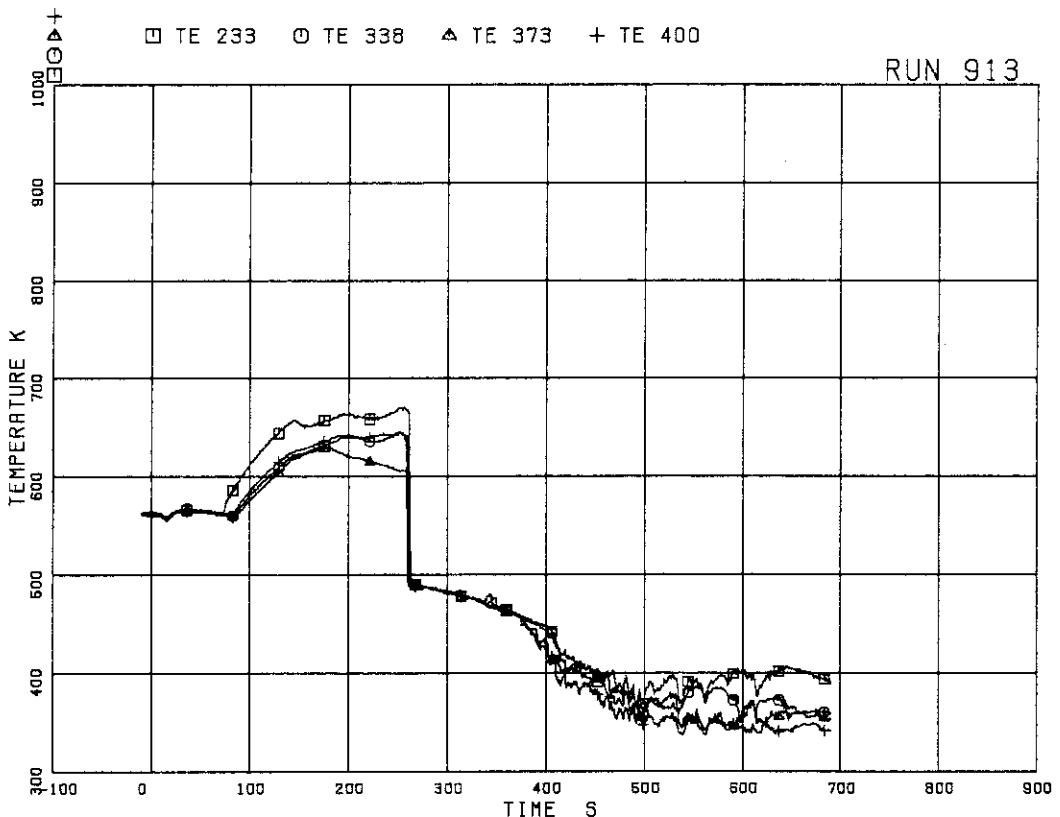


FIG.5.146 SURFACE TEMPERATURES OF FUEL RODS
A22,B22,C22,D22 AT POSITION 1

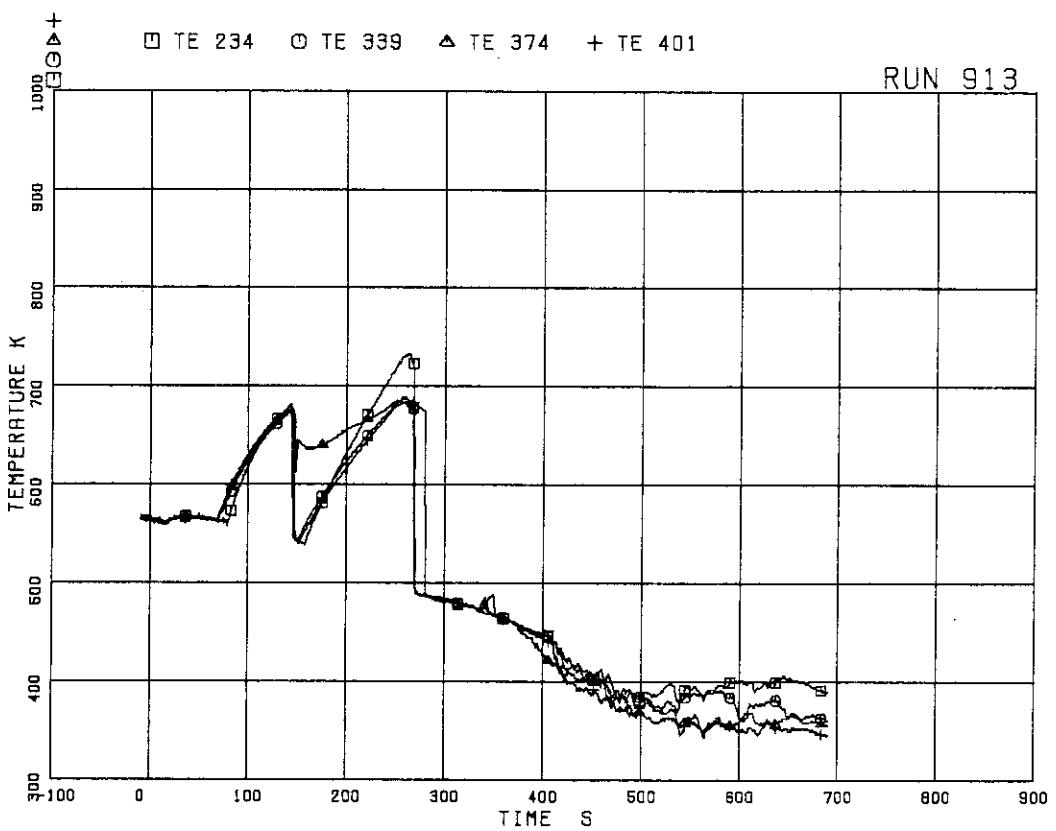


FIG.5.147 SURFACE TEMPERATURES OF FUEL RODS
A22,B22,C22,D22 AT POSITION 2

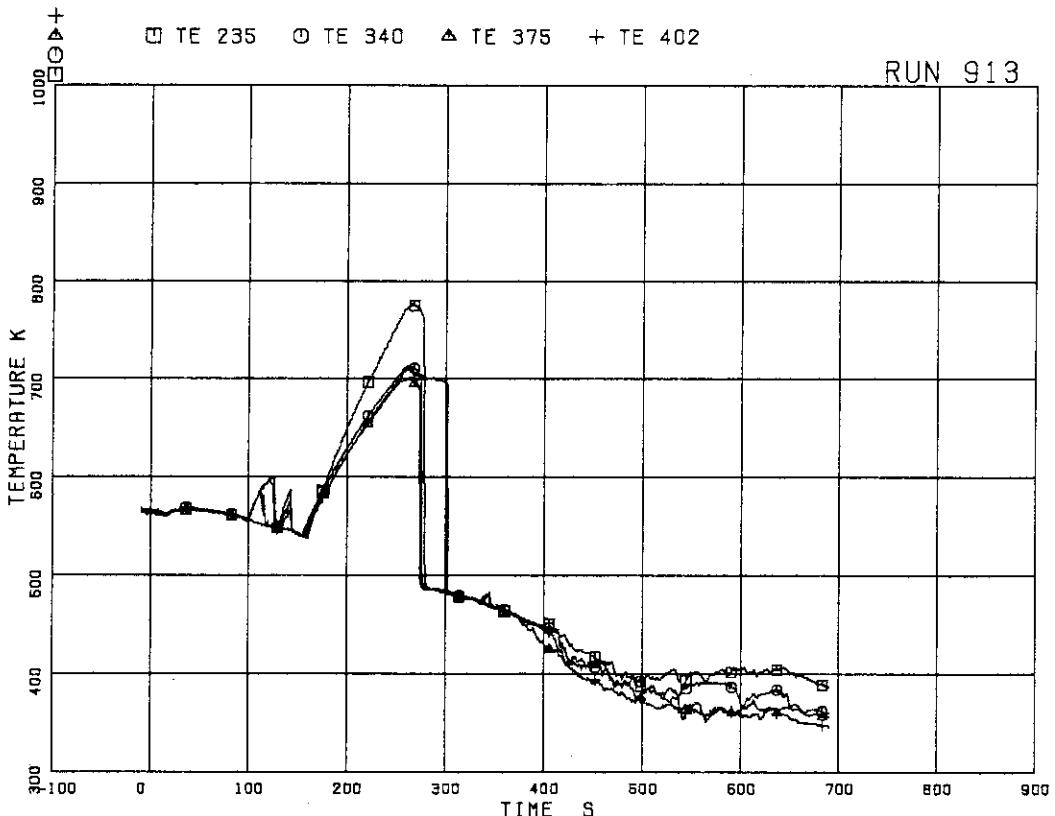


FIG.5.148 SURFACE TEMPERATURES OF FUEL RODS
A22,B22,C22,D22 AT POSITION 3

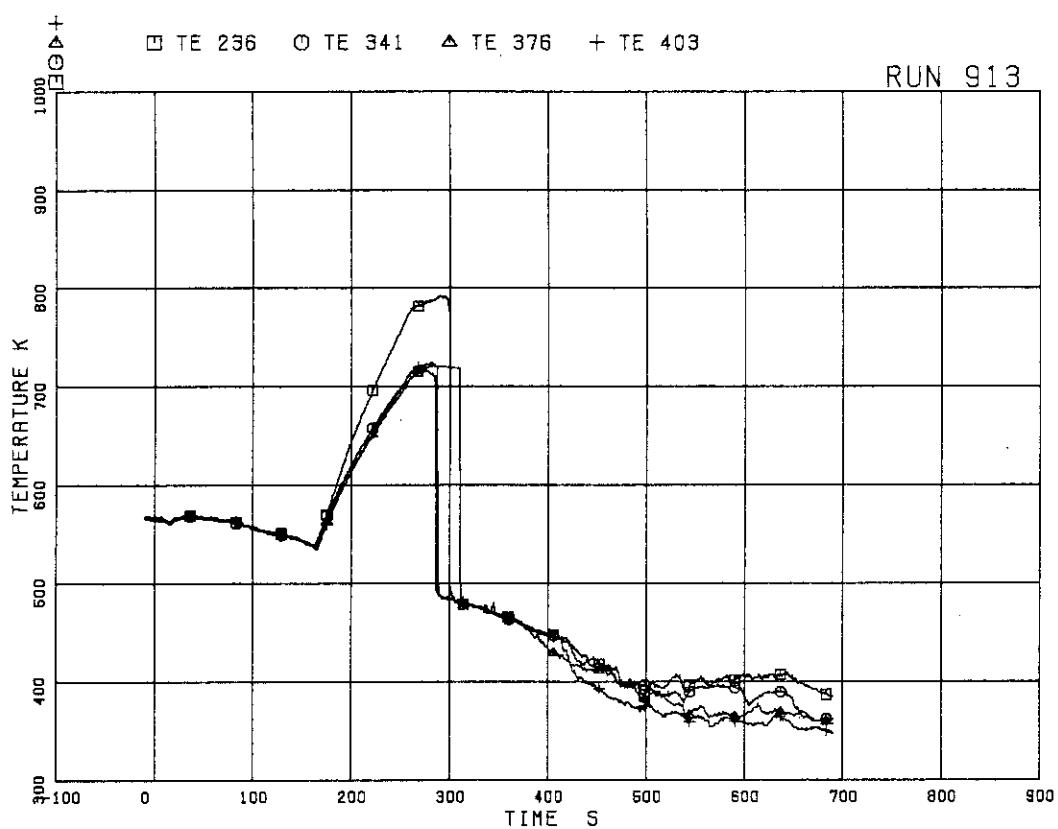


FIG.5.149 SURFACE TEMPERATURES OF FUEL RODS
A22,B22,C22,D22 RODS AT POSITION 4

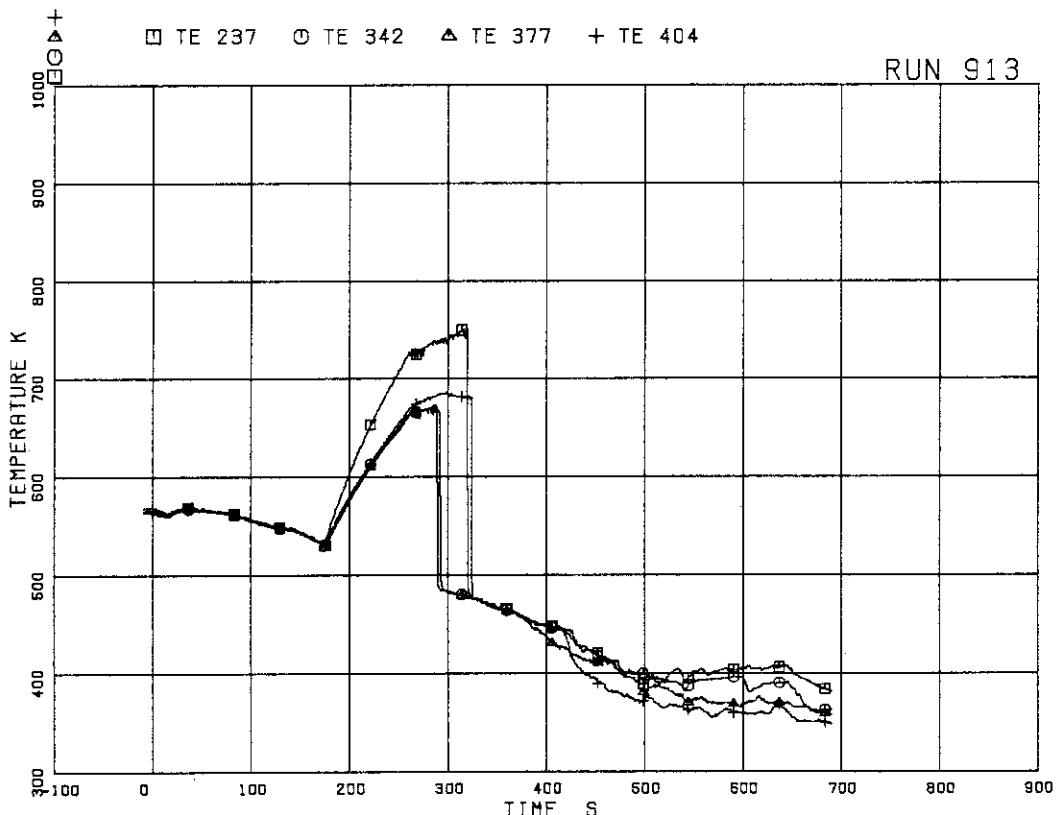


FIG.5.150 SURFACE TEMPERATURES OF FUEL RODS
A22,B22,C22,D22 AT POSITION 5

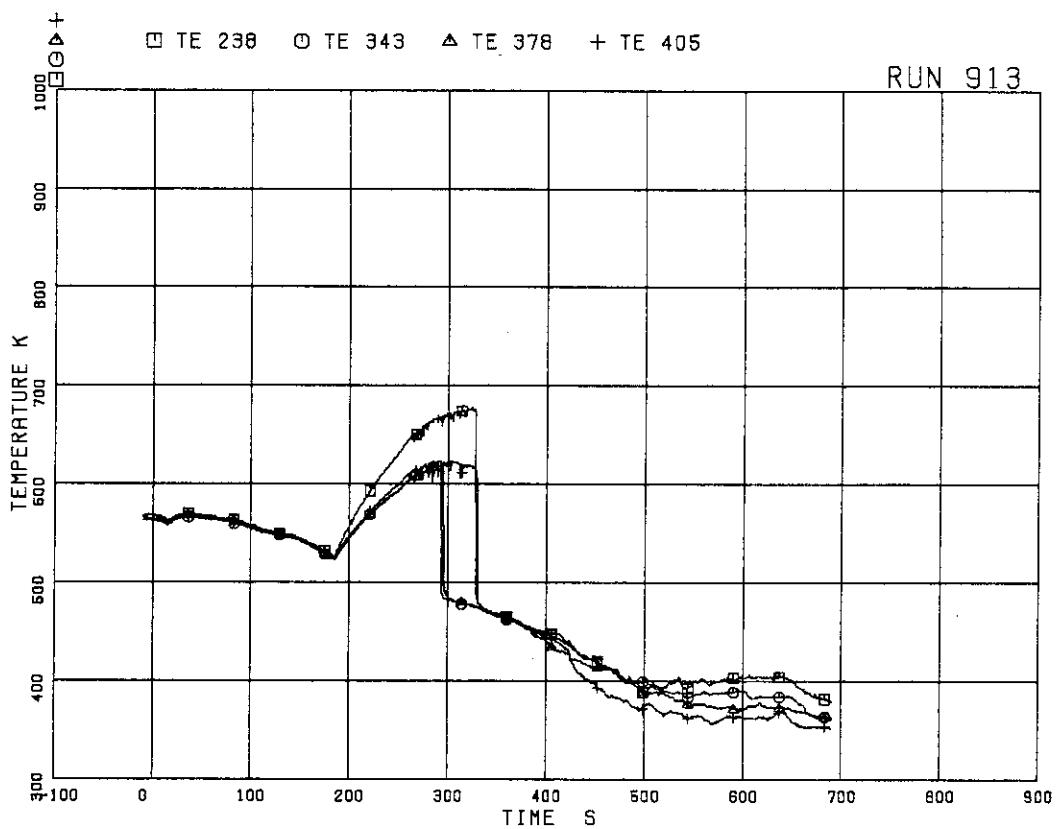


FIG.5.151 SURFACE TEMPERATURES OF FUEL RODS
A22,B22,C22,D22 AT POSITION 6

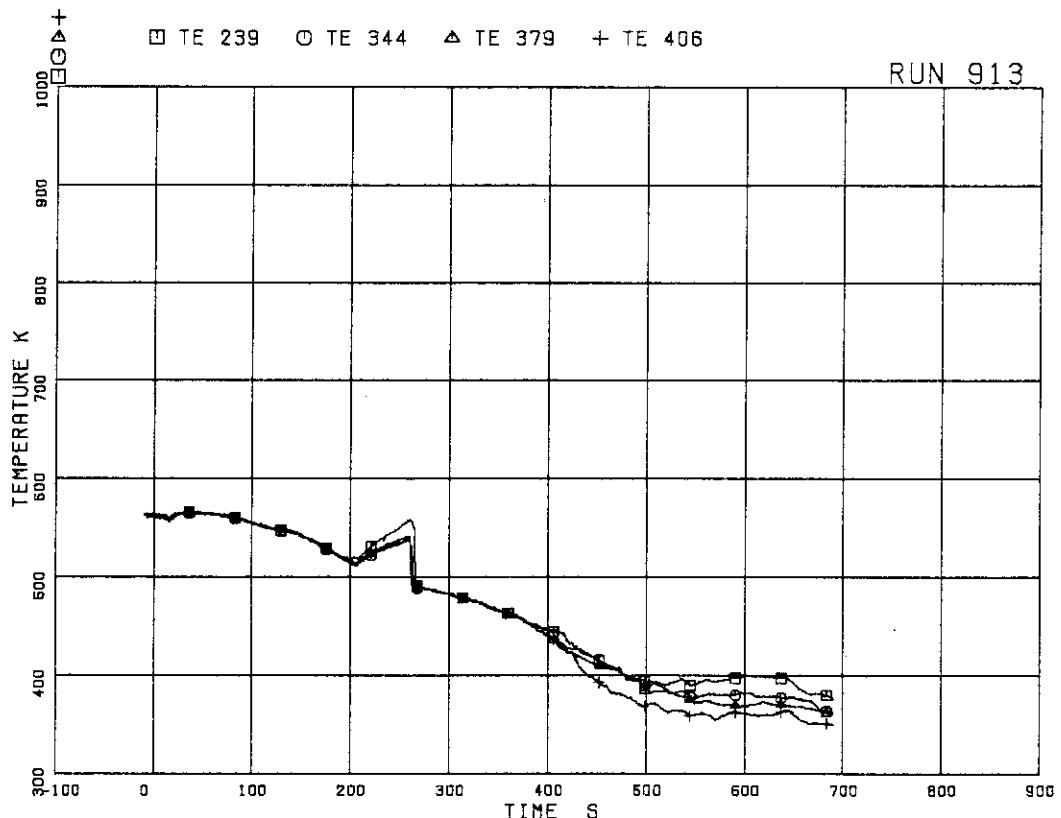


FIG.5.152 SURFACE TEMPERATURES OF FUEL RODS
A22,B22,C22,D22 AT POSITION 7

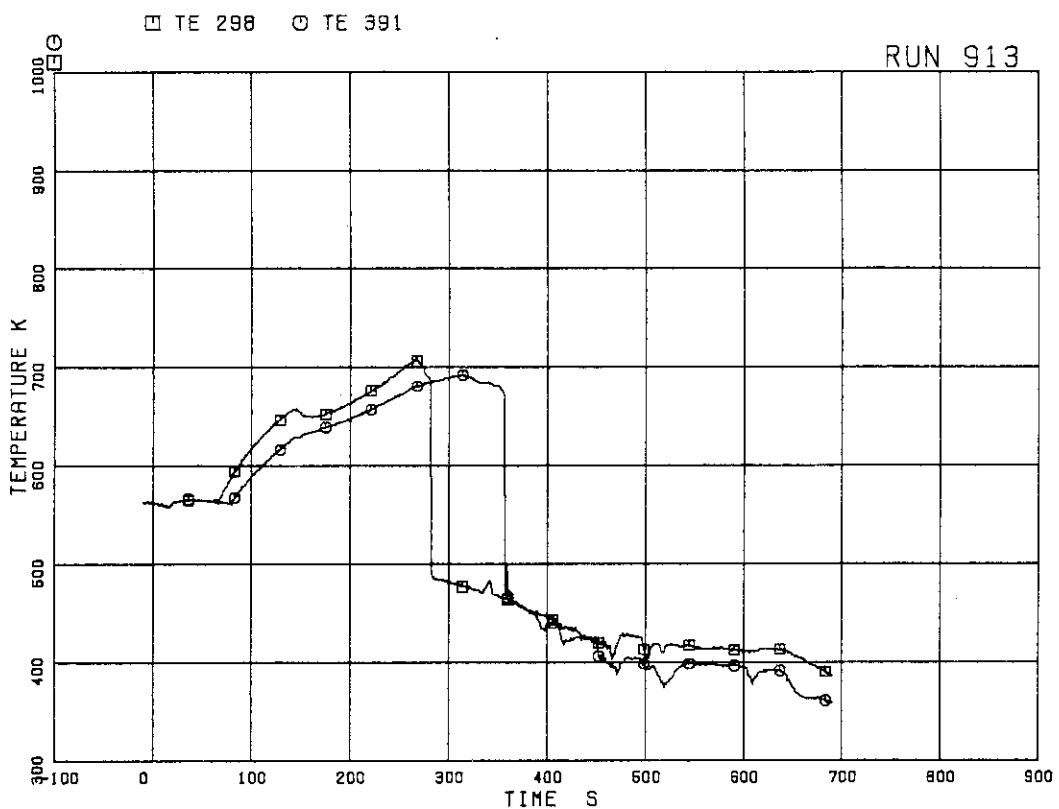


FIG. 5.153 SURFACE TEMPERATURES OF FUEL RODS
A77, C77 AT POSITION 1

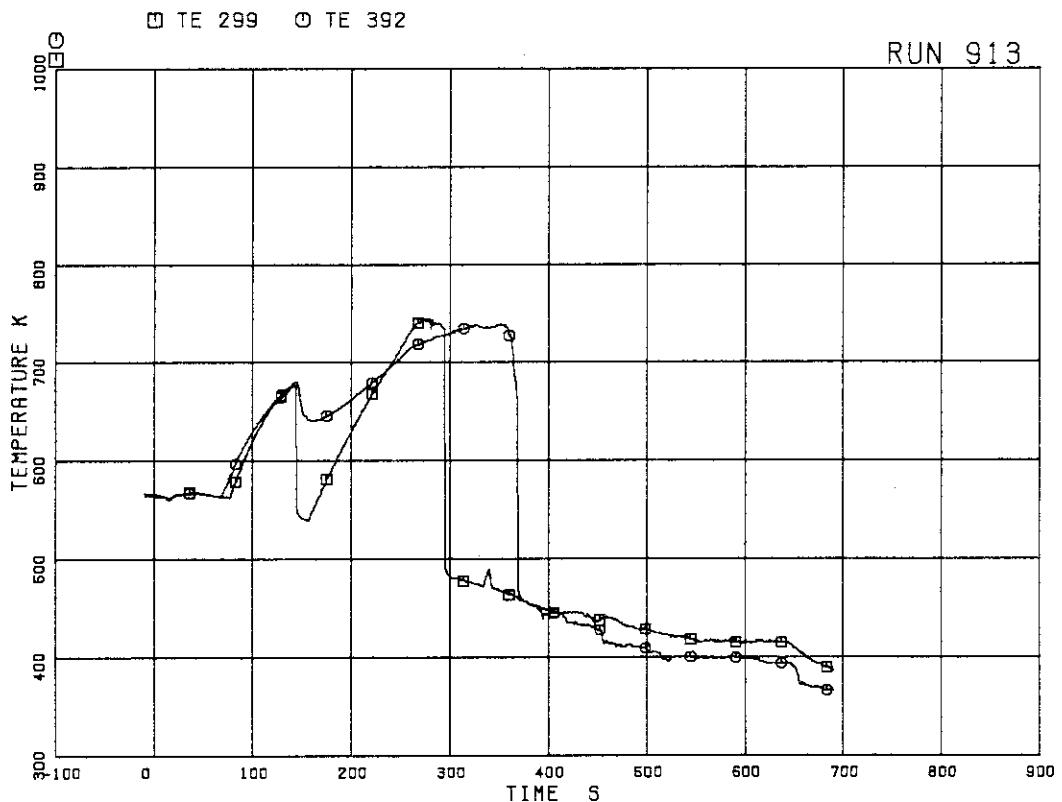


FIG. 5.154 SURFACE TEMPERATURES OF FUEL RODS
A77, C77 AT POSITION 2

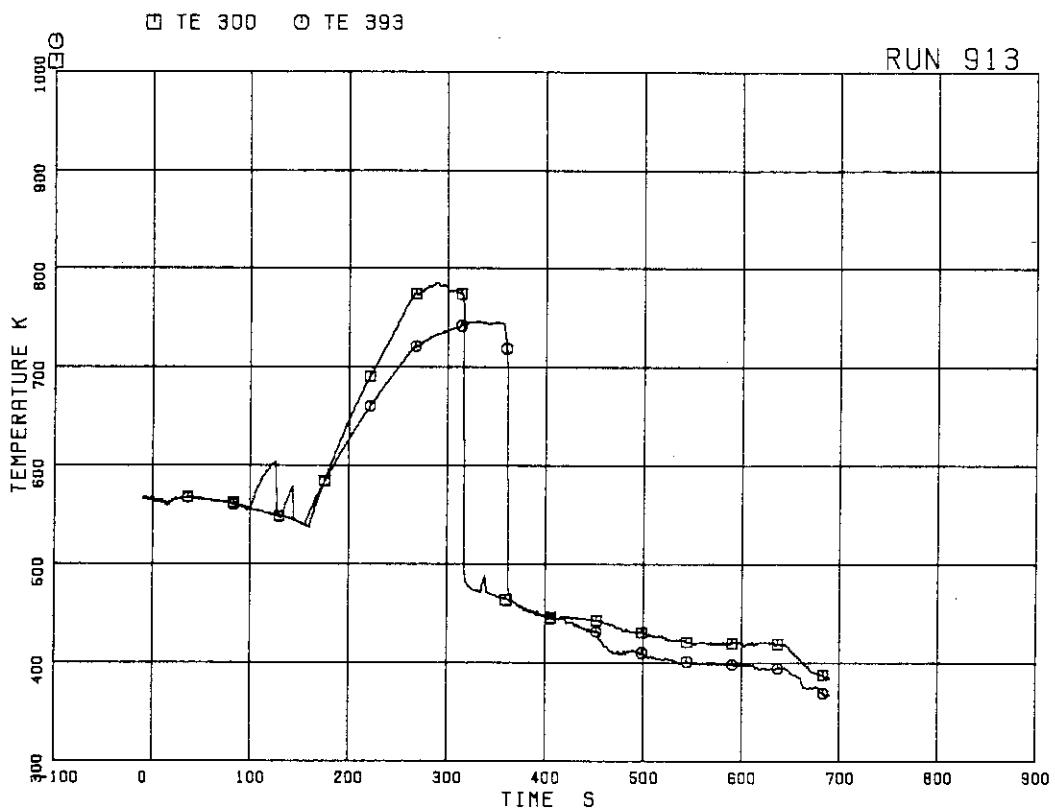


FIG. 5.155 SURFACE TEMPERATURES OF FUEL RODS A77,C77 AT POSITION 3

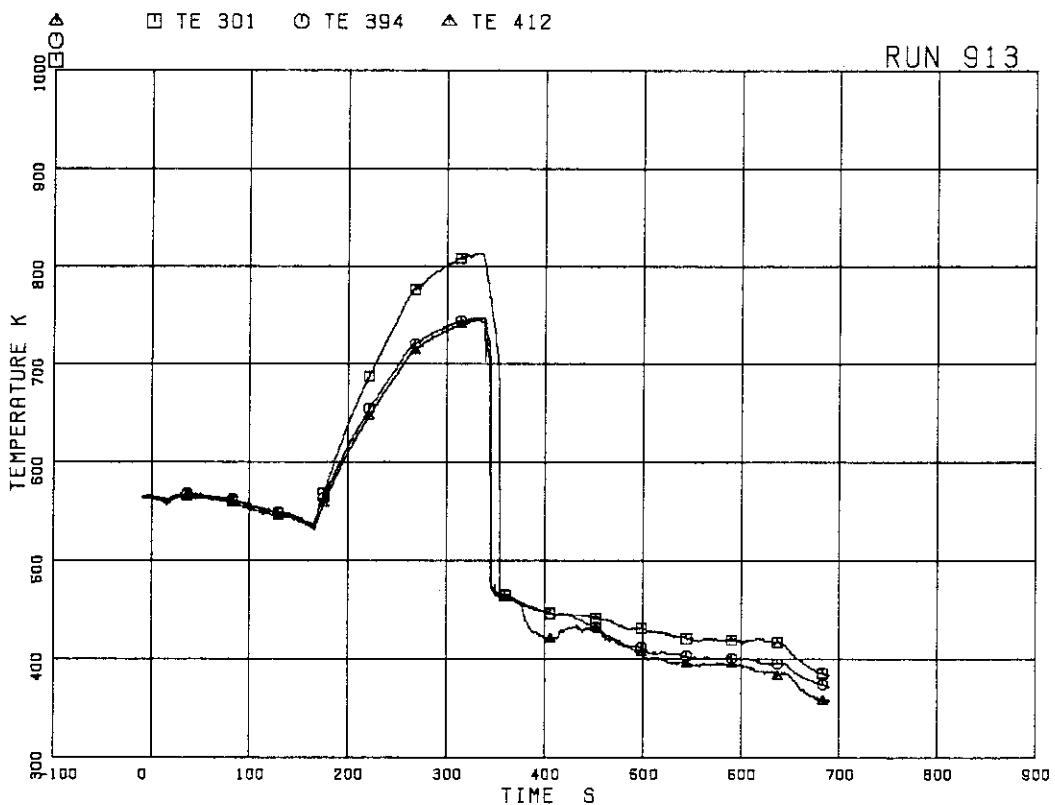


FIG. 5.156 SURFACE TEMPERATURES OF FUEL RODS A77,C77,D77 AT POSITION 4

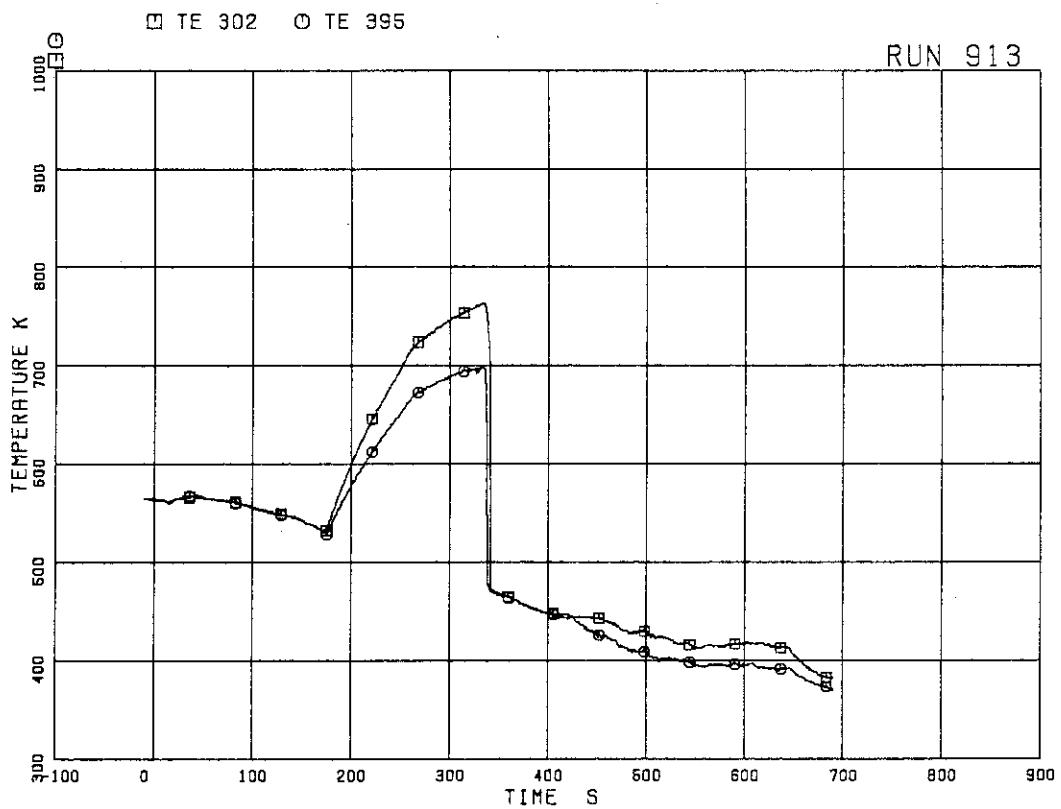


FIG.5.157 SURFACE TEMPERATURES OF FUEL RODS
A77,C77 AT POSITION 5

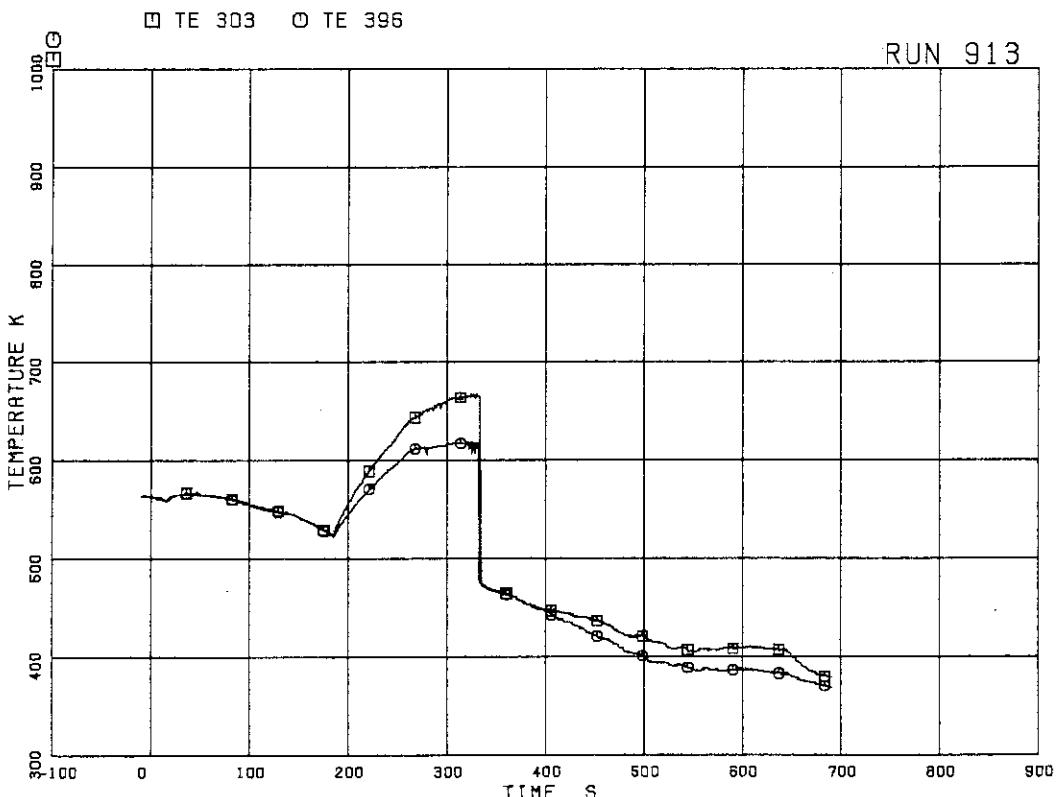


FIG.5.158 SURFACE TEMPERATURES OF FUEL RODS
A77,C77 AT POSITION 6

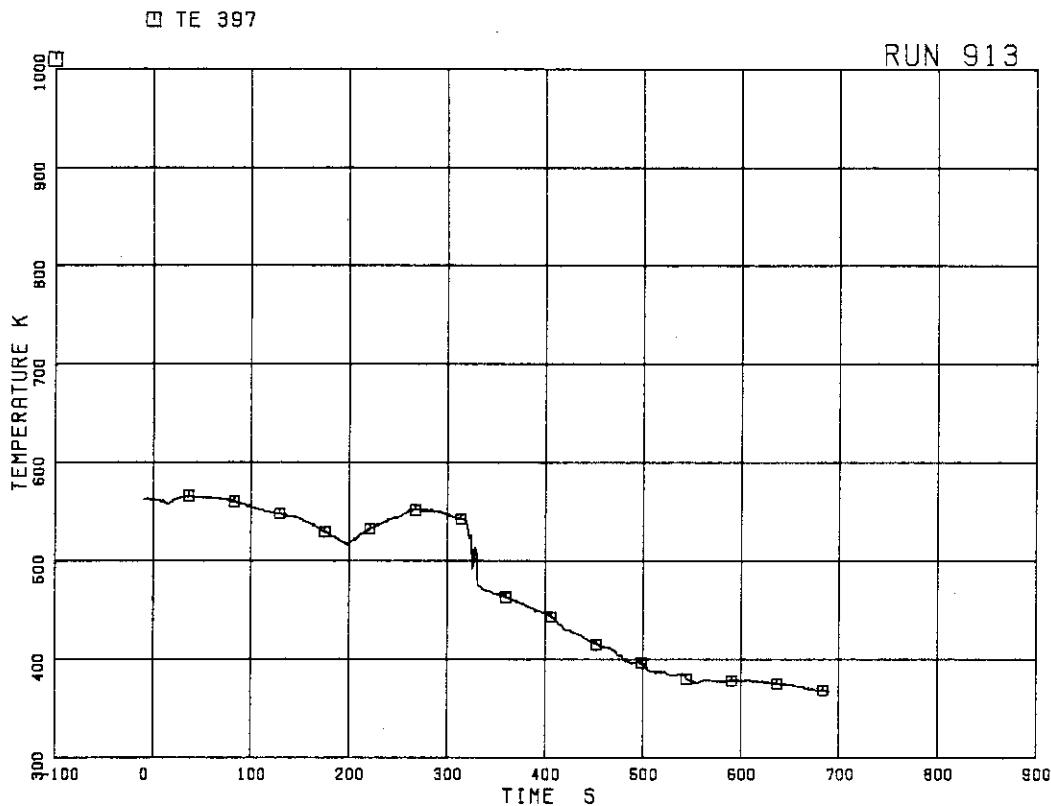


FIG.5.159 SURFACE TEMPERATURE OF FUEL ROD
A77,C77 RODS AT POSITION 7

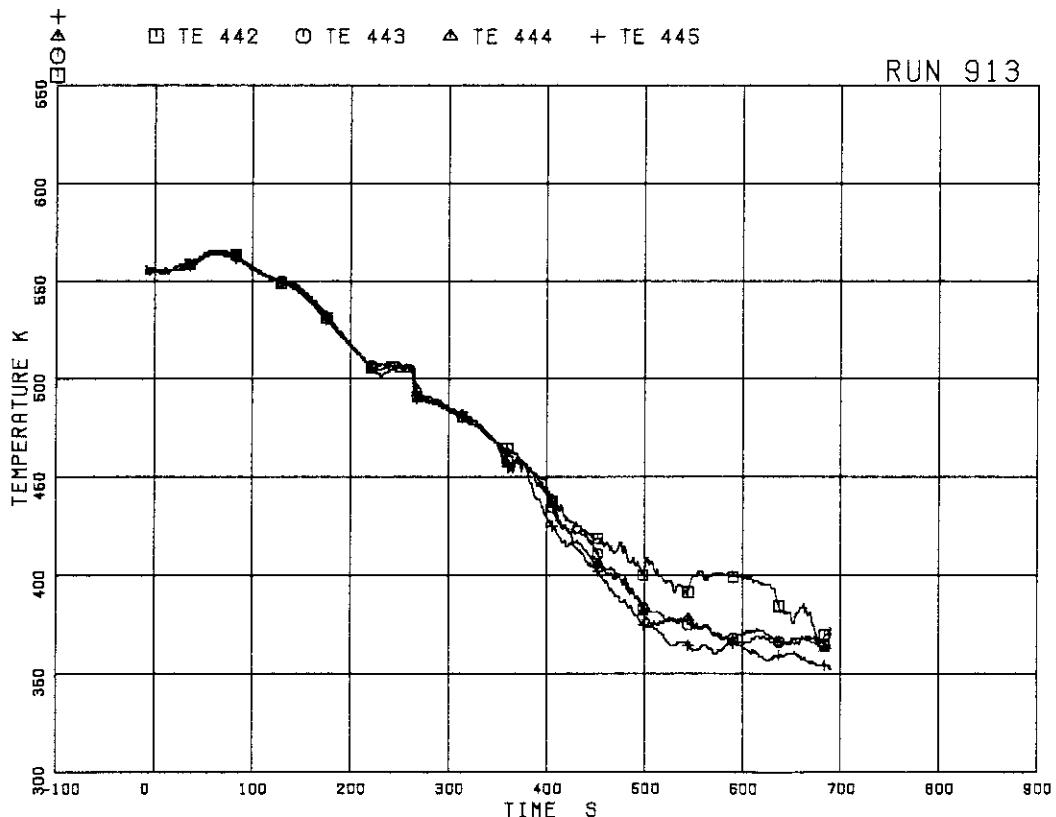


FIG.5.160 FLUID TEMPERATURES AT CHANNEL INLET

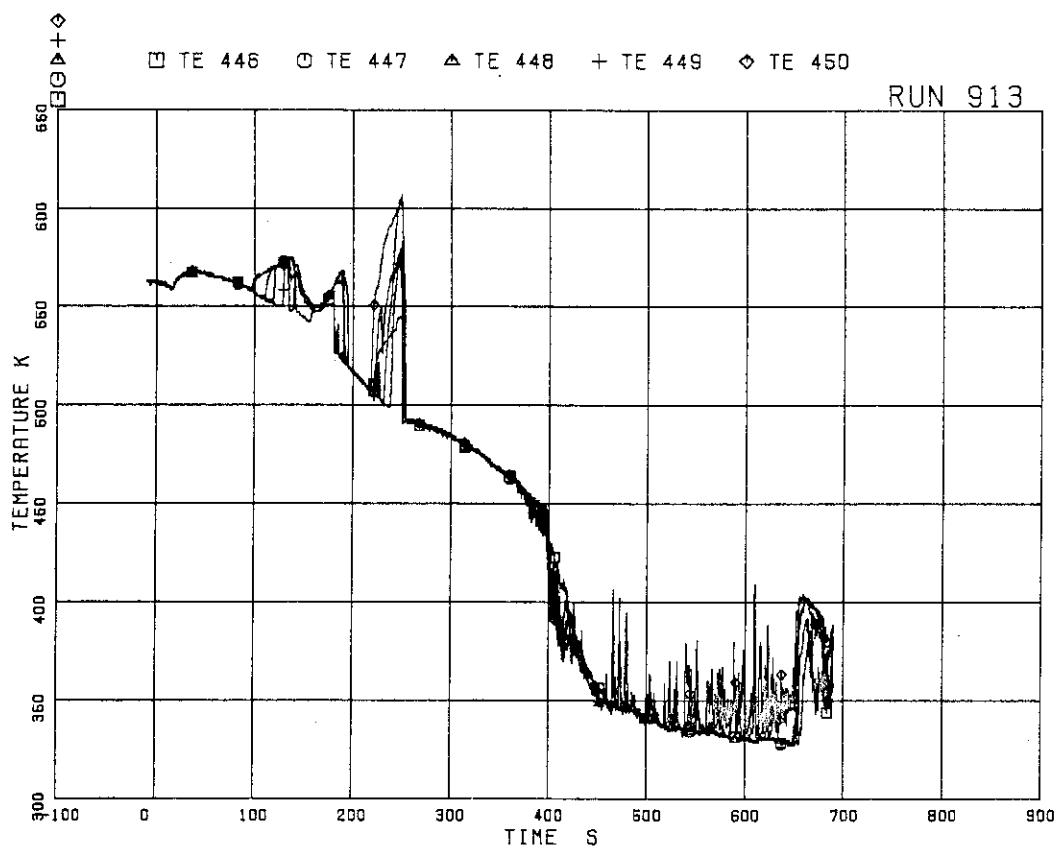


FIG.5.161 FLUID TEMPERATURES AT CHANNEL A OUTLET

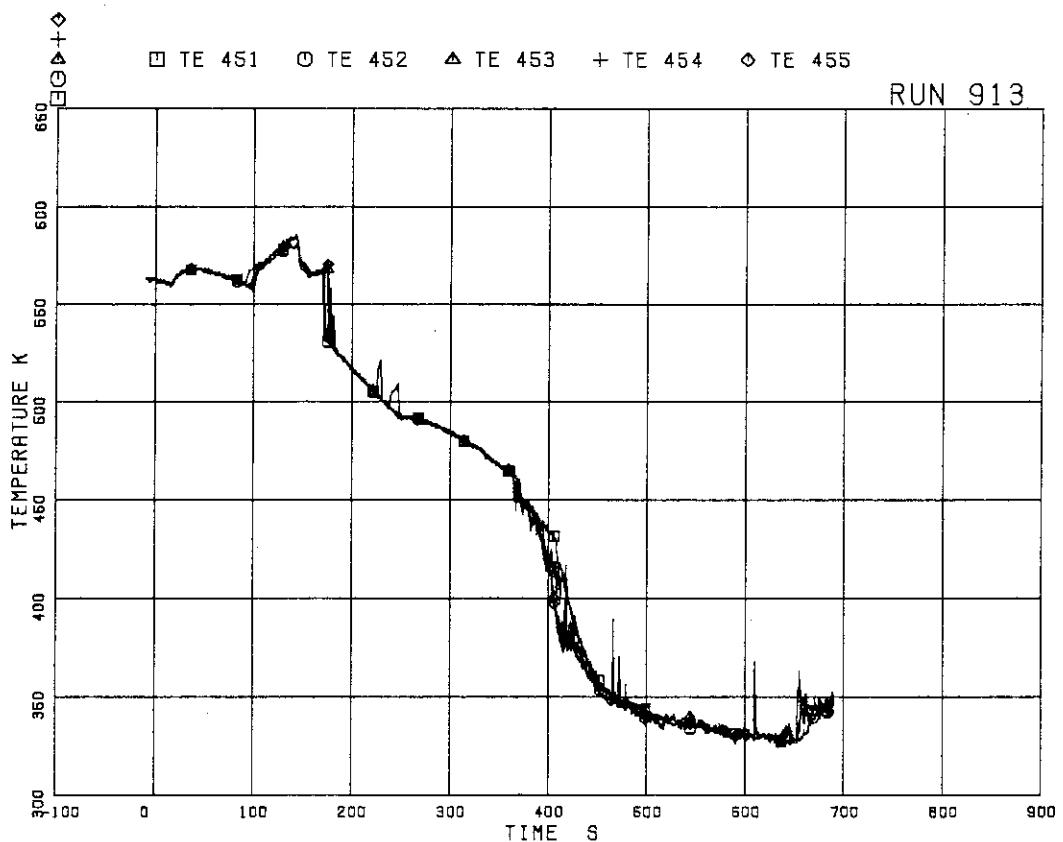


FIG.5.162 FLUID TEMPERATURES AT CHANNEL C OUTLET

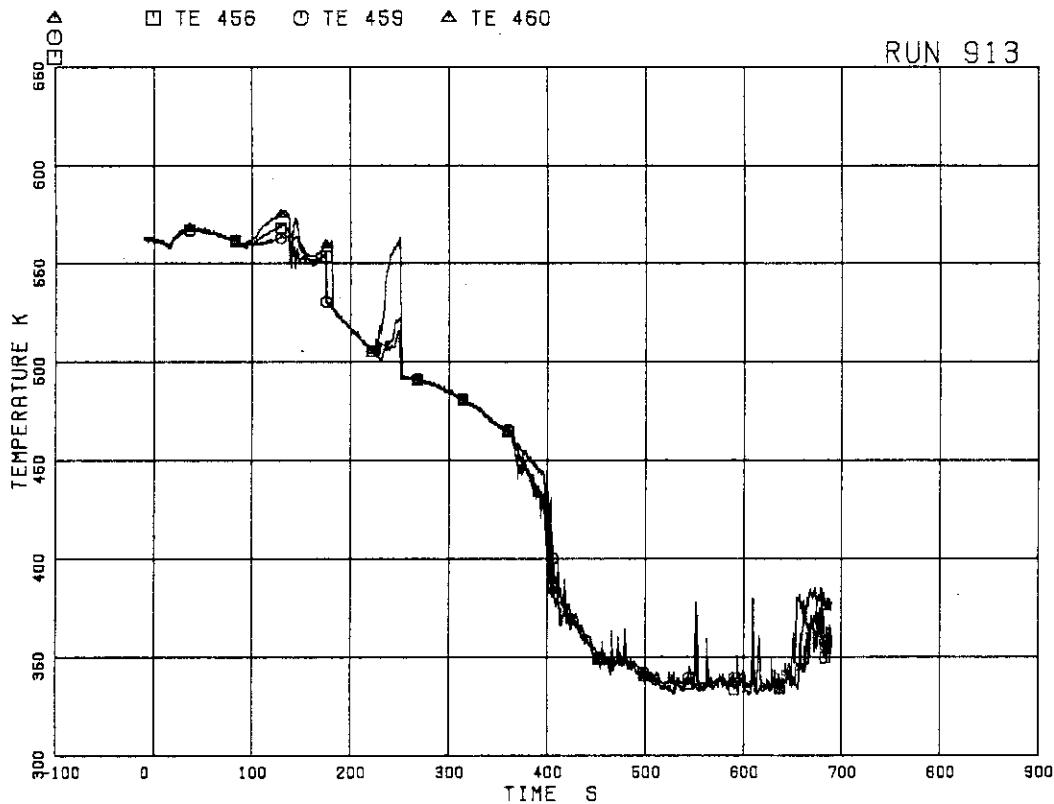


FIG.5.163 FLUID TEMPERATURES ABOVE UTP OF CHANNEL A, OPENINGS 1 TO 5

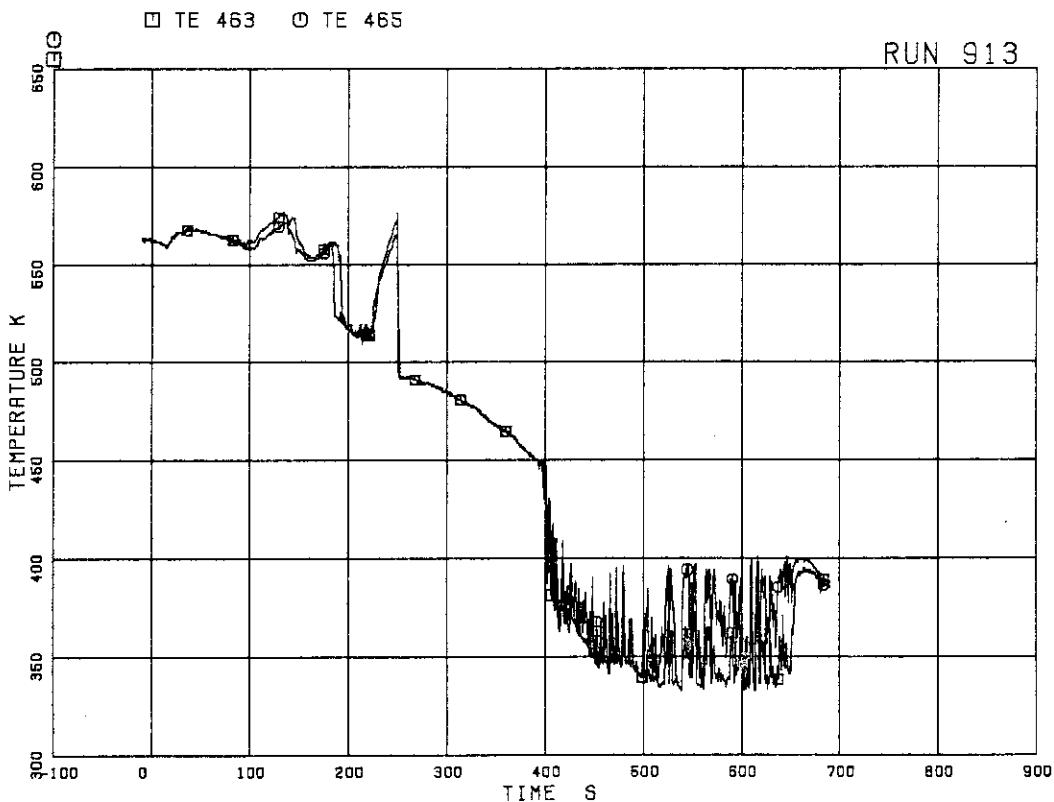


FIG.5.164 FLUID TEMPERATURES ABOVE UTP OF CHANNEL A, OPENINGS 6 TO 10

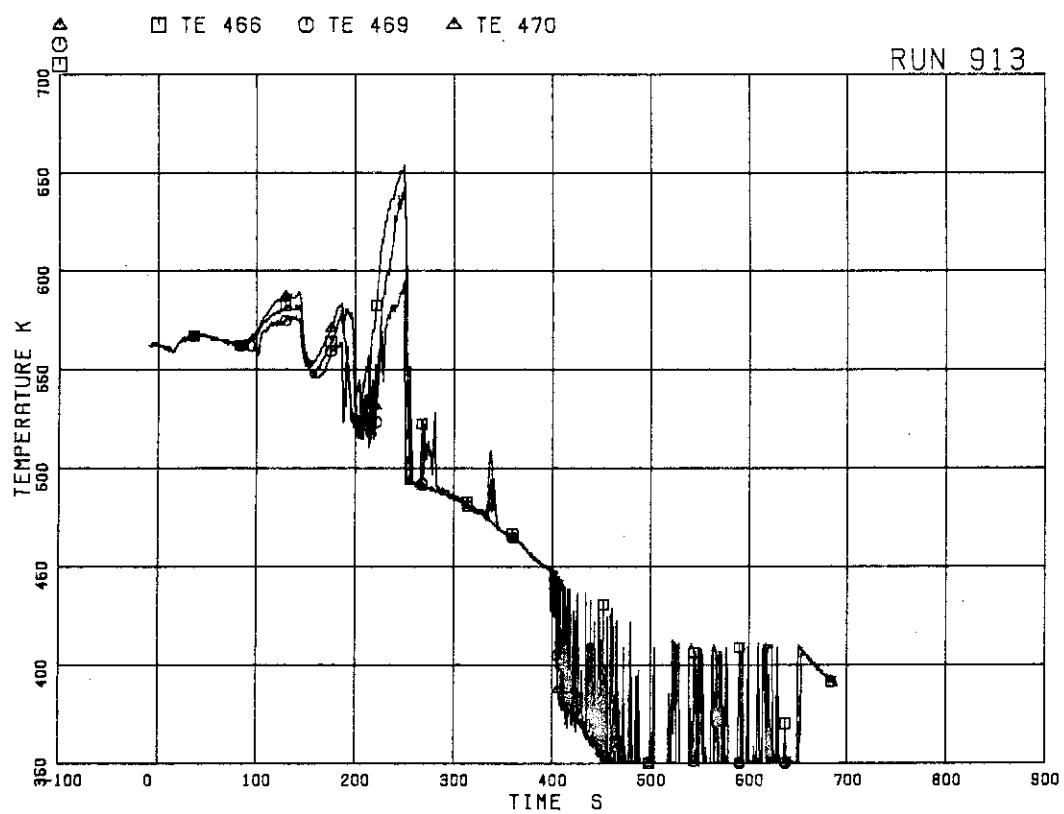


FIG.5.165 FLUID TEMPERATURES BELOW UTP OF CHANNEL A, OPENINGS 1 TO 5

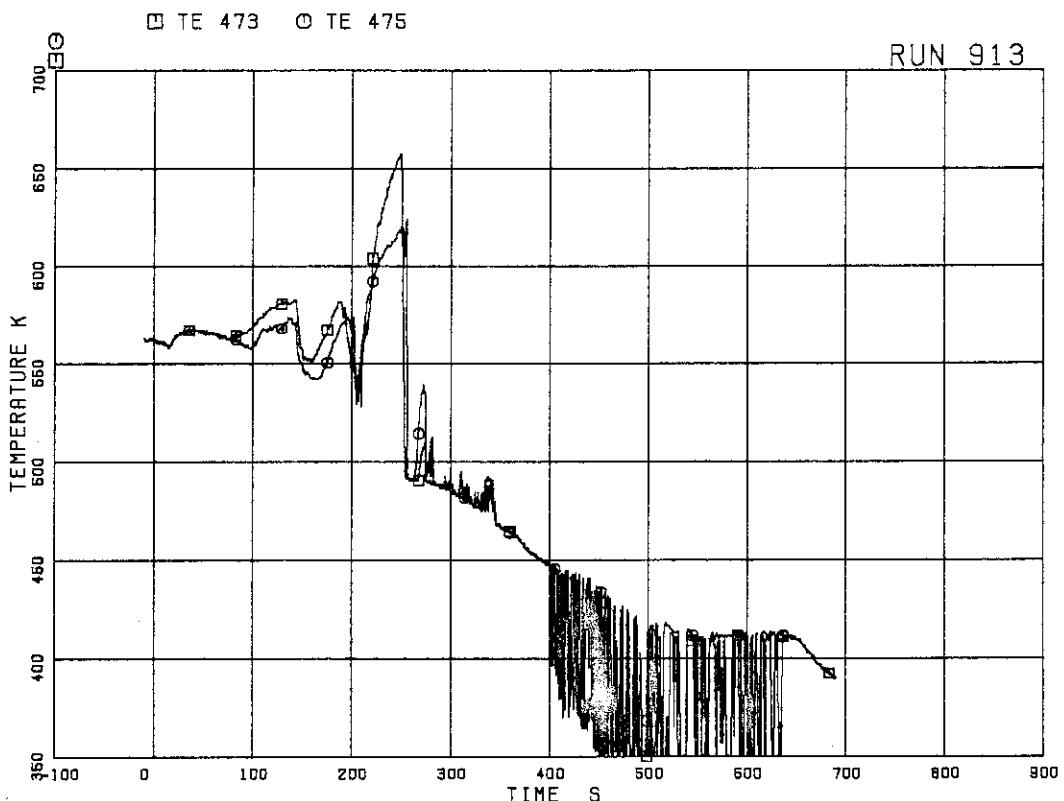


FIG.5.166 FLUID TEMPERATURES BELOW UTP OF CHANNEL A, OPENINGS 6 TO 10

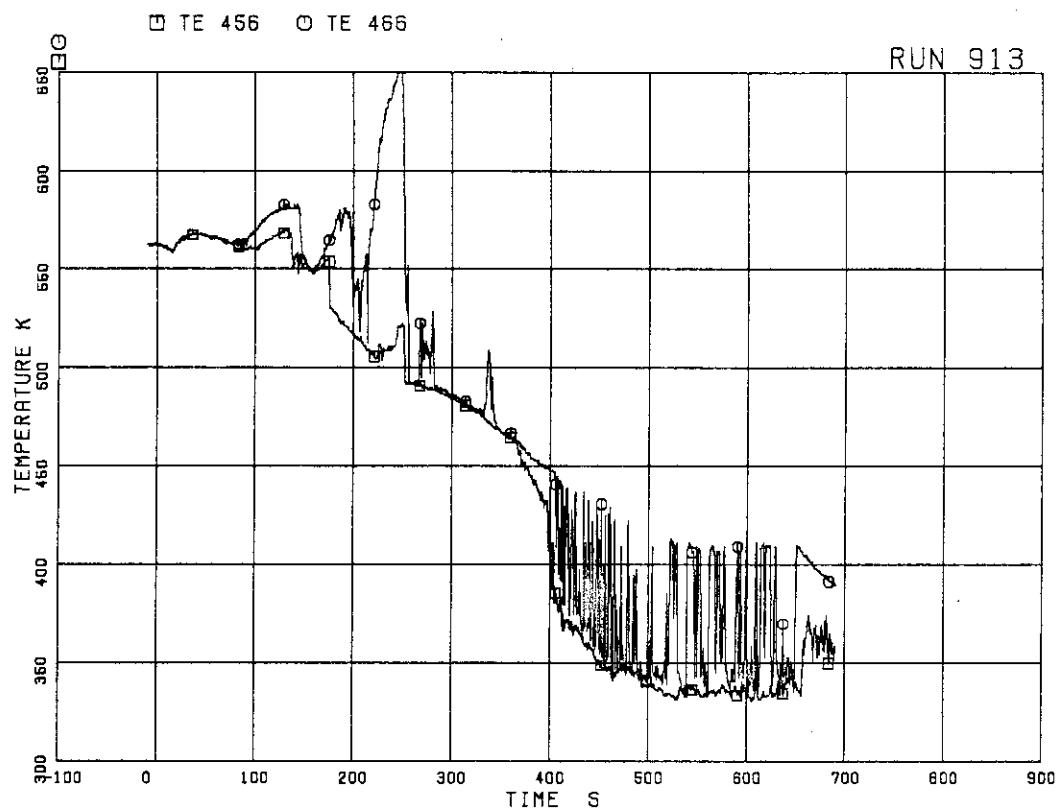


FIG.5.167 FLUID TEMPERATURES AT UTP IN CHANNEL A,
OPENING 1

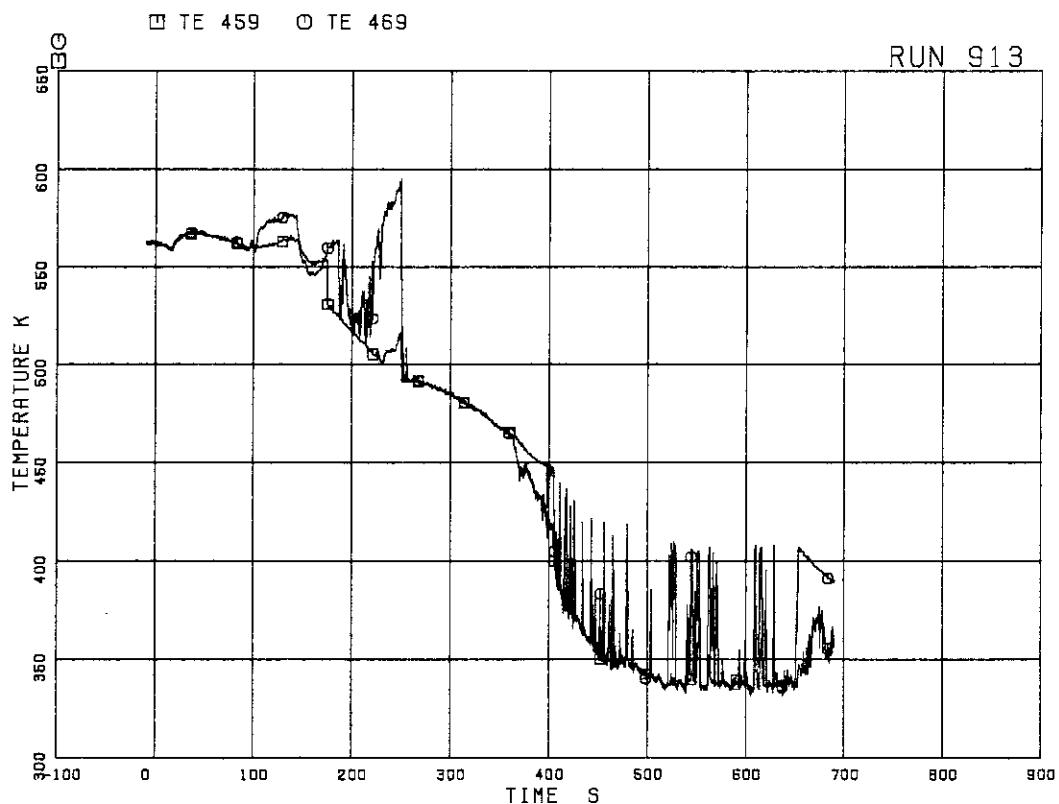


FIG.5.168 FLUID TEMPERATURES AT UTP IN CHANNEL A,
OPENING 4

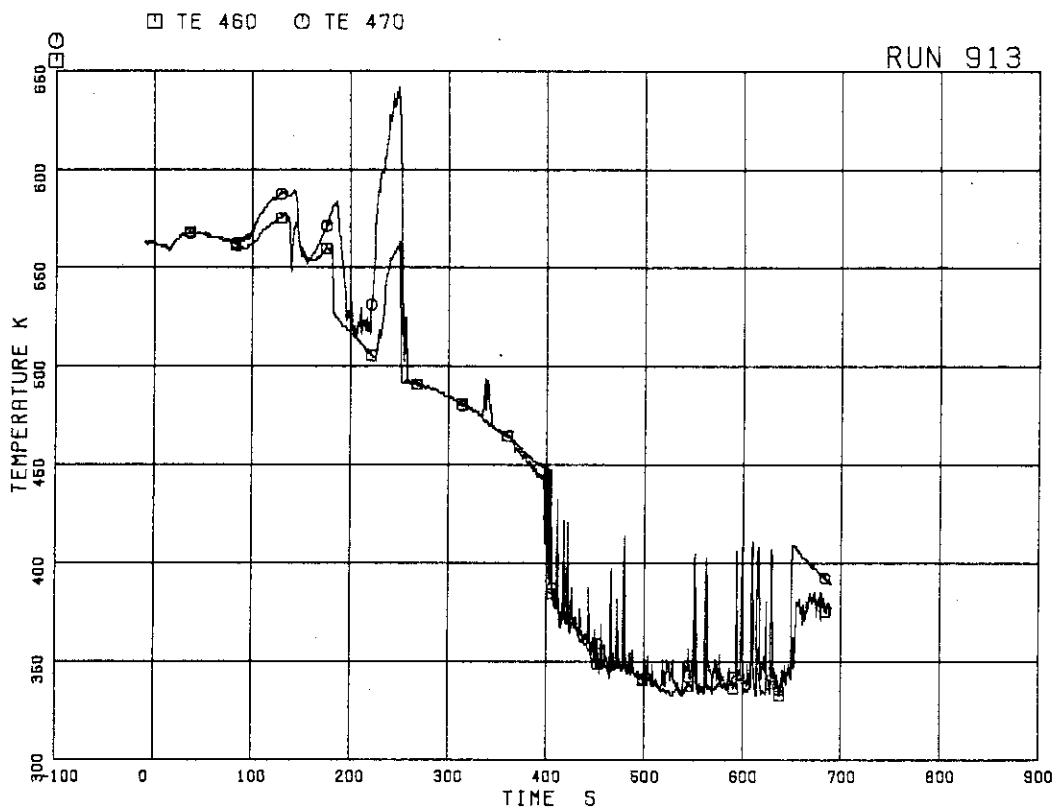


FIG.5.169 FLUID TEMPERATURES AT UTP IN CHANNEL A,
OPENING 5

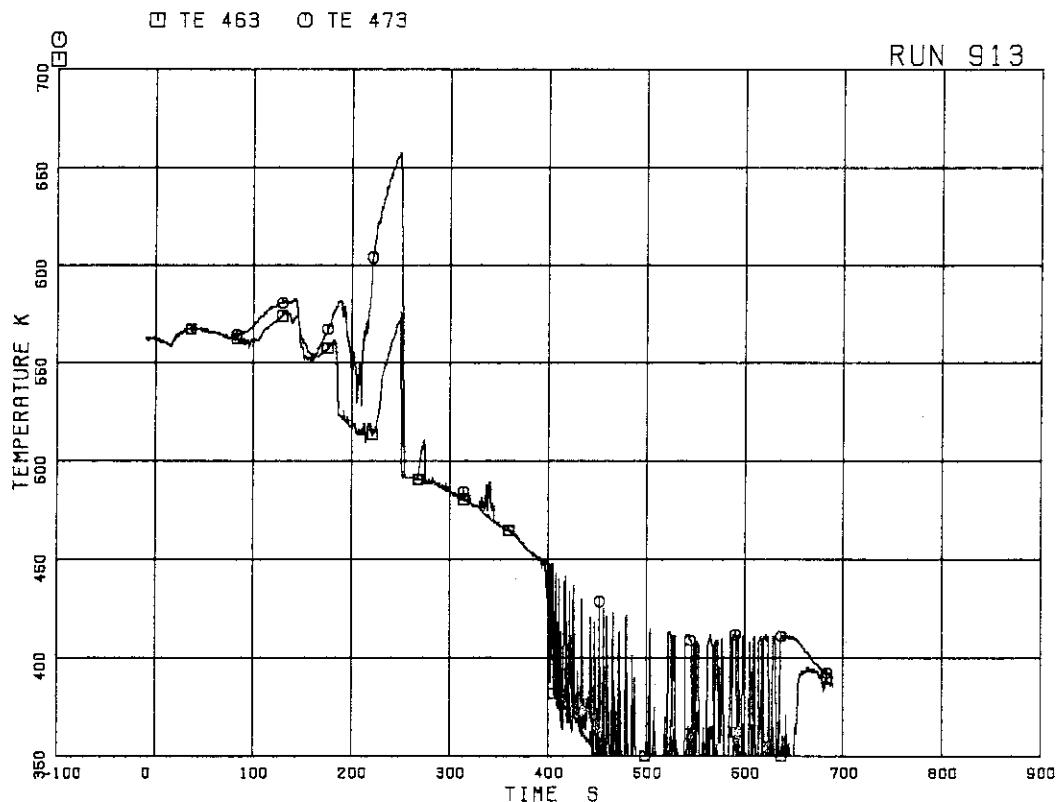


FIG.5.170 FLUID TEMPERATURES AT UTP IN CHANNEL A,
OPENING 8

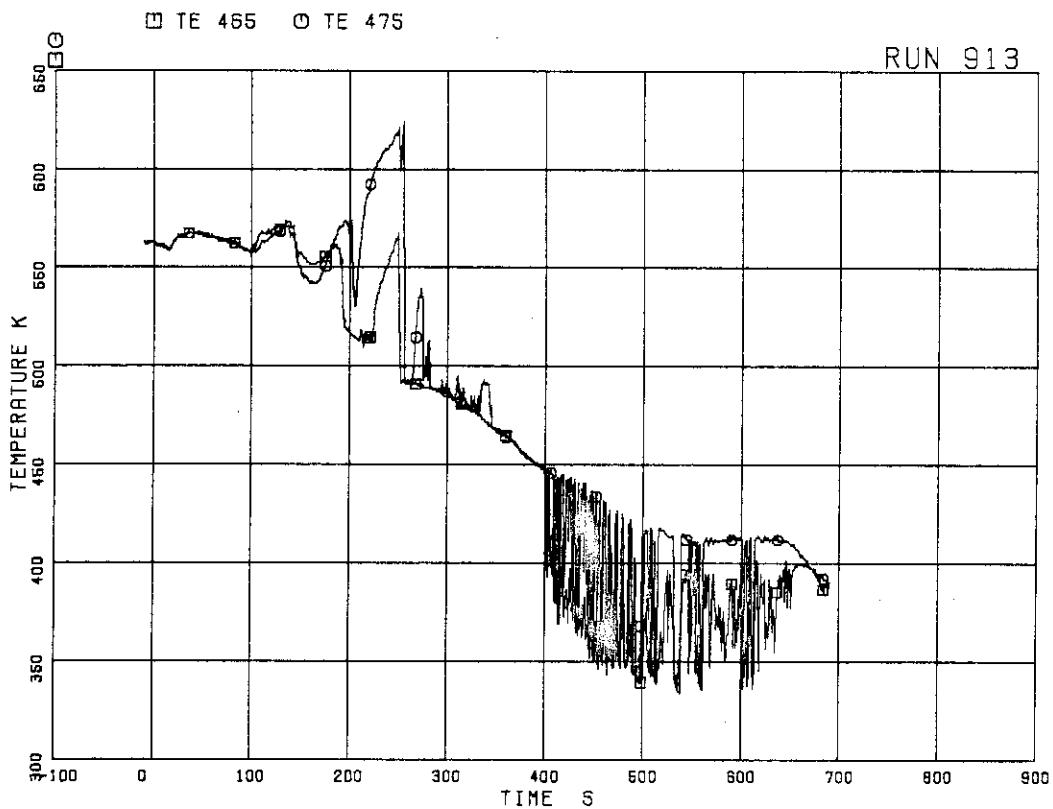


FIG.5.171 FLUID TEMPERATURES AT UTP IN CHANNEL A,
OPENING 10

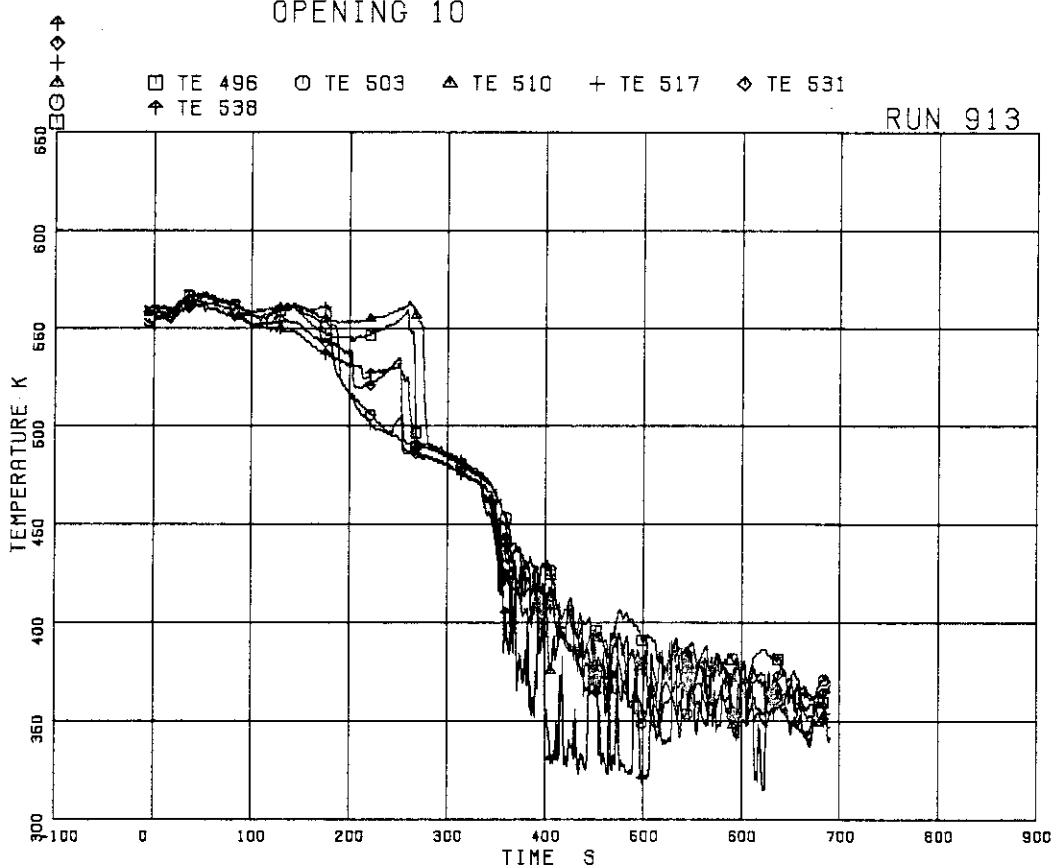


FIG.5.172 INNER AND OUTER SURFACE TEMPERATURES OF
CHANNEL BOX AT POS. 1

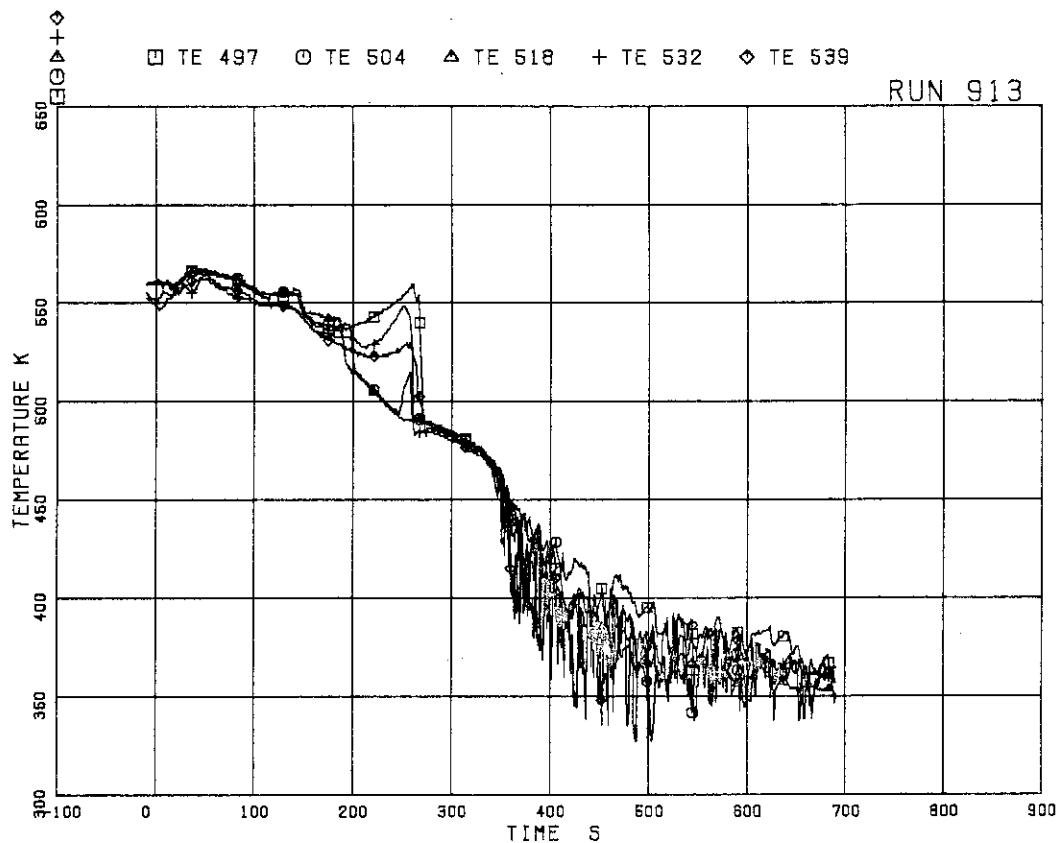


FIG.5.173 INNER AND OUTER SURFACE TEMPERATURES OF CHANNEL BOX AT POS.2

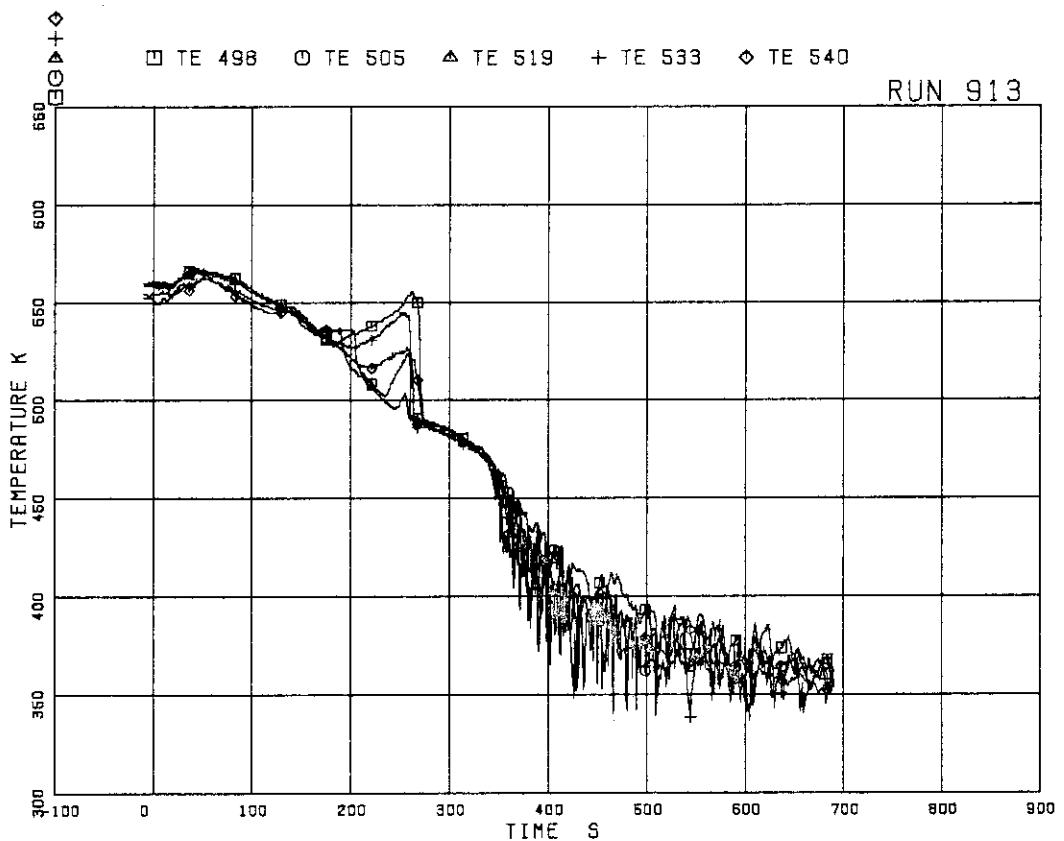


FIG.5.174 INNER AND OUTER SURFACE TEMPERATURES OF CHANNEL BOX AT POS.3

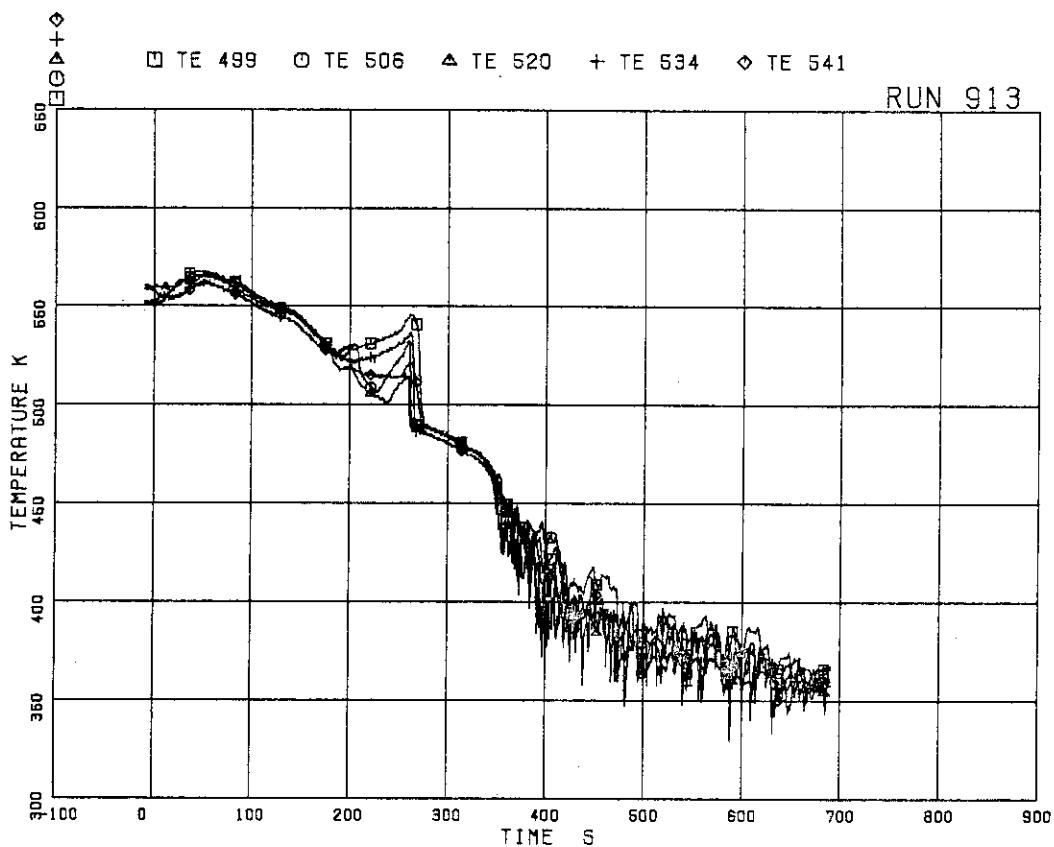


FIG.5.175 INNER AND OUTER SURFACE TEMPERATURES OF CHANNEL BOX AT POS.4

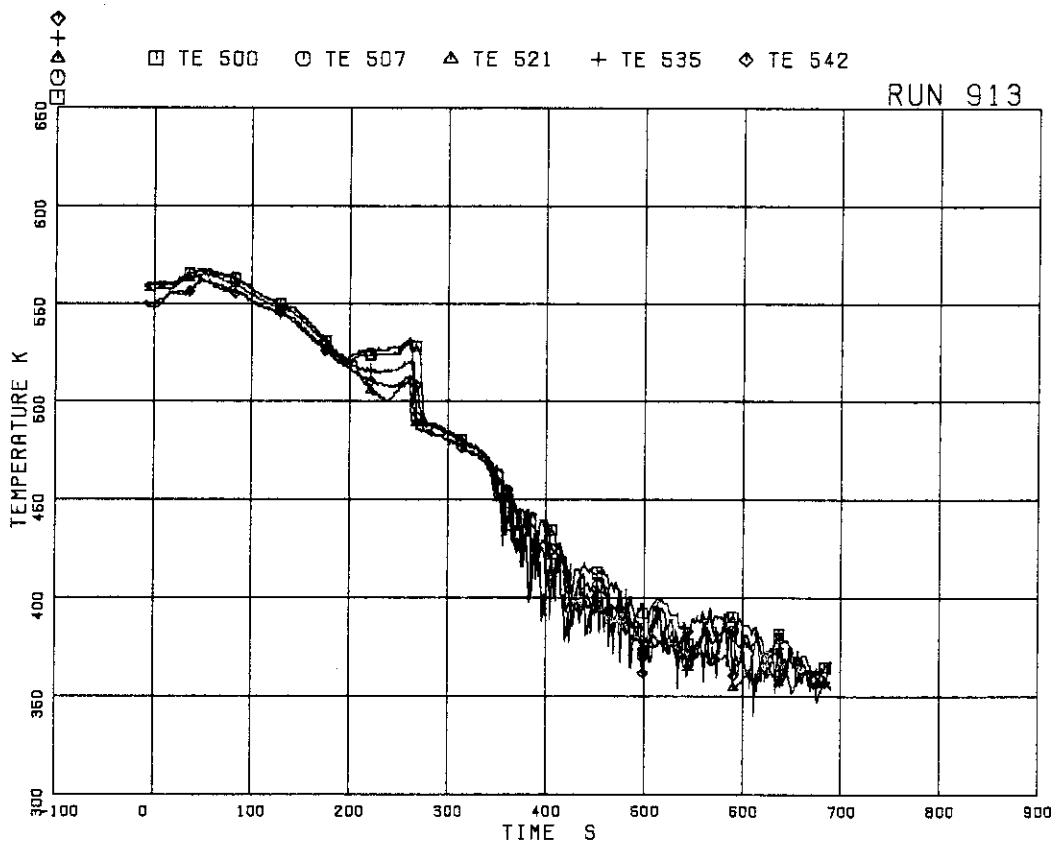


FIG.5.176 INNER AND OUTER SURFACE TEMPERATURES OF CHANNEL BOX AT POS.5

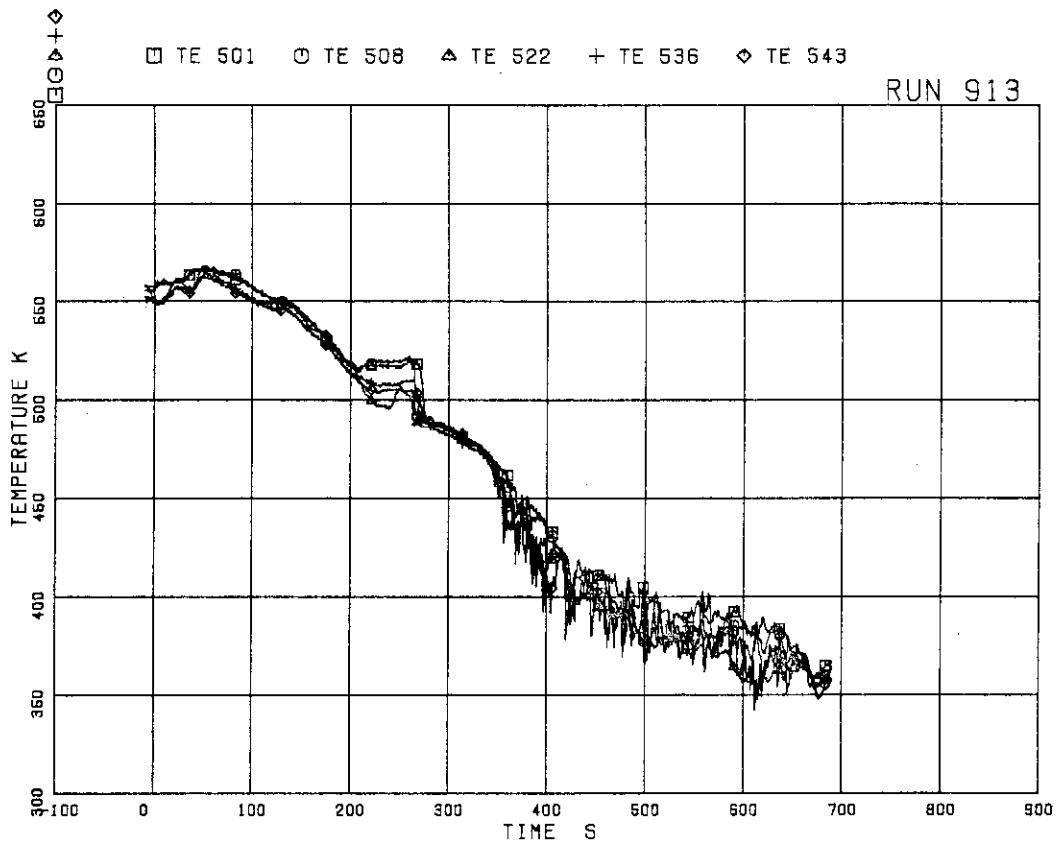


FIG.5.177 INNER AND OUTER SURFACE TEMPERATURES OF CHANNEL BOX AT POS.6

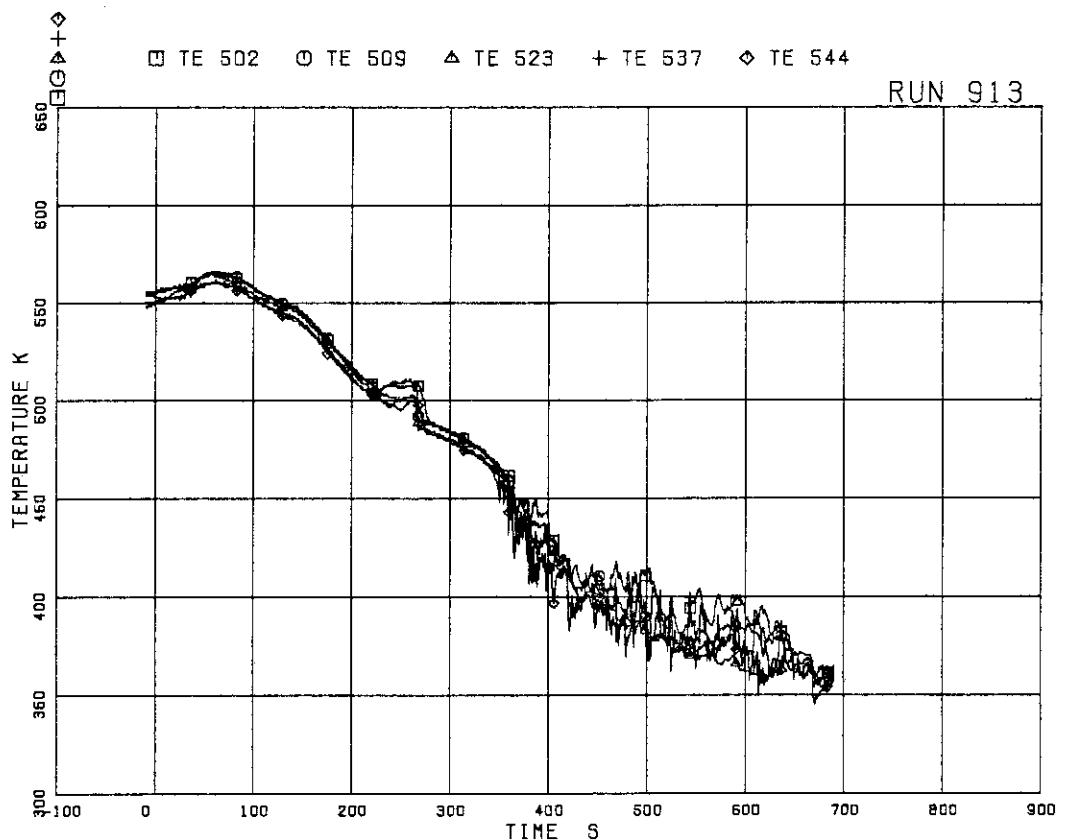
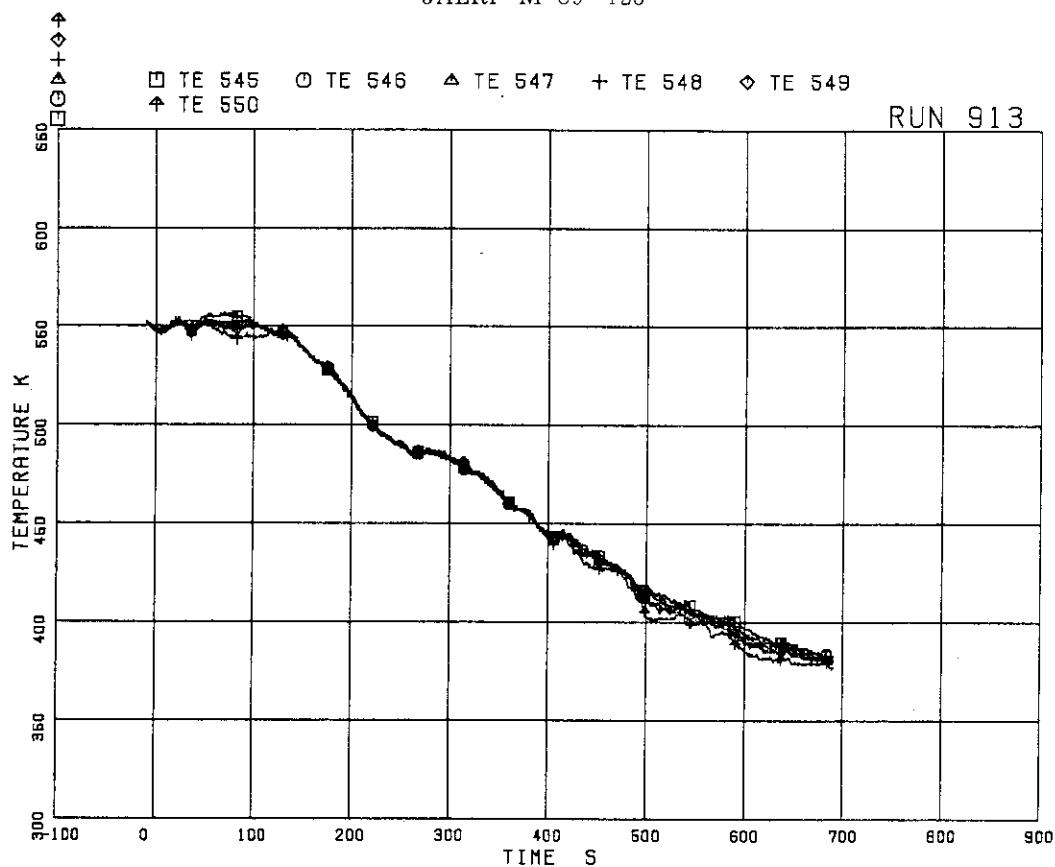
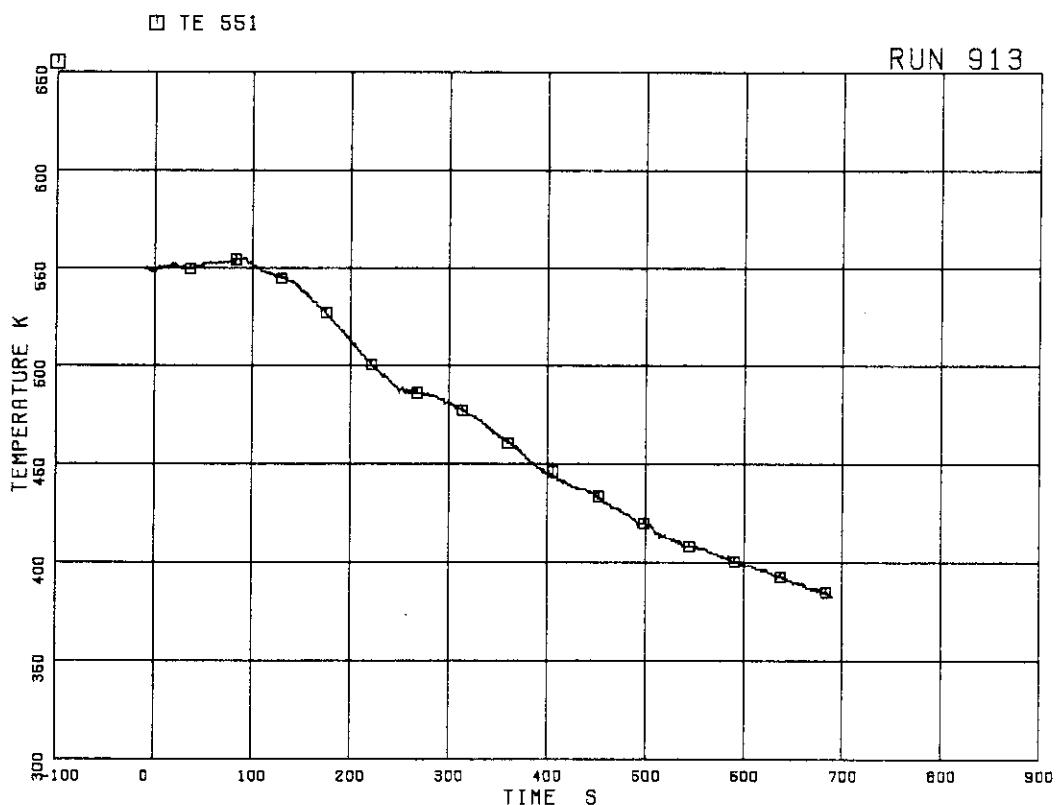


FIG.5.178 INNER AND OUTER SURFACE TEMPERATURES OF CHANNEL BOX AT POS.7

FIG.5.179 FLUID TEMPERATURES IN LOWER PLENUM,
CENTERFIG.5.180 FLUID TEMPERATURE IN LOWER PLENUM,
NORTH

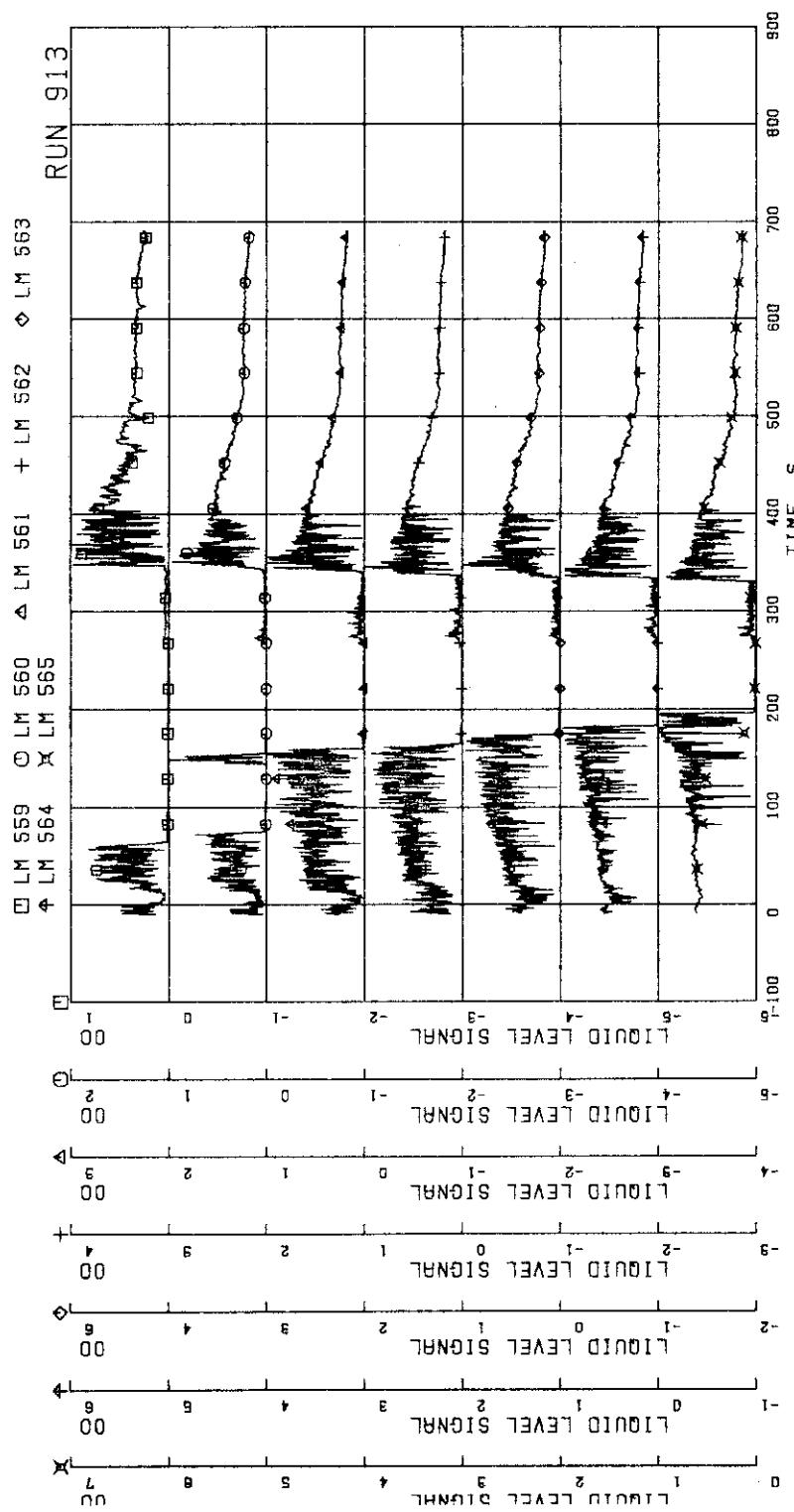


FIG. 5.181 LIQUID LEVEL SIGNALS IN CHANNEL BOX A,
LOCATION A1

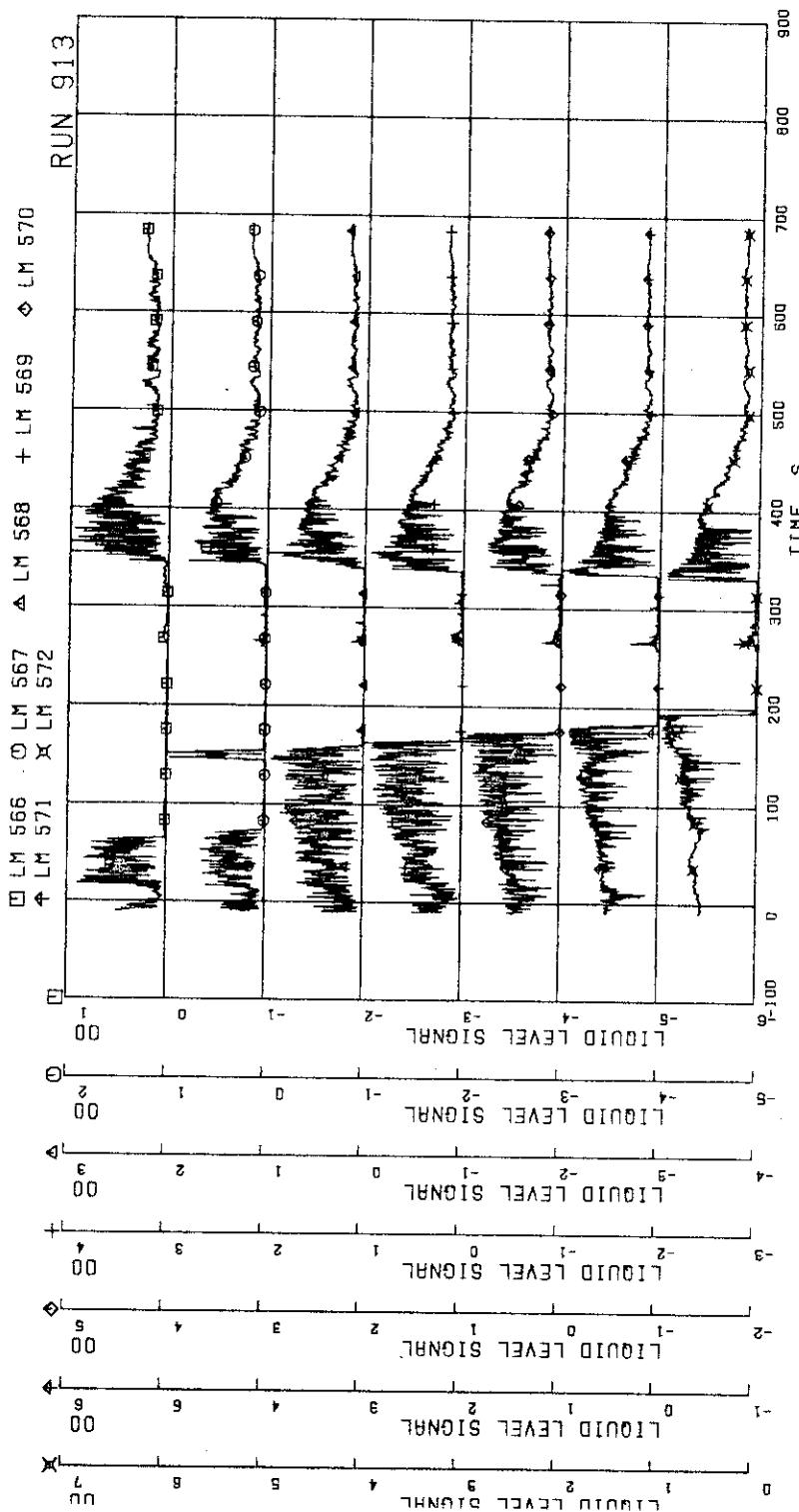


FIG. 5.182 LIQUID LEVEL SIGNALS IN CHANNEL BOX A,
LOCATION A2

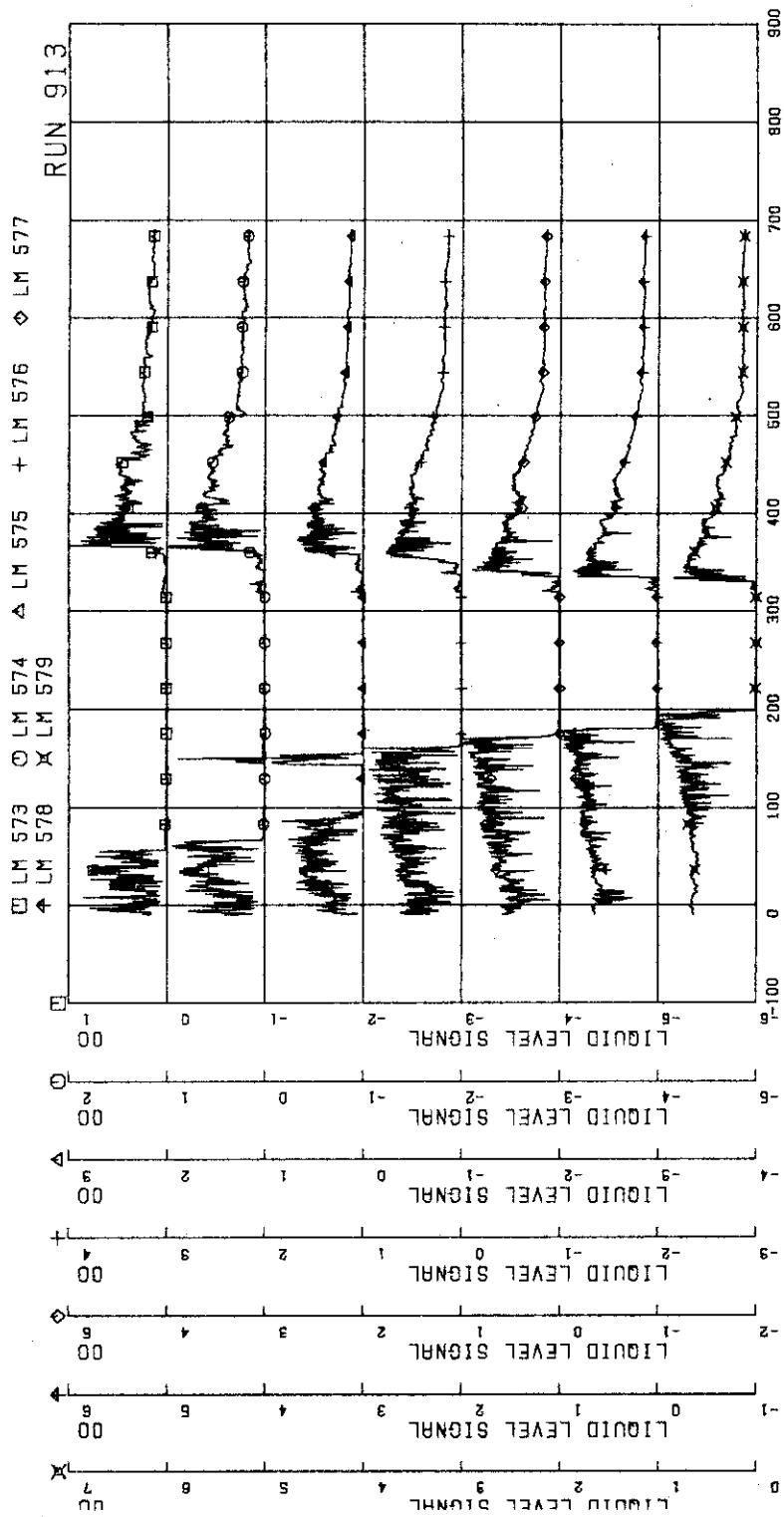


FIG. 5-183 LIQUID LEVEL SIGNALS IN CHANNEL BOX B

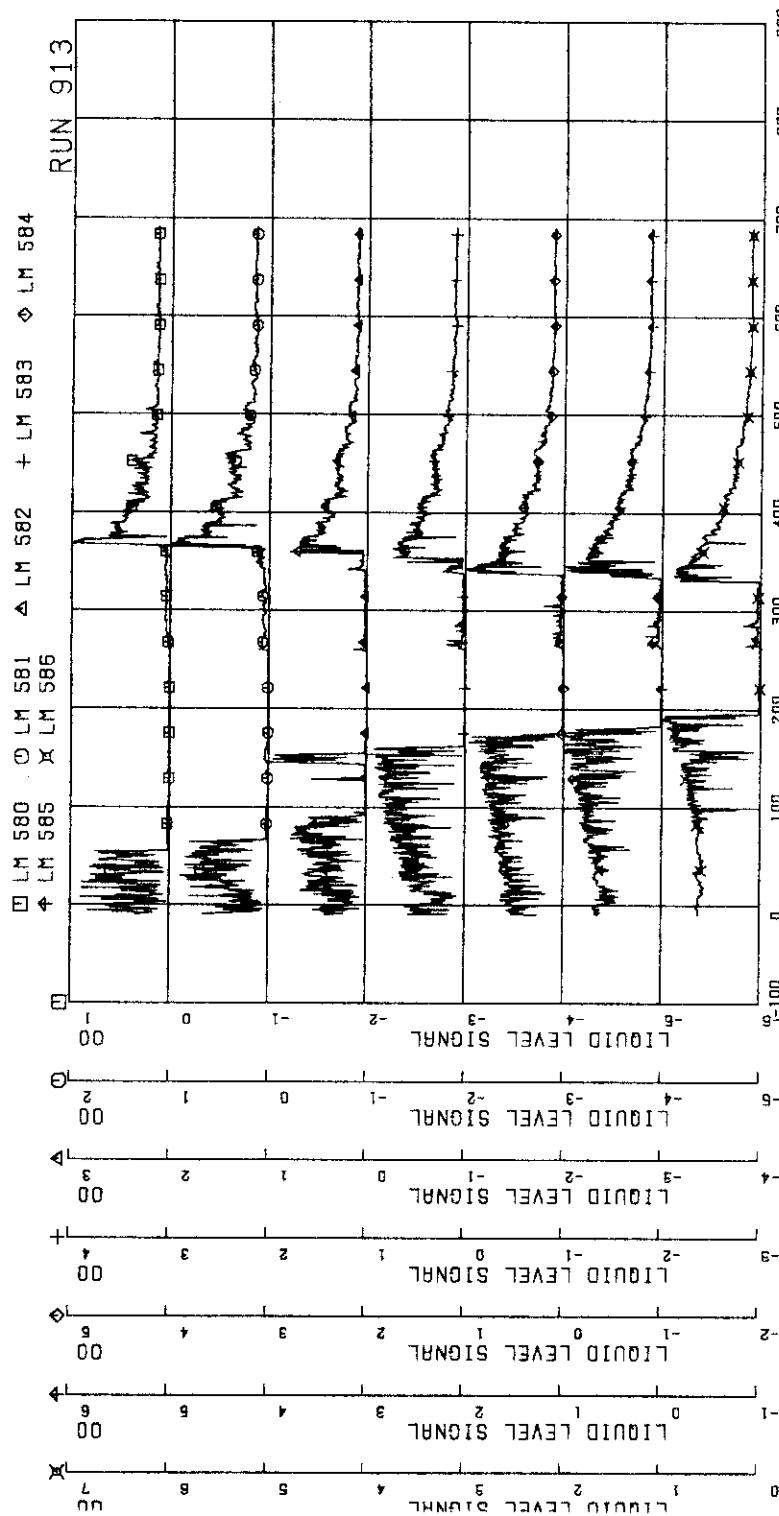


FIG. 5.184 LIQUID LEVEL SIGNALS IN CHANNEL BOX C

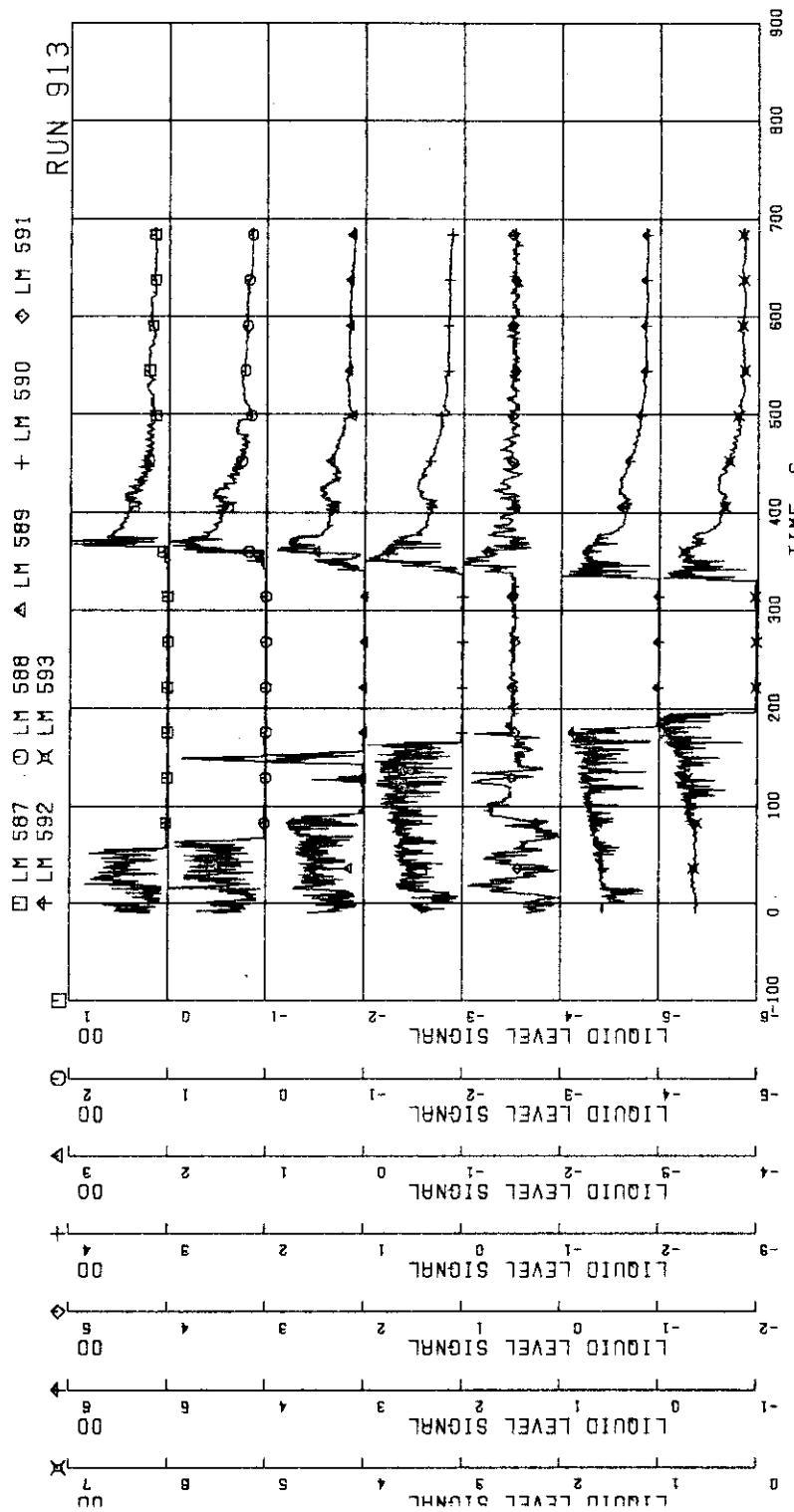


FIG. 5.185 LIQUID LEVEL SIGNALS IN CHANNEL BOX D

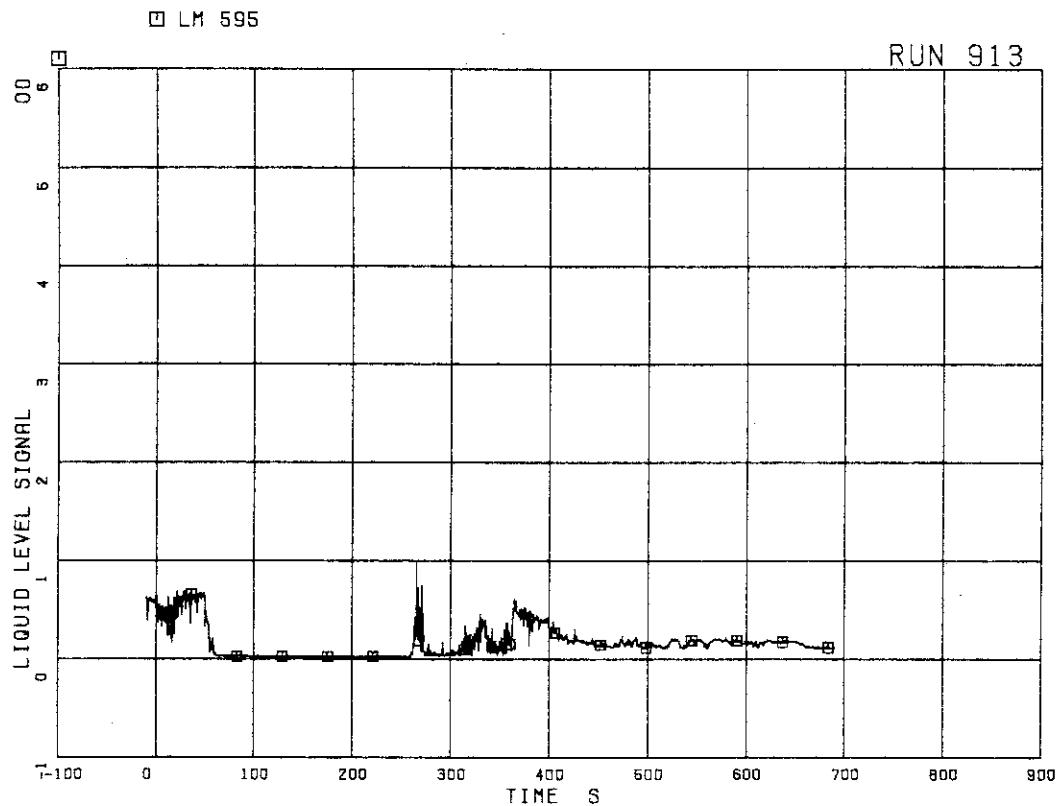
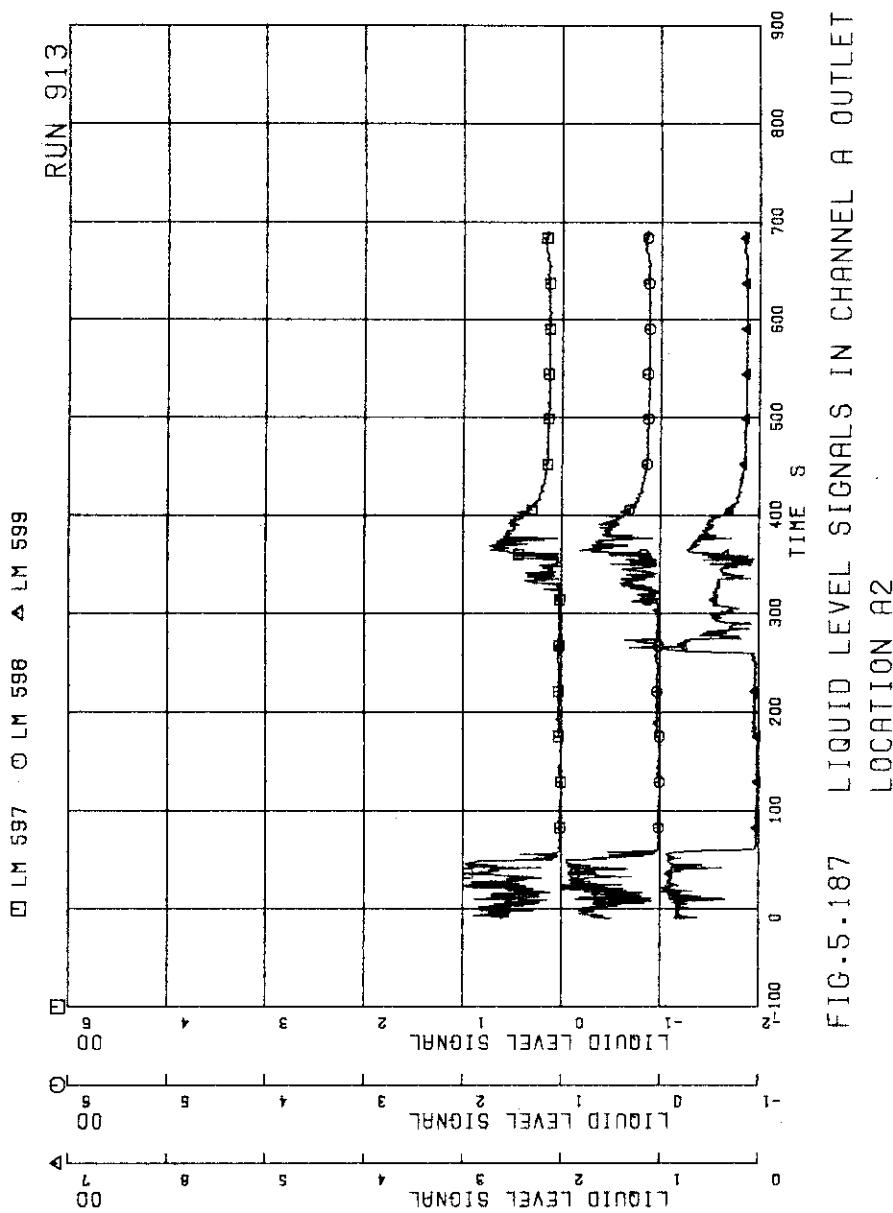


FIG.5.186 LIQUID LEVEL SIGNAL IN CHANNEL A OUTLET
LOCATION A1



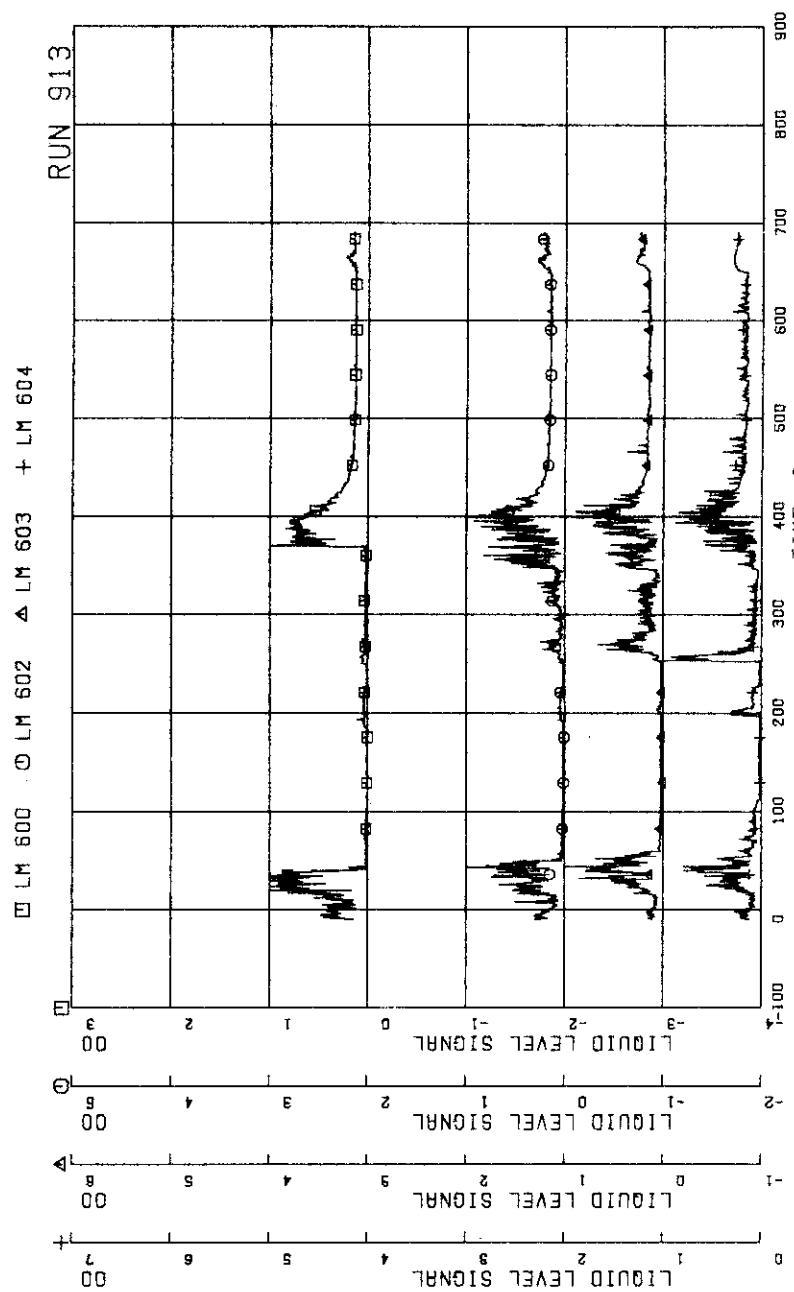
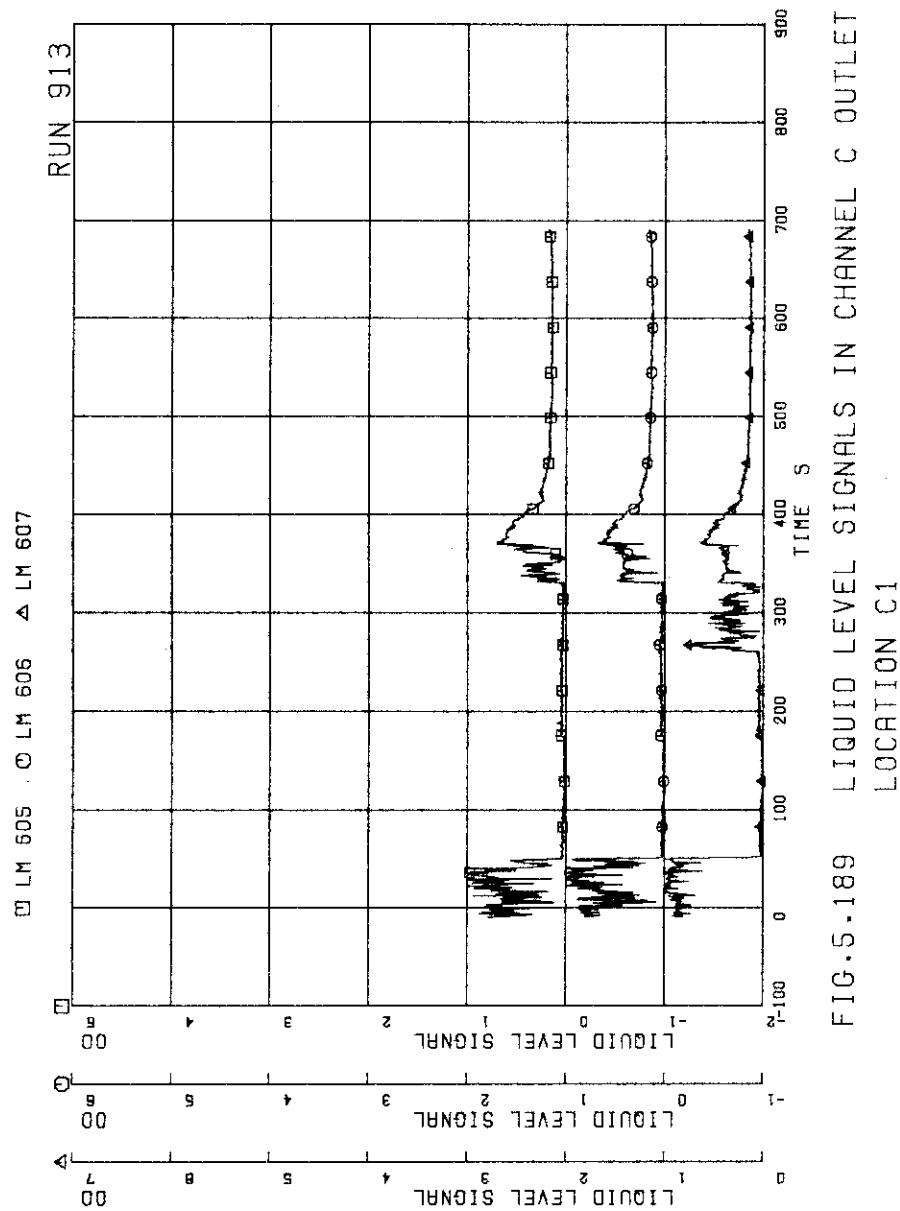


FIG.5.188 LIQUID LEVEL SIGNALS IN CHANNEL A OUTLET
CENTER



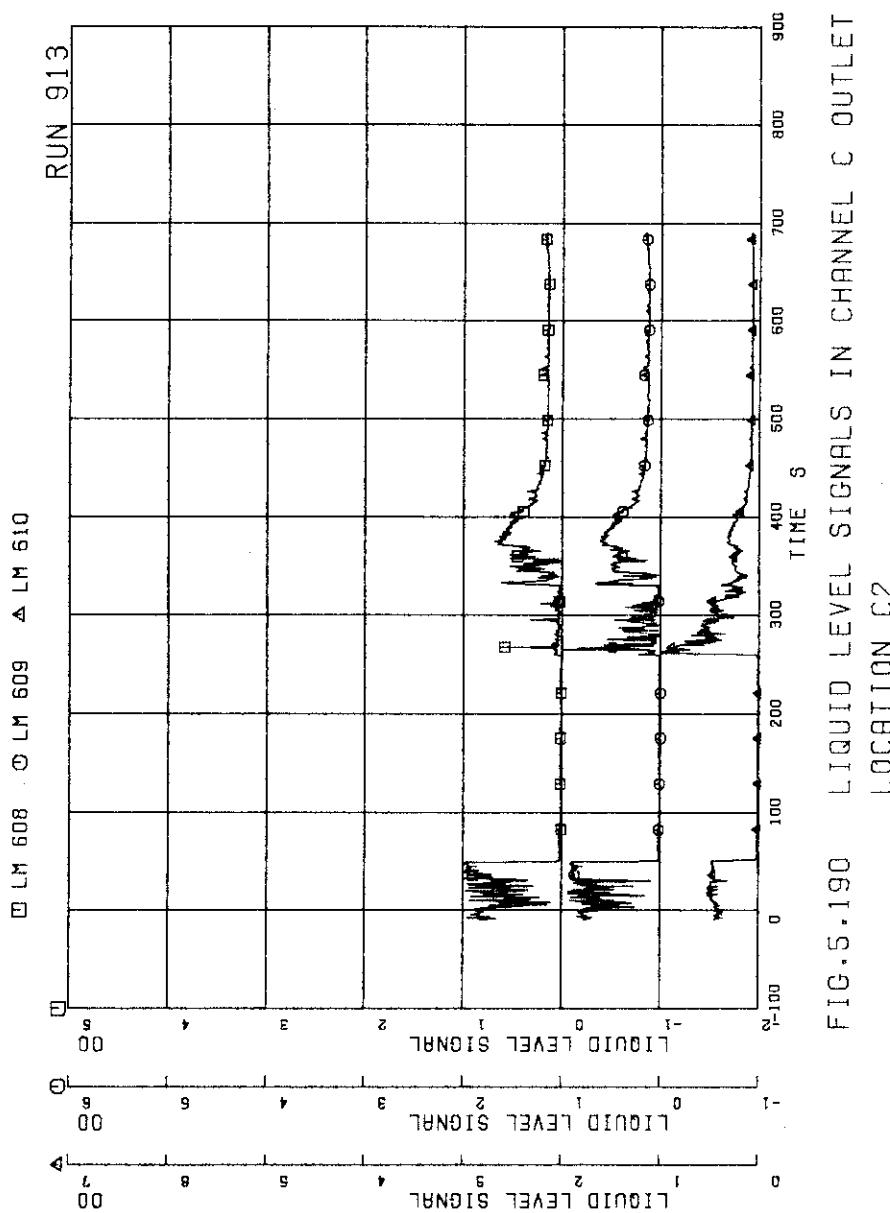


FIG. 5.1190 LIQUID LEVEL SIGNALS IN CHANNEL C OUTLET
LOCATION E2

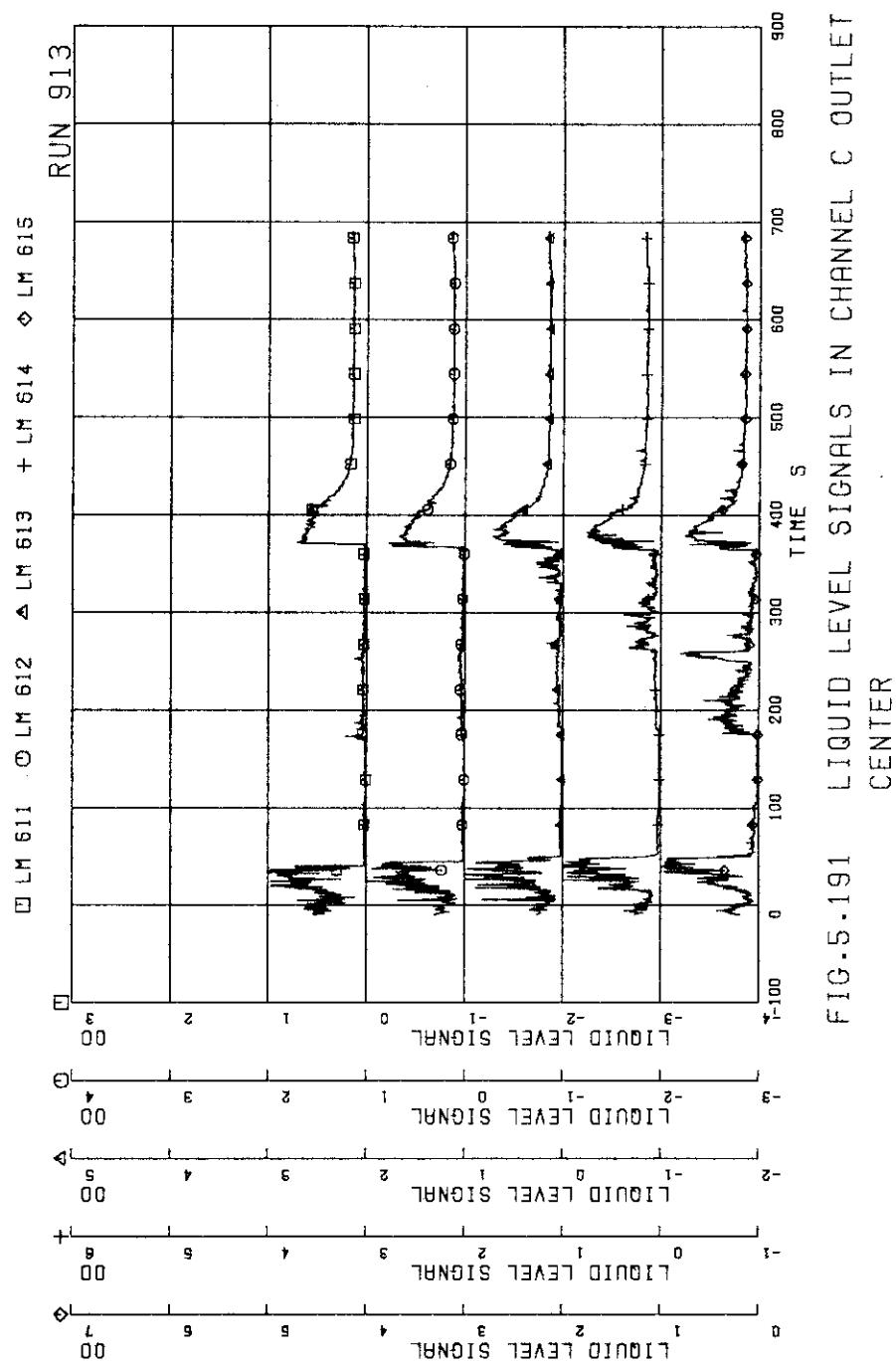


FIG. 5-191 LIQUID LEVEL SIGNALS IN CHANNEL C OUTLET CENTER

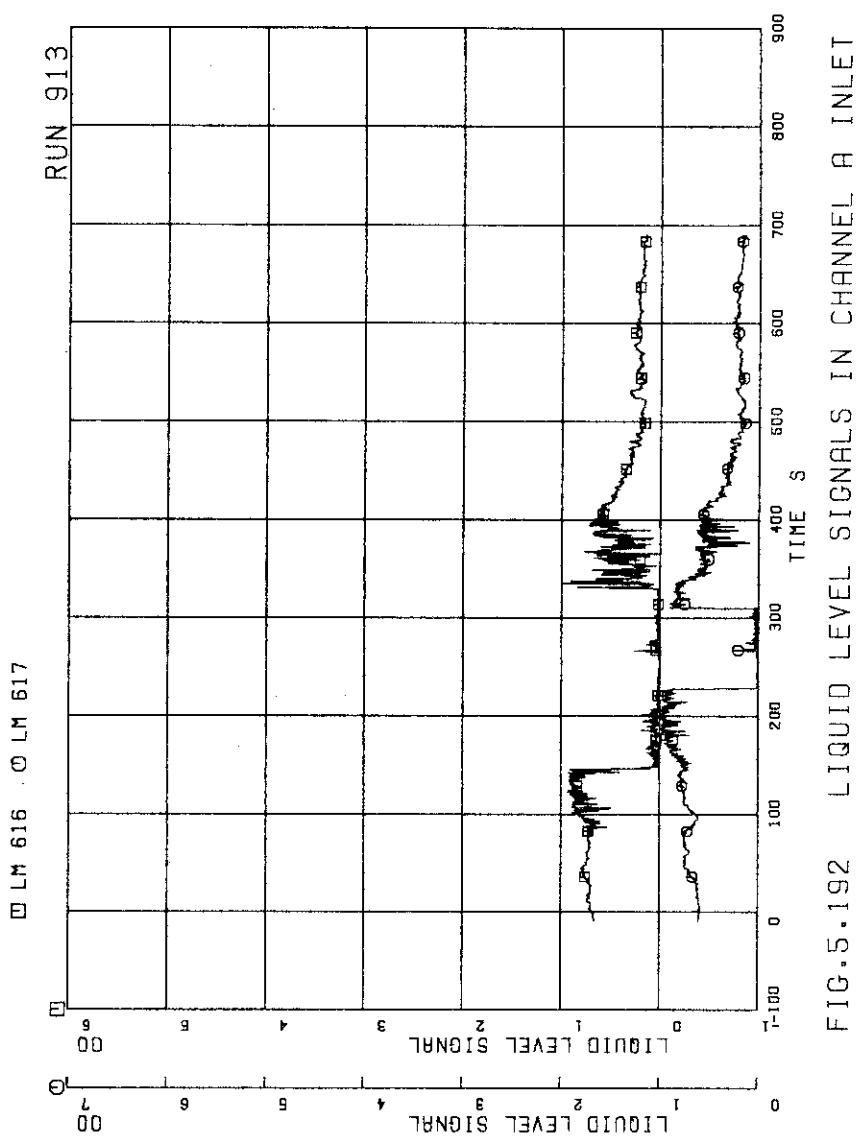


FIG.5.192 LIQUID LEVEL SIGNALS IN CHANNEL A INLET

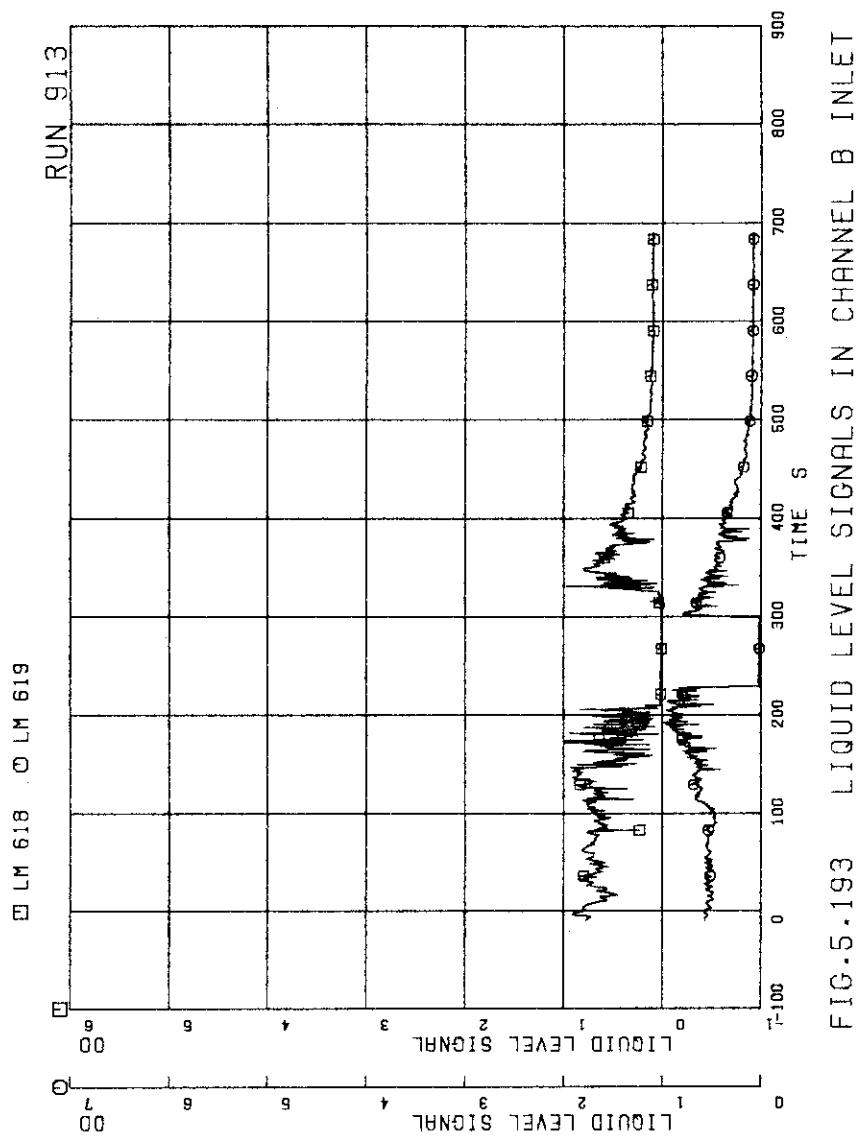


FIG.5.193 LIQUID LEVEL SIGNALS IN CHANNEL B INLET

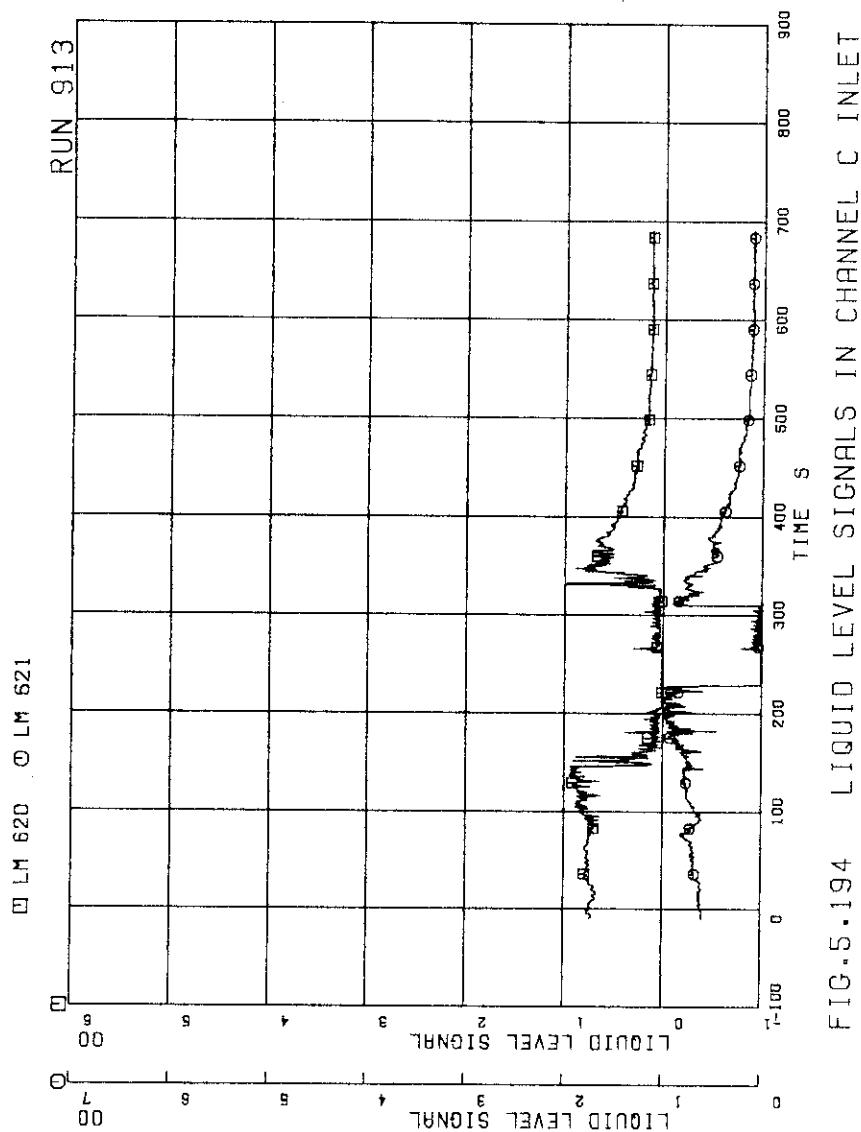


FIG. 5.194 LIQUID LEVEL SIGNALS IN CHANNEL C INLET

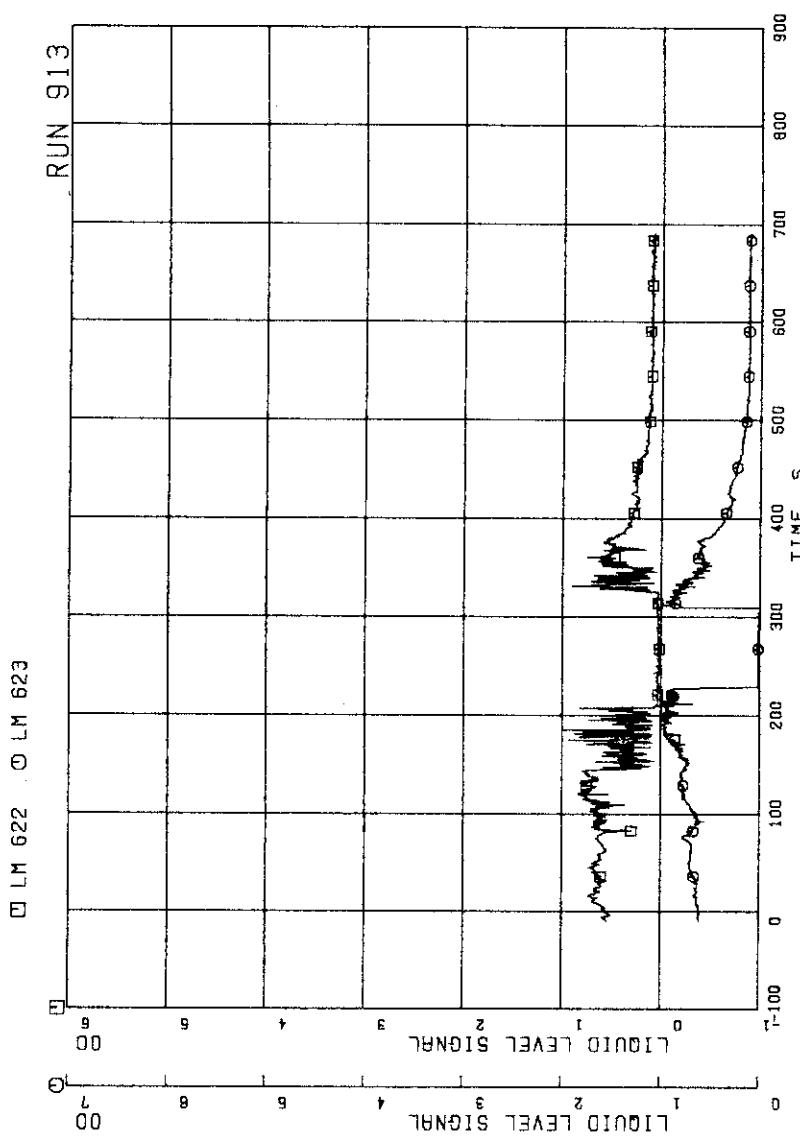


FIG. 5. 195 LIQUID LEVEL SIGNALS IN CHANNEL D INLET

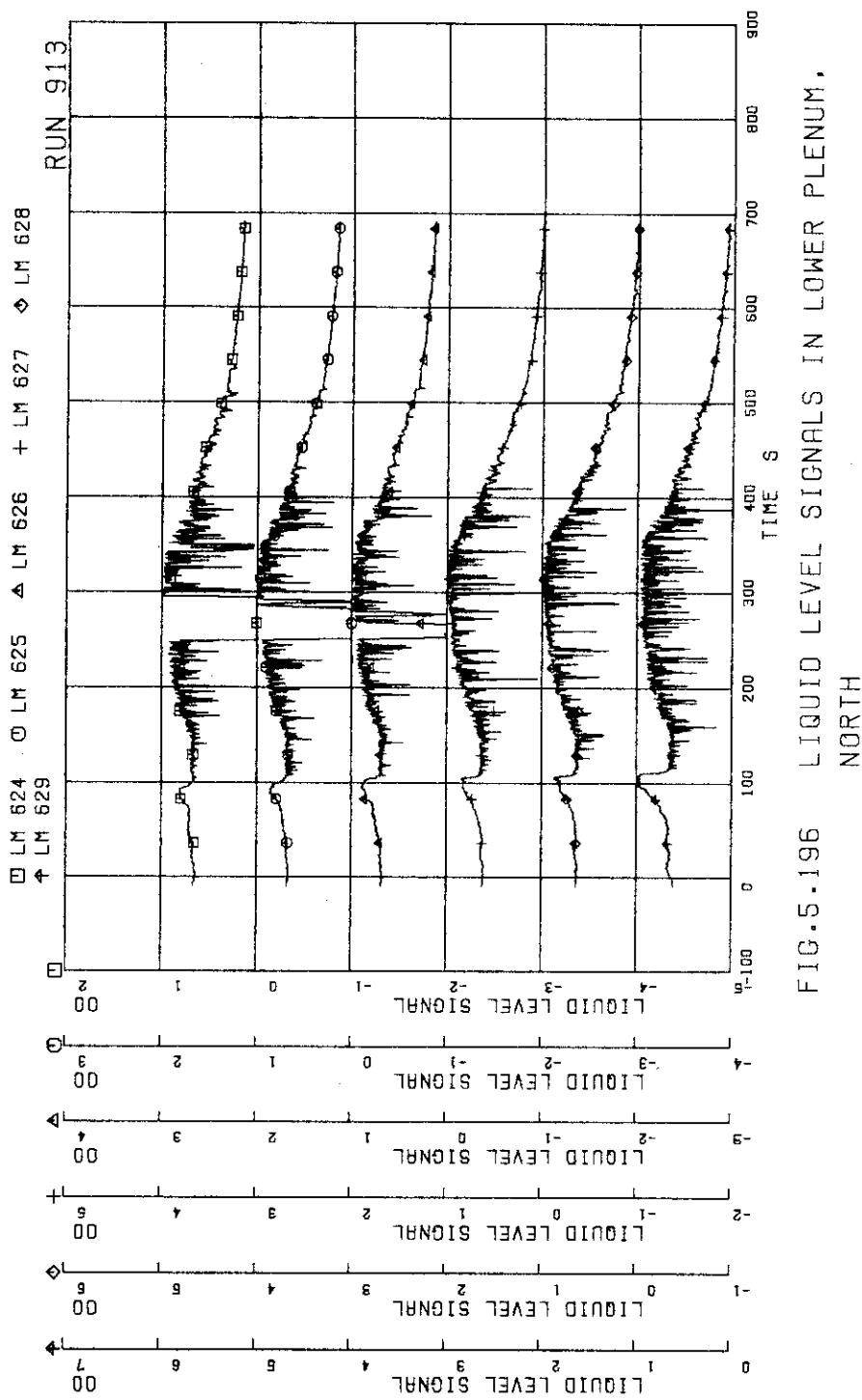


FIG. 5.196 LIQUID LEVEL SIGNALS IN LOWER PLenum,
NORTH

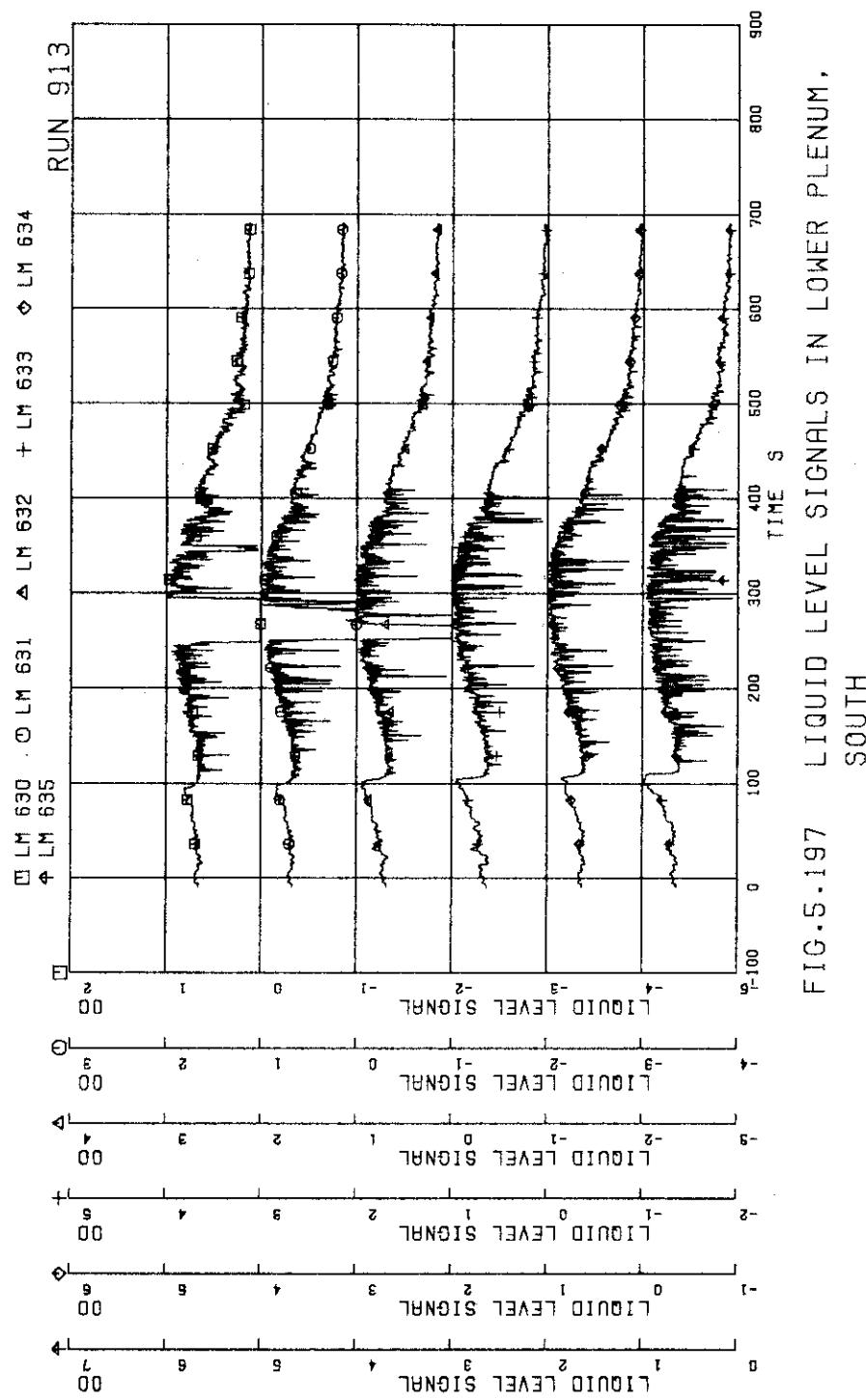


FIG. 5.197 LIQUID LEVEL SIGNALS IN LOWER PLUNUM,
SOUTH

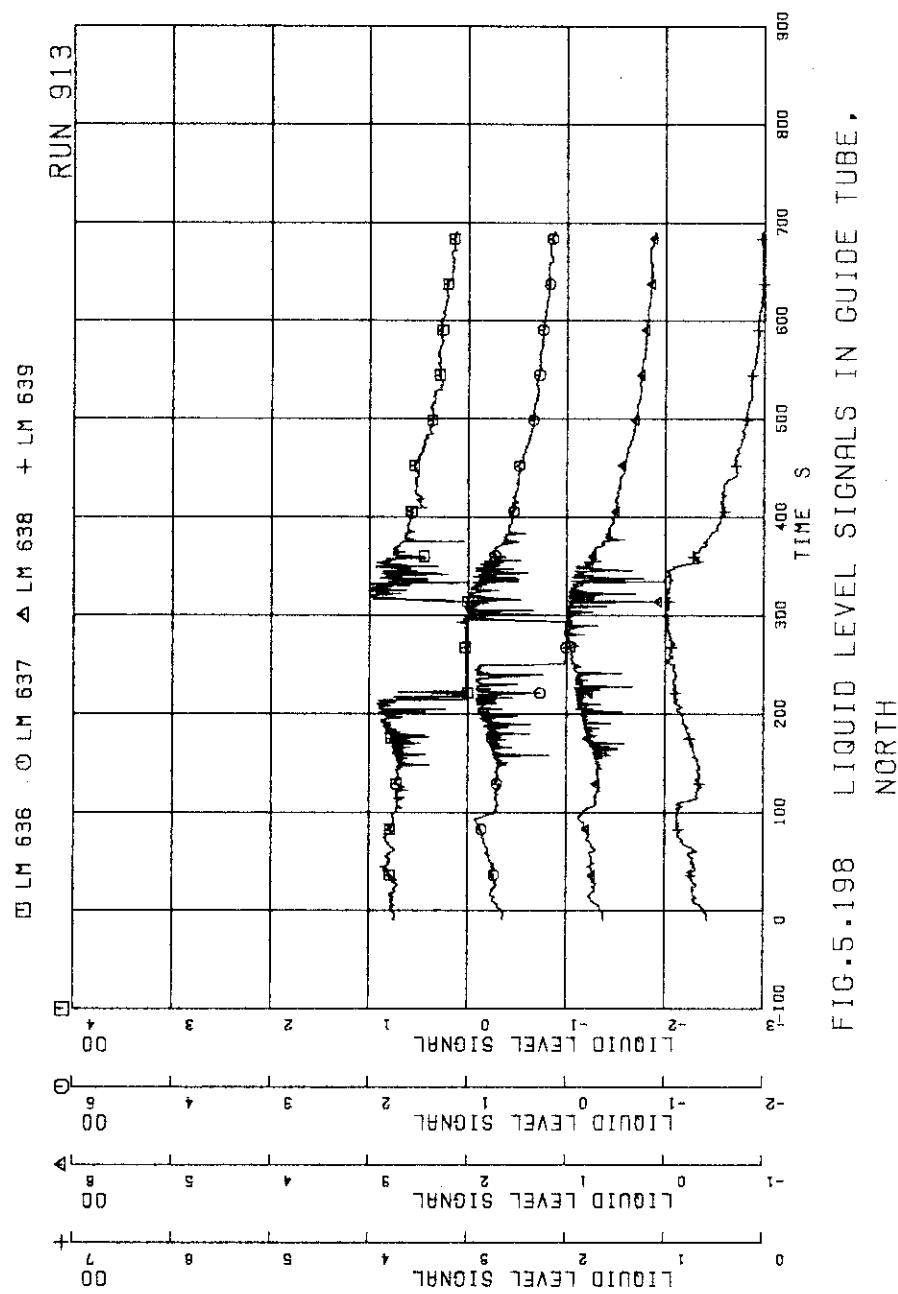


FIG. 5.198 LIQUID LEVEL SIGNALS IN GUIDE TUBE,
NORTH

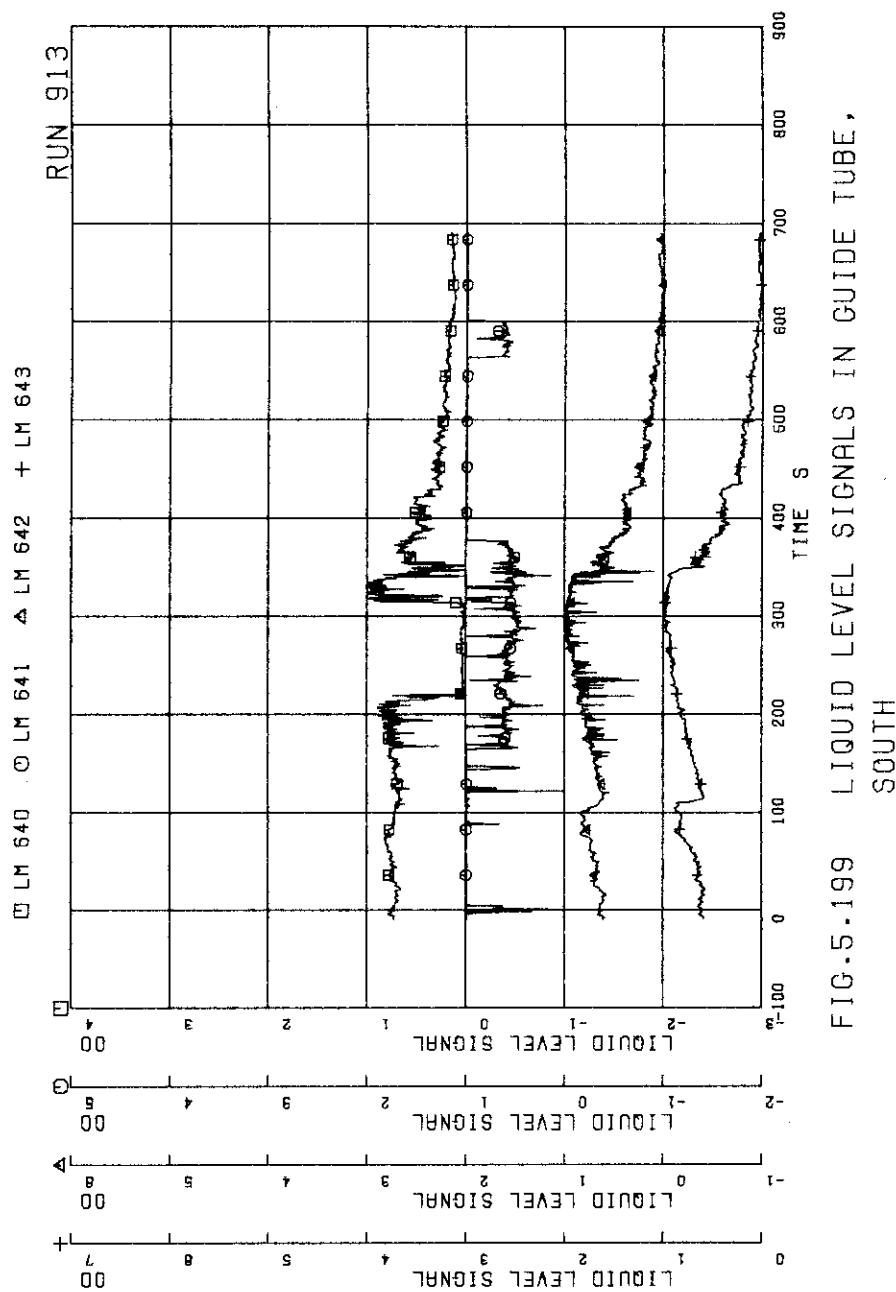


FIG. 5-199 LIQUID LEVEL SIGNALS IN GUIDE TUBE,
SOUTH

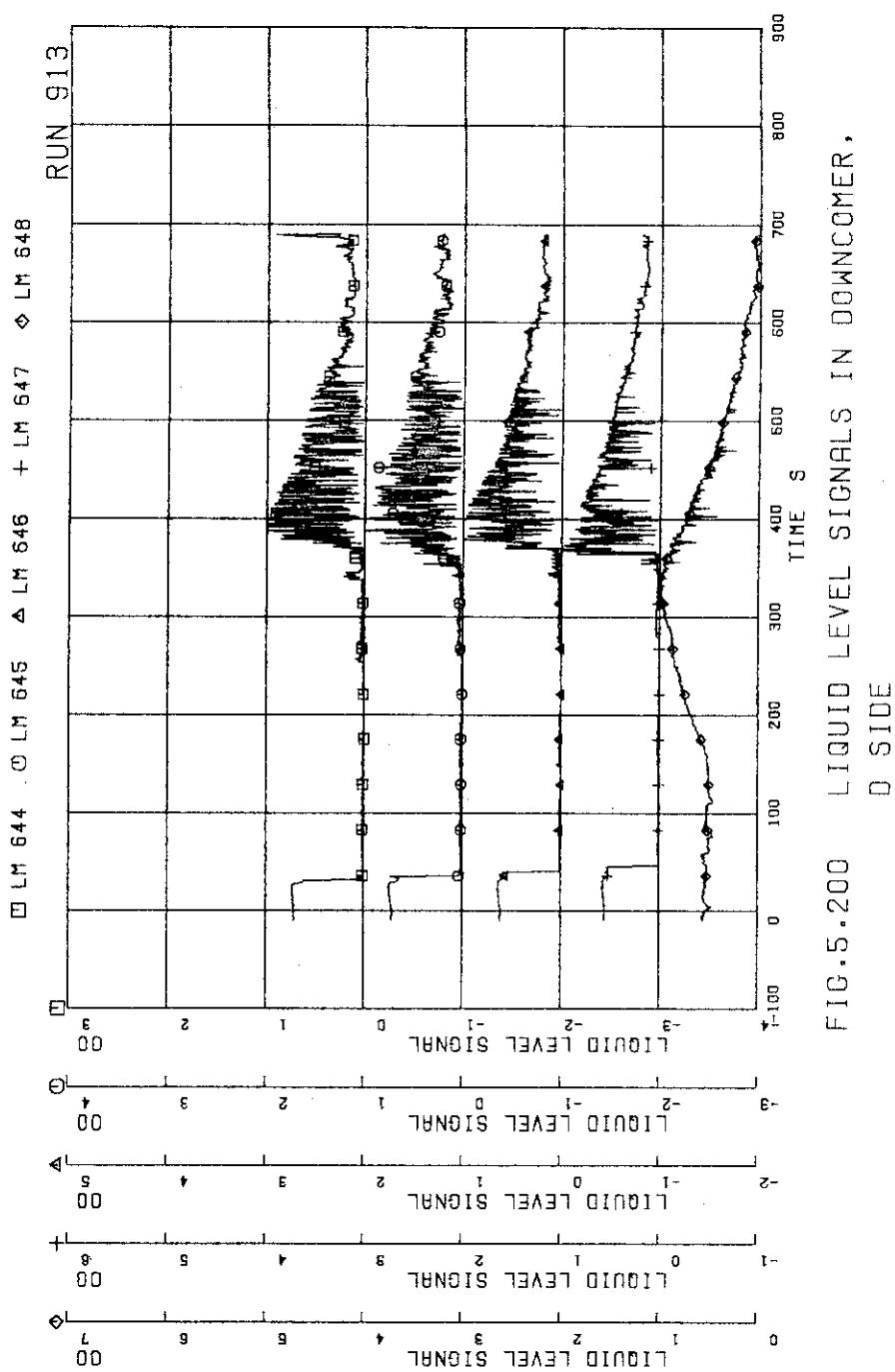


FIG. 5.200 LIQUID LEVEL SIGNALS IN DOWNCOMER,
D SIDE

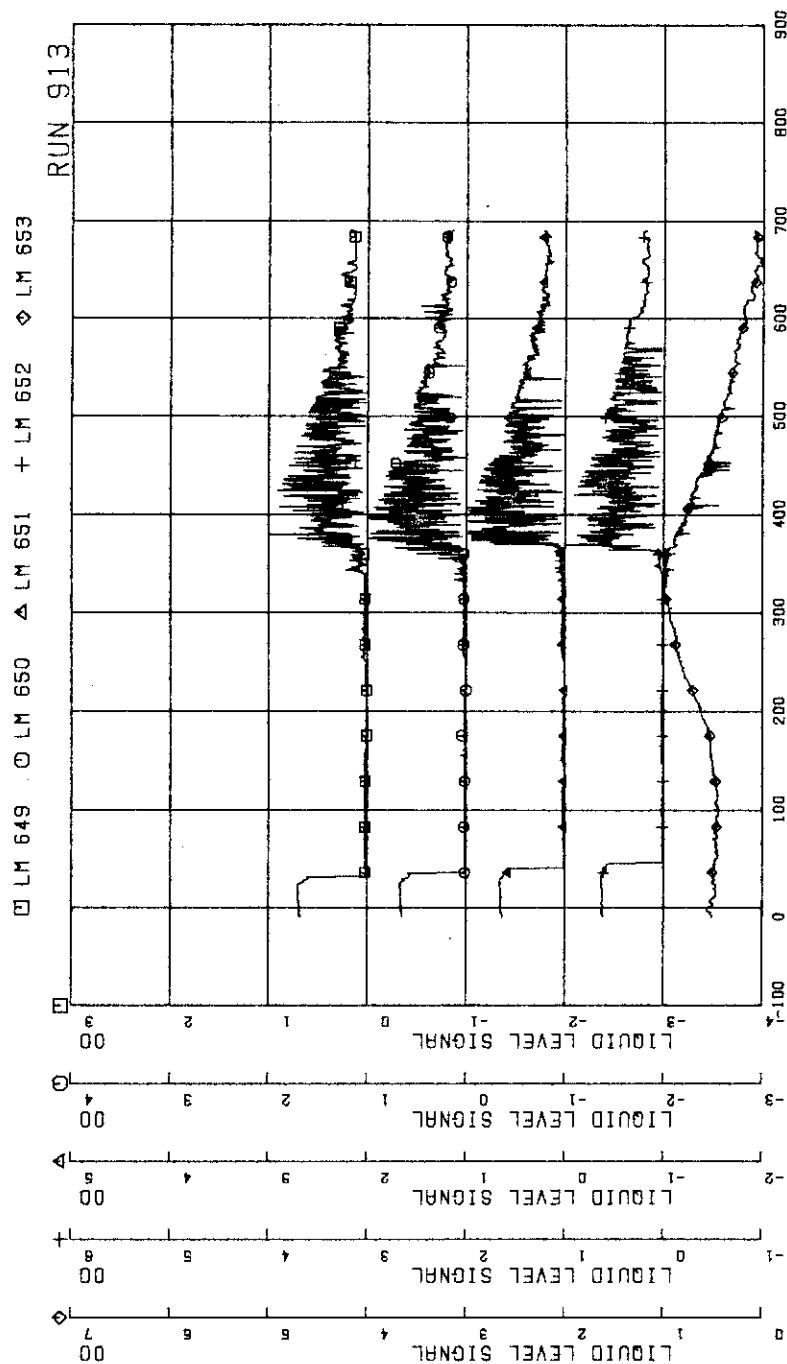


FIG.5.201 LIQUID LEVEL SIGNALS IN DOWNCOMER,
B SIDE

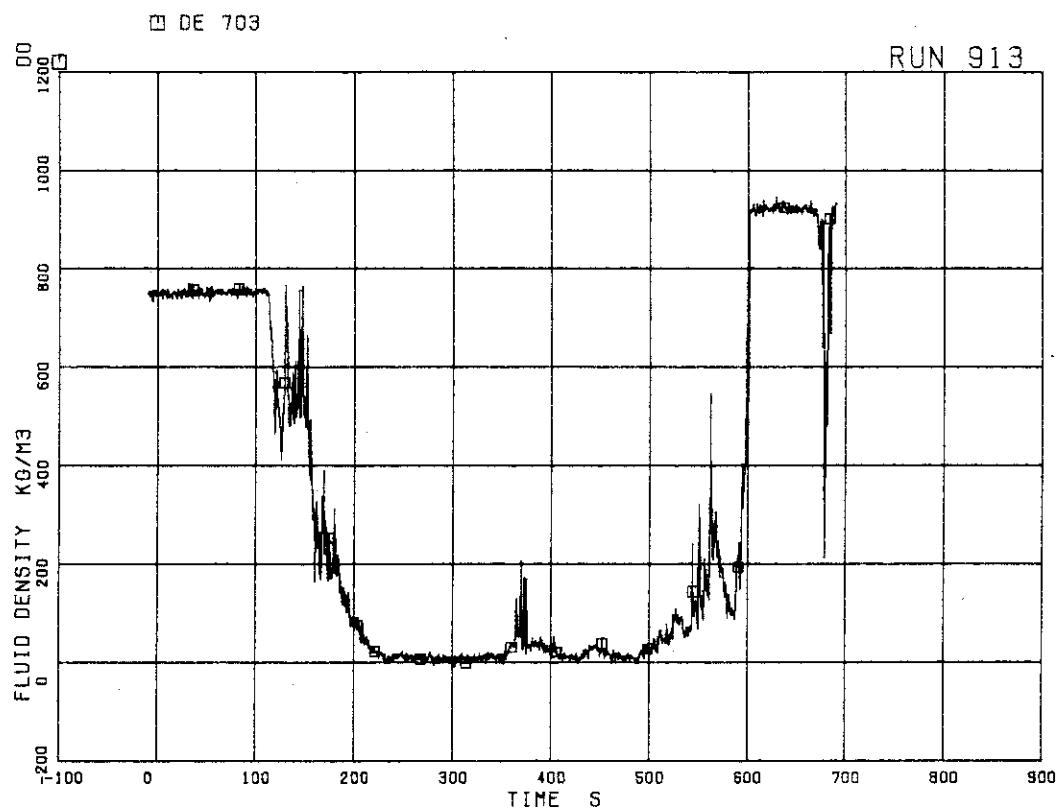


FIG.5.202 AVERAGE DENSITY AT MRP SIDE OF BREAK

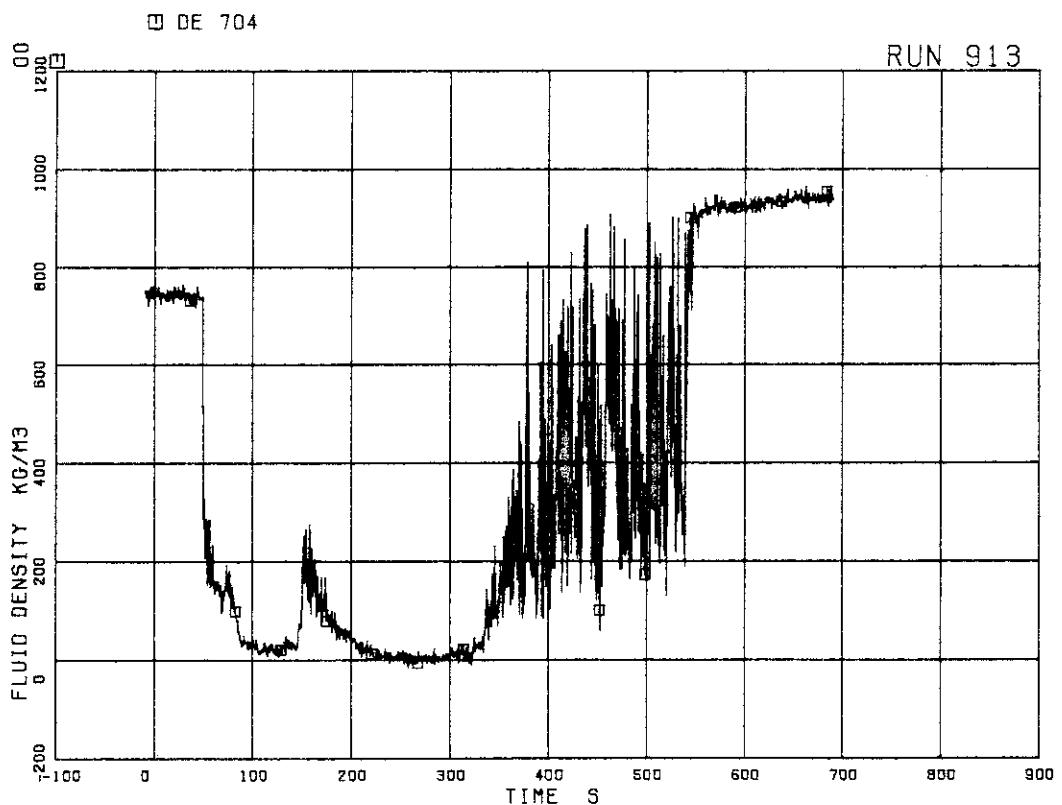


FIG.5.203 AVERAGE DENSITY AT PV SIDE OF BREAK

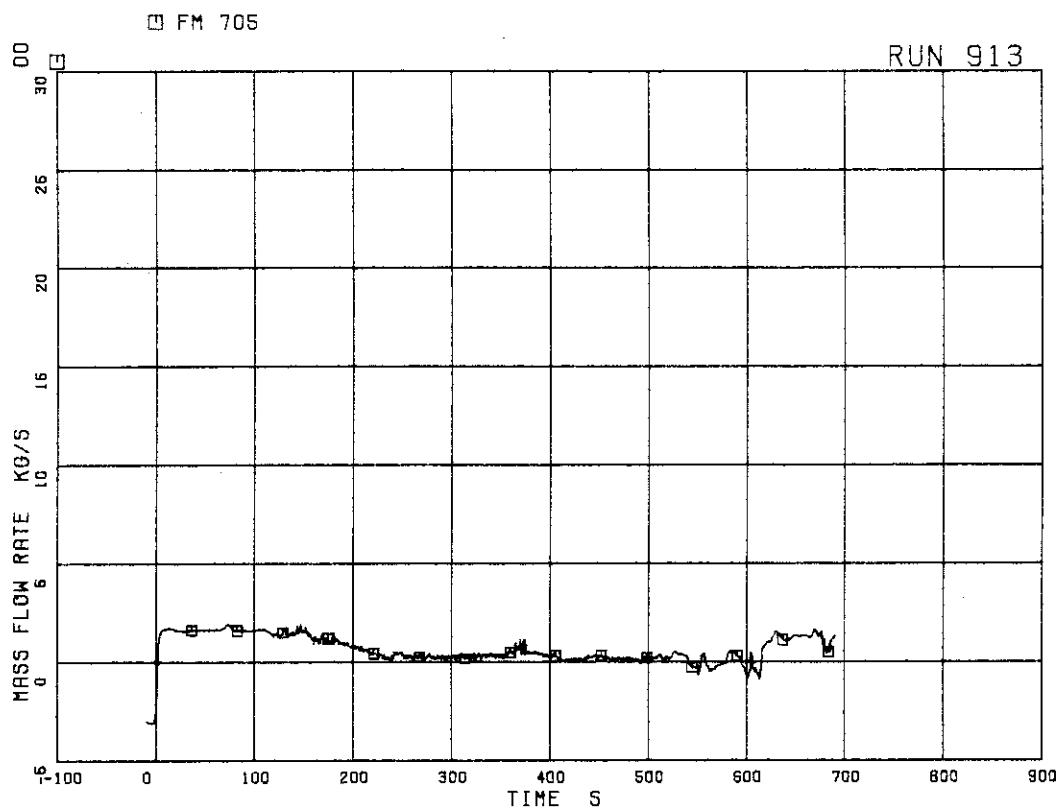


FIG.5.204 FLOW RATE AT MRP SIDE OF BREAK
(BASED ON LOW RANGE DRAG DISK DATA)

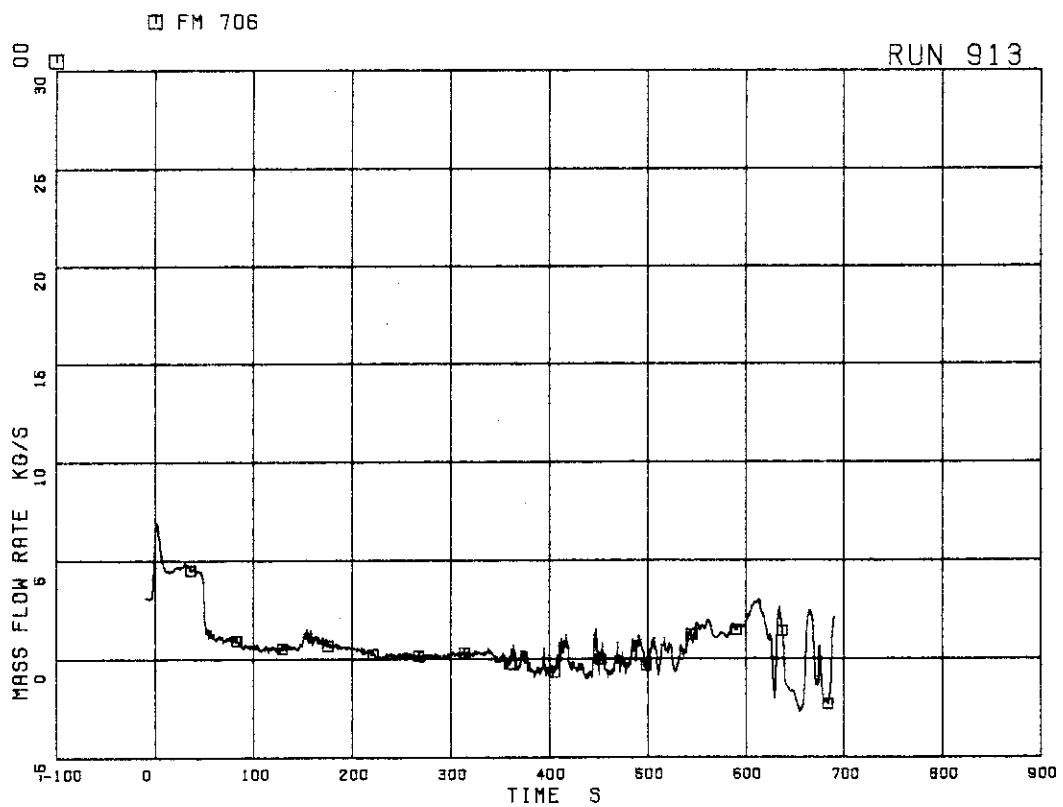


FIG.5.205 FLOW RATE AT PV SIDE OF BREAK
(BASED ON LOW RANGE DRAG DISK DATA)

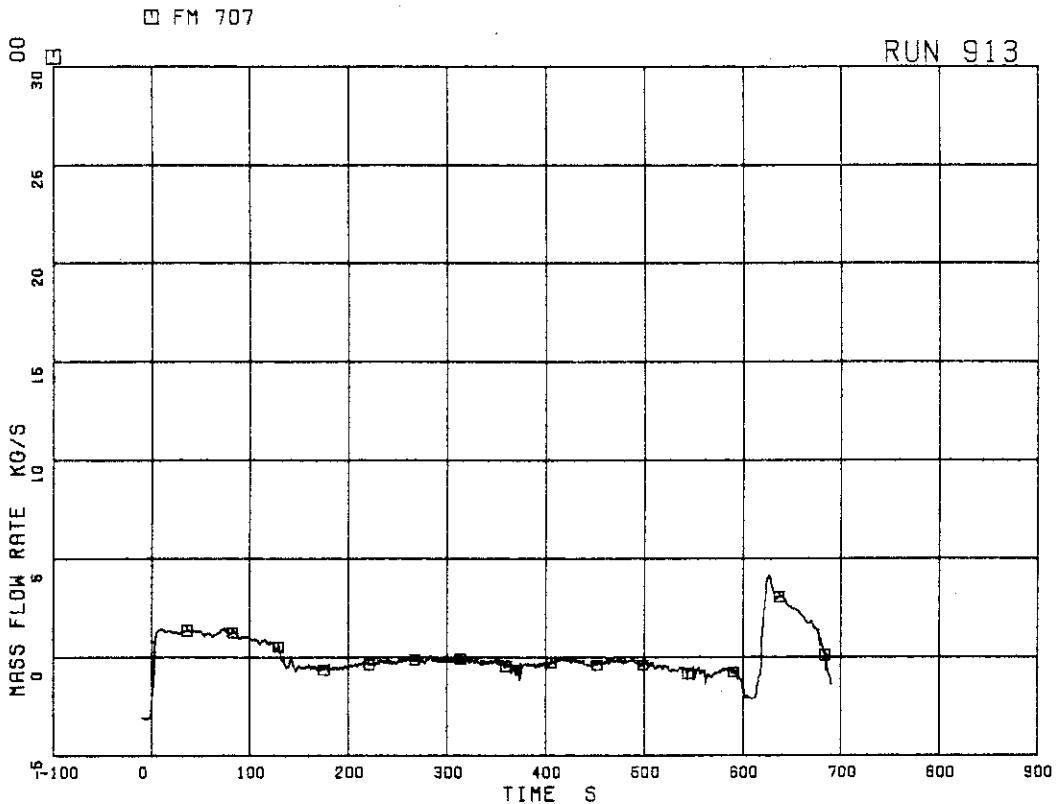


FIG.5.206 FLOW RATE AT MRP SIDE OF BREAK
(BASED ON HIGH RANGE DRAG DISK DATA)

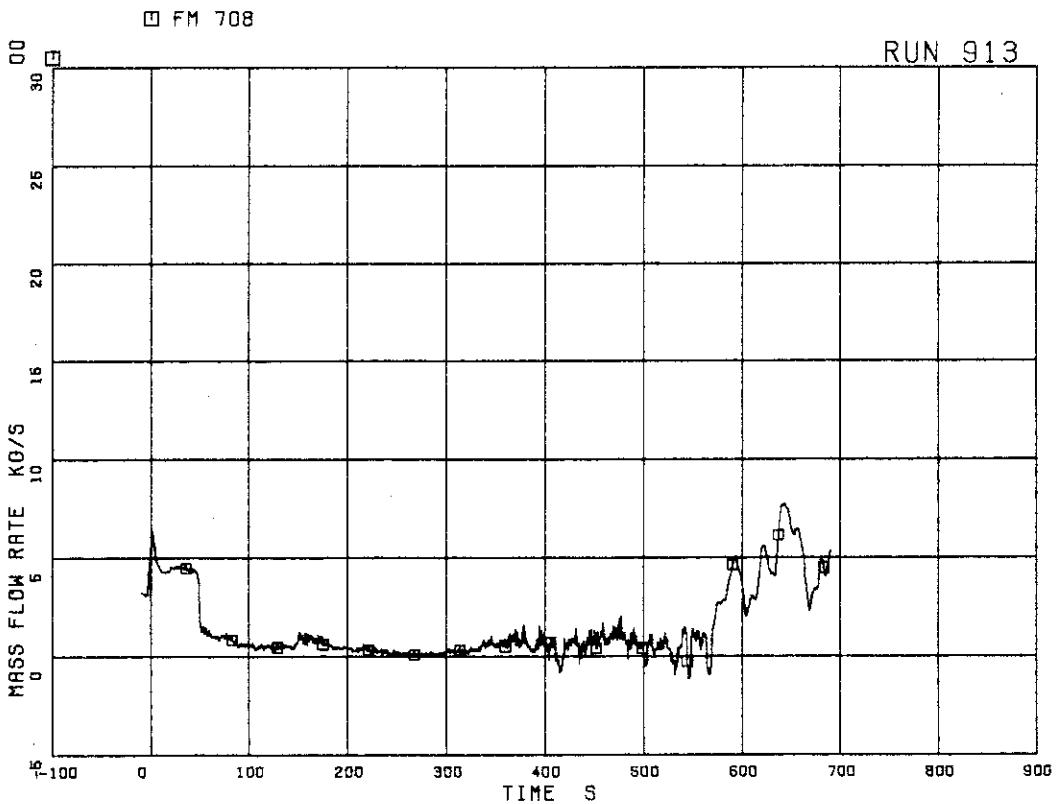


FIG.5.207 FLOW RATE AT PV SIDE OF BREAK
(BASED ON HIGH RANGE DRAG DISK DATA)

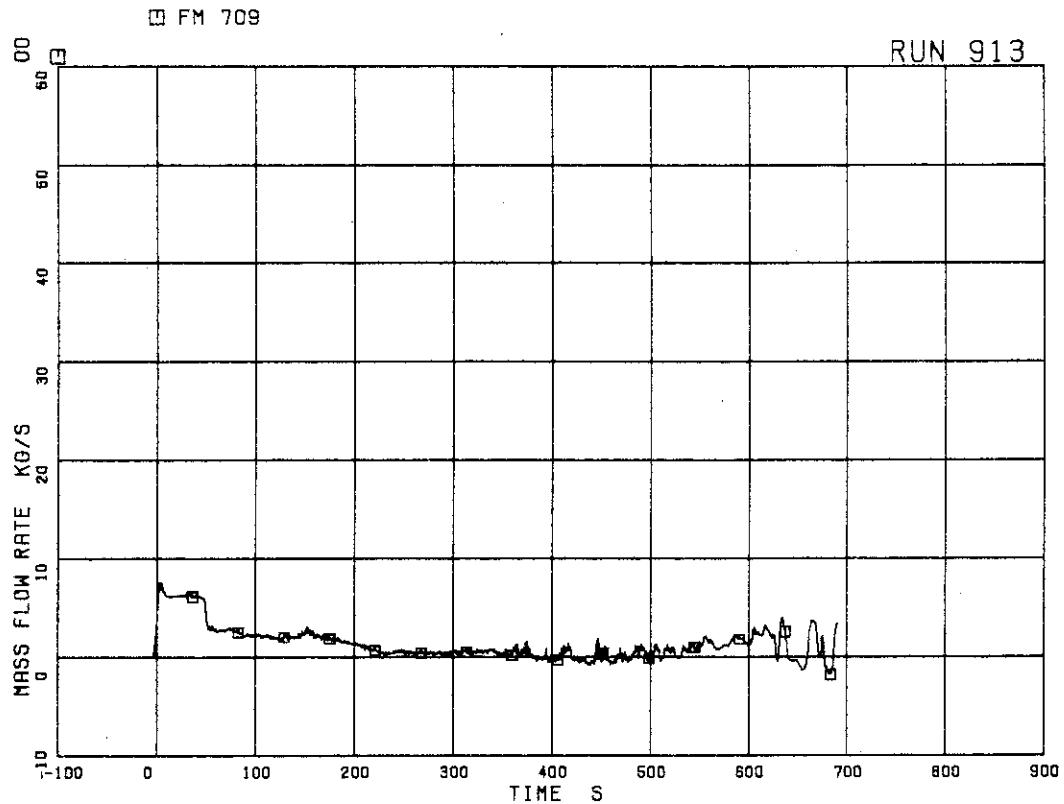


FIG.5.208 TOTAL DISCHARGE FLOW RATE FROM BREAK
(BASED ON LOW RANGE DRAG DISK DATA)

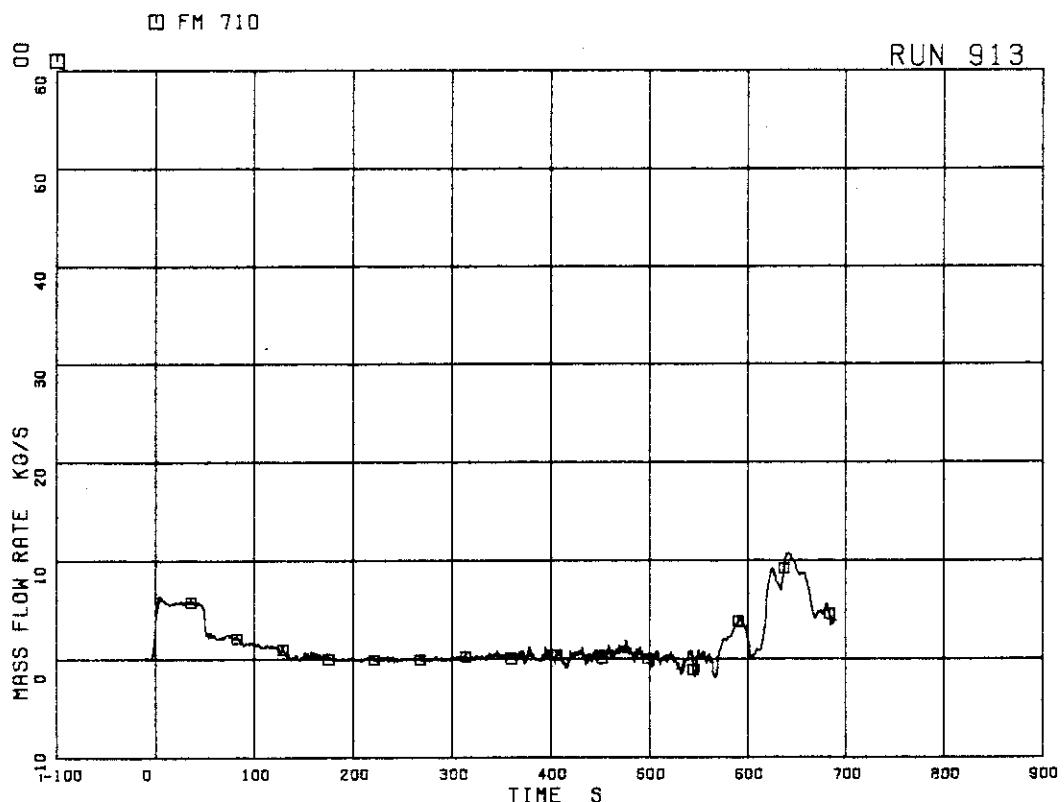


FIG.5.209 TOTAL DISCHARGE FLOW RATE FROM BREAK
(BASED ON HIGH RANGE DRAG DISK DATA)

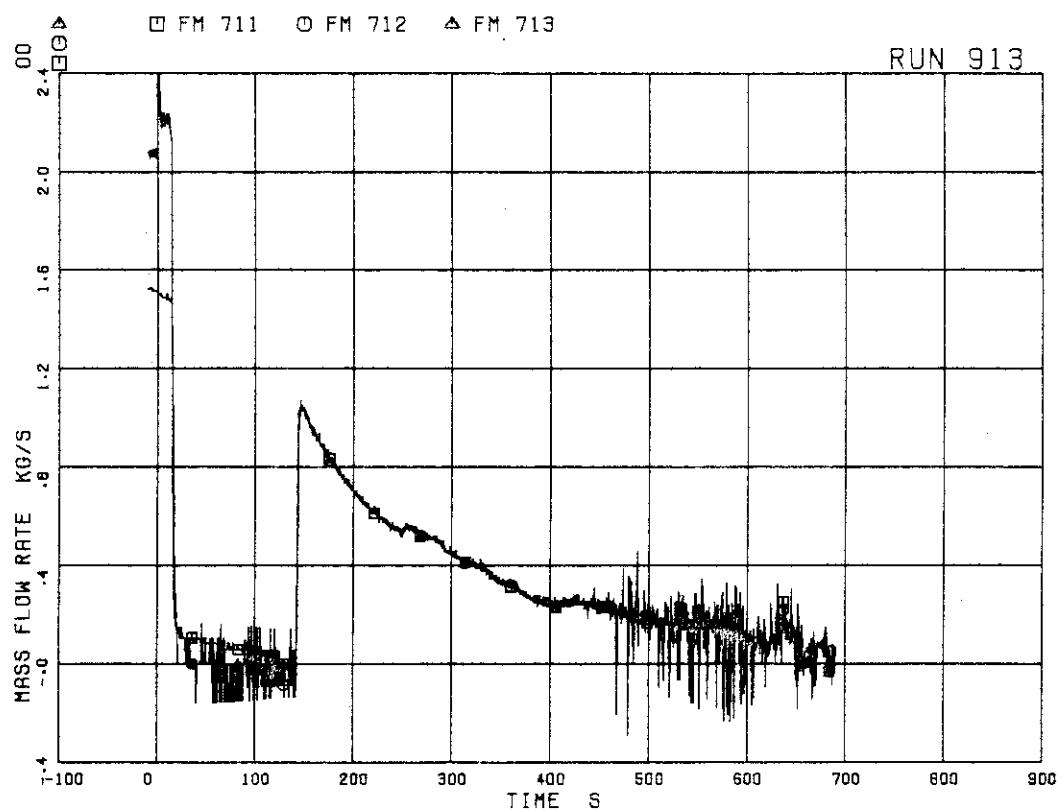


FIG.5.210 STEAM DISCHARGE FLOW RATE THROUGH MSL

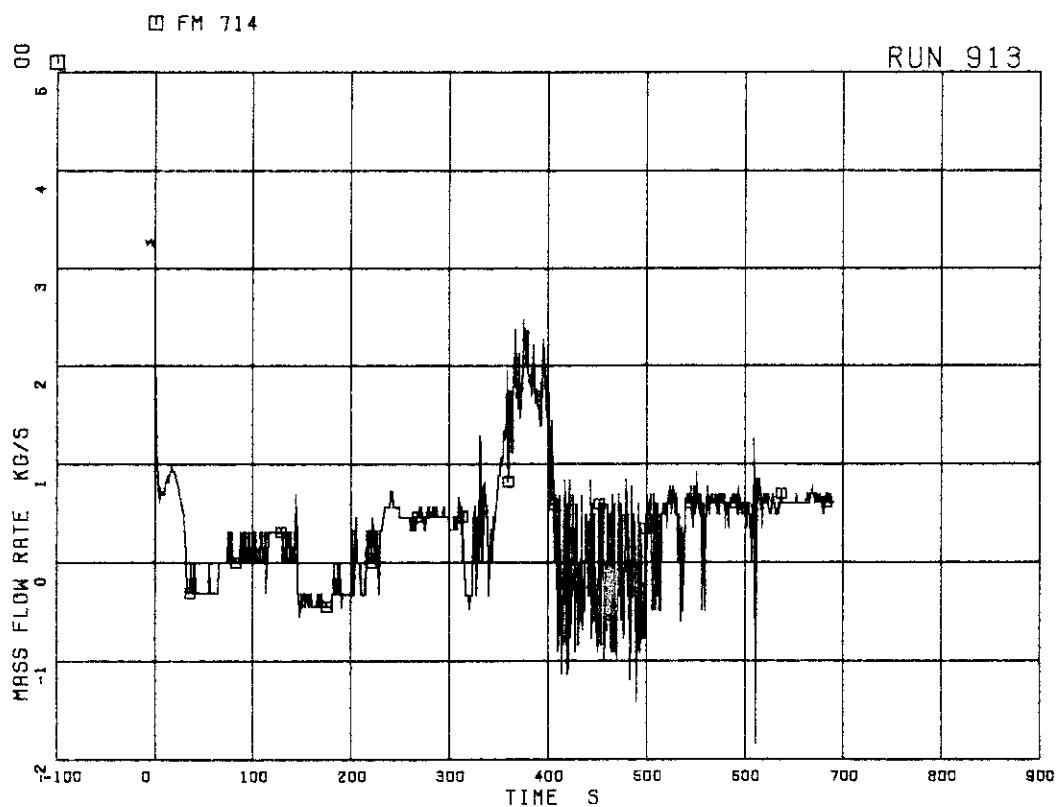


FIG.5.211 FLOW RATE AT CHANNEL A INLET

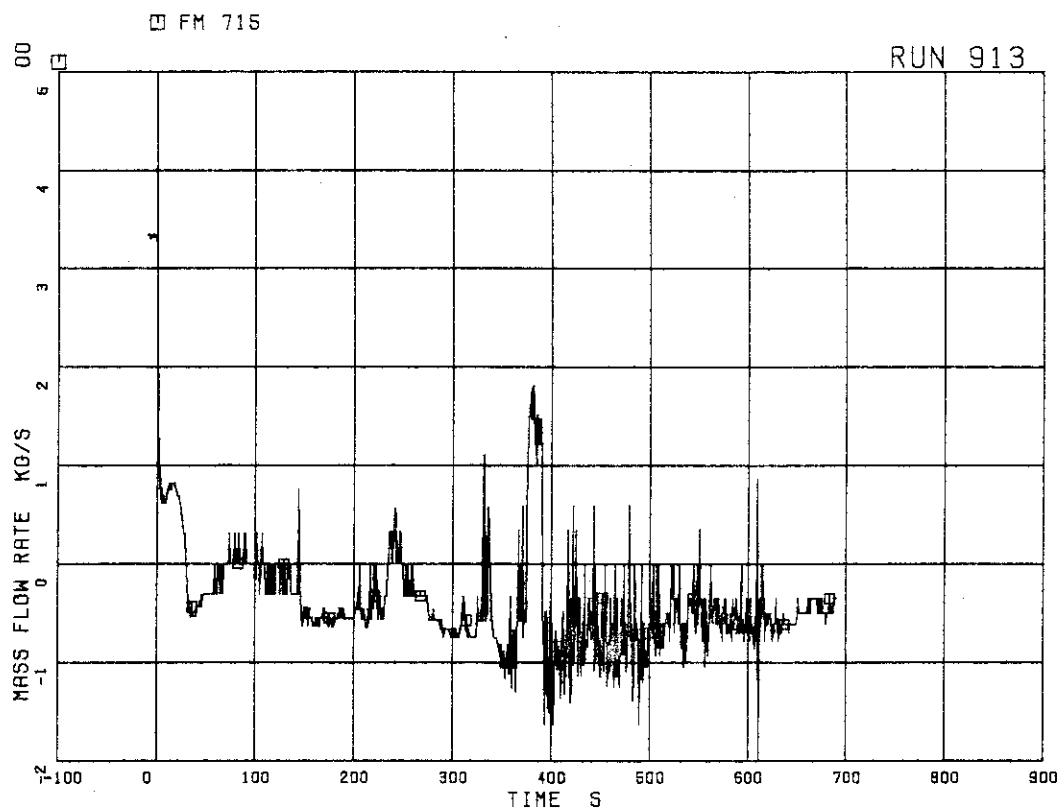


FIG.5.212 FLOW RATE AT CHANNEL B INLET

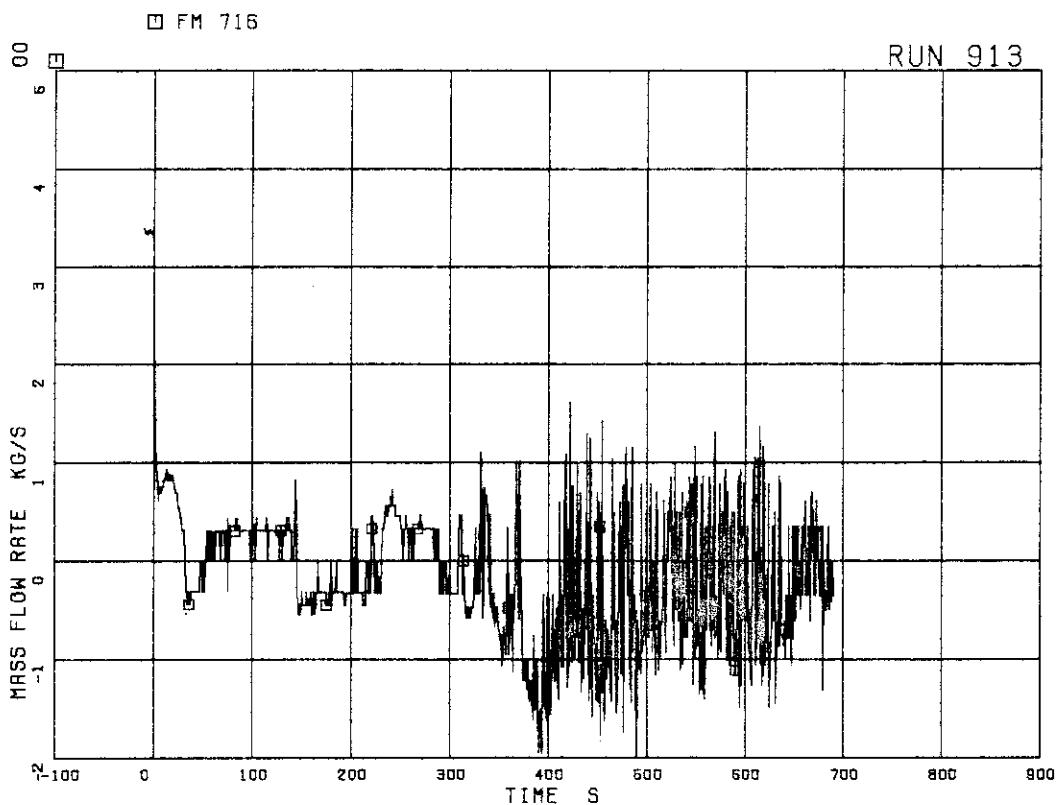


FIG.5.213 FLOW RATE AT CHANNEL C INLET

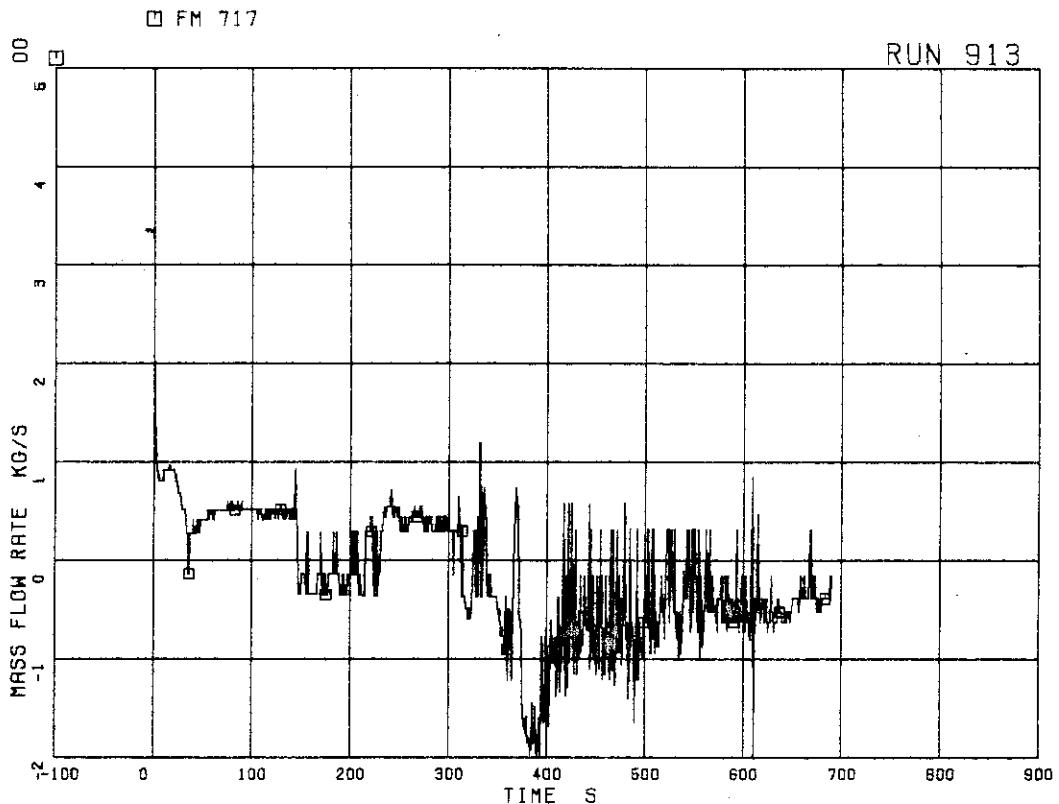


FIG.5.214 FLOW RATE AT CHANNEL D INLET

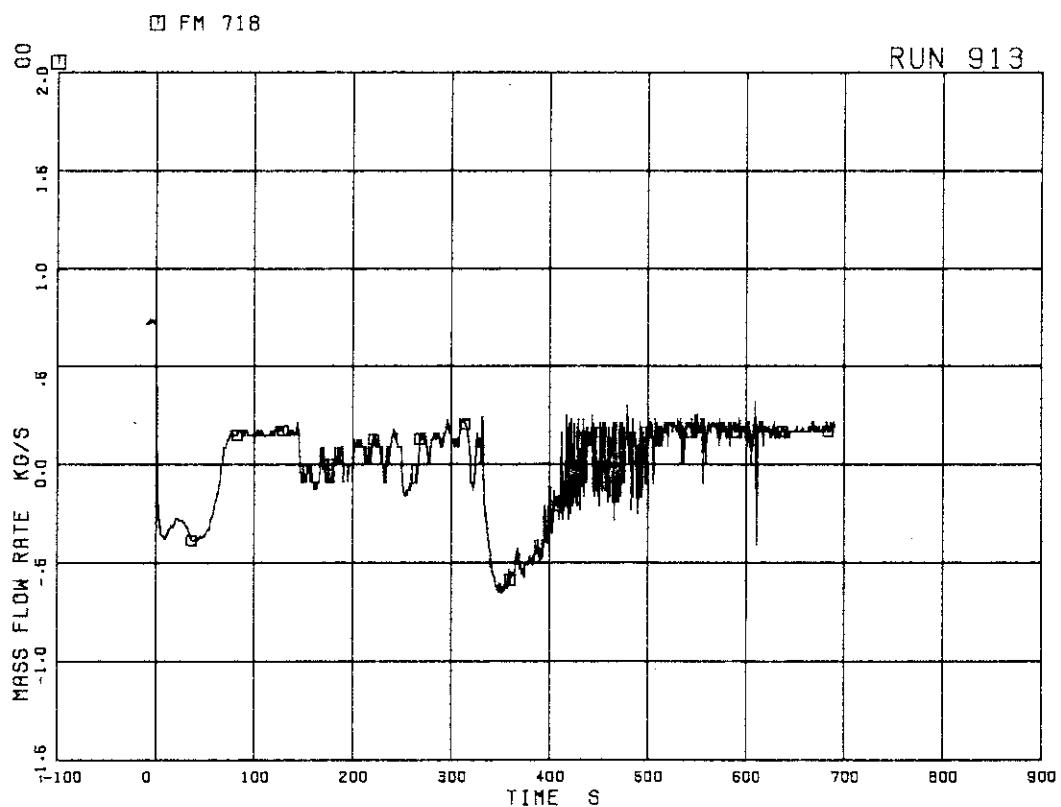


FIG.5.215 FLOW RATE AT BYPASS HOLE

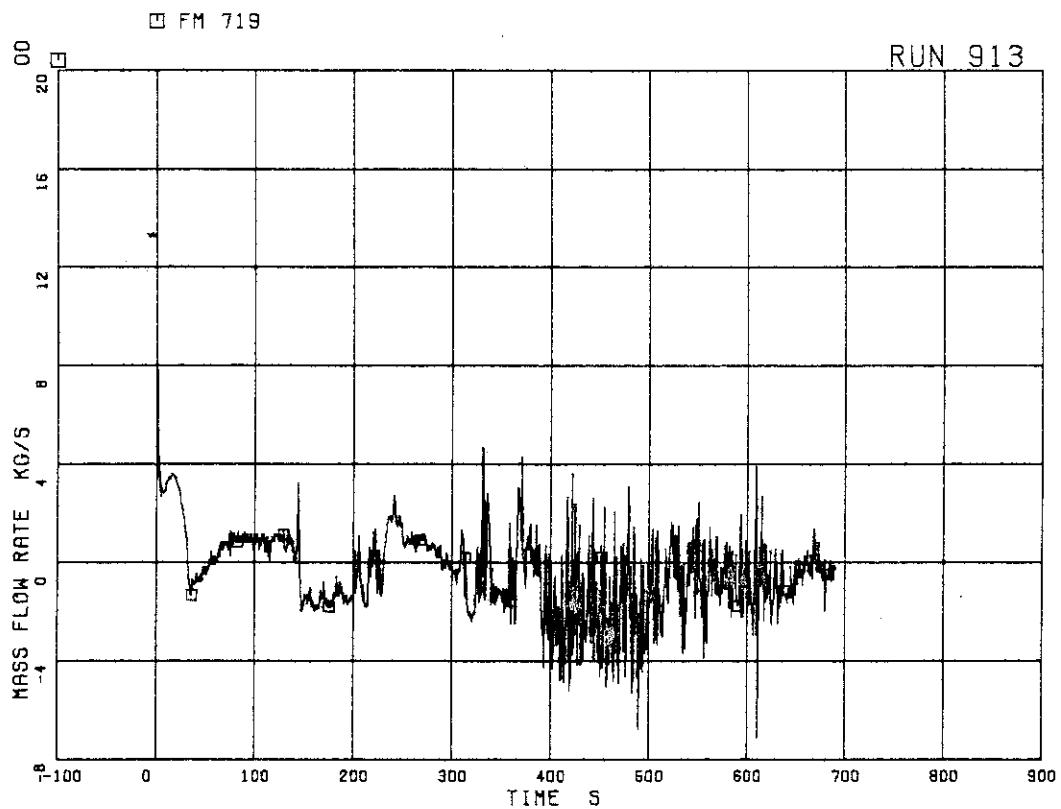


FIG.5.216 TOTAL CHANNEL INLET FLOW RATE

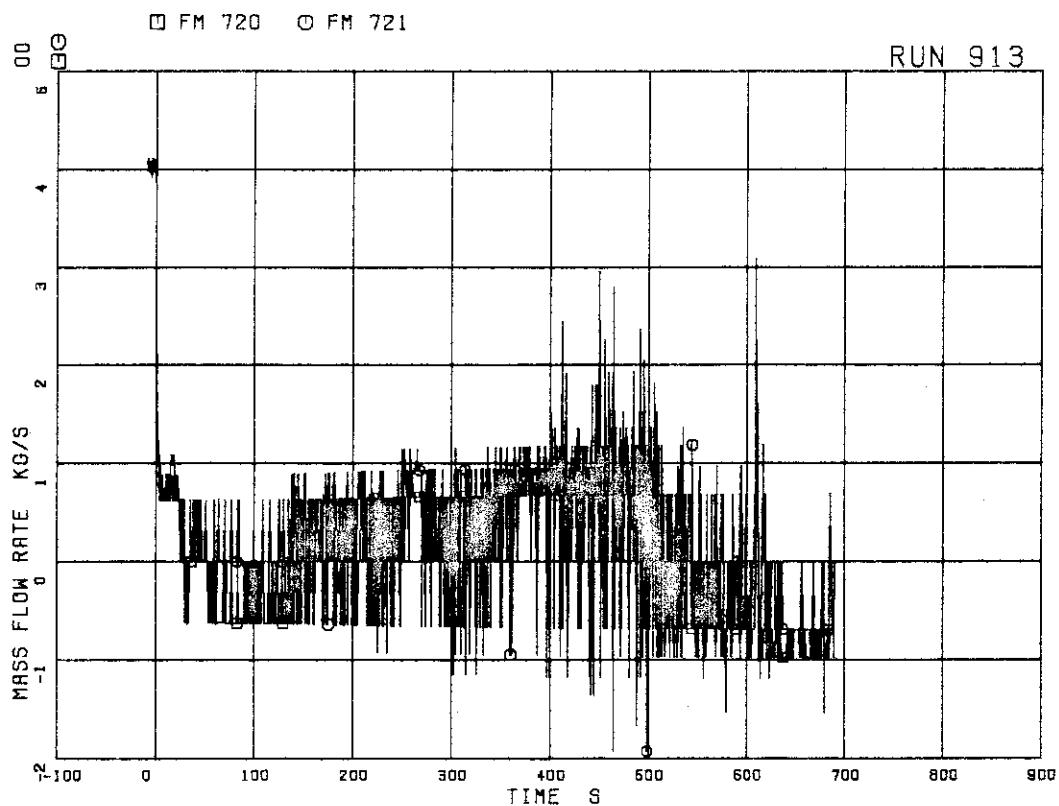


FIG.5.217 FLOW RATE AT JP-1,2 OUTLET (HIGH RANGE)

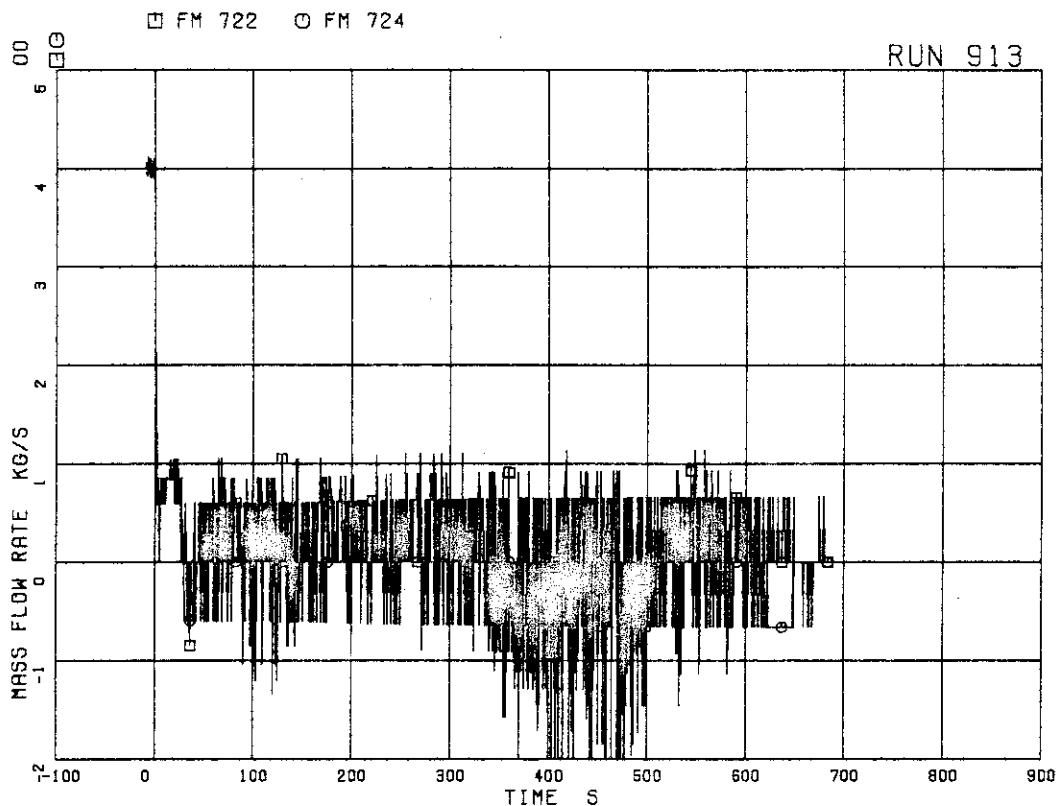


FIG.5.218 FLOW RATE AT JP-3,4 OUTLET (HIGH RANGE)

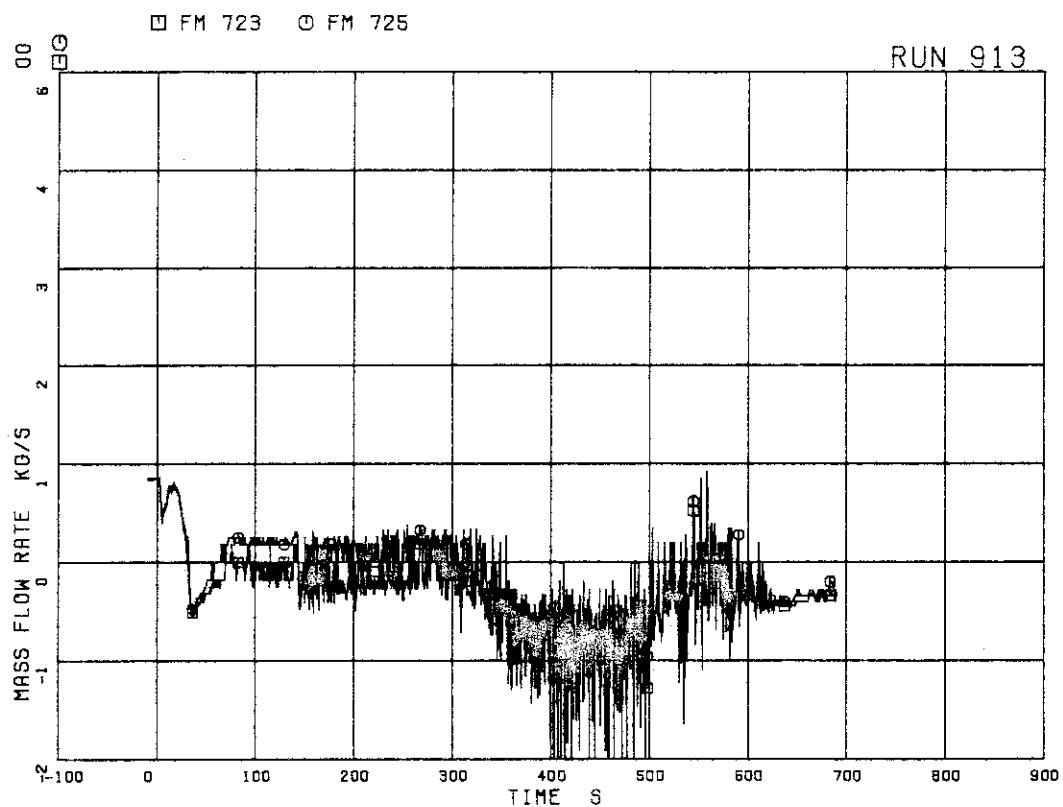


FIG.5.219 FLOW RATE AT JP-3,4 OUTLET (LOW RANGE)

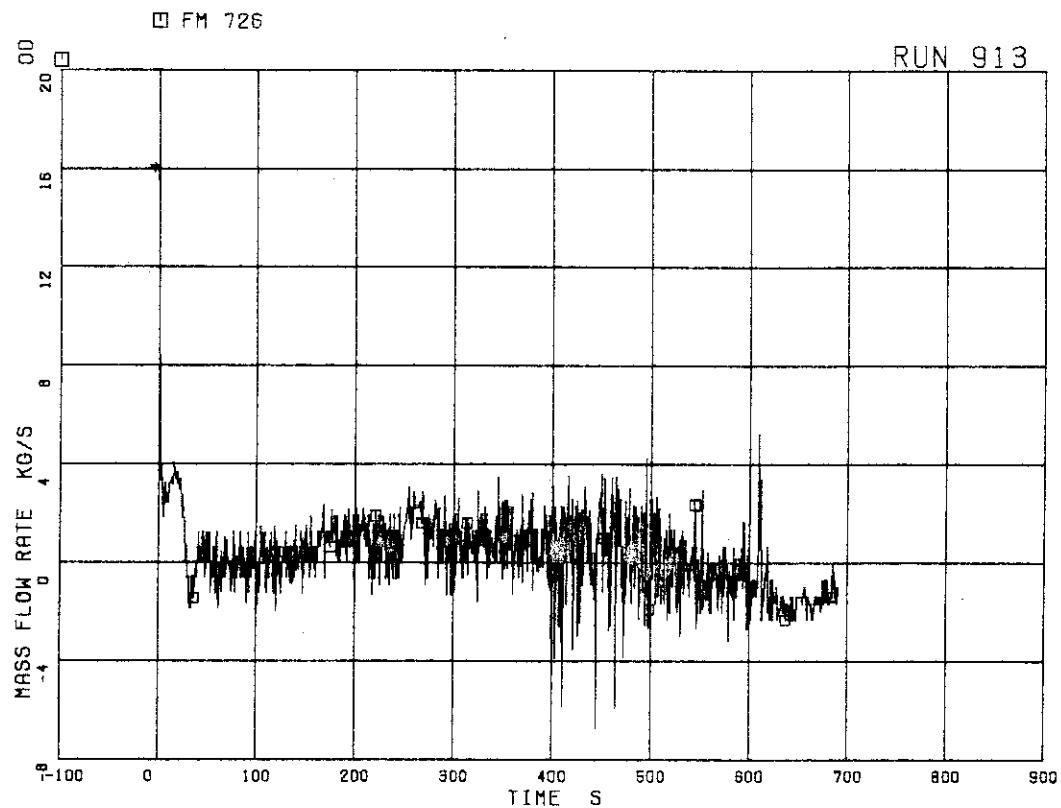


FIG.5.220 TOTAL JP OUTLET FLOW RATE (HIGH RANGE)

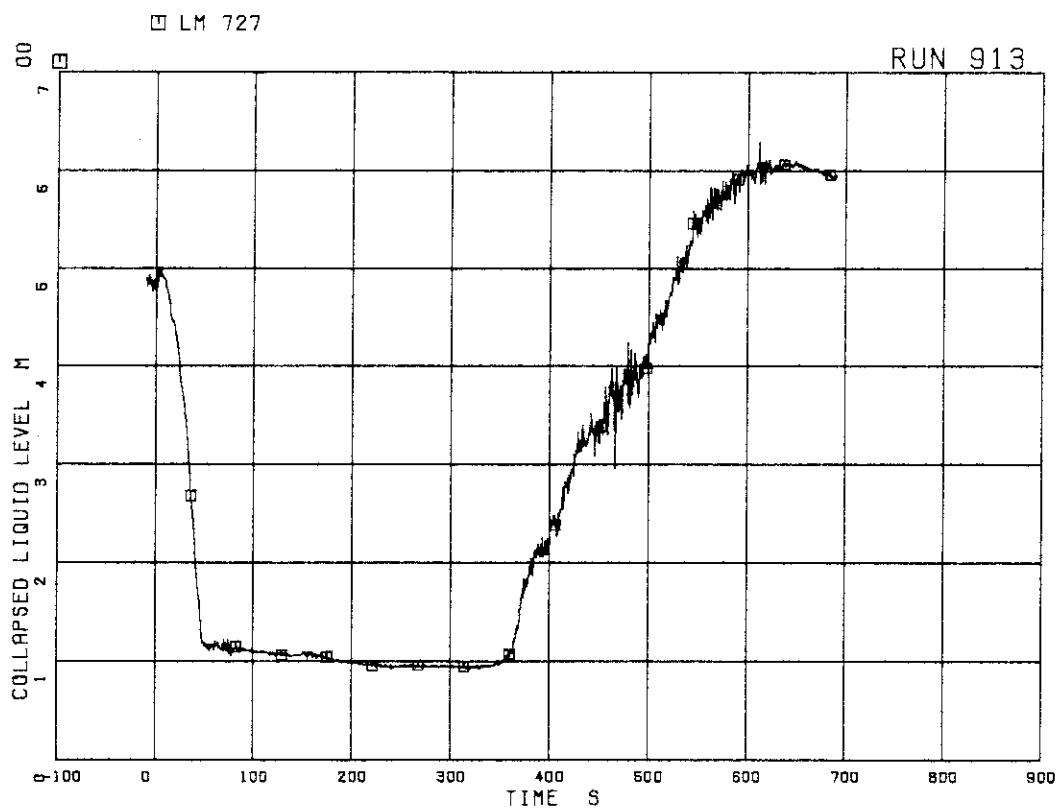


FIG.5.221 COLLAPSED LIQUID LEVEL IN DOWNCOMER

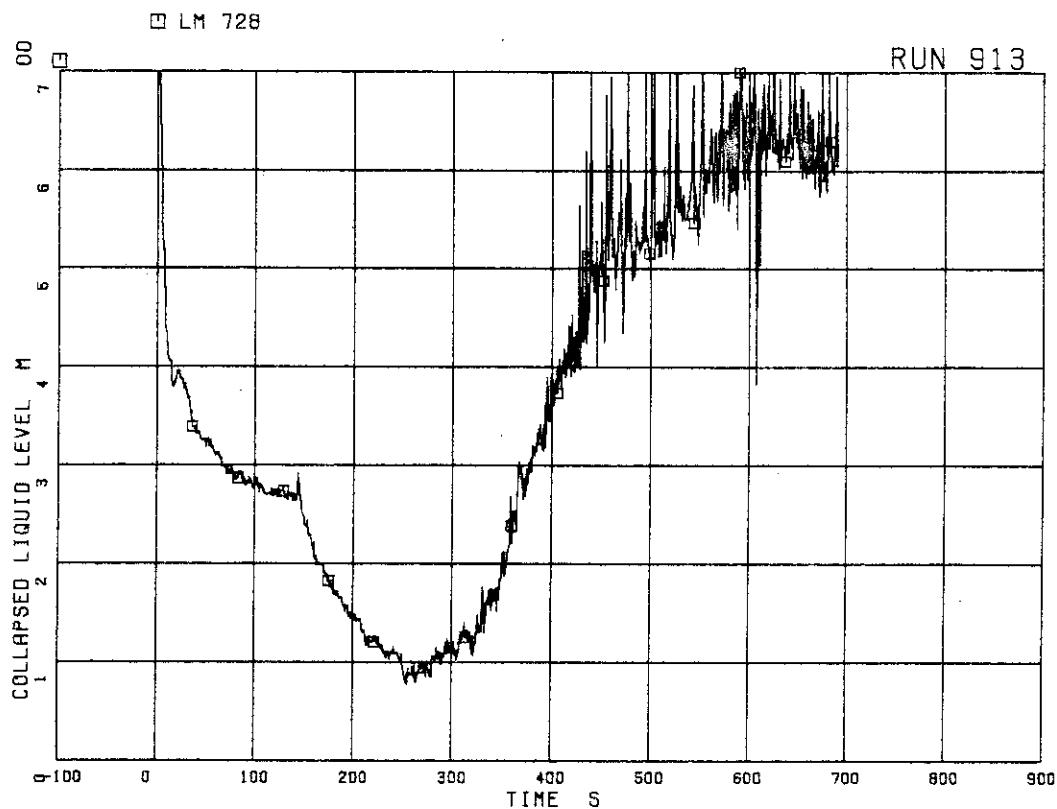


FIG.5.222 COLLAPSED LIQUID LEVEL INSIDE CORE SHROUD

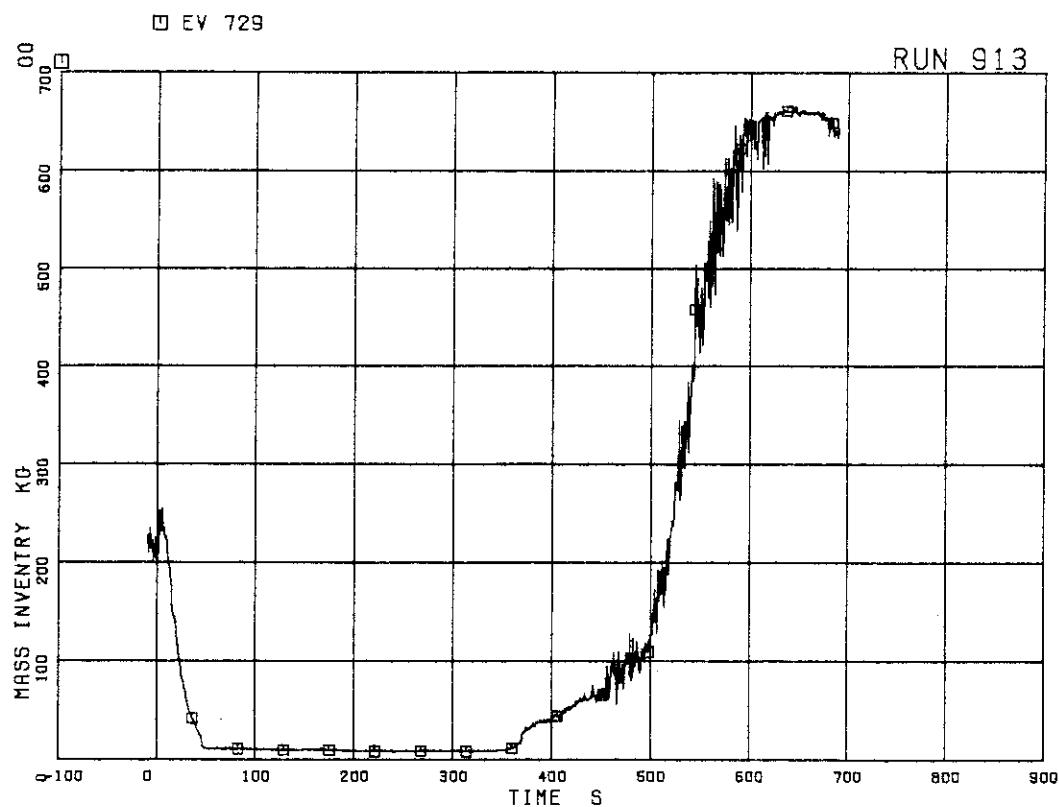


FIG.5.223 FLUID INVENTORY IN DOWNCOMER

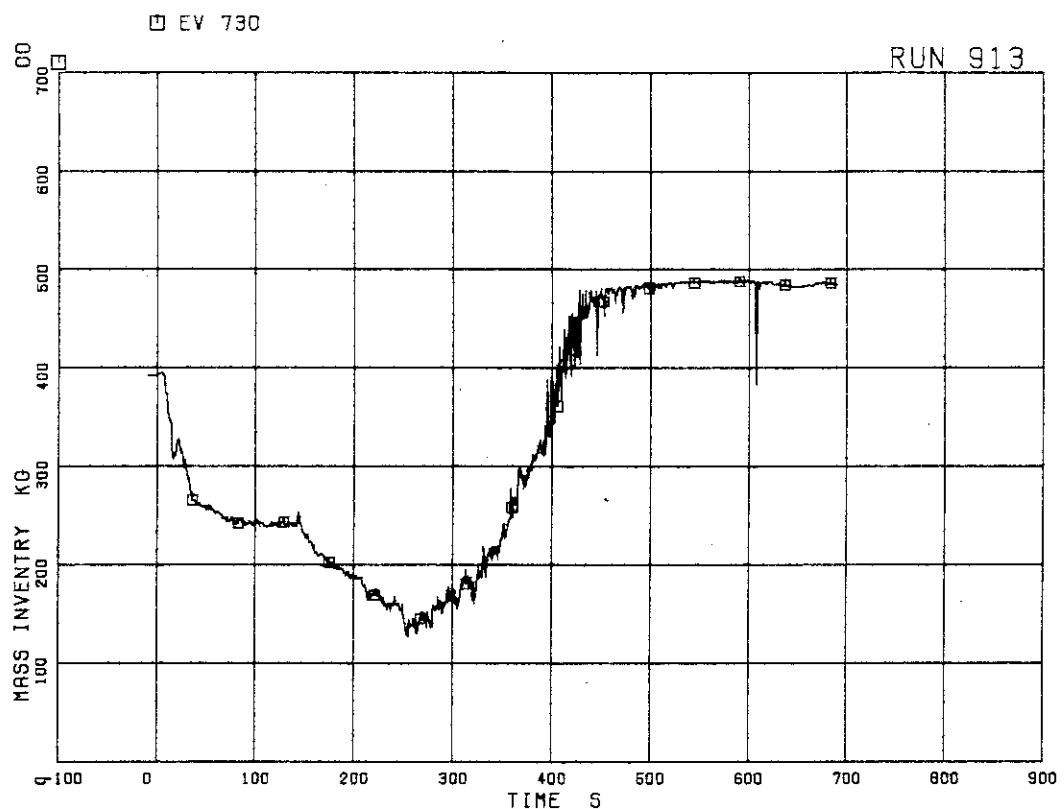


FIG.5.224 FLUID INVENTORY INSIDE CORE SHROUD

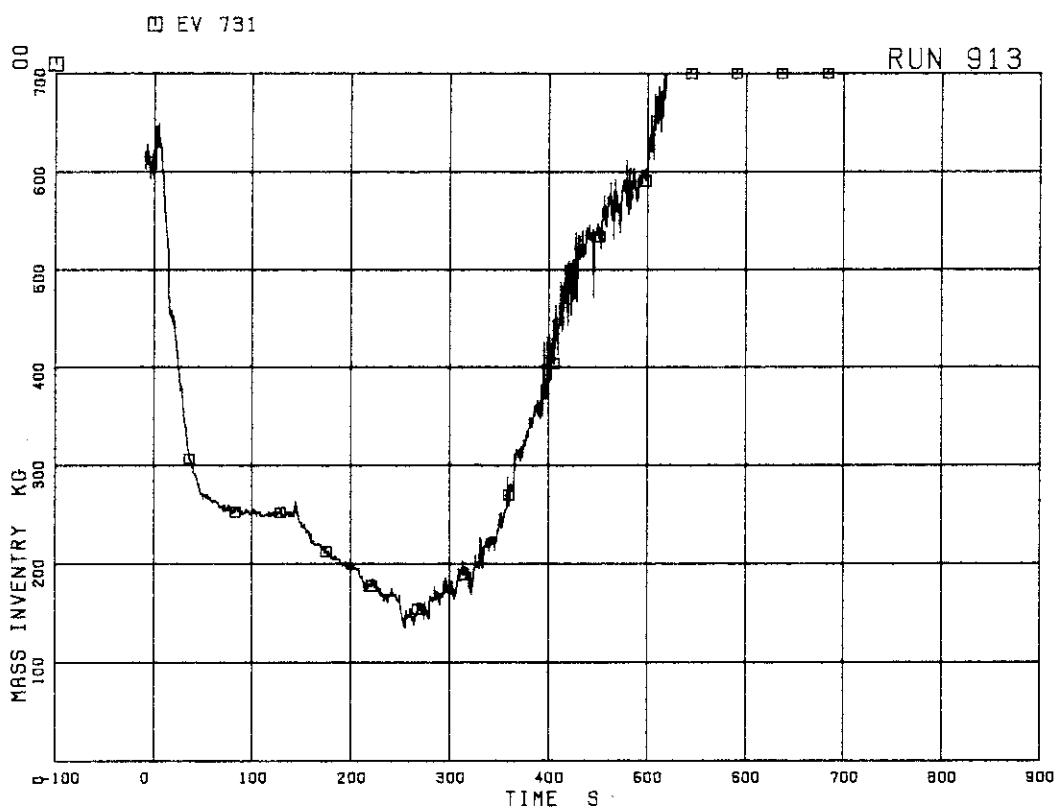


FIG.5.225 TOTAL FLUID INVENTORY IN PRESSURE VESSEL

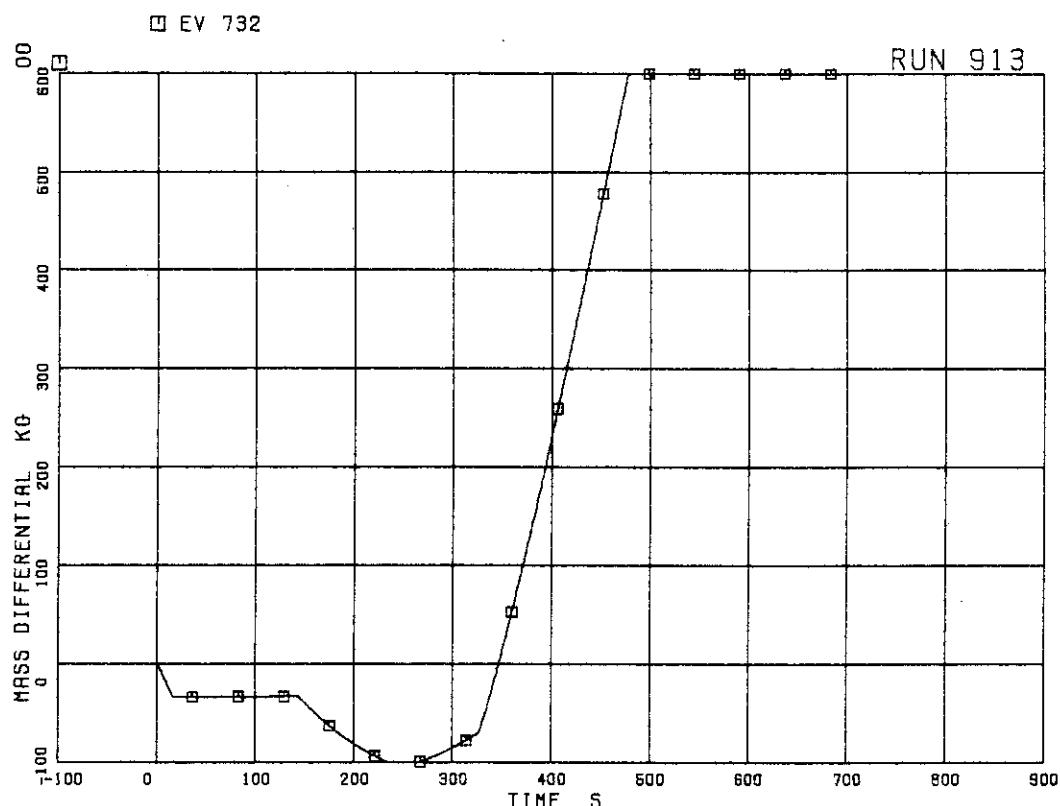


FIG.5.226 FLUID MASS INCREASE BY ECCS AND FW AND DECREASE BY STEAM DISCHARGE FLOW

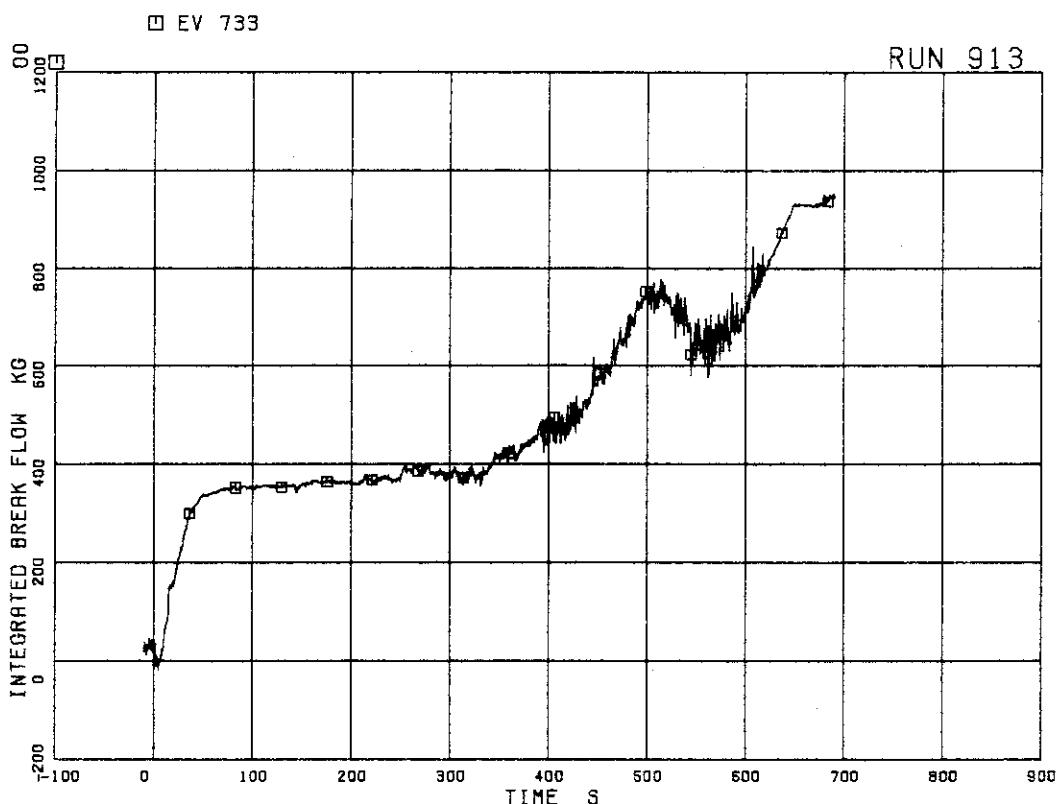


FIG.5.227 DISCHARGED FLUID MASS FROM BREAK

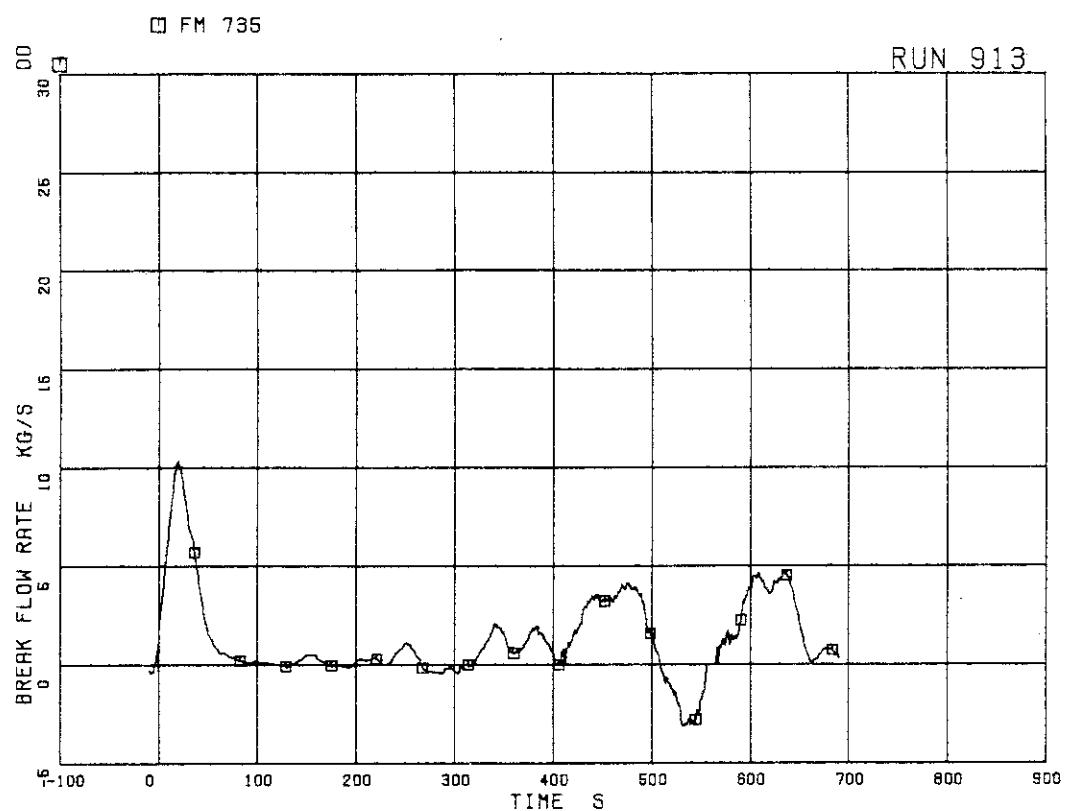


FIG.5.228 DISCHARGED FLOW RATE FROM BREAK