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Data Report of ROSA/LSTF Experiment IB-HL-01
– 17% Hot Leg Intermediate Break LOCA with Totally-failed High Pressure Injection System –

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－17% Hot Leg Intermediate Break LOCA with Totally-failed High Pressure Injection System－

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An experiment denoted as IB-HL-01 was conducted on November 19, 2009 using the Large Scale Test Facility (LSTF) in the Rig of Safety Assessment-V (ROSA-V) Program. The ROSA/LSTF experiment IB-HL-01 simulated a 17% hot leg intermediate break loss-of-coolant accident due to a double-ended guillotine break of pressurizer surge line in a pressurized water reactor (PWR). The break was simulated by a long nozzle upwardly mounted flush with a hot leg inner surface. The test assumptions included total failure of both high pressure injection system of emergency core cooling system (ECCS) and auxiliary feedwater system. In the experiment, relatively large size of break led to a fast transient of phenomena. The primary pressure steeply dropped after the break, and became lower than steam generator (SG) secondary-side pressure. Break flow turned from single-phase flow to two-phase flow soon after the break. Core uncovery started simultaneously with liquid level drop in downflow-side of crossover leg before loop seal clearing (LSC). The LSC was induced in both loops by steam condensation on accumulator (ACC) coolant of ECCS injected into cold legs. The whole core was quenched owing to the rapid recovery in the core liquid level after the LSC. Peak cladding temperature of simulated fuel rods was detected almost concurrently with the LSC. During the ACC coolant injection, liquid levels recovered in the hot legs and SG inlet plena because of liquid entrainment from the hot leg into the SG inlet plenum by high-velocity steam flow.

After the continuous core cooling was confirmed through the actuation of low pressure injection system of ECCS, the experiment was terminated.

This report summarizes the test procedures, conditions, and major observations in the ROSA/LSTF experiment IB-HL-01.

Keywords: PWR, LSTF, Hot Leg Break, Intermediate Break LOCA, Core Uncovery, Peak Cladding Temperature, Loop Seal Clearing, Steam Condensation, Accumulator, Emergency Core Cooling System

JAEA-Data/Code 2023-007

ROSA/LSTF 実験 IB-HL-01 データレポート
－高圧注入系全故障を伴う 17%高温側配管中破断冷却材喪失事故－

日本原子力研究開発機構 安全研究・防災支援部門
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ROSA-V 計画において、大型非定常実験装置(LSTF)を用いた実験(実験番号:IB-HL-01)が 2009 年 11 月 19 日に行われた。ROSA/LSTF IB-HL-01 実験では、加圧水型原子炉(PWR)の加圧器サージラインの両端ギロチン破断による 17%高温側配管中破断冷却材喪失事故を模擬した。このとき、高温側配管内面に接する様に、長いノズルを上向きに取り付けることにより破断口を模擬した。また、非常用炉心冷却系(ECCS)である高圧注入系の全故障と補助給水系の全故障を仮定した。実験では、比較的大きいサイズの破断が早い過渡現象を引き起こした。破断後一次系圧力が急激に低下し、蒸気発生器(SG)二次側圧力よりも低くなった。破断流は、破断直後に水単相から二相流に変化した。炉心露出は、ループシールクリアリング(LSC)前に、クロスオーバーレグの下降流側の水位低下と同時に開始した。低温側配管に注入された ECCS の蓄圧注入系(ACC)冷却水の蒸気凝縮により両ループの LSC が誘発された。LSC 後の炉心水位の急速な回復により、全炉心はクエンチした。模擬燃料棒被覆管最高温度は、LSC とほぼ同時に検出された。ACC 冷却水注入時、高速蒸気流による高温側配管から SG 入口プレナムへの液体のエントレインメントにより、高温側配管と SG 入口プレナムの水位が回復した。

ECCS である低圧注入系の作動を通じた継続的な炉心冷却を確認後、実験を終了した。

本報告書は、ROSA/LSTF IB-HL-01 実験の手順、条件および実験で観察された主な結果をまとめたものである。

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Acronyms and Abbreviations

ACC	Accumulator
CFR	Code of Federal Regulations
DEGB	Double-ended Guillotine Break
ECCS	Emergency Core Cooling System
IBLOCA	Intermediate Break Loss-of-coolant Accident
LOCA	Loss-of-coolant Accident
LPI	Low Pressure Injection
LSC	Loop Seal Clearing
LSTF	Large Scale Test Facility
NEA	Nuclear Energy Agency
OECD	Organisation for Economic Co-operation and Development
PWR	Pressurized Water Reactor
PZR	Pressurizer
ROSA	Rig-of-Safety Assessment
SG	Steam Generator

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1. Introduction

Risk assessment of a light water reactor has been extensively performed in relation to risk informed regulation in various ways including the clarification of occurrence frequency of incidents that may bring about abnormal transients or accidents. The break of piping in the primary system is a cause for loss-of-coolant accident (LOCA). The LOCA is applied as a hypothetical event for design and safety assessment to validate the effectiveness of emergency core cooling system (ECCS). The investigation was made on pipe integrity during long-term operation and for life extension of light water reactors. The occurrence frequency of the pipe break has been found to depend on the pipe size. A complete rupture of a smaller pipe or non-piping component is more likely to take place than a double-ended guillotine break (DEGB) of a larger pipe. The frequency of DEGB of main piping in the primary system such as hot leg and cold leg of pressurized water reactors (PWRs), leading to large break LOCA, would thus be quite low. The consideration of a complete rupture of the largest branch pipe connected to the main piping should become relatively more important than ever in safety analyses relevant to the risk informed regulation [1].

The United States Nuclear Regulatory Commission has proposed risk informed changes to LOCA technical requirements, Appendix K to CFR (Code of Federal Regulations) Part 50 [2]. In this proposal, intermediate break LOCA (IBLOCA) is chosen as a design basis event for the assessment of ECCS effectiveness. For PWR, DEGB of pressurizer (PZR) surge line connected to one of hot legs is considered as representative for the break location and size of IBLOCA. The experimental data, however, are quite limited for clarifying thermal-hydraulic behaviors during IBLOCA caused by DEGB of PZR surge line connected to a hot leg.

To simulate DEGB of PZR surge line, an experiment denoted as IB-HL-01 on a PWR hot leg IBLOCA with a break size of 17% [3-5] was conducted on November 19, 2009 utilizing the Large Scale Test Facility (LSTF) [6] in the Rig-of-Safety Assessment-V (ROSA-V) Program. The LSTF simulates a Westinghouse-type four-loop 3423 MW (thermal) PWR by a full-height and 1/48 volumetrically-scaled two-loop system. The experiment assumed total failure of both high pressure injection system of ECCS and auxiliary feedwater system.

The objectives of the ROSA/LSTF test IB-HL-01 were to make clear thermal-hydraulic responses during the hot leg IBLOCA arisen from the DEGB of PZR surge line, as well as to provide experimental data for the assessment of thermal-hydraulic safety analysis computer codes. The test data also would be useful for the code input uncertainty validation [7].

This report summarizes the test procedures, conditions, and major observations in the ROSA/LSTF experiment IB-HL-01. All the experimental data were processed carefully and qualified to acquire the best possible accuracy.

2. Overview of LSTF

Figure 2-1 shows a schematic view of the LSTF that simulates a typical 3423 MW (thermal) four-loop Westinghouse-type PWR with a two-loop system model by full height and 1/48 in volume [6]. The reference PWR of the LSTF is Tsuruga Unit-2 of Japan Atomic Power Company. The LSTF is composed of a pressure vessel, PZR, and primary loops. Each loop includes an active SG, primary coolant pump, crossover leg, hot leg, and cold leg. The crossover leg is a primary piping that connects the primary coolant pump to the SG. Loops with and without PZR are designated as loop-A and loop-B, respectively. The hot leg and cold leg, 207 mm in inner-diameter each, are sized to conserve the volumetric scale (2/48) and the ratio of length to square root of pipe diameter to better simulate flow regime transitions in the primary loops [8]. Each SG is furnished with 141 full-size U-tubes (inner-diameter of 19.6 mm each), inlet and outlet plena, boiler section, steam separator, steam dome, steam dryer, main steam line, four downcomer pipes, and other internals (see pp.260-273 in Ref. [6]). Six U-tubes are instrumented for each SG. Tubes 1 and 6 are short tubes (Type 1; see p.267 in Ref. [6]), Tubes 2 and 5 are medium tubes (Type 5), and Tubes 3 and 4 are long tubes (Type 9). The LSTF represents the reference PWR bypasses involving eight upper-head spray nozzles (inner-diameter of 3.4 mm each) (see p.202 in Ref. [6]) and the hot leg nozzle (see p.196 in Ref. [6]) leakage. The spray nozzles allow bypass flow that amounts to 0.3% of the total core flow rate during the initial steady state, while bypass area of the hot leg nozzle is set to allow 0.2% bypass flow for each loop. The LSTF core, 3.66 m in active height, mainly consists of 1008 electrically heater rods in 24 rod bundles to simulate the fuel rod assembly and 96 non-heating tie rods to simulate control rod guide thimble (see p.220 in Ref. [6]). The angle of the PZR surge line to the hot leg is 45°. All the types of ECCS fitted to the reference PWR are installed in the LSTF. Nitrogen gas is used for pressurization of ACC tanks of ECCS.

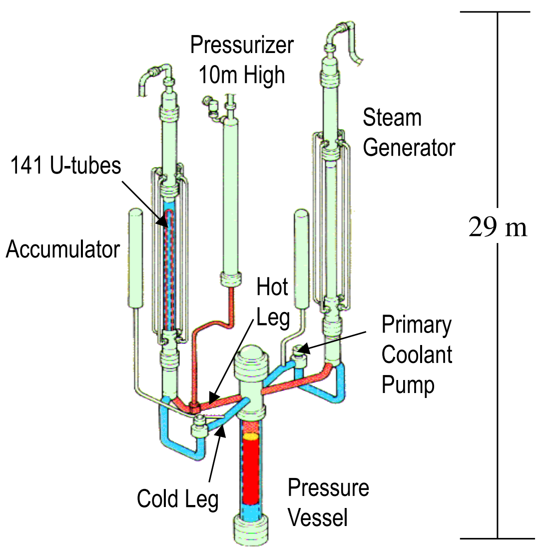

Fig. 2-1 Schematic view of the Large Scale Test Facility (LSTF)

3. Test Conditions and Procedures

With respect to the break, ECCS, and control logic, following assumptions were posed to the IB-HL-01 test conditions.

The assumption related to the break is the following;

1) Break size (flow area) corresponds to 17% of the volumetrically-scaled (1/48) cross-sectional area of the reference PWR cold leg. An upward long break nozzle is mounted flush with inner surface of a hot leg in loop without PZR for better simulation of break flow through PZR surge line piping. Inner-diameter and straight portion length of the break simulation nozzle are 41 mm and 492 mm, respectively.

The assumptions concerning the ECCS are as follows;

2) Total failure of high pressure injection system
3) When the primary pressure decreases to 4.51 MPa, ACC system is actuated in both loops. Coolant is injected from the ACC system into both cold legs. The ACC coolant injection flow rate ratio of loop with PZR to loop without PZR is designed to become 3:1. The ACC coolant injection temperature is 320 K.
4) Non-condensable gas (nitrogen gas) inflow to the primary system from the ACC tanks takes place owing to failure of the ACC system isolation after the coolant injection initiation.
5) When the pressure vessel lower plenum pressure lowers to 1.24 MPa, low pressure injection (LPI) system is activated in both loops. Coolant is injected from the LPI system into both cold legs. The LPI coolant injection flow rate ratio of loop with PZR to loop without PZR is intended to become 3:1. The LPI coolant injection temperature is 310 K.

The assumptions regarding the control logic are as below;

6) Total failure of auxiliary feedwater system
7) PZR is isolated by an isolation valve before the test initiation to better simulate the primary coolant inventory involved in the LOCA transient.
8) Core scram occurs at 4 s after the break since the reactor control logic is based on the pressure of PZR that is isolated prior to the break.
9) Loss of off-site power concurrently with the scram signal
10) Thresholds of maximum cladding surface temperature for the LSTF core protection system are as follows;
    958K=70%, 961K=35%, 966K=13%, 977K=5%, 1003K=0%, of pre-determined value [9].

3.1 Initial Steady State and Boundary Conditions

The specified initial steady state and boundary conditions are listed in **Table 3-1**. Initial steady state conditions such as upper plenum pressure, fluid temperatures in hot leg and cold leg were 15.5 MPa, 598 K, and 563 K respectively (to be indicated in **Table 4-1**), according to the reference PWR conditions.

The LSTF initial core power is limited to 10 MW on account of a limitation in the capacity of power supply. The 10 MW power corresponds to 14% of the volumetrically-scaled (1/48) PWR nominal core power (3423 MW). Radial peaking factors of high-, mean-, and low-power rod bundles are 1.51, 1.00, and 0.66 respectively in “Case 3” (see p.228 in Ref. [6]) shown in **Table 3-1**. Axial core power profile is a 9-step chopped cosine with a peaking factor of 1.495 (see p.227 in Ref. [6]). To attain the prototypical initial fluid temperatures with this core power, core flow rate was set to 14% of the 1/48-scaled nominal flow rate. Initial SG secondary-side pressure was raised to 7.3 MPa to limit the primary-to-secondary heat transfer rate to 10 MW, while 6.1 MPa is nominal value in the reference PWR. Initial PZR liquid level was about 7.4 m that is equivalent to about 66% of the PZR vessel height (see p.396 in Ref. [6]). However, the PZR liquid level mostly remained unchanged because the PZR was isolated before the test start. Initial SG secondary-side collapsed liquid level was about 10.2 m that corresponds to the SG medium tube height.

Proportional heaters in the PZR are utilized to trim the pressure, while backup heaters mitigate system heat losses. Powers of the PZR proportional and backup heaters were 3.8 kW and 33.7 kW respectively, as the initial conditions. Many regions of the LSTF are equipped with trace heaters to mitigate environmental heat losses.

The DEGB of PZR surge line was simulated by utilizing a long nozzle (**Fig. 3-1**), upwardly mounted flush with the hot leg inner surface, as drawn in **Fig. 3-2**. The break simulation nozzle is 41 mm in inner-diameter (d) and 492 mm in straight portion length (L). The ratio of L to d is designed to be 12 to avoid significant influences of the length on mass flux through the nozzle [10]. The nozzle flow area corresponds to 17% of the volumetrically-scaled cross-sectional area of the reference PWR cold leg. The break unit illustrated in **Fig. 3-2** is expected to be filled with nearly saturated coolant before the break. Venturi flow meter (FE-560-BU; see p.303 in Ref. [6]) is installed in the break unit.

For controlling ACC water injection volume (see p.322 in Ref. [6]), the specified initial water level and volume above the standpipe were 2.37 m and 1.68 m^3 respectively for loop with PZR. Conversely, they were 0.79 m and 0.56 m^3 respectively for loop without PZR. The specified initial volume of non-condensable gas (nitrogen gas) in the ACC tank was 0.69 m^3 for loop with PZR and 0.23 m^3 for loop without PZR. The angle of the ACC injection to cold leg is 90° for loop with PZR and 45° for loop without PZR (see pp.397-398 in Ref. [6]).

3.2 Test Procedures

Table 3-2 shows the specified control logic, operation set points, and conditions. The experiment was launched at time zero by opening a break valve located downstream of the break nozzle at the hot leg in loop without PZR. At the same time, rotation speed of primary coolant pumps was increased up to about 1550 rpm in 4 s for better simulation of pressure and temperature transients in the reference PWR.

A scram signal was generated at 4 s after the break. This caused the closure of SG main steam stop valve, the coastdown of primary coolant pumps, the termination of SG main feedwater, and the manual closure of SG main steam isolation valves. **Table 3-3** shows the specified rotation speed ratio of primary coolant pump after the scram signal. The specified pump rotation speed was reduced to zero 250 s after the scram signal.

Table 3-4 shows the pre-determined core power decay curve after the scram signal, based on calculations by making use of the RELAP5 code considering delayed neutron fission power and stored heat in PWR fuel rod [9]. The core power was held at the initial value of 10 MW for 18 s after the scram signal until the scaled PWR core decay power lowered to 10 MW. The LSTF core power began a decay afterwards according to the specified core power.

The pressure set points for opening and closure of the SG relief valves are 8.03 MPa and 7.82 MPa respectively, referring to the corresponding values in the reference PWR. The SG relief valve was simulated by employing a 16.2 mm inner-diameter sharp-edge orifice to provide steam flow rate of 2 kg/s when the SG secondary-side pressure is 8 MPa.

The ACC system is actuated in both loops at the primary pressure of 4.51 MPa according to the reference PWR. The ACC coolant injection flow rate ratio of loop with PZR to loop without PZR was designed to become 3:1 (to be plotted in **Fig. 4-11**). The ACC coolant injection temperature is 320 K, which is the same as that in the reference PWR.

The LPI system is activated in both loops at the pressure vessel lower plenum pressure of 1.24 MPa. As seen in **Table 3-5**, the LPI coolant injection flow rate is decided on the basis of Q-H curve for the LPI pump. The LPI coolant injection flow rate ratio of loop with PZR to loop without PZR was intended to become 3:1 (to be indicated in **Fig. 4-12**). The LPI coolant injection temperature is 310 K, which is equal to that in the reference PWR.

3.3 Instrumentation

Instruments are equipped in the LSTF to understand and evaluate thermal-hydraulic responses during simulated accidents and transients.

3.3.1 Measured Data

A list of available experimental data is shown in **Table A-1**, which is composed of Sequential No., Function ID., Tag Name, measurement location, range, unit, and uncertainty. The Tag Name is a fixed naming unique to each measurement. The alphabetical prefix in the Function

ID. and Tag Name represents the kind of variable or the kind of measurement as follows;

TE, fluid temperature,

DT, differential temperature,

TW, heater rod and structure temperature,

FE, flow rate measured with conventional (differential pressure) flow meters,

PE, pressure,

MI, miscellaneous instrumented-signal (power, pump rotation speed, etc.),

LE, liquid level,

DP, differential pressure,

DE, fluid density measured with gamma-ray densitometer.

After the experiment, data from these measurements are processed to obtain the “secondary” data, such as area-averaged fluid density derived from measurement with three-beam gamma-ray densitometer. These data are stored with Function ID. starting with a prefix of “RC”. The measurement uncertainty is assessed according to the accuracy of the relevant instrument.

3.3.2 Data Conversion, Reduction, and Calibration

The instrumented-signals are recorded in volts by the data logger of DARWIN system (Yokogawa Electric Co.), and are converted into engineering units utilizing appropriate conversion equations and factors. Differential pressure (DP) cell is a device that measures the differential pressure between two inputs. Some parameters such as flow rate (FE) and liquid level (LE) that employ DP cell data require the calculation of the single-phase coolant density based on local pressure and fluid temperature data using steam table.

DP cell data for both the differential pressures and liquid levels are corrected on the basis of a similar calibration test for static pressure effect, which is performed separately. Three-valve manifold is operated for each of DP cells to obtain zero calibration data for 200 s twice at a little before the break valve opening and at a little after the closure of the break valve.

The applicability of flow rates measured with the conventional flow meters employing venturi, orifice or nozzle and DP cell is limited in principle to either single-phase liquid or vapor flow. In addition, the accuracy is poor when the readings are below about 20% of the measurement range. This is explained by the fact that the flow rate is proportional to the square root of the measured DP. For example, a zero level drift of 1% in the DP cell output may result in the flow rate reading of 10% of the measurement range especially when the actual flow rate is nearly equal to zero. It is thus good to pay attention when the flow rate is below about 20% of the measurement range even though the data are corrected based on a calibration test for static pressure effect.

Two-phase flow instruments, such as gamma-ray densitometers, use certain conversion equations considering attenuation effects of gamma-ray that goes through coolant flow.

After the data acquisition, some experimental data are calibrated. The high-range pressure data in the PZR and the upper plenum, for example, are corrected on the basis of a zero level shift using the low-range pressure data first, and then all the density data are calibrated at two points with different fluid conditions.

3.3.3 Data Qualification

The experimental data are qualified manually. Thermocouple data are reviewed by employing pre-test ambient temperature data for anomalous readings, and are mutually compared with readings of instruments in the same vicinity. Pressure transducers are checked for zero level drift as well as any other suspicious behaviors. The outputs of conductance probe, power meters, pump speed and vibration meters, and valve position indicators are individually reviewed for inconsistent readings.

The flow meters, DP transducers, gamma-ray densitometers, and drag disk transducers require extensive manual qualification efforts. The validity of the flow meters and differential pressure data mostly depends on whether the reading is in the sensitive range of the measurement or not. The data from these instruments are presented with appropriate corrections based on calibration data for each transducer.

Available experimental data are “Good” defined as below. “Good” means that the type of data has been reviewed manually, and is presumed to lie within the range and uncertainty values of the instruments based on the design specification which are published in the reference [6]. Certain measurements, however, may be affected by various extraneous factors such as flow velocity, flow regime, and wall effects. **Table A-1** shows the list of available experimental data qualified as “Good” for LSTF IB-HL-01 (Run ID designated to be IB3).

Table 3-1 Specified initial steady state and boundary conditions (1/2)

Pressure Vessel	Initial core power	10 MW
	Radial core power profile	Case 3
	Axial core power profile	9-step chopped cosine, peaking factor = 1.495
	Initial upper plenum pressure	15.5 MPa
Primary Loops	Initial hot leg fluid temperatures	598.1 K
	Initial cold leg fluid temperatures	562.4 K
	Initial mass flow rate	24.3 kg/s / loop
	Initial downcomer-to-hot leg bypass	0.049 kg/s / loop
Pressurizer (PZR)	Initial pressure	15.5 MPa
	Initial liquid level	7.2 m
Steam Generators (SGs)	Initial secondary-side pressure	7.3 MPa
	Initial secondary-side liquid level	10.3 m
	Initial main steam flow rate	2.74 kg/s
	Initial main feedwater flow rate	2.74 kg/s
	Main feedwater temperature	495.2 K
	Inner-diameter of relief valve orifice	16.2 mm
	Relief valve open / closure	SG secondary-side pressure = 8.03 / 7.82 MPa
	Inner-diameter of safety valve orifice	26.6 mm
	Safety valve open / closure	SG secondary-side pressure = 8.68 / 7.69 MPa

Break

Location	Hot leg in loop without PZR (see **Fig. 3-2**)
Type	Nozzle
Inner-diameter of nozzle	41 mm
Straight portion length of nozzle	492 mm

Table 3-1 Specified initial steady state and boundary conditions (2/2)

ECCS

High pressure injection system		Not actuated
Accumulator (ACC) system	Initiation of system	Primary pressure = 4.51 MPa
	Water temperature	320 K
	Initial water level above tank bottom in loops with / without PZR	6.47 m / 7.14 m
	Standpipe level above tank bottom in loops with / without PZR	4.10 m / 6.35 m
	Initial water volume above standpipe in loops with / without PZR	1.68 m^3 *1 / 0.56 m^3 *2
	Initial gas volume above standpipe in loops with / without PZR	0.69 m^3 / 0.23 m^3
	Cross-sectional flow area above standpipe	0.7085 m^2
	Orifice diameter (d) in loops with / without PZR	50.5 mm / 26.0 mm
	Connecting pipe diameter (D) in both loops	97.1 mm
	Contraction ratio (d/D) in loops with / without PZR	0.393 / 0.360
	Coolant injection flow rate ratio of loop with PZR to loop without PZR	3:1
	Injection location	Cold legs in both loops
Low pressure injection (LPI) system	Initiation of system	Pressure vessel lower plenum pressure = 1.24 MPa
	Q-H pump characteristic	See **Table 3-5**
	Fluid temperature	310 K
	Coolant injection flow rate ratio of loop with PZR to loop without PZR	3:1
	Injection location	Same with ACC system

*1 (6.47−4.10 [m])×0.7085 [m^2] ≒ 1.68 [m^3]

*2 (7.14−6.35 [m])×0.7085 [m^2] ≒ 0.56 [m^3]

LSTF Core Protection System Logic

Control of core power to	Maximum cladding surface temperature reaches
70%	958 K
35%	961 K
13%	966 K
5%	977 K
0% (core power trip)	1003 K

Table 3-2 Specified control logic, operation set points, and conditions

Event	Condition
Closure of pressurizer (PZR) spray line valves *1	About 30 minutes before break
PZR isolation by closure of PZR surge line valve *2	About one minute before break
Break	Time zero
Generation of scram signal	4 s
PZR proportional heater off	Generation of scram signal
PZR backup heater off	Generation of scram signal
Initiation of core power decay curve simulation	Generation of scram signal
Initiation of primary coolant pump coastdown	Generation of scram signal
Closure of SG main steam stop valve	Generation of scram signal
Manual closure of SG main steam isolation valves	Generation of scram signal
Termination of SG main feedwater	Generation of scram signal
Initiation of ACC system in both loops	Primary pressure = 4.51 MPa
Initiation of LPI system in both loops	Pressure vessel lower plenum pressure = 1.24 MPa

*1 Heaters only are used to control primary pressure, compensating heat-loss of PZR.

*2 Pressure vessel lower plenum pressure is used as primary pressure for logic control.

Table 3-3 Specified pump rotation speed ratio after scram signal

Time (s)	Rotation Speed Ratio	Time (s)	Rotation Speed Ratio	Time (s)	Rotation Speed Ratio
0	1.000	30	0.280	80	0.125
2	0.850	40	0.220	90	0.110
5	0.730	50	0.185	100	0.100
10	0.540	60	0.160	250	0.000
20	0.370	70	0.140		

Table 3-4 Pre-determined core power decay curve after scram signal

Time (s)	Power (MW)	Time (s)	Power (MW)	Time (s)	Power (MW)
0	10	80	3.042	600	1.832
18	10	100	2.763	800	1.577
20	8.150	150	2.423	1000	1.487
30	5.366	200	2.263	1500	1.342
40	4.504	300	2.079	2000	1.238
50	3.906	400	2.000	3000	1.096
60	3.538	500	1.913	4000	1.003

Table 3-5 Pressure vessel lower plenum pressure versus LPI flow rate

Pressure vessel lower plenum pressure P (MPa)	Total LPI flow rate Q (kg/s) *1	LPI flow rate in loop with PZR (kg/s) *2	LPI flow rate in loop without PZR (kg/s) *2
1.24	1.52	1.14	0.38
1.20	2.15	1.61	0.54
1.15	2.83	2.12	0.71
1.10	3.40	2.55	0.85
1.05	3.89	2.91	0.97
1.0	4.30	3.23	1.08
0.9	4.97	3.73	1.24
0.8	5.52	4.14	1.38
0.6	6.49	4.87	1.62
0.4	7.49	5.61	1.87
0.2	8.39	6.29	2.10

*1 Based on following fitting equation for Q-H curve of LPI pump

$$Q = -10.502P^4 + 23.569P^3 - 18.956P^2 + 1.5189P + 8.6709$$

*2 75% and 25% of total flow rate for loops with and without PZR, respectively

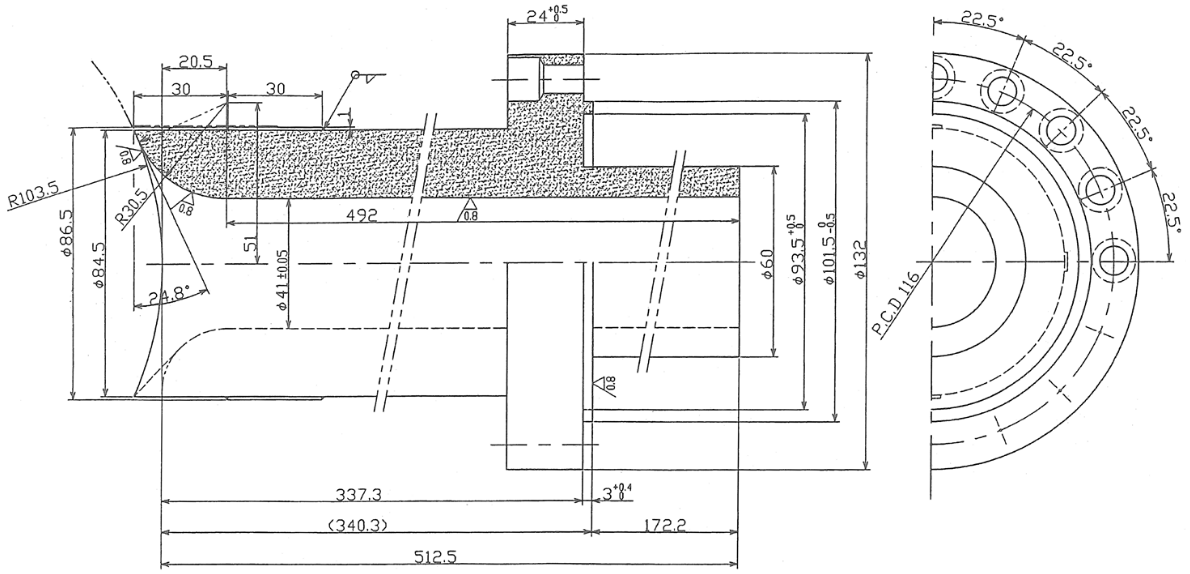

Fig. 3-1 Configuration of break nozzle

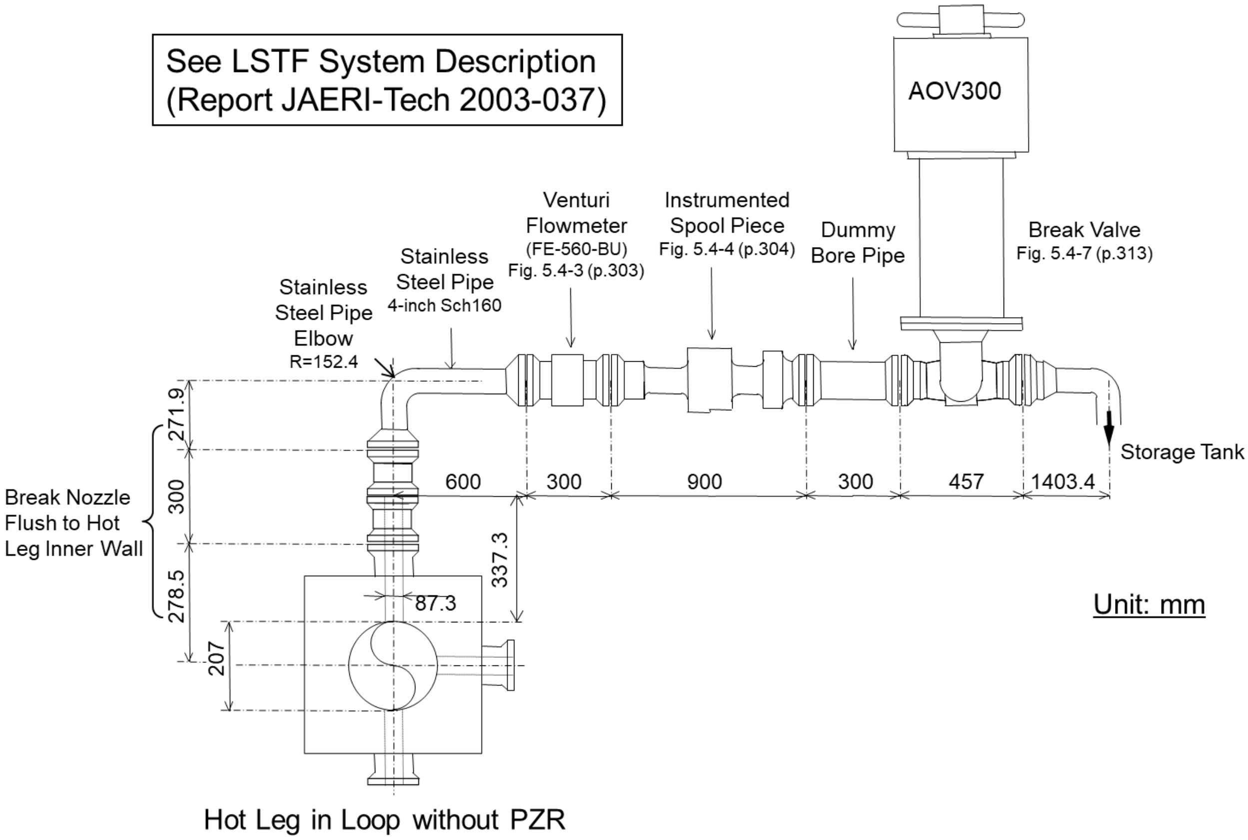

Fig. 3-2 Configuration of break unit

4. Experimental Results

4.1 Initial and Boundary Conditions

Initial steady state conditions achieved in the experiment were in reasonable agreement with the specified values, as mentioned in **Table 4-1**. The measured values indicated are those averaged for the last 60 s prior to the onset of the break. Initial SG re-circulation ratio estimated from the measured flow rates in the downcomer and SG main steam line was 6.5 in loop with PZR (loop-A) and 6.3 in loop without PZR (loop-B). **Table 4-2** gives the chronology of major events until 1574 s when the break valve [Valve No.; AOV (air-operated valve) -300] (see p.114 in Ref. [6]) was closed. It took 3 s for the LSTF CENTUM computer system (see pp.69-70 in Ref. [6]) to start the break valve after a break signal. The opening time of AOV-300 itself is less than 0.3 s. In this chronology, the timing of the break opening (time zero) is regarded as the completion of the break valve open.

[IMPORTANT NOTICE]

This delay in the break opening practically caused the earlier generation of the scram signal at 1 s from the specified time of 4 s. The LSTF test data were then shifted by 3 s to make the break opening timing as time = 0 s, so that the scram signal generation time is 1 s.

4.2 Thermal-hydraulic Responses Concerning Boundary Conditions

As drawn in **Fig. 4-1**, the core power initiated to decay at 20 s. The core power was controlled to the pre-determined value until 1533 s when the core power turned off. This is because the peak cladding temperature of 607 K during the core uncovery was below the pre-determined threshold of 958 K for the LSTF core protection system (to be depicted in **Figs. 4-20 and 4-21**).

As noted in **Fig. 4-2**, the power values of the PZR proportional and backup heaters were initially kept constant at 3.8 kW and 33.7 kW, respectively. The PZR proportional heater power turned off by 3 s following the scram signal. The PZR backup heater was manually powered-off at 19 s because the PZR was isolated before the test initiation.

Figures 4-3 and 4-4 respectively show the primary coolant pump rotation speed and the primary loop mass flow rate measured by exploiting a venturi flow meter at each primary coolant pump suction leg. The pump rotation speed began to rise simultaneously with the break, and attained about 1550 rpm in 4 s. The pump coastdown started at 5 s, following the scram signal. The pump rotation speed reduced thereafter, which led to a decrease in the primary loop mass flow rate. An unexpected steep rise appeared in the primary coolant pump rotation speed only in loop with PZR after about 210 s probably owing to defective sensor, though the loop flow behaviors were rather in symmetrical in the two loops. Oscillatory behavior of the primary loop mass flow rate may suggest that two-phase flows appeared after 180 s when loop seal clearing (LSC) took place in both loops (to be plotted in **Figs. 4-38 and 4-39**). The primary loop mass flow rate measured by the venturi flow meters then indicates trend values.

Figures 4-5 and 4-6 respectively show the SG main steam and feedwater flow rates. The SG main steam was terminated by the closure of the SG main steam stop valve [Valve No.; AOV (air-operated valve) -220] (see p.113 in Ref. [6]) at 1 s concurrently with the scram signal. The main feedwater injection into the secondary-side of both SGs was terminated by the closure of the SG main feedwater line valve [Valve No.; AOV-260] (see p.113 in Ref. [6]) at 7 s, following the scram signal. The main steam isolation valves of both SGs [Valve No.; AOV-170 and -200] (see pp.111-112 in Ref. [6]) were manually closed at 4 s, following the SG main steam stop valve closure.

Figure 4-7 shows the break flow rate derived as the differential of the time-integrated break flow evaluated from the liquid level increase in the storage tank. The break flow rate declined roughly stepwise. The break flow turned from single-phase liquid to two-phase flow in a very short time just after the break when the liquid level formed in the hot leg (to be presented in **Fig. 4-33**). The break flow changed to single-phase vapor when the hot leg was emptied of liquid temporarily.

Figure 4-8 shows the break-downstream area-averaged fluid density estimated from the measured data by using a three-beam gamma-ray densitometer located at instrumented spool piece (**Fig. 3-2**). After the break, flow at the break-downstream became single-phase vapor by about 150 s. **Figure 4-9** gives that the break-downstream pressure reduced instantly to about 4 MPa after the break, and decreased further in rather gradual manner. The pressure at the break-downstream was kept at near-atmospheric pressure after about 200 s.

Figure 4-10 shows the liquid level in the ACC tank. **Figure 4-11** gives the coolant injection flow rate from the ACC tank derived from the liquid level history in the ACC tank. Another name for the ACC tank in loop with PZR is ACC-cold tank, while that for the ACC tank in loop without PZR is ACC-hot tank. The coolant injection temperature is 320 K in both the ACC-cold tank and ACC-hot tank, but the heater capacity of the ACC-hot tank is designed to be twice that of the ACC-cold tank. When the primary pressure lowered to 4.51 MPa, the ACC system was initiated in both loops at 155 s. The initial water level above the ACC tank bottom was 6.39 m in loop with PZR and 7.09 m in loop without PZR. The final water level above the ACC tank bottom was 4.15 m in loop with PZR and 6.37 m in loop without PZR. The ACC system was terminated at 250 s in loop with PZR and 290 s in loop without PZR.

When the pressure vessel lower plenum pressure reduced to 1.23 MPa according to the discharge pressure of the LPI pump, the LPI system was activated in both loops at 505 s, as mentioned in **Fig. 4-12**. The activation of the LPI system was rather late due to the primary pressure rise after the termination of the ACC coolant injection. This suggests significant impacts of steam condensation on the ACC coolant on the primary pressure.

4.3 Transient Thermal-hydraulic Responses

Figure 4-13 shows the primary and secondary pressures. In this test, the primary pressure was represented by the upper plenum pressure because the PZR was isolated prior to the test initiation. The primary pressure began an abrupt decrease at time zero when the break valve was opened. The scram signal was generated at 1 s after the break valve opening. The scram signal gave rise to the closure of SG main steam stop valve, being followed by the manual closure of SG main steam isolation valves and the coastdown of primary coolant pumps. Relatively large size of break resulted in a fast primary depressurization. The SG secondary-side pressure rapidly increased up to about 8 MPa after the closure of the SG main steam isolation valves. However, the SG relief valves were not opened because the SG secondary-side pressure was a bit lower than the set point pressure of 8.03 MPa. The SGs no longer served as the heat sink after around 55 s when the primary pressure became lower than the SG secondary-side pressure. The primary depressurization was enhanced owing to steam condensation on the ACC coolant injected into both cold legs (**Fig. 4-11**).

4.3.1 Thermal-hydraulic Responses in Pressure Vessel

<u>Liquid level behaviors in upper plenum and core</u>

The differential pressure and collapsed liquid level respectively in the upper plenum are shown in **Figs. 4-14 and 4-15**, while those in the core are given in **Figs. 4-16 and 4-17**. The upper plenum liquid level greatly depressed after the break due to flashing of fluid on account of a fast primary depressurization. Water remained on the upper core plate in the upper plenum owing to counter-current flow limiting because of significant upward steam flow from the core to the break. Core uncovery occurred at 164 s simultaneously with the liquid level drop in the downflow-side of the crossover leg before the LSC. The LSC in both loops was attributed to steam condensation on the ACC coolant injected into the cold legs (to be indicated in **Fig. 4-35**). The core liquid level quickly recovered after the LSC at 180 s. Consequently, the whole core was quenched by 186 s (to be presented in **Figs. 4-20 and 21**) as the entire core was covered by a two-phase mixture.

<u>Responses of upper plenum fluid temperature, core exit temperature, and cladding surface temperature of simulated fuel rods</u>

Figure 4-18 shows the upper plenum fluid temperatures, being compared with the primary saturation temperature based on the upper plenum pressure. The upper plenum fluid temperatures at the top and middle indicted superheating at about 130 s and about 170 s,

respectively. These fluid temperatures may indicate the structure temperatures when the upper plenum at the top and middle is exposed to steam. By contrast, the upper plenum fluid temperature at the bottom was the saturation temperature throughout the experiment.

Figure 4-19 show the typical core exit temperatures measured at the center [Tag Name; TE-EX040-B22-UCP, -B21-UCP], middle region [TE-EX040-B19-UCP, -B18-UCP], and outer region [TE-EX040-B03-UCP, -B01-UCP] of the upper core plate (see pp.385-386 in Ref. [6]). The core exit temperatures were maintained saturated throughout the experiment.

The typical cladding surface temperatures at Positions 9 through 5 are shown in **Figs. 4-20 and 4-21**, while those at Positions 4 through 1 are given in **Figs. 4-22 and 4-23**. Positions 9, 8, 7, 6, 5, 4, 3, 2, and 1 are placed at 3.610 m, 3.048 m, 2.642 m, 2.236 m, 1.830 m, 1.424 m, 1.018 m, 0.612 m, and 0.050 m respectively above the core bottom (see p.222 in Ref. [6]). Positions 9, 5, and 1 respectively correspond to the top, center, and bottom of the core. The typical cladding surface temperature is represented by the cladding surface temperature of the rod bundle where the highest temperature emerges at each position. The arrangement of high-, mean-, and low-power bundles is presented in Ref. [6] (p.228). During the core uncovery period, the cladding surface temperatures at Positions 9, 8, 7, 6, 5, 4, 3, 2, and 1 respectively initiated to increase at 173 s, 168 s, 170 s, 168 s, 164 s, 168 s, 165 s, 174 s, and 178 s. The peak cladding temperature was observed at Position 5 at 182 s almost concurrently with the LSC occurred in both loops at 180 s (to be depicted in **Figs. 4-38 and 4-39**). The peak cladding temperature was 607 K, which was lower than the initial cladding surface temperature of 623 K. The cladding surface temperatures at Positions 9, 8, 7, 6, 4, 3, 2 and 1 respectively attained 545 K at 184 s, 566 K at 183 s, 587 K at 182 s, 592 K at 182 s, 568 K at 181 s, 544 K at 180 s, 532 K at 179 s, and 512 K at 178 s. The whole core was quenched by 186 s. The entire core was filled with a two-phase mixture afterwards. One third of the core bottom portion became subcooled by the ACC coolant after about 230 s, as plotted in **Figs. 4-22 and 4-23**.

<u>Coolant behaviors in pressure vessel</u>

Figures 4-24 and 4-25 show the differential pressure and collapsed liquid level respectively in the downcomer. The liquid level appeared in the downcomer at about 35 s, and dropped almost to the bottom by about 145 s on account of steam generation due to the fast primary depressurization. The downcomer liquid level began to recover steeply and manometrically after 155 s when the ACC system was actuated (**Fig. 4-11**). The downcomer fluid temperatures at 6.0 m and 3.6 m above the core bottom are shown in **Fig. 4-26**, while those at 1.8 m and 0.0 m above the core bottom are given in **Fig. 4-27**. The temperature measurement location is presented in Ref. [6] (p.390). The downcomer fluid at 6.0 m above the core bottom (i.e. 0.5 m above the horizontal leg elevation) and other lower elevations became saturated about 30 s and about 60 s, respectively. This was due to high-temperature coolant inflow from the upper-head and coolant flashing because of the primary depressurization. After the initiation of the

ACC coolant injection, subcooling of fluid was detected at 3.6 m, 1.8 m, and 0.0 m above the core bottom. The fluid temperature at 6.0 m above the core bottom showed superheating caused by uncovery of the inner wall after about 420 s. Conversely, the subcooling of fluid prevailed below the horizontal leg level owing to the ECCS coolant inflow.

Figures 4-28 and 4-29 show the differential pressure and fluid temperature respectively in the lower plenum. Fluid in the lower plenum became almost saturated at around 75-210 s, and became subcooled thereafter. The liquid level in the lower plenum may have changed in response to the fluid condition in the core including the liquid level (**Figs. 4-16 and 4-17**). It seems that the liquid level formed and dropped in the lower plenum at around 180 s when the LSC took place in both loops (to be presented in **Figs. 4-38 and 4-39**) after the initiation of the ACC coolant injection. However, this just reflected the pressure loss due to the rapid coolant flow towards the downcomer. Therefore, no liquid level formed in the lower plenum.

Figures 4-30 and 4-31 show the differential pressure and collapsed liquid level respectively in the upper-head. **Figure 4-32** gives the upper-head fluid temperature. Coolant in the upper-head became saturated soon after the break. The liquid level appeared and dropped in the upper-head after about 115 s. The level drop behavior in the upper-head was rather similar to that in the upper plenum and core under the influences of pressure balance between the upper plenum and downcomer. The liquid level in the upper-head initiated to recover after the liquid level recovery in the upper plenum. The upper-head fluid temperatures at the top and middle indicated the structure temperatures respectively after about 190 s and about 440 s, which were higher than the saturation temperature.

4.3.2 Thermal-hydraulic Responses in Primary Loops

Figures 4-33 and 4-34 show the liquid levels and fluid temperatures respectively in the hot legs. The hot leg liquid level is estimated from fluid densities measured by use of a three-beam gamma-ray densitometer. The liquid level formed in the hot leg just after the break owing to flashing of fluid. The hot leg fluid became saturated immediately after the break, and maintained the saturated condition afterwards. The hot leg liquid level in loop without PZR was lower than that in loop with PZR especially at around 30-100 s resulting from the relatively large break flow rate. The hot leg liquid levels became lost temporarily at the same timing as the start of the ACC coolant injection. This brought about the interruption of two-phase flow discharge from the break, as depicted in **Fig. 4-7**. During the ACC coolant injection, liquid in the hot leg was entrained towards the SG inlet plenum by high-velocity steam flow. This gave rise to temporarily coolant accumulation in the SG inlet plenum (to be plotted in **Figs. 4-50 and 4-51**) and rather slow recovery in the hot leg liquid level.

Figure 4-35 shows the liquid levels in the cold legs. The cold leg liquid level is evaluated from fluid densities measured by means of a three-beam gamma-ray densitometer. **Figures 4-36 and 4-37** respectively give the cold leg fluid temperatures at 1633.5 mm away from the pressure vessel center in loops with and without PZR. The cold leg liquid levels started to decline symmetrically in the two loops at around 55 s almost concurrently with the primary pressure became lower than the SG secondary-side pressure. The cold leg fluid then became saturated. The cold leg liquid level began to recover quickly just after the initiation of the ACC coolant injection. The cold leg was filled with subcooled water in loop with PZR. By contrast, the cold leg liquid level fluctuated greatly in loop without PZR. During the ACC coolant injection, fluid temperatures in both cold legs showed rather large subcooling especially in loop with PZR. The cold leg liquid levels depressed again abruptly soon after the termination of the ACC coolant injection. Some water remained in the ACC injection line was injected into the cold legs after about 420 s (**Fig. 4-11**) because of the primary pressure decrease. This led to the temporary recovery in the cold leg liquid level and the temporary reduction in the cold leg fluid temperature especially in loop with PZR. The cold leg liquid levels recovered a little again after the LPI system actuated the coolant injection at 505 s.

The differential pressure and collapsed liquid level respectively in the downflow-side of the crossover leg are noted in **Figs. 4-38 and 4-39**, while those in the upflow-side of the crossover leg are mentioned in **Figs. 4-40 and 4-41**. The upflow-side of the crossover leg once became empty of liquid at 140 s. This was caused by coolant flashing and steam inflow from the cold leg on account of the fast primary depressurization. In the LSC process, steam clears liquid out of the crossover leg downflow-side. The LSC in both loops at 180 s was induced due to manometric level change in the crossover leg because of the pressure difference between the hot leg and cold leg arisen from steam condensation on the ACC coolant injected into the cold legs (**Fig. 4-11**). The upflow-side of the crossover leg became voided by 195 s.

4.3.3 Thermal-hydraulic Responses of Steam Generators

Figures 4-42 through 4-49 show the differential pressures and collapsed liquid levels in the instrumented SG U-tubes. The instrumented SG U-tubes designated as Tubes 1 and 6 are short tubes (Type 1; see p.267 in Ref. [6]), Tubes 2 and 5 are medium tubes (Type 5), and Tubes 3 and 4 are long tubes (Type 9). **Figures 4-50 and 4-51** give the differential pressure and collapsed liquid level respectively in the SG inlet plenum. Coolant behaviors in the SG U-tubes were rather symmetrical between the two loops. The SG U-tube liquid levels initiated to decrease rapidly and monotonically soon after the break. This was due to the fast primary depressurization and steam flow from the SG inlet plenum that was temporarily emptied of liquid just after the break. The liquid level in the upflow-side balanced that in the downflow-side for each instrumented SG U-tube. The SG U-tubes became almost empty of liquid by around 55 s when the primary pressure became lower than the SG secondary-side pressure. Drop in the liquid levels in the SG inlet plenum and U-tubes in loop without PZR was slower than that in loop with PZR. This was probably owing to asymmetrical liquid levels in the hot legs under the impacts of the break (**Fig. 4-33**). Considerable level drop in the SG inlet plena started when the SG U-tube liquid levels became lost. The SG inlet plena became voided by about 110 s. The liquid levels in the SG inlet plena temporarily recovered with those in the hot legs after the core reflooding by the ACC coolant. The liquid levels in the SG inlet plena reduced again after the termination of the ACC coolant injection.

Figure 4-52 shows the SG secondary-side collapsed liquid level. The SG secondary-side collapsed liquid level began to rise after the main steam stop valve closure and the main feedwater termination (**Figs. 4-5 and 4-6**). This seems to be ascribed to the decrease in the net upward steam flow through the SG boiling section. The SG secondary-side collapsed liquid level was maintained at around 11.2 m thereafter, which is good to cover the SG long U-tubes.

Figures 4-53 and 4-54 respectively show the SG secondary-side fluid temperatures in loops with and without PZR. Positions 1, 3, 5, 7, and 9 are located at 0.811, 2.101, 3.381, 5.941, and 8.501 m respectively above the SG U-tube bottom. The SG secondary-side fluid temperature at Position 1 was kept subcooled with rather constant subcooling against the primary saturation temperature. Conversely, the SG secondary-side fluid at other positions was kept saturated.

Table 4-1　Initial steady state conditions

Items	Tag Name (Loops with / without PZR)	Specified (Loops with / without PZR)	Measured [*1] (Loops with / without PZR)
Pressure vessel			
Core power (MW)	WE270A-T	10.0±0.07	10.08
Upper plenum pressure (MPa)	PE280A-PV	15.5±0.108	15.53
Downcomer-to-upper head bypass (%)	None	0.3	Not Measured
Primary loop			
Hot leg fluid temperature (K)	TE020C-HLA /TE160C-HLB	598.1±2.75	598.2 / 596.9
Cold leg fluid temperature (K)	TE070C-CLA /TE210C-CLB	562.4±2.75	563.6 / 563.4
Mass flow rate (kg/s / loop)	FE020A-LSA / FE160A-LSB	24.3±1.25	25.13 / 24.84
Downcomer-to-hot leg bypass (kg/s)	FE010-HLA / FE150-HLB	0.049±0.01	0.052 / 0.048
Pressurizer (PZR)			
Pressure (MPa)	PE300A-PR	15.5±0.108	15.51
Liquid level (m)	LE280-PR	7.2±0.25	7.40
Steam generator			
Secondary-side pressure (MPa)	PE430-SGA / PE450-SGB	7.3±0.054	7.33 / 7.36
Secondary-side liquid level (m)	LE430-SGA / LE450-SGB	10.3±0.38	10.25 / 10.22
Steam flow rate (kg/s)	FE440-SGA / FE480-SGB	2.74±0.10	2.67 / 2.62
Main feedwater flow rate (kg/s)	FE430-SGA / FE470-SGB	2.74±0.05	2.75 / 2.67
Main feedwater temperature (K)	TE430-SGA / TE470-SGB	495.2±2.63	497.9 / 497.1
Accumulator system			
Pressure (MPa)	PE650-ACC / PE660-ACH	4.51±0.054	4.53 / 4.52
Temperature (K)	TE660-ACC / TE700-ACH	320±2.3 / 2.4	320.8 / 321.6
Water level above tank bottom (m) [*2]	LE650-ACC / LE660-ACH	6.47±0.12 / 7.14±0.15	6.39 / 7.09
Low pressure injection system			
Temperature (K)	TE840-PL	310±2.63	311.3

*1　Averaged for 60 s (-60 to 0 s)

*2　Distance from standpipe top to tank bottom is 4.10 m for loop with PZR and 6.35 m for loop without PZR.

Table 4-2 Chronology of major events until break valve closure

Time (s)	Event
-63	Pressurizer (PZR) isolation by valve closure at PZR surge line
0	Break valve open, start of primary coolant pumps rotation speed increase (to 1550 rpm in 4 s)
1	Scram signal, closure of SG main steam stop valve
4	Manual closure of SG main steam isolation valves
5	Initiation of coastdown of primary coolant pumps
7	Termination of SG main feedwater
10	Initiation of decrease in liquid level in SG U-tube
20	Initiation of core power decay
55	Primary pressure became lower than SG secondary-side pressure.
155	Initiation of ACC system in both loops
164	Initiation of core uncovery
180	Loop seal clearing in both loops
182	Peak cladding temperature of 607 K was observed at Position 5.
186	Whole core quench
250	Termination of ACC system in loop without PZR
252	Primary coolant pump stop
290	Termination of ACC system in loop with PZR
505	Initiation of LPI system in both loops
1533	Core power off
1574	Break valve closure

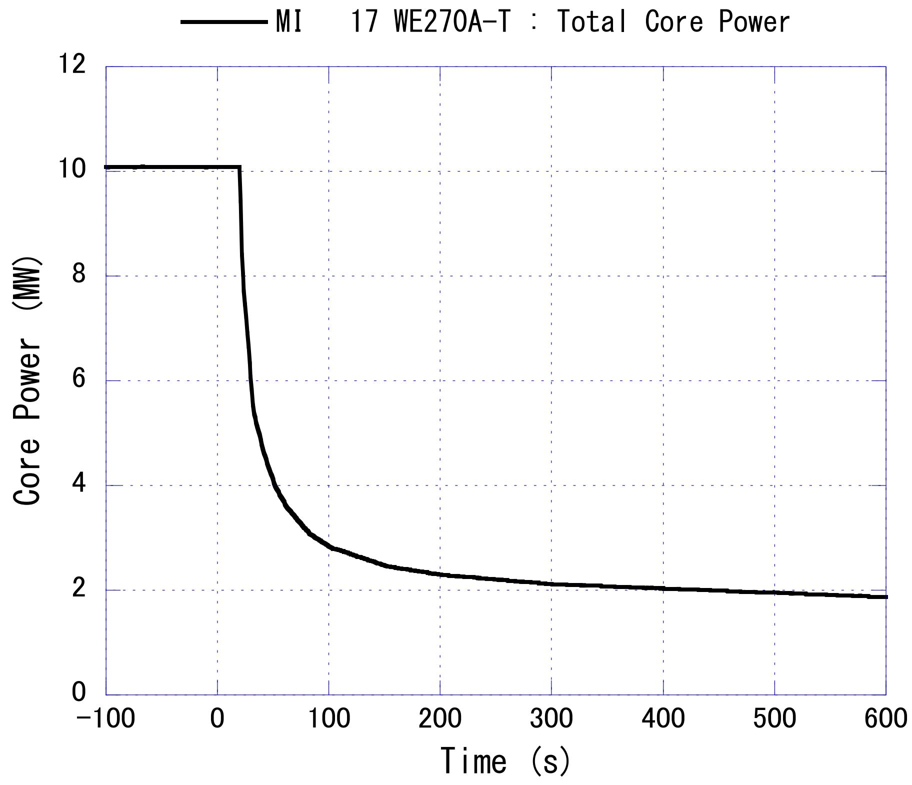

Fig. 4-1 Core power

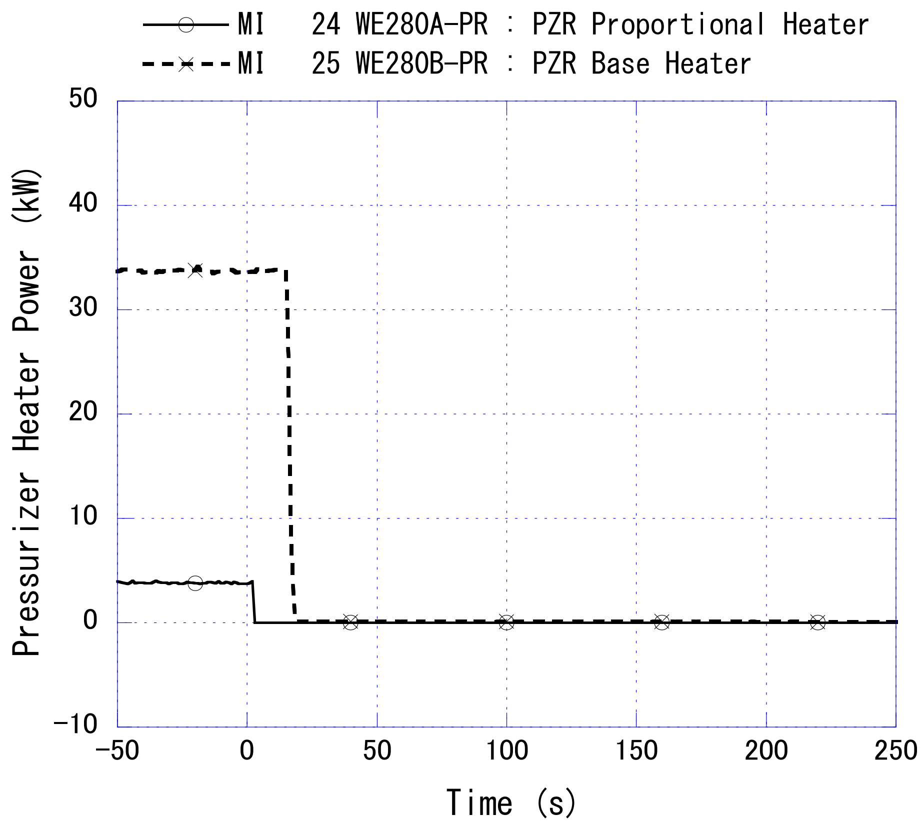

Fig. 4-2 Pressurizer heater power

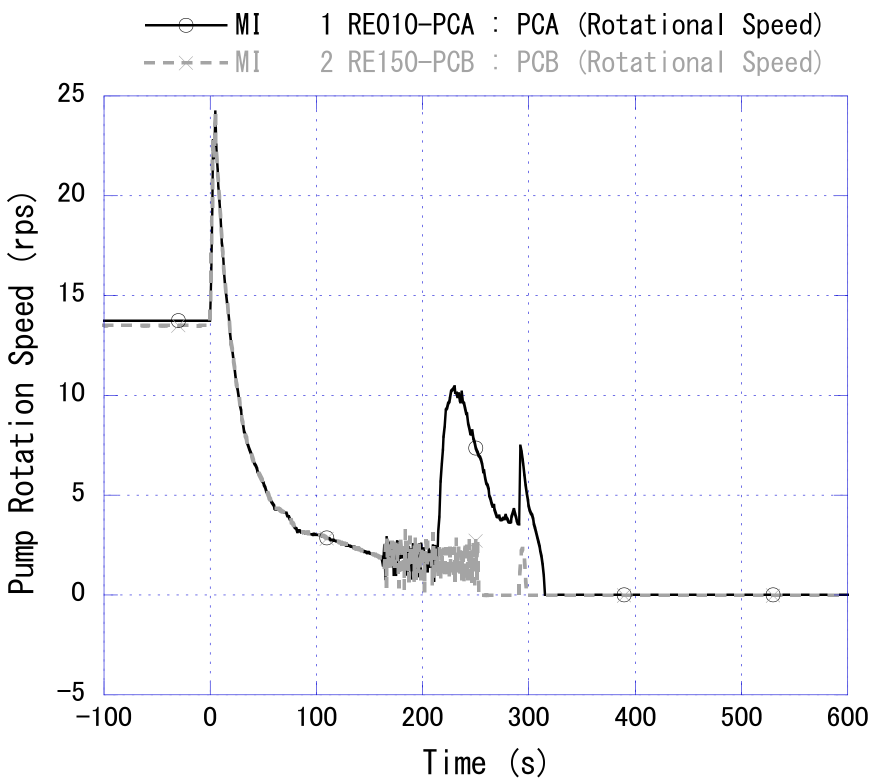

Fig. 4-3 Primary coolant pump rotation speed

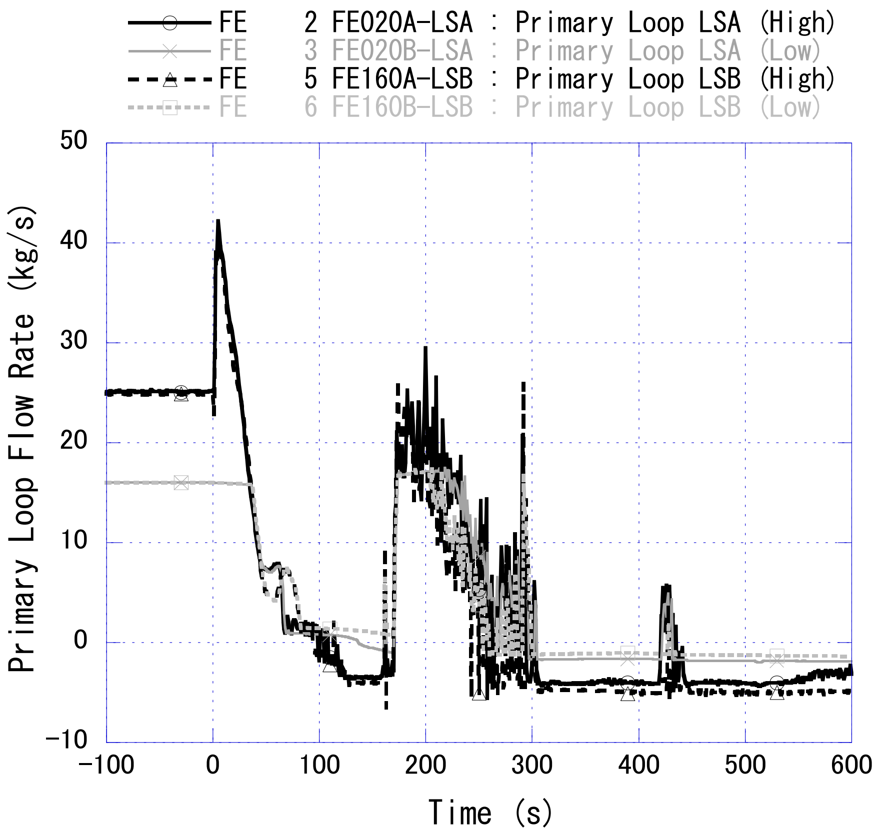

Fig. 4-4 Primary loop mass flow rate

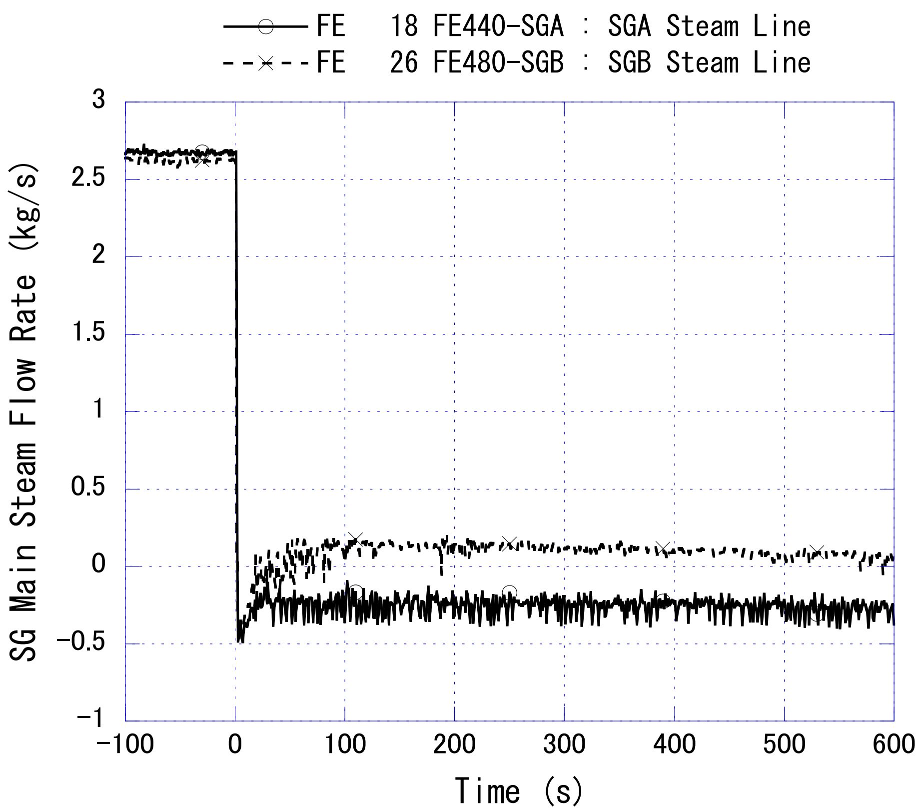

Fig. 4-5 SG main steam flow rate

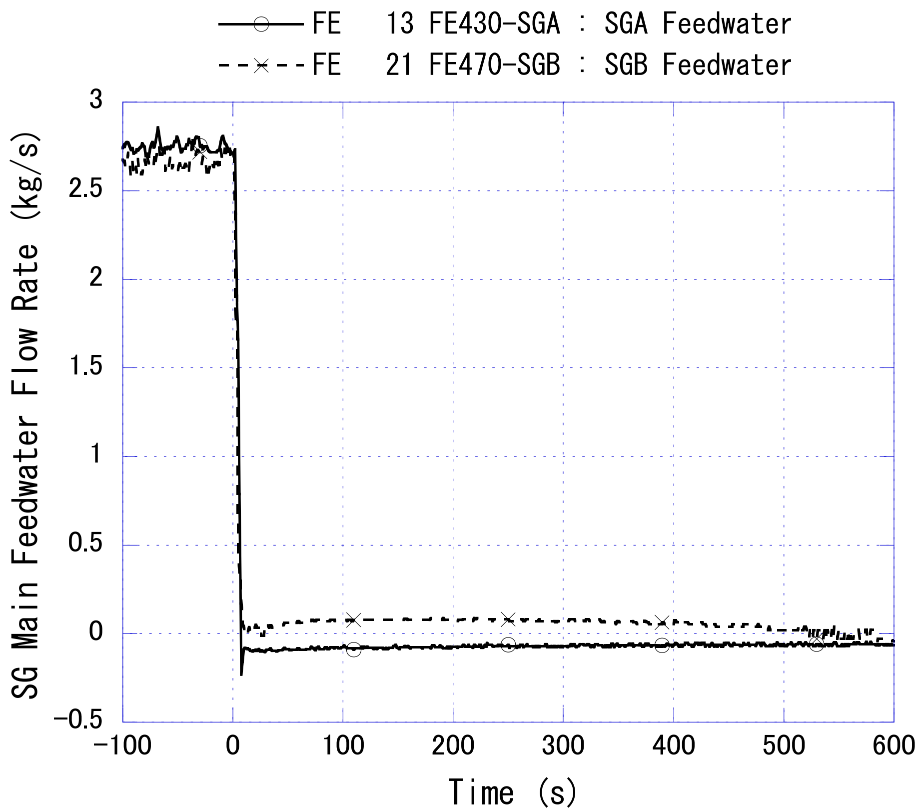

Fig. 4-6 SG main feedwater flow rate

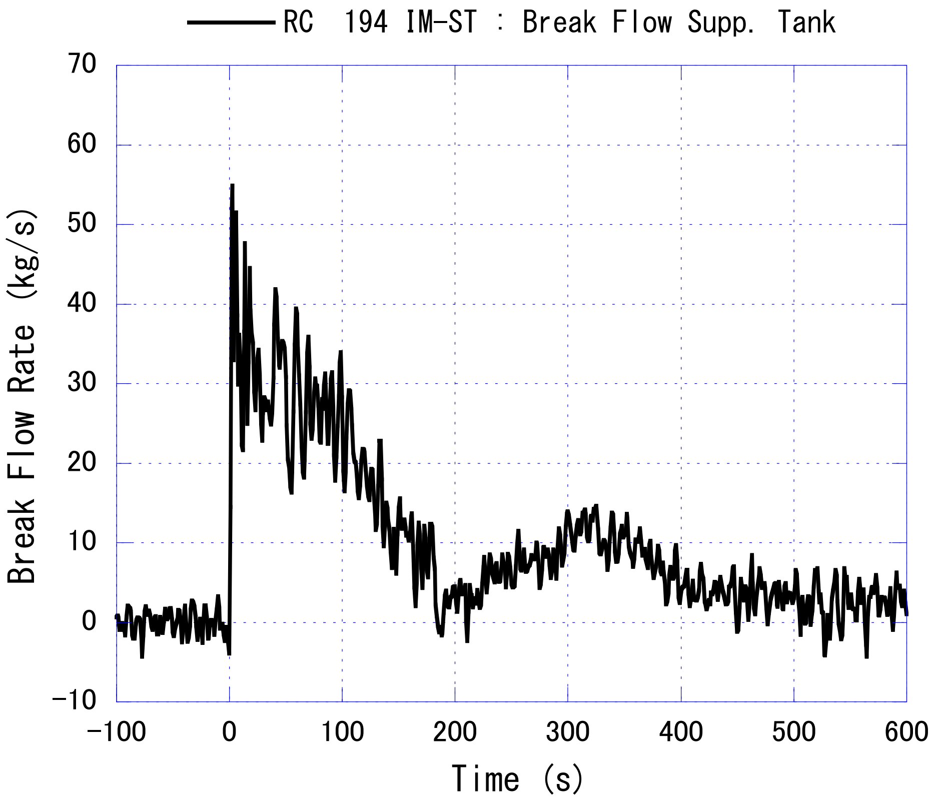

Fig. 4-7 Break flow rate

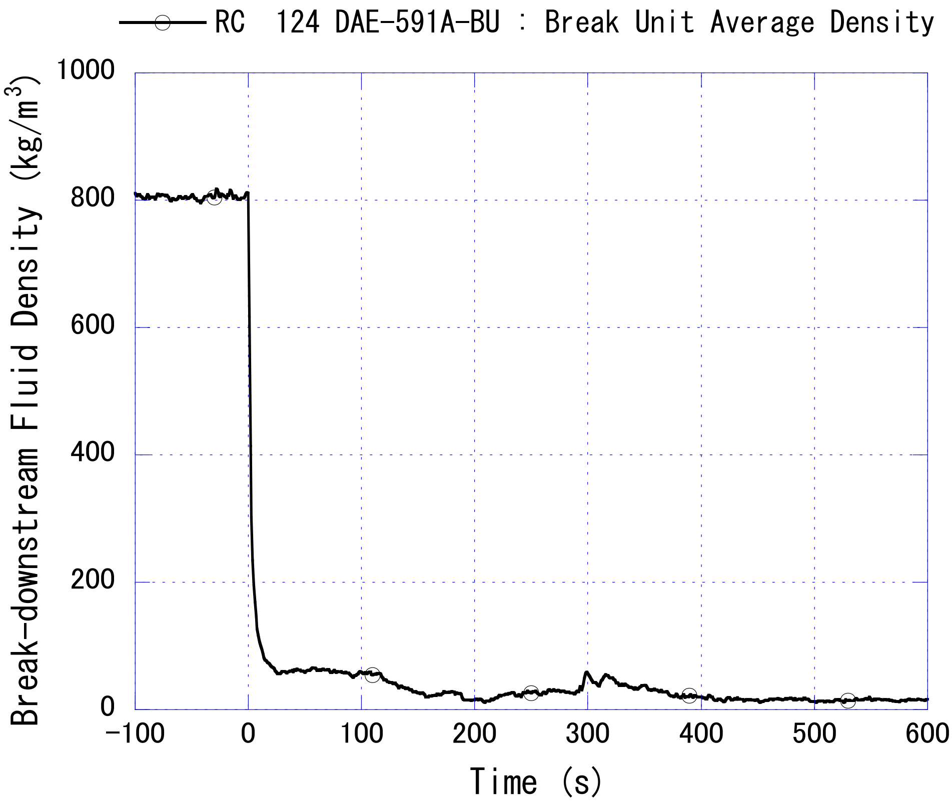

Fig. 4-8 Break-downstream averaged fluid density

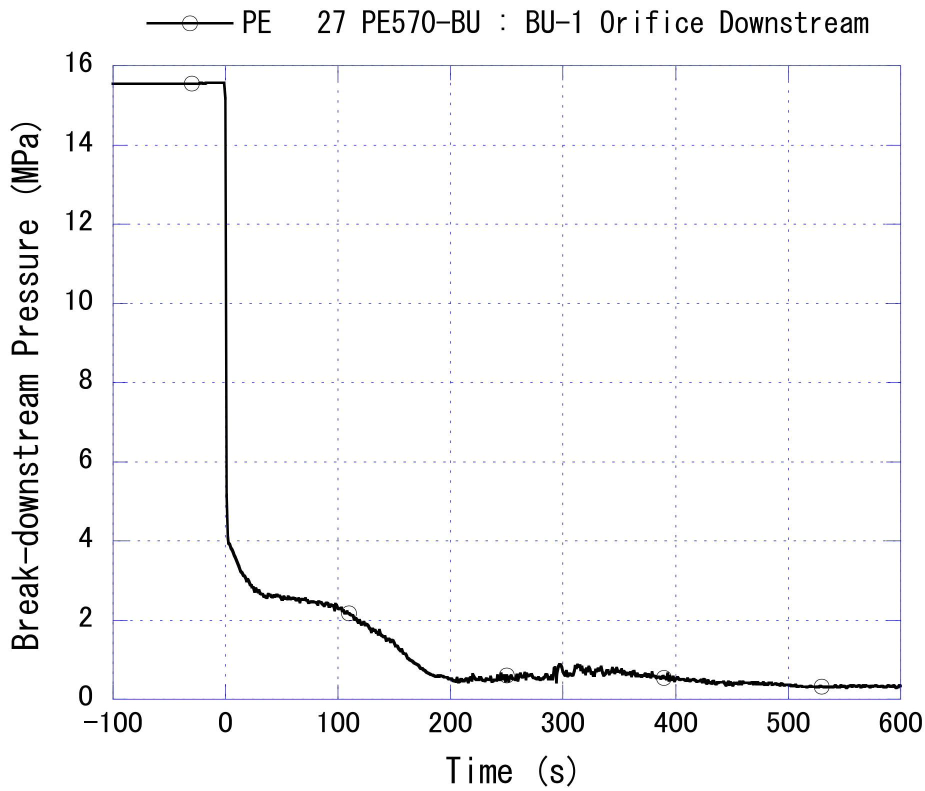

Fig. 4-9 Break-downstream pressure

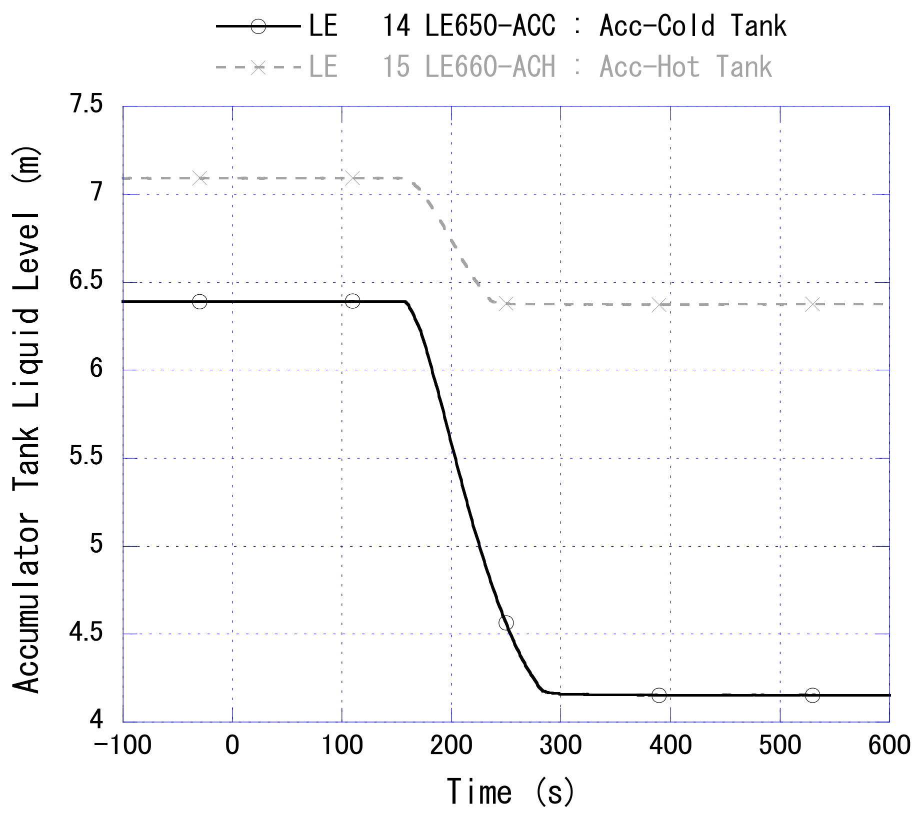

Fig. 4-10 Liquid level in accumulator tank

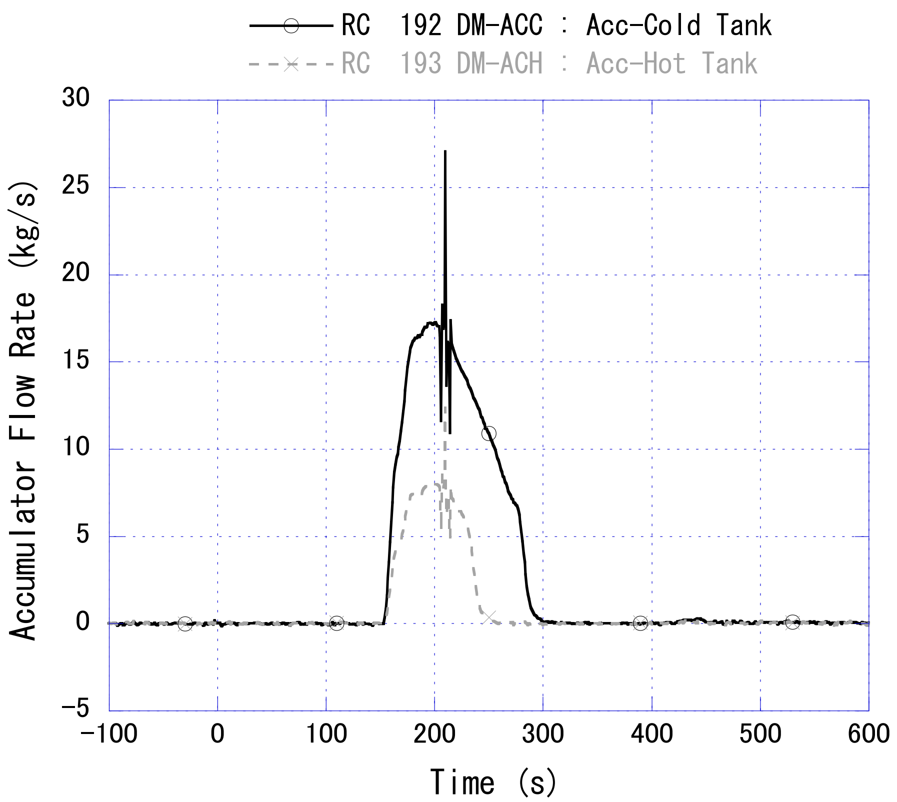

Fig. 4-11 Coolant injection flow rate from accumulator tank

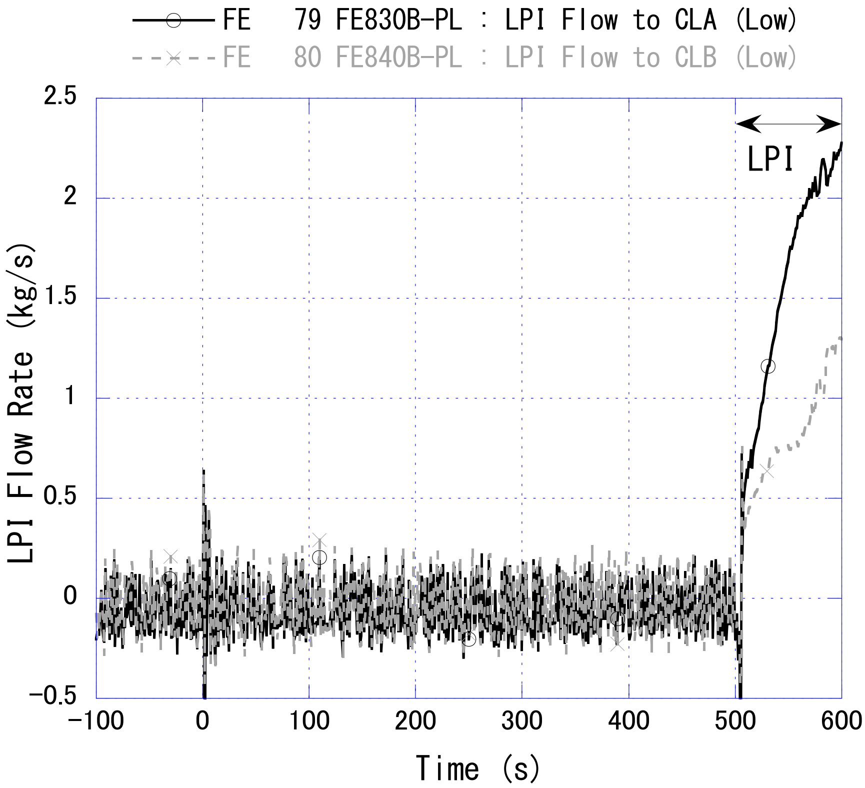

Fig. 4-12 Coolant injection flow rate from LPI system

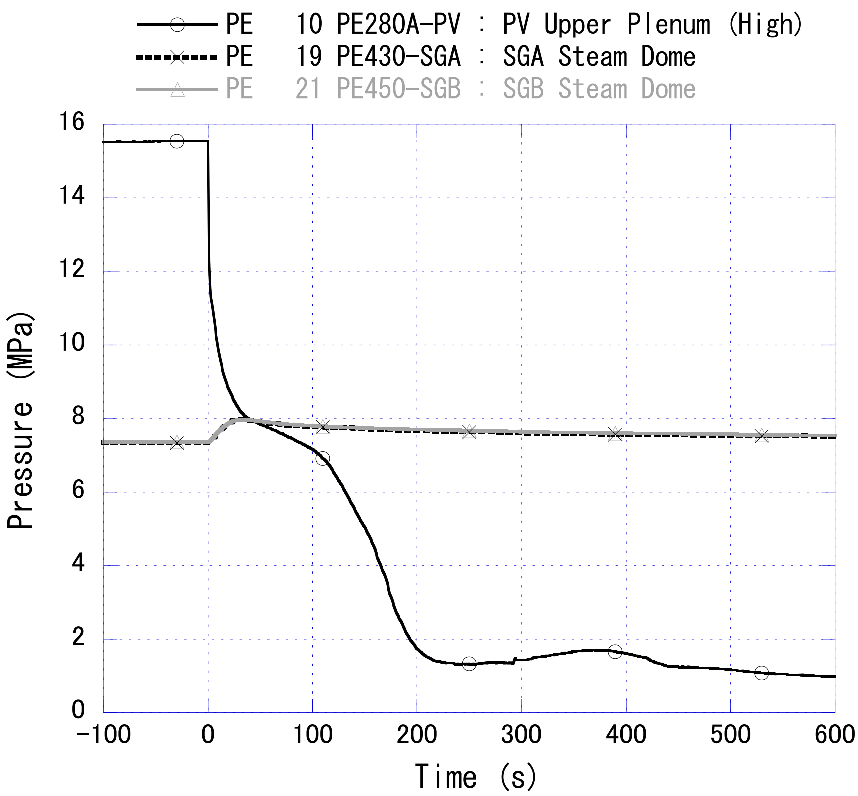

Fig. 4-13 Primary and secondary pressures

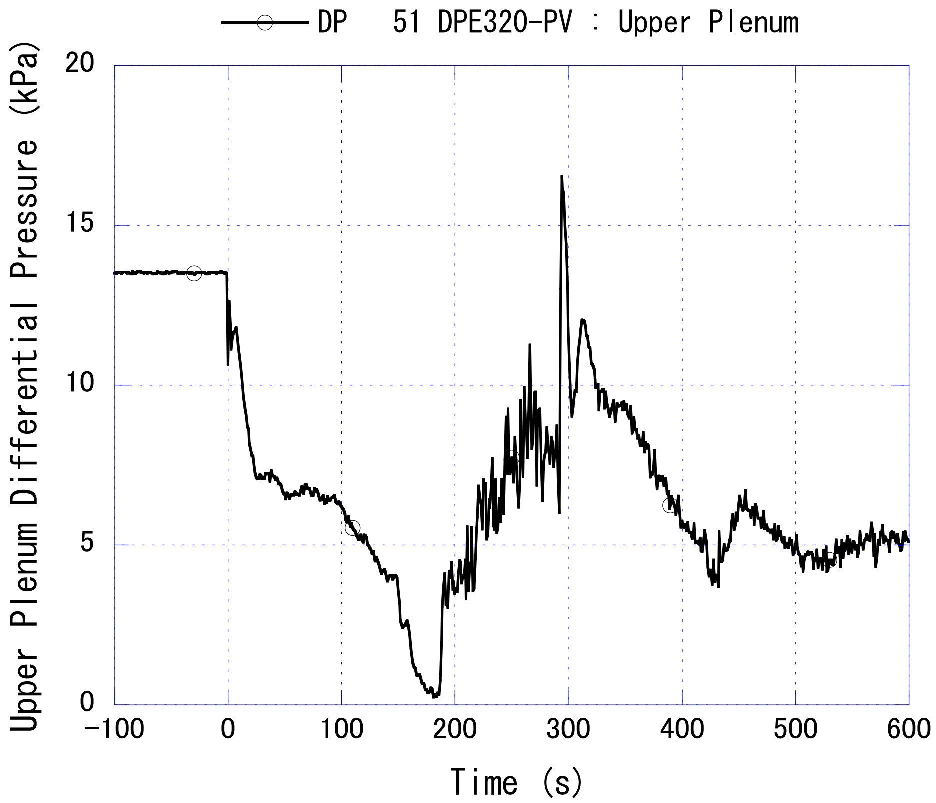

Fig. 4-14 Upper plenum differential pressure

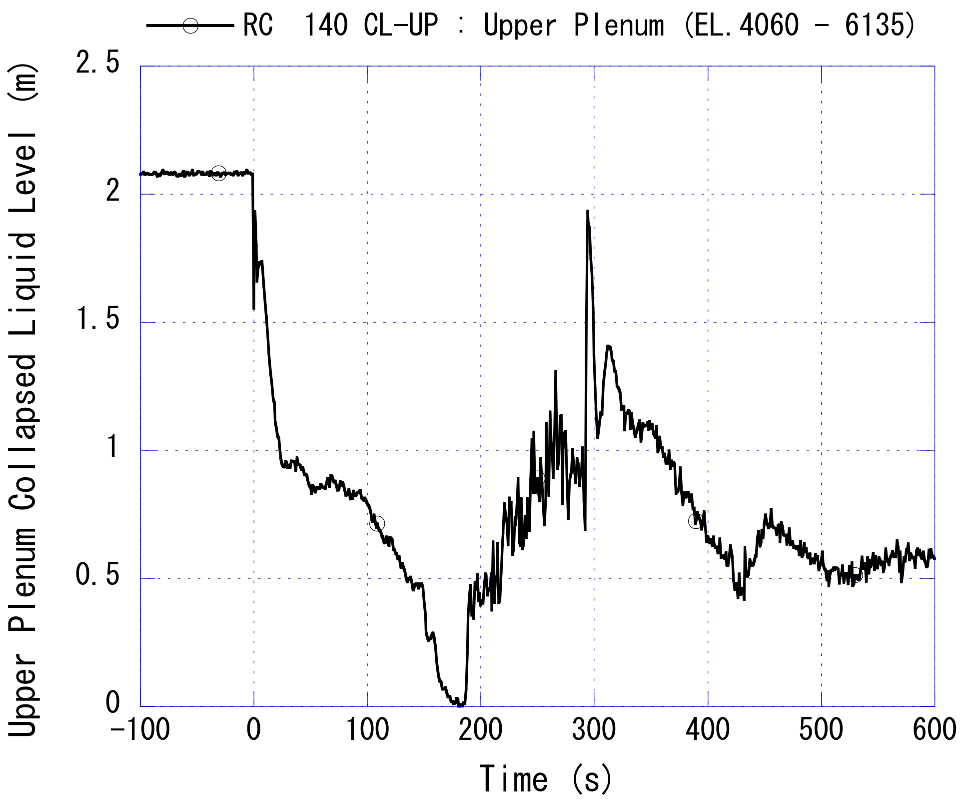

Fig. 4-15 Upper plenum collapsed liquid level

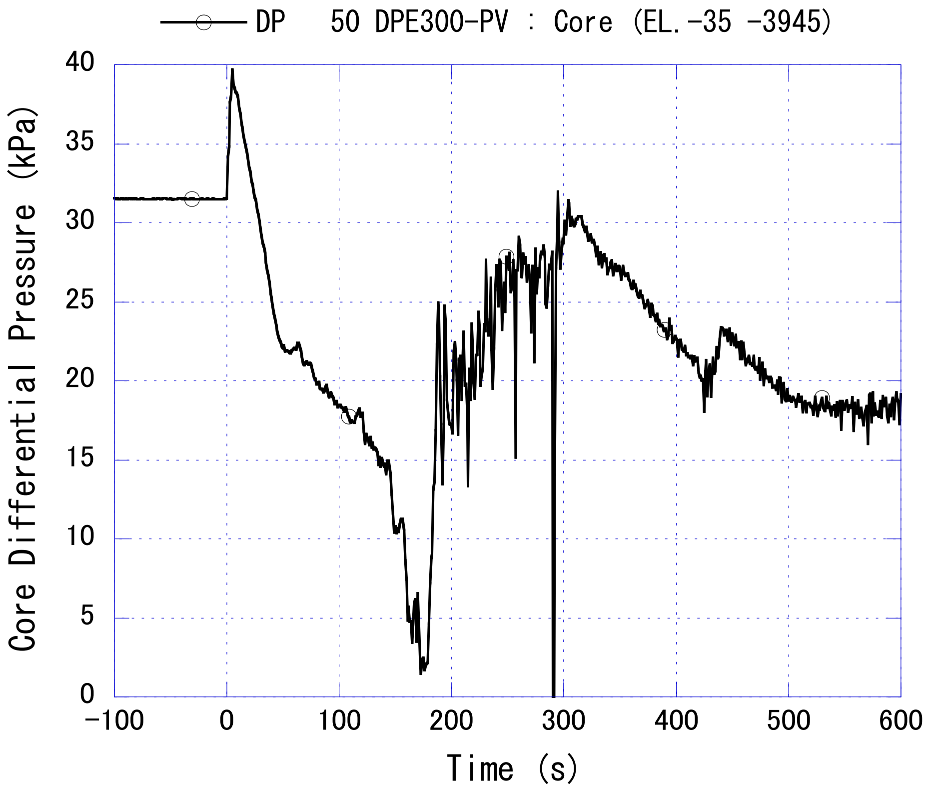

Fig. 4-16 Core differential pressure

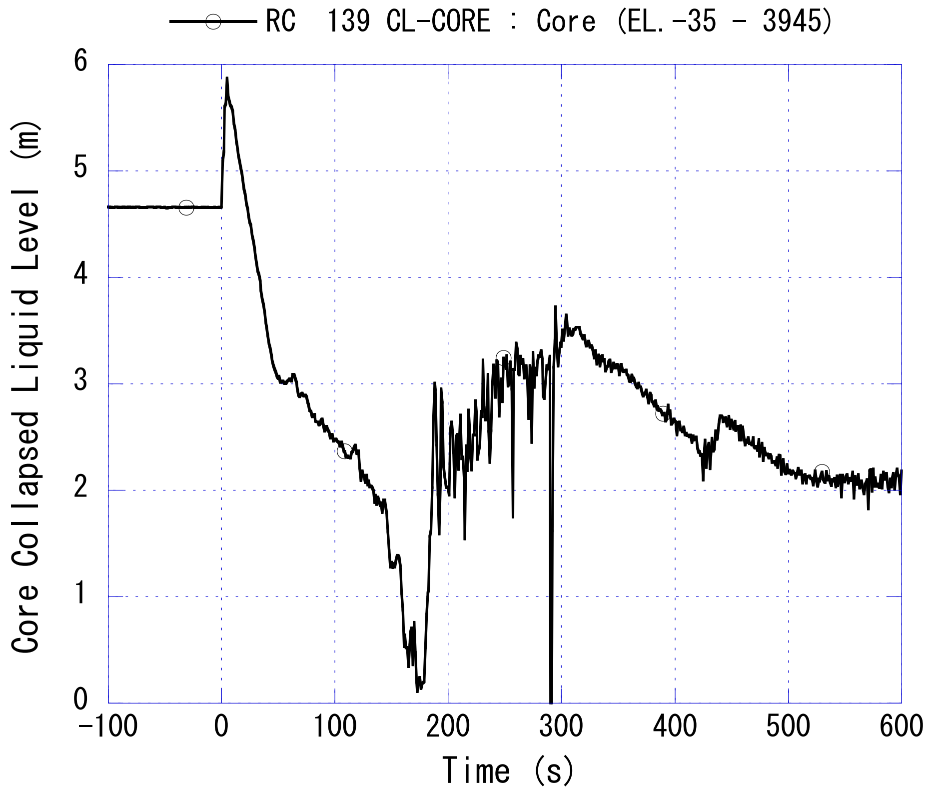

Fig. 4-17 Core collapsed liquid level

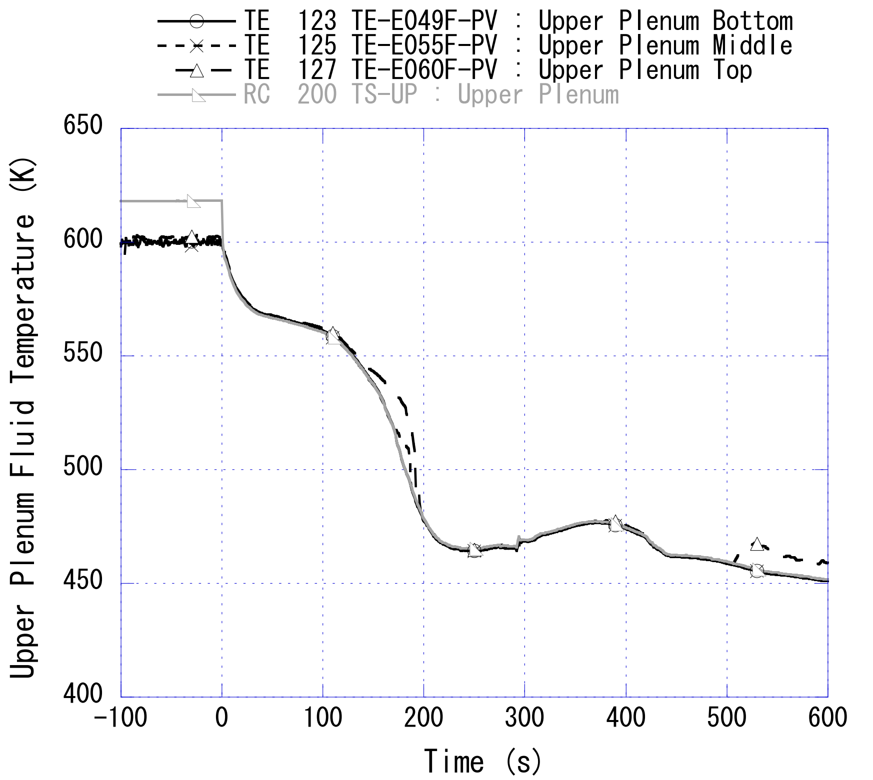

Fig. 4-18 Upper plenum fluid temperature

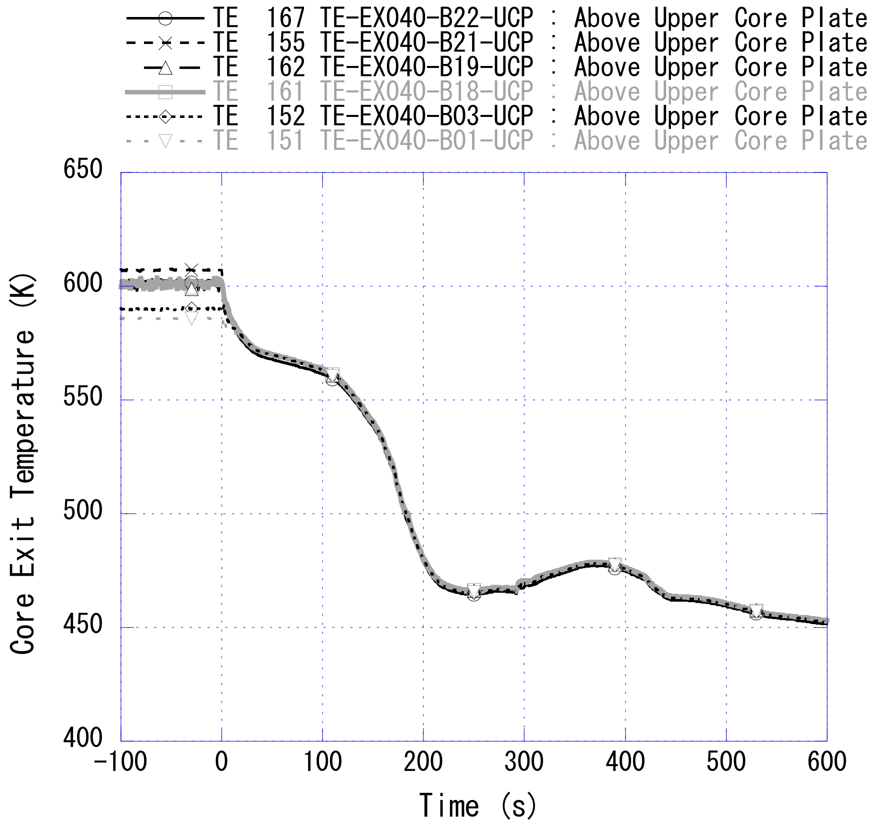

Fig. 4-19 Typical core exit temperatures

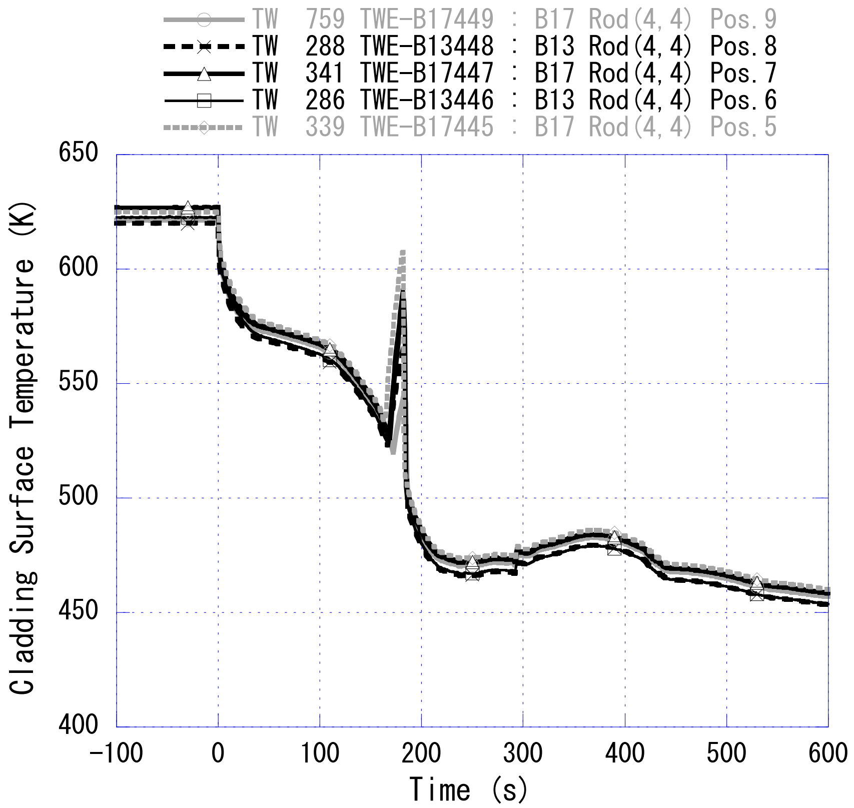

Fig. 4-20 Typical cladding surface temperatures at Positions 9-5 (-100 to 600 s)

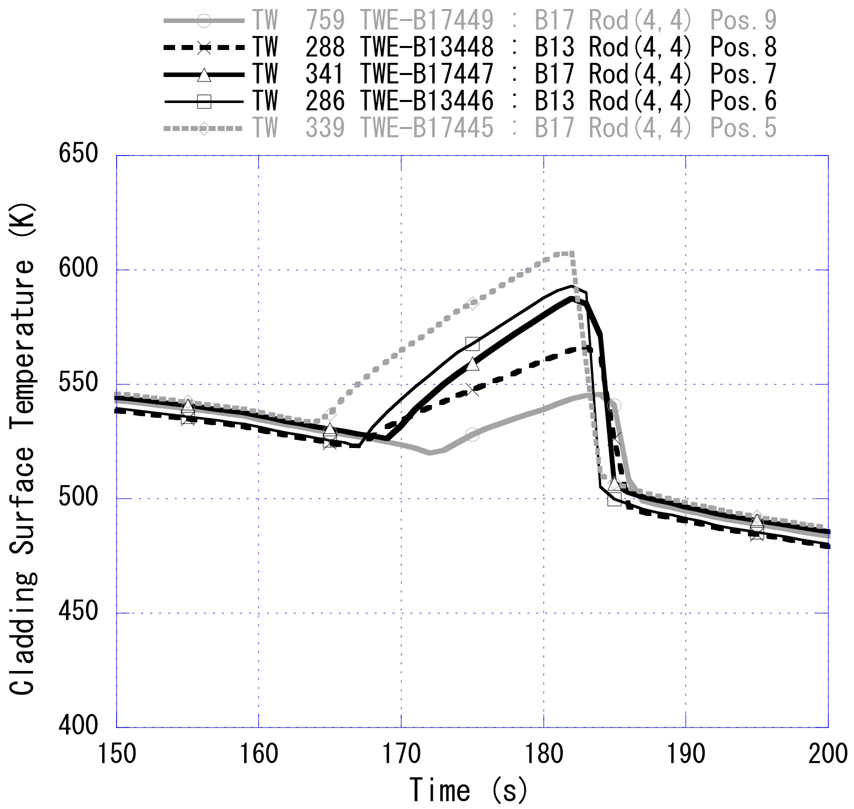

Fig. 4-21 Typical cladding surface temperatures at Positions 9-5 (150 to 200 s)

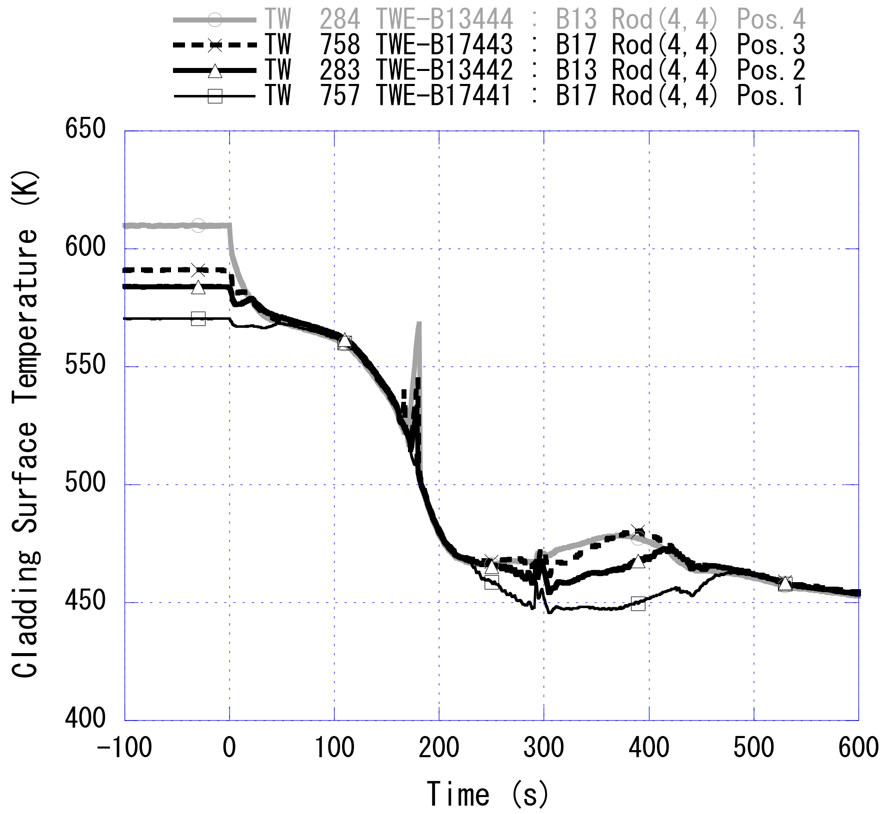

Fig. 4-22 Typical cladding surface temperatures at Positions 4-1 (-100 to 600 s)

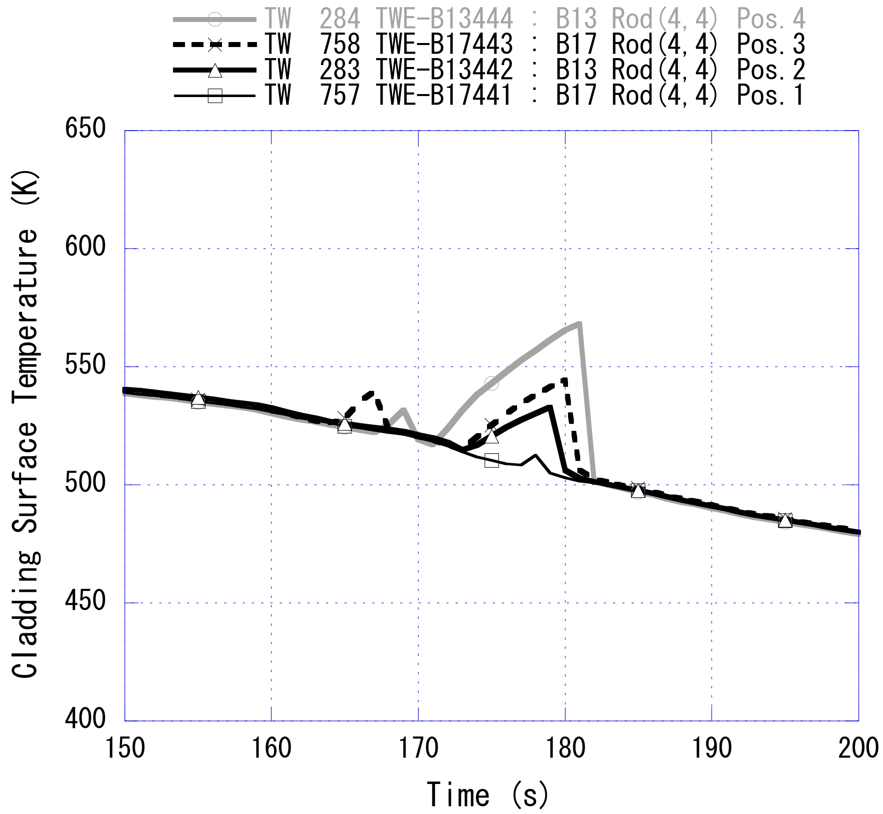

Fig. 4-23 Typical cladding surface temperatures at Positions 4-1 (150 to 200 s)

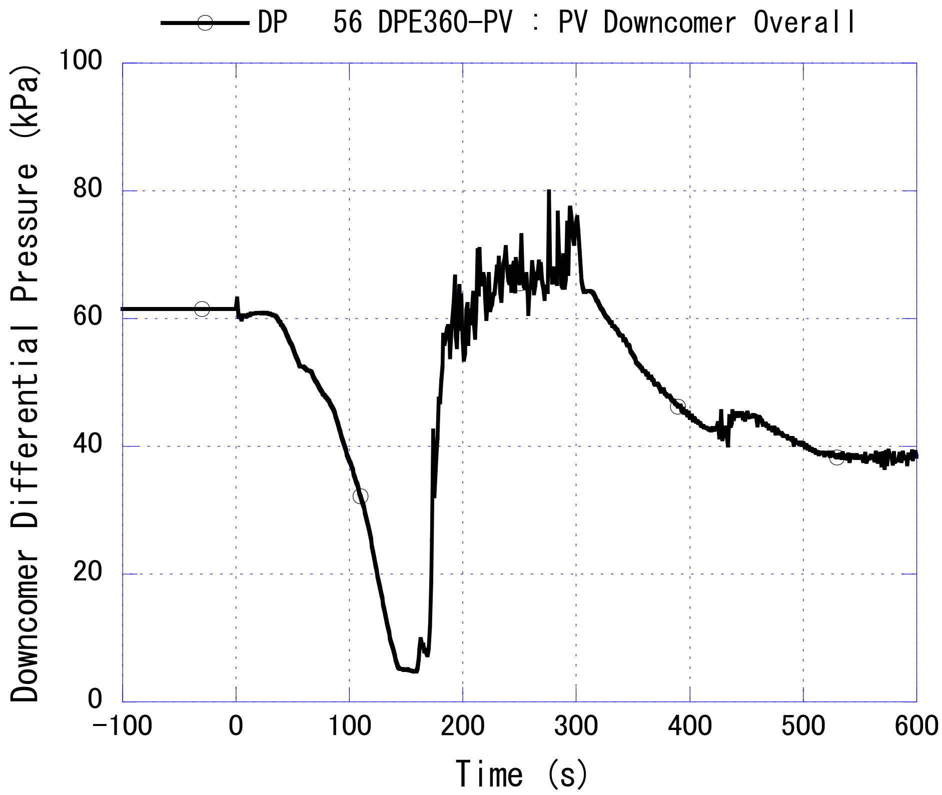

Fig. 4-24 Downcomer differential pressure

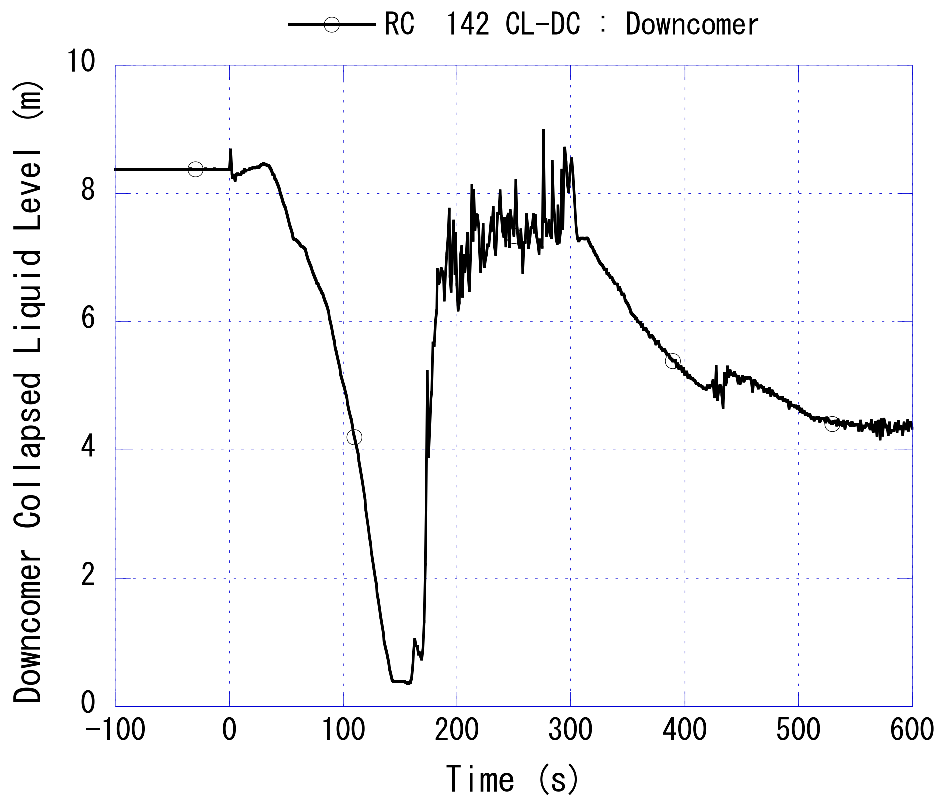

Fig. 4-25 Downcomer collapsed liquid level

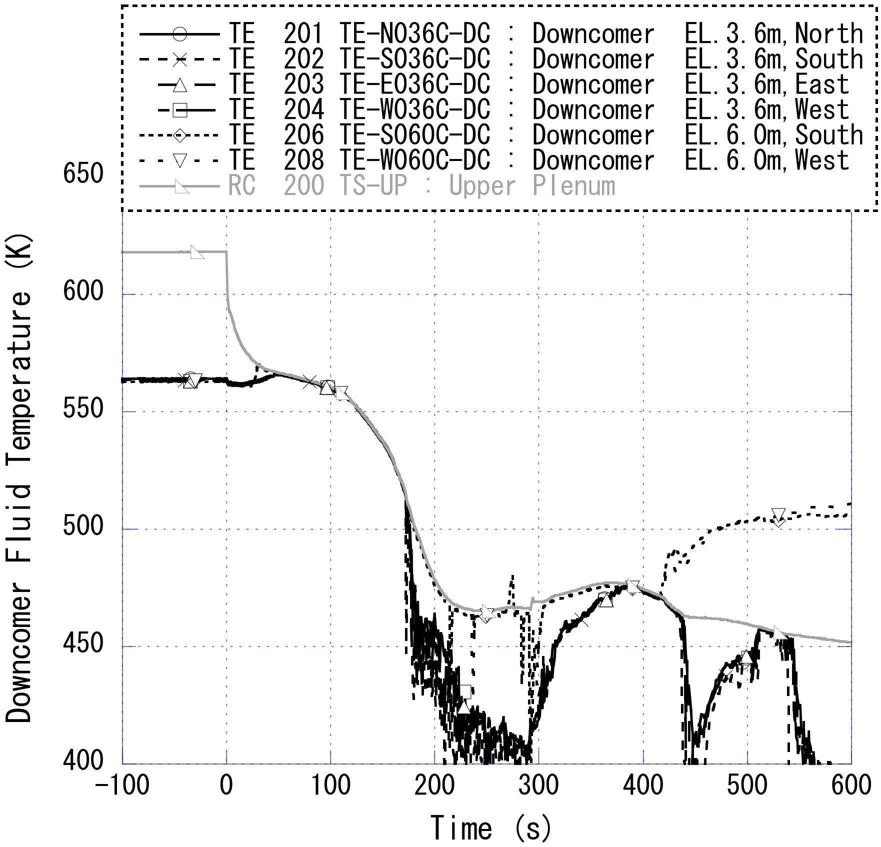

Fig. 4-26 Downcomer fluid temperature at 6.0 m and 3.6 m above core bottom

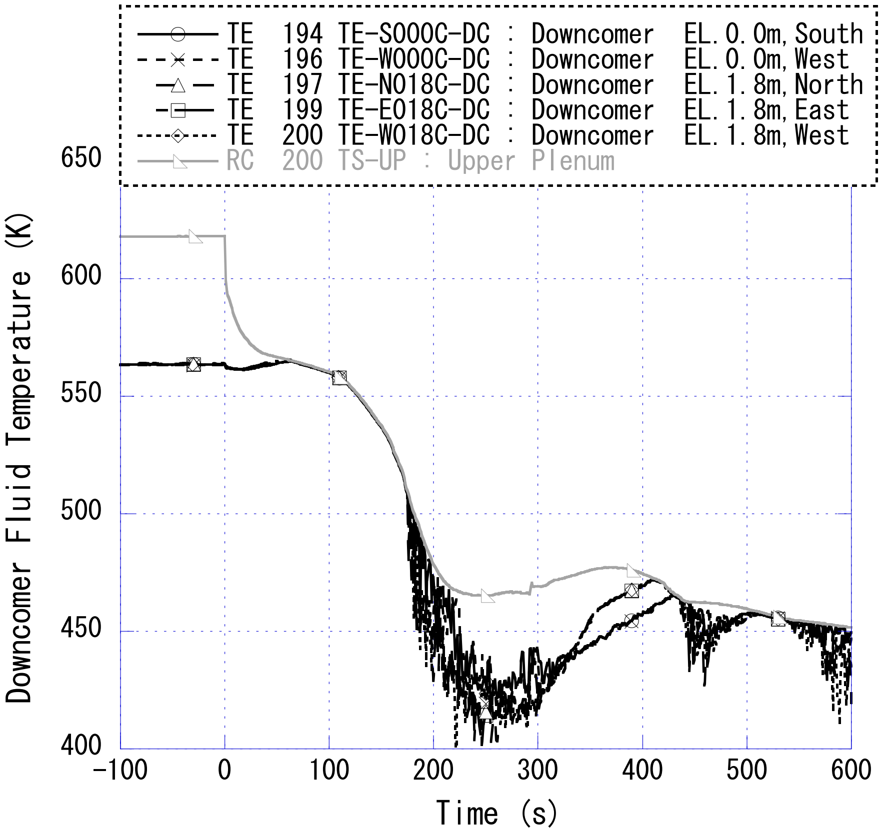

Fig. 4-27 Downcomer fluid temperature at 1.8 m and 0.0 m above core bottom

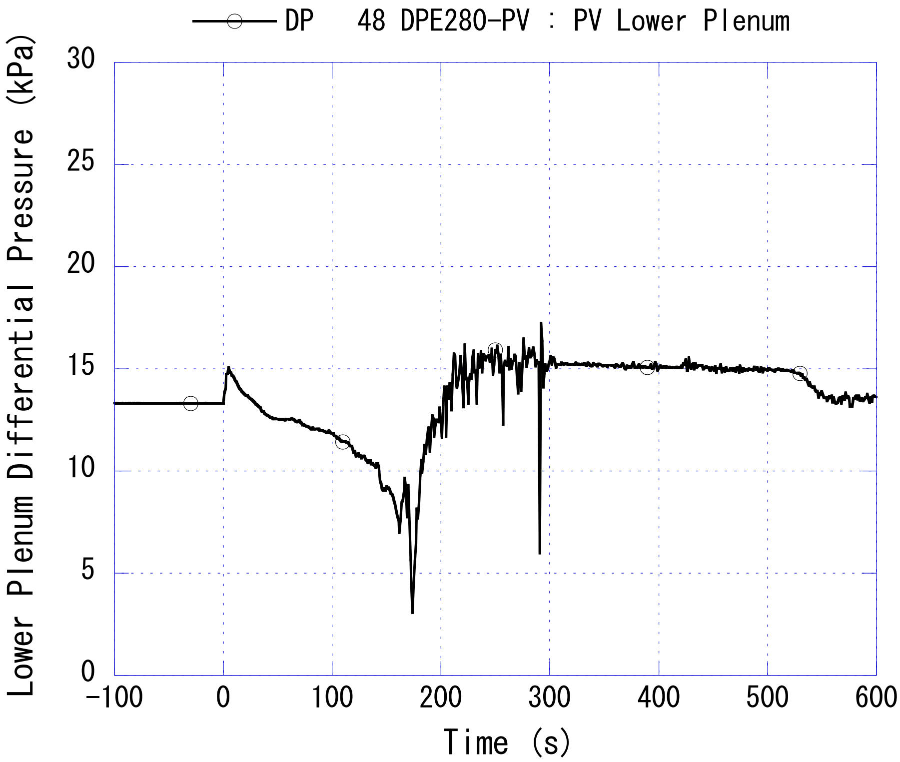

Fig. 4-28 Lower plenum differential pressure

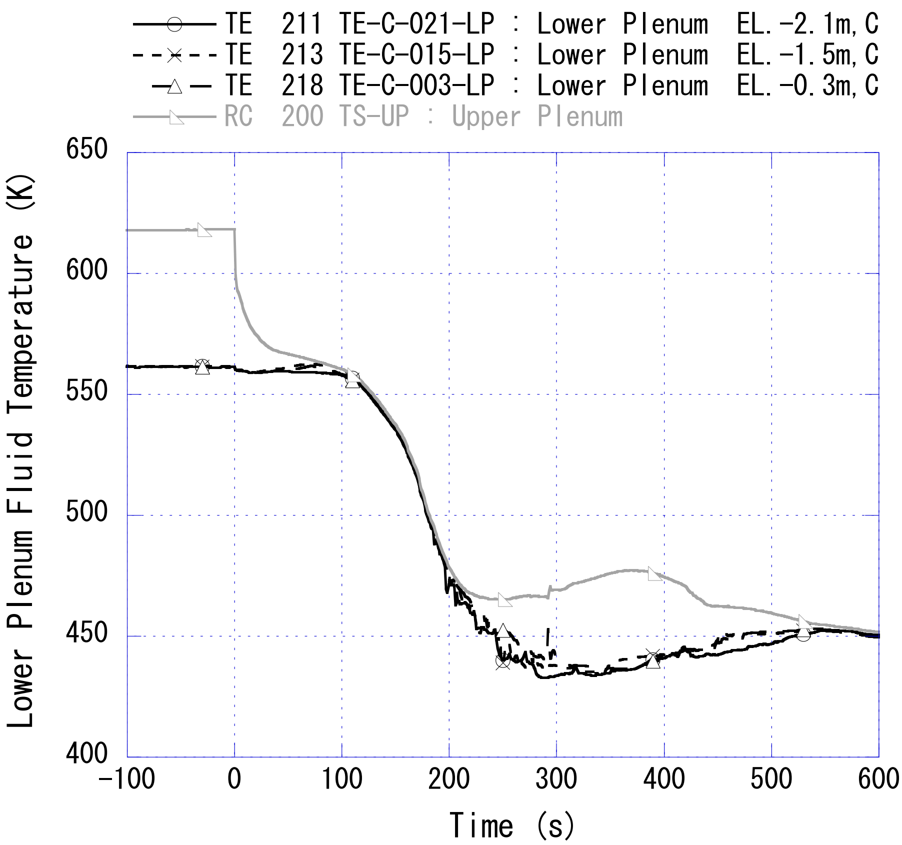

Fig. 4-29 Lower plenum fluid temperature

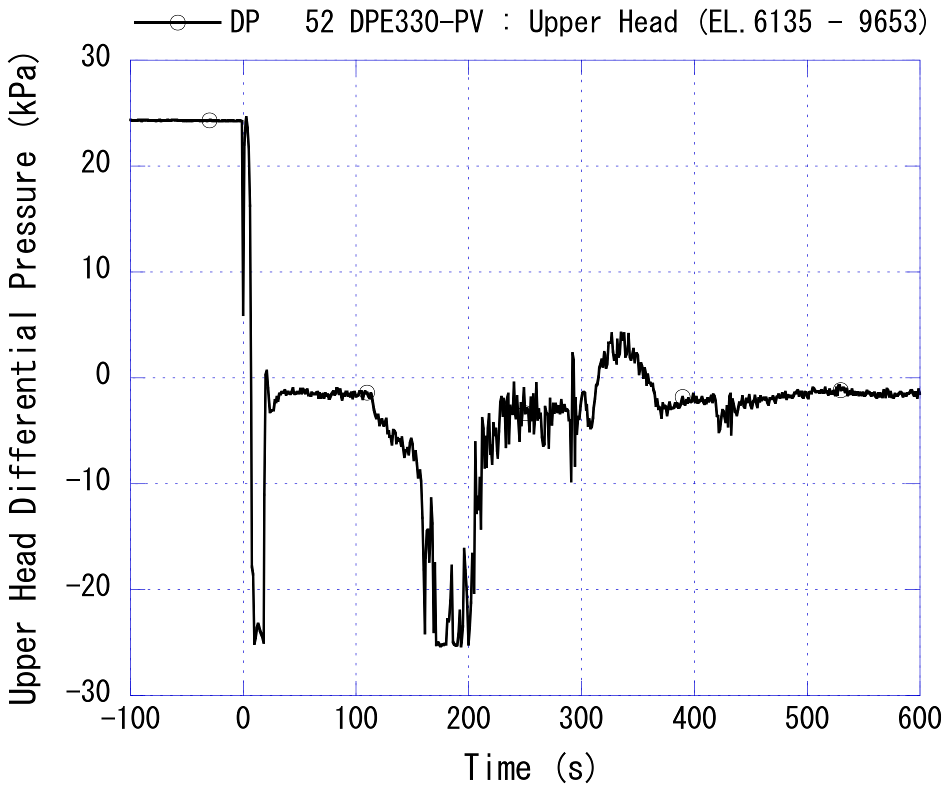

Fig. 4-30 Upper-head differential pressure

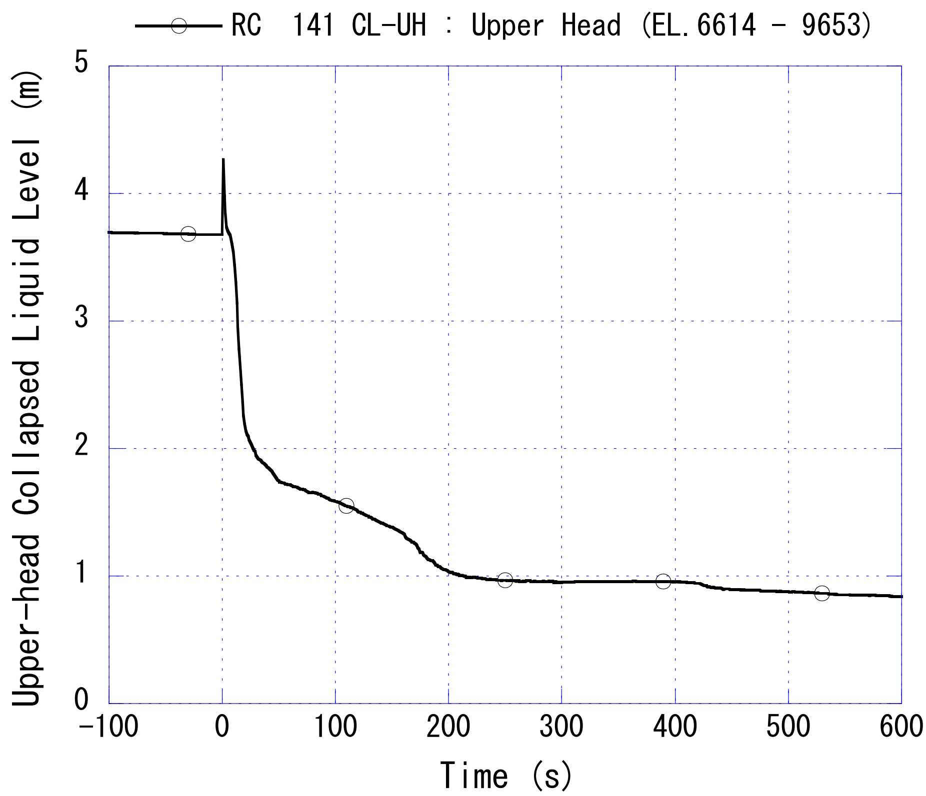

Fig. 4-31 Upper-head collapsed liquid level

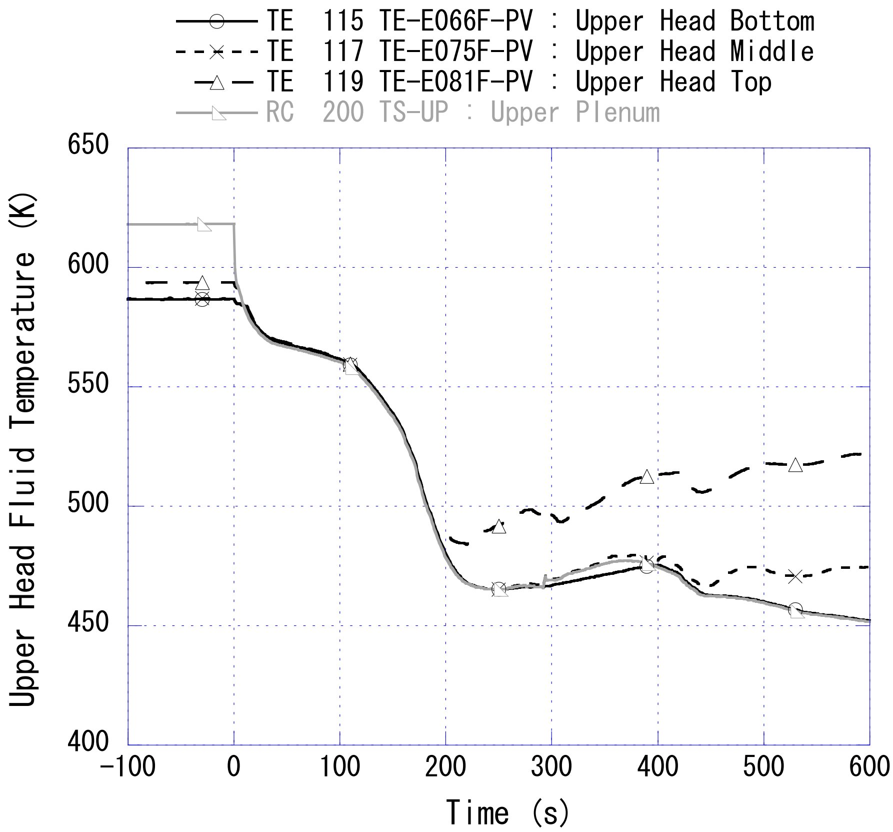

Fig. 4-32 Upper-head fluid temperature

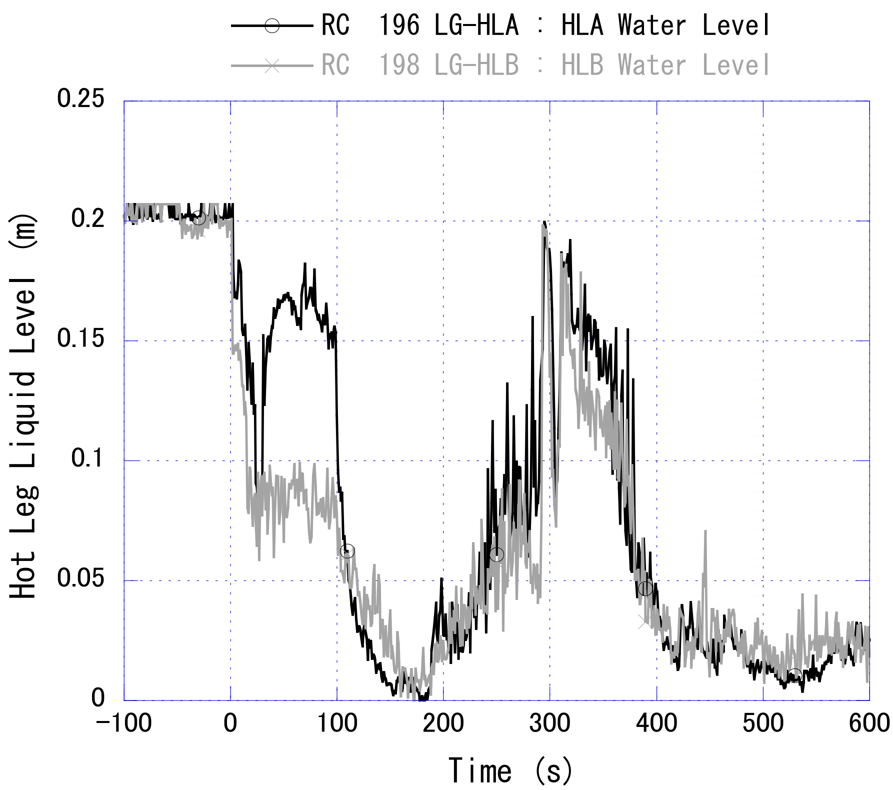

Fig. 4-33 Hot leg liquid level

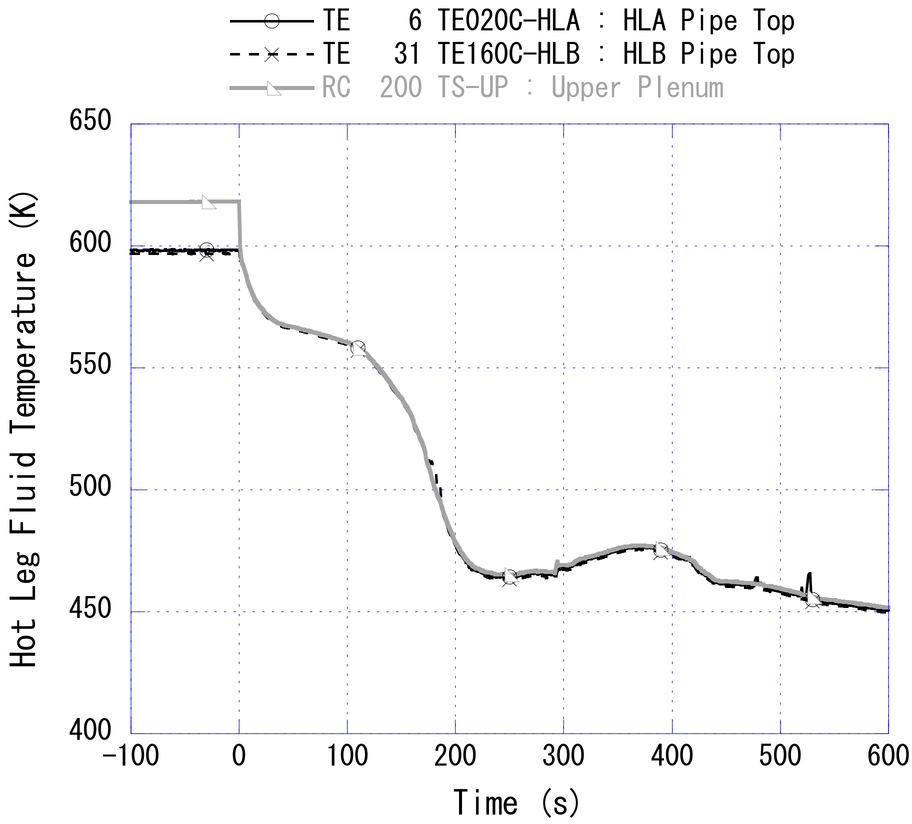

Fig. 4-34 Hot leg fluid temperature

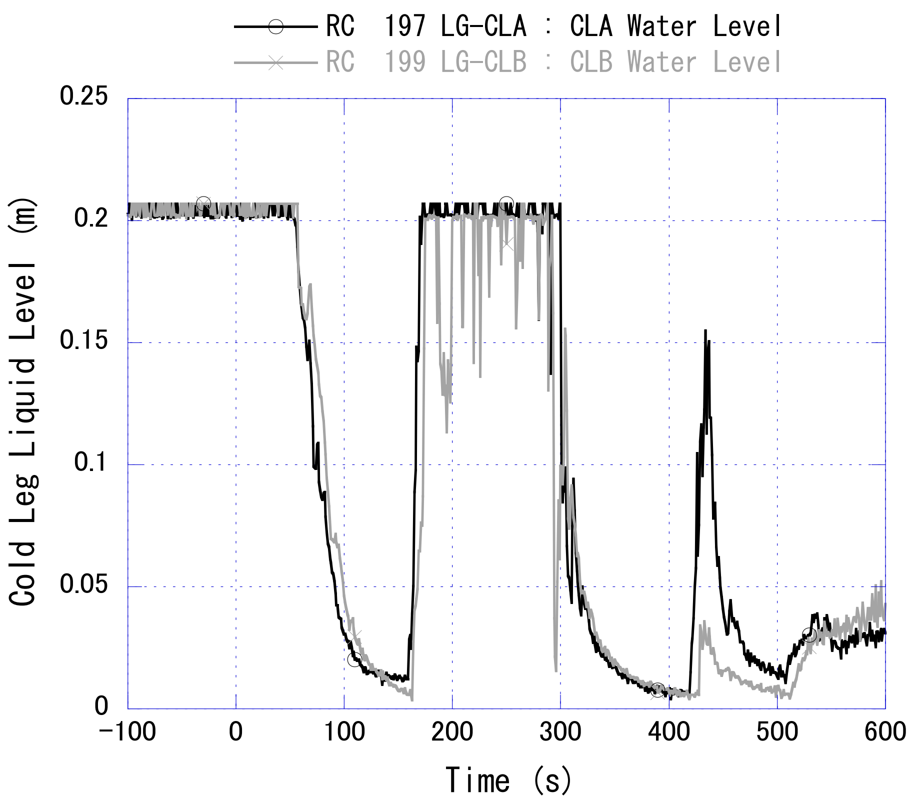

Fig. 4-35 Cold leg liquid level

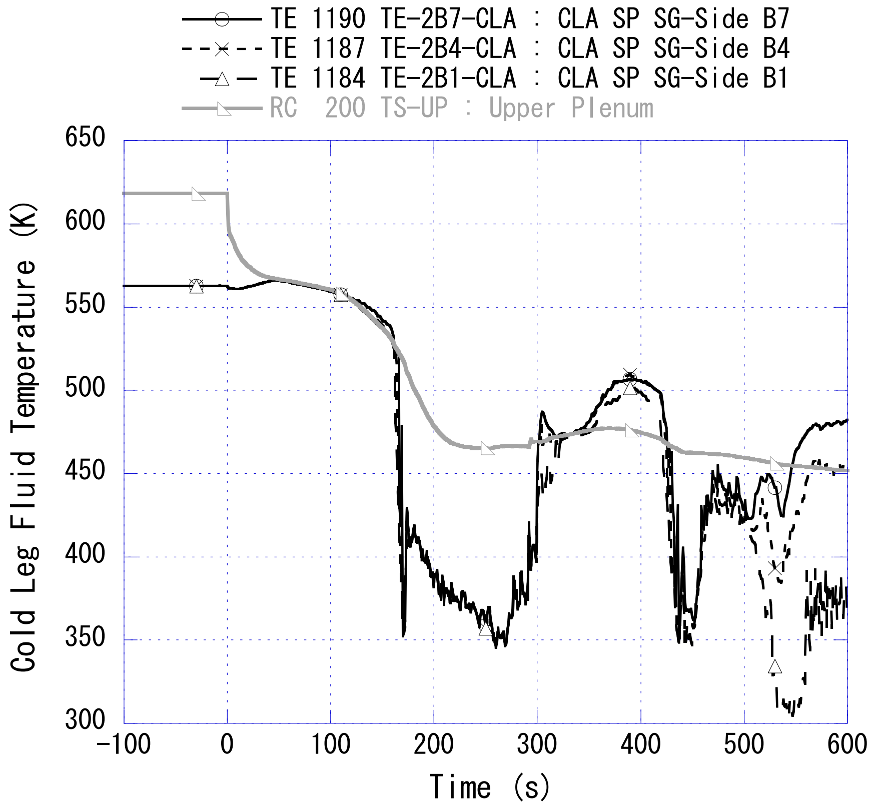

Fig. 4-36 Cold leg fluid temperature in loop with PZR

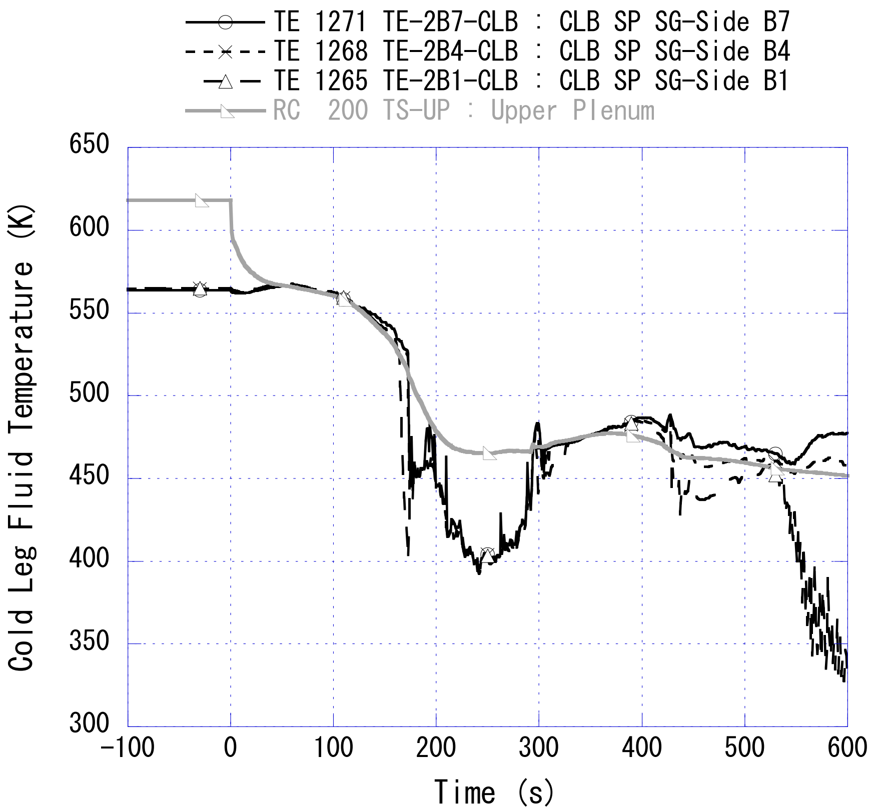

Fig. 4-37 Cold leg fluid temperature in loop without PZR

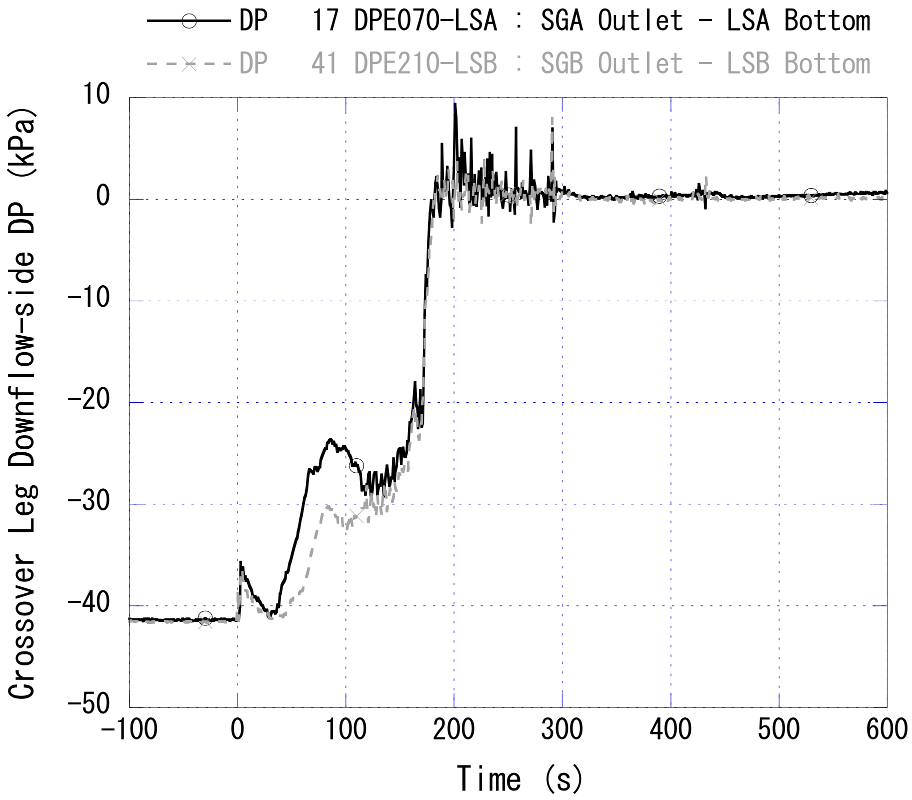

Fig. 4-38 Crossover leg downflow-side differential pressure

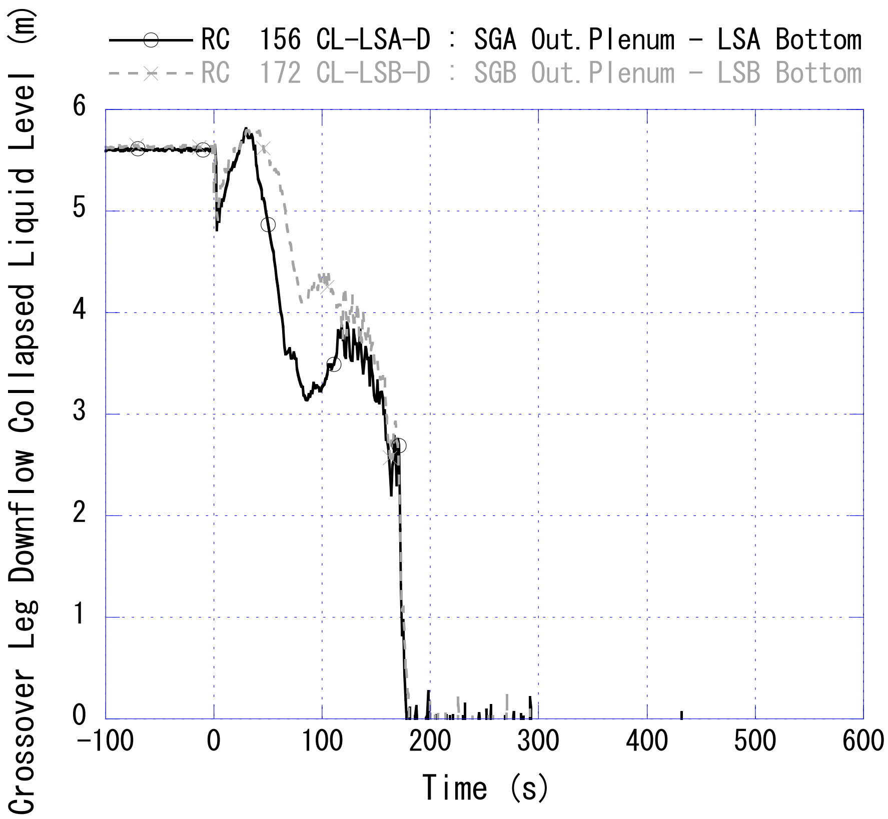

Fig. 4-39 Crossover leg downflow-side collapsed liquid level

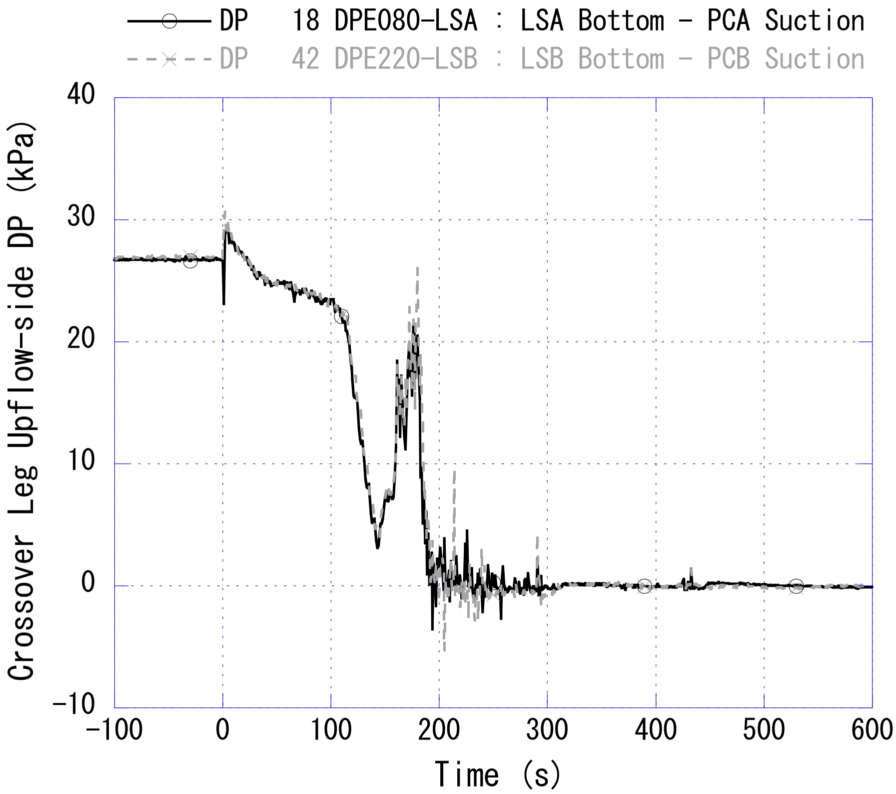

Fig. 4-40 Crossover leg upflow-side differential pressure

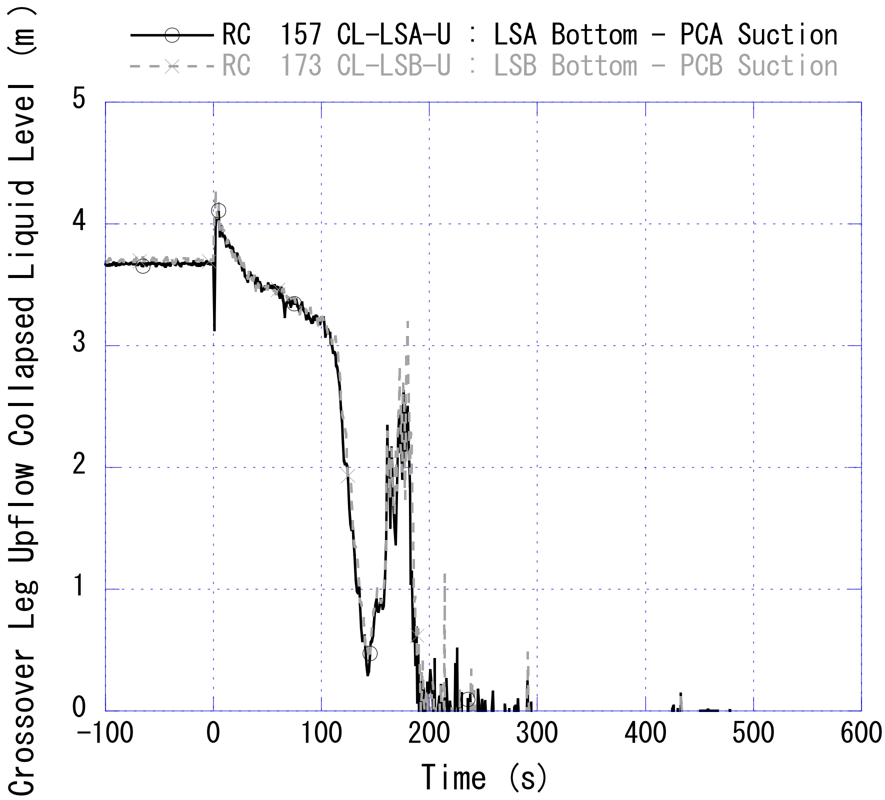

Fig. 4-41 Crossover leg upflow-side collapsed liquid level

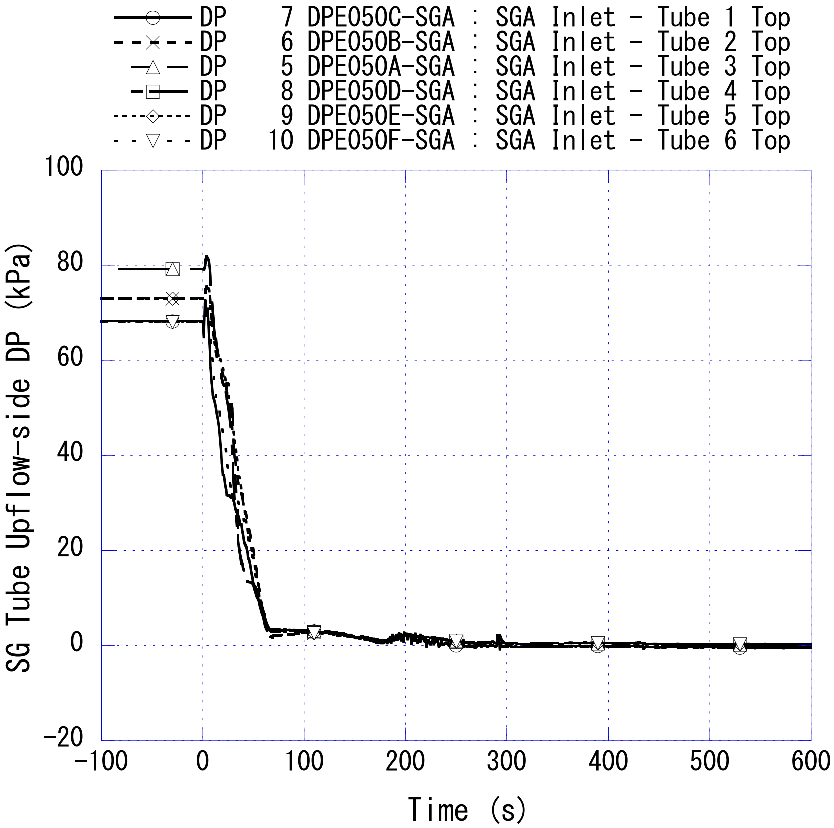

Fig. 4-42 SG U-tube upflow-side differential pressure in loop with pressurizer

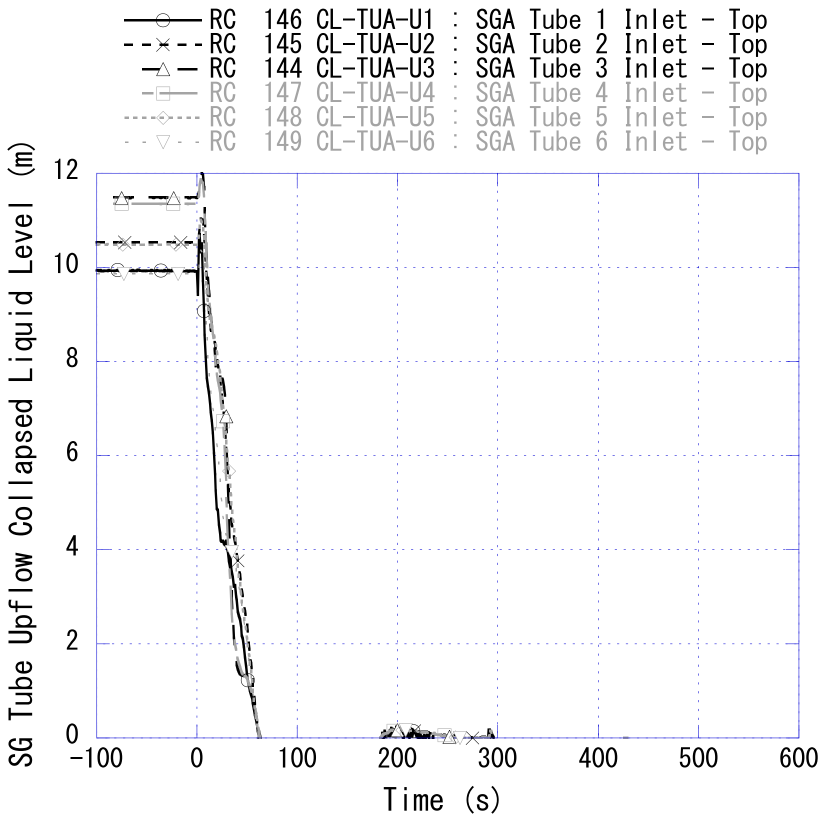

Fig. 4-43 SG U-tube upflow-side collapsed liquid level in loop with pressurizer

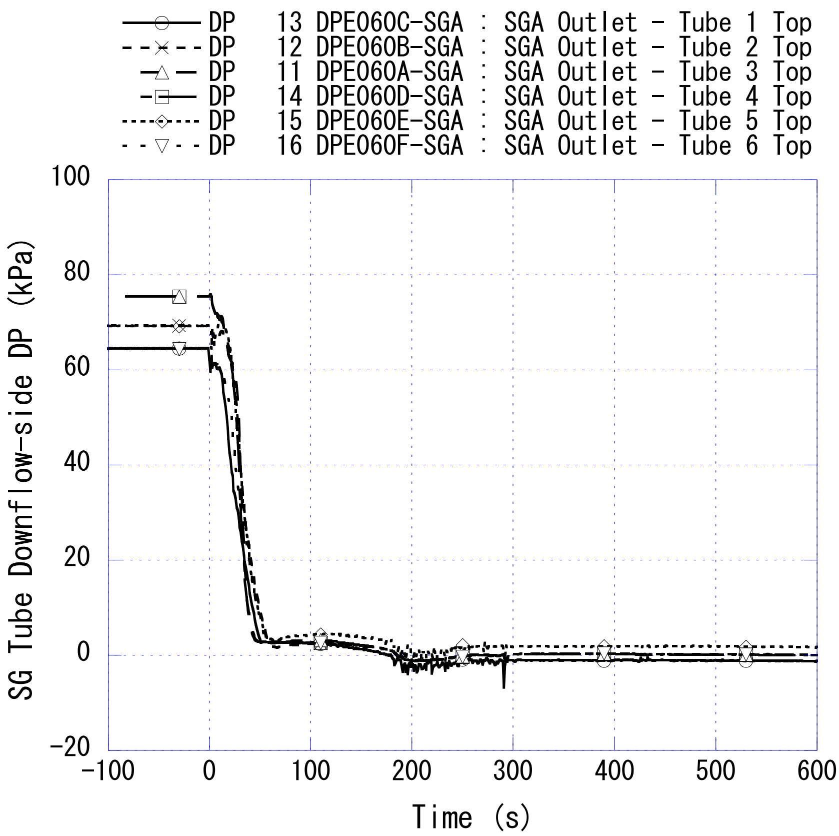

Fig. 4-44 SG U-tube downflow-side differential pressure in loop with pressurizer

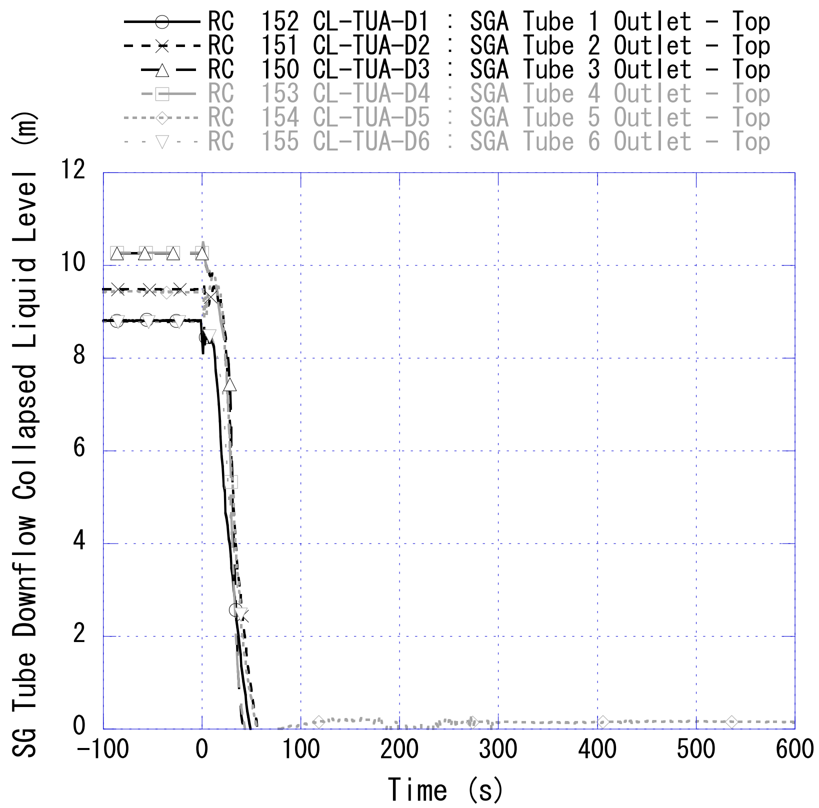

Fig. 4-45 SG U-tube downflow-side collapsed liquid level in loop with pressurizer

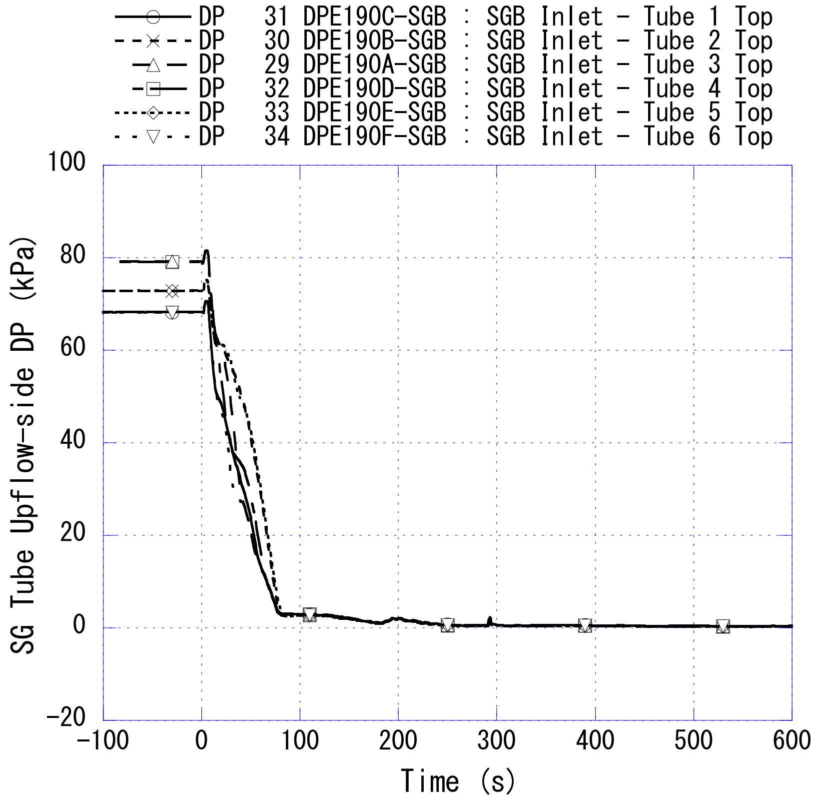

Fig. 4-46 SG U-tube upflow-side differential pressure in loop without pressurizer

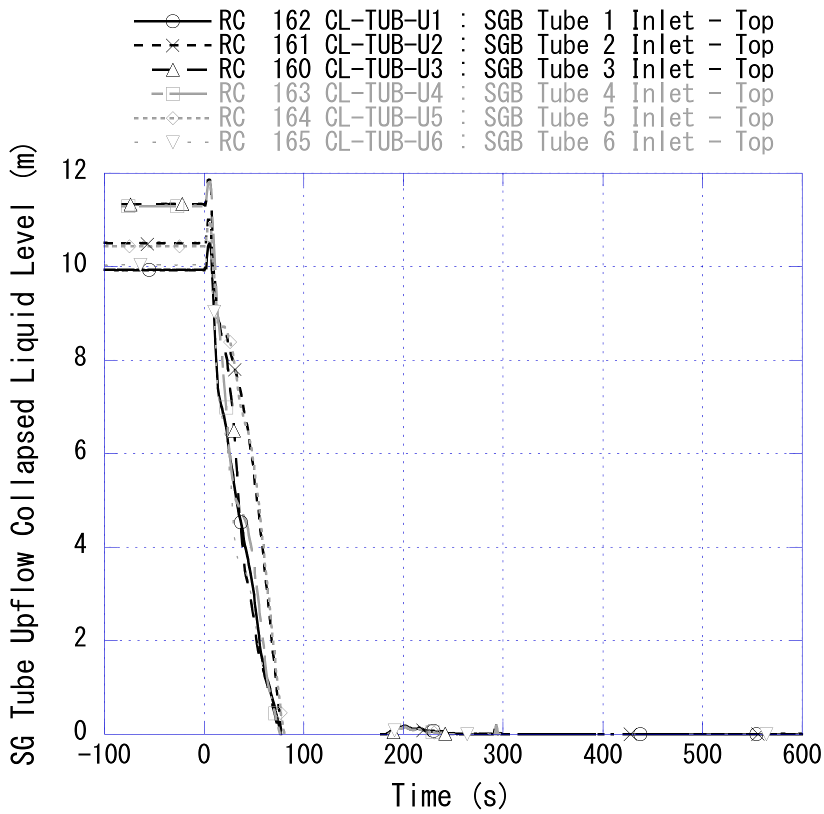

Fig. 4-47 SG U-tube upflow-side collapsed liquid level in loop without pressurizer

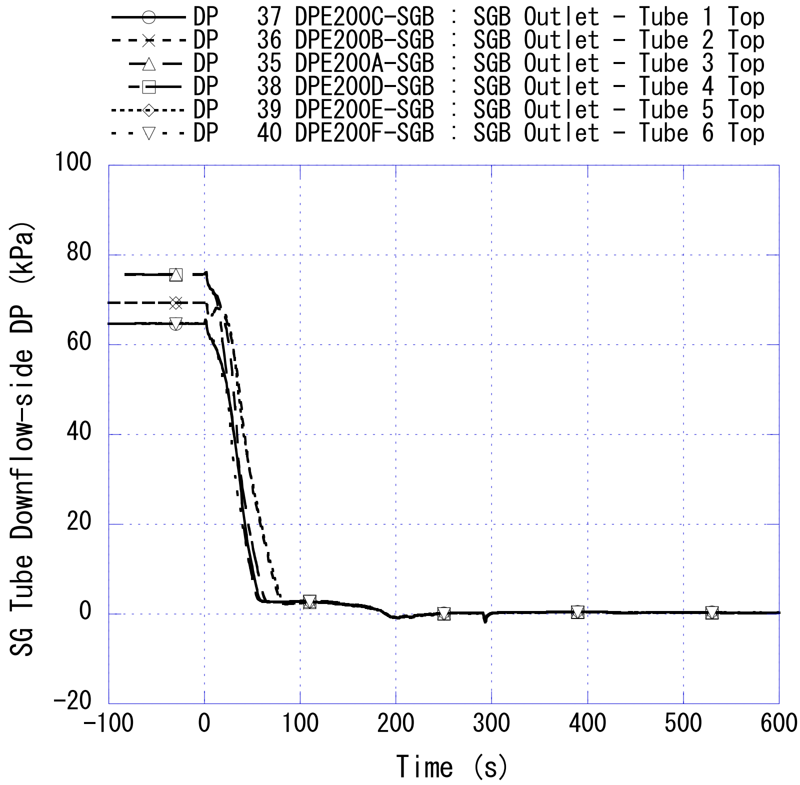

Fig. 4-48 SG U-tube downflow-side differential pressure in loop without pressurizer

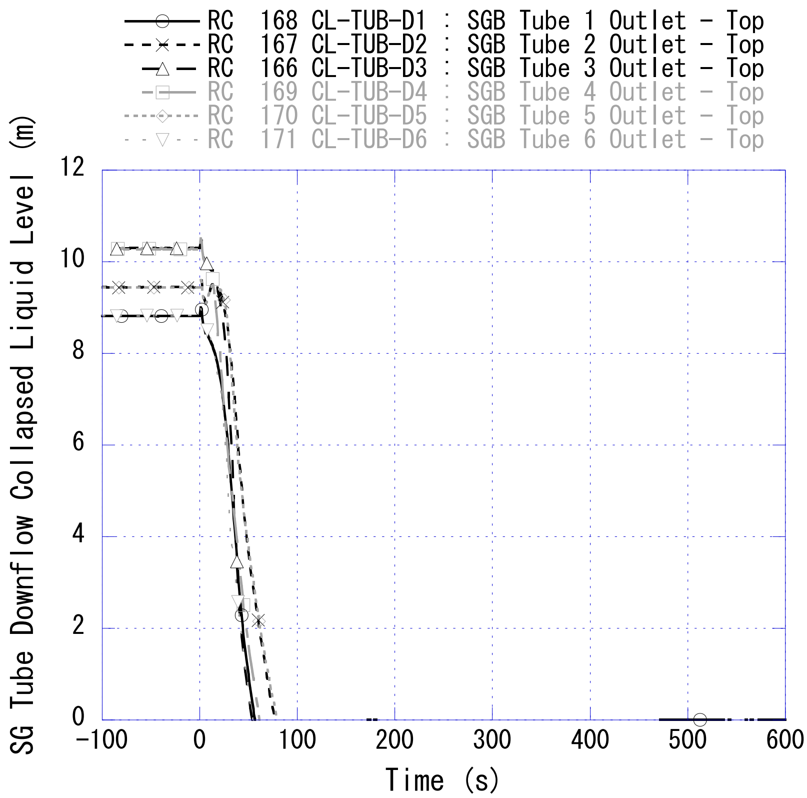

Fig. 4-49 SG U-tube downflow-side collapsed liquid level in loop without pressurizer

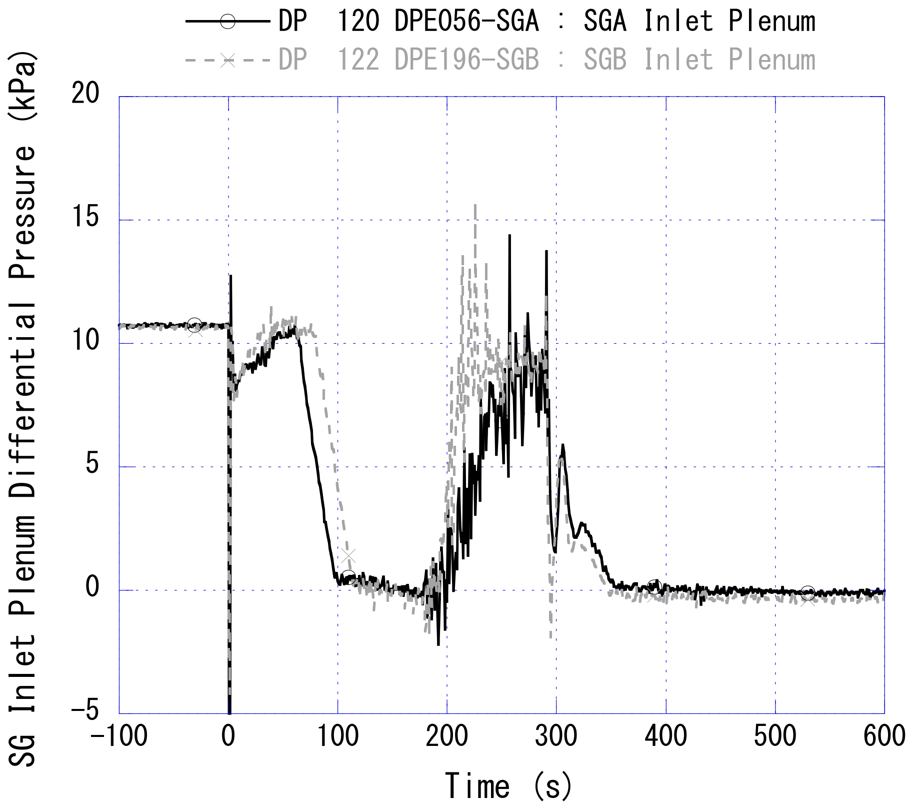

Fig. 4-50 SG inlet plenum differential pressure

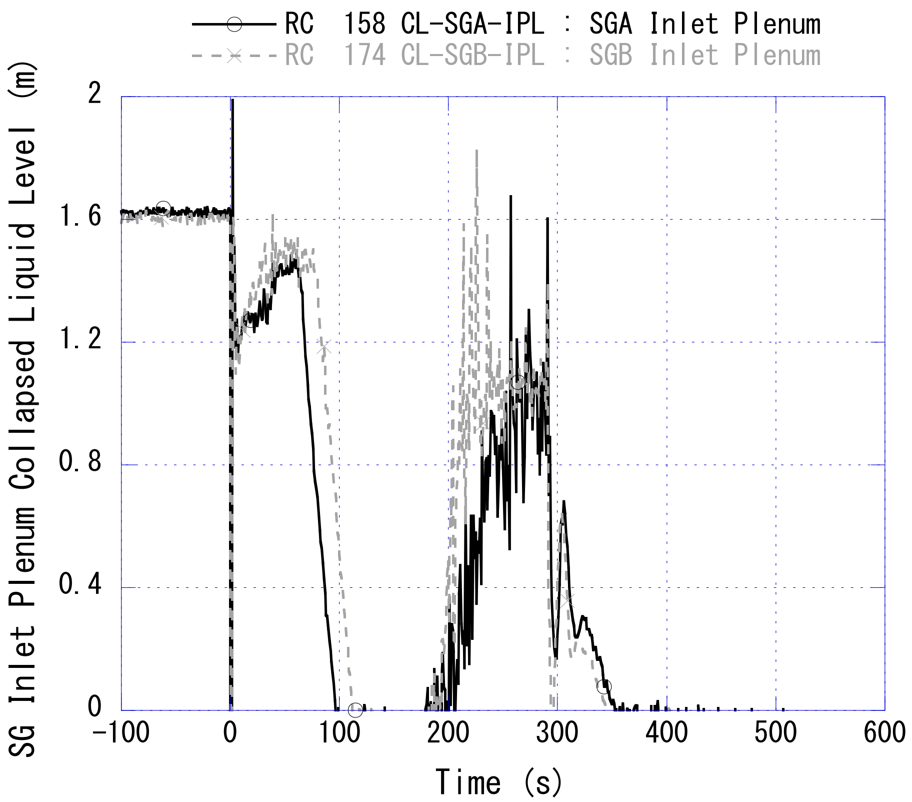

Fig. 4-51 SG inlet plenum collapsed liquid level

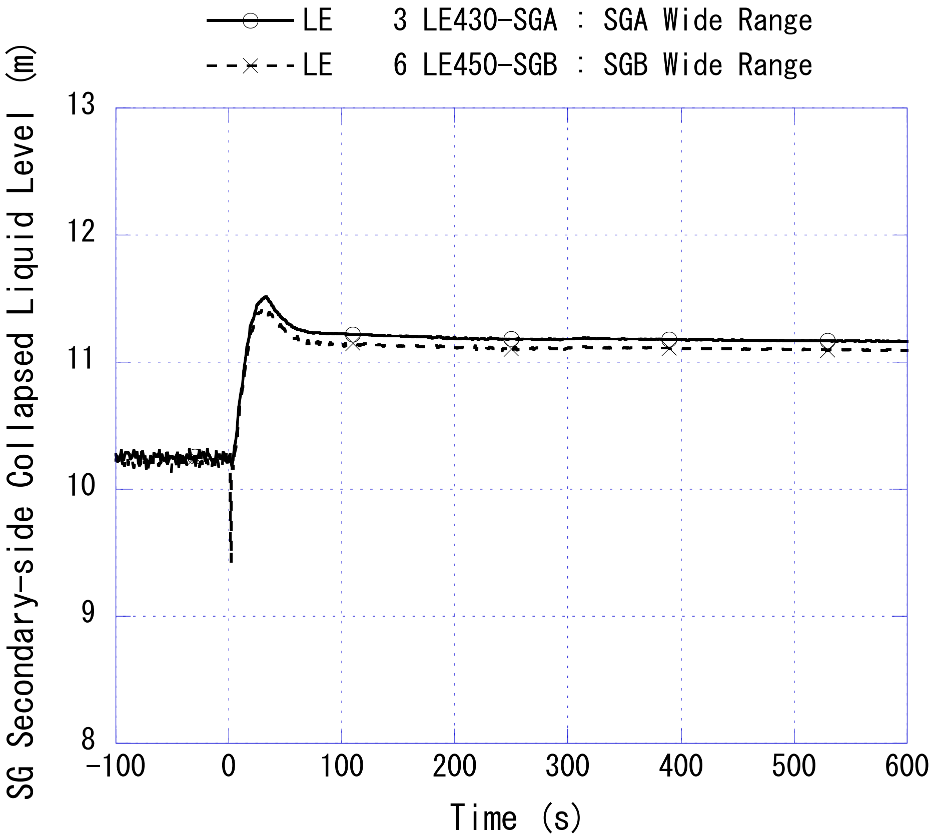

Fig. 4-52 SG secondary-side collapsed liquid level

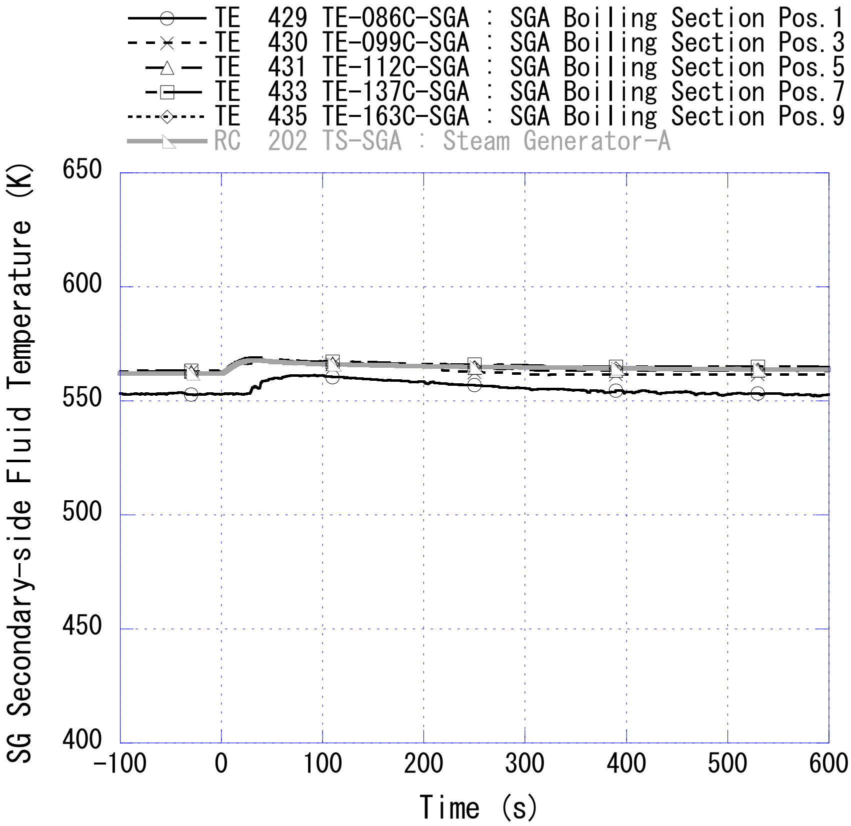

Fig. 4-53 SG secondary-side fluid temperature in loop with pressurizer

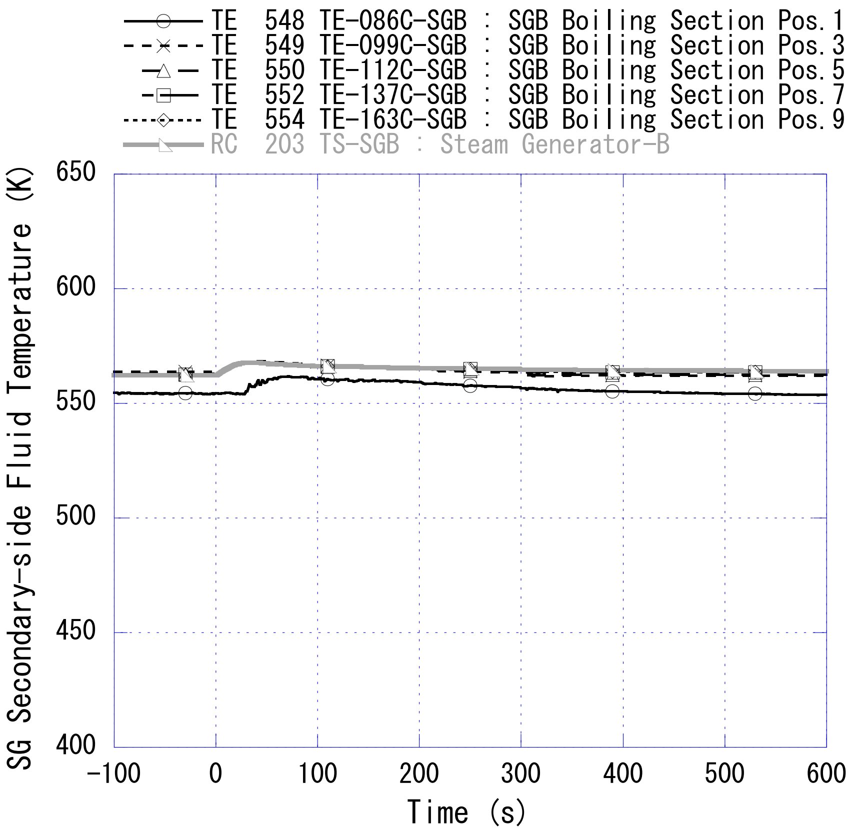

Fig. 4-54 SG secondary-side fluid temperature in loop without pressurizer

5. Summary

A ROSA/LSTF experiment named IB-HL-01 was performed on November 19, 2009, which simulated a PWR 17% hot leg IBLOCA owing to a double-ended guillotine break of PZR surge line. An upward long nozzle was mounted flush with the inner surface of a hot leg to simulate the break. The test assumptions were made such as total failure of both high pressure injection system of ECCS and auxiliary feedwater system. Major consequences are summarized in the following;

(1) Comparatively large size of break resulted in a fast primary depressurization. The primary pressure became lower than the SG secondary-side pressure. Break flow turned from single-phase liquid to two-phase flow immediately after the break, following the liquid level transient in the hot leg.

(2) Core uncovery started simultaneously with liquid level drop in downflow-side of crossover leg prior to LSC. The LSC in both loops resulted from steam condensation on the ACC coolant injected into cold legs.

(3) Peak cladding temperature was observed at Position 5 corresponding to the core center almost concurrently with the LSC. The peak cladding temperature of 607 K was lower than the initial cladding surface temperature of 623 K. The core was entirely quenched because of the quick recovery in the core liquid level after the LSC.

(4) During the ACC coolant injection, coolant entrainment appeared from the hot leg into the SG inlet plenum by high-velocity steam flow. As a result, the liquid level recovered in the SG inlet plenum temporarily with rather slow recovery in the hot leg liquid level.

(5) After the continuous core cooling was confirmed because of the coolant injection from the LPI system, the experiment was ended.

Acknowledgement

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Appendix A Available Experimental Data List

Table A-1 shows the list of available experimental data qualified as “Good” for LSTF IB-HL-01 (Run ID designated to be IB3). This table contains Sequential No., Function ID., Tag Name, measurement location, range, unit, and uncertainty. The alphabetical prefix of the Function ID. and Tag Name is explained as follows;

(1) TE, fluid temperature,

(2) DT, differential temperature,

(3) TW, heater rod and structure temperature,

(4) FE, flow rate measured with conventional (differential pressure) flow meters,

(5) PE, pressure,

(6) MI, miscellaneous instrumented-signal (power, pump rotation speed, etc.),

(7) LE, liquid level,

(8) DP, differential pressure,

(9) DE, fluid density measured with gamma-ray densitometer,

(10) RC, two-phase flow data calculated with DE and others.

Table A-1 List of available experimental data for LSTF IB-HL-01

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
1	TE	1	TE010A-HLA	HLA Vessel-Side CPT	270	720	K	2.75	0.61
2	TE	2	TE010B-HLA	HLA Vessel-Side CPT	270	720	K	2.75	0.61
3	TE	3	TE010C-HLA	HLA Vessel-Side CPT	270	720	K	2.75	0.61
4	TE	4	TE010D-HLA	HLA Vessel-Side CPT	270	720	K	2.75	0.61
5	TE	5	TE010E-HLA	HLA Vessel-Side CPT	270	720	K	2.75	0.61
6	TE	6	TE020C-HLA	HLA Pipe Top	270	720	K	2.75	0.61
7	TE	7	TE020D-HLA	HLA Pipe Bottom	270	720	K	2.75	0.61
8	TE	8	TE030C-HLA	HLA Pipe Top	270	720	K	2.75	0.61
9	TE	10	TE040A-HLA	HLA SG-Side CPT	270	720	K	2.75	0.61
10	TE	11	TE040B-HLA	HLA SG-Side CPT	270	720	K	2.75	0.61
11	TE	15	TE050C-LSA	LSA Upflow Leg	270	720	K	2.75	0.61
12	TE	16	TE070C-CLA	CLA Pipe Top	270	720	K	2.75	0.61
13	TE	17	TE070D-CLA	CLA Pipe Bottom	270	720	K	2.75	0.61
14	TE	18	TE080C-CLA	CLA Pipe Top	270	720	K	2.75	0.61
15	TE	20	TE090A-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
16	TE	21	TE090B-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
17	TE	22	TE090C-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
18	TE	25	TE100-HLA	HLA-CLA Average	270	720	K	2.75	0.61
19	TE	27	TE150B-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
20	TE	28	TE150C-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
21	TE	29	TE150D-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
22	TE	30	TE150E-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
23	TE	31	TE160C-HLB	HLB Pipe Top	270	720	K	2.75	0.61
24	TE	32	TE160D-HLB	HLB Pipe Bottom	270	720	K	2.75	0.61
25	TE	33	TE170C-HLB	HLB Pipe Top	270	720	K	2.75	0.61
26	TE	35	TE180A-HLB	HLB SG-Side CPT	270	720	K	2.75	0.61
27	TE	36	TE180B-HLB	HLB SG-Side CPT	270	720	K	2.75	0.61
28	TE	37	TE180C-HLB	HLB SG-Side CPT	270	720	K	2.75	0.61
29	TE	40	TE190C-LSB	LSB Upflow Leg	270	720	K	2.75	0.61
30	TE	41	TE210C-CLB	CLB Pipe Top	270	720	K	2.75	0.61
31	TE	42	TE210D-CLB	CLB Pipe Bottom	270	720	K	2.75	0.61
32	TE	43	TE220C-CLB	CLB Pipe Top	270	720	K	2.75	0.61
33	TE	45	TE230A-CLB	CLB Vessel-Side CPT	270	720	K	2.75	0.61
34	TE	46	TE230B-CLB	CLB Vessel-Side CPT	270	720	K	2.75	0.61
35	TE	50	TE240-HLB	HLB-CLB Average	270	720	K	2.75	0.61
36	TE	51	TE270C-PR	PZR Spray Line	270	720	K	2.75	0.61
37	TE	52	TE280C-PR	PZR Surge Line	270	720	K	2.75	0.61
38	TE	55	TE430-SGA	SGA Feedwater Line	270	670	K	2.63	0.66
39	TE	56	TE440-SGA	SGA Main Steam Line	270	670	K	2.63	0.66
40	TE	57	TE450-SGA	SGA Relief Valve Line	270	670	K	2.63	0.66
41	TE	59	TE470-SGB	SGB Feedwater Line	270	670	K	2.63	0.66
42	TE	60	TE480-SGB	SGB Main Steam Line	270	670	K	2.63	0.66
43	TE	61	TE490-SGB	SGB Relief Valve Line	270	670	K	2.63	0.66
44	TE	63	TE510-SH	MSL Steam Header	270	670	K	2.63	0.66
45	TE	64	TE520-JC	JC Hot Water	270	670	K	2.63	0.66
46	TE	65	TE530-JC	PF Suction Line	270	670	K	2.63	0.66
47	TE	66	TE540-JC	JC Spray Water	270	670	K	2.63	0.66
48	TE	67	TE550-JC	JC Steam Vent Line	270	670	K	2.63	0.66
49	TE	68	TE431-SGA	SGA Downcomer A	270	670	K	2.63	0.66
50	TE	69	TE432-SGA	SGA Downcomer B	270	670	K	2.63	0.66
51	TE	70	TE433-SGA	SGA Downcomer C	270	670	K	2.63	0.66
52	TE	71	TE434-SGA	SGA Downcomer D	270	670	K	2.63	0.66
53	TE	72	TE471-SGB	SGB Downcomer A	270	670	K	2.63	0.66
54	TE	73	TE472-SGB	SGB Downcomer B	270	670	K	2.63	0.66
55	TE	74	TE473-SGB	SGB Downcomer C	270	670	K	2.63	0.66
56	TE	75	TE474-SGB	SGB Downcomer D	270	670	K	2.63	0.66
57	TE	76	TE560C-BU	Break Upstream	270	720	K	2.63	0.66
58	TE	77	TE560D-BU	Break Upstream	270	720	K	2.63	0.66
59	TE	78	TE570C-BU	RSV Spool Piece, Outlet Side	270	720	K	2.63	0.66
60	TE	79	TE570D-BU	RSV Spool Piece, Outlet Side	270	720	K	2.63	0.66
61	TE	80	TE580C-BU	Break Orif. Upstream Top	270	720	K	2.63	0.66
62	TE	81	TE580D-BU	Break Orif. Upstream Bottom	270	720	K	2.63	0.66
63	TE	82	TE590C-BU	Break Orif. Downstream Top	270	720	K	2.63	0.66
64	TE	83	TE590D-BU	Break Orif. Downstream Bottom	270	720	K	2.63	0.66
65	TE	84	TE600-ST	ST Inlet Line	270	470	K	2.30	1.15
66	TE	85	TE610-ST	ST Top Region	270	470	K	2.30	1.15
67	TE	86	TE620-ST	ST Middle Region	270	470	K	2.30	1.15
68	TE	87	TE630-ST	ST Bottom Region	270	470	K	2.30	1.15
69	TE	88	TE640-ST	ST Spray Line	270	470	K	2.30	1.15
70	TE	89	TE650-ACC	Acc-Cold Tank Bottom	270	470	K	2.30	1.15
71	TE	90	TE660-ACC	Acc-Cold Tank Top	270	470	K	2.30	1.15
72	TE	91	TE670-ACC	Acc-Cold Line to CLA	270	470	K	2.30	1.15
73	TE	94	TE700-ACH	Acc-Hot Tank Top	270	570	K	2.42	0.81
74	TE	96	TE720-ACH	Acc-Hot Line to CLB	270	570	K	2.42	0.81
75	TE	97	TE730-HLA	HLA ECCS Nozzle	270	670	K	2.63	0.66
76	TE	98	TE740-LSA	LSA ECCS Nozzle	270	670	K	2.63	0.66
77	TE	99	TE750-CLA	CLA ECCS Nozzle	270	670	K	2.63	0.66

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
78	TE 100	TE760-HLB	HLB ECCS Nozzle	270	670	K	2.63	0.66
79	TE 101	TE770-LSB	LSB ECCS Nozzle	270	670	K	2.63	0.66
80	TE 102	TE780-CLB	CLB ECCS Nozzle	270	670	K	2.63	0.66
81	TE 103	TE790-PV	PV Bottom ECCS Nozzle	270	670	K	2.63	0.66
82	TE 104	TE800-PV	PV Top ECCS Nozzle	270	670	K	2.63	0.66
83	TE 106	TE820-PL	RHR Inlet Region	270	670	K	2.63	0.66
84	TE 107	TE830-PL	RHR Outlet Region	270	670	K	2.63	0.66
85	TE 108	TE840-PL	RHR Injection Line	270	670	K	2.63	0.66
86	TE 112	TE880-RWST	RWST Lower Region	270	370	K	2.37	2.37
87	TE 113	TE890-RWST	RWST Middle Region	270	370	K	2.37	2.37
88	TE 115	TE-E066F-PV	Upper Head Bottom	270	970	K	3.49	0.50
89	TE 117	TE-E075F-PV	Upper Head Middle	270	970	K	3.49	0.50
90	TE 118	TE-W075F-PV	Upper Head Middle	270	970	K	3.49	0.50
91	TE 119	TE-E081F-PV	Upper Head Top	270	970	K	3.49	0.50
92	TE 120	TE-W081F-PV	Upper Head Top	270	970	K	3.49	0.50
93	TE 121	TE-E080H-PV	CR Guide Tube Top	270	970	K	3.49	0.50
94	TE 122	TE-W080H-PV	CR Guide Tube Top	270	970	K	3.49	0.50
95	TE 123	TE-E049F-PV	Upper Plenum Bottom	270	970	K	3.49	0.50
96	TE 125	TE-E055F-PV	Upper Plenum Middle	270	970	K	3.49	0.50
97	TE 126	TE-W055F-PV	Upper Plenum Middle	270	970	K	3.49	0.50
98	TE 127	TE-E060F-PV	Upper Plenum Top	270	970	K	3.49	0.50
99	TE 128	TE-W060F-PV	Upper Plenum Top	270	970	K	3.49	0.50
100	TE 129	TE-IN038-B09-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
101	TE 130	TE-IN038-B11-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
102	TE 131	TE-IN038-B01-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
103	TE 132	TE-IN038-B03-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
104	TE 133	TE-IN038-B05-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
105	TE 134	TE-IN038-B07-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
106	TE 135	TE-IN038-B21-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
107	TE 136	TE-IN038-B23-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
108	TE 137	TE-IN038-B02-UCP	Below Upper core Plate	270	970	K	3.49	0.50
109	TE 138	TE-IN038-B06-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
110	TE 139	TE-IN038-B14-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
111	TE 140	TE-IN038-B15-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
112	TE 141	TE-IN038-B18-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
113	TE 142	TE-IN038-B19-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
114	TE 143	TE-IN038-B10-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
115	TE 144	TE-IN038-B12-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
116	TE 145	TE-IN038-B04-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
117	TE 146	TE-IN038-B08-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
118	TE 149	TE-EX040-B09-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
119	TE 150	TE-EX040-B11-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
120	TE 151	TE-EX040-B01-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
121	TE 152	TE-EX040-B03-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
122	TE 153	TE-EX040-B05-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
123	TE 154	TE-EX040-B07-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
124	TE 155	TE-EX040-B21-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
125	TE 156	TE-EX040-B23-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
126	TE 157	TE-EX040-B02-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
127	TE 158	TE-EX040-B06-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
128	TE 159	TE-EX040-B14-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
129	TE 160	TE-EX040-B15-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
130	TE 161	TE-EX040-B18-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
131	TE 162	TE-EX040-B19-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
132	TE 163	TE-EX040-B10-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
133	TE 164	TE-EX040-B12-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
134	TE 165	TE-EX040-B04-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
135	TE 166	TE-EX040-B08-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
136	TE 167	TE-EX040-B22-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
137	TE 168	TE-EX040-B24-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
138	TE 169	TE-IN-002B02-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
139	TE 171	TE-IN-002B06-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
140	TE 172	TE-IN-002B07-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
141	TE 174	TE-IN-002B11-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
142	TE 177	TE-IN-002B18-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
143	TE 178	TE-IN-002B20-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
144	TE 179	TE-IN-002B21-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
145	TE 184	TE-EX-000B07-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
146	TE 186	TE-EX-000B11-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
147	TE 189	TE-EX-000B18-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
148	TE 190	TE-EX-000B20-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
149	TE 191	TE-EX-000B21-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
150	TE 193	TE-N000C-DC	Downcomer EL.0.0m,North	270	720	K	2.75	0.61
151	TE 194	TE-S000C-DC	Downcomer EL.0.0m,South	270	720	K	2.75	0.61
152	TE 196	TE-W000C-DC	Downcomer EL.0.0m,West	270	720	K	2.75	0.61
153	TE 197	TE-N018C-DC	Downcomer EL.1.8m,North	270	720	K	2.75	0.61
154	TE 199	TE-E018C-DC	Downcomer EL.1.8m,East	270	720	K	2.75	0.61
155	TE 200	TE-W018C-DC	Downcomer EL.1.8m,West	270	720	K	2.75	0.61
156	TE 201	TE-N036C-DC	Downcomer EL.3.6m,North	270	720	K	2.75	0.61
157	TE 202	TE-S036C-DC	Downcomer EL.3.6m,South	270	720	K	2.75	0.61
158	TE 203	TE-E036C-DC	Downcomer EL.3.6m,East	270	720	K	2.75	0.61

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
159	TE 204	TE-W036C-DC	Downcomer EL.3.6m,West	270	720	K	2.75	0.61
160	TE 206	TE-S060C-DC	Downcomer EL.6.0m,South	270	720	K	2.75	0.61
161	TE 208	TE-W060C-DC	Downcomer EL.6.0m,West	270	720	K	2.75	0.61
162	TE 209	TE-N055C-DC	Downcomer EL.5.5m,North	270	720	K	2.75	0.61
163	TE 210	TE-S055C-DC	Downcomer EL.5.5m,South	270	720	K	2.75	0.61
164	TE 211	TE-C-021-LP	Lower Plenum EL.-2.1m,C	270	720	K	2.75	0.61
165	TE 212	TE-C-018-LP	Lower Plenum EL.-1.8m,C	270	720	K	2.75	0.61
166	TE 213	TE-C-015-LP	Lower Plenum EL.-1.5m,C	270	720	K	3.73	0.83
167	TE 216	TE-C-006-LP	Lower Plenum EL.-0.6m,C	270	720	K	2.75	0.61
168	TE 217	TE-C-005-LP	Lower Plenum EL.-0.5m,C	270	720	K	2.75	0.61
169	TE 218	TE-C-003-LP	Lower Plenum EL.-0.3m,C	270	720	K	2.75	0.61
170	TE 220	TE-B18622	B18 Rod(6,2) Pos.2,Fluid	270	970	K	3.49	0.50
171	TE 221	TE-B18623	B18 Rod(6,2) Pos.3,Fluid	270	970	K	3.49	0.50
172	TE 222	TE-B18624	B18 Rod(6,2) Pos.4,Fluid	270	970	K	3.49	0.50
173	TE 223	TE-B18625	B18 Rod(6,2) Pos.5,Fluid	270	970	K	3.49	0.50
174	TE 226	TE-B18628	B18 Rod(6,2) Pos.8,Fluid	270	970	K	3.49	0.50
175	TE 227	TE-B18629	B18 Rod(6,2) Pos.9,Fluid	270	970	K	3.49	0.50
176	TE 256	TE-B09663	B09 Rod(6,6) Pos.3,Fluid	270	970	K	3.69	0.53
177	TE 257	TE-B09665	B09 Rod(6,6) Pos.5,Fluid	270	970	K	3.69	0.53
178	TE 258	TE-B09666	B09 Rod(6,6) Pos.6,Fluid	270	970	K	3.69	0.53
179	TE 260	TE-B09669	B09 Rod(6,6) Pos.9,Fluid	270	970	K	3.69	0.53
180	TE 277	TE-B14267	B14 Rod(2,6) Pos.7,Fluid	270	970	K	3.49	0.50
181	TE 278	TE-B14269	B14 Rod(2,6) Pos.9,Fluid	270	970	K	3.49	0.50
182	TE 279	TE-B15261	B15 Rod(2,6) Pos.1,Fluid	270	970	K	4.31	0.62
183	TE 280	TE-B15263	B15 Rod(2,6) Pos.3,Fluid	270	970	K	4.31	0.62
184	TE 281	TE-B15265	B15 Rod(2,6) Pos.5,Fluid	270	970	K	4.31	0.62
185	TE 282	TE-B15266	B15 Rod(2,6) Pos.6,Fluid	270	970	K	4.31	0.62
186	TE 283	TE-B15267	B15 Rod(2,6) Pos.7,Fluid	270	970	K	3.69	0.53
187	TE 284	TE-B15269	B15 Rod(2,6) Pos.9,Fluid	270	970	K	3.69	0.53
188	TE 291	TE-B15262	B15 Rod(2,6) Pos.2,Fluid	270	970	K	4.31	0.62
189	TE 292	TE-B15264	B15 Rod(2,6) Pos.4,Fluid	270	970	K	4.31	0.62
190	TE 293	TE-B15268	B15 Rod(2,6) Pos.8,Fluid	270	970	K	3.69	0.53
191	TE 294	TE-B23221	B23 Rod(2,2) Pos.1,Fluid	270	970	K	3.69	0.53
192	TE 295	TE-B23223	B23 Rod(2,2) Pos.3,Fluid	270	970	K	3.69	0.53
193	TE 296	TE-B23225	B23 Rod(2,2) Pos.5,Fluid	270	970	K	3.69	0.53
194	TE 297	TE-B23226	B23 Rod(2,2) Pos.6,Fluid	270	970	K	3.69	0.53
195	TE 298	TE-B23227	B23 Rod(2,2) Pos.7,Fluid	270	970	K	3.69	0.53
196	TE 299	TE-B23229	B23 Rod(2,2) Pos.9,Fluid	270	970	K	3.69	0.53
197	TE 300	TE-B20661	B20 Rod(6,6) Pos.1,Fluid	270	970	K	3.69	0.53
198	TE 301	TE-B20662	B20 Rod(6,6) Pos.2,Fluid	270	970	K	3.69	0.53
199	TE 302	TE-B20663	B20 Rod(6,6) Pos.3,Fluid	270	970	K	3.69	0.53
200	TE 303	TE-B20664	B20 Rod(6,6) Pos.4,Fluid	270	970	K	3.69	0.53
201	TE 305	TE-B20666	B20 Rod(6,6) Pos.6,Fluid	270	970	K	3.69	0.53
202	TE 306	TE-B20667	B20 Rod(6,6) Pos.7,Fluid	270	970	K	0.00	0.00
203	TE 307	TE-B20668	B20 Rod(6,6) Pos.8,Fluid	270	970	K	3.69	0.53
204	TE 308	TE-B20669	B20 Rod(6,6) Pos.9,Fluid	270	970	K	0.00	0.00
205	TE 309	TE-B22661	B22 Rod(6,6) Pos.1,Fluid	270	970	K	4.31	0.62
206	TE 310	TE-B22662	B22 Rod(6,6) Pos.2,Fluid	270	970	K	4.31	0.62
207	TE 311	TE-B22663	B22 Rod(6,6) Pos.3,Fluid	270	970	K	4.31	0.62
208	TE 312	TE-B22664	B22 Rod(6,6) Pos.4,Fluid	270	970	K	4.31	0.62
209	TE 313	TE-B22665	B22 Rod(6,6) Pos.5,Fluid	270	970	K	4.31	0.62
210	TE 314	TE-B22666	B22 Rod(6,6) Pos.6,Fluid	270	970	K	4.31	0.62
211	TE 315	TE-B22667	B22 Rod(6,6) Pos.7,Fluid	270	970	K	4.31	0.62
212	TE 316	TE-B22668	B22 Rod(6,6) Pos.8,Fluid	270	970	K	4.31	0.62
213	TE 317	TE-B22669	B22 Rod(6,6) Pos.9,Fluid	270	970	K	4.31	0.62
214	TE 318	TE-B24621	B24 Rod(6,2) Pos.1,Fluid	270	970	K	3.69	0.53
215	TE 319	TE-B24623	B24 Rod(6,2) Pos.3,Fluid	270	970	K	3.69	0.53
216	TE 320	TE-B24625	B24 Rod(6,2) Pos.5,Fluid	270	970	K	3.69	0.53
217	TE 321	TE-B24626	B24 Rod(6,2) Pos.6,Fluid	270	970	K	3.69	0.53
218	TE 322	TE-B24627	B24 Rod(6,2) Pos.7,Fluid	270	970	K	3.69	0.53
219	TE 323	TE-B24629	B24 Rod(6,2) Pos.9,Fluid	270	970	K	3.69	0.53
220	TE 324	TE-IN0641-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
221	TE 325	TE-IN0642-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
222	TE 326	TE-IN0643-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
223	TE 330	TE-IN0861-SGA	SGA U-Tube(1,IN) Pos.1	270	720	K	2.75	0.61
224	TE 331	TE-IN0862-SGA	SGA U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
225	TE 332	TE-IN0863-SGA	SGA U-Tube(3,IN) Pos.1	270	720	K	2.75	0.61
226	TE 333	TE-IN0864-SGA	SGA U-Tube(4,IN) Pos.1	270	720	K	2.75	0.61
227	TE 334	TE-IN0865-SGA	SGA U-Tube(5,IN) Pos.1	270	720	K	2.75	0.61
228	TE 335	TE-IN0866-SGA	SGA U-Tube(6,IN) Pos.1	270	720	K	2.75	0.61
229	TE 336	TE-EX0861-SGA	SGA U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
230	TE 337	TE-EX0862-SGA	SGA U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
231	TE 338	TE-EX0863-SGA	SGA U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
232	TE 339	TE-EX0864-SGA	SGA U-Tube(4,EX) Pos.1	270	720	K	2.75	0.61
233	TE 340	TE-EX0865-SGA	SGA U-Tube(5,EX) Pos.1	270	720	K	2.75	0.61
234	TE 341	TE-EX0866-SGA	SGA U-Tube(6,EX) Pos.1	270	720	K	2.75	0.61
235	TE 344	TE-IN0933-SGA	SGA U-Tube(3,IN) Pos.2	270	720	K	2.75	0.61
236	TE 345	TE-IN0934-SGA	SGA U-Tube(4,IN) Pos.2	270	720	K	2.75	0.61
237	TE 347	TE-IN0936-SGA	SGA U-Tube(6,IN) Pos.2	270	720	K	2.75	0.61
238	TE 348	TE-IN0991-SGA	SGA U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
239	TE 349	TE-EX0991-SGA	SGA U-Tube(1,EX) Pos.3	270	720	K	2.75	0.61

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
240	TE 350	TE-IN0992-SGA	SGA U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
241	TE 352	TE-IN0993-SGA	SGA U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
242	TE 353	TE-EX0993-SGA	SGA U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
243	TE 354	TE-IN0994-SGA	SGA U-Tube(4,IN) Pos.3	270	720	K	2.75	0.61
244	TE 355	TE-EX0994-SGA	SGA U-Tube(4,EX) Pos.3	270	720	K	2.75	0.61
245	TE 356	TE-IN0995-SGA	SGA U-Tube(5,IN) Pos.3	270	720	K	2.75	0.61
246	TE 358	TE-IN0996-SGA	SGA U-Tube(6,IN) Pos.3	270	720	K	2.75	0.61
247	TE 359	TE-EX0996-SGA	SGA U-Tube(6,EX) Pos.3	270	720	K	2.75	0.61
248	TE 360	TE-IN1051-SGA	SGA U-Tube(1,IN) Pos.4	270	720	K	2.75	0.61
249	TE 361	TE-IN1052-SGA	SGA U-Tube(2,IN) Pos.4	270	720	K	2.75	0.61
250	TE 362	TE-IN1053-SGA	SGA U-Tube(3,IN) Pos.4	270	720	K	2.75	0.61
251	TE 363	TE-IN1054-SGA	SGA U-Tube(4,IN) Pos.4	270	720	K	2.75	0.61
252	TE 364	TE-IN1055-SGA	SGA U-Tube(5,IN) Pos.4	270	720	K	2.75	0.61
253	TE 365	TE-IN1056-SGA	SGA U-Tube(6,IN) Pos.4	270	720	K	2.75	0.61
254	TE 366	TE-IN1121-SGA	SGA U-Tube(1,IN) Pos.5	270	720	K	2.75	0.61
255	TE 367	TE-EX1121-SGA	SGA U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
256	TE 368	TE-IN1122-SGA	SGA U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
257	TE 369	TE-EX1122-SGA	SGA U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61
258	TE 371	TE-EX1123-SGA	SGA U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
259	TE 372	TE-IN1124-SGA	SGA U-Tube(4,IN) Pos.5	270	720	K	2.75	0.61
260	TE 373	TE-EX1124-SGA	SGA U-Tube(4,EX) Pos.5	270	720	K	2.75	0.61
261	TE 374	TE-IN1125-SGA	SGA U-Tube(5,IN) Pos.5	270	720	K	2.75	0.61
262	TE 376	TE-IN1126-SGA	SGA U-Tube(6,IN) Pos.5	270	720	K	2.75	0.61
263	TE 377	TE-EX1126-SGA	SGA U-Tube(6,EX) Pos.5	270	720	K	2.75	0.61
264	TE 378	TE-IN1251-SGA	SGA U-Tube(1,IN) Pos.6	270	720	K	2.75	0.61
265	TE 379	TE-EX1251-SGA	SGA U-Tube(1,EX) Pos.6	270	720	K	2.75	0.61
266	TE 380	TE-IN1252-SGA	SGA U-Tube(2,IN) Pos.6	270	720	K	2.75	0.61
267	TE 381	TE-EX1252-SGA	SGA U-Tube(2,EX) Pos.6	270	720	K	2.75	0.61
268	TE 382	TE-IN1253-SGA	SGA U-Tube(3,IN) Pos.6	270	720	K	2.75	0.61
269	TE 383	TE-EX1253-SGA	SGA U-Tube(3,EX) Pos.6	270	720	K	2.75	0.61
270	TE 384	TE-IN1254-SGA	SGA U-Tube(4,IN) Pos.6	270	720	K	2.75	0.61
271	TE 385	TE-EX1254-SGA	SGA U-Tube(4,EX) Pos.6	270	720	K	2.75	0.61
272	TE 386	TE-IN1255-SGA	SGA U-Tube(5,IN) Pos.6	270	720	K	2.75	0.61
273	TE 387	TE-EX1255-SGA	SGA U-Tube(5,EX) Pos.6	270	720	K	2.75	0.61
274	TE 388	TE-IN1256-SGA	SGA U-Tube(6,IN) Pos.6	270	720	K	2.75	0.61
275	TE 389	TE-EX1256-SGA	SGA U-Tube(6,EX) Pos.6	270	720	K	2.75	0.61
276	TE 390	TE-IN1371-SGA	SGA U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
277	TE 392	TE-IN1372-SGA	SGA U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
278	TE 393	TE-EX1372-SGA	SGA U-Tube(2,EX) Pos.7	270	720	K	2.75	0.61
279	TE 395	TE-EX1373-SGA	SGA U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
280	TE 396	TE-IN1374-SGA	SGA U-Tube(4,IN) Pos.7	270	720	K	2.75	0.61
281	TE 397	TE-EX1374-SGA	SGA U-Tube(4,EX) Pos.7	270	720	K	2.75	0.61
282	TE 399	TE-EX1375-SGA	SGA U-Tube(5,EX) Pos.7	270	720	K	2.75	0.61
283	TE 400	TE-IN1376-SGA	SGA U-Tube(6,IN) Pos.7	270	720	K	2.75	0.61
284	TE 401	TE-EX1376-SGA	SGA U-Tube(6,EX) Pos.7	270	720	K	2.75	0.61
285	TE 403	TE-EX1501-SGA	SGA U-Tube(1,EX) Pos.8	270	720	K	2.75	0.61
286	TE 404	TE-IN1502-SGA	SGA U-Tube(2,IN) Pos.8	270	720	K	2.75	0.61
287	TE 405	TE-EX1502-SGA	SGA U-Tube(2,EX) Pos.8	270	720	K	2.75	0.61
288	TE 407	TE-EX1503-SGA	SGA U-Tube(3,EX) Pos.8	270	720	K	2.75	0.61
289	TE 408	TE-IN1504-SGA	SGA U-Tube(4,IN) Pos.8	270	720	K	2.75	0.61
290	TE 410	TE-IN1505-SGA	SGA U-Tube(5,IN) Pos.8	270	720	K	2.75	0.61
291	TE 412	TE-IN1506-SGA	SGA U-Tube(6,IN) Pos.8	270	720	K	2.75	0.61
292	TE 413	TE-EX1506-SGA	SGA U-Tube(6,EX) Pos.8	270	720	K	2.75	0.61
293	TE 414	TE-IN1632-SGA	SGA U-Tube(2,IN) Pos.9	270	720	K	2.75	0.61
294	TE 415	TE-EX1632-SGA	SGA U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
295	TE 416	TE-IN1633-SGA	SGA U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
296	TE 417	TE-EX1633-SGA	SGA U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
297	TE 418	TE-IN1634-SGA	SGA U-Tube(4,IN) Pos.9	270	720	K	2.75	0.61
298	TE 419	TE-EX1634-SGA	SGA U-Tube(4,EX) Pos.9	270	720	K	2.75	0.61
299	TE 420	TE-IN1635-SGA	SGA U-Tube(5,IN) Pos.9	270	720	K	2.75	0.61
300	TE 421	TE-EX1635-SGA	SGA U-Tube(5,EX) Pos.9	270	720	K	2.75	0.61
301	TE 422	TE-IN1701-SGA	SGA U-Tube(1,IN) Pos.10	270	720	K	2.75	0.61
302	TE 424	TE-IN1782-SGA	SGA U-Tube(2,IN) Pos.10	270	720	K	2.75	0.61
303	TE 425	TE-IN1785-SGA	SGA U-Tube(5,IN) Pos.10	270	720	K	2.75	0.61
304	TE 426	TE-IN1863-SGA	SGA U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
305	TE 427	TE-IN1864-SGA	SGA U-Tube(4,IN) Pos.11	270	720	K	2.75	0.61
306	TE 429	TE-086C-SGA	SGA Boiling Section Pos.1	270	670	K	2.63	0.66
307	TE 430	TE-099C-SGA	SGA Boiling Section Pos.3	270	670	K	2.63	0.66
308	TE 431	TE-112C-SGA	SGA Boiling Section Pos.5	270	670	K	2.63	0.66
309	TE 432	TE-125C-SGA	SGA Boiling Section Pos.6	270	670	K	2.63	0.66
310	TE 433	TE-137C-SGA	SGA Boiling Section Pos.7	270	670	K	2.63	0.66
311	TE 434	TE-150C-SGA	SGA Boiling Section Pos.8	270	670	K	2.63	0.66
312	TE 435	TE-163C-SGA	SGA Boiling Section Pos.9	270	670	K	2.63	0.66
313	TE 436	TE-178C-SGA	SGA Boiling Section Pos.10	270	670	K	2.63	0.66
314	TE 437	TE-192F-SGA	SGA Boiling Section	270	670	K	2.63	0.66
315	TE 438	TE-208F-SGA	SGA Separator	270	670	K	2.63	0.66
316	TE 439	TE-192C-SGA	SGA Downcomer	270	670	K	2.63	0.66
317	TE 440	TE-208C-SGA	SGA Downcomer	270	670	K	2.63	0.66
318	TE 441	TE-223C-SGA	SGA Steam Dome	270	670	K	2.63	0.66
319	TE 442	TE-245C-SGA	SGA Steam Dome	270	670	K	2.63	0.66
320	TE 443	TE-IN0641-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
321	TE 444	TE-IN0642-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
322	TE 445	TE-IN0643-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
323	TE 449	TE-IN0861-SGB	SGB U-Tube(1,IN) Pos.1	270	720	K	2.75	0.61
324	TE 450	TE-IN0862-SGB	SGB U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
325	TE 452	TE-IN0864-SGB	SGB U-Tube(4,IN) Pos.1	270	720	K	2.75	0.61
326	TE 453	TE-IN0865-SGB	SGB U-Tube(5,IN) Pos.1	270	720	K	2.75	0.61
327	TE 454	TE-IN0866-SGB	SGB U-Tube(6,IN) Pos.1	270	720	K	2.75	0.61
328	TE 455	TE-EX0861-SGB	SGB U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
329	TE 456	TE-EX0862-SGB	SGB U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
330	TE 457	TE-EX0863-SGB	SGB U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
331	TE 458	TE-EX0864-SGB	SGB U-Tube(4,EX) Pos.1	270	720	K	2.75	0.61
332	TE 460	TE-EX0866-SGB	SGB U-Tube(6,EX) Pos.1	270	720	K	2.75	0.61
333	TE 461	TE-IN0931-SGB	SGB U-Tube(1,IN) Pos.2	270	720	K	2.75	0.61
334	TE 463	TE-IN0933-SGB	SGB U-Tube(3,IN) Pos.2	270	720	K	2.75	0.61
335	TE 464	TE-IN0934-SGB	SGB U-Tube(4,IN) Pos.2	270	720	K	2.75	0.61
336	TE 467	TE-IN0991-SGB	SGB U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
337	TE 468	TE-EX0991-SGB	SGB U-Tube(1,EX) Pos.3	270	720	K	2.75	0.61
338	TE 469	TE-IN0992-SGB	SGB U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
339	TE 470	TE-EX0992-SGB	SGB U-Tube(2,EX) Pos.3	270	720	K	2.75	0.61
340	TE 471	TE-IN0993-SGB	SGB U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
341	TE 472	TE-EX0993-SGB	SGB U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
342	TE 473	TE-IN0994-SGB	SGB U-Tube(4,IN) Pos.3	270	720	K	2.75	0.61
343	TE 474	TE-EX0994-SGB	SGB U-Tube(4,EX) Pos.3	270	720	K	2.75	0.61
344	TE 476	TE-EX0995-SGB	SGB U-Tube(5,EX) Pos.3	270	720	K	2.75	0.61
345	TE 477	TE-IN0996-SGB	SGB U-Tube(6,IN) Pos.3	270	720	K	2.75	0.61
346	TE 478	TE-EX0996-SGB	SGB U-Tube(6,EX) Pos.3	270	720	K	2.75	0.61
347	TE 479	TE-IN1051-SGB	SGB U-Tube(1,IN) Pos.4	270	720	K	2.75	0.61
348	TE 482	TE-IN1054-SGB	SGB U-Tube(4,IN) Pos.4	270	720	K	2.75	0.61
349	TE 486	TE-EX1121-SGB	SGB U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
350	TE 487	TE-IN1122-SGB	SGB U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
351	TE 488	TE-EX1122-SGB	SGB U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61
352	TE 489	TE-IN1123-SGB	SGB U-Tube(3,IN) Pos.5	270	720	K	2.75	0.61
353	TE 490	TE-EX1123-SGB	SGB U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
354	TE 491	TE-IN1124-SGB	SGB U-Tube(4,IN) Pos.5	270	720	K	2.75	0.61
355	TE 492	TE-EX1124-SGB	SGB U-Tube(4,EX) Pos.5	270	720	K	2.75	0.61
356	TE 497	TE-IN1251-SGB	SGB U-Tube(1,IN) Pos.6	270	720	K	2.75	0.61
357	TE 498	TE-EX1251-SGB	SGB U-Tube(1,EX) Pos.6	270	720	K	2.75	0.61
358	TE 499	TE-IN1252-SGB	SGB U-Tube(2,IN) Pos.6	270	720	K	2.75	0.61
359	TE 502	TE-EX1253-SGB	SGB U-Tube(3,EX) Pos.6	270	720	K	2.75	0.61
360	TE 503	TE-IN1254-SGB	SGB U-Tube(4,IN) Pos.6	270	720	K	2.75	0.61
361	TE 504	TE-EX1254-SGB	SGB U-Tube(4,EX) Pos.6	270	720	K	2.75	0.61
362	TE 505	TE-IN1255-SGB	SGB U-Tube(5,IN) Pos.6	270	720	K	2.75	0.61
363	TE 506	TE-EX1255-SGB	SGB U-Tube(5,EX) Pos.6	270	720	K	2.75	0.61
364	TE 508	TE-EX1256-SGB	SGB U-Tube(6,EX) Pos.6	270	720	K	2.75	0.61
365	TE 509	TE-IN1371-SGB	SGB U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
366	TE 510	TE-EX1371-SGB	SGB U-Tube(1,EX) Pos.7	270	720	K	2.75	0.61
367	TE 511	TE-IN1372-SGB	SGB U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
368	TE 512	TE-EX1372-SGB	SGB U-Tube(2,EX) Pos.7	270	720	K	2.75	0.61
369	TE 514	TE-EX1373-SGB	SGB U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
370	TE 515	TE-IN1374-SGB	SGB U-Tube(4,IN) Pos.7	270	720	K	2.75	0.61
371	TE 516	TE-EX1374-SGB	SGB U-Tube(4,EX) Pos.7	270	720	K	2.75	0.61
372	TE 517	TE-IN1375-SGB	SGB U-Tube(5,IN) Pos.7	270	720	K	2.75	0.61
373	TE 518	TE-EX1375-SGB	SGB U-Tube(5,EX) Pos.7	270	720	K	2.75	0.61
374	TE 519	TE-IN1376-SGB	SGB U-Tube(6,IN) Pos.7	270	720	K	2.75	0.61
375	TE 520	TE-EX1376-SGB	SGB U-Tube(6,EX) Pos.7	270	720	K	2.75	0.61
376	TE 523	TE-IN1502-SGB	SGB U-Tube(2,IN) Pos.8	270	720	K	2.75	0.61
377	TE 525	TE-IN1503-SGB	SGB U-Tube(3,IN) Pos.8	270	720	K	2.75	0.61
378	TE 526	TE-EX1503-SGB	SGB U-Tube(3,EX) Pos.8	270	720	K	2.75	0.61
379	TE 527	TE-IN1504-SGB	SGB U-Tube(4,IN) Pos.8	270	720	K	2.75	0.61
380	TE 528	TE-EX1504-SGB	SGB U-Tube(4,EX) Pos.8	270	720	K	2.75	0.61
381	TE 529	TE-IN1505-SGB	SGB U-Tube(5,IN) Pos.8	270	720	K	2.75	0.61
382	TE 530	TE-EX1505-SGB	SGB U-Tube(5,EX) Pos.8	270	720	K	2.75	0.61
383	TE 532	TE-EX1506-SGB	SGB U-Tube(6,EX) Pos.8	270	720	K	2.75	0.61
384	TE 533	TE-IN1632-SGB	SGB U-Tube(2,IN) Pos.9	270	720	K	2.75	0.61
385	TE 534	TE-EX1632-SGB	SGB U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
386	TE 535	TE-IN1633-SGB	SGB U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
387	TE 536	TE-EX1633-SGB	SGB U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
388	TE 537	TE-IN1634-SGB	SGB U-Tube(4,IN) Pos.9	270	720	K	2.75	0.61
389	TE 538	TE-EX1634-SGB	SGB U-Tube(4,EX) Pos.9	270	720	K	2.75	0.61
390	TE 539	TE-IN1635-SGB	SGB U-Tube(5,IN) Pos.9	270	720	K	2.75	0.61
391	TE 544	TE-IN1785-SGB	SGB U-Tube(5,IN) Pos.10	270	720	K	2.75	0.61
392	TE 545	TE-IN1863-SGB	SGB U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
393	TE 546	TE-IN1864-SGB	SGB U-Tube(4,IN) Pos.11	270	720	K	2.75	0.61
394	TE 548	TE-086C-SGB	SGB Boiling Section Pos.1	270	670	K	2.63	0.66
395	TE 549	TE-099C-SGB	SGB Boiling Section Pos.3	270	670	K	2.63	0.66
396	TE 550	TE-112C-SGB	SGB Boiling Section Pos.5	270	670	K	2.63	0.66
397	TE 551	TE-125C-SGB	SGB Boiling Section Pos.6	270	670	K	2.63	0.66
398	TE 552	TE-137C-SGB	SGB Boiling Section Pos.7	270	670	K	2.63	0.66
399	TE 553	TE-150C-SGB	SGB Boiling Section Pos.8	270	670	K	2.63	0.66
400	TE 554	TE-163C-SGB	SGB Boiling Section Pos.9	270	670	K	2.63	0.66
401	TE 555	TE-178C-SGB	SGB Boiling Section Pos.10	270	670	K	2.63	0.66

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
402	TE 556	TE-192F-SGB	SGB Boiling Section	270	670	K	2.63	0.66
403	TE 557	TE-208F-SGB	SGB Separator	270	670	K	2.63	0.66
404	TE 558	TE-192C-SGB	SGB Downcomer	270	670	K	2.63	0.66
405	TE 559	TE-208C-SGB	SGB Downcomer	270	670	K	2.63	0.66
406	TE 560	TE-223C-SGB	SGB Steam Dome	270	670	K	2.63	0.66
407	TE 561	TE-245C-SGB	SGB Steam Dome	270	670	K	2.63	0.29
408	TE 595	TE724-ACH	Acc-Hot Line to CLB	270	570	K	2.42	0.81
409	TE 609	TE012C-HLA	HLA Spool Piece Top	270	720	K	2.75	0.61
410	TE 610	TE012D-HLA	HLA Spool Piece Bottom	270	720	K	2.75	0.61
411	TE 615	TE052-LSA	LSA Spool Piece	270	720	K	2.75	0.61
412	TE 620	TE072D-CLA	CLA Spool Piece Bottom	270	720	K	2.75	0.61
413	TE 624	TE152C-HLB	HLB Spool Piece Top	270	720	K	2.75	0.61
414	TE 625	TE152D-HLB	HLB Spool Piece Bottom	270	720	K	2.75	0.61
415	TE 630	TE192-LSB	LSB Spool Piece	270	720	K	2.75	0.61
416	TE 634	TE212C-CLB	CLB Spool Piece Top	270	720	K	2.75	0.61
417	TE 635	TE212D-CLB	CLB Spool Piece Bottom	270	720	K	2.75	0.61
418	TE 644	TE571C-BU	RSV Spool Piece, Inlet Side	270	720	K	2.75	0.61
419	TE 645	TE571D-BU	RSV Spool Piece, Inlet Side	270	720	K	2.75	0.61
420	TE 662	TE-N-006-DC	PV Downcomer DTT North	270	720	K	2.75	0.61
421	TE 663	TE-S-006-DC	PV Downcomer DTT South	270	720	K	2.75	0.61
422	TE 664	TE-E-006-DC	PV Downcomer DTT East	270	720	K	2.75	0.61
423	TE 665	TE-W-006-DC	PV Downcomer DTT West	270	720	K	2.75	0.61
424	TE 707	TE-121E-UHDP	PLR-UH-9 Oil Outlet	270	720	K	2.75	0.61
425	TE 709	TE-121B-UHDP	PLR-UH-9 EL. 7.6m	270	720	K	2.75	0.61
426	TE 710	TE-121C-UHDP	PLR-UH-9 EL. 8.2m	270	720	K	2.75	0.61
427	TE 711	TE-E071C-DC	Downcomer EL.7.1m,East	270	720	K	2.75	0.61
428	TE 712	TE-W071C-DC	Downcomer EL.7.1m,West	270	720	K	2.75	0.61
429	TE 713	TE-E067C-DC	Downcomer EL.6.7m,East	270	720	K	2.75	0.61
430	TE 715	TE-951-CS	Oil Inlet-Main	270	720	K	2.75	0.61
431	TE 716	TE-952-CS	Oil Outlet-Main	270	720	K	2.75	0.61
432	TE 718	TE-B05221	B05 Rod(2,2) Pos.1,Fluid	270	970	K	3.69	0.53
433	TE 719	TE-B05223	B05 Rod(2,2) Pos.3,Fluid	270	970	K	3.69	0.53
434	TE 720	TE-B05225	B05 Rod(2,2) Pos.5,Fluid	270	970	K	3.69	0.53
435	TE 721	TE-B05226	B05 Rod(2,2) Pos.6,Fluid	270	970	K	3.69	0.53
436	TE 723	TE-B05229	B05 Rod(2,2) Pos.9,Fluid	270	970	K	3.69	0.53
437	TE 724	TE-B07221	B07 Rod(2,2) Pos.1,Fluid	270	1470	K	5.31	0.44
438	TE 725	TE-B07223	B07 Rod(2,2) Pos.3,Fluid	270	1470	K	5.31	0.44
439	TE 726	TE-B07225	B07 Rod(2,2) Pos.5,Fluid	270	1470	K	5.31	0.44
440	TE 727	TE-B07226	B07 Rod(2,2) Pos.6,Fluid	270	1470	K	5.31	0.44
441	TE 728	TE-B07227	B07 Rod(2,2) Pos.7,Fluid	270	1470	K	5.31	0.44
442	TE 729	TE-B07229	B07 Rod(2,2) Pos.9,Fluid	270	1470	K	5.31	0.44
443	TE 730	TE-EX0650-SGA	SGA Outlet Plenum	270	720	K	2.75	0.61
444	TE 731	TE-EX0680-SGA	SGA Outlet Plenum	270	720	K	2.75	0.61
445	TE 732	TE-EX0720-SGA	SGA Outlet Plenum	270	720	K	2.75	0.61
446	TE 733	TE-EX0650-SGB	SGB Outlet Plenum	270	720	K	2.75	0.61
447	TE 734	TE-EX0680-SGB	SGB Outlet Plenum	270	720	K	2.75	0.61
448	TE 735	TE-EX0720-SGB	SGB Outlet Plenum	270	720	K	2.75	0.61
449	TE 739	TE275C-PR	PZR Spray Inlet Nozzle	270	720	K	2.75	0.61
450	TE 752	TE293-ACH	Acc-Hot Top Gas Line	270	720	K	2.75	0.61
451	TE 780	TE687X-ACH	Acc-Hot Tank Fluid DL.6570	270	720	K	2.75	0.61
452	TE 854	TE-NP053F-PV	PV UP North Peri. EL.5299	270	630	K	3.05	0.85
453	TE 855	TE-NP055F-PV	PV UP North Peri. EL.5503	270	630	K	3.05	0.85
454	TE 856	TE-NP057F-PV	PV UP North Peri. EL.5706	270	630	K	3.05	0.85
455	TE 857	TE-NP059F-PV	PV UP North Peri. EL.5938	270	630	K	3.05	0.85
456	TE 858	TE-EP047F-PV	PV UP East Peri. EL.4672	270	630	K	3.05	0.85
457	TE 859	TE-EP053F-PV	PV UP East Peri. EL.5299	270	630	K	3.05	0.85
458	TE 860	TE-EP055F-PV	PV UP East Peri. EL.5503	270	630	K	3.05	0.85
459	TE 861	TE-EP057F-PV	PV UP East Peri. EL.5706	270	630	K	3.05	0.85
460	TE 862	TE-EP059F-PV	PV UP East Peri. EL.5938	270	630	K	3.05	0.85
461	TE 863	TE-SP047F-PV	PV UP South Peri. EL.4672	270	630	K	3.05	0.85
462	TE 864	TE-SP053F-PV	PV UP South Peri. EL.5299	270	630	k	3.05	0.85
463	TE 865	TE-SP055F-PV	PV UP South Peri. EL.5503	270	630	K	3.05	0.85
464	TE 866	TE-SP057F-PV	PV UP South Peri. EL.5706	270	630	K	3.05	0.85
465	TE 867	TE-SP059F-PV	PV UP South Peri. EL.5938	270	630	K	3.05	0.85
466	TE 868	TE-WP047F-PV	PV UP West Peri. EL.4672	270	630	K	3.05	0.85
467	TE 869	TE-WP053F-PV	PV UP West Peri. EL.5299	270	630	K	3.05	0.85
468	TE 870	TE-WP055F-PV	PV UP West Peri. EL.5503	270	630	K	3.05	0.85
469	TE 871	TE-WP057F-PV	PV UP West Peri. EL.5706	270	630	K	3.05	0.85
470	TE 872	TE-WP059F-PV	PV UP West Peri. EL.5938	270	630	K	3.05	0.85
471	TE 873	TE-EM053F-PV	PV UP East Middle EL.5299	270	630	K	3.05	0.85
472	TE 874	TE-EM057F-PV	PV UP East Middle EL.5706	270	630	K	3.05	0.85
473	TE 875	TE-WM053F-PV	PV UP West Middle EL.5299	270	630	K	3.05	0.85
474	TE 876	TE-WM057F-PV	PV UP West Middle EL.5706	270	630	K	3.05	0.85
475	TE 877	TE-WC047F-PV	PV UP West Center EL.4672	270	630	K	3.05	0.85
476	TE 878	TE-WC053F-PV	PV UP West Center EL.5299	270	630	K	3.05	0.85
477	TE 879	TE-WC055F-PV	PV UP West Center EL.5503	270	630	K	3.05	0.85
478	TE 880	TE-WC057F-PV	PV UP West Center EL.5706	270	630	K	3.05	0.85
479	TE 881	TE-WC059F-PV	PV UP West Center EL.5938	270	630	K	3.05	0.85
480	TE 882	TE-EC047F-PV	PV UP East Center EL.4672	270	630	K	3.05	0.85
481	TE 883	TE-EC053F-PV	PV UP East Center EL.5299	270	630	K	3.05	0.85
482	TE 884	TE-EC055F-PV	PV UP East Center EL.5503	270	630	K	3.05	0.85

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
483	TE 885	TE-EC057F-PV	PV UP East Center EL.5706	270	630	K	3.05	0.85
484	TE 886	TE-EC059F-PV	PV UP East Center EL.5938	270	630	K	3.05	0.85
485	TE 888	TE-E037C-DC	DC East EL.3662	270	630	K	3.05	0.85
486	TE 891	TE-W037C-DC	DC West EL.3662	270	630	K	3.05	0.85
487	TE 893	TE-EN040C-DC	DC East-North EL.4037	270	630	K	3.05	0.85
488	TE 894	TE-E040C-DC	DC East EL.4037	270	630	K	3.05	0.85
489	TE 895	TE-ES040C-DC	DC East-South EL.4037	270	630	K	3.05	0.85
490	TE 896	TE-WN040C-DC	DC West-North EL.4037	270	630	K	3.05	0.85
491	TE 897	TE-W040C-DC	DC West EL.4037	270	630	K	3.05	0.85
492	TE 898	TE-WS040C-DC	DC West-South EL.4037	270	630	K	3.05	0.85
493	TE 899	TE-W042C-DC	DC West EL.4210	270	630	K	3.05	0.85
494	TE 900	TE-E042C-DC	DC East EL.4210	270	630	K	3.05	0.85
495	TE 901	TE-SW045C-DC	DC South-West EL.4497	270	630	K	3.05	0.85
496	TE 902	TE-NE045C-DC	DC North-East EL.4497	270	630	K	3.05	0.85
497	TE 903	TE-N045C-DC	DC North EL.4497	270	630	K	3.05	0.85
498	TE 904	TE-NW045C-DC	DC North-West EL.4497	270	630	K	3.05	0.85
499	TE 905	TE-S045C-DC	DC South EL.4497	270	630	K	3.05	0.85
500	TE 906	TE-SE045C-DC	DC South-East EL.4497	270	630	K	3.05	0.85
501	TE 907	TE-NE051C-DC	DC North-East EL.5074	270	630	K	3.05	0.85
502	TE 908	TE-N051C-DC	DC North EL.5074	270	630	K	3.05	0.85
503	TE 909	TE-NW051C-DC	DC North-West EL.5074	270	630	K	3.05	0.85
504	TE 910	TE-SW051C-DC	DC South-West EL.5074	270	630	K	3.05	0.85
505	TE 911	TE-S051C-DC	DC South EL.5074	270	630	K	3.05	0.85
506	TE 912	TE-SE051C-DC	DC South-East EL.5074	270	630	K	3.05	0.85
507	TE 913	TE-N054C-DC	DC North EL.5363	270	630	K	3.05	0.85
508	TE 914	TE-S054C-DC	DC South EL.5363	270	630	K	3.05	0.85
509	TE 921	HTE-C046-PV	Heated TC, EL.4597	270	1270	K	4.55	0.46
510	TE 922	TE-C046-PV	HTC Fluid, EL.4597	270	1270	K	4.55	0.46
511	TE 924	TE-C051-PV	HTC Fluid, EL.5102	270	1270	K	4.55	0.46
512	TE 925	TE-C056-PV	HTC Fluid, EL.5606	270	1270	K	4.55	0.46
513	TE 926	HTE-C056-PV	Heated TC, EL.5606	270	1270	K	4.55	0.46
514	TE 958	TE194A-PR	PZR DL.2025	270	720	K	2.75	0.61
515	TE 960	TE194C-PR	PZR DL.5995	270	720	K	2.75	0.61
516	TE 961	TE194D-PR	PZR DL.7965	270	720	K	2.75	0.61
517	TE 962	TE194E-PR	PZR DL.9795	270	720	K	2.75	0.61
518	TE 963	TE194F-PR	PZR DL.11321	270	720	K	2.75	0.61
519	TE 964	TE-PR2	PZR HT	270	1470	K	5.31	0.44
520	TE 965	TE677-ACC	Acc-Cold Tank Fluid DL.6450	270	720	K	2.75	0.61
521	TE 1089	TE910-CWT	Cooling Water Tank	270	370	K	2.37	2.37
522	TE 1092	TE960-AIR	Atmospheric Temperature	170	370	K	2.30	1.15
523	TE 1093	TE961-AIR	Room Temperature	170	370	K	2.30	1.15
524	TE 1094	TC030D-HLA	HLA Fluid at Pipe Bottom	273	673	K	2.63	0.66
525	TE 1095	TC170D-HLB	HLB Fluid at Pipe Bottom	273	673	K	2.63	0.66
526	TE 1096	TC080D-CLA	CLA Fluid at Pipe Bottom	273	673	K	2.63	0.66
527	TE 1097	TC220D-CLB	CLB Fluid at Pipe Bottom	273	673	K	2.63	0.66
528	TE 1098	TC194B-PR	PZR Fluid	273	673	K	2.63	0.66
529	TE 1099	TC223D-SGA	SGA Steam Dome	273	673	K	2.63	0.66
530	TE 1100	TC223D-SGB	SGB Steam Dome	273	673	K	2.63	0.66
531	TE 1101	TC-E000C-DC	Douncomer EL.0.0m,East	273	673	K	2.63	0.66
532	TE 1102	TC-E060C-DC	Downcomer EL.6.0m,East	273	673	K	2.63	0.66
533	TE 1123	TE687A-ACH	Acc-Hot Tank Fluid DL.10	270	720	K	2.75	0.61
534	TE 1124	TE687B-ACH	Acc-Hot Tank Fluid DL.475	270	720	K	2.75	0.61
535	TE 1125	TE687C-ACH	Acc-Hot Tank Fluid DL.940	270	720	K	2.75	0.61
536	TE 1126	TE687D-ACH	Acc-Hot Tank Fluid DL.1405	270	720	K	2.75	0.61
537	TE 1127	TE687E-ACH	Acc-Hot Tank Fluid DL.1870	270	720	K	2.75	0.61
538	TE 1128	TE687F-ACH	Acc-Hot Tank Fluid DL.2335	270	720	K	2.75	0.61
539	TE 1129	TE687G-ACH	Acc-Hot Tank Fluid DL.2800	270	720	K	2.75	0.61
540	TE 1130	TE687H-ACH	Acc-Hot Tank Fluid DL.3265	270	720	K	2.75	0.61
541	TE 1131	TE687I-ACH	Acc-Hot Tank Fluid DL.3275	270	720	K	2.75	0.61
542	TE 1132	TE687J-ACH	Acc-Hot Tank Fluid DL.3285	270	720	K	2.75	0.61
543	TE 1133	TE687K-ACH	Acc-Hot Tank Fluid DL.3295	270	720	K	2.75	0.61
544	TE 1134	TE687L-ACH	Acc-Hot Tank Fluid DL.3305	270	720	K	2.75	0.61
545	TE 1135	TE687M-ACH	Acc-Hot Tank Fluid DL.3315	270	720	K	2.75	0.61
546	TE 1136	TE687N-ACH	Acc-Hot Tank Fluid DL.3325	270	720	K	2.75	0.61
547	TE 1137	TE687O-ACH	Acc-Hot Tank Fluid DL.3335	270	720	K	2.75	0.61
548	TE 1138	TE687P-ACH	Acc-Hot Tank Fluid DL.3345	270	720	K	2.75	0.61
549	TE 1139	TE687Q-ACH	Acc-Hot Tank Fluid DL.3355	270	720	K	2.75	0.61
550	TE 1140	TE687R-ACH	Acc-Hot Tank Fluid DL.3820	270	720	K	2.75	0.61
551	TE 1141	TE687S-ACH	Acc-Hot Tank Fluid DL.4285	270	720	K	2.75	0.61
552	TE 1142	TE687T-ACH	Acc-Hot Tank Fluid DL.4750	270	720	K	2.75	0.61
553	TE 1143	TE687U-ACH	Acc-Hot Tank Fluid DL.5215	270	720	K	2.75	0.61
554	TE 1144	TE687V-ACH	Acc-Hot Tank Fluid DL.5680	270	720	K	2.75	0.61
555	TE 1145	TE687W-ACH	Acc-Hot Tank Fluid DL.6145	270	720	K	2.75	0.61
556	TE 1151	TE075A-CLA	CLA TC Rake	270	720	K	2.75	0.61
557	TE 1152	TE075B-CLA	CLA TC Rake	270	720	K	2.75	0.61
558	TE 1153	TE075C-CLA	CLA TC Rake	270	720	K	2.75	0.61
559	TE 1154	TE075D-CLA	CLA TC Rake	270	720	K	2.75	0.61
560	TE 1155	TE075E-CLA	CLA TC Rake	270	720	K	2.75	0.61
561	TE 1156	TE215A-CLB	CLB TC Rake	270	720	K	2.75	0.61
562	TE 1157	TE215B-CLB	CLB TC Rake	270	720	K	2.75	0.61
563	TE 1158	TE215C-CLB	CLB TC Rake	270	720	K	2.75	0.61

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
564	TE 1159	TE215D-CLB	CLB TC Rake	270	720	K	2.75	0.61
565	TE 1160	TE215E-CLB	CLB TC Rake	270	720	K	2.75	0.61
566	TE 1165	TE970-DIS	Dis. Gas Sampling	270	470	K	2.30	1.15
567	TE 1166	TE-H10-GAS	Air Injection Line No.1	270	370	K	2.37	2.37
568	TE 1167	TE-H20-GAS	Air Injection Line No.2	270	370	K	2.37	2.37
569	TE 1168	TE-E030C-DC	DC East EL.3000	270	720	K	2.37	0.53
570	TE 1169	TE-S030C-DC	DC South EL.3000	270	720	K	2.37	0.53
571	TE 1170	TE-W030C-DC	DC West EL.3000	270	720	K	2.37	0.53
572	TE 1171	TE-N030C-DC	DC North EL.3000	270	720	K	2.37	0.53
573	TE 1172	TE-S037C-DC	DC South EL.3662	270	720	K	2.37	0.53
574	TE 1173	TE-N037C-DC	DC North EL.3662	270	720	K	2.37	0.53
575	DT 1	DTE020A-HLA	HLA Wall I/O	-150	150	K	2.90	0.97
576	DT 2	DTE020B-HLA	HLA Wall-Fluid	-150	150	K	2.90	0.97
577	DT 3	DTE030A-HLA	HLA Wall I/O	-150	150	K	2.90	0.97
578	DT 4	DTE030B-HLA	HLA Wall-Fluid	-150	150	K	2.90	0.97
579	DT 5	DTE050A-LSA	LSA Wall I/O	-150	150	K	2.90	0.97
580	DT 6	DTE050B-LSA	LSA Wall-Fluid	-150	150	K	2.90	0.97
581	DT 7	DTE060A-PCA	PCA Wall I/O	-150	150	K	2.90	0.97
582	DT 8	DTE070A-CLA	CLA Wall I/O	-150	150	K	2.90	0.97
583	DT 9	DTE070B-CLA	CLA Wall-Fluid	-150	150	K	2.90	0.97
584	DT 10	DTE080A-CLA	CLA Wall I/O	-150	150	K	2.90	0.97
585	DT 11	DTE080B-CLA	CLA Wall-Fluid	-150	150	K	2.90	0.97
586	DT 12	DTE100-HLA	HLA-CLA	-150	150	K	2.90	0.97
587	DT 13	DTE160A-HLB	HLB Wall I/O	-150	150	K	2.90	0.97
588	DT 14	DTE160B-HLB	HLB Wall-Fluid	-150	150	K	2.90	0.97
589	DT 15	DTE170A-HLB	HLB Wall I/O	-150	150	K	2.90	0.97
590	DT 16	DTE170B-HLB	HLB Wall-Fluid	-150	150	K	2.90	0.97
591	DT 17	DTE190A-LSB	LSB Wall I/O	-150	150	K	2.90	0.97
592	DT 18	DTE190B-LSB	LSB Wall-Fluid	-150	150	K	2.90	0.97
593	DT 19	DTE200A-PCB	PCB Wall I/O	-150	150	K	2.90	0.97
594	DT 20	DTE210A-CLB	CLB Wall I/O	-150	150	K	2.90	0.97
595	DT 21	DTE210B-CLB	CLB Wall-Fluid	-150	150	K	2.90	0.97
596	DT 22	DTE220A-CLB	CLB Wall I/O	-150	150	K	2.90	0.97
597	DT 23	DTE220B-CLB	CLB Wall-Fluid	-150	150	K	2.90	0.97
598	DT 24	DTE240-HLB	HLB-CLB	-150	150	K	2.90	0.97
599	DT 25	DTE270A-PR	PZR Spray Line Wall-Fluid	-150	150	K	2.90	0.97
600	DT 26	DTE280A-PR	PZR Surge Line Wall-Fluid	-150	150	K	2.90	0.97
601	DT 27	DTE-E-015A-PV	PV Wall I/O-E at L. Plenum	-150	150	K	2.90	0.97
602	DT 28	DTE-W-015A-PV	PV Wall I/O-W at L. Plenum	-150	150	K	2.90	0.97
603	DT 29	DTE-N000A-PV	PV Wall I/O-N at DC Bottom	-150	150	K	2.90	0.97
604	DT 30	DTE-S000A-PV	PV Wall I/O-S at DC Bottom	-150	150	K	2.90	0.97
605	DT 31	DTE-E000A-PV	PV Wall I/O-E at DC Bottom	-150	150	K	2.90	0.97
606	DT 32	DTE-W000A-PV	PV Wall I/O-W at DC Bottom	-150	150	K	2.90	0.97
607	DT 33	DTE-N018A-PV	PV Wall I/O-N at DC Middle	-150	150	K	2.90	0.97
608	DT 34	DTE-S018A-PV	PV Wall I/O-S at DC Middle	-150	150	K	2.90	0.97
609	DT 35	DTE-E018A-PV	PV Wall I/O-E at DC Middle	-150	150	K	2.90	0.97
610	DT 36	DTE-W018A-PV	PV Wall I/O-W at DC Middle	-150	150	K	2.90	0.97
611	DT 37	DTE-N036A-PV	PV Wall I/O-N at Upper DC	-150	150	K	2.90	0.97
612	DT 38	DTE-S036A-PV	PV Wall I/O-S at Upper DC	-150	150	K	2.90	0.97
613	DT 39	DTE-E036A-PV	PV Wall I/O-E at Upper DC	-150	150	K	2.90	0.97
614	DT 40	DTE-W036A-PV	PV Wall I/O-W at Upper DC	-150	150	K	2.90	0.97
615	DT 41	DTE-N060A-PV	PV Wall I/O-N at DC Top	-150	150	K	2.90	0.97
616	DT 42	DTE-S060A-PV	PV Wall I/O-S at DC Top	-150	150	K	2.90	0.97
617	DT 43	DTE-E060A-PV	PV Wall I/O-E at DC Top	-150	150	K	2.90	0.97
618	DT 44	DTE-W060A-PV	PV Wall I/O-W at DC Top	-150	150	K	2.90	0.97
619	DT 45	DTE-E080A-PV	PV Wall I/O-E at DC Head	-150	150	K	2.90	0.97
620	DT 46	DTE-W080A-PV	PV Wall I/O-W at DC Head	-150	150	K	2.90	0.97
621	DT 47	DTE-N000B-PV	PV/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
622	DT 48	DTE-S000B-PV	PV/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
623	DT 50	DTE-W000B-PV	PV/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
624	DT 51	DTE-N018B-PV	PV/DC Fluid at DC Middle	-150	150	K	2.90	0.97
625	DT 53	DTE-E018B-PV	PV/DC Fluid at DC Middle	-150	150	K	2.90	0.97
626	DT 54	DTE-W018B-PV	PV/DC Fluid at DC Middle	-150	150	K	2.90	0.97
627	DT 55	DTE-N036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
628	DT 56	DTE-S036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
629	DT 57	DTE-E036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
630	DT 58	DTE-W036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
631	DT 60	DTE-S060B-PV	PV/DC Fluid at DC Top	-150	150	K	2.90	0.97
632	DT 62	DTE-W060B-PV	PV/DC Fluid at DC Top	-150	150	K	2.90	0.97
633	DT 64	DTE-S000C-PV	CB/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
634	DT 66	DTE-W000C-PV	CB/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
635	DT 67	DTE-N018C-PV	CB/DC Fluid at DC Middle	-150	150	K	2.90	0.97
636	DT 69	DTE-E018C-PV	CB/DC Fluid at DC Middle	-150	150	K	2.90	0.97
637	DT 70	DTE-W018C-PV	CB/DC Fluid at DC Middle	-150	150	K	2.90	0.97
638	DT 71	DTE-N036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
639	DT 72	DTE-S036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
640	DT 73	DTE-E036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
641	DT 74	DTE-W036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
642	DT 76	DTE-S060C-PV	CB/DC Fluid at DC Top	-150	150	K	2.90	0.97
643	DT 78	DTE-W060C-PV	CB/DC Fluid at DC Top	-150	150	K	2.90	0.97

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
644	DT	80	DTE-S000E-PV	CB Wall I/O at DC Bottom	-150	150	K	2.90	0.97
645	DT	81	DTE-E000E-PV	CB Wall I/O at DC Bottom	-150	150	K	2.90	0.97
646	DT	82	DTE-W000E-PV	CB Wall I/O at DC Bottom	-150	150	K	2.90	0.97
647	DT	87	DTE-N018E-PV	CB Wall I/O at DC Middle	-150	150	K	2.90	0.97
648	DT	88	DTE-S018E-PV	CB Wall I/O at DC Middle	-150	150	K	2.90	0.97
649	DT	89	DTE-E018E-PV	CB Wall I/O at DC Middle	-150	150	K	2.90	0.97
650	DT	90	DTE-W018E-PV	CB Wall I/O at DC Middle	-150	150	K	2.90	0.97
651	DT	95	DTE-N036E-PV	CB Wall I/O at Upper DC	-150	150	K	2.90	0.97
652	DT	96	DTE-S036E-PV	CB Wall I/O at Upper DC	-150	150	K	2.90	0.97
653	DT	97	DTE-E036E-PV	CB Wall I/O at Upper DC	-150	150	K	2.90	0.97
654	DT	101	DTE-E049E-PV	CB Wall I/O below Nozzle	-150	150	K	2.90	0.97
655	DT	103	DTE-N060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
656	DT	104	DTE-S060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
657	DT	105	DTE-E060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
658	DT	106	DTE-W060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
659	DT	107	DTE-040-B09-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
660	DT	108	DTE-040-B11-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
661	DT	109	DTE-040-B01-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
662	DT	110	DTE-040-B03-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
663	DT	111	DTE-040-B05-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
664	DT	112	DTE-040-B07-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
665	DT	113	DTE-040-B21-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
666	DT	114	DTE-040-B23-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
667	DT	115	DTE-040-B02-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
668	DT	116	DTE-040-B15-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
669	DT	117	DTE-040-B06-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
670	DT	118	DTE-040-B14-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
671	DT	119	DTE-040-B18-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
672	DT	120	DTE-040-B19-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
673	DT	121	DTE-040-B10-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
674	DT	122	DTE-040-B12-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
675	DT	123	DTE-040-B04-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
676	DT	124	DTE-040-B08-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
677	DT	130	DTE-000-B07-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
678	DT	132	DTE-000-B11-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
679	DT	135	DTE-000-B18-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
680	DT	136	DTE-000-B20-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
681	DT	137	DTE-000-B21-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
682	DT	139	DTE-086A-SGA	SGA Wall I/O Pos.1	-40	40	K	2.07	2.58
683	DT	140	DTE-137A-SGA	SGA Wall I/O Pos.7	-40	40	K	2.07	2.58
684	DT	141	DTE-178A-SGA	SGA Wall I/O Pos.10	-40	40	K	2.07	2.58
685	DT	142	DTE-223A-SGA	SGA Steam Dome Wall I/O	-40	40	K	2.07	2.58
686	DT	143	DTE-IN0861-SGA	SGA U-Tube(1,IN) Pos.1	-100	100	K	2.42	1.21
687	DT	144	DTE-EX0861-SGA	SGA U-Tube(1,EX) Pos.1	-100	100	K	2.42	1.21
688	DT	145	DTE-IN0862-SGA	SGA U-Tube(2,IN) Pos.1	-100	100	K	2.42	1.21
689	DT	146	DTE-EX0862-SGA	SGA U-Tube(2,EX) Pos.1	-100	100	K	2.42	1.21
690	DT	147	DTE-IN0863-SGA	SGA U-Tube(3,IN) Pos.1	-100	100	K	2.42	1.21
691	DT	148	DTE-EX0863-SGA	SGA U-Tube(3,EX) Pos.1	-100	100	K	2.42	1.21
692	DT	149	DTE-IN0991-SGA	SGA U-Tube(1,IN) Pos.3	-100	100	K	2.42	1.21
693	DT	150	DTE-EX0991-SGA	SGA U-Tube(1,EX) Pos.3	-100	100	K	2.42	1.21
694	DT	151	DTE-IN0992-SGA	SGA U-Tube(2,IN) Pos.3	-100	100	K	2.42	1.21
695	DT	153	DTE-IN0993-SGA	SGA U-Tube(3,IN) Pos.3	-100	100	K	2.42	1.21
696	DT	154	DTE-EX0993-SGA	SGA U-Tube(3,EX) Pos.3	-100	100	K	2.42	1.21
697	DT	155	DTE-IN1121-SGA	SGA U-Tube(1,IN) Pos.5	-100	100	K	2.42	1.21
698	DT	156	DTE-EX1121-SGA	SGA U-Tube(1,EX) Pos.5	-100	100	K	2.42	1.21
699	DT	157	DTE-IN1122-SGA	SGA U-Tube(2,IN) Pos.5	-100	100	K	2.42	1.21
700	DT	158	DTE-EX1122-SGA	SGA U-Tube(2,EX) Pos.5	-100	100	K	2.42	1.21
701	DT	160	DTE-EX1123-SGA	SGA U-Tube(3,EX) Pos.5	-100	100	K	2.42	1.21
702	DT	161	DTE-IN1371-SGA	SGA U-Tube(1,IN) Pos.7	-100	100	K	2.42	1.21
703	DT	162	DTE-EX1371-SGA	SGA U-Tube(1,EX) Pos.7	-100	100	K	2.42	1.21
704	DT	163	DTE-IN1372-SGA	SGA U-Tube(2,IN) Pos.7	-100	100	K	2.42	1.21
705	DT	164	DTE-EX1372-SGA	SGA U-Tube(2,EX) Pos.7	-100	100	K	2.42	1.21
706	DT	166	DTE-EX1373-SGA	SGA U-Tube(3,EX) Pos.7	-100	100	K	2.42	1.21
707	DT	167	DTE-IN1632-SGA	SGA U-Tube(2,IN) Pos.9	-100	100	K	2.42	1.21
708	DT	168	DTE-EX1632-SGA	SGA U-Tube(2,EX) Pos.9	-100	100	K	2.42	1.21
709	DT	169	DTE-IN1633-SGA	SGA U-Tube(3,IN) Pos.9	-100	100	K	2.42	1.21
710	DT	170	DTE-EX1633-SGA	SGA U-Tube(3,EX) Pos.9	-100	100	K	2.42	1.21
711	DT	171	DTE-IN1701-SGA	SGA U-Tube(1,IN) Pos.10	-100	100	K	2.42	1.21
712	DT	172	DTE-IN1782-SGA	SGA U-Tube(2,IN) Pos.10	-100	100	K	2.42	1.21
713	DT	173	DTE-IN1863-SGA	SGA U-Tube(3,IN) Pos.11	-100	100	K	2.42	1.21
714	DT	174	DTE-086A-SGB	SGB Wall I/O Pos.1	-40	40	K	2.07	2.58
715	DT	175	DTE-137A-SGB	SGB Wall I/O Pos.7	-40	40	K	2.07	2.58
716	DT	176	DTE-178A-SGB	SGB Wall I/O Pos.10	-40	40	K	2.07	2.58
717	DT	177	DTE-223A-SGB	SGB Steam Dome Wall I/O	-40	40	K	2.07	2.58
718	DT	178	DTE-IN0861-SGB	SGB U-Tube(1,IN) Pos.1	-100	100	K	2.42	1.21
719	DT	179	DTE-EX0861-SGB	SGB U-Tube(1,EX) Pos.1	-100	100	K	2.42	1.21
720	DT	180	DTE-IN0862-SGB	SGB U-Tube(2,IN) Pos.1	-100	100	K	2.42	1.21
721	DT	181	DTE-EX0862-SGB	SGB U-Tube(2,EX) Pos.1	-100	100	K	2.42	1.21
722	DT	182	DTE-IN0863-SGB	SGB U-Tube(3,IN) Pos.1	-100	100	K	2.42	1.21
723	DT	183	DTE-EX0863-SGB	SGB U-Tube(3,EX) Pos.1	-100	100	K	2.42	1.21
724	DT	184	DTE-IN0991-SGB	SGB U-Tube(1,IN) Pos.3	-100	100	K	2.42	1.21

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
725	DT	185	DTE-EX0991-SGB	SGB U-Tube(1,EX) Pos.3	-100	100	K	2.42	1.21
726	DT	186	DTE-IN0992-SGB	SGB U-Tube(2,IN) Pos.3	-100	100	K	2.42	1.21
727	DT	187	DTE-EX0992-SGB	SGB U-Tube(2,EX) Pos.3	-100	100	K	2.42	1.21
728	DT	188	DTE-IN0993-SGB	SGB U-Tube(3,IN) Pos.3	-100	100	K	2.42	1.21
729	DT	189	DTE-EX0993-SGB	SGB U-Tube(3,EX) Pos.3	-100	100	K	2.42	1.21
730	DT	191	DTE-EX1121-SGB	SGB U-Tube(1,EX) Pos.5	-100	100	K	2.42	1.21
731	DT	192	DTE-IN1122-SGB	SGB U-Tube(2,IN) Pos.5	-100	100	K	2.42	1.21
732	DT	193	DTE-EX1122-SGB	SGB U-Tube(2,EX) Pos.5	-100	100	K	2.42	1.21
733	DT	194	DTE-IN1123-SGB	SGB U-Tube(3,IN) Pos.5	-100	100	K	2.42	1.21
734	DT	195	DTE-EX1123-SGB	SGB U-Tube(3,EX) Pos.5	-100	100	K	2.42	1.21
735	DT	196	DTE-IN1371-SGB	SGB U-Tube(1,IN) Pos.7	-100	100	K	2.42	1.21
736	DT	197	DTE-EX1371-SGB	SGB U-Tube(1,EX) Pos.7	-100	100	K	2.42	1.21
737	DT	198	DTE-IN1372-SGB	SGB U-Tube(2,IN) Pos.7	-100	100	K	2.42	1.21
738	DT	199	DTE-EX1372-SGB	SGB U-Tube(2,EX) Pos.7	-100	100	K	2.42	1.21
739	DT	201	DTE-EX1373-SGB	SGB U-Tube(3,EX) Pos.7	-100	100	K	2.42	1.21
740	DT	202	DTE-IN1632-SGB	SGB U-Tube(2,IN) Pos.9	-100	100	K	2.42	1.21
741	DT	203	DTE-EX1632-SGB	SGB U-Tube(2,EX) Pos.9	-100	100	K	2.42	1.21
742	DT	204	DTE-IN1633-SGB	SGB U-Tube(3,IN) Pos.9	-100	100	K	2.42	1.21
743	DT	205	DTE-EX1633-SGB	SGB U-Tube(3,EX) Pos.9	-100	100	K	2.42	1.21
744	DT	206	DTE-IN1701-SGB	SGB U-Tube(1,IN) Pos.10	-100	100	K	2.42	1.21
745	DT	208	DTE-IN1863-SGB	SGB U-Tube(3,IN) Pos.11	-100	100	K	2.42	1.21
746	DT	215	DTE-C046-PV	HTC Differential Temp	-150	150	K	2.90	0.97
747	DT	217	DTE-C056-PV	HTC Differential Temp	-150	150	K	2.90	0.97
748	TW	1	TWE020B-HLA	HLA Inner Surface	270	720	K	2.75	0.61
749	TW	2	TWE030B-HLA	HLA Inner Surface	270	720	K	2.75	0.61
750	TW	3	TWE050B-LSA	LSA Inner Surface	270	720	K	2.75	0.61
751	TW	4	TWE060B-PCA	PCA Inner Surface	270	720	K	2.75	0.61
752	TW	5	TWE070B-CLA	CLA Inner Surface	270	720	K	2.75	0.61
753	TW	6	TWE080B-CLA	CLA Inner Surface	270	720	K	2.75	0.61
754	TW	7	TWE160B-HLB	HLB Inner Surface	270	720	K	2.75	0.61
755	TW	8	TWE170B-HLB	HLB Inner Surface	270	720	K	2.75	0.61
756	TW	9	TWE190B-LSB	LSB Inner Surface	270	720	K	2.75	0.61
757	TW	10	TWE200B-PCB	PCB Inner Surface	270	720	K	2.75	0.61
758	TW	11	TWE210B-CLB	CLB Inner Surface	270	720	K	2.75	0.61
759	TW	12	TWE220B-CLB	CLB Inner Surface	270	720	K	2.75	0.61
760	TW	13	TWE280B-PR	Pressurizer Surge Line	270	720	K	2.75	0.61
761	TW	14	TWE431A-SGA	SGA Downcomer A Wall	270	670	K	2.63	0.66
762	TW	15	TWE432A-SGA	SGA Downcomer B Wall	270	670	K	2.63	0.66
763	TW	16	TWE433A-SGA	SGA Downcomer C Wall	270	670	K	2.63	0.66
764	TW	17	TWE434A-SGA	SGA Downcomer D Wall	270	670	K	2.63	0.66
765	TW	18	TWE471A-SGB	SGB Downcomer A Wall	270	670	K	2.63	0.66
766	TW	19	TWE472A-SGB	SGB Downcomer B Wall	270	670	K	2.63	0.66
767	TW	20	TWE473A-SGB	SGB Downcomer C Wall	270	670	K	2.63	0.66
768	TW	21	TWE474A-SGB	SGB Downcomer D Wall	270	670	K	2.63	0.66
769	TW	22	TWE-E-015B-PV	PV Inner Surf. EL.-1.5m,E	270	720	K	2.75	0.61
770	TW	23	TWE-W-015B-PV	PV Inner Surf. EL.-1.5m,W	270	720	K	2.75	0.61
771	TW	24	TWE-N000B-PV	PV Inner Surf. EL.0.0m,N	270	720	K	2.75	0.61
772	TW	25	TWE-S000B-PV	PV Inner Surf. EL.0.0m,S	270	720	K	2.75	0.61
773	TW	26	TWE-E000B-PV	PV Inner Surf. EL.0.0m,E	270	720	K	2.75	0.61
774	TW	27	TWE-W000B-PV	PV Inner Surf. EL.0.0m,W	270	720	K	2.75	0.61
775	TW	28	TWE-N018B-PV	PV Inner Surf. EL.1.8m,N	270	720	K	2.75	0.61
776	TW	29	TWE-S018B-PV	PV Inner Surf. EL.1.8m,S	270	720	K	2.75	0.61
777	TW	30	TWE-E018B-PV	PV Inner Surf. EL.1.8m,E	270	720	K	2.75	0.61
778	TW	31	TWE-W018B-PV	PV Inner Surf. EL.1.8m,W	270	720	K	2.75	0.61
779	TW	32	TWE-N036B-PV	PV Inner Surf. EL.3.6m,N	270	720	K	2.75	0.61
780	TW	33	TWE-S036B-PV	PV Inner Surf. EL.3.6m,S	270	720	K	2.75	0.61
781	TW	34	TWE-E036B-PV	PV Inner Surf. EL.3.6m,E	270	720	K	2.75	0.61
782	TW	35	TWE-W036B-PV	PV Inner Surf. EL.3.6m,W	270	720	K	2.75	0.61
783	TW	36	TWE-N060B-PV	PV Inner Surf. EL.6.0m,N	270	720	K	2.75	0.61
784	TW	37	TWE-S060B-PV	PV Inner Surf. EL.6.0m,S	270	720	K	2.75	0.61
785	TW	38	TWE-E060B-PV	PV Inner Surf. EL.6.0m,E	270	720	K	2.75	0.61
786	TW	39	TWE-W060B-PV	PV Inner Surf. EL.6.0m,W	270	720	K	2.75	0.61
787	TW	40	TWE-E080B-PV	PV Inner Surf. EL.8.0m,E	270	720	K	2.75	0.61
788	TW	41	TWE-W080B-PV	PV Inner Surf. EL.8.0m,W	270	720	K	2.75	0.61
789	TW	43	TWE-S000D-CB	CB Outer Surf. EL.0.0m,S	270	970	K	3.49	0.50
790	TW	44	TWE-E000D-CB	CB Outer Surf. EL.0.0m,E	270	970	K	3.49	0.50
791	TW	45	TWE-W000D-CB	CB Outer Surf. EL.0.0m,W	270	970	K	3.49	0.50
792	TW	50	TWE-N018D-CB	CB Outer Surf. EL.1.8m,N	270	970	K	3.49	0.50
793	TW	51	TWE-S018D-CB	CB Outer Surf. EL.1.8m,S	270	970	K	3.49	0.50
794	TW	52	TWE-E018D-CB	CB Outer Surf. EL.1.8m,E	270	970	K	3.49	0.50
795	TW	53	TWE-W018D-CB	CB Outer Surf. EL.1.8m,W	270	970	K	3.49	0.50
796	TW	57	TWE-W026D-CB	CB Outer Surf. EL.2.6m,W	270	970	K	3.49	0.50
797	TW	58	TWE-N036D-CB	CB Outer Surf. EL.3.6m,N	270	970	K	3.49	0.50
798	TW	59	TWE-S036D-CB	CB Outer Surf. EL.3.6m,S	270	970	K	3.49	0.50
799	TW	60	TWE-E036D-CB	CB Outer Surf. EL.3.6m,E	270	970	K	3.49	0.50
800	TW	61	TWE-W036D-CB	CB Outer Surf. EL.3.6m,W	270	970	K	3.49	0.50
801	TW	62	TWE-N049D-CB	CB Outer Surf. EL.4.9m,N	270	970	K	3.49	0.50
802	TW	63	TWE-S049D-CB	CB Outer Surf. EL.4.9m,S	270	970	K	3.49	0.50
803	TW	64	TWE-E049D-CB	CB Outer Surf. EL.4.9m,E	270	970	K	3.49	0.50
804	TW	65	TWE-W049D-CB	CB Outer Surf. EL.4.9m,W	270	970	K	3.49	0.50

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
805	TW	66	TWE-N060D-CB	CB Outer Surf. EL.6.0m,N	270	970	K	3.49	0.50
806	TW	67	TWE-S060D-CB	CB Outer Surf. EL.6.0m,S	270	970	K	3.49	0.50
807	TW	68	TWE-E060D-CB	CB Outer Surf. EL.6.0m,E	270	970	K	3.49	0.50
808	TW	69	TWE-W060D-CB	CB Outer Surf. EL.6.0m,W	270	970	K	3.49	0.50
809	TW	70	TWE-N000E-CB	CB Inner Surf. EL.0.0m,N	270	970	K	3.49	0.50
810	TW	71	TWE-S000E-CB	CB Inner Surf. EL.0.0m,S	270	970	K	3.49	0.50
811	TW	72	TWE-E000E-CB	CB Inner Surf. EL.0.0m,E	270	970	K	3.49	0.50
812	TW	73	TWE-W000E-CB	CB Inner Surf. EL.0.0m,W	270	970	K	3.49	0.50
813	TW	78	TWE-N018E-CB	CB Inner Surf. EL.1.8m,N	270	970	K	3.49	0.50
814	TW	79	TWE-S018E-CB	CB Inner Surf. EL.1.8m,S	270	970	K	3.49	0.50
815	TW	80	TWE-E018E-CB	CB Inner Surf. EL.1.8m,E	270	970	K	3.49	0.50
816	TW	81	TWE-W018E-CB	CB Inner Surf. EL.1.8m,W	270	970	K	3.49	0.50
817	TW	86	TWE-N036E-CB	CB Inner Surf. EL.3.6m,N	270	970	K	3.49	0.50
818	TW	87	TWE-S036E-CB	CB Inner Surf. EL.3.6m,S	270	970	K	3.49	0.50
819	TW	88	TWE-E036E-CB	CB Inner Surf. EL.3.6m,E	270	970	K	3.49	0.50
820	TW	92	TWE-E049E-CB	CB Inner Surf. EL.4.9m,E	270	970	K	3.49	0.50
821	TW	94	TWE-N060E-CB	CB Inner Surf. EL.6.0m,N	270	970	K	3.49	0.50
822	TW	95	TWE-S060E-CB	CB Inner Surf. EL.6.0m,S	270	970	K	3.49	0.50
823	TW	96	TWE-E060E-CB	CB Inner Surf. EL.6.0m,E	270	970	K	3.49	0.50
824	TW	97	TWE-W060E-CB	CB Inner Surf. EL.6.0m,W	270	970	K	3.49	0.50
825	TW	108	TWE-063-B09-UCSP	UCSP L.Surf. EL.6.3m,B09	270	970	K	3.49	0.50
826	TW	109	TWE-065-B09-UCSP	UCSP U.Surf. EL.6.5m,B09	270	970	K	3.49	0.50
827	TW	110	TWE-E047G-UP	UP Str. Surf. EL.4.7m,East	270	970	K	3.49	0.50
828	TW	111	TWE-W047G-UP	UP Str. Surf. EL.4.7m,West	270	970	K	3.49	0.50
829	TW	112	TWE-E056G-UP	UP Str. Surf. EL.5.6m,East	270	970	K	3.49	0.50
830	TW	113	TWE-W056G-UP	UP Str. Surf. EL.5.6m,West	270	970	K	3.49	0.50
831	TW	114	TWE-080G-UH	UH Str. Surf. EL.8.0m,CTR	270	970	K	3.49	0.50
832	TW	154	TWE-B03436	B03 Rod(4,3) Pos.6	270	1470	K	5.31	0.44
833	TW	155	TWE-B03438	B03 Rod(4,3) Pos.8	270	1470	K	5.31	0.44
834	TW	217	TWE-B08222	B08 Rod(2,2) Pos.2	270	970	K	5.31	0.44
835	TW	218	TWE-B08224	B08 Rod(2,2) Pos.4	270	970	K	5.31	0.44
836	TW	219	TWE-B08225	B08 Rod(2,2) Pos.5	270	970	K	5.31	0.44
837	TW	220	TWE-B08226	B08 Rod(2,2) Pos.6	270	970	K	5.31	0.44
838	TW	222	TWE-B08228	B08 Rod(2,2) Pos.8	270	970	K	5.31	0.44
839	TW	225	TWE-B08435	B08 Rod(4,3) Pos.5	270	1470	K	5.31	0.44
840	TW	227	TWE-B08437	B08 Rod(4,3) Pos.7	270	1470	K	5.31	0.44
841	TW	236	TWE-B10442	B10 Rod(4,4) Pos.2	270	1470	K	5.31	0.44
842	TW	237	TWE-B10444	B10 Rod(4,4) Pos.4	270	1470	K	5.31	0.44
843	TW	239	TWE-B10447	B10 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
844	TW	259	TWE-B12262	B12 Rod(2,6) Pos.2	270	970	K	5.31	0.44
845	TW	260	TWE-B12264	B12 Rod(2,6) Pos.4	270	970	K	5.31	0.44
846	TW	261	TWE-B12265	B12 Rod(2,6) Pos.5	270	970	K	5.31	0.44
847	TW	262	TWE-B12266	B12 Rod(2,6) Pos.6	270	970	K	5.31	0.44
848	TW	264	TWE-B12268	B12 Rod(2,6) Pos.8	270	970	K	5.31	0.44
849	TW	283	TWE-B13442	B13 Rod(4,4) Pos.2	270	1470	K	5.31	0.44
850	TW	284	TWE-B13444	B13 Rod(4,4) Pos.4	270	1470	K	5.31	0.44
851	TW	286	TWE-B13446	B13 Rod(4,4) Pos.6	270	1470	K	5.31	0.44
852	TW	287	TWE-B13447	B13 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
853	TW	288	TWE-B13448	B13 Rod(4,4) Pos.8	270	1470	K	5.31	0.44
854	TW	339	TWE-B17445	B17 Rod(4,4) Pos.5	270	1470	K	5.31	0.44
855	TW	341	TWE-B17447	B17 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
856	TW	391	TWE-B21662	B21 Rod(6,6) Pos.2	270	1470	K	5.31	0.44
857	TW	392	TWE-B21664	B21 Rod(6,6) Pos.4	270	1470	K	5.31	0.44
858	TW	394	TWE-B21666	B21 Rod(6,6) Pos.6	270	1470	K	5.31	0.44
859	TW	395	TWE-B21667	B21 Rod(6,6) Pos.7	270	1470	K	5.31	0.44
860	TW	409	TWE-B22441	B22 Rod(4,4) Pos.1	270	1470	K	5.31	0.44
861	TW	410	TWE-B22443	B22 Rod(4,4) Pos.3	270	1470	K	5.31	0.44
862	TW	411	TWE-B22445	B22 Rod(4,4) Pos.5	270	1470	K	5.31	0.44
863	TW	414	TWE-B22449	B22 Rod(4,4) Pos.9	270	1470	K	5.31	0.44
864	TW	457	TWE-IN0641-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
865	TW	459	TWE-IN0643-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
866	TW	463	TWE-086B-SGA	SGA Inner Surf. Pos.1	270	670	K	2.63	0.66
867	TW	464	TWE-137B-SGA	SGA Inner Surf. Pos.7	270	670	K	2.63	0.66
868	TW	465	TWE-178B-SGA	SGA Inner Surf. Pos.10	270	670	K	2.63	0.66
869	TW	466	TWE-223B-SGA	SGA Inner Surf.	270	670	K	2.63	0.66
870	TW	467	TWE-IN0861-SGA	SGA U-Tube(1,IN) Pos.1	270	720	K	2.75	0.61
871	TW	468	TWE-EX0861-SGA	SGA U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
872	TW	469	TWE-IN0862-SGA	SGA U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
873	TW	470	TWE-EX0862-SGA	SGA U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
874	TW	471	TWE-IN0863-SGA	SGA U-Tube(3,IN) Pos.1	270	720	K	2.75	0.61
875	TW	472	TWE-EX0863-SGA	SGA U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
876	TW	473	TWE-IN0991-SGA	SGA U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
877	TW	474	TWE-EX0991-SGA	SGA U-Tube(1,EX) Pos.3	270	720	K	2.75	0.61
878	TW	475	TWE-IN0992-SGA	SGA U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
879	TW	476	TWE-EX0992-SGA	SGA U-Tube(2,EX) Pos.3	270	720	K	2.75	0.61
880	TW	477	TWE-IN0993-SGA	SGA U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
881	TW	478	TWE-EX0993-SGA	SGA U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
882	TW	479	TWE-IN1121-SGA	SGA U-Tube(1,IN) Pos.5	270	720	K	2.75	0.61
883	TW	480	TWE-EX1121-SGA	SGA U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
884	TW	481	TWE-IN1122-SGA	SGA U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
885	TW	482	TWE-EX1122-SGA	SGA U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
886	TW 483	TWE-IN1123-SGA	SGA U-Tube(3,IN) Pos.5	270	720	K	2.75	0.61
887	TW 484	TWE-EX1123-SGA	SGA U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
888	TW 485	TWE-IN1371-SGA	SGA U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
889	TW 486	TWE-EX1371-SGA	SGA U-Tube(1,EX) Pos.7	270	720	K	2.75	0.61
890	TW 487	TWE-IN1372-SGA	SGA U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
891	TW 488	TWE-EX1372-SGA	SGA U-Tube(2,EX) Pos.7	270	720	K	2.75	0.61
892	TW 489	TWE-IN1373-SGA	SGA U-Tube(3,IN) Pos.7	270	720	K	2.75	0.61
893	TW 490	TWE-EX1373-SGA	SGA U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
894	TW 491	TWE-IN1632-SGA	SGA U-Tube(2,IN) Pos.9	270	720	K	2.75	0.61
895	TW 492	TWE-EX1632-SGA	SGA U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
896	TW 493	TWE-IN1633-SGA	SGA U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
897	TW 494	TWE-EX1633-SGA	SGA U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
898	TW 495	TWE-IN1701-SGA	SGA U-Tube(1,IN) Pos.10	270	720	K	2.75	0.61
899	TW 496	TWE-IN1782-SGA	SGA U-Tube(2,IN) Pos.10	270	720	K	2.75	0.61
900	TW 497	TWE-IN1863-SGA	SGA U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
901	TW 498	TWE-IN0641-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
902	TW 499	TWE-IN0642-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
903	TW 500	TWE-IN0643-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
904	TW 504	TWE-086B-SGB	SGB Inner Surf. Pos.1	270	670	K	2.63	0.66
905	TW 505	TWE-137B-SGB	SGB Inner Surf. Pos.7	270	670	K	2.63	0.66
906	TW 506	TWE-178B-SGB	SGB Inner Surf. Pos.10	270	670	K	2.63	0.66
907	TW 507	TWE-223B-SGB	SGB Inner Surf.	270	670	K	2.63	0.66
908	TW 508	TWE-IN0861-SGB	SGB U-Tube(1,IN) Pos.1	270	720	K	2.75	0.61
909	TW 509	TWE-EX0861-SGB	SGB U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
910	TW 510	TWE-IN0862-SGB	SGB U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
911	TW 511	TWE-EX0862-SGB	SGB U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
912	TW 512	TWE-IN0863-SGB	SGB U-Tube(3,IN) Pos.1	270	720	K	2.75	0.61
913	TW 513	TWE-EX0863-SGB	SGB U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
914	TW 514	TWE-IN0991-SGB	SGB U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
915	TW 515	TWE-EX0991-SGB	SGB U-Tube(1,EX) Pos.3	270	720	K	2.75	0.61
916	TW 516	TWE-IN0992-SGB	SGB U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
917	TW 517	TWE-EX0992-SGB	SGB U-Tube(2,EX) Pos.3	270	720	K	2.75	0.61
918	TW 518	TWE-IN0993-SGB	SGB U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
919	TW 519	TWE-EX0993-SGB	SGB U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
920	TW 520	TWE-IN1121-SGB	SGB U-Tube(1,IN) Pos.5	270	720	K	2.75	0.61
921	TW 521	TWE-EX1121-SGB	SGB U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
922	TW 522	TWE-IN1122-SGB	SGB U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
923	TW 523	TWE-EX1122-SGB	SGB U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61
924	TW 524	TWE-IN1123-SGB	SGB U-Tube(3,IN) Pos.5	270	720	K	2.75	0.61
925	TW 525	TWE-EX1123-SGB	SGB U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
926	TW 526	TWE-IN1371-SGB	SGB U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
927	TW 527	TWE-EX1371-SGB	SGB U-Tube(1,EX) Pos.7	270	720	K	2.75	0.61
928	TW 528	TWE-IN1372-SGB	SGB U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
929	TW 529	TWE-EX1372-SGB	SGB U-Tube(2,EX) Pos.7	270	720	K	2.75	0.61
930	TW 530	TWE-IN1373-SGB	SGB U-Tube(3,IN) Pos.7	270	720	K	2.75	0.61
931	TW 531	TWE-EX1373-SGB	SGB U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
932	TW 532	TWE-IN1632-SGB	SGB U-Tube(2,IN) Pos.9	270	720	K	2.75	0.61
933	TW 533	TWE-EX1632-SGB	SGB U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
934	TW 534	TWE-IN1633-SGB	SGB U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
935	TW 535	TWE-EX1633-SGB	SGB U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
936	TW 536	TWE-IN1701-SGB	SGB U-Tube(1,IN) Pos.10	270	720	K	2.75	0.61
937	TW 537	TWE-IN1782-SGB	SGB U-Tube(2,IN) Pos.10	270	720	K	2.75	0.61
938	TW 538	TWE-IN1863-SGB	SGB U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
939	TW 545	TWE270A-PR	PZR Spray Line Outer Surf.	270	720	K	2.75	0.61
940	TW 598	TWE-121D-UHDP	PLR-UH-9 Outer Surf.	270	970	K	3.49	0.50
941	TW 631	TWE-B01225	B01 Rod(2,2) Pos.5	270	1470	K	6.32	0.53
942	TW 635	TWE-B04221	B04 Rod(2,2) Pos.1	270	970	K	3.69	0.53
943	TW 638	TWE-B04226	B04 Rod(2,2) Pos.6	270	970	K	3.69	0.53
944	TW 640	TWE-B04229	B04 Rod(2,2) Pos.9	270	970	K	3.69	0.53
945	TW 649	TWE-B11225	B11 Rod(2,2) Pos.5	270	1470	K	6.32	0.53
946	TW 650	TWE-B11226	B11 Rod(2,2) Pos.6	270	1470	K	6.32	0.53
947	TW 653	TWE-B16221	B16 Rod(2,2) Pos.1	270	970	K	3.69	0.53
948	TW 654	TWE-B16223	B16 Rod(2,2) Pos.3	270	970	K	3.69	0.53
949	TW 656	TWE-B16226	B16 Rod(2,2) Pos.6	270	970	K	3.69	0.53
950	TW 658	TWE-B16229	B16 Rod(2,2) Pos.9	270	970	K	3.69	0.53
951	TW 673	TWE-EN037B-PV	PV East-North EL.3662	270	630	K	3.05	0.85
952	TW 674	TWE-E037B-PV	PV East EL.3662	270	630	K	3.05	0.85
953	TW 676	TWE-EN040B-PV	PV East-North EL.4037	270	630	K	3.05	0.85
954	TW 678	TWE-ES040B-PV	PV East-South EL.4037	270	630	K	3.05	0.85
955	TW 679	TWE-E042B-PV	PV East EL.4210	270	630	K	3.05	0.85
956	TW 680	TWE-WN037B-PV	PV West-North EL.3662	270	630	K	3.05	0.85
957	TW 681	TWE-W037B-PV	PV West EL.3662	270	630	K	3.05	0.85
958	TW 682	TWE-WS037B-PV	PV West-South EL.3662	270	630	K	3.05	0.85
959	TW 685	TWE-WS040B-PV	PV West-South EL.4037	270	630	K	3.05	0.85
960	TW 687	TWE-SW045B-PV	PV South-West EL.4497	270	630	K	3.05	0.85
961	TW 688	TWE-S045B-PV	PV South EL.4497	270	630	K	3.05	0.85
962	TW 689	TWE-SE045B-PV	PV South-East EL.4497	270	630	K	3.05	0.85
963	TW 690	TWE-SW051B-PV	PV South-West EL.5074	270	630	K	3.05	0.85
964	TW 691	TWE-S051B-PV	PV South EL.5074	270	630	K	3.05	0.85
965	TW 692	TWE-SE051B-PV	PV South-East EL.5074	270	630	K	3.05	0.85
966	TW 693	TWE-S054B-PV	PV South EL.5363	270	630	K	3.05	0.85

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
967	TW	694	TWE-NE045B-PV	PV North-East EL.4497	270	630	K	3.05	0.85
968	TW	696	TWE-NW045B-PV	PV North-West EL.4497	270	630	K	3.05	0.85
969	TW	697	TWE-NE051B-PV	PV North-East EL.5074	270	630	K	3.05	0.85
970	TW	698	TWE-N051B-PV	PV North EL.5074	270	630	K	3.05	0.85
971	TW	700	TWE-N054B-PV	PV North EL.5363	270	630	K	3.05	0.85
972	TW	709	TWE-IN038B02-UCP	UCP L.Surf. EL.3.8m,B02	270	970	K	3.49	0.50
973	TW	710	TWE-IN038B04-UCP	UCP L.Surf. EL.3.8m,B04	270	970	K	3.49	0.50
974	TW	711	TWE-IN038B06-UCP	UCP L.Surf. EL.3.8m,B06	270	970	K	3.49	0.50
975	TW	712	TWE-IN038B08-UCP	UCP L.Surf. EL.3.8m,B08	270	970	K	3.49	0.50
976	TW	713	TWE-IN038B21-UCP	UCP L.Surf. EL.3.8m,B21	270	970	K	3.49	0.50
977	TW	714	TWE-EX040B02-UCP	UCP U.Surf. EL.4.0m,B02	270	970	K	3.49	0.50
978	TW	715	TWE-EX040B04-UCP	UCP U.Surf. EL.4.0m,B04	270	970	K	3.49	0.50
979	TW	716	TWE-EX040B06-UCP	UCP U.Surf. EL.4.0m,B06	270	970	K	3.49	0.50
980	TW	717	TWE-EX040B08-UCP	UCP U.Surf. EL.4.0m,B08	270	970	K	3.49	0.50
981	TW	718	TWE-EX040B21-UCP	UCP U.Surf. EL.4.0m,B21	270	970	K	3.49	0.50
982	TW	727	TWE-B03437	B03 Rod(4,3) Pos.7	270	1470	K	5.31	0.44
983	TW	732	TWE-B08431	B08 Rod(4,3) Pos.1	270	1470	K	5.31	0.44
984	TW	733	TWE-B08433	B08 Rod(4,3) Pos.3	270	1470	K	5.31	0.44
985	TW	734	TWE-B08439	B08 Rod(4,3) Pos.9	270	1470	K	5.31	0.44
986	TW	739	TWE-B10446	B10 Rod(4,4) Pos.6	270	1470	K	5.31	0.44
987	TW	740	TWE-B10448	B10 Rod(4,4) Pos.8	270	1470	K	5.31	0.44
988	TW	757	TWE-B17441	B17 Rod(4,4) Pos.1	270	1470	K	5.31	0.44
989	TW	758	TWE-B17443	B17 Rod(4,4) Pos.3	270	1470	K	5.31	0.44
990	TW	759	TWE-B17449	B17 Rod(4,4) Pos.9	270	1470	K	5.31	0.44
991	TW	768	TWE-B22447	B22 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
992	TW	773	TWE211A-PR	PZR Wall DL.2025	270	720	K	2.75	0.61
993	TW	774	TWE211B-PR	PZR Wall DL.4238	270	720	K	2.75	0.61
994	TW	775	TWE211C-PR	PZR Wall DL.5995	270	720	K	2.75	0.61
995	TW	776	TWE211D-PR	PZR Wall DL.7965	270	720	K	2.75	0.61
996	TW	777	TWE211E-PR	PZR Wall DL.9795	270	720	K	2.75	0.61
997	TW	778	TWE211F-PR	PZR Wall DL.11321	270	720	K	2.75	0.61
998	TW	779	TWE678-ACC	Acc-Cold Tank Wall	270	720	K	2.75	0.61
999	TW	780	TWE688-ACH	Acc-Hot Tank Wall	270	720	K	2.75	0.61
1000	TW	783	TWE-A80-ADS	RSV(1-3) Line	270	720	K	2.75	0.61
1001	TW	845	TWE111A-PR	PZR Outer Wall DL.-289	270	720	K	2.75	0.61
1002	TW	846	TWE115A-PR	PZR Outer Wall DL.105	270	720	K	2.75	0.61
1003	TW	847	TWE189A-PR	PZR Outer Wall DL.7219	270	720	K	2.75	0.61
1004	TW	848	TWE198A-PR	PZR Outer Wall DL.8417	270	720	K	2.75	0.61
1005	TW	849	TWE-022A-PV	PV Outer Wall EL.-2245	270	720	K	2.75	0.61
1006	TW	850	TWE-027A-PV	PV Outer Wall EL.-2657	270	720	K	2.75	0.61
1007	TW	851	TWE-028A-PV	PV Outer Wall EL.-2677	270	720	K	2.75	0.61
1008	TW	852	TWE731A-HLA	HLA Outer Wall	270	720	K	2.75	0.61
1009	TW	853	TWE078A-SGA	SGA Outer Wall DL.-161	270	670	K	2.63	0.66
1010	TW	854	TWE245A-SGA	SGA Outer Wall DL.16572	270	670	K	2.63	0.66
1011	TW	859	TWE-A82-ADS	RSV123 Spool Piece	270	720	K	2.75	0.61
1012	TW	860	TWE-A83-ADS	RSV1 Orifice	270	720	K	2.75	0.61
1013	TW	862	TWE-A84-ADS	RSV AOV81 Body Wall	270	720	K	2.75	0.61
1014	TW	863	TWE-A85-ADS	RSV AOV81 Outer Frame	270	720	K	2.75	0.61
1015	TW	864	TWE292-PR	PZR VP-Line Pipe Wall	270	720	K	2.75	0.61
1016	TW	865	TWE442-SGA	SGA 8B MSL Pipe Wall	270	570	K	2.42	0.81
1017	TW	866	TWE441-SGA	SGA 8B MSL Support	270	570	K	2.42	0.81
1018	TW	867	TWE444-SGA	SGA 3B MSL Pipe Wall	270	570	K	2.42	0.81
1019	TW	868	TWE445-SGA	SGA 3B MSL Support	270	570	K	2.42	0.81
1020	TW	869	TWE446-SGA	SGA MSIV Body Wall	270	570	K	2.42	0.81
1021	TW	870	TWE447-SGA	SGA MSIV Outer Frame	270	570	K	2.42	0.81
1022	TW	871	TWE443-SGA	SGA BU-Line Pipe Wall	270	570	K	2.42	0.81
1023	TW	873	TWE-B03432	B03 Rod(4,3) Pos.2	270	1470	K	6.32	0.53
1024	TW	874	TWE-B03434	B03 Rod(4,3) Pos.4	270	1470	K	6.32	0.53
1025	FE	1	FE010-HLA	HLA Leakage (Normal)	0	0.4	kg/s	0.01	1.54
1026	FE	2	FE020A-LSA	Primary Loop LSA (High)	0	90	kg/s	1.25	1.39
1027	FE	3	FE020B-LSA	Primary Loop LSA (Low)	0	15.81	kg/s	0.22	1.37
1028	FE	4	FE150-HLB	HLB Leakage (Normal)	0	0.4	kg/s	0.01	1.54
1029	FE	5	FE160A-LSB	Primary Loop LSB (High)	0	90	kg/s	1.25	1.39
1030	FE	6	FE160B-LSB	Primary Loop LSB (Low)	0	15.81	kg/s	0.22	1.37
1031	FE	13	FE430-SGA	SGA Feedwater	0	4	kg/s	0.05	1.35
1032	FE	14	FE431-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1033	FE	15	FE432-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1034	FE	16	FE433-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1035	FE	17	FE434-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1036	FE	18	FE440-SGA	SGA Steam Line	0	5	kg/s	0.10	2.04
1037	FE	19	FE450-SGA	SGA Relief Valve Line	0	4	kg/s	0.07	1.82
1038	FE	21	FE470-SGB	SGB Feedwater	0	4	kg/s	0.05	1.35
1039	FE	22	FE471-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1040	FE	23	FE472-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1041	FE	24	FE473-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1042	FE	25	FE474-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1043	FE	26	FE480-SGB	SGB Steam Line	0	5	kg/s	0.10	2.04
1044	FE	27	FE490-SGB	SGB Relief Valve Line	0	4	kg/s	0.07	1.82
1045	FE	29	FE510-SH	Main-Steam Header	0	10	kg/s	0.22	2.16
1046	FE	31	FE560A-BU	BU-1 Venturi (High)	0	70	kg/s	1.12	1.61

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
1047	FE	35	FE580-ST	ST Vent Line	0	0.3	kg/s	–	–
1048	FE	36	FE590-ST	ST Bleed Line	0	20	kg/s	–	–
1049	FE	48	FE820-PL	RHR Outlet (High)	0	15	kg/s	0.24	1.62
1050	FE	49	FE830-PL	LPI Flow to CLA (High)	0	15	kg/s	0.24	1.62
1051	FE	50	FE840-PL	LPI Flow to CLB (High)	0	15	kg/s	0.24	1.62
1052	FE	62	FE010B-HLA	HLA Leakage (Reverse)	0	0.4	kg/s	0.01	1.53
1053	FE	63	FE150B-HLB	HLB Leakage (Reverse)	0	0.4	kg/s	0.01	1.53
1054	FE	65	FE440B-SGA	SGA Main Steam Line (Low)	0	1	kg/s	0.02	2.04
1055	FE	67	FE480B-SGB	SGB Main Steam Line (Low)	0	1	kg/s	0.02	2.04
1056	PE	1	PE561-BU	BU-1 Venturi	0	20	MPa	0.1077	0.54
1057	PE	3	PE010-SGA	SGA Inlet Plenum	0	20	MPa	0.1077	0.54
1058	PE	4	PE020-LSA	PCA Suction	0	20	MPa	0.1077	0.54
1059	PE	5	PE030-CLA	PCA Delivery	0	20	MPa	0.1077	0.54
1060	PE	6	PE150-SGB	SGB Inlet Plenum	0	20	MPa	0.1077	0.54
1061	PE	7	PE160-LSB	PCB Suction	0	20	MPa	0.1077	0.54
1062	PE	8	PE170-CLB	PCB Delivery	0	20	MPa	0.1077	0.54
1063	PE	9	PE290-PV	PV Upper Head	0	20	MPa	0.1077	0.54
1064	PE	10	PE280A-PV	PV Upper Plenum (High)	0	20	MPa	0.1077	0.54
1065	PE	11	PE280B-PV	PV Upper Plenum (Low)	0	5	MPa	0.0269	0.54
1066	PE	12	PE270-PV	PV Lower Plenum	0	20	MPa	0.1077	0.54
1067	PE	19	PE430-SGA	SGA Steam Dome	0	10	MPa	0.0539	0.54
1068	PE	20	PE440-SGA	SGA Steam Line	0	10	MPa	0.0539	0.54
1069	PE	21	PE450-SGB	SGB Steam Dome	0	10	MPa	0.0539	0.54
1070	PE	22	PE460-SGB	SGB Steam Line	0	10	MPa	0.0539	0.54
1071	PE	23	PE470-SH	Main-Steam Header	0	10	MPa	0.0539	0.54
1072	PE	24	PE480-JC	Jet Condenser	0	10	MPa	0.0539	0.54
1073	PE	25	PE610-ST	Break Flow Supp. Tank	0	1	MPa	0.0032	0.32
1074	PE	26	PE560-BU	BU-1 Orifice Upstream	0	20	MPa	0.1077	0.54
1075	PE	27	PE570-BU	BU-1 Orifice Downstream	0	20	MPa	0.1077	0.54
1076	PE	30	PE600-ST	Break-Flow Blowdown Line	0	2	MPa	0.0064	0.32
1077	PE	31	PE650-ACC	Acc-Cold Tank	0	10	MPa	0.0539	0.54
1078	PE	32	PE660-ACH	Acc-Hot Tank	0	10	MPa	0.0539	0.54
1079	PE	35	PE011-HLA	HLA Spool Piece	0	20	MPa	0.1077	0.54
1080	PE	36	PE071-CLA	CLA Spool Piece	0	20	MPa	0.1077	0.54
1081	PE	37	PE151-HLB	HLB Spool Piece	0	20	MPa	0.1077	0.54
1082	PE	38	PE211-CLB	CLB Spool Piece	0	20	MPa	0.1077	0.54
1083	PE	43	PE571-BU	RSV123 Inlet	0	20	MPa	0.1118	0.56
1084	PE	44	PE591-BU	Break Spool Piece	0	20	MPa	0.1118	0.56
1085	PE	46	PE820-RHR	PL Delivery	0	20	MPa	0.1077	0.54
1086	PE	62	PE-A50-DVIA	PV-DCA ECCS Line	0	20	MPa	0.0641	0.32
1087	PE	63	PE-A51-DVIA	PV-DCA ECCS Line	0	20	MPa	0.0641	0.32
1088	PE	64	PE-A55-DVIB	PV-DCB ECCS Line	0	20	MPa	0.0641	0.32
1089	PE	65	PE-A56-DVIB	PV-DCB ECCS Line	0	20	MPa	0.0641	0.32
1090	PE	73	PE-A83-ADS	RSV3 R.O Downstream	0	20	MPa	0.1077	0.54
1091	PE	76	PE280C-PV	PV Upper Plenum (Low)	0	0.5	MPa	0.0013	0.27
1092	PE	78	PE435-SGA	SGA Steam Dome	0	10	MPa	0.0224	0.22
1093	PE	79	PE455-SGB	SGB Steam Dome	0	10	MPa	0.0224	0.22
1094	MI	1	RE010-PCA	PCA (Rotational Speed)	0	70	rps	0.39	0.55
1095	MI	2	RE150-PCB	PCB (Rotational Speed)	0	70	rps	0.39	0.55
1096	MI	5	OPE430-SGA	SGA Feedwater (FCV430)	0	100	%	0.54	0.54
1097	MI	6	OPE470-SGB	SGB Feedwater (FCV470)	0	100	%	0.54	0.54
1098	MI	8	OPE510-SH	Steam Flow (FCV510)	0	100	%	0.54	0.54
1099	MI	11	VBE010-PCA	PCA (Vibration)	0	200	um	0.10	5.01
1100	MI	12	VBE150-PCB	PCB (Vibration)	0	200	um	0.10	5.01
1101	MI	13	TQE010-PCA	PCA (Torque)	0	100	Nm	1.60	1.60
1102	MI	14	TQE150-PCB	PCB (Torque)	0	100	Nm	1.60	1.60
1103	MI	15	AE010-PCA	PCA (Electric Current)	0	150	A	1.56	1.04
1104	MI	16	AE150-PCB	PCB (Electric Current)	0	150	A	1.56	1.04
1105	MI	17	WE270A-T	Total Core Power	0	16	MW	0.07	0.44
1106	MI	18	WE270B-M	Core Power (Mid. Flux)	0	2	MW	0.01	0.44
1107	MI	19	WE270C-H1	Core Power (High Flux 1)	0	4	MW	0.02	0.44
1108	MI	20	WE270D-H2	Core Power (High Flux 2)	0	4	MW	0.02	0.44
1109	MI	21	WE270E-L1	Core Power (Low Flux 1)	0	2	MW	0.01	0.44
1110	MI	22	WE270F-L2	Core Power (Low Flux 2)	0	2	MW	0.01	0.44
1111	MI	23	WE270G-L3	Core Power (Low Flux 3)	0	2	MW	0.01	0.44
1112	MI	24	WE280A-PR	PZR Proportional Heater	0	10	kW	0.04	0.39
1113	MI	25	WE280B-PR	PZR Base Heater	0	150	kW	0.59	0.39
1114	MI	26	WE010-PCA	PCA Power	0	30	kW	–	–
1115	MI	27	WE150-PCB	PCB Power	0	30	kW	–	–
1116	MI	29	WE020-HLA	HLA Heater Power	0	5	kW	0.01	1.50
1117	MI	30	WE030-LSA	LSA Heater Power	0	7.5	kW	0.01	1.50
1118	MI	31	WE040-CLA	CLA Heater Power	0	2	kW	0.003	1.50
1119	MI	32	WE160-HLB	HLB Heater Power	0	5	kW	0.01	1.50
1120	MI	33	WE170-LSB	LSB Heater Power	0	7.5	kW	0.01	1.50
1121	MI	34	WE180-CLB	CLB Heater Power	0	2	kW	0.003	1.50
1122	MI	35	WE271A-PV	PV Heater Power	0	15	kW	0.02	1.50
1123	MI	36	WE271B-PV	PV Heater Power	0	15	kW	0.02	1.50
1124	MI	37	WE271C-PV	PV Heater Power	0	15	kW	0.02	1.50
1125	MI	38	WE271D-PV	PV Heater Power	0	15	kW	0.02	1.50

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
1126	MI	39	WE430A-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1127	MI	40	WE430B-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1128	MI	41	WE430C-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1129	MI	42	WE430D-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1130	MI	43	WE440A-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1131	MI	44	WE440B-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1132	MI	45	WE440C-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1133	MI	46	WE440D-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1134	MI	47	WE290-PR	PZR Surge Line Heater Power	0	4	kW	0.01	1.50
1135	MI	48	WE300-PR	PZR Spray Line Heater Power	0	7.5	kW	0.01	1.50
1136	MI	49	WE450A-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1137	MI	50	WE450B-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1138	MI	51	WE450C-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1139	MI	52	WE450D-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1140	MI	53	WE460A-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1141	MI	54	WE460B-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1142	MI	55	WE460C-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1143	MI	56	WE460D-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1144	LE	1	LE270-PV	PV	0	11	m	0.29	2.68
1145	LE	3	LE430-SGA	SGA Wide Range	0	17	m	0.38	2.26
1146	LE	4	LE440-SGA	SGA Narrow Range	0	6	m	0.14	2.32
1147	LE	5	LE441-SGA	SGA Boiling Section	0	11	m	0.25	2.27
1148	LE	6	LE450-SGB	SGB Wide Range	0	17	m	0.38	2.26
1149	LE	7	LE460-SGB	SGB Narrow Range	0	6	m	0.14	2.32
1150	LE	8	LE461-SGB	SGB Boiling Section	0	11	m	0.25	2.27
1151	LE	9	LE470-JC	Jet Condenser	0	5.5	m	0.13	2.33
1152	LE	10	LE560-ST	ST Wide Range	0	12	m	0.27	2.26
1153	LE	11	LE570-ST	ST Low Level	0	4	m	0.09	2.25
1154	LE	12	LE580-ST	ST Middle Level	0	4	m	0.11	2.65
1155	LE	13	LE590-ST	ST High Level	0	4	m	0.11	2.65
1156	LE	14	LE650-ACC	Acc-Cold Tank	0	5.5	m	0.12	2.25
1157	LE	15	LE660-ACH	Acc-Hot Tank	0	5.5	m	0.15	2.65
1158	LE	17	LE830-RWST	RWST Overall	0	10	m	−	−
1159	LE	18	LE442-SGA	SGA Downcomer	0	12	m	0.27	2.25
1160	LE	19	LE462-SGB	SGB Downcomer	0	12	m	0.27	2.25
1161	LE	20	DLE270-PV	PV Overall	0	111.06	kPa	1.07	0.96
1162	LE	22	DLE430-SGA	SGA Wide Range	0	171.64	kPa	0.69	0.40
1163	LE	23	DLE440-SGA	SGA Narrow-Range	0	60.58	kPa	0.57	0.93
1164	LE	24	DLE441-SGA	SGA Boiling Section	0	111.06	kPa	0.61	0.55
1165	LE	25	DLE442-SGA	SGA Downcomer	0	114.27	kPa	0.62	0.54
1166	LE	26	DLE450-SGB	SGB Wide Range	0	171.64	kPa	0.69	0.40
1167	LE	27	DLE460-SGB	SGB Narrow-Range	0	60.58	kPa	0.57	0.93
1168	LE	28	DLE461-SGB	SGB Boiling Section	0	111.06	kPa	0.61	0.55
1169	LE	29	DLE462-SGB	SGB Downcomer	0	114.27	kPa	0.62	0.54
1170	LE	30	DLE470-JC	JC	0	55.53	kPa	0.56	1.01
1171	LE	31	DLE560-ST	ST Overall Level	0	121.16	kPa	0.59	0.49
1172	LE	32	DLE570-ST	ST Lower Region	0	40.39	kPa	0.16	0.40
1173	LE	33	DLE580-ST	ST Middle Region	0	40.39	kPa	0.27	0.68
1174	LE	34	DLE590-ST	ST Upper Region	0	40.39	kPa	0.27	0.68
1175	LE	35	DLE650-ACC	Acc-Cold Tank	0	55.53	kPa	0.53	0.95
1176	LE	36	DLE660-ACH	Acc-Hot Tank	0	55.53	kPa	1.02	1.84
1177	LE	38	DLE830-RWST	RWST	0	196.14	kPa	0.55	0.28
1178	DP	1	DPE010-HLA	Upper Plenum - HLA Nozzle	−40	40	kPa	1.02	1.28
1179	DP	2	DPE020-HLA	HLA Nozzle - HLA Break	−40	40	kPa	1.02	1.28
1180	DP	4	DPE040-HLA	HLA Break - SGA Inlet	−40	40	kPa	1.02	1.28
1181	DP	5	DPE050A-SGA	SGA Inlet - Tube 3 Top	−150	50	kPa	2.03	1.02
1182	DP	6	DPE050B-SGA	SGA Inlet - Tube 2 Top	−150	50	kPa	2.03	1.02
1183	DP	7	DPE050C-SGA	SGA Inlet - Tube 1 Top	−150	50	kPa	2.03	1.02
1184	DP	8	DPE050D-SGA	SGA Inlet - Tube 4 Top	−150	50	kPa	2.03	1.02
1185	DP	9	DPE050E-SGA	SGA Inlet - Tube 5 Top	−150	50	kPa	2.03	1.02
1186	DP	10	DPE050F-SGA	SGA Inlet - Tube 6 Top	−150	50	kPa	2.03	1.02
1187	DP	11	DPE060A-SGA	SGA Outlet - Tube 3 Top	−150	50	kPa	2.03	1.02
1188	DP	12	DPE060B-SGA	SGA Outlet - Tube 2 Top	−150	50	kPa	2.03	1.02
1189	DP	13	DPE060C-SGA	SGA Outlet - Tube 1 Top	−150	50	kPa	2.03	1.02
1190	DP	14	DPE060D-SGA	SGA Outlet - Tube 4 Top	−150	50	kPa	2.03	1.02
1191	DP	15	DPE060E-SGA	SGA Outlet - Tube 5 Top	−150	50	kPa	2.03	1.02
1192	DP	16	DPE060F-SGA	SGA Outlet - Tube 6 Top	−150	50	kPa	2.03	1.02
1193	DP	17	DPE070-LSA	SGA Outlet - LSA Bottom	−80	80	kPa	1.08	0.67
1194	DP	18	DPE080-LSA	LSA Bottom - PCA Suction	−50	50	kPa	1.03	1.03
1195	DP	19	DPE090-PCA	PCA Suction - Delivery	−50	50	kPa	1.03	1.03
1196	DP	21	DPE110-CLA	PCA Delivery - CLA Break	−50	50	kPa	1.03	1.03
1197	DP	22	DPE120-CLA	CLA Break - CLA Nozzle	−50	50	kPa	1.03	1.03
1198	DP	23	DPE130-CLA	CLA Nozzle - Downcomer	−50	50	kPa	1.03	1.03
1199	DP	24	DPE140-HLA	Upper Plenum - Downcomer	−30	30	kPa	1.01	1.69
1200	DP	25	DPE150-HLB	Upper Plenum - HLB Nozzle	−30	30	kPa	1.01	1.69
1201	DP	26	DPE160-HLB	HLB Nozzle - HLB Break	−30	30	kPa	1.01	1.69
1202	DP	27	DPE170-HLB	HLB Break - SGB Break	−30	30	kPa	1.01	1.69
1203	DP	28	DPE180-HLB	SGB Break - SGB Inlet	−30	30	kPa	1.01	1.69
1204	DP	29	DPE190A-SGB	SGB Inlet - Tube 3 Top	−150	50	kPa	2.03	1.02

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
1205	DP	30	DPE190B-SGB	SGB Inlet - Tube 2 Top	−150	50	kPa	2.03	1.02
1206	DP	31	DPE190C-SGB	SGB Inlet - Tube 1 Top	−150	50	kPa	3.96	1.98
1207	DP	32	DPE190D-SGB	SGB Inlet - Tube 4 Top	−150	50	kPa	3.96	1.98
1208	DP	33	DPE190E-SGB	SGB Inlet - Tube 5 Top	−150	50	kPa	3.96	1.98
1209	DP	34	DPE190F-SGB	SGB Inlet - Tube 6 Top	−150	50	kPa	3.96	1.98
1210	DP	35	DPE200A-SGB	SGB Outlet - Tube 3 Top	−150	50	kPa	3.96	1.98
1211	DP	36	DPE200B-SGB	SGB Outlet - Tube 2 Top	−150	50	kPa	3.96	1.98
1212	DP	37	DPE200C-SGB	SGB Outlet - Tube 1 Top	−150	50	kPa	3.96	1.98
1213	DP	38	DPE200D-SGB	SGB Outlet - Tube 4 Top	−150	50	kPa	3.96	1.98
1214	DP	39	DPE200E-SGB	SGB Outlet - Tube 5 Top	−150	50	kPa	3.96	1.98
1215	DP	40	DPE200F-SGB	SGB Outlet - Tube 6 Top	−150	50	kPa	3.96	1.98
1216	DP	41	DPE210-LSB	SGB Outlet - LSB Bottom	−80	80	kPa	1.08	0.67
1217	DP	42	DPE220-LSB	LSB Bottom - PCB Suction	−50	50	kPa	1.03	1.03
1218	DP	43	DPE230-PCB	PCB Suction - Delivery	−50	50	kPa	1.03	1.03
1219	DP	44	DPE240-CLB	PCB Delivery - CLB Break	−20	20	kPa	1.01	2.51
1220	DP	45	DPE250-CLB	CLB Break - CLB Nozzle	−20	20	kPa	1.01	2.51
1221	DP	46	DPE260-CLB	CLB Nozzle - Downcomer	−20	20	kPa	1.01	2.51
1222	DP	47	DPE270-PV	PV Bottom - Top	−100	400	kPa	4.12	0.82
1223	DP	48	DPE280-PV	PV Lower Plenum	−50	100	kPa	1.07	0.71
1224	DP	49	DPE290-PV	Lower Core Support Plate	−50	100	kPa	1.07	0.71
1225	DP	50	DPE300-PV	Core (EL.-35 -3945)	−50	100	kPa	1.07	0.71
1226	DP	51	DPE320-PV	Upper Plenum	−50	100	kPa	1.07	0.71
1227	DP	52	DPE330-PV	Upper Head (EL.6135 - 9653)	−50	100	kPa	1.07	0.71
1228	DP	53	DPE310-PV	Upper Core Support Plate	−100	100	kPa	3.96	1.98
1229	DP	54	DPE350A-PV	CR Guide Tube Top Orifice	−100	100	kPa	3.96	1.98
1230	DP	55	DPE350B-PV	CR Guide Tube Top Orifice	−100	100	kPa	3.96	1.98
1231	DP	56	DPE360-PV	PV Downcomer Overall	−100	300	kPa	4.05	1.01
1232	DP	57	DPE370-PV	Lower Downcomer	−50	150	kPa	3.96	1.98
1233	DP	58	DPE380-PV	Upper Downcomer	−50	150	kPa	3.96	1.98
1234	DP	59	DPE390-PV	UP-DC Check Valve A	−50	100	kPa	1.12	0.56
1235	DP	62	DPE332-PV	Upper Head - Downcomer	−100	100	kPa	3.96	1.98
1236	DP	63	DPE331-PV	Upper Head	−100	100	kPa	3.96	1.98
1237	DP	64	DPE560A-BU	FE560A (BU-1 High)	−100	245	kPa	1.03	0.42
1238	DP	65	DPE560B-BU	FE560B (BU-1 Low)	−100	5	kPa	0.20	4.04
1239	DP	71	DPE072-LSA	LSA (SG-Side)	0	45	kPa	0.34	0.75
1240	DP	72	DPE073-LSA	LSA (SG-Side)	−10	10	kPa	0.32	1.60
1241	DP	73	DPE074-LSA	LSA (SG-Side)	−10	10	kPa	0.32	1.60
1242	DP	74	DPE075-LSA	LSA (SG-Side)	−10	10	kPa	0.32	1.60
1243	DP	75	DPE076-LSA	LSA (SG-Side)	0	30	kPa	0.33	1.08
1244	DP	76	DPE212-LSB	LSB (SG-Side)	0	45	kPa	0.34	0.75
1245	DP	77	DPE213-LSB	LSB (SG-Side)	−10	10	kPa	0.32	1.60
1246	DP	78	DPE214-LSB	LSB (SG-Side)	−10	10	kPa	0.32	1.60
1247	DP	79	DPE215-LSB	LSB (SG-Side)	−10	10	kPa	0.32	1.60
1248	DP	80	DPE216-LSB	LSB (SG-Side)	0	30	kPa	0.33	1.08
1249	DP	81	DPE430-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1250	DP	82	DPE431-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1251	DP	83	DPE432-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1252	DP	84	DPE433-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1253	DP	85	DPE434-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1254	DP	86	DPE435-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1255	DP	87	DPE436-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1256	DP	88	DPE437-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1257	DP	89	DPE438-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1258	DP	90	DPE439-SGA	SGA Boiling Section	−30	0	kPa	0.33	1.08
1259	DP	91	DPE440-SGA	SGA Boiling Section	−40	0	kPa	0.33	0.83
1260	DP	92	DPE450-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1261	DP	93	DPE451-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1262	DP	94	DPE452-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1263	DP	95	DPE453-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1264	DP	96	DPE454-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1265	DP	97	DPE455-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1266	DP	98	DPE456-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1267	DP	99	DPE457-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1268	DP	100	DPE458-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1269	DP	101	DPE459-SGB	SGB Boiling Section	−30	0	kPa	0.33	1.08
1270	DP	102	DPE460-SGB	SGB Boiling Section	−40	0	kPa	0.33	0.83
1271	DP	103	DPE011-HLA	HLA Spool Piece	−10	10	kPa	0.32	1.60
1272	DP	104	DPE071-CLA	CLA Spool Piece	−10	10	kPa	0.32	1.60
1273	DP	105	DPE151-HLB	HLB Spool Piece	−10	10	kPa	0.32	1.60
1274	DP	106	DPE211-CLB	CLB Spool Piece	−10	10	kPa	0.32	1.60
1275	DP	107	DPE571-BU	RSV123 Inlet	0	200	kPa	1.12	0.56
1276	DP	116	DPE055A-SGA	SGA U-Tube I/O (High)	−30	30	kPa	0.29	0.49
1277	DP	117	DPE055B-SGA	SGA U-Tube I/O (Low)	−3	3	kPa	0.2	3.37
1278	DP	118	DPE195A-SGB	SGB U-Tube I/O (High)	−30	30	kPa	0.29	0.49
1279	DP	119	DPE195B-SGB	SGB U-Tube I/O (Low)	−3	3	kPa	0.2	3.37
1280	DP	120	DPE056-SGA	SGA Inlet Plenum	−40	40	kPa	1.02	1.28
1281	DP	122	DPE196-SGB	SGB Inlet Plenum	−40	40	kPa	0.48	0.60
1282	DP	123	DPE197-SGB	SGB Primary-Secondary	−1000	1000	kPa	9.44	0.47
1283	DP	133	DPE333-PV	Upper Head (EL.6634 - 8860)	−35	0	kPa	0.23	0.67
1284	DP	182	DPE491-SGB	SGB Feedwater Line	0	0	kPa	Not used	
1285	DP	183	DPE492-SGB	SGB Feedwater Line	−40	10	kPa	Not used	

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
1286	DE 1	DE011A-HLA	HLA Spool Piece, Beam A	0	10	V	−	−
1287	DE 2	DE011B-HLA	HLA Spool Piece, Beam B	0	10	V	−	−
1288	DE 3	DE011C-HLA	HLA Spool Piece, Beam C	0	10	V	−	−
1289	DE 4	DE051A-LSA	LSA Spool Piece, Beam A	0	10	V	−	−
1290	DE 5	DE051B-LSA	LSA Spool Piece, Beam B	0	10	V	−	−
1291	DE 6	DE051C-LSA	LSA Spool Piece, Beam C	0	10	V	−	−
1292	DE 7	DE071A-CLA	CLA Spool Piece, Beam A	0	10	V	−	−
1293	DE 8	DE071B-CLA	CLA Spool Piece, Beam B	0	10	V	−	−
1294	DE 9	DE071C-CLA	CLA Spool Piece, Beam C	0	10	V	−	−
1295	DE 10	DE151A-HLB	HLB Spool Piece, Beam A	0	10	V	−	−
1296	DE 11	DE151B-HLB	HLB Spool Piece, Beam B	0	10	V	−	−
1297	DE 12	DE151C-HLB	HLB Spool Piece, Beam C	0	10	V	−	−
1298	DE 13	DE191A-LSB	LSB Spool Piece, Beam A	0	10	V	−	−
1299	DE 14	DE191B-LSB	LSB Spool Piece, Beam B	0	10	V	−	−
1300	DE 15	DE191C-LSB	LSB Spool Piece, Beam C	0	10	V	−	−
1301	DE 16	DE211A-CLB	CLB Spool Piece, Beam A	0	10	V	−	−
1302	DE 17	DE211B-CLB	CLB Spool Piece, Beam B	0	10	V	−	−
1303	DE 18	DE211C-CLB	CLB Spool Piece, Beam C	0	10	V	−	−
1304	DE 19	DE052-LSA	PCA Suction	0	10	V	−	−
1305	DE 20	DE192-LSB	PCB Suction	0	10	V	−	−
1306	DE 33	DE591A-BU	Break Spool Piece, Beam A	0	10	V	−	−
1307	DE 34	DE591B-BU	Break Spool Piece, Beam B	0	10	V	−	−
1308	DE 35	DE591C-BU	Break Spool Piece, Beam C	0	10	V	−	−
1309	DE 40	DE291-SGB	SGB Feedwater Line	0	10	V	−	−
1310	CP 512	BU-SIGNAL	BU Signal	0	100	%	−	−
1311	RC 31	DE011A-HLA-EU	HLA Spool Piece, Beam A			kg/m^3	27	
1312	RC 32	DE011B-HLA-EU	HLA Spool Piece, Beam B			kg/m^3	20	
1313	RC 33	DE011C-HLA-EU	HLA Spool Piece, Beam C			kg/m^3	22	
1314	RC 34	DE151A-HLB-EU	HLB Spool Piece, Beam A			kg/m^3	27	
1315	RC 35	DE151B-HLB-EU	HLB Spool Piece, Beam B			kg/m^3	20	
1316	RC 36	DE151C-HLB-EU	HLB Spool Piece, Beam C			kg/m^3	22	
1317	RC 37	DE071A-CLA-EU	CLA Spool Piece, Beam A			kg/m^3	94.8	
1318	RC 38	DE071B-CLA-EU	CLA Spool Piece, Beam B			kg/m^3	94.8	
1319	RC 39	DE071C-CLA-EU	CLA Spool Piece, Beam C			kg/m^3	94.8	
1320	RC 40	DE211A-CLB-EU	CLB Spool Piece, Beam A			kg/m^3	94.8	
1321	RC 41	DE211B-CLB-EU	CLB Spool Piece, Beam B			kg/m^3	94.8	
1322	RC 42	DE211C-CLB-EU	CLB Spool Piece, Beam C			kg/m^3	94.8	
1323	RC 56	DE051A-LSA-EU	LSA Spool Piece, Beam A			kg/m^3	94.8	
1324	RC 57	DE051B-LSA-EU	LSA Spool Piece, Beam B			kg/m^3	94.8	
1325	RC 58	DE051C-LSA-EU	LSA Spool Piece, Beam C			kg/m^3	94.8	
1326	RC 59	DE191A-LSB-EU	LSB Spool Piece, Beam A			kg/m^3	94.8	
1327	RC 60	DE191B-LSB-EU	LSB Spool Piece, Beam B			kg/m^3	94.8	
1328	RC 61	DE191C-LSB-EU	LSB Spool Piece, Beam C			kg/m^3	94.8	
1329	RC 62	DE052-LSA-EU	PCA Suction			kg/m^3	94.8	
1330	RC 63	DE192-LSB-EU	PCB Suction			kg/m^3	94.8	
1331	RC 73	DE591A-BU-EU	Break Spool Piece, Beam A			kg/m^3	94.8	
1332	RC 74	DE591B-BU-EU	Break Spool Piece, Beam B			kg/m^3	94.8	
1333	RC 75	DE591C-BU-EU	Break Spool Piece, Beam C			kg/m^3	94.8	
1334	RC 124	DAE-591A-BU	Break Unit Average Density			kg/m^3	−	
1335	RC 133	TWE-PCT	Peak Cladding Temp.			K	5.31	
1336	RC 134	TWE-PCTLOC	Location of PCT				−	
1337	RC 139	CL-CORE	Core (EL.-35 - 3945)			m	0.216	
1338	RC 140	CL-UP	Upper Plenum (EL.4060 - 6135)			m	0.197	
1339	RC 141	CL-UH	Upper Head (EL.6614 - 9653)			m	0.21	
1340	RC 142	CL-DC	Downcomer			m	0.746	
1341	RC 143	CL-HLA-SGA	HLA Riser Part			m	0.181	
1342	RC 144	CL-TUA-U3	SGA Tube 3 Inlet - Top			m	0.43	
1343	RC 145	CL-TUA-U2	SGA Tube 2 Inlet - Top			m	0.42	
1344	RC 146	CL-TUA-U1	SGA Tube 1 Inlet - Top			m	0.413	
1345	RC 147	CL-TUA-U4	SGA Tube 4 Inlet - Top			m	0.43	
1346	RC 148	CL-TUA-U5	SGA Tube 5 Inlet - Top			m	0.42	
1347	RC 149	CL-TUA-U6	SGA Tube 6 Inlet - Top			m	0.425	
1348	RC 150	CL-TUA-D3	SGA Tube 3 Outlet - Top			m	0.442	
1349	RC 151	CL-TUA-D2	SGA Tube 2 Outlet - Top			m	0.431	
1350	RC 152	CL-TUA-D1	SGA Tube 1 Outlet - Top			m	0.422	
1351	RC 153	CL-TUA-D4	SGA Tube 4 Outlet - Top			m	0.422	
1352	RC 154	CL-TUA-D5	SGA Tube 5 Outlet - Top			m	0.431	
1353	RC 155	CL-TUA-D6	SGA Tube 6 Outlet - Top			m	0.422	
1354	RC 156	CL-LSA-D	SGA Out.Plenum - LSA Bottom			m	0.207	
1355	RC 157	CL-LSA-U	LSA Bottom - PCA Suction			m	0.188	
1356	RC 158	CL-SGA-IPL	SGA Inlet Plenum			m	0.185	
1357	RC 159	CL-HLB-SGB	HLB Riser Part			m	0.179	
1358	RC 160	CL-TUB-U3	SGB Tube 3 Inlet - Top			m	0.445	
1359	RC 161	CL-TUB-U2	SGB Tube 2 Inlet - Top			m	0.433	
1360	RC 162	CL-TUB-U1	SGB Tube 1 Inlet - Top			m	0.73	
1361	RC 163	CL-TUB-U4	SGB Tube 4 Inlet - Top			m	0.74	
1362	RC 164	CL-TUB-U5	SGB Tube 5 Inlet - Top			m	0.734	
1363	RC 165	CL-TUB-U6	SGB Tube 6 Inlet - Top			m	0.73	

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
1364	RC 166	CL-TUB-D3	SGB Tube 3 Outlet - Top			m	0.951	
1365	RC 167	CL-TUB-D2	SGB Tube 2 Outlet - Top			m	0.74	
1366	RC 168	CL-TUB-D1	SGB Tube 1 Outlet - Top			m	0.735	
1367	RC 169	CL-TUB-D4	SGB Tube 4 Outlet - Top			m	0.747	
1368	RC 170	CL-TUB-D5	SGB Tube 5 Outlet - Top			m	0.74	
1369	RC 171	CL-TUB-D6	SGB Tube 6 Outlet - Top			m	0.735	
1370	RC 172	CL-LSB-D	SGB Out.Plenum - LSB Bottom			m	0.207	
1371	RC 173	CL-LSB-U	LSB Bottom - PCB Suction			m	0.188	
1372	RC 174	CL-SGB-IPL	SGB Inlet Plenum			m	0.094	
1373	RC 175	MC-UH	Upper Head (EL.6614 - 9653)			kg	79.08	
1374	RC 176	MC-LSA-DW	SGA Out.Plenum+LSA Downflow			kg	42.68	
1375	RC 177	MC-LSB-DW	SGB Out.Plenum+LSB Downflow			kg	41.33	
1376	RC 178	MS-CORE	Core (EL.-35 - 3945)			kg	15.4	
1377	RC 179	MS-UP	Upper Plenum (EL.4060 - 6135)			kg	24.37	
1378	RC 180	MS-DC	Downcomer			kg	46.31	
1379	RC 181	MS-TUA-UP-AV	SGA Tubes Upflow side			kg	8.3	
1380	RC 182	MS-TUA-DW-AV	SGA Tubes Downflow side			kg	8.3	
1381	RC 183	MS-SGA-IPL	SGA Inlet Plenum			kg	27.81	
1382	RC 184	MS-LSA-UP	LSA Upflow side			kg	3.57	
1383	RC 185	MS-TUB-UP-AV	SGB Tubes Upflow side			kg	9.65	
1384	RC 186	MS-TUB-DW-AV	SGB Tubes Downflow side			kg	10.25	
1385	RC 187	MS-SGB-IPL	SGB Inlet Plenum			kg	14.61	
1386	RC 188	MS-LSB-UP	LSB Upflow side			kg	3.57	
1387	RC 189	MS-ACC	Acc-Cold Tank			kg	39.26	
1388	RC 190	MS-ACH	Acc-Hot Tank			kg	74.26	
1389	RC 191	MS-ST	Break Flow Supp. Tank			kg	323.61	
1390	RC 192	DM-ACC	Acc-Cold Tank			kg/s	13.55	
1391	RC 193	DM-ACH	Acc-Hot Tank			kg/s	26.08	
1392	RC 194	IM-ST	Break Flow Supp. Tank			kg/s	3.35	
1393	RC 195	DM-RWST	RWST			kg/s	51.9	
1394	RC 196	LG-HLA	HLA Water Level			m	0.012	
1395	RC 197	LG-CLA	CLA Water Level			m	0.028	
1396	RC 198	LG-HLB	HLB Water Level			m	0.012	
1397	RC 199	LG-CLB	CLB Water Level			m	0.028	
1398	RC 200	TS-UP	Upper Plenum			K	17.64	
1399	RC 202	TS-SGA	Steam Generator-A			K	7.82	
1400	RC 203	TS-SGB	Steam Generator-B			K	7.82	
1401	RC 279	DE291-SGB-EU	SGB Feedwater Line			kg/m^3		
1402	TE 1174	TE-1A1-CLA	CLA Below ECCS A1	270	720	K	2.75	0.61
1403	TE 1175	TE-1A2-CLA	CLA Below ECCS A2	270	720	K	2.75	0.61
1404	TE 1176	TE-1A3-CLA	CLA Below ECCS A3	270	720	K	2.75	0.61
1405	TE 1177	TE-2A1-CLA	CLA SP SG-Side A1	270	720	K	2.75	0.61
1406	TE 1178	TE-2A2-CLA	CLA SP SG-Side A2	270	720	K	2.75	0.61
1407	TE 1179	TE-2A3-CLA	CLA SP SG-Side A3	270	720	K	2.75	0.61
1408	TE 1180	TE-2A4-CLA	CLA SP SG-Side A4	270	720	K	2.75	0.61
1409	TE 1181	TE-2A5-CLA	CLA SP SG-Side A5	270	720	K	2.75	0.61
1410	TE 1182	TE-2A6-CLA	CLA SP SG-Side A6	270	720	K	2.75	0.61
1411	TE 1183	TE-2A7-CLA	CLA SP SG-Side A7	270	720	K	2.75	0.61
1412	TE 1184	TE-2B1-CLA	CLA SP SG-Side B1	270	720	K	2.75	0.61
1413	TE 1185	TE-2B2-CLA	CLA SP SG-Side B2	270	720	K	2.75	0.61
1414	TE 1186	TE-2B3-CLA	CLA SP SG-Side B3	270	720	K	2.75	0.61
1415	TE 1187	TE-2B4-CLA	CLA SP SG-Side B4	270	720	K	2.75	0.61
1416	TE 1188	TE-2B5-CLA	CLA SP SG-Side B5	270	720	K	2.75	0.61
1417	TE 1189	TE-2B6-CLA	CLA SP SG-Side B6	270	720	K	2.75	0.61
1418	TE 1190	TE-2B7-CLA	CLA SP SG-Side B7	270	720	K	2.75	0.61
1419	TE 1191	TE-2C1-CLA	CLA SP SG-Side C1	270	720	K	2.75	0.61
1420	TE 1192	TE-2C2-CLA	CLA SP SG-Side C2	270	720	K	2.75	0.61
1421	TE 1193	TE-2C3-CLA	CLA SP SG-Side C3	270	720	K	2.75	0.61
1422	TE 1194	TE-2C4-CLA	CLA SP SG-Side C4	270	720	K	2.75	0.61
1423	TE 1195	TE-2C5-CLA	CLA SP SG-Side C5	270	720	K	2.75	0.61
1424	TE 1196	TE-2C6-CLA	CLA SP SG-Side C6	270	720	K	2.75	0.61
1425	TE 1197	TE-2C7-CLA	CLA SP SG-Side C7	270	720	K	2.75	0.61
1426	TE 1198	TE-3A1-CLA	CLA SP Vessel-Side A1	270	720	K	2.75	0.61
1427	TE 1199	TE-3A2-CLA	CLA SP Vessel-Side A2	270	720	K	2.75	0.61
1428	TE 1200	TE-3A3-CLA	CLA SP Vessel-Side A3	270	720	K	2.75	0.61
1429	TE 1201	TE-3A4-CLA	CLA SP Vessel-Side A4	270	720	K	2.75	0.61
1430	TE 1202	TE-3A5-CLA	CLA SP Vessel-Side A5	270	720	K	2.75	0.61
1431	TE 1203	TE-3A6-CLA	CLA SP Vessel-Side A6	270	720	K	2.75	0.61
1432	TE 1204	TE-3A7-CLA	CLA SP Vessel-Side A7	270	720	K	2.75	0.61
1433	TE 1205	TE-3B1-CLA	CLA SP Vessel-Side B1	270	720	K	2.75	0.61
1434	TE 1206	TE-3B2-CLA	CLA SP Vessel-Side B2	270	720	K	2.75	0.61
1435	TE 1207	TE-3B3-CLA	CLA SP Vessel-Side B3	270	720	K	2.75	0.61
1436	TE 1208	TE-3B4-CLA	CLA SP Vessel-Side B4	270	720	K	2.75	0.61
1437	TE 1209	TE-3B5-CLA	CLA SP Vessel-Side B5	270	720	K	2.75	0.61
1438	TE 1210	TE-3B6-CLA	CLA SP Vessel-Side B6	270	720	K	2.75	0.61
1439	TE 1211	TE-3B7-CLA	CLA SP Vessel-Side B7	270	720	K	2.75	0.61
1440	TE 1212	TE-3C1-CLA	CLA SP Vessel-Side C1	270	720	K	2.75	0.61
1441	TE 1213	TE-3C2-CLA	CLA SP Vessel-Side C2	270	720	K	2.75	0.61
1442	TE 1214	TE-3C3-CLA	CLA SP Vessel-Side C3	270	720	K	2.75	0.61
1443	TE 1215	TE-3C4-CLA	CLA SP Vessel-Side C4	270	720	K	2.75	0.61

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
1444	TE 1216	TE-3C5-CLA	CLA SP Vessel-Side C5	270	720	K	2.75	0.61
1445	TE 1217	TE-3C6-CLA	CLA SP Vessel-Side C6	270	720	K	2.75	0.61
1446	TE 1218	TE-3C7-CLA	CLA SP Vessel-Side C7	270	720	K	2.75	0.61
1447	TE 1219	TE-4A11-CLA	CLA Downcomer A11	270	720	K	2.75	0.61
1448	TE 1220	TE-4A12-CLA	CLA Downcomer A12	270	720	K	2.75	0.61
1449	TE 1221	TE-4A13-CLA	CLA Downcomer A13	270	720	K	2.75	0.61
1450	TE 1222	TE-4A21-CLA	CLA Downcomer A21	270	720	K	2.75	0.61
1451	TE 1223	TE-4A22-CLA	CLA Downcomer A22	270	720	K	2.75	0.61
1452	TE 1224	TE-4A23-CLA	CLA Downcomer A23	270	720	K	2.75	0.61
1453	TE 1225	TE-4B11-CLA	CLA Downcomer B11	270	720	K	2.75	0.61
1454	TE 1226	TE-4B12-CLA	CLA Downcomer B12	270	720	K	2.75	0.61
1455	TE 1227	TE-4B13-CLA	CLA Downcomer B13	270	720	K	2.75	0.61
1456	TE 1228	TE-4B21-CLA	CLA Downcomer B21	270	720	K	2.75	0.61
1457	TE 1229	TE-4B22-CLA	CLA Downcomer B22	270	720	K	2.75	0.61
1458	TE 1230	TE-4B23-CLA	CLA Downcomer B23	270	720	K	2.75	0.61
1459	TE 1231	TE-4C11-CLA	CLA Downcomer C11	270	720	K	2.75	0.61
1460	TE 1232	TE-4C12-CLA	CLA Downcomer C12	270	720	K	2.75	0.61
1461	TE 1233	TE-4C13-CLA	CLA Downcomer C13	270	720	K	2.75	0.61
1462	TE 1234	TE-4C21-CLA	CLA Downcomer C21	270	720	K	2.75	0.61
1463	TE 1235	TE-4C22-CLA	CLA Downcomer C22	270	720	K	2.75	0.61
1464	TE 1236	TE-4C23-CLA	CLA Downcomer C23	270	720	K	2.75	0.61
1465	TE 1237	TE-1A1-CLB	CLB Elbow A1	270	720	K	2.75	0.61
1466	TE 1238	TE-1A2-CLB	CLB Elbow A2	270	720	K	2.75	0.61
1467	TE 1239	TE-1A3-CLB	CLB Elbow A3	270	720	K	2.75	0.61
1468	TE 1240	TE-1A4-CLB	CLB Elbow A4	270	720	K	2.75	0.61
1469	TE 1241	TE-1A5-CLB	CLB Elbow A5	270	720	K	2.75	0.61
1470	TE 1242	TE-1A6-CLB	CLB Elbow A6	270	720	K	2.75	0.61
1471	TE 1243	TE-1A7-CLB	CLB Elbow A7	270	720	K	2.75	0.61
1472	TE 1244	TE-1B1-CLB	CLB Elbow B1	270	720	K	2.75	0.61
1473	TE 1245	TE-1B2-CLB	CLB Elbow B2	270	720	K	2.75	0.61
1474	TE 1246	TE-1B3-CLB	CLB Elbow B3	270	720	K	2.75	0.61
1475	TE 1247	TE-1B4-CLB	CLB Elbow B4	270	720	K	2.75	0.61
1476	TE 1248	TE-1B5-CLB	CLB Elbow B5	270	720	K	2.75	0.61
1477	TE 1249	TE-1B6-CLB	CLB Elbow B6	270	720	K	2.75	0.61
1478	TE 1250	TE-1B7-CLB	CLB Elbow B7	270	720	K	2.75	0.61
1479	TE 1251	TE-1C1-CLB	CLB Elbow C1	270	720	K	2.75	0.61
1480	TE 1252	TE-1C2-CLB	CLB Elbow C2	270	720	K	2.75	0.61
1481	TE 1253	TE-1C3-CLB	CLB Elbow C3	270	720	K	2.75	0.61
1482	TE 1254	TE-1C4-CLB	CLB Elbow C4	270	720	K	2.75	0.61
1483	TE 1255	TE-1C5-CLB	CLB Elbow C5	270	720	K	2.75	0.61
1484	TE 1256	TE-1C6-CLB	CLB Elbow C6	270	720	K	2.75	0.61
1485	TE 1257	TE-1C7-CLB	CLB Elbow C7	270	720	K	2.75	0.61
1486	TE 1258	TE-2A1-CLB	CLB SP SG-Side A1	270	720	K	2.75	0.61
1487	TE 1259	TE-2A2-CLB	CLB SP SG-Side A2	270	720	K	2.75	0.61
1488	TE 1260	TE-2A3-CLB	CLB SP SG-Side A3	270	720	K	2.75	0.61
1489	TE 1261	TE-2A4-CLB	CLB SP SG-Side A4	270	720	K	2.75	0.61
1490	TE 1262	TE-2A5-CLB	CLB SP SG-Side A5	270	720	K	2.75	0.61
1491	TE 1263	TE-2A6-CLB	CLB SP SG-Side A6	270	720	K	2.75	0.61
1492	TE 1264	TE-2A7-CLB	CLB SP SG-Side A7	270	720	K	2.75	0.61
1493	TE 1265	TE-2B1-CLB	CLB SP SG-Side B1	270	720	K	2.75	0.61
1494	TE 1266	TE-2B2-CLB	CLB SP SG-Side B2	270	720	K	2.75	0.61
1495	TE 1267	TE-2B3-CLB	CLB SP SG-Side B3	270	720	K	2.75	0.61
1496	TE 1268	TE-2B4-CLB	CLB SP SG-Side B4	270	720	K	2.75	0.61
1497	TE 1269	TE-2B5-CLB	CLB SP SG-Side B5	270	720	K	2.75	0.61
1498	TE 1270	TE-2B6-CLB	CLB SP SG-Side B6	270	720	K	2.75	0.61
1499	TE 1271	TE-2B7-CLB	CLB SP SG-Side B7	270	720	K	2.75	0.61
1500	TE 1272	TE-2C1-CLB	CLB SP SG-Side C1	270	720	K	2.75	0.61
1501	TE 1273	TE-2C2-CLB	CLB SP SG-Side C2	270	720	K	2.75	0.61
1502	TE 1274	TE-2C3-CLB	CLB SP SG-Side C3	270	720	K	2.75	0.61
1503	TE 1275	TE-2C4-CLB	CLB SP SG-Side C4	270	720	K	2.75	0.61
1504	TE 1276	TE-2C5-CLB	CLB SP SG-Side C5	270	720	K	2.75	0.61
1505	TE 1277	TE-2C6-CLB	CLB SP SG-Side C6	270	720	K	2.75	0.61
1506	TE 1278	TE-2C7-CLB	CLB SP SG-Side C7	270	720	K	2.75	0.61
1507	TE 1279	TE-3A1-CLB	CLB SP Vessel-Side A1	270	720	K	2.75	0.61
1508	TE 1280	TE-3A2-CLB	CLB SP Vessel-Side A2	270	720	K	2.75	0.61
1509	TE 1281	TE-3A3-CLB	CLB SP Vessel-Side A3	270	720	K	2.75	0.61
1510	TE 1282	TE-3A4-CLB	CLB SP Vessel-Side A4	270	720	K	2.75	0.61
1511	TE 1283	TE-3A5-CLB	CLB SP Vessel-Side A5	270	720	K	2.75	0.61
1512	TE 1284	TE-3A6-CLB	CLB SP Vessel-Side A6	270	720	K	2.75	0.61
1513	TE 1285	TE-3A7-CLB	CLB SP Vessel-Side A7	270	720	K	2.75	0.61
1514	TE 1286	TE-3B1-CLB	CLB SP Vessel-Side B1	270	720	K	2.75	0.61
1515	TE 1287	TE-3B2-CLB	CLB SP Vessel-Side B2	270	720	K	2.75	0.61
1516	TE 1288	TE-3B3-CLB	CLB SP Vessel-Side B3	270	720	K	2.75	0.61
1517	TE 1289	TE-3B4-CLB	CLB SP Vessel-Side B4	270	720	K	2.75	0.61
1518	TE 1290	TE-3B5-CLB	CLB SP Vessel-Side B5	270	720	K	2.75	0.61
1519	TE 1291	TE-3B6-CLB	CLB SP Vessel-Side B6	270	720	K	2.75	0.61
1520	TE 1292	TE-3B7-CLB	CLB SP Vessel-Side B7	270	720	K	2.75	0.61
1521	TE 1293	TE-3C1-CLB	CLB SP Vessel-Side C1	270	720	K	2.75	0.61
1522	TE 1294	TE-3C2-CLB	CLB SP Vessel-Side C2	270	720	K	2.75	0.61
1523	TE 1295	TE-3C3-CLB	CLB SP Vessel-Side C3	270	720	K	2.75	0.61
1524	TE 1296	TE-3C4-CLB	CLB SP Vessel-Side C4	270	720	K	2.75	0.61

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
1525	TE 1297	TE-3C5-CLB	CLB SP Vessel-Side C5	270	720	K	2.75	0.61
1526	TE 1298	TE-3C6-CLB	CLB SP Vessel-Side C6	270	720	K	2.75	0.61
1527	TE 1299	TE-3C7-CLB	CLB SP Vessel-Side C7	270	720	K	2.75	0.61
1528	TE 1300	TE-4A11-CLB	CLB Downcomer A11	270	720	K	2.75	0.61
1529	TE 1301	TE-4A12-CLB	CLB Downcomer A12	270	720	K	2.75	0.61
1530	TE 1302	TE-4A13-CLB	CLB Downcomer A13	270	720	K	2.75	0.61
1531	TE 1303	TE-4A21-CLB	CLB Downcomer A21	270	720	K	2.75	0.61
1532	TE 1304	TE-4A22-CLB	CLB Downcomer A22	270	720	K	2.75	0.61
1533	TE 1305	TE-4A23-CLB	CLB Downcomer A23	270	720	K	2.75	0.61
1534	TE 1306	TE-4B11-CLB	CLB Downcomer B11	270	720	K	2.75	0.61
1535	TE 1307	TE-4B12-CLB	CLB Downcomer B12	270	720	K	2.75	0.61
1536	TE 1308	TE-4B13-CLB	CLB Downcomer B13	270	720	K	2.75	0.61
1537	TE 1309	TE-4B21-CLB	CLB Downcomer B21	270	720	K	2.75	0.61
1538	TE 1310	TE-4B22-CLB	CLB Downcomer B22	270	720	K	2.75	0.61
1539	TE 1311	TE-4B23-CLB	CLB Downcomer B23	270	720	K	2.75	0.61
1540	TE 1312	TE-4C11-CLB	CLB Downcomer C11	270	720	K	2.75	0.61
1541	TE 1313	TE-4C12-CLB	CLB Downcomer C12	270	720	K	2.75	0.61
1542	TE 1314	TE-4C13-CLB	CLB Downcomer C13	270	720	K	2.75	0.61
1543	TE 1315	TE-4C21-CLB	CLB Downcomer C21	270	720	K	2.75	0.61
1544	TE 1316	TE-4C22-CLB	CLB Downcomer C22	270	720	K	2.75	0.61
1545	TE 1317	TE-4C23-CLB	CLB Downcomer C23	270	720	K	2.75	0.61