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Data Report of ROSA/LSTF Experiment SB-PV-09

-1.9% Pressure Vessel Top Small Break LOCA with SG Depressurization and Gas Inflow-

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An experiment denoted as SB-PV-09 was conducted on November 17, 2005 using the Large Scale Test Facility (LSTF) in the Rig of Safety Assessment-V (ROSA-V) Program. The ROSA/LSTF experiment SB-PV-09 simulated a 1.9% pressure vessel top small-break loss-of-coolant accident in a pressurized water reactor (PWR). The test assumptions included total failure of high pressure injection system and non-condensable gas (nitrogen gas) inflow to the primary system from accumulator (ACC) tanks of emergency core cooling system (ECCS). In the experiment, liquid level in the upper-head was found to control break flow rate. When maximum core exit temperature reached 623 K, steam generator (SG) secondary-side depressurization was initiated by fully opening the relief valves in both SGs as an accident management (AM) action. The AM action, however, was ineffective on the primary depressurization until the SG secondary-side pressure decreased to the primary pressure. Meanwhile, the core power was automatically reduced when maximum cladding surface temperature of simulated fuel rods exceeded the pre-determined value of 958 K to protect the LSTF core due to late and slow response of core exit temperature. After the automatic core power reduction, loop seal clearing (LSC) was induced in both loops by steam condensation on the ACC coolant injected into cold legs. The whole core was quenched because of core recovery after the LSC. After the ACC tanks started to discharge nitrogen gas, the pressure difference between the primary and SG secondary sides became larger.

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 SB-PV-09.

Keywords: PWR, LSTF, Pressure Vessel Top Break, Small Break LOCA, Accident Management, Steam Generator Depressurization, Gas Inflow, Core Boil-off

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ROSA/LSTF 実験 SB-PV-09 データレポート
－ガスが流入する条件での 1.9%圧力容器頂部小破断冷却材喪失事故時蒸気発生器減圧－

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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:SB-PV-09)が 2005 年 11 月 17 日に行われた。ROSA/LSTF SB-PV-09 実験では、加圧水型原子炉(PWR)の 1.9%圧力容器頂部小破断冷却材喪失事故を模擬した。このとき、非常用炉心冷却系(ECCS)である高圧注入系の全故障と蓄圧注入(ACC)タンクから一次系への非凝縮性ガス(窒素ガス)の流入を仮定した。実験では、上部ヘッドに形成される水位が破断流量に影響を与えることを見出した。アクシデントマネジメント(AM)策として、両ループの蒸気発生器(SG)逃し弁開放による SG 二次側減圧を炉心出口最高温度が 623K に到達した時点で開始した。SG 二次側圧力が一次系圧力に低下するまで、この AM 策は一次系減圧に対して有効とならなかった。一方、炉心出口温度の応答が遅くかつ緩慢であるため、模擬燃料棒の被覆管表面最高温度が LSTF の炉心保護のために予め決定した値(958K)を超えたとき、炉心出力は自動的に低下した。炉心出力の自動低下後、低温側配管内での ACC 水と蒸気の凝縮により両ループのループシールクリアリング(LSC)が誘発された。LSC 後、炉心水位が回復して炉心はクエンチした。ACC タンクから窒素ガスの流入開始後、一次系と SG 二次側の圧力差が大きくなった。
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 SB-PV-09 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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Contents

1. Introduction ··· 1
2. Overview of LSTF ··· 2
3. Test Conditions and Procedures ··· 3
   - 3.1 Initial Steady State and Boundary Conditions ··· 3
   - 3.2 Test Procedures ··· 5
   - 3.3 Instrumentation ··· 6
     - 3.3.1 Measured Data ··· 6
     - 3.3.2 Data Conversion, Reduction, and Calibration ··· 6
     - 3.3.3 Data Qualification ··· 7
4. Experimental Results ··· 13
   - 4.1 Initial and Boundary Conditions ··· 13
   - 4.2 Thermal-hydraulic Responses Concerning Boundary Conditions ··· 13
   - 4.3 Transient Thermal-hydraulic Responses ··· 15
     - 4.3.1 Thermal-hydraulic Responses in Pressure Vessel ··· 15
     - 4.3.2 Thermal-hydraulic Responses in Primary Loops ··· 17
     - 4.3.3 Thermal-hydraulic Responses of Steam Generators ··· 17
5. Summary ··· 41

Acknowledgement ··· 42

References ··· 42

Appendix A Available Experimental Data List ··· 43

目次

1. 緒言 …………………………………………………………………………1
2. LSTF の概要……………………………………………………………………2
3. 実験条件および手順 …………………………………………………………3
3.1 初期定常および境界条件……………………………………………………3
3.2 実験手順………………………………………………………………………5
3.3 計装……………………………………………………………………………6
3.3.1 計測データ …………………………………………………………………6
3.3.2 データ変換、処理および校正………………………………………………6
3.3.3 データ評価……………………………………………………………………7
4. 実験結果 ……………………………………………………………………13
4.1 初期および境界条件…………………………………………………………13
4.2 境界条件に係る熱水力応答 ………………………………………………13
4.3 過渡熱水力応答………………………………………………………………15
4.3.1 圧力容器内の熱水力応答…………………………………………………15
4.3.2 一次系ループ内の熱水力応答……………………………………………17
4.3.3 蒸気発生器の熱水力応答…………………………………………………17
5. まとめ ………………………………………………………………………41
謝辞 ……………………………………………………………………………42
参考文献 ………………………………………………………………………42
付録 A 利用可能な実験データリスト………………………………………43

List of Tables

Table 3-1 Initial steady state and boundary conditions ··· 8
Table 3-2 Pressure vessel lower plenum pressure versus LPI flow rate ··· 10
Table 3-3 Specified control logic, operation set points, and conditions ··· 10
Table 3-4 Specified pump rotation speed ratio after scram signal ··· 11
Table 3-5 Pre-determined core power decay curve after scram signal ··· 11
Table 4-1 Initial steady state conditions ··· 19
Table 4-2 Chronology of major events until core power off ··· 20
Table A-1 List of available experimental data for LSTF SB-PV-09 ··· 44

List of Figures

Fig. 2-1 Schematic view of the Large Scale Test Facility (LSTF) ··· 2
Fig. 3-1 Configuration of break unit ··· 12
Fig. 3-2 Schematic view of pressure vessel and break unit ··· 12
Fig. 4-1 Core power ··· 21
Fig. 4-2 Pressurizer heater power ··· 22
Fig. 4-3 Pressurizer liquid level ··· 22
Fig. 4-4 Primary coolant pump rotation speed ··· 23
Fig. 4-5 Primary loop mass flow rate ··· 23
Fig. 4-6 SG main steam flow rate ··· 24
Fig. 4-7 SG main feedwater flow rate ··· 24
Fig. 4-8 SG secondary-side collapsed liquid level ··· 25
Fig. 4-9 Auxiliary feedwater flow rate ··· 25
Fig. 4-10 Break flow rate ··· 26
Fig. 4-11 Liquid level in accumulator tank ··· 26
Fig. 4-12 Coolant injection flow rate from accumulator tank ··· 27
Fig. 4-13 Coolant injection flow rate from LPI system ··· 27
Fig. 4-14 Primary and secondary pressures ··· 28
Fig. 4-15 SG relief valve line flow rate ··· 28
Fig. 4-16 Upper plenum collapsed liquid level ··· 29
Fig. 4-17 Core collapsed liquid level ··· 29
Fig. 4-18 Core exit temperatures (-365 to 3000 s) ··· 30
Fig. 4-19 Core exit temperatures (800 to 1600 s) ··· 30
Fig. 4-20 Cladding surface temperatures at Positions 9 through 5 (-365 to 3000 s) ··· 31
Fig. 4-21 Cladding surface temperatures at Positions 9 through 5 (800 to 1600 s) ··· 31

Fig. 4-22 Downcomer collapsed liquid level 32
Fig. 4-23 Upper-head collapsed liquid level 33
Fig. 4-24 Break-upstream averaged fluid density 33
Fig. 4-25 Hot leg liquid level 34
Fig. 4-26 Hot leg fluid temperature 34
Fig. 4-27 Cold leg liquid level 35
Fig. 4-28 Cold leg fluid temperature 35
Fig. 4-29 Crossover leg downflow-side collapsed liquid level 36
Fig. 4-30 Crossover leg upflow-side collapsed liquid level 36
Fig. 4-31 SG U-tube upflow-side collapsed liquid level in loop with pressurizer 37
Fig. 4-32 SG U-tube downflow-side collapsed liquid level in loop with pressurizer 37
Fig. 4-33 SG U-tube upflow-side collapsed liquid level in loop without pressurizer 38
Fig. 4-34 SG U-tube downflow-side collapsed liquid level in loop without pressurizer 38
Fig. 4-35 SG inlet plenum collapsed liquid level 39
Fig. 4-36 SG secondary-side fluid temperature in loop with pressurizer 40
Fig. 4-37 SG secondary-side fluid temperature in loop without pressurizer 40

Acronyms and Abbreviations

ACC	Accumulator
AFW	Auxiliary Feedwater
AM	Accident Management
CRGT	Control Rod Guide Tube
ECCS	Emergency Core Cooling System
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
PKL	Primärkreisläufe Versuchsanlage
PWR	Pressurized Water Reactor
PZR	Pressurizer
ROSA	Rig-of-Safety Assessment
RV	Relief Valve
SBLOCA	Small-break Loss-of-coolant Accident
SG	Steam Generator

1. Introduction

Pressure vessel head wall thinning [1][2] was found at the Davis Besse reactor in the US in 2002. This raised a safety issue concerning pressure vessel structural integrity. Circumferential cracking of penetration nozzle for the control rod drive mechanism may cause a small-break loss-of-coolant accident (SBLOCA) at the pressure vessel upper-head in a pressurized water reactor (PWR). Liquid level in the pressure vessel may be influenced by break flow because of steam-phase break in the pressure vessel top SBLOCA. During the core uncovery period, a core temperature excursion may be detected through core exit temperatures, which can initiate the symptom-oriented accident management (AM) operator action during the pressure vessel top SBLOCA. There, however, have been scarce experimental data on the pressure vessel top SBLOCA with the AM action.

A simulation experiment denoted as SB-PV-09 on a PWR pressure vessel top SBLOCA with a break size of 1.9% was conducted on November 17, 2005 utilizing the Large Scale Test Facility (LSTF) [3] 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 high pressure injection system of emergency core cooling system (ECCS). Steam generator (SG) secondary-side depressurization was started by fully opening the relief valves (RVs) in both SGs as the AM action when maximum core exit temperature reached 623 K: a criterion for Japanese PWR. Auxiliary feedwater (AFW) was injected into the SG secondary-side with some delay after the AM action onset. The experiment also supposed non-condensable gas (nitrogen gas) ingress to the primary system from accumulator (ACC) tanks of ECCS due to failure of the ACC system isolation after the coolant injection initiation.

The objectives of the ROSA/LSTF test SB-PV-09 were to investigate thermal-hydraulic phenomena, to clarify relationship between core exit temperature and cladding surface temperature of simulated fuel rods, and to confirm the AM action effectiveness for the core cooling and the primary depressurization under nitrogen gas inflow during the pressure vessel top SBLOCA, as well as to provide experimental data for the assessment of thermal-hydraulic safety analysis computer codes. The experimental data obtained would be useful to define the conditions for counterpart testing of other integral test facilities such as PKL (Primärkreisläufe Versuchsanlage) with a volumetric scale of 1/145 [4] to address scaling problems through thermal-hydraulic phenomena in PWR accidents, similar to the LSTF SBLOCA test data provided for the OECD/NEA PKL Phase 3 Project [5] [6].

This report summarizes the test procedures, conditions, and major observations in the ROSA/LSTF experiment SB-PV-09. 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 [3]. The reference PWR is Tsuruga Unit-2 of Japan Atomic Power Company. Loops with and without pressurizer (PZR) are designated as loop-A and loop-B, respectively. Hot and cold legs, 207 mm in inner-diameter, 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 [7]. Each loop has an active SG 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. [3]). Six U-tubes are instrumented for each SG. Tubes 1 and 6 are short tubes (Type 1; see p.267 in Ref. [3]), 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 including eight upper-head spray nozzles (inner-diameter of 3.4 mm each) (see p.202 in Ref. [3]) and the hot leg nozzle leakage. The spray nozzles allow bypass flow that amounts to 0.3% of the total core flow rate during initial steady state, while bypass area of the hot leg nozzle is set to allow 0.2% bypass flow for each loop. Control rod guide tube (CRGT) forms the flow path between the upper-head and the upper plenum. Eight CRGTs in the LSTF (see pp.208-209 in Ref. [3]) are attached to the upper core plate and pass through the upper core support plate to simulate the CRGT in the reference PWR. The LSTF core, 3.66 m in active height, mainly consists of 1008 electrically heater rods to simulate the fuel rod assembly and 96 non-heating tie rods to simulate control rod guide thimble (see p.220 in Ref. [3]).

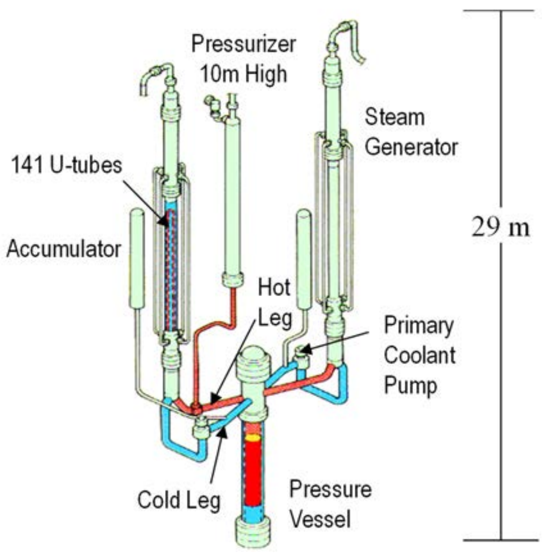

Fig. 2-1 Schematic view of the Large Scale Test Facility (LSTF)

3. Test Conditions and Procedures

With respect to the break, ECCS, and control logic, following assumptions were posed to the SB-PV-09 test conditions.

The assumption related to the break is the following;

1) Break size (flow area) corresponds to 1.9% of the volumetrically-scaled (1/48) cross-sectional area of the reference PWR cold leg. This is also equivalent to the size of ejection of one whole penetration nozzle for the control rod drive mechanism. The break is simulated by using a 13.8 mm inner-diameter sharp-edge orifice mounted at the downstream of a horizontal pipe that is connected to upper-head nozzle.

The assumptions concerning the ECCS are as below;

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

The assumptions regarding the control logic are as below;

6) Loss of off-site power concurrently with the scram signal
7) When maximum core exit temperature reaches 623 K, SG secondary-side depressurization is initiated by fully opening the RVs in both SGs as the AM action.
8) AFW is injected into the secondary-side of both SGs with some delay after the initiation of the AM action. The AFW flow rate in each loop is planned to be about 0.3 kg/s. Coolant injection temperature in the AFW system is 310 K.
9) Thresholds of maximum cladding surface temperature for the LSTF core protection system are as follows;
   958K=75%, 968K=50%, 969K=25%, 970K=10%, of pre-determined value [8].

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 PZR pressure, fluid temperatures in hot and cold legs were 15.5 MPa, 598 K, and 563 K, respectively, 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, and 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, that correspond to “Case 3” shown in **Table 3-1**. Axial core power profile is a 9-step chopped cosine with a peaking factor of 1.495. 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 7.2 m that is equivalent to about 64% of the PZR vessel height (see p.396 in Ref. [3]). 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 to the PZR proportional and backup heaters were 3.9 and 33.8 kW, respectively, as the initial conditions. Many regions of the LSTF are equipped with trace heaters to mitigate environmental heat losses.

Figure 3-1 shows the configuration of the break unit. **Figure 3-2** illustrates a schematic view of the pressure vessel and break unit. This figure contains a sketch of coolant inventory distribution estimated from the measured data at 250 s during two-phase flow discharge period (to be described in **Section 4.3.1**). The break was simulated by employing a 13.8 mm inner-diameter sharp-edge orifice No.19 (see p.307 in Ref. [3]) mounted at the downstream of a horizontal pipe that was connected to upper-head nozzle. The orifice flow area corresponded to 1.9% of the 1/48-scaled cross-sectional area of the reference PWR cold leg. Venturi flow meter (FE-560-BU; see p.303 in Ref. [3]) is installed in the break unit.

The specified initial water level and volume above the standpipe for the control of ACC water injection volume (see p.322 in Ref. [3]) are 1.58 m and 1.12 m^3, respectively, for both loops. The specified initial volume of non-condensable gas (nitrogen gas) in the ACC tank is 0.46 m^3 for both loops. Meanwhile, the initial water volume above the standpipe and the initial nitrogen gas volume were roughly estimated to be 1.0278 m^3 and 0.5565 m^3 respectively for both loops, on the basis of the measured data concerning the ACC system. The angle of the ACC injection to cold leg is 90° for loop with PZR (loop-A) and 45° for loop without PZR (loop-B) (see pp.397-398 in Ref. [3]).

Regarding the flow path between the upper-head and the upper plenum, a cap-plate is mounted at the top of each of eight CRGTs in the LSTF (see pp.208-209 in Ref. [3]). A rod inside of the cap-plate has a radius of 9 mm. The distance from the center line of the rod to the end of the cap-plate is 12 mm. Each of four spacers attached to the rod has a dimension of 4 mm × 2.5 mm. The total cross-sectional area of the flow path between the rod and the cap-plate is thus calculated to be 1264 mm^2.

3.2 Test Procedures

Table 3-3 shows the specified control logic, operation set points, and conditions. The experiment was launched by opening a break valve located downstream of the break orifice at time zero. 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.

When the primary pressure dropped to 12.97 MPa, a scram signal was generated, which 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 3-4** shows the specified rotation speed ratio of primary coolant pump after the scram signal. The pump rotation speed was reduced to zero 250 s after the scram signal.

Table 3-5 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 [8]. The core power was maintained 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 to decay afterwards according to the specified core power.

The pressure set points for opening and closure of the SG RVs are 8.03 and 7.82 MPa respectively, referring to the corresponding values in the reference PWR. The SG RV was simulated by using 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.

ACC system is actuated in both loops at the primary pressure of 4.51 MPa. The ACC flow rate ratio of loop with PZR to loop without PZR is approximately 1:1 (to be presented in **Fig. 4-12**). Coolant injection temperature from the ACC system is 320 K.

LPI system is activated in both loops at the pressure vessel lower plenum pressure of 1.24 MPa (**Table 3-2**). The LPI flow rate ratio of loop with PZR to loop without PZR is nearly 1:1 (to be indicated in **Fig. 4-13**). Coolant injection temperature from the LPI system is 310 K.

The AFW is injected into the secondary-side of both SGs to avoid a significant drop in the SG secondary-side collapsed liquid level after the start of the SG secondary-side depressurization as the AM action (to be presented in **Figs. 4-8 and 4-15**). The AFW injection is performed by monitoring the narrow-range (0-1 kg/s) feedwater flow rate [Tag Name; FE520B-PAA (for loop with PZR), FE530B-PAB (for loop without PZR)] (see pp.257-258 in Ref. [3]). The AFW flow rate in each loop was expected to be about 0.3 kg/s (to be indicated in **Fig. 4-9**). Coolant injection temperature in the AFW system is 310 K.

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 represent 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. Some parameters such as flow rate (FE) and liquid level (LE) that employ differential pressure (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 follows. “Good” means that the type of data has been reviewed manually, and is presumed to lie within the published span and uncertainty values. 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 SB-PV-09 (Run ID designated to be SP9).

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

Core	Initial core power	10 MW
	Radial core power profile	Case 3
	Axial core power profile	9-step chopped cosine, peaking factor = 1.495
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
	Inner-diameter of relief valve orifice	6.83 mm
	Relief valve open / closure	Primary pressure = 16.20 / 16.07 MPa
	Inner-diameter of safety valve orifice	14.4 mm
	Safety valve open / closure	Primary pressure = 17.26 / 17.06 MPa
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

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

Break

Location	Pressure vessel upper-head (see **Fig. 3-1**)
Type	Sharp-edge orifice
Inner-diameter of orifice	13.8 mm

ECCS

High pressure injection system		Not actuated
Accumu-lator (ACC) system	Initiation of system	Primary pressure = 4.51 MPa
	Water temperature	320 K
	Initial water level above tank bottom in both loops	6.8 m
	Standpipe level above tank bottom in both loops	5.22 m
	Initial water volume above standpipe in both loops	1.12 m^3*
	Initial gas volume in both loops	0.46 m^3
	Cross-sectional flow area above standpipe	0.7085 m^2
	Orifice diameter (d) in loops with / without PZR	38.2 mm / 35.0 mm
	Connecting pipe diameter (D) in both loops	97.1 mm
	Contraction ratio (d/D) in loops with / without PZR	0.393 / 0.360
	Ratio of injection flow rate of loop with PZR to loop without PZR	1:1
	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 3-2**
	Fluid temperature	310 K
	Ratio of injection flow rate of loop with PZR to loop without PZR	1:1
	Injection location	Same with ACC system

* $(6.8-5.22\ [m])\times 0.7085\ [m^2] \fallingdotseq 1.12\ [m^3]$

LSTF Core Protection System Logic

Control of core power to	Maximum cladding surface temperature reaches
75%	958 K
50%	968 K
25%	969 K
10%	970 K

Table 3-2 Pressure vessel lower plenum pressure versus LPI flow rate

Pressure vessel lower plenum pressure (MPa)	LPI flow rate in loop with PZR (kg/s)	LPI flow rate in loop without PZR (kg/s)
1.24	0.76	0.76
1.20	1.07	1.07
1.15	1.41	1.41
1.10	1.70	1.70
1.05	1.94	1.94
1.0	2.15	2.15
0.9	2.49	2.49
0.8	2.76	2.76
0.6	3.24	3.24

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

Event	Condition
Break	Time zero
Generation of scram signal	Primary pressure = 12.97 MPa
Pressurizer (PZR) proportional heater off	Generation of scram signal or PZR liquid level below 2.3 m
PZR backup heater off	PZR liquid level below 2.3 m
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 SG secondary-side depressurization by fully opening RVs in both SGs as AM action	Maximum core exit temperature reaches 623 K.
Initiation of auxiliary feedwater	With some delay after initiation of AM action
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

Table 3-4 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 3-5 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

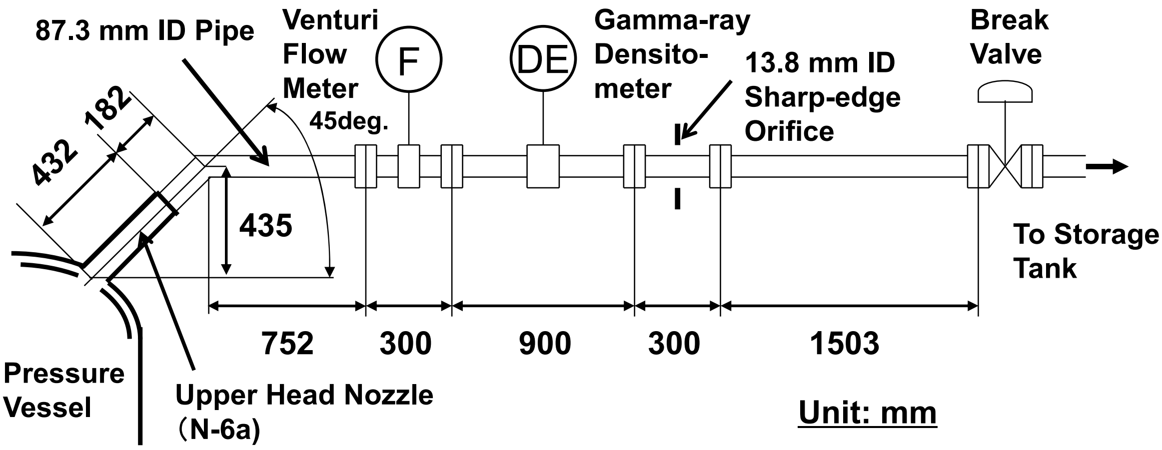

Fig. 3-1 Configuration of break unit

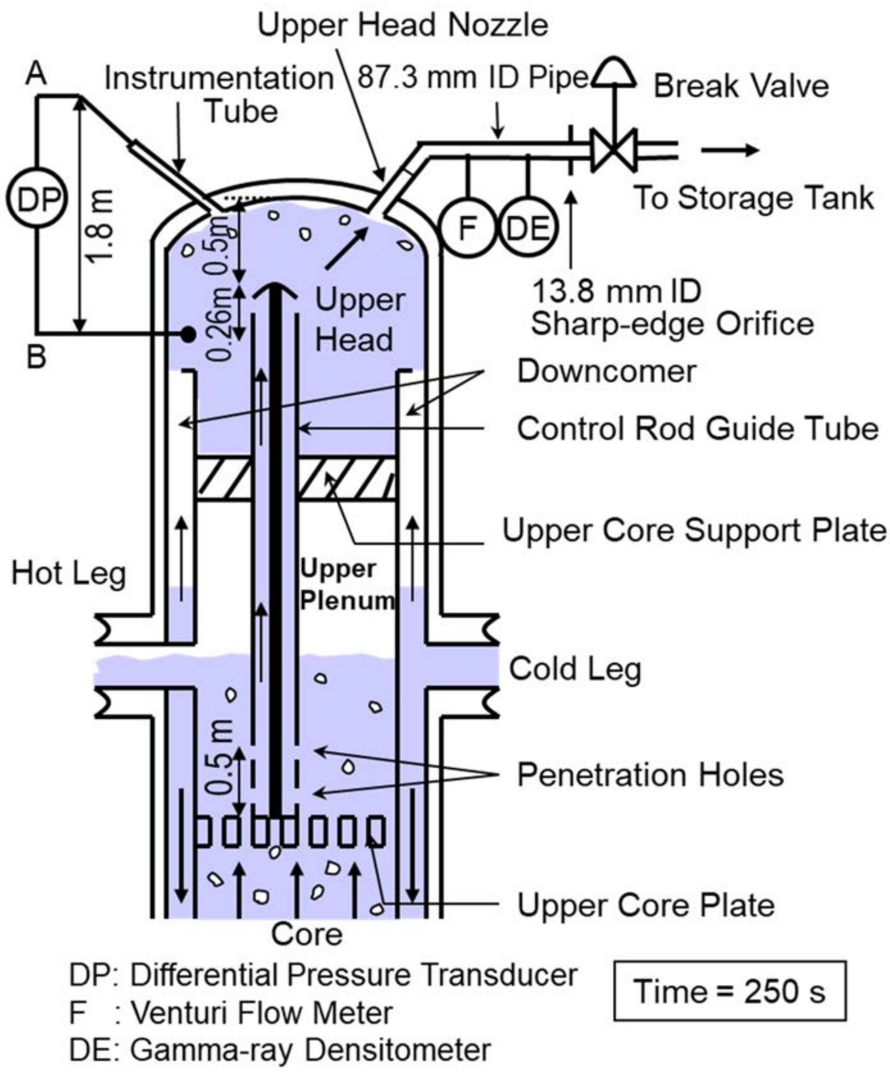

Fig. 3-2 Schematic view of pressure vessel and break unit

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 shown 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** shows the chronology of major events until 3279 s at the core power off.

4.2 Thermal-hydraulic Responses Concerning Boundary Conditions

As presented in **Fig. 4-1**, the core power began to decay at 46 s. The core power was automatically reduced by the LSTF core protection system at 1205 s when the maximum cladding surface temperature exceeded 958 K (to be shown in **Figs. 4-20 and 4-21**). The core power was controlled to 10% of the pre-determined value [8] at 1215 s when the maximum cladding surface temperature achieved 970 K. The core power turned off at 3279 s.

Figure 4-2 shows that the power values of the PZR proportional and backup heaters were initially kept constant at 3.9 and 33.8 kW, respectively. After the break, they began to increase up to 8.5 and 87.3 kW, respectively. The PZR proportional heater power turned off by 27 s following the scram signal. The PZR backup heater power turned off by 30 s on account of low liquid level in the PZR when the PZR liquid level lowered to 2.3 m, as indicated in **Fig. 4-3**. The PZR liquid level decreased largely but temporarily just after the break, and dropped monotonously afterwards. The PZR became empty of liquid by 55 s.

Figures 4-4 and 4-5 show the primary coolant pump rotation speed and the primary loop mass flow rate measured by using a venturi flow meter at each primary coolant pump suction leg, respectively. The pump rotation speed began to increase simultaneously with the break, and attained about 1550 rpm in 4 s. The pump coastdown started at 27 s following the scram signal. The pump rotation speed reduced thereafter, which led to a decrease in the primary loop mass flow rate. The primary loop mass flow rate oscillated during the time periods of the coolant injection from the ACC and LPI systems (to be presented in **Figs. 4-12 and 4-13**).

Figures 4-6 and 4-7 show the SG main steam and feedwater flow rates, respectively. 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. [3]) at 25 s following 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. [3]) at 28 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. [3]) were manually closed at 47 s following the SG main steam stop valve closure.

Figures 4-8 and 4-9 show the SG secondary-side collapsed liquid level and auxiliary feedwater (AFW) flow rate, respectively. The SG secondary-side collapsed liquid level began to raise after the main steam stop valve closure and the main feedwater termination (**Figs. 4-6 and 4-7**) probably due to the decrease in the net upward steam flow through the boiling section. The SG secondary-side collapsed liquid level was kept at a certain liquid level, which is enough to cover the SG long U-tubes, until 1090 s when the SG secondary-side depressurization was started. Flow meter for AFW counts flow rate in the return line from the AFW pump to the refueling water storage tank during the time period except the AFW pump actuation. The AFW injection into the secondary-side of both SGs was initiated at 1120 s, and continued thereafter. The AFW flow rate was about 0.24-0.26 kg/s in loop with PZR and about 0.28-0.37 kg/s in loop without PZR. The SG secondary-side collapsed liquid level began to drop at 1090 s when the SG secondary-side depressurization was initiated. It also turned to increase at around 2900 s in loop with PZR and around 2700 s in loop without PZR because the steam discharge flow rate through the SG RV became lower than the AFW flow rate.

Figure 4-10 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 decreased stepwise when the break flow turned from single-phase liquid to two-phase flow at about 50 s first, and then changed to single-phase vapor at about 700 s.

Figure 4-11 shows the liquid level in the ACC tank. **Figure 4-12** gives the coolant injection flow rate from the ACC tank derived from the liquid level history in the ACC tank. When the primary pressure lowered to 4.51 MPa, the ACC system was initiated in both loops at 1300 s. The initial water level above the ACC tank bottom was 6.72 m in both loops. The final water level above the ACC tank bottom was 5.27 m in loop with PZR and 5.24 m in loop without PZR. The ACC coolant injection occurred three times at around 1300-1415 s, 1500-1870 s, and 2020-2155 s. Owing to condensation of steam on the ACC coolant injected into both cold legs, the primary depressurization was enhanced twice at around 1360-1415 s and 1630-1930 s (to be presented in **Fig. 4-14**). The steam condensation produced loop seal clearing (LSC) in both loops at 1400 s (to be indicated in **Figs. 4-29 and 4-30**).

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 initiated in both loops at 2900 s, as shown in **Fig. 4-13**.

4.3 Transient Thermal-hydraulic Responses

Figure 4-14 shows the primary and secondary pressures. The primary pressure began to decrease at time zero when the break valve was opened. When the primary pressure lowered to 12.97 MPa, the scram signal was generated at 23 s, which gave rise to 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. The SG secondary-side pressure rapidly increased up to about 8 MPa after the closure of the SG main steam isolation valve. The SG secondary-side pressure fluctuated between 8.03 and 7.82 MPa by cycle opening of the SG RVs, as presented in **Fig. 4-15**. The primary pressure became lower than the SG secondary-side pressure at around 800 s. SG secondary-side depressurization was initiated by fully opening the RVs in both SGs as the AM action at 1090 s when the maximum core exit temperature reached 623 K, and continued thereafter. The AM action, however, was not effective on the primary depressurization until around 1300 s when the SG secondary-side pressure was higher than the primary pressure. When the primary pressure lowered to about 1.6 MPa, the ACC system was terminated in both loops at 2155 s. After nitrogen gas began to enter primary loops and SG U-tubes at around 2300 s, the primary depressurization rate decreased implying that degradation should occur in the condensation heat transfer in the SG U-tubes leading to delayed actuation of the LPI system in both loops (**Fig. 4-13**). The pressure difference between the primary and SG secondary sides increased after around 2500 s, as indicated in **Fig. 4-14**.

4.3.1 Thermal-hydraulic Responses in Pressure Vessel

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

Figures 4-16 and 4-17 respectively show the collapsed liquid levels in upper plenum and core. The upper plenum collapsed liquid level was kept constant at the penetration holes at the CRGT bottom (**Fig. 3-2**) during a short time of about 670-720 s. Core uncovery took place by core boil-off at 850 s after the upper plenum became empty of liquid. The core liquid level started to recover at 1410 s soon after the LSC occurred in both loops. The whole core was quenched by 1560 s. The upper plenum liquid level began to recover at 1570 s.

<u>Responses of core exit temperature and cladding surface temperature of simulated fuel rods</u>

Figures 4-18 and 4-19 show the core exit temperatures measured at the center [Tag Name; TE-EX040-B22-UCP, -B21-UCP] (see pp.385-386 in Ref. [3]), middle region [TE-EX040-B19-UCP, -B18-UCP], and outer region [TE-EX040-B03-UCP, -B01-UCP] of the upper core plate. The core exit temperatures were maintained saturated until 900 s even after core uncovery initiated partly at 850 s (to be presented in **Figs. 4-20 and 4-21**) because of condensate falling from hot leg nozzle. The core exit temperature at the center of the upper core plate began to increase at 900 s. The core exit temperatures depended on radial positions. When the maximum core exit temperature achieved 623 K, the AM action was initiated by fully opening the RVs in both SGs at 1090 s. The peak core exit temperature of 750 K was observed at the center of the upper core plate at 1260 s. Then, the core exit temperatures at the middle region of the upper core plate were higher than those at the outer region of the upper core plate. The core exit temperatures were kept saturated again after around 1575 s.

Figures 4-20 and 4-21 show the cladding surface temperatures in high-power bundles [Bundle No.; B13 and B17] (see p.228 in Ref. [3]) at Positions 9 through 5 (= respectively at 3.610 through 1.830 m above the core bottom (= 0.0 m EL)). EL means the elevation referred to the bottom of the heated length of the core heater rods. The arrangement of high-, mean-, and low-power bundles is presented in Ref. [3] (p.228). During the core uncovery period, the cladding surface temperatures at Positions 9, 8, 7, 6, and 5 (at 3.610, 3.048, 2.642, 2.236, and 1.830 m EL) began to increase at 850, 880, 910, 955, and 1015 s, respectively. The peak cladding temperature of 975 K was observed at Position 7 at 1220 s. The cladding surface temperatures at Positions 9, 8, 6, and 5 attained 847, 898, 943, and 887 K respectively at 1230, 1217, 1217, and 1217 s. The entire core was quenched by 1560 s following the LSC in both loops (to be shown in **Figs. 4-29 and 4-30**).

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

Figure 4-22 shows the downcomer collapsed liquid level. Liquid level appeared in the downcomer at about 150 s. The downcomer liquid level started to significantly drop at about 650 s, and began to recover at about 1350 s.

Figure 4-23 shows the upper-head collapsed liquid level evaluated from the differential pressure between the top and the bottom of the upper-head represented by the measured differential pressure making use of the instrumentation tube (**Fig. 3-2**) and saturated coolant densities. Liquid level in the upper-head was found to control break flow rate as coolant in the upper plenum entered the upper-head through the CRGTs until the penetration holes at the CRGT bottom were exposed to steam in the upper plenum. **Figure 4-24** shows the break-upstream averaged fluid density measured by utilizing a three-beam gamma-ray densitometer (see p.374 in Ref. [3]). Oscillation in the upper-head mixture level led to the oscillation in the break flow rate (**Fig. 4-10**) through the break-upstream fluid density that temporarily decreased when the SG RV opened and the primary pressure reduced (**Figs. 4-14 and 4-15**).

4.3.2 Thermal-hydraulic Responses in Primary Loops

Figures 4-25 and 4-26 respectively show liquid levels and fluid temperatures in the hot legs. The hot leg liquid level is estimated from fluid densities measured by using a three-beam gamma-ray densitometer. The hot leg fluid became saturated at 50 s almost simultaneously with the liquid level formation in the hot leg. The liquid level of the hot leg with an inner-diameter of 0.207 m was kept at around 0.14 m in both loops at around 110-630 s. When the liquid level in the upper plenum started to drop, the hot leg liquid level became close to zero. The hot leg fluid temperature temporarily increased when hot steam flow passed through the crossover leg following the LSC in both loops at 1400 s. The hot leg liquid level recovered twice at around 1630-1850 s and 2280-2480 s under the influence of the ACC coolant injection (**Fig. 4-12**). The hot leg fluid temperature indicated superheating after around 2040 s in loop with PZR and after around 2390 s in loop without PZR.

Figures 4-27 and 4-28 respectively show liquid levels and fluid temperatures in the cold legs. The cold leg liquid level is evaluated from fluid densities measured by utilizing a three-beam gamma-ray densitometer. The cold leg fluid became saturated at 180 s before the liquid level formation in the cold leg at 240 s. The cold legs became voided at around 750 s. When the cold legs became almost refilled but temporarily because of the ACC coolant injection (**Fig. 4-12**), the cold leg fluid temperature showed subcooling. The cold leg fluid temperature increased with a decrease in the cold leg liquid level following the termination of the ACC coolant injection.

Figures 4-29 and 4-30 show the collapsed liquid levels in the crossover leg downflow-side and upflow-side, respectively. Steam condensation on the ACC coolant injected into the cold legs (**Fig. 4-12**) induced the LSC in both loops at 1400 s. Coolant reversed from the cold legs and formed the crossover legs again at 1800 s.

4.3.3 Thermal-hydraulic Responses of Steam Generators

Figures 4-31 through 4-34 show the 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. [3]), Tubes 2 and 5 are medium tubes (Type 5), and Tubes 3 and 4 are long tubes (Type 9). The liquid level in the upflow-side balanced that in the downflow-side for each instrumented SG U-tube. There was little difference between the liquid levels in the upflow-side and the downflow-side for the same-length instrumented U-tubes. The initiation of a considerable decrease in the SG U-tube liquid level was nearly the same for loops with and without PZR. The SG U-tubes became empty of liquid by 480 s. The liquid level drop in the downflow-side and the upflow-side of the SG U-tubes continued down to the crossover leg downflow-side (**Fig. 4-29**) and the SG inlet plenum (**Fig. 4-35**), respectively.

Figure 4-35 shows the SG inlet plenum collapsed liquid level. A substantial decrease in the SG inlet plenum collapsed liquid level started at 480 s. The SG inlet plena became empty of liquid at 600 s. The SG inlet plenum liquid level recovered at around 1650-1800 s due to an increase in the ACC flow rate (**Fig. 4-12**).

Figures 4-36 and 4-37 show the SG secondary-side fluid temperatures in loops with and without PZR, respectively. 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 during the time periods until around 170 s and of 700-1080 s. The SG secondary-side fluid temperatures at positions except for Position 1 were mostly maintained saturated through the experiment because the minimum collapsed liquid level in the SG secondary-side was about 7 m (**Fig. 4-8**).

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	10.12
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	598.0 / 597.7
Cold leg fluid temperature (K)	TE070C-CLA /TE210C-CLB	562.4±2.75	563.5 / 563.3
Mass flow rate (kg/s / loop)	FE020A-LSA / FE160A-LSB	24.3±1.25	24.90 / 24.88
Downcomer-to-hot leg bypass (kg/s)	FE010-HLA / FE150-HLB	0.049±0.01	0.050 / 0.045
Pressurizer (PZR)			
Pressure (MPa)	PE300A-PR	15.5±0.108	15.51
Liquid level (m)	LE280-PR	7.2±0.25	7.18
Steam generator			
Secondary-side pressure (MPa)	PE430-SGA / PE450-SGB	7.3±0.054	7.33 / 7.33
Secondary-side liquid level (m)	LE430-SGA / LE450-SGB	10.3±0.38	10.25 / 10.23
Steam flow rate (kg/s)	FE440-SGA / FE480-SGB	2.74±0.10	2.65 / 2.60
Main feedwater flow rate (kg/s)	FE430-SGA / FE470-SGB	2.74±0.05	2.76 / 2.65
Main feedwater temperature (K)	TE430-SGA / TE470-SGB	495.2±2.63	495.9 / 495.1
Auxiliary feedwater temperature (K)	TE880-RWST	310±2.37	309.8
Accumulator system			
Pressure (MPa)	PE650-ACC / PE660-ACH	4.51±0.054	4.52 / 4.51
Temperature (K)	TE660-ACC / TE700-ACH	320±2.3 / 2.4	321.6 / 321.9
Water level above tank bottom (m) *2	LE650-ACC / LE660-ACH	6.8±0.12/0.15	6.72 / 6.72
Low pressure injection system			
Temperature (K)	TE840-PL	310±2.63	310.6

*1 Averaged for 60 s (-60 to 0 s)

*2 Distance from standpipe top to tank bottom is 5.22 m.

Table 4-2 Chronology of major events until core power off

Time (s)	Event
0	Break valve open Start of primary coolant pumps rotation speed increase (to 1550 rpm in 4 s)
23	Scram signal
25	Closure of SG main steam stop valve
27	Initiation of coastdown of primary coolant pumps
28	Termination of SG main feedwater
46	Initiation of core power decay
47	Manual closure of SG main steam isolation valves
276	Stop of primary coolant pumps
800	Primary pressure became lower than SG secondary-side pressure.
850	Start of increase in cladding surface temperature at Position 9 by core boil-off
900	Start of increase in core exit temperature at center of upper core plate
1090	Initiation of SG secondary-side depressurization by fully opening RVs in both SGs as AM action at maximum core exit temperature of 623 K
1120	Initiation of AFW injection into secondary-side of both SGs
1205	Initiation of automatic core power reduction at maximum cladding surface temperature of 958 K
1215	Core power was controlled to 10% of pre-determined value at maximum cladding surface temperature of 970 K.
1220	Peak cladding temperature of 975 K was observed at Position 7.
1260	Peak core exit temperature of 750 K was seen at center of upper core plate.
1300	Initiation of ACC system in both loops
1400	Loop seal clearing in both loops
1560	Whole core quench
2155	Termination of ACC system in both loops
2300	Start of degradation in primary depressurization after nitrogen gas inflow
2900	Initiation of LPI system in both loops
3265	Break valve closure
3279	Core power off

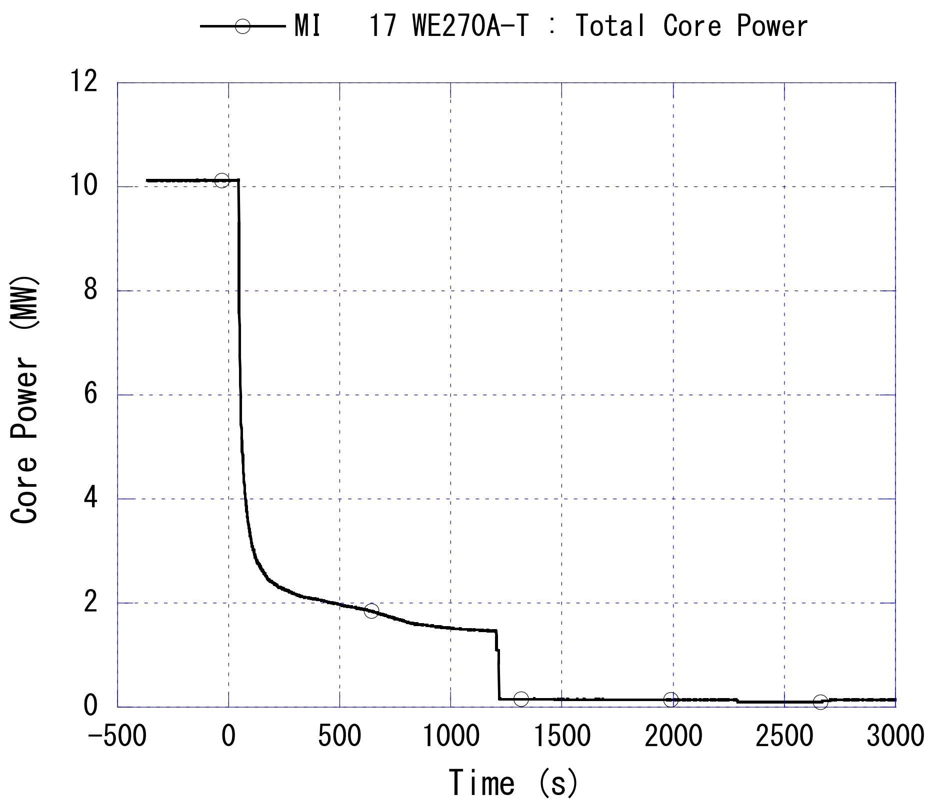

Fig. 4-1 Core power

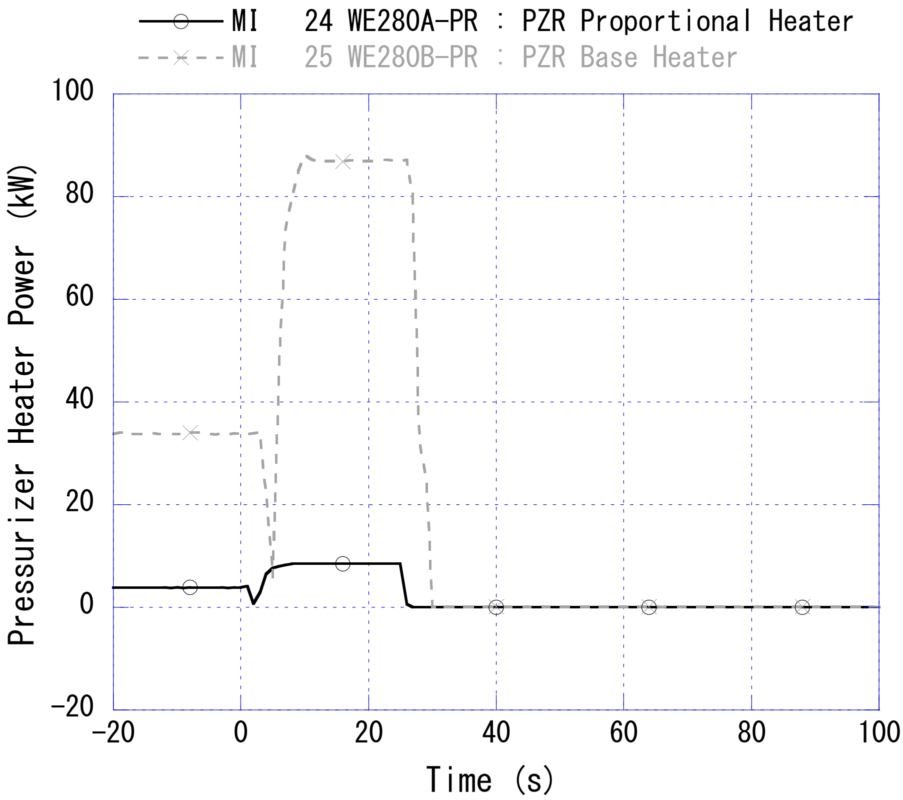

Fig. 4-2 Pressurizer heater power

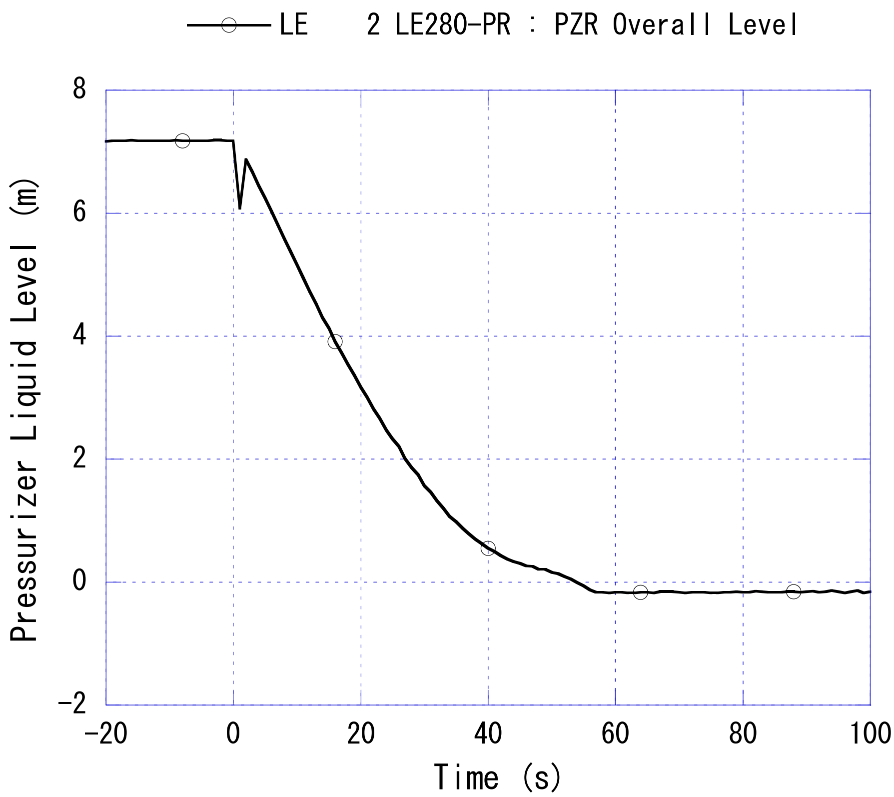

Fig. 4-3 Pressurizer liquid level

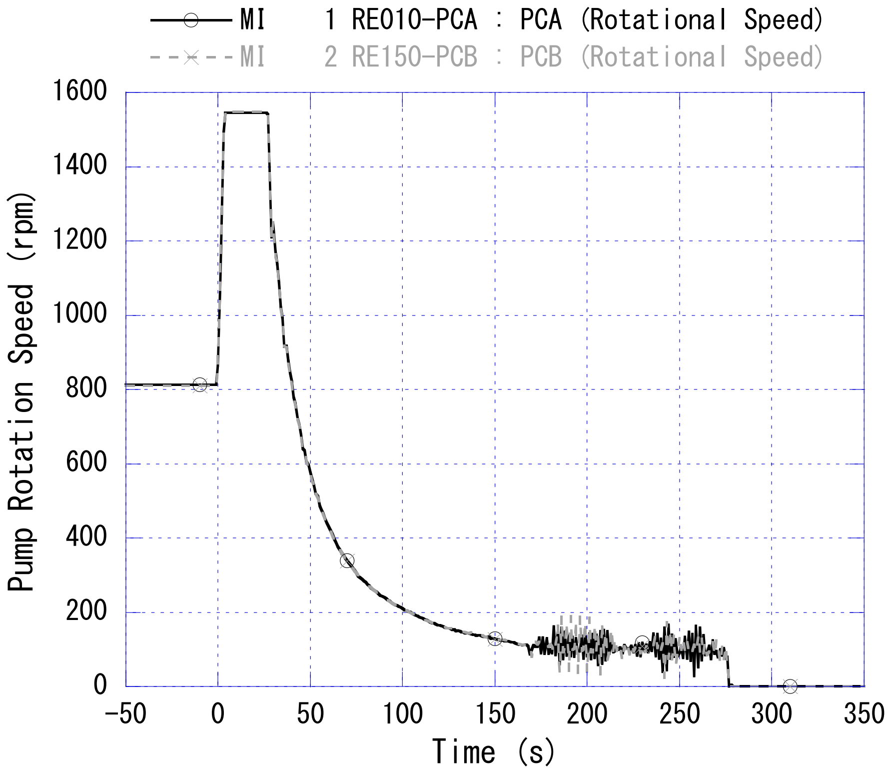

Fig. 4-4　Primary coolant pump rotation speed

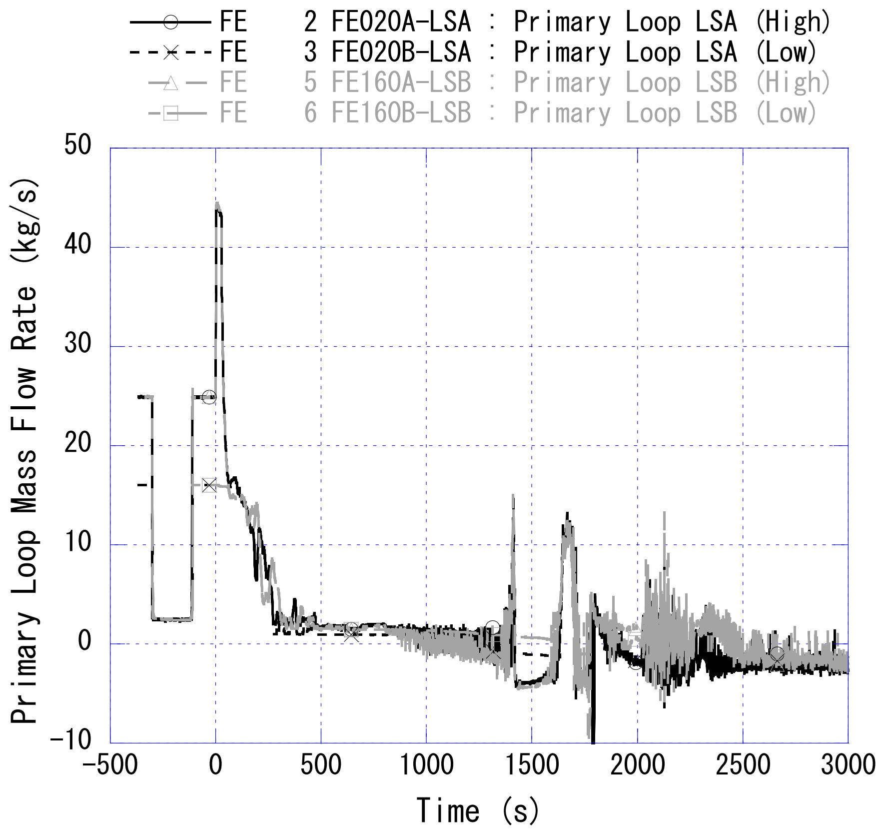

Fig. 4-5　Primary loop mass flow rate

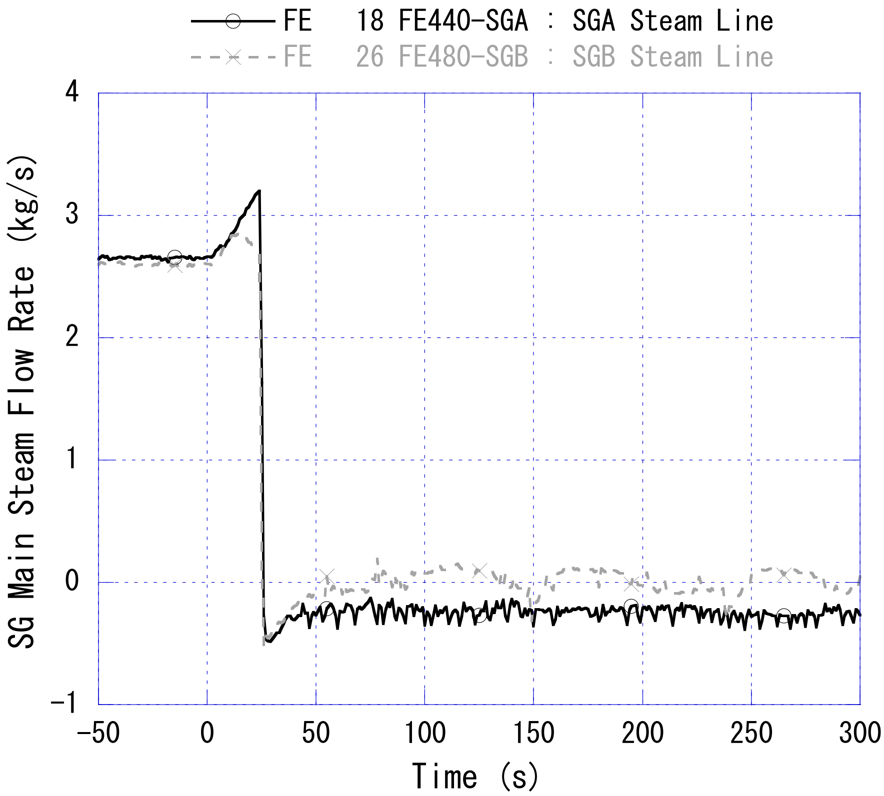

Fig. 4-6 SG main steam flow rate

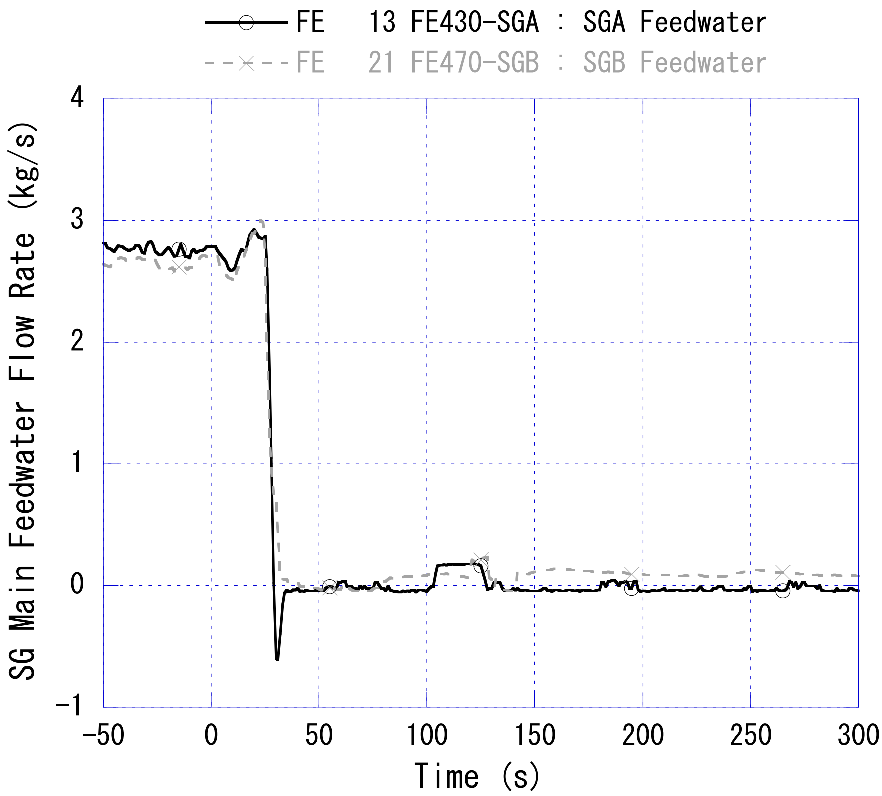

Fig. 4-7 SG main feedwater flow rate

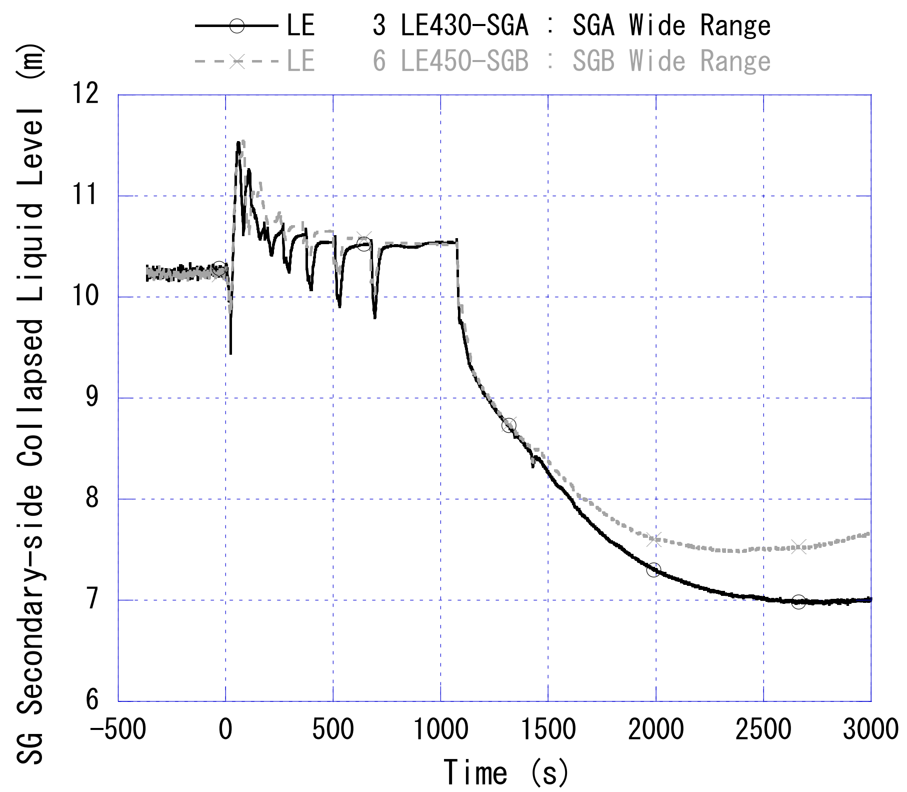

Fig. 4-8 SG secondary-side collapsed liquid level

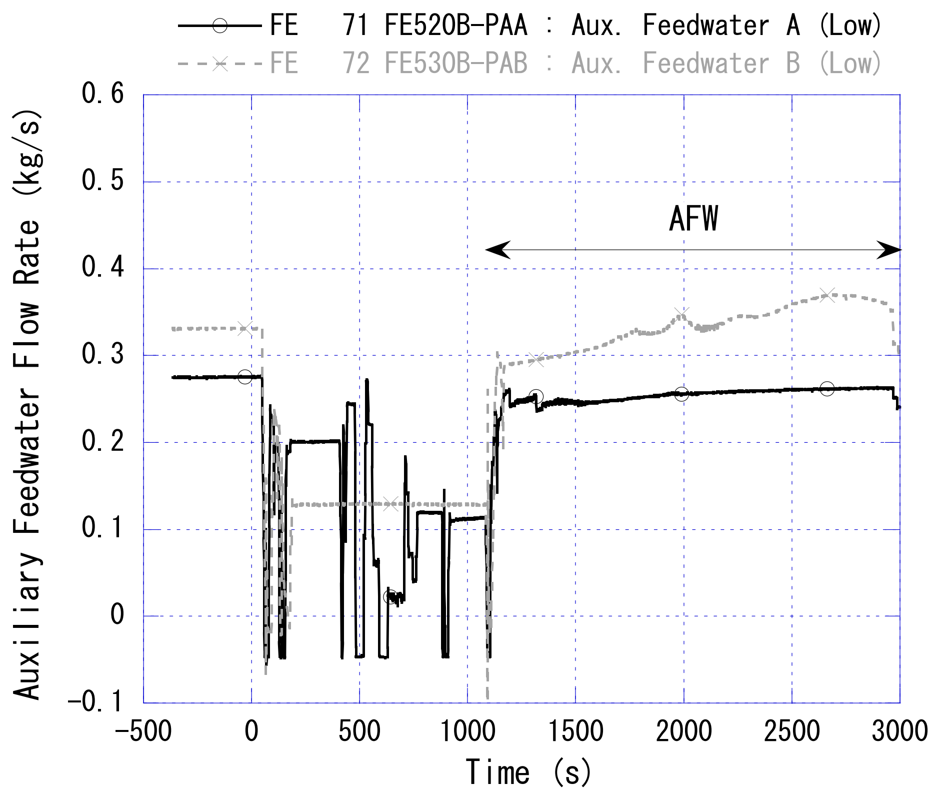

Fig. 4-9 Auxiliary feedwater flow rate

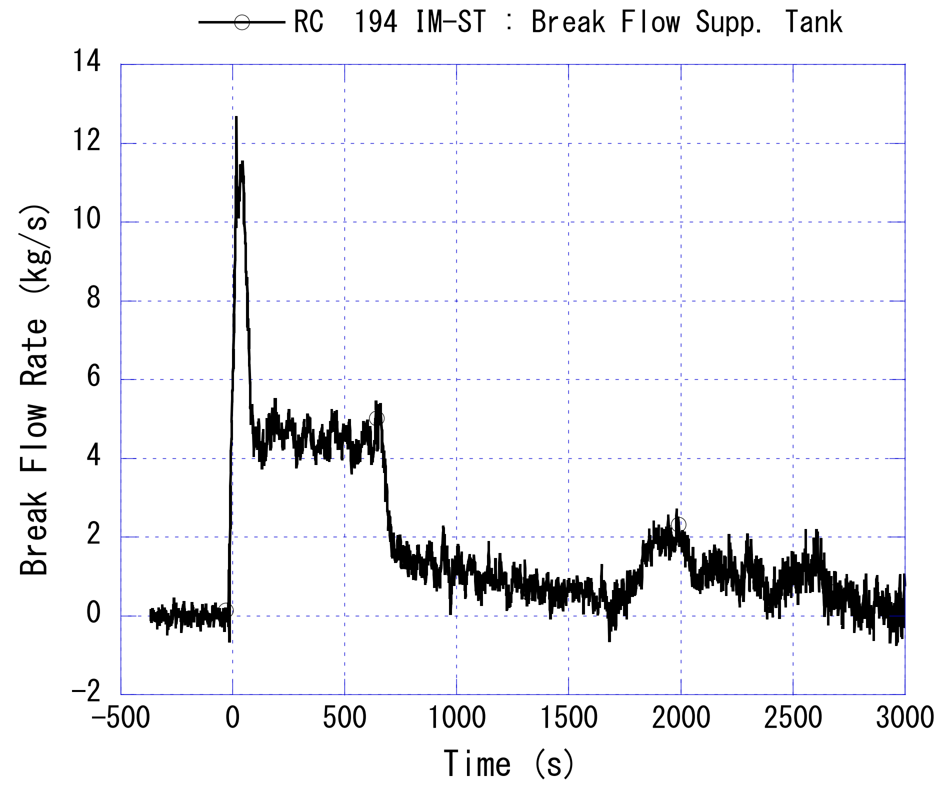

Fig. 4-10 Break flow rate

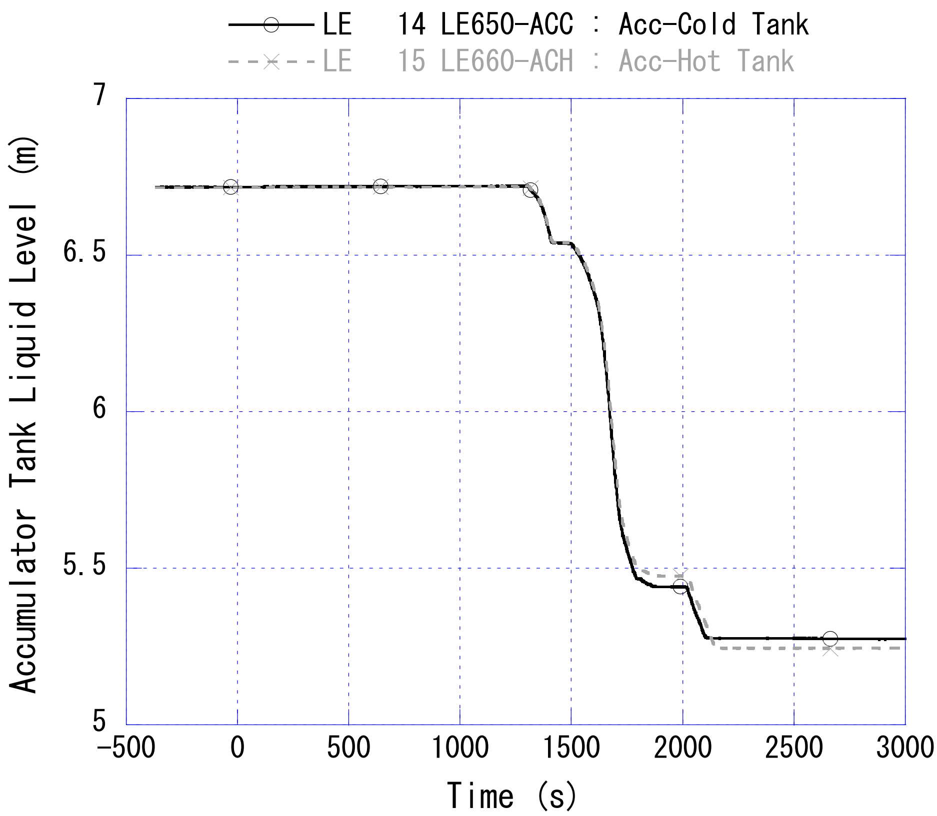

Fig. 4-11 Liquid level in accumulator tank

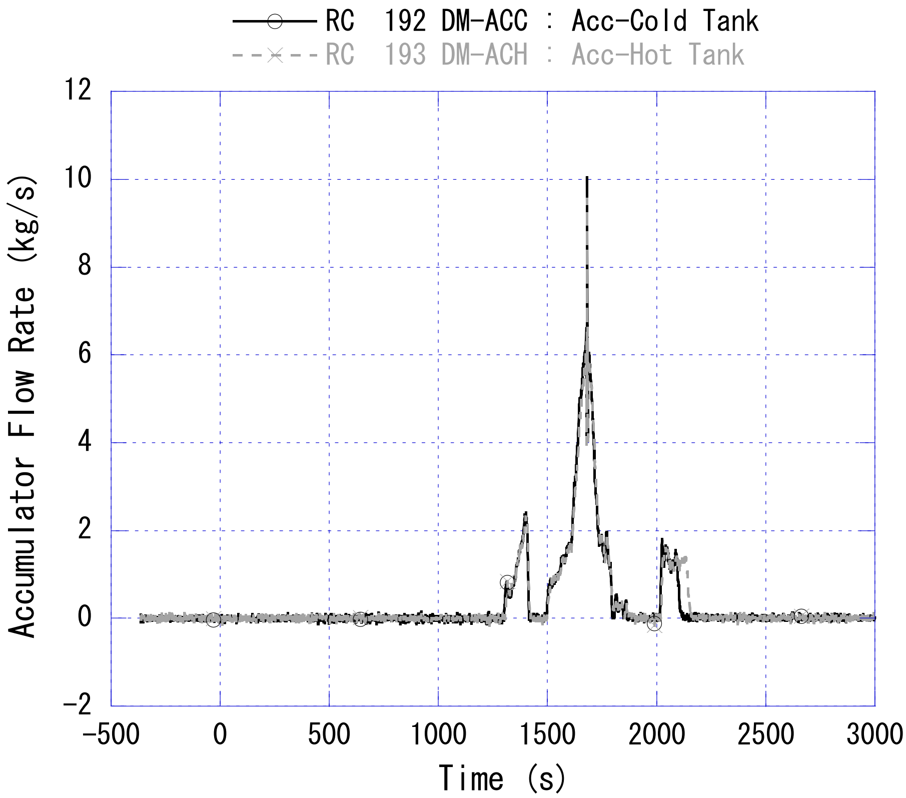

Fig. 4-12 Coolant injection flow rate from accumulator tank

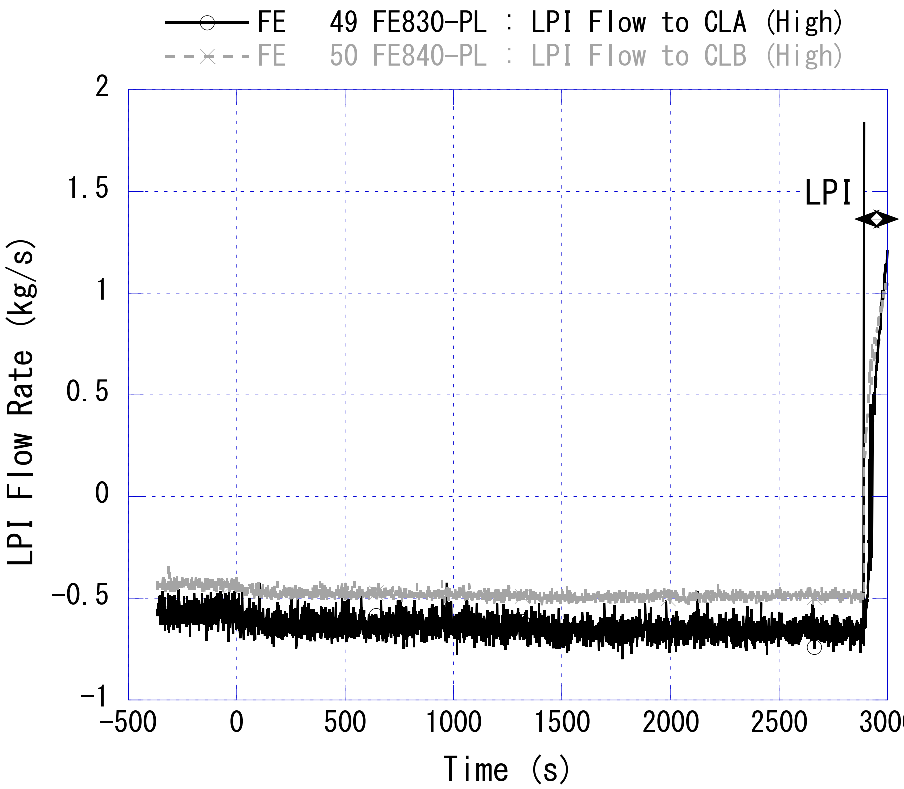

Fig. 4-13 Coolant injection flow rate from LPI system

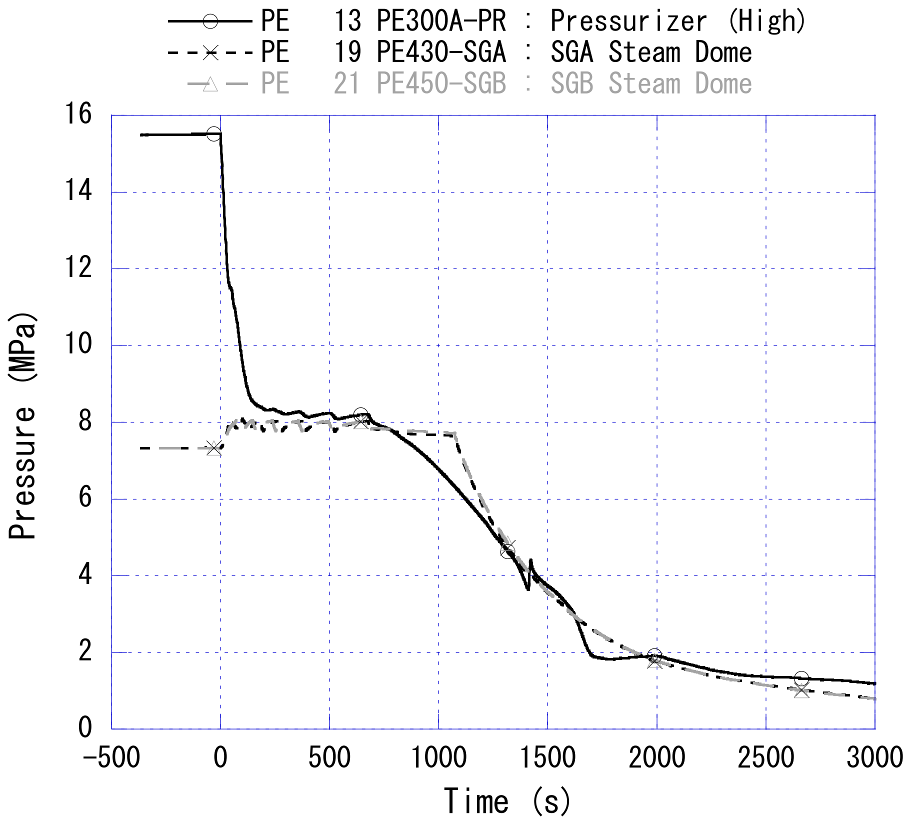

Fig. 4-14 Primary and secondary pressures

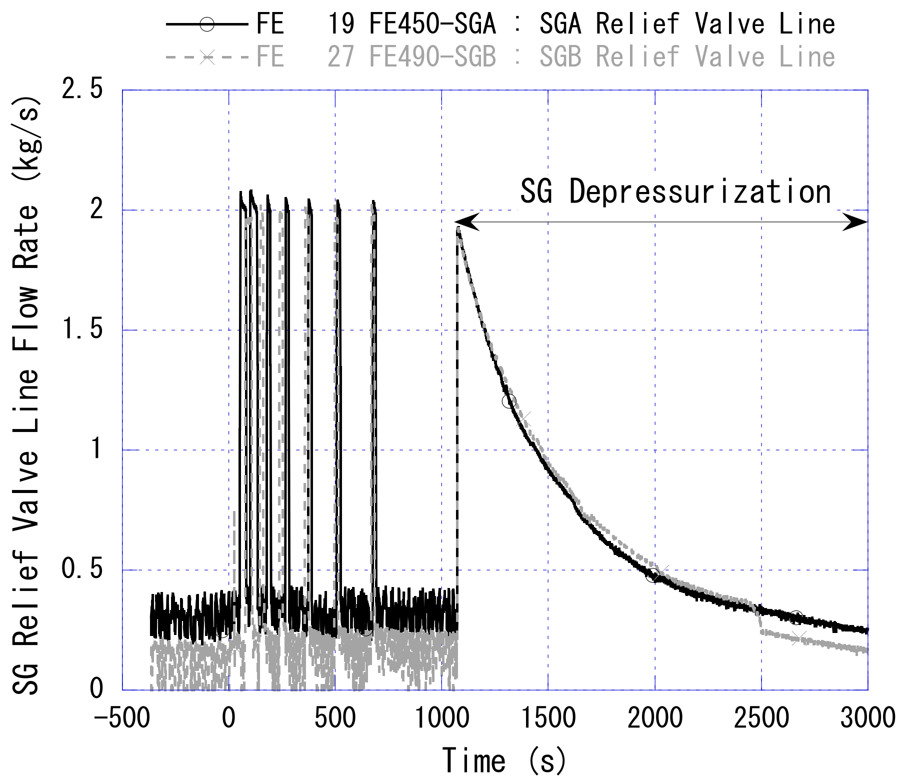

Fig. 4-15 SG relief valve line flow rate

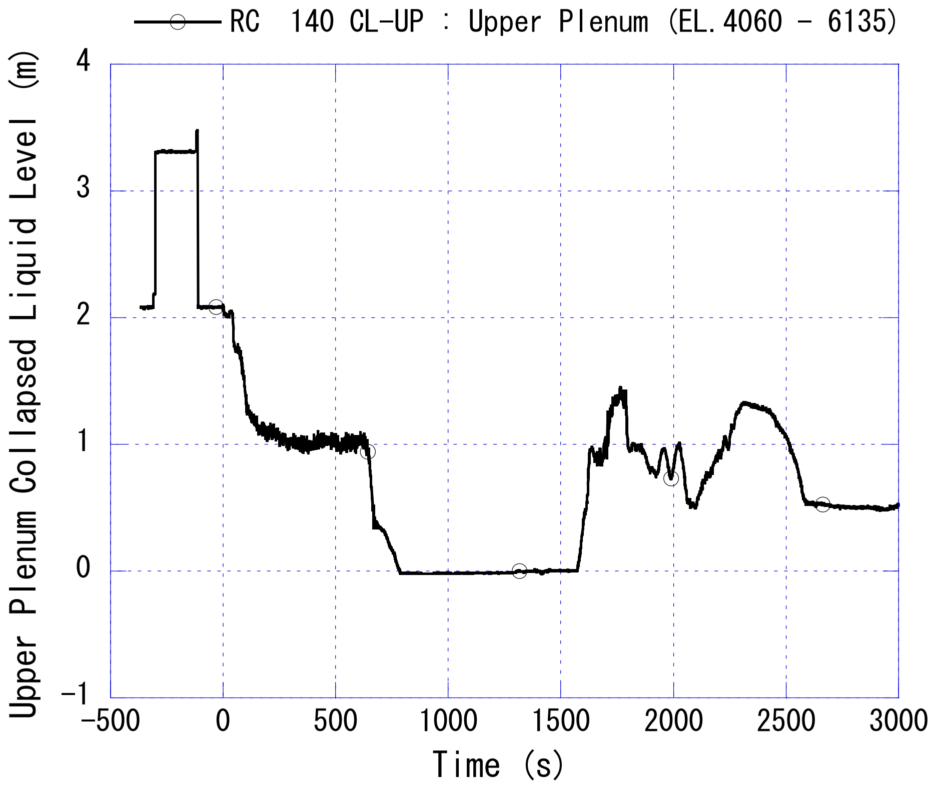

Fig. 4-16 Upper plenum collapsed liquid level

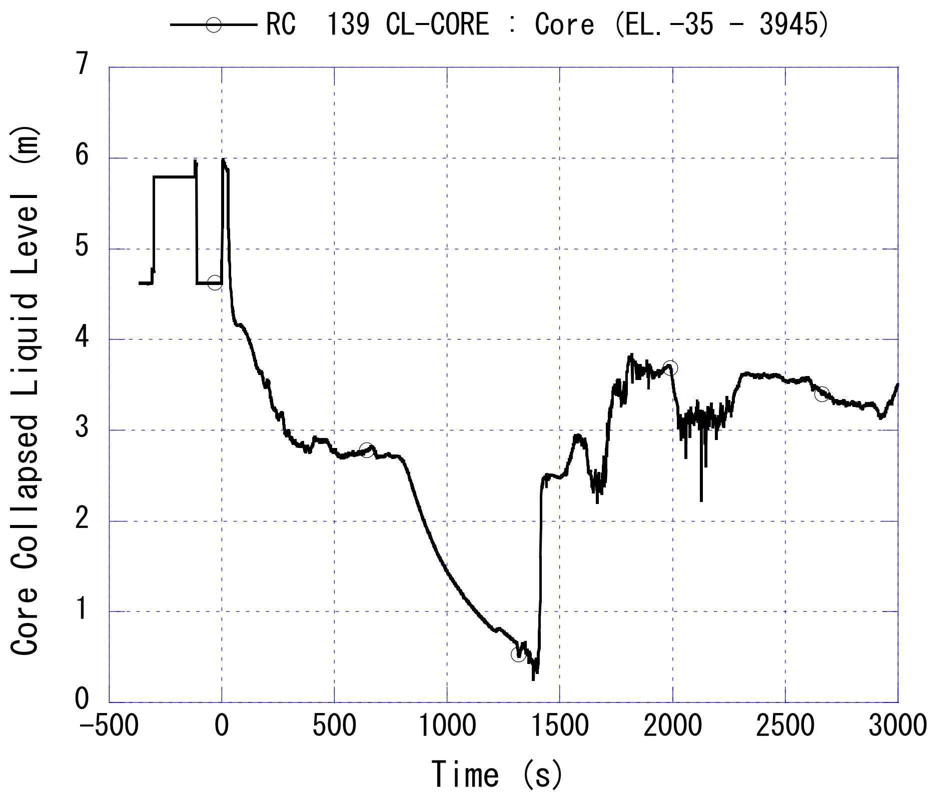

Fig. 4-17 Core collapsed liquid level

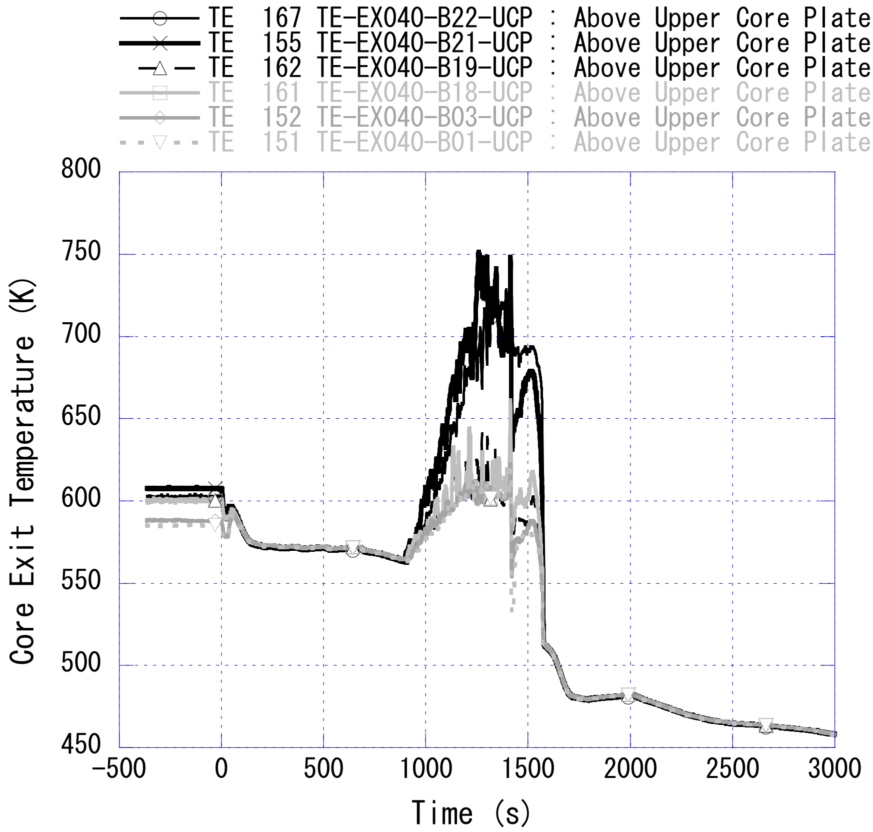

Fig. 4-18 Core exit temperatures (-365 to 3000 s)

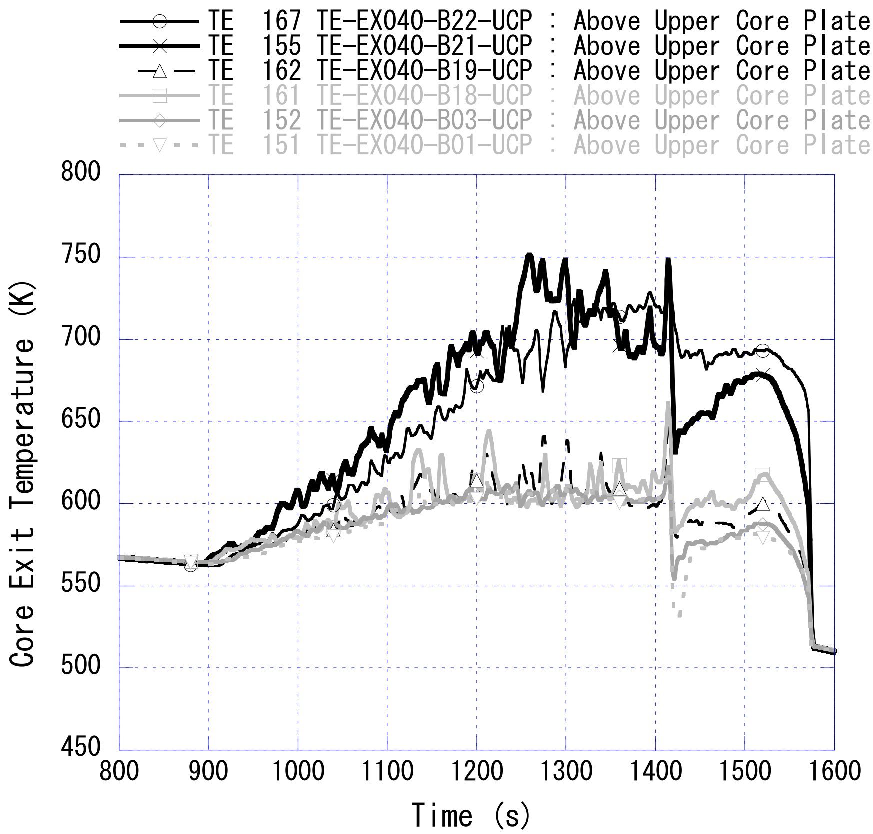

Fig. 4-19 Core exit temperatures (800 to 1600 s)

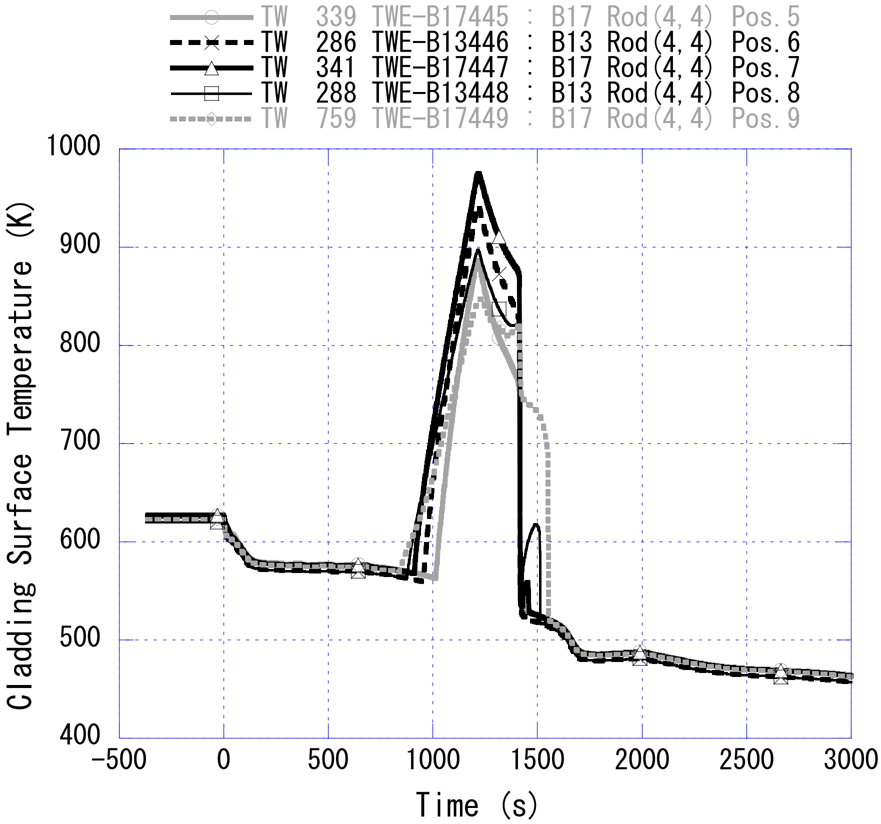

Fig. 4-20 Cladding surface temperatures at Positions 9 through 5 (-365 to 3000 s)

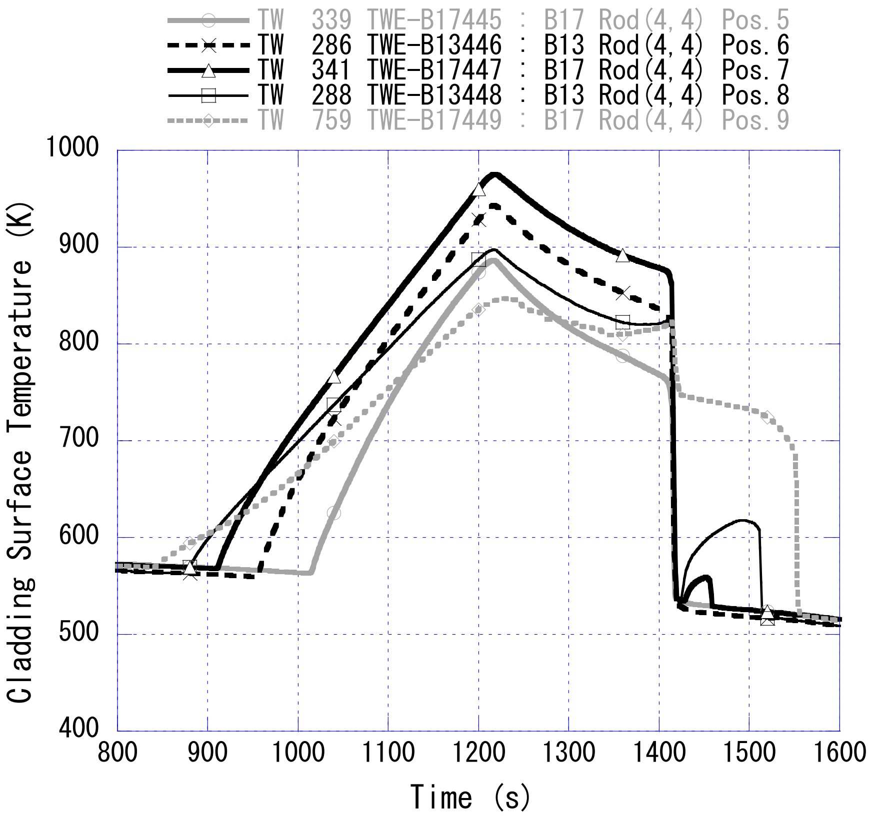

Fig. 4-21 Cladding surface temperatures at Positions 9 through 5 (800 to 1600 s)

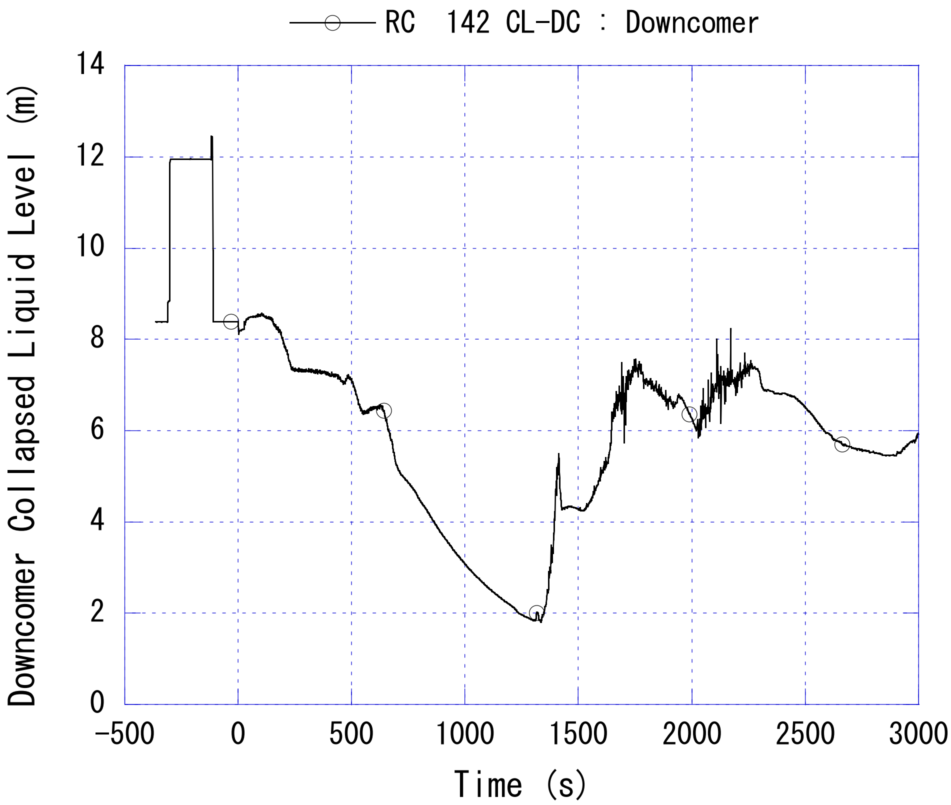

Fig. 4-22 Downcomer collapsed liquid level

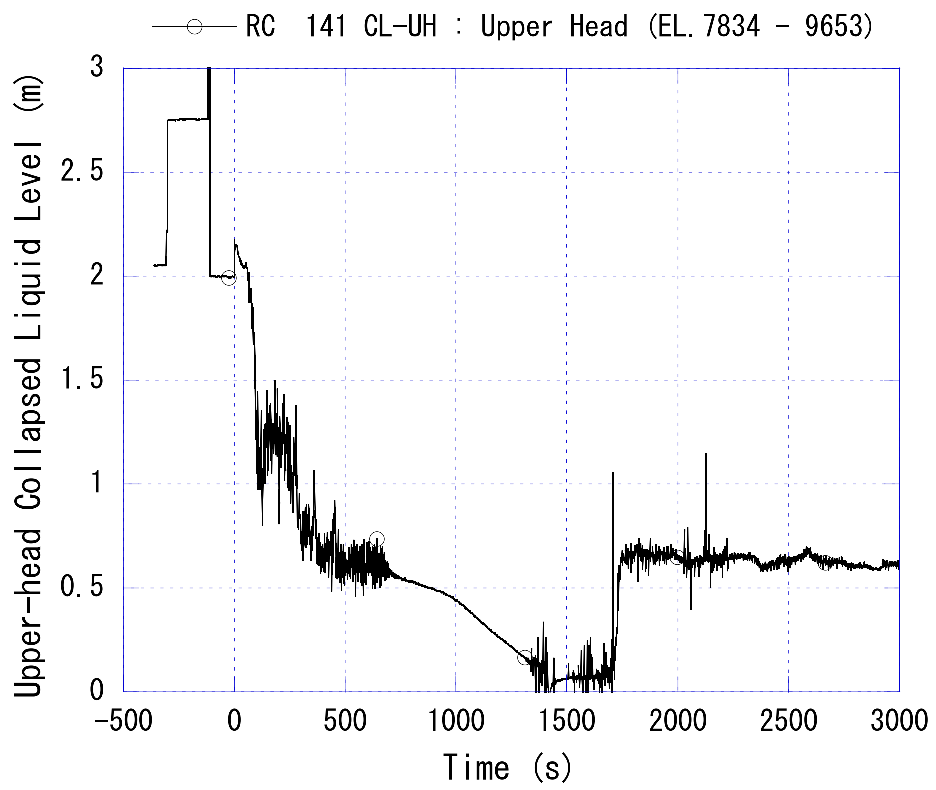

Fig. 4-23 Upper-head collapsed liquid level

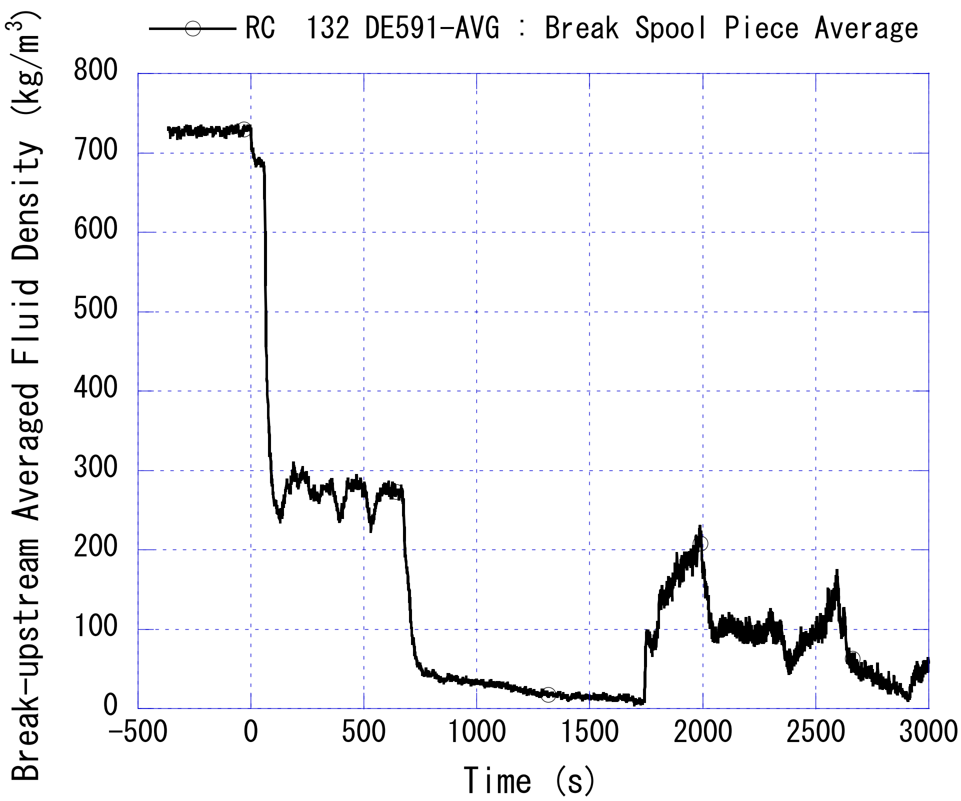

Fig. 4-24 Break-upstream averaged fluid density

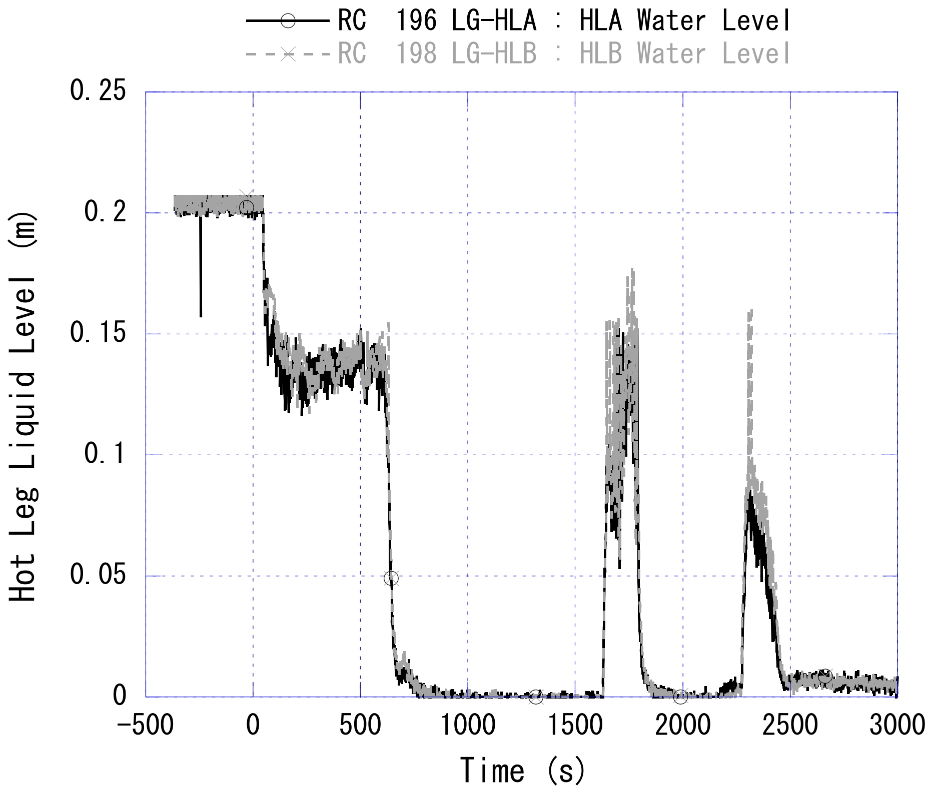

Fig. 4-25 Hot leg liquid level

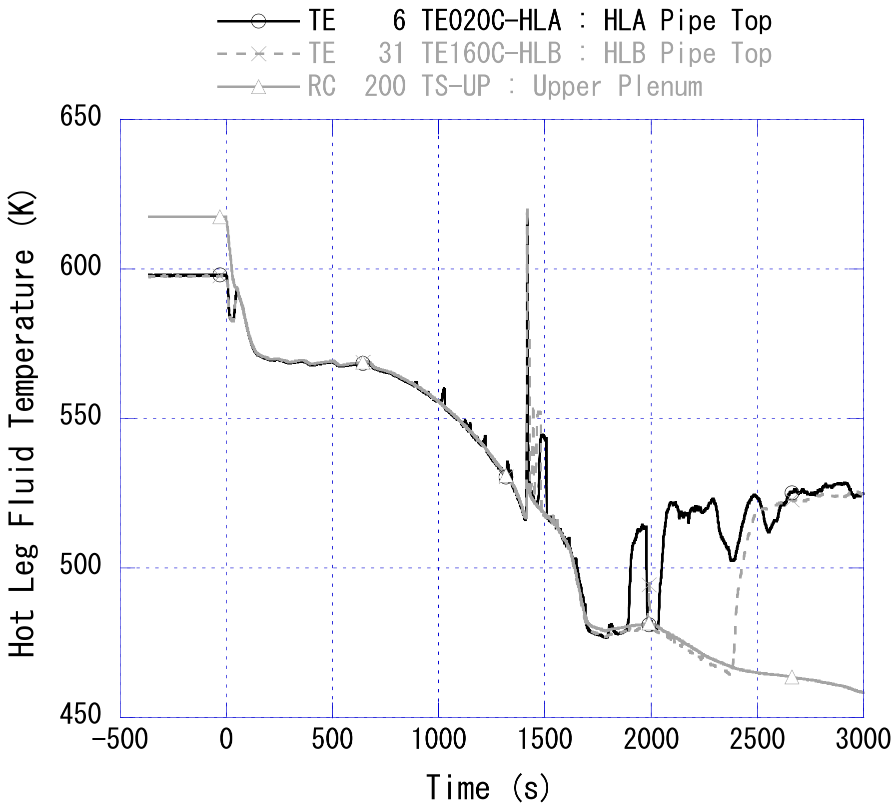

Fig. 4-26 Hot leg fluid temperature

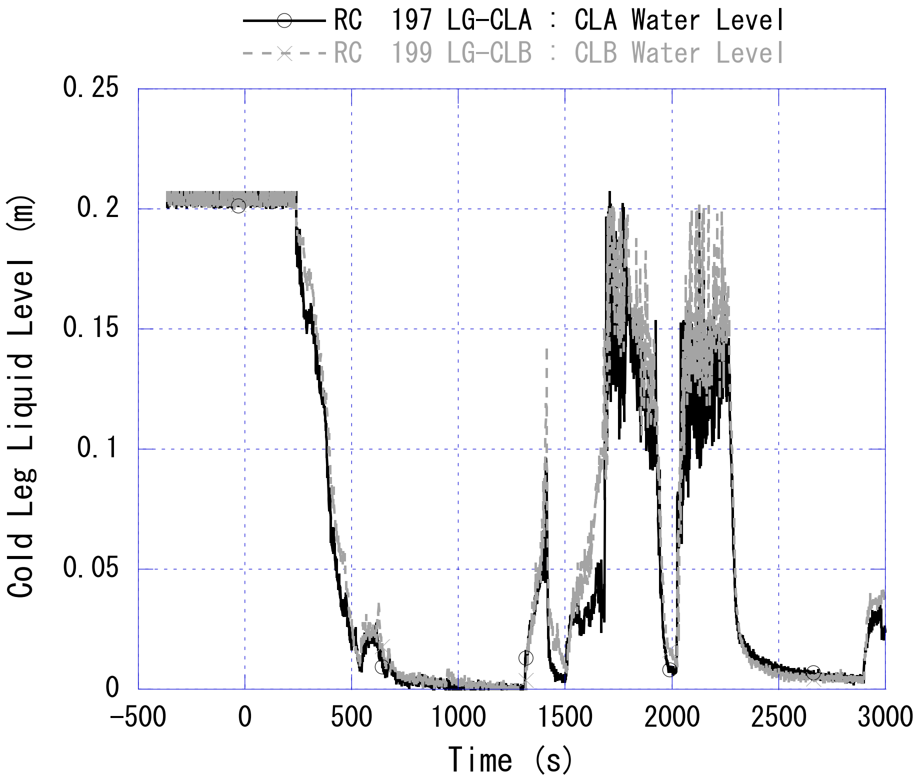

Fig. 4-27 Cold leg liquid level

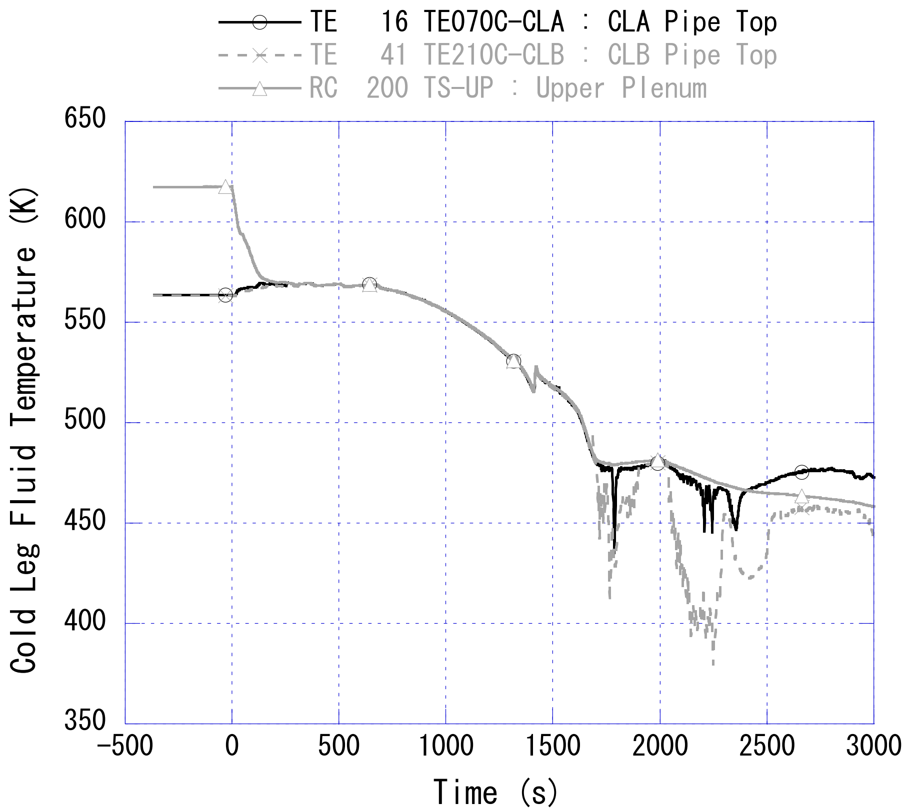

Fig. 4-28 Cold leg fluid temperature

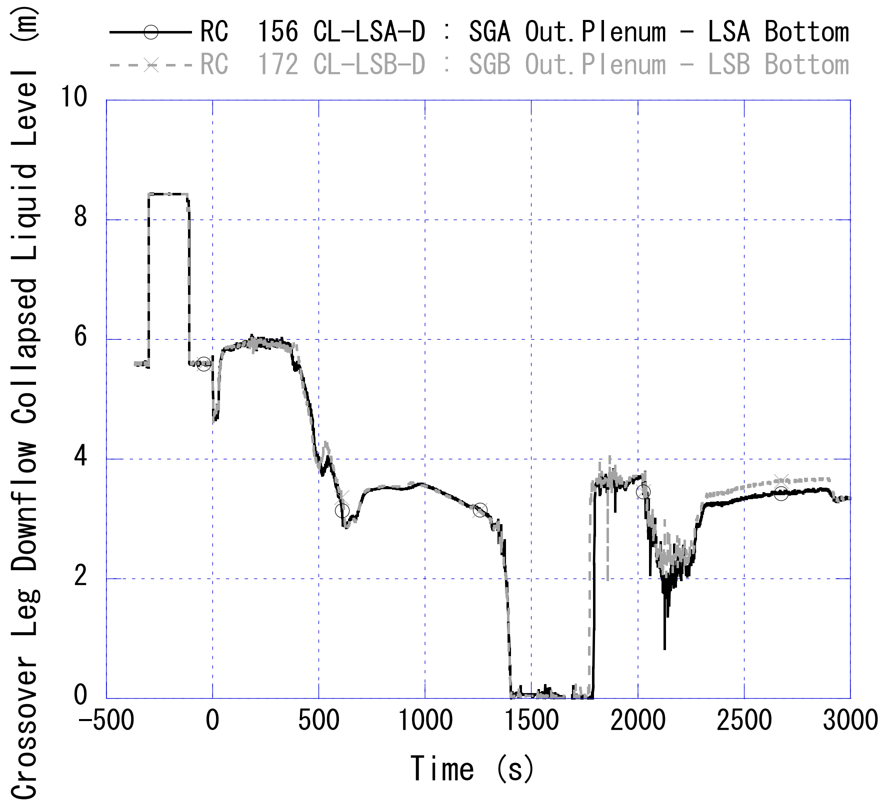

Fig. 4-29 Crossover leg downflow-side collapsed liquid level

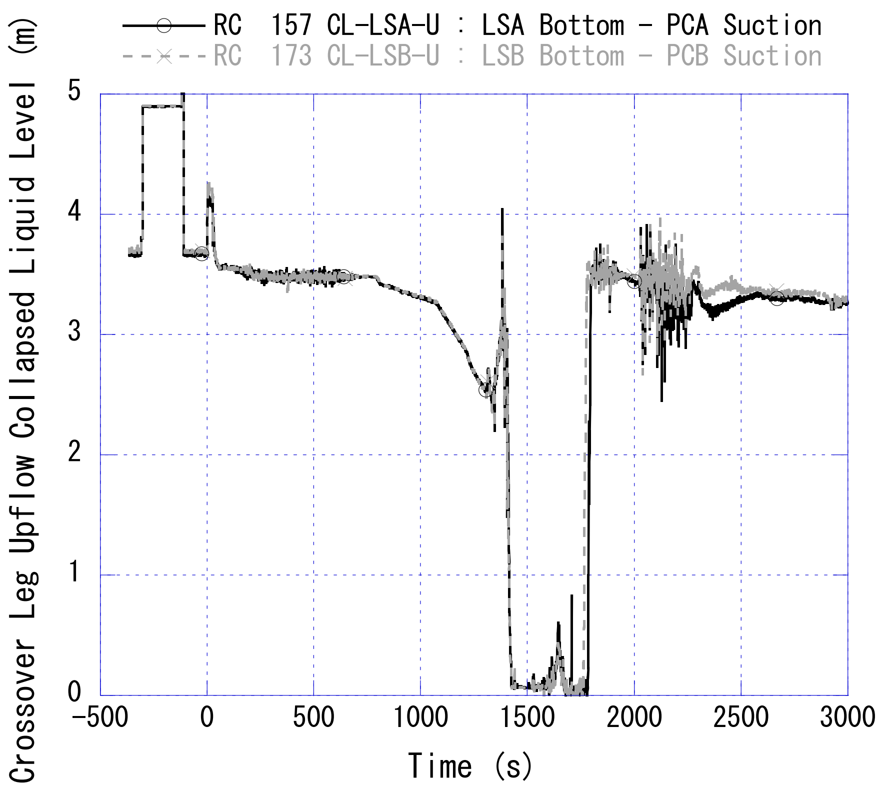

Fig. 4-30 Crossover leg upflow-side collapsed liquid level

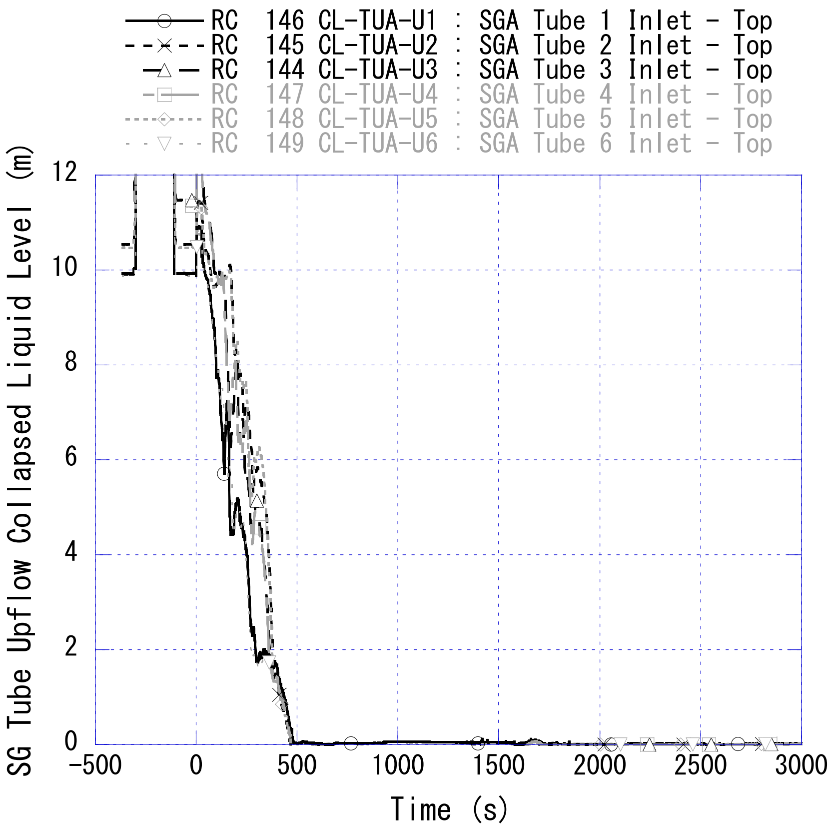

Fig. 4-31 SG U-tube upflow-side collapsed liquid level in loop with pressurizer

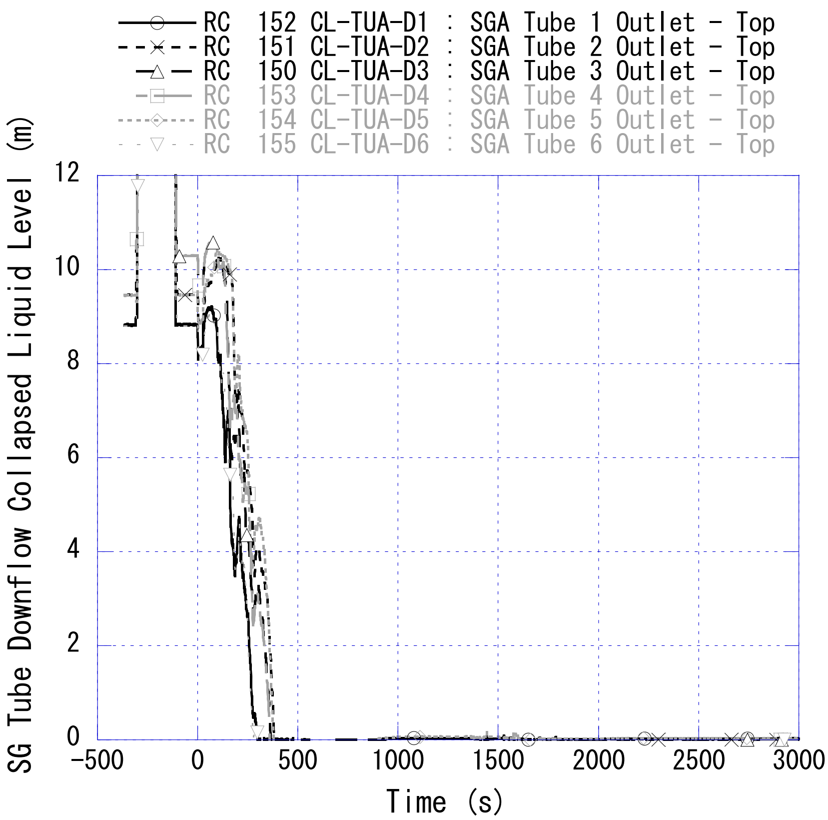

Fig. 4-32 SG U-tube downflow-side collapsed liquid level in loop with pressurizer

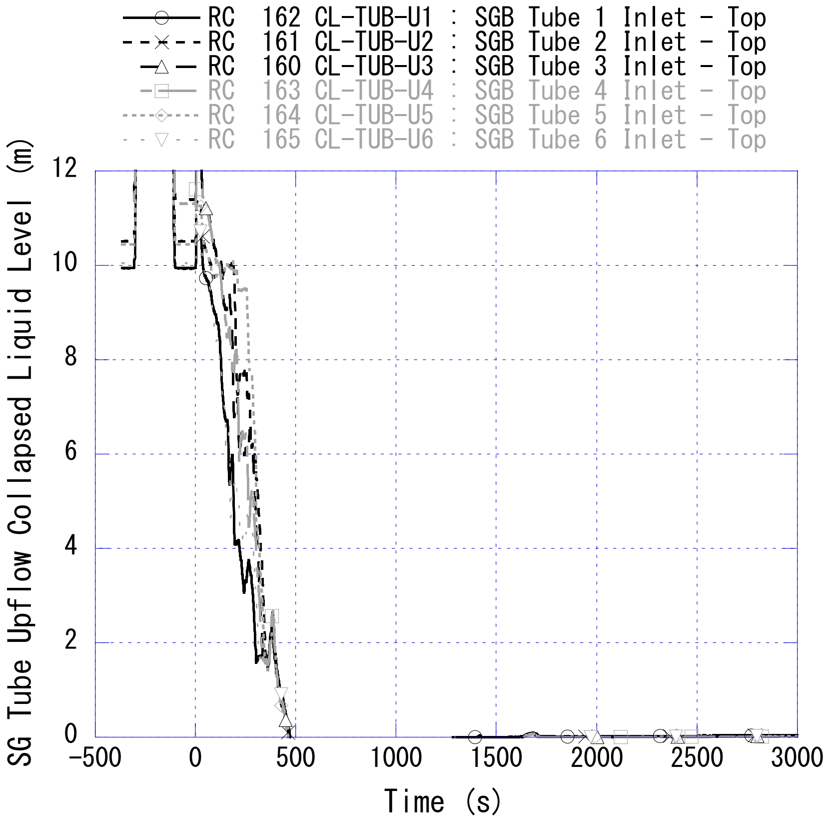

Fig. 4-33 SG U-tube upflow-side collapsed liquid level in loop without pressurizer

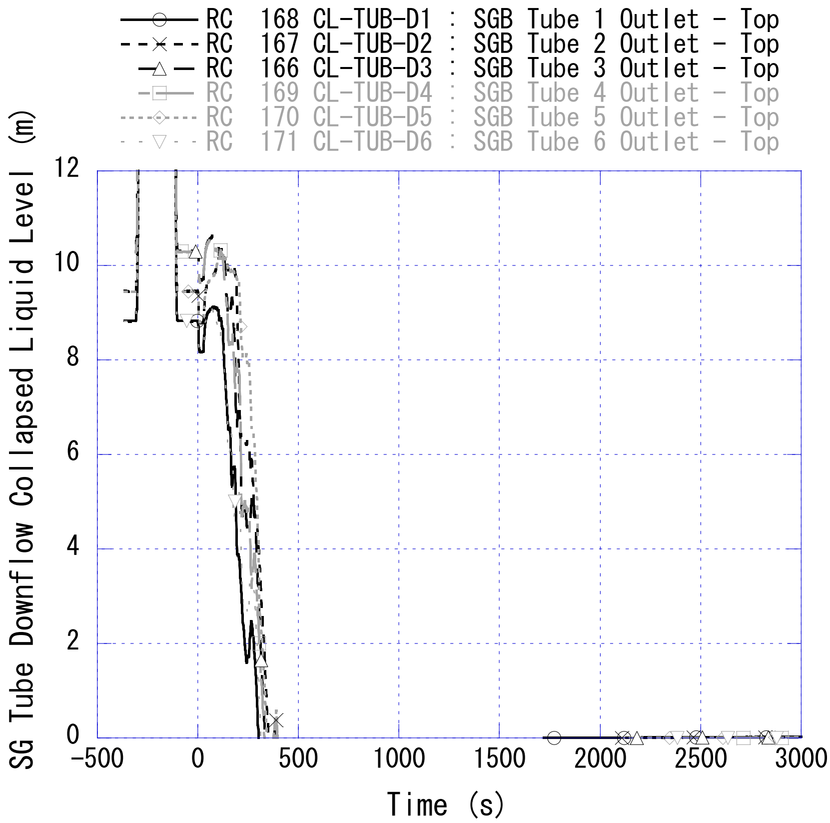

Fig. 4-34 SG U-tube downflow-side collapsed liquid level in loop without pressurizer

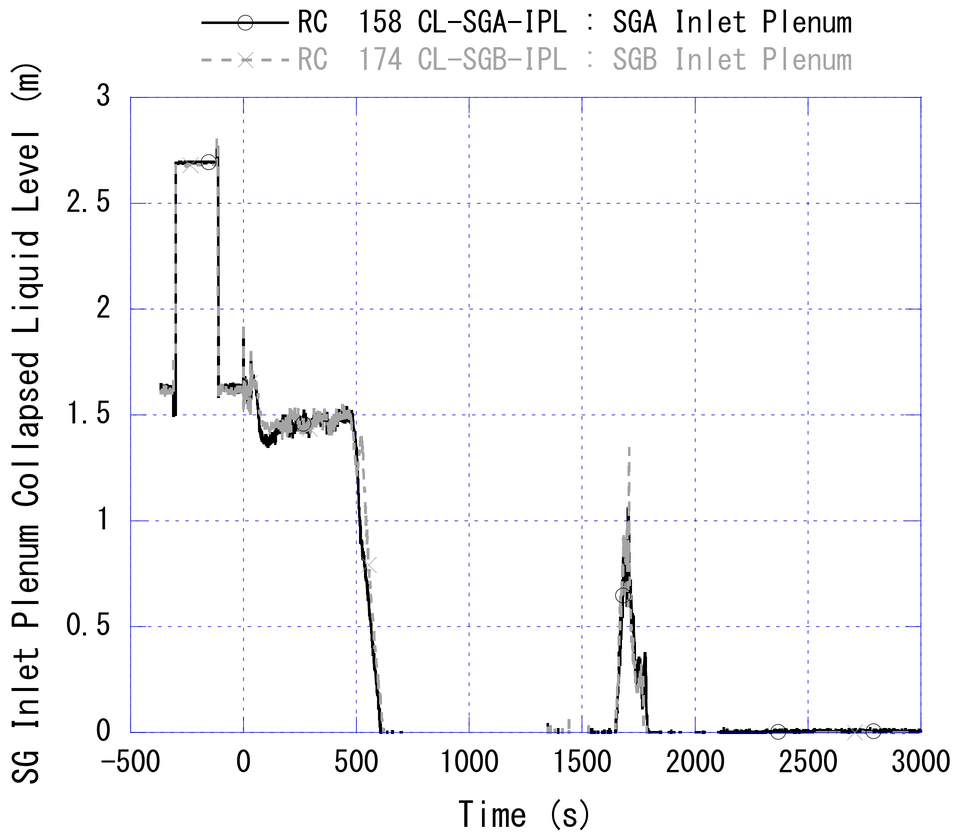

Fig. 4-35 SG inlet plenum collapsed liquid level

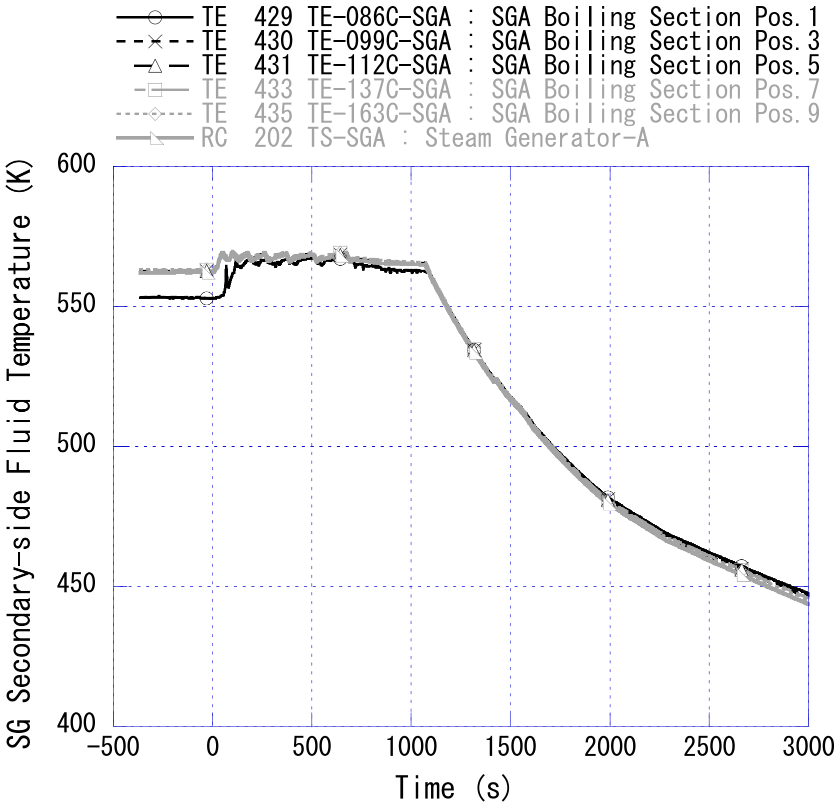

Fig. 4-36 SG secondary-side fluid temperature in loop with pressurizer

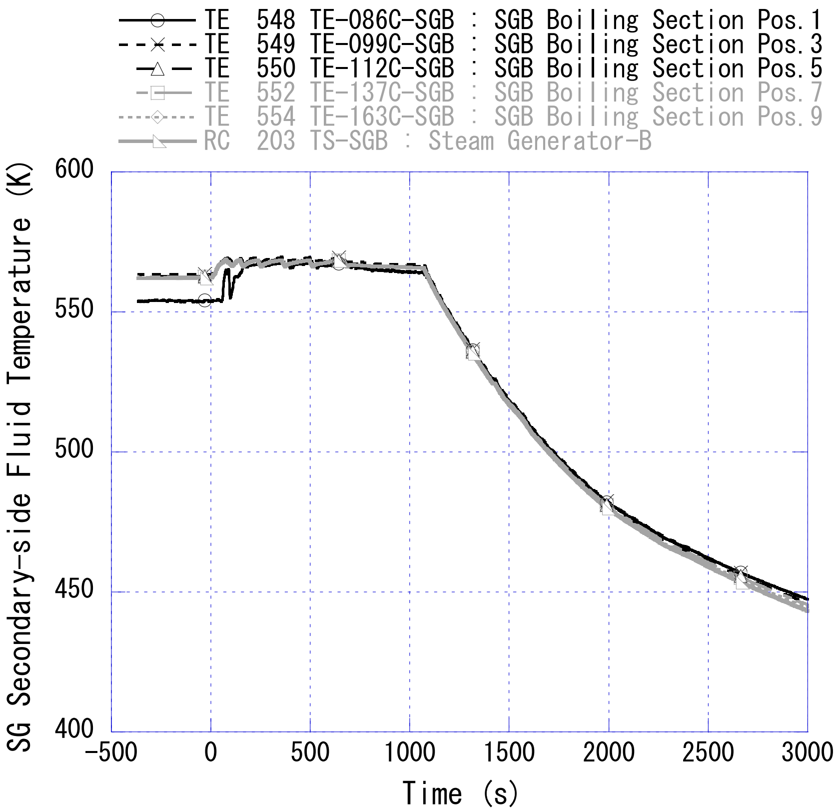

Fig. 4-37 SG secondary-side fluid temperature in loop without pressurizer

5. Summary

A ROSA/LSTF experiment designated as SB-PV-09 was performed on November 17, 2005, which simulated a PWR 1.9% pressure vessel top SBLOCA. The test assumptions were made such as total failure of high pressure injection system and non-condensable gas (nitrogen gas) ingress to the primary system from ACC tanks of ECCS. When maximum core exit temperature reached 623 K, SG secondary-side depressurization was initiated by fully opening the RVs in both SGs as an AM action. AFW was injected into the secondary-side of both SGs with some delay after the start of the AM action. Major findings are summarized as follows;

(1) Liquid level in the upper-head was found to control break flow rate as coolant in the upper plenum entered the upper-head through CRGTs until the penetration holes at the CRGT bottom were exposed to steam in the upper plenum. Oscillation in the upper-head mixture level caused the oscillation in the break flow rate through the break-upstream fluid density that temporarily decreased when the SG RV opened and the primary pressure dropped.

(2) The upper plenum collapsed liquid level was maintained constant at the penetration holes at the CRGT bottom for a short time. Core uncovery took place by core boil-off after the upper plenum became voided.

(3) The AM action was ineffective in the early stage on the intended primary depressurization to start the ACC coolant injection because the SG secondary-side pressure was higher than the primary pressure.

(4) A large increase occurred in cladding surface temperature of simulated fuel rods owing to late and slow response of core exit temperature. Automatic core power reduction procedure to protect the LSTF core was initiated when the maximum cladding surface temperature exceeded the pre-determined value of 958 K. The peak cladding temperature observed was 975 K.

(5) After the automatic core power reduction, the ACC system started the coolant injection. Steam condensation on the ACC coolant in cold legs led to LSC in both loops. The entire core was quenched by core recovery after the LSC.

(6) After the ACC tanks began to discharge nitrogen gas, the pressure difference between the primary and SG secondary sides became larger due to degradation in the condensation heat transfer in the SG U-tubes.

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

Acknowledgement

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References

[1] USNRC, Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity, NRC Bulletin 2002-01, OMB Control No. 3150-0012, 2002.

[2] USNRC, Davis-Besse Reactor Pressure Vessel Head Degradation: Overview, Lessons Learned, and NRC Actions Based on Lessons Learned, NUREG/BR-0353, Rev. 1, 2008.

[3] The ROSA-V Group, ROSA-V Large Scale Test Facility (LSTF) system description for the third and fourth simulated fuel assemblies, JAERI-Tech 2003-037, 2003, 479p.

[4] Umminger, K., Dennhardt, L., Schollenberger, S., Schoen, B., Integral test facility PKL: experimental PWR accident investigation, Science and Technology of Nuclear Installations, Article ID 891056, 2012, 16p.

[5] Takeda, T., Ohtsu, I., ROSA/LSTF test and RELAP5 analyses on PWR cold leg small-break LOCA with accident management measure and PKL counterpart test, Nuclear Engineering and Technology, 49, 2017, pp. 928-940.

[6] Takeda, T., Ohtsu, I., Uncertainty analysis of ROSA/LSTF test by RELAP5 code and PKL counterpart test concerning PWR hot leg break LOCAs, Nuclear Engineering and Technology, 50, 2018, pp. 829-841.

[7] Zuber, N., Problems in modeling small break LOCA, Technical Report, NUREG-0724, 1980.

[8] Kumamaru, H., Tasaka, K., Recalculation of simulated post-scram core power decay curve for use in ROSA-IV/LSTF experiments on PWR small-break LOCAs and transients, JAERI-M 90-142, 1990, 63p.

Appendix A Available Experimental Data List

Table A-1 shows the list of available experimental data qualified as “Good” for LSTF SB-PV-09 (Run ID designated to be SP9). 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 SB-PV-09

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	11	TE040B-HLA	HLA SG-Side CPT	270	720	K	2.75	0.61
10	TE	12	TE040C-HLA	HLA SG-Side CPT	270	720	K	2.75	0.61
11	TE	13	TE040D-HLA	HLA SG-Side CPT	270	720	K	2.75	0.61
12	TE	15	TE050C-LSA	LSA Upflow Leg	270	720	K	2.75	0.61
13	TE	16	TE070C-CLA	CLA Pipe Top	270	720	K	2.75	0.61
14	TE	17	TE070D-CLA	CLA Pipe Bottom	270	720	K	2.75	0.61
15	TE	18	TE080C-CLA	CLA Pipe Top	270	720	K	2.75	0.61
16	TE	20	TE090A-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
17	TE	21	TE090B-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
18	TE	22	TE090C-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
19	TE	23	TE090D-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
20	TE	24	TE090E-CLA	CLA Vessel-Side CPT	270	720	K	2.75	0.61
21	TE	25	TE100-HLA	HLA-CLA Average	270	720	K	2.75	0.61
22	TE	27	TE150B-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
23	TE	28	TE150C-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
24	TE	29	TE150D-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
25	TE	30	TE150E-HLB	HLB Vessel-Side CPT	270	720	K	2.75	0.61
26	TE	31	TE160C-HLB	HLB Pipe Top	270	720	K	2.75	0.61
27	TE	32	TE160D-HLB	HLB Pipe Bottom	270	720	K	2.75	0.61
28	TE	33	TE170C-HLB	HLB Pipe Top	270	720	K	2.75	0.61
29	TE	35	TE180A-HLB	HLB SG-Side CPT	270	720	K	2.75	0.61
30	TE	36	TE180B-HLB	HLB SG-Side CPT	270	720	K	2.75	0.61
31	TE	37	TE180C-HLB	HLB SG-Side CPT	270	720	K	2.75	0.61
32	TE	39	TE180E-HLB	HLB SG-Side CPT	270	720	K	2.75	0.61
33	TE	40	TE190C-LSB	LSB Upflow Leg	270	720	K	2.75	0.61
34	TE	41	TE210C-CLB	CLB Pipe Top	270	720	K	2.75	0.61
35	TE	42	TE210D-CLB	CLB Pipe Bottom	270	720	K	2.75	0.61
36	TE	43	TE220C-CLB	CLB Pipe Top	270	720	K	2.75	0.61
37	TE	46	TE230B-CLB	CLB Vessel-Side CPT	270	720	K	2.75	0.61
38	TE	47	TE230C-CLB	CLB Vessel-Side CPT	270	720	K	2.75	0.61
39	TE	48	TE230D-CLB	CLB Vessel-Side CPT	270	720	K	2.75	0.61
40	TE	49	TE230E-CLB	CLB Vessel-Side CPT	270	720	K	2.75	0.61
41	TE	50	TE240-HLB	HLB-CLB Average	270	720	K	2.75	0.61
42	TE	51	TE270C-PR	PZR Spray Line	270	720	K	2.75	0.61
43	TE	52	TE280C-PR	PZR Surge Line	270	720	K	2.75	0.61
44	TE	55	TE430-SGA	SGA Feedwater Line	270	670	K	2.63	0.66
45	TE	56	TE440-SGA	SGA Main Steam Line	270	670	K	2.63	0.66
46	TE	57	TE450-SGA	SGA Relief Valve Line	270	670	K	2.63	0.66
47	TE	59	TE470-SGB	SGB Feedwater Line	270	670	K	2.63	0.66
48	TE	60	TE480-SGB	SGB Main Steam Line	270	670	K	2.63	0.66
49	TE	61	TE490-SGB	SGB Relief Valve Line	270	670	K	2.63	0.66
50	TE	63	TE510-SH	MSL Steam Header	270	670	K	2.63	0.66
51	TE	64	TE520-JC	JC Hot Water	270	670	K	2.63	0.66
52	TE	65	TE530-JC	PF Suction Line	270	670	K	2.63	0.66
53	TE	66	TE540-JC	JC Spray Water	270	670	K	2.63	0.66
54	TE	67	TE550-JC	JC Steam Vent Line	270	670	K	2.63	0.66
55	TE	68	TE431-SGA	SGA Downcomer A	270	670	K	2.63	0.66
56	TE	69	TE432-SGA	SGA Downcomer B	270	670	K	2.63	0.66
57	TE	70	TE433-SGA	SGA Downcomer C	270	670	K	2.63	0.66
58	TE	71	TE434-SGA	SGA Downcomer D	270	670	K	2.63	0.66
59	TE	72	TE471-SGB	SGB Downcomer A	270	670	K	2.63	0.66
60	TE	73	TE472-SGB	SGB Downcomer B	270	670	K	2.63	0.66
61	TE	74	TE473-SGB	SGB Downcomer C	270	670	K	2.63	0.66
62	TE	75	TE474-SGB	SGB Downcomer D	270	670	K	2.63	0.66
63	TE	76	TE560C-BU	Break Upstream	270	720	K	2.63	0.66
64	TE	77	TE560D-BU	Break Upstream	270	720	K	2.63	0.66
65	TE	78	TE570C-BU	RSV Spool Piece, Outlet Side	270	720	K	2.63	0.66
66	TE	79	TE570D-BU	RSV Spool Piece, Outlet Side	270	720	K	2.63	0.66
67	TE	80	TE580C-BU	Break Orif. Upstream Top	270	720	K	2.63	0.66
68	TE	81	TE580D-BU	Break Orif. Upstream Bottom	270	720	K	2.63	0.66
69	TE	82	TE590C-BU	Break Orif. Downstream Top	270	720	K	2.63	0.66
70	TE	83	TE590D-BU	Break Orif. Downstream Bottom	270	720	K	2.63	0.66
71	TE	84	TE600-ST	ST Inlet Line	270	470	K	2.30	1.15
72	TE	85	TE610-ST	ST Top Region	270	470	K	2.30	1.15
73	TE	86	TE620-ST	ST Middle Region	270	470	K	2.30	1.15
74	TE	87	TE630-ST	ST Bottom Region	270	470	K	2.30	1.15
75	TE	88	TE640-ST	ST Spray Line	270	470	K	2.30	1.15
76	TE	89	TE650-ACC	Acc-Cold Tank Bottom	270	470	K	2.30	1.15
77	TE	90	TE660-ACC	Acc-Cold Tank Top	270	470	K	2.30	1.15
78	TE	91	TE670-ACC	Acc-Cold Line to CLA	270	470	K	2.30	1.15
79	TE	94	TE700-ACH	Acc-Hot Tank Top	270	570	K	2.42	0.81
80	TE	96	TE720-ACH	Acc-Hot Line to CLB	270	570	K	2.42	0.81
81	TE	97	TE730-HLA	HLA ECCS Nozzle	270	670	K	2.63	0.66

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
82	TE 98	TE740-LSA	LSA ECCS Nozzle	270	670	K	2.63	0.66
83	TE 99	TE750-CLA	CLA ECCS Nozzle	270	670	K	2.63	0.66
84	TE 100	TE760-HLB	HLB ECCS Nozzle	270	670	K	2.63	0.66
85	TE 101	TE770-LSB	LSB ECCS Nozzle	270	670	K	2.63	0.66
86	TE 102	TE780-CLB	CLB ECCS Nozzle	270	670	K	2.63	0.66
87	TE 103	TE790-PV	PV Bottom ECCS Nozzle	270	670	K	2.63	0.66
88	TE 104	TE800-PV	PV Top ECCS Nozzle	270	670	K	2.63	0.66
89	TE 106	TE820-PL	RHR Inlet Region	270	670	K	2.63	0.66
90	TE 107	TE830-PL	RHR Outlet Region	270	670	K	2.63	0.66
91	TE 108	TE840-PL	RHR Injection Line	270	670	K	2.63	0.66
92	TE 112	TE880-RWST	RWST Lower Region	270	370	K	2.37	2.37
93	TE 113	TE890-RWST	RWST Middle Region	270	370	K	2.37	2.37
94	TE 115	TE-E066F-PV	Upper Head Bottom	270	970	K	3.49	0.50
95	TE 117	TE-E075F-PV	Upper Head Middle	270	970	K	3.49	0.50
96	TE 118	TE-W075F-PV	Upper Head Middle	270	970	K	3.49	0.50
97	TE 119	TE-E081F-PV	Upper Head Top	270	970	K	3.49	0.50
98	TE 120	TE-W081F-PV	Upper Head Top	270	970	K	3.49	0.50
99	TE 121	TE-E080H-PV	CR Guide Tube Top	270	970	K	3.49	0.50
100	TE 122	TE-W080H-PV	CR Guide Tube Top	270	970	K	3.49	0.50
101	TE 123	TE-E049F-PV	Upper Plenum Bottom	270	970	K	3.49	0.50
102	TE 125	TE-E055F-PV	Upper Plenum Middle	270	970	K	3.49	0.50
103	TE 126	TE-W055F-PV	Upper Plenum Middle	270	970	K	3.49	0.50
104	TE 127	TE-E060F-PV	Upper Plenum Top	270	970	K	3.49	0.50
105	TE 128	TE-W060F-PV	Upper Plenum Top	270	970	K	3.49	0.50
106	TE 129	TE-IN038-B09-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
107	TE 130	TE-IN038-B11-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
108	TE 131	TE-IN038-B01-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
109	TE 132	TE-IN038-B03-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
110	TE 133	TE-IN038-B05-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
111	TE 134	TE-IN038-B07-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
112	TE 135	TE-IN038-B21-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
113	TE 136	TE-IN038-B23-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
114	TE 137	TE-IN038-B02-UCP	Below Upper core Plate	270	970	K	3.49	0.50
115	TE 138	TE-IN038-B06-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
116	TE 139	TE-IN038-B14-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
117	TE 140	TE-IN038-B15-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
118	TE 141	TE-IN038-B18-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
119	TE 142	TE-IN038-B19-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
120	TE 143	TE-IN038-B10-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
121	TE 144	TE-IN038-B12-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
122	TE 145	TE-IN038-B04-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
123	TE 146	TE-IN038-B08-UCP	Below Upper Core Plate	270	970	K	3.49	0.50
124	TE 149	TE-EX040-B09-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
125	TE 150	TE-EX040-B11-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
126	TE 151	TE-EX040-B01-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
127	TE 152	TE-EX040-B03-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
128	TE 153	TE-EX040-B05-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
129	TE 154	TE-EX040-B07-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
130	TE 155	TE-EX040-B21-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
131	TE 156	TE-EX040-B23-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
132	TE 157	TE-EX040-B02-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
133	TE 158	TE-EX040-B06-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
134	TE 159	TE-EX040-B14-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
135	TE 160	TE-EX040-B15-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
136	TE 161	TE-EX040-B18-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
137	TE 162	TE-EX040-B19-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
138	TE 163	TE-EX040-B10-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
139	TE 164	TE-EX040-B12-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
140	TE 165	TE-EX040-B04-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
141	TE 166	TE-EX040-B08-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
142	TE 167	TE-EX040-B22-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
143	TE 168	TE-EX040-B24-UCP	Above Upper Core Plate	270	970	K	3.49	0.50
144	TE 169	TE-IN-002B02-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
145	TE 171	TE-IN-002B06-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
146	TE 172	TE-IN-002B07-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
147	TE 174	TE-IN-002B11-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
148	TE 177	TE-IN-002B18-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
149	TE 178	TE-IN-002B20-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
150	TE 179	TE-IN-002B21-LCPP	Below Lower Core Plate	270	720	K	2.75	0.61
151	TE 184	TE-EX-000B07-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
152	TE 186	TE-EX-000B11-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
153	TE 189	TE-EX-000B18-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
154	TE 190	TE-EX-000B20-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
155	TE 191	TE-EX-000B21-LCPP	Above Lower Core Plate	270	720	K	2.75	0.61
156	TE 193	TE-N000C-DC	Downcomer EL.0.0m,North	270	720	K	2.75	0.61
157	TE 194	TE-S000C-DC	Downcomer EL.0.0m,South	270	720	K	2.75	0.61
158	TE 196	TE-W000C-DC	Downcomer EL.0.0m,West	270	720	K	2.75	0.61
159	TE 197	TE-N018C-DC	Downcomer EL.1.8m,North	270	720	K	2.75	0.61
160	TE 199	TE-E018C-DC	Downcomer EL.1.8m,East	270	720	K	2.75	0.61
161	TE 200	TE-W018C-DC	Downcomer EL.1.8m,West	270	720	K	2.75	0.61
162	TE 201	TE-N036C-DC	Downcomer EL.3.6m,North	270	720	K	2.75	0.61
163	TE 202	TE-S036C-DC	Downcomer EL.3.6m,South	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
164	TE 203	TE-E036C-DC	Downcomer EL.3.6m,East	270	720	K	2.75	0.61
165	TE 204	TE-W036C-DC	Downcomer EL.3.6m,West	270	720	K	2.75	0.61
166	TE 206	TE-S060C-DC	Downcomer EL.6.0m,South	270	720	K	2.75	0.61
167	TE 208	TE-W060C-DC	Downcomer EL.6.0m,West	270	720	K	2.75	0.61
168	TE 209	TE-N055C-DC	Downcomer EL.5.5m,North	270	720	K	2.75	0.61
169	TE 210	TE-S055C-DC	Downcomer EL.5.5m,South	270	720	K	2.75	0.61
170	TE 211	TE-C-021-LP	Lower Plenum EL.-2.1m,C	270	720	K	2.75	0.61
171	TE 212	TE-C-018-LP	Lower Plenum EL.-1.8m,C	270	720	K	2.75	0.61
172	TE 213	TE-C-015-LP	Lower Plenum EL.-1.5m,C	270	720	K	3.73	0.83
173	TE 216	TE-C-006-LP	Lower Plenum EL.-0.6m,C	270	720	K	2.75	0.61
174	TE 217	TE-C-005-LP	Lower Plenum EL.-0.5m,C	270	720	K	2.75	0.61
175	TE 218	TE-C-003-LP	Lower Plenum EL.-0.3m,C	270	720	K	2.75	0.61
176	TE 220	TE-B18622	B18 Rod(6,2) Pos.2,Fluid	270	970	K	3.49	0.50
177	TE 221	TE-B18623	B18 Rod(6,2) Pos.3,Fluid	270	970	K	3.49	0.50
178	TE 222	TE-B18624	B18 Rod(6,2) Pos.4,Fluid	270	970	K	3.49	0.50
179	TE 223	TE-B18625	B18 Rod(6,2) Pos.5,Fluid	270	970	K	3.49	0.50
180	TE 226	TE-B18628	B18 Rod(6,2) Pos.8,Fluid	270	970	K	3.49	0.50
181	TE 227	TE-B18629	B18 Rod(6,2) Pos.9,Fluid	270	970	K	3.49	0.50
182	TE 256	TE-B09663	B09 Rod(6,6) Pos.3,Fluid	270	970	K	3.69	0.53
183	TE 257	TE-B09665	B09 Rod(6,6) Pos.5,Fluid	270	970	K	3.69	0.53
184	TE 258	TE-B09666	B09 Rod(6,6) Pos.6,Fluid	270	970	K	3.69	0.53
185	TE 260	TE-B09669	B09 Rod(6,6) Pos.9,Fluid	270	970	K	3.69	0.53
186	TE 277	TE-B14267	B14 Rod(2,6) Pos.7,Fluid	270	970	K	3.49	0.50
187	TE 278	TE-B14269	B14 Rod(2,6) Pos.9,Fluid	270	970	K	3.49	0.50
188	TE 279	TE-B15261	B15 Rod(2,6) Pos.1,Fluid	270	970	K	4.31	0.62
189	TE 280	TE-B15263	B15 Rod(2,6) Pos.3,Fluid	270	970	K	4.31	0.62
190	TE 281	TE-B15265	B15 Rod(2,6) Pos.5,Fluid	270	970	K	4.31	0.62
191	TE 282	TE-B15266	B15 Rod(2,6) Pos.6,Fluid	270	970	K	4.31	0.62
192	TE 283	TE-B15267	B15 Rod(2,6) Pos.7,Fluid	270	970	K	3.69	0.53
193	TE 284	TE-B15269	B15 Rod(2,6) Pos.9,Fluid	270	970	K	3.69	0.53
194	TE 291	TE-B15262	B15 Rod(2,6) Pos.2,Fluid	270	970	K	4.31	0.62
195	TE 292	TE-B15264	B15 Rod(2,6) Pos.4,Fluid	270	970	K	4.31	0.62
196	TE 293	TE-B15268	B15 Rod(2,6) Pos.8,Fluid	270	970	K	3.69	0.53
197	TE 294	TE-B23221	B23 Rod(2,2) Pos.1,Fluid	270	970	K	3.69	0.53
198	TE 295	TE-B23223	B23 Rod(2,2) Pos.3,Fluid	270	970	K	3.69	0.53
199	TE 296	TE-B23225	B23 Rod(2,2) Pos.5,Fluid	270	970	K	3.69	0.53
200	TE 297	TE-B23226	B23 Rod(2,2) Pos.6,Fluid	270	970	K	3.69	0.53
201	TE 298	TE-B23227	B23 Rod(2,2) Pos.7,Fluid	270	970	K	3.69	0.53
202	TE 299	TE-B23229	B23 Rod(2,2) Pos.9,Fluid	270	970	K	3.69	0.53
203	TE 300	TE-B20661	B20 Rod(6,6) Pos.1,Fluid	270	970	K	3.69	0.53
204	TE 301	TE-B20662	B20 Rod(6,6) Pos.2,Fluid	270	970	K	3.69	0.53
205	TE 302	TE-B20663	B20 Rod(6,6) Pos.3,Fluid	270	970	K	3.69	0.53
206	TE 303	TE-B20664	B20 Rod(6,6) Pos.4,Fluid	270	970	K	3.69	0.53
207	TE 305	TE-B20666	B20 Rod(6,6) Pos.6,Fluid	270	970	K	3.69	0.53
208	TE 306	TE-B20667	B20 Rod(6,6) Pos.7,Fluid	270	970	K	0.00	0.00
209	TE 307	TE-B20668	B20 Rod(6,6) Pos.8,Fluid	270	970	K	3.69	0.53
210	TE 308	TE-B20669	B20 Rod(6,6) Pos.9,Fluid	270	970	K	0.00	0.00
211	TE 309	TE-B22661	B22 Rod(6,6) Pos.1,Fluid	270	970	K	4.31	0.62
212	TE 310	TE-B22662	B22 Rod(6,6) Pos.2,Fluid	270	970	K	4.31	0.62
213	TE 311	TE-B22663	B22 Rod(6,6) Pos.3,Fluid	270	970	K	4.31	0.62
214	TE 312	TE-B22664	B22 Rod(6,6) Pos.4,Fluid	270	970	K	4.31	0.62
215	TE 313	TE-B22665	B22 Rod(6,6) Pos.5,Fluid	270	970	K	4.31	0.62
216	TE 314	TE-B22666	B22 Rod(6,6) Pos.6,Fluid	270	970	K	4.31	0.62
217	TE 315	TE-B22667	B22 Rod(6,6) Pos.7,Fluid	270	970	K	4.31	0.62
218	TE 316	TE-B22668	B22 Rod(6,6) Pos.8,Fluid	270	970	K	4.31	0.62
219	TE 317	TE-B22669	B22 Rod(6,6) Pos.9,Fluid	270	970	K	4.31	0.62
220	TE 318	TE-B24621	B24 Rod(6,2) Pos.1,Fluid	270	970	K	3.69	0.53
221	TE 319	TE-B24623	B24 Rod(6,2) Pos.3,Fluid	270	970	K	3.69	0.53
222	TE 320	TE-B24625	B24 Rod(6,2) Pos.5,Fluid	270	970	K	3.69	0.53
223	TE 321	TE-B24626	B24 Rod(6,2) Pos.6,Fluid	270	970	K	3.69	0.53
224	TE 322	TE-B24627	B24 Rod(6,2) Pos.7,Fluid	270	970	K	3.69	0.53
225	TE 323	TE-B24629	B24 Rod(6,2) Pos.9,Fluid	270	970	K	3.69	0.53
226	TE 324	TE-IN0641-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
227	TE 325	TE-IN0642-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
228	TE 326	TE-IN0643-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
229	TE 330	TE-IN0861-SGA	SGA U-Tube(1,IN) Pos.1	270	720	K	2.75	0.61
230	TE 331	TE-IN0862-SGA	SGA U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
231	TE 332	TE-IN0863-SGA	SGA U-Tube(3,IN) Pos.1	270	720	K	2.75	0.61
232	TE 333	TE-IN0864-SGA	SGA U-Tube(4,IN) Pos.1	270	720	K	2.75	0.61
233	TE 334	TE-IN0865-SGA	SGA U-Tube(5,IN) Pos.1	270	720	K	2.75	0.61
234	TE 335	TE-IN0866-SGA	SGA U-Tube(6,IN) Pos.1	270	720	K	2.75	0.61
235	TE 336	TE-EX0861-SGA	SGA U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
236	TE 337	TE-EX0862-SGA	SGA U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
237	TE 338	TE-EX0863-SGA	SGA U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
238	TE 339	TE-EX0864-SGA	SGA U-Tube(4,EX) Pos.1	270	720	K	2.75	0.61
239	TE 340	TE-EX0865-SGA	SGA U-Tube(5,EX) Pos.1	270	720	K	2.75	0.61
240	TE 341	TE-EX0866-SGA	SGA U-Tube(6,EX) Pos.1	270	720	K	2.75	0.61
241	TE 344	TE-IN0933-SGA	SGA U-Tube(3,IN) Pos.2	270	720	K	2.75	0.61
242	TE 345	TE-IN0934-SGA	SGA U-Tube(4,IN) Pos.2	270	720	K	2.75	0.61
243	TE 347	TE-IN0936-SGA	SGA U-Tube(6,IN) Pos.2	270	720	K	2.75	0.61
244	TE 348	TE-IN0991-SGA	SGA U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
245	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
246	TE 350	TE-IN0992-SGA	SGA U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
247	TE 352	TE-IN0993-SGA	SGA U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
248	TE 353	TE-EX0993-SGA	SGA U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
249	TE 354	TE-IN0994-SGA	SGA U-Tube(4,IN) Pos.3	270	720	K	2.75	0.61
250	TE 355	TE-EX0994-SGA	SGA U-Tube(4,EX) Pos.3	270	720	K	2.75	0.61
251	TE 356	TE-IN0995-SGA	SGA U-Tube(5,IN) Pos.3	270	720	K	2.75	0.61
252	TE 358	TE-IN0996-SGA	SGA U-Tube(6,IN) Pos.3	270	720	K	2.75	0.61
253	TE 359	TE-EX0996-SGA	SGA U-Tube(6,EX) Pos.3	270	720	K	2.75	0.61
254	TE 360	TE-IN1051-SGA	SGA U-Tube(1,IN) Pos.4	270	720	K	2.75	0.61
255	TE 361	TE-IN1052-SGA	SGA U-Tube(2,IN) Pos.4	270	720	K	2.75	0.61
256	TE 362	TE-IN1053-SGA	SGA U-Tube(3,IN) Pos.4	270	720	K	2.75	0.61
257	TE 363	TE-IN1054-SGA	SGA U-Tube(4,IN) Pos.4	270	720	K	2.75	0.61
258	TE 364	TE-IN1055-SGA	SGA U-Tube(5,IN) Pos.4	270	720	K	2.75	0.61
259	TE 365	TE-IN1056-SGA	SGA U-Tube(6,IN) Pos.4	270	720	K	2.75	0.61
260	TE 366	TE-IN1121-SGA	SGA U-Tube(1,IN) Pos.5	270	720	K	2.75	0.61
261	TE 367	TE-EX1121-SGA	SGA U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
262	TE 368	TE-IN1122-SGA	SGA U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
263	TE 369	TE-EX1122-SGA	SGA U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61
264	TE 371	TE-EX1123-SGA	SGA U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
265	TE 372	TE-IN1124-SGA	SGA U-Tube(4,IN) Pos.5	270	720	K	2.75	0.61
266	TE 373	TE-EX1124-SGA	SGA U-Tube(4,EX) Pos.5	270	720	K	2.75	0.61
267	TE 374	TE-IN1125-SGA	SGA U-Tube(5,IN) Pos.5	270	720	K	2.75	0.61
268	TE 376	TE-IN1126-SGA	SGA U-Tube(6,IN) Pos.5	270	720	K	2.75	0.61
269	TE 377	TE-EX1126-SGA	SGA U-Tube(6,EX) Pos.5	270	720	K	2.75	0.61
270	TE 378	TE-IN1251-SGA	SGA U-Tube(1,IN) Pos.6	270	720	K	2.75	0.61
271	TE 379	TE-EX1251-SGA	SGA U-Tube(1,EX) Pos.6	270	720	K	2.75	0.61
272	TE 380	TE-IN1252-SGA	SGA U-Tube(2,IN) Pos.6	270	720	K	2.75	0.61
273	TE 381	TE-EX1252-SGA	SGA U-Tube(2,EX) Pos.6	270	720	K	2.75	0.61
274	TE 382	TE-IN1253-SGA	SGA U-Tube(3,IN) Pos.6	270	720	K	2.75	0.61
275	TE 383	TE-EX1253-SGA	SGA U-Tube(3,EX) Pos.6	270	720	K	2.75	0.61
276	TE 384	TE-IN1254-SGA	SGA U-Tube(4,IN) Pos.6	270	720	K	2.75	0.61
277	TE 385	TE-EX1254-SGA	SGA U-Tube(4,EX) Pos.6	270	720	K	2.75	0.61
278	TE 386	TE-IN1255-SGA	SGA U-Tube(5,IN) Pos.6	270	720	K	2.75	0.61
279	TE 387	TE-EX1255-SGA	SGA U-Tube(5,EX) Pos.6	270	720	K	2.75	0.61
280	TE 389	TE-EX1256-SGA	SGA U-Tube(6,EX) Pos.6	270	720	K	2.75	0.61
281	TE 390	TE-IN1371-SGA	SGA U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
282	TE 392	TE-IN1372-SGA	SGA U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
283	TE 393	TE-EX1372-SGA	SGA U-Tube(2,EX) Pos.7	270	720	K	2.75	0.61
284	TE 395	TE-EX1373-SGA	SGA U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
285	TE 396	TE-IN1374-SGA	SGA U-Tube(4,IN) Pos.7	270	720	K	2.75	0.61
286	TE 397	TE-EX1374-SGA	SGA U-Tube(4,EX) Pos.7	270	720	K	2.75	0.61
287	TE 399	TE-EX1375-SGA	SGA U-Tube(5,EX) Pos.7	270	720	K	2.75	0.61
288	TE 400	TE-IN1376-SGA	SGA U-Tube(6,IN) Pos.7	270	720	K	2.75	0.61
289	TE 401	TE-EX1376-SGA	SGA U-Tube(6,EX) Pos.7	270	720	K	2.75	0.61
290	TE 403	TE-EX1501-SGA	SGA U-Tube(1,EX) Pos.8	270	720	K	2.75	0.61
291	TE 404	TE-IN1502-SGA	SGA U-Tube(2,IN) Pos.8	270	720	K	2.75	0.61
292	TE 405	TE-EX1502-SGA	SGA U-Tube(2,EX) Pos.8	270	720	K	2.75	0.61
293	TE 407	TE-EX1503-SGA	SGA U-Tube(3,EX) Pos.8	270	720	K	2.75	0.61
294	TE 408	TE-IN1504-SGA	SGA U-Tube(4,IN) Pos.8	270	720	K	2.75	0.61
295	TE 410	TE-IN1505-SGA	SGA U-Tube(5,IN) Pos.8	270	720	K	2.75	0.61
296	TE 412	TE-IN1506-SGA	SGA U-Tube(6,IN) Pos.8	270	720	K	2.75	0.61
297	TE 413	TE-EX1506-SGA	SGA U-Tube(6,EX) Pos.8	270	720	K	2.75	0.61
298	TE 414	TE-IN1632-SGA	SGA U-Tube(2,IN) Pos.9	270	720	K	2.75	0.61
299	TE 415	TE-EX1632-SGA	SGA U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
300	TE 416	TE-IN1633-SGA	SGA U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
301	TE 417	TE-EX1633-SGA	SGA U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
302	TE 418	TE-IN1634-SGA	SGA U-Tube(4,IN) Pos.9	270	720	K	2.75	0.61
303	TE 419	TE-EX1634-SGA	SGA U-Tube(4,EX) Pos.9	270	720	K	2.75	0.61
304	TE 420	TE-IN1635-SGA	SGA U-Tube(5,IN) Pos.9	270	720	K	2.75	0.61
305	TE 421	TE-EX1635-SGA	SGA U-Tube(5,EX) Pos.9	270	720	K	2.75	0.61
306	TE 422	TE-IN1701-SGA	SGA U-Tube(1,IN) Pos.10	270	720	K	2.75	0.61
307	TE 424	TE-IN1782-SGA	SGA U-Tube(2,IN) Pos.10	270	720	K	2.75	0.61
308	TE 426	TE-IN1863-SGA	SGA U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
309	TE 427	TE-IN1864-SGA	SGA U-Tube(4,IN) Pos.11	270	720	K	2.75	0.61
310	TE 429	TE-086C-SGA	SGA Boiling Section Pos.1	270	670	K	2.63	0.66
311	TE 430	TE-099C-SGA	SGA Boiling Section Pos.3	270	670	K	2.63	0.66
312	TE 431	TE-112C-SGA	SGA Boiling Section Pos.5	270	670	K	2.63	0.66
313	TE 432	TE-125C-SGA	SGA Boiling Section Pos.6	270	670	K	2.63	0.66
314	TE 433	TE-137C-SGA	SGA Boiling Section Pos.7	270	670	K	2.63	0.66
315	TE 434	TE-150C-SGA	SGA Boiling Section Pos.8	270	670	K	2.63	0.66
316	TE 435	TE-163C-SGA	SGA Boiling Section Pos.9	270	670	K	2.63	0.66
317	TE 436	TE-178C-SGA	SGA Boiling Section Pos.10	270	670	K	2.63	0.66
318	TE 437	TE-192F-SGA	SGA Boiling Section	270	670	K	2.63	0.66
319	TE 438	TE-208F-SGA	SGA Separator	270	670	K	2.63	0.66
320	TE 439	TE-192C-SGA	SGA Downcomer	270	670	K	2.63	0.66
321	TE 440	TE-208C-SGA	SGA Downcomer	270	670	K	2.63	0.66
322	TE 441	TE-223C-SGA	SGA Steam Dome	270	670	K	2.63	0.66
323	TE 442	TE-245C-SGA	SGA Steam Dome	270	670	K	2.63	0.66
324	TE 443	TE-IN0641-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
325	TE 444	TE-IN0642-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
326	TE 445	TE-IN0643-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
327	TE 449	TE-IN0861-SGB	SGB U-Tube(1,IN) Pos.1	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
328	TE 450	TE-IN0862-SGB	SGB U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
329	TE 451	TE-IN0863-SGB	SGB U-Tube(3,IN) Pos.1	270	720	K	2.75	0.61
330	TE 452	TE-IN0864-SGB	SGB U-Tube(4,IN) Pos.1	270	720	K	2.75	0.61
331	TE 453	TE-IN0865-SGB	SGB U-Tube(5,IN) Pos.1	270	720	K	2.75	0.61
332	TE 454	TE-IN0866-SGB	SGB U-Tube(6,IN) Pos.1	270	720	K	2.75	0.61
333	TE 455	TE-EX0861-SGB	SGB U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
334	TE 456	TE-EX0862-SGB	SGB U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
335	TE 457	TE-EX0863-SGB	SGB U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
336	TE 458	TE-EX0864-SGB	SGB U-Tube(4,EX) Pos.1	270	720	K	2.75	0.61
337	TE 460	TE-EX0866-SGB	SGB U-Tube(6,EX) Pos.1	270	720	K	2.75	0.61
338	TE 461	TE-IN0931-SGB	SGB U-Tube(1,IN) Pos.2	270	720	K	2.75	0.61
339	TE 463	TE-IN0933-SGB	SGB U-Tube(3,IN) Pos.2	270	720	K	2.75	0.61
340	TE 464	TE-IN0934-SGB	SGB U-Tube(4,IN) Pos.2	270	720	K	2.75	0.61
341	TE 467	TE-IN0991-SGB	SGB U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
342	TE 468	TE-EX0991-SGB	SGB U-Tube(1,EX) Pos.3	270	720	K	2.75	0.61
343	TE 469	TE-IN0992-SGB	SGB U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
344	TE 470	TE-EX0992-SGB	SGB U-Tube(2,EX) Pos.3	270	720	K	2.75	0.61
345	TE 471	TE-IN0993-SGB	SGB U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
346	TE 472	TE-EX0993-SGB	SGB U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
347	TE 473	TE-IN0994-SGB	SGB U-Tube(4,IN) Pos.3	270	720	K	2.75	0.61
348	TE 474	TE-EX0994-SGB	SGB U-Tube(4,EX) Pos.3	270	720	K	2.75	0.61
349	TE 476	TE-EX0995-SGB	SGB U-Tube(5,EX) Pos.3	270	720	K	2.75	0.61
350	TE 477	TE-IN0996-SGB	SGB U-Tube(6,IN) Pos.3	270	720	K	2.75	0.61
351	TE 478	TE-EX0996-SGB	SGB U-Tube(6,EX) Pos.3	270	720	K	2.75	0.61
352	TE 479	TE-IN1051-SGB	SGB U-Tube(1,IN) Pos.4	270	720	K	2.75	0.61
353	TE 482	TE-IN1054-SGB	SGB U-Tube(4,IN) Pos.4	270	720	K	2.75	0.61
354	TE 486	TE-EX1121-SGB	SGB U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
355	TE 487	TE-IN1122-SGB	SGB U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
356	TE 488	TE-EX1122-SGB	SGB U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61
357	TE 489	TE-IN1123-SGB	SGB U-Tube(3,IN) Pos.5	270	720	K	2.75	0.61
358	TE 490	TE-EX1123-SGB	SGB U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
359	TE 491	TE-IN1124-SGB	SGB U-Tube(4,IN) Pos.5	270	720	K	2.75	0.61
360	TE 492	TE-EX1124-SGB	SGB U-Tube(4,EX) Pos.5	270	720	K	2.75	0.61
361	TE 497	TE-IN1251-SGB	SGB U-Tube(1,IN) Pos.6	270	720	K	2.75	0.61
362	TE 498	TE-EX1251-SGB	SGB U-Tube(1,EX) Pos.6	270	720	K	2.75	0.61
363	TE 499	TE-IN1252-SGB	SGB U-Tube(2,IN) Pos.6	270	720	K	2.75	0.61
364	TE 502	TE-EX1253-SGB	SGB U-Tube(3,EX) Pos.6	270	720	K	2.75	0.61
365	TE 503	TE-IN1254-SGB	SGB U-Tube(4,IN) Pos.6	270	720	K	2.75	0.61
366	TE 504	TE-EX1254-SGB	SGB U-Tube(4,EX) Pos.6	270	720	K	2.75	0.61
367	TE 505	TE-IN1255-SGB	SGB U-Tube(5,IN) Pos.6	270	720	K	2.75	0.61
368	TE 506	TE-EX1255-SGB	SGB U-Tube(5,EX) Pos.6	270	720	K	2.75	0.61
369	TE 508	TE-EX1256-SGB	SGB U-Tube(6,EX) Pos.6	270	720	K	2.75	0.61
370	TE 509	TE-IN1371-SGB	SGB U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
371	TE 510	TE-EX1371-SGB	SGB U-Tube(1,EX) Pos.7	270	720	K	2.75	0.61
372	TE 511	TE-IN1372-SGB	SGB U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
373	TE 514	TE-EX1373-SGB	SGB U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
374	TE 515	TE-IN1374-SGB	SGB U-Tube(4,IN) Pos.7	270	720	K	2.75	0.61
375	TE 516	TE-EX1374-SGB	SGB U-Tube(4,EX) Pos.7	270	720	K	2.75	0.61
376	TE 517	TE-IN1375-SGB	SGB U-Tube(5,IN) Pos.7	270	720	K	2.75	0.61
377	TE 518	TE-EX1375-SGB	SGB U-Tube(5,EX) Pos.7	270	720	K	2.75	0.61
378	TE 519	TE-IN1376-SGB	SGB U-Tube(6,IN) Pos.7	270	720	K	2.75	0.61
379	TE 520	TE-EX1376-SGB	SGB U-Tube(6,EX) Pos.7	270	720	K	2.75	0.61
380	TE 525	TE-IN1503-SGB	SGB U-Tube(3,IN) Pos.8	270	720	K	2.75	0.61
381	TE 526	TE-EX1503-SGB	SGB U-Tube(3,EX) Pos.8	270	720	K	2.75	0.61
382	TE 527	TE-IN1504-SGB	SGB U-Tube(4,IN) Pos.8	270	720	K	2.75	0.61
383	TE 528	TE-EX1504-SGB	SGB U-Tube(4,EX) Pos.8	270	720	K	2.75	0.61
384	TE 529	TE-IN1505-SGB	SGB U-Tube(5,IN) Pos.8	270	720	K	2.75	0.61
385	TE 530	TE-EX1505-SGB	SGB U-Tube(5,EX) Pos.8	270	720	K	2.75	0.61
386	TE 532	TE-EX1506-SGB	SGB U-Tube(6,EX) Pos.8	270	720	K	2.75	0.61
387	TE 533	TE-IN1632-SGB	SGB U-Tube(2,IN) Pos.9	270	720	K	2.75	0.61
388	TE 534	TE-EX1632-SGB	SGB U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
389	TE 535	TE-IN1633-SGB	SGB U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
390	TE 536	TE-EX1633-SGB	SGB U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
391	TE 537	TE-IN1634-SGB	SGB U-Tube(4,IN) Pos.9	270	720	K	2.75	0.61
392	TE 538	TE-EX1634-SGB	SGB U-Tube(4,EX) Pos.9	270	720	K	2.75	0.61
393	TE 539	TE-IN1635-SGB	SGB U-Tube(5,IN) Pos.9	270	720	K	2.75	0.61
394	TE 541	TE-IN1701-SGB	SGB U-Tube(1,IN) Pos.10	270	720	K	2.75	0.61
395	TE 544	TE-IN1785-SGB	SGB U-Tube(5,IN) Pos.10	270	720	K	2.75	0.61
396	TE 545	TE-IN1863-SGB	SGB U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
397	TE 546	TE-IN1864-SGB	SGB U-Tube(4,IN) Pos.11	270	720	K	2.75	0.61
398	TE 548	TE-086C-SGB	SGB Boiling Section Pos.1	270	670	K	2.63	0.66
399	TE 549	TE-099C-SGB	SGB Boiling Section Pos.3	270	670	K	2.63	0.66
400	TE 550	TE-112C-SGB	SGB Boiling Section Pos.5	270	670	K	2.63	0.66
401	TE 551	TE-125C-SGB	SGB Boiling Section Pos.6	270	670	K	2.63	0.66
402	TE 552	TE-137C-SGB	SGB Boiling Section Pos.7	270	670	K	2.63	0.66
403	TE 553	TE-150C-SGB	SGB Boiling Section Pos.8	270	670	K	2.63	0.66
404	TE 554	TE-163C-SGB	SGB Boiling Section Pos.9	270	670	K	2.63	0.66
405	TE 555	TE-178C-SGB	SGB Boiling Section Pos.10	270	670	K	2.63	0.66
406	TE 556	TE-192F-SGB	SGB Boiling Section	270	670	K	2.63	0.66
407	TE 557	TE-208F-SGB	SGB Separator	270	670	K	2.63	0.66
408	TE 558	TE-192C-SGB	SGB Downcomer	270	670	K	2.63	0.66
409	TE 559	TE-208C-SGB	SGB Downcomer	270	670	K	2.63	0.66

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
410	TE 560	TE-223C-SGB	SGB Steam Dome	270	670	K	2.63	0.66
411	TE 561	TE-245C-SGB	SGB Steam Dome	270	670	K	2.63	0.29
412	TE 595	TE724-ACH	Acc-Hot Line to CLB	270	570	K	2.42	0.81
413	TE 607	TE011B-HLA	HLA Spool Piece Side	270	720	K	2.75	0.61
414	TE 609	TE012C-HLA	HLA Spool Piece Top	270	720	K	2.75	0.61
415	TE 610	TE012D-HLA	HLA Spool Piece Bottom	270	720	K	2.75	0.61
416	TE 615	TE052-LSA	LSA Spool Piece	270	720	K	2.75	0.61
417	TE 619	TE072C-CLA	CLA Spool Piece Top	270	720	K	2.75	0.61
418	TE 620	TE072D-CLA	CLA Spool Piece Bottom	270	720	K	2.75	0.61
419	TE 624	TE152C-HLB	HLB Spool Piece Top	270	720	K	2.75	0.61
420	TE 625	TE152D-HLB	HLB Spool Piece Bottom	270	720	K	2.75	0.61
421	TE 628	TE191C-LSB	LSB Spool Piece East	270	720	K	2.75	0.61
422	TE 630	TE192-LSB	LSB Spool Piece	270	720	K	2.75	0.61
423	TE 634	TE212C-CLB	CLB Spool Piece Top	270	720	K	2.75	0.61
424	TE 635	TE212D-CLB	CLB Spool Piece Bottom	270	720	K	2.75	0.61
425	TE 644	TE571C-BU	RSV Spool Piece, Inlet Side	270	720	K	2.75	0.61
426	TE 645	TE571D-BU	RSV Spool Piece, Inlet Side	270	720	K	2.75	0.61
427	TE 651	TE591C-BU	Break Spool Piece	270	720	K	2.75	0.61
428	TE 652	TE591D-BU	Break Spool Piece	270	720	K	2.75	0.61
429	TE 662	TE-N-006-DC	PV Downcomer DTT North	270	720	K	2.75	0.61
430	TE 663	TE-S-006-DC	PV Downcomer DTT South	270	720	K	2.75	0.61
431	TE 664	TE-E-006-DC	PV Downcomer DTT East	270	720	K	2.75	0.61
432	TE 665	TE-W-006-DC	PV Downcomer DTT West	270	720	K	2.75	0.61
433	TE 707	TE-121E-UHDP	PLR-UH-9 Oil Outlet	270	720	K	2.75	0.61
434	TE 709	TE-121B-UHDP	PLR-UH-9 EL. 7.6m	270	720	K	2.75	0.61
435	TE 710	TE-121C-UHDP	PLR-UH-9 EL. 8.2m	270	720	K	2.75	0.61
436	TE 711	TE-E071C-DC	Downcomer EL.7.1m,East	270	720	K	2.75	0.61
437	TE 712	TE-W071C-DC	Downcomer EL.7.1m,West	270	720	K	2.75	0.61
438	TE 713	TE-E067C-DC	Downcomer EL.6.7m,East	270	720	K	2.75	0.61
439	TE 715	TE-951-CS	Oil Inlet-Main	270	720	K	2.75	0.61
440	TE 716	TE-952-CS	Oil Outlet-Main	270	720	K	2.75	0.61
441	TE 718	TE-B05221	B05 Rod(2,2) Pos.1,Fluid	270	970	K	3.69	0.53
442	TE 719	TE-B05223	B05 Rod(2,2) Pos.3,Fluid	270	970	K	3.69	0.53
443	TE 720	TE-B05225	B05 Rod(2,2) Pos.5,Fluid	270	970	K	3.69	0.53
444	TE 721	TE-B05226	B05 Rod(2,2) Pos.6,Fluid	270	970	K	3.69	0.53
445	TE 723	TE-B05229	B05 Rod(2,2) Pos.9,Fluid	270	970	K	3.69	0.53
446	TE 724	TE-B07221	B07 Rod(2,2) Pos.1,Fluid	270	1470	K	5.31	0.44
447	TE 725	TE-B07223	B07 Rod(2,2) Pos.3,Fluid	270	1470	K	5.31	0.44
448	TE 726	TE-B07225	B07 Rod(2,2) Pos.5,Fluid	270	1470	K	5.31	0.44
449	TE 727	TE-B07226	B07 Rod(2,2) Pos.6,Fluid	270	1470	K	5.31	0.44
450	TE 728	TE-B07227	B07 Rod(2,2) Pos.7,Fluid	270	1470	K	5.31	0.44
451	TE 729	TE-B07229	B07 Rod(2,2) Pos.9,Fluid	270	1470	K	5.31	0.44
452	TE 730	TE-EX0650-SGA	SGA Outlet Plenum	270	720	K	2.75	0.61
453	TE 731	TE-EX0680-SGA	SGA Outlet Plenum	270	720	K	2.75	0.61
454	TE 732	TE-EX0720-SGA	SGA Outlet Plenum	270	720	K	2.75	0.61
455	TE 733	TE-EX0650-SGB	SGB Outlet Plenum	270	720	K	2.75	0.61
456	TE 734	TE-EX0680-SGB	SGB Outlet Plenum	270	720	K	2.75	0.61
457	TE 735	TE-EX0720-SGB	SGB Outlet Plenum	270	720	K	2.75	0.61
458	TE 739	TE275C-PR	PZR Spray Inlet Nozzle	270	720	K	2.75	0.61
459	TE 752	TE293-ACH	Acc-Hot Top Gas Line	270	720	K	2.75	0.61
460	TE 780	TE687X-ACH	Acc-Hot Tank Fluid DL.6570	270	720	K	2.75	0.61
461	TE 854	TE-NP053F-PV	PV UP North Peri. EL.5299	270	630	K	3.05	0.85
462	TE 855	TE-NP055F-PV	PV UP North Peri. EL.5503	270	630	K	3.05	0.85
463	TE 856	TE-NP057F-PV	PV UP North Peri. EL.5706	270	630	K	3.05	0.85
464	TE 857	TE-NP059F-PV	PV UP North Peri. EL.5938	270	630	K	3.05	0.85
465	TE 858	TE-EP047F-PV	PV UP East Peri. EL.4672	270	630	K	3.05	0.85
466	TE 859	TE-EP053F-PV	PV UP East Peri. EL.5299	270	630	K	3.05	0.85
467	TE 860	TE-EP055F-PV	PV UP East Peri. EL.5503	270	630	K	3.05	0.85
469	TE 861	TE-EP057F-PV	PV UP East Peri. EL.5706	270	630	K	3.05	0.85
469	TE 862	TE-EP059F-PV	PV UP East Peri. EL.5938	270	630	K	3.05	0.85
470	TE 863	TE-SP047F-PV	PV UP South Peri. EL.4672	270	630	K	3.05	0.85
471	TE 864	TE-SP053F-PV	PV UP South Peri. EL.5299	270	630	k	3.05	0.85
472	TE 865	TE-SP055F-PV	PV UP South Peri. EL.5503	270	630	K	3.05	0.85
473	TE 866	TE-SP057F-PV	PV UP South Peri. EL.5706	270	630	K	3.05	0.85
474	TE 867	TE-SP059F-PV	PV UP South Peri. EL.5938	270	630	K	3.05	0.85
475	TE 868	TE-WP047F-PV	PV UP West Peri. EL.4672	270	630	K	3.05	0.85
476	TE 869	TE-WP053F-PV	PV UP West Peri. EL.5299	270	630	K	3.05	0.85
477	TE 870	TE-WP055F-PV	PV UP West Peri. EL.5503	270	630	K	3.05	0.85
478	TE 871	TE-WP057F-PV	PV UP West Peri. EL.5706	270	630	K	3.05	0.85
479	TE 872	TE-WP059F-PV	PV UP West Peri. EL.5938	270	630	K	3.05	0.85
480	TE 873	TE-EM053F-PV	PV UP East Middle EL.5299	270	630	K	3.05	0.85
481	TE 874	TE-EM057F-PV	PV UP East Middle EL.5706	270	630	K	3.05	0.85
482	TE 875	TE-WM053F-PV	PV UP West Middle EL.5299	270	630	K	3.05	0.85
483	TE 876	TE-WM057F-PV	PV UP West Middle EL.5706	270	630	K	3.05	0.85
484	TE 877	TE-WC047F-PV	PV UP West Center EL.4672	270	630	K	3.05	0.85
485	TE 878	TE-WC053F-PV	PV UP West Center EL.5299	270	630	K	3.05	0.85
486	TE 879	TE-WC055F-PV	PV UP West Center EL.5503	270	630	K	3.05	0.85
487	TE 880	TE-WC057F-PV	PV UP West Center EL.5706	270	630	K	3.05	0.85
488	TE 881	TE-WC059F-PV	PV UP West Center EL.5938	270	630	K	3.05	0.85
489	TE 882	TE-EC047F-PV	PV UP East Center EL.4672	270	630	K	3.05	0.85
490	TE 883	TE-EC053F-PV	PV UP East Center EL.5299	270	630	K	3.05	0.85
491	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		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
492	TE 885	TE-EC057F-PV	PV UP East Center EL.5706	270	630	K	3.05	0.85
493	TE 886	TE-EC059F-PV	PV UP East Center EL.5938	270	630	K	3.05	0.85
494	TE 888	TE-E037C-DC	DC East EL.3662	270	630	K	3.05	0.85
495	TE 891	TE-W037C-DC	DC West EL.3662	270	630	K	3.05	0.85
496	TE 893	TE-EN040C-DC	DC East-North EL.4037	270	630	K	3.05	0.85
497	TE 894	TE-E040C-DC	DC East EL.4037	270	630	K	3.05	0.85
498	TE 895	TE-ES040C-DC	DC East-South EL.4037	270	630	K	3.05	0.85
499	TE 896	TE-WN040C-DC	DC West-North EL.4037	270	630	K	3.05	0.85
500	TE 897	TE-W040C-DC	DC West EL.4037	270	630	K	3.05	0.85
501	TE 898	TE-WS040C-DC	DC West-South EL.4037	270	630	K	3.05	0.85
502	TE 899	TE-W042C-DC	DC West EL.4210	270	630	K	3.05	0.85
503	TE 900	TE-E042C-DC	DC East EL.4210	270	630	K	3.05	0.85
504	TE 901	TE-SW045C-DC	DC South-West EL.4497	270	630	K	3.05	0.85
505	TE 902	TE-NE045C-DC	DC North-East EL.4497	270	630	K	3.05	0.85
506	TE 903	TE-N045C-DC	DC North EL.4497	270	630	K	3.05	0.85
507	TE 904	TE-NW045C-DC	DC North-West EL.4497	270	630	K	3.05	0.85
508	TE 905	TE-S045C-DC	DC South EL.4497	270	630	K	3.05	0.85
509	TE 906	TE-SE045C-DC	DC South-East EL.4497	270	630	K	3.05	0.85
510	TE 907	TE-NE051C-DC	DC North-East EL.5074	270	630	K	3.05	0.85
511	TE 908	TE-N051C-DC	DC North EL.5074	270	630	K	3.05	0.85
512	TE 909	TE-NW051C-DC	DC North-West EL.5074	270	630	K	3.05	0.85
513	TE 910	TE-SW051C-DC	DC South-West EL.5074	270	630	K	3.05	0.85
514	TE 911	TE-S051C-DC	DC South EL.5074	270	630	K	3.05	0.85
515	TE 912	TE-SE051C-DC	DC South-East EL.5074	270	630	K	3.05	0.85
516	TE 913	TE-N054C-DC	DC North EL.5363	270	630	K	3.05	0.85
517	TE 914	TE-S054C-DC	DC South EL.5363	270	630	K	3.05	0.85
518	TE 921	HTE-C046-PV	Heated TC, EL.4597	270	1270	K	4.55	0.46
519	TE 922	TE-C046-PV	HTC Fluid, EL.4597	270	1270	K	4.55	0.46
520	TE 925	TE-C056-PV	HTC Fluid, EL.5606	270	1270	K	4.55	0.46
521	TE 926	HTE-C056-PV	Heated TC, EL.5606	270	1270	K	4.55	0.46
522	TE 958	TE194A-PR	PZR DL.2025	270	720	K	2.75	0.61
523	TE 960	TE194C-PR	PZR DL.5995	270	720	K	2.75	0.61
524	TE 961	TE194D-PR	PZR DL.7965	270	720	K	2.75	0.61
525	TE 962	TE194E-PR	PZR DL.9795	270	720	K	2.75	0.61
526	TE 963	TE194F-PR	PZR DL.11321	270	720	K	2.75	0.61
527	TE 964	TE-PR2	PZR HT	270	1470	K	5.31	0.44
528	TE 965	TE677-ACC	Acc-Cold Tank Fluid DL.6450	270	720	K	2.75	0.61
529	TE 1089	TE910-CWT	Cooling Water Tank	270	370	K	2.37	2.37
530	TE 1092	TE960-AIR	Atmospheric Temperature	170	370	K	2.30	1.15
531	TE 1093	TE961-AIR	Room Temperature	170	370	K	2.30	1.15
532	TE 1094	TC030D-HLA	HLA Fluid at Pipe Bottom	273	673	K	2.63	0.66
533	TE 1095	TC170D-HLB	HLB Fluid at Pipe Bottom	273	673	K	2.63	0.66
534	TE 1096	TC080D-CLA	CLA Fluid at Pipe Bottom	273	673	K	2.63	0.66
535	TE 1097	TC220D-CLB	CLB Fluid at Pipe Bottom	273	673	K	2.63	0.66
536	TE 1098	TC194B-PR	PZR Fluid	273	673	K	2.63	0.66
537	TE 1099	TC223D-SGA	SGA Steam Dome	273	673	K	2.63	0.66
538	TE 1100	TC223D-SGB	SGB Steam Dome	273	673	K	2.63	0.66
539	TE 1101	TC-E000C-DC	Douncomer EL.0.0m,East	273	673	K	2.63	0.66
540	TE 1102	TC-E060C-DC	Downcomer EL.6.0m,East	273	673	K	2.63	0.66
541	TE 1123	TE687A-ACH	Acc-Hot Tank Fluid DL.10	270	720	K	2.75	0.61
542	TE 1124	TE687B-ACH	Acc-Hot Tank Fluid DL.475	270	720	K	2.75	0.61
543	TE 1125	TE687C-ACH	Acc-Hot Tank Fluid DL.940	270	720	K	2.75	0.61
544	TE 1126	TE687D-ACH	Acc-Hot Tank Fluid DL.1405	270	720	K	2.75	0.61
545	TE 1127	TE687E-ACH	Acc-Hot Tank Fluid DL.1870	270	720	K	2.75	0.61
546	TE 1128	TE687F-ACH	Acc-Hot Tank Fluid DL.2335	270	720	K	2.75	0.61
547	TE 1129	TE687G-ACH	Acc-Hot Tank Fluid DL.2800	270	720	K	2.75	0.61
548	TE 1130	TE687H-ACH	Acc-Hot Tank Fluid DL.3265	270	720	K	2.75	0.61
549	TE 1131	TE687I-ACH	Acc-Hot Tank Fluid DL.3275	270	720	K	2.75	0.61
550	TE 1132	TE687J-ACH	Acc-Hot Tank Fluid DL.3285	270	720	K	2.75	0.61
551	TE 1133	TE687K-ACH	Acc-Hot Tank Fluid DL.3295	270	720	K	2.75	0.61
552	TE 1135	TE687M-ACH	Acc-Hot Tank Fluid DL.3315	270	720	K	2.75	0.61
553	TE 1136	TE687N-ACH	Acc-Hot Tank Fluid DL.3325	270	720	K	2.75	0.61
554	TE 1137	TE687O-ACH	Acc-Hot Tank Fluid DL.3335	270	720	K	2.75	0.61
555	TE 1138	TE687P-ACH	Acc-Hot Tank Fluid DL.3345	270	720	K	2.75	0.61
556	TE 1139	TE687Q-ACH	Acc-Hot Tank Fluid DL.3355	270	720	K	2.75	0.61
557	TE 1140	TE687R-ACH	Acc-Hot Tank Fluid DL.3820	270	720	K	2.75	0.61
558	TE 1141	TE687S-ACH	Acc-Hot Tank Fluid DL.4285	270	720	K	2.75	0.61
559	TE 1142	TE687T-ACH	Acc-Hot Tank Fluid DL.4750	270	720	K	2.75	0.61
560	TE 1143	TE687U-ACH	Acc-Hot Tank Fluid DL.5215	270	720	K	2.75	0.61
561	TE 1144	TE687V-ACH	Acc-Hot Tank Fluid DL.5680	270	720	K	2.75	0.61
562	TE 1145	TE687W-ACH	Acc-Hot Tank Fluid DL.6145	270	720	K	2.75	0.61
563	TE 1151	TE075A-CLA	CLA TC Rake	270	720	K	2.75	0.61
564	TE 1152	TE075B-CLA	CLA TC Rake	270	720	K	2.75	0.61
565	TE 1153	TE075C-CLA	CLA TC Rake	270	720	K	2.75	0.61
566	TE 1154	TE075D-CLA	CLA TC Rake	270	720	K	2.75	0.61
567	TE 1155	TE075E-CLA	CLA TC Rake	270	720	K	2.75	0.61
568	TE 1156	TE215A-CLB	CLB TC Rake	270	720	K	2.75	0.61
569	TE 1157	TE215B-CLB	CLB TC Rake	270	720	K	2.75	0.61
570	TE 1158	TE215C-CLB	CLB TC Rake	270	720	K	2.75	0.61
571	TE 1159	TE215D-CLB	CLB TC Rake	270	720	K	2.75	0.61
572	TE 1160	TE215E-CLB	CLB TC Rake	270	720	K	2.75	0.61
573	TE 1165	TE970-DIS	Dis. Gas Sampling	270	470	K	2.30	1.15

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
574	TE 1166	TE-H10-GAS	Air Injection Line No.1	270	370	K	2.37	2.37
575	TE 1167	TE-H20-GAS	Air Injection Line No.2	270	370	K	2.37	2.37
576	TE 1168	TE-E030C-DC	DC East EL.3000	270	720	K	2.37	0.53
577	TE 1169	TE-S030C-DC	DC South EL.3000	270	720	K	2.37	0.53
578	TE 1170	TE-W030C-DC	DC West EL.3000	270	720	K	2.37	0.53
579	TE 1171	TE-N030C-DC	DC North EL.3000	270	720	K	2.37	0.53
580	TE 1172	TE-S037C-DC	DC South EL.3662	270	720	K	2.37	0.53
581	TE 1173	TE-N037C-DC	DC North EL.3662	270	720	K	2.37	0.53
582	DT 1	DTE020A-HLA	HLA Wall I/O	-150	150	K	2.90	0.97
583	DT 2	DTE020B-HLA	HLA Wall-Fluid	-150	150	K	2.90	0.97
584	DT 3	DTE030A-HLA	HLA Wall I/O	-150	150	K	2.90	0.97
585	DT 4	DTE030B-HLA	HLA Wall-Fluid	-150	150	K	2.90	0.97
586	DT 5	DTE050A-LSA	LSA Wall I/O	-150	150	K	2.90	0.97
587	DT 6	DTE050B-LSA	LSA Wall-Fluid	-150	150	K	2.90	0.97
588	DT 7	DTE060A-PCA	PCA Wall I/O	-150	150	K	2.90	0.97
589	DT 8	DTE070A-CLA	CLA Wall I/O	-150	150	K	2.90	0.97
590	DT 9	DTE070B-CLA	CLA Wall-Fluid	-150	150	K	2.90	0.97
591	DT 10	DTE080A-CLA	CLA Wall I/O	-150	150	K	2.90	0.97
592	DT 11	DTE080B-CLA	CLA Wall-Fluid	-150	150	K	2.90	0.97
593	DT 12	DTE100-HLA	HLA-CLA	-150	150	K	2.90	0.97
594	DT 13	DTE160A-HLB	HLB Wall I/O	-150	150	K	2.90	0.97
595	DT 14	DTE160B-HLB	HLB Wall-Fluid	-150	150	K	2.90	0.97
596	DT 15	DTE170A-HLB	HLB Wall I/O	-150	150	K	2.90	0.97
597	DT 16	DTE170B-HLB	HLB Wall-Fluid	-150	150	K	2.90	0.97
598	DT 17	DTE190A-LSB	LSB Wall I/O	-150	150	K	2.90	0.97
599	DT 18	DTE190B-LSB	LSB Wall-Fluid	-150	150	K	2.90	0.97
600	DT 19	DTE200A-PCB	PCB Wall I/O	-150	150	K	2.90	0.97
601	DT 20	DTE210A-CLB	CLB Wall I/O	-150	150	K	2.90	0.97
602	DT 21	DTE210B-CLB	CLB Wall-Fluid	-150	150	K	2.90	0.97
603	DT 22	DTE220A-CLB	CLB Wall I/O	-150	150	K	2.90	0.97
604	DT 23	DTE220B-CLB	CLB Wall-Fluid	-150	150	K	2.90	0.97
605	DT 24	DTE240-HLB	HLB-CLB	-150	150	K	2.90	0.97
606	DT 25	DTE270A-PR	PZR Spray Line Wall-Fluid	-150	150	K	2.90	0.97
607	DT 26	DTE280A-PR	PZR Surge Line Wall-Fluid	-150	150	K	2.90	0.97
608	DT 27	DTE-E-015A-PV	PV Wall I/O-E at L. Plenum	-150	150	K	2.90	0.97
609	DT 28	DTE-W-015A-PV	PV Wall I/O-W at L. Plenum	-150	150	K	2.90	0.97
610	DT 29	DTE-N000A-PV	PV Wall I/O-N at DC Bottom	-150	150	K	2.90	0.97
611	DT 30	DTE-S000A-PV	PV Wall I/O-S at DC Bottom	-150	150	K	2.90	0.97
612	DT 31	DTE-E000A-PV	PV Wall I/O-E at DC Bottom	-150	150	K	2.90	0.97
613	DT 32	DTE-W000A-PV	PV Wall I/O-W at DC Bottom	-150	150	K	2.90	0.97
614	DT 33	DTE-N018A-PV	PV Wall I/O-N at DC Middle	-150	150	K	2.90	0.97
615	DT 34	DTE-S018A-PV	PV Wall I/O-S at DC Middle	-150	150	K	2.90	0.97
616	DT 35	DTE-E018A-PV	PV Wall I/O-E at DC Middle	-150	150	K	2.90	0.97
617	DT 36	DTE-W018A-PV	PV Wall I/O-W at DC Middle	-150	150	K	2.90	0.97
618	DT 37	DTE-N036A-PV	PV Wall I/O-N at Upper DC	-150	150	K	2.90	0.97
619	DT 38	DTE-S036A-PV	PV Wall I/O-S at Upper DC	-150	150	K	2.90	0.97
620	DT 39	DTE-E036A-PV	PV Wall I/O-E at Upper DC	-150	150	K	2.90	0.97
621	DT 40	DTE-W036A-PV	PV Wall I/O-W at Upper DC	-150	150	K	2.90	0.97
622	DT 41	DTE-N060A-PV	PV Wall I/O-N at DC Top	-150	150	K	2.90	0.97
623	DT 42	DTE-S060A-PV	PV Wall I/O-S at DC Top	-150	150	K	2.90	0.97
624	DT 43	DTE-E060A-PV	PV Wall I/O-E at DC Top	-150	150	K	2.90	0.97
625	DT 44	DTE-W060A-PV	PV Wall I/O-W at DC Top	-150	150	K	2.90	0.97
626	DT 45	DTE-E080A-PV	PV Wall I/O-E at DC Head	-150	150	K	2.90	0.97
627	DT 46	DTE-W080A-PV	PV Wall I/O-W at DC Head	-150	150	K	2.90	0.97
628	DT 47	DTE-N000B-PV	PV/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
629	DT 48	DTE-S000B-PV	PV/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
630	DT 50	DTE-W000B-PV	PV/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
631	DT 51	DTE-N018B-PV	PV/DC Fluid at DC Middle	-150	150	K	2.90	0.97
632	DT 53	DTE-E018B-PV	PV/DC Fluid at DC Middle	-150	150	K	2.90	0.97
633	DT 54	DTE-W018B-PV	PV/DC Fluid at DC Middle	-150	150	K	2.90	0.97
634	DT 55	DTE-N036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
635	DT 56	DTE-S036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
636	DT 57	DTE-E036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
637	DT 58	DTE-W036B-PV	PV/DC Fluid at Upper DC	-150	150	K	2.90	0.97
638	DT 60	DTE-S060B-PV	PV/DC Fluid at DC Top	-150	150	K	2.90	0.97
639	DT 62	DTE-W060B-PV	PV/DC Fluid at DC Top	-150	150	K	2.90	0.97
640	DT 64	DTE-S000C-PV	CB/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
641	DT 66	DTE-W000C-PV	CB/DC Fluid at DC Bottom	-150	150	K	2.90	0.97
642	DT 67	DTE-N018C-PV	CB/DC Fluid at DC Middle	-150	150	K	2.90	0.97
643	DT 69	DTE-E018C-PV	CB/DC Fluid at DC Middle	-150	150	K	2.90	0.97
644	DT 70	DTE-W018C-PV	CB/DC Fluid at DC Middle	-150	150	K	2.90	0.97
645	DT 71	DTE-N036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
646	DT 72	DTE-S036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
647	DT 73	DTE-E036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
648	DT 74	DTE-W036C-PV	CB/DC Fluid at Upper DC	-150	150	K	2.90	0.97
649	DT 76	DTE-S060C-PV	CB/DC Fluid at DC Top	-150	150	K	2.90	0.97
650	DT 78	DTE-W060C-PV	CB/DC Fluid at DC Top	-150	150	K	2.90	0.97
651	DT 80	DTE-S000E-PV	CB Wall I/O at DC Bottom	-150	150	K	2.90	0.97
652	DT 81	DTE-E000E-PV	CB Wall I/O at DC Bottom	-150	150	K	2.90	0.97
653	DT 82	DTE-W000E-PV	CB Wall I/O at DC Bottom	-150	150	K	2.90	0.97
654	DT 87	DTE-N018E-PV	CB Wall I/O at DC Middle	-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
655	DT 88	DTE-S018E-PV	CB Wall I/O at DC Middle	-150	150	K	2.90	0.97
656	DT 89	DTE-E018E-PV	CB Wall I/O at DC Middle	-150	150	K	2.90	0.97
657	DT 90	DTE-W018E-PV	CB Wall I/O at DC Middle	-150	150	K	2.90	0.97
658	DT 95	DTE-N036E-PV	CB Wall I/O at Upper DC	-150	150	K	2.90	0.97
659	DT 96	DTE-S036E-PV	CB Wall I/O at Upper DC	-150	150	K	2.90	0.97
660	DT 97	DTE-E036E-PV	CB Wall I/O at Upper DC	-150	150	K	2.90	0.97
661	DT 101	DTE-E049E-PV	CB Wall I/O below Nozzle	-150	150	K	2.90	0.97
662	DT 103	DTE-N060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
663	DT 104	DTE-S060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
664	DT 105	DTE-E060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
665	DT 106	DTE-W060E-PV	CB Wall I/O at DC Top	-150	150	K	2.90	0.97
666	DT 107	DTE-040-B09-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
667	DT 108	DTE-040-B11-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
668	DT 109	DTE-040-B01-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
669	DT 110	DTE-040-B03-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
670	DT 111	DTE-040-B05-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
671	DT 112	DTE-040-B07-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
672	DT 113	DTE-040-B21-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
673	DT 114	DTE-040-B23-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
674	DT 115	DTE-040-B02-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
675	DT 116	DTE-040-B15-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
676	DT 117	DTE-040-B06-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
677	DT 118	DTE-040-B14-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
678	DT 119	DTE-040-B18-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
679	DT 120	DTE-040-B19-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
680	DT 121	DTE-040-B10-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
681	DT 122	DTE-040-B12-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
682	DT 123	DTE-040-B04-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
683	DT 124	DTE-040-B08-UCP	Fluid DT across UCP	-150	150	K	2.90	0.97
684	DT 130	DTE-000-B07-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
685	DT 132	DTE-000-B11-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
686	DT 135	DTE-000-B18-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
687	DT 136	DTE-000-B20-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
688	DT 137	DTE-000-B21-LCP	In/Out Fluid across LCP	-150	150	K	1.67	0.56
689	DT 139	DTE-086A-SGA	SGA Wall I/O Pos.1	-40	40	K	2.07	2.58
690	DT 140	DTE-137A-SGA	SGA Wall I/O Pos.7	-40	40	K	2.07	2.58
691	DT 141	DTE-178A-SGA	SGA Wall I/O Pos.10	-40	40	K	2.07	2.58
692	DT 142	DTE-223A-SGA	SGA Steam Dome Wall I/O	-40	40	K	2.07	2.58
693	DT 143	DTE-IN0861-SGA	SGA U-Tube(1,IN) Pos.1	-100	100	K	2.42	1.21
694	DT 144	DTE-EX0861-SGA	SGA U-Tube(1,EX) Pos.1	-100	100	K	2.42	1.21
695	DT 145	DTE-IN0862-SGA	SGA U-Tube(2,IN) Pos.1	-100	100	K	2.42	1.21
696	DT 146	DTE-EX0862-SGA	SGA U-Tube(2,EX) Pos.1	-100	100	K	2.42	1.21
697	DT 147	DTE-IN0863-SGA	SGA U-Tube(3,IN) Pos.1	-100	100	K	2.42	1.21
698	DT 148	DTE-EX0863-SGA	SGA U-Tube(3,EX) Pos.1	-100	100	K	2.42	1.21
699	DT 149	DTE-IN0991-SGA	SGA U-Tube(1,IN) Pos.3	-100	100	K	2.42	1.21
700	DT 150	DTE-EX0991-SGA	SGA U-Tube(1,EX) Pos.3	-100	100	K	2.42	1.21
701	DT 151	DTE-IN0992-SGA	SGA U-Tube(2,IN) Pos.3	-100	100	K	2.42	1.21
702	DT 152	DTE-EX0992-SGA	SGA U-Tube(2,EX) Pos.3	-100	100	K	2.42	1.21
703	DT 153	DTE-IN0993-SGA	SGA U-Tube(3,IN) Pos.3	-100	100	K	2.42	1.21
704	DT 154	DTE-EX0993-SGA	SGA U-Tube(3,EX) Pos.3	-100	100	K	2.42	1.21
705	DT 155	DTE-IN1121-SGA	SGA U-Tube(1,IN) Pos.5	-100	100	K	2.42	1.21
706	DT 156	DTE-EX1121-SGA	SGA U-Tube(1,EX) Pos.5	-100	100	K	2.42	1.21
707	DT 157	DTE-IN1122-SGA	SGA U-Tube(2,IN) Pos.5	-100	100	K	2.42	1.21
708	DT 161	DTE-IN1371-SGA	SGA U-Tube(1,IN) Pos.7	-100	100	K	2.42	1.21
709	DT 163	DTE-IN1372-SGA	SGA U-Tube(2,IN) Pos.7	-100	100	K	2.42	1.21
710	DT 164	DTE-EX1372-SGA	SGA U-Tube(2,EX) Pos.7	-100	100	K	2.42	1.21
711	DT 165	DTE-IN1373-SGA	SGA U-Tube(3,IN) Pos.7	-100	100	K	2.42	1.21
712	DT 166	DTE-EX1373-SGA	SGA U-Tube(3,EX) Pos.7	-100	100	K	2.42	1.21
713	DT 167	DTE-IN1632-SGA	SGA U-Tube(2,IN) Pos.9	-100	100	K	2.42	1.21
714	DT 168	DTE-EX1632-SGA	SGA U-Tube(2,EX) Pos.9	-100	100	K	2.42	1.21
715	DT 169	DTE-IN1633-SGA	SGA U-Tube(3,IN) Pos.9	-100	100	K	2.42	1.21
716	DT 170	DTE-EX1633-SGA	SGA U-Tube(3,EX) Pos.9	-100	100	K	2.42	1.21
717	DT 171	DTE-IN1701-SGA	SGA U-Tube(1,IN) Pos.10	-100	100	K	2.42	1.21
718	DT 172	DTE-IN1782-SGA	SGA U-Tube(2,IN) Pos.10	-100	100	K	2.42	1.21
719	DT 173	DTE-IN1863-SGA	SGA U-Tube(3,IN) Pos.11	-100	100	K	2.42	1.21
720	DT 174	DTE-086A-SGB	SGB Wall I/O Pos.1	-40	40	K	2.07	2.58
721	DT 175	DTE-137A-SGB	SGB Wall I/O Pos.7	-40	40	K	2.07	2.58
722	DT 176	DTE-178A-SGB	SGB Wall I/O Pos.10	-40	40	K	2.07	2.58
723	DT 177	DTE-223A-SGB	SGB Steam Dome Wall I/O	-40	40	K	2.07	2.58
724	DT 178	DTE-IN0861-SGB	SGB U-Tube(1,IN) Pos.1	-100	100	K	2.42	1.21
725	DT 179	DTE-EX0861-SGB	SGB U-Tube(1,EX) Pos.1	-100	100	K	2.42	1.21
726	DT 180	DTE-IN0862-SGB	SGB U-Tube(2,IN) Pos.1	-100	100	K	2.42	1.21
727	DT 181	DTE-EX0862-SGB	SGB U-Tube(2,EX) Pos.1	-100	100	K	2.42	1.21
728	DT 182	DTE-IN0863-SGB	SGB U-Tube(3,IN) Pos.1	-100	100	K	2.42	1.21
729	DT 183	DTE-EX0863-SGB	SGB U-Tube(3,EX) Pos.1	-100	100	K	2.42	1.21
730	DT 184	DTE-IN0991-SGB	SGB U-Tube(1,IN) Pos.3	-100	100	K	2.42	1.21
731	DT 185	DTE-EX0991-SGB	SGB U-Tube(1,EX) Pos.3	-100	100	K	2.42	1.21
732	DT 186	DTE-IN0992-SGB	SGB U-Tube(2,IN) Pos.3	-100	100	K	2.42	1.21
733	DT 187	DTE-EX0992-SGB	SGB U-Tube(2,EX) Pos.3	-100	100	K	2.42	1.21
734	DT 188	DTE-IN0993-SGB	SGB U-Tube(3,IN) Pos.3	-100	100	K	2.42	1.21
735	DT 189	DTE-EX0993-SGB	SGB U-Tube(3,EX) Pos.3	-100	100	K	2.42	1.21
736	DT 191	DTE-EX1121-SGB	SGB U-Tube(1,EX) Pos.5	-100	100	K	2.42	1.21

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range LO	Range HI	Unit	Uncertainty ±ABS.	Uncertainty ±%FR
737	DT 192	DTE-IN1122-SGB	SGB U-Tube(2,IN) Pos.5	-100	100	K	2.42	1.21
738	DT 193	DTE-EX1122-SGB	SGB U-Tube(2,EX) Pos.5	-100	100	K	2.42	1.21
739	DT 194	DTE-IN1123-SGB	SGB U-Tube(3,IN) Pos.5	-100	100	K	2.42	1.21
740	DT 195	DTE-EX1123-SGB	SGB U-Tube(3,EX) Pos.5	-100	100	K	2.42	1.21
741	DT 196	DTE-IN1371-SGB	SGB U-Tube(1,IN) Pos.7	-100	100	K	2.42	1.21
742	DT 197	DTE-EX1371-SGB	SGB U-Tube(1,EX) Pos.7	-100	100	K	2.42	1.21
743	DT 198	DTE-IN1372-SGB	SGB U-Tube(2,IN) Pos.7	-100	100	K	2.42	1.21
744	DT 201	DTE-EX1373-SGB	SGB U-Tube(3,EX) Pos.7	-100	100	K	2.42	1.21
745	DT 203	DTE-EX1632-SGB	SGB U-Tube(2,EX) Pos.9	-100	100	K	2.42	1.21
746	DT 204	DTE-IN1633-SGB	SGB U-Tube(3,IN) Pos.9	-100	100	K	2.42	1.21
747	DT 205	DTE-EX1633-SGB	SGB U-Tube(3,EX) Pos.9	-100	100	K	2.42	1.21
748	DT 206	DTE-IN1701-SGB	SGB U-Tube(1,IN) Pos.10	-100	100	K	2.42	1.21
749	DT 208	DTE-IN1863-SGB	SGB U-Tube(3,IN) Pos.11	-100	100	K	2.42	1.21
750	DT 215	DTE-C046-PV	HTC Differential Temp	-150	150	K	2.90	0.97
751	DT 216	DTE-C051-PV	HTC Differential Temp	-150	150	K	2.90	0.97
752	DT 217	DTE-C056-PV	HTC Differential Temp	-150	150	K	2.90	0.97
753	TW 1	TWE020B-HLA	HLA Inner Surface	270	720	K	2.75	0.61
754	TW 2	TWE030B-HLA	HLA Inner Surface	270	720	K	2.75	0.61
755	TW 3	TWE050B-LSA	LSA Inner Surface	270	720	K	2.75	0.61
756	TW 4	TWE060B-PCA	PCA Inner Surface	270	720	K	2.75	0.61
757	TW 5	TWE070B-CLA	CLA Inner Surface	270	720	K	2.75	0.61
758	TW 6	TWE080B-CLA	CLA Inner Surface	270	720	K	2.75	0.61
759	TW 7	TWE160B-HLB	HLB Inner Surface	270	720	K	2.75	0.61
760	TW 8	TWE170B-HLB	HLB Inner Surface	270	720	K	2.75	0.61
761	TW 9	TWE190B-LSB	LSB Inner Surface	270	720	K	2.75	0.61
762	TW 10	TWE200B-PCB	PCB Inner Surface	270	720	K	2.75	0.61
763	TW 11	TWE210B-CLB	CLB Inner Surface	270	720	K	2.75	0.61
764	TW 12	TWE220B-CLB	CLB Inner Surface	270	720	K	2.75	0.61
765	TW 13	TWE280B-PR	Pressurizer Surge Line	270	720	K	2.75	0.61
766	TW 14	TWE431A-SGA	SGA Downcomer A Wall	270	670	K	2.63	0.66
767	TW 15	TWE432A-SGA	SGA Downcomer B Wall	270	670	K	2.63	0.66
768	TW 16	TWE433A-SGA	SGA Downcomer C Wall	270	670	K	2.63	0.66
769	TW 17	TWE434A-SGA	SGA Downcomer D Wall	270	670	K	2.63	0.66
770	TW 18	TWE471A-SGB	SGB Downcomer A Wall	270	670	K	2.63	0.66
771	TW 19	TWE472A-SGB	SGB Downcomer B Wall	270	670	K	2.63	0.66
772	TW 20	TWE473A-SGB	SGB Downcomer C Wall	270	670	K	2.63	0.66
773	TW 21	TWE474A-SGB	SGB Downcomer D Wall	270	670	K	2.63	0.66
774	TW 22	TWE-E-015B-PV	PV Inner Surf. EL.-1.5m,E	270	720	K	2.75	0.61
775	TW 23	TWE-W-015B-PV	PV Inner Surf. EL.-1.5m,W	270	720	K	2.75	0.61
776	TW 24	TWE-N000B-PV	PV Inner Surf. EL.0.0m,N	270	720	K	2.75	0.61
777	TW 25	TWE-S000B-PV	PV Inner Surf. EL.0.0m,S	270	720	K	2.75	0.61
778	TW 26	TWE-E000B-PV	PV Inner Surf. EL.0.0m,E	270	720	K	2.75	0.61
779	TW 27	TWE-W000B-PV	PV Inner Surf. EL.0.0m,W	270	720	K	2.75	0.61
780	TW 28	TWE-N018B-PV	PV Inner Surf. EL.1.8m,N	270	720	K	2.75	0.61
781	TW 29	TWE-S018B-PV	PV Inner Surf. EL.1.8m,S	270	720	K	2.75	0.61
782	TW 30	TWE-E018B-PV	PV Inner Surf. EL.1.8m,E	270	720	K	2.75	0.61
783	TW 31	TWE-W018B-PV	PV Inner Surf. EL.1.8m,W	270	720	K	2.75	0.61
784	TW 32	TWE-N036B-PV	PV Inner Surf. EL.3.6m,N	270	720	K	2.75	0.61
785	TW 33	TWE-S036B-PV	PV Inner Surf. EL.3.6m,S	270	720	K	2.75	0.61
786	TW 34	TWE-E036B-PV	PV Inner Surf. EL.3.6m,E	270	720	K	2.75	0.61
787	TW 35	TWE-W036B-PV	PV Inner Surf. EL.3.6m,W	270	720	K	2.75	0.61
788	TW 36	TWE-N060B-PV	PV Inner Surf. EL.6.0m,N	270	720	K	2.75	0.61
789	TW 37	TWE-S060B-PV	PV Inner Surf. EL.6.0m,S	270	720	K	2.75	0.61
790	TW 38	TWE-E060B-PV	PV Inner Surf. EL.6.0m,E	270	720	K	2.75	0.61
791	TW 39	TWE-W060B-PV	PV Inner Surf. EL.6.0m,W	270	720	K	2.75	0.61
792	TW 40	TWE-E080B-PV	PV Inner Surf. EL.8.0m,E	270	720	K	2.75	0.61
793	TW 41	TWE-W080B-PV	PV Inner Surf. EL.8.0m,W	270	720	K	2.75	0.61
794	TW 43	TWE-S000D-CB	CB Outer Surf. EL.0.0m,S	270	970	K	3.49	0.50
795	TW 44	TWE-E000D-CB	CB Outer Surf. EL.0.0m,E	270	970	K	3.49	0.50
796	TW 45	TWE-W000D-CB	CB Outer Surf. EL.0.0m,W	270	970	K	3.49	0.50
797	TW 50	TWE-N018D-CB	CB Outer Surf. EL.1.8m,N	270	970	K	3.49	0.50
798	TW 51	TWE-S018D-CB	CB Outer Surf. EL.1.8m,S	270	970	K	3.49	0.50
799	TW 52	TWE-E018D-CB	CB Outer Surf. EL.1.8m,E	270	970	K	3.49	0.50
800	TW 53	TWE-W018D-CB	CB Outer Surf. EL.1.8m,W	270	970	K	3.49	0.50
801	TW 57	TWE-W026D-CB	CB Outer Surf. EL.2.6m,W	270	970	K	3.49	0.50
802	TW 58	TWE-N036D-CB	CB Outer Surf. EL.3.6m,N	270	970	K	3.49	0.50
803	TW 59	TWE-S036D-CB	CB Outer Surf. EL.3.6m,S	270	970	K	3.49	0.50
804	TW 60	TWE-E036D-CB	CB Outer Surf. EL.3.6m,E	270	970	K	3.49	0.50
805	TW 61	TWE-W036D-CB	CB Outer Surf. EL.3.6m,W	270	970	K	3.49	0.50
806	TW 62	TWE-N049D-CB	CB Outer Surf. EL.4.9m,N	270	970	K	3.49	0.50
807	TW 63	TWE-S049D-CB	CB Outer Surf. EL.4.9m,S	270	970	K	3.49	0.50
808	TW 64	TWE-E049D-CB	CB Outer Surf. EL.4.9m,E	270	970	K	3.49	0.50
809	TW 65	TWE-W049D-CB	CB Outer Surf. EL.4.9m,W	270	970	K	3.49	0.50
810	TW 66	TWE-N060D-CB	CB Outer Surf. EL.6.0m,N	270	970	K	3.49	0.50
811	TW 67	TWE-S060D-CB	CB Outer Surf. EL.6.0m,S	270	970	K	3.49	0.50
812	TW 68	TWE-E060D-CB	CB Outer Surf. EL.6.0m,E	270	970	K	3.49	0.50
813	TW 69	TWE-W060D-CB	CB Outer Surf. EL.6.0m,W	270	970	K	3.49	0.50
814	TW 70	TWE-N000E-CB	CB Inner Surf. EL.0.0m,N	270	970	K	3.49	0.50
815	TW 71	TWE-S000E-CB	CB Inner Surf. EL.0.0m,S	270	970	K	3.49	0.50
816	TW 72	TWE-E000E-CB	CB Inner Surf. EL.0.0m,E	270	970	K	3.49	0.50
817	TW 73	TWE-W000E-CB	CB Inner Surf. EL.0.0m,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
818	TW 78	TWE-N018E-CB	CB Inner Surf. EL.1.8m,N	270	970	K	3.49	0.50
819	TW 79	TWE-S018E-CB	CB Inner Surf. EL.1.8m,S	270	970	K	3.49	0.50
820	TW 80	TWE-E018E-CB	CB Inner Surf. EL.1.8m,E	270	970	K	3.49	0.50
821	TW 81	TWE-W018E-CB	CB Inner Surf. EL.1.8m,W	270	970	K	3.49	0.50
822	TW 86	TWE-N036E-CB	CB Inner Surf. EL.3.6m,N	270	970	K	3.49	0.50
823	TW 87	TWE-S036E-CB	CB Inner Surf. EL.3.6m,S	270	970	K	3.49	0.50
824	TW 88	TWE-E036E-CB	CB Inner Surf. EL.3.6m,E	270	970	K	3.49	0.50
825	TW 92	TWE-E049E-CB	CB Inner Surf. EL.4.9m,E	270	970	K	3.49	0.50
826	TW 94	TWE-N060E-CB	CB Inner Surf. EL.6.0m,N	270	970	K	3.49	0.50
827	TW 95	TWE-S060E-CB	CB Inner Surf. EL.6.0m,S	270	970	K	3.49	0.50
828	TW 96	TWE-E060E-CB	CB Inner Surf. EL.6.0m,E	270	970	K	3.49	0.50
829	TW 97	TWE-W060E-CB	CB Inner Surf. EL.6.0m,W	270	970	K	3.49	0.50
830	TW 108	TWE-063-B09-UCSP	UCSP L.Surf. EL.6.3m,B09	270	970	K	3.49	0.50
831	TW 109	TWE-065-B09-UCSP	UCSP U.Surf. EL.6.5m,B09	270	970	K	3.49	0.50
832	TW 110	TWE-E047G-UP	UP Str. Surf. EL.4.7m,East	270	970	K	3.49	0.50
833	TW 111	TWE-W047G-UP	UP Str. Surf. EL.4.7m,West	270	970	K	3.49	0.50
834	TW 112	TWE-E056G-UP	UP Str. Surf. EL.5.6m,East	270	970	K	3.49	0.50
835	TW 113	TWE-W056G-UP	UP Str. Surf. EL.5.6m,West	270	970	K	3.49	0.50
836	TW 114	TWE-080G-UH	UH Str. Surf. EL.8.0m,CTR	270	970	K	3.49	0.50
837	TW 154	TWE-B03436	B03 Rod(4,3) Pos.6	270	1470	K	5.31	0.44
838	TW 155	TWE-B03438	B03 Rod(4,3) Pos.8	270	1470	K	5.31	0.44
839	TW 217	TWE-B08222	B08 Rod(2,2) Pos.2	270	970	K	5.31	0.44
840	TW 218	TWE-B08224	B08 Rod(2,2) Pos.4	270	970	K	5.31	0.44
841	TW 219	TWE-B08225	B08 Rod(2,2) Pos.5	270	970	K	5.31	0.44
842	TW 220	TWE-B08226	B08 Rod(2,2) Pos.6	270	970	K	5.31	0.44
843	TW 222	TWE-B08228	B08 Rod(2,2) Pos.8	270	970	K	5.31	0.44
844	TW 225	TWE-B08435	B08 Rod(4,3) Pos.5	270	1470	K	5.31	0.44
845	TW 227	TWE-B08437	B08 Rod(4,3) Pos.7	270	1470	K	5.31	0.44
846	TW 236	TWE-B10442	B10 Rod(4,4) Pos.2	270	1470	K	5.31	0.44
847	TW 237	TWE-B10444	B10 Rod(4,4) Pos.4	270	1470	K	5.31	0.44
848	TW 239	TWE-B10447	B10 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
849	TW 259	TWE-B12262	B12 Rod(2,6) Pos.2	270	970	K	5.31	0.44
850	TW 260	TWE-B12264	B12 Rod(2,6) Pos.4	270	970	K	5.31	0.44
851	TW 261	TWE-B12265	B12 Rod(2,6) Pos.5	270	970	K	5.31	0.44
852	TW 262	TWE-B12266	B12 Rod(2,6) Pos.6	270	970	K	5.31	0.44
853	TW 264	TWE-B12268	B12 Rod(2,6) Pos.8	270	970	K	5.31	0.44
854	TW 283	TWE-B13442	B13 Rod(4,4) Pos.2	270	1470	K	5.31	0.44
855	TW 284	TWE-B13444	B13 Rod(4,4) Pos.4	270	1470	K	5.31	0.44
856	TW 286	TWE-B13446	B13 Rod(4,4) Pos.6	270	1470	K	5.31	0.44
857	TW 287	TWE-B13447	B13 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
858	TW 288	TWE-B13448	B13 Rod(4,4) Pos.8	270	1470	K	5.31	0.44
859	TW 339	TWE-B17445	B17 Rod(4,4) Pos.5	270	1470	K	5.31	0.44
860	TW 341	TWE-B17447	B17 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
861	TW 391	TWE-B21662	B21 Rod(6,6) Pos.2	270	1470	K	5.31	0.44
862	TW 392	TWE-B21664	B21 Rod(6,6) Pos.4	270	1470	K	5.31	0.44
863	TW 394	TWE-B21666	B21 Rod(6,6) Pos.6	270	1470	K	5.31	0.44
864	TW 395	TWE-B21667	B21 Rod(6,6) Pos.7	270	1470	K	5.31	0.44
865	TW 409	TWE-B22441	B22 Rod(4,4) Pos.1	270	1470	K	5.31	0.44
866	TW 410	TWE-B22443	B22 Rod(4,4) Pos.3	270	1470	K	5.31	0.44
867	TW 411	TWE-B22445	B22 Rod(4,4) Pos.5	270	1470	K	5.31	0.44
868	TW 414	TWE-B22449	B22 Rod(4,4) Pos.9	270	1470	K	5.31	0.44
869	TW 457	TWE-IN0641-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
870	TW 459	TWE-IN0643-SGA	SGA Inlet Plenum	270	720	K	2.75	0.61
871	TW 463	TWE-086B-SGA	SGA Inner Surf. Pos.1	270	670	K	2.63	0.66
872	TW 464	TWE-137B-SGA	SGA Inner Surf. Pos.7	270	670	K	2.63	0.66
873	TW 465	TWE-178B-SGA	SGA Inner Surf. Pos.10	270	670	K	2.63	0.66
874	TW 466	TWE-223B-SGA	SGA Inner Surf.	270	670	K	2.63	0.66
875	TW 467	TWE-IN0861-SGA	SGA U-Tube(1,IN) Pos.1	270	720	K	2.75	0.61
876	TW 468	TWE-EX0861-SGA	SGA U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
877	TW 469	TWE-IN0862-SGA	SGA U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
878	TW 470	TWE-EX0862-SGA	SGA U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
879	TW 471	TWE-IN0863-SGA	SGA U-Tube(3,IN) Pos.1	270	720	K	2.75	0.61
880	TW 472	TWE-EX0863-SGA	SGA U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
881	TW 473	TWE-IN0991-SGA	SGA U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
882	TW 474	TWE-EX0991-SGA	SGA U-Tube(1,EX) Pos.3	270	720	K	2.75	0.61
883	TW 475	TWE-IN0992-SGA	SGA U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
884	TW 476	TWE-EX0992-SGA	SGA U-Tube(2,EX) Pos.3	270	720	K	2.75	0.61
885	TW 477	TWE-IN0993-SGA	SGA U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
886	TW 478	TWE-EX0993-SGA	SGA U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
887	TW 479	TWE-IN1121-SGA	SGA U-Tube(1,IN) Pos.5	270	720	K	2.75	0.61
888	TW 480	TWE-EX1121-SGA	SGA U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
889	TW 481	TWE-IN1122-SGA	SGA U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
890	TW 482	TWE-EX1122-SGA	SGA U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61
891	TW 483	TWE-IN1123-SGA	SGA U-Tube(3,IN) Pos.5	270	720	K	2.75	0.61
892	TW 484	TWE-EX1123-SGA	SGA U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
893	TW 485	TWE-IN1371-SGA	SGA U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
894	TW 486	TWE-EX1371-SGA	SGA U-Tube(1,EX) Pos.7	270	720	K	2.75	0.61
895	TW 487	TWE-IN1372-SGA	SGA U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
896	TW 488	TWE-EX1372-SGA	SGA U-Tube(2,EX) Pos.7	270	720	K	2.75	0.61
897	TW 489	TWE-IN1373-SGA	SGA U-Tube(3,IN) Pos.7	270	720	K	2.75	0.61
898	TW 490	TWE-EX1373-SGA	SGA U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
899	TW 491	TWE-IN1632-SGA	SGA U-Tube(2,IN) Pos.9	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
900	TW 492	TWE-EX1632-SGA	SGA U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
901	TW 493	TWE-IN1633-SGA	SGA U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
902	TW 494	TWE-EX1633-SGA	SGA U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
903	TW 495	TWE-IN1701-SGA	SGA U-Tube(1,IN) Pos.10	270	720	K	2.75	0.61
904	TW 496	TWE-IN1782-SGA	SGA U-Tube(2,IN) Pos.10	270	720	K	2.75	0.61
905	TW 497	TWE-IN1863-SGA	SGA U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
906	TW 498	TWE-IN0641-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
907	TW 499	TWE-IN0642-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
908	TW 500	TWE-IN0643-SGB	SGB Inlet Plenum	270	720	K	2.75	0.61
909	TW 504	TWE-086B-SGB	SGB Inner Surf. Pos.1	270	670	K	2.63	0.66
910	TW 505	TWE-137B-SGB	SGB Inner Surf. Pos.7	270	670	K	2.63	0.66
911	TW 506	TWE-178B-SGB	SGB Inner Surf. Pos.10	270	670	K	2.63	0.66
912	TW 507	TWE-223B-SGB	SGB Inner Surf.	270	670	K	2.63	0.66
913	TW 508	TWE-IN0861-SGB	SGB U-Tube(1,IN) Pos.1	270	720	K	2.75	0.61
914	TW 509	TWE-EX0861-SGB	SGB U-Tube(1,EX) Pos.1	270	720	K	2.75	0.61
915	TW 510	TWE-IN0862-SGB	SGB U-Tube(2,IN) Pos.1	270	720	K	2.75	0.61
916	TW 511	TWE-EX0862-SGB	SGB U-Tube(2,EX) Pos.1	270	720	K	2.75	0.61
917	TW 512	TWE-IN0863-SGB	SGB U-Tube(3,IN) Pos.1	270	720	K	2.75	0.61
918	TW 513	TWE-EX0863-SGB	SGB U-Tube(3,EX) Pos.1	270	720	K	2.75	0.61
919	TW 514	TWE-IN0991-SGB	SGB U-Tube(1,IN) Pos.3	270	720	K	2.75	0.61
920	TW 515	TWE-EX0991-SGB	SGB U-Tube(1,EX) Pos.3	270	720	K	2.75	0.61
921	TW 516	TWE-IN0992-SGB	SGB U-Tube(2,IN) Pos.3	270	720	K	2.75	0.61
922	TW 517	TWE-EX0992-SGB	SGB U-Tube(2,EX) Pos.3	270	720	K	2.75	0.61
923	TW 518	TWE-IN0993-SGB	SGB U-Tube(3,IN) Pos.3	270	720	K	2.75	0.61
924	TW 519	TWE-EX0993-SGB	SGB U-Tube(3,EX) Pos.3	270	720	K	2.75	0.61
925	TW 520	TWE-IN1121-SGB	SGB U-Tube(1,IN) Pos.5	270	720	K	2.75	0.61
926	TW 521	TWE-EX1121-SGB	SGB U-Tube(1,EX) Pos.5	270	720	K	2.75	0.61
927	TW 522	TWE-IN1122-SGB	SGB U-Tube(2,IN) Pos.5	270	720	K	2.75	0.61
928	TW 523	TWE-EX1122-SGB	SGB U-Tube(2,EX) Pos.5	270	720	K	2.75	0.61
929	TW 524	TWE-IN1123-SGB	SGB U-Tube(3,IN) Pos.5	270	720	K	2.75	0.61
930	TW 525	TWE-EX1123-SGB	SGB U-Tube(3,EX) Pos.5	270	720	K	2.75	0.61
931	TW 526	TWE-IN1371-SGB	SGB U-Tube(1,IN) Pos.7	270	720	K	2.75	0.61
932	TW 527	TWE-EX1371-SGB	SGB U-Tube(1,EX) Pos.7	270	720	K	2.75	0.61
933	TW 528	TWE-IN1372-SGB	SGB U-Tube(2,IN) Pos.7	270	720	K	2.75	0.61
934	TW 529	TWE-EX1372-SGB	SGB U-Tube(2,EX) Pos.7	270	720	K	2.75	0.61
935	TW 530	TWE-IN1373-SGB	SGB U-Tube(3,IN) Pos.7	270	720	K	2.75	0.61
936	TW 531	TWE-EX1373-SGB	SGB U-Tube(3,EX) Pos.7	270	720	K	2.75	0.61
937	TW 532	TWE-IN1632-SGB	SGB U-Tube(2,IN) Pos.9	270	720	K	2.75	0.61
938	TW 533	TWE-EX1632-SGB	SGB U-Tube(2,EX) Pos.9	270	720	K	2.75	0.61
939	TW 534	TWE-IN1633-SGB	SGB U-Tube(3,IN) Pos.9	270	720	K	2.75	0.61
940	TW 535	TWE-EX1633-SGB	SGB U-Tube(3,EX) Pos.9	270	720	K	2.75	0.61
941	TW 536	TWE-IN1701-SGB	SGB U-Tube(1,IN) Pos.10	270	720	K	2.75	0.61
942	TW 537	TWE-IN1782-SGB	SGB U-Tube(2,IN) Pos.10	270	720	K	2.75	0.61
943	TW 538	TWE-IN1863-SGB	SGB U-Tube(3,IN) Pos.11	270	720	K	2.75	0.61
944	TW 545	TWE270A-PR	PZR Spray Line Outer Surf.	270	720	K	2.75	0.61
945	TW 598	TWE-121D-UHDP	PLR-UH-9 Outer Surf.	270	970	K	3.49	0.50
946	TW 631	TWE-B01225	B01 Rod(2,2) Pos.5	270	1470	K	6.32	0.53
947	TW 635	TWE-B04221	B04 Rod(2,2) Pos.1	270	970	K	3.69	0.53
948	TW 638	TWE-B04226	B04 Rod(2,2) Pos.6	270	970	K	3.69	0.53
949	TW 640	TWE-B04229	B04 Rod(2,2) Pos.9	270	970	K	3.69	0.53
950	TW 649	TWE-B11225	B11 Rod(2,2) Pos.5	270	1470	K	6.32	0.53
951	TW 650	TWE-B11226	B11 Rod(2,2) Pos.6	270	1470	K	6.32	0.53
952	TW 653	TWE-B16221	B16 Rod(2,2) Pos.1	270	970	K	3.69	0.53
953	TW 654	TWE-B16223	B16 Rod(2,2) Pos.3	270	970	K	3.69	0.53
954	TW 656	TWE-B16226	B16 Rod(2,2) Pos.6	270	970	K	3.69	0.53
955	TW 658	TWE-B16229	B16 Rod(2,2) Pos.9	270	970	K	3.69	0.53
956	TW 673	TWE-EN037B-PV	PV East-North EL.3662	270	630	K	3.05	0.85
957	TW 674	TWE-E037B-PV	PV East EL.3662	270	630	K	3.05	0.85
958	TW 676	TWE-EN040B-PV	PV East-North EL.4037	270	630	K	3.05	0.85
959	TW 678	TWE-ES040B-PV	PV East-South EL.4037	270	630	K	3.05	0.85
960	TW 679	TWE-E042B-PV	PV East EL.4210	270	630	K	3.05	0.85
961	TW 680	TWE-WN037B-PV	PV West-North EL.3662	270	630	K	3.05	0.85
962	TW 681	TWE-W037B-PV	PV West EL.3662	270	630	K	3.05	0.85
963	TW 682	TWE-WS037B-PV	PV West-South EL.3662	270	630	K	3.05	0.85
964	TW 685	TWE-WS040B-PV	PV West-South EL.4037	270	630	K	3.05	0.85
965	TW 687	TWE-SW045B-PV	PV South-West EL.4497	270	630	K	3.05	0.85
966	TW 688	TWE-S045B-PV	PV South EL.4497	270	630	K	3.05	0.85
967	TW 689	TWE-SE045B-PV	PV South-East EL.4497	270	630	K	3.05	0.85
968	TW 690	TWE-SW051B-PV	PV South-West EL.5074	270	630	K	3.05	0.85
969	TW 691	TWE-S051B-PV	PV South EL.5074	270	630	K	3.05	0.85
970	TW 692	TWE-SE051B-PV	PV South-East EL.5074	270	630	K	3.05	0.85
971	TW 693	TWE-S054B-PV	PV South EL.5363	270	630	K	3.05	0.85
972	TW 694	TWE-NE045B-PV	PV North-East EL.4497	270	630	K	3.05	0.85
973	TW 696	TWE-NW045B-PV	PV North-West EL.4497	270	630	K	3.05	0.85
974	TW 697	TWE-NE051B-PV	PV North-East EL.5074	270	630	K	3.05	0.85
975	TW 698	TWE-N051B-PV	PV North EL.5074	270	630	K	3.05	0.85
976	TW 700	TWE-N054B-PV	PV North EL.5363	270	630	K	3.05	0.85
977	TW 709	TWE-IN038B02-UCP	UCP L.Surf. EL.3.8m,B02	270	970	K	3.49	0.50
978	TW 710	TWE-IN038B04-UCP	UCP L.Surf. EL.3.8m,B04	270	970	K	3.49	0.50
979	TW 711	TWE-IN038B06-UCP	UCP L.Surf. EL.3.8m,B06	270	970	K	3.49	0.50
980	TW 712	TWE-IN038B08-UCP	UCP L.Surf. EL.3.8m,B08	270	970	K	3.49	0.50
981	TW 713	TWE-IN038B21-UCP	UCP L.Surf. EL.3.8m,B21	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
982	TW 714	TWE-EX040B02-UCP	UCP U.Surf. EL.4.0m,B02	270	970	K	3.49	0.50
983	TW 715	TWE-EX040B04-UCP	UCP U.Surf. EL.4.0m,B04	270	970	K	3.49	0.50
984	TW 716	TWE-EX040B06-UCP	UCP U.Surf. EL.4.0m,B06	270	970	K	3.49	0.50
985	TW 717	TWE-EX040B08-UCP	UCP U.Surf. EL.4.0m,B08	270	970	K	3.49	0.50
986	TW 718	TWE-EX040B21-UCP	UCP U.Surf. EL.4.0m,B21	270	970	K	3.49	0.50
987	TW 727	TWE-B03437	B03 Rod(4,3) Pos.7	270	1470	K	5.31	0.44
988	TW 732	TWE-B08431	B08 Rod(4,3) Pos.1	270	1470	K	5.31	0.44
989	TW 733	TWE-B08433	B08 Rod(4,3) Pos.3	270	1470	K	5.31	0.44
990	TW 734	TWE-B08439	B08 Rod(4,3) Pos.9	270	1470	K	5.31	0.44
991	TW 739	TWE-B10446	B10 Rod(4,4) Pos.6	270	1470	K	5.31	0.44
992	TW 740	TWE-B10448	B10 Rod(4,4) Pos.8	270	1470	K	5.31	0.44
993	TW 757	TWE-B17441	B17 Rod(4,4) Pos.1	270	1470	K	5.31	0.44
994	TW 758	TWE-B17443	B17 Rod(4,4) Pos.3	270	1470	K	5.31	0.44
995	TW 759	TWE-B17449	B17 Rod(4,4) Pos.9	270	1470	K	5.31	0.44
996	TW 768	TWE-B22447	B22 Rod(4,4) Pos.7	270	1470	K	5.31	0.44
997	TW 773	TWE211A-PR	PZR Wall DL.2025	270	720	K	2.75	0.61
998	TW 774	TWE211B-PR	PZR Wall DL.4238	270	720	K	2.75	0.61
999	TW 775	TWE211C-PR	PZR Wall DL.5995	270	720	K	2.75	0.61
1000	TW 776	TWE211D-PR	PZR Wall DL.7965	270	720	K	2.75	0.61
1001	TW 777	TWE211E-PR	PZR Wall DL.9795	270	720	K	2.75	0.61
1002	TW 778	TWE211F-PR	PZR Wall DL.11321	270	720	K	2.75	0.61
1003	TW 779	TWE678-ACC	Acc-Cold Tank Wall	270	720	K	2.75	0.61
1004	TW 780	TWE688-ACH	Acc-Hot Tank Wall	270	720	K	2.75	0.61
1005	TW 783	TWE-A80-ADS	RSV(1-3) Line	270	720	K	2.75	0.61
1006	TW 845	TWE111A-PR	PZR Outer Wall DL.-289	270	720	K	2.75	0.61
1007	TW 846	TWE115A-PR	PZR Outer Wall DL.105	270	720	K	2.75	0.61
1008	TW 847	TWE189A-PR	PZR Outer Wall DL.7219	270	720	K	2.75	0.61
1009	TW 848	TWE198A-PR	PZR Outer Wall DL.8417	270	720	K	2.75	0.61
1010	TW 849	TWE-022A-PV	PV Outer Wall EL.-2245	270	720	K	2.75	0.61
1011	TW 850	TWE-027A-PV	PV Outer Wall EL.-2657	270	720	K	2.75	0.61
1012	TW 851	TWE-028A-PV	PV Outer Wall EL.-2677	270	720	K	2.75	0.61
1013	TW 852	TWE731A-HLA	HLA Outer Wall	270	720	K	2.75	0.61
1014	TW 853	TWE078A-SGA	SGA Outer Wall DL.-161	270	670	K	2.63	0.66
1015	TW 854	TWE245A-SGA	SGA Outer Wall DL.16572	270	670	K	2.63	0.66
1016	TW 859	TWE-A82-ADS	RSV123 Spool Piece	270	720	K	2.75	0.61
1017	TW 860	TWE-A83-ADS	RSV1 Orifice	270	720	K	2.75	0.61
1018	TW 862	TWE-A84-ADS	RSV AOV81 Body Wall	270	720	K	2.75	0.61
1019	TW 863	TWE-A85-ADS	RSV AOV81 Outer Frame	270	720	K	2.75	0.61
1020	TW 864	TWE292-PR	PZR VP-Line Pipe Wall	270	720	K	2.75	0.61
1021	TW 865	TWE442-SGA	SGA 8B MSL Pipe Wall	270	570	K	2.42	0.81
1022	TW 866	TWE441-SGA	SGA 8B MSL Support	270	570	K	2.42	0.81
1023	TW 867	TWE444-SGA	SGA 3B MSL Pipe Wall	270	570	K	2.42	0.81
1024	TW 868	TWE445-SGA	SGA 3B MSL Support	270	570	K	2.42	0.81
1025	TW 869	TWE446-SGA	SGA MSIV Body Wall	270	570	K	2.42	0.81
1026	TW 870	TWE447-SGA	SGA MSIV Outer Frame	270	570	K	2.42	0.81
1027	TW 871	TWE443-SGA	SGA BU-Line Pipe Wall	270	570	K	2.42	0.81
1028	TW 873	TWE-B03432	B03 Rod(4,3) Pos.2	270	1470	K	6.32	0.53
1029	TW 874	TWE-B03434	B03 Rod(4,3) Pos.4	270	1470	K	6.32	0.53
1030	FE 1	FE010-HLA	HLA Leakage (Normal)	0	0.4	kg/s	0.01	1.54
1031	FE 2	FE020A-LSA	Primary Loop LSA (High)	0	90	kg/s	1.25	1.39
1032	FE 3	FE020B-LSA	Primary Loop LSA (Low)	0	15.81	kg/s	0.22	1.37
1033	FE 4	FE150-HLB	HLB Leakage (Normal)	0	0.4	kg/s	0.01	1.54
1034	FE 5	FE160A-LSB	Primary Loop LSB (High)	0	90	kg/s	1.25	1.39
1035	FE 6	FE160B-LSB	Primary Loop LSB (Low)	0	15.81	kg/s	0.22	1.37
1036	FE 13	FE430-SGA	SGA Feedwater	0	4	kg/s	0.05	1.35
1037	FE 14	FE431-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1038	FE 15	FE432-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1039	FE 16	FE433-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1040	FE 17	FE434-SGA	SGA Downcomer	0	7	kg/s	0.09	1.26
1041	FE 18	FE440-SGA	SGA Steam Line	0	5	kg/s	0.10	2.04
1042	FE 19	FE450-SGA	SGA Relief Valve Line	0	4	kg/s	0.07	1.82
1043	FE 21	FE470-SGB	SGB Feedwater	0	4	kg/s	0.05	1.35
1044	FE 22	FE471-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1045	FE 23	FE472-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1046	FE 24	FE473-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1047	FE 25	FE474-SGB	SGB Downcomer	0	7	kg/s	0.09	1.26
1048	FE 26	FE480-SGB	SGB Steam Line	0	5	kg/s	0.10	2.04
1049	FE 27	FE490-SGB	SGB Relief Valve Line	0	4	kg/s	0.07	1.82
1050	FE 29	FE510-SH	Main-Steam Header	0	10	kg/s	0.22	2.16
1051	FE 31	FE560A-BU	BU-1 Venturi (High)	0	70	kg/s	1.12	1.61
1052	FE 32	FE560B-BU	BU-1 Venturi (Low)	0	10	kg/s	0.26	2.57
1053	FE 35	FE580-ST	ST Vent Line	0	0.3	kg/s	–	–
1054	FE 36	FE590-ST	ST Bleed Line	0	20	kg/s	–	–
1055	FE 37	FE650-ACC	Acc-Cold Flow to CLA	0	15	kg/s	0.19	1.25
1056	FE 40	FE680-ACH	Acc-Hot Flow to CLB	0	10	kg/s	0.12	1.23
1057	FE 41	FE730-PJ	HPI (PJ) Delivery (High)	0	2.2	kg/s	0.03	1.25
1058	FE 42	FE740-PJ	HPI (PJ) Flow to A (High)	0	1.4	kg/s	0.02	1.26
1059	FE 44	FE760-PH	HPI (PH) Delivery (High)	0	1.5	kg/s	0.02	1.23
1060	FE 45	FE770-PH	HPI (PH) Flow to A	0	3	kg/s	0.05	1.54
1061	FE 46	FE780-PH	HPI (PH) Flow to B (High)	0	0.5	kg/s	0.01	1.26
1062	FE 48	FE820-PL	RHR Outlet (High)	0	15	kg/s	0.24	1.62

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
1063	FE	49	FE830-PL	LPI Flow to CLA (High)	0	15	kg/s	0.24	1.62
1064	FE	50	FE840-PL	LPI Flow to CLB (High)	0	15	kg/s	0.24	1.62
1065	FE	57	FE783-PH	HPI (PH) Flow to CLB	0	3	kg/s	0.05	1.54
1066	FE	62	FE010B-HLA	HLA Leakage (Reverse)	0	0.4	kg/s	0.01	1.53
1067	FE	63	FE150B-HLB	HLB Leakage (Reverse)	0	0.4	kg/s	0.01	1.53
1068	FE	65	FE440B-SGA	SGA Main Steam Line (Low)	0	1	kg/s	0.02	2.04
1069	FE	67	FE480B-SGB	SGB Main Steam Line (Low)	0	1	kg/s	0.02	2.04
1070	FE	70	FE520-PAA	Aux. Feedwater A (High)	0	1.5	kg/s	0.02	1.23
1071	FE	71	FE520B-PAA	Aux. Feedwater A (Low)	0	1	kg/s	0.01	1.23
1072	FE	72	FE530B-PAB	Aux. Feedwater B (Low)	0	1	kg/s	0.01	1.23
1074	FE	76	FE760B-PH	HPI (PH) Delivery (Low)	0	1	kg/s	0.01	1.25
1073	FE	77	FE780B-PH	HPI (PH) Flow to B (low)	0	0.3	kg/s	0.004	1.23
1075	FE	78	FE820B-PL	RHR Outlet (Low)	0	5	kg/s	0.08	1.60
1076	FE	79	FE830B-PL	LPI Flow to CLA (Low)	0	5	kg/s	0.08	1.60
1077	FE	80	FE840B-PL	LPI Flow to CLB (Low)	0	3	kg/s	0.05	1.60
1078	PE	1	PE561-BU	BU-1 Venturi	0	20	MPa	0.1077	0.54
1079	PE	3	PE010-SGA	SGA Inlet Plenum	0	20	MPa	0.1077	0.54
1080	PE	4	PE020-LSA	PCA Suction	0	20	MPa	0.1077	0.54
1081	PE	5	PE030-CLA	PCA Delivery	0	20	MPa	0.1077	0.54
1082	PE	6	PE150-SGB	SGB Inlet Plenum	0	20	MPa	0.1077	0.54
1083	PE	7	PE160-LSB	PCB Suction	0	20	MPa	0.1077	0.54
1084	PE	8	PE170-CLB	PCB Delivery	0	20	MPa	0.1077	0.54
1085	PE	9	PE290-PV	PV Upper Head	0	20	MPa	0.1077	0.54
1086	PE	10	PE280A-PV	PV Upper Plenum (High)	0	20	MPa	0.1077	0.54
1087	PE	11	PE280B-PV	PV Upper Plenum (Low)	0	5	MPa	0.0269	0.54
1088	PE	12	PE270-PV	PV Lower Plenum	0	20	MPa	0.1077	0.54
1089	PE	13	PE300A-PR	Pressurizer (High)	0	20	MPa	0.1077	0.54
1090	PE	14	PE300B-PR	Pressurizer (Low)	0	5	MPa	0.0269	0.54
1091	PE	19	PE430-SGA	SGA Steam Dome	0	10	MPa	0.0539	0.54
1092	PE	20	PE440-SGA	SGA Steam Line	0	10	MPa	0.0539	0.54
1093	PE	21	PE450-SGB	SGB Steam Dome	0	10	MPa	0.0539	0.54
1094	PE	22	PE460-SGB	SGB Steam Line	0	10	MPa	0.0539	0.54
1095	PE	23	PE470-SH	Main-Steam Header	0	10	MPa	0.0539	0.54
1096	PE	24	PE480-JC	Jet Condenser	0	10	MPa	0.0539	0.54
1097	PE	25	PE610-ST	Break Flow Supp. Tank	0	1	MPa	0.0032	0.32
1098	PE	26	PE560-BU	BU-1 Orifice Upstream	0	20	MPa	0.1077	0.54
1099	PE	27	PE570-BU	BU-1 Orifice Downstream	0	20	MPa	0.1077	0.54
1100	PE	30	PE600-ST	Break-Flow Blowdown Line	0	2	MPa	0.0064	0.32
1101	PE	31	PE650-ACC	Acc-Cold Tank	0	10	MPa	0.0539	0.54
1102	PE	32	PE660-ACH	Acc-Hot Tank	0	10	MPa	0.0539	0.54
1103	PE	35	PE011-HLA	HLA Spool Piece	0	20	MPa	0.1077	0.54
1104	PE	36	PE071-CLA	CLA Spool Piece	0	20	MPa	0.1077	0.54
1105	PE	37	PE151-HLB	HLB Spool Piece	0	20	MPa	0.1077	0.54
1106	PE	38	PE211-CLB	CLB Spool Piece	0	20	MPa	0.1077	0.54
1107	PE	43	PE571-BU	RSV123 Inlet	0	20	MPa	0.1118	0.56
1108	PE	44	PE591-BU	Break Spool Piece	0	20	MPa	0.1118	0.56
1109	PE	46	PE820-RHR	PL Delivery	0	20	MPa	0.1077	0.54
1110	PE	53	PE430B-SGA	SGA Steam Dome (Low)	0	1	MPa	0.0032	0.32
1111	PE	54	PE450B-SGB	SGB Steam Dome (Low)	0	1	MPa	0.0032	0.32
1112	PE	62	PE-A50-DVIA	PV-DCA ECCS Line	0	20	MPa	0.0641	0.32
1113	PE	63	PE-A51-DVIA	PV-DCA ECCS Line	0	20	MPa	0.0641	0.32
1114	PE	64	PE-A55-DVIB	PV-DCB ECCS Line	0	20	MPa	0.0641	0.32
1115	PE	65	PE-A56-DVIB	PV-DCB ECCS Line	0	20	MPa	0.0641	0.32
1116	PE	73	PE-A83-ADS	RSV3 R.O Downstream	0	20	MPa	0.1077	0.54
1117	PE	76	PE280C-PV	PV Upper Plenum (Low)	0	0.5	MPa	0.0013	0.27
1118	PE	77	PE300C-PR	Pressurizer (Low)	0	0.7	MPa	0.0019	0.27
1119	PE	78	PE435-SGA	SGA Steam Dome	0	10	MPa	0.0224	0.22
1120	PE	79	PE455-SGB	SGB Steam Dome	0	10	MPa	0.0224	0.22
1121	MI	1	RE010-PCA	PCA (Rotational Speed)	0	70	rps	0.39	0.55
1122	MI	2	RE150-PCB	PCB (Rotational Speed)	0	70	rps	0.39	0.55
1123	MI	5	OPE430-SGA	SGA Feedwater (FCV430)	0	100	%	0.54	0.54
1124	MI	6	OPE470-SGB	SGB Feedwater (FCV470)	0	100	%	0.54	0.54
1125	MI	8	OPE510-SH	Steam Flow (FCV510)	0	100	%	0.54	0.54
1126	MI	9	OPE820-PL	RHR Flow (FCV820)	0	100	%	0.54	0.54
1127	MI	11	VBE010-PCA	PCA (Vibration)	0	200	um	0.10	5.01
1128	MI	12	VBE150-PCB	PCB (Vibration)	0	200	um	0.10	5.01
1129	MI	13	TQE010-PCA	PCA (Torque)	0	100	Nm	1.60	1.60
1130	MI	14	TQE150-PCB	PCB (Torque)	0	100	Nm	1.60	1.60
1131	MI	15	AE010-PCA	PCA (Electric Current)	0	150	A	1.56	1.04
1132	MI	16	AE150-PCB	PCB (Electric Current)	0	150	A	1.56	1.04
1133	MI	17	WE270A-T	Total Core Power	0	16	MW	0.07	0.44
1134	MI	18	WE270B-M	Core Power (Mid. Flux)	0	2	MW	0.01	0.44
1135	MI	19	WE270C-H1	Core Power (High Flux 1)	0	4	MW	0.02	0.44
1136	MI	20	WE270D-H2	Core Power (High Flux 2)	0	4	MW	0.02	0.44
1137	MI	21	WE270E-L1	Core Power (Low Flux 1)	0	2	MW	0.01	0.44
1138	MI	22	WE270F-L2	Core Power (Low Flux 2)	0	2	MW	0.01	0.44
1139	MI	23	WE270G-L3	Core Power (Low Flux 3)	0	2	MW	0.01	0.44
1140	MI	24	WE280A-PR	PZR Proportional Heater	0	10	kW	0.04	0.39
1141	MI	25	WE280B-PR	PZR Base Heater	0	150	kW	0.59	0.39
1142	MI	26	WE010-PCA	PCA Power	0	30	kW	–	–

Table A-1 (Cont'd)

SEQ No.	Function ID.		Tagname	Location	Range		Unit	Uncertainty	
					LO	HI		±ABS.	±%FR
1143	MI	27	WE150-PCB	PCB Power	0	30	kW	-	-
1144	MI	29	WE020-HLA	HLA Heater Power	0	5	kW	0.01	1.50
1145	MI	30	WE030-LSA	LSA Heater Power	0	7.5	kW	0.01	1.50
1146	MI	31	WE040-CLA	CLA Heater Power	0	2	kW	0.003	1.50
1147	MI	32	WE160-HLB	HLB Heater Power	0	5	kW	0.01	1.50
1148	MI	33	WE170-LSB	LSB Heater Power	0	7.5	kW	0.01	1.50
1149	MI	34	WE180-CLB	CLB Heater Power	0	2	kW	0.003	1.50
1150	MI	35	WE271A-PV	PV Heater Power	0	15	kW	0.02	1.50
1151	MI	36	WE271B-PV	PV Heater Power	0	15	kW	0.02	1.50
1152	MI	37	WE271C-PV	PV Heater Power	0	15	kW	0.02	1.50
1153	MI	38	WE271D-PV	PV Heater Power	0	15	kW	0.02	1.50
1154	MI	39	WE430A-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1155	MI	40	WE430B-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1156	MI	41	WE430C-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1157	MI	42	WE430D-SGA	SGA Heater Power	0	4	kW	0.01	1.50
1158	MI	43	WE440A-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1159	MI	44	WE440B-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1160	MI	45	WE440C-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1161	MI	46	WE440D-SGA	SGA Downcomer Heater Power	0	2	kW	0.003	1.50
1162	MI	47	WE290-PR	PZR Surge Line Heater Power	0	4	kW	0.01	1.50
1163	MI	48	WE300-PR	PZR Spray Line Heater Power	0	7.5	kW	0.01	1.50
1164	MI	49	WE450A-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1165	MI	50	WE450B-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1166	MI	51	WE450C-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1167	MI	52	WE450D-SGB	SGB Heater Power	0	4	kW	0.01	1.50
1168	MI	53	WE460A-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1169	MI	54	WE460B-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1170	MI	55	WE460C-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1171	MI	56	WE460D-SGB	SGB Downcomer Heater Power	0	2	kW	0.003	1.50
1172	LE	1	LE270-PV	PV	0	11	m	0.29	2.68
1173	LE	2	LE280-PR	PZR Overall Level	0	11.24	m	0.25	2.22
1174	LE	3	LE430-SGA	SGA Wide Range	0	17	m	0.38	2.26
1175	LE	4	LE440-SGA	SGA Narrow Range	0	6	m	0.14	2.32
1176	LE	5	LE441-SGA	SGA Boiling Section	0	11	m	0.25	2.27
1177	LE	6	LE450-SGB	SGB Wide Range	0	17	m	0.38	2.26
1178	LE	7	LE460-SGB	SGB Narrow Range	0	6	m	0.14	2.32
1179	LE	8	LE461-SGB	SGB Boiling Section	0	11	m	0.25	2.27
1180	LE	9	LE470-JC	Jet Condenser	0	5.5	m	0.13	2.33
1181	LE	10	LE560-ST	ST Wide Range	0	12	m	0.27	2.26
1182	LE	11	LE570-ST	ST Low Level	0	4	m	0.09	2.25
1183	LE	12	LE580-ST	ST Middle Level	0	4	m	0.11	2.65
1184	LE	13	LE590-ST	ST High Level	0	4	m	0.11	2.65
1185	LE	14	LE650-ACC	Acc-Cold Tank	0	5.5	m	0.12	2.25
1186	LE	15	LE660-ACH	Acc-Hot Tank	0	5.5	m	0.15	2.65
1187	LE	17	LE830-RWST	RWST Overall	0	10	m	-	-
1188	LE	18	LE442-SGA	SGA Downcomer	0	12	m	0.27	2.25
1189	LE	19	LE462-SGB	SGB Downcomer	0	12	m	0.27	2.25
1190	LE	20	DLE270-PV	PV Overall	0	111.06	kPa	1.07	0.96
1191	LE	21	DLE280-PR	PZR Overall	0	113.63	kPa	0.48	0.42
1192	LE	22	DLE430-SGA	SGA Wide Range	0	171.64	kPa	0.69	0.40
1193	LE	23	DLE440-SGA	SGA Narrow-Range	0	60.58	kPa	0.57	0.93
1194	LE	24	DLE441-SGA	SGA Boiling Section	0	111.06	kPa	0.61	0.55
1195	LE	25	DLE442-SGA	SGA Downcomer	0	114.27	kPa	0.62	0.54
1196	LE	26	DLE450-SGB	SGB Wide Range	0	171.64	kPa	0.69	0.40
1197	LE	27	DLE460-SGB	SGB Narrow-Range	0	60.58	kPa	0.57	0.93
1198	LE	28	DLE461-SGB	SGB Boiling Section	0	111.06	kPa	0.61	0.55
1199	LE	29	DLE462-SGB	SGB Downcomer	0	114.27	kPa	0.62	0.54
1200	LE	30	DLE470-JC	JC	0	55.53	kPa	0.56	1.01
1201	LE	31	DLE560-ST	ST Overall Level	0	121.16	kPa	0.59	0.49
1202	LE	32	DLE570-ST	ST Lower Region	0	40.39	kPa	0.16	0.40
1203	LE	33	DLE580-ST	ST Middle Region	0	40.39	kPa	0.27	0.68
1204	LE	34	DLE590-ST	ST Upper Region	0	40.39	kPa	0.27	0.68
1205	LE	35	DLE650-ACC	Acc-Cold Tank	0	55.53	kPa	0.53	0.95
1206	LE	36	DLE660-ACH	Acc-Hot Tank	0	55.53	kPa	1.02	1.84
1207	LE	38	DLE830-RWST	RWST	0	196.14	kPa	0.55	0.28
1208	DP	1	DPE010-HLA	Upper Plenum - HLA Nozzle	-40	40	kPa	1.02	1.28
1209	DP	2	DPE020-HLA	HLA Nozzle - HLA Break	-40	40	kPa	1.02	1.28
1210	DP	4	DPE040-HLA	HLA Break - SGA Inlet	-40	40	kPa	1.02	1.28
1211	DP	5	DPE050A-SGA	SGA Inlet - Tube 3 Top	-150	50	kPa	2.03	1.02
1212	DP	6	DPE050B-SGA	SGA Inlet - Tube 2 Top	-150	50	kPa	2.03	1.02
1213	DP	7	DPE050C-SGA	SGA Inlet - Tube 1 Top	-150	50	kPa	2.03	1.02
1214	DP	8	DPE050D-SGA	SGA Inlet - Tube 4 Top	-150	50	kPa	2.03	1.02
1215	DP	9	DPE050E-SGA	SGA Inlet - Tube 5 Top	-150	50	kPa	2.03	1.02
1216	DP	10	DPE050F-SGA	SGA Inlet - Tube 6 Top	-150	50	kPa	2.03	1.02
1217	DP	11	DPE060A-SGA	SGA Outlet - Tube 3 Top	-150	50	kPa	2.03	1.02
1218	DP	12	DPE060B-SGA	SGA Outlet - Tube 2 Top	-150	50	kPa	2.03	1.02
1219	DP	13	DPE060C-SGA	SGA Outlet - Tube 1 Top	-150	50	kPa	2.03	1.02
1220	DP	14	DPE060D-SGA	SGA Outlet - Tube 4 Top	-150	50	kPa	2.03	1.02
1221	DP	15	DPE060E-SGA	SGA Outlet - Tube 5 Top	-150	50	kPa	2.03	1.02
1222	DP	16	DPE060F-SGA	SGA Outlet - Tube 6 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
1223	DP	17	DPE070-LSA	SGA Outlet - LSA Bottom	-80	80	kPa	1.08	0.67
1224	DP	18	DPE080-LSA	LSA Bottom - PCA Suction	-50	50	kPa	1.03	1.03
1225	DP	19	DPE090-PCA	PCA Suction - Delivery	-50	50	kPa	1.03	1.03
1226	DP	20	DPE100-CLA	PZR Spray Line	-200	200	kPa	2.21	0.55
1227	DP	21	DPE110-CLA	PCA Delivery - CLA Break	-50	50	kPa	1.03	1.03
1228	DP	22	DPE120-CLA	CLA Break - CLA Nozzle	-50	50	kPa	1.03	1.03
1229	DP	23	DPE130-CLA	CLA Nozzle - Downcomer	-50	50	kPa	1.03	1.03
1230	DP	24	DPE140-HLA	Upper Plenum - Downcomer	-30	30	kPa	1.01	1.69
1231	DP	25	DPE150-HLB	Upper Plenum - HLB Nozzle	-30	30	kPa	1.01	1.69
1232	DP	26	DPE160-HLB	HLB Nozzle - HLB Break	-30	30	kPa	1.01	1.69
1233	DP	27	DPE170-HLB	HLB Break - SGB Break	-30	30	kPa	1.01	1.69
1234	DP	28	DPE180-HLB	SGB Break - SGB Inlet	-30	30	kPa	1.01	1.69
1235	DP	29	DPE190A-SGB	SGB Inlet - Tube 3 Top	-150	50	kPa	2.03	1.02
1236	DP	30	DPE190B-SGB	SGB Inlet - Tube 2 Top	-150	50	kPa	2.03	1.02
1237	DP	31	DPE190C-SGB	SGB Inlet - Tube 1 Top	-150	50	kPa	3.96	1.98
1238	DP	32	DPE190D-SGB	SGB Inlet - Tube 4 Top	-150	50	kPa	3.96	1.98
1239	DP	33	DPE190E-SGB	SGB Inlet - Tube 5 Top	-150	50	kPa	3.96	1.98
1240	DP	34	DPE190F-SGB	SGB Inlet - Tube 6 Top	-150	50	kPa	3.96	1.98
1241	DP	35	DPE200A-SGB	SGB Outlet - Tube 3 Top	-150	50	kPa	3.96	1.98
1242	DP	36	DPE200B-SGB	SGB Outlet - Tube 2 Top	-150	50	kPa	3.96	1.98
1243	DP	37	DPE200C-SGB	SGB Outlet - Tube 1 Top	-150	50	kPa	3.96	1.98
1244	DP	38	DPE200D-SGB	SGB Outlet - Tube 4 Top	-150	50	kPa	3.96	1.98
1245	DP	39	DPE200E-SGB	SGB Outlet - Tube 5 Top	-150	50	kPa	3.96	1.98
1246	DP	40	DPE200F-SGB	SGB Outlet - Tube 6 Top	-150	50	kPa	3.96	1.98
1247	DP	41	DPE210-LSB	SGB Outlet - LSB Bottom	-80	80	kPa	1.08	0.67
1248	DP	42	DPE220-LSB	LSB Bottom - PCB Suction	-50	50	kPa	1.03	1.03
1249	DP	43	DPE230-PCB	PCB Suction - Delivery	-50	50	kPa	1.03	1.03
1250	DP	44	DPE240-CLB	PCB Delivery - CLB Break	-20	20	kPa	1.01	2.51
1251	DP	45	DPE250-CLB	CLB Break - CLB Nozzle	-20	20	kPa	1.01	2.51
1252	DP	46	DPE260-CLB	CLB Nozzle - Downcomer	-20	20	kPa	1.01	2.51
1253	DP	47	DPE270-PV	PV Bottom - Top	-100	400	kPa	4.12	0.82
1254	DP	48	DPE280-PV	PV Lower Plenum	-50	100	kPa	1.07	0.71
1255	DP	49	DPE290-PV	Lower Core Support Plate	-50	100	kPa	1.07	0.71
1256	DP	50	DPE300-PV	Core (EL.-35 -3945)	-50	100	kPa	1.07	0.71
1257	DP	51	DPE320-PV	Upper Plenum	-50	100	kPa	1.07	0.71
1258	DP	52	DPE330-PV	Upper Head (EL.6135 - 9653)	-50	100	kPa	1.07	0.71
1259	DP	53	DPE310-PV	Upper Core Support Plate	-100	100	kPa	3.96	1.98
1260	DP	54	DPE350A-PV	CR Guide Tube Top Orifice	-100	100	kPa	3.96	1.98
1261	DP	55	DPE350B-PV	CR Guide Tube Top Orifice	-100	100	kPa	3.96	1.98
1262	DP	56	DPE360-PV	PV Downcomer Overall	-100	300	kPa	4.05	1.01
1263	DP	57	DPE370-PV	Lower Downcomer	-50	150	kPa	3.96	1.98
1264	DP	58	DPE380-PV	Upper Downcomer	-50	150	kPa	3.96	1.98
1265	DP	59	DPE390-PV	UP-DC Check Valve A	-50	100	kPa	1.12	0.56
1266	DP	62	DPE332-PV	Upper Head - Downcomer	-100	100	kPa	3.96	1.98
1267	DP	63	DPE331-PV	Upper Head	-100	100	kPa	3.96	1.98
1268	DP	64	DPE560A-BU	FE560A (BU-1 High)	-100	245	kPa	1.03	0.42
1269	DP	65	DPE560B-BU	FE560B (BU-1 Low)	-100	5	kPa	0.20	4.04
1270	DP	70	DPE030B-HLA	PZR Surge Line (Low)	-300	300	kPa	2.48	0.41
1271	DP	71	DPE072-LSA	LSA (SG-Side)	0	45	kPa	0.34	0.75
1272	DP	72	DPE073-LSA	LSA (SG-Side)	-10	10	kPa	0.32	1.60
1273	DP	73	DPE074-LSA	LSA (SG-Side)	-10	10	kPa	0.32	1.60
1274	DP	74	DPE075-LSA	LSA (SG-Side)	-10	10	kPa	0.32	1.60
1275	DP	75	DPE076-LSA	LSA (SG-Side)	0	30	kPa	0.33	1.08
1276	DP	76	DPE212-LSB	LSB (SG-Side)	0	45	kPa	0.34	0.75
1277	DP	77	DPE213-LSB	LSB (SG-Side)	-10	10	kPa	0.32	1.60
1278	DP	78	DPE214-LSB	LSB (SG-Side)	-10	10	kPa	0.32	1.60
1279	DP	79	DPE215-LSB	LSB (SG-Side)	-10	10	kPa	0.32	1.60
1280	DP	80	DPE216-LSB	LSB (SG-Side)	0	30	kPa	0.33	1.08
1281	DP	81	DPE430-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1282	DP	82	DPE431-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1283	DP	83	DPE432-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1284	DP	84	DPE433-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1285	DP	85	DPE434-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1286	DP	86	DPE435-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1287	DP	87	DPE436-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1288	DP	88	DPE437-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1289	DP	89	DPE438-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1290	DP	90	DPE439-SGA	SGA Boiling Section	-30	0	kPa	0.33	1.08
1291	DP	91	DPE440-SGA	SGA Boiling Section	-40	0	kPa	0.33	0.83
1292	DP	92	DPE450-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1293	DP	93	DPE451-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1294	DP	94	DPE452-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1295	DP	95	DPE453-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1296	DP	96	DPE454-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1297	DP	97	DPE455-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1298	DP	98	DPE456-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1299	DP	99	DPE457-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1300	DP	100	DPE458-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1301	DP	101	DPE459-SGB	SGB Boiling Section	-30	0	kPa	0.33	1.08
1302	DP	102	DPE460-SGB	SGB Boiling Section	-40	0	kPa	0.33	0.83
1303	DP	103	DPE011-HLA	HLA Spool Piece	-10	10	kPa	0.32	1.60
1304	DP	104	DPE071-CLA	CLA Spool Piece	-10	10	kPa	0.32	1.60

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
1305	DP 105	DPE151-HLB	HLB Spool Piece	-10	10	kPa	0.32	1.60
1306	DP 106	DPE211-CLB	CLB Spool Piece	-10	10	kPa	0.32	1.60
1307	DP 107	DPE571-BU	RSV123 Inlet	0	200	kPa	1.12	0.56
1308	DP 109	DPE041-PR	PZR (DL.9795 - 11321)	-14.95	0	kPa	0.25	1.69
1309	DP 110	DPE042-PR	PZR (DL.7965 - 9795)	-17.93	0	kPa	0.23	1.27
1310	DP 111	DPE043-PR	PZR (DL.5995 - 7965)	-19.31	0	kPa	0.23	1.18
1311	DP 112	DPE044-PR	PZR (DL.4238 - 5995)	-17.22	0	kPa	0.23	1.32
1312	DP 113	DPE045-PR	PZR (DL.2025 - 4238)	-21.68	0	kPa	0.23	1.06
1313	DP 114	DPE046-PR	PZR (DL.80 - 2025)	-19.06	0	kPa	0.23	1.20
1314	DP 115	DPE101-PR	PZR-CLA	-200	200	kPa	1.30	0.32
1315	DP 116	DPE055A-SGA	SGA U-Tube I/O (High)	-30	30	kPa	0.29	0.49
1316	DP 117	DPE055B-SGA	SGA U-Tube I/O (Low)	-3	3	kPa	0.2	3.37
1317	DP 118	DPE195A-SGB	SGB U-Tube I/O (High)	-30	30	kPa	0.29	0.49
1318	DP 119	DPE195B-SGB	SGB U-Tube I/O (Low)	-3	3	kPa	0.2	3.37
1319	DP 120	DPE056-SGA	SGA Inlet Plenum	-40	40	kPa	1.02	1.28
1320	DP 122	DPE196-SGB	SGB Inlet Plenum	-40	40	kPa	0.48	0.60
1321	DP 123	DPE197-SGB	SGB Primary-Secondary	-1000	1000	kPa	9.44	0.47
1322	DP 133	DPE333-PV	Upper Head (EL.6634 - 8860)	-35	0	kPa	0.23	0.67
1323	DP 182	DPE491-SGB	SGB Feedwater Line	0	0	kPa	Not used	
1324	DP 183	DPE492-SGB	SGB Feedwater Line	-40	10	kPa	Not used	
1325	DE 1	DE011A-HLA	HLA Spool Piece, Beam A	0	10	V	–	–
1326	DE 2	DE011B-HLA	HLA Spool Piece, Beam B	0	10	V	–	–
1327	DE 3	DE011C-HLA	HLA Spool Piece, Beam C	0	10	V	–	–
1328	DE 4	DE051A-LSA	LSA Spool Piece, Beam A	0	10	V	–	–
1329	DE 5	DE051B-LSA	LSA Spool Piece, Beam B	0	10	V	–	–
1330	DE 6	DE051C-LSA	LSA Spool Piece, Beam C	0	10	V	–	–
1331	DE 7	DE071A-CLA	CLA Spool Piece, Beam A	0	10	V	–	–
1332	DE 8	DE071B-CLA	CLA Spool Piece, Beam B	0	10	V	–	–
1333	DE 9	DE071C-CLA	CLA Spool Piece, Beam C	0	10	V	–	–
1334	DE 10	DE151A-HLB	HLB Spool Piece, Beam A	0	10	V	–	–
1335	DE 11	DE151B-HLB	HLB Spool Piece, Beam B	0	10	V	–	–
1336	DE 12	DE151C-HLB	HLB Spool Piece, Beam C	0	10	V	–	–
1337	DE 13	DE191A-LSB	LSB Spool Piece, Beam A	0	10	V	–	–
1338	DE 14	DE191B-LSB	LSB Spool Piece, Beam B	0	10	V	–	–
1339	DE 15	DE191C-LSB	LSB Spool Piece, Beam C	0	10	V	–	–
1340	DE 16	DE211A-CLB	CLB Spool Piece, Beam A	0	10	V	–	–
1341	DE 17	DE211B-CLB	CLB Spool Piece, Beam B	0	10	V	–	–
1342	DE 18	DE211C-CLB	CLB Spool Piece, Beam C	0	10	V	–	–
1343	DE 19	DE052-LSA	PCA Suction	0	10	V	–	–
1344	DE 20	DE192-LSB	PCB Suction	0	10	V	–	–
1345	DE 21	DE281-PR	PZR Surge Line	0	10	V	–	–
1346	DE 33	DE591A-BU	Break Spool Piece, Beam A	0	10	V	–	–
1347	DE 34	DE591B-BU	Break Spool Piece, Beam B	0	10	V	–	–
1348	DE 35	DE591C-BU	Break Spool Piece, Beam C	0	10	V	–	–
1349	DE 40	DE291-SGB	SGB Feedwater Line	0	10	V	–	–
1350	RC 31	DE011A-HLA-EU	HLA Spool Piece, Beam A	–	–	kg/m^3	27	–
1351	RC 32	DE011B-HLA-EU	HLA Spool Piece, Beam B	–	–	kg/m^3	20	–
1352	RC 33	DE011C-HLA-EU	HLA Spool Piece, Beam C	–	–	kg/m^3	22	–
1353	RC 34	DE151A-HLB-EU	HLB Spool Piece, Beam A	–	–	kg/m^3	27	–
1354	RC 35	DE151B-HLB-EU	HLB Spool Piece, Beam B	–	–	kg/m^3	20	–
1355	RC 36	DE151C-HLB-EU	HLB Spool Piece, Beam C	–	–	kg/m^3	22	–
1356	RC 37	DE071A-CLA-EU	CLA Spool Piece, Beam A	–	–	kg/m^3	94.8	–
1357	RC 38	DE071B-CLA-EU	CLA Spool Piece, Beam B	–	–	kg/m^3	94.8	–
1358	RC 39	DE071C-CLA-EU	CLA Spool Piece, Beam C	–	–	kg/m^3	94.8	–
1359	RC 40	DE211A-CLB-EU	CLB Spool Piece, Beam A	–	–	kg/m^3	94.8	–
1360	RC 41	DE211B-CLB-EU	CLB Spool Piece, Beam B	–	–	kg/m^3	94.8	–
1361	RC 42	DE211C-CLB-EU	CLB Spool Piece, Beam C	–	–	kg/m^3	94.8	–
1362	RC 56	DE051A-LSA-EU	LSA Spool Piece, Beam A	–	–	kg/m^3	94.8	–
1363	RC 57	DE051B-LSA-EU	LSA Spool Piece, Beam B	–	–	kg/m^3	94.8	–
1364	RC 58	DE051C-LSA-EU	LSA Spool Piece, Beam C	–	–	kg/m^3	94.8	–
1365	RC 59	DE191A-LSB-EU	LSB Spool Piece, Beam A	–	–	kg/m^3	94.8	–
1366	RC 60	DE191B-LSB-EU	LSB Spool Piece, Beam B	–	–	kg/m^3	94.8	–
1367	RC 61	DE191C-LSB-EU	LSB Spool Piece, Beam C	–	–	kg/m^3	94.8	–
1368	RC 62	DE052-LSA-EU	PCA Suction	–	–	kg/m^3	94.8	–
1369	RC 63	DE192-LSB-EU	PCB Suction	–	–	kg/m^3	94.8	–
1370	RC 64	DE281-PR-EU	PZR Surge Line	–	–	kg/m^3	94.8	–
1371	RC 73	DE591A-BU-EU	Break Spool Piece, Beam A	–	–	kg/m^3	94.8	–
1372	RC 74	DE591B-BU-EU	Break Spool Piece, Beam B	–	–	kg/m^3	94.8	–
1373	RC 75	DE591C-BU-EU	Break Spool Piece, Beam C	–	–	kg/m^3	94.8	–
1374	RC 132	DE591-AVG	Break Spool Piece Average	–	–	kg/m^3	55.62	–
1375	RC 133	TWE-PCT	Peak Cladding Temp.	–	–	K	5.31	–
1376	RC 134	TWE-PCTLOC	Location of PCT	–	–	–	–	–
1377	RC 139	CL-CORE	Core (EL.-35 - 3945)	–	–	m	0.216	–
1378	RC 140	CL-UP	Upper Plenum (EL.4060 - 6135)	–	–	m	0.197	–
1379	RC 141	CL-UH	Upper Head (EL.7834 - 9653)	–	–	m	0.21	–
1380	RC 142	CL-DC	Downcomer	–	–	m	0.746	–
1381	RC 143	CL-HLA-SGA	HLA Riser Part	–	–	m	0.181	–
1382	RC 144	CL-TUA-U3	SGA Tube 3 Inlet - Top	–	–	m	0.43	–
1383	RC 145	CL-TUA-U2	SGA Tube 2 Inlet - Top	–	–	m	0.42	–
1384	RC 146	CL-TUA-U1	SGA Tube 1 Inlet - Top	–	–	m	0.413	–

Table A-1 (Cont'd)

SEQ No.	Function ID.	Tagname	Location	Range		Unit	Uncertainty	
				LO	HI		±ABS.	±%FR
1385	RC 147	CL-TUA-U4	SGA Tube 4 Inlet - Top	-	-	m	0.43	-
1386	RC 148	CL-TUA-U5	SGA Tube 5 Inlet - Top	-	-	m	0.42	-
1387	RC 149	CL-TUA-U6	SGA Tube 6 Inlet - Top	-	-	m	0.425	-
1388	RC 150	CL-TUA-D3	SGA Tube 3 Outlet - Top	-	-	m	0.442	-
1389	RC 151	CL-TUA-D2	SGA Tube 2 Outlet - Top	-	-	m	0.431	-
1390	RC 152	CL-TUA-D1	SGA Tube 1 Outlet - Top	-	-	m	0.422	-
1391	RC 153	CL-TUA-D4	SGA Tube 4 Outlet - Top	-	-	m	0.422	-
1392	RC 154	CL-TUA-D5	SGA Tube 5 Outlet - Top	-	-	m	0.431	-
1393	RC 155	CL-TUA-D6	SGA Tube 6 Outlet - Top	-	-	m	0.422	-
1394	RC 156	CL-LSA-D	SGA Out.Plenum - LSA Bottom	-	-	m	0.207	-
1395	RC 157	CL-LSA-U	LSA Bottom - PCA Suction	-	-	m	0.188	-
1396	RC 158	CL-SGA-IPL	SGA Inlet Plenum	-	-	m	0.185	-
1397	RC 159	CL-HLB-SGB	HLB Riser Part	-	-	m	0.179	-
1398	RC 160	CL-TUB-U3	SGB Tube 3 Inlet - Top	-	-	m	0.445	-
1399	RC 161	CL-TUB-U2	SGB Tube 2 Inlet - Top	-	-	m	0.433	-
1400	RC 162	CL-TUB-U1	SGB Tube 1 Inlet - Top	-	-	m	0.73	-
1401	RC 163	CL-TUB-U4	SGB Tube 4 Inlet - Top	-	-	m	0.74	-
1402	RC 164	CL-TUB-U5	SGB Tube 5 Inlet - Top	-	-	m	0.734	-
1403	RC 165	CL-TUB-U6	SGB Tube 6 Inlet - Top	-	-	m	0.73	-
1404	RC 166	CL-TUB-D3	SGB Tube 3 Outlet - Top	-	-	m	0.951	-
1405	RC 167	CL-TUB-D2	SGB Tube 2 Outlet - Top	-	-	m	0.74	-
1406	RC 168	CL-TUB-D1	SGB Tube 1 Outlet - Top	-	-	m	0.735	-
1407	RC 169	CL-TUB-D4	SGB Tube 4 Outlet - Top	-	-	m	0.747	-
1408	RC 170	CL-TUB-D5	SGB Tube 5 Outlet - Top	-	-	m	0.74	-
1409	RC 171	CL-TUB-D6	SGB Tube 6 Outlet - Top	-	-	m	0.735	-
1410	RC 172	CL-LSB-D	SGB Out.Plenum - LSB Bottom	-	-	m	0.207	-
1411	RC 173	CL-LSB-U	LSB Bottom - PCB Suction	-	-	m	0.188	-
1412	RC 174	CL-SGB-IPL	SGB Inlet Plenum	-	-	m	0.094	-
1413	RC 175	MC-UH	Upper Head (EL.6634 - 8860)	-	-	kg	79.08	-
1414	RC 176	MC-LSA-DW	SGA Out.Plenum+LSA Downflow	-	-	kg	42.68	-
1415	RC 177	MC-LSB-DW	SGB Out.Plenum+LSB Downflow	-	-	kg	41.33	-
1416	RC 178	MS-CORE	Core (EL.-35 - 3945)	-	-	kg	15.4	-
1417	RC 179	MS-UP	Upper Plenum (EL.4060 - 6135)	-	-	kg	24.37	-
1418	RC 180	MS-DC	Downcomer	-	-	kg	46.31	-
1419	RC 181	MS-TUA-UP-AV	SGA Tubes Upflow side	-	-	kg	8.3	-
1420	RC 182	MS-TUA-DW-AV	SGA Tubes Downflow side	-	-	kg	8.3	-
1421	RC 183	MS-SGA-IPL	SGA Inlet Plenum	-	-	kg	27.81	-
1422	RC 184	MS-LSA-UP	LSA Upflow side	-	-	kg	3.57	-
1423	RC 185	MS-TUB-UP-AV	SGB Tubes Upflow side	-	-	kg	9.65	-
1424	RC 186	MS-TUB-DW-AV	SGB Tubes Downflow side	-	-	kg	10.25	-
1425	RC 187	MS-SGB-IPL	SGB Inlet Plenum	-	-	kg	14.61	-
1426	RC 188	MS-LSB-UP	LSB Upflow side	-	-	kg	3.57	-
1427	RC 189	MS-ACC	Acc-Cold Tank	-	-	kg	39.26	-
1428	RC 190	MS-ACH	Acc-Hot Tank	-	-	kg	74.26	-
1429	RC 191	MS-ST	Break Flow Supp. Tank	-	-	kg	323.61	-
1430	RC 192	DM-ACC	Acc-Cold Tank	-	-	kg/s	13.55	-
1431	RC 193	DM-ACH	Acc-Hot Tank	-	-	kg/s	26.08	-
1432	RC 194	IM-ST	Break Flow Supp. Tank	-	-	kg/s	3.35	-
1433	RC 195	DM-RWST	RWST	-	-	kg/s	51.9	-
1434	RC 196	LG-HLA	HLA Water Level	-	-	m	0.012	-
1435	RC 197	LG-CLA	CLA Water Level	-	-	m	0.028	-
1436	RC 198	LG-HLB	HLB Water Level	-	-	m	0.012	-
1437	RC 199	LG-CLB	CLB Water Level	-	-	m	0.028	-
1438	RC 200	TS-UP	Upper Plenum	-	-	K	17.64	-
1439	RC 201	TS-PR	Pressurizer	-	-	K	17.64	-
1440	RC 202	TS-SGA	Steam Generator-A	-	-	K	7.82	-
1441	RC 203	TS-SGB	Steam Generator-B	-	-	K	7.82	-
1442	RC 279	DE291-SGB-EU	SGB Feedwater Line	-	-	kg/m^3	-	-

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