L44 140815 001

Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-14-106

August 15, 2014

10 CFR 50.4

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Response to NRC Request for Additional Information Regarding Proposed Technical Specification Change to Revise the Leakage Rate Through MSIVs -TS-485 (TAC NOS. MF3124, MF3125, MF3126, MF8124, MF8125, and MF8126)**

References:

1. Letter from TVA to NRC, "Browns Ferry Nuclear Plant, Units 1, 2, and 3 - Proposed Technical Specification Change To Revise The Leakage Rate Through MSIVs–TS-485," dated November 22, 2013 (ADAMS Accession No. ML14015A403)

2. Electronic mail from NRC to TVA, "Browns Ferry Nuclear Plant, Units 1, 2, and 3 – Request for Additional Information Regarding Proposed Technical Specification Change to Revise the Leakage Rate Through Main Steam Isolation Valves–TS-485 (TAC NOS. MF3124, MF3125, AND MF3126)," dated June 19, 2014 (ADAMS Accession No. ML14171A288)

3. Electronic mail from NRC to TVA, "RAI for TAC MF8124, MF8125, AND MF8126)," dated July 1, 2014 (ADAMS Accession No. ML14183A008)

By letter dated November 22, 2013 (Reference 1), the Tennessee Valley Authority (TVA) submitted a license amendment request (LAR) for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, to revise the individual and total leakage rate through the main steam isolation valves (MSIVs).

By electronic mail dated June 19, 2014, the Nuclear Regulatory Commission (NRC) transmitted a request for additional information (RAI) (Reference 2) from the Balance of Plant Branch (SBPB). The original due date for the response was July 18, 2014. Per telecom with the BFN NRC Project Manager, Ms. Farideh Saba, the response date for the Reference 2 RAIs were extended to August 15, 2014. Enclosure 1 to this letter provides TVA's response to the Reference 2 RAIs.

By electronic mail dated July 1, 2014, the NRC transmitted additional RAIs from the Containment and Ventilation Review Branch (SCVB) (Reference 3). The due date for the response is August 15, 2014. Enclosure 2 to this letter provides TVA's response to the Reference 3 RAIs.

One new regulatory commitment and one revised regulatory commitment are contained in these responses. Please address any questions regarding this submittal to Mr. Edward D. Schrull at (423) 751-3850.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 15th day of August 2014.

Respectfully,

J. W. Shea

Digitally signed by J. W. Shea
DN: cn=J. W. Shea, o=Tennessee Valley Authority, ou=Nuclear Licensing, email=jwshea@tva.gov, c=US
Date: 2014.08.15 14:02:04 -04'00'

J. W. Shea
Vice President, Nuclear Licensing

Enclosures:

1. Response to NRC Request for Additional Information (SBPB Branch)
2. Response to NRC Request for Additional Information (SCVB Branch)
3. List of Regulatory Commitments

cc (Enclosures):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Browns Ferry Nuclear Plant
NRC Project Manager - Browns Ferry Nuclear Plant
NRC Branch Chief - Region II
State Health Officer, Alabama State Department of Health

ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3
PROPOSED TECHNICAL SPECIFICATION CHANGE TO REVISE
THE LEAKAGE RATE THROUGH MSIVS – TS-485
DOCKET NOS. 50-259, 50-260, AND 50-296
(TAC NOS. MF3124, MF3125, and MF3126).

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION (RAI)
Balance-of-Plant Branch (SBPB)

ENCLOSURE 1

SBPB RAI-1

BFN Updated Final Safety Analysis Report (FSAR), Section 4.11.4 states that the outside mainsteam drain lines on the four mainsteam headers are used to allow continuous draining to the condenser through the orifice. In addition the outside steam line drains are capable of being utilized to equalize pressure across the main steam isolation valves prior to restart following steam line isolation. Also the main steam drain lines are used to warm up and pressurize the outside steam lines.

However, in the LAR, the licensee states:

> *In the unlikely event the primary flow path is not available, and consistent with the guidance provided in NEDC-31858P, a secondary flow path is provided (although not with orifice flow). The secondary flow path is through normally open valves FCV-1-168, FCV-1-169, FCV-1-170, and FCV-1-171, and continues through valves FCV-1-57, FCV-1-58, and FCV-1-59 to the main condenser.*

Descriptions of drain pathways appear to be different between the FSAR reference and the statement in the LAR. Additionally, the licensee implies that some operator actions may be necessary for secondary drain flow path alignment.

a. *Clarify any differences in how the primary and secondary ALT pathway is operated post-accident versus the mainstream line drains systems while at power, startup, or shutdown. Consider revising the UFSAR by adding the two ALT pathway descriptions to the UFSAR.*

b. *Explain how main control room (MCR) operators know when or how the primary flow path, which is passive, is unavailable in order to line-up the secondary path. Provide drawings and/or describe the instruments that are available to the MCR staff in order to make such an assessment.*

Response:

BFN Updated Final Safety Analysis Report (FSAR), Revision 25, Section 4.11 describes both the inside and outside containment flowpaths and as such, is not a description of the ALT pathways. BFN FSAR Section 4.11 states:

> "A drain line is connected to the low points of each main steam line, both inside and outside the drywell. Both sets of drains are connected to a header and are connected by valving to permit drainage to the main condenser hotwell. A vent line is provided around the final valve to the condenser hotwell to permit continuous draining of the steam line low points. The inside steam line drains slope downward from the steam line low point to the orifice outside the drywell. The drain line from the orifice to the condenser hotwell slopes down to the main condenser. An additional drain is provided from the low point of the drains to clean-radwaste to permit purging the lines for maintenance. During operations only the outside drain valve is open allowing continuous drainage to the condenser through the orifice."

The inside drain line described in the above FSAR passage is the drain line from the Inboard Main Steam Isolation Valves (MSIVs). This inside drain line is not part of the ALT pathway (see Figure 1). The drain line inside of the drywell connects to a three-inch header which exits primary containment. This header has a valve inside of containment (FCV-1-55) and a valve outside of containment (FCV-1-56), both of which are normally closed. The header then continues on through valves FCV-1-58 and FCV-1-59 to the condenser.

The outside of the drywell portion of the drain line contains the proposed ALT pathway that is described in the LAR. Currently, there is no detailed discussion of the ALT pathway in the FSAR. TVA will revise the FSAR to add descriptions of the two proposed ALT pathways.

a) Referring to Figure 1, the proposed primary ALT flow pathway for the main steam line drains, while at power, taps off the Steam Lines A through D and flows through the four 0.25-inch orifices. Steam continues to flow through a three-inch header, then through the open (motive power will be removed) main steam drain to condenser isolation valve (FCV-1-57). The steam flow continues through a 0.1875-inch orifice around valve FCV-1-58 and lastly, through the four-inch vent bypass line (around valve FCV-1-59) into the condenser.

   The proposed secondary ALT flow pathway for the main steam line drains at power is through the four open isolation valves (FCV-1-168, FCV-1-169, FCV-1-170, and FCV-1-171) off the Steam Lines A, B, C, and D. Steam continues to flow through the open (motive power removed) main steam drain to condenser isolation valve (FCV-1-57). The steam flow continues through main steam drain to condenser isolation valve (FCV-1-58) and through main steam drain to condenser isolation valve (FCV-1-59) into the condenser.

   During startup, the steam flow path for the proposed primary ALT pathway is the same as the at-power pathway except that main steam drain to condenser isolation valves FCV-1-58 and FCV-1-59 are opened to allow the main steam lines to drain condensate and warm the drain lines. After the condensate is drained and the lines are warmed, main steam drain to condenser isolation valves FCV-1-58 and FCV-1-59 are closed. The proposed secondary ALT pathway during startup operates the same as at-power except that main steam drain to condenser isolation valves FCV-1-58 and FCV-1-59 are opened to allow the main steam lines to drain condensate and warm the drain lines. After the condensate is drained and the lines are warmed, main steam drain to condenser isolation valves FCV-1-58 and FCV-1-59 are closed.

   During shutdown, the steam flow path for the proposed primary ALT flow path is the same as the at-power pathway except that main steam drain to condenser isolation valves FCV-1-58 and FCV-1-59 are opened to allow the main steam lines to drain condensate. The proposed secondary pathway during shutdown operates the same as at-power except that main steam drain to condenser isolation valves FCV-1-58 and FCV-1-59 are opened to allow the main steam lines to drain condensate.

   There is no difference between the proposed primary ALT pathway post-accident and the proposed primary ALT pathway at power. The passive pathway (using orifices) will operate the same in both conditions.

   The difference between the proposed secondary ALT pathway post-accident and the proposed secondary ALT pathway at power is that at power, the four open isolation valves (FCV-1-168, FCV-1-169, FCV-1-170, and FCV-1-171) off the Steam Lines A, B, C, and D will automatically close if power is available, when any MSIV is closed and the turbine speed is greater than 1700 rpm, or will, on a loss of power (post accident), remain in the position they were in prior to power being lost. Consequently, the 0.25-inch orifices in the bypass lines around FCV-1-168, FCV-1-169, FCV-1-170, and FCV-1-171 will be the credited pathway. Additionally, the main steam drain to condenser isolation valves FCV-1-58 and FCV-1-59 will fail on loss of power to the position they were in prior to power being lost. Because these valves are normally closed, the failed position will be closed. With these valves closed, the 0.1875-inch orifice around FCV-1-58 and the vent line around FCV-1-59 becomes the credited pathway.

b.) There are no instruments available for the main control room (MCR) operators to know if the primary pathway is unavailable. Although there are no instruments for the MCR operators to know if the primary pathway is unavailable, when a drywell radiation alarm is received, operators are procedurally directed to open the upper main steam line drain valve (FCV-1-58) and the lower main steam line drain valve to the condenser (FCV-1-59). By opening these valves, a portion of the secondary pathway has been established that bypasses the orifice.

SBPB RAI-2

In the LAR, the licensee states:

> *One of the valves (FCV-1-59) has a four-inch bypass containing no valves or orifices. Therefore, there is no concern associated with FCV-1-59 with respect to ALT pathway availability."*

Also, in the LAR, the licensee states:

> *The secondary ALT pathway (Figure 2) has now been defined as the pathway through the main steam drain lines and through open valves FCV-1-57, FCV-1 -58, and FCV-1-59 to the condenser.*

Descriptions of drain pathways appear to be different between the UFSAR reference and the licensee statements in the LAR.

Confirm that there are no restrictions in the bypass line around FCV-1-59 and provide explanation of the system configuration and why the valve is closed and why the valve is necessary. If FCV-1-59 is truly a full bypass, describe why FCV-1-59 exists and why it needed to be open in the secondary ALT pathway.

Response:

As stated in the response to SBPB RAI-1, the description of the drain pathways in the FSAR is not the description of the ALT pathways. The inside drain line described in the FSAR is the drain line from the Inboard MSIVs. The outside drain line described in the FSAR is the drain line from the Outboard MSIVs. The drain line on the outboard MSIVs is the ALT pathway that contains the primary pathway and the secondary pathway.

As shown in Figures 2 and 3, FCV-1-59 is the final valve in the proposed secondary ALT pathway to the condenser hotwell. This section of piping contains a vent line around the valve to permit continuous draining of the steam line low points. This four-inch diameter vent line has no restrictions to allow continuous draining of the steam line low points.

Valve FCV-1-59 is cycled during pre-startup/standby readiness requirements, startup, and cooldowns to drain condensate back into the condenser. It can also be used during refueling operations to facilitate drain down after flooding MSIVs for Local Leak Rate Tested (LLRT) and keeping MSIV lines drained downstream of the Inboard MSIVs. After the main steam line drain systems are drained of any condensate and the drain lines are warmed, FCV-1-59 is closed for power operation. When a drywell radiation alarm is received, operators are procedurally directed to open the lower main steam line drain valve to the condenser (FCV-1-59), which is the proposed secondary ALT pathway.

SBPB RAI-3

In the LAR, the licensee states:

> *That all the valves in the ALT pathway, and any boundary valves required to close, are included in the IST or augmented IST programs. The IST program and will test the power operated valves on an appropriate periodic basis.*

In addition, the licensee states that the primary ALT Pathway is through this 0.1875-inch orifice with valve FCV-1-58 closed. To ensure the flow through the 0.1875-inch orifice is not obstructed, periodic radiography inspection of the 0.1875-inch orifice will be performed during refueling outages. Also four two-inch bypass lines, that contain 0.25-inch orifices (around valves FCV-1-168, FCV-1-169, FCV-1-170 and FCV-1-171), connecting to a three-inch header.

Inspection methodology for all orifices in the flow path, to verify there is no flow blockage, is not described in the LAR.

a. *Describe why a radiography (RT) inspection of the 0.1875 inch orifice around FCV-1-58 is preferred over a visual inspection. Also, describe why radiography was selected to verify an open flow path versus other means such as a visual inspection.*

b. *Provide an explanation of how a RT would provide assurance on an open pathway through on orifice plate. Describe the acceptance criteria of the RT for the 0.1875 inch orifice.*

c. *Identify the procedures/methodology that ensures that inspections are performed during refueling outages, including the frequency (i.e., every refueling outage) that the inspection is performed.*

d. *Discuss the rational for not performing a periodic radiography inspection or visual inspection of the 0.25 inch orifices around FCV-1-168, FCV-1-169, FCV-1-170 and FCV-1-171.*

Response:

a.) The orifice around FCV-1-58 is made from a 1” blank socket weld full coupling that is not easily accessible for visual inspection. Therefore, the RT inspection was chosen over orifice removal for inspection. The RT inspection verifies that the flow path is not impaired. TVA will perform this radiography inspection on site using the existing radiographic procedure and trained radiography personnel.

b.) The radiographic technique used is determined by the physical size and configuration of the specific flow orifice. The flow orifice being addressed has a 2.25-inch outside diameter and 0.1875-inch inside diameter. The radiographic procedure contains good practice guidelines, in accordance with the intent of Section V of the ASME Code. For this technique, an $Iridium^{192}$ gamma ray source is used in conjunction with Computed Radiography Imaging plates. The ability of radiography to image an object or foreign material which could obstruct proper flow is based on the assumption that the foreign object would be of a greater density, i.e., more radiation absorbing, than the water present inside the component.

Although there are no established acceptance criteria for the flow orifice, a radiographic examination can determine if there is a flow obstruction present. The initial radiography inspection was performed during the spring outage of 2014 for Unit 3. The radiographic image obtained clearly displayed the orifice with no evidence of foreign material that

could obstruct proper flow. This determination was based on an evaluation by the radiographic interpreter and the responsible engineer.

c.) TVA will comply with the commitment to perform the Radiography inspections as stated in the LAR. However, the commitment contained in the LAR is being clarified such that TVA will perform the radiographic inspection during each refueling outage. As stated in the Regulatory Commitment, “to ensure the flow through the 0.1875-inch orifice is not obstructed, periodic radiography inspection of the 0.1875-inch orifice will be performed during refueling outages. These inspections will first be performed during the spring outage of 2014 for Unit 3, during the fall outage of 2014 for Unit 1, and during the spring outage of 2015 for Unit 2.”

d.) The 0.25-inch orifices have socket weld connections and are not readily accessible for visual inspections. Unlike the orifice around FCV-1-58, the orifices around FCV-1-168, FCV-1-169, FCV-1-170 and FCV-1-171 are located in a position that is difficult to perform a radiography inspection. TVA will not add the orifices around FCV-1-168, FCV-1-169, FCV-1-170 and FCV-1-171 to the existing commitment to perform radiography exams periodically.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3
PROPOSED TECHNICAL SPECIFICATION CHANGE TO REVISE
THE LEAKAGE RATE THROUGH MSIVS – TS-485
DOCKET NOS. 50-259, 50-260, AND 50-296
(TAC NOS. MF8124, MF8125, and MF8126).

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION (RAI)
Containment and Ventilation Review Branch (SCVB)

ENCLOSURE 2

SCVB RAI-1

The license amendment request letter dated November 22, 2013 identified a commitment (#2) for periodic radiography inspection of the 0.1875-inch orifice (parallel to valve FCV-1-58) to be performed during refueling outages.

a. *Is this frequency to be each refueling outage?*

b. *With an orifice area this size, debris big enough to bridge the opening and significantly obstruct could be very small. Is the radiography reasonably assured of being capable of detecting such debris?*

c. *Is the orifice flanged/bolted in place or welded? If flanged, why not remove and inspect the orifice/line rather than radiograph?*

d. *Is there any operational way to verify this orifice is unobstructed?*

TVA Response

a. TVA will perform the radiographic inspection during each refueling outage.

b. The ability of radiography to image an object or foreign material which could obstruct proper flow is based on the assumption that the foreign object would be of a greater density, i.e., more radiation absorbing, than the water present inside the component. Therefore radiography reasonably assures detection of debris big or small enough to bridge the orifice opening.

c. The 0.1875-inch orifice is welded in place. The orifice around FCV-1-58 is made from a 1" blank socket weld full coupling that is not readily accessible for visual inspection.

d. There is no operational way to determine if the 0.1875-inch orifice is unobstructed.

SCVB RAI-2

The license amendment request letter states "…the Main Steam Stop and Control Valves are included in the preventative maintenance program. As such, one Main Steam Stop and one Control Valve is refurbished each outage. These valves are also tested each refueling outage for leak tightness and are highly reliable." The letter also indicates that the "Generic Flow Area to HP Turbine" is 0.0288 square inches.

a. *Describe the main steam stop and control valve leakage testing that verifies the flow area to the HP turbine is 0.0288 square inches or less.*

TVA Response

a. The Main Steam Stop and Control Valve testing described in the license amendment request is not a test conducted to verify flow to the HP turbine is 0.0288 square inches or less. The MSIV leakage flow path analysis is described in Section 4.0 of the General Electric proprietary document, NEDC-31858P, "BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems," Revision 2, dated September 1993. The Generic Flow Area to HP turbine used in TVA's MSIV leakage analysis is a derived value based on General Electric turbine

testing that demonstrates turbine speed remains less than one-third rated speed under no load conditions with the unit at hot standby. The following discussion is taken from NEDC-31858P;

> *The effective leakage flow area of the turbine control valves (control valves have tighter leakage requirements than stop valves) has been estimated from results of tests which are conducted every 6-12 months, where the requirement is that the no load (hot standby) turbine speed must be less than one-third rated. GE Turbine Department personnel state there has essentially been no problems passing the stop and control valve leakage tests and when both the turbine stop and control valves are closed the resulting no load turbine speed is almost always zero. For purposes of the condenser-high pressure turbine flow split analyses, it is conservatively assumed that the turbine valves leak such that the turbine speed is 50% of the maximum allowable speed. This results in an effective leakage flow area of 0.029 square inches. Bypass valve leakage is assumed to be on the same order of magnitude, and this level of leakage appears to be reasonable (1.5×10^3 lb/hour).*

The configuration used to perform the stop valve "tightness" check is during start up, specifically during the turbine shell warming phase while the turbine is on turning gear with speed of 3 to 5 RPM recorded. During this phase, the control valves will open while the stop valves will remain closed. Acceptance criteria in this phase is based upon the speed change of the turbine for a period of 5 minutes and the turbine first stage shell pressure change. If the turbine speed does not increase and the first stage shell pressure does not increase, the stop valve has passed the "tightness" test.

SCVB RAI-3

The license amendment request letter proposed SR 3.6.1.3.10 reads: "Verify leakage rate through each MSIV is ≤ 60 scfh and that the combined leakage rate for all four main steam lines is ≤ 85 scfh when tested at ≥ 25 psig." The frequency is stated as: "In accordance with the Primary Containment Leakage Rate Testing Program."

a. *How is the combined steam line leakage criterion evaluated? Minimum pathway for assessing past operability, maximum pathway for leaving cold shutdown? Some other basis?*

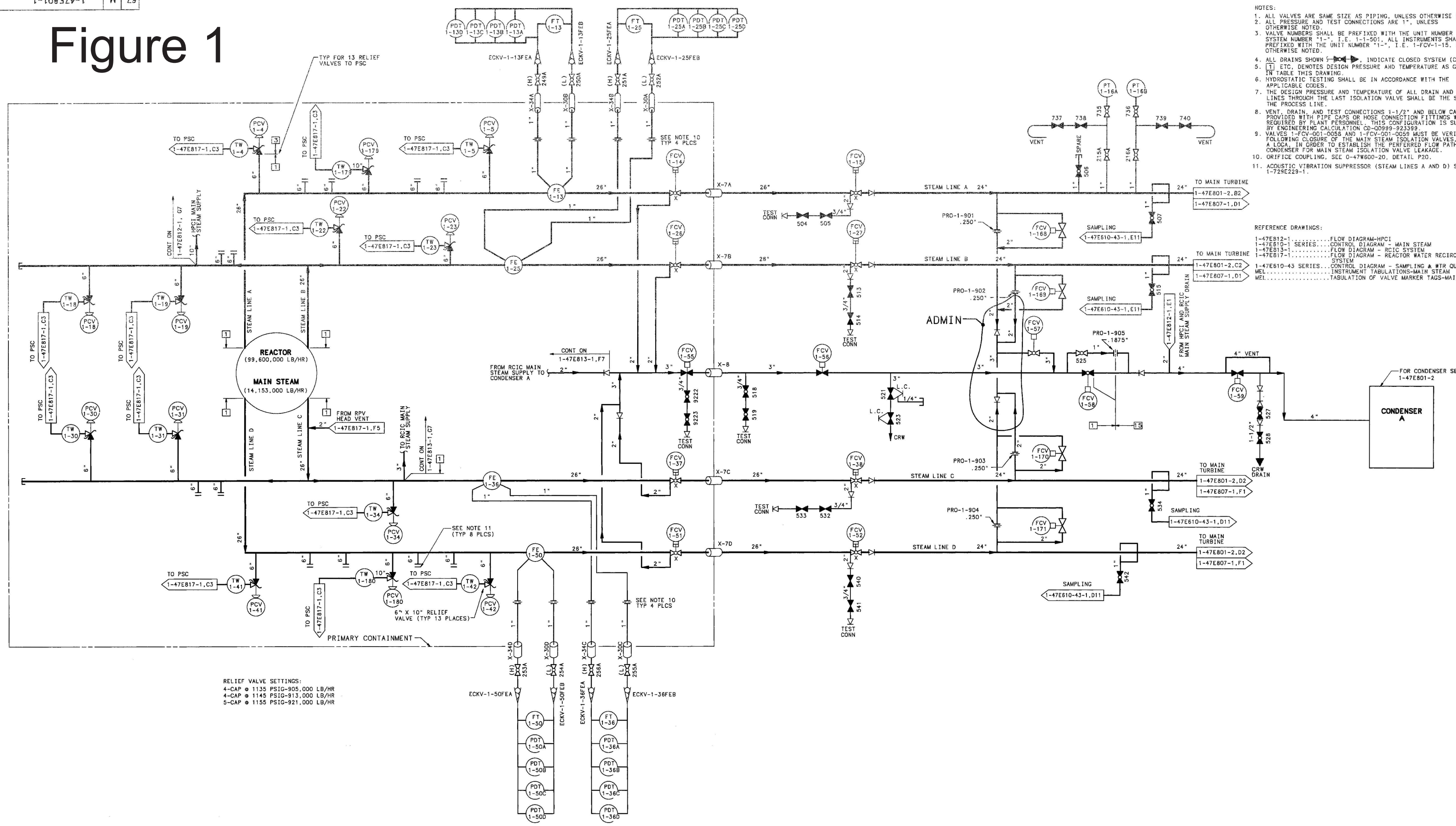
TVA Response

a. Currently, BFN uses the Minimum Pathway Leakage Rate (MNPLR) for the "as-found" data, which takes the lowest leakage of all four pathways and adds them together. For the "as-left" data, BFN uses the Maximum Pathway Leakage Rate (MXPLR), which takes the highest leakage of all four pathways and adds them together. This testing methodology was approved by the NRC in the Safety Evaluation for Amendments 267 and 227 for Units 2 and 3, respectively (ADAMS Accession No. ML010300326).

   The current Acceptance Criteria does not ensure that Technical Specification (TS) Surveillance Requirement (SR) 3.6.1.3.10 verifies the validity of the design basis. Therefore, TVA will supplement the proposed Technical Specification change to revise the leakage rate through the MSIVs submitted to the NRC on

November 22, 2013 (ADAMS Accession No. ML14015A403). This supplement will revise TS SR 3.6.1.3.10 to ensure that the method of calculating MSIV leakage agrees with the assumptions in the Dose Calculations.

Figure 1



RELIEF VALVE SETTINGS:
4-CAP @ 1135 PSIG-905,000 LB/HR
4-CAP @ 1145 PSIG-913,000 LB/HR
5-CAP @ 1155 PSIG-921,000 LB/HR

NOTES:

1. ALL VALVES ARE SAME SIZE AS PIPING, UNLESS OTHERWISE NOTED.
2. ALL PRESSURE AND TEST CONNECTIONS ARE 1", UNLESS OTHERWISE NOTED.
3. VALVE NUMBERS SHALL BE PREFIXED WITH THE UNIT NUMBER "1-" AND SYSTEM NUMBER "1-", I.E. 1-1-501, ALL INSTRUMENTS SHALL BE PREFIXED WITH THE UNIT NUMBER "1-", I.E. 1-FCV-1-15, UNLESS OTHERWISE NOTED.
4. ALL DRAINS SHOWN, INDICATE CLOSED SYSTEM (CRW).
5. [1] ETC, DENOTES DESIGN PRESSURE AND TEMPERATURE AS GIVEN IN TABLE THIS DRAWING.
6. HYDROSTATIC TESTING SHALL BE IN ACCORDANCE WITH THE APPLICABLE CODES.
7. THE DESIGN PRESSURE AND TEMPERATURE OF ALL DRAIN AND VENT LINES THROUGH THE LAST ISOLATION VALVE SHALL BE THE SAME AS THE PROCESS LINE.
8. VENT, DRAIN, AND TEST CONNECTIONS 1-1/2" AND BELOW CAN BE PROVIDED WITH PIPE CAPS OR HOSE CONNECTION FITTINGS WHERE REQUIRED BY PLANT PERSONNEL. THIS CONFIGURATION IS SUPPORTED BY ENGINEERING CALCULATION CD-Q0999-923399.
9. VALVES 1-FCV-001-0058 AND 1-FCV-001-0059 MUST BE VERIFIED OPEN FOLLOWING CLOSURE OF THE MAIN STEAM ISOLATION VALVES, FOLLOWING A LOCA, IN ORDER TO ESTABLISH THE PERFERRED FLOW PATH TO THE CONDENSER FOR MAIN STEAM ISOLATION VALVE LEAKAGE.
10. ORIFICE COUPLING, SEE 0-47W600-20, DETAIL P20.
11. ACOUSTIC VIBRATION SUPPRESSOR (STEAM LINES A AND D) SEE 1-729E229-1.

REFERENCE DRAWINGS:

1-47E812-1..........FLOW DIAGRAM-HPCI
1-47E610-1 SERIES....CONTROL DIAGRAM - MAIN STEAM
1-47E813-1..........FLOW DIAGRAM - RCIC SYSTEM
1-47E817-1..........FLOW DIAGRAM - REACTOR WATER RECIRCULATION SYSTEM
1-47E610-43 SERIES...CONTROL DIAGRAM - SAMPLING & WTR QUALITY SYS
MEL..................INSTRUMENT TABULATIONS-MAIN STEAM
MEL..................TABULATION OF VALVE MARKER TAGS-MAIN STEAM

RELIEF VALVE DATA

VALVE ID	ST LINE	SETPOINT	ADS
1-4	A	1155	N
1-179	A	1155	N
1-5	A	1145	Y
1-18	B	1145	N
1-19	B	1135	Y
1-22	B	1145	Y
1-23	B	1135	N
1-30	C	1145	Y
1-31	C	1135	Y
1-34	C	1135	Y
1-41	D	1155	N
1-180	D	1155	N
1-42	D	1155	N

SYSTEM PRESS.- TEMP DATA

LINE MK NO.	DESIGN PRESSURE (PSIG)	DESIGN TEMP (°F)
1	1146	562
2	1045	550
3	625	500
4	150	500
5	860	540
6	1250	575
7	285	415
8	310	423
9	285	415
10	285	415
11	285	415
12	285	415
13	285	415
14	275	415
15	400	450
16	150	400

COMPANION DRAWING:
1-47E801-2

ISSUED BY: N/A

* FOR ORIGINAL SIGNATURES SEE MICROFILM COPY

REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE
023	ADMIN	D.Stanford	J.McFarland	DP Walker	06/26/14
REVISED PER RIMS MEMO R14 140625 109 (REF: BFPER 849404)					

SCALE: NONE — EXCEPT AS NOTED

POWERHOUSE
UNIT 1

SYSTEM NO. 1

MECHANICAL
FLOW DIAGRAM
MAIN STEAM

BROWNS FERRY NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY

DESIGN: DRAFTER *, CHECKER *, DESIGNER *, REVIEWER *
INITIAL ISSUE
ENGINEERING APPROVAL: 1 *, 2 *, 3 *

DATE * | 67 | M | 1-47E801-1 | R023

CAD MAINTAINED DRAWING

CCD

ALL A/D HISTORY RESEARCHED AT R001

67 | M | 1-47E801-1

Figure 2

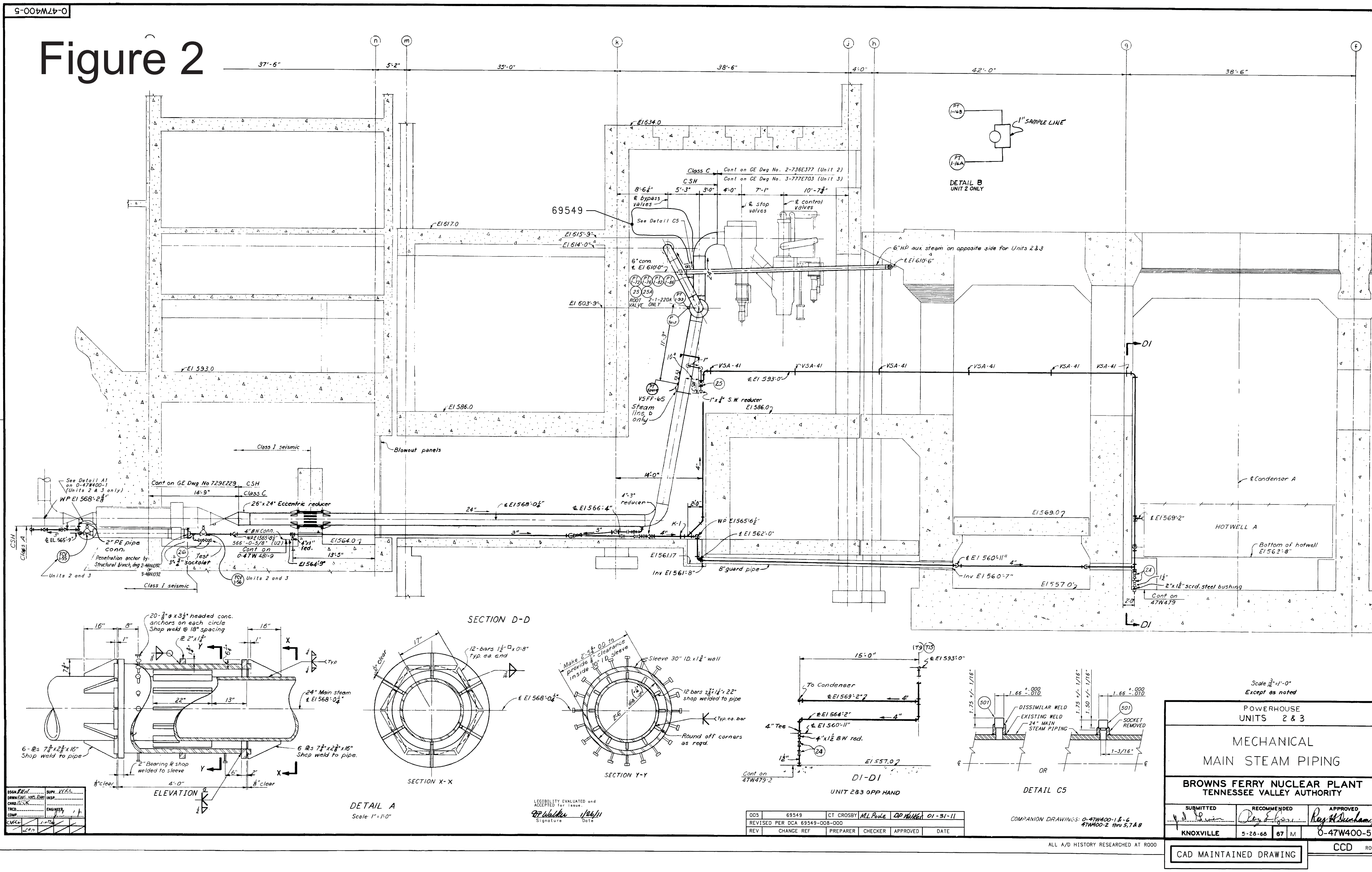
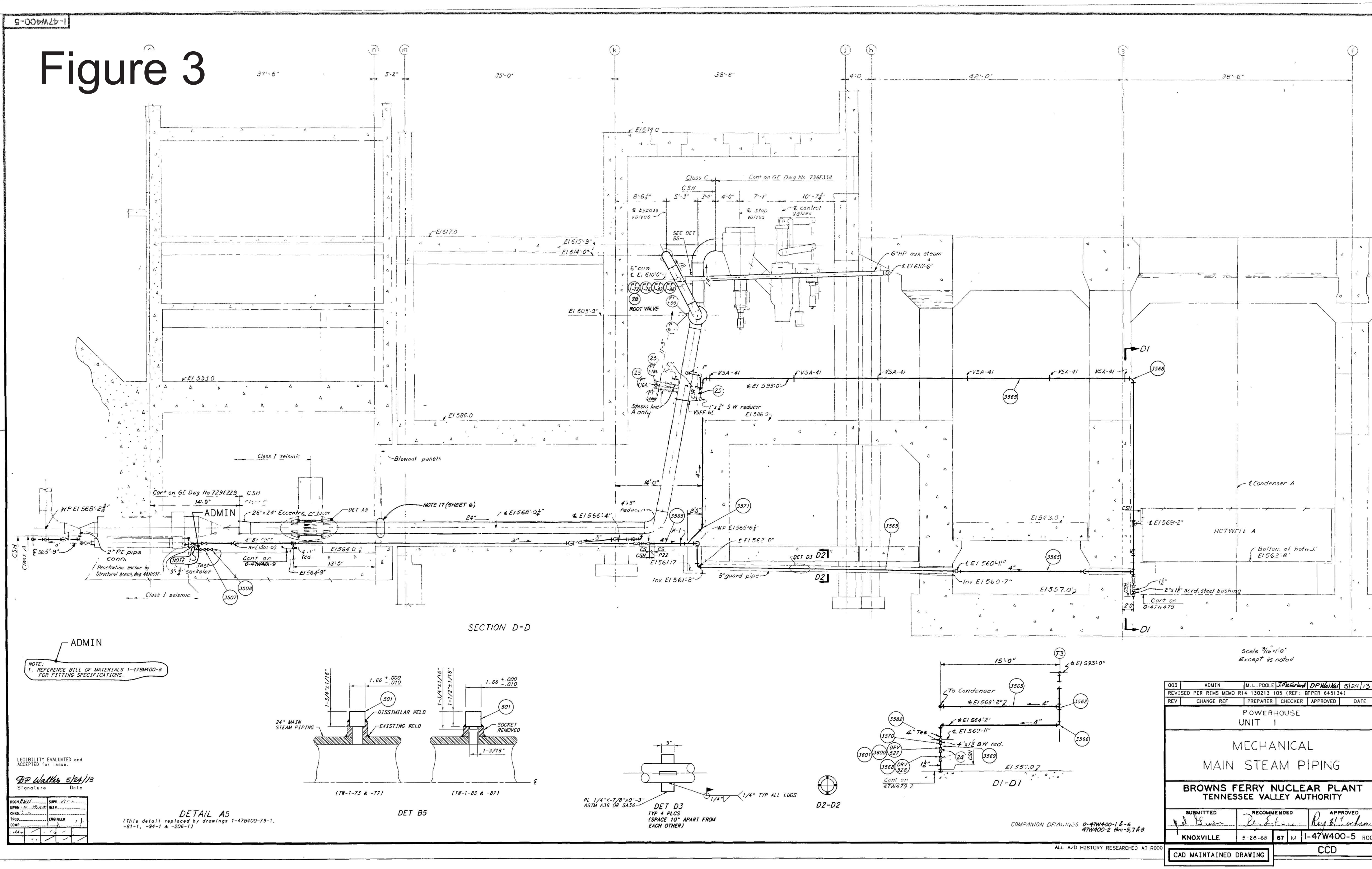

0-47W400-5
DETAIL B
UNIT 2 ONLY
SECTION D-D
DETAIL A
Scale 1"=1'-0"
ELEVATION
SECTION X-X
SECTION Y-Y
D1-D1
UNIT 2&3 OPP HAND
DETAIL C5
COMPANION DRAWINGS: 0-47W400-1 & -6
47W400-2 thru 5,7 & 8
POWERHOUSE
UNITS 2 & 3
MECHANICAL
MAIN STEAM PIPING
BROWNS FERRY NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY
KNOXVILLE
5-28-68
0-47W400-5
CAD MAINTAINED DRAWING
ALL A/D HISTORY RESEARCHED AT R000
REVISED PER DCA 69549-008-000

Figure 3



1-47W400-5
SECTION D-D
DETAIL A5
DET B5
DET D3
D2-D2
D1-D1
NOTE:
1. REFERENCE BILL OF MATERIALS 1-47B400-8 FOR FITTING SPECIFICATIONS.
ADMIN
LEGIBILITY EVALUATED and ACCEPTED for issue.
Signature Date
POWERHOUSE
UNIT 1
MECHANICAL
MAIN STEAM PIPING
BROWNS FERRY NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY
SUBMITTED
RECOMMENDED
APPROVED
KNOXVILLE
5-28-68
1-47W400-5 R003
CCD
CAD MAINTAINED DRAWING
ALL A/D HISTORY RESEARCHED AT R000
Scale 3/16"=1'-0"
Except as noted

ENCLOSURE 3

List of Regulatory Commitments

ENCLOSURE 3

List of Regulatory Commitments

New Commitment:

TVA will revise the FSAR to add descriptions of the two proposed ALT pathways.

Revised Commitment:

[Note: This commitment has been revised from that contained in the letter from TVA to NRC, "Browns Ferry Nuclear Plant, Units 1, 2, and 3 - Proposed Technical Specification Change To Revise The Leakage Rate Through MSIVs–TS-485," dated November 22, 2013 (ADAMS Accession No. ML14015A403)**]**

To ensure the flow through the 0.1875-inch orifice is not obstructed, radiography inspections of the 0.1875-inch orifice will be performed during each refueling outage. These inspections will first be performed during the spring outage of 2014 for Unit 3, during the fall outage of 2014 for Unit 1, and during the spring outage of 2015 for Unit 2.