Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

JUL 27 2004

10 CFR 50.54(f)

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

Gentlemen:

In the Matter of	)	Docket No. 50-327
Tennessee Valley Authority	)	50-328
		50-390

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2 AND WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - SIXTY-DAY RESPONSE TO NRC BULLETIN 2004-01, "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED-WATER REACTORS," DATED MAY 28, 2004

The purpose of this letter is to submit TVA's 60-day response to the subject bulletin for SQN and WBN, with the exception of that portion of the response identified by TVA in its extension request dated June 14, 2004. Specifically, as stated in the June 14 letter, TVA committed to sending a response within 60 days addressing Items (1)(a) through (1)(d) for SQN and WBN. TVA's response to Item (1)(a) would include the available information (e.g., Alloy 600/82/182 locations, joint configuration and design, etc.,) retrieved from plant records. The balance of the requested information would be obtained from the original equipment manufacturer (Westinghouse Electric Company [Westinghouse]). Westinghouse has projected that a comprehensive report would be provided to TVA by November 24, 2004. Accordingly, as committed to in the June 14 letter, TVA will submit a supplemental response within two weeks following receipt and subsequent confirmation of the information received from Westinghouse.

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Examples of the types of information pertaining to each pressurizer penetration requested from Westinghouse include: drawings of the penetration joint, including weld cladding and cladding details; specification of the pressurizer boundary and weld materials; and identification of the stress relief process applied to the welded connections.

Enclosures 1 and 2 provide the requested information for Items (1)a through 1(d), for SQN and WBN, respectively. Enclosure 3 lists new regulatory commitments contained in this submittal.

In accordance with the requested information for Item (2) contained in the subject bulletin, TVA plans to submit the required response for SQN Units 1 and 2 and WBN Unit 1 within 60 days after each plant restart following the next inspection of the Alloy 82/182/600 pressurizer penetrations and steam space piping connections to identify the presence of any degradation.

If you have any questions concerning this matter, please contact Terry Knuettel at (423) 751-6673.

Sincerely,

Mark J. Burzynski

Mark J. Burzynski
Manager
Nuclear Licensing

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 27th day of July 2004.

Enclosures
cc (Enclosures):
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cc: Continued on page 3

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2

SIXTY-DAY RESPONSE TO NRC BULLETIN 2004-01, "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED-WATER REACTORS," DATED MAY 28, 2004

NRC Requested Information:

1. ***All subject PWR licensees are requested to provide the following information within 60 days of the date of this bulletin.***

   NRC Question 1.(a)

   A description of the pressurizer penetrations and steam space piping connections at your plant. At a minimum, this description should include materials of construction (e.g., stainless steel piping and/or weld metal, Alloy 600 piping/sleeves, Alloy 82/182 weld metal or buttering, etc.), joint design (e.g., partial penetration welds, full penetration welds, bolted connections, etc.), and, in the case of welded joints, whether or not the weld was stress-relieved prior to being put into service. Additional information relevant with respect to determining the susceptibility of your plant's pressurizer penetrations and steam space piping connections to PWSCC should also be included.

   TVA RESPONSE:

   The SQN pressurizers were manufactured by Westinghouse Electric Company [Westinghouse] and are identified as Westinghouse Series 84 pressurizers. The size of the Westinghouse pressurizer varies with the plant thermal rating. The SQN pressurizers have an inside diameter of 84 inches (i.e., Series 84 pressurizers) with a nominal volume of 1800 cubic feet. The pressurizer is a cylindrical vessel which is installed with its longitudinal axis in a vertical position.

The pressurizer vessel consists of the following:

1. An upper head which is hemispherical in shape and fabricated from manganese-molybdenum steel plate clad with austenitic stainless steel. The head contains ports for a 6-inch relief nozzle, three 6 inch safety nozzles, a 4-inch spray nozzle, and a 16-inch inside diameter (ID) manway. The safety, spray, and relief nozzles are welded-in forgings fabricated of SA508, Class 2A material. The nozzles are equipped with a stainless steel safe-end to provide a welding interface with the attached piping. The safe-end is a SA-182 Type 316L stainless steel forging. The nozzles are buttered with Inconel 82/182 weld metal and then post-weld heat treated. The safe-end is welded to the buttering with Inconel 82/182 weld metal.

2. A shell assembly which is a cylindrical barrel fabricated from manganese-molybdenum steel plate clad with austenitic stainless steel. The shell contains ports for eight ¾-inch instrumentation nozzles and a sample nozzle coupling. Instrument nozzles are provided on the pressurizer for water level, temperature, and sample measurements. The nozzles are fabricated from the same material and are the same size, making the intended application interchangeable. The nozzles are fabricated assemblies made from a stainless steel tube and a stainless steel-forged coupling for interfacing with the connecting piping. The tube is SA 213 Type 316 and the coupling is fabricated from a SA 182 Type 304 stainless steel forging.

3. A lower head which is hemispherical in shape and fabricated from manganese-molybdenum steel plate clad with austenitic stainless steel. A 14-inch surge nozzle (specifically excluded from this Bulletin) is located in the lower head along with 78 penetrations

for the immersion heaters. Heater wells are stainless steel-forged penetrations (SA-182 Grade F316) through which the immersion heaters are installed. Heater wells are inserted through holes in the lower head, expanded with mechanical rollers, and welded to the cladding on the inside of the lower head with a partial penetration weld.

The Attachment to this letter contains details of the pressurizer along with a summary of the penetrations and the additional information requested above.

A review of the general fabrication methods employed by Westinghouse for pressurizers has been performed to ensure the locations which utilized Alloy 600/82/182 material have been identified. These locations are shown in the Attachment and discussed below.

As discussed in the 15-day response to Bulletin 2004-01 dated June 14, 2004, TVA is in the process of reviewing the SQN component fabrication records with Westinghouse to verify the general fabrication information contained in this response. Westinghouse has projected that they can support this review by providing TVA with a comprehensive report by November 24, 2004. As previously committed to in the 15-day response, TVA will submit a supplemental response within two weeks following receipt and subsequent confirmation of the information received from Westinghouse. The purpose of this supplemental response will be to document TVA's review of the information provided by Westinghouse and to identify any differences.

The steady state values for the pressurizer at 100 percent Reactor Thermal Power [RTP] is:

- Pressurizer Level - 60 percent
- Pressure - 2235 pounds per square inch guage [psig]
- Temperature - 653 degrees Fahrenheit (T_{sat} at 2235 psig)

The piping attached to the pressurizer is austenitic stainless steel.

NRC Question 1.(b)

A description of the inspection program for Alloy 82/182/600 pressurizer penetrations and steam space piping connections that has been implemented at your plant. The description should include when the inspections were performed; the areas, penetrations and steam space piping connections inspected; the extent (percentage) of coverage achieved for each location which was inspected; the inspection methods used; the process used to resolve any inspection findings; the quality of the documentation of the inspections (e.g., written report, video record, photographs); and, the basis for concluding that your plant satisfies applicable regulatory requirements related to the integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections were found, indicate what follow-up NDE was performed to characterize flaws in the leaking penetrations.

TVA RESPONSE:

TVA performed visual examinations of the Unit 1 and Unit 2 pressurizer penetrations during the Unit 1 Cycle 11 Refueling Outage [RFO] and the Unit 2 Cycle 11 RFO due to industry operating experience. The alloy 82/182/600 penetrations examined were the spray nozzle safe-end (SE), safety valve nozzle SEs (three each), and relief valve nozzle SE, which are located on the top of the pressurizer. Mirror insulation was removed to afford access to the vessel wall around each nozzle.

The examination was performed by qualified metallurgical engineers under the TVA Borated Water Corrosion Preventative Maintenance (PM) program. A visual examination was

performed at each specified location and 100 percent of the weld circumference was examined for evidence of boron leakage. No evidence of leakage was observed. The inspection results were documented either in the work order or PM package. Digital photographs were taken to document the inspection results.

The following table list the latest ASME Section XI volumetric (UT) and surface examinations (PT) performed on the pressurizer dissimilar metal welds. TVA's procedure, "Evaluation and Resolution of Ultrasonic Data," is used to resolve any ultrasonic examination indications. Surface examination indications are resolved using procedure, "Liquid Penetrant Examination of ASME and ANSI Code Components and Welds." These ASME Section XI examinations are documented on written reports and stored on micro-film or in an electronic data base.

ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2

SIXTY-DAY RESPONSE TO NRC BULLETIN 2004-01, "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED-WATER REACTORS," DATED MAY 28, 2004

ASME Section XI Examinations

UNIT	WELD NUMBER	EXAM CATEGORY AND ITEM NUMBER	EXAM METHOD/ REPORT#	CYCLE (EXAM DATE)	EXAM COVERAGE ACHIEVED	REJECTABLE INDICATIONS
1	RCW-24-SE spray nozzle to safe-end	B-F, B5.40 B-F, B5.40	UT (R6930) PT (R6914)	U1C8 (4/97) U1C8 (3/97)	UT 100% PT 100%	NO NO
1	RCW-25-SE safety nozzle to safe-end	B-F, B5.20 B-F, B5.20	UT (R2334) PT (R5340)	U1C3 (9/85) U1C5 (10/91)	UT 80% PT 100%	NO NO
1	RCW-26-SE relief nozzle to safe-end	B-F, B5.20 B-F, B5.20	UT (R2333) PT (R5340)	U1C3 (9/85) U1C5 (10/91)	UT 80% PT 100%	NO NO
1	RCW-27-SE safety nozzle to safe-end	B-F, B5.20 B-F, B5.20	UT (R5064) PT (R5173)	U1C5 (10/91) U1C5 (10/91)	UT 75% PT 100%	NO NO
1	RCW-28-SE safety nozzle to safe-end	B-F, B5.20 B-F, B5.40	UT (R5065) PT (R7968)	U1C5 (10/91) U1C12 (3/03)	UT 75% PT 100%	NO NO - This was the third successive examination following cycle 5.
2	RCW-24-SE spray nozzle to safe-end	B-F, B5.40 B-F, B5.40	UT (R5658) PT (R5624)	U2C7 (5/96) U2C7 (5/96)	UT 100% PT 100%	NO NO
2	RCW-25-SE safety nozzle to safe-end	B-F, B5.20 B-F, B5.20	UT (R3444, R3511) PT (R3391)	U2C3 (2/89) U2C3 (2/89)	UT 70% PT 100%	NO NO

2	RCW-26-SE safety nozzle to safe-end	B-F, B5.20 B-F, B5.20	UT (R3445, R3512) PT (R3391)	U2C3 (2/89) U2C3 (2/89)	UT 70% PT 100%	NO NO
2	RCW-27-SE relief nozzle to safe-end	B-F, B5.20 B-F, B5.20	UT (R4471) PT (R4538)	U2C5 (4/92) U2C5 (3/92)	UT 80% PT 100%	NO NO
2	RCW-28-SE safety nozzle to safe-end	B-F, B5.20 B-F, B5.20	UT (R4472) PT (R4544)	U2C5 (4/92) U2C5 (3/92)	UT 80% PT 100%	NO NO

Based on these acceptable examinations and the future examinations scheduled for these areas, the integrity of the pressurizer will be maintained. As documented in the table above, no pressurizer dissimilar metal welds have been identified as leaking. Future ASME Section XI examination coverage will be based on Performance Demonstration Initiative (PDI) Appendix VIII qualifications.

NRC Question 1.(c)

A description of the Alloy 82/182/600 pressurizer penetration and steam space piping connection inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the areas, penetrations and steam space piping connections to be inspected; the extent (percentage) of coverage to be achieved for each location; inspection methods to be used; qualification standards for the inspection methods and personnel; the process used to resolve any inspection indications; the inspection documentation to be generated; and the basis for concluding that your plant will satisfy applicable regulatory requirements related to the structural and leakage integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam

space piping connections are found, indicate what follow-up NDE will be performed to characterize flaws in the leaking penetrations. Provide your plans for expansion of the scope of NDE to be performed if circumferential flaws are found in any portion of the leaking pressurizer penetrations or steam space piping connections.

TVA RESPONSE:

In accordance with NRC Staff recommendations contained in the subject bulletin, TVA will perform a bare metal visual (BMV) inspection of the upper pressurizer Alloy 600 locations (safety, spray, and relief safe-ends) at SQN during the upcoming Unit 1 Cycle 13 RFO in the fall 2004 and the Unit 2 Cycle 13 RFO in the spring 2005. This examination will be performed utilizing "in-house" procedure titled, "Visual Inspection of Alloy 600/82/182 Pressure Boundary Components." In accordance with plant procedures personnel performing the inspection will be certified Non-Destructive Examination (NDE) inspectors qualified in the ASME Section XI, VT-2 method. The extent of the examination will be 100 percent of each weld circumference and will be documented on written reports which may include photographs or video.

These BMVs are in response to recommendations contained in the Electric Power Research Institute [EPRI] Materials Reliability Project [MRP] 2003-039, issued January 20, 2004. Under the purview of the Nuclear Energy Institute [NEI] 03-08, Materials Initiative, the BMVs were categorized as "Needed" for butt welded primary pressure boundary locations containing Alloy 600/82/182 in EPRI MRP 2004-05, issued April 2, 2004. In addition, this inspection includes obtaining "as-built" information on each weld joint configuration and determining the available access to prepare for future volumetric examinations per ASME Section XI, Appendix VIII (PDI) and the potential stress improvement

applications (e.g., Mechanical Stress Improvement Process [MSIP], weld overlay).

TVA will revise its Corrosion Control Program to require performance of BMV examinations of the Alloy 600/82/182 locations on the upper pressurizer penetrations each refueling outage until further guidance is provided by the MRP.

TVA plans to utilize the "in-house" corrective action program and corrosion control program to evaluate the findings identified during the pressurizer penetration examinations. The process includes evaluations to determine if the findings are relevant indications. The source of any leakage will be identified and reported. A volumetric examination will be performed to determine the extent of any through-wall cracking. If circumferential cracking is confirmed, the volumetric NDE would be expanded to the other upper pressurizer penetration locations based on the evaluation of the findings.

The MRP is actively working on an Inspection and Evaluation (I&E) guidelines document for Alloy 600 butt welds which it is expected to include requirements for future volumetric inspections. TVA's current plan includes volumetric inspection of the upper pressurizer Alloy 600 welds as part of the ASME Section XI augmented inspection program. The schedule for performing these volumetric inspections is pending ASME Section XI, PDI qualification and issuance of the MRP I&E document.

NRC Question 1.(d)

In light of the information discussed in this bulletin and your understanding of the relevance of recent industry operating experience to your facility, explain why the inspection program identified in your response to item (1)(c) above is adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all

applicable regulatory requirements which pertain to your facility.

TVA RESPONSE:

TVA conducts each inspection with a questioning attitude in accordance with industry guidance and evaluates and determines the source of any boric acid deposit identified on the upper pressurizer penetrations and steam space piping. These requirements are incorporated in the visual inspection guidance contained TVA's Corrosion Control Program and Inspection procedures. Implementation of these requirements precludes a through-wall crack remaining undetected for years.

Based on the thoroughness and past performance of TVA's inspection program described above, TVA believes there is reasonable assurance that the program implemented at SQN satisfies the applicable regulatory requirements related to the structural and leakage integrity of the pressurizer penetrations and steam space piping.

NRC Requested Information:

For lines attached directly to the pressurizer, with the exception of the surge line, the information requested in (1) and (2) above should be provided for any locations, including those remote from the pressurizer shell, which contain Alloy 82/182/600 materials which are exposed to conditions similar to those of the pressurizer environment.

TVA RESPONSE:

The piping attached to the pressurizer is austenitic stainless steel and does not contain the subject alloy material.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY (TVA)
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1

SIXTY-DAY RESPONSE TO NRC BULLETIN 2004-01, "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED-WATER REACTORS," DATED MAY 28, 2004

NRC Requested Information:

1. ***All subject PWR licensees are requested to provide the following information within 60 days of the date of this bulletin.***

   NRC Question 1.(a)

   A description of the pressurizer penetrations and steam space piping connections at your plant. At a minimum, this description should include materials of construction (e.g., stainless steel piping and/or weld metal, Alloy 600 piping/sleeves, Alloy 82/182 weld metal or buttering, etc.), joint design (e.g., partial penetration welds, full penetration welds, bolted connections, etc.), and, in the case of welded joints, whether or not the weld was stress-relieved prior to being put into service. Additional information relevant with respect to determining the susceptibility of your plant's pressurizer penetrations and steam space piping connections to PWSCC should also be included.

   TVA RESPONSE:

   WBN's pressurizer was manufactured by Westinghouse Electric Company [Westinghouse] and is identified as a Westinghouse Series 84 pressurizer. The size of the Westinghouse pressurizer varies with the plant thermal rating. The WBN pressurizer has an ID of 84 inches (i.e., Series 84 pressurizers) with a nominal volume of 1800 cubic feet. The pressurizer is a cylindrical vessel which is installed with its longitudinal axis in a vertical position.

   The pressurizer vessel consists of the following:

   1. An upper head which is hemispherical in shape and fabricated from manganese-molybdenum steel plate clad with austenitic stainless steel. The head contains ports for a 6-inch relief nozzle, three 6-inch safety nozzles, a 4-inch spray nozzle, and a 16-inch inside

diameter manway. The safety, spray, and relief nozzles are welded-in forgings fabricated of SA508, Class 2A material. The nozzles are equipped with a stainless steel safe-end to provide a welding interface with the attached piping. The safe-end is a SA-182 Type 316L stainless steel forging. The nozzles are buttered with Inconel 82/182 weld metal and then post-weld heat treated. The safe-end is welded to the buttering with Inconel 82/182 weld metal.

2. A shell assembly which is a cylindrical barrel fabricated from manganese-molybdenum steel plate clad with austenitic stainless steel. The shell contains ports for eight ¾-inch instrumentation nozzles and a sample nozzle coupling. Instrument nozzles are provided on the pressurizer for water level, temperature, and sample measurements. The nozzles are fabricated from the same material and are the same size, making the intended application interchangeable. The nozzles are fabricated assemblies made from a stainless steel tube and a stainless steel-forged coupling for interfacing with the connecting piping. The tube is SA 213 Type 316 and the coupling is fabricated from a SA 182 Type 304 stainless steel forging.

3. A lower head which is hemispherical in shape and fabricated from manganese-molybdenum steel plate clad with austenitic stainless steel. A 14-inch surge nozzle (specifically excluded from this Bulletin) is located in the lower head along with 78 penetrations for the immersion heaters. Heater wells are stainless steel-forged penetrations (SA-182 Grade F316) through which the immersion heaters are installed. Heater wells are inserted through holes in the lower head, expanded with mechanical rollers, and welded to the cladding on the inside of the lower head with a partial penetration weld.

The Attachment to this letter contains details of the pressurizer along with a summary of the penetrations and the additional information requested above.

A review of the general fabrication methods employed by Westinghouse for pressurizers has been performed to ensure the locations which utilized Alloy 600/82/182 material have been identified. These locations are shown in the Attachment and discussed below.

As discussed in the 15-day response to Bulletin 2004-01 dated June 14, 2004, TVA is in the process of reviewing the WBN component fabrication records with Westinghouse to verify the general fabrication information contained in this response. Westinghouse has projected that they can support this review by providing TVA with a comprehensive report by November 24, 2004. As previously committed to in the 15-day response, TVA will submit a supplemental response within two weeks following receipt and subsequent confirmation of the information received from Westinghouse. The purpose of this supplemental response will be to document TVA's review of the information provided by Westinghouse and identify any differences.

The steady state values for the pressurizer at 100 percent Reactor Thermal Power is:

- Pressurizer Level - 60 percent
- Pressure - 2235 pounds per square inch gauge [psig]
- Temperature - 653 degrees Fahrenheit (T_{sat} at 2235 psig)

The attached piping is austenitic stainless steel.

NRC Question 1.(b)

A description of the inspection program for Alloy 82/182/600 pressurizer penetrations and steam space piping connections that has been implemented at your plant. The description should include when the inspections were performed; the areas, penetrations and steam space piping connections inspected; the extent (percentage) of coverage achieved for each location which was inspected; the inspection methods used; the process used to resolve any inspection findings; the quality of the documentation of the inspections (e.g., written report, video record, photographs); and, the basis for concluding that your plant satisfies applicable regulatory requirements related to the integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections were found, indicate what follow-up NDE was performed to characterize flaws in the leaking penetrations.

TVA RESPONSE:

TVA performed visual examinations of the Unit 1 pressurizer penetrations during the Cycle 05 Refueling Outage (RFO). The Alloy 600/82/182 penetrations examined were the spray nozzle safe-end (SE), safety valve nozzle SEs (three each), and relief valve nozzle SE which are located on the top of the pressurizer. Mirror insulation was removed to afford access to the vessel wall around each nozzle.

The examination was performed by certified Level II Non-Destructive Examination (NDE) inspectors. A visual examination was performed at each specified location and 100 percent of the weld circumference was examined for evidence of boron leakage. In addition, visual examinations (VT-1) of the welds were performed. No evidence of leakage or cracking was observed. The inspection results are

documented in NDE Examination reports. In addition, this inspection included obtaining "as-built" information on each weld joint configuration and determining the available access to prepare for future volumetric examinations per ASME Section XI, Appendix VIII (PDI), and the potential stress improvement applications (e.g., Mechanical Stress Improvement Process [MSIP], weld overlay).

Based on these acceptable examinations and the future examinations scheduled for these areas, the integrity of the pressurizer will be maintained. No leaking pressurizer dissimilar metal welds have been identified. Future ASME Section XI examination coverage will be based on Performance Demonstration Initiative [PDI] Appendix VIII qualifications.

NRC Question 1.(c)

A description of the Alloy 82/182/600 pressurizer penetration and steam space piping connection inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the areas, penetrations and steam space piping connections to be inspected; the extent (percentage) of coverage to be achieved for each location; inspection methods to be used; qualification standards for the inspection methods and personnel; the process used to resolve any inspection indications; the inspection documentation to be generated; and the basis for concluding that your plant will satisfy applicable regulatory requirements related to the structural and leakage integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections are found, indicate what follow-up NDE will be performed to characterize flaws in the leaking penetrations. Provide your plans for expansion of the scope of NDE to be performed if circumferential flaws are found in any portion of the leaking pressurizer penetrations or steam space piping connections.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY (TVA)
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1

SIXTY-DAY RESPONSE TO NRC BULLETIN 2004-01, "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED-WATER REACTORS," DATED MAY 28, 2004

TVA RESPONSE:

In accordance with NRC Staff recommendations contained in the subject bulletin, TVA will perform a bare metal visual (BMV) inspection of the upper pressurizer Alloy 600 locations (safety, spray, and relief safe-ends) during the upcoming Unit 1 Cycle 6 RFO in the spring 2005. This examination will be performed utilizing "in-house" procedure titled, "Visual Inspection of Alloy 600/82/182 Pressure Boundary Components." In accordance with plant procedures personnel performing the inspection will be certified NDE inspectors qualified in the ASME Section XI, VT-2 method. The extent of the examination will be 100 percent of each weld circumference and will be documented on written reports which may include photographs or video.

These BMVs are in response to recommendations contained in Electric Power Research Institute (EPRI) Materials Reliability Project (MRP) 2003-039, issued January 20, 2004. Under the purview of the Nuclear Energy Institute (NEI) 03-08 Materials Initiative, the BMVs were categorized as "Needed" for butt welded primary pressure boundary locations containing Alloy 600/82/182 in EPRI MRP 2004-05, issued April 2, 2004. This inspection includes obtaining any additional "as-built" information on each weld joint configuration and determining the available access to prepare for future volumetric examinations per ASME Section XI, Appendix VIII (PDI), and the potential stress improvement applications (e.g., Mechanical Stress Improvement Process, weld overlay).

TVA will revise its Corrosion Control Program to require performance of BMV examinations of Alloy 600/82/182 locations on the upper pressurizer penetrations each RFO until further guidance is provided by the MRP.

TVA plans to utilize the "in-house" corrective action program and corrosion control program to evaluate the findings identified during the pressurizer penetration examinations. The process includes evaluations to determine if the findings are relevant indications. The source of any leakage will be identified and reported. A volumetric examination will be performed to determine the extent of any through-wall cracking. If circumferential cracking is confirmed, the volumetric NDE would be expanded to the other upper pressurizer penetration locations based on the evaluation of the findings.

The MRP is actively working on an Inspection and Evaluation (I&E) guidelines document for Alloy 600 butt welds which it is expected to include requirements for future volumetric inspections. TVA's current plan includes volumetric inspection of the upper pressurizer Alloy 600 welds as part of the ASME Section XI augmented program. The schedule for performing these volumetric inspections is pending ASME Section XI, PDI qualification, and issuance of the MRP I&E document.

NRC Question 1.(d)

In light of the information discussed in this bulletin and your understanding of the relevance of recent industry operating experience to your facility, explain why the inspection program identified in your response to item (1)(c) above is adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all applicable regulatory requirements which pertain to your facility.

TVA RESPONSE:

TVA conducts each inspection with a questioning attitude in accordance with existing industry guidance that includes evaluating and determining the source of any boric acid deposit identified on the upper pressurizer penetrations and steam space piping. These requirements are incorporated in the visual inspection guidance contained in TVA's Corrosion Control Program and Inspection procedures. Implementation of these requirements precludes a through-wall crack remaining undetected for years.

Based on the thoroughness and past performance of TVA's inspection program described above, TVA believes there is reasonable assurance that the program implemented at WBN satisfies the applicable regulatory requirements related to the structural and leakage integrity of the pressurizer penetrations and steam space piping.

NRC Requested Information:

For lines attached directly to the pressurizer, with the exception of the surge line, the information requested in (1) and (2) above should be provided for any locations, including those remote from the pressurizer shell, which contain Alloy 82/182/600 materials which are exposed to conditions similar to those of the pressurizer environment.

TVA RESPONSE:

The piping attached to the pressurizer is austenitic stainless steel and does not contain the subject alloy material.

ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY (TVA)
SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1

SIXTY-DAY RESPONSE TO NRC BULLETIN 2004-01, "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED-WATER REACTORS," DATED MAY 28, 2004

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1. TVA will perform a bare metal visual (BMV) inspection of the upper pressurizer alloy 600 locations (safety, spray, and relief safe-ends) during the upcoming SQN Unit 1 Cycle 13 refueling outage [RFO] in the fall 2004 and the SQN Unit 2 Cycle 13 RFO in the spring 2005.

2. TVA will perform a BMV inspection of the upper pressurizer alloy 600 locations (safety, spray, and relief safe-ends) during the upcoming WBN Unit 1 Cycle 6 RFO in the spring 2005.

3. TVA will revise its Corrosion Control Program to require performance of BMV examinations of the Alloy 600/82/182 locations on the upper pressurizer penetrations at SQN and WBN each RFO until further guidance is issued from the Materials Reliability Project.

ATTACHMENT

TENNESSEE VALLEY AUTHORITY (TVA)
SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1

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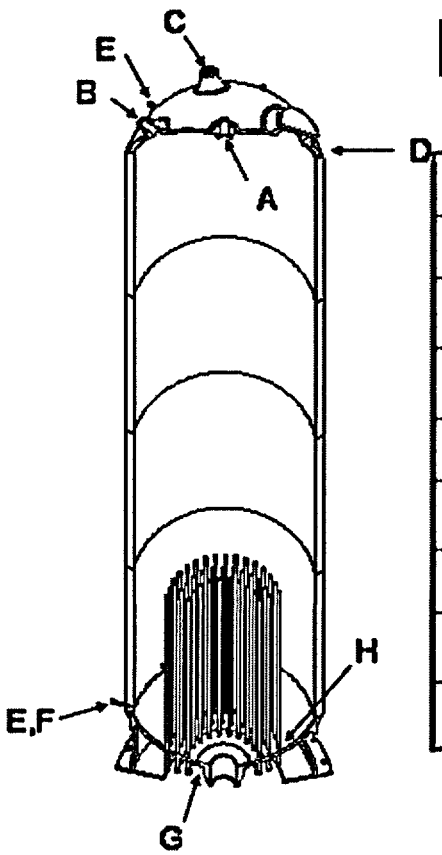

Pressurizer Details

Penetration (size)	Location (#)	Weld Material	Joint	Stress Relieved
Spray Nozzle (4")	A (1)	Butter – 82/182 Weld – 82/182	Build-up Full Penetration	Yes No
Safety Nozzle (6")	B (3)	Butter – 82/182 Weld – 82/182	Build-up Full Penetration	Yes No
Relief Nozzle (6")	C (1)	Butter – 82/182 Weld – 82/182	Build-up Full Penetration	Yes No
Manway (16")	D (1)	N/A	Bolted	N/A
Instrumentation (¾")	E (8)	Stainless Steel	Partial Penetration	No
Sample (¾")	F (1)	Stainless Steel	Partial Penetration	Yes
Surge Nozzle (14")	G (1)	Butter – 82/182 Weld – 82/182	Build-up Full Penetration	Yes No
Heater Penetrations	H (78)	Stainless Steel	Partial Penetration	No

All above information will be verified and supplemented/revised as needed when requested Westinghouse information is received.