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SUBJECT: Forwards relief requests 1RR-24 & 2RR-21 in response to NRC questions re Units 1 & 2.

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SUSQUEHANNA STEAM ELECTRIC STATION
FIRST 10-YEAR INSERVICE INSPECTION INTERVAL
PROGRAM RELIEF REQUESTS 1RR-24 AND 2RR-21:
AUGMENTED RPV SHELL WELD EXAMINATIONS
PLA-4398 FILES R41-2, R15-10

Docket Nos. 50-387
and 50-388

During a recent telephone call, the NRC staff requested additional information on our augmented examination of the reactor vessel in order to close out the First 10-Year ISI Program Interval. The attached Relief requests 1RR-24 and 2RR-21 are in response to the NRC questions regarding SSES Units 1 and 2 compliance with the requirements of 10CFR50.55a(g)(6)(ii)(A), augmented examination of reactor vessel, for the First 10-Year Inservice Inspection Interval. These relief requests replace Relief Request RR-10 which was generated for the Second 10-Year Inservice Inspection Interval Program to address previous questions on this issue. Relief Request RR-10 will be removed from the Second 10-Year ISI Interval program upon NRC acceptance of Relief Requests 1RR-24 and 2RR-21.

In addition, the following clarifications are provided to assist with close out of the First 10-Year Inservice Inspection Interval Program:

- Relief Request 1RR-18 is withdrawn. The subject Class 2 Examination Category C-F piping weld only required a surface examination. Surface examination of the weld was successfully completed, and relief is not required. This weld is, however, included in Relief Request 1RR-19 for relief from complete volumetric examination in accordance with augmented program requirements.

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- Relief Request 1RR-19 lists two welds - VRRB311-FW-A20 and VRRB311-1-A - twice. This is an editorial error; the welds need only be listed once. Attached is a revision to Relief Request 1RR-19 which corrects this error.

If you have any questions, please contact Mr. C. T. Coddington at (610) 774-7531.

Very truly yours,

R. G. Byram

Attachments

copy: NRC Region I
Ms. M. Banerjee, NRC Sr. Resident Inspector
Mr. C. Poslusny, NRC Sr. Project Manager

RELIEF REQUEST 1RR-24

I. RELIEF REQUEST APPLICABILITY

A.	Unit:	1
B.	Code Examination Category:	B-A, Pressure Retaining Welds in Reactor Vessel
C.	Code Item Number(s):	B1.10, B1.11, B1.12
D.	Reference:	10CFR50.55(a)(g)(6)(ii)(A) - Augmented examination of reactor vessel

II. IDENTIFICATION OF COMPONENTS

SSES Units 1 and 2 reactor vessel pressure retaining welds identified in Table1RR-24-1 are the subject of this relief request.

TABLE 1RR-24-1

Component Identification	Description/Item Number	Limiting Condition	Examination Coverage (%)
AD	Shell circumferential weld/B1.11	Permanent RPV mirror insulation support steel precludes complete examination	85.6
BK	Shell longitudinal weld/B1.12	Permanent RPV mirror insulation support steel precludes complete examination	81.1
BM	Shell longitudinal weld/B1.12	Permanent RPV mirror insulation support steel precludes complete examination	81.1

III. CODE/REGULATORY REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

10CFR50.55(a)(g)(6)(ii)(A)(2) requires volumetric examination of essentially 100% of the weld length of all circumferential and longitudinal shell welds in accordance with the examination requirements of Examination Category B-A, Item B1.10 of TableIWB-2500-1 of the 1989 Edition of ASME Section XI. Relief is requested from complete examination of the affected welds (AD, BK, and BM) due to a plant design obstruction caused by permanent RPV mirror insulation support steel.

RELIEF REQUEST 1RR-24

IV. BASIS FOR RELIEF

Examination of the affected welds will be performed to the maximum extent practical using both automated and manual ultrasonic techniques from the RPV OD surface. This is the most practical examination approach for all Susquehanna reactor pressure vessel welds while still maintaining an acceptable level of quality and safety.

The three RPV welds (AD, BK, and BM) with coverage less than 90% are located on the fourth RPV shell course (approximately 171" above the top of the beltline region). The examination restriction is caused by permanent RPV mirror insulation support steel. Plant design changes to effect greater examination coverage represent extreme hardship without a compensating return in increased plant safety.

The obstruction allows examination of only 16.25 inches (each) of longitudinal welds BK and BM from both sides. The unexamined volume of welds BK and BM accounts for only 0.56% of the total RPV shell weld length. There is no unexamined volume for circumferential weld AD. The obstructed portion of weld AD can be examined from the other (unobstructed) side of the weld.

Since all portions of the three obstructed welds are above the top of active fuel, the volume of weld that has been completely examined is representative of the weld volume not examined. With 96% overall RPV shell weld examination coverage, the inability to completely examine a very small percentage of the total RPV weld length does not present an increased risk to public health and safety.

To date, the RPV shell welds have been examined twice and no service related flaw indications have been detected. Non-relevant fabrication flaw indications were recorded during both preservice baseline examinations (PSI) and the first interval inservice examinations (ISI). The location and size of these indications has not changed between the PSI and the ISI examinations. The results from both examinations certify that RPV shell weld integrity continues to provide for acceptable levels of plant quality and safety.

Overall ultrasonic examination coverage has increased significantly between the preservice examination and the inservice examinations. Improvements in manipulators and ultrasonic transducer design have resulted in increased coverage with the automated examination equipment. Performance of manual "pick-up" examinations further enhances coverage. These examination improvements have resulted in an increase in the quality of the examination and increased assurance of plant safety.

Alternative examination techniques for the subject welds were evaluated, and it was determined that no additional examination coverage is obtainable. Ultrasonic examination coverage of the three subject welds from the RPV ID surface was also evaluated. Coverage from the ID has been estimated to be approximately 80-85%, and offers no significant increase in coverage. Ultrasonic examinations from the RPV ID surface significantly impact refuel floor activities and resources with no commensurate increase in examination coverage or plant safety.

RELIEF REQUEST 1RR-24

Performance of RPV shell weld ultrasonic examinations from the RPV ID is not a prudent approach for Susquehanna. Actual RPV shell weld examination coverage from the RPV OD surface is 96% (based on total shell weld length). Whereas, overall ultrasonic examination coverage from the RPV ID has been estimated to be, at best, only 80 - 85%. Performance of supplemental external examinations would be necessary to maximize overall ID examination coverage to even match that achieved by the total OD examinations.

Implementing an examination plan which combines both OD and ID examinations provides no commensurate increase in quality and/or plant safety. The combined examination approach would result in examination coverage which is essentially equivalent to the current OD examination coverage; however, the combined examination approach will require additional resources and result in increased radiation dose. The increase in radiation dose is from performance of expanded supplemental manual OD examinations required to obtain ID coverage equivalent to a complete OD examination.

V. ALTERNATE PROVISIONS

Examinations of the affected welds will be performed to the maximum extent practical using automated ultrasonic examination techniques from the RPV OD surface.

In addition, the reactor pressure vessel pressure retaining welds are subject to VT-2 visual examination during system pressure testing in accordance with the requirements of Examination Category B-P.

RELIEF REQUEST 2RR-21

I. RELIEF REQUEST APPLICABILITY

A. Unit: 2

B. Code Examination Category: B-A, Pressure Retaining Welds in Reactor Vessel

C. Code Item Number(s): B1.10, B1.11, B1.12

D. Reference: 10CFR50.55(a)(g)(6)(ii)(A) - Augmented examination of reactor vessel

II. IDENTIFICATION OF COMPONENTS

SSES Units 1 and 2 reactor vessel pressure retaining welds identified in Table2RR-21-1 are the subject of this relief request.

TABLE 2RR-21-1

Component Identification	Description/Item Number	Limiting Condition	Examination Coverage (%)
AD	Shell circumferential weld/B1.11	Permanent RPV mirror insulation support steel precludes complete examination	85.6
BK	Shell longitudinal weld/B1.12	Permanent RPV mirror insulation support steel precludes complete examination	81.1
BM	Shell longitudinal weld/B1.12	Permanent RPV mirror insulation support steel precludes complete examination	81.1

III. CODE/REGULATORY REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

10CFR50.55(a)(g)(6)(ii)(A)(2) requires volumetric examination of essentially 100% of the weld length of all circumferential and longitudinal shell welds in accordance with the examination requirements of Examination Category B-A, Item B1.10 of TableIWB-2500-1 of the 1989 Edition of ASME Section XI. Relief is requested from complete examination of the affected welds (AD, BK, and BM) due to a plant design obstruction caused by permanent RPV mirror insulation support steel.

RELIEF REQUEST 2RR-21

IV. BASIS FOR RELIEF

Examination of the affected welds will be performed to the maximum extent practical using both automated and manual ultrasonic techniques from the RPV OD surface. This is the most practical examination approach for all Susquehanna reactor pressure vessel welds while still maintaining an acceptable level of quality and safety.

The three RPV welds (AD, BK, and BM) with coverage less than 90% are located on the fourth RPV shell course (approximately 171" above the top of the beltline region). The examination restriction is caused by permanent RPV mirror insulation support steel. Plant design changes to effect greater examination coverage represent extreme hardship without a compensating return in increased plant safety.

The obstruction allows examination of only 16.25 inches (each) of longitudinal welds BK and BM from both sides. The unexamined volume of welds BK and BM accounts for only 0.56% of the total RPV shell weld length. There is no unexamined volume for circumferential weld AD. The obstructed portion of weld AD can be examined from the other (unobstructed) side of the weld.

Since all portions of the three obstructed welds are above the top of active fuel, the volume of weld that has been completely examined is representative of the weld volume not examined. With 96% overall RPV shell weld examination coverage, the inability to completely examine a very small percentage of the total RPV weld length does not present an increased risk to public health and safety.

To date, the RPV shell welds have been examined twice and no service related flaw indications have been detected. Non-relevant fabrication flaw indications were recorded during both preservice baseline examinations (PSI) and the first interval inservice examinations (ISI). The location and size of these indications has not changed between the PSI and the ISI examinations. The results from both examinations certify that RPV shell weld integrity continues to provide for acceptable levels of plant quality and safety.

Overall ultrasonic examination coverage has increased significantly between the preservice examination and the inservice examinations. Improvements in manipulators and ultrasonic transducer design have resulted in increased coverage with the automated examination equipment. Performance of manual "pick-up" examinations further enhances coverage. These examination improvements have resulted in an increase in the quality of the examination and increased assurance of plant safety.

Alternative examination techniques for the subject welds were evaluated, and it was determined that no additional examination coverage is obtainable. Ultrasonic examination coverage of the three subject welds from the RPV ID surface was also evaluated. Coverage from the ID has been estimated to be approximately 80-85%, and offers no significant increase in coverage. Ultrasonic examinations from the RPV ID surface significantly impact refuel floor activities and resources with no commensurate increase in examination coverage or plant safety.

RELIEF REQUEST 2RR-21

Performance of RPV shell weld ultrasonic examinations from the RPV ID is not a prudent approach for Susquehanna. Actual RPV shell weld examination coverage from the RPV OD surface is 96% (based on total shell weld length). Whereas, overall ultrasonic examination coverage from the RPV ID has been estimated to be, at best, only 80 - 85%. Performance of supplemental external examinations would be necessary to maximize overall ID examination coverage to even match that achieved by the total OD examinations.

Implementing an examination plan which combines both OD and ID examinations provides no commensurate increase in quality and/or plant safety. The combined examination approach would result in examination coverage which is essentially equivalent to the current OD examination coverage; however, the combined examination approach will require additional resources and result in increased radiation dose. The increase in radiation dose is from performance of expanded supplemental manual OD examinations required to obtain ID coverage equivalent to a complete OD examination.

V. ALTERNATE PROVISIONS

Examinations of the affected welds will be performed to the maximum extent practical using automated ultrasonic examination techniques from the RPV OD surface.

In addition, the reactor pressure vessel pressure retaining welds are subject to VT-2 visual examination during system pressure testing in accordance with the requirements of Examination Category B-P.

RELIEF REQUEST NO. 1RR-18

I. IDENTIFICATION OF COMPONENTS AND IMPRACTICAL CODE REQUIREMENTS

Relief Request 1RR-18 is no longer needed and has been withdrawn.

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TABLE 1RR-19-1

Component Identification	Configuration/ System	Exam Source	Exam Type	Limiting Condition	Estimate of Exam Coverage	Basis for relief	Alternate Provisions
DLA1011-FW-1	Pipe-valve/ Feedwater	FSAR Section 6.6.8	Vol	Limited access due to pipe whip restraint	87% Complete	Examination performed to maximum extent practical.	NONE
DBA1012-FW-6	Pipe-flued head/RWCU	FSAR Section 6.6.8	Vol	Hanger removal required to facilitate exam. Area survey indicates 18R field. Estimate 801 mhrs in area to complete inspection.	0%	Excessive radiological environment prohibits examination.	NONE
N4B-IR	Nozzle inner radius	NUREG 0619	Vol	Biological shield wall restricts access to exam equipment.	84.7%	Examination completed to maximum extent practical.	NONE
N4B-BORE	Nozzle bore/ Feedwater				84.9%		NONE
N4D-IR	Nozzle inner radius	NUREG 0619	Vol	Thermocouple pads restrict access to examination equipment.	82.6%	Examination completed to maximum extent practical.	NONE
N4D-BORE	Nozzle bore/ Feedwater				85%		NONE
DBB1071-1-B	Elbow-Pipe/RHR	NUREG 0313	Vol	Permanent pipe support saddle restricts complete scan	84%	Examination completed to the maximum extent practical.	NONE
DCB1021-FW-2	Valve-Flued Head/RHR	NUREG 0313	Vol	Component configuration	50%	Examination completed to the maximum extent practical.	NONE
DCB1021-FW-4	Flued Head-Elbow/RHR	NUREG 0313	Vol	Welded pipe clamp	89.4%	Examination completed to the maximum extent practical.	NONE

TABLE 1RR-19-1

Component Identification	Configuration/ System	Exam Source	Exam Type	Limiting Condition	Estimate of Exam Coverage	Basis for relief	Alternate Provisions
VRRB311-FW-A20	Weldolet-Pipe/Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%*	Examination performed to the maximum extent practical.	NONE
VRRB311-1-A	Pipe-Weldolet/ Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%*	Examination performed to the maximum extent practical.	NONE
VRRB311-2-B	Pipe-Weldolet/ Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%*	Examination performed to the maximum extent practical.	NONE
VRRB312-FW-B20	Weldolet-Pipe/ Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%*	Examination performed to the maximum extent practical.	NONE
VRRB312-10-B	Pipe-Weldolet/ Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%*	Examination performed to the maximum extent practical.	NONE
VRRB312-12-A	Pipe-Weldolet/ Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%*	Examination performed to the maximum extent practical.	NONE
VRRB312-3-A	Pipe-Weldolet/ Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%*	Examination performed to the maximum extent practical.	NONE
VRRB312-3-B	Pipe-Weldolet/ Reactor Recirculation	NUREG 0313	Vol	Component (Weldolet) Configuration	50%	Examination performed to the maximum extent practical.	NONE
DBB1181-1-A	Pipe-Sweepolet/ Feedwater	FSAR 6.6.8	Vol	Component (Sweepolet) Configuration	50%	Examination performed to the maximum extent practical.	NONE

*Axial scan 100%; Circumferential scan 0%.