

6.6 IN-SERVICE INSPECTION OF CLASS 2 AND 3 COMPONENTS

The construction permit for Susquehanna SES was issued in November 1973.

Based on the conditions listed in 10CFR50.55a(g), the mandatory pre-service inspection requirements, including provisions for design and access, are stipulated to be Section XI of the ASME B&PV Code effective six months prior to the date of issuance of the construction permit. For Susquehanna SES the code in effect would be the 1971 Edition including the Summer 1972 Addenda, which required inspection of the reactor coolant pressure boundary only.

The actual pre-service inspection for Susquehanna SES will be conducted in accordance with the requirements of the 1974 Edition of the ASME Code, Section XI, including Addenda through Summer, 1975 as modified by Appendix III to Winter 1975 Addenda and IWA-2232 of the Summer 1976 Addenda to the extent practical within the limitations of design and access provisions and the geometry and materials of construction of the component. Pre-service inspection of Class 2 integrally welded supports, Category C-E-I and pressure retaining bolting, category C-D, will be in accordance with ASME Section XI, 1977 edition including addenda through Summer 1978. Subsequent in-service inspections will be conducted in accordance with the requirements of 10CFR50.55a(g), also, on an "as practical" basis.

The initial in-service examinations conducted during the first 120 months will comply, to the extent practical, with the requirements of the ASME B&PV Code Section XI Edition and Addenda incorporated by reference in 10CFR50.55a(b) on the date 12 months prior to the date of issuance of the operating license, subject to modifications listed by the reference sections.

The in-service examinations conducted throughout the service life of the Susquehanna SES will comply, to the extent practical, with the requirements of the ASME B&PV Code Section XI Edition and Addenda incorporated by reference in 10CFR50.55a(b) 12 months prior to the start of the inspection interval, subject to limitations listed by the reference sections.

Details of the in-service inspection program intervals are contained in the approved In-service Inspection Program; these documents will be updated to reflect program commitments for subsequent intervals.

6.6.1 COMPONENTS SUBJECT TO EXAMINATION

The inspection requirements of ASME Code Section XI, Articles IWC-2000 and IWD-2000, will be met within the limitations of design and access provisions and the geometry and materials of construction of the component, for all Class 2 and Class 3 pressure retaining components except for components excluded under IWC-1220. Class 2 and Class 3 supports are examined in accordance with IWF-2000. Note that Code Case N-716-1 will be utilized for implementing the risk-informed inservice inspection program. The risk-informed program scope will be implemented as an alternative to the ASME Section XI examination program for Class 2 Examination Categories C-F-1 and C-F-2 welds in accordance with 10CFR 50.55a(z)(1). The risk-informed inservice inspection program has been expanded to include welds in the break exclusion region piping, also referred to as the high energy line break region, which includes several non-class welds that fall within the break exclusion region augmented inspection program. Additional guidance for

adaptation of the risk-informed inservice inspection evaluation process to break exclusion region piping is given in EPRI TR-1006937 Rev. 0-A.

6.6.2 ACCESSIBILITY

In-service inspection access to the ASME Code Class 2 and 3 components is provided in the design of the plant on an "as practical" basis. Pre-service inspections are provided to the "extent practical" within the limitations of design and access provisions for Code Class 2 and 3 components. Aside from providing normal access to components for installation, maintenance, and testing, the following provisions have been considered in the Susquehanna SES design:

6.6.2.1 Piping and Component Welds

Access envelopes have been considered for Class 2 components requiring volumetric and/or surface examinations. Weld contours and surfaces have been prepared for meaningful ultrasonic examination where required.

6.6.2.2 Insulation Removal

Class 2 piping or components requiring volumetric and/or surface examinations are equipped with removable insulation panels.

For Class 2 and Class 3 piping requiring a visual examination during system pressure tests that is not equipped with removable insulation, the visual examinations will be performed by inspecting the exposed surfaces and joints in component insulation to locate evidence of leakage and the floor areas (or equipment) directly underneath components for evidence of accumulated leakage that may drip from components.

For Class 2 and Class 3 piping requiring a visual examination during system pressure tests that is equipped with removable insulation, the visual examinations will be performed by inspecting the exposed surfaces for evidence of leakage.

6.6.2.3 Inaccessible Class 3 Piping

Piping located beneath the spray pond is embedded in concrete and is open-ended.

Piping of the ESW and RHRSW systems, running to and from the spray pond, is run underground.

Piping of the Fuel Pool Cooling Water system, running to the spent fuel pool, is embedded in the concrete of the reactor building refuel floor.

6.6.3 EXAMINATION TECHNIQUES AND PROCEDURES

In-service examination techniques and procedures used for Code Class 2 and 3 components will conform to the requirements of Subsection IWA-3100 of the governing Code edition and addenda.

6.6.4 INSPECTION INTERVALS

The ISI program schedule of required examinations to be completed in each inspection interval meets the requirements of IWC-2412 and IWD-2412 of Section XI.

6.6.5 EXAMINATION CATEGORIES AND REQUIREMENTS

ISI examination categories and requirements for ASME Class 2 and 3 components will be examined in accordance with IWC-2500, Table IWC-2500-1, IWD-2500, Table IWD-2500-1, and IWF-2500, and Table IWF-2500-1 of Section XI. Areas subject to examination and the extent of examination for Class 2 and Class 3 components comply with the requirements of Section XI on an "as practical" basis. Note that Code Case N-716-1 will be utilized for implementing the risk informed inservice inspection program. The risk-informed program scope will be implemented as an alternative to the ASME Section XI examination program for Class 2 Examination Categories C-F-1 and C-F-2 welds in accordance with 10CFR50.55a(z)(1). The risk-informed inservice inspection program has been expanded to include welds in the break exclusion region piping, also referred to as the high energy line break region, which includes several non-class welds that fall within the break exclusion region augmented inspection program. Additional guidance for adaptation of the risk-informed inservice inspection evaluation process to break exclusion region piping is given in EPRI TR-1006937 Rev. 0-A.

6.6.6 EVALUATION OF EXAMINATION RESULTS

Evaluation of examination results will be in accordance with IWA-3000, IWC-3000, IWD-3000, and IWF-3000 for ASME Code Class 2 and 3 components.

Repairs to, or replacement of components containing unacceptable indications will be performed in accordance with the requirements of IWA-4000 of Section XI.

6.6.7 SYSTEM PRESSURE TESTS

System pressure tests will meet the requirements of IWC-5000 and IWD-5000 of Section XI.

6.6.8 AUGMENTED IN-SERVICE INSPECTION TO PROTECT AGAINST POSTULATED PIPING FAILURES

The augmented in-service inspection program to provide assurance against postulated piping failures of high energy systems between containment isolation valves will be reviewed and implemented as described below. There are no guard pipes used to enclose high energy piping on the Susquehanna SES.

The following augmented inspection program applies to piping between the containment isolation valves for which no breaks are postulated;

For ASME III, Class I and 2 piping, the requirements of the applicable Code apply, with the exception that the extent of examination will be augmented such that 100% of the circumferential welds within the containment isolation boundary will receive 100% volumetric examination during

the first and second ten year inspection intervals. Commencing with the Third Ten Year Inspection Interval, the risk-informed break exclusion region program methodology, described in EPRI TR-1006937, Rev. 0-A, will be used to define the inspection scope in lieu of the 100% examination of all piping welds in the previous break exclusion region augmented program. Therefore, all welds in the original augmented program for the break exclusion region will be evaluated under the risk-informed inservice inspection program using an integrated risk-informed approach.

Volumetric examination of branch connections containing weldolets, half-couplings, and socket welds would not be meaningful due to the geometry of the branch connection and the small pipe sizes involved. Full coverage of the weld and required volume cannot be obtained. Therefore, surface examination will be performed on all branch to main run welds and all socket welds up to the first isolation valve on the branch line. All butt welds included in the branch piping up to the first isolation valve will receive full volumetric examination.

The inspection program will be performed, completely in accordance with ASME Section XI requirements, however, the extent of examination of ASME Section XI will be supplemented to comply with the augmented inspection program requirements outlined above.

Welds in piping 1" NPS and smaller are exempt from augmented in-service inspection as described above.

6.6.9 CONTAINMENT INSPECTIONS

On August 8, 1996, final rulemaking was published in the Federal Register (Volume 61, Number 154, Pages 41303-41312) to incorporate by reference Subsections IWE and IWL of the ASME Section XI Code into 10 CFR 50.55a. The effective date of this amendment was September 9, 1996. This rulemaking included several requirements in addition to those required in ASME Section XI and further required that a Containment Inspection Program be developed and implemented by September 9, 2001, five years following the effective date of the amendment.

This rulemaking specifies requirements to assure that the critical areas of the primary containment structure are inspected to detect degradation that could compromise its structural integrity and implement prescribed corrective actions accordingly.

ASME Section XI, Subsection IWE, defines the requirements for inservice inspection, repair, and replacement of Class MC (metal containment) pressure retaining components and their integral attachments, and of metallic shell and penetration liners of Class CC (concrete containment) pressure retaining components and their integral attachments. ASME Section XI, Subsection IWL, defines the requirements for inservice inspection and repair of reinforced concrete and replacement of post-tensioning systems of Class CC components. The amendment to 10 CFR 50.55a mandated the implementation of the 1992 Edition with the 1992 Addenda of Subsections IWE and IWL, including Subsection IWA for General Requirements, for the initial Containment Inspection Program interval.

Per 10CFR.50.55a(g), licensees are required to update their Containment Inservice Inspection Programs to meet the requirements of ASME Section XI once every ten years or inspection interval. The Containment Inservice Inspection Program is required to comply with the latest edition and addenda of the Code incorporated by reference in 10CFR50.55a twelve(12) months prior to the start of the interval per 10CFR50.55a(g)(4)(ii).

With the update to the Inservice Inspection Program for the Third Ten Year Inspection Interval for Class, 2 and 3 components, PPL has updated the Containment Inservice Inspection Program to its Second Interval. This update will enable all the Inservice Inspection Program components to be based on the same Edition and Addenda of ASME Section XI as well as share a common interval start date and end date.