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PERFORMANCE OF INSERVICE INSPECTION OF STEEL CONTAINMENT AND STEEL CONTAINMENT LINER LEAK CHASE CHANNEL SYSTEMS

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Purpose of Presentation

- Notify Industry of upcoming Information Notice (IN) discussing material degradation and lack of visual inspection of PWR steel containment/liner
- ASME Section XI, Subsection IWE is an existing program required by 10 CFR 50.55a that is also credited for aging management
  - GALL Report Chapter XI.S1 is one way to meet aging management requirements for license renewal

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Purpose of Information Notice

- Inform licensees about the steel containment and liner plate leak chase channel systems degradation that could impact the integrity of PWR containment structures
- Inform licensees of several instances where Subsection IWE has not been properly applied
- Identify and discuss the regulatory requirements for visual examinations and leak rate tests performed on the leak chase channel systems during the periods of current and extended licensed operations

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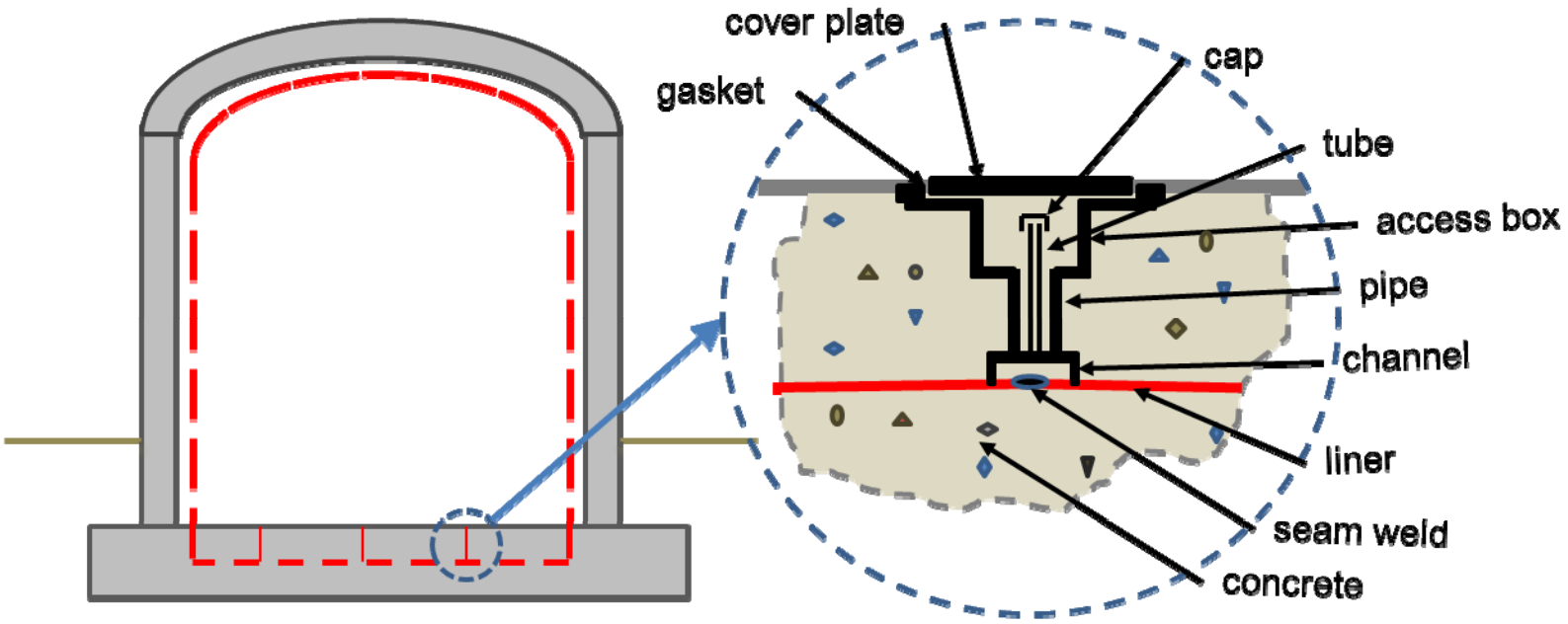
Steel Containment Shell and Liner Plate Leak Chase Channel System



- The bottom of the PWR steel containment shells or liner plates are embedded in a concrete slab.
- The containment shell/liner plate seam welds covered with channels are tested for leak tightness via tube connections.
- During plant operations caps are placed to prevent moisture and debris from entering the leak chase channel seam weld areas.

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Operating Experience

- Degraded conditions were identified in the leak chase channel systems at several plants (missing covers, corrosion, standing water, blocked channels)
- Leak chase channel systems for containment/liner not inspected consistent with ASME Code (100% visual is required)
- Leak chase channel covers not included as moisture barriers in IWE scoping
- Identification of the potential need for Augmented IWE examination

ASME Requirements for Inspection of Steel Containment and Liner Plate

- ASME Table IWE-2500-1, Category E-A, Item E1.30 requires a general visual examination of 100 percent of moisture barriers each inspection period
  - Some licensees failed to identify and implement required examinations of moisture barriers subject to this provision

ASME Code Requirements – Augmented Inspection

IWE-1240 SURFACE AREAS REQUIRING AUGMENTED EXAMINATION

IWE-1241 Examination Surface Areas

Surface areas subject to accelerated degradation and aging require the augmented examinations identified in Table IWE-2500-1, Examination Category E-C. Such areas include the following:

(a) interior and exterior containment surface areas that are subject to accelerated corrosion with no or minimal corrosion allowance or areas where the absence or repeated loss of protective coatings has resulted in substantial corrosion and pitting. Typical locations of such areas are those exposed to standing water, repeated wetting and drying, persistent leakage, and those with geometries that permit water accumulation, condensation, and microbiological attack. Such areas may include penetration sleeves, stiffeners, surfaces wetted during refueling, concrete-to-steel shell or liner interfaces, embedment zones, leak chase channels, drain areas, or sump liners.

10 CFR 50.55a(b)(2)(ix)(A)

"….requires that licensees shall evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could be indicative of or result in degradation of inaccessible areas."

Degradation of accessible areas of the leak chase system would require evaluation of inaccessible areas to ensure the integrity of the containment/liner seam weld

10 CFR Part 50 Appendix J Requirements

- For licensees committed to NEI 94-01 and ANSI/ANS 56.8 (industry guideline/standard endorsed in RG 1.163 for implementing Option B of Appendix J program):
  - General visual examinations of accessible surfaces of the containment system for structural deterioration that could affect the containment leak-tight integrity (i.e., containment liner seam welds) must be conducted prior to ILRT
  - These general visual examinations can be performed in conjunction with the ASME Section XI, Subsection IWE inspections

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GALL Report XI.S1 "ASME Section XI, Subsection IWE" Aging Management Program

- Condition Monitoring: Perform visual examinations with tools/methods (e.g., boroscope) on the embedded liner/seam weld areas within the leak chase channel systems
- Performance Monitoring: An alternative is to perform local leak rate tests (LLRTs) for loss of containment leak-tight integrity on the leak chase channel systems

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Actions

- NRC staff prepared draft IN
- NRC plans to issue IN by Q1/2014