Examination Guidelines and Integrity Assessment Guidelines Available on epri.com

- Implementation date August 31, 2017
- New philosophy
  - Integrity Assessment Guidelines will contain the guidance for inspection scope and frequency (First ISI and Subsequent ISI)
    - This began with Interim Guidance Letters that moved from prescriptive guidance in the Exam Guidelines to performance-based guidance in the Integrity Assessment Guidelines
  - Pre-service inspection (PSI) requirements for tubes, sleeves, plugs, other repairs remain in Exam Guidelines
  - Section 3.3 “SG ISI Requirements” now refers to plant Technical Specifications and the degradation assessment and operational assessment for ISI requirements (TSTF-449 detailed information has been removed)
NEI 03-08 Requirements in SGMP Guidelines

- Early revisions of the SGMP Guidelines predated NEI 03-08
  - Included “shall” requirements that met both the definition of needed and good practice elements of NEI 03-08
- SGMP guidelines contain many more needed elements than the other materials programs
- Recent revisions of guidelines include a review of the definitions of each element in NEI 03-08
  - Results in fewer needed elements and more good practice elements
Integrity Assessment Guidelines NEI 03-08 Needed Requirements – Changes from Rev 3 to Rev 4

- NEI 03-08 Elements in Revision 3
  - 2 Mandatory Elements
  - 97 Needed Requirements
  - 6 Good Practice Elements
    105 Total

- NEI 03-08 Elements in Revision 4
  - 2 Mandatory Elements
  - 70 Needed Requirements
  - 22 Good Practice Elements
    94 Total
Deletions of Needed Requirements in the Integrity Assessment Guidelines, Rev 4

- Eliminated redundant requirements
  - Example: the need to account for uncertainties
  - The requirement is now in Section 6 only

- Eliminated requirements that are contained in other documents
  - Examples:
    - Requirements for material properties are included in the Flaw Handbook
    - Requirements to plug degraded tubes are in Technical Specifications
    - The need to account for physical constraints is discussed in the In Situ Pressure Test Guidelines
    - Extension of techniques are discussed in the Examination Guidelines
Deletions of Needed Requirements in the Integrity Assessment Guidelines, Rev 4

- Deleted requirements that were administrative in nature
  - Examples:
    - Prior to each outage, the limiting leakage accident and allowable leakage value shall be confirmed
    - Requirements for monitoring and projecting secondary side conditions and developing long-term strategies
    - Training requirements for FOSAR crew
    - Entering plant data into the SGDD
    - Timing for DA, CM, and OA

- Deleted requirements that were instructional in nature
  - Examples:
    - When to evaluate a volumetric indication as circumferential
Deletions of Needed Requirements in the Integrity Assessment Guidelines, Rev 4

- Requirements for inspections for old issues that have been incorporated into utilities’ programs have been reduced to discussion or recommendations
  - Examples:
    - The listing of actions regarding failure of a plugged tube have already been completed by utilities. The list has been consolidated with no needed requirement
    - Inspection requirements for tubes within the tubesheet
    - Dispositioning PLPs

- Requirements for actions upon finding an unexpected degradation changed from needed to good practice

- Requirement to compare CM results to previous cycle OA changed to recommendation
  - Added more guidance
Deletions of Needed Requirements in the Integrity Assessment Guidelines, Rev 4

- Deleted requirements for actions upon detection of primary-to-secondary operational leakage other than performing a root cause analysis
  - Difficult to have requirements in this unpredictable situation. Changed the needed to recommendations

- Deleted requirements to include secondary side inspections in degradation assessments, and condition monitoring assessments
  - Added a needed requirement to document secondary side component degradation in the utilities corrective action program as a minimum
  - Added a needed requirement to establish an appropriate FOSAR interval in secondary side assessments
Deletions of Needed Requirements in the Integrity Assessment Guidelines, Rev 4

- Deleted the requirement to use Appendix I ETSSs as they become available
  - There is an ongoing effort to replace Appendix H ETSSs with Appendix I. This requirement is unnecessary

- Deleted the requirement to verify collector bar engagement in the low row tubes by eddy current.
  - It is believed that utilities have already done this. Left the statement that utilities have verified collector bar engagement.
Additional Requirements in the Integrity Assessment Guidelines, Rev 4

- Analysis procedures other than those specified in this document may be used but the technical basis shall be documented by the user.
- Added a recommendation to evaluate each area of the SG tube bundle with existing or potential degradation for the effect of noise.
  - New process needs vetting.
- Added a recommendation to evaluate AVB insertion depths in replacement steam generators built prior to 1985 for susceptibility to fatigue.
- Added requirements for plug inspections.
- Added recommendation to perform SG channel head visual inspections.
Additional Requirements in the Integrity Assessment Guidelines, Rev 4

- Added a recommendation to monitor the uppermost tube support for blockage
- Added requirement to determine appropriate accident-induced leakage limit
- Added a requirement and guidance for combining mechanisms in a probabilistic assessment
- Requirements for expanding ECT scope does not apply to foreign object wear
  - Added guidance
- Added requirement for initial sampling (20%) and expansion criteria – taken from the Examination Guidelines
Changes Made at the Integration Committee Endorsement Phase

- Clarified that proactive inspections are not subject to minimum sampling requirements
- The initial sampling plan of 20% was added
  - The DA may document the need for increased sampling
  - Appendix F provides guidance in defining sample plans
- Changed the note in Section 6.6.2, “Classification of Results”
  - New Note: In all inspections, previously degraded tubes must exhibit significant (>10%) further wall penetrations or growth greater than 25% of the repair limit to be included in the above percentage calculations. Growth rates are calculated on a per fuel cycle basis.
- Clarified that the expansion tables provide minimum expansion scopes; however, a larger expansion scope may be required to support the OA
  - Refers to Appendix F
Changes Made at the Integration Committee Endorsement Phase

- Added a bullet to the new section that provides guidance for evaluating eddy current indications

Determining an eddy current indication’s angular position in the tube can be accomplished by, but not limited to, placing a magnet or energized probe in an adjacent tube. For example, positioning a magnet probe into an adjacent tube near the area of interest, while scanning the signal with a rotating coil in the tube of interest, allows a determination of the angular position of the signal. This can also be accomplished by placing an energized array probe in an adjacent tube while scanning the signal with another array probe in the tube of interest, as the energized array probe creates crosstalk in the tube of interest.
Examination Guidelines NEI 03-08 Needed Requirements – Changes from Rev 7 to Rev 8

- **NEI 03-08 Elements in Revision 7**
  - 0 Mandatory Elements
  - Needed Requirements
    - 96 in the body
    - 19 in Appendix G
    - 6 in Appendix H
    - 17 in Appendix I
    - 6 in Appendix J
    - 5 in Appendix K
  - 149 Total

- **NEI 03-08 Elements in Revision 8**
  - 0 Mandatory Elements
  - Needed Requirements
    - 28 in the body
    - 17 in Appendix G
    - 6 in Appendix H
    - 15 in Appendix I
    - 6 in Appendix J
    - 4 in Appendix K
    - 20 in Appendix L
  - 96 Total
Examination Guidelines NEI 03-08 Needed Requirements – Changes from Rev 7 to Rev 8

- NEI 03-08 Elements in Revision 7
  - Good Practice Elements
    - 27 in the body
    - 1 in Appendix F
    - 34 in Appendix G
    - 13 in Appendix H
    - 4 in Appendix I
    - 20 in Appendix J
    99 Total
  - Needed + GPE = 248

- NEI 03-08 Elements in Revision 8
  - Good Practice Elements
    - 63 in the body
    - 1 in Appendix F
    - 34 in Appendix G
    - 16 in Appendix H
    - 5 in Appendix I
    - 20 in Appendix J
    - 12 in Appendix K
    - 9 in Appendix L
    - 4 in Appendix N
    164 Total
  - Needed + GPE = 260
Deletions of Needed Requirements in the Examination Guidelines, Rev 8

- Eliminated requirements that are contained in other documents
  - Example:
    - Material-specific inspection requirements are included in the Technical Specifications

- Eliminated redundant requirements
  - Example:
    - All automated data analysis requirements are now in Appendix L

- Changed needed requirements to good practices that are administrative in nature
  - Examples:
    - Requirements for data management tracking of inspection plans, having a closeout procedures and details for resolving discrepancies from a redundant data management system
    - Requirements for details for closeout
    - Data analysis feedback process
Deletions of Needed Requirements in the Examination Guidelines, Rev 8

- Requirements regarding old issues that have been incorporated into utilities’ programs have been reduced to discussion or recommendations
  - Examples:
    - Calibration standard designs
    - Voltage normalization
    - Site-specific analysis guidelines
    - Verification of data quality parameters
    - Utility verification of critical aspects of the SG inspection
Deletions of Needed Requirements in the Examination Guidelines, Rev 8

- Deleted all inservice inspection requirements
  - Moved to the Integrity Assessment Guidelines as more performance-based guidance
- Deleted requirement for additional testing of personnel following an interrupted service
  - Site-specific performance testing is sufficient
Additional Needed Requirements in Examination Guidelines, Rev 8

- Guidance on technique selection when multiple techniques are available
- Justifying extension of techniques applicability
- Use of MAPOD in Appendix I
- Automated data analysis
Additional Recommendations in Examination Guidelines, Rev 8

- Utility’s examination and engineering functions
- Guidance for sizing indications or performing historical comparisons
- Indications that require review by qualified data analysts
- New recommendations for measuring and monitoring noise
- Raw data formats
- New recommendations in Appendix I
- New recommendations in Appendix K to be consistent with Appendix G
- New recommendations in Appendix L
Summary

- EPRI SGMP Guidelines predated NEI 03-08
- Many of the requirements in existing guidelines meet the definition of both needed and good practice
- Revisions of SGMP guideline documents include a review of all NEI 03-08 elements to ensure they are consistent with definitions
- Many utilities implement both needed and good practice elements
- The guideline documents provide the elements for a conservative steam generator program
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