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Gurjendra S. Bedi, PE
Mechanical Engineering and Inservice Testing Branch
Division of Engineering
Office of Nuclear Reactor Regulation
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Topic for Discussion

- Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a Rulemaking Updates
- Rulemaking Regulatory Guide (RG) Update – OM Code Case Acceptability
- Fleet's Snubber Program Issues
- Clinton Power Station - Non-Cited Violation (NCV)
- Operating Experience at various plants
- Thirteenth ASME/NRC Pump & Valve Symposium
- Conclusion



10 CFR 50.55a Rulemaking Updates

- Last ASME Code Rulemaking issued on July 18, 2017 (Federal Register, Vol. 82, No. 136, page 32934-32986, dated July 18, 2017). This final rule is effective on August 17, 2017.
- Rulemaking incorporates by Reference the 2009 Edition through 2012 Edition of the American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code , and the 2009 Addenda through 2013 Edition of ASME Boiler and Pressure Vessel (B&PV) Code Section XI.
- For current 10 CFR 50.55a, see www.ecfr.gov



10 CFR 50.55a Rulemaking Updates (cont.)

- The scope of the next proposed rulemaking to amend 10 CFR 50.55a is currently planned to include 2015 and 2017 Editions to the ASME BPV Code section III, Division 1, and Section XI, Division 1 and ASME OM Code, Division 1 with conditions, and 2015 and 2017 Editions to the ASME OM Code, Division 1 with conditions.
- Specific items of interest in the proposed next rulemaking related to the ASME OM Code Edition 2017 being considered include:
 - Add NRC inservice testing (IST) Plan submittal and reporting requirements consistent with current Edition of the ASME OM Code.



10 CFR 50.55a Rulemaking Updates (cont.)

- Specific items of interest in the proposed next rulemaking related to the ASME OM Code Edition 2017 being considered include (cont.):
 - Revise 10 CFR 50.55a(f)(4)(i) and (ii) and (g)(4)(i) and (ii) to relax the time scheduled for complying with the latest Edition and Addenda of the ASME OM or BP&V Codes for IST and ISI Programs, respectively, from 12 months to 18 months before the applicable milestones in these paragraphs.
 - Streamline the reference to editions of the ASME OM Code in each condition to simplify future 10 CFR 50.55a rulemaking, and to update specific conditions to reflect the latest ASME OM Code editions.



10 CFR 50.55a Rulemaking Updates (cont.)

- ASME requested that the NRC delay this rulemaking to incorporate by reference the 2017 Edition to the ASME BPV Code, Section III, Division 1 and Section XI, Division 1.
- The NRC Rulemaking Steering Committee agreed to accommodate ASME's request. Therefore, this proposed rulemaking is now currently scheduled to be published for public comments in the mid-2018, with a 75 day public comment period. The final rulemaking package is currently scheduled to be published in mid-2019.



10 CFR 50.55a Rulemaking Updates – OM Code Case Applicability

- Final Reg. Guide Rulemaking & Reg. Guides 1.192, Rev. 2 “O&M Code Case Acceptability, ASME OM Code” and RG 1.147, Rev. 18, “Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1” are issued and published in Federal Register in January 2018 (Federal Register, Vol. 83, No. 11, Pages 2331-2354, dated January 17, 2018, 2014). Effective date is February 16, 2018.
- Revision 2 of RG 1.192, and Revision 18 of RG 1.147 address the acceptability of the Code Cases published in the 2012 Edition of the ASME OM Code and the Section XI Code Cases listed in Supplement 1 through 10 to the 2012 Edition of the ASME B&PV Code. The current regulations in 10 CFR 50.55a incorporate by reference these specific revisions to RGs.



10 CFR 50.55a Rulemaking Updates – OM Code Case Applicability (cont.)

- The use of Code Case OMN-15, Revision 2 is approved for the first time in RG1.192, Rev. 2 whereas Code Case OMN-13 was earlier approved under RG1.192, Revision 1.
- The NRC staff has completed a review of the new and revised code cases published with the 2015 Edition and 2017 Edition of the ASME OM Code. The proposed rulemaking and RGs for these code cases is currently scheduled to be published in March 2018, with a 60 day comment period. The final rulemaking and RGs for these code cases is currently scheduled to be published in August 2018.



Fleet's Snubber Program Issues

- NRC staff has observed that some of the fleets have developed a common Snubber Inservice Inspection and Testing Plan or Program for various plants (more than 14 plants) with the following:
 - Applicable 10-year ISI or IST intervals including start and end dates are not specified for plants
 - Various Editions & Addendas of ASME BPV, Section XI and ASME OM Code are used for various plants to develop common document
 - Use of 10% plan or 37 snubber plan specified without specifying which plant is using 10% plan or 37 snubber plan
 - No guidelines provided to develop a separate Defined Test Plan Group (DTPG) for Large Bore snubbers attached to steam generator and reactor coolant pumps, as required by the ASME OM Code Subsection ISTD-5253



Fleet's Snubber Program Issues (cont.)

- Snubber Program Plan states that Code Case OMN-13 may be used to extend the visual examination, if applicable conditions are met (without specifying which plant is using OMN-13).
- Code Case OMN-13, Revision 1, Section 3.7(b) is ignored. If the cumulative number of unacceptable snubbers exceeds the applicable values in Table ISTD-4252-1, the use of Code Case OMN-13 ends.
- Fleet's combined snubber program cover sheet shows as snubber program, whereas inside the document it states snubber procedure.
- All the above items will create confusion for the snubber program owners, users, and as well as for the NRC inspectors.



Clinton Power Station - Non-Cited Violation

- Clinton Power Station (CPS) committed to ASME OM Code, Subsection ISTD for snubber inservice examination and testing.
- In September 2017, NRC inspectors selected a mechanical snubber failure condition reports for in-depth review at CPS.
- NRC inspectors identified a finding of low safety significant and associated Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the licensee’s failure to demonstrate compliance with the requirement as prescribed in plant procedure ER-CL-330, “CPS Snubber Program,” Revisions 1 and 2. (ADAMS Accession No. ML17313A039)



Clinton Power Station - Non-Cited Violation (cont.)

- NRC inspector discovered that for three continuous refueling outages (2013, 2015 & 2017), the licensee failed to perform engineering evaluations to determine the cause of failure of snubbers that did not satisfy their functional testing acceptance criteria.
- The CPS Snubber Program is governed by Clinton Plant Procedure ER-CL-330, which established the requirements for activities including inservice testing and data evaluation. CPS Procedure ER-CL-330, Section 7.1.2 states, in part, that “[..] If a snubber fails to satisfy the acceptance criteria of an operational readiness test, then an engineering evaluation of the failed snubber shall be performed within 72 hours to determine the cause of the failure [.....].”



Clinton Power Station - Non-Cited Violation (cont.)

Summary:

- Snubber failure evaluation during inservice functional testing must have two parts:
 - Evaluation to determine the cause of the snubber failure, and
 - Evaluation to determine the effect to the piping components supported by the failed snubber.
- The CPS failed to determine the cause of the snubber failure.
- There is no operability concern because, as part of their corrective actions, the licensee evaluated the components affected by the failed snubbers. Further, CPS replaced the failed snubbers with fully functional ones to restore the affected piping systems to original design configuration.



Plant A - Operating Experience

- Event Summary:
 - In 2015, During a Unit 2 refueling outage and the month prior activities at Plant A, nine snubbers (mechanical & hydraulic) on main steam (MS) and turbine generator (TG) lines failed their functional test. This resulted in scope expansion of functional tests, replacement of failed snubbers, and repair cost.



Plant A - Operating Experience (cont.)

- Apparent Cause Summary:
 - The cause of the failure is determined to be main steam and turbine generator piping elevated vibration. Elevated vibration over time has caused functional tests failures in several mechanical and hydraulic snubbers.
 - An organization and Programmatic review was performed and identified that “Lack of Program Monitoring” as a dominant failure mode. An adverse trend of snubber failures (mechanical & hydraulic) has been occurring associated with excessive vibrational forces.
 - This vibration problem has been well documented in corrective actions but not fully addressed in snubber program (i.e. changing service life, increasing maintenance).

Plant A - Operating Experience (cont.)

- Results Summary:
 - Lack of Program Monitoring. The ongoing monitoring of program implementation does not detect and response to implementation gaps (i.e. monitoring does not occur, monitoring is not completed with quality, management does not have skills need to reinforce desired behavior). The following evidence supports:
 - An adverse trend in mechanical snubber test failures is occurring due to excessive vibration.
 - Service life of hydraulic snubbers is impacted due to seal failures and loss of fluid due to excessive vibration.
 - Lack of proper implementation service life monitoring (ISTD-6000)

Plant A - Operational Experience (cont.)

- Results Summary (cont.):
 - Lack of Program Evaluation Process. This failure mode is described a situation where a program has repetitive implementation gaps. In this case no periodic assessment of the assessments do not detect implementation gaps. The following evidence supports this:
 - No record of self-assessment within last 5 years.
 - Replaced 8 mechanical snubbers with hydraulic snubbers based on high rate failures on MS line, whereas the cause is excessive vibration.
 - Large bore mechanical continued to fail functional test.
 - Snubber Maintenance practices overlooked vibration.



Plant A - Operational Experience (cont.)

- Results Summary (cont.):
 - Lack of Responsibility, Authority, Accountability. This failure mode is described a situation where the organization assigned to implement or oversee a program lacks the structure, authority, or accountability to effectively implement the program. The following evidence supports this:
 - Ownership of the Snubber Program has frequently changed with three persons filling the position over a 10 year IST/ISI interval.
 - Snubber Program Owner is assigned multiple jobs assignment in areas outside snubbers.
 - There is no backup owner.
 - Snubber testing and maintenance is based on what is required, not what is desired.



Plant B - Operating Experience

- Event Summary:
 - At Plant B, due to Feedwater system vibration, several mechanical snubbers were replaced with enclosed hydraulic snubbers to improve service life in 2014 .
 - During a walkdown on September 12, 2015, a broken feedwater snubber was identified. This was reported to control room and unplanned limiting condition for operation (LCO) was entered. Engineering evaluation of FW line was performed assuming inoperable snubber (removed) and found acceptable. LCO was exited. A new enclosed hydraulic snubber was later installed with original extension piece and a new collar with full set of threads welds on. On September 18, 2015, the snubber was declared operable.



Plant B - Operating Experience (cont.)

- Apparent Cause Summary:
 - The cause of the failure is determined that the snubber was installed without adequate thread engagement.
 - Work order instructions were lacking in details and were not planned in accordance with procedure.
 - Lack of information regarding installation and removal procedures of hydraulic snubbers.



Plant C - Operating Experience

- Event Summary:
 - Upon completion of NRC 4th quarter 2014 inspection, the site received an NRC noncited violation (NCVs) with Cross Cutting Aspects (CCA) of H.13, Consistent Process- Individual use a consistent, systematic approach to make decisions. The site received four NCVs with in 12-month period. One of the NCV finding was related to snubber 2014-005-01 (4Q2014), Cornerstone Mitigating Systems, Failure to Accomplish Procedure for Leaking Pipe Snubber, CR 2010686- May 2014.



Plant C - Operating Experience (cont.)

- Apparent Cause Summary:
 - Root Cause : Maintenance Procedure for snubbers was deficient for rebuilds that performed during RF023. Incorrect torque values and in sufficient detail contributed to several snubbers having leaks.
 - Contributing Cause : The CR documented an oil leak with a snubber, the initiator provided limited technical data within the CR that operations used as a basis for determining the snubber was functional. The CR was incorrectly closed to the WR that was generated to add oil. A degraded condition existed and station failed to evaluate functionality of the snubber.



Plant C - Operating Experience (cont.)

- Apparent Cause Summary (cont.):
 - Factor 1 (People/Organizational): The CR was incorrectly closed to the WR that was generated to add oil. A degraded condition existed and station failed to evaluate functionality of the snubber.
 - Factor 2 (Programmatic) Maintenance Procedure for snubbers was deficient for rebuilds that performed during RF023. Incorrect torque values and in sufficient detail contributed to several snubbers having leaks.



Plant D - Operating Experience

- Event Summary:
 - In 2015, it was discovered that design calculation were not updated to reflect the snubber replacements implemented during the Plant D, Unit 1, 18th refueling outage and scheduled for replacement during Plant D, Unit 2, 17th refueling outage.



Plant D - Operating Experience (cont.)

- Apparent Cause Summary:
 - The project of replacement of all expiring mechanical snubbers with hydraulic snubbers was characterized as a low-complexity major project per the applicable plant's Project Management procedures.
 - A Project Lead (Snubber Engineer) was assigned to implement the project rather than a Project Manager, because of the project's low complexity.
 - The Project Lead failed to issue an action for Design Engineering to update the affected calculations



Plant D - Operating Experience (cont.)

- Apparent Cause Summary (cont.):
 - Following causes were identified:
 - Cause 1: Did not use and adhere to all requirements of implementing Pre-Engineering Specification.
 - Cause 2: Roles and responsibilities of the Project Lead were not understood.
 - Cause 3: Leadership did not enforce use and adherence of all requirements of the Implementing Pre-Engineering Specification.
 - Cause 4: Specification detailing Snubber Replacement Project implementation is not stand alone document.



Thirteenth ASME/NRC Pump & Valve Symposium which included Snubber

- The ASME and the NRC jointly sponsored the thirteenth Pump & Valve Symposium July 17-19, 2017, In Silver Spring, Maryland, at the Double Tree by Hilton Hotel Washington DC – Silver Spring.
- Participants reported that symposium was highly successful in providing significant technical and regulatory information for use at the operating and new power plants.
- ASME has offered to include the symposium papers on its website. Therefore, the NRC staff will not issue a NUREG collection of the symposium.



Thirteenth ASME/NRC Pump & Valve Symposium which included Snubber (cont.)

- Following Snubber papers were presented during snubbers track:
 1. Snubber Program Transition from ISI Code to IST Code, ISTD
 2. Delivering the Nuclear Promise in Snubber ISI and IST Through Effective Use of the O&M ISTD Code
 3. Inservice Examination and Testing Issues of Snubbers at Nuclear Power Plants

Conclusions

- Licensees who believe that some of the items discussed are applicable to their facilities may wish to review their current snubber program and modify their program as appropriate.



Questions?

Gurjendra.Bedi@nrc.gov

Phone: 301-415-1393