**RESPONSE TO PUBLIC COMMENTS ON DRAFT STANDARD REVIEW PLAN SECTION 14.3.3, PIPING SYSTEMS AND COMPONENTS – INSPECTIONS, TESTS, ANALYSES AND ACCEPTANCE CRITERIA**

On September 11, 2017, a Notice of Opportunity for Public Comment was published in the Federal Register (82 FR42709) on the proposed revision to NUREG-0800, Standard Review Plan (SRP), Section 14.3.3,Piping Systems and Components – Inspections, Tests, Analyses, and Acceptance Criteria. Comments were received from:

Unknown Commenter

Nuclear Energy Institute
1201 F Street, NW, Suite 1100
Washington, D. C., 20004

The comments can be found in ML17312A276 and ML18081A241 respectively.

The NRC's staff review and disposition of the comments are provided in the following table.

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| 1 | General | Nearly 8 million acres have burned in 2017, such wildfires will release thousands of tons of greenhouse gas emissions and other harmful air pollutants." impact of wildfires on the atmosphere. After smoke from the Chetco Bar Fire forced the Ashland Shakespeare Festival to cancel performances last month due to smoke and haze, Rep. Greg Walden declared, "Enough is enough." Newspaper report, 2007 said California wildfires pumped nearly 8 million metric tons of climate-warming carbon dioxide into the atmosphere, nov 29 201\6 Wildfire smoke can result in significant air quality impacts to_ public health. Then we have 2017 wildfire again. Another report from Scientists study estimated that Fires in US release millions | Comment is out of scope. No revisions to the SRP were made. |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | metric tons of carbon dioxide per year. Wildfires can produce more greenhouse gas (GHG) emissions then gas and oil, therefore we should manage forest better by stopping the regulations against clear cutting to help prevent co2 from mass wildfires in western states. US Forest service page; fuels buildup to unnatural levels and forests become overcrowded. This led to forests being more susceptible to insects and disease outbreaks, but also to unnaturally large fires on the landscape. Another report:, "Forest fires may produce as. much co2 as half of all fossil-.fuels burned", U~ orest Service page, 2015 Pacific Northwest wildfire season Washington 130,000 tons Oregon 90,000 tons of fine particulate matter The greenhouse gas emissions alone were equivalent to more than 8.5 million passenger vehicles driven for a year or heating 3. 7 million homes. government charge or fine califomia for Co2 wildfire pollutants? US forest service page wildfire report on 2015 year reported on greatest threat to many endangered species and their habitat is catastrophic WILDFIRE leads to susceptible to insects and disease outbreaks ... MUST do thinning forest to protect habitat and more resistant to insect predation. concentration of trees and underbrush amounts to 45 tons of dry fuel per acre, potential for catastrophic fire ..... Currently, even utility crews must receive Congressional approval before preforming regular maintenance or the repairing of damaged power lines. When a right-of-way is not properly maintained, a tree can grow into or fall on to a power line, causing fires . 201 7 Mr | |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | Secretary Zinke accumulation and thickening of vegetation exacerbates fuel conditions and often leads to larger and higher-intensity fires," .. · ... 2015 USFS Chief Dave Bosworth Said, "We Do Not Have A Fire Problem On Our Nation's . Forests; We Have A Land Management Problem" LITIGATION has had a profound impact on mismanagement of our national forests, Need to update or repeal the Equal Access to Justice Act (EAJA) of 1980, subsection of EAJA, codified at 28 U.S.C. 2412(d) section 2412 (b). | |
| 2 | II.1 – Generic Piping Design, p. 6 | This section describes the five ITAAC that relate to piping design. Consistent with the subsections under Verification of Components and Systems, the SRP should identify the NRC-proposed standard ITAAC. | The NRC staff will reformat the ITAAC description as suggested by NEI. |
| 3 | II.2.C – Hydrostatic Test, p. 10 | Consistent with other sections of this SRP, this section should identify the NRC-proposed standard ITAAC language for hydro testing. | As discussed in paragraph II.2.C, “Pressure Test,” in SRP Section 14.3.3, the NRC staff has not proposed a standardized ITAAC for pressure testing of piping systems. The pressure test is typically addressed as part of the standard ITAAC for ASME BPV Code, Section III, Code Class 1, 2, and 3 Data Reports discussed in paragraph II.1, “Generic Piping Design.” In addition, instances of the phrase “hydrostatic test” have been replaced with the more generic phrase “pressure test” to include the option of pneumatic testing in accordance with ASME BPV Code requirements. |
| 4 | II.2.C – Hydrostatic Test, p. 10 | Editorial – the word “also” in the second sentence lacks context. | The NRC staff will make the editorial change as suggested by NEI. |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| 5 | II.2.D – Equipment Seismic and Dynamic Qualification, p. 10 | It is a general principle of ITAAC and historical practice that Acceptance Criteria should not refer to industry codes and standards or NRC regulatory guidance. Instead, references to codes, standards and regulatory guidance are provided in Tier 2 of the DCD along with related design information. Acceptance Criterion (i) for seismic EQ violates this principle/practice as well as specific guidance provided in Section II.1 of this SRP under "Regulations, Codes and Standards." That guidance states that references to Codes and Standards should be minimized and identifies references to the ASME BPV Code as an exception. | The NRC staff disagrees with the NEI recommendation. In design certification reviews, the NRC staff has considered the seismic qualification methods and standards to be Tier 1 information, but has allowed applicants to specify this information as Tier 2* in design certification rulemaking. To minimize the use of Tier 2* as discussed in Commission Paper SECY-17-0075, the NRC staff has provided guidance in SRP Section 14.3.3 to specify IEEE 344-2004 and ASME QME-1-2007 (as accepted in RG 1.100, Revision 3) in the ITAAC description to eliminate the need for this Tier 2* item in the design certification rulemaking. An applicant may propose alternative ITAAC to address the Tier 1 information for seismic qualification methods and standards. For example, the applicant might include a table in Tier 1 specifying the seismic qualification methods and standards. |
| 6 | II.2.D – Equipment Seismic and Dynamic Qualification, p. 10 | The format of this section makes it hard to discern that there are two Acceptance Criteria for seismic EQ. | The NRC staff will reformat the ITAAC description consistent with descriptions of other ITAAC in SRP Section 14.3.3. |
| 7 | II.2.D – Equipment Seismic and Dynamic Qualification, p. 11 | Starting from, "In some instances, …" the paragraph becomes confusing and adds little value beyond the discussion already presented. For example, there is a reference to "basic configuration ITAAC" in SRP 14.3, App. D, that does not exist. In addition, the discussion of Tier 2* information does not reflect updated NRC practice in the wake of SECY-17-0075. Furthermore, as discussed in Comment [5], | The NRC staff agrees with NEI that the reference to a basic configuration ITAAC might be confusing and will delete "basic configuration" from paragraph II.2.D, "Equipment Seismic and Dynamic Qualification." In addition, the staff will clarify the discussion of Tier 2* information at the end of the paragraph. The staff discusses the ITAAC references to ASME QME-1-2007 and RG 1.100 (Revision 3) for seismic qualification |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | above, it is inappropriate to suggest that references to ASME QME-1 and RG 1.100 should be included in ITAAC. | methods and standards in response to Comment 5. |
| 8 | II.2.F.1.a – Pump and Valves, p. 12 | Refer to Comment [5], above, concerning avoiding reference in ITAAC to industry codes and standards or NRC regulatory guidance. The requirement that Functional Qualification Reports be prepared in accordance with ASME QME-1/RG 1.100 is appropriate to include in Tier 2 of the DCD. | The NRC staff disagrees with the NEI recommendation to remove the reference to ASME Standard QME-1-2007 from the guidance in SRP Section 14.3.3 for ITAAC for pump and valve qualification. The NRC staff has considered the qualification of power-operated valves and/or motor-operated valves in new reactors to be Tier 1 information based on lessons learned from inadequacies in the design and qualification of valves in current nuclear power plants. Rather than Tier 1 requirements, the staff has allowed design certification applicants to specify this information as Tier 2* in the design certification rulemaking. To minimize the use of Tier 2* information consistent with Commission Paper SECY-17-0075, SRP Section 14.3.3 provides guidance to address the qualification of pumps and valves in ITAAC by specifying the acceptable methodologies provided in ASME Standard QME-1-2007 as accepted in RG 1.100 (Revision 3). An applicant could propose an alternative method to the guidance in SRP Section 14.3.3 to address this Tier 1 information. For example, the applicant might include a table in Tier 1 specifying the pump and valve qualification standards. |
| 9 | II.2.F.1.a – Pumps and Valves, p. 13 | The discussion of Tier 2* information does not reflect updated NRC practice in the wake of SECY-17-0075. Moreover, it is inappropriate to suggest that references to ASME QME-1 and | The NRC staff disagrees with the NEI recommendation to delete the last two sentences under subparagraph (a) of paragraph II.2.F.1. Commission Paper SECY-17-0075 states that based on consideration of the advantages and |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | RG 1.100 should be included in ITAAC. Refer also to Comment [7], above. | disadvantages of the potential alternatives, the NRC staff intends to continue use of the Tier 2* designation in design certifications. Therefore, the NRC staff guidance in SRP Section 14.3.3 is consistent with the NRC staff position in SECY-17-0075. As discussed in response to Comment 8, the NRC staff has considered the qualification of power-operated valves and/or motor-operated valves in new reactors to be Tier 1 information based on lessons learned from inadequacies in the design and qualification of valves in current nuclear power plants. Rather than Tier 1 requirements, the staff has allowed design certification applicants to specify this information as Tier 2* in the design certification rulemaking. To minimize the use of Tier 2* information, SRP Section 14.3.3 provides guidance to address the qualification of pumps and valves in ITAAC by specifying the acceptable methodologies provided in ASME Standard QME-1-2007 as accepted in RG 1.100 (Revision 3). An applicant could propose an alternative method to the guidance in SRP Section 14.3.3 to address this Tier 1 information. For example, the applicant might include a table in Tier 1 specifying the pump and valve qualification standards. |
| 10 | II.2.F.2 – Pump and Valve Preop Testing, p. 14 | Editorial:<br>Add “pumps and” so the second sentence reads:<br>“…for verification of the performance of these pumps and valves.” | The NRC staff will include this editorial correction. |
| 11 | II.2.F.2.b.i, iii, iv – Valve Preop Testing, p. 15-16 | There is no basis in NRC regulations or NRC guidance to require preoperational diagnostic test data to correlate valve test results to valve | The NRC staff disagrees with the NEI recommendations to delete diagnostic data from the ITAAC for valve preoperational testing, and to |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | design basis capability. This has not been a requirement in either Tier 1 or Tier 2 of any previous DCD. As indicated by the vague requirement for "sufficient" diagnostic data, there is no approved methodology for correlating preop results to design basis capability. Moreover, an Acceptance Criterion that requires "sufficient" data violates the key tenet that ITAAC be clear and objective with respect to demonstrating Acceptance Criteria are met. | delete the requirement for analyses correlating preoperational test results to design-basis capability. ASME Standard QME-1-2007 establishes the qualification requirements to demonstrate the functional capability of the valve actuator assembly over the full range of pressure, temperature, and flow conditions using diagnostic data. ASME QME-1-2007 also requires post-installation verification and IST baseline testing under representative fluid conditions to collect diagnostic data to verify the production valve assembly meets the functional requirements of the Qualification Specification. The guidance in SRP Section 14.3.3 describes an acceptable ITAAC for valve preoperational testing that will satisfy the provisions in ASME Standard QME-1-2007 for post-installation testing. The staff accepts the NEI recommendation to delete the word "sufficient" as not necessary in the ITAAC requirement. |
| 12 | II.2.G – Installed Configuration, p. 17 | The Installed Configuration ITAAC envisioned by this SRP is ambiguous, unbounded, unverifiable, and completely unnecessary. It is redundant to other ITAAC that provide reasonable assurance that SSCs are properly installed and will operate as designed. It is also redundant to the Quality Assurance Program which is approved and overseen by the NRC and assures that quality-related activities associated with plant design, procurement, fabrication, construction, testing (including use of appropriate and calibrated tools) and operation are implemented properly and in accordance with licensee procedures, applicable codes and standards and NRC regulations. QAP | The NRC staff disagrees with the NEI recommendation to delete paragraph G in SRP 14.3.3 describing the Installed Configuration ITAAC. The NRC regulations in 10 CFR 52.80, "Contents of applications; additional technical information," require in paragraph (a) that a combined license (COL) application must contain the proposed inspections, tests, and analyses, including those applicable to emergency planning, that the licensee shall perform, and the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will be operated in conformity with |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | implementation as well as turnover and commissioning testing confirm the proper configuration and performance of systems. ITAAC and the QAP have distinct, yet complementary roles. While the QAP assures the proper implementation of quality-related activities, ITAAC focus on verifying that as-built SSCs satisfy the top level design and performance standards specified in the COL. The envisioned Installed Configuration ITAAC would not maintain the vital distinction between the roles of ITAAC and the QAP and significantly expand the scope of Tier 1 and ITAAC to include matters that have historically, effectively and appropriately been addressed in Tier 2.<br><br>Inclusion of this ITAAC would negate the extensive efforts expended to ensure the clarity and focus of every other ITAAC, as well as the important distinction between verifying the top-level design and performance characteristics of Tier 1 versus the balance of design information in Tier 2. The unbounded nature of this ITAAC renders it essentially unverifiable under the ITAAC closure process. This is precisely the reason for the distinction between ITAAC and the QAP and the why the ITAAC process relies upon – and does not repeat – QAP activities that assure the proper implementation of quality-related activities.<br>For these reasons, no functional arrangement, installed configuration, or similar ITAAC is included in the standardized ITAAC developed for use by KHNP, NuScale or future design | the COL, the provisions of the Atomic Energy Act, and the NRC's rules and regulations. This regulation requires the licensee to implement ITAAC that verify that the nuclear power plant was built in accordance with the certified design and will be operated safely. The licensee's completion of the Installed Configuration ITAAC (also referred to as Functional Arrangement ITAAC) will verify that the installation of the nuclear power plant components and piping is consistent with the requirements specified in the final safety analysis report. Other ITAAC focus on attributes of specific components (such as structural integrity or operation) or systems (such as flow rates or hydrostatic testing), but do not verify that the installation aspects (such as component orientation and piping slope) have been completed in accordance with the certified design requirements. Therefore, the Installed Configuration ITAAC are part of the overall set of ITAAC used to verify that the nuclear power plant is constructed and will operate in accordance with the COL. The NRC will rely on its sample inspections of the licensee's completion of the Tier 1 ITAAC, including the Installed Configuration ITAAC, to support the NRC finding in 10 CFR 52.103(g). To verify that the licensee has completed the ITAAC required by 10 CFR 52.80, multiple inspections under NRC Inspection Manual Chapter (IMC) 2503, "Construction Inspection Program: Inspections of Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Related Work," will be conducted to sample the licensee's activities to verify the installed configuration or functional arrangement of plant systems consistent with those ITAAC. For |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | certification applicants, and none should be called for anywhere in SRP 14.3. | example, AP1000 ITAAC Family 14A, "As-Built Complex Systems with Multiple Components," includes functional arrangement ITAAC for the Reactor Coolant System (RCS) in ITAAC 2.1.2.1, Passive Core Cooling System (PXS) in ITAAC 2.2.3.1, and Protection and Safety Monitoring System (PMS) in ITAAC 2.5.2.1. The primary IMC 2503 inspection procedures for this ITAAC family include Inspection Procedure (IP) 65001.A, "ITAAC Attributes for As-Built Inspection," IP 65001.03, "Inspection of ITAAC-Related Installation of Piping," IP 65001.06, "Inspection of ITAAC-Related Installation of Mechanical Components," IP 65001.07, "Inspection of ITAAC-Related Installation of Valves," IP 65001.10, "Inspection of ITAAC-Related Installation of Instrument Components and Systems," and IP 65001.14, "Inspection of ITAAC-Related Installation of Complex Systems with Multiple Components." For example, IP 65001.A specifies that the inspector will verify that the licensee has approved implementing procedures that describe administrative controls, work processes, and inspection requirements; and will observe work activities to verify that the construction and installation work is being accomplished under controlled conditions and in conformance with design requirements. The inspection of the as-built characteristics will include verification of location, alignment, orientation, dimensions, and functionality. IP 65001.06 addresses installation of mechanical components, including installation requirements, removal of packing material, use of special tools, correct work procedures, and lifting and rigging. Also, IP 65001.07 addresses |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | | installation of valves, including verification of Code nameplate requirements, check valve diversity, and orientation of valve and actuator. The licensee QA program and NRC QA inspections might overlap in some respects with, but cannot replace, the Installed Configuration ITAAC because the QA program and associated inspections do not verify all of the items to be addressed by the completion of those ITAAC. The NRC staff has established the ITAAC inspection process for the Vogtle Units 3 and 4 AP1000 nuclear power plant to include sample inspections to verify the completion of the Installed Configuration (or Functional Arrangement) ITAAC. Contrary to the NEI position, the NRC staff considers this ITAAC to be necessary to verify the installed configuration of the applicable components and systems, based on the NRC inspection procedures and guidance provided to NRC inspectors. However, the staff agrees with NEI that the Installed Configuration ITAAC should be modified to focus on the geometric installation features of the applicable components and systems. Therefore, the staff will revise SRP Section 14.3.3 to update the guidance for the preparation of the Installed Configuration ITAAC. |
| 13 | II.2.H – RTNSS, p. 17 | Existing guidance and practice makes clear that Tier 1 and ITAAC must cover the entirety of the SSCs within the scope of the certified design (an essentially complete design), and that the level of detail provided in Tier 1 is based on a graded approach, including both safety-related and safety-significant SSCs. Thus RTNSS SSCs are already considered and evaluated for inclusion in Tier 1/ITAAC as appropriate, and it is | The NRC staff disagrees with the NEI recommendation to delete paragraph H on the ITAAC for RTNSS equipment. SECY-90-016, "Evolutionary Light Water Reactor (LWR) Certification Issues and their Relationship to Current Regulatory Requirements;" SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs;" SECY-94-084, "Policy and |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | unnecessary and potentially confusing to add SRP guidance calling for ITAAC on equipment within the scope of the RTNSS program. | Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs;" and SECY 95-132, "Policy and Technical Issues Associated with the Regulatory Treatment of Non Safety Systems (RTNSS) in Passive Plant Designs (SECY-94-084)," discuss the Commission policy and technical issues associated with RTNSS equipment in new passive nuclear power plant designs. These Commission papers indicate that some new nuclear power plants have ALWR designs that use passive safety systems that rely on natural forces, such as density differences, gravity, and stored energy to supply safety injection water and to provide reactor core and containment cooling. The papers note that active systems in passive ALWR designs are categorized as non-safety systems with limited exceptions. Active systems in passive ALWR designs provide the first line of defense to reduce challenges to the passive systems in the event of a transient at the nuclear power plant. Active systems that provide a defense-in-depth function in passive ALWR designs need not meet all of the acceptance criteria for safety-related systems. The Commission papers specify that there should be a high level of confidence that these active systems will be available and reliable when needed. Therefore, design certification applications should include ITAAC for RTNSS equipment consistent with the Commission policy for nuclear power plants with passive core cooling systems. With respect to the specific NEI comment, the staff has found that public meeting discussions of standardized ITAAC focus on safety-related SSCs whereas nonsafety-related |

| No. | Reference | Comment Submission | NRC Resolution |
|---|---|---|---|
| | | | SSCs with high safety significance (such as RTNSS equipment) are often omitted during those discussions. To avoid confusion by applicants during the development of proposed ITAAC, the staff considers that SRP Section 14.3.3 should include guidance to provide assurance that design certification and COL applicants are aware that ITAAC need to address nonsafety-related SSCs with high safety significance in addition to ITAAC for safety-related SSCs. |
| 14 | II.2.I – DRAP, p.17 | During discussions on development of standardized ITAAC, NRC concluded that DRAP ITAAC was not necessary in future design certifications and would not be included as a standard ITAAC. Agreement that DRAP should be addressed as a Tier 2 matter only was based in part on experience indicating that implementing DRAP ITAAC for AP1000 has provided little or no value. This SRP should be revised to reflect this conclusion. | The NRC has not adopted the position that DRAP ITAAC are not necessary. The content of this SRP is consistent with current agency position, so the content will remain unchanged. |