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Approval of American Society of Mechanical Engineers' Code Cases; Proposed Rule

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Comment on FR Doc # 2021-00890

## Submitter Information

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## General Comment

See attached file(s)

## Attachments

04-01-21_Letter to NRC with Industry Comments on Draft RGs 1_147 1_84 and 1_192

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NUCLEAR ENERGY INSTITUTE

April 1, 2021

Secretary, U.S. Nuclear Regulatory Commission
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemakings and Adjudications Staff

**Project Number: 689**

**Subject:** NEI Comments on Draft Regulatory Guides

1. DG-1366, Proposed Revision 39 to RG 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III;"
2. DG-1367, Proposed Revision 20 to RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1;" and
3. DG-1368, Proposed Revision 4 to RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code;" FRN 2021-00890; Docket ID NRC-2017-0025.

*Submitted via regulations.gov*

Dear Rulemakings and Adjudications Staff,

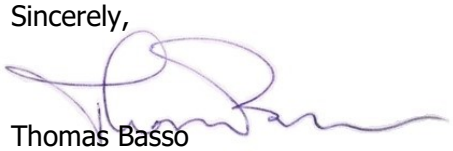
The Nuclear Energy Institute (NEI)[1], on behalf of our members, appreciates the opportunity to provide comments on the Draft Regulatory Guides DG-1366, DG-1367, and DG-1368 on the subject Proposed Revisions to Regulatory Guides 1.84, 1.147 and 1.192 correspondingly. These regulatory guides list the code cases for ASME Section III, Section XI-Division 1, and the OM Code, that the U.S. Nuclear Regulatory Commission (NRC) has approved for use as voluntary alternatives to the mandatory referenced Code provisions that are incorporated by reference into Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." We support the agency's diligence in maintaining the routine approval of ASME Code Cases which provides the industry the opportunity to implement the improvements and efficiencies developed by the various code committees through the standards development organization consensus process.

[1] The Nuclear Energy Institute (NEI) is responsible for establishing unified policy on behalf of its members relating to matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect and engineering firms, fuel cycle facilities, nuclear materials licensees, and other organizations involved in the nuclear energy industry.

In our review, we include several comments on conditions being applied to code cases that add unnecessary implementation burden, reducing or in some cases defeating the utility of an alternative. The specific comments for each draft regulatory guide are provided on separate attachments: Attachment 1 for Draft Regulator Guide 1.84, Attachment 2 for Draft Regulatory Guide 1.147, and Attachment 3 for Draft Regulatory Guide 1.192. The attachments also include recommendations for each comment, for the agency to consider in finalizing the regulatory guides.

We appreciate the NRC's effort in developing these guidance documents and encourage your consideration of all stakeholder comments prior to finalizing these draft Regulatory Guides. We trust that you will find these comments useful and informative. Please contact me at tbb@nei.org or (202) 739-8049 with any questions or comments about the content of this letter or the attached comments.

Sincerely,



Thomas Basso

Attachments

c: Andrea Veil, NRR/NRC
Robert Taylor, NRR/NRC

**Attachment 1: Industry Comments on NRC DG-1.84 Rev. 39**

| Affected Section | Comment | Recommendation |
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| 1. N-755-4 | The proposed conditions on the use of this case are consistent with similar requirements specified in Section III, Division 1, Mandatory Appendix XXVI. In addition, with conditional acceptance of Appendix XXVI in 10CFR50.55(a), this Code Case has been annulled. | Code Case N-755-4 should be moved to Table 4 of RG 1.84. |
| 2. N-886 | NEI provides the following comments on the conditions to N-886:<br><br>a. *This Code Case is only for **Design** of above ground HDPE piping systems and per the case all other requirements for Materials, Fabrication and Installation, Examination, Testing, Overpressure Protection, Nameplates, Stamping and Reports are to be done in accordance with Appendix XXVI. Conditions (1) thru (3) are the conditions imposed on the use of Appendix XXVI in Section (b) (1) (xi) of the current issue of 10CFR50.55(a) and relate to fabrication and examination. As such they are not applicable to the content of this Code Case and are redundant to the requirements placed on Appendix XXVI in 10CFR50.55(a). This application of redundant requirements on sections of Appendix XXVI not within the scope of this Code Case could result in conflicts should the USNRC change or add requirements to the use of Appendix XXVI in areas other than Design. Therefore, it is strongly suggested these requirements be removed.*<br><br>b. *Proposed condition (4) requires that "For above ground applications licensees must provide active or passive fire protection for HDPE consistent with the safety significance of the affected piping, the risk of fire, the projected fire duration at the affected location, and the mission time of the affected piping."* | Remove conditions (1), (2), and (3).<br><br>Remove condition (4), or revise to a simple statement such as; "The use of HDPE piping in above ground applications shall be considered in the plant fire protection program."<br><br>Remove condition (5) or significantly modify it to provide the requested clarifications.<br><br>Considering the overall concerns and conflicts noted in the provided comments, it is strongly recommended that all the conditions on Code Case N-886 be deleted, and that Code Case N-886 be moved to Table 1 of RG 1.84 and approved with no conditions. |

| Affected Section | Comment | Recommendation |
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| | *The NRC may impose additional requirements on licensees above and beyond what is required by the ASME Code. However, the ASME Boiler and Pressure Vessel Code, Section III is a component construction code for pressure boundary integrity. Section III provides no rules for such a design requirement. Such a requirement should be addressed in the plant fire protection program and any specific limitations or requirements for fire protection on the piping system should be communicated by the Piping Design Specification. It is strongly suggested that the proposed condition be removed or at most be limited to something to the effect of "The use of HDPE piping in above ground applications shall be considered in the plant fire protection program."*<br><br>*c. Proposed condition (5) requires that "Carbon Black distribution of HDPE Pipes must be sufficiently homogenous to prevent windows and delamination." The proposed condition should be clarified to address the following questions:*<br>*(i) This issue was reviewed extensively by the ASME BPVC Section III committees and it was determined that this is a pipe manufacturing process issue and not a component construction code issue. It was determined that this issue was adequately addressed by the requirements XXVI-2231(b). Again, this Code Case is only for **Design,** all material requirements must meet the requirements of Appendix XXVI and therefore this limitation* | |

| Affected Section | Comment | Recommendation |
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| | *would not appear to be applicable to this Code Case.*<br>*(ii) Is the proposed condition applicable to the base HDPE material or only to joints in HDPE piping?*<br>*(iii) What are the acceptance criteria for Carbon Black distribution in HDPE pipe to be "sufficiently homogenous"? This term is not defined here or in the ASME Code and therefore compliance to this condition cannot be demonstrated. Again, this would appear to be addressed in XXVI-2231(b).*<br>*(iv) What is the technical basis for the statement in the draft 10CFR50.55(a) rule, page 7827 that "In addition, a condition requiring homogeneous carbon black distribution is needed because experiments have shown that inhomogeneous carbon black distribution can lead to windows and delamination"? If this is the case, it is not clear why this condition was not applied to Appendix XXVI when it was reviewed by the USNRC. This situation could occur in both buried and above ground HDPE piping. Why is it being specifically applied to above ground piping?*<br>*(v) Please clarify what is meant by delamination and clarify the basis for this concern?* | |

**Attachment 2: Industry Comments on NRC DG-1.147 Rev. 20**

| Affected Section | Comment | Recommendation |
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| 1. N-513-5 | Code Case N-513-4 in Revision 19 of RG 1.147 was approved with no conditions. The scope of the code case was expanded in N-513-5 from that in N-513-5, however, the requirements in Section 5, "AUGMENTED EXAMINATION," were not changed and still require additional samples if a flaw is found in the expanded sample.<br><br>The proposed condition does attempt to clarify terms "flaw" and "significant flaw" which have been in the code case at least since N-513-3; however, it creates confusion with the requirement: *"If a significant flaw is present, an additional augmented examination in accordance with Section 5 of N-513-5 must be performed."*<br><br>What is meant by "an additional augmented examination" if a "significant flaw" is found when additional exams are already required to be performed if a flaw is found? Does this require more examinations than the additional samples already required? | Remove the last sentence of the condition, *"If a significant flaw is present, an additional augmented examination in accordance with Section 5 of N-513-5 must be performed"* since the code case already requires additional samples if flaws are found; or clarify the statement.<br><br>If additional inspections are being required beyond the expanded inspections already required, then provide the technical and safety justification for the additional burden placed on licensees. |
| 2. N-557-1 | This case has not been updated for application for use with any version of ASME XI beyond the 1995 Edition of ASME XI. Code Case N-557-1 was annulled by ASME XI on 05/13/20. | N-557-1 should be reflected in the Annulled Case portion of the Reg Guide rather than in the Conditionally Approved section of the Regulatory Guide. |
| 3. N-569-1 | This case has not been updated for application for use with any version of ASME XI beyond the 2019 Edition of ASME XI. Code Case N-569-1 was annulled by ASME XI on 05/13/20. | N-569-1 should be reflected in the Annulled Case portion of the Reg Guide rather than in the Conditionally Approved section of the Regulatory Guide. |
| 4. N-597-3 | The condition imposed on this Code Case cites the use of EPRI/NSAC 202L – 2. This EPRI document however has been updated to Revision 4. | Review this condition to establish if the latest revision of EPRI/NSAC, rather than revision 2 cited, is more appropriate. Update the condition to reference the appropriate revision of the EPRI/NSA2C document. |
| 5. N-705-1 | Code Case N-705-1 provides a technical approach for limiting the time which the temporary repair can be in place. What's the technical bases for the condition that limits the temporary repairs under this Code Case | Endorse Code Case N-705-1 with no conditions and relocate N-705-1 to Table 1 of RG 1.147. |

| Affected Section | Comment | Recommendation |
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| | to the next refueling outage when N-705-1 includes *"…for a limited time not exceeding the evaluation period as defined in this Case?"* | |
| 6. N-778 | The condition on Code Case N-778 requires the submittal of the inservice inspection summary report to the USNRC to be within 90 days of the completion of each refueling outage. In contrast, Code Case N-892, which is proposed by this draft Regulatory Guide as an **Acceptable** ASME Section XI Code Case, alters the submission time of the Form OAR-1 (Owner's Activity Report) inservice inspection report to 120 days. The N-778 condition directly conflicts with Code Case N-892. | Revise the N-778 condition to allow the inservice inspection summary report to be submitted within 120 calendar days of the completion of each refueling outage vs 90 calendar days to be consistent with Code Case N-892 which allows for report submittals in 120 days. |
| 7. N-831-1 | The condition noted for this case prohibits the use of UT in lieu of RT for ferritic and austenitic piping welds but provides no technical rational for this prohibition or alternative options. RT that is normally performed by construction codes (e.g., ASME III) are merely confirmatory examinations of acceptable workmanship. They are not based on ASME XI based acceptance criteria founded in fracture mechanics which are more robust and relevant. The use of ASME XI based UT methods and related techniques are far more appropriate to: (1) establish baseline exam results for future ISI and (2) are more revealing to be able to identify deleterious anomalies in piping welds (e.g., planar flaws) rather than common but benign weld anomalies revealed by RT such as slag inclusions or porosity. | Delete the condition and permit use for new construction. |
| 8. N-847 | 1. Condition (1) states N-847 is limited to installation of full 360-degree excavation and weld repair (EWR). There is insufficient technical basis provided for this limitation. Extensive testing, modeling and validation work was performed demonstrating the effectiveness of the partial arc EWR. Refer to the following for key publications documenting the body of this work.<br>a. Michael Benson and Patrick Raynaud, "Weld Residual Stress Analysis of Excavate and Weld Repair Mockup, Technical Letter Report," U.S. NRC, September 2016 (ML16257A523).<br>b. WRTC: Technical Basis and Residual Stress Studies to Support the Excavate and Weld Repair Methodology for | 1. Remove Condition (1) and permit the Partial Arc EWR repair based on industry demonstration, evaluation, and validation by 2-D and 3-D residual stress modeling, residual stress measurements, and UT of two partial arc EWR mockups; including welding demonstration and UT performance demonstration on two full scale partial arc EWRs. |

| Affected Section | Comment | Recommendation |
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| | Mitigation of Stress Corrosion Cracking in Class 1 Butt Welds. EPRI, Palo Alto, CA: 2016. 3002007901.<br>c. MRP: Study of New Mitigation Technique Effects on Nondestructive Evaluation Inspectability. EPRI, Palo Alto, CA: 2015. 3002005511.<br>d. Steven McCracken, Jonathan Tatman and Pete Riccardella, "Technical Basis for Code Case N-847 – Excavate and Weld Repair (EWR) for SCC Mitigation," PVP2016-63769, Proc. ASME 2016 PVP Division Conference, Vancouver, BC, Canada.<br>e. Francis Ku, Pete Riccardella and Steve McCracken, "3D Residual Stress Simulation of an Excavate and Weld Repair Mockup," PVP2016-63815, Proc. ASME 2016 PVP Division Conference, Vancouver, BC, Canada.<br>f. Mitchell Olson, Adrian DeWald, Michael Hill and Steve McCracken, "Residual Stress Mapping for an Excavate and Weld Repair Mockup," PVP2016-63197, Proc. ASME 2016 PVP Division Conference, Vancouver, BC, Canada.<br><br>2. Condition (2) specifies the <u>intersection points</u> in Figure 1A and Figure 1B at the interface between the EWR metal and existing base metal be rounded. This condition is assumed to imply a radius is necessary at the bottom corners of the EWR excavation. Figures 1A and 1B are not intended to specify weld joint or excavation details. Weld joint details, such as a corner radius requirement, are addressed in weld detail drawings or the WPS.<br><br>3. Condition (3) states that the 2(d)(2) evaluation must include crack growth in the Alloy 690 weld material, <u>including the dilution zone</u>. Since this condition applies to nickel base dissimilar metal EWRs, the correct subparagraph should likely be 2(d)(1) not 2(d)(2).<br><br>The intent of 2(d)(1) is to demonstrate by analysis that a crack in the original SCC susceptible nickel alloy groove weld will arrest at | 2. Remove Condition (2) since weld joint details should be in design drawings and WPS requirements.<br><br>3. Recommend deleting Condition (3) entirely. If deletion is not acceptable the re-worded condition below is recommended. |

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| | the "axial overlap" below the new SCC-resistant (≥ 24% Cr) EWR weld metal (see Figure 1A). The implied requirement is to design the EWR axial overlap with sufficient length to arrest an existing crack or potential crack in the remnant SCC-susceptible groove weld. It is important to note that 1st layer dilution zones in full penetration groove welds using high Cr Ni-base weld metals such as 52i, 52M or 52MSS (Alloy 690 weld metal variants) for new construction or new replacement groove welds are considered resistant to SCC in a PWR environment. This SCC resistance in similar dilution zones is no different for a new EWR or WOL installed with high Cr Ni-base weld metal. | Potential new wording, "The evaluation in section 2(d)(1) must include evaluation of the crack growth below the SCC-resistant EWR metal in the axial overlap region. Evaluation must also include the dilution zone in the axial overlap region if the minimum 24% Cr required by 1.2(e)(2) is not met. |
| | ASME Section XI through the Standards Development Organization consensus process determined that the examination requirements of Examination Category B-G-1, Item Number B6.40 were no longer necessary. The NRC condition on this Code Case imposes an inspection requirement that is unnecessary and contrary to industry operating experience. The industry has demonstrated through the many years of operating history and inspections the robustness of these components. Other more frequent maintenance practices, testing and monitoring, (e.g., vessel stud installation/elongation measurements, pressure tests, and leakage monitoring) provide more than sufficient and timely means of recognizing any potential adverse change in material conditions, than a once in 30-year inspection. The "Regulatory Analysis for the Proposed Rule: Approval of American Society of Mechanical Engineers Code Cases" (ML20133K152) provides no insights on the technical or safety bases for conditioning CC N-864.<br><br>Additionally, part (2) of the condition; *"Monitoring and maintenance activities must be performed and documented to monitor the condition of the reactor pressure vessel threads in flange for signs of degradation and to mitigate any degradation that occurs"* is not clear and therefore leaving licensee's compliance vulnerable to subjective enforcement based on individual inspector interpretation. What is meant by monitoring, and maintenance activities? How often is this | Delete the entire condition from Code Case N-864 and relocate N-864 to Table 1, or as a minimum, delete part (2) from the condition. If not deleted, then provide enough clarity so licensees can comply with part (2) of this condition. |

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| | monitoring and/or maintenance to be performed? What are the criteria for signs of degradation? How is this monitoring to be documented? If licensees are to determine how and how often to comply with part (2) of this condition then is anything and everything acceptable? | |
| 9. N-878 | The proposed conditions provide only two options for a Licensee to employ the use of this Case.<br><br>Both options require that the Licensee or the designated Repair Replacement Organization to either:<br>• Supervise and monitor the performance qualification tests of the fittings to ensure the design is in compliance with the Licensee's design specifications and ASME Section III NB/NC/ND-3671.7; or<br><br>• The Licensee or Repair/Replacement Organization conducts qualification tests of the fittings or conducts design analyses to ensure the design is in compliance with the Licensee's design specifications and ASME Section III NB/NC/ND-3671.7.<br><br>The purpose of these imposed conditions as stated in the draft rule is to address how to ensure the non-welded fittings met the design and testing requirements of Section III NB/NC/ND-3671.7 since this is not addressed in the two Cases. As written in the draft Regulatory Guide DG-1367 each individual licensee is required to repeat this qualification process that is onerous, costly and is not commensurate with an increase in plant safety. This burden is especially impactful because as written, each individual licensee is expected to individually supervise the ASME III required qualification testing or perform a separate analysis to support the use of a patented fitting.<br><br>Current industry efforts (e.g., EPRI) are in progress to generically qualify the design or testing requirements of such fittings to Section | Add to the condition cited in the draft Regulatory Guide 1.1.47 for Cases N-878 and N-880 the following (additional text included in *underlined, italics*).<br><br>(1) For ASME Section III items, the Licensee must verify the design and testing activities associated with qualification of non-welded fittings performed by the fabricator as follows:<br><br>(a) Review the fabricator's design documentation and methods to ensure the fittings design is in compliance with the Licensee's design specifications, and ASME Section III NB/NC/ND-3671.7 requirements; and either<br>i) Supervise and monitor the performance qualification tests of the fittings to ensure the design is in compliance with the Licensee's design specifications and ASME Section III NB/NC/ND-3671.7; or<br><br>ii) The Licensee or Repair/Replacement |

| Affected Section | Comment | Recommendation |
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| | III. The NRC should permit a Licensee to use such industry accepted studies demonstrating compliance with Section III design and testing requirements rather than requiring each Licensee to individually supervise and monitoring qualification testing, or to reconduct qualification tests or design analysis of patented fittings. Licensee would only need to ensure that the testing conducted meets the requirements of any application Design Specification. | Organization conducts qualification tests of the fittings or conducts design analyses to ensure the design is in compliance with the Licensee's design specifications and ASME Section III NB/NC/ND-3671.7*, or*<br><br>*iii) The Licensee may utilize the results from industry organizations that have qualified the fitting to ASME Section III NB/NC/ND-3671.7 provided the Licensee's design specification requirements are also met.* |
| 10. N-880 | The comments noted above for the conditions cited for Code Case N-878 apply to the conditions cited for Code Case N-880. | Recommend the same changes to the conditions on Code Case N-880 as noted for the condition on Code Case N-878 above. |

**Attachment 3: Industry Comments on NRC DG-1.192 Rev. 4**

| Affected Section | Comment | Recommendation |
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| 1. OMN-18 | OMN-18 (2020 Edition) Alternate Testing Requirements for Pumps Tested Quarterly Within ±20% of Design Flow<br><br>The upper-end values of the Group A test acceptable ranges for flow and differential pressure (or discharge pressure) must be 1.06Qr and 1.06ΔPr (or 1.06Pr), respectively, as applicable to the pump type. The high values of the required action ranges for flow and differential pressure (or discharge pressure) must be >1.06Qr and >1.06ΔPr (or 1.06Pr), respectively, as applicable to the pump type. Note 1: The conditions are identical to those imposed on OMN-18 (2017 Edition) in Revision 3 to RG 1.192.<br><br>**Comment:**<br><br>The above condition placed on Code Case OMN-18 does not provide an increase in the level of safety or quality.<br><br>The ASME OM Code and Code Case OMN-18 provide an appropriate approach for pump testing to assess operational readiness and to identify any adverse trends without the additional requirements imposed by the condition on OMN-18; which adds undue burden to licensees. OMN-18 already requires Owners to test with very accurate instrumentation; meeting the requirements of OM Table ISTB-3510-1. Even though the testing may be at +20% of pump design flow rate, the required testing would be more than sufficient to show any degradation/adverse trends for an Owner to take the appropriate actions.<br><br>**Basis for Comment:**<br><br>The intent and origin of Code Case OMN-18 was to address an unintended consequence resulting from major changes in OM pump test requirements that introduced separate Group A, Group B, Comprehensive, and Preservice test requirements and became effective in the 1995 Edition of OM code. The unintended consequence occurs at plants that perform quarterly Group A pump testing at the same hydraulic condition as the Comprehensive pump testing. In this scenario, the high side of the OM hydraulic acceptance criteria is 1.10 times the reference value for the Group A test and 1.03 times the reference value for the Comprehensive test. This creates an | Remove the condition from OMN-18 and relocate Code Case OMN-18 to Table 1 of RG 1.192. |

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| | issue when test data enters the range between 1.03 and 1.10 times the reference value during quarterly testing. Technically this data meets the quarterly test acceptance criteria, but would be in the required action range and require the pump to be declared inoperable if the test data was collected during a comprehensive test. This creates concern among the on-shift operations personnel when they learn that test data collected would not meet future acceptance criteria. Code Case OMN-18 eliminates the comprehensive test for those plants that perform quarterly testing at hydraulic conditions and instrumentation that would meet the comprehensive test requirements.<br><br>Before the major pump test changes in OM 1995 Edition, pumps were required to be tested quarterly under repeatable conditions, but there were no specific flow requirements for the testing. As a result, a large percentage of quarterly IST pump testing in the industry at that time was performed using a pump minimum flow recirculation line or similar test line that provided a relatively low flow rate due to limitations in plant design. In addition, many plant Technical Specifications at the time included hydraulic acceptance criteria for the ECCS pumps tested at the low flow test conditions. It was recognized that testing at relatively low flow did not provide a lot of value in detecting pump degradation because the flow point was back on the flat portion of the pump curve. Therefore, OM made major changes to pump testing and introduced the requirement to perform comprehensive pump tests every two years which required all pumps to be tested within 20% of design flow where there is sufficient slope in the pump curve to better detect degradation in pump performance. The issue with the change to the pump testing in the OM 1995 Edition was that it failed to recognize that some plants' design and testing methods allowed essentially full flow testing quarterly. In retrospect, the comprehensive test requirement should have only applied to those pumps that were not tested within 20% of design flow during quarterly testing. Code Case OMN-18 was intended to correct that error.<br><br>Pump hydraulic performance doesn't normally improve as a pump degrades. Therefore, the intent of a reduced high acceptance criteria for the comprehensive pump test was to detect problems with the test or instrumentation. This seemed appropriate at the time because it was expected that the comprehensive test would use a different flow path/alignment than the quarterly test and would be performed much less frequently (every two years). Code Case OMN-18 recognized the error in that thinking and those | |

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| | plants capable of performing their quarterly pump tests at the same hydraulic conditions as the comprehensive pump test would use the same flow path/alignment and there was no benefit in reduced high acceptance criteria. Quarterly test data at essentially the same flow conditions was more than adequate to monitor degradation of the pump and identify issues with data scatter or flow path/alignment issues without reducing the high acceptance criteria. | |