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Acceptability of ASME Section XI, Division 2, 'Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Power Plants,' for Non-Light Water Reactors

Comment On: NRC-2021-0166-0001

Acceptability of ASME Code Section XI, Division 2, Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Power Plants, for Non-Light Water Reactors

Document: NRC-2021-0166-DRAFT-0004

Comment on FR Doc # 2021-21295

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General Comment

See attached file(s)

Attachments

DG 1383 RG Comments From POMO18 Consult LLC. docx



11/10/2021

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SUBJECT: Comments to the Draft Regulatory Guide DG-1383 – Acceptability of ASME Code Section XI, Division 2, “Requirements for Reliability and Integrity Management (RIM) Programs for Nuclear Power Plants,” for Non-Light Water Reactors

TO: To whom it may concern,
United States Nuclear Regulatory Commission
Office of Administration
Program Management

Thank you for the opportunity to review and provide comments to the draft regulatory guide DG-1383 for the considerations to endorse ASME Section XI Division 2.

As a significant contributor over many years during the development and the initial issuance of ASME XI Division 2, RIM 2019 Edition, I am taking this opportunity to provide a series of suggestions and recommendations to DG-1383 for consideration by the USNRC.

I believe these suggestions will better serve the needs of prospective users of RIM and also provide greater clarification to the draft regulatory guide when issued as Regulatory Guide 1.246.

These recommendations are contained in the attachment to this introductory letter.

Please feel free to contact me if any further clarifications or questions arise from the consideration of these recommendations.

Thank you.

Sincerely:

A handwritten signature in cursive script that reads "Allen Thomas Roberts III".

Principal Officer – POMO18 Consult LLC



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ATTACHMENT 1

GENERAL COMMENT:

A general comment is that traditional LWR considerations appears to permeate throughout and may have influenced the compilation of this draft Regulatory Guide. For, example, by assuming refueling outages and linking any reporting submission criteria to them is may be inappropriate for a RIM program developed for some advanced designs.

Some advanced reactor designs are anticipated to be fueled for life and the intended design life is 20 years. Further, while some of these designs do anticipate having scheduled maintenance outages, they also anticipate conducting as much online maintenance and monitoring as possible.

Consequently, from the submittal of the OAR report, it is suggested that the Owner, based on the specifically developed RIM program, propose an appropriate submittal period for reports and documents such as the OAR to the USNRC.

It is unlikely there will be a one size fits all submission period that meaningfully would work for all advanced reactor designs.

(1) DG-1383 REFERENCE:

Title and various locations contained in the Draft Regulatory Guide referencing Non-Light Water Reactors.

(1) BACKGROUND:

It is understood that a Regulatory Guide cannot supersede existing regulations. It is also recognized that Title 10 CFR PART 50.55a establishes regulation for the use of ASME XI Division 1 as applied to light water reactors. However, a careful examination of ASME XI Division 1 reveals that the light water reactors that are appropriately addressed by ASME XI Division 1 consists of the existing fleet of PWR and BWR operating plant designs. Several advanced reactors design that are currently in development are light water cooled or moderated reactors, but for which the use of ASME XI Division 1 is neither adequate, nor appropriate. In some of these advanced LWR designs, even the traditional safety cases that are a foundational consideration for the application of ASME XI Division 1, may not be as relevant as the safety cases used in the existing fleet design (e.g., CDF, LERF, LOOP, etc.).

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ASME XI Division 2 was developed to be technology neutral standard and can be equally applied to non-LWR as well as LWR technology. In fact, ASME XI Division 2 permits the use of Division 1 criteria if it is appropriate for a given reactor design and distinguishes which PRA standard should be

used in the development of a RIM program when addressing a non-LWR versus a LWR advanced reactor design.

It is recognized that a license applicant for any advanced LWR design could request an alternative to 10CFR 50.55a but this may not be immediately obvious to some new reactor designers who may not have familiarity with the provisions of 10CFR50.55a (z).

(1) RECOMMENDATION:

It is recommended that DG-1383 be amended to provide a clarification to prospective future users that the use of ASME XI Division 2 is a potential option for advanced LWR designs that are not well suited to the use of ASME XI Division 1, and an explanation regarding the regulatory provisions that would need to be addressed to make use this option.

(2) DG-1383 REFERENCE:

Basis for Regulatory Guidance Position 1 (page 6) and various other locations in the use of the word safety.

(2) BACKGROUND:

The term safety is used throughout this draft RG. Reference to 10CFR50 Appendix B is also a cited reference. It is not obvious that the term safety as it is used throughout this draft RG is meant to infer traditional "Safety Related" classification protocol (e.g., ASME Class 1, 2, 3 and Quality Groups A, B & C) or a broader use of the term safety (e.g., worker/public safety.) This is noted since ASME XI Division 2 applies no specific safety classifications to SSC within a RIM Program. Instead, RIM requires that any SSC that is "risk significant" for the safe operation of a plant and therefore worker and public safety is to be an SSC within the scope of the RIM developed program. This very well might include SSC that would otherwise not be traditionally classified as "Safety Related".

(2) RECOMMENDATION:

A better description as to what is specifically intended by the use of the word SAFETY, so as to make it clear to users what SSC are specifically to be addressed should be provided for clarification within this Regulatory Guide.



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(3) DG-1383 REFERENCE:

Basis for Regulatory Guidance Position 1 (page 7 - third bullet):

[For plants that do not have regularly scheduled refueling outages at frequencies of 5 years or less, proposed frequencies for the submission of owner's activity reports (OARs) and owner's repair/replacement certification (NIS-2) forms]

(3) BACKGROUND:

RIM establishes that an Inspection Interval shall not exceed 12 years (i.e., 144 months) irrespective of the time between refueling (e.g., on-line refueling vs traditional off-line refueling.) This was created with the recognition that some advanced reactor designs may not be taken out of service (e.g., "offline") to accommodate a refueling. From an ASME Code perspective it would be at the end of this 12-year interval that an OAR-1 Form would be prepared.

It is understandable why the USNRC may not wish to wait until the end of a 12 interval to receive information contained in a prepared OAR-1 Form for twelve years and hence has established that a five-year periodicity for the preparation of an OAR-1 be created and submitted.

There are however two clarifications that would be useful to include in DG-1383 regarding this matter.

The first is the descriptor of *refueling outage*. As noted, some advanced reactor designs may not have a traditional refueling outage, but instead a maintenance outage as the unit remains operational while refueling, or may be fueled for life.

The second is that with the 2019 Edition of ASME XI, both in Division 1 and Division 2, the FORM NIS-2 is merely an attestation for the completion of a Repair and Replacement Activity (RRA) signed by the Licensee and an Authorized Nuclear Inservice Inspector.

There is, however, no insightful or technical information contained on the FORM NIS-2 itself. This change represents the incorporation of ASME Code N-532, where RRA that were required because an SSC had failed to an established ASME XI acceptance criteria would be documented on the OAR-1 Form but the FORM NIS-2 became abbreviated.

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- (3) RECOMMENDATIONS:**
- (1) Provide a clarification to the presently used term *refueling outage* to be more inclusive to evolutions such as maintenance outages or a description of a time frame for the desired submittal of an OAR-1 Form, exclusive of using the terminology refueling outage.
 - (2) Consider deleting the requirement to submit NIS-2 Forms as suggested, since the information that is likely of interest to the USNRC will already be contained in the OAR-1 Form.

(4) DG-1383 REFERENCE:

Basis for Regulatory Guidance Position 1 (page 7 – 4th bullet):
[*“Appropriate justification for flaw evaluation acceptance criteria for any components that exceed the temperature ranges in ASME Code, Section III, Division 1”.*]

(4) BACKGROUND:

ASME III Division 1 is for traditional LWR reactor designs and the normal operating temperature ranges of LWRs. In contrast, ASME III Division 5 is for High temperature reactors and includes provisions for certain HAA materials to operate in the creep regime with a stated maximum number of permissible cycles. This same limitation is found in RIM Appendix VII Article VII-3 .1. Consequently, it is not obvious why ASME Division 1 is cited for advanced reactor design flaw acceptance criteria.

(4) RECOMMENDATION:

Consider, revising this bullet so it is clearer that for advanced reactor designs that operate in the creep regime such as those designed in accordance and permitted by ASME Section III Division 5, that appropriate justification for flaw evaluation acceptance criteria shall be provided by the applicant.

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(5) DG-1383 REFERENCE:

Basis for Regulatory Guidance Position 4 (page 8 5th paragraph)

(5) BACKGROUND:

Similar to the background and recommendation 3 noted above, the use of the term refueling outage may not specifically have a universally understood definition for some advanced designs, that may not have a discrete refueling outage or cycle. Additionally, this Regulatory Guidance Position states that: *Licensees should submit the notification prior to the next refueling outage or within 3 years, whichever is less.*”. This 3-year periodicity appears to be contradictory to the Regulatory Guidance Position offered in Regulatory Guidance Position 1 (page 7 - third bullet) which reflects a five year or less periodicity.

(5) RECOMMENDATION:

Provide a clarification to the presently used term *refueling outage* to be more inclusive to evolutions such as maintenance outages or a description of a time frame for the desired submittal of an OAR-1 Form, exclusive of using the terminology refueling outage, and (2) clarify what appears to be discrepancy in the desired periodicity reflected in the two noted Regulatory Guidance Positions.

(6) DG-1383 REFERENCE:

Basis for Regulatory Guidance Position 5 - Qualification of NDE personnel.

(6) BACKGROUND:

This Regulatory Basis is understandable since the staff has not endorsed either Code Case N-788-1 nor ANDE-1 2015.

However, as written it is not clear whether the intent of the basis is to imply that the *performance demonstration* type of protocol of ASME XI Division 1 as is found in Division 1 Appendix VIII is meant to be employed.

Performance demonstration of any MANDE that may be selected for an SSC under a RIM program is an essential and imperative input and quantitatively factors into the establishment a Reliability Target assigned to an SSC for such considerations a Probability of Detection (POD) criteria.

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It is believed that while the USNRC has not formally endorsed the use of either Code Case N-788 or ANDE-1 2015, the reservation by the staff is understood to be based on the fact that ANDE-1 describes a process for the qualification of NDE personnel. If that is in fact the existing reservation then the following recommendation is provided.

(6) RECOMMENDATION:

Provide guidance regarding the type of information that would be expected to be provided by a Licensee applicant that would allow for consideration of approval by the USNRC to use ANDE-1 for NDE personnel qualification under Division 2. This would assure that factors such as POD for any MANDE methods selected are established with consistency. The use of other already endorsed NDE personnel qualification criteria, such as CP-189 do not afford this essential criteria (i.e., POD) and potentially undermines a cornerstone to the development of a sound RIM Program.

(7) DG-1383 REFERENCE:

C. STAFF REGULATORY GUIDANCE 1. (Page 14 – 2nd bullet and 7th bullet)

(7) BACKGROUND:

It is understood that the USNRC would seek to have summaries of:

- (a) The bases for the scope of the program and
 - (b) RIM strategies selected to achieve the reliability targets,
- as denoted in this portion of the Staff Regulatory Guidance at the time a Licensee/applicant makes an initial filing. However, both of these provisions may not be fully developed at the time of initial application and would not be fully vetted to be able to provide a detailed listing of all bases or strategies that may apply to each SSC selected to be within a final RIM program.

(7) RECOMMENDATION:

It is suggested that a clarification be provided to both of these items so as to better define what contents are expected to be provided by a Licensee/applicant at the time of license application.

(8) DG-1383 REFERENCE:

C. STAFF REGULATORY GUIDANCE 1. (Page 14 – 12th bullet)

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As previously outlined in comment 3 above, the FORM NIS-2 is merely an attestation for the completion of a Repair and Replacement Activity (RRA) signed by the Licensee and an Authorized Nuclear Inservice Inspector.

There is, however, no insightful or technical information contained on the FORM NIS-2 itself because the 2019 Edition of ASME XI Division 1 and Division 2 represents the incorporation of ASME Code N-532, where RRA that were required because an SSC had failed to an established ASME XI acceptance criteria would be documented on the OAR-1 Form, but the FORM NIS-2 became abbreviated.

(8) RECOMMENDATION:

Consider deleting the requirement to submit NIS-2 Forms as suggested, since the information that is likely of interest to the USNRC will already be contained in the OAR-1 Form.

(9) DG-1383 REFERENCE:

C. STAFF REGULATORY GUIDANCE 5. *Use of ANDE-1-2015 is not endorsed by the NRC staff* (Page 15)

(9) BACKGROUND:

As cited in comment 6 above, performance demonstration of any MANDE that may be selected for an SSC under a RIM program is an essential and imperative input and quantitatively factors into the establishment of a Reliability Target assigned to an SSC by using considerations such as Probability of Detection (POD) criteria. The use of ANDE-1 requires such performance demonstrations that are not a mandate of ANSI/ASNT CP-189.

(9) RECOMMENDATION:

Consider providing guidance regarding the type of information that would be expected to be provided by a Licensee applicant that would allow for consideration of approval by the USNRC

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to use ANDE-1 for NDE personnel qualification under Division 2 as an alternative to advocating the use of ANSI/ASNT CP-189.