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February 24, 2014

Ms. Cindy K. Bladey
Chief, Rules, Announcements, and Directives Branch (RADB)
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Industry Comments on License Renewal Interim Staff Guidance, LR-ISG-2013-01, "Aging Management of Loss of Coating Integrity for Internal Service Level III (Augmented) Coatings" Docket ID NRC-2014-0004

Project Code: 689

Dear Ms. Bladey:

The U.S. Nuclear Regulatory Commission (NRC) requested public comment on Draft ISG, "Aging Management of Loss of Coating Integrity for Internal Service Level III (Augmented) Coatings." The draft ISG has been issued to address loss of coating integrity due to blistering, cracking, flaking, peeling or physical damage of Service Level III (augmented) internal coatings in piping, tanks and heat exchangers within the scope of 10 CFR Part 54.

The purpose of this letter is to provide integrated industry comments on the subject ISG. Due to the numerous comments provided, significant industry comments and considerations are summarized and provided in Attachment 1, and detailed comments are provided in Attachment 2.

We appreciate the opportunity to comment on the ISG and respectfully request that you incorporate industry comments as recommended in the two attachments. If you have any questions or require additional information, please contact me.

Sincerely,

Jason Remer

Attachments

c: Mr. John W. Lubinski, NRR/DLR, NRC
Mr. William C. Holston, NRR/DLR, NRC
NRC Document Control Desk

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= W. Holston (wch1)

Significant Industry Comments and Considerations for LR–ISG - 2013-01, Coatings

Due to the numerous comments provided, significant industry comments and considerations are summarized and provided in this attachment. Detailed comments are provided in Attachment 2.

1. The ISG addresses age-related degradation for immersion coatings that are replaced based on a qualified life or specified time period and are, therefore, not subject to aging management review. We are not aware of any coating vendor that can provide an immersion coating with a service life of greater than forty years. Any coatings in this category could be considered within the scope of License Renewal but are not subject to an aging management review. Most plants are licensed with component structural integrity or pressure boundary as the principle intended functions that are susceptible to aging effects. With exception of service level 1 coatings, analysis of design basis events and regulated events have not credited coatings as having intended functions. Components can perform their structural integrity or pressure boundary functions without coating integrity. The ISG should clearly indicate that the coating intended function is related to the coating's safety function (maintain adherence to prevent affecting intended function of other components).
2. Blister stability in an immersion protective coating can be determined by periodic inspections. Blisters that are not growing are indicative of a very low or non-existent corrosion rate. Coatings with stable blisters may be justified with reasonable assurance to provide an adequate coating function. The exact cause of the coating blister may be difficult to determine. AMP element 6 (acceptance criteria) requires the blister to be repaired if the cause cannot be determined. This will result in unnecessary work for stable blisters that are performing their intended function.
3. The effects of aging of the base metal, including pitting, are not unanticipated and are adequately addressed by existing GALL AMPs. Existing GALL AMPS provide aging management to preserve the structural integrity and pressure boundary intended functions with or without coatings as a preventive measure. GALL AMPs include the following considerations for managing the effects of aging on coated components.
    - AMP XI.M38 (Inspection of Internals Surfaces) and AMP XI.M20 (Open-Cycle Cooling Water) address aging of coated and non-coated base metal in raw water, waste water, and other aggressive water environments. Coatings are considered preventive measures and are inspected where applied to metal components.
    - There is no known coating that can withstand erosion or cavitation in a piping system. LR-ISG-2012-01, "Wall Thinning Due to Erosion Mechanisms", provides aging management guidance for erosion and cavitation in piping systems that is applicable to coated and uncoated components.
    - The effects of aging on lined components such as valves, tanks, and piping should be managed by AMP XI.M38 and consider the unique material properties of the linings and environmental conditions (e.g. aggressive chemical environments).
    - Coating physical damage due to maintenance activities is not an aging effect requiring management.

4. Flow blockage in non-stagnant systems is self-revealing through system performance monitoring of pressure and flow. As demonstrated by the OE presented in this draft ISG, flow blockage is detectable through normal system performance monitoring prior to loss of system intended function. Therefore, Maintenance Rule performance monitoring rather than aging management is appropriate.
5. Several of the operating experience examples are conditions caused by events other than aging (e.g., failure of a newly installed coating). Examples unrelated to the effects of aging should be removed. In addition, the operating experience discussion in the body of the ISG should be consistent with the OE noted in Element 10 of the proposed AMP.
6. Coating inspection sample size for internally coated piping should be consistent with sample sizes recommended in other AMPs. Commercial Grade Dedication of coatings which identify ASTM standards as critical characteristics for acceptance provide reasonable assurance those coatings are procured and tested in accordance with industry consensus documents (ASTM). Qualification of coatings applicators and inspectors are also typically performed in accordance with industry consensus documents (ASTM).
7. Recommend deleting Table 4a category C requirements for newly installed coatings or coatings that have been repaired or replaced. AMP Table 4a inspection requirements for category C coatings should not be more stringent than existing coatings inspection requirements or repair or replacement inspection requirements of other AMPs for aging management of ASME Code for pressure boundary or structural integrity intended functions of the base metal components. Newly installed, repaired, or replacement coatings are procured, installed, and tested to ASTM standards and/or industry consensus documents and should not require re-inspection during the next two refueling cycles. In addition, qualification of coatings applicators and inspectors are also typically performed in accordance with industry consensus documents (ASTM). Consistent with Table 4a category A, one re-inspection within six years is recommended for newly installed or replaced coatings. Consistent with Table 4a category B, one re-inspection within four years is recommended for repaired coatings.
8. Recommendations for more stringent inspection requirements of newly installed coatings should not be included in the ISG. Newly installed SSCs in the PEO are not subject to the provisions of 54.37(b). Likewise, inspection requirements for newly installed coatings should not be considered part of an aging management program. This is not managing the effects of aging as the Commission envisioned during preparation of the statements of consideration for the license renewal rule. These provisions of the ISG are essentially proposing an AMP to manage the proper design and installation of new coatings. This seems inappropriate for an aging management program. This would be a precedent that could extend into a multitude of areas.

Number	Page #	Section #	Description	Justification
1	General	---	The ISG should be revised to focus on age-related degradation of coating systems that remain in service beyond their qualified service life.	The ISG addresses degradation of coatings which are generally not long-lived (i.e., coatings have a qualified life as specified by the manufacturer). This ISG should only address age-related coatings issues. However, the ISG primarily addresses non-age-related installation and design issues that are not pertinent to License Renewal. In addition to the non-age-related issues, the ISG addresses operating experience of age-related degradation that has occurred when a coating system has remained in operation beyond its qualified design life. If an applicant chooses to keep a coating system in service beyond its qualified life and replace based on condition, then the condition monitoring of the coating needs to be evaluated as an AMP and, therefore, the recommendations of this ISG may apply. The first principle of the license renewal rule (10 CFR 54) is that the existing regulatory process is adequate to ensure that the licensing bases of all currently operating plants provide and maintain an acceptable level of safety for operation such that operation will not be inimical to public health and safety or common defense and security with the exception of detrimental effects of aging on the functionality of certain SSCs during the PEO and other issues related to safety only during the period extended of operation.

Number	Page #	Section #	Description	Justification
				As stated in the ISG, internal coatings are generally not expected to last more than 15-20 years and OE of coating failures is normally due to the mis-application of the coating or the use of the wrong type of coating and, as such, occur in the first few years after installation (see ISG section II.a). Therefore, since these types of coating failures are not due to age-related degradation, the existing regulatory process is sufficient (i.e., 10 CFR Part 50). Furthermore, since the degradation and failure of coatings is not unique to the period of extended operation, any significant additions to safety obtained through the performance of the recommendations made in this ISG would also be applicable during the current operating term. That is, if the recommendations made in this ISG significantly add to safety then there is no basis for waiting until the period of extended operation before implementing the program. This issue should be and has been addressed for the initial operating term (i.e., through the issuance of IN 85-24, Reg Guide 1.54). The existing regulatory process (i.e., 10 CFR Part 50), as continued during the period of extended operation, provides reasonable assurance that non-age-related degradation and failure of internal coatings are managed such that an acceptable level of safety for operation will be maintained.

Number	Page #	Section #	Description	Justification
2	All pages	All sections	General comment regarding the ISG issuance.	Given the significant amount of confusion resulting from the release of this ISG for public comment, the NUCC believes that it would be wise to delay/rewrite this ISG and proceed with research in the area of immersion service life, blistering, adhesion, historical data collection, etc. Pursuant to this, there are currently EPRI projects which are already underway. Additionally, this ISG presents a fundamental change in licensing basis. Currently, most plants are licensed with required structural integrity being based on corrosion and not with required structural integrity being based on coatings used to provide protection.
3	1	Title	The wording used by the ISG Title and throughout of "....Loss of Coating Integrity..." should be changed.	This is too nebulous in spite of the definition provided in Appendix B, page B-5. The term could mean far more than simply disbondment. It further leads to confusion as to the scope of this ISG. **Suggested Change:** **"Aging Management of Coating Disbondment for Internal Service Level III Coatings".** This term should be used consistently and exhaustively. Or define the term clearly in the introduction / discussion and fully explain the deviation from past understanding of a coatings safety function (adhesion) and a coating's operational function (corrosion deterrence). This ISG is now blending these two functions which is causing confusion. During these early paragraphs it would be good to reference the appendix with the amended and improved definition of "Loss of Integrity."

Number	Page #	Section #	Description	Justification
4	1	Title	The term "...Service Level III (Augmented) Coatings" has caused confusion.	The use of CSL III (Augmented) has caused confusion among industry. This term should be abandoned, because it implies that these coatings referenced within this ISG are subsets of regular CSL III applications. Coating Service Level III coatings are, by definition, safety-related (See ASTM D4538-05). A number of coatings that fall under 10CFR54.4(a)(3) are NOT safety-related and, as such, do not fall under the established definition of Coating Service Level III. A new definition is needed to cover coatings which are NOT safety-related and which fall under 10CFR54.4(a)(3). This will avoid confusion of Licensees which currently use the established definition of Coating Service Level III in their licensing basis documents. . **Suggested Change:** Use the term **Coating Service Level - Aging Management**. Stay consistent with industry/ASTM. This term should be used throughout the ISG.
5	1 thru 14	---	Add a section to the ISG that characterizes the applicable environments (i.e., raw water, treated water, treated borated water, waste water, fuel oil and lube oil)	Although the marked up SRP and GALL address environment, the ISG itself does not have any focus on environments. For example a Fire System CO2 tank or piping may be internally coated, but this condition is not addressed within the scope of this ISG.

Number	Page #	Section #	Description	Justification
6	1	Discussion	In reference to "...due to blistering, cracking, ...", the term blistering should be removed.	A blister in an immersion protective coating is an area of no adhesion. There are multiple causes which include lack of proper surface preparation leaving contaminants at the substrate; improper curing times which can leave solvents in the primer that were not removed through evaporation; cold wall and cathodic disbondment. All of these failures have been seen in safety-related level III tanks and piping. Stable blisters in areas of low or no flow provide no credible risk for clogging of downstream components. Stability of blisters can easily be determined by inspection. An example would be a reactor water storage tank which has not been open for 30 years and the inspector observes blisters (quarter to dime size) at multiple locations with no anomalies such as cracking or peeling within the blister. These blisters can easily be considered stable. These blisters can be opened to determine corrosion rate; however, typically when blisters are stable the corrosion rate is very low. The chemical composition of the constituencies within the blister has reached equilibrium and, therefore, is considered stable.

Number	Page #	Section #	Description	Justification
				Acceptable adhesion for immersion coatings cannot be judged by the manufacturer's original newly applied coatings laboratory adhesion data. The type, cure, uptake of moisture, surface preparation, aging mechanisms, immersion solutions, etc. of the coatings factor into adhesion values. Manufacturers cannot supply valid adhesion values for coatings that have been in immersion for many years. Adhesion values do not represent the functionality of the coating which can only be determined by the visual inspection. Holiday testing cannot be used due to the uptake of moisture and could severely damage the coating. If the coating has no peeling, flaking, or cracking then no additional actions should be required. If blistering is detected then a few sample blisters should be opened to determine if active corrosion is present. No actions are required if the as-found corrosion rate does not present a minimum-wall risk for the required service life. The safety-related function of both Service Level I and III coatings is for the coating to remain on the substrate. This is verified by visual inspection and has been accepted by the NRC. Level III coatings are not subject to severe environmental changes such as a LOCA.

Number	Page #	Section #	Description	Justification
7	1, 2	I. Background	Entire paragraphs should be reviewed with consideration made to reword significantly.	Similar to the note in the comment about the title above, the word "degraded" is used with apparent association with "loss of coating integrity." Both terms do not seem to adequately convey the intent of the purpose relative to the definition found on page B-5 of the ISG. One term should be picked, it should not be picked capriciously, that term should be clear, and it should be used consistently. Additionally, there is lack of clarity of whether the question of integrity is related to the coatings operational function (prevent/deter corrosion) versus its safety function (stay adhered). Also, the ISG references and does not seem to fully distinguish degraded coatings (operational function) with disbonded coatings (safety function). This should be carefully discriminated. **Suggested Change:** Choose a the applicable term (such as coating disbondment) and be consistent. For the purpose of this ISG, it was declared that "[c]oating" includes linings consisting of rubber and cementitious materials. These materials appear to be outside the typical purview of a coatings program and ASTM D33; and, therefore, should not be included within this scope. According to ASTM D4538, coatings consist of a single or multiple coats of polymeric protective film and linings which are subset of coatings. It would not include these additional materials. **Suggested Change:** Remove this reference. . At the top of page 2 (and in other places) the term SL III (augmented) is used. This should change as proposed above.

Number	Page #	Section #	Description	Justification
				Suggested Change The recent proposed change was to Coating Service Level - Aging Management. Please stay consistent with ASTM terminology to avoid confusion.
8	1	I. Background (and throughout)	Remove reference to "accelerated" corrosion	The ISG is in part designed to address "accelerated" corrosion of the base metal of the coated components if the coating fails. The existing AMPs already adequately address accelerated corrosion of the base metal. Accelerated aging of the base metal due to localized coating failures manifests as localized pitting. Existing AMPs address pitting of the base metal regardless of whether the component is coated or not.
9	1	I. Background	Eliminate zinc-based coatings (e.g., galvanized piping) from the scope of the ISG	As stated in the fourth paragraph of section V.b of this ISG, monitoring of coatings is required by the maintenance rule. The license renewal process is intended to address issues that are not sufficiently addressed by the maintenance rule. Since this issue is addressed by the maintenance rule there is no need for it to be addressed as part of the license renewal process.
10	1	I. Background	Suggest deleting this "background" discussion.	The intended functions suggested for coatings in these "background" sections are outside the current design basis for these Service Level III coatings. Per 10CFR54, license renewal is not an appropriate method for expanding the design basis of a licensed facility.

Number	Page #	Section #	Description	Justification
11	1	I. Background (and throughout)	Remove reference to "unanticipated" corrosion	The ISG is in part designed to address "unanticipated" corrosion of the base metal of the coated components if the coating fails. By current license renewal methodology, aging of the base metal is anticipated since credit is not taken for the coatings when determining aging effects (i.e., credit is not taken for the coating to conclude that the aging of the component will not occur). In other words, it is assumed that the component will age even if it has an internal coating and the AMPs are designed to manage the aging. Therefore, aging of the base metal is not "unanticipated." Furthermore, as stated in section V.b of this ISG the existing LR guidance documents and AMPs address age-related degradation of coated components when/if the coating fails (e.g., SRP-LR item 3.3.1-26 and 3.3.1-37). Therefore, the potential for aging of the base metal was anticipated during the development of existing LR guidance documents (GALL, SRP).
12	2	I. Background	Remove reference to (a)(2) functions in the last sentence of section I.b.	The ISG states that loss of coating integrity must be managed if the coating failure could prevent the accomplishment of 10 CFR 54.4(a)(2) intended functions. License renewal guidance documents (e.g., NEI 95-10) state that cascading hypothetical failures need not be considered if they are not part of the station's CLB and have not previously been experienced. For a coating failure to cause loss of an (a)(2) function the following cascading failures would have to occur: (1) the age-related failure of a coating, (2) the subsequent failure of the base metal, (3) interaction with a component performing an (a)(1) function (e.g., leakage or spray), and (4) the subsequent failure of the component performing the (a)(1) function. This series of cascading failures has not been experienced nor is it likely postulated in a station's CLB. It is not credible that this series of cascading failures would occur and go unidentified and,

Number	Page #	Section #	Description	Justification
				therefore, it need not be considered for license renewal.
13	2	I.a V - Summary	The descriptions of the definition of SL3 coatings in the two locations noted is redundant to Section V.a. Recommend deleting the redundant text and leaving needed text in V.a.	Editorial.
14	2	I.b	First sentence begins with "The staff has noted that for AMR steel pipe with…". The phrase "AMR steel pipe" is not clear.	The meaning of "AMR steel pipe" is unclear. Perhaps delete "AMR."
15	2	I.b	First sentence appears incorrect in stating that "many applicants state that the elastomer lining is not credited for aging."	Consider aging management as the proper term.

Number	Page #	Section #	Description	Justification
16	2	I.b	Delete "The staff recognizes that the corrosion allowance used for the design of a component could have incorporated a general corrosion rate that reflects 40 or 60 years of service" and delete "However" from the beginning of the next sentence.	The sentence is not relevant. An applicant typically performs periodic inspections on a system with internal coating on the same frequency as for a system that is not coated. It is not a function of whether there is a corrosion allowance.
17	2	I.b	Clarify how accelerated corrosion that could occur at the location of a coating holiday is different from pitting corrosion that is adequately managed by existing programs.	The ISG is partially to address accelerated aging at coating holidays. Existing GALL AMPs provide guidance for managing pitting corrosion which is an accelerated localized corrosion effect. If the existing GALL AMPs are sufficient for pitting why are they not for accelerated corrosion at the locations of coating holidays? What is unique about the corrosion at coating holidays that makes the existing GALL AMPs inadequate?
18	2	I.b	Clarify the first sentence of I.b. with respect to applicants not crediting a lining for aging.	Generally applicants do not credit an internal lining or coating when determining which aging effects are applicable for the base metal of the coated component. For example, applicants do not claim that a coated carbon steel component is not subject to Loss of Material due to General, Pitting, and Crevice Corrosion in a water environment simply because of the coating. Instead, it is assumed the component will age (i.e., no credit is taken for the coating) and the AMP is designed to ensure that the aging will not prevent the accomplishment of an intended function. In other words, aging of the base metal, including accelerated aging (e.g., pitting) is not unanticipated and is adequately addressed by existing GALL AMPs. Note: there is no Adams ML#.

Number	Page #	Section #	Description	Justification
19	2	II.a	Entire sub-paragraph II.a should be reviewed with consideration made to rewording.	~Paragraph "IIa" is not an OE example; it is a background/introduction to the other six OE examples found in sections b through g. **Suggested Change:** Change or delete subsection II.a as an OE example. . ~Sections IIb through IIg appear to be examples of OE for applications that are older than what would expected to be within "two to three refueling outage intervals." There does not appear to be adequate connection between subsection IIa and the six OE examples. **Suggested Change:** Please provide clear justification and connection based on OE. . ~See last sentence. **Suggested Change:** Change the last portion of the last sentence to read, "...repaired or replaced to be inspected within the period of the next two refueling outages."

Number	Page #	Section #	Description	Justification
20	2	II.a	This OE example is not relevant to license renewal and should be removed.	The issue identified in this example has been addressed by an Information Notice (IN 85-24) and has been adequately considered by the 10 CFR Part 50 regulatory process. The example describes an event in which a misapplied coating failed after it had been in service for two years. Failure due to misapplication of a coating is not age-related and generally occurs after no more than a few years after installation. Since the effects of misapplication of coatings are realized after only a few years it is inappropriate to postpone any significant enhancements to safety until the period of extended operation. As such, any significant enhancements to safety that can be made to address this OE should be performed during the current operating term and, therefore, should be regulated under 10 CFR Part 50. This is not related to long term aging and is not unique to operation beyond the initial 40-year term and, as such, it is inappropriate to address this issue through the license renewal process.
21	3	II.a	In the second sentence of the last paragraph in this section, change the word "satisfactory" to satisfactorily".	Editorial.
22	3	II.a	This is not an example of a coating failure that occurred as a result of aging.	In the top full paragraph it states "Although the root cause of the failure was related to installation practices the failure occurred as time elapsed." Failures occur as time elapses. The fact that a failure occurred after a period of time, does not mean that it was due to the effects of aging, even though one may call it age-related. The cause in this example was poor installation; not aging.

Number	Page #	Section #	Description	Justification
23	3 & C-2	II OE Examples, a & Appendix C, Table 4a	New coating degradation associated with installation practices is not an aging effect. Recommendations to inspect newly installed coatings should not be in the GALL.	The inspection may be a good practice and perhaps another Information Notice should be issued with the recommendation, but the GALL is for aging management and license renewal. Other good maintenance practices do not belong in it. This could dilute its use and allow for the GALL to be revised for other items that are not associated with aging management in the future.
24	3, C-2	II.a Table 4a	Delete the recommendation in Table 4a, "Inspection Intervals for Service Level III (augmented) Coatings for Tanks, Piping, and Heat Exchangers," of the new GALL Report AMP XI.M42, "Service Level III (augmented) Coatings Monitoring and Maintenance Program," for inspection during the next two refueling outage intervals of newly installed coatings or coatings that have been repaired or replaced.	Recommending inspections within two operating cycle intervals is addressing installation deficiencies; not the effects of aging. This violates the letter and the spirit of the statements of consideration for the license renewal rule, which state "The Commission still believes that mitigation of the detrimental effects of aging resulting from operation beyond the initial license term should be the focus for license renewal." Clearly addressing the results of inadequate installation or maintenance within two operating cycles of installation is not addressing the detrimental effects of aging resulting from operation beyond the initial license term. Additionally, OE doesn't appear to support the proposed requirement to re-inspect two more times after initial installation/repairs/replacements. Installation/repairs of coatings will be applied by certified specialists which should count for some consideration from the proposed requirement.
25	3	II.a, d	"...Number ML 12097A064."	Please verify Accession number; it appears to be in error.

Number	Page #	Section #	Description	Justification
26	3	II.b	This OE example does not support the establishment of a new AMP to manage internal coatings.	As demonstrated by this OE example, the failure of the coating itself is irrelevant to the intended function of the component. The intended function is performed as long as the pressure boundary of the component is maintained and, therefore, the appropriate corrective action is to monitor for wall loss of the base metal and not inspect the coating. Furthermore, it is unlikely that coatings subject to erosion would fail as a sheet but instead would wear away locally due to the abrasive nature of water with entrained solids at high velocities. In addition, if a coating subject to erosion were to fail in a sheet it is likely that the coating would break apart in the flow prior to causing flow blockage.
27	3	II.c	This OE example demonstrates that it is inappropriate to address this issue through license renewal.	The OE describes the failure of a coating system that is designed to last 15-20 years per the manufacturer. Evidence of coating degradation was identified as early as three years after installation. Failure of the coating occurred 19 years before the station entered the period of extended operation. The recommendations made in this program would not go into effect until the period of extended operation and, as such, would not have prevented the event. This time period was exceeded and the material started to fail by migration of plasticizers resulting in embrittlement and cracking which would be expected. This should be considered a historical design issue. Rather than addressing this issue through the license renewal process, it should be addressed for the initial operating term since the failure was not due to long term aging unique to the extended period of operation.

Number	Page #	Section #	Description	Justification
28	3	II.d	This OE example demonstrates that it is unlikely that failure of properly designed and installed coating systems will not cause degradation of downstream components and should be removed.	Modern coating systems designed for immersion are designed such that they do not fail as a sheet. If the coating is properly installed the coating will become brittle prior to loss of adhesion and therefore flake off in small pieces. This OE example does not provide any indication that the coating system used would fail as a sheet in the future. The referenced RAI postulates that the coating debris could block individual heat exchanger tubes. Blocking or plugging of individual heat exchanger tubes does not prevent the heat exchanger from performing its design function since heat exchangers are designed such that there are excess tubes for the required heat transfer. The intended function of a downstream heat exchanger is not challenged unless an upstream coating fails as a large enough sheet to block multiple heat exchanger tubes (generally 10%-15% for heat exchangers important to safety). This OE example does not provide any evidence that coating failures capable of causing flow blockage of downstream heat exchangers are likely to occur.
29	3	II.e	Please remove the lining reference found in "...flow reduction occurred because rubber lining on butterfly valve body became detached..."	Rubber lining in valve bodies is not the responsibility of the coating program. Valves are procured with these type linings installed as part of the manufacturing process and aging management of these linings should reside in the AMPs associated with valve components.

Number	Page #	Section #	Description	Justification
30	3	II.e	This OE example is due to the use of an improper coating system for the service environment and therefore, is not age-related	As demonstrated by the corrective actions taken, the cause of the OE was the use of a rubber lining in a chlorinated water environment. Replacement with a proper coating system (i.e., non-rubber) has corrected the issue. Based on this it can be concluded that the issue is due to a design deficiency rather than long-term aging. In addition, this OE demonstrates that coating failures are self-revealing via normal system monitoring and, therefore, additional inspections are not necessary. Finally, this issue demonstrates that coating failures are adequately regulated through the 10 CFR Part 50 process. This process continues through the period of extended operation and, therefore, a 10 CFR 54 AMP is not required to ensure that an acceptable level of safety for operation is maintained.
31	4	II.f	This OE example is not relevant unless the license renewal applicant credits the internal coating to preclude aging and, therefore, does not have an aging management program that anticipates aging.	The contention in this OE example is that aging of coated components is not anticipated and, thus, the coating has to be managed for aging so that this assumption remains valid. However, as stated earlier in this ISG, applicants for license renewal generally do not credit internal coatings to preclude aging and, therefore, the aging is anticipated. As such, the AMPs are designed to manage the aging of the base metal, including accelerated aging (e.g., pitting corrosion).
32	4	II.f	Qualify, reword, or delete the text "cavitation in piping downstream of flow control valve eroded the pipe coating resulting in unanticipated corrosion through the pipe wall."	There are no known coatings that will withstand cavitation issues in a piping system. Aging management issues due to cavitation in piping systems should reside in the AMP for the piping system and not the AMP for coatings.

Number	Page #	Section #	Description	Justification
33	4	II.g	This OE example does not support the establishment of a new AMP to manage internal coatings.	As demonstrated by this OE example, the failure of the coating itself is irrelevant to the intended function of the component. The intended function is performed as long as the pressure boundary of the component is maintained. Had an appropriate aging management program been in place to manage the degradation of the base metal, the event would not have occurred. In addition, the failure of the concrete lining appears to be due to a design deficiency rather than age-related degradation. The concrete lining is not designed to withstand the high flow velocities and turbulence caused by the valve located just upstream of the degraded area. Use of an appropriate, erosion resistant lining would have prevented this event.
34	4	III.a	The quoted paragraph refers to small flaws where anodic conditions can occur and then it states, "small anodic areas supported by a large cathode." What is the large cathode?	Provide clarity on what the large cathode is. The substrate or the fluid?

Number	Page #	Section #	Description	Justification
35	5	V	Entire section should be reviewed.	Please note that this section appears to treat 10 CFR 54.4 (a) (1), (a)(2), and (a)(3) as having equivalent safety-related applications. They are not. The subsection noted as (a)(3) is not safety-related and to include them as a part of the scope of this ISG is simply an impetus for further confusion. This overlap is leading to confusion by industry. This was evident during the recent ASTM D33 meeting where confusion continued even after extensive discussion between industry and NRC representatives. This confusion is compounded when the CSL III term is used whether it utilizes the term "augmented" or not. Additionally, during previous public meetings the NRC noted that this ISG was to affect change to "Commission Regulated Event[s"] which included Fire Protection and Safety Blackout. These were noted as part of 10 CFR Part 50 criteria. 10 CFR Part 50 is no longer being referenced but the ISG does contain components/systems that are found within Part 50. This is leading to continued confusion. **Suggested Change:** Extensive clarification through re-writing several of these sections to segregate safety-related versus nonsafety-related components is warranted due to the extensive confusion which has occurred.
36	5	V	The definition of Service Level III (augmented) coating is too broad because it includes in-scope components not subject to AMR. There are many active components that are in-scope for license renewal. Strictly reading, this definition could apply to motor operated valve actuators housing internal coatings. I	Recommend the definition should read: ...coatings applied to the internal surfaces of an in-scope component **subject to AMR (passive and long-lived).....**

Number	Page #	Section #	Description	Justification
			believe this is not the intent of the definition.	
37	5	V.a	Delete the first sentence of this section. It is inserted before the definition and it is confusing whether it is part of the definition.	A statement of what coatings are in the scope of the license renewal rule should not be inserted in the definition of SL III coating. If the intent is to say that SL III coating is within the scope of license renewal, then such statement should follow the definition of SL III coating.
38	5	V.a	Term for SL III (augmented) should be changed to SL III-augmented if previous comments are not incorporated.	Clarification. Implies augmented = SLIII

Number	Page #	Section #	Description	Justification
39	5	V.a	Revise (delete i and revise ii) to read: "V. Definition of Coating Service Level - Aging Management a. All coatings applied to the internal surfaces of an in-scope component, that are not covered by the existing definition of Coating Service Level III (see ASTM D4538-05), are in the scope of this LR-ISG if its degradation could prevent satisfactory accomplishment of any of the functions identified under 10CFR54.4(a)(3). Coating Service Level Aging Management are those: i. Applied to the internal surfaces of in-scope components and whose failure could prevent satisfactory accomplishment of any of the functions identified under 10CFR54.4 (a)(3) (e.g.., fire protection, station blackout)."	Clarification.

Number	Page #	Section #	Description	Justification
40	5	V.a	This section of the report really does not address the case of material that is used to repair a 0.25 inch pit in a tank. It is hard to characterize this as a coating and as such should be stated that coating does not include these types of very limited pit repairs.	The dictionary definition of a coating is "a layer of any substance spread over a surface." EPRI 1019157 defines paints/coatings/linings as "essentially synonymous terms for liquid-applied materials consisting of pigments and fillers bound in a resin matrix that dry or cure to form a thin, continuous protective or decorated film." This is different than a substance used to fill-in a pit because it is not a continuous thin film. In addition one of the justifications for stating coatings can be a concern is large areas could come off and significantly impact flow, pressure, and heat transfer downstream. Clarifying the definition of a coating should address this concern.
41	6	V.a	Clarify if the SLIII (augmented) definition (and therefore the ISG) only applies for SSCs located outside the containment	The current definition seems to imply that the internal coating of a safety-related component located inside containment is not a SLIII (augmented) coating. Is this the intent?
42	6	V.a.i V.e.i	Clarify if the SLIII (augmented) definition (and therefore the ISG) only applies for internal coatings	The existing SLIII coating (in RG 1.54) includes external coatings if their failure could impact a safety function (see RG 1.54 section C.1.c, "coating on the external surface of a reactor containment may be designated Service Level III"). Failure of an external coating could potentially leave the exposed base metal vulnerable to "unanticipated" external degradation. Is the intent to include both internal and external coatings within the scope of this ISG? Furthermore, the example provided in section V.e.i of this ISG seems to be just as applicable to external coatings. If an external coating in the area of drains credited for Fire Protection were to fail, they could also cause flow blockage in the drain line. Would these coatings be considered SLIII (augmented)?

Number	Page #	Section #	Description	Justification
43	6	V.a.i	Revise the definition to read "used in areas outside the reactor containment whose age-related failure could adversely affect the safety-function of a safety-related SSC..."	Failure mechanisms that are not age-related are not relevant to license renewal. This comment is also applicable throughout the ISG. References to coating failures should be limited to age-related coating failures since this is the purview of license renewal.
44	6	V.a.ii	Revise the definition to read "...applied to the internal surfaces of in-scope components and whose age-related failure could prevent satisfactory accomplishment of any of the functions identified under 10 CFR 54.4(a)(3) (e.g., fire protection, station blackout)."	Failure mechanisms that are not age-related are not relevant to license renewal.
45	6	V.a.ii	Clarify whether an in-scope coated component located near a component performing a 10 CFR 54.4(a)(3) component is to be included in scope under 10 CFR 54.4(a)(3).	Although it is clear that, based on the guidance in this ISG, internal coatings for components within the scope of license renewal in accordance with 10 CFR 54.4(a)(2) would be considered SLIII (augmented), it is unclear what intended function they perform if there failure could potentially impact the performance of a 10 CFR 54.4(a)(3) function. For example, theoretically, an internal coating for a component that is in-scope under 10 CFR 54.4(a)(2) and is located near nonsafety-related switchgear that is required to perform an (a)(3) function could fail and cause the base metal to corrode through and spray the switchgear. This could potentially prevent the switchgear from performing its (a)(3) function. Per the definition in the ISG, this coating would be classified as a SLIII (augmented) since (1) it is applied to the internal coating of an in-scope component and (2) its failure could prevent the accomplishment of an (a)(3) function. Per NUREG-1800, each function of a component within the scope of license renewal must be identified. This spatial interaction is beyond the scope of 10 CFR 54.4(a)(2). Would the

Number	Page #	Section #	Description	Justification
				coated component be in-scope under

Number	Page #	Section #	Description	Justification
				10 CFR 54.4(a)(3)? If so, this is inconsistent with the Statements of Consideration which takes care to limit the unnecessary expansion of the scope of review for (a)(3). If not, the SLIII (augmented) definition should be modified to make this clear. Note that this concern is also applicable to (a)(2) components with internal coatings located upstream of components performing an (a)(3) function (i.e., would the internal coating for the (a)(2) component perform an (a)(3) function). Suggested rewording: "...applied to the internal surfaces of components within the scope of license renewal in accordance with 10 CFR 54.4(a)(3) and whose failure could prevent satisfactory accomplishment of any of the functions identified under 10 CFR 54.4(a)(3) (e.g., fire protection, station blackout)."
46	6	V.a.ii	The ii definition creates a condition that is outside the scope of 10CFR54.	If the coated component is non safety-related and in scope for (a)(2) but its failure impacts an (a)(3) component, doesn't this create a new function of NSR whose failure could affect a nonsafety-related (a)(3) component function, i.e. (a)(4)? For example, what if a coating on (a)(2) component failed and piping leaked on (a)(3) component, in accordance with 54.4, does that make the coated component in scope?
47	6	V.b	It is not clear, in the first sentence, what/where the example is of a coating being considered an SSC. Add some clarification that the description is located in the last paragraph under V.b.	Clarification

Number	Page #	Section #	Description	Justification
48	6	V.b	In the 5th sentence add the word "offers" as follows: "A coating is an integral part of an in-scope component, providing it offers protection from…."	Editorial
49	6	V.b	In the first sentence of the paragraph it states the coating is an integral part of the component. If the coating is an integral part of the in scope component then the only aging effect required to be identified for the coated portion of the component is loss of coating integrity managed by this program. As a result no other programs are required to manage the coated surface. This should be stated somewhere such that it is clear.	To add clarity on aging management of coated components.
50	6, 7	V. b	Edit the last sentence of the section.	Within the last sentence, replace the word "unique" with the words "integral part of."
51	6	V.b	The second paragraph of section V.b addresses reduction of flow due to coating debris. Maintaining adequate flow rates is an active function of the system, not passive, and therefore, is beyond the scope of license renewal.	Other than for stagnant systems (e.g., Fire Protection), reduction in flow due to coating debris, or any other mechanism, is self revealing during normal system monitoring and as such, internal visual inspections are not required. OE examples II.c and II.e in this ISG demonstrate that normal system monitoring is effective at detecting reduction in flow due to coating debris prior to loss of function. Maintaining active functions of systems is adequately addressed by system performance monitoring in accordance with the maintenance rule and need not be addressed for license renewal.

Number	Page #	Section #	Description	Justification
52	7	V.b	The third paragraph of section V.b is inconsistent with the definition of SLIII (augmented).	This section of the ISG states that the function of the coated component drives the function of the coating (i.e., if a component has an (a)(3) function then the coating has an (a)(3) function). This is not consistent with the SLIII (augmented) definition. A component with an internal coating that is connected to safety-related equipment through a normally open isolation valve but is beyond the first seismic anchor and physically separated from safety-related equipment such that spatial interaction (e.g., leakage or spray) is not possible would meet the definition of SLIII (augmented) but the coated component would not meet any scoping criterion. In addition, the coated component does not have an intended function related to flow blockage of downstream components in contrast to the function of the coating itself (in other words the coating has an additional function that is not driven by the function of the coated component). Clarification of the definition is needed to address this inconsistency.

Number	Page #	Section #	Description	Justification
53	7	V.d.i & iii	It is not clear why these two sections are needed. Consider deletion.	The concerns of these two sections are managed by other programs regardless if they are coated or not. Hypothetical cascading failures that have not been experienced and are not part of the station's CLB need not be addressed when scoping for license renewal. If there is operating experience that is generically applicable (i.e., to many different coating systems in many different service environments) that indicate that failure of a coating that in turn causes failure of the base metal leading to spray on safety-related equipment where the safety-function is lost (or could have been lost) then this OE should be provided. If this is just a theoretical, hypothetical concern then it need not be addressed for license renewal. In addition, failure of the coating itself is irrelevant to the function of the component. The leakage boundary function of the component is maintained as long as through-wall leakage of the base metal is prevented. The existing license renewal guidance (e.g., GALL/SRP, Rev 2) provides AMPs that ensure that aging of the base metal is adequately managed to prevent through-wall leakage. Therefore, managing any potential aging of the coating is not required.

Number	Page #	Section #	Description	Justification
54	8	V.d.iii	The internal coatings on nonsafety-related pipe that maintains mechanical and structural integrity to provide structural support to SR piping and components should not be in scope unless credit was specifically taken for the coating in designing the system. Delete or revise this section.	Typically credit is not taken for pipe coatings for the pipe to perform its function. The coating is more like an added provision. Therefore, the coating should not need to be age-managed. The system can perform its function without the coating. As stated in NEI 95-10 appendix F even aged pipe does not fail in a seismic event and only the supports are in scope. As written this would require you to include coatings in air systems if there were any that were in for structural support only. Hypothetical cascading failures that have not been experienced and are not part of the station's CLB need not be addressed when scoping for license renewal. Internal coating failures generally lead to localized pitting of the base metal. It is not credible that localized pitting would render the component unable to perform its structural support function. If there is operating experience that is generically applicable (i.e., too many different coating systems in many different service environments) that indicate that failure of a coating that in turn causes failure of the base metal leading to loss of the component's structural support function then this OE should be provided. If this is just a theoretical, hypothetical concern then it need not be addressed for license renewal. In addition, failure of the coating itself is irrelevant to the function of the component. The structural support function of the component is maintained as long significant loss of material (in both depth and area) is not allowed to occur. The existing license renewal guidance (e.g., GALL/SRP, Rev 2+G64) provides AMPs that ensure that aging of the base metal is adequately managed to prevent significant loss of material. Therefore, managing any potential aging of the coating is not required.

Number	Page #	Section #	Description	Justification
55	8	V.e.ii	General references to tanks should be reviewed and reworded.	As noted above, blisters have been observed to remain stable due to equilibrium of the conditions which initiated the blistering. In low flow conditions, these blisters do not typically generate debris for down-the-line concerns.
56	9	VI	This section is inconsistent with the definition of SLII coatings provided in RG 1.54	Many of the coatings that are included in the definition of SLIII (augmented) and by extension included in the scope of this ISG are SLII coatings. Therefore, many (if not most) SLII coatings are included within the scope of this ISG.
57	9	VII	The next to last sentence includes piping, piping components, heat exchangers and tanks. According to Chapter IX, piping components includes a lot of specific components. "Examples include fittings, tubing, flow elements/indicators, demineralizers, nozzles, orifices, flex hoses, pump casings and bowls, safe ends sight glasses, spray heads, strainers, thermowells, and valve bodies and bonnets." Is it the intent of this ISG to address piping, tanks and heat exchangers, or all of the above listed components?	Delete "piping components" from the subject sentence.

Number	Page #	Section #	Description	Justification
58	9	VII	Suggest rewording this sentence: "The staff included the Service Level III (augmented) coatings AMP in the mechanical series of AMPs instead of the structural series because the components being age-managed by the program will principally be piping, piping components, heat exchangers, and tanks." To this: "The staff included the Service Level III (augmented) coatings AMP in the mechanical series of AMPs instead of the structural series because the aging effects being managed by the program will be associated principally with piping, piping components, heat exchangers, and tanks."	"Age-managed" is a term that does not appear in NUREG-1800 or NUREG-1801.
59	9	VII.a.i	It is not clear how periodicity of visual inspections is based on impact of coating failure. There is nothing in Table 4a based on impact of coating failure. An explanation of how impact of coating failure affects periodicity of visual inspection seems warranted.	An explanation of how impact of coating failure affects periodicity of visual inspection is needed to allow determination of periodicity of inspections.

Number	Page #	Section #	Description	Justification
60	9	VII.a.i	The inspection criteria indicated by "extent of inspections for internally coated piping" should be qualified.	Coating inspection sampling size for internally coated piping should not be more stringent than sampling sizes recommended in other AMPs. Commercial Grade Dedication of coatings which identify ASTM standards as critical characteristics for acceptance provide reasonable assurance those coatings are procured and tested in accordance with industry consensus documents (ASTM). Qualification of coatings applicators and inspectors are also typically performed in accordance with industry consensus documents (ASTM).
61	9 and 10	VII.a.i	"Visual inspections are conducted on all coatings applied to ..." should be reworded. It is incorrectly stated.	Visual inspections are not performed on all internal coatings of in-scope components. **Suggested Change:** Replace the word "all" with the word "accessible." . The first paragraph at the top of page 10 provides an example of inspection requirements for all tanks and heat exchangers. This example is unclear. **Suggested Change:** Rewrite and redefine this example for the sake of clarity.
62	10 C-3	VII.a.i App C, Section 4	The 73 1-foot lengths of pipe or 50% of total length of material and environment combination seems excessive. Is 95/95 confidence level needed for this ISG?	For service level I coatings, requirement is to do walkdown of accessible locations. For service level III internal coatings, piping will need to be opened up, so it goes beyond looking at accessible areas. There should be a balance between the cost (resources, industrial safety, rad safety), feasibility and the benefit, to have the amount of inspections be more cost-beneficial.

Number	Page #	Section #	Description	Justification
63	10 C-3	VII.a.i Element 4	Change to read as follows: "The extent of inspections for internally coated piping is either (remove 'a') 73 representative 1-foot axial length circumferential segments...."	Editorial
64	11 C-2	VII.a.iv Element 3	Stating the specific ASTM standard in Element 3 seems to contradict NRC response to Resolution of Public Comments, Item 79. Consider revising the subject paragraphs to point to the Reg Guide or to the EPRI document.	Consistency
65	11	VII.a.vii	The in-scope indication of the installed coating upstream of the cooling pond is incorrect.	Example (a) "coating installed upstream of a cooling pond with no piping obstructions between coating and cooling pond with flow circulation such that coating debris would not transport to an inlet pipe" was given as basis to perform external wall thickness measurements in lieu of coating inspections. This piping would not be an in scope component because loss of coating could not prevent it from satisfactorily accomplishing any of its functions identified under 10 CFR 54.4 as written and should be removed as an example.
66	11	VII.c	Change from "Attachment C" to "Appendix C".	Editorial
67	A-1	Table 3.0-1 Description of Program	Provide detail in the main body of the ISG (maybe in Section II OE examples) as to the environments applicable to this AMP, in addition to naming them in Table 3.0-1.	Clarification

Number	Page #	Section #	Description	Justification
68	A-2	Table 3.2-1	Remove "physical damage" from aging effect/mechanism column.	Physical damage is not an aging effect or aging mechanism. License renewal aging management programs should not be relied on to manage physical damage or other conditions that are not related to operation beyond the initial license term.
69	A-4, A-5, B-1, B-2, B-3, B-5	Appendices A and B	Throughout the body of the ISG, and in Elements 4 and 6 of AMP XI.M42, aging mechanisms of "rusting" and "delamination(s)" are typically listed yet the appendices do not include these terms consistently. Recommend adding these two terms where listings of aging mechanisms are given, e.g. Tables in the Appendices, and Definitions GALL Report Section IX.E.	Clarification
70	B-4	Appendix B	There is nothing that addresses the extent of material installed and it qualifying as being a coating. Provide provision to exclude inspection if a small pit is filled in with a ceramic metal based material or change the definition of a coating to clearly define small repairs don't qualify.	Small pits filled in with a ceramic metal-based material are not coatings as defined in EPRI or ASTM guidance.

Number	Page #	Section #	Description	Justification
71	B-4 and B-5	Appendix B	Please clarify and reword the definitions of "Coatings" and "Loss of Coating Integrity".	(See the definition of Coating as shown on page B-4) As noted above, the materials described as a part of coating linings includes materials which are not typically within the purview of a coatings system owner or ASTM D33. **Suggested Change:** Suggest removing "**...linings (e.g., rubber, cementitious)...**" . (Please see definition of Loss of Coating Integrity as shown on page B-5) As previously noted, this term is very unclear it leads to continued confusion between whether this ISG relates to the safety function of coatings (adhesion) or the operational function of coatings (deterrence of corrosion of the substrate). **Suggested Change:** Suggest removing third paragraph entirely - "**Where the...can occur**"
72	B-5	Appendix B, IX.F	Tanks can become fouled in the sense that sediment can build up and lead to corrosion. The definition of fouling in the GALL should be more inclusive. Include tanks in the list of components that can become fouled in the sense that sediment can build up and lead to corrosion. The other option is to remove the detail about raw water.	OE has documented that the cause of the pitting corrosion in fuel oil tanks was fouling/sediment that occurred on the bottom of the tank.
73	C-1	Program Description	The EPRI document is listed and NOT the Reg Guide. revise program description as needed for consistency.	Consistency

Number	Page #	Section #	Description	Justification
74	C-1	Various	Appendix C of the ISG is intended to provide guidance for managing age-related degradation of coatings but is written to address any degradation of coatings. Revise the wording to specify that the focus is age-related coating failure and degradation. As an example, the first sentence of the last paragraph at the bottom of page C-3 should be revised to say "The above recommendations for inspection of coatings may be omitted if the age-related degradation of coatings cannot result in downstream effects..."	Since this is an aging management program there is no need to address degradation due to non age-related mechanisms.
75	C-1, C-3, C-4	Various	Revise the program to exclude components where the corrosion of the base metal is the only issue related to coating degradation.	This program is designed to manage age-related degradation of internal coatings. The age-related degradation of the base metal is managed by other AMPs (e.g., Open Cycle Cooling Water System). If it can be shown that the only issue related to coating degradation is the corrosion of the base metal then the coating should be excluded from this AMP. The other AMPs assume age-related degradation, including accelerated degradation (e.g., pitting), and as such, provide sufficient aging management activities to ensure that the aging of the base metal is adequately managed. It is inefficient for one program to track corrosion rates for coated components (as required by element 5) and a different program to track corrosion rates for non-coated components in the same system.
76	C-1	Appendix C	Include use of other programs to manage coatings such as Diesel Fuel Monitoring.	EDG Tanks sampling aspect of the Diesel Fuel Monitoring Program could be used to detect coating degradation rather than performing a visual inspection.

Number	Page #	Section #	Description	Justification
77	C-1 thru C-6	Appendix C	The new GALL program description is much more detailed for Service Level III coatings than the existing program for Service Level I coatings. This doesn't seem appropriate.	Clarification
78	C-2	Element 2	Revise the preventive actions element to read as follows: "The use of the appropriate coating system for the service environment and the proper installation practices ensure that coating systems will perform as designed during the period of extended operation. Coating systems should be chosen using applicable industry guidance documents (e.g., NACE TPC 2, "Coatings and Linings for Immersion Service"). The installation and repairs of coating systems should be performed in accordance with manufacturer's guidance to ensure proper adhesion of the coating (e.g., proper cleaning of the surface to be coated). If these preventive measures are taken then the newly installed or repaired coating can be considered an Inspection Category A coating rather than an Inspection Category C coating (see Table 4A)."	The inspection frequency for Inspection Category C coatings is intended to address misapplied coatings or the use of the wrong coating system. If the coating is properly applied and the correct coating system is chosen then there is no reason to believe that a coating will fail in the first few years of service. In addition, the way Table 4A is currently structured provides motivation to allow continued operation with degraded coatings as long as minimum requirements for the coating system are met rather than proactively repairing minor instances of coating degradation. If a coating has a blister that has been deemed acceptable by a coating specialist there is a disincentive to perform a repair of the blister since additional inspections would be required as a result. This is counter productive to the goal of ensuring that coating systems are properly maintained.

Number	Page #	Section #	Description	Justification
79	C-2	Element 3	The draft ISG identifies in several places (e.g. on PDF page 1 of 36) the aging effect to be managed as "loss of coating integrity due to blistering, cracking, flaking, peeling, or physical damage…". However in Appendix C of the draft ISG, the Parameters Monitored/Inspected (Element 3) in GALL AMP XI.M42 states "Visual inspections are intended to identify coatings that do not meet acceptance criteria, such as peeling and delamination." Recommend consistency in the identified parameters monitored with aging mechanisms that are being managed by the AMP.	Section 10.2 of ASTM D7167-12 identifies (for parameters to be monitored) conditions other than peeling and delamination (e.g., such as blistering, cracking, and rusting).
80	C-2	Element 4	The inspection frequency for diesel oil storage tanks should be set at 10 years, consistent with internal tank inspections recommended in GALL program XI.M30.	The OE examples provided in this ISG do not provide any basis for why a ten year inspection frequency for the internal coatings for diesel oil storage tanks is insufficient. If generically applicable OE exists to warrant more frequent inspections, that OE should be provided. If not, the ten year frequency recommended in XI.M30 is appropriate.
81	C-2	Element 4	The baseline inspection is only discussed in Element 4. Revise the body of the ISG to provide the basis for the Baseline Inspection.	Clarification

Number	Page #	Section #	Description	Justification
82	C-2	Element 4	Category C inspection requirement should be deleted for newly installed, repaired or replace coatings. One re-inspection within six years (similar to Category A) is recommended for newly installed or replaced coatings. One re-inspection within four years (similar to Category B) is recommended for repaired coatings.	AMP Table 4(a), inspection category C coatings for newly installed coatings or coatings that have been repaired or replaced should not be more stringent than repair or replacement inspection requirements of other AMPs of ASME Code for pressure boundary or structural integrity intended functions of the base metal components. Newly installed, repaired, or replacement coatings are procured, installed, and tested to ASTM standards and/or Industry consensus documents and should not require re-inspection during the next two refueling cycles. In addition, qualification of coatings applicators and inspectors are also typically performed in accordance with industry consensus documents (ASTM).
83	C-2, C-4	Element 4	In Appendix C of the Draft ISG, the Detection of Aging Effects (Element 4) in GALL AMP XI.M42 states "Subsequent inspection intervals are established by a coating specialist qualified in accordance with an ASTM International standard endorsed in RG 1.54 (hereinafter Revision 2 or later)." Later in the same element it states: "The training and qualification of individuals involved in coating inspections and evaluating degraded conditions is conducted in accordance with an ASTM International standard endorsed in RG 1.54 including staff guidance associated with a particular standard." Recommend allowing use of a later year editions of the ASTM	RG 1.54, Revision 2, currently endorses ASTM D 7108-05 for qualification of Nuclear Coatings Specialist and ASTM D 4537-04a for qualification of coating inspection personnel. These standards have been superseded by ASTM D 7108-12 and ASTM D 4537-12, respectively.

Number	Page #	Section #	Description	Justification
			International standard endorsed in RG 1.54 for qualification of coatings specialist and coating inspectors.	
84	C-3	Element 4	In 2nd paragraph below Table 4a, change "(e.g., flanges" to "(e.g., flange faces)"	Clarification
85	C-3	Element 4	In the last paragraph on page C-3, clarify what is meant by the following two sentences and consider a revision: "However, the recommendations for inspections are met if corrosion rates or inspection intervals have been based on the integrity of the coatings. In this case, loss of coating integrity could result in unanticipated or accelerated corrosion rates of the base metal."	Clarification

Number	Page #	Section #	Description	Justification
86	C-3	Element 4	In the 2nd to last paragraph on p. C-3, do not understand what is meant by "For areas not readily accessible for direct inspection, such as small pipelines, heat exchangers, other equipment, consideration is given to the use of remote or robotic inspection tools." Does this mean that we have to use the tools? Above it already requires inspection of all accessible internal surface areas of heat exchangers.	Clarification
87	C-3	Element 4	Last paragraph on p. C-3 - First sentence is clear. The rest of the paragraph should be split out and clarified.	The second sentence can be read multiple ways. It needs clarification. Also, the 2nd through 4th sentences are unrelated to the 1st sentence and should be separate.
88	C-3	Element 4	Allow the use of normal system monitoring rather than intrusive internal visual inspections for detection of flow blockage in non-stagnant systems.	Flow blockage in non-stagnant systems is self-revealing through system monitoring. As demonstrated by the OE presented in this ISG flow blockage is detectable through normal system monitoring prior to loss of system intended function.
89	C-3	Element 4	Revise to recommend 20% of coated piping be inspected with a maximum of 25 1-foot sections.	The internal coating for components performs a secondary function in that the coating may (1) protect the base metal which performs a primary function and/or (2) cause flow blockage of a component performing a primary function if it fails. Given that 90-90 confidence is acceptable for components with a primary function it is not justifiable to require 95-95 confidence for coatings with a secondary function even considering the fact that procurement, installation, and testing industry guidance may not be as rigorous.

Number	Page #	Section #	Description	Justification
90	C-3	Element 4	Last paragraph needs to include guidance on the numbers of UT inspections on the pipe per foot such as in accordance with FAC guidance documents.	Guidance is presently left open to interpretation. FAC is well established inspection criteria.
91	C-2	Table 4a	Category C inspection frequency is not justified and should be reduced to one outage interval for coating - new, repairs, or replacements.	Inspection interval should require inspection only during the next refueling outage after installation and not the next two. Historically, OE has shown if a newly installed coating is going to fail it will fail, or show signs of failing, within the first 1½ - 2 years (typical refueling outage interval). A determination of subsequent inspection intervals (longer or shorter) can reliably be made after the first refueling outage inspection. Additionally, this is not reasonable for minor coating repairs. One follow-up . inspection to determine if there is continuing degradation should be adequate to move to category A or B. Going two cycles will not expose coating to any new stresses from loads or temperatures that would not have occurred in one cycle. Note: this comment is applicable only if the above comment for Cat C inspection deletions is not accepted by NRC.
92	C-3	Table 4a, Item 3b	Change turbulence to erosion.	Erosion is the issue if there are concerns about high velocities and change of direction wearing away the coating. Most fluid flow in nuclear plants is turbulent to some extent.
93	C-3	Table 4a, Item 4	For clarity, change first sentence to read "Subsequent inspections being conducted to Inspection Category B or C are re-inspected at the original as well as new locations."	Editorial

Number	Page #	Section #	Description	Justification
94	C-3	Table 4a, Item 5	Change sentence to read "If two sequential subsequent inspections demonstrate no change in coating condition, subsequent Category B inspections may be conducted at six-year intervals."	Editorial
95	C-4	Element 5	Revise the first sentence to read as follows: "A review of the previous two inspection results, when available, is conducted..."	Editorial
96	C-4	Element 6.a	Revise the first sentence to read as follows: "...and coatings are repaired, replaced, or removed."	The current text doesn't allow for another option, to remove the coating altogether.
97	C-4	Element 6.a	Why is the criteria peeling and delamination more stringent than required by GALL XI.S8 for service level I coating? That program refers to ASTM D 5163-08, which requires measuring size of degraded area, noting pattern and seeing carefully if lifting can easily be achieved beyond obvious peeled area. The standard also states that physical tests may be performed for deficient coating when directed by the nuclear coating specialist. In this new Coating program, it directly goes to the testing as the acceptance criteria.	Using existing standards seems appropriate, when available.
98	C-4	Element 6.b & 6.c	Delete or clarify what is meant by the following citations: "...including staff guidance associated with use of a particular standard."	Clarification

Number	Page #	Section #	Description	Justification
99	C-4	Element 6f	This needs to be included in 6a. Also define engineering documents.	It is the acceptance criteria that is part of the requirement for adhesion testing specified in 6a.
100	C-5	Element 10.a	This paragraph identifies blistering, delamination, etc, as "aging effects" which is contrary to other ISG locations , which lists them as "aging mechanisms". Revise locations of this text as appropriate to be consistent.	Clarification and consistency.
101	General	Various	Remove the word "Draft" prior to issuance.	Editorial