Enclosure 2

Handouts discussed during the September 16, 2015 ROP WG Public Meeting

Dated October 08, 2015

Comments Related to Draft NRC Inspection Procedure 71111 Attachment 21P[1] And Attachment 1- Environmental Qualification Programs

Purpose and Objective of Inspection – Comment 1

Our understanding is that the Component Design Bases Inspection program inspections are intended to provide a vehicle for a focused examination of the adequacy of established programs' implementation. In that light, the as-drafted procedure for Environmental Qualification Programs may be too broadly scoped to achieve that goal, particularly within the efficiency goals stated in the procedure.

As evidenced by the introductory language in the Background discussion, and as specifically implemented through the Appendices (A and B), the procedure appears to be written for performance of a traditional baseline inspection of the entire EQ Program, focused on EQ documentation files, with the addition of some new elements (HELB, storage time). As structured, the procedure could direct the inspection team away from program assessments and into detailed, historical, re-inspection of intricate component level and unit-specific licensing basis examinations. Indeed, elements of the procedure utilize inspection methods employed in the NRC's original EQ compliance audits and inspections for specific equipment conformance to 10 CFR 50.49, which were conducted at every plant in the 1980's, followed by 'second round' inspections in the 1980's and 1990's. In that light, it is also unclear whether the resource allocations are at all consistent with such a, potentially, extraordinarily broad scope inspection.

In brief, we observe that many elements of the procedure, including portions of the Background discussion, the actions for example in Sections 02.01, 02.02, and also 02.03 c.1(intro) and d.; as well as the entire set of tasks spelled out in Appendices A and B, are focused only on specific equipment re-evaluation of qualification documentation and not ongoing program maintenance and implementation.

In contrast, there are elements of the procedure which would focus on the programmatic implementation and maintenance that are consistent with the underlying goals. For instance, portions of Sections 02.03 (a.2; b. 1-3; c.1. a), and e.)) Comment 6, below, provides additional discussion on areas of potential focus to achieve the ultimate programmatic assessment goals of the inspection.

EQ Licensing Basis – Comment 2

The current draft of the IP does not acknowledge or accommodate the provision of 10CFR50.49(k) that applies to a majority of the operating plants. The grandfather clause in para

[1] These comments were prepared by the Nuclear Utility Group on Equipment Qualification (founded in 1981, the NUGEQ is comprised of representatives of over 90 of the operating nuclear power units in the United States) , with additional support by EQ expert representatives of Curtiss-Wright, Scientech Nuclear Division.

(k) of the EQ final rule removed the need to requalify electrical equipment important to safety if the Commission has previously required qualification of that equipment in accordance with the "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 (DOR Guidelines), or NUREG-0588 (for Comment Version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment."

Out of the 15 units at the 8 pilot plants, there are 11 DOR units, 1 NUREG-0588 Category II unit and 3 NUREG-0588 Category I units.

Some specific comments that are related to this topic include the following:

1) Attachment 1, Section 02.02: Since the pilot effort involves a variety of plant designs with different EQ licensing basis (e.g. DOR Guidelines, NUREG-0588 Cat II, & NUREG-0588 Cat I), the pre-inspection tasks should focus on the acquisition of documents for the inspectors to become familiar with the specific EQ licensing basis of the plants/units being inspected (similar to what is currently contained for HELB). The goal being for the IP to outline the activities and documents necessary to validate the proper implementation of the EQ Program. Some examples of this type of documentation would include:
   a) EQ SER
   b) RG 1.97 SER (if the selected components include PAM)
   c) EQ Related docketed correspondence
   d) FSAR Q&As related to EQ (as applicable)
   e) Site Documentation that describes the EQ Licensing Basis (EQ Program Manual, Program Basis Document, EQ Topical DBD, etc.)
   f) Any Ongoing or Living Commitments related to the EQ Program.

   It should be recognized that there can be significant differences in EQ Licensing basis between units at the same site. If the selected components involve multiple units at a site, then this could affect the documentation requests prior to site arrival.

2) Attachment 1, Appendix A contains a checklist that is fundamentally based on a presumption that the EQ File being reviewed is based on NUREG-0588 Category I or 10CFR50.49 and IEEE 323-1974. The IP should contain sufficient guidance for the inspection team to evaluate qualification that is based on the DOR Guidelines or NUREG-0588, which are both nominally based off of IEEE 323-1971. Some specific examples include:

   a) The DOR Guideline plants are not required to have a Qualified Life for every EQ component.
   b) The DOR Guidelines and NUREG-0588 Category II plants are allowed to use separate effects testing as opposed to a fully sequential type test that is typical of an IEEE 323-74 test program.
   c) The test sequence requirements for DOR Guidelines and NUREG-0588 Category II plants are different from a fully sequential type test that is typical of an IEEE 323-74 test program.

d) Suggested qualification margin as recommended in IEEE 323-74 and modified by RG 1.89 Rev 1 are not applicable to equipment being qualified to DOR Guidelines or NUREG-0588 Category II.

If the inspectors are trained to understand these nuances, and the EQ Documentation File review is performed as a general review to verify that the important qualification requirements have been addressed in the qualification files, as currently drafted in Attachment 1, Section 02.03.c.1, and the inspection focuses on verifying these requirements have been implemented on the installed components, understanding the licensing basis and revision of the Attachment 1, Appendix A checklist becomes less important.

3) Section 71111.21P-03 on References should be updated to include citations for documents that provide specific guidance related to the variations of EQ Licensing basis that has been recognized under 10CFR50.49(k). As a minimum, the reference section should include a citation for the DOR Guidelines (Enclosure 4 to IEB 79-01B). Other potential reference sources would include:
   a) NRC Bulletin 79-01B, including Supplements 1, 2 and 3.
   b) Commission Memorandum and Order CLI-80-21
   c) NUREG-0800, Section 3.11
   d) The EQ SER or the EQ Section of the Plant's SER
   e) RG 1.97 Rev 2 and 3 (as applicable) since none of the pilot plants are committed to revision 4 of RG 1.97.
   f) The RG 1.97 SER and docketed correspondence (as applicable)
   g) NRC Generic Letter 84-24, Certification of Compliance to 10CFR50.49, Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants.
   h) NRC Information Notice 85-39, Auditability of Electrical Equipment Qualification Records at Licensees' Facilities, May 22, 1985.

4) Depending on the degree of focus on the High Energy Line Break (HELB) analysis that is described in Section 02.03.a.1 of Attachment 1, the IP should include references to documents that provide relevant information related to HELB design and licensing basis. For example this could include:
   a) 1972 AEC HELB Criteria (aka Giambusso Letter) including the subsequent Errata that is provided in Appendix B to BTP 3-3.
   b) The "O'Leary Letter" which is provided as Appendix C to BTP 3-3
   c) NUREG-0800 Sections 3.6.1 and 3.6.2 and the associated Branch Technical Positions
   d) NRC Generic Letter 87-11
   e) ASME/ANS 58.2

Terminology Consistency – Comment 3

To assure a common understanding of issues, it is important that terminology usage be consistent and reflect appropriate application of regulations and guidance.

One specific example noted in the procedure is the use of terms associated with "life" of components. While there can be some variation in usage and application, it must be emphasized that the intent of specific terminology must be established before dealing with related issues to avoid misunderstandings. Therefore, using "life" terminology as an example, we note the following:

- "Qualified life" terminology is intended for use in the context of establishing the period of qualification to demonstrate conformance with 10 CFR 50.49. If an issue is outside of 10 CFR 50.49, then "qualified life" would not be appropriate terminology.

- "Service life" is used (Section 02.03 a.3., and Appendix B, page B-8) in a context where it appears that the intent is "qualified life." That being said, the application is not wholly accurate from a regulatory perspective in that the application of a storage period related to a component's qualified life is not directed by regulation, but instead is premised on licensee evaluations on a case-by-case basis.

In addition, "qualification specification" is used in Section 02.03, c.1. That term is not defined in and is not consistent with regulatory direction. It is not clear if this is intended to address standards other than/beyond 10 CFR 50.49(d); to be an outgrowth of procurement specifications; or some other intent. It may be that it was meant to refer to "performance specification" which would be consistent with terminology in 10 CFR 50.49(d)(1) and IEEE 323-1974. The intent should be clarified, and tied to specific regulatory direction.

Also noted was an apparent tie between the term "qualified" and "type-tested" in Section 02.03 c.1.b). Those terms are not synonymous. Type-testing is not required for all equipment. In fact, 10 CFR 50.49(f) recognizes 4 different qualification methods, including analysis in combination with partial type test data and experience with identical or similar equipment.

High Energy Line Break - Comment 4

The scope of the IP also includes a review of the HELB basis. Given this focus, it should be recognized that the HELB licensing basis can be more complex and diverse than the EQ licensing basis is for the pilot plants. Similar to EQ, the HELB licensing basis varies depending on the vintage of the plant and units and the same site can have different HELB licensing basis.

Essentially, HELB is a "program" unto itself and could potentially represent a separate inspection focus area. Depending on the degree of focus on the High Energy Line Break (HELB) analysis that is described in Section 02.03.a.1 of Attachment 1, additional guidance on how to evaluate the HELB analysis may be warranted either within Attachment 1 or as a new standalone attachment that is specific to HELB.

If inspection of the HELB Program is maintained as part of Attachment 1 and not placed in a separate attachment for the HELB Program, the reference section should be expanded to reflect the relevant documents that describe or define the licensing basis requirements for HELB. For example this could include:

- 1972 AEC HELB Criteria (aka Giambusso Letter) including the subsequent Errata that is provided in Appendix B to BTP 3-3.
- The "O'Leary Letter" which is provided as Appendix C to BTP 3-3
- NUREG-0800 and NUREG-75/087 Sections 3.6.1 and 3.6.2
- Branch Technical Positions MEB 3-1, 3-3 and 3-4.
- NRC Generic Letter 87-11
- ASME/ANS 58.2
- NRC Information Notice 87-106, including all supplements

Risk-Informed Perspectives and Sample Selection Process – Comment 5

There are two points to be made with respect to references to, and consideration of, risk-perspectives in the procedure.

> First, general descriptions in the procedure imply that all EQ equipment is risk significant. It should be noted that 10 CFR 50.49 is itself not premised on risk, but addresses a set of safety-related and non-safety-related electrical equipment defined deterministically in the rule itself. Thus, the procedure's mention of risk considerations - while reasonable in certain contexts - should not suggest that the entirety of equipment within a 10 CFR 50.49 program is risk-significant.
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> Second, it is reasonable to focus the equipment selection for any specific equipment reviews using a plant's PRA to provide risk insights, as noted in Section 02.01.[2] However, it is also suggested that to assure meaningful selections in support of the purpose(s) of the inspection, that equipment selection be informed by operating experience and considerations of which equipment would provide insights into program maintenance (e.g., equipment that has recently changed).

Regarding sample selection, the discussions with respect to the timing of equipment selection, with pre-selection of the equipment sample prior to the bagman trip, raises questions related to the timing of and ties between the program inspections and the overall broad CDBI inspection processes, and the implementation of Program inspections (e.g., Sections 71111.21P-01 to 05, Attachment Section 02.02 b.). Defining the relationship between the overall inspections, and the program inspections, and in turn the steps to be taken for the Program inspections including sample selection, remains to be accomplished.

[2] In addition, reference could be made to Appendix A of Inspection TI 2515/76 which has already listed the most risk-significant EQ components. The EQ Risk Scoping Study (NUREG/CR-5313) may also be useful.

Additional Areas of Review Focused on Ongoing Implementation and Maintenance of EQ Programs – Comment 6

The stated objective in Attachment 1 is to review the licensee's implementation of their 10CFR50.49 EQ programs relative to maintaining the qualified status of equipment during the life of the plant. The inspection will also include a review of the EQ documentation files to verify that electrical equipment important to safety meets the requirements of 50.49(j) and will include inspection of selected accessible equipment which are within the scope of the EQ program.

Based on this objective, the focus of the inspection would include elements of the EQ program that are essential to preserving the qualified status of equipment, establishing the basis for qualification of any new EQ equipment, and to ensure that the qualification basis is maintained current (e.g. in alignment with the current plant configuration, design basis and licensing basis) and auditable manner.

Given the limited sampling of EQ items (6-10) that will be reviewed, the selected equipment items may not have recent activities that would include a sufficient number of examples of program implementation needed to achieve the objective of the IP. This sample size could allow confirmation of certain aspects of program implementation such as translation of EQ specific installation or configuration requirements, EQ specific maintenance requirements and EQ specific procurement requirements. However, other programmatic review techniques may be needed to address some of the other program elements identified by the IP if not demonstrated by a review of the selected equipment.

If this situation is encountered, the following suggestions are provided for consideration as supplemental areas of review in order to achieve the ultimate programmatic assessment goals of the inspection without simply increasing the number of EQ components selected for review until such elements are encountered:

a) Evidence of the EQML and EQ documentation being developed and maintained via the applicable engineering change or configuration management process. For example this may be a sampling of EQ document changes that have occurred within the last 3 years.
b) Evidence that recent EQ related OE has been evaluated and addressed, including updating of any applicable EQ documentation (e.g. not specifically limited to the 6-10 selected EQ components).
c) Evidence that the EQ program interface with the design change process. For example, this could include recent plant modification activities or major plant initiatives that have potential impacts to EQ programs (e.g., License Renewal activities, Power Uprates, SG Replacement, AST implementation, transitioning from 18 month to 24 month refueling cycles, etc.)

These elements could be evaluated similarly to the existing guidance in Attachment 1, Section 02.03.a.2., b.1-3, and e which cover efforts such as these.

Clarifications and Editorial Notes – Comment 7

There are a number of specific comments that relate to clarifications or editorial notes that warrant consideration. These are set out separately, below, by procedure section.

Background

The overall description of the EQ Program is simplistic. It is assumed that training, and the use of additional references, will be provided to assist in defining and describing EQ programs. See for example, NUREG-0413, Appendix A; Holahan to Thadani letter (Accession Number 9902170325); or EPRI EQ Reference Manual, Appendix A or Appendix 1, depending on the version of the Reference Manual (the NRC has the EQ Reference Manual in its library).

Third paragraph, harsh environments are not defined in 10 CFR 50.49. Only mild environments are defined in 50.49. Licensees define in their program the criteria that separate harsh and mild environments.

The final two paragraphs appear out of place in that they are not directed specifically at an EQ inspection, and in any event are not being adhered to in the pilot context. Relocation and clarification is suggested.

Section 02.02

In several sections in the procedure, the use of the terminology with respect to Environmental Qualification topics is misstated as Equipment Qualification. See e.g., 02.02, Subsection b. (ENVIRONMENTAL Qualification Master List (EQML)) and Subsection b.1. (ENVIRONMENTAL Qualification Program).

Subsection b.2. SCEW sheets are summary level documents that are not required by 10 CFR 50.49. They were used in the context of original EQ inspections, in response to Bulletin 79-01B, for facilitating those inspections related to specific equipment, but may or may not exist any longer or have been maintained. See also the mention of SCEWs in the reference section. Qualification support data is contained in EQ Data Packages in most instances, and summary reports are not required documentation.

Subsection c.1. A positive statement of qualification is derived from considerations related to NRC Information Notice 85-39, but is not used in the context of a determination that EQ documentation has been reviewed and approved. That function is fulfilled by document signatures for preparation and review.

Section 02.03

Subsection c.1.a). Two “verify that” in the sentence.

Subsection d.3. The reference to warehouse replacement parts is a broad statement, not directly tied to EQ components or EQML contents. The paragraph should be revised to identify specific replacement parts approved for installation in EQ applications.

Comments Intended to Improve the Effectiveness of the Pilot Inspections – Comment 8

Comments Intended to Improve the Effectiveness of the Pilot Inspections

During the review of IP 71111.21P, several examples were identified that are related to the technical accuracy of statements contained within the Inspection Procedure. The intent of this comment is to identify some areas where the IP could improve the effectiveness of the pilot EQ program inspections.

Some examples are provided below.

a) Attachment 1, Section 02.01 identifies air operated valves, which is somewhat misleading since these are mechanical equipment that are not subject to 10CFR50.49. The major ancillary equipment for AOVs (e.g. pilot solenoid valves and limit switches that are subject to EQ requirements) are already included in the example.

b) Attachment 1, Section 02.02.b.2 contains a note regarding indicating that due to the size of full qualification test reports, inspectors may choose to initially ask for summary reports consisting of the majority of review material needed for each component. It should be recognized that licensees may not have a "summary report" for each qualification test report and the need to develop these could be an unnecessary burden on the licensee to produce. The main body of EQ file(s) which is used to establish qualification of the selected components and identify the applicable EQ related installation, configuration, maintenance or procurement requirements should contain sufficient information for review activities prior to arrival on site.

c) Attachment 1, Section 02.03.c.1.b talks about reviewing the qualification documentation to determine if the licensee has demonstrated that the installed devices are the same, or similar devices that were qualified. This is effectively talking about the similarity analysis between the installed and tested devices, which is only relevant for when type testing is used as a qualification method. As a general comment, the IP does not recognize or identify the various qualification methods outlined in 50.49 or IEEE 323-74. Recommend that "(i.e., type tested)." be replaced by "i.e., similarity analysis)." to avoid any inference that type tests are the only qualification method that can be used or some additional guidance be added to the IP to clarify the use of the various qualification methods described in 50.49 and IEEE 323-74.

d) Attachment 1, Section 02.03.a.3 refers to verifying that the licensee accounts for warehouse storage time and environmental conditions, where applicable, in the service life of components approved as EQ replacement parts in plant systems. This element of the inspection procedure does not appear consistent with the following:

- 50.49(e)(5) states; "Equipment qualified by test must be preconditioned by natural or artificial (accelerated) aging to its end-of-installed life condition. Consideration must be given to all significant types of degradation which can have an effect on the functional capability of the equipment. If preconditioning to an end-of-installed life condition is not practicable, the equipment may be preconditioned to a shorter designated life. The equipment must be replaced or refurbished at the end of this designated life unless ongoing qualification demonstrates that the item has additional life."
- NUREG-0588 states in Section 2.2(2) "Qualification by Test" specifically states that test results should demonstrate that the equipment can perform its required function for all service conditions postulated (with margin) during its installed life.
- IEEE 323-1974 defines qualified life as "The period of time for which satisfactory performance can be demonstrated for a specific set of service conditions." The definition of service conditions is specific to environmental and operational conditions that are expected as a result of normal operating requirements.
- Section 7.0 of the DOR Guidelines covers the basis for why the staff did not require that a specific Qualified Life for all Class 1E equipment.

We suggest that the discussion in the IP be clarified using the guidance in these documents for those plants (equipment items) where a qualified life is required. If the intent of the IP is to evaluate the interface between the EQ Program and the Shelf Life Program, then there should be some additional guidance on this as well.

e) Attachment 1, Section 02.03.d.2 asks the inspectors to determine during the performance of equipment walkdowns, if the equipment surrounding the component being inspected may fail in a manner that could prevent the device from performing its safety function. It is not clear what criteria would be used to make this determination or whether these postulated failure mechanisms would be limited to those resulting from events covered by the EQ program (e.g. spectrum of LOCA and HELBs) or the environmental conditions used to establish qualification. In other words, these potential failure modes are directly related to 50.49 compliance and do not include events such as external events, dynamic effects, etc. It should also be noted that this type of determination may not always be achievable solely through the performance of a walkdown and could require additional documentation reviews or research involving the review of design documents and drawings.

f) Attachment 1, Section 02.03.d.3 calls for the verification of a sample of replacement parts in the warehouse, approved for installation in plant systems is that described in the licensee's documentation and EQML. The wording of d.3 is very generic and not necessarily limited to EQ applications. It is recommended that wording be revised to be specific to replacement parts in the warehouse which are approved for installation in EQ applications. It should also be noted that replacement parts are not typically identified in the EQML and may be identified outside the EQ documentation (e.g. BOMs, Approved Part Numbers, Stock Codes, Vendor Manuals, Vendor Drawings, etc.).

END OF COMMENTS