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70 FR 44127

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**SUBJECT:** Comments on Proposed Generic Communication: *Inaccessible or Underground Cable Failures That Disable Accident Mitigation Systems* (70 FR 44127, August 1, 2005)

Progress Energy is submitting the following comments related to the subject Federal Register Notice (FRN).

General Comments

1. Progress Energy recognizes the importance of this matter and appreciates the staff's efforts on this proposed Generic Letter (GL). However, we believe that the proposed GL is overreaching and unnecessary. It characterizes random failures as multiple equipment failures, uses events involving medium voltage (MV) cables as justification for including low voltage cables, and references unproven technology (i.e. broadband impedance spectroscopy), for which there are no industry standards, to meet the intent of the GL.

However, if the staff decides to issue the GL, we have the specific comments listed below.

2. There is no justification for the broad scope of the proposed GL. The title of the proposed GL implies that it is only applicable to accident mitigation systems. Further, the Background section of the proposed GL only discusses failures of MV cables. However, Requested Information section (1) includes all cable types, including, but not limited to, low voltage power, control, instrumentation, and medium voltage power within the scope of 10 CFR 50.65. This is despite the fact that underground wetted-cable degradation phenomenon is most prevalent in medium-voltage cables (i.e. those in the 13.8 kV, 6.9 kV and 4.16 kV ranges). The proposed GL offers no evidence that underground wetted cable degradation is a problem in low-voltage cables. However, the proposed GL specifically states that the low voltage cables need to be included in any monitoring program.

FRNDS-ADM-03

SFSP Review Complete

Template = ADM-013

Call = T. Koshy (TKK)  
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3. We agree that there is an aging management issue with MV cables that are constantly energized in wetted environments. However, cable failures have been random in nature. There is no indication that there is any vulnerability to multiple equipment failures. Failures that have occurred with higher frequencies have historically been attributed to manufacturing defects and installation damage.
4. Nuclear plant safety systems are designed with redundancy in accordance with 10 CFR 50, Appendix A, General Design Criterion 17. Since there is no indication of multiple equipment failures in the industry and plants are designed with this defense in depth safety system redundancy, the staff's desire to monitor and/or test all wetted cable is an unnecessary regulatory burden.
5. The proposed GL requests information on inaccessible or underground cable failures. Inaccessible cables encompass underground cables, but the scope of inaccessible cables is much broader and moves way beyond those that are just underground. This has far reaching plant implications. Rather than using the terms inaccessible or underground, the scope of the proposed GL should be limited to cables subject to operating in a wet environment.

Comments on Background Section

6. Failures of cables due to water trees applies only to medium voltage (MV) cables (and above) that are constantly energized because only they have sufficient field strength to allow trees to propagate and convert to electrical trees. This does not apply to low voltage cables, control cables, instrumentation cables, and MV cables that are not energized or are only energized infrequently. Therefore, these cables should not be included in the scope of this GL.
7. One of the examples cited in the GL is an incident at Davis-Besse. While the proposed GL is for cables that disable accident mitigation systems, this event involved a circulating water pump which is non-safety related, and not an accident mitigating component.

Comments on Applicable Regulatory Requirements Section

8. Required surveillance testing of critical safety components includes the cabling (power and control) as part of the functional test. We believe that this meets the requirements of 10 CFR Part 50, Appendix B, Criterion XI. An example of this would be periodic testing of Emergency Diesel Generators which would include functional testing of power cables and associated control cables.

Comments on Discussion Section

9. The Discussion Section states: "The incipient failures of these cables can go undetected because these cables generally remain de-energized when the plant is generating power." However, given the absence of some sort of installation (or mechanical) damage, we do not believe that this is true. We are not aware of any industry evidence that would suggest that a de-energized underground cable experiences significant aging of a magnitude severe enough to render it unavailable when called upon to perform its intended function. In addition, these cables are regularly energized, and therefore monitored, during surveillance testing.
10. The Discussion Section states: "Potential cables failures can be detected through state-of-the-art techniques for measuring and trending the condition of cable insulation." However, in the context of underground wetted cables, this is not entirely accurate. There is no industry standard for accurately detecting cable degradation in this environment and/or predicting cable life. A series of tests is typically employed with limited usefulness. While this may be considered state-of-the art, it hardly meets the threshold for predicting potential cable failures. The Discussion Section later discusses various testing techniques that have helped licensees assess the condition of the cable insulation. This is a more accurate representation of what the current technologies available today can do.
11. The cables referred to in the first and second bullets are functionally tested with the Emergency Diesel Generator surveillance test as described above. In addition, multiple cable failures have not been an issue due to the random nature of cable failures.
12. The FRN states "As cables that are not qualified for wet environments are exposed to wet environments, they will continue to degrade with an increasing possibility that more than one cable will fail on demand from a cable fault or a switching transient." We are unclear as to why this is germane to the GL. As far as we know, the only medium voltage cables in use in nuclear plants have EPR or XLPE insulation. NEI 05-02 "Medium Voltage Underground Cable White Paper" discusses the susceptibility of MV insulations to degradation in underground environments. It states that while subject to aging in a wet environment, EPR and XLPE MV cable insulations along with the various jacket configurations were manufactured for wet conditions. There is no discussion about them not being qualified for wet environments or that they need to be installed in completely dry environments.
13. Proven diagnostic test methods for MV cables include partial discharge characterization, dissipation factor with VLF sinusoidal waveform, and VLF Withstand as described in IEEE 400. There is no known industry standard for using time domain reflectometry and broadband impedance spectroscopy as diagnostic tools for MV cable condition monitoring.

Comments on Requested Information Section

14. The title of the proposed GL is "Proposed Generic Communication: Inaccessible or Underground Cable Failures That Disable Accident Mitigation Systems." Item 1 requests that we provide a history of inaccessible or underground cable failures that are within the scope of 10 CFR 50.65 (the Maintenance Rule). The Maintenance Rule encompasses significantly more Structures, Systems, and Components than accident mitigation systems. The scope of the proposed GL should be limited to cables in accident mitigation systems.
15. The wording in items 1 & 2 of the Requested Information section, pg 44129 should reference medium voltage level cable; not all voltage levels. There are no industry studies or industry evidence which suggests that there are any concerns (failures due to water/electrical treeing or other insulation degradation issues) with cable voltages less than those considered as medium voltage.

Comments on Reasons for Requested Information Section

16. The Reasons for Requested Information section states "The staff considers 40 hours of information collection burden to be reasonable in light of the benefit gained to identify and correct unanticipated failures of accident mitigation systems." However, given the broad scope of information requested (systems other than those that mitigate accidents and low voltage cables), the data collection will significantly exceed 40 hours, and is not justified based on the small number of actual failures in the industry, system (train) redundancies, surveillance testing performed, and monitoring already being performed in accordance with other plant programs such as the Maintenance Rule (10 CFR 50.65).

Please contact me at (919) 546-4579 if you have any questions.

Sincerely,



Brian McCabe  
Supervisor - Corporate Regulatory Affairs

BM/kmh