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Regulatory Publications Branch
DFIPS
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Attn: Docketing and Service Branch

Subject: Nuclear Power Engineering Committee Comments to Draft Regulatory Guide DG-1001, "Maintenance Programs For Nuclear Power Plants"

Dear Sir:

The comments transmitted herewith were developed from a thorough review of the subject document by Subcommittee-3, "Operations, Surveillance and Testing," on behalf of the Nuclear Power Engineering Committee. Subcommittee-3 and, particular Working Group 3.3, has responsibility for maintenance practices and is the NPEC designated review body for the subject document.

The NPEC review indicates that the majority of the draft regulatory guide coverage is in the multidiscipline maintenance management area. NPEC supports the concept that a complete maintenance program should typically include maintenance process analysis, planning and scheduling, maintenance program execution, maintenance program effectiveness assessments, and feedback of results for continuing program improvement. Technical support to effective maintenance should also typically include appropriate design for maintainability, adequacy and availability of quality spare and replacement parts, attention to retention of original qualification levels, root cause and failure analysis, maintenance training, configuration control, interdepartment communications, and all those other activities which are necessary for the management of nuclear plant maintenance.

The NPEC focus is on technical activities, primarily in electrical equipment and systems areas.

Therefore, NPEC offers the following technical comments:

1. Where guidance exists in maintenance areas based on the consensus process used by the Standards Development Organizations (e.g., IEEE and ANSI) they should be evaluated by the NRC for Regulatory Guide inclusion. For example:

   - Draft Regulatory Guide Section C 4.3.6, "Control of Calibration and Test Equipment," should reference IEEE 498, "Supplementary Requirements for the Calibration and Control of Measuring and Test Equipment Used in the Construction and Maintenance of Nuclear Power Generating Stations."

   - Draft Regulatory Guide Section C 4.4, "Maintenance Procedures," which [illegible] maintenance procedures ... be presented utilizing sound [illegible] principles," should reference IEEE 1023, "Guide to the Application of Human Factors Engineering to Systems Equipment and Facilities of Nuclear Power Generating Stations."

2. Where guidance exists for specific electrical equipment maintenance, such as IEEE Publication 89TH0248-5-PWR, "Maintenance Good Practices for Nuclear Power Plant Electrical Equipment," we recommend that it be reviewed as part of the regulatory guide process. IEEE Publication 89TH0248-5-PWR is the product of Working Group 3.3, "Maintenance Good Practices," under aforementioned Subcommittee-3. Included in this document is specific coverage of certain electrical equipment types which were selected for coverage on a priority basis (e.g., motors, solenoid operated valves, motor operated valves, limit switches). This Special Publication provided the mechanism to release the first series of "Maintenance Good Practices for Nuclear Power Plant Electrical Equipment" to industry under a retrievable IEEE Special Publication control number. This document provides useful data although not a consensus document.

3. The NRC solicited specific comments in their transmittal letter in regards to levels of detail in the regulatory guide, scope of coverage, degree of quantitative measures to use, and effectiveness criteria.

   - Prior to proceeding to issue the maintenance regulatory guide the NRC should adopt concepts of Reliability (i.e., is there a true or a perceived problem, what is the root cause, etc.). A study should be made to determine the effectiveness of current and specific equipment maintenance programs and to determine if any significant specific problems exist which require greater attention to maintenance. Furthermore, any recommended regulatory guide coverage must be available within the current state of the art. Maintenance based on actual needs should prevent maintenance that may be counter to safety.

- The draft regulatory guide should include reference to existing guidance documents. For example, guidance exists on Quality Control and Assurance even within the NRC family of regulatory guides (e.g., RG 1.33), yet paragraph C 4.3.4 provides just general guidance which could be interpreted differently by many readers, inspectors, licensees and others.

4. Paragraph B, "Discussion," states in the first sentence that, "Safe operation ... is directly dependent on the plant's maintenance program." This excessive and sole dependence on maintenance should be expanded as follows: "Safe operation ... is directly dependent on the **plant's original design, engineering support, operations staff,** and maintenance program."

5. Paragraph B, "Discussion," states in the last sentence of the second paragraph, BOP equipment must be included, "because failure of BOP equipment can initiate transients or accidents ..." This substantially extends the scope of traditional "safety system" coverage beyond that for other issues relating to plant operation. Plants are specifically designed to accommodate non-safety system failures. If specific equipment interfaces with the safety systems are of concern these must be clearly identified for review, analysis and maintenance. Therefore, this sentence should be more specific in its scope.

6. Position C.1, first sentence, first paragraph, contains a statement requiring the prevention of, "the degradation or failure of ... components." Degradation of equipment when anticipated and accounted for in the design is not a problem. The phrase should be changed to "the **unacceptable** degradation **beyond that expected by the equipment or systems** of failure of ... components."

7. Paragraph C.3.1 implies that all degradation must be prevented which is impossible to achieve on most if not all equipment. The Regulatory Guide should clarify that degradation itself is not a concern unless such degradation is significant to plant safety and has not been accommodated in the plant design or maintenance.

8. Position C.4.3.1, fourth sentence, states: "Regulatory requirements ... manufacturer's recommendations ... should be effectively incorporated into all maintenance activities." This sentence should be changed to: "Regulatory requirements, ... manufacturer's recommendations ... should be **evaluated and when appropriate** effectively incorporated into all maintenance activities."

9. Position C.4.6, first sentence, includes the phrase: "preventive maintenance based on manufacturer's recommendations ..." It should be changed to: "preventive maintenance **which considers and evaluates** manufacturer's recommendations ..."

10. Position C.4.6.3, first sentence, includes the phrase: "predictive maintenance consists of the actions necessary to monitor ..." It should be changed to "predictive maintenance consists of the actions **within the cost-effective and achievable state of the art** necessary to **determine** ..."

Thank you for your consideration and response to these comments. If clarification is required, please contact Mr. Larry C. Gradin, Chairman of Working Group 3.3 "Maintenance Good Practices" at

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Very truly yours,

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