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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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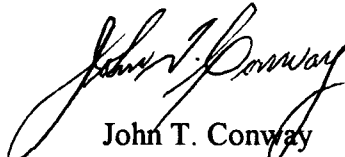
July 8, 1999

The Honorable David Michaels
Assistant Secretary for Environment,
Safety and Health
Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0119

Dear Dr. Michaels:

The Defense Nuclear Facilities Safety Board (Board) has reviewed the Department of Energy's (DOE) final draft guide DOE G 421.1-1, *Criticality Safety Good Practices Program Guide for Nonreactor Nuclear Facilities*. The Board believes that much of the material in this guide may be useful to practitioners in the field and worthy of issuance as a work in progress. However, the guide could be substantially improved and made more user-friendly. Suggestions for doing so are enclosed. It is our understanding that Revision 1 will be issued in the year 2000 as noted in a DOE Letter from A. Garcia, Chairman of the Criticality Safety Support Group, to R. Dintamin, (Defense Program-13), Co-Chairman, Nuclear Criticality Safety Program Management Team (NCSPMT), and D. Cabrilla, Environmental Management (EM-66), Co-Chairman, NCSPMT, dated March 5, 1999. The Board encourages the DOE Headquarters to move expeditiously on this effort.

Sincerely,


John T. Conway
Chairman

c: Mr. Mark B. Whitaker, Jr.

Enclosure

Comments on Draft DOE Good Practices Guide G 421.1-1

1. The guide is too long with too much detail, and as a result, lacks emphasis on what is important and what is less important.
2. The guide should state at the outset that it should be used in the spirit of Recommendation 95-2. That is, it is to be a source document from which practices may be culled that can be used in specific circumstances.
3. There are several kinds of material among the contents of the guide. Some are practices that could be followed in application to estimating criticality. Some are materials that would be appropriate among lecture notes for a course on criticality control. Some are admonitions and examples that might be useful in a workbook. Maybe there should be more than one document containing the appropriate material.
4. The process that is discussed for analyzing criticality control for a process is almost a prescription for writing a Safety Analysis Report. A document is not needed for each process step. There should be a statement of the objective sought in documenting the decision on appropriate criticality control in each case, but the analyst should be left more freedom to decide what is appropriate and sufficient. The Appendix on a graded approach does seem to recognize this point to an extent, but then it comes into conflict with the process in the main body of the text which is a much more mechanical description of a full safety analysis that even contains event tree analysis.
5. The methodology does not follow the hierarchy of validity stated in Recommendation 97-2. That hierarchy was: First, experiment, then theory benchmarked on experiment, then unbenchmarked theory. The statement in the Draft is not identical to this. Throughout there is much more emphasis on theory alone.
6. The concept of qualification of criticality control personnel differs from that behind Recommendation 97-2. The importance of the intuitive capability was emphasized, fostered by familiarity with the experimental information available and the experience from participation in an experimental project. That view approaches a requirement for qualification that included a tour of experimental participation at Los Alamos. The Draft advocates qualification through on the job training of an individual with an engineering degree; this lacks the recognition of the importance of first-hand knowledge of the situation of criticality.