UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 1, 1980

Mr. John McConnell, Chairman
Federal Radiological Preparedness Coordinating Committee
Federal Emergency Management Agency
Plans and Preparedness
Washington, D. C. 20472

Dear Mr. McConnell:

This letter is in response to your request of October 8, 1980, for review and comment on the draft document "Draft Guidance on Offsite Radiation Measurement Systems, Phase 2, Monitoring and Measurement of Radioiodine to Determine Dose Commitment in the Milk Pathway", dated August 1980. My office has coordinated the review and comments for the U. S. Nuclear Regulatory Commission.

In general, the NRC finds that this initial effort is a well defined and scoped document. However, the following major changes are recommended to improve this guidance:

1. More emphasis should be placed on handling the management and logistics of monitoring the milk shed from the standpoint of monitoring team deployment, communications, data collection and the use of the Federal resources described in Appendix C of the document.

2. The problem of managing of the milk pathway for the smaller, more limited releases of radioiodine from the plant site is not covered adequately. This type of incident scenario has a higher probability of occurrence than the larger, more extensive type incident that might cover the entire ingestion EPZ.

3. The fact that the CDV-700 type instrumentation is the only instrument that has been evaluated to-date for the rapid, direct field approximation of radioiodine concentration in bulk milk shipments and storage needs additional explanation and clarification so that the reader understands that use of this particular instrument is not the only way of making the measurement.

A number of specific comments and suggested changes on the details of the document are attached to this letter. We hope the comments and corrections will be helpful in revising this document.

Sincerely,

Brian K. Grimes, Director
Division of Emergency Preparedness

MISC

Attachment: As stated

cc w/attachment: K. Siebentritt

SPECIFIC COMMENTS AND CHANGES

1. Pg. 2-1, it recommended that the decription of the problem on this page be modified to paraphase the introduction to Appendix C, Milk Control in NCRP #55 (a copy is attached for your information). This is an excellent succinct statement of the problem from a well recognized authority.

2. Pg. 2-3, Section 2.2, 1st paragraph, last sentence should be changed to read: "Should the projected dose reach the emergency PAG level, the food stuff shall be withheld from commerce until..."

3. Pg. 2-4, Section 2.3, 1st paragraph, first sentence should be changed to read: "Radioiodine can be a major contributor to the ingestion pathway, particularly via the air-pasture-cow-milk pathway."

4. Pg. 2-5, 16th line from top, the conservative meteorological conditions used generate the deposited activity levels in Table 2 should be given in terms of stability class, wind speed, etc.

5. Pg. 2-5, Section 2.4, 1st paragraph, first and second sentence should be changed to read: "The hazard immediately after an accident will be greater for radioiodine than for strontium, cesium and the heavy metals under most reactor accident scenarios. This is because these radionuclides are not as abundant in the reactor core as radioiodine and will be released as particulates in smaller fractions than the radioiodine which will be in both the particulate and gaseous phase."

6. Pg. 2-5, Section 2.4, 1st paragraph, 3rd sentence bases the percentage of elemental radioiodine on the Reactor Safety Study, NUREG-75/014. There has been considerable controversy about the amount of radioiodine which would be released in this chemical form. This paragraph should be expanded to indicate that the radioiodine levels in Table 2 are based on very conservative release estimates and may not be as overwhelming as indicated.

7. Pg. 2-9, Section 2.4, last paragraph, 2nd sentence should be changed to read: "...other radionuclides will not be a problem; however, in accident scenarios, such as fuel pool accidents where the radioiodine has decayed to insignificant levels, cesium and strontium nuclides become the governing release constitutents."

8. Pg. 2-9, Section 2.4, last paragraph, 3rd sentence should be changed to read: "...the PAG levels have been reached but should be continued as long as significant dose reductions can be achieved."

9. Pg. 2-13, Section 2.6.2, 2nd paragraph, 2nd and 3rd sentences omit the word "only" in front of "2.6%" and "about 1-2%" in these sentences.

10. Pg. 2-15, Section 2.6.4, 1st paragraph, 1st sentence should be changed to read: "Although there are a number of technical problems with regard to making rapid assessment measurements at PAG level, the problem of logistics and management of the large number of monitoring teams and the size of the area to be monitored is of a considerable higher magnitude."

11. Pg. 3-1, Section 3, 2nd paragraph should be expanded to provide detail on how to manage the large monitoring resources needed to handle this problem, particularly after the extensive Federal response arrives.

12. Pg. 3-1, Section 3.1, 2nd paragraph should go into detail on procedures for handling smaller accidents down to those that may only require monitoring of a limited amount of pasture on several farms.

13. Pg. 3-2, Section 3.1, 3rd paragraph, 1st sentence should be changed to read: "The substitution of uncontaminated forage will slowly reduce the production of contaminated milk from cows originally contaminated by the release. However, some milk may continue to be produced with contamination levels above the PAG."

14. Pg. 3-2, Section 3.1, 3rd paragraph following the comment in Item #13 above should provide a discussion of the effective half-life of radioiodine in the cow and an estimation on the decrease in the amount of radioiodine in milk with time after the milk shed is placed on stored feed.

15. Pg. 3-2, Section 3.1, 4th paragraph should contain information on the use of the AMS aircraft to identify family farms which should be notified that they should not drink the milk produced on their farms.

16. Pg. 3-2, Section 3.1, 5th paragraph, 2nd sentence should be changed to read: "Major decisions on procedures and general techniques to be followed should be made prior to an accident so that the necessary information will be collected to determine the necessary actions to mitigate the effects of a contaminated milk shed."

17. Pg. 3-3, 2nd paragraph, 2nd sentence should be changed to read: "This dilution will be accomplished at the expense of contaminating additional uncontaminated milk and if carried out with foreknowledge would be considered adulteration by the FDA."

18. Pg. 4-1, 1st paragraph, last sentence should be changed to read: "...but will result in the potentially greatest benefit, other than the immediate removal of all dairy herds from any suspected contaminated pasture."

19. Pg. 4-1, Section 4.1, 2nd paragraph, 2nd listing, item 1, should be changed to read: "1) limits of sensitivity to measure radioiodine concentrations in milk."

20. Pg. 4-2, Table 5 add a footnote to the last column as follows: Preventive PAG = 0.012 μ Ci/l; Emergency PAG = 0.12 μ Ci/l.

21. Pg. 4-3, Section 4.1.5, 5th paragraph, 1st sentence should be changed to read: "...are capable of detecting contamination of milk at the emergency PAGs level..."

22. Pg. 4-3, Section 4.1, 5th paragraph, 3rd sentence should be changed to read: "...will be capable of monitoring milk at the preventive PAG level."

23. Pg. 4-6, Section 4.1, 7th paragraph should be expanded to include some statement about the influence of fluid temperature on the collection efficiency of resin for this purpose and whether this is a consideration.

24. Pg. 4-8, Section 4.1, 12th paragraph, 2nd sentence should be changed to read: "...in the event that contaminated milk is detected providing he is given clear limits and is properly trained."

25. Pg. 4-12, Section 4.3, 1st paragraph, 6th sentence should be changed to read: "The release information, the offsite plume monitoring data and the meteorological information will serve as input for computer predictions of the radioiodine concentrations..."

26. Pg. 4-12, Section 4.3, 1st paragraph, 14th sentence should be changed to read: "For a two hour exposure, the plume concentration necessary to deposit ^{131}I at the PAG level can be estimated as:"

27. Pg. 4-13, Section 4.5, 1st paragraph, last 3 lines are repeated on this page and should be omitted.

28. Pg. 4-13, Section 4.6, is very general and does not go into the specifics of handling smaller accidents. This section should be rewritten and expanded since this is the higher probability incident and more likely to occur.

29. Pg. 5-1, Reference, Item No. 3, add "NUREG-75/014" to this reference.

30. Pg. A-1, Appendix A, Section A.1, 1st paragraph should be rewritten to include the information on other laboratory type systems which could be used and the reasons for not using them such as the amount of time required to do the evaluation. Also, it should state that the CDV-700 with the 6306 G tube and anion resin system is the only one that has been evaluated specifically for this type of emergency monitoring of fluid milk but this does not exclude the use of other instruments.

31. Pg. C-1, Appendix C, 1st paragraph should also site and summarize Public Law 93-288.

Appendix C

Milk Control

Countermeasures to avoid milk contamination and the risk of radiation exposure to milk users resulting from a nuclear facility accident must be implemented immediately after such an accident if they are to be effective. The protective actions to be considered require breaking the cycle through which contamination spreads—namely, the pasture-cow-milk-man pathway.

Since the potential for accidental radiation exposure of the population through milk may extend for many miles from the accident site; and since the magnitude of exposure through milk may be 400–700 times greater than through inhalation, the need for appropriate protective action is of paramount importance (Lengemann and Thompson, 1963; Bernhardt *et al.*, 1971).

First, a pre-determined emergency communications plan must be set in motion on an area-by-area basis whereby dairy farmers in the affected land area are alerted immediately and instructed by the appropriate state and local officials to move their cattle from pasture to stored feed. This breaks the cycle of transmission of radioactivity contamination at the root and must be accomplished immediately.

Within 48–72 hours, contaminated land areas can be identified by ground and aerial surveillance. Only those farmers in contaminated land areas would be required to keep their cattle on stored feed. This obviously reduces the possibility of fluid milk contamination.

In order to provide surveillance of all milk produced in the affected area, state or local sanitarians or milk control specialists should be immediately assigned to one or more of the milk receiving or processing plants likely to receive milk from contaminated farms. The sanitarians would be responsible for:

(1) Establishing immediate liaison with the industry and the officials responsible for taking protective actions.
(2) Identifying the dairy farms in the affected area shipping milk to the plant and determining if the cattle on these farms have been placed on stored feed.
(3) Providing drivers of bulk milk tanks with guidelines and

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requirements covering protective actions in effect and instructing them not to accept milk from farmers having cattle on pasture in the affected area.
(4) Assisting the industry in establishing a procedure for collection of contaminated milk in excess of acceptable levels and diversion to a non-fluid milk processing plant.
(5) Ensuring that the processed milk products containing unacceptable levels be stored to await decay of radioiodines and monitoring of these products prior to release for public consumption.
(6) Initiating a sampling program, including the collection of representative samples of the finished product and the sampling of raw milk as needed and based upon capacity of the laboratory to handle samples.

If it has been determined through monitoring and sampling that some fluid milk has been contaminated, then appropriate local officials should request the milk industry to import uncontaminated fluid milk and/or only powdered and canned milk products. Children, lactating mothers and pregnant women can be placed on evaporated or powdered dry skim milk until imported fluid milk is brought in. Uncontaminated refrigerated fluid milk, frozen whole milk concentrate and canned sterile whole milk can also be used.

Date

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REMARKS

Enclosed for your review and comment is the initial draft version of the Phase 2-Guidance for Monitoring and Measurement of Radioiodine to Determine Dose Committment in the Milk Pathway. This guidance has been developed by the Exxon Nuclear Idaho Co., Inc., INEL, under contract to NRC and coordinated with Federal Interagency Task Force on Off-site Emerg. Instrumentation for Nuclear Incidents.

Please forward your comments/suggested changes to me for review by both INEL and the Task Force by November 28, 1980.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
John W. McConnell, Chairman FRPCC FEMA	Phone No.

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