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

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MEMORANDUM FOR: Karl Goller, Director
Division of Siting, Health
and Safeguard Standards, SD

FROM: Richard E. Cunningham, Director
Division of Fuel Cycle and
Material Safety, NMSS

SUBJECT: TECHNICAL REVIEW OF PROPOSED
ANSI STANDARD N721, "INTERNAL
DOSIMETRY STANDARDS FOR TRITIUM"

We have reviewed the subject document and recommend a vote of abstention on the letter ballot. The document is unacceptable as an NRC regulatory guide in its present form. To be suitable as a bioassay guide it must be understandable to all licensees. Many licensees do not have professional health physicists on their staff and lack the sophistication in that field necessary for proper application of the ANSI recommendations.

The dose equivalent of 0.3 rem per calendar quarter selected by ANSI as a lower limit for determining the need for bioassays is too high. This dose equivalent represents a significant increase in the current guidelines. Selection of 0.3 rems appears to be based on 25% of the external maximum permissible dose of 1.25 rem per calendar quarter although this is not explained in the standard. 0.12 rems per calendar quarter or 10% of the maximum permissible dose would seem to be more in keeping with ALARA and a better goal for evaluating the effectiveness of tritium control procedures. ANSI's 0.3 rem per calendar quarter is also exclusive of all other internal and external sources of radiation.

There was frequent confusion about "should" and "shall" especially in Section 5. The document was read initially by one professional health physics staff member, who interpreted it to imply that justification for all bioassays could be based on Table 5 or the judgment of the licensee's

health physicist. The misinterpretation was clarified after careful re-reading of Section 5, but indicated a potential source of confusion to licensees.

Many of our objections to the standard are directly related to Table 5.

1. Table 5 stipulates only the total amount of tritium which would be handled in a quarter. There should also be guidelines for quantities which would be handled at any one time, i.e., batch size. Table 5 limits allow a large quantity to be handled once or twice in a quarter without a bioassay requirement.

2. The data in Table 5 is difficult to apply in its present form. We recommend using the total "through-put" or "total" daily activity handled and believe that would be simpler for most licensees.

3. We don't know how "quantity processed" in Table 5 will be interpreted. The term "processed" as used in this context should be precisely defined.

4. There may be some circumstances when use of activity concentration (Ci/kg values in Table 5) is appropriate, but it is not appropriate for most licensees. In order to have it applied correctly, a complete explanation should be included in the text.

5. There is no provision for evaluating the need for a bioassay check for use of quantities less than those in Table 5. Our present guide requires an evaluation of bioassay needs when amounts greater than 0.1 of the tabular values are used. We recommend that the needs should be evaluated at a value far less than the 0.3 rem lower limit used by ANSI. This would be in keeping with the ALARA concept.

The action points in Table 10 are based on a 50 year dose equivalent rather than calendar quarter doses. Since the whole discussion is based on tritiated water which has a relatively short biological half life, a 50 year dose equivalent may not be appropriate. Action points would be better if related to quarterly dose. Although the differences would be minimal, the longer period could be confusing to those using the standard as a guide.

It would be helpful if there were a Table or other means of correlating concentration of tritium found in the bioassay sample with dose. Such a Table would provide a quick means of dose determination without extensive calculations.

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