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Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Docketing and Service Branch

Dear Sir:

Technical Operations, Incorporated would like to provide you with the following remarks on the draft regulatory guide and value/impact statement, "Audible-Alarm Dosimeters" issued in August 1979 for comment.

1. Sections B and C, Discussion and Regulatory Position

We generally agree with the statements made in these two sections. They present a good outline of the advantages and disadvantages of audible alarm dosimeters with respect to users of byproduct materials. We firmly support your position that chirpers are useful for warning of high level exposure rate situations, such as often occur in industrial radiography. However, the impact of your position is softened by BNW's low opinion of the survivability of present day equipment in the environmental conditions that are supposed to prevail in the isotope radiography industry. Our own experience indicates a 7% failure rate over a two year period for a particular chirper model that we sell to the radiography industry. Most of the failures were mechanical in nature, primarily a loosening of the bond between the transducer and the case, probably due to rough handling. More recent experience with improved bonding indicates that a substantially lower failure rate can be expected in the future.

We do not consider BNW's tests as reported in NUREG-CR-0554 to be definitive or even adequate. Many of the units were lost in attempting to determine their resistance to the effects of water, which is not even included as a specification in the HPSSC draft standard quoted in the draft regulatory guide, and which in our experience is not a common environmental problem. As a consequence the important tests for effects of physical impact were skipped, and hence statistical confidence in the results is low.

Sec C1. It is not clear what is implied by NRC staff approval of the use of audible alarm dosimeters as secondary warning devices. We believe that this conclusion should be given in more positive terms so that the NRC would recommend that these instruments be used as secondary equipment in situations where survey meters are the primary required instrumentation. Most radiographic accidents have occurred when the survey meter-operator system has failed to warn of the presence of high radiation fields. In our opinion, redundancy through use of a secondary instrument has a good chance of eliminating many such accidents.

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Secs C2 and C3. We agree that audible alarm dosimeters should be constructed according to performance specifications such as those quoted in the appendix and that they should not be used as substitutes for survey meters, but should be employed as secondary warning devices.

Sec C4. Audible alarm dosimeters cannot be expected to meet all situations, and these are certainly instances in which they do not work very well. It should be noted that survey meters also have their limitations, e.g., they cannot provide information to the operator in the absence of illumination.

Sec C5. We agree that such instrumentation, whether they be audible alarm dosimeters or survey meters, should be checked for proper operation each day before use. In our radiation safety course we recommend that radiographers test survey meters in the external field of their exposure devices whenever they prepare to make an exposure. In this situation chirpers are self-testing in that the chirp rate increases to a noticeable level.

Sec C6. Most electronic radiation detection equipment, including both audible alarm dosimeters and survey meters, is delicate in nature and it is certainly in order to warn against treating any of these instruments roughly.

Sec C7. We thoroughly agree with the distinction that is drawn between the use of chirpers and audible alarm dosimeters. Chirpers are particularly valuable in situations where high exposure rates may be inadvertently encountered.

II. Value/Impact Statement

In Section A(2) reference is made to various comments from users. These comments are confusing because they refer to chirpers and to dosimeters indiscriminately. Most users appear to have judged instrument performance on the basis of experience with one or two specimens manufactured several years ago. It should be pointed out that this is a field where instrumentation is being continually improved.

The section contains a statement that radiographers using audible alarm dosimeters place less reliance on the use of survey meters. This is a completely undocumented statement and we are unaware of any supportive evidence for this assertion. In any event, the real question is whether in an accident situation the operator would have paid attention to his survey meter, whether or not he was wearing a chirper.

In connection with Section C(1) it is our belief that collective whole-body dose is not a good measure in typical radiographic situations where a relatively few individuals risk very large exposures. Avoidance of an accident can be expected to save individual whole-body exposures of tens of rems and of hundreds to thousands of rems to the extremities. Because relatively few accidents occur, the total number of whole-body man-rems is indeed probably only a few hundred per year. The relatively high cost per man-rem saved is misleading; far more important is the cost saved per accident. A typical accident may

cost tens of thousands of dollars when investigation times, medical tests, law suits, etc., are taken into account. Because of this, a strong case can be made for mandatory use of chirpers by industrial radiographers as secondary instrumentation to back up the primary survey meters which, when considered as operator-instrument systems, prove to be of low reliability in preventing all serious accidents.

Yours very truly,

Eric T. Clarke

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cc: Norman Comerford, RPD
John J. Munro, RPD

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