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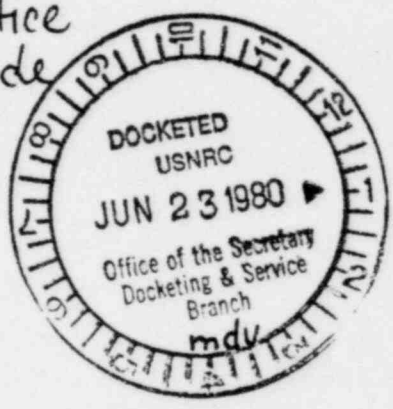

Attention: Docketing and Service Branch

Reference: Draft Regulatory Guide, Task OH-902-1, "Instructions Concerning Risk from Occupational Radiation Exposure": Comments.

Gentlemen:

We feel that this approach to risk analysis and training fails in its mission to educate. We agree with the need to put this material in perspective to employees and to make it readily available. The problems that I see with the proposed guide are (1) style, (2) content, (3) emphasis and (4) syntax.

Style

The question and answer format may be good for some presentations, but leads to a haphazard presentation here. Some of the questions are very difficult to answer in an acceptable manner that is unambiguous. For example, birth defects are claimed as an effect of radiation and in the next sentence they are excepted from our experience base. They are never put in perspective adequately, partly because it is a tough question to answer easily.

The questions dwell on 450 rem, and then puts this number in the same category as 20-100 milli rem (emphasis added) per week for several years - a total dose of only, say, 2 to 20 rem.

Card game probabilities are used to illustrate probabilities. But they aren t carefully explained. For example, the chance of being dealt three aces in a row is different then the chance of being dealt 3 aces, which is not the same probability as being dealt three aces as the first three cards from the deck. People, even card players, have a hard time with these distinctions unless they are explained much better than they are here.

The risk estimates for cancer caused by radiation is a heavy handed treatment. The style is pompous. The material is ponderous. What is a boilermaker, a carpenter, or a laborer to think of this material. They truly won't understand it.

NRC dose limits aren't needed in this document. They are presented elsewhere.

I+P-11

Acknowledged by card. 6/23/80. mdv

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I like the analogy about speed limits (question 20). More material presented in this style would be very helpful.

Content

The following questions have little to do with risk:

12. NRC limits
30. dose determination.

There is absolutely no information here relating contamination to risk. This is a perenial question and even HP people have a hard time answering this.

There is no distinction at all between the various qualities of radiation. High LET radiation needs explanation. Also the effects of local doses from Pu particles should be considered.

How does radiation cause cancer? The question isn't answered. Theories don't belong here. Just give the facts.

Question 14: The answer is irrelevant to the question.

Question 22: This answer does not in any way relate to the question. Instead it is part of the answer to the following question. Answer the question honestly.

Question 24: Answer (b) needs clarification so that some information is given regarding diagnostic x-ray exposure to the fetus. This is not occupational exposure but will nonetheless be a question regarding the risk (hazard) of radiation to the fetus.

Question 27: This question requires a complicated answer to be applicable to all workers. There is no mention of injection as a mode of entry.

There are actually three questions answered here, none well: What is internal exposure?; How does it happen?; How do we measure it? In fact, all the effort in contamination control, protective clothing and use of respirators are based on prevention of internal exposure.

Question 28: I'm having a hard time following this explanation. I think it misses the point of a calculated body burden that may be accumulated through many different routes but still adds up to a total body or organ dose.

Question 29: The quarterly limit is 1.25 rem/quarter - not 3. Three is the exception case only if a complete Form 4 is on file, In fact, for whole body irradiation from such nuclides as Cs-137 (in muscle) or tritium (in total body water), it is appropriate to add the quarterly dose commitment to the external body dose, even though it is not technically required by the regulations.

Question 30 is irrelevant to risk.

Emphasis

This whole reg guide does not present the risk (hazard) in correct perspective, even though it tries. The hazard is small for ordinary work under current working practices. There are conditions that occur under accident conditions where people can be badly hurt. These aren't brought to light and the human failures that lead to accidents aren't brought out. Therefore, things look mysterious. What we need is some emphasis on obeying rules to prevent accidents so people won't get hurt by radiation. Examples include:

- Don't fall in the fuel pool, you'll get highly contaminated.
- Don't take radioactivity home with you, your family will get contaminated.
- Don't violate boundaries or signs or enter locked areas without permission, dangerous radiation areas can exist in some parts of facilities.
- Don't ignore the need for respiratory protection, you only have one pair of lungs.

In my opinion, the largest risk (risk) comes from accidental serious overexposure to an unwary worker because of his or someone else's carelessness. The history of our industry bears this out. We need emphasis on this also.

Syntax

In our work as a nuclear maintenance contractor, we deal with craft unions. The language of this reg guide is inappropriate for most of these people, and probably for almost everyone else in a once through classroom training session.

The language needs to be simplified. Get rid of footnotes, don't mince words, say "you" and "don't" and use pictures.

Probably the best format for this whole presentation would be a comic book story. I'm serious.

People quickly identify with characters in comic books, and one picture is worth many words. The comic approach is also amenable to the Q & A format. Comics also get read by many people. A comic book prepared and distributed at low cost by NRC to the licensees would be a very valuable tool for presenting this material.

I sincerely hope that you find this material helpful in revising this reg guide.

Sincerely,

John P. Andrews

John P. Andrews
Supervisor, Health Physics

JPA:cw