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Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, DC 20555

Dear Sirs,

In response to your request for public comment on the Draft Environmental Impact Statement for the clean-up at Three Mile Island (NUREG-0683), we are submitting the following observations and criticisms.

First, the authors of the Statement are to be commended for having included the issue of psychological stress in assessing the environmental impact of cleanup operations. It was a forward-looking step, which we hope will be emulated by the authors of other attempts to predict the impact of important social actions, for many undertakings may be desirable in themselves and yet may cause a great deal of avoidable human suffering if carried out without regard to their psychological impact.

Perhaps the fact that it was a pioneer effort accounts for the amateurish quality of the material on psychological stress. Not only is section 3.1.7 vague and inconclusive, it shows so little grasp of the issues that it appears to have been written by a well-meaning but technically untrained bureaucrat rather than by a qualified professional. Psychological stress is treated in a confused and inconsistent way, but fundamentally without understanding of the kind of concept it is. Stress is not something that exists within a person and has effects; it is not "created from anxiety" (p. 3-24, par. 2) or from anything else. Rather, it is a convenient term for a class of phenomena, just as (for example) perception is a general term for the fact that we take in sensory information and experience the world. Seeing is something studied by psychologists under the general heading of perception; by the same token, the subjective and objective effects of going through upsetting experiences are studied under the general heading of stress. It is perfectly possible to write an entire chapter for a book on Stress and mental disorder, as one of the major pioneers in the study of life stress, Dr. Thomas Holmes, did, without once using the word "stress." In fact, as he suggests (on p. 62 of the above-mentioned 1979 book) it is an excellent idea to avoid the use of this ambiguous term, which so readily lends itself to the reification illustrated in the above-quoted passage from p. 3-24.

On this matter of terminology, the relevant parts of the Statement have a regrettable tendency to fall into jargon instead of plain speaking. A glaring example is the constant misuse of the term "perception" for "belief." True, there is a certain precedent in psychological literature for this usage, but it is unnecessary and positively misleading, as happened here. Perceiving and believing are both

subjecti[illegible]gnitive processes, but that's about as far as the similarity goes. More specifically, perception implies forming a subjective impression of the actual status of some aspect of reality: I perceive that this paper is white, regardless of the amount of light actually reflected from it. If I know that someone has written on it in invisible ink, I believe that it contains a concealed message but I cannot perceive that until the paper is heated.

In the particular case of radiation damage, this distinction happens to be extremely important. Someone who has had a 10 REM whole-body exposure perceives nothing, but if he is correctly informed that he has been so exposed, he may well believe not only that he has been irradiated (true) but that he has been damaged (possibly true, possibly false). Only when dosages become heavy enough to cause radiation sickness can a person perceive that he has been harmed. In section 10.6.2, perception is repeatedly misused in this way, implying to the unwary that ionizing radiation is perceptible, when part of its terrifying (or stressful, if you will) effect is that one can receive a severely life-shortening dose without any perception of that fact.

But the consistent use of this inaccurate terminology actually has a much more serious consequence; we have no way of knowing whether it was done deliberately or not. In any case, the text masquerades as scientific but lacks scientific objectivity. By blurring the distinction between false or delusional belief and realistic belief through calling both kinds "perceptions," the author(s) of these sections were able to slip over from discussing rare, pathological kinds of reactions--like delusions and phobias--into talking about normal and adaptive responses to threat such as apprehension about the possible danger from radiation, in such a way as to imply that any concern for the consequences of radiological accidents is psychopathological. Likewise, any mistrust of the NRC or Met Ed is called "phobic" without any justification (phobic means "irrationally fearful"--Wolman's Dictionary of Behavioral Science).

We want to emphasize the danger to the NRC of this kind of apparently self-serving misuse of scientific concepts. It may be temporarily reassuring to accept the purely speculative notion of R. L. Dupont that all fears of radiation are phobic, hence pathological phenomena for which you have no responsibility. True, there are always a few severely disturbed persons who have unrealistic, unjustified, even delusional fears about almost any social institution or major event; doubtless there are psychotic patients in California mental hospitals who are convinced that Love Canal is poisoning them. But it would be a great mistake to conclude that therefore all fear of toxic chemical wastes is a symptom of paranoid schizophrenia! Not only would that be fallacious scientific reasoning, it would be politically suicidal for the relevant regulatory commissions.

The NRC is in precisely the same kind of danger here, if the staff relies on "experts" who concoct such arguments as those presented in sections 3.1.7 and 10.6.2 to justify existing policies. Not only is the job poorly done and immediately seen through by anyone with independent scientific knowledge about psychological stress; it also hinders you from accurately assessing the probable psychological effects of contemplated policies.

In another way, we find the discussions in the cited sections to be remarkably deficient. Nowhere is there any mention of a central paradox of policy here: the dilemma of secrecy. Since radiation and the physical harm it does is imperceptible (and in fact imperfectly known as yet), people will not become upset (or otherwise "stressed") unless they are more or less officially informed about any release of radionuclides, or unless they have other reasons to conclude that such releases may have taken place. Therefore, anyone who stands to lose in any way if people are distressed by such information is strongly motivated to conceal or minimize it. A utility would naturally want to be quite certain that the danger was imminent or actual before giving out any information to the media about a possible release of radionuclides. On the other hand, the public has the right to know, and the right to have enough background information to be able to appraise and understand the dangers of a radiological emergency as well as to know what protective action should be taken. That implies a program of public education--since in fact the level of public information and understanding on these matters is now unsatisfactory--which could be expected to raise the level of anxiety in some persons even without any abnormal incidents at nearby nuclear plants.

In this respect, we are reminded of the controversy that has arisen about the problem of informed consent in medical research. Some scientists argue that giving people enough information so that they can fully understand the possible dangers to which they may be exposed (if, for example, a patient agrees to take an experimental drug for some disease) often upsets them and the apprehension that is caused results in more social harm than the physical side effects themselves might cause. Yet the alternative is unacceptable--putting people unwittingly into situations of danger for a presumed benefit which may be outweighed by the harm, and which not all of them would willingly risk. In a democracy, we must in general accept the risks of having an informed citizenry while trying to minimize them by using care and prudence in the way we carry out the task of public education.

In this light, the psychological aspects of the environmental impact of cleaning up after the TMI accident will differ greatly, depending on what is done about the so-far neglected problem of informing people about the dangers of ionizing radiation. The NRC must face up to the facts that many citizens in the affected area of Pennsylvania distrust the Commission and will not accept at face value information it distributes, and that this distrust is in considerable part justified. Unfortunately, the tendentious reasoning of the parts of NUREG-0683 we have studied suggests that at least the authors of this Statement have not properly heeded the lesson of TMI--the need to change of which the Kemeny Commission spoke.

Summary

The sections on psychological stress, while a good idea, are actually counterproductive because of the following flaws:

1. The concept of psychological stress is confusedly and misleadingly presented.

2. The draft misleadingly implies that the recipient can perceive radiation damage.

3. It falsely treats all concern about radiation damage as morbid or pathological, failing to note that realistic concern and apprehension is the most rational reaction to a danger of uncertain scope.

4. It shows a shocking lack of scientific objectivity. All of its distortions tend to justify NRC policy and to promote the dangerous myth that all opposition is neurotic and may be disregarded. Hence, NRC does not get a true picture of expectable psychological stress, and the public distrust will grow.

5. The people's right to know the full facts about radiation dangers outweighs the desirability of not revealing facts that might upset them.

Sincerely yours,

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