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AGENCE POUR L'ÉNERGIE NUCLÉAIRE
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PROPOSED RULE PR-Safety Goals
(45 FR 71023)



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Dear Joe,

It was a pleasure for me to have learned of some of the policy development and evaluation efforts currently underway at NRC. Providing more explicit policy guidance internally (Policy and Planning Guide) and externally (Safety Goals) are particularly significant contributions. I have obtained copies of each of these since we talked, and am impressed by the intent, even if I do not always agree with all specifics. I enclose a few comments on the Safety Goals - which will be somewhat post deadline, and somewhat more specific comments on the PPG, which you can do with as you see fit.

Overall, there seems to have been progress in controlling the overbearing arrogance of NRC, but what has not yet been portrayed is that evidence of flexibility which will encourage invention. My comments on the Safety Goal are very much in this line: there will be no revitalization of the U.S. nuclear industry, and thus likely no U.S. nuclear industry (with the associated rather frightening economic prospects of that), unless the industry leaders are persuaded that they will be positively rewarded for doing better. Withholding the rod is not sufficient. Nothing your Commission has done appears to preclude this, but there is little evident encouragement to the industry to meet a given objective in a better (e.g. cheaper) way if they can. On this point, the PPG is even less encouraging than the Goals paper in that the language generally reflects a prescriptive mentality.

Chairman N.J. PALLADINO
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The major factors missing from the Goals paper are sufficient admission of the role of judgement in regulatory decisions, and an essentially total omission of the role of uncertainty. Most concerns over nuclear safety are not over risk, but over "can we really be sure".

The stated role and function of NRC Research in the PPG remains vague and unsatisfying.

From my current position, I am sensitive to the international implications of what NRC does. While the technological participation is generally reasonable, there seems to be embarrassingly little recognition of the possibility of learning from or of influencing regulatory practice elsewhere.

I hope you find these comments to be constructive.

Yours sincerely,

William H. Hannum
Deputy Director General

c.c. Dr. F. Remick, w/encl. ✓

Comments by W.H. Hannum on
NUREG 0880
Safety Goals Discussion Paper

This paper is constructive, bold and forthright. It is a major contribution to the discussion and establishment of safety goals. However, it (1) gives too little recognition of the role of uncertainties, confidence limits, the role of judgement, and responsibility roles; (2) it presents a framework which is difficult to translate into practice; and (3) the "Implementation" suggests supplemental requirements rather than a consolidation.

1. There is a classic, longstanding confusion in applied statistics between "frequency" and "confidence". I know of no place where this confusion is more damaging than in nuclear safety. WASH-1400 uses the two concepts interchangeably. Licensing assessments tend to do the same. Thus, it may be reasonable to set goals at 0.1% of some reference if this is meant to refer, for example, to a 3 σ confidence limit on a best estimate. However, confidence limits in an uncertain world are most often subjective. Thus, the real goal becomes: in the judgement of reasonable and qualified individuals, the risk does not exceed The structure of nuclear regulations suggest that this statement should be further transformed to say that the regulatory authorities would wish the applicant to provide evidence sufficient to convince them (appropriate measures having been taken to ensure that the licensing authorities are reasonable and qualified) that the risk does not exceed

There is much more intended than purity of presentation. The essential role, function and responsibility of NRC is ultimately judgemental. A clear discrimination between the statistical use of frequency (which follows the normal combinatorial rules of statistics) and confidence limits (which tend to defy normal statistical rules of combination) would allow a more rational appreciation of differences in judgement, perception, and credence, and to separate these from simple questions of ignorance. The concept of defence-in-depth, of course, arises explicitly from the concept of confidence, and the non-linearity thereof.

2. The approach presented implies a switch to a probabilistic licensing basis. The principles: comparability, ALARA, and cost-benefit, seem somehow disconnected from this. Are these meant to be separate and parallel requirements? Comparability, from past experience would seem to call for a comparable degree of understanding of the risks of power generating using non-nuclear means, which would be interesting to pursue, but which would be outside NRC's current scope of competence. Also, it seems clear that applying the level of conservatism used for nuclear licensing to other means of generating electricity would be likely to be disruptive to society, in that it would probably preclude the use of most fossil fuels.

The ALARA principle, unqualified, is a gross disincentive to investment unless there is an automatic retrofit exclusion. If it is coupled to the benefit-risk test, it is less objectionable; but some care should be taken to ensure that those who benefit are broadly those who pay.

3. What is most needed in the safety and licensing area is not further restrictions, constraints and rules, but a change in attitudes. Orderliness and discipline in the regulatory process can go a long way toward restoring confidence, but this is not enough. To influence basic attitudes, it is necessary to review reward structures; and basic safety goals can say a lot about the reward structure.

This could be accomplished, along with providing continuity and convertability, by taking quite a different criterion of acceptability. There is an empirically accepted base, which is evidently satisfactory; namely, the risk associated with current plants, given our current knowledge of DBAs, materials performance, etc. If that is accepted as a reference, then subsequent licensing actions ought not add to existing known risks (this could require marginal upgradings of existing plants as a number of plants increase; continued surveillance to guard against deterioration; upgrading and retrofitting whenever previously unknown and unrecognized risks are identified; etc.). Since the precedent has been established based on DBAs, the burden of analysis on such new issues as Class 9 accidents and operator performance (where current licenses are based on a presumed level of performance), would fall to showing that these do not add more to the DBA risk than has historically be assumed. For new considerations, some window may be required by lowering DBA risk to make room for the newly introduced component. This pattern would be vaguely analogous to EPA's air quality standard approach.

Tying to currently accepted known reactor risks would permit inventive and creative approaches to risk reduction to be rewarded. This is what is required to free the genie of creativity to restore nuclear power to a position of aggressive competitiveness, at least so far as the licensing impediment is concerned. It would make safety a positive factor rather than a negative one.

Comments on NUREG-0885
Policy and Planning Guide 1982

General:

In spite of some evidence of bureaucratic posturing, this document is remarkably lucid. Its existence is clear evidence of a commitment to internal as well as external discipline, openness and responsiveness. The willingness of the Commission to expose its intents and processes to scrutiny and criticism in this manner is noteworthy and commendable. The more explicit and direct the policy statement, the easier it is to criticize. Hopefully such efforts will be rewarded by constructive criticism.

1. Safe Operation of Licensed Plants

Policy: It may be Freudian, but the stated policy implies that NRC operates plants and facilities. It suggests that NRCs goal is to see that "... plants ... are operated ..." etc. Because of NRCs reputation for overbearing prescriptive regulation, policy guidance on this point must be strong and clear (see comment 18 below). NRC should also provide a basis for public appreciation of the risks and precautions involved in nuclear facilities.

2. Planning Guidance:

The picture is unambiguously one of imposed safety. There is no mention or allusion to encouraging constructive attitudes by those ultimately responsible. Safety must be a pervasive attitude throughout, it cannot be imposed.

3. Item 1: Inspection

The intent should be more clearly stated to be to encourage professionalism in the attitude of operators.

4. Item 4: Human Factors

The first sentence here says that a program approach must be developed; this explains why the remainder of this section is very fuzzy. A first step must include specification as to what is meant by the jargon term "human factors". As a detail, note that items (c) and (d) require NRC staff to "improve ... requirements", and "develop ...". NRC should "ensure that ... requirements are improved ..." and "require the development of ...". Wherever possible, NRC should put itself in a position of review and approval, not of developer, if there is to be any hope of having a competent industry.

5. Item 6: Compliance

The last sentence of this item (Licensees who cannot meet requirements will be shut down) is unarguable.

The rest of this item could be counterproductive, in that it seems to encourage a confrontational attitude.

6. Near Term Problems

Policy: As a very minor comment, NRC should "encourage" use of cost effective procedures rather than to "allow" use of such.

Planning Guidance: No comment.

7. Co-ordinating Requirements

Policy: The statement here is both encouraging and discouraging. The statement makes it clear that the current disastrous state of disarray is recognized. But, except for cost-benefit (item C) and rule-making (item E), there is little policy guidance. The basic policy ought to define when and why new requirements should be issued in the first place. Presumably this is to correct previously unrecognized deficiencies or to take account of new data or understandings. Presumably they are not the means to progress to ever and ever decreasing risks (the concept of "strangulation" is relevant here). To the extent that a new requirement is justified by a cost-benefit argument, one would have to admit to the right of the applicant to a relaxation of requirements which are similarly below a cost-benefit threshold. Neither of these arguments are sensible unless there is some association between those paying and those benefitting, such as a mandatory inclusion of all safety features in the rate base.

Policy guidance should address the intent of regulatory requirements rather than the process. Regulatory Requirements should contain a statement of objective and an explanation as to the degree and extent to which this objective will protect public health and safety or property. When the intent is to protect an intermediate function (e.g. containment, vital power), the linking to ultimate objectives should be clear. Contra-indications should always be given. Specific means of meeting a requirement, when given, should be considered illustrative not mandatory. Specific reference should be made to immediate action directives.

8. Planning Guidance:

The items enumerated here would seem to be a level of detail that could be left to the responsible managers.

9. Improving the Licensing Process:

No comments.

10. New Initiatives: Waste Management

Policy: It is mostly presentational, but the statement here is descriptive, not policy. The last two sentences imply a rational policy: NRC criteria on waste management are to be based on a defence-in-depth strategy that

requires thorough consideration of various types of sites, demonstrated NRC will work with DOE to ensure that DOE site characterization activities realistically and responsibly address NRC criteria. NRC review efforts will not unduly delay implementation efforts.

11. Planning Guidance:

Two details on item (2): the third sentence can be read to imply that NRC staff should develop methods and tests to demonstrate I trust this is not implied. The 3½ year projected time scale is disturbing, but may be realistic. A detail on item (3): The second sentence should refer to storage pools and/or dry storage.

12. TMI No comment

13. Safety Goal and Risk Assessment No comment

14. Siting Policy:

While it is not a commentary on what is proposed here, the source term illustrates a particular case in point. I would prefer the atmosphere to be such that applicants would wish to present a case for a revision to current rates, and that NRC would review the adequacy of the case made, rather than for NRC to reassess and revise the "official" source term. Thus, while I agree with the intent of the policy as stated, I would prefer that planning "encourage applicants to employ updated source terms to the extent they are justified by available data". Siting Regulations then would be directed more toward performance requirements than to numerical specifications, and could proceed in parallel.

15. Q.A.: Good.

16. Research

The policy guidance is so vague as to be meaningless. Of the items of planning guidance, only the last is real: someone needs to figure out what NRC is trying to do in the research field.

17. Safeguards:

International: This is an understandable statement.

18. Domestic: This statement is clear. It is a pity that the planning guidance statement "Emphasis should be given to performance requirements rather than prescriptive requirements ..." appears here only. That should be number one planning guidance for all areas.

19. Other:

There should be more explicit policy expression of the mutual interaction between U.S. and non-U.S. licensing and regulation activities.

20. There could well be guidance with regard to the NRC interface with applicants, the regulated industry, professional intervenors, the press, the general public (public information), the university community, national laboratories, other contractors, etc.