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SUBJECT: Forwards comments on Suppl 2 to NUREG-0654, "Suppl to Operation of Susquehanna Steam Electric Station, Units 1 & 2." Rept not adequate to describe environ & public health consequences of postulated accidents.

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RG

104 Davey Laboratory  
The Penn. State University  
University Park  
Pa., 16802

1 June 1981

U.S. Nuclear Regulatory Commission  
Washington, D.C., 20555

Attention: Director,  
Division of Licensing

Dear Director:

Enclosed are my comments on Supplement 2 to the Draft EIS on the Susqueanna Steam Electric Station Units 1 and 2. Please note that the opinions and calculations presented here are my own, and not necessarily those of The Pennsylvania State University, which affiliation is given for identification purposes only.

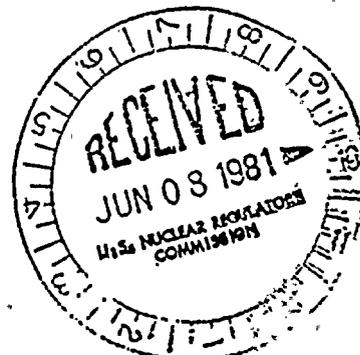
I should note that I requested a copy of the draft in a letter to the Director, Technical Information and Document Control, NRC, postmarked May 13, but did not receive the document until May 30. It was thus impossible to meet your May 26 deadline, which I assume to be extended under the circumstances. I have attempted to respond as quickly as possible.

I hope these comments are useful in developing the Final Environmental Impact Statement.

Sincerely,

*William A. Lochstet*

Wm. A. Lochstet, Ph.D.



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Environmental Impact  
of  
Postulated Accidents  
Susquehanna 1 & 2  
by

William A. Lochstet, Ph.D.

The Pennsylvania State University \*  
June 1981

The Nuclear Regulatory Commission (NRC) has attempted to evaluate the environmental and public health consequences of postulated accidents at Susquehanna 1 & 2 in its "Supplement to Draft Environmental Statement related to the operation of Susquehanna Steam Electric Station Units 1 and 2," NUREG-0564 Supplement No. 2 (Ref. 1). Unfortunately, the mere 41 pages of this report are not adequate to describe a calculation that was previously presented in the eight volumes of the Reactor Safety Study (RSS) WASH-1400. I should add that the attempt to do something about this issue is a giant step improvement over the past practice of doing nothing. For severe accidents the assessment is carried out considering the entire population within radii of 80 km (50 miles) and 800 km (500 miles) (Ref. 1, section 6.1.4.2, page 6-12) which would include part of Maine to the north and North Carolina to the south. The use of such large radii is certainly appropriate. As is properly recognized in Sec. 6.1.1.2 (Ref. 1, P. 6-3) at larger distances from the release site, the exposure per person decreases, but the number of people exposed increases. Thus, as it was recognized in 1975 by the APS study (Ref. 2) the major health impact may be located at the larger distances from the release site.

\* The opinions and calculations contained herein are my own, and do not necessarily represent those of The Pennsylvania State University, which is well known for its encouragement of diverse thinking.

June 1981

The next item to examine is for what time period are the exposures to the populations considered. It is stated in § 6.1.4.2 (Ref. 1, P.6-12) that: ---

Unless otherwise specified the calculations for Susquehanna incorporate this provision for relocation following seven days of exposure.

Since other alternatives for earlier evacuation are also considered, it would appear that the population is permanently relocated seven days after the accident or less. This issue arises further in § 6.1.4.4 (Ref. 1, P. 6-14) where the cost of decontaminating property is considered, "where practical". This would seem to indicate that the population is allowed to return in some limited way to the area affected. But this would involve additional radiation exposure which would seem to contradict § 6.1.4.2. Two cases will be examined here, permanent relocation, and temporary (indefinite) relocation.

In the case of permanent relocation, the radiation doses  $x$  will indeed end after the seventh day. In the case of a large accident the affected area would be "the size of the state of Pennsylvania." (Ref. 3). This is an area of 29 million acres, which at an average value of \$1,000 per acre would total \$29 billion. This is somewhat beyond the largest dollar cost indicated by the last data point in Fig. 6.1.4-6 (Ref. 1, P. 6-33). The last data point in this Figure would appear to be only \$15 billion. This case does not seem to fit the NRC estimate.

In the case of temporary relocation, the population of the affected area would return after a suitable waiting period and decontamination where practical. In the case of a large accident, with 29 million acres or so affected, it is not "practical" to decontaminate the large areas with fairly low contamination. In these areas, the population would return and receive a fairly small individual dose for a long time. This, in fact would be the major consequence of the accident (Ref. 2). This does not seem to have been considered in the NRC estimate.

The present study (Ref. 1) seems to be based on the RSS (Ref. 4) and "Rebaselining" to incorporate peer group comments, better data and other developments since the publication of RSS (Ref.1, P. 6-11). In its January 1979 statement of policy referred to in § 6.1.4.7 (Ref. 1) the Commission took the following actions:

**The Peer Review Process:** The Commission agrees that the peer review process followed in publishing WASH-1400 was inadequate and that proper peer review is fundamental to making sound, technical decisions. The Commission will take whatever corrective action is necessary to assure that effective peer review is an integral feature of the NRC's risk assessment program.

**Accident Probabilities:** The Commission accepts the Review Group Report's conclusion that absolute values of the risks presented by WASH-1400 should not be used uncritically either in the regulatory process or for public policy purposes and has taken and will continue to take steps to assure that any such use in the past will be corrected appropriately. In particular, in light of the Review Group conclusions on accident probabilities, the Commission does not regard as reliable the Reactor Safety Study's numerical estimate of the overall risk of reactor accident. (Ref. 5, P.3)

The second statement would preclude the use of results from the RSS at this time. The first statement requires a thorough peer review process for any such study. It is here suggested that the new "Rebaselining" has undergone less peer review than the RSS of 1975. The present report (Ref. 1) is too incomplete for any hint at peer review.

It would appear that the NRC has at least two choices to face up to these important issues. One choice is to publish a new version of the RSS. Another choice would be to expand the present report (Ref. 1) to be as comprehensive as the RSS. In either case, thorough peer review would be necessary, of the scale that the 1975 RSS was reviewed. Your efforts in this direction are appreciated.

There are in addition a number of minor inaccuracies in the present report which should be pointed out. In the second paragraph of § 6.1.1.3 (Ref. 1, P. 6-4) it is stated that doses of ten to twenty times 25 rem received over a short period of time can be expected to cause "some fatal injuries". Twenty times 25 rem is 500 rem. This is the approximate value of LD 50, the dose lethal to 50% of a mixed population. It is suggested that "some" is a bit of an understatement of half of the population.

In § 6.1.1.4 (Ref. 1, P. 6-5) it is suggested that for soil contamination, the hazard can continue for even decades. With some half lives in the order of 30 years, or longer for fission products, mere decades would seem to be a bit short.

#### References

- 1 "Supplement to Draft Environmental Statement related to the operation of Susquehanna Steam Electric Station, Units 1 and 2." NUREG-0564, Supplement No. 2, Draft, U.S. Nuclear Regulatory Commission, March 1981
- 2 "Report to the American Physical Society by the Study group on light-water reactor safety", H.W. Lewis, et al., Reviews of Modern Physics, Vol 47, Supp No. 1, Summer 1975
- 3 AEC, WASH-740 update file, document 92, page 4
- 4 "Reactor Safety Study", WASH-1400 (NUREG#75/014), 1975
- 5 "NRC Statement on Risk Assessment and The Reactor Safety Study Report (WASH-1400) In Light of the Risk Assessment Review Group Report", U.S. NRC, January 18, 1979.

