

OCT 14 1963

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COMMENTS: SPERT I LOW-ENRICHMENT OXIDE CORE DESTRUCTIVE TEST
PROGRAM SAFETY ANALYSIS REPORT

HSHP:RFB

The subject report has been reviewed, with particular emphasis on Chapters V and VI, by the Health and Safety Division. The hazards evaluation for the destructive test has been found to be rather incomplete. However, on the basis of supplementary calculations we agree that no significant hazard to on-site personnel or to the general public will result from the test.

General Comments: The radiological hazards evaluation has determined the fission product inventory following a 250 mwatt-sec destructive test, direct gamma doses from the reactor core, whole body doses from cloud passage, and fission product fallout concentrations on the ground. In addition, consideration should have been given to potential inhalation doses both within the NRTS and to the general public; to the possibility of ingestion doses from radioiodines entering the milk food chain; and to the potential doses from the fission products that may be deposited on the ground. The possibility of a wind shift soon after the destructive excursion occurs should also have been considered. The hazards due to such a wind shift during lapse conditions should be determined for completeness even though the probability of such an occurrence is low, since the test will be initiated only after a wind persistency of at least three hours is forecast. Some results of the supplementary calculations made by the Division are included with this letter.

Specific Comments:

1. The presentation of the hazards evaluation is rather general. Specification of particular hazards should be made and dealt with. For instance, Table V (page 28) presents downwind doses at distances of one and eight miles in addition to one-half mile. Why the one and eight mile distances were chosen and their significance, if any, is not mentioned.

REPOSITORY INEL

COLLECTION SPERT
#22305 FRC#430 780073

BOX No. File: SPert-1963

th. 10-14-63 SPert I Low Enrichment
FOLDER Oxide Core Destructive Test.

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2. Wind direction limits for the destructive test, as stated in the report (page 21), are from 180° to 260° . This is misleading. One might conclude that the test may be conducted with winds blowing directly toward TREAT and the EBR-II area. The wind direction limits are from 200° to 240° for prevailing winds. The marginal 20° sectors only allow for short term fluctuations of the wind direction.

3. The purpose of the inversion condition determinations is not evident. Operational controls will be exercised so that this atmospheric condition is not credible for the test. If inclusion of inversion conditions is intended as a hazards evaluation for the whole test program then a discussion of credible accidents should be provided and complete calculations of all types of radiation exposures for the maximum credible accident should be included.

4. The equations used and the numerical values used for parameters should be provided in the report as well as the calculated results. In particular, Section 1.5 (Fission Product Cloud Dose) omits the method of calculation and some parameter values.

5. Equation (6) in Section 1.4 (Direct Gamma Dose) should include a dose build-up factor in air. This factor increases the dose rate at one-half mile by a factor as large as 18 for 1.0 Mev gamma energies. In view of other conservative assumptions made in the calculation, and of the relatively low dose values calculated, this omission does not neglect a serious hazard.

6. Appendix B-4. (Operational Procedure for a Transient Test) does not give a comprehensive description of the safety requirements to be fulfilled before a transient test is initiated. The ID Health Physics Liaison Representative (incorrectly titled on page 30), who has verbal contact with a U. S. Weather Bureau representative and an aerial monitoring team, will give approval for initiating the test only after the meteorological requirements are met and only after the monitoring grid and surrounding area is ascertained to be free of personnel by the aerial team.

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Supplementary Information:

Doses for Strong Lapse Conditions

	Distance		
	1/2 mile	CPP (3 miles)	EBR-II (11 miles)
Inhalation Thyroid Dose(mrem)	150	10	1
Fission Product Deposition Whole Body Dose (mrem)	10	0.5	

The inhalation doses are based on 50% release of radioiodines and center-of-cloud distance. The fission product deposition, whole body doses are based on infinite exposure time. The off-site ingestion dose for adults is estimated at less than 50 mrem.

On the basis of calculated doses like those above, in addition to those in the subject report, no significant radiation hazard will be incurred by personnel or by the general public as a result of the destructive test.

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DATE ▶	10-11-63	10-11-63	10-11-63	10-14-63		