

AUG 4 - 1971

Docket No. 50-231

General Electric Company
ATTN: Dr. Karl Cohen, General Manager
Breeder Reactor Development Operation
310 DeGuigne Drive
Sunnyvale, California 94086

Gentlemen:

We have reviewed the reports submitted by your transmittals of June 18, July 14 and 16, 1971, that present the results of the experimental program including the sub-prompt critical tests for Core I and are prerequisites required by the Technical Specifications for initiation of the super-prompt critical transient test program.

We conclude that the proposed changes to the Technical Specifications to permit the initiation of the super-prompt critical transient tests do not present significant hazards considerations not described or implicit in the safety analysis report and there is reasonable assurance that the health and safety of the public will not be endangered.

During our review, we informed your staff that additional changes to the Technical Specifications were necessary to meet our regulatory requirements. These changes have been made.

Accordingly, the super-prompt critical transient test program is hereby authorized, and pursuant to 10 CFR 50.59, changes to the Technical Specifications are also authorized as indicated by margin bars on the enclosed replacement pages 3.12-1, 3.12-1d, 3.12-2.1, 3.12-5 and 3.12-6.

Sincerely,

Original Signed by
Peter A. Morris

Peter A. Morris, Director
Division of Reactor Licensing

Enclosures:
Revised pages

cc: Jules Pearlman, General Counsel
General Electric Company

R. J. Schemel, DRL
R. W. Woodruff, DRL
S. A. Teets, DRL

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|---------|----------|-------------|------------|-------------|--------------|-----------|
| OFFICE | DRL | DRL | DRL | DRL | DRL | DRL |
| SURNAME | SA Teets | RW Woodruff | RJ Schemel | DJ Skovholt | FS Schroeder | PA Morris |
| DATE | 8/2/71 | 8/3/71 | 8/3/71 | 8/3/71 | | |



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

August 4, 1971

Docket, No. 50-231

General Electric Company
ATTN: Dr. Karl Cohen, General Manager
Breeder Reactor Development Operation
310 DeGuigne Drive
Sunnyvale, California. 94086

Change No. 4
License No. DR-15

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Sincerely,

A handwritten signature in cursive script, reading "Peter A. Morris", is positioned above the typed name.

Peter A. Morris, Director
Division of Reactor Licensing

Enclosures.
Revised pages

cc: Paul Van Buren, Attorney
General Electric Company

3.12 Excursion Tests

Applicability

These limits apply when excursion tests are conducted with the Fast Reactivity Excursion Device (FRED). The prompt critical test program for Core II shall not be initiated until DRL has completed its review of the special reports described in Specification 6.6.B.5 and determined whether or not additional specifications are required.

Objective

To specify additional limits which are applicable only during the excursion tests.

Specifications

A. Experimental Program with FRED

The experiments with the FRED shall be carried out in three phases as indicated below. Progress to the next phase shall be contingent upon adequate agreement with predicted results.

1. Familiarization Tests

- a. The worth of the poison slug used in these tests shall be 0.5\$ or less.
- b. The initial reactor power level shall be equal to or less than 15 MWt.

2. Sub-Prompt Critical Tests

- a. The worth of the poison slug used in the sub-prompt critical tests shall be 0.98\$ or less.

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- b. The initial reactor power level for sub-prompt critical tests with the FRED shall be equal to or less than 15 MWt.

3. Super-Prompt Critical Tests

- a. The worth of the poison slug used in the prompt critical tests shall be equal to or less than 1.3\$ if the nominal value of the magnitude of the sodium-in negative Doppler coefficient ($T \frac{dk}{dT}$) is equal to or greater than 0.008. The worth of the poison slug shall be equal to or less than 1.2\$ if the nominal value of the magnitude of the sodium-in negative Doppler coefficient ($T \frac{dk}{dT}$) is less than 0.008.
- b. The initial reactor power level for prompt critical tests shall not exceed 11 MWt.

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11. Redundant flux monitoring equipment, capable of monitoring the reactor flux throughout the transient, shall be operable throughout each familiarization, sub-prompt and super-prompt test.
12. The switchover in data recording between the two U-238 fission chambers and the two gamma chambers shall be such that the switching times for the two data recording channels are staggered so that overlapping data are obtained from one U-238 fission chamber and one gamma chamber prior to complete switchovers of both recording channels between the U-238 fission chambers and the gamma chambers for those transient tests that require the use of both instruments due to the magnitude of the excursion.

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starting from initial power levels as low as 0.1 MWt is still well below the safety limit.

Initial checkout tests of the FRED after it is installed on the reactor head will be performed with the reactor either sub-critical or at low power level (less than 0.1 MWt). The FRED will have a negligible effect on reactivity when it is in a position more than 20 inches above the core midplane.

The minimum limit of 700°F on the core coolant inlet temperature is to assure that the total reactivity of the core is maintained at the equivalent of 50¢ excess at 20 MW conditions.⁽⁹⁾ At lower temperatures, the excess core reactivity would be higher. The 50¢ excess limit assures that the Maximum Planned Transient will not be initiated from a power level in excess of 11 MWt, and also limits the final reactor power if the reactor does not scram and the FRED slug remains out of the core following any excursion test.

The requirement for redundant flux monitoring equipment during the transient tests will provide a cross check on data and will also assure monitoring of reactor flux throughout the transients while providing the flexibility to use wide range monitors, U-238 fission chambers or gamma chambers as required by the magnitude of each test.⁽¹³⁾

Obtaining overlapping data from both the U-238 fission chambers

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and the gamma chambers prior to switching from one instrument to the other for those transients whose magnitude require the use of both instruments will provide a cross check between instrument readings during switchover.

References

- (1) SEFOR FDSAR, Appendix B, Section B.5, p. B-3.
- (2) SEFOR FDSAR, Section 16.4.2.6.1.1, p. 16-28
- (3) SEFOR FDSAR, Volume II, Section 13.4.3.
- (4) SEFOR FDSAR, Volume II, Section 16.2.7.
- (5) SEFOR FDSAR, Volume II, Section 16.2.7, p. 16-10.
- (6) SEFOR FDSAR, Supplement 17, p. G-1.
- (7) SEFOR FDSAR, Supplement 3, Section 5.1.3.
- (8) SEFOR FDSAR, Supplement 19, p. 57.
- (9) SEFOR FDSAR, Volume II, Section 12.3.6, pp. 12-15, -16.
- (10) SEFOR FDSAR, Supplement 10, p. 1-48.
- (11) Additional Information Regarding Sodium Logging of SEFOR Fuel Rods, February 1, 1971.
- (12) SEFOR FDSAR, Supplement 21, p. 4.
- (13) "Results of the Familiarization and Sub-Prompt Critical Transients for Core I", pp. 4 and 18 submitted to the AEC-DRL on July 16, 1971, by the Breeder Reactor Department of the General Electric Company.

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