SNUPPS

Standardized Nuclear Unit
Power Plant System

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Nicholas A. Petrick
Executive Director

February 4, 1982

SLNRC 82-07 FILE: 0541
SUBJ: NRC Request for Additional Information - Reactor Systems

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Docket Nos: STN 50-482 and STN 50-483

References: 1. NRC (Youngblood) letter to KGE (Koester), dated December 31, 1981: Same subject

2. NRC (Youngblood) letter to UE (Schnell), dated January 15, 1982: Same subject

Dear Mr. Denton:

The referenced letters requested additional information on the SNUPPS plants concerning the analyses of a locked reactor coolant pump rotor and a sheared pump shaft. The enclosure to this letter provides the requested information and will be incorporated in Revision 8 to the SNUPPS FSAR.

Very truly yours,

[signature] for

Nicholas A. Petrick

RLS/mtk4b28&4b16-18

Enclosure

cc: G. L. Koester KGE
D. T. McPhee KCPL
D. F. Schnell UE
T. E. Vandel NRC/WC
J. H. Neisler NRC/CAL

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(440.3WC)
(440.1C)

The analyses of a locked reactor coolant pump rotor and a sheared reactor coolant pump shaft in the FSAR assumes the availability of offsite power throughout the event. In accordance with Standard Review Plan 15.3.3 and GDC 17, we require that this event be analyzed assuming turbine trip and coincident loss of offsite power to the undamaged pumps.

Appropriate delay times may be assumed for loss of offsite power if suitably justified.

Steam generator tube leakage should be assumed at the rates specified in the Technical Specifications.

The event should also be analyzed assuming the worst single failure of a safety-system active component. Maximum technical specification primary system activity and steam generator tube leakage should be assumed. The analyses should demonstrate that offsite doses are less than 10 CFR 100 guidelines values.

RESPONSE

Accident Scenario

The locked Rotor followed by a loss of offsite power transient is postulated to occur in the following manner:

a. Reactor coolant pump rotor locks (or shears) and flow in that loop begins to coastdown.

b. The reactor is tripped on low RCS flow in one loop.

c. Turbine/Generator trips.

d. Offsite power is lost.

NOTE: Grid stability analyses show that the grid will remain stable and offsite power will not be lost because of a unit trip from 100% power. Refer to Section 8.2.2 of each Site Addendum. The following analysis assumes a 2 second time delay between reactor trip and loss of offsite power. This is a conservative assumption based on the grid stability analyses.

e. The loss of offsite power causes the three remaining reactor coolant pumps to coast down.

Method of Analysis

The method of analysis used is the same as the cases presented in Section 15.3.3. The following case is analysed;

Four loops operating, one rotor locks. Followed by coastdown of other three reactor coolant pumps.

Results

Figures 440.1-1 through 440.1-5 show a comparison between the locked rotor transient without offiste power and the locked rotor transient with offiste power from section 15.3.3. As can be seen from the figures, losing offsite power results in the same peak clad temperature and the same peak RCS pressure.

The calculated sequence of events for the case without offsite power is shown in Table 440.1-1.

Conclusion

The locked rotor without offsite power transient is no more limiting than the case presented in Section 15.3.3.

TABLE 440.1-1

SEQUENCE OF EVENTS

LOCKED ROTOR WITHOUT OFFSITE POWER

EVENT	TIME (SECONDS)
Rotor on one pump locks	0.0
Low RCS flow trip setpoint reached	.05
Rods begin to drop	1.05
Maximum RCS pressure occurs	3.0
Maximum clad temperature occurs	3.01
Remaining reactor coolant pumps begin to coastdown	3.05

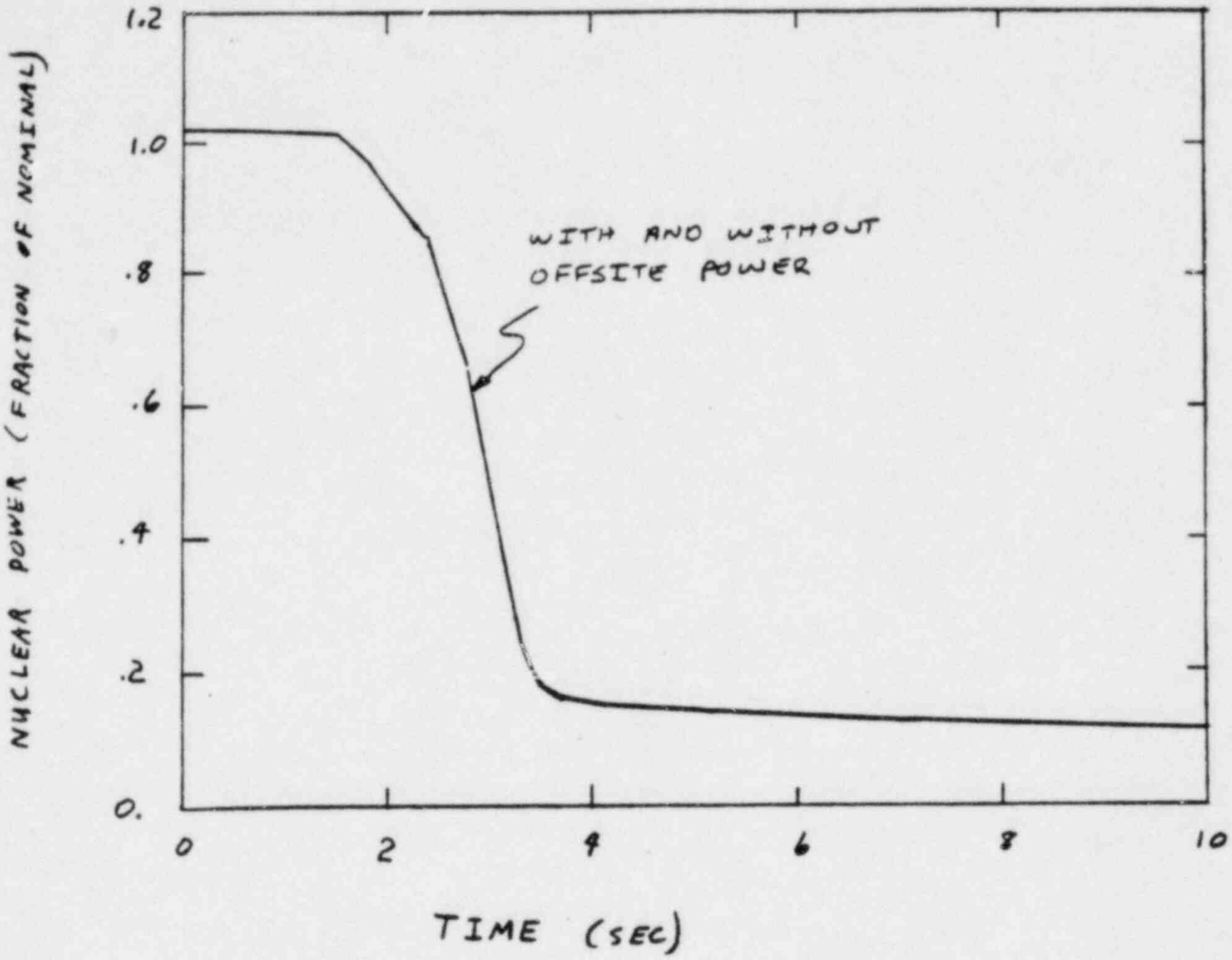

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Figure 440.1-1
Nuclear Power Transient,
Locked Rotor With and Without
Offsite Power

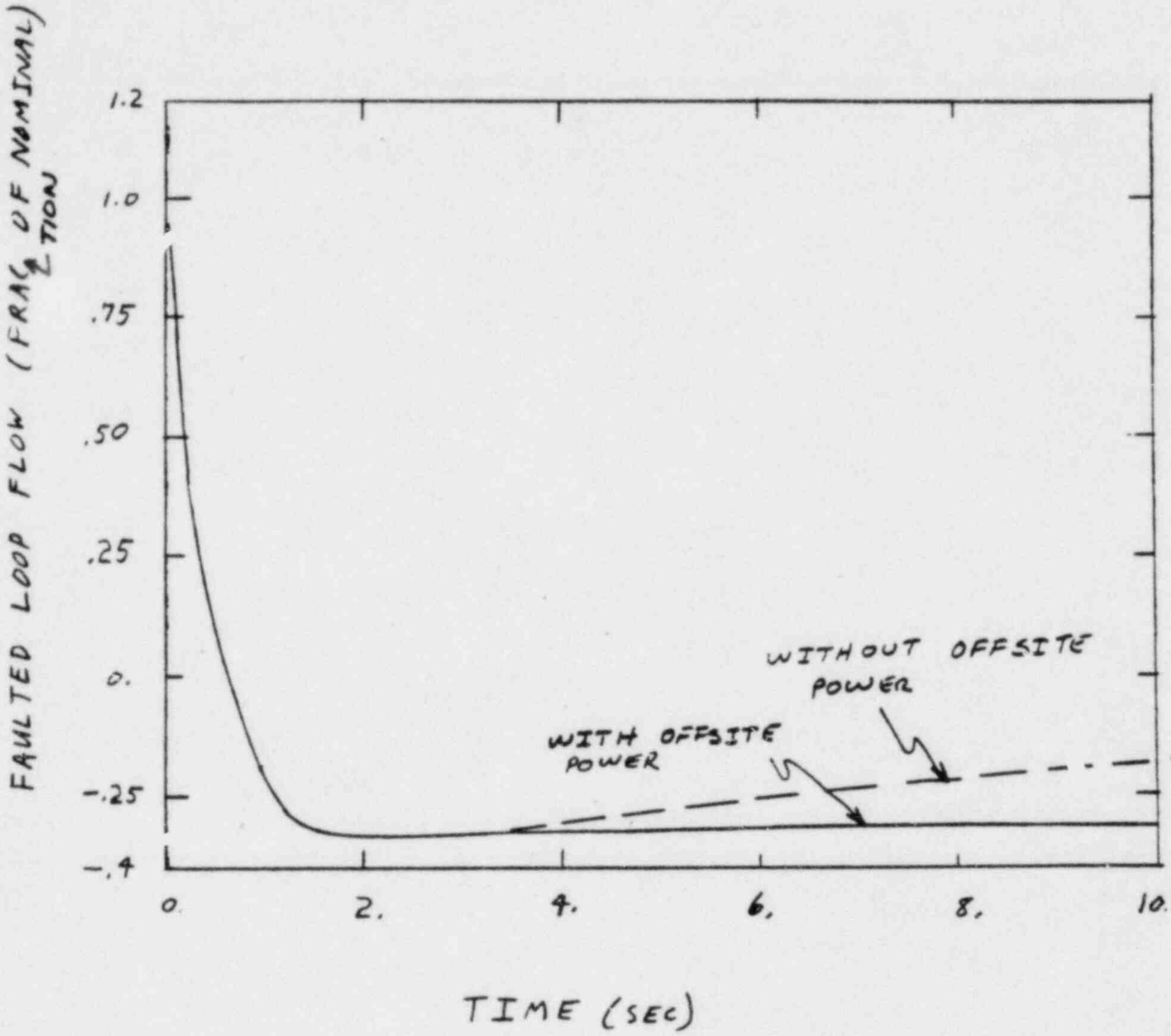

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Figure 440.1-2
Faulted Loop Flow Transient, Locked Rotor With and Without Offsite Power

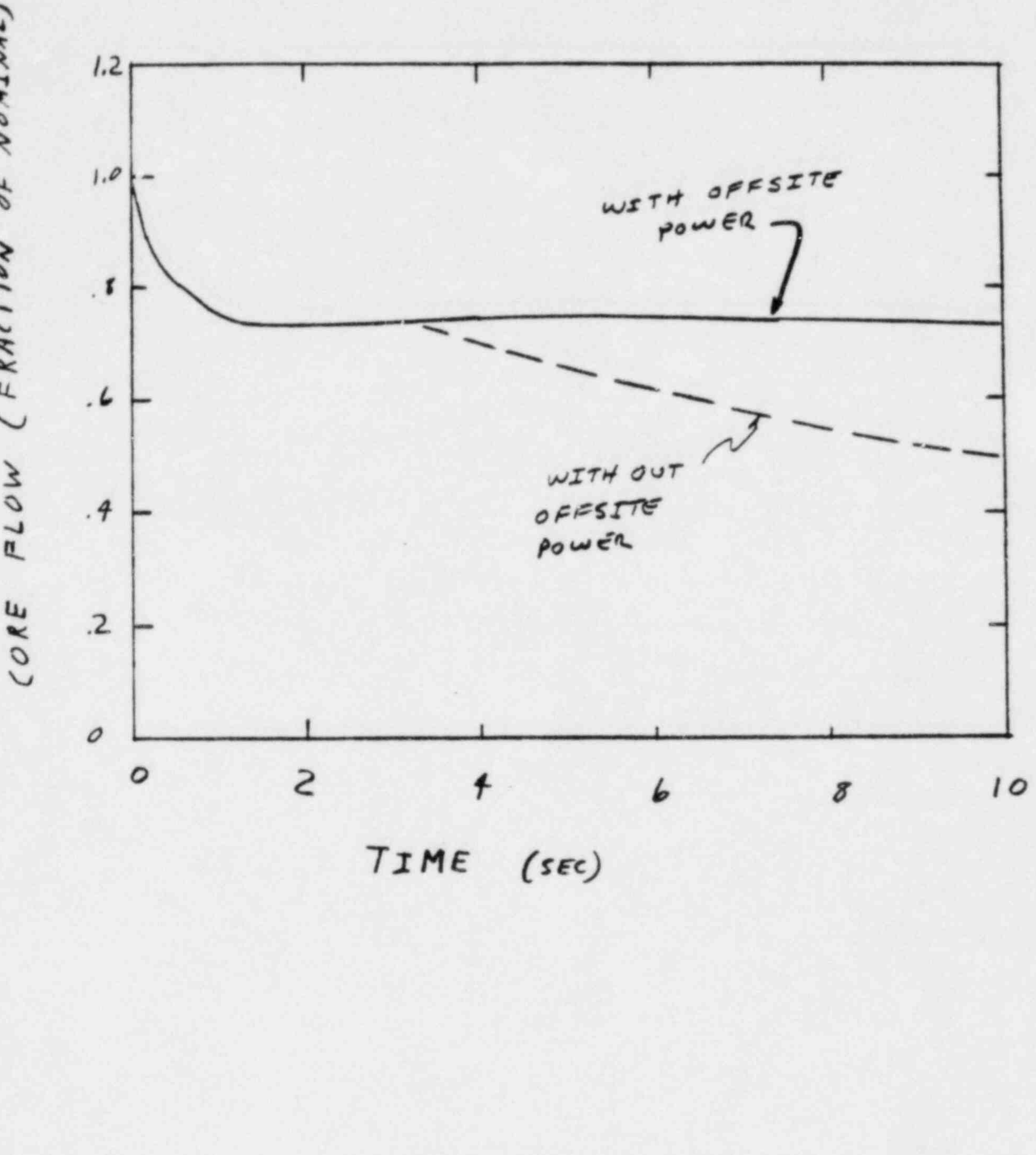

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Figure 440.1-3
Core Flow Transient,
Locked Rotor With and Without
Offsite Power

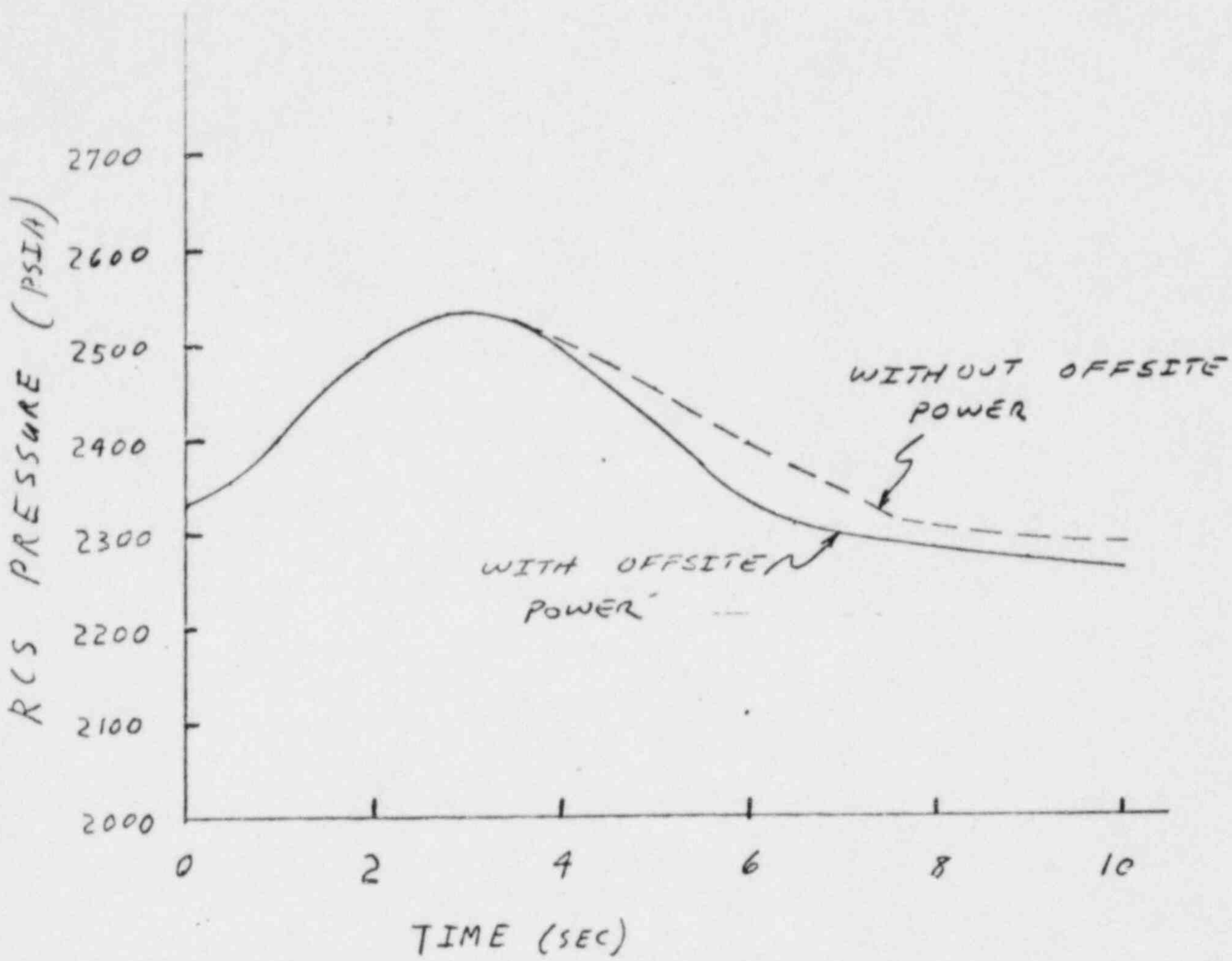

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Figure 440.1-4 RCS Pressure Transient, Locked Rotor With and Without Offsite Power

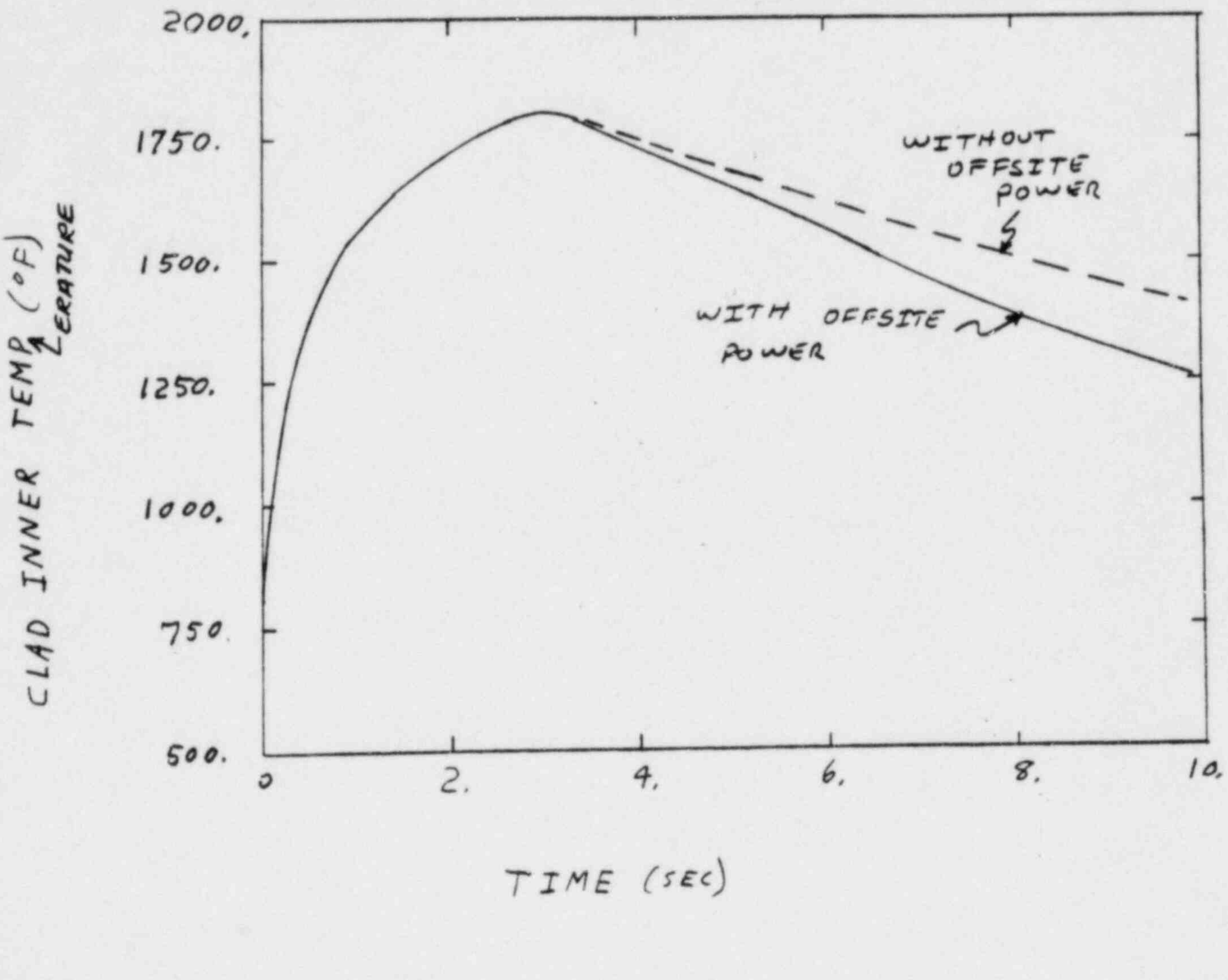

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Figure 440.1-5
Clad Inner Temperature Transient, Locked Rotor With and Without Offsite Power