March 23, 1987

AEOD/E703

MEMORANDUM FOR: James H. Sniezek, Deputy Director Office of Nuclear Reactor Regulation

FROM:

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PDR

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PDR

Frederick J. Hebdon, Deputy Director Office for Analysis and Evaluation of Operational Data

SUBJECT: LOSS OF OFFSITE POWER DUE TO UNNEEDED ACTUATION OF STARTUP TRANSFORMER PROTECTIVE DIFFERENTIAL RELAY

Enclosed is an AEOD engineering evaluation report concerning an event at H. B. Robinson Unit 2 involving loss of offsite power following a unit trip due to unneeded actuation of a startup or reserve transformer protective differential relay. The loss of offsite power occurred during a transfer of auxiliary loads from a unit auxiliary transformer to a startup transformer. Extensive investigations performed subsequent to the Robinson event concluded that loss of offsite power to the emergency buses had occurred because of direct current (DC) saturation of a current transformer (CT) attendant to a startup transformer protective differential relay. The associated safety concern for auxiliary power systems which are designed to operate in this manner following a unit trip is that power to the emergency buses may be lost at a time when needed to operate safety-related electrical equipment.

Although the review did not identify any other reported occurrence in which DC saturation of a CT attendant to a power transformer protective differential relay was a concern, susceptibility of such CTs to DC saturation could potentially exist elsewhere. This conclusion is supportable, since the Robinson operating history along with the analysis of the Robinson event clearly indicates that grid system conditions at the time of the transfer, in conjunction with a higher than usual auxiliary load in-rush current, are likely to be the limiting factors in a given operating plant. Since the Office of Inspection and Enforcement has already issued an information notice addressing the Robinson event, it is suggested that NRR consider the lessons learned from this event as appropriate in ongoing licensing reviews. In addition, it is suggested that consideration be given to incorporating the lessons from this event into the next revision of Standard Review Plan Section 8.2. The report also suggests that the revision focus on the potential occurrence of DC saturation of CTs attendant to startup or reserve transformer protective differential relays.

James H. Sniezek

If you or your staff have questions or comments, please contact me or Frank Ashe (x24442) of my staff. We would also be pleased to meet with you or your staff to discuss this matter.

Onginal Signed by C. J. Heltemes, Jr.

Frederick J. Hebdon, Deputy Director Office for Analysis and Evaluation of Operational Data

Enclosure: As stated

cc w/enclosure: G. Holahan, NRR G. Requa, NRR A. Rubin, NRR J. Knox, NRR A. Dromerick, IE J. Stewart, IE P. Krug, SRI, RII T. Guynn, OCM M. Beaumont, W C. Brinkman, CE R. Borsum, B&W L. Gifford, GE E. Jordan, IE

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