UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 04 1980

MEMORANDUM FOR: William J. Dircks
Acting Executive Director for Operations

FROM: Robert J. Budnitz, Director
Office of Nuclear Regulatory Research

SUBJECT: IMPLEMENTATION OF RECOMMENDATIONS OF SPECIAL TASK FORCE ON THREE MILE ISLAND CLEANUP

Reference: Your memorandum of March 6, 1980, same subject

Enclosed is the report "A Further Evaluation of the Risk of Recriticality At TMI-2," which you requested be prepared in the referenced memorandum.

This report reviews previous studies related to the probability and consequences of criticality at the damaged Three Mile Island Unit-2 reactor. More detailed assessments are performed to confirm the adequacy of those studies and to provide additional insight into ways to minimize risk from criticality. The most important conclusions of this study are:

1. The most probable mechanism for criticality, boron dilution, is a slow enough process that with appropriate instrumentation and procedures, the approach to criticality can be detected and corrected. To the extent that boron concentration in excess of 3500 ppm can be ensured, the probability of criticality is further minimized.

2. The most likely direct radiological consequence of criticality is increased dose rates inside containment. For the more realistic and more probable criticality events studied, off-site consequences are nonexistent. More conservative assumptions regarding the nature of the criticality, combined with multiple failures of engineered safety features are required before one calculates detectable health effects. Even then, the consequences, as expressed in terms of the probability of latent cancer fatality, appear to be very small compared to the observed incidence of cancer death. To the extent that core cooling and containment integrity can be maintained, the consequences of criticality can be further minimized.

This completes RES' response to Task V of the referenced memorandum.

Robert J. Budnitz, Director
Office of Nuclear Regulatory Research

Enclosure: Report As Stated

cc w/encl: H. Denton, NRR
V. Stello, IE
H. Shapar, ELD
J. Fouchard, PA
R. Minogue, SD
J. G. Davis, NMSS
B. Snyder, TMI-2
Public Document Room