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MEMORANDUM FOR: Carlyle Michelson, Director
Office for Analysis and Evaluation
of Operational Data

FROM: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

SUBJECT: EFFECTS OF FIRE PROTECTION SYSTEM ACTUATION
ON SAFETY-RELATED EQUIPMENT

As discussed in the AEOD memorandum on the above subject dated January 28, 1982, recent operating reactor events show that safety-related equipment subjected to water spray from fire protection systems can be rendered inoperable. The events also indicate that spurious actuation of fire protection systems can be initiated by operator error, steam flow, high humidity or maintenance activities in the vicinity of fire protection system detectors. These events tend to show that the interactions between fire protection systems and other systems that affect the operation of safety-related systems may not have been adequately considered.

The AEOD memorandum of July 28, 1982, "Carbon Dioxide Systems Used for Fire Protection In or Adjacent to Critical Areas," discusses the inadvertent actuation of the CO₂ system in the Grand Gulf ECCS penetration room. The CO₂ system overpressurized the penetration room and consequently forced open the locked door to the auxiliary building. In addition to the event description, a number of questions relating to carbon dioxide fire protection systems were raised. We consider the Grand Gulf event to be an extension of the original concern.

GDC 3 states, in part "Firefighting systems shall be designed to assure that their rupture and inadvertent operation does not significantly impair the safety capability of these structures, systems, and components." Branch Technical Position CMEB 9.5-1 to BTP 9.5.1 has additional functional criteria for CO₂ systems. During the Operating Reactor Event meeting of January 7, 1982 the Division of Engineering was assigned to review the recent fire system actuations and consider the need for modifications to requirements or reviews. The DE study is ongoing and will consider the AEOD concern for all types of fire protection systems (e.g., water, halides, carbon dioxide and other chemicals).

We will inform you of any recommendations that may result from this study. Additional information may be obtained from the Chemical Engineering Branch.

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Harold R. Denton, Director
Office of Nuclear Reactor Regulation

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