DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

February 17, 1981

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

Attention: Mr. B. J. Youngblood
Licensing Projects Branch No. 1

Re: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370

Dear Mr. Denton:

The accident which occurred at TMI Unit 2 resulted in the generation of hydrogen beyond the limits specified in 10CFR §50.44. This excessive hydrogen generation was primarily due to premature termination of the emergency core cooling system (ECCS). Duke Power Company believes that measures taken subsequent to the accident at TMI Unit 2 effectively preclude premature termination of the ECCS in the event of an accident requiring its initiation. Therefore, hydrogen will not be generated in amounts in excess of the limits set forth in 10CFR §50.44 and no additional safety systems are necessary.

However, Duke has installed a system for controlling the effects of excessive hydrogen generation in the extremely unlikely event of an accident resulting in such hydrogen generation at McGuire Nuclear Station. This system is described in the document "Duke Power Company, An Analysis of Hydrogen Control Measures at McGuire Nuclear Station." Volumes 1 and 2 of this document were submitted to the NRC on November 17, 1980. Volume 3 was submitted to the NRC on January 5, 1981. Fifteen copies of Volume 4 are enclosed with this letter. Also enclosed are fifteen copies of errata for Volume 2. This document is summarized below.

Chapter 1 provides an introduction to the control of hydrogen generation at light water cooled nuclear power plants.

Chapter 2 presents analyses which have been performed to study hydrogen burn transients in ice condenser containments for an accident sequence similar to the TMI-2 accident. At TMI-2 equipment failure coupled with dynamic man-machine interactions led to an arrested core melt event.

Accident sequences proceeding beyond the stage of an arrested core melt include events beyond the question of hydrogen generation and as such are not appropriate for evaluating the effectiveness of a hydrogen control system. Therefore, in order to evaluate the effectiveness of a hydrogen control system it is reasonable to select an accident sequence that is comparable to the TMI-2 accident. As such, the small break LOCA with failure of safety injection (the S_2D sequence in WASH 1400) was selected for this evaluation. The selection of a small break LOCA is even more appropriate considering the conclusion of WASH 1400 that "(these) sequences contribute the largest probability to PWR core melt." The S_2D sequence is representative of TMI-type sequences in which a hydrogen control system may be called upon to function.

Chapter 3 provides a description of the Emergency Hydrogen Mitigation (EHM) system which has been installed at McGuire Nuclear Station Unit 1. The operation and testing of this system is described in Chapter 8. A test program which demonstrates the effectiveness of the EHM system igniters is described in Chapter 5.

Chapter 4 describes a detailed structural analysis of the McGuire containment which established the functional capability of the McGuire containment as 67.5 psig. The structural response of the McGuire containment to a postulated localized hydrogen detonation is discussed in Chapter 7. This evaluation was conducted even though investigations show detonable mixtures of hydrogen will not be formed as the result of a postulated TMI-type accident at McGuire. The analyses discussed in Chapters 4 and 7 provide assurance that the McGuire containment can withstand the effects of a TMI-type accident.

Chapter 6 discusses the effects of hydrogen combustion on equipment located inside containment.

Very truly yours,

William O. Parker, Jr.

THH:scs

Enclosures