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

JUL 15 1980

The Honorable Max Baucus
United States Senator
320 Securities Building
2708-1/2 First Avenue North
Billings, Montana 59101

Dear Senator Baucus:

We are pleased to respond to your letter of June 23, 1980, which has been referred to this office for reply. In your letter, you requested assistance in responding to two questions raised by a Mr. Ed Dobson concerning the Three Mile Island nuclear incident. We would respond as follows.

Question: Was there a pressure spike or explosion within the containment chamber anytime during the accident? If so, was the stress factor 30 psi? Was hydrogen involved in the explosion?

Answer: Yes, the reactor containment building experienced a pressure pulse at approximately 1:50 p.m. on Wednesday, March 28. This was 9 hours and 50 minutes after onset of the accident. For the first 9 hours and 50 minutes after onset of the accident at Three Mile Island, Unit 2 (TMI-2), the pressure in the reactor containment remained around four pounds per square inch gauge (psig). Then, within a half hour period, the reactor containment building pressure increased from about 4 psig to a peak pressure of about 28 psig and then back to below 4 psig. The pressure pulse is believed to have been caused by the combustion of hydrogen. The principal source of this hydrogen was the metal-steam reaction of the zirconium in the reactor core. The metal-steam reaction is believed to have occurred during the period from 1-1/2 hours to about 3-1/2 hours after onset of the accident when portions of the fuel cladding (zirconium) reached temperatures which were high enough to allow the cladding to react with steam and produce the hydrogen.

Question: What is the design strength of the containment? 60 psi has been given as a measurement; is that common to most other reactors?

Answer: The reactor containment building for TMI-2 is designed for an internal pressure of 60 pounds per square inch gauge (psig). However, internal pressure is just one of several design

factors used in load combination equations to ensure that the as-built containment structure maintains an adequate margin of safety. Based on our analysis of similar containment structures, we conclude that the TMI-2 containment should be able to withstand at least twice the internal design pressure without failure.

The reactor containment building for TMI-2 is classified as a dry containment and the reactor is a pressurized water reactor (PWR). For PWR's with a dry containment, the design pressure is typically about 60 psig. For other types of reactor containment buildings and reactors, the design pressure will be different. The table below summarizes the various reactor containment building design pressures.

Typical Design Pressure of Various Containments
(Typical 1200 MWe Plants)

Containment Type	Reactor Type*	Design Pressure (psig)
Mark I	BWR	62
Mark II	BWR	45
Mark III	BWR	15
Ice Condenser	PWR	12
Subatmospheric	PWR	45
Dry	PWR	60

* BWR: Boiling Water Reactor
PWR: Pressurizer Water Reactor

I hope the above response provides you with the information you require.

Sincerely,

(Signed) T. A. Rehm
for William Dircks
Acting Executive Director
for Operations