



GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, Pennsylvania 17057-0191
717 944-7621
TELEX 84-2386
Writer's Direct Dial Number:

September 29, 1983
4410-83-L-0222

TMI Program Office
Attn: Dr. B. J. Snyder
Program Director
US Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Head Removal - First Pass Stud Detensioning

Attached for your approval is an evaluation for the first pass detensioning of the reactor vessel studs. Included with the Safety Evaluation is justification for removing up to five (5) studs. GPUNC has reviewed the proposal and determined that the proposed operation is similar to those operations routinely accomplished during PWR refuelings. GPUNC has also determined that first pass detensioning can be accomplished without undue risk to the health and safety of the public.

In accordance with 10 CFR 170.22, a check for \$4,000.00 for evaluation of a single safety issue will be forwarded under separate cover.

If you have any questions, please contact Mr. J. J. Byrne of my staff.

Sincerely,

B. K. Kanga
B. K. Kanga
Director, TMI-2

BKK/RBS/jep

Attachment

CC: Mr. L. H. Barrett, Deputy Program Director - TMI Program Office

SAFETY EVALUATION FOR FIRST PASS DETENSIONING
AND REMOVAL OF UP TO FIVE STUDS

This safety evaluation covers the activities required for first pass detensioning of the 60 reactor vessel studs and the removal of up to five reactor vessel studs.

Detensioning is a routine evolution occurring during a normal head removal sequence. The reactor vessel will be in a depressurized condition, and the vessel water level will be lowered below the elevation of the flange seals during the detensioning process. This process consists of a two step (pass) controlled relaxation of the tension in the studs. During the first pass, each stud is partially unloaded by stretching the stud material with a hydraulic jack until the nut is free to rotate. The nut is then partially unscrewed and the hydraulic stretching force is removed, allowing the nut to reseal on the head flange, leaving the stud in a partially unloaded condition. This process is repeated in an ordered sequence until each of the 60 studs have been partially unloaded or "first pass detensioned". In order to finally remove a stud, additional detensioning is accomplished in a manner similar to that described above.

After first pass detensioning, up to five studs may be totally unloaded and removed. Two of these studs will be replaced by alignment studs, which will be used to facilitate later activities. The removal of up to five reactor vessel studs deviates from the normal stud detensioning procedure in that the removal is prior to the total unloading of all sixty studs (second pass detensioning).

The purpose of first pass detensioning and removal of up to five studs at this time is primarily to check for stuck nuts and to examine the condition of the removed studs. Checking for difficulties with nut rotation and stud removal is desirable because it will yield early information regarding the amount of work required to fully detension the closure studs. Further, prudence dictates the advisability of investigating areas of potential downstream problems as early as practicable, and since detensioning of the closure studs is an essential step in the eventual removal of the reactor vessel head, accomplishment of this activity at this time is particularly beneficial. Adherence to an approved procedure will insure that the removal of up to five studs will not cause overloading of adjacent studs or abnormal deflection of the Reactor Vessel Closure Head.

This activity has been evaluated for potential safety concerns, and it has been determined that the major issue is the decrease in the pressure retaining capability of the closure head seals.

Analysis has shown that the reactor vessel head seal will be capable of maintaining up to 1000 psig after first pass detensioning of all of the studs and the removal of up to five studs. Therefore, should the RCS require repressurization during any phase of this stud detensioning or stud removal activity, even to the pressure limit of 600 psig established in Technical Specification 3.4.9.1, the reactor vessel head seal pressure boundary will be capable of maintaining the pressure.

The issues of criticality safety and potential releases of radioactivity have also been evaluated, and it has been determined that activities associated with first pass detensioning and removal of up to five studs are adequately disconnected from credible scenarios which could lead to valid concern regarding these issues. For example, detensioning may cause a very slight movement of the plenum assembly but this movement will be less than 0.007 inches. It is not considered credible that a plenum movement of this magnitude would cause a gross rearrangement of the existing core configuration. Likewise, no credible mechanism has been identified which could lead to releases of radioactivity as a consequence of these activities.

As stated above, stud detensioning is a normal evolution for operating power plants. Although first pass detensioning and removal of up to five studs will reduce the pressure retention capacity of the reactor vessel, this reduction will not go below those levels required by the Technical Specifications. As such the margin of safety provided by the bases to the Technical Specification is not reduced nor does the detensioning create the possibility of a accident of a type not previously evaluated or increase the possibility of an accident previously evaluated. Therefore the proposed operation does not constitute an unreviewed safety question and maybe accomplished without undue risk to the health and safety of the public.