

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )

METROPOLITAN EDISON COMPANY, ET AL. )

(Three Mile Island Nuclear Station, )  
Unit No. 1)

Docket No. 50-289  
(Steam Generator Repair)

STATEMENT OF MATERIAL FACTS AS TO WHICH  
THERE IS NO GENUINE ISSUE TO BE HEARD  
(TMIA CONTENTION 1.c.)

1. TMIA Contention 1.c. reads as follows:

Neither Licensee nor the NRC Staff have demonstrated that the kinetic expansion steam generator tube repair technique, combined with selective tube plugging, provides reasonable assurance that the operation of TMI-1 with the as-repaired steam generator can be conducted without endangering the health and safety of the public, for the following reasons:

c. The kinetic expansion repair weakened the tubes. As a result the plugs will not be able to hold and give a good seal, and thus the plant's ability to respond to transients and accidents will be adversely affected.

2. Whenever a steam generator tube becomes degraded it is either repaired or it is removed from service. When a tube is removed from service, it is no longer part of the reactor coolant pressure boundary. A tube is removed from service by sealing the tubesheet. The tubesheet is sealed by the installation of a metal tapered plug in the primary side of the tubesheet at each end and where the affected tube had penetrated. With this method of repair, the tubesheet plugs then become a new primary pressure boundary and the strength or weakness of the

original tube is irrelevant from a technical standpoint. In fact, in many cases portions of degraded tubes are physically removed from the steam generator for examination, as was the case for 29 tubes at TMI-1. (McCracken and Frank Affidavit, ¶ 3).

3. The American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," Article IWB-4400, "Heater Exchanger Tube or Tubesheet Bore Hole Plugging," is used in addition to other standards to qualify the plugging procedures. Code qualification includes liquid penetrant examination for cracks, metallurgical examination for bonding and non-destructive and mechanical testing of qualification samples. Plug retention capability rests on using proper procedures to establish a new seal within the tubesheet and not on whether a tube was expanded, suffered corrosion damage or was removed. (McCracken and Frank Affidavit, ¶ 4).

4. Once plugs are installed, the steam generator secondary side is pressurized and the primary side is left open to determine if plugs are leaking (See Topical Report 008, Rev. 3, Appendix A). Plugs that are leaking excessively are identified and repaired, using the procedures identified in the preceding paragraph. This leak test is part of the repair process and the plugging repair is not completed until the leak test is completed. (McCracken and Frank Affidavit, ¶ 5).

5. At TMI-1, 23 leaking plugs were detected during the initial leak test, out of a total of approximately 2,500 which exist in the two OTSG's. This percentage of leaking plugs is not unusual for typical plugging operations which do not include kinetic expansion. These 23

plugs were repaired as necessary to ensure that technical specifications for primary to secondary leakage were maintained. Acceptability of tube plugging was verified by the low primary to secondary leakage detected during the steam generator hot functional test (See NUREG-1019, Supplement No. 1, page 22).

6. TMIA's concern that the kinetic expansion repair weakened the tubes is irrelevant from a technical standpoint because the plugs seal within the tubesheet and the remaining tube strength is not a factor because the tube is no longer part of the primary pressure boundary. In fact, the tube can even be missing, as is the case when tubes are removed for metallurgical examination. (McCracken and Frank Affidavit, ¶ 7a).

7. Primary to secondary leakage during the steam generator hot functional test was determined to be approximately 1.0 gph which is one/sixtieth of technical specification limits (See NUREG-1019, Supplement No. 1, page 22). In the event leakage increases by more than 0.1 gpm during operation, a plant shutdown for leak testing and repair is required. (McCracken and Frank Affidavit, ¶ 7b).

8. Design basis transients and accidents analyzed in the FSAR are characterized by large changes in reactor mass and energy flows. Maximum allowable steam generator tube leakage during operation is smaller by a factor of  $10^6$ . Even though small changes would occur in steam generator tube leakage as a result of changes in primary to secondary pressure differential during transients, the tube leakage would still be a very small fraction of the reactor mass and energy flow and would not change the course of the transient or accident. The ability of the plant to respond to transients or accidents would not be significantly affected by leaking plugs. (Jensen Affidavit, ¶ 3).