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MEMORANDUM FOR: Thomas E. Murley, Regional Administrator
Region I

FROM:  Ben B. Hayes, Director
Office of Investigations

SUBJECT: INVESTIGATION REPORT 1-83-028/THREE MILE ISLAND
NUCLEAR GENERATING STATION (NGS) UNIT 1 -
POSSIBLE FALSIFICATION OF REACTOR COOLANT SYSTEM
INVENTORY LEAK RATE TESTS

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Enclosed with this memorandum are two Reports of Investigation from the Office of Investigations (OI) Field Office Region 1 concerning the captioned matter. The first report was submitted as pending; the second report (supplemental) concludes all investigative leads.

This investigation was initiated for the purpose of uncovering and identifying evidence indicative of a systematic pattern of falsification of reactor coolant system (RCS) leak rate surveillance tests at Three Mile Island NGS (TMI) Unit 1 by the addition of hydrogen or water to the RCS make-up tank (MUT) without these additions being accounted for in the leak rate calculations. Additionally, the investigation focused on the level of licensee management involved in and/or condoning such activities. The investigation centered on the time period of April 1, 1978 through March 19, 1979.

The basis for this investigation is an NRC Region I Special Inspection (Report No. 50-289/83-20) and its subsequent revision which identified eleven instances in which hydrogen had been added to the RCS MUT and thirteen instances in which water had been added to the RCS MUT during the performance of RCS leak rate surveillance tests without these additions being properly accounted for in the test calculations. Additionally, thirteen feed and bleed operations were identified as occurring during leak rate tests which constitutes a procedural violation. These thirty-seven instances amount to 5.7% of the 645 surveillance tests that were examined. Of this number, none of the hydrogen additions had a significant effect on the leak rate test results such that the technical specification limits would have been exceeded if the hydrogen additions had not been made. Three of the water additions and one feed and bleed operation masked RCS leakage that would have exceeded the technical specification limit for unidentified leakage. This results in .62% of the actual test results exceeding technical specification limits.

Given the relatively small percentage of questionable test results identified, the investigation focused on attempting to determine whether or not there was a consistent pattern to the identified questionable test results and whether a motive existed for the operators and their supervision to attempt to manipulate leak rate test results by making hydrogen or water additions. No pattern was

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identified with regards to the dates and times of the tests; however, seven of the eleven hydrogen additions occurred on the "A" shift and the remaining four instances occurred on the "D" shift. With regards to the water additions, there was no consistent identifiable pattern with the additions equally spread out among all the shifts.

Technical analysis has demonstrated that TMI-1 was an inherently "tight" plant in terms of RCS leakage and that there was minimal difficulty experienced in obtaining acceptable leak rate test results. Additionally, the surveillance tests were performed in a conservative fashion in that while the surveillance tests were required by technical specifications to be performed every twenty-four hours, the operators routinely performed the tests every shift. As such, we have not been able to identify any motive which would cause the operators to feel they had a reason to attempt to alter leak rate test results by making unaccounted for hydrogen or water additions.

During the investigation, every licensed operator employed at TMI-1 during the time period covered by this investigation was interviewed under oath. All of the operators interviewed adamantly denied that they had ever attempted to manipulate the leak rate test results. The operators interviewed denied that they had ever been directed to manipulate test results in any fashion and denied that there was any management pressure exerted on them that would have forced them to attempt to alter leak rate surveillance test results. The Shift Foremen, the current Shift Supervisors and the Supervisor of Operations denied any knowledge or participation in the falsification of leak rate surveillance tests at TMI-1. The supervisory and management personnel interviewed during the investigation echoed the operators' testimony that there was no reason to attempt to manipulate leak rate surveillance test results.

Based on the testimony received and the documents and analysis reviewed, we have concluded that there was no systematic pattern of falsification of leak rate surveillance tests at TMI-1 during the time period in question nor can we prove that any individual operator knowingly and willfully attempted to manipulate leak rate surveillance test results. At the same time, we cannot exclude the possibility that individual operators may have attempted to manipulate test results for unknown reasons. The explanations given by the operators and licensee management, as to why the hydrogen and particularly the water additions are present during the test periods, are plausible given the numerically small number of tests actually involved and the magnitude of the responsibilities assigned to the shift operators.

What is clear from the investigation is that the performance of reactor coolant system leak rate surveillance testing at TMI-1 was considered so mundane and repetitive that the actual performance of the tests was approached in a very perfunctory manner. Because the surveillance tests were done by computer, the operators had only to enter the program code to initiate the test and had no need to rely on the detailed procedure to complete the surveillance test. This resulted in an apparent lack of familiarity on the part of the operators and their supervisors with the intricate details and requirements of the procedure itself.

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Interviews of the operators and their supervisors indicated that it was a common practice to discard test results that were deemed invalid. The testimony provided by the operators and supervisory personnel does not give any indication that the intent in discarding an invalid test result was to conceal information from regulatory officials but rather was an apparent lack of understanding among the operators and their supervisors as to what their record keeping requirements were.

What was also identified during this investigation is that a significant amount of information was available to Plant Management (specifically, the Faegre and Benson Investigation Report at TMI-2 and various Unit I plant maintenance memorandums) regarding the hydrogen effect caused by the "loop seal" in the RCS MUT and its apparent cause and effect on the leak rate surveillance test. Despite this information, no affirmative actions were initiated at TMI-1 to determine if the potential for the same problem existed until the NRC Region I Special Inspection in September 1983.

Subsequent to the completion of the Department of Justice's (DOJ) criminal proceedings regarding the alleged falsification of TMI-2 RCS leak rate surveillance tests, additional interviews were conducted with witnesses to that proceeding who were previously unavailable to OI investigators at DOJ's request. These interviews are documented in the supplemental report. The interviewees included the pre-accident dual licensed shift supervisors, the pre-accident TMI-2 Supervisor of Operations, and TMI-1 Plant superintendents. None of these witnesses provided any information that would contradict testimony given by other attestants in this investigation. In sworn testimony these interviewees denied that they were either cognizant or involved in the falsification of TMI-I RCS leak rate surveillance tests.

During the questioning of these witnesses, particular emphasis was directed to determine if the current TMI Operations Supervisor was either aware of or involved in the falsification of TMI-2 leak rate surveillance tests. None of these interviewees implicated this individual in any improprieties either at TMI-1 or 2. Additionally, they supported testimony given by this attestant to OI that he had only minimal involvement in TMI-2 operations.

You should also take note that the first report and its exhibits provide extensive historical information regarding the past and present operating staff and management structure at TMI-1 which you should find useful during your restart deliberations.

Enclosures:
as stated

cc: Chairman Palladino
Commissioner Roberts
Commissioner Gilinsky
Commissioner Asselstine
Commissioner Bernthal
W.J.Dircks, EDO (3 copies)
R.K.Christopher, OI:RI