GPU Nuclear

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:
(717) 948-8005

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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Dear Sir:

Subject: Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Inservice Testing (IST) of Pumps and Valves - Operability

On December 3, 1990, GPU Nuclear responded to NRC Generic Letter (GL) 89-04 concerning the Inservice Testing (IST) and operability of pumps and valves at TMI-1. GPU Nuclear intends to fulfill our obligations relative to the license, Technical Specifications (Tech Specs) and other NRC requirements. However, our response took exception to Position 8 of GL 89-04[1] which calls for declaring a component inoperable, without proper evaluation, when the test data for a component test falls within the ASME Section XI "required action range." GPU Nuclear has concluded that to do so could ultimately result in entering a 72-hour Tech Spec allowable outage time (AOT) and lead to an unnecessary plant shutdown.

Discussions with the NRC during a April 28-29, 1992 workshop on Generic Letter 91-18 in King of Prussia, PA, as well as operating experience subsequent to our December 3, 1990 letter, have reinforced our desire to continue our ongoing discussion of operability considerations regarding the pump and valve IST program. The purpose of this letter is to clarify our position regarding operability determinations resulting from IST, to demonstrate that our approach is consistent with the general view espoused by NRC management, and to attempt to achieve consensus with the NRC staff regarding this approach. It is noteworthy that the history of component test operability determinations as a result of IST are a rare occurrence at TMI-1. Typically we have experienced this condition one or two times each year and, in almost every instance, the final evaluation proved the component to be operable.

[1]This exception applies also to Section 6.11, "Technical Specification Operability vs. ASME Code Section XI Operative Criteria," of the NRC Inspection Manual Part 9900, which was transmitted to licensees as an enclosure to NRC Generic Letter 91-18.

A047

GPU Nuclear believes there are greater risks associated with unnecessarily shutting down the plant during an operating cycle than those associated with operating while a component's continued operability is being evaluated. We endorse the general guidance promulgated by Dr. T. Murley in his memorandum of July 19, 1989. In his memorandum Dr. Murley stated that after careful consideration, NRR had concluded that guidance was not necessary concerning the length of time a licensee should be allowed to decide the question of operability when an equipment deficiency is discovered. He stated "There is no generally appropriate timeframe in which operability determinations should be made." Further, Dr. Murley went on to note that equipment which is in fact inoperable should be immediately declared as such and the appropriate Tech Spec timeclock entered. However, when a question is raised regarding the operability of a component, operability determinations should be made using the best information available (e.g., analyses, a test or partial test, experience with operating events, engineering judgement, or a combination of these factors). We have and will continue to adhere to these guidelines. Actions taken at TMI-1 over the years support our position that compliance with this philosophy is prudent.

The central issue related to an operability determination is the component's ability to perform its intended function. A determination of operability based solely on generic limits, narrowly defined by ASME Section XI tables or formulae, may force a judgement to declare a component inoperable when, in fact, the component will perform its intended function acceptably and predictably. Attachment 1 provides examples where TMI-1 components have been determined to be in the "required action range" and remained fully functional. Consequently, GPU Nuclear considers it imprudent to start the Tech Spec timeclock when a component has not been evaluated and may be fully able to perform its intended function.

GPU Nuclear intends to assure compliance with NRC requirements, including the TMI-1 Tech Specs. However, GPU Nuclear believes it is appropriate to adequately evaluate test data before making a determination of inoperability which could potentially force a shutdown of the plant based on acceptance criteria which may prove to be excessively conservative. We remain committed to the premise that obviously inoperable components (i.e., broken shaft, pump/valve will not move, etc.), will be declared inoperable immediately per Administrative Procedure (AP) 1041, and the appropriate action will be taken as directed by Tech Specs. In regard to pump tests, AP 1041 states: "If confirmed test data falls within the 'Required Action Range' and the pump is clearly inoperable in the judgement of the Shift Foreman, the pump shall be declared inoperable and the applicable Tech Spec requirements observed." In regard to valve tests, AP 1041 states: "If confirmed test data exceeds the maximum allowable stroke time for a MOV (or if a check valve fails to move to its safety position) and the valve is clearly inoperable in the judgement of the SF/SS, the Tech Spec time clock shall be started per the applicable Tech Spec."

Therefore, based on the above rationale, GPU Nuclear has concluded that it is not appropriate to declare a component inoperable based solely on IST results which fall within the "Required Action Range" as proposed in Position 8 of GL 89-04. When a component's IST results fall within that range, the preliminary determination will be made that a component is operable unless its inoperability is apparent. Operability determinations are based upon everything we know about that component. GPU Nuclear will apply the resources

necessary to complete a timely evaluation to support the initial determination of operability when the results from IST fall in the "required action range." We agree with the statement made by the NRC during the GL 91-18 workshop that the time for evaluation will depend on safety significance. When a judgement based upon evaluation determines that a component is in fact inoperable, adherence to the Tech Spec AOT, retroactive to discovery of the discrepant data, will be effected.

Sincerely,

T. G. Broughton
Vice President and Director, TMI-1

MRK

Attachment

cc: Region I Administrator
TMI-1 Senior Project Manager
TMI Senior Resident Inspector

ATTACHMENT

MS-V13B

MS-V13B is an air operated valve which supplies steam to the turbine driven Emergency Feedwater (EFW) Pump, EF-P1, one of three safety related EFW pumps. Since 1988, the stroke time for MS-V13B had been 19 to 20 seconds with a maximum allowable stroke time of 23 seconds. On 12/29/91 at ~0200 hours, its stroke time was 24.7 seconds which would have rendered MS-V13B immediately inoperable under strict GL 89-04 guidance. Tech Spec 3.4.1.1 requires the operability of all three EFW pumps. If one pump is inoperable, it must be restored in 72 hours or the plant is required to be in cold shutdown within the next 12 hours.

In an initial telephone call on 12/29/91 at ~0800 hours, MS-V13B was evaluated to be operable based upon the satisfactory EF-P1 startup time data. Extensive analysis by the GPU Nuclear's technical support organization was completed on 2/11/92 which showed that the maximum stroke time of MS-V13B could be increased to a conservative value of 27 seconds. It is noteworthy that the solenoid valve for MS-V13B was replaced on 1/25/92 leaving the "as left" stroke time for MS-V13B of 17.5 seconds.

MU-V51

MU-V51 is a 1", 150 lb Grinnell air operated diaphragm valve which fails closed. The valve opens with air pressure on one side of a diaphragm and closes by spring force when a solenoid valve bleeds the air off. On 7/10/91 the measured stroke time of MU-V51 was 3.8 seconds. This exceeded its 2 second maximum allowable stroke time. Restroking MU-V51 gave acceptable stroke times of 1.6 and 1.5 seconds. The valve's stroke time was ~1 second in 1988, ~1.2 sec in 1989, and ~1.8 sec in 1990 and 1991.

The safety function of MU-V51 is to open and supply concentrated boric acid from the Boric Acid Mix Tank (BAMT) or Reclaimed Boric Acid Tanks (RBATs) to the Makeup Tank (MUT) if the Borated Water Storage Tank (BWST) is lost. The MUT is pumped to the Reactor Coolant System (RCS) by the High Pressure Injection (HPI) Pumps. As provided in the Basis of Tech Spec 3.2.2, the RCS can be borated to one percent (1% $\Delta k/k$) subcritical at the worst time in core life with a stuck control rod assembly in less than 13 hours using one of the 10 gpm BAMT Pumps. In addition to the MU-V51 line, there is an alternative flow path through WDL-V61 from the BAMT or RBATs to the MUT. Operator action is required to start the pump to begin addition of concentrated boric acid to the MUT. The above shows that it takes significant time to add a sufficient amount of boric acid such that a stroke time of 3.8 second for MU-V51 has no significant impact on pumping time.

On 11/1/91 maintenance was performed on MU-V51 when tests demonstrated an increasing stroke time. The solenoid valve operator was found rusty with interior scale deposits. MU-V51 stroke time following maintenance was ~1.0 second.

SF-P1A/B

TMI-1 FSAR, Table 9.4-1 states that the capacity of SF-P1A/B is 1,000 gpm at 100 ft. A flow rate of 1,000 gpm per pump ensures that under the highest heat load (574 spent fuel assemblies in storage accumulated from 11 successive yearly refuelings and the addition of the entire core, 177 assemblies during the twelfth refueling, completed in 150 hours) the pool temperature will not exceed 147°F. Therefore, 1,000 gpm from SF-P1A/B delivered to the pool(s) satisfies the safety function of SF-P1A/B. SF-P1A/B is operable if ≥1,000 gpm can be delivered to the pool(s) and vibration is satisfactory.

In 1985 SF-P1A/B were in the ΔP required action range. At 1000 gpm SF-P1A had 85.6 ft of head and SF-P1B had 83.3 ft of head. For SF-P1A this was 14.4% less than the design point (100 ft and 1000 gpm) and for SF-P1B this was 16.7% below the design point. Pump vibration was extremely low (0.21H for SF-P1A and 0.15H for SF-P1B). ASME Section XI, Table IWP 3100-2 states that the required action range is <.9 times the reference value. For SF-P1A: 85.6 ft X (<.9) = <77 ft. For SF-P1B: 83.3 ft X (<.9) = <75 ft. For SF-P1A and SF-P1B trains the head loss (both piping frictional loss and elevation head) has been estimated to be <50 ft by standard head loss calculations in accordance with the Crane Handbook and other text book references. This indicates that the head of SF-P1A/B could drop to 50 ft and 1000 gpm still could be delivered to the pool(s). Therefore, <75 ft as a required action range is clearly acceptable and conservative. IST Testing in 1991 shows that SF-P1A has remained at ~85.6 ft at 1000 gpm while SF-P1B has dropped to ~80 ft at 1000 gpm. 80 ft is greater than the <75 ft chosen as the required action range.