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POWER AUTHORITY OF THE STATE OF NEW YORK

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December 12, 1978
JNRC-78-62

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Thomas A. Ippolito
Operating Reactors Branch No. 3
Division of Operating Reactors

Subject: James A. FitzPatrick Nuclear Power Plant
Request for Immediate Waiver of
Technical Specification Regarding
Main Steam Isolation Valve Leak Rate
Docket No. 50-333

Dear Sir:

A temporary waiver of the Technical Specifications for the FitzPatrick Plant is urgently requested in order to allow operation at full load rather than with one main steam line out of service with the plant at reduced power. Your prompt response to this request would be appreciated.

The requested waiver would permit operation of the plant with both main steam isolation valves in the "A" line open, with a local leak rate test leakage through the outboard valve which slightly exceeds the limit specified in Table 3.7-2 of the Technical Specifications. The local leak rate test limit specified in the Technical Specifications is 11.5 SCFH (276 SCFD), whereas the actual hot test result indicated a leakage of 295.22 SCFD.

The following is an outline of how the applicable leak rate test results were obtained during the recently completed second refueling outage, how the results were evaluated, and our reasons for concluding that the FitzPatrick Plant can be operated with the main steam isolation valves in the "A" line open without endangering the health and safety of the public.

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During the early part of this outage, local leak rate tests were performed on the main steam isolation valves. The combined leakage through both isolation valves in the "A" main steam line was 105.36 SCFD with a pressure between the valves at 25 psig. This was well below the local leak rate limit of 276 SCFD specified by the Technical Specifications. Subsequently, during the primary containment integrated leak rate test (ILRT), it was determined that excessive leakage was passing out of the containment through the "A" main steam line. In order to continue with the ILRT, the "A" line main steam piping between the two isolation valves was pressurized to 43 psig. The ILRT was then performed with this pressure seal between the "A" line isolation valves, and with the conservative assumption that there was no leakage through these valves. (A leak rate derived from a subsequent local leak rate test on these valves was added later to complete the ILRT results).

After the ILRT was completed, a second local leak rate test was performed on the "A" main steam isolation valves. The results of this test showed that the combined leakage of the inboard and outboard valves was excessive. Repair work was then conducted on the seating surfaces of the outboard valve. On reassembly after repair, it was noted that the seating surface was in excellent condition, extending around the entire 360° at a width of 3/8". After repair of the outboard valve, it was determined through a combined leak rate test that the inboard leakage was on the order of 90 SCFD at 25 psig while the outboard was still excessive at approximately 600 SCFD. It was noted that by application of a very slight jacking pressure on the outboard valve stem, the leakage went to zero. For this reason, it was thought the valve might have some foreign material on the seat preventing complete closure. The valve was then flushed with water in an attempt to remove any foreign material. This did not solve the problem.

It was then determined that further repair would probably not improve the seating surface and that the valve should be tested hot wherein very probably an expansion of the stem and/or disc would reduce the leak rate. A hot test was performed under the following conditions: "A" inboard was shut with 24.4 lbs. pressure in the reactor. This was as close to 25 lbs. as we could maintain with certainty that 25 psig would not be exceeded. At a pressure of 25 psig between the inboard and outboard isolation valves, the combined leak rate of the two valves was 295.22 SCFD. At a pressure of 24.9 psig between the valves, the combined leak rate was 278.4 SCFD. At a pressure of 24.8 psig, the combined leak rate was 240.4 SCFD. At a pressure of 24.6 psig, the combined leak rate was 226.5 SCFD. The Technical Specifications limit for a valve is 276 SCFD.

Since there was a pressure differential (in the range of 0.6 psi to 0.2 psi) across the inboard isolation valve during each of these tests, we believe that some leakage was passing through this valve. The actual test leak rates through the outboard valve were therefore lower than the rates given above. The Division of Inspection and Enforcement, Headquarters Region I, Nuclear Regulatory Commission does not consider an allowance for leakage through the inboard valve appropriate and does not consider that we have demonstrated that the "A" outboard valve passes the Technical Specifications limitation of 276 SCFD at a differential pressure of 25 psi. It is therefore mandatory that a Technical Specification waiver be obtained if the FitzPatrick Plant is to be operated normally with the "A" main steam isolation valves open. Even at the worst case situation of accepting that all leakage at 25 psi, i.e., 295.22 SCFD, is through the outboard isolation valve, we are well within the primary containment integrated leak rate criteria.

As mentioned above, the leak rate, allowed by the Technical Specifications, through each main steam isolation valve is 276 SCFD. The latest local leak rate test results for the outboard main steam isolation valves is as follows at 25 psi pressure differential across the valve:

Main Steam Line	Test Leak Rate (SCFD)
A	295.22 *
B	1.02
C	178.70
D	4.22
Total For All Valves	479.16

* Hot Test Value

As shown above, the total measured leak rate for all four valves is significantly less than that which would exist if all four valves are leaking at their allowable limit (4 x 276 = 1104 SCFD).

Consideration should also be given to the disposition of leakage through the main steam isolation valves. The main steam line design is as follows: On each of the four main steam lines there are double isolation valves on its containment penetration, one inboard and one outboard. All four steam lines lead to a common steam chest. At the end of each line prior to the inlet of the steam chest, is a turbine stop valve. Prior to entrance into the steam chest and before the stop valves, the four main steam lines are cross connected, and that cross connect leads to the bypass valve steam chest. The main steam lines are approximately 198' in length from the outboard isolation valves to the main turbine stop valves.

Last year, to fulfill a commitment to the NRC, the main steam isolation valve leak collection system was installed at the FitzPatrick Plant. This system is now fully operational, has passed its preoperational test and is scheduled on our surveillance test program utilizing the frequency which we have proposed in the Technical Specification changes submitted to you with our letter of July 25, 1977. This leak collection system is designed specifically for the collection of leakage from the main steam isolation valves after a loss of coolant accident. Stem packing leakage and leakage through the seats is routed to the standby gas treatment system through the main steam isolation valve leak collection system. In the standby gas treatment system, the leakage is filtered through charcoal filters, high efficiency particulate filters, and any vapors remaining are evacuated through the off gas stack. We believe it is appropriate to take this system fully into account for the purpose of granting this Technical Specification waiver request.

With respect to the accuracy of the instrumentation used in the performance of the leak rate tests outlined above, the equipment has been calibrated to standards traceable to the National Bureau of Standards, Standards VMC-610, VMC-503 and VMC-502 as designated by the Volumetrics Corporation in Inglewood, California. The certified accuracy of the volumetric flow rate is given as 1% of full scale. These scales range from 20 standard cubic centimeters per minute to 200 standard cubic centimeters per minute for the midrange and to 20,000 standard cubic centimeters per minute for the high range. Actual calibration data illustrates that, at the pressure and flow rates of interest, the instrumentation used in the test is significantly more accurate than the certified values.

During the outage, we repaired six (6) out of eight (8) main steam isolation valves. Based on this work, it is our estimate that a repair of a single outboard main steam isolation valve will require approximately 3.3 manrem in a radiation field of 100 millirem per hour.

The Authority has available four skilled mechanics who have received training from the valve supplier in the repair of these valves. One of these mechanics is the skilled machinist who performs the lapping and grinding operation on these valves. This machinist has received an integrated dose rate for the year of 5.13 rem and had approximately 2000 millirem to date for this quarter.

Based on the above considerations of leak rate test results, we believe that the FitzPatrick Plant can safely operate with all main steam isolation valves open until the

next refueling outage without endangering the health and safety of the general public. At the next refueling outage, the main steam valves would be repaired if they do not meet the Technical Specifications.

We request your temporary waiver of the 11.5 SCFH (276 SCFD) at 25 psig maximum leak rate requirement for the "A" main steam isolation valve and your acceptance of the measured leak rate (295.22 SCFD), as given above. This represents a waiver of 0.8 SCFH over the Technical Specification limit. Since the waiver would allow operation of the FitzPatrick Plant at full load, rather than reduced load with one main steam line out of service, your prompt response would be appreciated.

Very truly yours,

Paul J. Early
Assistant Chief Engineer-
Projects