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DUKE POWER

September 13, 1991

U.S. Nuclear Regulatory Commission Document Control Desk Washington, D.C. 20555

Subject. McGuire Nuclear Station Unit 2 Docket No. 50-370 Licensee Event Report 370/91-08

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 370/91-08 concerning the inoperability of both trains of the Annulus Ventilation System. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(1), (a)(2)(v) and (a)(2)(vii). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Tony R. M. & Connell / 93-T. L. McConnell

ADJ/cbl

Attachment

xc. Mr. S. D. Ebneter Administrator, Region II U.S. Nuclear Regulatory Commission 101 Marietta St., NW, Suite 2900 Atlanta, GA 30323

> INPO Records Center Suite 1500 1100 Circle 75 Parkway Atlanta, GA 30339

Mr. Tim Reed U.S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Washington, D.C. 20555

Mr. P. K. Van Doorn NRC Resident Inspector McGuire Nuclear Station

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EVALUATION:

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The Annulus Ventilation (VE) system [EIIS:VD] is designed to produce and maintain a negative pressure in the Annulus following a Loss of Coolant Accident (LOCA), to minimize the release of radioactive material to the environment and to provide long term fission product removal. Technical Specification (TS) 3.6.2.8 specifies that two independent VE system trains be operable in Modes 1 (Power Operation), 2 (Startup), 3 (Not Standby), and 4 (Not Shutdown).

The negative pressure is accomplished by the VE Fan [EIIS:FAN] discharging through filters [EIIS:FLT] to the Unit Vent [EIIS:VL], where the release is monitored. This continues until a negative pressure of 4.2 inches water gage (W.G.) is reached. Then, the VE system goes into a recirculation mode until the negative pressure reaches 1.2 inches W.G. At that setpoint, the fan again discharges to the Unit Vent and the cycle continues. TS Surveillance 4.6.1.8d.4 requires that a minimum negative differential pressure of greater than or equal to 1.2 inches W.G. shall be maintained between inside the Annulus and outside the Reactor Building during surveillance testing.

Description of Event

In April, 1988, a Nuclear Station Modification (NSM) Request was generated to address concerns of the NRC involving the physical location of certain station components. This request initiated NSM-MG-22142 which would physically alter certain Control Access Doors [EIIS:DR] (CAD) and modify the existing security Vital Area boundary.

The initial phase of the NSM implementation began on August 5, 1991, at 1303, when the contact points for CAD 322 were opened, thus removing the CAD from service. A Security Officer was posted as a required compensatory measure for the door. It should be noted at this point that the door in question is also a Selected Licensee Commitment (SLC) Fire Door (FD) designated as FD 713A and serves as an entrance into the Unit 2 Lower Annulus area. Door 713A is also a VE pressure boundary.

The NSM work was performed by the Construction Maintenance Department (CMD) and began on August 12,1991, under the guidance of procedure TN/2/A/2142/00/AEI, Implementation Procedure for NSM-MG-~7142 (Annulus and Bypass Leakage Enclosure) and Work Request (WR) 954200. The preliminary work proceeded throughout the day without incident. On August 13, 1991, CMD worker A contacted Radiation Protection (RP) personnel to obtain and review the necessary Radiation Work Permit (RWP) as directed by the procedure. RP personnel questioned if Operations (OPS) personnel were aware of the work that would be performed on the annulus door. When CMD worker A informed RP personnel that OPS had not yet been informed, the RP personnel referred him to the Unit 2 OPS Manager. This was the next procedure step. Subsequently, a pre-job meeting was held to discuss the work. Those in attendance were the

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Unit 2 OPS Manager, the Projects Services Accountable Engineer, and CMD worker A. The topics discussed included the necessity of "plugging " all holes resulting from cable rpmcval and whether the door(s) would remain operable. CMD worker A later stated that his main focus was to ensure that the holes were in fact sealed properly. CMD worker A was the only crew member in attendance and the information from the meeting was not relayed to the other two workers on the CMD crew. With the meeting completed and all partics in agreement concerning the establishment of a firewatch and the maintenance of direct communications with the Control Room (CR) [EIIS:NA], the appropriate Fire Barrier Watch Tags were issued and OPS personnel granted clearance to begin work. The work proceeded without incident to conclusion on this day. The fire watch was terminated, tags removed, and the door closed.

On the morning of August 14, 1991, the work resumed. Fire Barrier Watch Tag 7231 was issued for FD 713A. The door was logged as inoperable in the Technical Specification Action Iten Log (TSAIL) (entry number 17268) at 0845 this date and CMD workers A,B, and C proceeded to the work area. A Security Officer was still posted for compensatory measures at the door. CMD worker A stayed in the area from approximately 0900 until 1615 at which time the tags were removed and returned to the CR. However, CMD worker A neglected to close the door. There was little conversation between CMD worker A and OPS CR personnel other than CMD worker A stating that " all the holes are sealed." The TSAIL entry was cleared at 1630, and compensatory measures for the VE system were discontinued. Since the door was still open, the VE system was inoperable; however, OPS CR personnel were not aware of this fact.

At 2250 on August 14, 1991, the oncoming Security Compensatory Officer noticed that FD 713 A was opened but no Fire Barrier Watch Tags were in evidence. He reported this to the Secondary Alarm Station (SAS) personnel who in turn contacted the OPS Senior Reactor Operator(SRO). OPS personnel were unaware that the door was open. The door was immediately closed at the direction of the OPS SRO. After discussion, OPS Management personnel determined the VE system had been inoperable from 1630 until 2250 on August 14, 1991. With the VE system inoperable, the Unit was unable to meet the Limiting Condition for Operation (LCO) and TS 3.0.3 was entered at 2250. TS 3.0.3 states in part that when an LCO cannot be met, the unit will be placed in a Mode in which the specification does not apply. This action must be initiated within one hour. The required 4 hour notification was made to the Nuclear Regulatory Commission at 0042 on August 15, 1991.

Conclusion

This event has been assigned a cause of Inappropriate Action because of a Lack of Attention to Detail resulting from the failure to close FD 713A upon completion of work.

Although a pre-job meeting was held, the importance of ensuring that the door was closed in addition to sealing the abandoned holes was not clearly perceived by CMD worker A. CMD

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worker A later stated that his main focus was to be sure that all abandoned holes re", lting from the removal of cables were "plugged". CMD worker A did however, successfully close the affected door on the previous two days.

Several factors contributing to the inappropriate action were also identified during the investigation. CMD worker A was the only member of the crew who attended the pre-job meeting. Furthermore, the information from the meeting was not passed along to the other crew members or the CMD crew supervisor. During a post-event interview, CMD worker A did not demonstrate a good understanding of VE system operation or the importance of ensuring that the door was closed. He also stated that he decided to remain in the area for approximately 7 hours without a break on the previous day and again on the day of the event. The temporary procedure made no specific mention of closing the door upon completion of work but references the sealing of abandoned holes on several occasions.

A cause of Management Deficiency resulting from a lack of an adequate policy is also apsigned because no independent verification process exists to ensure that SLC Fire Barriers are restored to operable condition upon the completion of work. CMD worker A was not fully aware of what his signature on the Fire Barrier Watch Tag signified. Since there was no requirement for Independent Verification, he was the only link with OPS personnel when FD 713A was logged as operable. There was little conversation between CMD worker A and the OPS CR person upon return of the tags. CMD worker A stated that he told the OPS CR person that all the holes were sealed and overything was satisfactory.

This event is not reportable to the Nuclear Plant Reliability Data System (NPRDS)

There were no personnel injuries, radiation overexposures, or uncontrolled radioactive releases as a result of this event.

A review of the Operating Experience Program Data Base for the twenty-four months prior to this event revealed two events involving Inappropriate Action resulting from the Lack of Attention to Detail and Management Deficiency. These events were documented on Dicensee Event Report (LER) number 369/89-27 and 369/91-05. These LERs addressed the inoperability of both trains of the VE system. Therefore, this event is considered recurring. The corrective actions resulting from the previous LERs would not have prevented occurrence of this event because the corrective actions were specific to those incidents.

CORRECTIVE ACTIONS:

Immediate:

 The Annulus Door was immediately closed by the Security Force Officer at the direction of the SRO.

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Subsequent:

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- A communication package has been issued by Station Management to reemphasize the importance of attention to detail to all station personnel.
- Training on the importance of attention to detail has been conducted with all OPS personnel in shift meetings.

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Pl/.nned:

OPS Management will i corporate Independent Verification provisions into the Fire Watch Barrier Tag Program.

SAFETY ANALYSIS:

The VE system is an accident mitigation system. It is only required to function following a LOCA and is actuated by a Containment Hi-Hi pressure signal of 3 psig. The purpose of the VE system is to create and maintain a negative pressure zone in the Annulus to minimize the release of radioactive interial to the environment, and to provide long term fission product us door open, the VE system would be able to function, but the removal. With the A negative pressure attained would be less than that required. Assuming LOCA conditions with an Annulus door open, the Design Engineering dose assessment produced values that exceeded the NRC dose guidelines. NRC dose guidelines are calculated based on instantaneous release of fission products following a LOCA. The assumption is extremely conservative. The VE system would not be able to maintain the required negative pressure zone. At this point, radioactivity could leak into the Auxiliary Building [EIIS:NF]. However, the Auxiliary Building Ventilation (VA) system [EIIS:VF] should be able to handle this inleakage. This system consists of two redundant trains and automatically switches to the filtered exhaust mode of operation on a Blackout or LOCA, or if radiation is detected by the exhaust radiation monitor. When the VA system switches to the filtered exhaust mode, the supply units and unfiltered exhaust units are automatically secured. Operation of the filtered exhaust units without the benefit of the supply units allows a negative pressure to be pulled on the Auxiliary Building, thereby, facilitating the removal of radioactivity from the Auxiliary Building.

The VE system was not challe ged nor required to perform the safety function required under accident conditions during performance of any of the activities associated with this event.

For most accident sequences, there is significant time between when OPS CR personnel would be aware that they had a situation which would lead to core damage, and the time that large fission product release would actually occur. The source term used for the offsite dose

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calculations is currently recognized to contain conservatism with respect to both timing and composition of radioactive releases following a design basis accident. For the highest frequency core damage sequences, one to two hours would be available for OPS CR personnel to diagnose the situation and take the appropriate actions required by the emergency procedures. Some very unlikely accident sequences exist, however, that could result in core damage in a 30 minute time period. This still reflects significant margin to the expected 15 minute reaction time provided by the steps included in the emergency procedures. Additionally, EP/162/A/5000/01, Reactor Trip or Safety Injection, step 11, directs the CR personnel to ensure that Containment pressure has remained less than 3 psig. The "Results Not Obtained" column of the procedure, step e., also directs CR personnel to ensure VE Fans are running and Annulus pressure is maintained negative. If CR personnel had found that the Annulus negative pressure was not being maintained, OPS personnel would have been dispatched to ensure that the doors were closed. The doors in question were in no way inoperable other than FD 713A was left open.

The health and safety of the public were not affected by this event.

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