NON-PUBLIC?: N
ACCESSION #: 9207310108
LICENSEE EVENT REPORT (LER)

FACILITY NAME: McGuire Nuclear Station, Unit 1 PAGE: 1 OF 8

DOCKET NUMBER: 05000369

TITLE: A Unit 1 Reactor Trip Occurred Due To Removal Of A Solid State Protection System Fuse Caused By An Inappropriate Action And A Management Deficiency.
EVENT DATE: 06/25/92 LER #: 92-09-0 REPORT DATE: 07/25/92

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Terry L. Pedersen, Manager, TELEPHONE: (704) 875-4487
Safety Review Group

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On June 25, 1992, A Unit 1 Reactor Trip occurred at 1312. Prior to the event, Unit 1 was operating in Mode 1 (Power Operation) at 100 percent power. The Reactor was tripped by a Nuclear Instrumentation Power Range Hi Flux Low setpoint and intermediate Range Hi Flux signal. The trip signal was initiated when Instrument and Electrical personnel inadvertently removed and re-inserted the Solid State Protection System Train A Ground Return Fuse. The removal of the Ground Return Fuse removed the Intermediate and Power Range Hi Flux Reactor Trip inputs and blocks. upon reinsertion of the fuse, a Reactor Trip was initiated because the inputs were reinstated but the blocks were not reinstated. A post trip review was performed and Unit 1 was returned to Mode 2 (Startup) on June 26, 1992 at 0430 and entered Mode 1 on June 26, 1992 at 0930. This event is assigned causes of Inappropriate Action and

Management Deficiency.

END OF ABSTRACT

EVALUATION:

Background

The Reactor Protection System (IPE) EIIS:JC! automatically keeps the Reactor EIIS:RCT! operating within a safe region by preventing it from exceeding safety limits during normal operation and design basis occurrences. This is accomplished by surveillance of various process variables. Whenever a process variable exceeds a predetermined setpoint, the IPE initiates a Reactor Trip to protect against gross fuel damage or a loss of Reactor Coolant System (NC) EIIS:AB! integrity which could result in a release of radioactive fission products into the containment structure.

The Solid State Protection System (SSPS) takes digital inputs from the 7300 Process Control System (PCS) and nuclear instrumentation channels EIIS:CHA! corresponding to conditions of unit parameters. The system combines the signals in the required logic combination and generates a trip signal to the undervoltage coils EIIS:CL! of the Reactor Trip circuit breaker EIIS:52! when the necessary combination of signals occur. The system also provides annunciator EIIS:ANN!, status lights (EIIS:IL!, and computer EIIS:CPU! input signals which indicate the condition of bistable input signals, partial trip and full trip functions, and the status of the various blocking EIIS:BLK!, permissive EIIS:69!, and actuation functions. Bistables actuate at the setpoints at which a signal would be initiated through the IPE.

The P-10 permissive interlock EIIS:IEL! allows blocking of a Reactor Trip from both the Intermediate Range (I/R) Hi Flux and Power Range (P/R) Hi Flux Lo Setpoint signals if the unit is above 10 percent of full power. The I/R and P/R Hi Flux Reactor Trips protect the core during startup in the event of an inadvertent positive reactivity addition. The I/R and P/R Hi Flux Reactor Trips will initiate a Reactor Trip at 25 percent of full power if not blocked when the P-10 permissive interlock is enabled.

Description of Event

On June 25, 1992, at approximately 0730, Instrument And Electrical (IAE) Technicians A and B were assigned the task of performing preventive

maintenance (PM) work request (WR) number 08573E. The scope of WR 08573E was to inspect and clean as necessary the Unit 1 IPE cabinets EIIS:CAB!.

The Technicians then obtained and verified procedure IP/0/A/3190/01, Preventive Maintenance Inspection And Cleaning. Procedure IP/0/A/3190/01 is a generic procedure used to inspect and clean instrumentation and electrical equipment. At approximately 0800, the IAE Technicians arrived in the control Room (CR) EIIS:NA!, requested and obtained clearance to begin work on WR 08573E from an Operations (OPS) Senior Reactor Operator (SRO). The IAE Technicians then began inspection and cleaning of the Unit 1 RPS cabinets. At approximately 1130, the IAE Technicians informed the CR SRO that work was completed on the 7300 Process

Control System (PCS) portion of the IPE and they were going to lunch.

At approximately 1245, the IAE Technicians returned to the CR and obtained permission from the CR SRO to continue the inspection and cleaning of the IPE cabinets. The Technicians identified the proper equipment and began performing procedure IP/0/A/3190/01 on the SSPS Train A portion of the IPE. While performing step 10.1.14 of procedure IP/0/A/3190/01, (to check and replace burned out light bulbs) IAE Technician A noticed three lights were burned out on the SSPS Train A logic cabinet. IAE Technician A began to remove the light lens covers to replace the burned out bulbs. At 1312, IAE Technician A inadvertently removed the cover on the ground return fuse EIIS:FU! in the SSPS Train A logiC cabinet. When the fuse cover was loosened and a general warning light came on, the Technician realized that he had loosened the cover on the fuse and immediately tightened the fuse cover. When the fuse lens cover was loosened, the fuse electrical contact was broken which caused the inputs and block permissives to IPE Train A to be inhibited. When the fuse lens cover was subsequently retightened, the fuse made contact reinstating the inputs to IPE Train A which generated a Unit 1 Reactor Trip. Unit 1 was in Mode 1 (Power Operations) at 100 percent power when the trip occurred.

OPS personnel responded to the trip and implemented procedure EP/1/A/5500/01, Safety Injection or Reactor Trip. All systems responded as expected and Unit 1 was stabilized in Mode 3 (Hot Standby) at 1340. NRC notification was made at 1453 in accordance with procedure RP/0/A/5700/10, NRC Immediate Notification.

Conclusion

This event is assigned a cause of Inappropriate Action due to lack of

attention to detail because IAE Technician A erroneously removed, then replaced, the ground return fuse located in the SSPS Train A logic cabinet, which subsequently generated a Reactor Trip signal.

When IAE Technician A checked for burned out bulbs as required by step 10.1.14 of procedure IP/0/A/3190/01, he noticed that 3 of 4 bulbs in a row were burned out (Bee page 8 of 8). He unscrewed the lens covers for the burned out bulbs, then continued on and unscrewed the ground return fuse cover. During the event investigation, IAE Technician A stated that he was aware, prior to the event, that the lens cover on the extreme right was not for a light bulb. However, at the time, he did not adequately self check to ensure he was on the correct component prior to unscrewing the ground return fuse cover. The 4 bulbs and 1 ground return fuse are in a horizontal row in the SSPS cabinet. The transparent ground return fuse cover looks very similar to the light bulb covers, and the ground return fuse, as installed, physically resembles a burned out light bulb. Both IAE Technicians A and B were familiar with the SSPS logic cabinet and had performed this task, and other tasks, on the SSPS many times before the event. The ground return fuse is labeled with a "5A" designation, which is

a recognized method of identifying a fuse. There was no pressure to complete the job in a hurry. The crew supervisor had discussed the consequences of error with Technicians A and B as part of the prejob briefing that morning.

Once IAE Technician A saw the General Warning light come on (not one of the bulbs that were replaced), he instinctively tried to clear the General Warning by pushing the fuse cover back in. Since Unit 1 was above P-10, the attempt to clear the General Warning resulted in a SSPS Train A Reactor Trip signal being generated. The action taken by IAE Technician A to clear the General Warning was a reflex reaction due to being surprised when the General Warning light came on. It is possible to clear a General Warning without generating a Reactor Trip signal. This thought did not occur to IAE Technician A at the time; therefore, he did not consult with more knowledgeable personnel who would have implemented the correct recovery procedure and avoided the generation of a Reactor Trip signal.

This event is assigned a cause of Management Deficiency because the procedure was scheduled at an inappropriate time when light bulb replacement was not necessary. When IAE Technician A inspected the SSPS Train A logic cabinet, he was not surprised to find burned out bulbs. Both Technician A, B, and their supervisor stated the bulbs burn out very

quickly and some of them are usually replaced every time the quarterly PM is performed. However, the only time the bulbs are used is during monthly PM to check out SSPS per procedure. These bulbs are located behind a normally locked cabinet door EIIS:DR! and are not visible to the CR Operators when the door is closed.

At the time of this event, Unit 1 had been operating at 100 percent power for approximately one week after being returned to service following an outage of approximately 45 days duration.

Had this activity been scheduled during an outage, it could have been performed without risk of tripping the unit. Management personnel were aware that any activity inside the SSPS cabinets while the unit is on line presents a risk of spurious Reactor Trip. The
M activity being
performed at the time of the event involved cleaning the cabinet, inspection for loose, damaged, or missing parts, and replacement of burned out light bulbs. The replacement of burned out indication light bulbs had minimal benefit and was not adequately reviewed to ensure that the benefits obtained outweighed the risk of performing the work at this particular time.

A review of the Operating Experience Data Base for the previous 24 months prior to this event revealed 1 LER and no non-reportable events involving a Reactor Trip which was due to the SSPS generating a trip signal. During the previous event, and SSPS General Warning Reactor Trip occurred on Unit 1 while IAE personnel were performing a bi-monthly periodic test.

This event was attributed to Equipment Failure and was documented in LER 369/90-27. Since a cause

of Inappropriate Action or Management Deficiency was not involved in that event, the event documented in this LER is not considered recurring.

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

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

CORRECTIVE ACTIONS:

Immediate: OPS personnel implemented Reactor Trip recovery procedures.

Subsequent: 1) IAE supervision conducted a meeting with the crew involved in this event and emphasized the importance of self checking.

2) The frequency of the quarterly PM to clean the SSPS cabinet was changed to 18 months and to be performed only during an outage.

3) An investigation was performed by IAE and McGuire Engineering to determine why the Reactor Trip occurred.

4) McGuire Engineering personnel presented a technical explanation to all SSPS qualified IAE technicians of why pulling and replacing the fuse caused the Reactor Trip.

5) McGuire Engineering personnel investigated the type of lamps being used in the SSPS, determined that the existing lamps may have been rated at the wrong voltage, and subsequently specified a different type to be used as replacements to avoid frequent lamp changeouts in the future.

6) Component Engineering personnel performed a review of all RPS PM work requests of this type and determined them to be TS related, therefore, the surveillance frequency could not be changed and they can not be deleted.

7) Unit 1 was returned to operation on June 26, 1992.

Planned: None.

SAFETY ANALYSIS:

The Reactor Trip was caused by an inadvertent high flux signal generated by the Power Range and Intermediate Range detectors through the SSPS Train A. The SSPS sensed an abnormal unit condition and responded to that condition as required by sending a signal to the Main and Bypass Reactor Trip Breakers EIIS:52!. The Breakers in turn, responded by performing their function, by opening.

All plant Safety Systems responded as required. A Lo-Lo Steam Generator EIIS:SG! level was received which initiated the automatic start of the Auxiliary Feedwater System (EIIS:BA!. All four Steam Generator Power Operated Relief Valves EIIS:PCV! opened momentarily and reclosed. The Pressurizer EIIS:PZR! Code Safety Valves EIIs:RV!, Pressurizer Power Operated Relief Valves, and Main Steam Line Code Safety Valves were not required and did not actuate. The Steam Dumps EIIS:JI! to the Condenser EIIS:COND! opened as required to maintain a heat sink for decay heat removal. The Atmospheric Steam Dumps were not required and did not actuate.

All Primary and Secondary system parameters necessary to achieve a Safe Shutdown were at or approaching no-load conditions approximately 30 minutes after the Reactor Trip.

Emergency Core Cooling and emergency power were not required and were not actuated. The event presented no hazard to the integrity of the plant and no problems were identified that would prevent a restart of the unit.

There were no radiological consequences as a result of the event and the health and safety of the public were not affected as a result of this event.

ADDITIONAL INFORMATION:

Sequence of Events

TR - Trip Report
PR - Personnel Recollection
ER - Events Recorder
LB - Log Books
WR - Work Request

DATE TIME EVENT

6/25/92 0800 Instrument And Electrical personnel started cleaning the Reactor Protection System cabinets.

(PR)

1130 Instrument And Electrical personnel finished cleaning the 7300 Process Control System cabinets. (PR)

1245 Instrument And Electrical personnel began cleaning the Solid State Protection System cabinets. (PR)

1312 Instrument And Electrical personnel inadvertently loosen the cover for the ground return fuse in the Solid State Protection System logic cabinet. A General Warning light came on.

The block permissive for the Intermediate Range Detectors High Flux Reactor Trip and the Power Range Detectors High Flux Low Setpoint Reactor Trip was removed. Instrument And Electrical personnel immediately retightened the fuse cover to clear the General Warning light. (PR)
1312:40 Intermediate Range High Flux Reactor Trip Alarm received, Power Range High Flux Low Setpoint Reactor Trip alarm received, Reactor Trip, and Turbine EIIS:TRB! Trip above P-8 (48 percent power) is initiated. (ER)

1312:44 Operations Control Room personnel manually exercise the reactor trip breakers. (ER)

1312:59 All four Steam Generators Power Operated Relief Valves cycled. (TR)

1315:50 Motor Driven Auxiliary Feed Water pumps automatically start on Steam Generator Low water level signals. (TR)

1316:58 Turbine Driven Auxiliary Feedwater pump starts on Steam Generator Low Low water level signal. (TR).

1340 Unit 1 is stabilized in Mode 3 at no-load temperature and pressure. (LB)

1453 NRC notification completed in accordance with procedure RP/0/A/5700/10. (LB)

6/26/92 0430 Unit 1 Reactor is returned to critical and enters Mode 2 (Startup) operation. (LB)

0930 Unit 1 is placed on line and enters Mode 1. (LB)

SSPS TRAIN A

LOGIC CABINET

LOGIC TEST PANEL

Pulled Fuse

Burned Out Light Bulbs

Duke Power Company T. C. McMEEKIN
McGuire Nuclear Generation Department Vice President
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DUKE POWER

July 25,1992

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

Subject: McGuire Nuclear Station Unit 1
Docket No. 50-369
Licensee Event Report 369/92-09

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 369/92-09 concerning a Unit 1 Reactor Trip. This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (iv). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

T. C. McMeekin

TLP/bcb

Attachment

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