

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
 P. O. BOX A
 SANATOGA, PENNSYLVANIA 19464

(215) 327-1200 EXT. 2000

December 18, 1990
 Docket No. 50-352
 License No. NPF-39

M. J. McCORMICK, JR., P.E.
 PLANT MANAGER
 LIMERICK GENERATING STATION

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

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER reports a Unit 1 reactor scram as a result of a Reactor Protection System (RPS) actuation. The scram initiation occurred as a result of high reactor pressure due to a personnel error during an Operational Hydrostatic Test.

| | |
|------------------|---|
| Reference: | Docket No. 50-352 |
| Report Number: | 1-90-026 |
| Revision Number: | 00 |
| Event Date: | November 18, 1990 |
| Report Date: | December 18, 1990 |
| Facility: | Limerick Generating Station P.O. Box A, Sanatoga, PA 19464 |

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv).

Very truly yours,

JKP:rgs

cc: T. T. Martin, Administrator, Region 1, USNRC
 T. J. Kenny, USNRC Senior Resident Inspector, LGS

9012260170 901218
 PDR ADOCK 05000352
 S PDR

TEC
 11

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): Limerick Generating Station, Unit 1
DOCKET NUMBER (2): 0 5 0 0 0 3 5 2 1 OF 0 4

TITLE (4): Reactor high pressure SCRAM during an Operational Hydrostatic test due to a personnel error

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | | |
|----------------|-----|--------|----------------|-------------------|-----------------|-----------------|---------|------|-------------------------------|--|------------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAMES | | DOCKET NUMBER(S) |
| 1 | 1 | 18 9 0 | 9 0 | 0 2 6 | 0 0 | 1 2 | 1 8 9 0 | | | | 0 5 0 0 0 |
| | | | | | | | | | | | 0 5 0 0 0 |

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)

| OPERATING MODE (9) | 20.402(b) | 20.405(a) | 50.73(a)(2)(iv) | 73.71(b) |
|--------------------|--------------------------|--------------------------|-------------------------------------|--|
| 4 | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| POWER LEVEL (10) | 20.405(a)(1)(i) | 50.38(a)(1) | 50.73(a)(2)(v) | 73.71(c) |
| 0, 0, 0 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 20.405(a)(1)(ii) | 50.38(a)(2) | 50.73(a)(2)(vii) | OTHER (Specify in Abstract below and in Text, NRC Form 386A) |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 20.405(a)(1)(iii) | 50.73(a)(2)(i) | 50.73(a)(2)(viii)(A) | |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 20.405(a)(1)(iv) | 50.73(a)(2)(ii) | 50.73(a)(2)(viii)(B) | |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | 20.405(a)(1)(v) | 50.73(a)(2)(iii) | 50.73(a)(2)(ix) | |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

LICENSEE CONTACT FOR THIS LER (12)

NAME: Gil J. Madsen, Regulatory Engineer, Limerick Generating Station
TELEPHONE NUMBER: 2 1 5 3 2 7 - 1 2 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFAC TURER | REPORTABLE TO NPROS | CAUSE | SYSTEM | COMPONENT | MANUFAC TURER | REPORTABLE TO NPROS |
|-------|--------|-----------|---------------|---------------------|-------|--------|-----------|---------------|---------------------|
| | | | | | | | | | |
| | | | | | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

YES NO (15)

EXPECTED SUBMISSION DATE (15): MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single space typewritten lines) (16)

On November 18, 1990, during the performance of the Unit 1 Reactor Pressure Vessel (RPV) Operational Hydrostatic Test, with the plant shutdown, a full reactor scram signal was generated on high RPV pressure at 2347 hours. The reactor scram signal occurred when reactor pressure reached a high pressure of 1033 psig. Immediately after the reactor scram, reactor pressure decreased to 825 psig. The scram was reset at 2349 hours and the RPV pressure was restored to 970 psig prior to continuing with the test. The root cause of this event was a personnel error. The Unit 1 Main Control Room (MCR) licensed operator did not monitor reactor pressure for a sufficient duration to verify proper response following a Reactor Water Cleanup (RWCU) system dump flow adjustment. In addition, Unit 1 Reactor Operator did not observe a 'Reactor High Pressure' annunciator alarm which annunciated concurrently with other alarms during the pressure rise preceding the scram. All of the control rods were fully inserted prior to the event and therefore no rod movement occurred. The operator involved in this incident was counseled on the importance of monitoring plant parameters, after any manipulation of controls, in order to verify proper system/plant response. This event will also be included in licensed operator training to reinforce the importance of verifying proper system/plant response after any manipulation of controls.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| | | | | | | |
|-------------------|-------------------|---------------------------------------|-------------------|-----------------|----------|----|
| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (8) | | | PAGE (3) | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | |
| | | 0 6 0 0 0 3 5 2 9 0 | — 0 2 6 | — 0 0 0 | 2 | OF |

TEXT (if more space is required, use additional NRC Form 366A's) (17)

Unit Conditions Prior to the Event:

Unit 1 operating condition was 4 (Cold Shutdown) at 0% power level.

Unit 1 was in a refueling outage with a test General Plant (GP) procedure GP-10 "Reactor Pressure Vessel (RPV) Operational Hydrostatic Test," in progress during the occurrence of this event. During an Operational Hydrostatic Test, the reactor pressure is increased to approximately 1000 psig (normal operating pressure) in order to perform various tests and inspections prior to normal operation. The reactor pressure is increased by controlling the water flow into the reactor vessel using the Control Rod Drive (CRD) (E11S:AA) system. Once the desired conditions are established, constant CRD flow into the vessel is maintained and, reactor pressure is controlled by adjusting reactor water level by varying the Reactor Water Cleanup (RWCU) (E11S:CE) system dump flow to the main condenser.

There were no structures, systems or components out of service which contributed to this event.

Description of the Event:

On November 18, 1990, during the performance of the Unit 1 RPV Operational Hydrostatic Test, a full reactor scram signal was generated at 2347 hours. The reactor scram signal occurred when reactor vessel pressure reached 1033 psig. The Technical Specification (TS) reactor scram setpoint is set at 1037 psig and the maximum allowable TS high pressure safety limit is 1057 psig. The reactor scram occurred within the safe, conservative direction and was within the tolerance of the monitoring instrumentation.

Prior to the reactor SCRAM signal, the Operational Hydrostatic Test was being performed with reactor vessel pressure at 1000 psig. During performance of the test, the Unit 1 Reactor Operator, a licensed operator, noted a gradual increase in reactor vessel pressure to 1007 psig. In response to this increase, the operator proceeded to adjust the RWCU system dump flow to the main condenser in order to reduce reactor vessel pressure. The adjustment of the RWCU system dump flow to the main condenser was completed by 2345 hours.

Following the RWCU system flow adjustment, however, the reactor vessel pressure continued to increase at an even greater rate. An automatic reactor scram occurred at 2347 hours when the vessel pressure increased to 1033 psig. Immediately following the reactor scram, the RPV pressure decreased since the pressurized vessel water was relieved to the depressurized scram discharge volume through the opened Hydraulic Control Unit (HCU, E11S:HCU) scram outlet valves. The Main Control Room (MCR) operators stabilized RPV at 825 psig by terminating CRD system drive water flow to the reactor and securing RWCU system dump flow. The scram was reset at 2349 hours and the RPV pressure was restored to 970 psig prior to continuing with the test. No control rod movement resulted

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| | | | | | | | |
|--|-------------------|---|----------------|-------------------|-----------------|----------|---|
| FACILITY NAME (1) Limerick Generating Station, Unit 1 | DOCKET NUMBER (2) | | LER NUMBER (3) | | | PAGE (3) | |
| | | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | |
| | 0 | 5 | 0 | 0 | 0 | 3 | 5 |
| | | 9 | 0 | — | 0 | 2 | 6 |
| | | | | | — | 0 | 0 |
| | | | | | | 0 | 3 |
| | | | | | | OF | 0 |
| | | | | | | | 4 |

TEXT (if more space is required, use additional NRC Form 366A) (17)

during this event since all of the control rods were fully inserted due to the shutdown condition of the reactor.

A four hour notification was made to the NRC at 0311 hours on November 19, 1990 in accordance with the requirements of 10 CFR 50.72 (b)(2)(ii) since this event resulted in an automatic actuation of the RPS. This LER is being submitted in accordance with the requirements of 10 CFR 50.73 (a)(2).

Consequences of the Event:

There was no control rod motion since all control rods were already inserted. Reactor vessel temperature and pressure limits were not violated during this event. The maximum RPV pressure at the time of the event was 1033 psig and was well below the Technical Specifications Safety Limit of 1325 psig. In the event that a scram failed to occur during this event, and the Reactor Operators also failed to notice the increasing reactor pressure, the safety relief valves would have opened to relieve reactor pressure, prior to reaching the reactor high pressure safety limit. This event could not have occurred at power since the Operational Hydrostatic Test and the resultant makeup and dump flow configuration, are only performed during refueling operations.

Cause of the Event:

The root cause of this event was a personnel error. The Unit 1 Reactor Operator did not monitor RPV pressure for a sufficient duration to verify proper response following the RWCU system flow adjustment. The Human Performance Review process revealed that, the Unit 1 Reactor Operator was distracted after making the RWCU dump flow adjustment by two other MCR operators who, in the course of normal duties, inquired about the status of certain systems. This distraction contributed to the operator's failure to adequately monitor the RPV pressure response. In addition, the Reactor Operator did not observe a 'Reactor High Pressure' annunciator alarm which annunciated concurrently with other alarms during the pressure rise preceding the scram. This annunciator alarms when reactor pressure reaches 1020 psig. This high pressure alarm condition was confirmed following the event using the Process computer alarm printout. A functional test of the annunciator after completion of the hydrostatic test also verified proper alarm operation.

The cause of the increasing pressure after the RWCU dump flow adjustment may have been the result of misadjustment of RWCU dump flow by the Reactor Operator. Since there was constant CRD flow into the reactor, the increase in reactor pressure may have been attributed to the misadjustment of the RWCU dump flow into the condenser.

Corrective Actions:

The operator involved in this incident was counseled on the importance of monitoring plant parameters, after any manipulation of controls, in order to verify proper system/plant response. This event will also be included in

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| | | | | | | |
|---|---|----------------|-------------------|-----------------|----------|----------|
| FACILITY NAME (1): Limerick Generating Station, Unit 1 | DOCKET NUMBER (2): 0 5 0 0 0 3 5 2 | LER NUMBER (3) | | | PAGE (3) | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | |
| | | 9 0 | 0 2 6 | 0 0 | 0 4 | OF 0 4 |

TEXT IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC Form 388A (1/77)

licensed operator training to reinforce the importance of verifying proper system/plant response after any manipulation of controls. The operator action of monitoring and controlling reactor pressure during the Operational Hydrostatic Test is a simple uncomplicated procedure task. The performance of this task does not require any additional training and therefore the above mentioned counseling and training are considered adequate corrective actions to prevent recurrence. It is to be noted that the Licensed Operator had been successfully adjusting the RWCU flow during the course of his shift. This operator is normally very precise in the performance of his duties and the fact that routine evolutions, even though being performed by experienced operators, still require constant vigilance to avoid error will be emphasized in Operator Training.

Previous Similar Occurrences:

LER 1-84-023 resulted in a reactor scram while an Operational Hydrostatic Test was being performed. This LER resulted from the alarm setpoint for 'reactor high pressure' being set higher than the RPS scram setpoint, and therefore, the operator was not alerted to the condition of the reactor pressure increase before the scram occurred. The cause of LER 1-84-023 is different from the cause of the LER, therefore the corrective actions for 1-84-023 would not have prevented this event.