

April 22, 1996

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE PNO-I-96-024

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by Region I staff in King of Prussia, Pennsylvania on this date.

Facility

Boston Edison Co.
Pilgrim 1
Plymouth, Massachusetts
Dockets: 50-293

Licensee Emergency Classification

Notification of Unusual Event
Alert
Site Area Emergency
General Emergency
X Not Applicable

Subject: HIGH TURBINE VIBRATIONS CAUSE AUTOMATIC REACTOR SCRAM FROM
22% REACTOR POWER

At 10:16 a.m. on 4/19/96, high turbine vibrations occurred at 22% reactor power causing a turbine trip resulting in an automatic reactor scram. This event occurred during a planned shutdown (to last 5 days) to facilitate corrective maintenance on a leaking safety relief valve (RV 203-3B) and a degraded mechanical seal on the "A" recirculation pump. Due to the low power level, there was no challenge to the SRVs and the turbine bypass valves functioned properly. The resident inspector was in the control room when the reactor scram occurred and independently verified conditions as they occurred. Although four anomalies occurred, no adverse safety conditions were noted by the inspector during or after the transient (event details discussed below). BECo reported this event to the NRC (Event Number 30321' pursuant to 10CFR50.72(b)(2)(ii) for reactor protection system and engineered safety feature actuations. BECo established a post scram review team to review the event causes and any equipment performance issues. The outage work and post scram review activities are scheduled to be completed to support start-up on April 23, 1996.

The main turbine tripped due to a valid high vibration signal, which has a trip setpoint at 12 mils. High vibrations were experienced at bearings Nos. 5 and 6. During the last outage (RFO10, April-May 1995), BECo replaced both low pressure turbines with boreless monoblock rotors that inherently use closer tolerances. During start-up from RFO10, high vibrations were experienced when "rubs" occurred during wear-in. "Rubbing" occurs when the turbine blade/wheels come in close contact with the diaphragms in between turbine rotating wheels. During start-up from this mid-cycle outage, BECo plans to have a General Electric turbine specialist monitor the turbine performance and recommend any possible techniques to minimize the impact of "rubbing".

The turbine trip caused a reactor trip. Subsequently, operators experienced difficulty in maintaining the prescribed reactor vessel water level band. In accordance with the reactor scram procedure (EOP-1), operators established a reactor vessel water level band of +20 to +40 inches after the lowest water level reached was +9 inches, well above top of active fuel. As water level increased to approximately +30 inches, the operators secured the running feed pump to prevent water level from going high out of band. However, the reactor vessel water level

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"swelled" high causing a primary containment isolation system (PCIS) Group I isolation (Main Steam Isolation Valve (MSIV) Closure), as designed, which occurred two minutes after the scram. The BECo post scram review team is closely reviewing an unexplained sharp drop in reactor pressure of approximately 150 psig which may have greatly exacerbated the water level "swell". Reactor vessel water level went to the offscale high point (approximately 60 inches) as read on the narrow range instrumentation.

Four minutes after the automatic reactor scram, a turbine lock-out relay coil (located in a control room panel) overheated and burned, which added light smoke into the control room atmosphere. Operators quickly extinguished the smoldering relay coil with a fire extinguisher and established maximum ventilation. No adverse consequence resulted from the charred relay coil. BECo is evaluating the cause of the coil failure.

Approximately 16 minutes after the automatic reactor scram, the operators entered emergency operating procedure (EOP-2), RPV Control With Failure-To-Scram. Up to 48 of 144 control rod bottom lights were not lit; however, a computer print-out indicated all but two rods (06-27 and 38-11) indicated full in (46 of 48 lights were not lite because of an over-travel condition). Actual computer data indicated unreliable information for these two rods. After replacing the rod bottom light bulb indicator for one of these two rods, operators satisfied the exit condition of EOP-2 (reactor to remain shutdown). During these difficulties in verifying no ATWS (anticipated transient without scram) conditions, operators had source range and intermediate range nuclear instrumentation which indicated that the reactor was shutdown. No ATWS actually occurred.

Finally, operators declared the HPCI system inoperable four hours after the scram due to a higher than expected discharge pressure (approx. 1200 psig instead of 200 psig) with the system in the pressure control mode which uses the test return line (condensate storage tank (CST) to CST recirculation). Initially, BECo suspected that a test line restricting orifice (RO-2301-59) was clogged. However, BECo disassembled the orifice and found no debris. The licensee is continuing to evaluate this issue. In summary, the operators followed the EOPs to place the plant in a stable condition following an unexpected, automatic reactor scram from 22% reactor power. No adverse safety consequence existed. The BECo post scram review team is reviewing the above anomalies to identify the root causes and corrective actions, if needed. The resident inspectors observed outage maintenance activities over the weekend. A conference call with NRC staff was conducted on April 22, 1996 at 2:00 p.m. with BECo senior management to further discuss these issues.

Region I Public Affairs is prepared to respond to media inquiries.

The Commonwealth of Massachusetts was notified on April 19, 1996.

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