

Indian Point 3
Nuclear Power Plant
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**New York Power
Authority**

Joseph E. Russell
Resident Manager

April 3, 1990
IP3-90-031
MFP-90-078B

Docket No. 50-286
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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

Dear Sir:

The following is a special report of a Pressurizer Power Operated Relief Valve (PORV) actuation at Indian Point 3, prepared in accordance with Technical Specification 6.9.2.j. The event described is covered by Technical Specification 3.1.A.8.c.

At 1549 hours on March 3, 1990, during a plant cooldown preparatory to a maintenance outage, the low temperature overpressure protection system (OPS) actuated, as designed, to protect the Reactor Coolant System (RCS) from exceeding pressures in excess of the Appendix G limits.

At 1530 hours on March 3, 1990 the following initial conditions existed.

RCS cold leg temperature	175 degrees F
RCS pressure	400 psig
Pressurizer level	100%
RCP in operation	#34
Charging pumps in operation	#31 and #33
OPS status	in service

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34 reactor coolant pump (RCP) was in service to provide chemical mixing and to continue to cooldown the metal masses of the RCS. 31 and 33 charging pumps were in service to replenish RCS volume lost to thermal shrinkage of the RCS mass during cooldown. At 1547 hours control room (CR) operators started activities to shut down one of the operating charging pumps.

A reactor operator (RO) began a slow speed reduction on 33 charging pump while slowly, simultaneously increasing 31 charging pump speed. When 33 charging pump was reduced to minimum, RCS pressure began to decrease rapidly. Concerned with maintaining minimum pressure required for the operating RCP, the RO continued to slowly increase the speed of 31 charging pump. This action had little effect until, at 1549, charging flow suddenly, abruptly increased from approximately 52 gpm to over 100 gpm. As a result, RCS pressure began a rapid increase. The RO began to decrease the speed of 31 charging pump. Again, this action had little initial effect and charging flow remained at greater than 100 gpm for over 30 seconds. The RCS pressure rise could not be terminated before the OPS power-operated relief valve (PORV) actuation setpoint was reached and the PORVs opened three times to terminate the pressure transient as follows:

<u>Time</u>	<u>PORV(s)</u>
15:49:28	PCV-455C
15:49:42	PCV-455C and PCV-456
15:49:58	PCV-456

After the OPS actuations, charging flow began dropping in response to the decreasing 31 charging pump speed demand. In addition, the operators stopped 33 charging pump. This caused RCS pressure to once again decrease rapidly. As before, increasing 31 charging pump had no effect until flow suddenly increased. RCS pressure responded, increasing. The RO immediately reduced 31 charging pump speed but a fourth OPS PORV actuation (both valves) occurred at 1553, before any reaction was affected on charging flow.

At this point, 6 minutes into this event, the operators determined that 31 charging pump speed was responding non-linearly and was the cause of the erratic charging flow. The SS ordered the RO to place 33 charging pump in service and shut down 31 charging pump. After this was done, the CR operators were able to stabilize RCS pressure at 400 psig with one charging pump.

The root causes of this event are as follows:

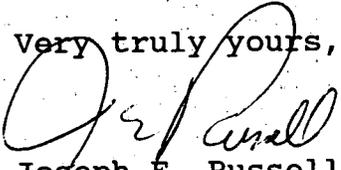
1. The 31 charging pump scoop tube positioner/regulator had failed, causing the erratic speed response of 31 charging pump,
2. During low pressure and temperature operations with reactor coolant pumps running, the operators are required to maintain pressure within a very narrow band to prevent OPS actuation.

The following corrective actions are being implemented to prevent recurrence:

1. The 31 charging pump speed control loop has been recalibrated and the 31 charging pump scoop tube positioner/regulator has been repaired.
2. An evaluation is in progress to determine the feasibility of changing the OPS curve and the minimum pressure requirements for RCP operation in order to widen the RCS pressure operating band at low RCS temperatures.

Should you or your staff have any questions regarding this matter, please contact Mr. M. Peckham of my staff.

Very truly yours,


Joseph E. Russell
Resident Manager
Indian Point Three Nuclear Power Plant

JR/rj

cc: Mr. Thomas T. Martin
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Indian Point 3 Resident Inspector's Officer