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 Region 2 (Post 820201)

SUBJECT: Special rept: on 921127, PORV PCV-3-456 opened due to high pressure in RCS. Initial temps of shell side water in SG found to be approx 145 F. Caused by lack of pressure absorbing bubble in pressurizer. Procedure revised.

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10 CFR 50.36

Stewart D. Ebnetter
Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
101 Marietta St., N.W., Suite 2900
Atlanta, GA 30323

Mr. Stewart D. Ebnetter:

Re: Turkey Point Unit 3
Docket No. 50-250
Special Report - Overpressure Mitigating System

In accordance with Technical Specifications 3.4.9.3 and 6.9.2, the attached Special Report details the cycling of pressure control valve 3-456.

Should there be any questions on this information please contact us.

Very truly yours,

T.F. Plunkett by L.W. Pearce

T. F. Plunkett
Vice President
Turkey Point Nuclear

TFP/JEK/jk

Attachment

cc: USNRC, Document Control Desk, Washington D.C.
Ross C. Butcher, Senior Resident Inspector, USNRC, Turkey Point Plant

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SPECIAL REPORT

PORV PCV-3-456 USED TO MITIGATE AN RCS PRESSURE TRANSIENT

PURPOSE:

Technical Specifications (TS) 3.4.9.3 Action 3, requires the submission of a special report to the NRC in the event that a power operated relief valve is used to mitigate a reactor coolant system pressure transient. The TS requires the report to describe the circumstances initiating the transient, the effect of the PORV on the transient, and any corrective action necessary to prevent recurrence.

BACKGROUND:

Turkey Point has an overpressure mitigating system which is designed to protect the reactor coolant system from pressure transients which could exceed the limits of Appendix G to 10 CFR Part 50 when one or more of the reactor coolant system cold legs is less than or equal to 275 °F.

During the last week of November 1992, Turkey Point Unit 3 was in the process of filling and venting the reactor coolant system. Plant procedures specify 375 psig for filling and venting to allow for operating margin, since the Westinghouse technical manual identifies a minimum loop pressure of 325 psig for filling and venting operations. This pressure is to be maintained so that the starting pressure of the coolant loop does not fall below the 200 psid required across the number one seal of the reactor coolant pump.

The setpoint for the overpressure mitigating system is 415 psig plus or minus 15 psig.

TRANSIENT DESCRIPTION:

On November 27, 1992, at approximately 0255 EST, the 3C reactor coolant pump was started during the fill and vent process. Soon thereafter, the Unit 3 pressurizer power operated relief valve PCV-3-455B opened due to high pressure in the reactor coolant system. At the time of the event, the reactor coolant system was water solid with no bubble in the pressurizer. Reactor coolant system pressure was 375 psig prior to the pump start and the temperature of the reactor coolant system was 127 °F. Operations Procedure 3-OP-41.1, Reactor Coolant Pump, limits a reactor coolant pump start to times when the temperature of the steam generator is no more than 10 °F greater than that of the reactor coolant system. This temperature limitation is required to be maintained to minimize the



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potential for a temperature induced pressure increase during the start of a reactor coolant pump.

Temperature measurements of blowdown from the steam generator were monitored starting at 2330 EST on November 26, 1992, in accordance with 3-OP-41.1. The initial temperatures of the shell side water in the steam generators were found to be approximately 145 °F. Feed and bleed of the steam generator shell side volume was begun and monitored until the blowdown temperature reached 128 °F. Soon after reaching this temperature the 3C reactor coolant pump was started. The control operator conducting the start of the reactor coolant pump also started opening pressure control valve PCV-145 to help control a possible pressure increase due to a temperature differential between the reactor coolant system and the steam generator. PCV-145 is the outlet valve from the reactor coolant system letdown orifices. None the less, after the start of the 3C reactor coolant pump, PCV-3-455B opened relieving pressure in the reactor coolant system.

The following factors are believed to have contributed to the lift of PCV-3-455B:

Starting a reactor coolant pump with a solid reactor coolant system, because no pressure absorbing bubble in the pressurizer was available to mitigate a pressure increase,

A differential temperature between the reactor coolant system and the steam generator, resulted in an increase in pressure as an increase in the temperature in the bulk reactor coolant system occurred,

A slow acting (by design) letdown outlet pressure control valve reduced the ability to quickly control pressure by use of the letdown system,

Based upon the mass of the reactor head and its location outside the bulk residual heat removal cooling flow path, a potential thermal gradient could have existed which contributed to the pressure rise in the reactor coolant system after starting the reactor coolant pump.

Reactor coolant system pressure indications observed in the control room during the event, according to pressure indicator PI-3-402, never exceeded 400 psig. Graphs of pressure versus time, generated from the plant computer system, substantiate this finding.

EFFECTS OF PORV ACTUATION:

The opening of the pressurizer power operated relief valve was successful in reducing the pressure to less than the setpoint for its opening. Continued operation of the letdown system at approximately 130 gpm returned the pressure to the normal operating band.

CORRECTIVE ACTIONS:

In accordance with the recommendation contained in the Westinghouse technical manual designated minimum pressure for a reactor coolant pump start, operating procedure 3/4-OP-41.1 has been revised to include a pressure for fill and vent operations of greater than 325 psig. A caution will be included to maintain the reactor coolant system pressure between 325 and 330 psig to allow margin to the overpressure mitigating system setpoint.



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