

TOLEDO EDISON COMPANY
DAVIS-BESSE NUCLEAR POWER STATION UNIT ONE
SUPPLEMENTAL INFORMATION FOR LER NP-32-79-15

DATE OF EVENT: December 31, 1979

FACILITY: Davis-Besse Unit 1

IDENTIFICATION OF OCCURRENCE: Power range nuclear instruments calibration deficiency

Conditions Prior to Occurrence: The unit was in Mode 5, with Power (MWT) = 0, and Load (Gross MWE) = 0.

Description of Occurrence: During a review of the effects of a changing Reactor Coolant System (RCS) cold leg temperature on the accuracy of the power range nuclear instrumentation (NI), the procedures governing NI calibration were found to be inconsistent with the assumptions of the Final Safety Analysis Report (FSAR).

The specific effect under investigation was the decrease in NI indicated power below actual reactor power with a decrease in RCS cold leg temperature. The decrease in NI indicated power is caused by a reduction in neutron leakage from the reactor vessel as cold leg temperature falls and the density of water in the vessel down-comer increases (along with the concentration of boron atoms per unit volume).

A review of the safety analysis for those accidents involving an overcooling transient with a reactor trip on high flux revealed that for the feedwater temperature reduction from 100% full power, the error induced in NI power was approximately 4% between NI power and heat balance power. This analysis also assumes that indicated NI power is equal to (or greater than) the heat balance power. However, the station procedures allow the heat balance power to be 2% greater than the indicated power. In the event of an excessive heat removal transient from 100% full power, this additional 2% error could cause the reactor to trip at 114% power instead of the 112% assumed in the FSAI.

Designation of Apparent Cause of Occurrence: The procedures covering the calibration requirements were in error. These procedures were written in accordance with instructions provided by Babcock and Wilcox.

Analysis of Occurrence: There was no danger to the health and safety of the public or to station personnel. Preliminary evaluation of a feedwater temperature reduction transient with a 2% error between NI power and heat balance power shows that there are no significant changes in the outcome of the event. No such feedwater temperature reduction transients have occurred.

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Corrective Action: The RCS Daily Heat Balance Check, ST 5030.01, has been modified with concurrence from Babcock and Wilcox to assure that the NI power is maintained equal to or greater than the heat balance power. This will assure that in the event

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of an excessive heat removal transient, that the reactor will be tripped at 112% power or less.

Failure Data: There have been no previous similar reportable occurrences.

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