ENCLOSURE

Metropolitan Edison Company
Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Docket No. 50-289
Operating License DPR-50
Nonroutine 10-Day Report 74-06

Report of Inability to Sufficiently
Decrease the Reactor Power/Imbalance Setpoint

Description of Event

On November 17, 1974, a defective Control Rod Drive Motor stator winding caused a dropped control rod condition which resulted in a maximum quadrant power tilt of 21%. Appropriate precautions were taken with regard to this condition, except that it was discovered that the power/imbalance reactor trip envelope could not be decreased to the appropriate value as defined by Section 3.5.2.4.b.1. and figure 2.3-2 of the TMI-1 Technical Specifications (Note: For this event the trip setting needed to be decreased from a value which would ensure a reactor trip prior to 108% reactor power, to a value which would ensure a reactor trip prior to 66% reactor power; i.e. 108% - 2x(21%) = 66%. The trip setpoint was, however, capable of being reduced only to an indicated trip setpoint of 72% reactor power).

Upon determing that the dropped rod could not be utilized to reduce quadrant power tilt, and after attempts to reduce quadrant power tilt with part length axial power shaping rods proved unsuccessful, the reactor was shutdown.

Apparent Cause of Event

The apparent cause of the event was inadequate design, in that the reactor power trip circuitry does not have a great enough range to permit reduction of the reactor power trip setting to the point which corresponds to the maximum allowable quadrant power tilt of 25% (ref: TMI-1 T.S. Section 3.5.2.4.6.).

Analysis of Event

Neither the health nor safety of the public was threatened as a result of this event, in that

a. once the control rod had dropped, reactor power immediately decreased to less than 60%, which was less than the quadrant tilt limiting level of 66%, and never again exceeded 60% until after the reactor was shut-down and repairs were made on the control rod drive motor,

b. during the period of this event, the maximum heat rate experienced was 6 KW/ft, which is well below the Technical Specification limit of 19.6 KW/ft, and the lowest DNBR (Departure from Nucleate Boiling Ratio) was 8.1, which is well above the Technical Specification Limit of 1.3, and

c. sufficient added precautions, including heat balances taken at 15 minute intervals, were taken to check the accuracy of the indicated power levels.

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Corrective Actions

Following reactor shut-down, the faulty rod drive motor stator was replaced, and an investigation was conducted to determine what design changes could be made to the power/imbalance reactor power trip module to allow the trip setpoint to be set to a value corresponding to the maximum allowable quadrant power tilt of 25%. This investigation is still in progress.

Failure Data

a. Bailey Meter Company System 880 Buffer Amplifier.

b. Although not related to the inadequate design of the above referenced module, identifying data for the control rod drive motor that failed is as follows:

Rod Drive Motor Stator - Diamond / Royal Industries
Number 120J-341-I
Serial EP04