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(TEMPORARY FORM)

CONTROL NO: 2146

FILE: INCIDENT REPORT

FROM: Met. Edison Company Reading, Pa. 19603 R.C. Arnold		DATE OF DOC 2-21-75	DATE REC'D 2-24-75	LTR XXX	TWX	RPT	OTHER
TO: DRL		ORIG 1 signed	CC	OTHER	SENT AEC PDR SENT LOCAL PDR		XX XX
CLASS	UNCLASS XXX	PROP INFO	INPUT	NO CYS REC'D 1	DOCKET NO: 50-289		

DESCRIPTION: Ltr reporting Abnormal Occurrence AO-50-289/75-05 on 2-10-75 re failure to declare group 6 cton rod 6 inoperable when misalignment of group 6 control rod 6 was greater than 9 inches from group 6 average position....

ENCLOSURES:

PLANT NAME: Three Mile Island Unit 1

FOR ACTION INFORMATION DHL 2-25-75

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INTERNAL DISTRIBUTION

REG FILE NRC PDR OGC, ROOM P-506-A GOSSICK /STAFF CASE GIAMBUSSO BOYD MOORE (S) (BWR) DEYOUNG (S) (PWR) SKOVHOLT (S) GOLLER (S) P. COLLINS DENISE REG OPR FILE & REGION T.R. WILSON	TECH REVIEW SCHROEDER MACCARRY KNIGHT PAWLICKI SHAO STELLO HOUSTON NOVAK ROSS IPPOLITO TEDESCO LONG LAINAS BENAROYA STEELE VOLIMER	DENTON GRIMES GAMMILL KASTNER BALLARD SPANGLER ENVIRO MULLER DICKER KNIGHTON YOUNGBLOOD REGAN PROJECT LDR HARLESS	LIC. ASST. DIGGS (S) GEARIN (S) GOULBOURNE (S) KREUTZER (E) LEE (S) MAIGRET (S) REED (E) SERVICE (S) SHEPPARD (S) SLATER (E) SMITH (S) TEETS (S) WILLIAMS (E) WILSON (S) IN AM (S)	A/T IND BRAITMAN SALTZMAN B. HURT PLANS MCDONALD CHAPMAN DUBE w/input E. COUPE R. Hartfield (2) KLECKER P. WILLIAMS
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EXTERNAL DISTRIBUTION

1-LOCAL PDR <u>Harrisburg, Pa.</u>	(1)(2)(10)-NATIONAL LABS	1-PDR SAN/LA/NY
1-TIC (ABERNATHY)	1-W. PENNINGTON, RM E-201 G.T.	1-BROOKHAVEN NAT LAB
1-NSIC (BUCHANAN)	1-CONSULTANTS	1-G. ULRIKSON, ORNL
1-ASLB	NEWMARK/BLUME/ASBABIAN	1-AGMED (RUTH GUSMAN) RM B-127 G.T.
1-NEWTON ANDERSON		1-J. RUNKLES, RM E-201 G.T.
1-ACRS SENT TO LIC. ASST. S. Teets 2-25-75		

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METROPOLITAN EDISON COMPANY

POST OFFICE BOX 542 READING, PENNSYLVANIA 19603

TELEPHONE 215 - 929-3801

February 21, 1975

Director
Directorate of Reactor Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Operating License DPR-50
Docket #50-289

In accordance with Technical Specifications for the Three Mile Island Nuclear Station Unit 1, we are reporting the following abnormal occurrence. Please also be informed that this report is being submitted one day late in accordance with the conversation between your office's Mr. D. Jaffe and our Mr. D. N. Grace.

- (1) Report Number: AO 50-289/75-05
- (2a) Report Date:
- (2b) Occurrence Date: February 20, 1975
- (3) Facility: Three Mile Island Nuclear Generating Station Unit 1
- (4) Identification of Occurrence:

Title: Failure to Declare Group 6 Control Rod 6 Inoperable When Misalignment of Group 6 Control Rod 6 Was Greater Than Nine Inches From Group 6 Average Position

Type: An abnormal occurrence as defined by the Technical Specifications, paragraph 1.8g, in that the failure to declare Group 6 Control Rod 6 inoperable when the misalignment was greater than nine inches with Group 6 average position constituted an observed inadequacy in the implementation of administrative or procedural controls that threatened to cause an unsafe condition in the operation of the plant.

- (5) Conditions Prior to Occurrence:

Power: Core: 100%
Elec.: 869 MW (Gross)

2146

1482 155

RC Flow: 136×10^6 lb/hr

RC Pressure: 2153 psig

RC Temp.: 579°F

PRZR Level: 228 in.

PRZR Temp.: 646°F

(6) Description of Occurrence:

During the period 1/31/75 to 2/9/75 the rod 6-6 absolute position indicator indicated that rod 6-6 was 7 to 10% lower in the core than the group 6 average position. There has, however, been a history of occasional problems with inaccurate absolute rod position indications; and this, in conjunction with the fact that during the period in question the rod 6-6 relative position indicator indicated the rod was within 9 inches of its group average position, resulted in operating personnel concluding that the rod 6-6 absolute position indicator was in error. Having reached this conclusion, the rod 6-6 absolute position S-2 bypass switch was placed to by-pass (thus the automatic alarm, outmotion inhibiting, and runback functions were defeated for this rod).

On 2/9/75, in an attempt to verify that the rod 6-6 absolute position indication was in error, rod 6-6 was withdrawn from its indicated absolute position of 82%, and it was anticipated that the rod top light would be activated prior to the rod's reaching the indicated group average position of 92%. This action, however, resulted in the rod's reaching an indicated absolute position of 92% without actuation of the rod top light. This then led to additional analyses from which it was concluded on 2/10/75 that

- (a) rod 6-6 had been misaligned with its group average position by more than 9 inches during the period 1/31/75 to 2/9/75, and
- (b) the rod 6-6 absolute position indication was correct, and that the 2/9/75 rod withdrawal action had, therefore, corrected the misalignment condition.

(7) Designation of Apparent Cause of Occurrence:

The apparent cause of the occurrence has been determined to be procedure, in that there was insufficient procedural guidance to require operating personnel to thoroughly investigate contradictory rod position indications. Also, it has been determined that

- (a) personnel was a contributing cause, in that licensed operators should be aware of the need to thoroughly investigate contradictory rod position indications, without having to be required to do so by procedure, and

1482 156

February 21, 1975

- (b) material was a contributing cause, in that the installed control rod position indicators should give more reliable indications of control rod positions.

(8) Analysis of Occurrence:

The safety related issue of this occurrence concerns the question of whether or not core physics safety limits were, could have been, or could be exceeded as a result of

- (a) having operated with an out of specification rod alignment condition and/or
- (b) having operated with absolute rod position S-2 by-pass switches in the bypass mode.*

*Note: In addition to the S-2 switch on rod 6-6 being in by-pass, three others were also in by-pass. Also, the potential safety related problem regarding operations with S-2 by-pass switches in by-pass concerns the disabling of the rod outmotion inhibit and runback circuits and resultant potential for unanalyzed flux distributions.

The above issues have been reviewed, and it has been determined that there were no potential threats to the health and safety of the public as a result of this occurrence in that

- (a) the nuclear steam system supply vendor has conducted an analysis on the effects of having operated with the subject out of specification rod alignment condition, the analysis has been reviewed and approved by both the Plant Operations Review Committee (PORC) and the Met-Ed Technical Support Staff, and the analysis shows that
 1. no core safety limit was violated during the course of the occurrence,
 2. there existed substantial margins to the safety limits, during the course of the occurrence, and
 3. there exists no significant alteration of the core physics parameters, as a result of this occurrence, that would cause an unanticipated core physics condition to exist in the future, and
- (b) with regard to the S-2 switches being in the by-pass mode
 1. it is believed that when operating in this condition, additional independent checks, such as an abnormal quadrant power tilt indication, would have alerted operators to take appropriate corrective actions prior to core physics parameters exceeding safety limits, and

1482 157

2. for all operations subsequent to the occurrence, the subject by-pass switches were not, and will not be, placed in by-pass without either the Station or Unit Superintendent's analyzing the potential consequences and giving permission.

(9) Corrective Actions:

Actions were taken as previously described, which resulted in rod 6-6 being returned to its group average position; and upon determining that rod 6-6 was in fact out of its specified alignment limits, analyses were initiated and completed to ensure that there existed neither previous nor future potential threats to the health and safety of the public as a result of this occurrence.

In addition to the actions described above, additional immediate corrective actions consisted of

1. conducting a thorough investigation of all four of the rods whose S-2 switches had been placed in by-pass to ensure that rod positions, as previously derived from operating personnel calculations, represented accurate indications of rod positions,
2. returning those S-2 switches to normal for which the respective absolute rod position indicators gave an accurate indication, and
3. obtaining the necessary approval to leave in by-pass those S-2 switches for which the respective absolute rod position indicators did not give an accurate indication.

A preventative action that has been completed consists of a procedure which was developed and implemented, and includes requirements

- (a) to compare both absolute and relative rod position indications against the respective group averages by hand calculation at least once per shift,
- (b) for prompt immediate action to realign any misaligned rod and to inform plant supervisory personnel before the magnitude of the misalignment exceeds $\pm 5\%$,
- (c) to reduce power to 60% if any rod misalignment exceeds $\pm 6.5\%$ and the rod can not be immediately realigned, and
- (d) to obtain either the station or unit superintendent's review and approval of requests to place S-2 by-pass switches in by-pass before taking such actions.

The PORC reviewed and approved the above described corrective and preventative actions, and in addition recommended to the Station Superintendent that as additional long-term preventative actions

- (a) operating personnel be instructed in the causes and consequences of this occurrence, with special emphasis on the necessity of properly investigating the causes of any abnormal indication of plant parameters, and

February 21, 1975

- (b) programming into the plant computer the presently hand calculated once/shift comparison of both absolute and relative rod position indications against the respective group averages.

The Station Superintendent concurred with PORC's findings, and has taken appropriate steps to ensure implementation of the yet to be completed long-term preventative actions.

In addition to actions described above, the Met-Ed Technical Support Staff is pursuing with the NSSS vendor the possibility of a potential generic problem within the plant's absolute position indication circuitry, in an attempt to obtain more reliable indications of control rod positions.

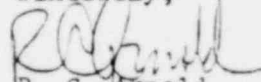
(10) Failure Data:

- a. Previous Failures: There has been a history of occasional problems with inaccurate absolute rod position indications, although no previous failure has been considered to constitute a reportable incident, therefore, no previous reports have been made in this subject area.

It should also be noted that although the rod 6-6 relative position indicator was in error, this error has been determined to not constitute a failure of the relative position indication system, in that

- 1. the system design is such that occasional pole slippage within the rod drive motor mechanism has always been recognized to exist thereby causing occasional errors in relative position indications, and
 - 2. based on this recognized characteristic of the system, the relative position indication system is to be utilized as a back-up, and not as a primary source of control rod position indication.
- b. Equipment Identification: The occasional problems of inaccurate absolute rod position indications have been traced to intermittent failures within
 - 1. PI Tube connections, and
 - 2. the system's Reed Switches

Sincerely,


R. C. Arnold
Vice President

RCA/DNG/cas
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1482 159