NRC Form 366 (9-83)			LIC	CENSEE EV	ENT R	EPORT	(LER)	U.S.	APPROVED EXPIRES	-		
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U.S. NUCLEAR REGULATORY COMMISSION APPROVED OM8 NO 3150-0104

ACILITY NAME (1)	the second se		
	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)
Oconee Nuclear Station, Unit 2		YEAR SEQUENTIAL REVISION	
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## Description of Occurrence:

NAC Form 366A

On April 21, 1985 between 1340 and 1500 hours, boron and control rod positions were set to meet the Technical Specifications (T.S.) requirements for control rod positions and established system conditions. This was done in preparation for power escalation testing, as outlined in the Zero Power Physics Test (ZPPT) procedure. ZPPT was at this time closed out. Operations personnel were told to continue in their procedures for power escalation. Rod index and boration requirements were not addressed as a prerequisite for power escalation.

At 1530 hours, power was increased by withdrawing Group 5 regulating rods. As reactor power was increased, the T.S. Rod Position Index Limit curve was approached, and at approximately 1714 hours it was violated. When the violation occurred, reactor power was  $\frac{1}{26.5\%}$ . Normally at  $\frac{5\%}{25}$  of Thermal Power Best, a computer alarm associated with the Control Rod Withdrawal Index program is operable. However, for reasons still under investigation, this alarm did not actuate.

At 2250 hours, with rod Group 5 at 70% withdrawn and reactor power at 15%, the Rod Withdrawal Limit Statalarm was actuated. Immediately upon receiving the alarm, the rod position was compared with the Error Adjusted Rod Index Limit curve and determined to be beyond the limit allowed by the curve. Appropriate personnel were notified, and boration was started to move the rods within the allowable operating region. At 0055 hours on April 22, 1985 the rods were within the allow-

# Cause of Occurrence:

The cause of the incident is attributable to personnel error, in that there was failure to verify the control rod position and maintain the rods within the Error Adjusted Rod Position Limit curve during power escalation.

Additional factors that contributed to this incident are:

- The ZPPT procedure did not address the rod index or boration requirements for power escalation subsequent to the test.
- 2. Operations procedure did not address verifying the rod position with the allowable limits prior to withdrawing the regulating rods for power escalation.
- 3. The computer program, used to monitor Rod Index and to actuate an alarm before exceeding the limit, did not respond until after the violation had occurred.

A review of past incident reports indicated this is a non-recurring event.

# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104 EXPIRES 8/31/85

ACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)		
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Oconee Nuclear Station, Unit 2	0 15 10 10 0 2 7 0	8 5 - 0 0 3 - 0 1	OL 3 OF OL		

#### Analysis of Occurrence:

AC Form 366A

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The ability to shutdown the core from any operating condition by 1% AK/K is a Technical Specification requirement. This is accomplished by analytical calculation during the reload design. Rod index limits are set such that at least a 1% AK/K shutdown margin is available for a trip from any allowable operation condition. When the rod index limit (shutdown margin curve) was violated the available shutdown margin was 2.78% AK/K with the worst case stuck rod out. This demonstrates that at least a 1% AK/K available shutdown margin was maintained during power escalation. Therefore the reactor could have been safely shutdown and made subcritical by >1% AK/K had a trip occurred at the time. During the reload design analysis the beginning of cycle maximum ejected rod worth was calculated to be  $0.289\% \rho$  with control rod groups (CRGP's) 5-7 fully inserted. Including a 15% calculational uncertainity results in a maximum worth of 0.332% Q. This is clearly less than either the HZP limit (<1.00%p) on the HFP limit (<0.65%p). Since the reactor power was near HZP (6.5%FP) and CRCP 5 partially withdrawn these conditions are conservatively bounded by the previous calculation. The health and safety of the public were not affected.

#### Corrective Action:

The immediate corrective action was to commence boration of the Reactor Coolant System. This action was continued until the rods were within the acceptable operating region. In addition, involved personnel were counseled on the matter.

Planned corrective action is for Operations management to provide training to their personnel to increase awareness of rod position limits during power maneuvers. In addition, shutdown procedures and ZPPT procedures will be revised to include statements to remind personnel of Rod Index and Boration requirements, and remind them to consult the rod position limit curves prior to increasing power. An investigation is being performed to determine the cause for the Computer Rod Index program malfunction and to correct it.

## DUKE POWER COMPANY P.O. BOX 33189 CHARLOTTE, N.C. 28242

HAL B. TUCKER VICE PRESIDENT NUCLEAR PRODUCTION

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September 19, 1985

TELEPHONE (704) 373-4531

Document Control Desk U. S. Nuclear Regulatory Commission Washington, D. C. 20555

Subject: Oconee Nuclear Station, Unit 2 Docket Nos. 50-269, -270, -287 LER 270/85-03

Gentlemen:

Attached is Licensee Event Report 270/85-03, Revision 1 which supersedes LER 270/85-03 dated May 21, 1985. Revision 1 is being submitted in order to provide additional information to the safety analysis.

Very truly yours,

H.B. Tucher 1stel

Hal B. Tucker

SGG:s1b

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator U. S. Nuclear Regulatory Commission Region II 101 Marietta Street, NW, Suite 2900 Atlanta, Georgia 30323

> Ms. Helen Nicolaras Office of Nuclear Reactor Regulation U. S. Nuclear Regulatory Commission Washington, D. C. 20555

M & M Nuclear Consultants 1221 Avenue of the Americas New York, New York 10020

INPO Records Center Suite 1500 1100 Circle 75 Parkway Atlanta, Georgia 30339

Mr. J. C. Bryant NRC Resident Inspector Oconee Nuclear Station

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American Nuclear Insurers c/o Dottie Sherman, ANI Library The Exchange, Suite 245 270 Farmington Avenue Farmington, CT 06032

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NONTH         DAY         YEAR         YEAR         SEQUENTIAL         REVISION NUMBER         MONTH         DAY         YEAR         PACILITY           0         4         2         1         8         5         0         0         3         0         I         0         9         1         9         8         5           0         4         2         1         8         5         0         0         3         0         I         0         9         1         9         8         5           0         4         2         1         8         5         0         0         3         0         I         0         9         1         9         8         5           0         4         2         1         8         5         0         0         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3         6         3	(A) AREA CODE 7 1014	C 0 2 7 0 1 0F 0 VOLVED (8) DOCKET NUMBER(S) 0 5 0 0 0 0 0 5 0 0 0 0 5 0 0 0 11) 73.71(b) 73.71(c) 0 THER (Specify in Abstract Data on a fext, NRC For 366A) TELEPHONE NUMBER E 4 3 7 3 - 2 3 6
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Zero Power Physics Testing (ZPPT), the control rods were p allowed by the Technical Specifications (T.S.) Rod Positi The rod withdrawal limit Statalarm did not actuate as it was being approached, therefore, the violation was not di hours when the alarm did actuate. The apparent cause of failure of Operations personnel to maintain the control r within the T.S. limits. Although the Rod Position Index Limit was beyond that all Specifications, a 1% AK/K available shutdown margin was co throughout the power escalation sequence. Thus the healt public were not endangered. The immediate corrective action was to commence boration of System until the control rods were within the acceptable of Shutdown and ZPPT procedures will be revised to include state.	sitioned n Index I hould whe covered t he incide d group p wed per T ntinually and safe f the Rea peration	beyond that Limit curve. en the limit until 2250 ent was position Technical y maintained ety of the actor Cool int

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NAC Form 366A

#### Description of Occurrence:

On April 21, 1985 between 1340 and 1500 hours, boron and control rod positions were set to meet the Technical Specifications (T.S.) requirements for control rod positions and established system conditions. This was done in preparation for power escalation testing, as outlined in the Zero Power Physics Test (ZPPT) procedure. ZPPT was at this time closed out. Operations personnel were told to continue in their procedures for power escalation. Rod index and boration requirements were not addressed as a prerequisite for power escalation.

At 1530 hours, power was increased by withdrawing Group 5 regulating rods. As reactor power was increased, the T.S. Rod Position Index Limit curve was approached, and at approximately 1714 hours it was violated. When the violation occurred, reactor power was ~6.5%. Normally at >5% of Thermal Power Best, a computer alarm associated with the Control Rod Withdrawal Index program is operable. However, for reasons still under investigation, this alarm did not actuate.

At 2250 hours, with rod Group 5 at 70% withdrawn and reactor power at 15%, the Rod Withdrawal Limit Statalarm was actuated. Immediately upon receiving the alarm, the rod position was compared with the Error Adjusted Rod Index Limit curve and determined to be beyond the limit allowed by the curve. Appropriate personnel were notified, and boration was started to move the rods within the allowable operating region. At 0055 hours on April 22, 1985 the rods were within the allowable operating region.

## Cause of Occurrence:

The cause of the incident is attributable to personnel error, in that there was failure to verify the control rod position and maintain the rods within the Error Adjusted Rod Position Limit curve during power escalation.

Additional factors that contributed to this incident are:

- 1. The ZPPT procedure did not address the rod index or boration requirements for power escalation subsequent to the test.
- 2. Operations procedure did not address verifying the rod position with the allowable limits prior to withdrawing the regulating rods for power escalation.
- 3. The computer program, used to monitor Rod Index and to actuate an alarm before exceeding the limit, did not respond until after the violation had occurred.

A review of past incident reports indicated this is a non-recurring event.

#### LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104 EXP(RES\_8/11/86

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)	
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Oconee Nuclear Station, Unit 2	0 5 0 0 0 2 70	8 5 - 0 0 3 - 0 1	0 3 OF 0	

## Analysis of Occurrence:

RC Form 366A

The ability to shutdown the core from any operating condition by  $1\% \Delta K/K$  is a Technical Specification requirement. This is accomplished by analytical calculation during the reload design. Rod index limits are set such that at least a 1% \K/K shutdown margin is available for a trip from any allowable operation condition. When the rod index limit (shutdown margin curve) was violated the available shutdown margin was 2.78% AK/K with the worst case stuck rod out. This demonstrates that at least a 1% AK/K available shutdown margin was maintained during power escalation. Therefore the reactor could have been safely shutdown and made subcritical by >1% AK/K had a trip occurred at the time. During the reload design analysis the beginning of cycle maximum ejected rod worth was calculated to be 0.289% p with control rod groups (CRGP's) 5-7 fully inserted. Including a 15% calculational uncertainity results in a maximum worth of 0.332% p. This is clearly less than either the HZP limit (<1.00%p) on the HFP limit (<0.65%p). Since the reactor power was near HZP ( 6.5%FP) and CRCP 5 partially withdrawn these conditions are conservatively bounded by the previous calculation. The health and safety of the public were not affected.

#### Corrective Action:

NRC FORM 3664

The immediate corrective action was to commence boration of the Reactor Coolant System. This action was continued until the rods were within the acceptable operating region. In addition, involved personnel were counseled on the matter.

Planned corrective action is for Operations management to provide training to their personnel to increase awareness of rod position limits during power maneuvers. In addition, shutdown procedures and ZPPT procedures will be revised to include statements to remind personnel of Rod Index and Boration requirements, and remind them to consult the rod position limit curves prior to increasing power. An investigation is being performed to determine the cause for the Computer Rod Index program malfunction and to correct it.

### DUKE POWER COMPANY P.O. BOX 33189 CHARLOTTE, N.C. 28242

HAL B. TUCKER VICE PRESIDENT NUCLEAR PRODUCTION

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September 19, 1985

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Document Control Desk U. S. Nuclear Regulatory Commission Washington, D. C. 20555

Subject: Oconee Nuclear Station, Unit 2 Docket Nos. 50-269, -270, -287 LER 270/85-03

Gentlemen:

Attached is Licensee Event Report 270/85-03, Revision 1 which supersedes LER 270/85-03 dated May 21, 1985. Revision 1 is being submitted in order to provide additional information to the safety analysis.

Very truly yours,

H.B. Tucher 1stel

Hal B. Tucker

SGG:s1b

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator U. S. Nuclear Regulatory Commission Region II 101 Marietta Street, NW, Suite 2900 Atlanta, Georgia 30323

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