NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)

Reactor Trip Instrumentation Would Have Been in a Condition Prohibited by Technical Specifications

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	17	97	97	-- 007 --	01	02	06	98	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	3
POWER LEVEL (10)	000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

20.2201(b)	20.2203(a)(2)(v)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)
20.2203(a)(1)	20.2203(a)(3)(i)	50.73(a)(2)(ii)	50.73(a)(2)(x)
20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71
20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	OTHER
20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
John T. St. Martin - Technical Assistant	(716) 771-3641

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On November 17, 1997, the plant was in Mode 3 with a reactor coolant system heatup in progress. One nuclear instrumentation system power range channel was removed from service in preparation for the beginning of Cycle 27 physics testing. The reactor engineer recognized that the neutron flux low range trip circuitry for this channel was not in the tripped condition, as required prior to entry into Mode 2. Since the plant was not in a mode where the power ranges are required to be operable, no immediate corrective action was required.

Subsequent to the November 17 condition, research into the system design and operating history showed that, prior to 1988, the neutron flux high range trip circuitry was not routinely placed in the tripped condition during channel defeats.

The underlying cause was technical inadequacies in procedures and design deficiency, in that Instrument and Control procedures utilized for channel defeat did not address the need for neutron flux low range trip circuitry to be in the tripped condition, and the original plant design required lifting leads to place the neutron flux high range trip circuitry in the tripped condition.

While this condition is not reportable for the November 17, 1997, condition, this condition would have occurred during physics testing performed in the past, and was not recognized at those times. At those times, the plant would have been in a condition prohibited by the Technical Specifications.

Corrective action to prevent recurrence is outlined in Section V.B.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

I. PRE-EVENT PLANT CONDITIONS:

On November 17, 1997, the plant was in Mode 3 with the reactor trip breakers open and a reactor coolant system (RCS) heatup in progress. RCS temperature was being increased from 350 degrees F to greater than 540 degrees F and pressurizer (PRZR) pressure was being increased from less than 1000 PSIG to 2235 PSIG (normal conditions for Mode 2). Instrument and Control (I&C) personnel had defeated one nuclear instrumentation system (NIS) power range (PR) channel (channel N-44) to allow its detectors to be connected to a reactivity computer during reactor startup and Cycle 27 physics testing.

II. DESCRIPTION OF EVENT:

A. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

- June 9, 1996 (and other times): Physics testing during previous plant outages with neutron flux trip circuitry not in the tripped condition. Estimated event dates.
- November 17, 1997, 1152 EST: Discovery date and time.

B. EVENT:

On November 17, 1997, at approximately 1152 EST, after the defeat of NIS PR channel N-44, a Main Control Board walkdown was conducted by the reactor engineer. During this walkdown, he recognized that the NC44P bistable light, for neutron flux low range trip (NFLRT) circuitry, was not illuminated. Thus, it was not in the tripped condition. An investigation was conducted and it was confirmed that the NFLRT circuitry for channel N-44 was not placed in the tripped condition, as required by the Ginna Station Improved Technical Specifications (ITS), Limiting Condition for Operation (LCO) REQUIRED ACTION 3.3.1.D.1 (which is applicable for only Modes 1 and 2). Since the plant was in Mode 3 at the time of discovery, and the NFLRT function is not required to be operable in Mode 3, the plant was in compliance with the ITS.

A test current signal was simulated in the N-44 channel to place the channel's NFLRT circuitry in the tripped condition. This ensured compliance with ITS LCO 3.3.1 for subsequent entry into Mode 2, where this LCO was applicable.

Investigation of this event, and research into the system design and operating history showed:

- The I&C procedure used for the defeat of NIS PR channel N-44 was specified as applicable in all plant modes. The procedure was deficient, since it did not ensure that the NFLRT circuitry was placed in a tripped condition when in the ITS modes of applicability (Mode 2 and when in Mode 1 with thermal power < 6%) as specified in ITS Table 3.3.1-1, Function 2.b.

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- This condition did not apply to the NIS PR neutron flux high range trip (NFHRT) circuitry in 1997, because the NFHRT circuitry had been modified in 1990. This earlier modification, performed under Engineering Work Request (EWR) 4862, installed two-position (OT-2) switches that permitted maintaining the affected NFHRT circuitry in the tripped condition.

- However, as part of the investigation and research for this LER, it was discovered that prior to 1988, there were instances when it is presumed that the NFHRT circuitry had not been placed in a tripped condition by applicable I&C procedures. Thus, from initial plant startup until 1988, the plant would not have been in compliance with the original Ginna Station Technical Specifications at those times when an NIS PR channel would have been required to be defeated with appropriate neutron flux trip circuitry in the tripped condition. As per Technical Specifications in effect at those times, the NIS PR NFHRT is required to be operable for all 4 channels "when RCCA is withdrawn". Note that "RCCA" stands for "rod cluster control assembly". Any time (including physics testing) prior to 1988 when a NIS PR channel was removed from service utilizing I&C procedures (when RCCA was withdrawn), it is now presumed that those actions did not comply with Technical Specifications requirements.

- Note that from 1988 to 1990, temporary procedure changes ensured that the NFHRT circuitry was tripped by lifting two leads. After completion of EWR 4862 (from 1990 to the present), the NFHRT circuitry is now tripped by use of a two-position OT-2 switch.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

None

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None

E. METHOD OF DISCOVERY:

During the research conducted by plant staff, it became apparent that even though the current ITS were complied with during this evolution in 1997, in the past the plant would have been in a condition prohibited by Technical Specifications at specific times.

F. OPERATOR ACTION:

Since the plant was in compliance with ITS at the time of discovery, no operator actions were required.

G. SAFETY SYSTEM RESPONSES:

None

III. CAUSE OF EVENT:

A. IMMEDIATE CAUSE:

The immediate cause of being in a condition prohibited by Technical Specifications would have been failure to place NIS PR neutron flux trip circuitry into a tripped condition at the times required by the Technical Specifications.

For the NIS PR NFLRT circuitry, this could have occurred during past plant startups from refueling outages, when channel N-44 was defeated for physics testing. This could have also occurred if any NIS PR channel had been removed from service utilizing I&C procedures during Mode 2 or during Mode 1 and thermal power < 6%. Events could have occurred from initial plant startup until June 9, 1996 (the date of the Cycle 26 physics testing).

For the NIS PR NFHRT circuitry, this also could have occurred if any NIS PR channel had been removed from service utilizing I&C procedures "when RCCA is withdrawn" from initial plant startup until 1988.

B. INTERMEDIATE CAUSE:

The intermediate cause of not placing NIS PR neutron flux trip circuitry into a tripped condition when required is due to technical inaccuracies in written procedures, in that the I&C procedures utilized to defeat a NIS PR channel did not ensure neutron flux trip circuitry was in a tripped condition, and procedures used to document the inoperability of NIS PR channels did not ensure compliance with ITS requirements.

C. ROOT CAUSE:

Underlying causes for the technical inaccuracies in procedures include:

- Interface Design, in that the uniqueness of the original design for placing neutron flux trip circuitry into a tripped condition was not emphasized.
- Change Management, in that the uniqueness of the original design was recognized during implementation of EWR 4862. The PR NFLRT circuitry may be placed in the tripped condition by use of a "barrel" switch. The unique aspects of this barrel switch were recognized by the design engineer and addressed at that time, but this information was not adequately incorporated into plant knowledge and procedures. Change-related training was not adequate, and procedures were not revised at that time.

- Design Configuration and Analysis, in that the original plant design was deficient. The associated switches were designed for reactor trip logic testing, and not for channel defeat. Prior to 1990, proper defeat required that leads be lifted to ensure the PR NFHRT circuitry was placed in the tripped condition.

- Training, in that there was not sufficient understanding of the need to place affected trip circuitry into a tripped condition when defeating a channel, and insufficient awareness of available methods for tripping and verifying tripping was accomplished.

IV. ANALYSIS OF EVENT:

This event is reportable in accordance with 10 CFR 50.73, Licensee Event Report System, item (a) (2) (i) (B), which requires a report of, "Any operation or condition prohibited by the plant's Technical Specifications". It is postulated that ITS LCO REQUIRED ACTION 3.3.1.D.1 was not performed during the scheduled physics testing of June 9, 1996. Prior to the implementation of the ITS on February 24, 1996, it is postulated that the original Technical Specifications, Section 3.5.1.1, were not properly performed during previous physics testing and at various other times from initial plant startup until 1996.

An assessment was performed considering both the safety consequences and implications of this event with the following results and conclusions:

There were no operational or safety consequences or implications attributed to not placing a NIS PR neutron flux trip circuitry into a tripped condition because:

- As described in the ITS basis, the Power Range Neutron Flux Trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident. Therefore, the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation.

- As described in the ITS basis, the Power Range Neutron Flux - Low Trip Function ensures that protection is provided against a positive reactivity excursion from low power or subcritical conditions.

- With one NIS PR channel improperly defeated, there would still be 3 available channels with a 2 out of 3 logic required to actuate the neutron flux trip function. Therefore, an assumed single failure would not prevent this trip from actuating as designed.

- The intermediate range (IR) channel reactor trip (which is a backup to the PR NFLRT) was unaffected by this condition and would also have been available to mitigate a reactivity transient at low power (1/2 channels).

- For initial startups it is the standard practice that the NIS PR NFHRT setpoint be lowered from its normal setpoint of 108% to 50% power. This reduction in setpoint provides an additional backup to the NFLRT. Note the NFHRT is properly defeated by CPI-AXIAL-N44.

Based on the above, it can be concluded that the public's health and safety was assured at all times.

V. CORRECTIVE ACTION:

A. ACTION TAKEN TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

None required.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

- EWR 4862 was implemented, which resolved the design deficiency for the NIS PR NFHRT circuitry.
- Procedures CPI-AXIAL-N-41/42/43/44 and CPI-BISTABLE-N41/42/43/44 will be reviewed, and revised as necessary, to ensure proper defeat of neutron flux trip circuitry. Note that operations procedures will not be changed, since they accomplish proper defeat, including placing required trip circuitry in the tripped condition.
- The design and operation of the barrel switch, which is available to place a PR NFLRT circuit in a tripped condition, will be the subject of future training for I&C, operations, and other appropriate personnel.
- This issue was not reported to the NRC when initially discovered in 1988. In 1988, administrative processes for identifying and reviewing adverse conditions were deficient. This was recognized, and the ACTION reporting process was implemented. The ACTION process ensures that such issues are properly evaluated for NRC reportability.
- Deficiencies in Change Management that occurred with EWR 4862 have been corrected. Organizational changes have combined groups over the intervening years. These changes have streamlined and enhanced interactions and communications.
- Appropriate indications to verify proper NIS PR channel defeat will be identified. The need to enhance affected procedures will be evaluated.
- A Training Work Request has been initiated, to ensure this event is discussed with all operating shifts. These discussions will sensitize operators to evaluate similar situations and will address operations understanding of the need to place affected trip circuitry in the tripped condition.

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VI. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

None

B. PREVIOUS LERs ON SIMILAR EVENTS:

A similar LER event historical search was conducted with the following results: No documentation of similar LER events with the same root cause at Ginna Station could be identified.

C. SPECIAL COMMENTS:

- For the original Ginna Station Technical Specifications (effective until February 24, 1996), 4 channels of Nuclear Flux Power Range low setting were required to be operable "when RCCA is withdrawn" and could be bypassed when "2 of 4 power range channels greater than 10% F.P.". (Nuclear Flux Power Range high setting was required at all times when RCCA is withdrawn). The action statement was:

  "With the number of operable channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the tripped condition ..."

- For the current ITS, 4 channels of Power Range Neutron Flux low range trip function are required to be operable when in Mode 1 with thermal power < 6% or in Mode 2. The Required Action is to place the inoperable channel in trip within 6 hours or be in Mode 3 within an additional 6 hours.