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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-007-00:on 890619,safety injection pumps inoperability concerns due to flow meter calibration errors.
W/8 ltr.

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July 19, 1989

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

Subject: LER 89-007, Safety Injection Pumps Inoperability Concerns Due To Flow Meter Calibration Errors Could Be Of Generic Concern To Nuclear Industry
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

In accordance with 10 CFR 50.73, Licensee Event Report System, which permits and encourages Licensees to report significant events that may be of generic interest or concern even though they may not meet the criteria contained in 10 CFR 50.73, the attached Licensee event report LER 89-007 is hereby submitted.

This event has in no way affected the public's health and safety.

Very truly yours,

Robert C. Mecredy
General Manager
Nuclear Production

xc: U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Ginna USNRC Senior Resident Inspector

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	1 OF 1 0

TITLE (4) Safety Injection Pumps Inoperability Concerns Due To Flow Meter Calibration Errors Could Be Of Generic Concern To Nuclear Industry

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 NAMES	DOCKET NUMBER(S)
										0 5 0 0 0
0 6	1 9	8 9	8 9	— 0 0 7	— 0 0	0 7	1 9	8 9		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 9 9		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Wesley H. Backus Technical Assistant to the Operations Manager	AREA CODE 3 1 5 5 2 4 - 4 4 4 6

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 fifteen single-space typewritten lines) (16)

On June 19, 1989 at 1440 EDST with the reactor at approximately 99% full power the "B" and "C" Safety Injection (SI) pumps were declared inoperable due to assessed design flow delivery concerns.

Declaring two (2) SI pumps inoperable placed the plant outside the Technical Specifications requiring a plant shutdown. While in the process of plant shutdown the SI pump flows were returned to the required flow rates by pump minimum flow recirculation line valve throttling.

On June 21, 1989 at 1401 a similar problem occurred with the "B" and "C" SI pumps and plant management decided to shut the plant down until the SI pump flow concerns were resolved. The plant was shutdown and subsequently cooled down to less than 350°F.

Original calibration data provided by the plant design was incorrect for the installed application. The underlying cause of the event resulted from incorrect original calibration data, provided by the plant designer for the installed system.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	— 0 0 7	— 0 0	0 2 OF 0 7

TEXT (If more space is required, use additional NRC Form 366A's) (17)

I. PRE-EVENT PLANT CONDITIONS

The unit was at approximately 99% steady state full power with no major activities in progress. Results and Test (R&T) personnel were in the Control Room discussing changes to periodic test procedure PT-2.1 (Safety Injection System Pumps) with the Control Room operators. These changes to PT-2.1 were necessary to reflect modifications made to the Safety Injection (SI) pumps minimum flow recirculation lines during the recent annual refueling and maintenance outage. This modification in part increased the size of the SI pumps recirculation lines to increase the recirculation flow for better pump reliability. During the post modification testing of the SI pumps, the "B" and "C" SI pumps exhibited problems meeting the design flow rates to the reactor coolant system as indicated on SI flow indicator FI-925. Because of the above indicated design flow rate delivery problems, the "B" and "C" SI pump minimum flow recirculation valves were throttled to 50 gpm to achieve the required design flow rates to the reactor coolant system. As the "A" SI pump did not exhibit problems achieving design flow rates to the Reactor Coolant System (RCS), its recirculation valve was locked full open.

II. DESCRIPTION OF EVENT

A. DATES AND APPROXIMATE TIMES FOR MAJOR OCCURRENCES:

- o June 19, 1989, 1440 EDST: Event date and time.
- o June 19, 1989, 1440 EDST: Discovery date and time.
- o June 19, 1989, 1440 EDST: Started unit load reduction.
- o June 19, 1989, 1515 EDST: Unusual Event declared.

- o June 19, 1989, 1615 EDST: "B" and "C" SI pumps declared operable.
- o June 19, 1989, 1615 EDST: Stopped unit load reduction.
- o June 19, 1989, 1626 EDST: Unusual Event terminated.
- o June 21, 1989, 1401 EDST: Started PT-2.1 on the SI pumps.
- o June 21, 1989, 1728 EDST: Declared the "C" SI pump inoperable.
- o June 21, 1989, 1915 EDST: Started unit load reduction.
- o June 22, 1989, 0707 EDST: Reactor Coolant System (RCS) cold leg temperatures less than 350°F and RCS pressure less than 1600 psig.

B. EVENT:

On June 19, 1989 at 1440 EDST the reactor was at approximately 99% full power. During discussions in the Control Room between R&T personnel and Control Room operators concerning proposed changes to procedure PT-2.1, it became apparent that the "B and "C" SI pump minimum flow recirculation line valves were locked full open rather than the required throttled position. The Operations Shift Supervisor determined at this time that if the "B" and "C SI pumps were not aligned as per design, then the pumps were inoperable and this placed the plant operations outside of Technical Specification 3.3.1.1.C and 3.3.1.4 which state the following:

- o 3.3.1.1.C: At or above a reactor coolant system pressure and temperature of 1600 psig and 350°F, except during performance of RCS Hydro Test, three safety injection pumps are operable.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	— 0 0 7	— 0 0	0 4 OF 1 0

TEXT (If more space is required, use additional NRC Form 366A's) (17)

- 3.3.1.4: The requirements of 3.3.1.1.C may be modified to allow one safety injection pump to be inoperable for up to 72 hours.

Because more than one SI pump was declared inoperable, this placed the plant in a condition covered by Technical Specification 3.0.1 which states the following:

- In the event a Limiting Condition for operation and/or associated action requirements cannot be satisfied because of circumstances in excess of those addressed in the specification, within 1 hour action shall be initiated to place the unit in at least hot shutdown within the next 6 hours (i.e., a total of seven hours), and in at least cold shutdown within the following 30 hours (i.e., a total of 37 hours) unless corrective measures are completed that permit operation under the permissible action statements for the specified time interval as measured from initial discovery or until the reactor is placed in a mode in which the specification is not applicable.

Because of the above specification a unit load reduction to hot shutdown was started June 19, 1989 at 1440 EDST.

At approximately 1515 EDST, June 19, 1989, the Operations Shift Supervisor declared an Unusual Event in accordance with SC-100, "Ginna Station Event Evaluation and Classification" EAL: Loss of Engineered Safety Features: exceeding a Limiting Condition for operation on a safety system requiring a plant shutdown; Tech Spec section 3.3 Emergency Core Cooling System. All offsite notifications were made per SC-601, "Unusual Event Notifications".

At approximately 1615 EDST, June 19, 1989 subsequent to the satisfactory testing and throttling of the "B" and "C" safety injection pumps minimum flow recirculation valves to 50 gpm, the "B" and "C" safety injection pumps were declared operable and the load reduction stopped.

With the "B" and "C" safety injection pumps declared operable and the load reduction stopped, the Operations Shift Supervisor, with approval and concurrence from the Plant Manager Ginna Station, and PORC declared the Unusual Event terminated at 1626 EDST, June 19, 1989 in accordance with SC-110, "Ginna Station Event Evaluation For Reducing the Classification". All offsite notifications were made of the Unusual Event termination and the plant was subsequently returned to approximately full power.

On June 21, 1989 at 1401 EDST with the reactor at approximately full power, periodic test procedure PT-2.1 (Safety Injection Pumps) was started for the monthly test of the safety injection pumps. The following is a sequence of important events that happened:

- The "A" SI pump was tested first and tested satisfactorily.
- At approximately 1544 EDST, upon starting the "B" SI pump for the test, the pump minimum flow recirculation flow rate was found to be 70 gpm. This was contrary to the required 50 gpm maximum flow rate. The recirculation flow rate was reset to 45 gpm per PT-2.1.
- At approximately 1637 EDST, upon starting the "C" SI pump for the test, the pump minimum flow recirculation flow rate was found to be 56 gpm. This was contrary to the required 50 gpm maximum flow rate. The recirculation flow rate was reset to 45 gpm per PT-2.1.

- o At approximately 1726 EDST, the "B" and "C" SI pumps were started and stopped to verify recirc flow was less than or equal to the required 50 gpm. Found the "B" SI pump recirc flow at 50 gpm and the "C" SI pump recirc flow at 55 gpm.

- o At approximately 1728 EDST the "C" SI pump was declared inoperable.

- o At approximately 1900 EDST a meeting between shift operations and plant staff was conducted and the following course of action was decided upon:

  1) Shutdown the plant to less than 350°F and less than 1600 psig, until the problem with the "C" SI pump minimum flow recirculation line flow repeatability is found and corrected.

  2) Reset the "C" SI pump minimum flow recirculation flow.

  3) Test repeatability of the "C" SI pump minimum flow recirculation flow.

  4) Correct the cause of pump minimum flow recirculation flow problem.

On June 22, 1989 at approximately 0707 EDST the reactor coolant system cold leg temperatures were less than 350°F and RCS pressure was less than 1600 psig.

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

None.

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	— 0 0 7	— 0 0	0 7 OF 1 0

TEXT (If more space is required, use additional NRC Form 366A's) (17)

E. METHOD OF DISCOVERY:

The first event was discovered during discussions between R&T personnel and the Control Room operators, concerning proposed changes to PT-2.1.

The second event was discovered during the monthly test of the safety injection pumps.

F. OPERATOR ACTION:

The major operator action during the events was to reduce plant load and subsequently take the unit off line and cool down to less than 350°F.

G. SAFETY SYSTEM RESPONSES:

None.

III. CAUSE OF EVENT

A. IMMEDIATE CAUSE:

The "B" and "C" SI pumps were thought to be inoperable because they could not meet their design flow rates to the RCS due to their recirc valves being full open rather than throttled as required.

B. INTERMEDIATE CAUSE:

- The "B" and "C" SI pump minimum flow recirculation valves were positioned full open rather than throttled as required.
- With the pump minimum flow recirculation valves restored to the throttled position, subsequent pump testing failed to achieve repeatable pump recirculation flow results.

C. ROOT CAUSE:

The underlying cause of the event resulted from incorrect calibration data, provided by the plant designer for the installed system. The calibration data provided for flow transmitters FT-924 and FT-925 did not correlate accurately with the installed flow orifice plates, FE-924 and FE-925.

IV. ANALYSIS OF EVENT

The event is being reported in accordance with 10 CFR 50.73 Licensee Event Report System, which permits and encourages Licensees to report significant events that may be of generic interest or concern even though they may not meet the criteria contained in 10 CFR 50.73.

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 the deemed to be inoperable "B" and "C" SI pumps because:

- An analysis was performed using current calibration data, and it was determined that even with the "B" and "C" SI pumps minimum flow recirculation valves full open, the SI design flow rates to the RCS were still achieved. Thus the "B" and "C" SI pumps were never truly inoperable.

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	— 0 0 7	— 0 0	0 9 OF 1 0

TEXT (If more space is required, use additional NRC Form 366A's) (17)

V. CORRECTIVE ACTION

A. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

- The orifice plates installed in SI flow loops F-924 and F-925 were verified to be correct.
- Flow transmitters FT-924 and FT-925 were correctly calibrated to the installed orifice plates.
- The three safety injection pumps were tested with the pump minimum flow recirculation line throttling valves full open, and the required SI design flow to the RCS was achieved.
- All installed safety-related flow orifice plates were assessed for correct installation and calibration. Correct calibration data was confirmed for each orifice/flow transmitter combination.
- Affected calibration procedures were changed to reflect correct calibration data.
- The nuclear industry will be notified via NUCLEAR NETWORK of the generic concerns of correct calibration data for flow orifice/flow transmitter combinations.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	— 0 0 7	— 0 0	1 0 OF 1 0

TEXT (If more space is required, use additional NRC Form 366A's) (17)

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:

None.