
Nuclear Data Inc.

Instrumentation Division

2734 South Cobb Industrial Boulevard

Smyrna, Georgia 30082 ■ Telephone (404) 434-9889



March 18, 1988

Mr. Jim Wigginton
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Wigginton:

This letter is in response to our recent conversations concerning prompt notification of Nuclear Data customers that have software that might cause public reportability under 10CRF part 21.

Nuclear Data has taken steps and modified our internal procedures to include the notification of all power plant customers when we become aware of a "critical software" problem. These procedures have been in effect since March 13, 1987.

The notification includes two parts.

1. Notification of the problem and its possible consequences.
2. If known, a "work-around" solution to temporarily correct the problem until a formal program correction is announced.

Nuclear Data will work with our customers with software support contracts on formally correcting the problem. Customers not under contract have the responsibility to implement action that will, in their opinion, correct the problem. Nuclear Data will enter into a contract with any customers that request assistance in correcting a critical software problem.

Last year at the time of the problem with the Waste Editor program at Callaway, we determined that this problem was not generic with all customers having a Waste Editor program, but was specific to the modifications required by Callaway's requirements for set-point calculations and off-site dose calculations. Accordingly, we working with Callaway to assure ourselves and them that the problem had been resolved. Callaway personnel corrected the problem.

If you have additional questions or would like to audit our procedures that cover the above situations, please call either myself at 404/434-9889 or Bob Kujawa at 312/884-3738.

Sincerely,

David Samsky
Manager, Software and Services

8804070177 880318
PDR ADOCK 05000483
S PDR

DNS/mpe

cc: Bob Kujawa

Amsterdam Atlanta Boston Chicago Denver Frankfurt London Los Angeles New York San Francisco Seattle Stockholm Washington, DC



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 2 4 1987

Mr. Michael Ault
Technical Manager
Nuclear Power Division
Nuclear Data, Incorporated
2734 S. Cobb Indiana Boulevard
Smyrna, Georgia 30080

Dear Mr. Ault:

The Nuclear Regulatory Commission has received a nuclear power reactor (Callaway) licensee event report (LER) that describes a computer software deficiency relating to control of radioactive liquid releases. The software package, "Waste Editor Program" (WEP), is supplied by your company (ND) and is run on the ND 6685 computer. As stated in detail in the enclosed copy of the LER, in some instances the WEP calculated non-conservative values for the alarm/isolation setpoint function required by the facility's technical specifications. This isolation function automatically terminates the liquid release when the calculated alarm level is reached. These setpoints values were non-conservative (too high) by approximately three orders of magnitude. The Callaway plant's review of the affected releases showed no actual abnormal levels of radioactivity were released and no regulatory requirements were violated as a result of the software defect.

As Mr. Wigginton of my Branch discussed with you on April 2, 1987, computer code deficiencies that could cause or lead to a major reduction in the degree of protection provided to the public is reportable under 10 CFR Part 21 (for clarification, see enclosed IE Information Notice, IN 85-52). After discussions with the licensee and a review of the events and circumstances at Callaway plant, we believe the WEP problem was reportable under 10 CFR Part 21. From our review of a ND memorandum (Kujawa - Scheckel, March 13, 1987) which clarifies ND's customer problem notification policy, we understand that your company will notify all affected NRC licensees when a product problem such as WEP deficiency arises.

One of the responsibilities of my Branch is to identify and help resolve generic industry problems. When appropriate, this responsibility also includes notifying industry. We would appreciate a copy of the end-user notification, written summary of corrective actions, and a list of all affected NRC licensees. In cases such as this, when vendor's problem resolution is reasonable and thorough, we typically do not issue an information notice to industry, thus avoiding duplication of efforts.

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Mr. Michael Ault

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APR 24 1987

If you have any questions about this matter, please contact me (301) 492-4734
or James Wigginton (301) 492-4663.

Sincerely,

LeMoine J. Cunningham, Acting Chief
Radiation Protection Branch
Radiation Protection and
Emergency Preparedness Division

Enclosure:
As stated

cc: R. E. Kujawa, Nuclear Data
-----Incorporated



Callaway Plant

January 14, 1987

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

ULNRC-1431

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 86-039-00
ACTION STATEMENT NOT ENTERED WHEN LESS CONSERVATIVE
RADIATION MONITOR SETPOINT CALCULATED DUE TO COMPUTER SOFTWARE ERROR

The enclos Licensee Event Report is submitted pursuant to 10 CFR 50.73(a)(2)(i) concerning a failure to enter Action Statement (a) for Technical Specification 3.3.3.9, Radioactive Liquid Effluent Monitoring Instrumentation, when a less conservative alarm/trip setpoint was calculated for Radiation Monitor HB-RE-18 due to computer software error.

G. L. Randolph
G. L. Randolph
Manager, Callaway Plant

eer TRS
RRR/TPS/SEMe/drs
Enclosure

cc: Distribution attached

~~8701200203~~ spp

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Callaway Plant Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 4 1 8 3										PAGE (3) 1 OF 0 6																															
TITLE (4) Action Statement Not Entered When Less Conservative Radiation Monitor Setpoint Calculated Due to Computer Software Error																																																			
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 (5)																																					
1	0	1	9	8	6	8	6	0	3	9	0	0	0	1	1	4	8	7	0 5 0 0 0 0																																
OPERATING MODE (9) 1												THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)																																							
POWER LEVEL (10) 0 9 1 1												20.402(b) 20.405(a)(1)(i) 20.405(a)(1)(ii) 20.405(a)(1)(iii) 20.405(a)(1)(iv) 20.405(a)(1)(v)										20.405(c) 30.38(e)(1) 30.38(e)(2) 30.73(a)(2)(i) 30.73(a)(2)(ii) 30.73(a)(2)(iii)										30.73(a)(2)(iv) 30.73(a)(2)(v) 30.73(a)(2)(vi) 30.73(a)(2)(vii)(A) 30.73(a)(2)(vii)(B) 30.73(a)(2)(ix)										73.71(b) 73.71(c) OTHER (Specify in Abstract below and in Text, NRC Form 356A)									
LICENSEE CONTACT FOR THIS LER (12)												TELEPHONE NUMBER																																							
NAME Ronald R. Roselius - Superintendent, Health Physics												AREA CODE 3 1 1 4 6 1 7 1 6 1 - 1 8 3 1 2 1 1																																							
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS																																					
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)																																							
YES (If yes, complete EXPECTED SUBMISSION DATE)												X NO																																							

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

On 12/15/86, a utility Health Physicist discovered that a liquid radioactive release from Discharge Monitor Tank 'B' on 10/19/86 at 2304 CDT to 10/20/86 at 0521 CDT, was performed with the Liquid Radwaste Discharge Monitor, HB-RE-18, set at a trip setpoint less conservative than that required by Technical Specification (T/S) 3.3.3.9. Accordingly, Action Statement (a) of this T/S was not met. Upon subsequent review, it was discovered that 7 similar events have occurred since initial criticality (10/2/84). The plant was in Mode 1 - Power Operation at 98% power at the time of discovery.

A Health Physics Nuclear Data, Inc. ND6685 computer software deficiency (Waste Editor Program [WEP]) caused the non-gamma emitter value to be summed with the gamma emitters resulting in a less conservative setpoint calculation.

Technicians were instructed to check non-gamma emitter designators on permits and in the interim, a procedure was revised. All liquid release permits were reviewed. Software has been temporarily modified and the WEP will be permanently revised to permit editing non-gamma emitters. Technicians will receive additional training.

There was no threat to the health and safety of the public. Actual post release data shows that T/S limits were not exceeded. Sampling and analysis, release calculations, permit approvals, and discharge line valving were performed in accordance with approved procedures.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Callaway Plant Unit 1	0 5 0 0 0 4 8 3	8 6	- 0 3 9	- 0 0 0	2	OF	0 6

TEXT (If more space is required, use additional NRC Form 305A (1) (17))

This LER covers eight similar reportable events. The events are summarized in Table 1, Evaluation of Post-Release Data.

Plant conditions at the time of each event are summarized in Table 2, Plant Conditions at Time of Events.

Description and Immediate Corrective Actions

Event Eight referenced in Table 1 was discovered on 12/15/86 at 1310 CST by a utility nonlicensed Health Physicist while obtaining data from liquid release permits for reasons unrelated to this event. The plant was in Mode 1 - Power Operation at 98% Reactor Power at the time of discovery. The tritium (H-3) concentration was erroneously used in the sum of gamma emitters to calculate the Liquid Radwaste Discharge Monitor, (1) HB-RE-18, alarm/trip setpoint for a Discharge Monitor Tank (DMT) (2) 'B' release performed on 10/19/86 at 2304 CDT to 10/20/86 at 0521 CDT. The calculated setpoint, 2.81 E-2 $\mu\text{Ci/ml}$, was less conservative than the correct Technical Specification (T/S) setpoint of 2.9E-5 $\mu\text{Ci/ml}$ and therefore, the requirements of T/S 3.3.3.9, Radioactive Liquid Effluent Monitoring Instrumentation, Action (a) were not met.

In response to this event, utility personnel began an immediate investigation into the circumstances of Event Eight. They found that the Offsite Dose Calculation Manual (ODCM) and procedures governing sampling and analysis, release calculations, release permit generation and approval, and discharge line valving had been properly followed. A Health Physics (HP) Nuclear Data, Inc. ND6685 computer (3) software error was suspected due to the fact that the non-gamma emitter designator for H-3 had not appeared on the permit printout. On 12/15/86, the on-shift HP technicians were instructed to ensure upon permit review that the non-gamma emitter designators were present. A thorough review of all liquid release permits generated at the Callaway Plant since initial criticality (10/2/84) was initiated. As a result of this review, it was discovered that a total of eight of the 1225 permits exhibited the same error. Extensive testing and review of the computer software was immediately initiated to determine the exact cause.

The post-release data in Table 1 shows that all releases were well within the limits of T/S 3.11.1.1, Liquid Effluents, and T/S 3.11.1.2, Dose. This evaluation is based on actual grab sample analysis, actual start/stop times, dilution and waste flow rates, and discharge line valving. This data is documented in each release permit package.

These events are being reported pursuant to 10 CFR 50.73(a)(2)(i) as operation prohibited by the plant's T/S's and are being submitted 30 days from the discovery date (12/15/86) of Event Eight.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Callaway Plant Unit 1	0 5 0 0 0 4 8 3 8 6	—	0 3 9	—	0 0	0 3 OF 0 6

TEXT (If more space is required, use additional NRC Form 356A's) (17)

Root Cause

The root cause was determined to be the use of the Nuclear Data, Inc., ND6685 computer's Waste Editor Program (WEP) to edit the H-3 concentration value. The software used to generate release permits allowed use of the WEP to correct any erroneous data. When used to edit a non-gamma emitter such as H-3, the non-gamma designator was removed and the value for H-3 would be summed with the gamma emitters resulting in a less conservative setpoint calculation. This deficiency was not described in the software operator's manual. The software vendor has been notified of this problem.

Corrective Actions and Actions Taken to Prevent Recurrence

1. On 12/17/86 and 12/31/86 during routine meetings, HP technicians were again instructed to ensure non-gamma emitter designators were present during their release permit reviews.
2. In the interim, HP technical procedure HTP-ZZ-02014, "LRW/GRW⁽⁴⁾ Release Permit Generation," was revised on 12/31/86 to require that the non-gamma emitter designators be checked on each liquid release permit and that the waste editor not be used to edit a non-gamma emitter until the WEP is upgraded.
3. The review of all liquid release permits generated since 10/2/84 was completed on 1/6/87.
4. The computer software was extensively evaluated and tested to determine the cause of the problem. Testing was completed on 12/31/86. The sequence of programs used for release permit generation was temporarily modified on 12/31/86 such that the WEP cannot be used to edit a non-gamma emitter. The WEP will be revised to permit editing a non-gamma emitter and setting the proper designators. The new software will also produce a report showing designator status and if a value has been edited. Although the Nuclear Data, Inc. ND6685 computer software was initially tested to verify calculation accuracies, this testing would not have revealed the WEP edit problem.
5. Additional training will be developed and presented to the appropriate Rad/Chem personnel regarding the review of release permits.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Callaway Plant Unit 1	0 5 0 0 0 4 8 5	8 6	- 0 3 9	- 0 1 0 0 4	OF	0 6

TEXT (If more space is required, use additional NRC Form 386A's) (17)

Safety Significance

These events posed no threat to the public health and safety. Sampling and analysis, release calculations, permit approvals, and discharge line valving for all eight events were performed in accordance with approved procedures and the ODCM. Additionally, T/S limits were not exceeded during these events.

Previous occurrences: none

Footnotes

The system and component codes listed below for items 1, 2, and 3 are from IEEE Standards 805-1983 and 803A-1983, respectively.

- (1) System - IL, Component - MON
- (2) System - WD, Component - TK
- (3) System - code not available, Component - CPU
- (4) LRW/GRW - Liquid Radioactive Waste/Gaseous Radioactive Waste