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 FACIL:50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
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SUBJECT: LER 90-013-00:on 900911,freon leak resulting in emergency
 action level classification alert.W/901120 ltr.

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Carolina Power & Light Company

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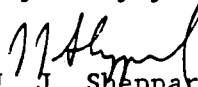
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
LICENSEE EVENT REPORT 90-013

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted in accordance with 10CFR50.73 and NUREG-1022, including supplements No. 1 and 2.

Very truly yours,


J. J. Sheppard
General Manager

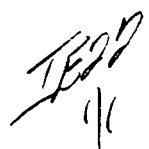
H. B. Robinson S. E. Plant

DHB:dwm

Enclosure

cc: Mr. S. D. Ebnetter
Mr. L. W. Garner
INPO

9011280851 901120
RPT ADOL 08000701



LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2										DOCKET NUMBER (2) 0 5 0 0 0 2 6 1				PAGE (3) 1 OF 0 8				
TITLE (4) FREON LEAK RESULTING IN AN EMERGENCY ACTION LEVEL CLASSIFICATION ALERT																		
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	9	1	1	9	0	9	0	0	0	1	3	0	0	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)		0 0 0				20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)		73.71(c)		
		20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vii)				<input checked="" type="checkbox"/> 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)				VOLUNTARY REPORT				
LICENSEE CONTACT FOR THIS LER (12)																		
NAME D. H. BAUR										TELEPHONE NUMBER 8 0 3 3 8 3 - 1 2 9 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		
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)												<input checked="" type="checkbox"/> NO						

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

This is a voluntary Licensee Event Report.

On September 11, 1990, at approximately 0850, with H. B. Robinson Unit No. 2 in cold shutdown for Refueling Outage No. 13, a freon refrigerant line was inadvertently cut. As a result of the loss of freon, half of the split system air conditioning serving the Computer Room and the Reactor Protection Equipment Room was lost. Additionally, the area was evacuated and an Unusual Event was declared due to a release of a toxic gas in the Protected Area. About 35 minutes later the event was reclassified to an Alert following the discovery that the release was into a Vital Area.

The cut freon line was repaired, the system recharged, and returned to service. The investigation into the event recommended that contractor workers receive additional training, Emergency Response Organization personnel be provided additional specific information on vital and protected area boundaries and gases encountered at the plant.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/96

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
H. B. ROBINSON PLANT, UNIT NO. 2	0 5 0 0 0 2 6 1	9 0	0 1 3	0 0	0 2	OF 0 8

TEXT (If more space is required, use additional NRC Form 365A's) (17)

I. DESCRIPTION OF EVENT

On September 11, 1990, at approximately 0850, with H. B. Robinson Unit No. 2 in cold shutdown for Refueling Outage No. 13, a freon refrigerant line was inadvertently cut.¹ As a result of the cut line about 55 lbs. of Freon 22 were released in the Heating and Ventilation (H&V) Equipment Room, disabling one of two condensing units of an operable air conditioning system which reduced the cooling capacity of that system by about one half. The H&V Equipment Room was immediately evacuated and at 0910 an Unusual Event was declared due to an unplanned release of a toxic or flammable gas in the Protected Area. The NRC Operations Center was notified by ENS at 0935. At 0946, with no change in plant conditions, the Shift Foreman reclassified the event to an Alert following the discovery that the H&V Equipment Room is a Vital area. The NRC Operations Center was notified by ENS at 1018 of the reclassification.

Several air samples were taken in the H&V Equipment Room with the final samples at 1021 being 1.9 PPM Freon, 20.8-21.0% Oxygen. The threshold limit for freon is 1000 PPM and the Oxygen concentration was normal. With these samples, the Alert was terminated at 1021.

At the time the event occurred the Control Room ventilation system, HVA-1, was under clearance and was being removed as part of a modification for Control Room Habitability. The freon line that was cut supplied HVA-2 which is the ventilation system for the Computer Room and the Reactor Protection Equipment Room. A temporary cooling system had been installed to supply the Control Room during the modification and part of its excess capacity was diverted to the HVA-2 areas to make up for the lost capacity there.

The initiating cause of the event was personnel error in that a contract worker inadvertently cut a HVA-2 freon line while in the process of removing HVA-1 lines. The second personnel error occurred when the Shift Foreman, Site Emergency Coordinator, classified the condition as an Unusual Event instead of an Alert, based on information available in the Control Room. This error was caused by the Site Security Plan that did not provide clear and ready reference that the room where the release was occurring was classified as a vital area.

¹H. B. Robinson Unit No. 2 is a 700MW Pressurized Water Reactor in commercial operation since March 1971.

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

II. CAUSE OF EVENT

The initiating event was the inadvertent cutting of an inservice freon line by a contractor. Personnel error is the root cause, however, there were other factors that contributed to the error as shown below:

- Contractor Worker A, who later cut the wrong freon line, made several initial cuts on two of the four freon lines to be removed, one of which was close to the penetration inside the H&V Equipment Room. Work was stopped at this point to allow the insulation to be removed from the remaining two lines by others.
- Contract workers A & B were sent to the Control Room to work while the insulation was being removed from the freon lines but found they were unable to work on the Control Room job due to other delays. By this time, insulation removal was completed and Workers A & B returned to the H&V Equipment Room to complete freon line cutting and removal.
- Worker C cut the four freon lines to be removed on the side of the penetration outside the H&V Equipment Room. Worker A, who had made the original cuts inside the room, returned to cut the freon lines at the penetration so Worker C, outside, could pull the pipe out of the penetration. By the time Worker A was signed into the H&V Equipment Room by Security, Worker C, on the outside, had already pulled the first line out of the penetration. Both then proceeded to cut and remove the next three lines, one at a time. Then, Worker A on the inside, not remembering the line he had cut earlier in the day and unaware that the first line had been removed from the penetration by Worker C while he (Worker A) was signing into the room, proceeded to cut the fifth line in sequence, thinking he was cutting the fourth line to be removed. In reality, this fifth line was part of another HVA unit which was in service (HVA-2 for the Computer Room and Reactor Protection Equipment Room).
- Distractions caused by high noise and dust conditions from the jack hammer removal of concrete in the same room.
- Worker A stress caused by self-imposed pressure of being on a critical path job.
- Worker A did not perform a self check to verify status of the task prior to the restart of cutting operations when he returned to the task the second time.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMS NO. 3150-0104

EXPIRES: 8/31/95

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

Incorrect Classification of Event

The Shift Foreman, who was also the Site Emergency Coordinator during the event, and is a utility licensed operator, made an incorrect Emergency Action Level classification of Unusual Event based on information that was available to him. An Alert should have been declared at the initial classification considering the room in which the freon gas leak occurred was a Vital Area as defined in the Site Security Plan, a copy of which was located in the Shift Foreman's Office.

Factors which significantly diminished the Shift Foreman's capability to make the correct decision are shown below:

- The Site Security Plan did not provide a clear and ready reference that the room in question was classified as a Vital Area. Drawing 5.4 in Chapter 5, Vital Area Portals, did define both security doors to the room in questions as Vital Area Portals. However, the listing of vital areas/rooms under Section 5.2.1.1 did not list the room in question. The listing in the back of the Site Security Plan also did not list the room in question. The Shift Foreman read the listings but did not know the drawing was there that defined the room to be a Vital Area. Thus, he made the initial Emergency Action Level classification of Unusual Event based on his reasoning that the room in question was in the Protected Area. If he had recognized the room to be in the Vital Area, he would have declared the event an Alert in the initial classification.

The room in question was noted to be referenced by at least four different names during interviews conducted in this review; for example:

H&V Equipment Room (Old FSAR)
Control Room HVAC Room (interview)
Old Cable Spread Room (interview)
HVAC Equipment Room (UFSAR)

- The Plant Emergency Procedures did not identify Vital and Protected Areas for use in making Emergency Action Level decisions. The Plant Emergency Procedures and associated Emergency Action Level (EAL) decision flowpath charts did not provide clear definitions for the words "toxic", "vital" and "protected" used in the decision blocks of the EAL-2 path chart.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 366A-1) (17)

With no clear definition of these terms, the Shift Foreman's decision process was impaired when he reached the EAL-2 decision block containing the words "toxic" and "vital". He made a conservative decision in assuming the released gas to be toxic but then was faced with a decision based on "vital" or "protected".

These two words were the keys to deciding whether the event was to be classified as an Unusual Event or an Alert. The Shift Foreman consulted with others who were also unsure of the classification of the room in question. When the Site Security Plan did not readily provide clarification, the Shift Foreman decided the room was not a Vital Area and declared the Unusual Event. Shortly thereafter, Security personnel recommended the room be classified as a Vital Area whereupon the Shift Foreman promptly reclassified the event as an Alert.

Plant Emergency Procedures did not identify gases used at H. B. Robinson Unit 2 as to their toxicity or life-threatening properties (e.g., Freon gas). It was noted that other gases, such as nitrogen, halon, argon, carbon dioxide and oxygen are similarly not effectively identified in the procedures. Absence of this information contributed to a delay in classification of the event.

Several air samples were taken in the H&V Equipment Room with the final samples at 1021 being 1.9 PPM Freon, 20.8-21.0% Oxygen. The threshold limit for freon is 1000 PPM and the Oxygen concentration was normal. With these samples, the Alert was terminated at 1021.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED CASE NO. 3150-0104

EXPIRES: 8/31/96

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

III. ANALYSIS OF EVENT

This event was reported to the NRC Operations Center via the Emergency Notification System as required by 10CFR50.72(a), Declaration of Emergency Plan Emergency Classification.

This event does not meet the criteria of 10CFR50.73(a)(2)(x) in that it did not pose an actual threat to the safety of the nuclear power plant.

Review of "Dangerous Properties of Industrial Materials," 5th Edition, indicates that Freon 22 (Chlorodifluoromethane) will produce toxic effects on humans only under the most unusual conditions, or by an overwhelming dosage. Further, this reference states that the substance produces no fire hazard, and has no lower or upper explosion limit. During this event, sufficient quantifies were not released to be considered an overwhelming dosage to personnel.

Site personnel were not hampered in the performance of their duties necessary for safe shutdown of the plant. Minimal (16 ppm) Freon 22 was detected in the Control Room, and the H&V Equipment Room where the substance was released did not contain any equipment necessary for plant operation at the time of the event. There was no fire nor was there a radioactive release as a result of this event.

NUREG 1022, Supplement 1, paragraph 9.2, discusses "internal threats". In determining if there was an actual threat, the plant mode is allowed to be used as a basis. At the time of this event, the Plant was in cold shutdown condition. In addition, paragraph 9.5 of this document uses a fire as an example of an internal threat. Using this example as a parallel, the NUREG states that "if the fire was not severe enough to pose an actual threat, and delay of the modification did not significantly threaten plant operations" then an LER is not required. In the event evaluated, the affected area was immediately evacuated, and within a short time was ventilated of the Freon gas. (This was the basis for terminating the event as reported to the State, Counties, and the NRC.)

Based on the above, this event does not constitute a reportable condition as defined in 10CFR50.73, and no LER is required. However, this LER is being reported as a For Information Only Voluntary Report.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT: If more space is required, use additional NRC Form 366A-1/117)

IV. CORRECTIVE ACTION

The cut freon line on HVA-2 was repaired, the system recharged, and returned to service. During the review and analysis of the event, corrective actions were recommended that address each of the errors committed. These recommended corrective actions have been added to the plant's Corrective Action Program where they will be tracked to completion.

a) Corrective Actions Related to Contract Workers

- Workers' training should include the techniques of self checking and verification; i.e., system walkdowns, independent checks by other crew members or supervision, etc. Training should also stress self checking following periods of inactivity during the day as well as at the beginning of the shift.
- Supervisors should not assign a task knowing that the task must be interrupted for other reasons prior to completion; i.e., insulation removal.
- When management is stressing the importance of "getting the job done on time" and "doing the job right," they should also stress that we have the time to do the job right the first time.
- Use of more extensive marking methods for lines to be removed.

b) Corrective Actions Related to Emergency Classification Error

- Emergency Response Organization personnel, especially those in the Control Room, should be provided specific identification of plant Vital Areas. Identification, whether in the form of text or drawings, should clearly delineate the boundaries for Vital and Protected Areas. The current two-dimensional map used for this purpose appears to be too limiting in its depiction of areas. A three-dimensional description that leaves no doubt as to classification of an area should be considered.
- The Site Security Plan should be periodically reviewed and updated to the current status of the plant as areas/rooms are renamed or equipment boundaries change.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

- The Plant Emergency Procedures and associated Emergency Action Level path charts should be revised to include definitions of the key words used in procedural steps. These definitions should then be used consistently throughout the Emergency Response Organization process, especially in decision making steps such as found in the Emergency Action Level path charts. Uniform technical basis for the definitions should be provided and included in the Plant Emergency Procedures for reference as well.
- Life-threatening (toxic, asphyxiate, flammable) properties of gases encountered at the Plant should be researched, documented, and provided in appropriate format in Plant Emergency Procedures.

V. ADDITIONAL INFORMATION

The air conditioning system was manufactured by York and installed during plant construction in the late 1960's.

There are no previous similar Licensee Event Reports.