

REPORT OF INCIDENT

SUBJECT: SALEM NUCLEAR GENERATING STATION UNIT 2/HEALTH PHYSICS
ALLEGATIONS RELATED TO CONTAMINATION INCIDENT

REPORT NUMBER: O-1-83-011

DATE CLOSED: April 26, 1983

This inquiry was initiated for the purpose of interviewing an alleged regarding allegations related to activities of the onsite health physics technicians in response to a contamination incident that occurred at Salem Nuclear Generating Station, Unit 2 on April 16, 1983. The alleged has requested confidentiality and has signed the confidentiality agreement.

As background, the licensee (Public Service Electric and Gas, PSE&G) reported that at approximately 4:30 p.m. on April 16, 1983, workers exiting containment were found contaminated around the nasal area. Grab sampling of containment air indicated cobalt 58, 60 and manganese 54 equal to more than 41 times the Appendix B limits. Approximately 67 workers sustained low-level intakes of radioactive materials.

The alleged, [REDACTED] contacted the NRC Duty Officer on April 19, 1983 and made several allegations related to the actions of the plant health physics technicians who responded to the incident.

[REDACTED] was interviewed in depth during the evening of April 20, 1983. Appended to this Inquiry Report as Attachment (1) is a Report of Interview containing the details of that Interview. The details of [REDACTED] allegations and concerns were discussed with Ronald NIMITZ, Radiation Specialist, Radiological Protection Branch, Division of Engineering and Technical Inspection, Region 1, for follow-up inspection. The results of his inspection effort will be documented in Region 1 Inspection Report Number 83-14.

The details of the allegations were also discussed with William Ward, Director, Division of Field Operations on April 21, 1983. He advised that inasmuch as the alleged's allegations did not contain any indications of wrongdoing

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PDR FOIA
TOTTEN84-574 PDR

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... Office of Investigations. Accordingly this inquiry is CLOSED.

Prepared by:

R. Keith Christopher, Director
Office of Investigations
Field Office, Region 1

Approved by:

R. Keith Christopher, Director
Office of Investigations
Field Office, Region 1

Attachment:
As stated

cc: Pete Baci
J. Allar
R. Keimig
R. Nimitz

[redacted] was interviewed by K. Keith CHRISTOPHER, Director, Office of Investigation, Field Office, Region 1, on April 20, 1983 at the [redacted] interview. at [redacted] request, was [redacted] who [redacted] described as [redacted]

[redacted] said [redacted] has been employed as a [redacted] at the Salem Nuclear Generating Station Unit 2 since [redacted] [redacted] is a site contractor [redacted] for the current outage. [redacted] noted this job was [redacted]

[redacted] said that during [redacted] employment at Salem [redacted] has worked in various areas of containment [redacted] however, [redacted] said [redacted] has not performed any work on the reactor coolant pumps or the steam generators but has worked on the safety injection pumps.

[redacted] said that on the day of the contamination incident (April 16, 1983) [redacted] spent the entire day assisting a welder (identified as [redacted]) on [redacted], welding [redacted]. [redacted] said [redacted] entered containment at approximately [redacted] and worked in the aforementioned area until [redacted] when [redacted] exited the area for lunch. [redacted] said [redacted] re-entered containment at approximately [redacted] and signed out at [redacted]

[redacted] continued that [redacted] left the site at approximately [redacted] and went home. [redacted] said at the time of [redacted] departure [redacted] was not aware of any potential problems relating to the contamination of workers at Salem Unit 2. [redacted] said [redacted] returned to work the following day (April 17, 1983) at [redacted] at which time [redacted] was informed that [redacted] would have to take a whole body count. [redacted] said it wasn't until two hours later that [redacted] finally received [redacted] whole body count. [redacted] said [redacted] whole body count indicated a cobalt 58 contamination of .96 maximum permissible concentration (MPC). In this regard, [redacted] complained that no one explained to [redacted] what was going on or why [redacted] needed to take a whole body count.

[redacted] said when [redacted] returned to work on April 17, 1983 he talked to two [redacted] identified as [redacted] and [redacted]. [redacted] said these individuals told [redacted] they ([redacted] and [redacted]) had talked to a laborer who told them that on the day of the contamination incident (April 16) he had observed a health physics technician turn off an air monitoring alarm in containment without ever making an effort to survey the area for radioactive contamination or to do anything to ensure that the radiation alarm was not valid. [redacted] said [redacted] did not know the names of the laborer or the health physics technician because [redacted] was not there at the

time of the incident. [redacted] conjectured that [redacted] and [redacted] would be able to provide more information regarding this incident, particularly with regards to the location of the monitor in question and the name of the health physics technician.

[redacted] continued that on Monday, April 18, 1983, [redacted] came to work and "overheard" two boilermakers and two [redacted] technicians talking. [redacted] said it was [redacted] perception that these men (whom [redacted] could not identify), had been kept in the plant overnight because of contamination. [redacted] said these individuals appeared to be of the opinion that one of the health physics technicians (not further identified) was "on some type of hard drugs." [redacted] said [redacted] had no personal knowledge relative to this incident and didn't know what the health physics technician did to create the impression that he was on drugs. [redacted] said the only thing [redacted] heard from the aforementioned individuals was that the health physics technician was incoherent and in a "stupor".

[redacted] voiced another concern wherein [redacted] stated that the portal monitor at control point A (the contractor exit) had been malfunctioning for at least a month and a half. [redacted] said the monitor alarm was going off even when there was no one coming through the portal and there was no health physics technician at the portal to check workers for contamination when the alarm did sound. [redacted] said everyone knew about the problem including the health physics technicians but no one ever did anything to correct the problem.

[redacted] also voiced [redacted] opinion that it was not proper for health physics trainees to be working in containment without supervision. He opined that [redacted] and other workers were being used as "guinea pigs" while the health physics trainees learned their trade. According to [redacted], [redacted] became concerned about this when one of the health physics supervisor's told [redacted] many of the trainees did not know what was going on.

[redacted] then proceeded to relate several additional concerns which [redacted] viewed as being detrimental to the health and safety of the workers. [redacted] said that approximately three to four months ago, several men were washing down the "dome" using high pressure hoses. [redacted] said these men were properly attired in protective clothing and respirators but that a group of approximately 25 men, who were no more than 30 feet away, were not given respirators and were forced to breath the mist created by the washdown. [redacted] said when the men requested respirators, the health physics technicians refused saying there were not enough respirators to go around. Additionally, [redacted] said [redacted] was told [redacted] could only have a respirator if the REP said [redacted] required one for the job [redacted] was doing.

[redacted] also voiced a concern wherein [redacted] stated that when [redacted] first started to work in [redacted] was given a respirator fit test by an individual who [redacted] said was a "janitor" for [redacted], a site contractor. [redacted] said [redacted] was concerned about the qualifications of the individual who gave [redacted] the fitness test. [redacted] could not identify the individual

in question or provide any other information regarding this concern.

in conclusion, [REDACTED] clarified that when [REDACTED] earlier told the NRC that the licensee was covering up the incident [REDACTED] was referring to the licensee's failure to tell them (the workers) what was going on and not to any act or statement by the licensee's management relative to covering up the incident. [REDACTED] provided no further information regarding the incident and had no other concerns.

REPORT OF ALLEGATION
(See RI No. 1200.10)

NOTE: When receiving an allegation by telephone, it is important that the recipient be alert to the emotional state of the caller and use judgement when attempting to elicit the following information to avoid possibly discouraging the caller from reporting it.

RECEIVED BY: John R. White DATE/TIME: _____

ALLEGER'S NAME: _____

TEL. NO.: (Home) _____ (Business) _____

ADDRESS: Unknown _____

MAY CONTACT: Yes No After 1800
(Time) (Place)

EMPLOYER: _____ POSITION/TITLE: _____

AFFECTED LICENSEE OR COMPANY: Public Service Electric and Gas Company

FACILITY: Salem Unit 2

DETAILS (Use additional pages as necessary):

NOTE: Call was received from HQ Duty Officer at [] A bridge was set-up and the conversati
was recorded.

The individual stated that he was working in the Salem Unit 2 containment on the afternoon of April 16, 1983 (at the time contamination incident occurred). He and others in the contain- ment were not informed if they were subjected to any contamination. He was allowed to leave the site and reported for work the next morning (4/17/83). At that time he and others were told that they must have whole body counts. They were not told why. No explanation was given. He learned of the event from news reports on television that evening. Following, he either learned of or actually observed the following:

A friend of his (who was involved in the incident) told him that he observed an HP technician silence an alarming air monitoring device on the day of the incident, but did not take any action in response to the alarm. He says his friend will identify the HP.

Some individuals who were involved remained at the facility (probably overnight). He heard from some of these individuals (boilermakers and Hydro-Nuclear decon technicians) that the HP technician who was monitoring them was "high on drugs", "spaced-out", and in general was not able to function.

The portal monitor at the exit from the controlled area has been malfunctioning for months. It alarms whenever anyone passed through, but personnel merely reset the device to silence it. Everyone knows about the problem, but nothing is done.

(CONTINUED ON FOLLOWING PAGE)

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REPORT OF ALLEGATION

2

During the outage, the utility ran out of plastic boots (protective clothing). To compensate, plastic bags were brought out of the containment to be used. Personnel were directed to use the bags.

The licensee is covering up the event. HP technicians have been providing inadequate control. Poor practices are constantly being observed.

He does not appear to care about anonymity. He expects he will shortly be fired since he now refuses to work in containment.

The individual appeared to be concerned about his own health and safety. He is extremely distrustful of the licensee.

April 22, 1983

To Radiation Protection Engineer

AIR SAMPLE FROM #22 REACTOR COOLANT PUMP

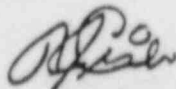
After reviewing the log from the U/2 containment HP's, it was found that there was an air sample running on the 104' elevation on #22 RCP on 4/16/83. The log indicated that there was a RCP pump drawing an air sample running from 1035 until 1715 hours.

Upon investigation, it was found that this air sample was indeed taken and that upon frisking this sample it pegged a RM-14 with a HP-210 probe on the X100 scale. When the sample did this it was placed in the source locker under lead shielding. The sample was recovered on 4/20/83 and determined to be the correct sample from the information on the glove on the outside of the sample.

I then calculated the sample volume to correspond to the time that the RCP was started until the sample was pulled. The sample was analyzed on the GeLi and the MPC hrs. calculated. The sample was counted two more times. The results were written a reasonable deviation of each other. The result from this sample were a total of 13.4 MPC's.

I feel that this sample should be used to determine the actual MPC's received by personnel who were in the immediate area on the pump platform.

This sample should help clear the problem of us not having an air sample running during the time of the RCP running.



R. J. Cislo
Technical Supervisor
Radiation Protection

RJC:am

Attachments

cc: File 1105
W. Ferguson

Isotope	Activity	Upper Limit	Upper Limit	Upper Limit
FF-10				NUCLIDE NOT DETECTED
FF-11				NUCLIDE NOT DETECTED
CO-58				HALF LIFE TOO SHORT
CO-59				HALF LIFE TOO SHORT
CO-60				NUCLIDE NOT DETECTED
NI-57				NUCLIDE NOT DETECTED
NI-58				HALF LIFE TOO SHORT
CU-64	12.73H	< 5.282E-08		NUCLIDE NOT DETECTED
ZN-65	244.60D	< 1.206E-11		NUCLIDE NOT DETECTED
AG-110M	252.60D	< 4.199E-12		NUCLIDE NOT DETECTED
NB-94	20300.60Y	< 4.361E-12		NUCLIDE NOT DETECTED
ZR-95	65.50D	< 7.651E-12		NUCLIDE NOT DETECTED
NB-95	35.10D	< 4.602E-12		NUCLIDE NOT DETECTED
ZR-97	17.00H	< 1.846E-10		NUCLIDE NOT DETECTED
NB-97	17.00H	< 1.775E-10		NUCLIDE NOT DETECTED
RB-98	2.80H			HALF LIFE TOO SHORT
RB-99	15.60M			HALF LIFE TOO SHORT
BR-84	31.80M			HALF LIFE TOO SHORT
I-131	8.04D	< 2.956E-12		NUCLIDE NOT DETECTED
I-132	2.28H			HALF LIFE TOO SHORT
I-133	20.80H	< 9.518E-11		NUCLIDE NOT DETECTED
I-134	52.20M			HALF LIFE TOO SHORT
I-135	6.70H			HALF LIFE TOO SHORT
SP-85	65.20D	< 8.689E-12		NUCLIDE NOT DETECTED
SP-86	2.75H			HALF LIFE TOO SHORT
SP-87	2.71H			HALF LIFE TOO SHORT
Y-88	1.96.60Y	< 2.895E-12		NUCLIDE NOT DETECTED
Y-90	49.70M			HALF LIFE TOO SHORT
Y-91	1.53H			HALF LIFE TOO SHORT
RU-104	157.60D	< 4.523E-11		NUCLIDE NOT DETECTED
RU-105	39.60D	< 2.062E-12		NUCLIDE NOT DETECTED
CS-134	2.05Y	< 4.859E-12		NUCLIDE NOT DETECTED
CS-136	13.00D	< 7.272E-12		NUCLIDE NOT DETECTED
CS-137	30.17Y	< 4.485E-12		NUCLIDE NOT DETECTED
CS-138	32.20M			HALF LIFE TOO SHORT
BR-139	18.50Y	< 2.900E-12		NUCLIDE NOT DETECTED
BR-140	82.71H			HALF LIFE TOO SHORT
BR-142	12.75D	< 1.901E-11		NUCLIDE NOT DETECTED
BR-143	18.27H			HALF LIFE TOO SHORT
LR-144	18.22H	< 9.469E-12		NUCLIDE NOT DETECTED
LR-145	32.00M			HALF LIFE TOO SHORT
CE-142	33.60H	< 2.780E-11		NUCLIDE NOT DETECTED
CE-144	284.26D	< 7.488E-12		NUCLIDE NOT DETECTED
CD-109	452.60D	< 1.615E-11		NUCLIDE NOT DETECTED
CD-113M	12.60Y	< 1.500E-09		NUCLIDE NOT DETECTED
CE-115	137.26D	< 1.289E-12		NUCLIDE NOT DETECTED
HO-163	49.70D	< 2.045E-12		NUCLIDE NOT DETECTED
SM-151	147.34Y	< 2.084E-12		NUCLIDE NOT DETECTED
K-41	5473.60Y	< 2.451E-11		NUCLIDE NOT DETECTED
SE-155	2.72H	< 2.704E-12		NUCLIDE NOT DETECTED
SE-156	6.23Y	< 4.177E-12		NUCLIDE NOT DETECTED

HALF LIFE TOO SHORT
 NUCLIDE NOT DETECTED
 HALF LIFE TOO SHORT
 HALF LIFE TOO SHORT
 NUCLIDE NOT DETECTED
 NUCLIDE NOT DETECTED
 1.099E-09 6.78
 9.817E-10 1.09

~~1.09~~ 0.007 mpc
~~6.78~~ 2.82 mpc
~~1.09~~ 9.98 mpc

Tot. = 13.38 mpc

ISOTOPE	ACTIVITY	CONFIDENCE LEVEL	ERROR	1. Error	2. MPC
CR-51	3.50H	-----	-----	-----	-----
CR-51	3.50H	< 6.202E-11	-----	-----	-----
CR-51	3.50H	< 7.407E-11	-----	-----	-----
CR-51	2.25M	< 5.572E-11	-----	-----	-----
CR-51	3.41H	-----	-----	-----	-----
CR-51	10.50H	-----	-----	-----	-----
CR-51	3.80H	-----	-----	-----	-----
CR-51	14.50H	-----	-----	-----	-----
CR-51	4.48H	-----	-----	-----	-----
CR-51	10.76Y	< 1.806E-09	-----	-----	-----
CR-51	76.31M	-----	-----	-----	-----
CR-51	2.80H	-----	-----	-----	-----
CR-51	3.17M	-----	-----	-----	-----
<u>ANN-EN</u>	<u>1.00D</u>	3.047E-07	4.344E-09	1.43	0.00
NA-24	15.03H	< 1.364E-10	-----	-----	-----
F-18	109.74M	-----	-----	-----	-----
BE-7	53.28D	< 2.344E-11	-----	-----	-----
NP-239	2.35D	< 1.019E-11	-----	-----	-----
CR-51	27.72D	< 2.104E-11	-----	-----	-----
W-187	23.90H	< 1.350E-10	-----	-----	-----
RE-188	16.98H	< 2.764E-10	-----	-----	-----
MIN-54	312.50D	2.274E-08	5.372E-10	2.36	0.00 0.57mPC
KN-55	2.59H	-----	-----	-----	-----

$0.57 \text{ mPC} = 2 \times 10^7 \text{ u/cc}$

$0.55 \text{ mPC} = 5 \times 10^8 \text{ u/cc}$

$0.60 \text{ mPC} = 9 \times 10^9 \text{ u/cc}$

$0.77 \text{ mPC} = 4 \times 10^8 \text{ u/cc}$

NUCLIDE	DATE	CONCENTRATION	ERROR	% ERROR	MPC
CR-51	1. 50H	-----	-----	-----	-----
CR-51	2. 50H	< 6. 202E-11	-----	-----	-----
CR-51	3. 50H	< 2. 007E-10	-----	-----	-----
CR-51	4. 50H	< 1. 572E-11	-----	-----	-----
CR-51	5. 51H	-----	-----	-----	-----
CR-51	10. 50H	-----	-----	-----	-----
CR-51	13. 80H	-----	-----	-----	-----
CR-51	14. 50H	-----	-----	-----	-----
CR-85M	4. 40H	-----	-----	-----	-----
CR-85	10. 76Y	< 1. 806E-09	-----	-----	-----
CR-87	76. 31M	-----	-----	-----	-----
CR-88	2. 80H	-----	-----	-----	-----
CR-92	3. 17M	-----	-----	-----	-----
<u>RNN-EN</u>	<u>1. 60D</u>	3. 047E-07	4. 344E-09	1. 43	0. 00
NR-24	15. 03H	< 1. 364E-10	-----	-----	-----
F-18	109. 74H	-----	-----	-----	-----
BE-7	53. 28D	< 2. 344E-11	-----	-----	-----
NP-239	2. 35D	< 1. 019E-11	-----	-----	-----
CR-51	27. 72D	< 2. 104E-11	-----	-----	-----
W-187	23. 90H	< 1. 350E-10	-----	-----	-----
FE-159	16. 98H	< 2. 764E-10	-----	-----	-----
MI-54	312. 50D	2. 274E-08	5. 373E-10	2. 36	-----
KN-55	2. 59H	-----	-----	-----	-----

~~0. 57~~ 0. 57 mpc

0.57 mpc = 2×10^{-7} u/cc
 0.58 mpc = 5×10^{-8} u/cc
 0.60 mpc = 9×10^{-9} u/cc
 0.77 mpc = 4×10^{-8} u/cc

GEN. GENERALING DIVISION HEALTH PHYSICS DIVISION

SAMPLE COLLECTION START DATE: 16-APR-83 14:30:00
 SAMPLE COLLECTION END DATE: 16-APR-83 17:15:00
 SAMPLE IDENTIFICATION: 27/RCP/104/4/10z
 TYPE OF SAMPLE: PAK, W 7.5'
 SAMPLE QUANTITY: 6200000. UNITS: CG
 PER CENT YIELD: 100.00000 REACTOR: 2
 SAMPLE GEOMETRY: GE-111 OPERATORS: INITIATOR SIGMA
 EFFICIENCY FILE NAME: EFF.DEL111

ACQUIRE DATE: 20-APR-83 16:19:13 * FWHM (50%) : 1.920
 PRESET TIME (11VF): 1000. SEC * SENSITIVITY: 10.000
 ELAPSED REAL TIME: 1010. SEC * SHAPE PARAMETER: 40.0 %
 ELAPSED LIVE TIME: 1000. SEC * RBK ITERATIONS: 10.

DETECTOR: PGT * LIBRARY: NUCL .LIB1
 CALIB DATE: 11-APR-83 12:38:29 * ENERGY TOLERANCE: 2.000KV
 KEV/CHNL: 0.5014504 * HALF LIFE RATIO: 8.00
 OFFSET: 3.1568980 KEV * ABUNDANCE LIMIT: 40.002
 D. COEFF.: -9.338E-09 KEV/CHNL

ENERGY WINDOW 61.33 TO 2033.80

PK	IT	ENERGY	AREA	BKGD	FWHM	CHANNEL LEFT	FW	CTS/SEC	ZERR	FIT
1	1	122.25	741.	3092.	1.01	237.50	233	9.741E-01	11.2	0.57E-03
2	1	511.35	8792.	3705.	2.53	1013.46	1005	20.0.79E 00	1.4	2.03E 00
3	1	811.00	19810.	2569.	1.58	1611.06	1604	20.0.1.98E 01	0.8	1.14E 01
4	1	835.07	3242.	1059.	1.55	1659.06	1652	19.0.3.24E 00	2.3	4.53E-01
5	1	1173.40	10106.	824.	1.86	2333.81	2320	27.0.1.01E 01	1.1	5.02E 00
6	1	1332.69	8937.	150.	1.99	2651.30	2641	30.0.6.94E 00	1.1	1.02E 01

PEAK SEARCH COMPLETED (REV 12)

NUCLIDE IDENTIFICATION SYSTEM (REV 5/80)
 UNKNOWN LINE REPORT

PK	IT	ENERGY	AREA	BKGD	FWHM	CHANNEL LEFT	FW	CTS/SEC	ZERR	ZEFF
1	1	511.35	8792.	3705.	2.53	1013.46	1005	20.0.79E 00	1.4	0.00E-0

LINES NOT MEETING SUMMARY CRITERIA

PK	NUCLIDE	ENERGY	HLFE	DECAY	UCI /UNIT	ABNDIFF	FAILED
1	HO-90	122.30	5.70H	1.11E-5	1.647E-4	40.11X	DCY
1	SE-75	121.11	120.00D	1.023E-0	6.687E-9	9.72X	ABN
1	EU-152	121.78	13.20Y	1.901E-0	4.145E-9	23.67X	ABN
4	KR-88	834.70	2.80H	1.870E-10	3.329E-3	16.99X	DCY,ABN

NUCLIDE IDENTIFICATION SYSTEM (REV 5/80)
 SUMMARY OF NUCLIDE ACTIVITY

TOTAL LINES IN SPECTRUM 6
 LINES NOT LISTED IN LIBRARY 1
 IDENTIFIED IN SUMMARY REPORT 5 65.332

ACTIVITY PRODUCT

PK	IT	ENERGY	AREA	BKGD	FWHM	CHANNEL LEFT	FW	CTS/SEC	ZERR	ZEFF
1	1	511.35	8792.	3705.	2.53	1013.46	1005	20.0.79E 00	1.4	0.00E-0
2	1	811.00	19810.	2569.	1.58	1611.06	1604	20.0.1.98E 01	0.8	1.14E 01
3	1	835.07	3242.	1059.	1.55	1659.06	1652	19.0.3.24E 00	2.3	4.53E-01
4	1	1173.40	10106.	824.	1.86	2333.81	2320	27.0.1.01E 01	1.1	5.02E 00
5	1	1332.69	8937.	150.	1.99	2651.30	2641	30.0.6.94E 00	1.1	1.02E 01

ENTER OPERATING STATION NUMBER PHYSICS 150000000000

SAMPLE COLLECTION START DATE: 16-APR-63 14:50:00
 SAMPLE COLLECTION END DATE: 16-APR-63 17:15:00
 SAMPLE IDENTIFICATION: 22/RCF/104/4/16/
 TYPE OF SAMPLE: PAK, 6 2.5"
 SAMPLE WEIGHT: 0.200000. UNITS: LB
 PER CENT YIELD: 100.00000 REALOR 1 2
 SAMPLE GEOMETRY: GE-111 OPERATIONS INITIATION: MAX
 EFFICIENCY FACTOR NAME: DEF. GEOM.:

ACQUIRE DATE: 20-APR-63 18:07:32 * FWHM(1332) : 1.920
 PRESET TIME(LIVE): 300. SEC * SENSITIVITY: 17.000
 ELAPSED REAL TIME: 303. SEC * SHAPE PARAMETER: 40.0 %
 ELAPSED LIVE TIME: 300. SEC * NBR ITERATIONS: 10.

DETECTOR: PGT * LIBRARY: NUCL .LIB1
 CALIB DATE: 11-APR-63 12:38:29 * ENERGY TOLERANCE: 2.000KV
 LAUNCHER: 0.5014504 * HALF LIFE RATIO: 8.00
 OFFSET: 3.1568980 KEV * ABUNDANCE LIMIT: 40.00Z
 D. COEFF. : -9.338E-09 KEV/CH22 *

ENERGY WINDOW 61.35 TO 2035.08

PK	IT	ENERGY	AREA	BKGD	FWHM	CHANNEL LEFT	CH	CPS/SEC	ZERR	FIT
1	1	511.40	2735.	1190.	2.09	1013.56	1005	23 9.12E 00	2.6	1.28E 00
2	1	811.01	6029.	588.	1.54	1611.09	1602	23 2.01E 01	1.4	6.02E 00
3	1	835.07	945.	284.	1.60	1659.07	1655	14 3.15E 00	4.1	1.51E 00
4	1	1173.41	3042.	258.	1.87	2333.84	2325	24 1.01E 01	2.0	2.37E 00
5	1	1332.67	2708.	61.	2.04	2651.47	2641	77 9.23E 00	1.2	2.59E 00

PEAK SEARCH COMPLETED (REV 12)

NUCLIDE IDENTIFICATION SYSTEM (REV 6/61)
 UNKNOWN LINE REPORT

PAGE 1

PK	IT	ENERGY	AREA	BKGD	FWHM	CHANNEL LEFT	CH	CPS/SEC	ZERR	ZOFF
1	1	511.40	2735.	1190.	2.09	1013.56	1005	23 9.12E 00	2.6	7.47E 00

LINE NOT MEETING SUMMARY CRITERIA

PK	NUCLIDE	ENERGY	HLFE	DECAY	DCI	ZERR	ABNDIFF	FAILED
3	KR-86	835.70	2.80H	2.620E 10	4.0930	3	16.75%	DCY/GRN

NUCLIDE IDENTIFICATION SYSTEM (REV 6/61)
 SUMMARY OF NUCLIDE ACTIVITY

PAGE 2

1 LINE LISTED IN SPECTRUM
 1 LINE NOT LISTED IN LIBRARY
 1 IDENTIFIED IN UNKNOWN REPORT

LIST OF PEAKS

PK	IT	ENERGY	AREA	BKGD	FWHM	CHANNEL LEFT	CH	CPS/SEC	ZERR	ZOFF
1	1	511.40	2735.	1190.	2.09	1013.56	1005	23 9.12E 00	2.6	7.47E 00
2	1	811.01	6029.	588.	1.54	1611.09	1602	23 2.01E 01	1.4	6.02E 00
3	1	835.07	945.	284.	1.60	1659.07	1655	14 3.15E 00	4.1	1.51E 00
4	1	1173.41	3042.	258.	1.87	2333.84	2325	24 1.01E 01	2.0	2.37E 00
5	1	1332.67	2708.	61.	2.04	2651.47	2641	77 9.23E 00	1.2	2.59E 00

Name

SSN

7

Co.

1977

Initial
WBC

Calculated
Assigned
MPC-Hrs.

Catalytic	4/17	3.65 ✓
Catalytic	4/18	0.20 ✓ ✓
Catalytic	4/17	2.76 ✓ ✓
PSE&G	4/17	2.76 ✓ ✓
Hydro Nuclear Ser.	4/16	0.57 ✓ ✓
Rad Services Inc.	4/18	13.76 ✓

Catalytic	4/17	0.20 ✓ ✓
Catalytic	4/17	0.20 ✓ ✓
HAP	4/17	4.30 ✓ ✓
HAP	4/17	0.1 ✓
Westinghouse	4/16	3.67 ✓ ✓
Westinghouse	4/17	4.27 ✓ ✓
Catalytic	4/17	0.1 ✓
Catalytic	4/17	0.20 ✓ ✓
Catalytic	4/17	3.09 ✓ ✓
Catalytic	4/17	4.75 ✓ ✓
Catalytic	4/17	0.1 ✓
Catalytic	4/17	1.30 ✓ ✓
Hydro Nuclear Ser.	4/17	1.89 ✓ ✓
Catalytic	4/17	4.70 ✓ ✓
Rad Services Inc.	4/18	0.1 ✓
Rad Services Inc.	4/17	3.99 ✓ ✓
Catalytic	4/17	0.1 ✓
Rad Services Inc.	4/18	0.1 ✓
PSE&G	4/17	1.20 ✓ ✓
Catalytic	4/17	1.44 ✓ ✓
Catalytic	4/16	1.41 ✓ ✓
Catalytic	4/17	 ✓

Catalytic	4/18	1.40 ✓ ✓
Catalytic	4/17	1.24 ✓ ✓
PSE&G	4/18	0.1 ✓
PSE&G	4/17	0.24 ✓ ✓
Catalytic	4/17	1.50 ✓ ✓
Westinghouse	4/16	1.54 ✓ ✓

75
1
3

Calculated
Assigned
MPC-Hrs.

2 of 7

Name

SSN

Co.

Initial
WBC

7

<u>Name</u>	<u>SSN</u>	<u>Co.</u>	<u>Initial WBC</u>	<u>Calculated Assigned MPC-Hrs.</u>
Rad Services Inc.			4/18	1.55 ✓ ✓
PSE&G			4/18	0.58 ✓ ✓
Combustion Eng.			4/17	4.10 ✓ ✓
Catalytic			4/17	0.42 ✓ ✓
Catalytic			4/17	3.90 ✓ ✓
Catalytic			4/17	0.74 ✓ ✓
Catalytic			4/17	0.68 ✓ ✓
Catalytic			4/17	████████ ✓
Catalytic			4/16	4.64 ✓ ✓
Combustion Eng.			4/17	0.20 ✓
Catalytic			4/17	1.10 ✓
Catalytic			4/18	████████ ✓
Catalytic			4/18	0.40 ✓
Catalytic			4/17	1.11 ✓
Westinghouse			4/15	<0.1 ✓
Kemper Ins.			4/18	<0.1 ✓
PSE&G			4/18	1.20 ✓
Rad Services Inc.			4/18	<0.1 ✓
Catalytic			4/16	3.76 ✓
Cooperheat			4/18	0.36 ✓
Rad Services Inc.			4/18	<0.1 ✓
Catalytic			4/17	<0.1 ✓
Rad Services Inc.			4/18	4.95 ✓
Rad Services Inc.			4/17	3.59 ✓
Catalytic			4/16	4.63 ✓
Catalytic			4/17	<0.1 ✓
Catalytic			4/17	0.95 ✓
Westinghouse			4/17	0.70 ✓
Hydro Nuclear Ser.			4/18	38.17 ✓
Catalytic			4/17	0.20 ✓
Catalytic			4/17	1.13 ✓
Cooper Heat			4/17	4.59 ✓
Rad Services Inc.			4/16	21.73 ✓
Catalytic			4/18	<0.1 ✓
Catalytic			4/16	<0.1 ✓

23

42

2

94.1

Name

SSM

Co.

347

Initial
WBC

Calculated
Assigned
MPC-Hrs.

Rad Services Inc.	4/18	2.65 ✓
Catalytic	4/17	<0.1 ✓
Catalytic	4/16	1.39 ✓
Westinghouse	4/16	<0.1 ✓
Catalytic	4/17	1.02 ✓
Catalytic	4/17	0.41 ✓
Combustion Eng.	4/17	0.20 ✓
Catalytic	4/17	0.20 ✓
Catalytic	4/17	<0.1 ✓
Rad Services Inc.	4/17	1.61 ✓
Westinghouse	4/17	4.12 ✓
PSE&G	4/17	1.20 ✓
PSE&G	4/18	1.68 ✓ 7.28
Catalytic	4/20	0.30 ✓
Catalytic	4/17	1.14 ✓
Catalytic	4/16	3.34 ✓ 5.5
Catalytic	4/17	<0.1 ✓
PSE&G	4/16	2.73 ✓
Catalytic	4/17	3.04 ✓
PSE&G	4/17	0.67 ✓
Catalytic	4/17	<0.1 ✓
Catalytic	4/17	0.20 ✓
Rad Services Inc.	4/18	<0.1 ✓
Catalytic	4/18	0.61 ✓
Catalytic	4/18	<0.1 ✓
Catalytic	4/17	1.32 ✓
Catalytic	4/17	2.87 ✓
Catalytic	4/18	<0.1 ✓
Catalytic	4/18	4.30 ✓
Catalytic	4/17	3.90 ✓
Combustion Eng,	4/17	0.20 ✓
Catalytic	4/17	2.08 ✓
PSE&G	4/17	2.14 ✓

25

34.1

4 of 7

Calculated
Assigned
MPC-Hrs

Name

SSN

Co.

Initial
WBC

Catalytic	4/18	<0.1 ✓
Catalytic	4/17	<0.1 ✓
Rad Services Inc.	4/16	4.67 ✓
Catalytic	4/15	<0.1 ✓
Catalytic	4/17	2.59
Catalytic	4/18	0.30
Rad Services Inc.	4/19	0.17
PSE&G	4/17	3.34
Catalytic	4/17	4.64
Catalytic	4/17	<0.1 ✓
Catalytic	4/17	<0.1
Combustion Eng.	4/18	<0.1
PSE&G	4/17	1.50 ✓
PSE&G	4/18	<0.1 ✓
W. tinghouse	4/17	1.10 ✓
Hydro Nuclear Ser.	4/18	1.54 ✓
Catalytic	4/16	3.28
PSE&G	4/18	<0.1 ✓
Catalytic	4/17	0.20
Catalytic	4/18	1.43
Catalytic	4/17	0.35
Catalytic	4/16	1.67
Catalytic	4/18	3.65
Catalytic	4/17	<0.1 ✓
Catalytic	4/17	3.48 ✓
Catalytic	4/17	0.79 ✓

Name

SSN

Co.

547

Initial
WBC

Calculated
Assigned
MPC-Hrs.

Catalytic	4/17	██████	✓
Catalytic	4/16	2.92	✓
Catalytic	4/18	██████	✓
Catalytic	4/17	2.65	✓
Catalytic	4/17	4.16	
Hydro Nuclear Ser.	4/17	2.67	✓
Catalytic	4/17	.2	✓
Catalytic	4/17	.3	
PSE&G	4/17	.93	✓
Catalytic	4/17	<0.1	✓
Catalytic	4/17	.2	✓
Catalytic	4/17	1.19	
Catalytic	4/19	1.03	✓
Catalytic	4/17	<0.1	
Catalytic	4/17	1.84	✓
Catalytic	4/19	1.5	✓
Catalytic	4/15	11.5 9.29	✓
Catalytic	4/16	12.25	✓
Catalytic	4/15	1.65	✓
PSE&G	4/18	1.84	✓
Catalytic	4/18	1.7	✓
Combustion Eng.	4/18	1	✓
Hydro Nuclear Ser.	4/16	24.3	
Catalytic	4/17	<0.1	✓
Westinghouse	4/16	<0.1	5.9
Rad Services Inc.	4/16	4.15	✓
Westinghouse	4/16	2.78	✓
PSE&G	4/17	.9	✓
Catalytic	4/17	.2	
PSE&G	4/17	1.5	✓
Catalytic	4/19	<0.1	✓
Catalytic	4/16	██████	✓

(2)

21

++

54.1 3

Name

SSN

Co.

Initial
WBC

Calculated
Assigned
MPC-Hrs.

6/17

Catalytic	4/17	<2 ✓
Catalytic	4/17	✓ [REDACTED]
Rad Services Inc.	4/19	2.57 ✓
Rad Services Inc.	4/18	.26 ✓
PSE&G	4/18	2.76 ✓
PSE&G	4/17	1.35 ✓
Rad Services Inc.	4/17	.54 ✓
Catalytic	4/17	<0.1 ✓
Catalytic	4/17	3.04 ✓
Catalytic	4/18	1.64 ✓
Rad Services Inc.	4/18	1.8 ✓
Rad Services Inc.	4/18	<0.1 ✓
Catalytic	4/16	✓ [REDACTED]
Catalytic	4/17	.37 ✓
Traid		.36 ✓
Catalytic	4/17	✓ [REDACTED]
Catalytic	4/17	1.14 ✓
Catalytic	4/17	2.76 ✓
Catalytic	4/17	3.11 ✓
Catalytic	4/18	✓ [REDACTED]
Catalytic	4/17	.61 ✓
Catalytic	4/17	1.1 ✓
Catalytic	4/17	.2 ✓
Wisco	4/17	1.1 ✓
Rad Services Inc.	4/17	✓ [REDACTED]
Catalytic	4/17	1.1 ✓
Catalytic	4/17	<0.1 ✓
Rad Services Inc.	4/18	2.31 ✓
Catalytic	4/17	.2 ✓
Hydro Nuclear Ser.	4/16	1.04 ✓
Catalytic	4/17	.2 ✓
Catalytic	4/17	1.06 ✓
Catalytic	4/17	1.54 ✓
Catalytic	4/18	3.62 ✓
Catalytic	4/17	1.12 ✓

27 120

34.1

Name	SS	Co.	Initial WBC	Calculated Assigned MPC-Hrs.
		Catalytic	4/17	.73 ✓
		HAP	4/17	4.3 ✓
		Catalytic	4/16	3.02 ✓
		Catalytic	4/17	3.45 ✓
		Catalytic	4/18	.79 ✓
		Catalytic	4/17	1.84 ✓
		Catalytic	4/19	1.8 ✓
		Rad Services Inc.	4/19	.92 ✓
		Catalytic	4/18	3.5 ✓
		HAP	4/17	4.1 ✓
		PSE&G	4/17	1.5 ✓
		Catalytic	4/16	✓ 10.73 ✓
		Catalytic	4/17	.37 ✓
		Catalytic	4/17	<0.1 ✓
		PSE&G	4/18	<0.1 ✓
		Rad Services Inc.	4/19	.43 ✓
		Catalytic	4/17	<0.1 ✓
		Bartlett	4/17	.9 ✓
		Catalytic	4/16	.2 ✓
		Catalytic	4/18	1.8 ✓
		Catalytic	4/18	4.73 ✓
		Catalytic	4/17	1.2 ✓
		Catalytic	4/17	<0.1 ✓
		Catalytic	4/17	
		Rad Services Inc.	4/17	.46 ✓
		Catalytic	4/18	4.31 ✓
		Catalytic	4/17	.46 ✓
		Catalytic	4/18	.2 ✓
		Catalytic	4/18	.2 ✓
		Catalytic	4/18	.2 ✓
		Westinghouse	4/17	1.25 ✓
		Catalytic	4/17	
		Westinghouse	4/15	3.14 ✓
		Catalytic	4/17	
		Catalytic	4/17	

707

3

26

42.1

(1)

Whole Body Count
DATA

Calculated
Assigned
MPC-Hrs.

<u>Name</u>	<u>SSN</u>	<u>Co.</u>	<u>Initial WBC</u>	
		Catalytic	4/17	[8.28] [4.64]
		Catalytic	4/16	
		Catalytic	4/17	4.64
		Catalytic	4/16	8.42
		Catalytic	4/18	9.12
		Catalytic	4/15	11.5
		Catalytic	4/16	12.25

* UNKNOWN which is correct

5/12/52 - Requester agreed to deletion B.C.

App. A-1

to: Ron Nimitz

4 pages text

fr: R. SUMMERS

MPC - HOUR ASSIGNMENTS FOR INDIVIDUALS
INTERNALLY CONTAMINATED ON APRIL 16, 1983

<u>Individuals Name</u>	<u>MPC - hrs based on Stay - time and Air Samples</u>	<u>MPC - based on Whole Body Counts</u>
1.	24.3	43.0
2.	1.0	29.5
3.	38.2	25.5
4.	11.5	22.9
5.	0.6	21.7
6.	2.3	17.9
7.	21.7	14.5
8.	4.6	10.4
9.	<0.1	6.5
10.	12.3	2.6
11.	1.2	2.2

MPC - HOUR ASSIGNMENT METHODS

The two methods of assigning MPC - hrs to the dose records of internally contaminated individuals are described below:

A. Stay - Time Method

This method is included in the Radiation Protection Procedure Number RP11.011. The formula used is as follows:

$$\text{MPC - hours} = \frac{\text{Time spent* in the area} \times \frac{\text{airborne activity**}}{\text{MPC}}}{\text{Protection fraction for respiratory equipment}}$$

* The time spent in the area is obtained from the appropriate REP Sign-in Sheet.

** After Geli analysis a "percent MPC" number is included on the printout. This number is calculated by dividing MPC values into each respective radionuclide activity and summing to give a total "percent MPC".

04 B.S.
S.W.

B. Whole Body Count Method

This method is based on assumptions given in ICRP2 and ANSI - N343. The formula used and the assumptions made are given below.

$$\text{MPC - hours} = \frac{\mu\text{Ci} (1.25\text{E}6 \text{ cc/hr} \times 0.125)}{(\mu\text{Ci/cc per MPC})}$$

- This calculation is repeated for each radionuclide with the results summed to give an MPC hour assignment.
- 1.25E6 is the standard working breathing rate.
- 0.125 is based on the assumption that 12.5 percent of the radioactive particles inhaled are left in the lungs after 24 hours.
- The μCi number is obtained from whole body count data on the lung burden, approximately 24 hours after the initial exposure.

222B 16 APR Co-58 L 0.0224 ± 0.0017

0015 17 APR Co-58 L 0.0111 ± 0.0013
T 0.0270 ± 0.0018

0112 17 APR Co-58 L 0.0161 ± 0.0098
T 0.0197 ± 0.0016

1456 17 APR Co-58 L 0.0151 ± 0.0015
T 0.0214 ± 0.0019

0758 19 APR Co-58 L 0.0137 ± 0.0014
T 0.0366 ± 0.0022

Co-60 L 0.0098 ± 0.0012

Co-57 T 0.0052 ± 0.0075

7906 18 APR Co-58 L 0.0124 ± 0.0012

0806 21 APR Co-58 L 0.0121 ± 0.0011

2215	16 APR	Co-58	L	0.0421 ± 0.0021
			T	0.0905 ± 0.0029
2353	16 APR	Co-58	L	0.0386 ± 0.0019
			T	0.1005 ± 0.0034
0100	16 APR	Co-58	L	0.0542 ± 0.0021
			T	0.0889 ± 0.0030
0201	17 APR	Co-58	L	0.0455 ± 0.0020
			T	0.0619 ± 0.0056
		Co-60	L	0.0226 ± 0.0013
0322	17 APR	Co-58	L	0.0558 ± 0.0022
			T	0.0691 ± 0.0027
1505	17 APR	Co-58	L	0.0534 ± 0.0023
			T	0.0779 ± 0.0028
1010	18 APR	Co-58	L	0.0517 ± 0.0021
			T	0.0368 ± 0.0025
0854	19 APR	Co-58	L	0.0631 ± 0.0023
			T	0.0252 ± 0.0021
		Co-60	L	0.0260 ± 0.0015
0957	21 APR	Co-58	L	0.0513 ± 0.0021
			T	0.0204 ± 0.0019

2127	16 APR	Co-58	L	0.0328	± 0.0018
			T	0.1039	± 0.0032
2330	16 APR	Co-58	L	0.0346	± 0.0019
			T	0.0761	± 0.0041
0048	17 APR	Co-58	L	0.0302	± 0.0018
			T	0.0637	± 0.0032
		Co-60	T	0.0121	± 0.0014
0124	17 APR	Co-57	T	0.0138	± 0.0064
			Co-58	L	0.0267
			T	0.0747	± 0.0029
1809	17 APR	Co-58	L	0.0199	± 0.0016
			T	0.0649	± 0.0026
0954	18 APR	Co-58	L	0.0256	± 0.0015
			T	0.0150	± 0.0016

1119 17 APR Co-58 L 0.0201 ± 0.0012
T 0.0765 ± 0.0017

Co-60 L 0.0101 ± 0.0089
T 0.0361 ± 0.0011

1518 17 APR Co-58 L 0.0220 ± 0.0017
T 0.0948 ± 0.0031

0815 18 APR Co-58 L 0.0144 ± 0.0013
T 0.0242 ± 0.0017

Co-60 L 0.0157 ± 0.0012

0824 21 Apr Co-58 L 0.0144 ± 0.0015

UNITED STATES OF AMERICA
 DEPARTMENT OF ENERGY
 WASHINGTON, D.C. 20545
 TERMINATION REPORT - DATE 6/20/83

SSN: [REDACTED]
 BIRTH DATE: [REDACTED]

COMPANY: CATALYTIC TRADER
 1500 MARKET STREET
 PHILADELPHIA PA 19102

SUBJECT: RADIATION EXPOSURE REPORT

PLEASE BE ADVISED THAT DURING THE FOLLOWING WORK PERIODS,
 YOU RECEIVED EXPOSURE TO IONIZING RADIATION AS MEASURED
 BY THERMOLUMINESCENT DOSEMETER AS INDICATED BELOW:

ALL OCCURRED/RECEIVED AT SALEM NUCLEAR GENERATING STATION

	WHOLE BODY MREM	SKIN MREM	EXTREMITY MREM	EXTREMITY MREM
CURRENT VISIT 6/15/83 TO 6/20/83	610	777	0	610
2ND QUARTER 1983 TO DATE 07/1/83 TO 6/20/83	266	400	0	266
1983 YEAR-TO-DATE 1/1/83 TO 6/20/83	346	600	0	400
TOTAL FOR RECORDED PERIOD 1/1/83 TO 6/20/83	717	866	0	717

ASSAY RESULTS ATTACHED YES

>> THIS REPORT IS FURNISHED TO YOU UNDER THE PROVISIONS OF THE
 >> NUCLEAR REGULATORY COMMISSION, REGULATIONS TO CFR PART 19. <<

YOU SHOULD PRESERVE THIS REPORT FOR FURTHER REFERENCE

CC: DIRECTOR OF MANAGEMENT AND PROGRAM ANALYSIS
 U.S. NUCLEAR REGULATORY COMMISSION
 WASHINGTON, D.C. 20555

[Signature]
 E. S. JOHNSON
 TECHNICAL SUPERVISOR - DOSEMETER
 RADIATION PROTECTION

B-10

1983 7

TERMINATION REPORT - DATE 6/7/85

SSN: [REDACTED]
BIRTH DATE: [REDACTED]

NAME: [REDACTED]

COMPANY: CATALYTIC TRADES
1500 MARKET STREET
PHILADELPHIA PA 19102

SUBJECT: RADIATION EXPOSURE REPORT

PLEASE BE ADVISED THAT DURING THE FOLLOWING PERIODS YOU RECEIVED EXPOSURE TO IONIZING RADIATION AS MEASURED BY THERMOLUMINESCENT DOSIMETRY AS INDICATED BELOW:

RECORDED/RECEIVED AT SALEM NUCLEAR GENERATING STATION

	WHOLE BODY MREM	SKIN MREM	NEUTRON MREM	EXTREMITY MREM
CURRENT VISIT 11/7/82 TO 07/7/85	429	1094	0	439
2ND QUARTER 1985 TO DATE 07/1/85 TO 07/7/85	268	853	0	268
1985 YEAR-TO-DATE 11/1/85 TO 07/7/85	688	1955	0	688
TOTAL FOR ALL WORK PERIODS 11/07/82 TO 07/7/85	1217	3847	0	1237

DIAGNOSTIC RESULTS ATTACHED YES

>> THIS REPORT IS FURNISHED TO YOU UNDER THE PROVISIONS OF THE NUCLEAR REGULATORY COMMISSION, REGULATION 10 CFR PART 19.

YOU SHOULD PRESERVE THIS REPORT FOR FURTHER REFERENCE.

CCS DIRECTOR OF MANAGEMENT AND PROGRAM ANALYSIS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

Al Jones
AL JONES
TECHNICAL SUPERVISOR - DOSIMETRY
RADIATION PROTECTION

11/85

SAL NUCLEAR GENERATING STATION
P.O. BOX 212
MANEQUAS BRIDGE, NEW JERSEY 07055

TERMINATION REPORT - DATE 5/10/83

SSN:
BIRTH DATE:

NAME:

COMPANY: CATALYTIC TRADES
1500 MARKET STREET
PHILADELPHIA PA 19102

SUBJECT: RADIATION EXPOSURE REPORT

PLEASE BE ADVISED THAT DURING THE FOLLOWING WORK PERIODS,
YOU RECEIVED EXPOSURE TO IONIZING RADIATION AS MEASURED
BY THERMOLUMINESCENT DOSIMETRY AS INDICATED BELOW:

** RECORDED/RECEIVED - SAL NUCLEAR GENERATING STATION

	SHOULDER MREM	SAFETY MREM	EXTREMITY MREM	EXTREMITY MREM
LOCAL VISIT 2/1/83 TO 5/15/83	207	207	0	207
2nd QUARTER 1985 TO DATE 4/1/85 TO 5/10/85	214	214	0	214
1985 YEAR-TO-DATE 1/1/85 TO 5/15/85	267	267	0	267
TOTAL FOR RECORDED PERIOD 1/1/83 TO 5/15/85	671	671	0	671

ADJUDICATORY RESULTS ATTACHED

YES

NO

>> THIS REPORT IS FURNISHED TO YOU UNDER THE PROVISIONS OF THE NUCLEAR REGULATORY COMMISSION, REGULATION 10 CFR PART 19. <<

** YOU SHOULD PRESERVE THIS REPORT FOR FURTHER REFERENCE **

CC: DIRECTOR OF MANAGEMENT AND PROGRAM ANALYSIS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

Handwritten Signature
TECHNICAL SUPERVISOR - DOSIMETRY
RADIATION PROTECTION

SALEM NUCLEAR GENERATING STATION
 4840 LEAS DRIVE, SALEM, MISSOURI
 TERMINATION REPORT - DATE 5/15/85

SS#: [REDACTED]
 BIRTH DATE: [REDACTED]

FIR: [REDACTED]

COMPANY: CATALYTIC TRADES
 1500 MARKET STREET
 PHILADELPHIA PA 19102

SUBJECT: RADIATION EXPOSURE REPORT

PLEASE BE ADVISED THAT DURING THE FOLLOWING WORK PERIODS, YOU RECEIVED EXPOSURE TO IONIZING RADIATION AS MEASURED BY THERMOLUMINESCENT DOSIMETRY AS INDICATED BELOW:

** RECORDED/RECEIVED AT SALEM NUCLEAR GENERATING STATION **

	WHOLE BODY MREM	SKIN MREM	NEUTRON MREM	EXTREMITY MREM
CURRENT VISIT 2/25/85 TO 5/15/85	45	40	0	45
2ND QUARTER 1985 (3) DATE 4/1/85 TO 5/15/85	35	65	0	35
1985 YEAR-TO-DATE 1/1/85 TO 5/15/85	40	40	0	45
TOTAL FOR RECORDED PERIOD 2/25/85 TO 5/15/85	45	40	0	45

DIAGNOSIS RESULTS ATTACHED: YES

>> THIS REPORT IS FURNISHED TO YOU UNDER THE PROVISIONS OF THE NUCLEAR REGULATORY COMMISSION, REGULATION 10 CFR PART 19. <<

** YOU SHOULD PRESERVE THIS REPORT FOR FURTHER REFERENCE **

CC: DIRECTOR OF MANAGEMENT AND PROGRAM ANALYSIS
 U.S. NUCLEAR REGULATORY COMMISSION
 WASHINGTON, D.C. 20555

Candy Mertes
 by A.S. DUREX
 TECHNICAL SUPERVISOR - DOSIMETRY
 RADIATION PROTECTION

13
 4

SAMPLE @ 2CFM

As per telecon with
Teledyne Isotopes - 5-20-83

Sample # from EL 104 - (40 mrad/filter)

- No Sample Number -

Gross Alpha $< 1E-5$ μCi per filter (both)

$\therefore < 1.08E-12$ $\mu Ci/cc$

RAN FROM 1035-1715 HOURS - ASSUME 1450-1715 hours

Activity/filter (μCi)

Activity ~~per~~ Concentration (μCi)

ISOTOPE

Pu-238	$< 9E-5$	$< 3.7E-12$
Pu-239, 240	$< 2E-5$	$< 2.2E-12$
Pu-241	$< 1E-5$	$< 1.2E-12$
Am-241	$< 1E-5$	$< 1.2E-12$
Cm-242	$< 1E-5$	$< 1.2E-12$
Cm-244	$< 1E-5$	$< 1.2E-12$
U-234	$< 3.7E-6$	$< 3.7E-13$
U-235	$< 1E-6$	$< 1.2E-13$
U-238	$< 1E-6$	$< 1.2E-13$

(800 mRad/filter) EL 931 -

RAN: 1213-1700
SAMPLE # 12332 - ASSUME 1450-1700

Pu-238	$< 3E-5$	$< 4.1E-12$
Pu-239, 240	$< 1E-5$	$< 1.4E-12$
Pu-241	$< 1E-5$	$< 1.4E-12$
Am-241	$6.2 \pm 2.0E-5$	$8.38 \pm 2.7E-12$
Cm-242	$< 1E-6$	$< 1.4E-13$
Cm-244	$< 1E-5$	$< 1.4E-12$
U-234	$< 1E-6$	$< 1.4E-13$
U-235	$< 1E-6$	$< 1.4E-13$
U-238	$< 1E-6$	$< 1.4E-13$

8/14
9

- 1.
- 2.
- 3. P
- 4. C

1350

Called + stated that he remembers the HPS removed his W.B. TLD on 81 EL. He thinks he may have lost it in the containment between 81 EL and 100' EL Airlock.

- 5. Ple
- 6. Cha
- 7. Plat
- 8. Chan

1355

Q.C. to cover the S/B jump just got out of the body counter and is now able to go in the containment. He is contacting [redacted] who will accompany him to the H.P. office and the job can be set up.

- 9. Inspec
- 10. All to
- 11. Light

1500

Briefing complete extremities being issued. Going in to pull temp covers + to install diaphragms.

1530

Found [redacted] TLD in Containment Annular

C 200

1100

reports (W) equip has been removed from 22/24 SIG. Approximately 12 bags w/ doses ranging from 5-150 m1/hr.8 and 3-500 mrad/hr. The bags are now in the fuel handling building.

1150

a new A/S changeout log is to be implemented which will insure that one A/S will be pulled every hour inside the containment. The containment crew is to pull the 21/23 + 22/24 bio shield A/S when change out is due.

1200

Survey of the crows nest shows from 1.2K to 2.6K dpm/100 cm². Dose rates range from 4 to 5 mrem/hr.

1300

Called (W) again to ask about [] lost TLD. A search of the locker room for his TLD turned up an exposure limit increase authorization form for

The ~~E~~ Slot # on the jump sheet is #. A search of the racks was made and neither TLD #. or. could be found.

1. 0545 (W) Jumpers Completed Removing
 2. 1 Dam Stud in 24% L. D.C. is in to
 INSPECT BOWL, RESULTS TO FOLLOW
 P8836

0615 (W) D.C. INSPECTION OF 24% L HAS PASSED
 AND BOTH RECESS DAMS ARE OUT OF
 22-24 % L FOR 22-24% L

0616 INFORMED
 THAT (W) Jumpers TLDs ARE STILL IN
 CONT 5% DESK AND NEED TO BE FRISKED AND
 BROUGHT TO POSIMITARY

0630 CAT Q.C. STILL HAS TO DO Bowl wipe
 DOWNS FOR 22-24% L, THEN THEY WILL
 INSPECT FOR CLASS B' CLEANLINESS. 22-24
 H/L STILL HAVE TEMP NOZZEL DAMS
 IN BOWLS.

0630 T/O received from

0900 in to cover (W) Equip
 removal from 22/24 SIG Platform

0912 Whole Body TLD lost (L) (W) Search
 at TLD frisking station, walk to
 trailer, trash and break room
 TLD not found.

0920 Contacted (W) [] to see if
 [] took his TLD home []
 will call back.

tl
 3. Pl
 4. Cl

the
 5. Pl
 6. Cha

ther
 7. Plat
 E. Chan

then
 9. Inspe

10. All to
 11. Light

0920

logged in 0730

found
 1530

CONTINUED

1815 INFORMED THAT THEY DO NOT KNOW WHEN IT WAS TURNED ON. AND THAT IT WAS NOT ON @ THIS TIME.

1830 ALL PERSONEL EXITING 1/2 CONT DUE TO AIR BORNE PROBLEM.
AIR SAMPLE RESULTS TO FOLLOW

- ① 22-24 1/2 TENT 93'
OFF 416-83 1814 800 MRAD 287 min LO-VOL
- ② 21-23 1/2 81'
OFF - 1722 1.0 E-8 4-16-83 10 min HI-VOL
- ③ 1/2 CONT 22-24 1/2 PLATFORM
OFF - 1700 2.96 E-9 4-16-83 407 min LO-VOL
- ④ 1/2 CONT 21-23 1/2 81' ELEV
OFF - 1500 - 1.39 E-10 4-16-83 930 min HI-VOL
- ⑤ 1/2 CONT 23 1/2 TENT COOL LEG 93' ELEV 4-16-83 5 min HI-VOL
OFF - 1.50 E-8
- ⑥ 1/2 CONT 22-24 1/2 PLATFORM 93' ELEV
OFF 2000 4-16-83 5.28 E-9 LO-VOL 158 min
- ⑦ 1/2 CONT 22-24 1/2 PLATFORM 93' ELEV 4-16-83 HI-VOL 5 min
OFF - 2020 1.78 E-9
- ⑧ 1/2 CONT 22 1/2 TENT HOT LEG 93' ELEV HI-VOL 5 min
OFF 2007 - 5.07 E-9
- ⑨ 1/2 CONT @ H.P. DESK 81' ELEV 21-23 1/2
OFF - 0031 4-17-83 HI-VOL 12 min 5.07 E-11
- ⑩ 1/2 CONT 22-24 1/2 93' ELEV
OFF - 0242 4-17-83 2.4 E-10 6 min HI-VOL
- ⑪ 1/2 CONT 22-24 1/2 81' ELEV DIAGRAM CLEANING VAT
OFF - 0335 4-17-83 1.3 E-10 6 min HI-VOL

0230 (W) WAS INFORMED THAT 1/2'S AND RAD'S SMEAR SURVEYS SHOWED THAT AREA WAS CLEAN ENOUGH TO START JUMPING 24 1/2. THEY ARE NOW GETTING READY.

- 1. i
- 2. i
- 3. Pl
- 4. Ch

if insp. sat, Cat ~~at~~ B.M. will pull needed.
 and ~~inspect~~ install ~~drift~~ informed of
 the mock-up training requirement for P.S. Q.C.
 inspection. talked to P.S. Q.C. to obtain
 them of training requirements for Y6 (D's). Some time
 waiting on scheduling training.

- 5. Plat
- 6. Cha
- 7. Plat
- 8. Chen

1355 (W) on 2nd drill evolution on 22 e/L.

1450 22RCP STARTED - COMMUNICATION
 on platform impossible due to
 noise levels. Job put on hold
 temporarily.

1600 RCP SHUT DOWN. S/B JOB
 RESTARTED. 22 CL STUD + BUCKE.
 DRILL BIT ARE BOTH OUT. 24HL
 STILL NEEDS TO BE DONE

- 9. Inspe.

1700 Completed stud removal - 22 CL (W) Q.C.
 inspecting now, will do P.S. inspections on
 both bouds at 1 time, after both bound
 completed. Completed training P.S. Q.C.
 will train Igg at 1730.

- 10. All to
- 11. Light

1370 (W)

1530 [] removing Hercules from 5/6-21 Plat for
 Also removed several sections of elephant
 hose from 5/6 23. only found 1-2K dpm in

CPa

1815

[] INFORMED US THAT FRIDAY
 11-15-83 THAT [] CONTACTED U/2
 CONTROL ROOM TO TURN ON IRU VENTILATION
 [] CONTACTED U/2 CONTROL -
 ROOM @ 1815 TO ASK WHEN IRU VENTILATION
 WAS TURNED ON, CONTROL ROOM OPERATOR

Generator log

000

(4925)

4-16-83

DAYS

0600 REVIEWED LOG & RELIEVED NIGHT SHIFT, NO ONE IN CTMT NEEDING RELIEF.

0755 RECEIVED CALL FROM [unclear], HE WILL NOT BE READY TO START UNTIL 0900, HE HAS TO GET HIS EQUIP TOGETHER.

0845 called, he will not be in today, but will be in tomorrow.

0900 Job held up because [unclear] JOSE IS NOT RECORDED CORRECTLY & AT HOME. HAD TO BE CALLED

0945 Received TLD, Holding Jump Briefing now - Brief completed @ 1005, men dressing up for entry.

1130 P.S. requested P.S. Q.C. be on the platform + [unclear] Q.C. be on the platform for entire evolution. No P.S. Q.C. has been mock-up trained, [unclear] package does not require [unclear] Q.C. to be on the platform, since the S.O.C. of [unclear] packages provides for a site Q.C. inspection of bowls for thread inspection + grade B bowl inspection. contacted, he said NO-ONE over to site platform without mock-up training. investigating Q.C. requirements.

1100 P.S. gives final word on [unclear] package Q.C. inspections. [unclear] Q.C. will inspect for thread damage and loose chips and debris, P.S. Q.C. will inspect for grade B cleanliness, with them Cat Q.C. B.M. will jump for bowl wipe down, P.S. Q.C. will inspect for grade B cleanliness, Cat Q.C. will inspect for final grade B cleanliness.

38

4.15.83

REP 0500

1100 BRIEFING HELD W/

ON DRILL SEQUENCE & OTHER JOB RELATED PROBLEMS. HE WILL BE MOVING EQUIP. IN THIS AFTERNOON & MAKING PREP FOR JOB START IN THE MORNINGS.

IN CONVERSATION W/

TEARING DOWN OF PLT. TENTS, PHONE BOOTH & REMAINS OF THE DELMONOX UNIT CAN NOT BE SUPPORTED AT THIS TIME BECAUSE OF OTHER PRIORITY JOBS, NOTIFIED.

1340 Cat safety contacted about snift test for jumping 22+24, they said snift test not required.

1445 Completed brief with Cat h.m.'s + H.P.'s for re-estab tool control + installing Lightbright done on 22+24 s/g's Hot legs.

1445 Cat on the way in for above evolutions.

1515 22+24 s/g evolution complete & 22+24 1 1/2's have & temp. nozzle covers installed, utilities hooked up, temp. w/p come off 22+24 s/g's both legs of each s/g Q.C. inspected Tool Control established for 22+24 s/g's requested remove dog out on 22 IRU.

1645 1655 remove from 22 IRU, 22 IRU started.

220

0130

Called in Walter
problems, will be late.

0200

Inspected ACP, PSTN (shit), containment crew, that
anyone contained after initial SATURDAY is required
to have a WBC or MAC calculated prior to
entry into containment. Per!
Informed CAT supervisor [], who will instruct
all CAT supervisor of requirements

0230

[] called, shit, will be in = 12.0 if better

0300

Inspected RCOT Hermitz cover, it is
still firmly in place

0330

Setting up support @ to moving equipment to FHB.

0345

Checked Cat Log

evacuated Bioshield @ 1745 4-16-83

evacuated containment @ 1822 4-16-83

1100

Performed Smer surveys in Bioshield, ^{50cm} ~~at~~ Smer
> 20k (42k+48k) _{10pm} between 22 1/6 + 22 ACP
(1A-50k = 22 ACP + 1 smer @ 96k dpm)

1000

Called control Room - Ventilation check

21+22 IRU's running, 22 FCU running

2210 of Maint was notified that crew from 22 LCP must be brought in at 0830 Sunday for whole body counts.

2215 Outage Coord. is calling to request Maint. 22 LCP crew be called back to site for whole body counts, after another phone conversation with

2320 - Access to $\frac{1}{2}$ Cont. w/ exception of the bioshield was restored. Cat., NCS all notified.

4/17/83

0006 - Contacted & briefed him on the situation.

0200 - Access to the Bioshield $\frac{1}{2}$ CTMT is restored.

0430 - The $\frac{1}{4}$ barrels for the $\frac{3}{4}$ diagrams on the *22 $\frac{3}{4}$ side are full of water.

0445 - called, will not be in.

0455 - will not be in.

0535 - will not be in.

0550 - will not be in.

0605 - just woke up, he will be in.

0615 - just woke up, he will be in.

2045 Water level in Sul transfer Canal is being checked. Level is 6-12 inches.

2055 HNS whole body counter activated.

2110

called and updated.

2115 One man from Cat. crew working on NEPA hose cut-up job was body counted satisfactorily. The rest of crew members have been released by H.P. The men still want whole body counts anyway and are being sent to HNS whole body counter.

2120 Geli is back in operation.

2130 11 RHR has from 1.5 to 3 feet of water.
~~HNS is going to pump water out!~~

2155

called in and was advised of situation. He advised it was correct and give his approval to call maint. crew work in CTMT back to site for whole body counts tonight.

2205

called back and advised that maint. crew is not to be recalled tonight, but are to be brought in a. 0830 Sunday for whole body counts.

2000 Reviewed procedures to make sure all requirements are being met.

Ref # 1.006

Ref # 1 RPI 6,009 - Respiratory Protective Equip., Selection, Use, Return, and Nasal Smear.

Ref # 3 RPI 3.027 - whole Body Counting Frequency and Action Levels.

Ref # 4 RPI 7.008 - Calculating Airborne Particulate

Ref # 2 RPI 3.034 - Determination of Skin Dose Resulting from Skin Contamination.

2005 4/2 Shift Supervisor notified of status for 100' and 130' Airlocks. Also asked for list of any Operations personnel in Containment 1450 to 1825.

2030 Still trying to contact [redacted]

2030 [redacted] called in and was briefed of situation and steps taken. He indicated satisfaction and will call back in an hour to hour and a half for update.

2035 Verified flow on ILL into A/S bowl. Flow is directionally correct.

2040 130' Airlock is now secure

2040 PSE:G whole ^{Cell} body counter is locked up and they are trying to correct problem.

1930 22 FCU is the only unit available for operation per

^{date} Entry - 1915 H.N.S. calling in Whole Body Counter operator).

1935 Cat. notified Containment is secured.
Called

1930 Beeped

1940 Unable to secure 130' Airlock due to Skw hose running through airlock. ^{investigating}
hose removal.

1945 100' Airlock will not open. (Internal Dca)

^{date} Entry 1915 Tour of 42 Cup Bldg. check of AM's and EM's. All levels operating in normal range (200 cts or less) per.

^{date} Entry 1900 Cat., H.N.S. ~~Appoint~~ all notified to have a list of workers who were in containment during airborne problem completed. Those still on site are being sent to N.P. for nasal smears and whole body counts as needed.

^{date} Entry 1900 Trying to contact Maint. supervisor for list of personnel who may have been in cont.

1810 Contacted [redacted] to have personnel who were covering 5/6 22/24 side to all obtain nasal smears, + WDC if necessary.

1815 ACP will obtain nasal smears from all personnel who worked containment / NOTE - they sent them to ENTRY

1825 Notified containment being evacuated.

Act. on 1825 may include to include 130 outside.

1825 Evacuating 1/2 Containment, shutting Airlock doors 120' + 130', starting 22 FCU, Taking H.V. 120' SPP, 120' Ave. Moving Guards down from outside 130' Airlock

1830 Called [redacted] and informed him of situation.

1835 Two major evaluations were taking place in bio shield this afternoon, June 22 5/6 colds and 22 ACP run test

1840 Called 1/2 control Room 22 IRU is not running, nothing in their log to determine when it was turned on/off since cleared tonight Friday.

1900 VOH Security notified to send all guards on 120' + 130' airlock to obtain nasal smears prior to going home. A list of names will be provided to us

1905 [redacted] not home

1910 [redacted] will organize a party to enter 1/2 Containment to take a series of H.V. air samples

1900 - 22 IRU started

Late entry - in charge of count room

1815
1825
1835

1835

1905

inter

1240 Called [redacted], informed him of Trj requirements,
also T.H. Ivers that H.P. could support making
Trj. today at PS QA - O/C convenience.

1430 22 RCP motor has been started, ^{no notification} uncoupled from
pump, noise level on s/c platform above,
jumping is too loud for communications. Called
42 control room + requested they shut it off, they
went until I contact [redacted] + got his
approval, called planning + requested RCP be shut off,
called [redacted], not in line

Also - Fitters started grinding on scaffold area
near platform. H.P.s + (W) cannot communicate
on platform.

1515 * Stopped grinding, welding, + hammering + 22 RCP
during s/c jumping, called [redacted]

1600 Secured 22 RCP - Test complete

1645 [redacted] called in sick

1645 Relieved PS H.P.s on 120', casing & Head work in
progress, FCU's, and s/c secondary manway.

1705 informed by [redacted] several people
coming out of containment are contaminated,
they were working 22/24 side bioshield, RCPs + s/c
Assigned 4 H.P.s to document, investigating +
Decontamination Personnel, Surveying 22 RCP
area + bioshield

1730 [redacted] called, will be in at 1930

1745 Evacuated Bioshield, ^{LATE ENTRY} [redacted] 180Kdpm on H.V. sample with Frister

1800 N 8 Air in bioshield, N 9 air by Accumulator

- 0840 Increasing water level in Fuel xfer canal to reduce cavity closer to, no draining planned @ this time.
- 0850 checked with APLP - running smooth - "no" last TLO!!!
- 0910 AT 0830 it was noticed the only operating Alpha counter (SACM) has a broken O ring in the slide tray causing a light leak. Duration of light leak unknown, sometime after 1800 Friday 15th
- 0930 CAT Labors cleaning up heretofore on cont. sump area. Then they will start demul. of 2/23 s/c platform
- 0940 Cont H.P. requested HNS wipe up water on 22RCP area - too wet to allow work, informed HNS.
- 1000 Late entry - ☺ called. will not start s/c till 0940.
 @ 0915 discussed exposure record problem with ☺
 Engineer who is required for job to start. Resolved exposure record - issued TLO @ 0945. Held Job brief @ 0945 to 1005, went to cont. Took equipment to platform - set up, Prepared for jumping equipment @ 10:00
 requested PS GC jump s/c for Grade B, NO PS GC personal attended mock up try. Called to check package on GC closeout requirements
 Part 5.8.6 page 22 of 31 requires "Acceptance O/C" perform s/c closeout.
- 1220 Called He informed me that a new page (#5) was added to the ☺ package for drilling out the studs in 22/24 s/c cold legs. has required that P.S. GC must inspect 22/24 s/c for grade B cleanliness after the drilling operation. this page was added to the package yesterday, 4-15-83

218

Supernova

Saturday

16 Apr 83

0055 - WHOLE OPEN - DRAINING TANKS EQUAL.

0115 - STOPPED DRAINING XFR-CANAL. NO WATER
RETREATING. HAVE IDENTIFIED SMALL
METAL "FILINGS" → ISO R/HR CONTACT.

0500 - PROBLEMS w/ CONT. SUMP PUMPS, HOLDING ON
XFR-CANAL DECEN.

0500 - | _____ | CALLED. - WILL BE IN @ 1200.

0522 - | _____ | CALLED. - SICK.

0600 - T/O TO

0700 TALKED WITH (ALARA COORD.) ABOUT
SHIELDING, 1R/HR RTD LINE UNDER PLT. WHERE OIL
PAN WORK IS TO BE DONE, HE SAID HE WILL BE SHIELDING
THIS WHEN CAT CARPENTERS & LABORERS COME IN AT
0800.

0730 XFR CANAL DRAINING HAS BEEN PUT ON HOLD BY
BECAUSE ^{CONTAINMENT} CAUTION SUMP IS BACKED UP, THE
PUMPS ARE NOT PUMPING.

0755 RECEIVED CALL FROM . THEY WILL BE OVER
ABOUT 0900 AFTER THEY GET THEIR EQUIP TOGETHER.

0825 INFORMED ME THAT NIGHT SHIFT
CARPENTERS LEFT SCAFFOLDING IN DOOR WAY OF 130"
14R CAT CALLED, HE WILL HAVE LABORERS
REMOVE IT IMMEDIATELY.

0830 T/O TO
0835

called - will not be in, medical

Radiation Protection Dept PSEG Salem Units 1 and 2

DATE 4-11-85

00-0800	08-1600	16-2400																																																												
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Time	Description	Initials
<u>0607</u> 	<u>What a Night!</u> <u>4/17</u> <u>U/1 U/2 - Aux Routine Surveys</u> <u>not complete!</u>	

B-11

Counting - All H.P.s. CAT, PSE+G

Workers who were in Cont at time

Date
4-1683

WBC -

Time		Initials
1900	Called in Bio-shield - Told of Incident - Suggested looking into E.P.s -	
1915	- Hot Air Samples 800 MRAD FROM - 22S/G 40 MRAD FROM - 22RCP in Source Locker DO NOT REMOVE	
2000	Contact HNS for assistance with Whole Body Count. Containment is Now Posted as "Airborne Activity."	
2100	Both Iodine Removal Units running 22 FCU has been running since	
2130	1/2 RHR - 11 side / -3' @ H ₂ O. HNS. To Pump water to 64 AUX Drain	
2300	1/2 Cont Integrity Broken, Air Samples - showing 130' .5.1 E ⁻¹⁰ CAVITY HNS 7E ⁻¹⁰ 100' - 1. E ⁻¹⁰ @ 2224 78'	
	HNS. To Decon BioShield 22RCP H.P. Doing Extensive Surveys of all areas - Notified.	

C

Pg ___ of ___

Reviewed by _____ Date _____

List of Events

Time		Initials
0.1545	<p>U/2 Cont Bio-shield. 22 RCP ←</p>	
	<p>While working on Top of Motor Saw Vibration Test - U/2 Controll Pm. bumped on Motor kicking up Air-borne Contamination - Worker had no respirator - See WBC-Surveys.</p>	
<p>height was - was d/m</p>	<p>Next came 4 H.N.S. workers who were in the vicinity of the Motor. They also became contaminated. See WBC-Personnel Survey Sheets.</p>	
	<p>After these workers - We began to realize that there must be a potential Airborne problem. H.V. Air Samples were started at various locations.</p>	
1600	<p>Contact H.P. U/2 Cont checking last</p>	
1630	<p>Surveys on 22 RCP - Results < 3000. High Vols being taken</p>	
	<p>Because of 22 RCP motor being tested - Conditions surrounding Areas - Bio - all elevation - 100 - 150' changing Conditions - have occurred</p>	
C	<p>Air Samples — Following Page</p>	

PSE and G Salem Units 1 and 2

DATE 4/15/83

00-0800	08-1600	16-2400																																																																					
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Time	Description	Initials
<u>0030</u>	<u>Drawing transfer canal 4/2 - no noticeable</u> <u>loss water on pipes</u>	
	<u>- lost his TLD in Locker Room</u>	
	<u>Possibly stolen</u>	
<u>0510</u>	<u>We found it, we found it!</u>	
<u>0700</u>	<u>checked by</u>	
<u>0835</u>	<u>1/2 Containment - I=C working on the safety injection valves</u> <u>starts from the containment sump start case until maintenance (P)</u> <u>enters to repair the sump in which case I=C will have to stop.</u>	
<u>1500</u>	<u>RELIEVED</u>	
<u>1523</u>		

Fig. 1 of _____

Reviewed by _____ Date _____



(1)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

AUG 28 1984

Docket No. 50-10
Docket No. 50-237
Docket No. 50-249

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

Enclosed for your review, prior to our scheduled meeting of September 17, 1984, is the SALP Board Report for the Dresden Nuclear Power Station, covering the period January 1, 1983 through May 31, 1984.

Overall, we find that your performance of licensed activities generally is acceptable and directed toward safe facility operation. Notwithstanding, we believe Dresden Station is capable of a stronger regulatory performance, particularly in the areas of radiological controls and maintenance. While these latter two categories might well be rated as a low Category 2, as recommended, by the SALP Board, I have rated them as Category 3 with the hope and expectation that increased NRC and licensee management attention will bring about considerably improved performance in the next SALP period. While good performance was demonstrated in the other functional areas, we consider the Category 1 rating in emergency preparedness a major strength.

We are encouraged by the Regulatory Improvement Program being implemented at all Commonwealth Edison Company operating reactor stations and believe this program will bring about an overall improvement in operations and regulatory performance.

While you will have sufficient opportunity to present your comments at the meeting on September 17, 1984, we also solicit written comments within 30 days after the meeting to enable us to thoroughly evaluate your comments and provide you with our conclusions relative to them.

In accordance with Section 2.790 of the NRC's "Rules of Practice" Part 2, Title 10, Code of Federal Regulations, a copy of this letter, the SALP Report will be placed in the NRC's Public Document Room.

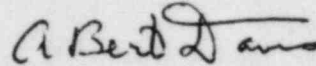
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If you have any question concerning the SALP Report we will be happy to discuss them with you.

Sincerely,



for James G. Keppler
Regional Administrator

Enclosures: SALP Board Report
No. 50-10/84-06; 50-237/84-08; 50-249/84-07

cc w/encls:

D. L. Farrar, Director
of Nuclear Licensing
D. J. Scott, Station
Superintendent
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
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General's Office, Environmental
Control Division
R. C. DeYoung, IE
H. R. Denton, NRR
INPO
Regional Administrators
RI, RII, RIV, RV
NRR Project Manager

SALP BOARD REPORT

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

50-10/84-06; 50-237/84-08; 50-249/84-07

Commonwealth Edison Company

Dresden Nuclear Power Station

January 1, 1983 through May 31, 1984

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operation.

A NRC SALP Board composed of staff members listed below, met on July 31, 1984, to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee safety performance at the Dresden Nuclear Power Station for the period January 1, 1983, through May 31, 1984.

SALP Board for Dresden Nuclear Power Station:

<u>Name</u>	<u>Title</u>
J. A. Hind	Director, Division of Radiation Safety and Safeguards
C. E. Norelius	Director, Division of Reactor Projects
R. L. Spessard	Director, Division of Reactor Safety
C. J. Paperiello	Chief, Emergency Preparedness and Radiological Protection Branch
N. J. Chrissotimos	Chief, Reactor Projects Section 2C
L. R. Greger	Chief, Facilities Radiation Protection Section
M. Schumacher	Chief, Independent Measurements and Environmental Protection Section
R. A. Gilbert	Licensing Project Manager, NRR
S. Stasek	Resident Inspector, Dresden
J. E. Foster	Compliance Specialist, DRP
T. Ploski	Emergency Preparedness Analyst, DRSS
G. Pirtle	Physical Security Specialist, DRSS
A. Januska	Radiation Specialist, DRSS

II. CRITERIA

The licensee performance is assessed in selected functional areas depending whether the facility is in a construction, preoperational or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement in assuring quality.
2. Approach to resolution of technical issues from safety standpoint
3. Responsiveness to NRC initiatives
4. Enforcement history
5. Reporting and analysis of reportable events
6. Staffing (including management)
7. Training effectiveness and qualification

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definition of these performance categories is:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used such that a high level of performance with respect to operational safety or construction is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective such that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to

be strained or not effectively used such that minimally satisfactory performance with respect to operational safety or construction is being achieved.

Trend. The performance gradient over the course of the SALP assessment period.

III. SUMMARY OF RESULTS

Overall, during this period the licensee's performance was found to be acceptable and in general showed a steady trend with some improvements later in the period. The licensee has shown an effort to improve performance in areas where poor or mediocre performance was previously indicated. However, other areas previously identified as acceptable or good, indicated a decline in performance. For the most part, the licensee showed improvements in most areas later in the assessment period through greater management attention.

<u>Functional Area</u>	<u>Rating Last Period</u>	<u>Rating This Period</u>	<u>Trend Within the Period</u>
Plant Operations	2	2	Improved
Radiological Controls	2	2 3*	Declined
Maintenance	3	2 3*	Improved
Surveillance	2	1	Improved
Fire Protection	2	2	Improved
Emergency Preparedness	2	1	Improved
Security	1	2	Declined
Refueling	1	1	Same
Quality Programs and Administrative Controls	2	2	Same
Licensing Activities	1	2	Declined

*Rating changed by Regional Administrator.

IV. PERFORMANCE ANALYSIS

A. Plant Operations

1. Analysis

This functional area was reviewed by the resident inspectors during 10 routine inspections and three special inspections conducted during the assessment period. Areas looked at included review of logs and records, direct observation of station activities, verification of selected equipment lineups and operability, and followup of significant operating events to verify conformance with applicable requirements. This functional area was also evaluated as part of a Performance Appraisal Team inspection which was done during the period. Seven items of noncompliance were identified as follows:

- a. Severity Level V - Failure to have Technical Specifications properly updated (50-237/83-05).
- b. Severity Level IV - Inadequate procedure and personnel error resulted in an open flow path for suppression pool water to be released to the reactor building (50-237/83-21).
- c. Severity Level IV - Inadequate corrective action resulted in nonconservative Average Power Range Monitor (APRM) trip setpoints during a shutdown and corrective action was not implemented in an expeditious manner (50-249/83-27).
- d. Severity Level V - Isolation condenser valve was not locked as required and no formal procedure had been established to specify criteria for locking valves, operation of locked valves, control of keys, etc. (50-10/83-22; 50-237/83-32; 50-249/83-30).
- e. Severity Level IV - Failure to have a procedure to specify reading material in the control room and failure to follow a procedure by not recording reactor power levels following reactivity changes (50-237/83-32; 50-249/83-30). This finding is also addressed in maintenance and fire protection functional areas.
- f. Severity Level IV - Failure to follow control rod sequence procedure during a shutdown (50-237/84-02).
- g. Severity Level IV - Failure to follow the out-of-service procedure for the rod worth minimizer (50-237/84-02).

Of the seven items of noncompliance, five were categorized as personnel errors with three of these being attributed directly to the operations staff. In all cases, the licensee's corrective actions were appropriate and timely.

During this SALP period, the licensee's performance remained substantially the same as it was during the SALP 3 period. The average number of noncompliances increased slightly from SALP 3 (from 0.33 per month to 0.4 per month). However, there were no Severity Level III noncompliances and no noncompliances that resulted in escalated enforcement action within this functional area.

Eleven reactor scrams occurred on Unit 2 and six on Unit 3 during the period. Of these, six occurred while Unit 2 was in cold shutdown with no resultant control rod movement. Six of the seventeen scrams were attributed to personnel error. This is an increase from the SALP 3 period where, out of a total of eleven reactor scrams, two were attributed to personnel error.

As discussed in Section V.F.1, LER data indicates that personnel errors occurred at a rate nearly twice as high as that in SALP 3. However, only three out of the twenty-one LERs indicating personnel errors were attributed to the operations department.

A special inspection was conducted upon identification of an error in control rod insertion sequence and removal of the rod worth minimizer on Unit 2. The inspection revealed that licensee personnel identified the error early in the shutdown and the prompt identification and corrective action resulted in no compromise to the safety of the reactor. A confirmatory action letter (CAL) was issued on January 12, 1984, relating to the licensee actions for restart of Unit 2 following the control rod insertion event.

A second special inspection was conducted at the request of NRC Headquarters to assure that the drywell leakage identification criteria on Unit 2 had been applied to Unit 3 in light of the resolution of operating with known or potential crack indications in primary piping. All aspects of the licensee's program were found to be acceptable.

A third special inspection was conducted upon identification that a safety-related snubber on the suction header from the Unit 3 Torus had been removed and its replacement left partially disconnected for a period of time without proper authorization or knowledge by the operations department. It was found that operations required more control over the work being performed by contractors onsite.

During the assessment period, ten Reactor Operator (RO) and seven Senior Reactor Operator (SRO) examinations were administered to Dresden personnel. Sixty-four percent of the candidates passed their examinations, which is lower than the national average of approximately 80%. An audit of the requalification program was also conducted during the period.

As a result of several management meetings between NRC and Commonwealth Edison Company covering the company's enforcement history at all nuclear stations, a Regulatory Program for Improved Performance (RPIP) was instituted in February 1984. Pertinent aspects of the program included:

- a. Corporate directives for improving operating performance covering identification of potentially significant events, post-trip analysis prior to plant restart, and conduct of operations.
- b. Improved communications at all levels.
- c. Corporate site visits and a station management shift overview function.
- d. Corrective actions for personnel errors.

2. Conclusion

The licensee is rated Category 2 in this functional area. Performance in this area has shown some improvement due to additional management efforts and the absence of escalated enforcement actions.

3. Board Recommendations

The licensee should continue efforts to reduce the number of plant trips and safety system challenges. Included in this should be an increased effort to reduce the number of reactor protection system actuations while the plant is in a shutdown condition.

B. Radiological Controls

1. Analysis

Five inspections were performed during the assessment period by regional specialists. The inspections included outage radiation protection, radwaste management, operational

radiation protection, confirmatory measurements, and environmental protection. The resident inspectors also inspected in this area. Eight violations were identified and one civil penalty was issued. The violations were as follows:

- a. Severity Level III - Exceeding DOT radiation limits in cab of transport vehicle (50-237/83-08; 50-249/83-07).
- b. Severity Level IV - Failure to adhere to radiation control procedures (2 examples) (50-237/83-08; 50-249/83-07).
- c. Severity Level IV - Failure to calibrate chimney radiation monitors (50-10/83-17; 50-237/83-26; 50-249/83-24).
- d. Severity Level V - Failure to adhere to radiation control (1 example) (50-10/83-17; 50-237/83-26; 50-249/83-24).
- e. Severity Level III - Failure to give radiological training; Failure to control access to high radiation areas (2 examples); Failure to provide personnel monitoring equipment to individuals entering a high radiation area; and Failure to evaluate radiation hazards in the drumming room before personnel entry (50-10/83-23; 50-237/83-33; 50-249/83-31).
- f. Severity Level IV - Failure to adhere to radiation protection standards: evidence of eating, smoking and chewing in a controlled area (50-10/84-02; 50-237/84-03; 50-249/84-02).
- g. Severity Level IV - Failure to survey material before release from the site (50-10/84-05; 50-237/84-07; 50-249/84-06).
- h. Severity Level IV - Transfer of byproduct material to persons not licensed to receive or possess radioactive material (50-10/84-05; 50-237/84-07; 50-249/84-06).

These violations include a civil penalty of \$40,000 imposed for an incident involving deliberate circumvention of plant radiation protection controls by several plant and contractor personnel. (Four violations were classified collectively as Severity Level III.) The enforcement meeting for this incident stressed a need for improved acceptance of radiation protection program requirements by workers and the possible need for stronger disciplinary measures to encourage such acceptance. The remaining violations include high radiation area control and procedural adherence problems which are indicative of continuing problems in these areas, and an inadequate survey problem which led to the release of contaminated rugs offsite. The latter problem was particularly significant because numerous

plant personnel, including radiation protection personnel, should have recognized the potential for release of the contaminated rugs but apparently did not. The licensee's enforcement record during this assessment period was poorer than during the previous assessment period.

Other radiation protection program weaknesses identified during this assessment period concern personal contamination monitoring techniques and the effectiveness of corrective measures for self-identified radiation protection problems. The labor-management issue referenced in earlier SALPs appears to have continued as an impediment to radiation protection program improvement as evidenced by protracted negotiation (in excess of one year) over a poor ALARA practice involving multiple out-of-service tag usage in radiation areas.

Radiation protection program improvements noted during the assessment period include: continued strengthening of the professional health physicists' role in the radiation protection program, continued progress in implementation of an ALARA program, continued improvement in health physics management surveillance of plant conditions, increased use of the radiation occurrence report system, installation of more personal contamination monitoring stations, increased RCT coverage at strategic locations during refueling outages to ensure workers properly remove protective clothing and frisk themselves, and increased plant management support for the health physics program. Management stability in the radiation protection program has improved; management and technician staffing levels currently appear adequate.

Total worker radiation exposures (person-rems) during 1983 were approximately 60% above the licensee's average annual exposures over the preceding five years and approximately 70% above the average for U.S. boiling water reactors for 1983. Over the last five years, annual worker radiation exposures have increased more rapidly than the U.S. average for boiling water reactors.

Gaseous effluents and solid waste production were about average for U.S. boiling water reactors; liquid radioactive waste discharges remained low. Two unplanned liquid releases were reported during the assessment period. Both were less than regulatory and technical specification limits. No unplanned gaseous releases occurred.

One radioactive material transportation violation was identified during the assessment period for an elevated radiation level in the cab of a transport vehicle. Although the violation was categorized as Severity Level III in accordance with NRC enforcement policy, the elevated radiation level was limited in magnitude and area. The licensee was temporarily suspended from the Richland low level waste burial site by the State of Washington

due to the violation, therefore escalated enforcement action was not taken for this violation. Elevated contamination levels on several spent fuel shipping casks necessitated conduct of a smear efficiency study. The licensee's responsiveness to spent fuel shipping problems and their overall conduct of the spent fuel shipments during this assessment period were good.

The licensee continues its strong performance in the area of confirmatory measurements, with thirty-two agreements or possible agreements out of thirty-three comparisons. The disagreement was a conservative quantification of I-131 on a charcoal adsorber. An NRC and licensee National Bureau of Standards traceable charcoal standard was counted by the licensee with results 20-30% above the certified values. The charcoal efficiency was changed during the inspection and reanalysis of the adsorber yielded an agreement.

Dresden Station chemists continue to do a thorough job of reviewing analytical data to assure proper measurement evaluation. In addition, the licensee's corporate office fulfilled a commitment made during the last SALP period by providing written guidance to assure that nuclides represented by Class 2 and Class 3 peaks in the Automated Analytical Instrumentation System (AAIS) are properly evaluated.

Quality control for the chemistry lab and counting room appears to be adequate. Improvement was noted in chemistry procedures with implementation of new procedures covering instrument quality control and analyst performance verification. Quality control checks of laboratory and counting room equipment were performed in accordance with applicable procedures.

The licensee's performance in the areas of confirmatory measurements and environmental protection has continued to be very good. The licensee's performance in the radiation protection area, however, exhibited significant weaknesses and did not sustain the improvements noted during the previous assessment period. Management attention appeared improved in the radiation protection program. Improvements were also noted in chemistry lab and counting room quality control. New procedures, written in response to an INPO audit in 1982, define a general quality control program for analyzing spiked and split samples as a check on analytic performance.

The new procedures were implemented during the current SALP period.

The radiological Environmental Monitoring Program, conducted by a contractor, satisfied Technical Specification requirements. Environmental air sampling stations examined were operating properly. Samples were collected and instrument operational checks performed as required. No management problems were

identified. However, one minor weakness, a holdover from the previous SALP period was noted. The station environmental coordinators showed a lack of familiarity with the location of the environmental sampling stations.

2. Conclusion

The licensee is rated Category 2* in this area. This is the same rating as SALP 3, however licensee performance has declined during the assessment period. The licensee's performance in the areas of confirmatory measurements and environmental protection has continued to be very good, equivalent to Category 1 performance. The licensee's performance in the radiation protection area, however, exhibited significant weaknesses and did not sustain the improvements noted during the previous assessment period. This decrease in performance was evident in the licensee's enforcement history, which appears indicative of weaknesses in management attention to worker's acceptance of radiation protection program requirements. Although programmatic improvements in the radiation protection program were made during this assessment period, improper adherence to plant procedures and good radiation protection practices on the working level continued to plague the program. Performance in the radiation protection area was borderline SALP Category 2/3.

3. Board Recommendations

Inspection effort should be increased in the radiation protection area to evaluate the effectiveness of licensee efforts at improving performance. Licensee management efforts should continue and should include methods of assessing affected improvements at the working level. Failure to effect substantial improvements should be cause for licensee and NRC concern.

C. Maintenance

1. Analysis

This functional area was inspected routinely throughout the assessment period by resident and regional inspectors. It was also inspected during three special inspections by resident and regional inspectors, and one inspection by the Performance Appraisal Team. The following noncompliances were identified:

- a. Severity Level V - Failure to adequately control welding materials (stubs, rod and wire) in suitable containers (50-237/83-03).
- b. Severity Level V - Failure to establish adequate design procedures for torus penetration piping calculations and support base plate analysis (50-237/83-06; 50-249/83-05).

*Rating changed by Regional Administrator to Category 3.

- c. Severity Level V - Failure to maintain adequate document control in that procedures were implemented prior to formal review and approval (50-237/83-06; 50-249/83-05).
- d. Severity Level V - Failure to conduct adequate QA audits of consultant activities (50-237/83-06; 50-249/83-05).
- e. Severity Level IV - Foreign substance (grease) identified on the seats and discs of containment isolation valves (50-237/83-11).
- f. Severity Level V - Failure to conduct adequate IE Bulletin 79-14 walkdown inspections and engineering reviews of as-built data (50-237/83-12; 50-249/83-10).
- g. Severity Level V - Failure to follow design procedures in the evaluation of branch anchor seismic movements (50-237/83-12; 50-249/83-10).
- h. Severity Level IV - Inadequate safety reviews resulting in a failure to request a Technical Specification change and removal of safety-related snubbers (50-249/83-12).
- i. Severity Level IV - Failure to implement corrective actions resulting in an ECCS motor operated valve breaker with improper settings (50-237/83-14; 50-249/83-13).
- j. Severity Level IV - Inadequate corrective actions and failure to control contractor personnel resulting in perforation of primary containment bellows while working on supports nearby (50-237/83-21).
- k. Severity Level IV - Failure to properly store or protect safety-related components in the storeroom. (50-10/83-30; 50-237/83-32; 50-249/83-30). This is a combined item and is also addressed in the Operations and Fire Protection areas.

An enforcement meeting was held on June 20, 1983, with a followup meeting on July 8, 1983, following the event where grease was applied to the seats and discs of main steam isolation valves and feedwater check valves. Also discussed was the removal of a safety-related snubber without proper evaluation. The licensee discussed their plans for improving performance in this area. Followup evaluations have shown that the licensee has applied more management attention, improved training, and implemented new or improved procedures. Additional management attention in the area of maintenance was noted when the Regulatory Program for Improved Performance (RPIP) was implemented in the latter part of the assessment period. Also noted was implementation of a more extensive program to positively control contractor work onsite.

The Performance Appraisal Team identified weaknesses in the preplanning of maintenance activities; the failure to document evaluation of equipment failures for root causes; and the failure of management to enforce the use of an approved procedure. A strength was the use of color-coded work packages for maintenance activities.

IE Bulletin 83-02 inspection activities included a review of UT procedures, personnel certifications, material and equipment certifications, data reports and observation of several ultrasonic examinations at the site. Based on these efforts, it was determined that UT procedures, calibration standards, equipment and Intergranular Stress Corrosion Cracking detection capabilities were satisfactorily demonstrated in accordance with IE Bulletin 83-02 and that the same procedures and techniques were used in the UT examinations. The inspectors also observed the welding of some overlays and determined that the weld overlay repairs were performed in accordance with qualified and approved procedures. In addition, observations of the decontamination and the induction heating stress improvement treatment performed on the recirculation system piping confirmed that these activities were conducted in accordance with approved procedures.

Inspections conducted to review the licensee's implementation of the IE Bulletin 79-14 piping re-evaluation programs are complete. The licensee's efforts in this area were substantial and have satisfied the bulletin requirements. During a review of the piping re-evaluation program which included followup on the licensee's actions to comply with a Confirmatory Action Letter (CAL) issued July 14, 1982, the licensee informed the staff that they were going to perform additional evaluations on 950 "no action supports". Supports installed in piping systems that met the original Blume rigid span criteria during the piping stress analysis review and as a result, required no further evaluation to comply with IE Bulletin 79-14 requirements were classified as "no action supports". At the conclusion of a meeting held at Region III on July 8, 1983, to discuss "no action supports" the licensee agreed to provide certain additional information. The above CAL will remain open pending our followup inspection of the licensee's evaluation/information provided for the "no action supports".

Except as stated above, the activities observed, the management controls used, and the records and record control systems in place met requirements. Personnel involved in the areas reviewed were properly trained and certified. The licensee's audit reports were found to be generally complete and thorough.

As discussed in Section V.F.1, there were nearly twice as many personnel errors (21) which resulted in Licensee Event Reports (LERs), during this assessment period than was noted in the previous period. Six of these were attributed to the maintenance department and eight to contractor personnel working onsite.

There were two Confirmatory Action Letters issued during the period addressing the maintenance and modifications area. One outlined licensee actions in response to the identification of a number of failed safety-related snubbers. The other related to corrective actions to be taken concerning the finding of foreign matter (grease) on the seats and discs of main steam isolation valves and feedwater check valves.

2. Conclusion

The licensee is rated Category 2* in this functional area. Although this is an improvement from the previous SALP period, performance in this area was a borderline 2/3 during this assessment period. The improvement is primarily due to greater management attention, an improved training program, institution of a program to better control contractor activities onsite and no escalated enforcement actions.

3. Board Recommendations

The licensee should continue efforts to increase the effectiveness of management controls and to decrease the number of personnel errors.

D. Surveillance

1. Analysis

This functional area was examined routinely throughout the SALP period by the resident inspectors and during two special inspections by regional specialists.

No items of noncompliance were identified, whereas four items of noncompliance were issued in SALP 3.

The inspections examined the current program and procedures, material and equipment certifications, personnel certifications, data reports and audit reports. In addition, work was observed and discussions were held with personnel performing surveillance and inservice inspection activities.

The management control systems met regulatory requirements and personnel, equipment and material certifications were current and complete. Records were found to be complete, well maintained and available. Discussions with licensee and contractor personnel indicated that they were knowledgeable in their job; records indicate they were properly trained and certified. The licensee's audit reports were found to be generally complete and thorough.

*Rating changed by Regional Administrator to Category 3.

is evident by the fact that only one LER was submitted during the assessment period because of a late or missed surveillance. This is an improvement from SALP 3 where there were three LERs of this type.

The previous assessment (SALP 3) discussed a need for better procedure review to eliminate typographical errors prior to issuance. Also, it was found that formulas, constants, etc., used in procedures were not identified with a source or a reference. Both of these concerns have been addressed during this assessment period as is evidenced by higher quality procedures.

2. Conclusion

The licensee is rated Category 1 in this area. This is an improvement from the Category 2 in SALP 3 and is due to the improved enforcement record and licensee initiatives in improving the surveillance program.

3. Board Recommendation

None.

E. Fire Protection

1. Analysis

This functional area was routinely inspected by the resident inspectors during the assessment period. In addition, the fire protection program was reviewed in-depth by the inspectors in one routine inspection during the period. Three items of noncompliance were identified as follows:

- a. Severity Level IV - Panel doors left open on vital electrical cabinets following surveillance or maintenance leaving internals vulnerable to intrusion by dust, spray, etc. (50-237/83-14; 50-249/83-13).
- b. Severity Level IV - Failure to have or follow procedures, excessive dirt, spilled bags of chemicals and unknown substances on shelves in the safety-related storage area of the warehouse (50-10/83-22; 50-237/83-32; 50-249/83-30). This is also addressed in the Operations and Maintenance functional areas.
- c. Severity Level IV - Inadequate procedures; numerous compressed gas cylinders with inadequate or no restraints to prevent falling and creating potential missiles in the vicinity of safety-related equipment (50-237/84-03; 50-249/84-02).

In response to the items of noncompliances, the corrective actions were adequate and timely. The licensee's performance in this functional area has remained steady with respect to the SALP 3 period. Management attention and use of resources has been adequate. During the latter part of the assessment period, the licensee began an accelerated program of upgrading the physical condition of the plant. Extensive cleaning and repainting has been ongoing since inception of the program.

Concerns have arisen with respect to the scheduling and implementation of specific requirements of 10 CFR 50 Appendix R. Although substantial efforts have been expended by the licensee in this regard, Dresden Station is pursuing conformance with the applicable requirements. Appraisal of this aspect of the Fire Protection program has accordingly been held in abeyance.

2. Conclusion

The licensee is rated Category 2 in this functional area. Licensee performance has been the same through this assessment period.

3. Board Recommendations

None.

F. Emergency Preparedness

1. Analysis

Three inspections were conducted between February 1983 and early June 1984 to evaluate compliance with 10 CFR Part 50, Technical Specifications, and procedures. No items of non-compliance were identified during these inspections.

Two exercises were conducted during this period. Although the licensee's overall performances were satisfactory, areas for improvement were identified during both exercises. However, it was apparent during the second exercise that station and corporate staffs had implemented acceptable corrective actions on the majority of improvement items identified during previous exercises. Only several improvement items, related to communications equipment usage by inplant teams, availability and use of Health Physics supplies within the control room, and status board provisions for displaying protective action and meteorological information, were weaknesses common to the 1983 and 1984 exercises. The licensee has chosen exercises at the Dresden Station to introduce refinements to its emergency preparedness capabilities and related training program. Such

improvements included successful demonstrations of a minimum Emergency Operations Facility staffing concept and protracted recovery planning activities, plus the use of NRC and news media role players to further challenge exercise participants.

It became evident during the 1984 routine inspection that corporate and station management had completed acceptable corrective actions on several deficiencies identified during the last rating period, including: the annual review of Emergency Action levels with offsite officials, annual distribution of the emergency information brochures, and the establishment of a quality assurance/quality control program for the offsite prompt notification (siren) system. Although the licensee's capability to promptly notify offsite officials of emergency plan activations had improved during the rating period, additional refinements to the notification process are still warranted. Corporate staff had expanded the scope of annual audits of the emergency preparedness program. Quality assurance personnel were also involved in tracking progress toward resolving Open Items; however, the informal system still used to track corrective actions on drill and exercise improvement items should be replaced by a more formal tracking system, per corporate guidance.

Sufficient numbers of staff had received adequate training for appropriate emergency response positions, as evidenced by their performances during drills, exercises, and walk-throughs, and by records review. The maintenance of emergency preparedness training records had improved during the rating period. Timely staff augmentation had been demonstrated by off-hours drills, which occurred more frequently than the semi-annual commitment in the emergency plan.

The licensee has completed action on most NRC concerns, and is improving the timeliness of initial offsite notifications following emergency plan activations. The licensee's overall exercise performances were good with few repeat items for improvement having been identified. The demonstrated capabilities of emergency response personnel remained acceptable, while documentation of their training had improved.

2. Conclusion

The licensee is rated Category 1 in this area. This is an improvement from SALP 3 where the rating was Category 2.

3. Board Recommendation

None.

G. Security and Safeguards

1. Analysis

Four safeguards inspections (two routine security; one special security; and one routine Material Control and Accountability) were completed by region based inspectors during the assessment period. The special inspection involved a review of a serious security event reported by the licensee under 10 CFR 73.71 which subsequently resulted in two violations being cited and a proposed civil penalty of \$100,000. In addition, the resident inspectors routinely conducted observations of security activities. Three items of noncompliance were identified relative to the security program. Two of the three items resulted from the special inspection.

The noncompliances involved:

- a. Severity Level IV - Security Force members failed to report vehicle access control violations in the manner or format required by the approved security plan (50-10/83-10; 50-237/83-15; 50-249/83-14).
- b. Severity Level III - A plant employee gained entry into the protected area in an unauthorized manner after the licensee took ineffective compensatory measures (50-10/84-03; 50-237/84-04; 50-249/84-03).
- c. Severity Level III - The licensee failed to report the event noted in the above item in a timely manner (50-10/84-03; 50-237/84-04; 50-249/84-03).

The above Severity Level III violations represented a single but serious degradation of the security program, and were indicative of an isolated instance of inattention to duty by several security force members, and careless disregard by first line non-security supervisors of well stated, properly disseminated, station security procedures.

Site management initiated extensive corrective actions which included measures addressing a major cause of the problem, the actions and inactions of people and their attitudes. The Station Security Administrator conducted meetings with all guard force personnel, emphasizing the importance of their security work practices. The Station Superintendent conducted meetings for all station employees in groups of 20 to 25, emphasizing personal responsibilities towards plant security.

Continuing their close involvement with site security matters, the corporate nuclear staff communicated the "lessons learned" from the Dresden incident, to the other station security

administrators during monthly staff meetings sponsored by the corporate security office. The corporate security office has continued to be a major supporter of the site personnel screening program. A corporate nuclear staff representative has attended all NRC security exit meetings.

Audits by the Quality Assurance Department have been timely and have met commitments in the security plan regarding the audit function; however, the audits have tended to be based on a checklist, which in turn are based on the security plan. As such, it is questionable if the present audit program would have detected the "people" problems which led to the two major violations.

Positions within the security organization are identified; responsibilities and authorities are well defined. The training and qualification program contributes to an adequate understanding of work and fair adherence to procedures with a modest number of personnel errors.

In summary, the two Severity Level III violations and one Severity Level IV violation represents an increase in the number and significance of violations cited since the previous SALP period. Although the Severity Level III violations pertained to a single incident, they represented a significant degradation of the licensee's security program.

2. Conclusion

The licensee is rated Category 2 in this functional area. This is a reduction from the licensee's previous SALP rating. However, implementation of the overall security program was generally adequate despite the two Severity Level III violations which resulted from an isolated incident. Site management is mostly effective in its enforcement of site security procedures.

3. Board Recommendations

None.

H. Refueling Activities

1. Analysis

The resident inspectors conducted portions of several inspections during the Unit 2 refueling and startup early in 1983 and during the Unit 3 refueling late in 1983 and portions of the incomplete return to power early in 1984.

No items of noncompliance were identified.

The licensee has continued to maintain their high level of performance as in the past. Activities continue to be well managed with competent and qualified personnel resulting in minimal events. Adequate procedures were available and used. Conservatism was routinely exhibited through technically sound approaches to activities.

Within the area of fuel handling, the resident inspectors have monitored the shipments of Unit 1 spent fuel upon its arrival at Dresden from West Valley, New York. These activities are quite complex in terms of coordinating with other agencies and each of the states involved. However, they have been handled smoothly and with minimal problems. A special inspection was conducted by the Senior Resident Inspector where issues were raised relating to evaluation of radioactive contamination leaching on the spent fuel cask (observed on several shipments) and to the unhitching of the cask trailer from the tractor during the first shipment. The unhitching problem has not recurred and the leaching phenomenon evaluation appears to be resolved.

2. Conclusion

The licensee is rated Category 1 in this functional area. Performance in this area remains the same.

3. Board Recommendations

None.

I. Quality Programs and Administrative Controls Affecting Quality

1. Analysis

This functional area was inspected routinely by the resident inspectors, during a special inspection by regional specialists and by the Performance Appraisal Team.

Each item of noncompliance identified in other functional areas could fall under the general heading of Quality Assurance. One item of noncompliance listed here overlaps several functional areas and represented the most serious breakdown in the quality programs.

Severity Level III - Failure to identify and control safety-related items (parts for the drywell to torus vacuum breaker shaft seals) (50-237/83-17).

This item is considered significant because of the time the unit was allowed to operate (one cycle) with a degraded containment system. An enforcement conference was held on December 20, 1983 on this subject and a \$50,000 Civil Penalty

was issued. The above described violation is an isolated incident and applies to a very narrow portion of quality activities in several functional areas. For this reason it is not solely representative of the Dresden Quality Program.

Routine inspections by the resident inspectors revealed that in general, the Quality Assurance organization was aware of ongoing safety-related activities and ensured that prompt corrective action was taken on identified problems.

The Performance Appraisal Team (PAT) inspected Quality Assurance audits and identified a number of significant strengths, such as: a licensed Senior Reactor Operator (SRO) for the site audit staff; a comprehensive schedule of audits and surveillances; and effective reports to upper level management, including a proven method of escalating late responses or deficient corrective actions on audit findings. One weakness was identified by the PAT team in the failure of the Onsite and Offsite Review and Investigative Functions to review Quality Assurance (QA) audit reports or findings. Poor trending and minor problems in the performance of audits were other weaknesses. The licensee's QA audit program continues to be acceptable with a well qualified staff.

To improve performance in this area, as well as overall station performance, the licensee has implemented the Regulatory Program to Improve Performance (RPIP). Steps have been taken to improve management involvement and to reduce personnel errors. Specific aspects of the program are discussed in Section IV.1.A.

2. Conclusion

The licensee is rated Category 2 in this functional area. Licensee performance has been the same in this area.

3. Board Recommendations

None.

J. Licensing Activities

1. Analysis

During the SALP 4 period, the major emphasis was on Dresden 2 and 3 since Dresden 1 is shutdown for chemical decontamination. During the review period, seven amendments were issued to the licensee for Dresden 2 and eight for Dresden 3. There were two emergency exemptions issued, one for Dresden 2 with regards to Appendix J and Dresden Unit 3 was ordered to shutdown for examination of reactor coolant system (RCS) piping for cracks

in the heat affected zones of welds. A similar, but smaller scale, examination was done for Dresden 2. Both units had Cycle 9 Reload amendments approved.

The evaluation of licensing activities was based on a review of the following areas.

- . T.S. - D2 Cycle 9 Reload - Hydrogen Addition
- . T.S. - D2 Cycle 9 Reload - Pipe Cracks
- . T.S. - D2 Cycle 9 Reload - Reload Parameters
- . T.S. - ECCS Ring Header Snubbers
- . T.S. - SRV Position Indication
- . T.S. - D3 Cycle 9 Reload - Revision to MAPLHGR Curves
- . T.S. - D3 Cycle 9 Reload - Core Parameters
- . T.S. - D3 Cycle 9 Reload - Thermal Hydraulics
- . T.S. - D3 Cycle 9 Reload - ASEA-Atom Control Rod Blades
- . Control Room Habitability
- . SEP Program
- . Appendix J Exemptions
- . D3 Pipe Crack Evaluation
- . SRV Testing
- . Detailed Control Room Design Review
- . RCS Vents
- . Licensed Operator Topical Report
- . Purge and Vent Valve Operability
- . "De Minimis" Radioactive Waste Review
- . Post Accident Sampling System
- . Safety Parameter Display System

The licensee has procedures in place for management involvement in licensing activities but there does not appear to be evidence that management oversight is consistently maintained at a high level. They have demonstrated a clear understanding of the technical issues, they routinely exhibit conservatism, have sound and thorough approaches and provide timely resolutions in almost all cases. With respect to NRC initiatives, the SEP program and, purge and vent valve operability issues, reviewers believe that resolution has not occurred as quickly as it should have.

Management attention and involvement with matters of nuclear safety is generally evident and staffing and training are highly regarded with respect to the implementation and availability of trained personnel. However, the licensee's responses are usually, but not always, timely and the resolution of licensing activities is reasonably responsive although occasionally repeated attempts are necessary to gain resolution to technical issues.

With respect to safeguards licensing, Commonwealth Edison Company participates in site activities by providing managerial review at the corporate and site levels. Corporate and site management

have demonstrated constructive, prior planning, and proper prioritization of safeguards matters. Minor problems seem to have developed between the corporate and site level in attempting to standardize all site plans to the same commitments. The licensee has presented generally well planned approaches to technical safeguards matters which demonstrate an understanding of security issues. Throughout the period of evaluation, the licensee has responded promptly and completely to all safeguards licensing comments and concerns. In addition, key positions within Commonwealth Edison Company are clearly identified and authorities and responsibilities are well defined.

2. Conclusion

The licensee is rated Category 2 in this functional area. This is a reduction from a Category 1 rating in the SALP 3 assessment.

3. Board Recommendations

The licensee should improve timeliness and the resolution of licensing activities.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

Unit 1 - was shutdown throughout the entire assessment period for chemical cleaning, refueling and ECCS modifications.

Unit 2 - was shutdown January 8, 1983 to April 26, 1983, for refueling, modifications, and assessment of the presence of pipe crack indications and their interim repair. This unit is also conducting an experiment of adding gaseous hydrogen to the condensate system during operation as a means of arresting intergranular stress corrosion cracking (IGSCC).

Unit 3 - was shutdown from September 30, 1983 to the end of the assessment period for refueling; extensive testing, evaluation and interim repair of primary pipe crack indications; and extended outage for major repair of the high pressure unit of the main turbine.

A number of Unit 1 spent fuel shipments had been made from West Valley, New York to Dresden during the assessment period.

B. Inspection Activities

1. Noncompliance Data

Facility Name: Dresden, Units 1, 2, and 3

Inspections No. 50-10/83-01 through 50-10/83-24
 50-10/84-01 through 50-10/84-07
 50-237/83-01 through 50-237/83-33
 50-237/84-01 through 50-237/84-08
 50-249/83-01 through 50-249/83-31
 50-249/84-01 through 50-249/84-08

Functional Area Assessment	Noncompliances and Deviations Severity Levels					DEV
	I	II	III	IV	V	
A. Plant Operations				4(1)	2	
B. Radiological Controls			1(1)	5	1	
C. Maintenance				4(1)	6	
D. Surveillance						
E. Fire Protection				2(1)		
F. Emergency Preparedness						
G. Security and Safeguards			2	1		
H. Refueling Activities						
I. Quality Programs and Administrative Controls			1			
J. Licensing Activities						
Totals			4	17	9	

Note: () Indicates a noncompliance with several findings combined into one notice of violation resulting in a total that does not match the numbers shown in the columns.

During the assessment period, a Performance Appraisal Team inspection was performed. (May 9 through June 3, 1983).

C. Investigations and Allegation Reviews

One special inspection was performed at Dresden during April 1983, related to an allegation received by the resident inspector where a foreign substance (grease) was applied to the seats of the main steam isolation valves and feedwater check valves on Unit 2. The inspection resulted in a citation for failure to follow a procedure. However, no willful wrongdoing was identified by the inspectors.

No investigations were conducted at Dresden during the assessment period.

D. Escalated Enforcement Actions

1. Civil Penalties

a. A \$50,000 Civil Penalty was issued and paid for failure to follow proper quality assurance practices on procurement, replacement and use of parts, grease, etc., for drywell to torus vacuum breaker shaft seals. The basic civil penalty of \$40,000 was raised by 25% due to the long duration of the inferior condition (50-237/83-17).

b. A combined \$140,000 Civil Penalty was proposed for violations related to two events with multiple findings. Portions are described as follows:

(i) A \$40,000 Civil Penalty for breakdowns in radiation protection program related to failure to train contractor employees, a high radiation area left unlocked and unmanned, contractor employees being allowed to enter the high radiation area several times, and failure to evaluate radiation hazards prior to entry into the high radiation area (50-10/83-23; 50-237/83-33; 50-249/83-31).

(ii) A \$100,000 Civil Penalty for security matters:

(1) \$40,000 Civil Penalty for failure to take effective compensatory measures resulting in an employee gaining unauthorized access to the protected area.

(2) \$60,000 Civil Penalty for a significant delay in reporting the unauthorized entry. This Civil Penalty was increased above the base penalty by 50% due to the disregard by management employees causing the delay.

2. Orders

No orders were issued to the licensee for enforcement actions during the assessment period.

E. Management Conferences Held During the Appraisal Period

1. Conferences Related to Regulatory Performance and Enforcement

- a. February 17, 1983 - Management meeting to discuss future improvement of the regulatory performance of Commonwealth Edison Company.
- b. April 22 and May 5, 1983 - Related to snubber failures on Unit 2.
- c. May 23, 1983 - Meeting to discuss indications that licensee QA audits were not of sufficient depth to verify technical adequacy of designs.
- d. May 24, June 10, June 20, and July 8, 1983 - Meetings and enforcement conferences to discuss maintenance problems and missing snubber on Unit 3 ECCS suction header.
- e. July 26, 1983 - Management meeting to discuss improvement of licensee regulatory performance and enhancement of communications between the NRC and Commonwealth Edison Company.
- f. August 11, 1983 - Enforcement meeting related to drywell to torus vacuum breaker shaft seal replacement parts.
- g. September 9, 1983 - Management meeting to continue discussions on improvement of licensee regulatory performance and enhancement of communications between Commonwealth Edison Company and NRC.
- h. October 19, 1983 - Management meeting to continue discussions on improvement of licensee regulatory performance and enhancement of communications between Commonwealth Edison Company and NRC.
- i. December 20, 1983 - Enforcement meeting related to the unauthorized entry into a high radiation area.
- j. February 15, 1984 - Enforcement meeting related to the security event of inadequate compensatory actions and unauthorized protected area entry.

2. Confirmatory Action Letters

- a. March 17, 1983 - Licensee actions to be taken related to failed safety related snubbers prior to the restart of Unit 2.
- b. April 13, 1983 - Related to the introduction of foreign matter (grease) onto the seats and discs of main steam isolation valves and feedwater check valves.
- c. January 12, 1984 - Related to the improper insertion of control rods on Unit 2.

F. Review of Licensee Event Reports

1. LER Review

On January 1, 1984, the NRC criteria for LER reports was modified significantly and made a regulation in 10 CFR 50.73. The same regulation cancelled the previous LER criteria in existing Technical Specifications and relevant portions of NUREG 1.16. This move also shifted the majority of event reports to the INPO - NPRDS reporting system and only those LERs of significance are now reported to the NRC.

LICENSEE EVENT REPORTS

SALP Period 3 (12 Months) 01/01/82 - 12/31/82	SALP Period 4 (17 Months) 01/01/83 - 05/31/84	Proximace Cause*
8(0.67)**	21(1.24)**	Personnel Error
7(0.58)	7(0.42)	Design, Manufacturing and Construction/ Installation
1(0.08)	0	External Cause
6(0.5)	5(0.29)	Defective Procedure
74(6.17)	87(5.11)	Component Failure
2(0.16)	1(0.06)	Other
98(8.17)	121(7.12)	

*Proximace cause is the cause assigned by the licensee according to NUREG-0161, "Instructions for Preparation of Data Entry Sheets for Licensee Event Report (LER) File," or NUREG-1022, "Licensee Event Report System."

**Number in parentheses are the average number of events per month.

NOTE: Unit 1, which remained shutdown for an extended outage for modifications had no reportable events during the SALP 4 period.

With the change of reporting requirements beginning January 1, 1984, trending of LERs has become more difficult. However, the increase in LERs which were caused by personnel errors is highly visible. Specifically, the number of LERs per month due to personnel errors nearly doubled from the last assessment period.

However, LERs due to defective procedures decreased this period to less than half the number found in SALP 3. The number of LERs attributed to component failures remains relatively the same from the last assessment period to this one.

LERs are reviewed extensively by resident inspectors, regional as well as headquarters personnel. In summary, based on the reporting criteria, the licensee normally submitted clear, concise and fully adequate event reports during the assessment period. No significant report deficiencies were found.

The most significant LERs submitted during the SALP 4 period were: the crack indications identified on the Units 2 and 3 primary piping, the control rod insertion error on Unit 2, pinhole leaks detected in torus to drywell vacuum breaker bellows on Unit 2, the failure of local leak rate tests on the drywell to torus shaft seals on Unit 3, the failure to follow radiation protection standards resulting in contractors being escorted into high radiation areas, and, a failure to adequately control access to a security area and take adequate compensatory measures. Each of these items are addressed under their respective functional areas.

2. 10 CFR 21 Reports

No Part 21 reports were submitted by the licensee during the evaluation period.



(2)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

AUG 28 1984

Docket No. 50-373
Docket No. 50-374

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

Enclosed for your review, prior to our scheduled meeting of September 17, 1984, is the SALP Board Report for the LaSalle County Nuclear Power Station, covering the period January 1, 1983 through April 30, 1984.

Although the number of inspection findings is not unexpected for two units in these phases of their operation, we believe there is a continuing weakness in the area of equipment control and operational awareness. This weakness has resulted in a Category 3 rating in the area of plant operations.

Overall, during this period, your performance was found to be acceptable and showed improvement in three functional areas. Performance in the area of maintenance declined as indicated by the lack of supervisory involvement and the increase in noncompliance and reportable events.

We recognize and endorse your Regulatory Performance Improvement Program and have noted its positive effect on overall performance. To date, however, we do not find that this program has had a significant impact in improving equipment control and operational awareness.

While you will have sufficient opportunity to present your comments at the meeting on September 17, 1984, we also solicit written comments within 30 days after the meeting to enable us to thoroughly evaluate your comments and provide you with our conclusion relative to them.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the SALP Report will be placed in the NRC's Public Document Room.

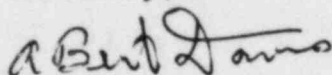
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AUG 28 1984

No reply to this letter is required at this time; however, should you have any questions concerning the SALP report, we would be pleased to discuss them with you.

Sincerely,



for James G. Keppler
Regional Administrator

Enclosure: SALP Report No.
50-373/84-08; 50-374/84-09

cc w/encl:

D. L. Farrar, Director
of Nuclear Licensing

G. J. Diederich, Station
Superintendent

R. H. Holyoak, Project Manager
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII

Phyllis Dunton, Attorney
General's Office, Environmental
Control Division

P. C. DeYoung, IE

H. R. Denton, NRR

INPO

Regional Administrators

RI, RII, RIV, RV

NRR Project Manager

SALP BOARD REPORT

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

COMMONWEALTH EDISON COMPANY

LASALLE COUNTY NUCLEAR POWER STATION

Docket No(s). 50-373; 50-374

Report(s) No. 50-373/84-08; 50-374/84-09

Assessment Period

January 1, 1983 through April 30, 1984

I. INTRODUCTION

The Systematic Assessment of Licensee Performance program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operations.

During the SALP 4 assessment period LaSalle Unit 1 completed its initial startup test program and was declared in commercial service on January 1, 1984. LaSalle Unit 2 completed the final phases of construction and preoperational testing. A low power operating license was issued on December 16, 1983. Low power startup testing began with low power license issuance and continued until full power license issuance on March 23, 1984. From March 23, 1984 until the close of the assessment period Unit 2 underwent power ascension startup testing.

In general, the SALP 4 assessment period was characterized by a high level of activity and changing plant status. This high level of activity placed a strain on the licensee's resources in all areas and at all levels from general employee through upper management. This was particularly true in the areas of testing (preoperational and startup), plant operations, maintenance, and radiological controls. While the licensee's performance in these areas was judged to be acceptable overall, weaknesses were noted and culminated in a request by the NRC that the licensee implement a management overview program during the final phases of Unit 2 preoperational testing and final loading to ensure that the number of concurrent activities remained controllable.

A NRC SALP Board, composed of the staff members listed below, met on July 11, 1984, to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee's safety performance at LaSalle County Station for the period January 1, 1983 through April 30, 1984.

SALP Board for LaSalle:

<u>Name</u>	<u>Title</u>
J. A. Hind	Chairman, SALP Board
A. B. Davis	Deputy Regional Administrator
R. L. Spessard	Director, Division of Reactor Safety
C. E. Norelius	Director, Division of Reactor Projects
T. N. Tambling	Chief, Technical Support Staff
N. J. Chrissotimos	Chief, Projects Section 2C
M. J. Jordan	Senior Resident Inspector, LaSalle
S. Guthrie	Resident Inspector, LaSalle
W. G. Guldemon	Chief, Operational Programs Section
G. L. Pirtle	Physical Protection Inspector
J. R. Creed	Chief, Physical Security Section
M. P. Phillips	Chief, Emergency Preparedness Section
A. Bournia	Project Manager, LaSalle, NRR

II. CRITERIA

The licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction, preoperational, or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

Section III of this report, "Summary of Results" presents those functional areas assessed during SALP 4. Because of the wide range of activities occurring during the assessment period, most of the performance category assignments were based on observations from both units; however, some functional areas encompassed a limited range of activities or were one time only activities and, as such, the assessment in those areas was based on observations from only one unit. This is reflected in Section III.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement and control in assuring quality
2. Approach to resolution of technical issues from a safety standpoint
3. Responsiveness to NRC initiatives
4. Enforcement history
5. Reporting and analysis of reportable events
6. Staffing (including management)
7. Training effectiveness and qualification

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definition of these performance categories is:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety or construction is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective so that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety or construction is being achieved.

Trend. The performance gradient over the course of the SALP assessment period.

III. SUMMARY OF RESULTS

Overall, the licensee's performance was found acceptable. The overall performance trend towards the end of the assessment period was improving although performance during the assessment period had declined in two functional areas. This positive note toward the end of the assessment appears to be indicative of renewed management attention to operating problems subsequent to the major efforts involved in the transition from preoperational and startup testing. However, equipment control and operator awareness remained as NRC concerns requiring continued management attention.

<u>Functional Areas</u>	<u>Applica- bility</u>	<u>January 1 - December 31 1982</u>	<u>January 1, 1983 - April 30, 1984</u>	<u>Trend Within The Period</u>
A. Plant Operations	Common	2	3	Declined
B. Radiological Controls	Common	2	2	Same
C. Maintenance	Common	1	2	Declined
D. Surveillance	Unit 1*	3	2	Improved
E. Fire Protection	Common	2	2	Same
F. Emergency Preparedness	Common	2	2	Same
G. Security and Safeguards	Common	3	2	Improved
H. Initial Fuel Loading	Unit 2	1	1	Same
I. Licensing Activities	Unit 2*	2	2	Same
J. Preoperational and Startup Testing	Common**	2	2	Same
K. Piping Systems and Supports	Unit 2	2	2	Same
L. Contractor Quality Assurance	Common	3	2	Improved
M. Quality Programs and Administrative Controls Affecting Quality	Common	Not Rated	2	ID
N. Electrical Equip- ment and Cables	Common	Not Rated	2	ID
O. Containment and Other Safety- Related Structures	Common	Not Rated	2	ID

NR = not rated

ID = indeterminate

* = Observations were made predominantly on the unit referenced

** = Preoperational testing observations were predominantly from Unit 2.
Startup testing observations were predominantly from Unit 1.

IV. PERFORMANCE ANALYSES

A. Plant Operation

1. Analysis

Inspection activities in this functional area consisted of portions of 15 inspections performed by two resident inspectors and two special inspections conducted by a combination of resident, Region III, and Office of Nuclear Reactor Regulation (NRR) personnel. Resident inspector activity focused on Technical Specification, license, and procedural compliance, emergency systems operability, operator performance, and operational problems including an assessment of technical and managerial support of these areas for Unit 1 and 2 operations during startup testing and Unit 1 operations following completion of the startup testing program. The two special inspections were performed at the initiative of the NRC to assess specialized areas germane to Unit 2 license issuance. The first special inspection focused on the ability of the operating staff to respond to off-normal conditions as a cohesive unit. The second special inspection focused on the degree to which as-built conditions conformed to FSAR descriptions and Technical Specification requirements. Neither special inspection identified any items of noncompliance, deviation, or concern.

As a result of resident inspections, 15 items of noncompliance were identified as follows:

- a. Severity Level V - Failure to lock a valve as required by procedure following an operational evolution (50-373/83-01).
- b. Severity Level V - Failure to identify and perform required operational testing with one offsite power supply out of service (50-373/83-42).
- c. Severity Level V - Failure to reposition and lock a valve after manipulation as required by procedure (50-374/84-13).
- d. Severity Level IV - Failure to lock a valve as required by procedure following a testing evolution (50-373/83-05).
- e. Severity Level IV - Failure to report an inoperable containment vacuum breaker in a timely fashion (50-373/83-26).
- f. Severity Level IV - Failure to follow a procedure for paralleling a diesel generator resulting in damage to the diesel generator (50-373/83-34).
- g. Severity Level IV - Failure to monitor plant temperature with a resulting inadvertent mode change with required systems inoperable (50-373/83-34).

- h. Severity Level IV - Failure to follow Residual Heat Removal startup procedures with a resultant reactor vessel overflow and pressurization (50-373/83-34).
- i. Severity Level IV - Failure to identify the need to test one diesel generator after another was taken out of service inoperable (50-373/83-42).
- j. Severity Level IV - Failure to identify that a valve access plate constituted part of secondary containment with the result that secondary containment was inadvertently violated (50-373/83-42).
- k. Severity Level IV - Maloperation of a containment isolation valve rendering the valve inoperable in the open position (50-373/83-48).
- l. Severity Level IV - Failure to include certain containment isolation valves on a locked valve checklist as required by procedure (50-373/83-48).
- m. Severity Level IV - Failure to identify and terminate an unmonitored liquid radwaste discharge (50-373/84-02).
- n. Severity Level IV - Failure to lock valves as required by procedure (50-374/84-01).
- o. Severity Level III - Failure to coordinate activities and follow procedures resulting in an isolated containment vacuum breaker (50-373/83-26).

Six of the 15 items of noncompliance identified in the operations area were the result of a failure to adequately control the status of sensitive equipment (items a., c., d., l., n., and o.). All of these, in whole or in part, involved a failure to comply with existing controls for locked valves. Four of the items of noncompliance were the direct result of a failure to identify and take required compensatory actions for off-normal conditions (items b., g., i., and m.). Two items resulted from a lack of understanding by personnel of the impact of actions taken (items j. and k.). Two items resulted from a failure to follow procedures (items f. and h.). One of these items resulted in damage to safety-related equipment. The other created the potential for damage to safety-related equipment. One item (item e.) was an isolated case of failure to report a significant event.

Of particular concern to the NRC during the assessment period were those items of noncompliance relating to equipment control and identification of off-normal conditions. Equipment control was the focus of an enforcement conference held on June 30, 1983 following identification of the Severity Level III item of

noncompliance relating to an inoperable containment vacuum breaker which resulted in a civil penalty. Identification of off-normal conditions was the subject of an enforcement conference held on September 30, 1983, following identification of the item of noncompliance relating to inadvertent heatup and mode change. Despite these NRC initiatives and licensee-initiated corrective actions, problems in these areas continued throughout the assessment period.

The inoperable vacuum breaker was a significant violation. The causal factors of this incident were: (1) Failure to control the status of equipment which was one of two areas of significant weakness identified during the SALP 3 assessment period; (2) Equipment control problems which continued throughout the assessment period despite licensee corrective actions and an enforcement conference and; (3) Equipment control problems which occurred not only in the operations area, but in other areas, particularly maintenance, as discussed in other sections of this report. Based on these factors and despite the commitment of significant resources to this area, licensee management initiatives failed to solve existing problems early in the rating period.

Two items of noncompliance noted above in the area of operator identification of off-normal conditions are viewed as being of some significance. The inadvertent heatup and mode change is viewed as significant because of the number of indicators which should have alerted the operating staff to the potential problem and the fact that the operators were aware that they were relying on equipment for cooling which had previously been identified as deficient. The unmonitored discharge is significant for the same reasons and compounded by the potential impact of a release in excess of regulatory limits.

Concerns in the area of operations identification of off-normal conditions are highlighted by: (1) This area was the second of two areas of significant weakness identified in the plant operations functional area of SALP 3 and; (2) Problems in this area continued throughout the assessment period despite an enforcement conference following the inadvertent heatup, and licensee initiatives in this area.

In addition, 17 reportable events occurred during the assessment period. Fourteen of the events were the result of personnel error, one event was the result of equipment failure, one event was the result of a communications breakdown, and one event was the result of inadequate procedures.

Twenty-eight reactor trips occurred, twenty-two on Unit 1 and six on Unit 2. Fifteen trips were due to material problems, four were planned, six were due to personnel errors, the remaining are classified as other. A detailed breakdown of these reactor trips is given in Figure 1, Section V.

The Board recognized the difficulty of initial operation and startup testing of the plants which are more complex than most older plants and have the more extensive technical specifications.

During the assessment period four sets of replacement examinations were administered to LaSalle County Station personnel. In addition, requalification oral examinations were administered to 15 licensed persons in July of 1983. The evaluation of the requalification examinations indicated that the program appeared to be adequate and personnel were being trained on the differences between Unit 1 and 2. Of 32 examinations administered, 22 were passed for an overall pass rate of 68%, which is below the national average of approximately 80%.

In response to NRC concerns in November 1983, the licensee assigned a supervisory individual to monitor control room activities. The primary purpose of this assignment was to ensure that the number of activities was held to a controllable level. This action produced positive results.

In response to NRC concerns in the plant operations area, the licensee implemented a Regulatory Improvement Program during the first quarter of 1984. This program included a General Office reorganization to better focus management attention on operations, periodic Corporate management visits to the operating sites, around-the-clock management presence at the sites, and implementation of more extensive sanctions for personnel-related regulatory compliance violations. The initial assessment of this program at the LaSalle facility was that it succeeded in focusing management and supervisory attention on operating activities with a resultant decrease in the number of operating personnel errors.

Several strengths were noted in the area of plant operations during the SALP 4 assessment period. These included:

- (1) In all cases, licensee management exhibited a strong desire to devote those resources necessary to resolve identified problems. Failure to resolve problems noted above is not viewed as hesitation on the part of management to become involved or devote resources, but rather a failure to clearly define the problems.
- (2) Operator reaction to off-normal conditions, when identified, was aggressive, thorough, and correct.

- (3) Communications within the plant organization and with the NRC were effective and showed continuing improvement.
- (4) Conservative approaches were uniformly taken during problem resolution.
- (5) Plant housekeeping and cleanliness showed continual improvement throughout the assessment period.

Although these strengths are recognized, overall performance in the area of plant operations showed little improvement. Weaknesses in the areas of equipment control and operator awareness of off-normal conditions continued.

2. Conclusion

The licensee is rated Category 3 in this functional area based on the number of noncompliances in the areas previously addressed as weaknesses in SALP 3.

3. Board Recommendations

None, recognizing that a Regulatory Performance Improvement Program has been implemented.

B. Radiological Controls

1. Analysis

Five inspections, one preoperational radiation protection, two operational radiation protection, one operational radwaste and Unit 1 startup, and one confirmatory measurements and environmental monitoring were performed during the assessment period by region based inspectors. The resident inspectors also inspected in this area for programmatic implementation and procedural compliances. Five violations were identified as follows:

- a. Severity Level V - Failure to follow procedure for completion of radiation work permits (373/83-18).
- b. Severity Level V - Failure to perform bioassays at the frequencies specified in station procedures (373/84-34; 374/83-33).
- c. Severity Level V - Failure to follow procedure for personal frisking and release of material from controlled areas (373/83-53; 374/83-56).
- d. Severity Level IV - Failure to follow procedure for posting of a contaminated area (373/84-02; 374/84-01).
- e. Severity Level V - Failure to perform environmental monitoring in accordance with Technical Specification 4.12.1 (373/83-40).

These violations are indicative of licensee inattention to procedural details and may reflect adjustment difficulties in converting from a preoperational to an operational radiation protection program. No overexposures or other violations of 10 CFR 20 resulted. The licensee has generally been responsive to regulatory and internal audit concerns; corrective actions have been timely and adequate. Training and qualifications of radiation protection personnel were adequate. The licensee is seeking acceptable candidates to increase the staff of Health Physicists and Rad/Chem Technicians to correct a recognized shortage now existing. Management support of, and involvement in, station radiological matters appear adequate.

There is insufficient operational history to permit meaningful comparative evaluation of personal radiation exposure control, radioactive effluents, and solid radwaste program effectiveness; however, no significant problems were identified in these areas. ALARA program improvements continued during this assessment period.

Problems concerning the frequent failure rate of process and effluent monitors, and eating, drinking, smoking, and chewing in radiologically controlled areas, described in the previous SALP report, have been adequately corrected based on observations during this assessment period.

In the area of Confirmatory Measurements the licensee had 26 agreements or possible agreements out of 26 comparisons. The licensee does a good job of reviewing gamma analysis results. Quality control and quality assurance in the chemistry labs and counting room appear adequate. Procedures appear adequate and, with a few exceptions, are current.

Minor changes were made in the licensee's Radiological Environmental Monitoring Program (REMP), which is basically sound, to bring it into full agreement with the Technical Specifications requirements. Air sampling stations and equipment examined were operating properly. No management problems were identified.

2. Conclusion

The licensee is rated Category 2 in this area.

3. Board Recommendations

None.

C. Maintenance

1. Analysis

One special inspection was conducted by region based inspectors to review activities surrounding Licensee Event Report (LER) 83-107/03L-0. The LER specifically dealt with the excessive leakage rate of the inboard feedwater check valves experienced during local leak rate testing.

The inspection identified one item of noncompliance (Inspection Reports 50-373/83-41 and 50-374/83-42) relating to inadequate design control measures relative to the modifications from hard seat seals to soft seat seals on the feedwater check valves and to the procurement of the soft seat seals. The deficiencies specifically dealt with structural adequacy and environmental qualification of the soft seat seal material. This issue is being treated generically by the NRC.

As a result of this inspection, the licensee has embarked on an accelerated valve testing program and a program to environmentally qualify a seal material for use in the feedwater check valves. A confirmatory action letter was issued for licensee commitments made in this area.

Portions of eight resident inspector inspections were devoted to maintenance activities. These inspections involved monitoring work activities, review of maintenance procedures, interface with operations, and system restoration following maintenance. As a result of these inspections, eight items of noncompliance were identified as follows:

- a. Severity Level V - Failure to reconnect nuclear instrument cables following maintenance (50-373/84-05).
- b. Severity Level V - Failure to revise procedures following a plant modification (50-373/83-15).
- c. Severity Level IV - Inadequate maintenance procedure for the Traversing Incore Probe System (50-373/83-17).
- d. Severity Level V - Failure to control maintenance on the Standby Gas Treatment System (SBGT) rendering the system inoperable (50-373/83-29).
- e. Severity Level IV - Failure to control a jumper installation in the SBGT initiation circuitry (50-373/83-49).
- f. Severity Level IV - Failure to incorporate post maintenance testing requirements into a diesel generator modification procedure (50-373/83-49).

- g. Severity Level V - Failure to review and update drawings (50-374/84-04).
- h. Severity Level V - Failure to control installation of a jumper (50-374/84-04).

In addition to the above noted items of noncompliance, 27 reportable events occurred in the maintenance area. Thirteen of these events involved personnel error, six of which were inadvertent jostling of sensitive equipment. The remaining seven events involved improper maintenance practices. Eight events involved discovery of leaking welds. One event involved material failure. Five events involved improper quality classification of maintenance work, four of which related to the feedwater check valve issue discussed above.

Of the nine items of noncompliance, four items involved failure to control equipment during maintenance activities (items a., d., e., and h.), two items involved failure to update related documents following maintenance/modification activities (items b. and g.) and are viewed as isolated events, two items involved failure to incorporate applicable requirements into maintenance procedures (items c. and f.) and are likewise viewed as isolated events. One item involved improper classification of modification activities.

As noted in the Plant Operations section of this report, the failure to control the status of equipment is of concern to the NRC. It is noteworthy that noncompliance items a., e., and h. in this area exhibited two common attributes - lack of supervisory involvement and lack of independent verification of activities. These factors were key contributors to a subsequent event during which a control room atmosphere monitor was miswired.

The licensee was rated Category 1 in the maintenance area during SALP 3 based on the technical ability of the maintenance staff and the few number of events attributable to maintenance activities. During the SALP 4 assessment period, a deterioration in performance was observed as indicated by the number of items of noncompliance, reportable events, and lack of supervisory involvement.

The licensee has been aggressive in pursuing the root causes of maintenance errors and has been responsive to NRC concerns and extensive training on independent verification requirements has been conducted.

2. Conclusion

The licensee is rated Category 2 in this functional area. This represents a decline in performance from the previous SALP assessment. The overall trend in performance during the assessment period was downward.

3. Board Recommendations

None.

D. Surveillance

1. Analysis

Portions of eight resident staff inspections were devoted to this functional area during the assessment period. These inspections focused on procedural compliance and adequacy, results review, and scheduling of tests. One special inspection was conducted to observe the Unit 2 containment integrated leak rate test. Portions of a routine fire protection inspection were devoted to surveillance testing of fire protection equipment. As a result of these inspections, 11 items of noncompliance were identified as indicated below:

- a. Severity Level V - Failure to document test performance (50-373/83-02).
- b. Severity Level V - Failure to perform a control rod position indication test (50-373/83-53).
- c. Severity Level V - Failure to follow the containment integrated leak rate test (CILRT) procedure (50-374/83-23).
- d. Severity Level V - Failure to establish valve controls as required by the CILRT procedures (50-374/83-23).
- e. Severity Level V - Failure to follow a test procedure (50-374/83-29).
- f. Severity Level IV - Inadequate surveillance procedure (50-373/83-14).
- g. Severity Level IV - Failure to perform a time response test (50-373/83-14).
- h. Severity Level IV - Inadequate fire protection surveillance procedures (50-373/83-44; 50-374/83-48).
- i. Severity Level IV - Failure to perform a breathing air cylinder hydrotest (50-373/83-44; 50-374/83-48).

- j. Severity Level IV - Failure to perform surveillance on nuclear instrumentation (50-373/83-43).
- k. Severity Level IV - Failure to restore instruments to service following a surveillance (50-373/84-05).

Four of these items of noncompliance (items b., g., i. and j.) involved a failure to perform required surveillance testing and were indicative of program weaknesses. Two items (d. and k.) involved failure to control the status of equipment during surveillance testing, a problem addressed in Section IV.1 of this report. Two items (f. and h.) occurred as the result of inadequate procedures. Two items (c. and e.) involved failure to follow procedures. One item a. involved a failure to document test results.

Twenty-six reportable events (1.5 events per month) occurred as a result of surveillance activities. Fourteen of these events were attributable to personnel errors, five were attributable to inadequate procedures, two were attributable to faulty equipment, and five were attributable to program weaknesses including failure to incorporate testing requirements into the surveillance tracking program.

Evaluation of the noncompliance and reportable event data for this functional area supported three concerns:

- (1) The personnel error rate was undesirably high. This was due, in part, to the manpower resources available to support Unit 1 operational surveillances, and Unit 2 preoperational test and surveillances. This problem was identified to the licensee prior to Unit 2 low power license issuance. In response to this concern the licensee committed to retain the services of a contractor until such time as the workload and staffing levels are more consistent.
- (2) The problems of equipment control identified in Section IV.1 of this report also surfaced in the area of surveillance testing, indicative of a facility-wide problem. Lack of independent verification was again a contributory factor. The licensee conducted additional training on this subject and revised procedures to more clearly reflect independent verification requirements.
- (3) Weakness existed in the surveillance program in the areas of entering required tests into the program and tracking their status. This concern was originally identified at the close of the SALP 3 period and carried over to SALP 4.

During the SALP 4 assessment period, the licensee devoted significant management resources to ensure that a comprehensive surveillance program was in place. These actions included; reviews by all departments of assigned surveillance responsibilities and comparison to existing surveillance requirements; creation of a surveillance task force; preparation of a detailed surveillance matrix; plant-requested corporate audits of the surveillance program; computerization of the surveillance programs for tracking; and a utility-requested INPO inspection of the surveillance program and activities.

These actions resulted in a significant upgrading of the surveillance program at LaSalle and prevented a recurrence of similar problems on Unit 2.

Four of five reportable events attributable to program weaknesses were licensee identified as a result of the aforementioned activities.

Throughout the SALP 4 assessment period extensive management involvement in the surveillance area produced significant programmatic improvements. Where other weaknesses were identified, prompt corrective action was initiated including training and procedure changes; however, the staffing problems identified above were reflective of a weakness in planning.

2. Conclusion

The licensee is rated Category 2 in the surveillance area. This rating represents an improvement over the SALP 3 rating and is based primarily on licensee reaction to identified programmatic weaknesses.

3. Board Recommendations

None.

E. Fire Protection

1. Analysis

One inspection to assess the implementation of fire protection FSAR commitments and license conditions was performed by the regional inspection staff during this evaluation period. Meetings were held on November 14 and 22, 1983 in Bethesda, Maryland, and November 18, 1983, in the Region III office to discuss those findings which were of concern to a scheduled Unit 1 restart following extensive maintenance activities. In addition, portions of fifteen resident staff inspections were devoted to fire protection. Resident inspection activities focused on

fire hazards control and equipment operability. Six items of noncompliance, one with eight examples, were identified as follows:

- a. Severity Level IV - Failure to comply with 10 CFR 50, Appendix R, Section III.J. regarding four of five emergency lighting units tested that failed the 8-hour discharge test. In addition, a sufficient number of emergency lighting units were not provided for access and egress routes to areas and equipment needed to accomplish safe shutdown (50-373/83-44).
- b. Severity Level V - Failure to comply with 10 CFR 50, Appendix R, Section III.H. in that an onsite 6-hour supply of reserve air was not provided with neither the air compressor being operable to provide adequate breathing quality air, nor were there sufficient numbers of NIOSH approved hydrostatically tested breathing apparatus cylinders available (50-373/83-44).
- c. Severity Level IV - Seven examples of inadequate fire protection program implementing procedures regarding 10 CFR 50, Appendix R and National Fire Protection Association Standards (NFPA) (50-373/83-44).
- d. Severity Level V - Failure to take prompt corrective action after an air flow problem with the carbon monoxide monitor was identified. The monitor is required to assure air quality when refilling the self-contained breathing apparatus used by the fire brigade (50-373/83-44).
- e. Severity Level IV - Failure to adequately design and install the fire detection system throughout all areas of the plant to meet the provisions of NFPA Standard 72E in that the number of detectors installed were inadequate and those detectors installed are improperly positioned (50-373/83-44; 50-374/83-48).
- f. Severity Level V - There was no documented evidence that offsite contractor personnel performing fire watch duty were required to be trained in the use of portable fire extinguishers including adequate classroom and hands-on training on test fires (50-374/83-48).

The inspections also identified 20 unresolved items for both units and 13 open items for Unit 2, concerning safe shutdown, instrumentation for safe shutdown, 10 CFR 50 Appendix R, Section III.H. and J., fire hoses, HVAC effect on the fire detection system, hydrogen buildup in battery rooms, surveillance testing of fire protection equipment, and fire pumps. These issues were resolved by incorporation as Unit 2 license conditions. No items of noncompliance were identified during those inspections conducted by the resident staff.

It is the view of Region III that the above noted inspection findings were the result of a lack of clear understanding on the part of the licensee of certain technical issues related to fire protection requirements compounded by a failure on the part of the licensee to clearly communicate to the NRC the intent of commitments made to industry codes and standards. In general, the station fire organization did adequately implement those requirements imposed by the corporate organization.

Following issuance of the inspection report documenting the regional staff inspection, the licensee indicated they would appeal violations c., d., e., and f. The basis for this appeal was not the technical merits of the issues represented by the items of noncompliance but the manner in which the requirements referenced in the items of noncompliance were being imposed. On March 28, 1984 a meeting was convened with the licensee and representatives of the NRR staff to discuss the concerns related to the appeal. During the meeting the licensee proposed certain actions to resolve these concerns outside the appeal process. This proposal is being reviewed by NRR.

The following attributes of the onsite fire protection program were observed during routine resident inspections:

- (1) Fire brigade response was very good to both actual and simulated fire conditions. Staffing levels were adequate and quality training of fire brigade members was witnessed.
- (2) The licensee has established a good working relationship with the offsite fire department and has demonstrated the ability to expeditiously process that department onsite during simulated fire conditions. This is indicative of comprehensive pre-planning for fire emergencies.
- (3) The Fire Marshal and his assistant are extremely capable and knowledgeable in fire protection matters. They aggressively pursue resolution of issues identified internally or by the NRC.
- (4) Effective onsite communication was maintained with the NRC. All events were promptly reported.
- (5) Corrective action for identified deficiencies was prompt and effective.

During the SALP 4 period the licensee's onsite fire protection organization maintained the same level of performance identified in SALP 3. Improvements were made in the overall level of fire protection as a result of resolution to issues identified by the regional staff inspection.

2. Conclusion

The licensee is rated Category 2 in this area.

3. Board Recommendations

None.

F. Emergency Preparedness

1. Analysis

Four inspections or portions of inspections were conducted between January 1983 and early May 1984, to evaluate compliance with 10 CFR Part 50, Technical Specifications, and procedures. Two items of noncompliance were identified as follows:

- a. Severity Level V - Failure to declare an Unusual Event on HPCS initiation (373/83-12).
- b. Severity Level IV - Failure to demonstrate the capability of initially notifying State governmental agencies within 15 minutes after emergency plan activation (373/84-12).

The second item was first identified in a deficiency issued to the licensee at the beginning of the rating period. During the rating period, the licensee's capability to promptly notify State agencies of an emergency declaration had improved due to increased emphasis on training and several refinements to the notification process. However, the licensee continued the policy of notifying the load dispatcher and corporate duty officer prior to notifying the State. As a result, for the two emergency declarations that occurred after implementation of the aforementioned corrective actions, the State was not notified in a timely manner.

Between routine inspections the licensee made effective use of the station's action item tracking system for addressing emergency preparedness items. All NRC concerns except those involving issuance of the next emergency plan revision, which is handled at the corporate level, have been satisfactorily corrected. Since the beginning of the rating period, the licensee has demonstrated improvements in the following areas of emergency preparedness: reviewing Emergency Action Levels with offsite support groups; expanding the scope of internal audits; record-keeping related to drills, exercises, communications tests and actual plan activations; and documenting training requirements for specific onsite emergency organization positions. The training program was still in the process of being upgraded to include a required reading file for procedure

revisions between annual training sessions. In addition, a checklist was being developed to evaluate plan activation records to ensure that they were complete. These actions indicate that station personnel have been and are continuing to strive to improve the emergency planning program. The licensee maintained a staff, adequate in numbers and in training, to fulfill all onsite emergency response duties, and was in the process of filling a permanent emergency planning coordinator position. Currently, two Rad/Chem staff personnel share this responsibility.

The licensee's overall performance during the 1983 exercise was generally acceptable; however, weaknesses were identified in the following areas: completing onsite assembly/accountability in a timely manner; providing inplant teams with adequate respiratory protection guidance and survey report forms; and several items related to the performance of personnel at the Emergency Operations Facility. Most of these items were acceptably addressed in procedures; however, the performance of the participants indicated that the training program could be improved. The licensee had undertaken corrective actions on all of these items. Most actions have been completed, but will not be observed until the next exercise.

In summary, the licensee's overall performance has improved during this rating period, as evidenced by the number of corrective actions completed and by the implementation of several other program improvements. However, the licensee needs to implement additional measures to ensure that State agencies are consistently notified of emergency declarations in accordance with the current regulatory time requirement.

2. Conclusion

The licensee is rated Category 2 in this area. The licensee's performance has generally improved over the course of the assessment period.

3. Board Recommendations

None.

G. Security and Safeguards

1. Analysis

Seven inspections (four routine and three reactive inspections) were conducted by region based physical security inspectors during this assessment period. The resident inspectors also made periodic inspections of security activities assessing routine program implementation and providing initial response to security events.

Twelve violations, including a civil penalty violation, were identified during the inspection effort.

- a. Severity Level IV - The licensee failed to conduct testing of some search equipment (373/83-03).
- b. Severity Level IV - One type of search equipment did not perform its function with a high probability of detection (373/83-03).
- c. Severity Level IV - A protected area barrier was not adequately controlled (373/83-03).
- d. Severity Level V - An item of security equipment was not alarm equipped (373/83-03).
- e. Severity Level IV - A piece of security equipment lacked a required safeguard capability (373/83-03).
- f. Severity Level IV - The licensee failed to adequately control obstructions within the isolation zone (373/83-22).
- g. Severity Level IV - Personnel screening deficiencies were noted in some records (373/83-22).
- h. Severity Level V - A designated vehicle was not adequately controlled within the protected area (373/83-22).
- i. Severity Level IV - The licensee failed to adequately compensate for a short-term defective feature of alarm station equipment (373/83-22).
- j. Severity Level IV - The licensee failed to adequately protect some Safeguards Information (373/83-22).
- k. Severity Level III - A vital area access point was not controlled as required by the security plan (373/83-45).
- l. Severity Level IV - An alarm monitor station did not have a capability required by the security plan (373/83-45).

Ten of the 12 violations occurred within the first six months of the 16-month assessment period.

During the initial portion of the assessment period, the licensee failed to adequately correct programmatic weaknesses identified in the previous SALP report. Evidence of inadequate supervision and a breakdown in management controls continued during the early months. For example, the inspection conducted in January 1983 noted continued inadequate management controls and ineffective guidance in the documentation, follow-up, and correction of identified problems on a generic basis.

The licensee's performance and progress in gradually correcting the programmatic weaknesses addressed in the previous SALP became evident in subsequent inspections. The inspection conducted in May and June 1983 noted that, although the number of violations (5) were the same as the January 1983 inspection, the nature of the violations had changed in that the violations generally pertained to noncompliance with procedures rather than lack of programmatic effectiveness and guidance.

Two violations, including a civil penalty violation, were identified in October 1983. The civil penalty violation was identified by the licensee as a result of an employee's analysis of possible vulnerabilities in vital area barriers, and management initiated immediate action when advised of the violation. An enforcement conference was held on November 10, 1983. The civil penalty violation was reduced by 75 percent of the base amount (\$40,000) because of the licensee's prompt, extensive, and effective corrective actions, and timely reporting. The licensee's corrective actions involved a review of barrier integrity for all vital area portals, rather than just the portal cited in the inspection report. Additionally, the licensee's Corporate Security office required all other sites under the licensee's control to conduct an analysis to assure that similar violations were not present at the other sites. This was indicative of addressing corrective actions on a generic rather than a single incident onsite specific basis.

No violations were identified during the two security inspections conducted since October 1983. The March 1984 inspection addressed management effectiveness and noted a significant improvement in the area of management effectiveness from that noted during the previous SALP period when the licensee was rated a Category 3, due in large part to ineffective management controls.

The licensee has initiated several actions to strengthen the security program and management related weaknesses noted in the previous SALP report and early months of this evaluation period. An additional security administrator was added to the site security staff in early 1983. The new security administrator spends approximately 50 percent of his available time within the plant observing activities and identifying potential problem areas before they become significant issues. Site security management review of security events also appear more in-depth. Corrective actions appear effective in preventing recurrence and have been technically sound. Daily review of security shift logs by licensee and contract security management has resulted in the recognition and prompt action for non-reportable security

concerns. A systematic approach to solving equipment problems has become evident. For example, the licensee's recently implemented a preventive maintenance program for card reader access control equipment. This is indicative of security management's approach to address root causes rather than the symptomatic problems. The quality of the security program audits has also improved, particularly toward the latter part of the evaluation period.

The licensee's response to two violations noted in the January 1983 inspection was either unsatisfactory or incomplete and required follow-up correspondence to adequately resolve. Since April 1983, the site security staff has responded to cited violations and areas of concern in a manner that resolved the issues in a timely manner. Areas of concern appear to receive the same level of site security management review as violations receive. Most issues are resolved at the Station Security Administrator level. The licensee has generally been responsive to NRC concerns.

Senior site management support for the security program has also improved since the previous SALP report. Addition of the assistant security administrator position, general support of security budget items, and the planned conversion of a warehouse facility into an administrative/training center for the security force demonstrates senior management's action to provide sufficient resources to improve security effectiveness. The actions cited above have also had a positive effect on the morale of the security force. The previous SALP report cited excessive overtime as having a negative effect on guard force morale. This no longer appears to be a problem.

The licensee has generally reported security events in a timely manner and with adequate information. Corrective actions initiated for security events which are reported or logged appear adequate.

Training effectiveness and qualification of the security force has improved, particularly in the latter part of the assessment period. Errors due to inattentiveness have occurred however, and require close supervisory attention.

Corporate security support of site security operations appears adequate. Licensing actions are submitted in a timely manner and corporate security representatives monitor inspection results.

2. Conclusion

The licensee is rated Category 2 in this area. This is a higher rating than was given in the previous assessment period, and is primarily due to the licensee's ability to reverse the adverse

trend noted in the previous SALP and early part of this assessment period. The licensee's actions resulted in a sustained improvement for the last 10 months of the assessment period. The civil penalty violation, although significant, was identified by a licensee employee prior to an incident occurring, and the corrective actions were extensive, timely and broad in scope. Management and programmatic weaknesses noted in the previous SALP appear resolved.

3. Board Recommendations

None.

H. Initial Fuel Loading

1. Analysis

During the assessment period a portion of one inspection was devoted to Unit 2 initial fuel loading to assess procedural compliance and personnel qualifications. One item of noncompliance was identified:

Severity Level V - Failure to update a fuel load status aid as required by procedure (374/83-56).

Initial fuel loading was conducted during the period December 30, 1983 through January 10, 1984. The item of noncompliance was minor in nature and immediate corrective action was taken. Based on the short time required to load fuel and the lack of problems encountered it was apparent that sufficient numbers of well trained personnel were made available and that the effort was well coordinated from a management standpoint. This level of performance was consistent with that observed during the Unit 1 fuel load documented in SALP 3.

2. Conclusion

The licensee is rated Category 1 in this area. They were also rated Category 1 for Unit 1 during the previous SALP assessment period.

3. Board Recommendations

None.

I. Licensing Activities

1. Analysis

Planning and assignment of priorities and decision making is at a level that ensures adequate management review of licensing

activities. Management within CECO was accessible which facilitated the reviews. Typical areas where management involvement was evident were resolution of Appendix R issues following identification by the NRC, inservice inspection, technical specifications, cable separation and responding to the requirements of emergency response capability.

With respect to resolution of technical issues from a safety standpoint in the area of fire protection the licensee demonstrated a lack of understanding of the specific fire protection principles involved with the resolution of technical issues. In contrast to this the licensee demonstrated strengths in adequate core cooling where they took the initiative to propose a concept design of reactor water level reference leg cooling for assuring accurate water level measurement in the reactor. Management attention and involvement with matters of nuclear safety is evident, and staffing and training is highly regarded with respect to the implementation and availability of trained personnel.

The licensee has generally provided timely responses which are sound and thorough, e.g., reduction of fast starts for diesel generators. They have generally been aware of and sensitive to the needs of the staff to perform its review function with adequate lead time; however, some delays were experienced in receiving submittals to resolve licensing issues. The licensee has been responsive to meet with the staff on short notice to resolve critical path issues. However, in the licensing activity related to Engineered Safety Features (ESF) reset the reporting was not complete and as a result of a Region III inspection further review was performed to rectify the problem.

The licensee has competent plant managers with nuclear experience. Most of the plant managers have worked up through the organization and have acquired nuclear background. The licensee has 23 ROs and 26 SROs, all having Unit 1 experience. The staffing requirements to operate the station are 36 licensed personnel and the licensee has a total of 49. Therefore, the station is well staffed with operating personnel. In addition, the licensee has the position which has the combination of an SRO/STA position.

The licensee as a result of being committed to nuclear power has both a corporate training program which includes simulators for their plants and at each respective site for its site specific program. Training and qualification for Unit 2 was effectively implemented to provide sufficient numbers of licensed personnel for the operation of Unit 2. As indicated above, the licensee does not have any problems with respect to resources for manning the station.

Management attention and involvement with matters of nuclear safety is evident, and staffing and training is highly regarded with respect to the implementation and availability of trained personnel. The licensee's responses are usually, but not always, timely and the resolution of licensing activities and licensing actions are reasonably responsive although occasionally repeated attempts are necessary to gain resolution to technical problems.

The licensing activities represent a lower rating than was determined for the previous SALP evaluation period (January 1, 1982 to December 31, 1983) and an equal rating for the licensing actions. This downward trend for the licensing activities may be due, in part, to management involvement in both operating and constructing of plants.

2. Conclusion

The licensee is rated Category 2 in this functional area.

3. Board Recommendations

None.

J. Preoperational and Startup Testing

1. Analysis

During the assessment period Unit 1 conducted its initial startup testing program and Unit 2 completed its preoperational testing program and began its startup testing program.

Unit 1 inspection activities during the assessment period consisted of witnessing of startup test performance, in-depth review of startup test results evaluations, independent inspection effort, and observation of corrective actions for problems identified. This inspection effort was divided between region based and resident inspectors. The region based inspectors performed two inspections during this assessment period. Portions of eight inspections by resident inspectors were devoted to this area.

Unit 2 inspection activities during the assessment period consisted of in-depth reviews of both preoperational and startup test procedures, witnessing of preoperational and startup test performance, in-depth reviews of preoperational test results evaluations, observations of corrective actions for problems identified, and independent inspection effort. The inspection effort was divided between region based and resident

inspectors. The region based inspectors performed 12 inspections during this assessment period. Portions of eight inspections by resident inspectors were devoted to this area.

Twelve items of noncompliance were identified as follows:

- a. Severity Level V - Failure to ensure that all testing requirements were adequately implemented (50-374/83-05).
- b. Severity Level IV - Failure to follow an approved procedure (50-374/83-05).
- c. Severity Level IV - Two examples of failure to have an adequate preoperational test procedure (50-374/83-06).
- d. Severity Level V - Failure to identify deficient conditions and to note in the evaluation that the acceptance criteria had not been met (50-374/83-20).
- e. Severity Level IV - Failure to follow procedures during the Residual Heat Removal System preoperational test such that initial test conditions were not adequately prescribed (50-374/83-23).
- f. Severity Level V - Failure to follow procedures in that a control switch was out of position during performance of the Diesel Generator 2A preoperational test (50-374/83-29).
- g. Severity Level V - Failure to have a written procedure for performing maintenance on a reactor core isolation cooling system motor operated valve (50-374/83-39).
- h. Severity Level IV - Failure to have a procedure to test a safety design feature (50-373/83-54) and (50-374/83-57).
- i. Severity Level V - Two examples of failure to use a calibrated instrument (50-374/83-57).
- j. Severity Level V - Two examples of failure to have appropriate acceptance criteria for a test affecting quality (50-374/84-11).
- k. Severity Level V - Failure to test a replaced safety-related component (50-374/84-14).
- l. Severity Level IV - Failure to implement all design requirements in a safety-related design (50-373/83-52) and (50-374/83-55).

Items a., b., c., e., f., g., and j. above involved procedure compliance problems relative to Unit 2 preoperational testing activities. The licensee corrected each of the specific items as they were identified; however, the licensee's corrective actions did not consistently address the root cause of the problem as evidenced by the repetitive nature of the noncompliances. The problems encountered with procedure compliance were attributable in part to insufficient management presence in the field during testing evolutions. As noted in other sections of this report, as the assessment period progressed, licensee corrective actions for identified problems became more comprehensive. This is supported by the fact that the procedure compliance problem did not manifest itself in the startup test program at either unit as no items of noncompliance were identified in this area.

A problem was identified that dealt with the licensee's lack of compliance with several specific NRR directives (Noncompliance Items h. and l.). Specifically, the licensee failed to have a test to verify that no Engineered Safety Feature (ESF) components would reposition themselves upon reset of an ESF signal. Further, the licensee failed to either modify or report to the NRC all ESF components that did not conform to NRC criteria as set forth in NUREG-0737 and IE Bulletin No. 80-06. This was the subject of a management meeting on November 21, 1983, and an enforcement conference on February 28, 1984. The failure to provide complete and accurate information to the NRC has been determined to be an isolated event, and it was concluded that the licensee has in place appropriate management systems to provide an adequate level of confidence in their submittals.

Analysis of the licensee's noncompliance history in this functional area indicates that:

- (1) The number and severity level of the items of noncompliance are consistent with other facilities undergoing preoperational testing. Further, the noncompliance history compares favorably with operating facilities in Region III considering that over 3000 inspector-hours were expended in this functional area to meet inspection program requirements. The approximately 250 hours of inspection per item of noncompliance in this functional area compares favorably with the regional average for operating facilities during this SALP period of 117 hours of inspection per item of noncompliance. It should be noted that during this assessment period, LaSalle had one unit in startup testing and operations, and the second unit in preoperational and startup phases.
- (2) None of the items of noncompliance in this functional area resulted in corrective action by the licensee which required extensive rereview, reanalysis, or retesting of licensee completed preoperational or startup tests.

- (3) The licensee's preoperational testing problems indicated by the items of noncompliance have been largely corrected. This is indicated by the fact that none of the above items of noncompliance resulted from inspection in the area of startup testing.

The licensee generally responds to NRC initiatives in a timely fashion with viable, sound and thorough responses. The licensee has few longstanding regulatory issues pending in this functional area.

Licensee staffing in this area is generally adequate in size and the training and qualifications of the staff are adequate.

The SALP Board stated during the previous SALP that the construction Operations Analysis Department (OAD) performance would be monitored during the Unit 2 preoperational test program to determine if its performance had improved. The results of this monitoring indicate that OAD performance has not improved during this rating period. In Inspection Report No. 50-374/83-39, the NRC expressed a concern that activities affecting quality appear to be performed by construction OAD without adequate written procedures and without maintaining adequate documentation of the work they have performed. Since construction OAD's role at LaSalle is complete, this will be followed as it may pertain to the Byron and Braidwood sites.

2. Conclusion

The licensee is rated Category 2 in the area of preoperational testing and startup testing. The licensee performance has remained essentially constant during this assessment period.

3. Board Recommendations

The performance of construction OAD should be monitored at other Commonwealth Edison Company sites. The performance of the licensee in the area of startup testing of Unit 1 indicates that reduced inspection in this area should be considered for the Unit 2 startup test program.

K. Piping Systems and Supports

1. Analysis

Examination of this functional area consisted of eight routine inspections and one special inspection on Unit 2. The inspections examined the (1) specific calculations and the methodology being applied for fatigue usage factors, (2) repairs made to various pipe restraints in response to damage caused by "water hammer" as reported in LER 83-120/03L-0, (3) evaluations, welding repairs, post weld heat treatment, and the failure

analysis performed on the socket welds connecting 2" O.D. drain lines to main steam isolation valves as reported in LER 83-006/02L-0 and LER-007/01T-0, (4) induction heating stress improvement treatment performed on Unit 2 recirculation system piping welds to prevent the initiation of intergranular stress corrosion cracking, (5) piping installation records and a field as-built verification of selected portions of safety-related piping systems, (6) radiographs for over 130 shop and field piping welds, (7) actions related to previous inspection findings, 10 CFR 50.55(e) items and IE Bulletins, and (8) allegations brought to the attention of the NRC.

The activities in this area were conducted during the latter stages of construction. No items of noncompliance or deviations were identified. The activities observed, the management controls used, and the records and record control systems in place met requirements. Records indicate the personnel were properly trained and certified. The licensee's audit reports were found to be generally complete and thorough.

The inspections into the problems contained in the allegations related primarily to the qualification of welders. Areas examined during the review included welding instructions, lecture outlines, welding procedures, surveillance reports, and welder qualification records. Within the scope of the review, no items of noncompliance or deviations were identified. The concern that the licensee's Quality Assurance organization had recently identified that for approximately two months a welder employed by Walsh performed welds in Unit 2 for which he was not qualified, was substantiated; however, appropriate notifications were made and corrective actions were taken. Other allegations were not substantiated. The observations in this area indicate that overall performance was satisfactory.

2. Conclusions

This licensee is rated Category 2 in this area. This is the same rating as the previous assessment period.

3. Board Recommendations

None.

L. Contractor Quality Assurance

1. Analysis

One inspection was conducted by two NRC inspectors to follow up on quality assurance concerns identified in followup of allegations associated with Morrison Construction Company as

recommended by SALP 3. The findings of this inspection indicated that the licensee has adequately resolved concerns with respect to contractor auditing.

2. Conclusion

Licensee performance has improved over the course of the SALP assessment period. The licensee is rated Category 2 in this functional area.

3. Board Recommendations

The enhanced inspection effort recommendation in SALP 3 may be discontinued. Future assessments in this area will be made as part of the assessment for Quality Programs and Administrative Controls Affecting Quality.

M. Quality Programs and Administrative Controls Affecting Quality

1. Analysis

Three Quality Assurance Program inspections by region based personnel and portions of two inspections by resident personnel were performed.

One inspection involved determining the adequacy of the QA Programs for the administrative control of procurement; documentation; receipt, storage, and handling of equipment and materials; records; design change and modifications; maintenance; tests and experiments; surveillance testing and calibration; test and measurement equipment; lifted leads and jumpers; and startup testing activities.

One item of noncompliance in the area of modifications was issued for failure to follow procedures. Corrective action was completed during the inspection.

Several weaknesses were identified in the areas of maintenance and modifications involving lack of detail in modification procedures, drawing updates, and review of maintenance requests for root causes.

Another inspection was conducted to verify that the licensee's audit program met the requirements of Technical Specification Section 6.1.G.1.b.1 regarding Technical Specification audits. One unresolved item was identified during this inspection regarding the adequacy of QA audits to verify adherence to Technical Specifications. NRC policy relative to this item has been developed and is currently being implemented in the Regional inspection program.

The third inspection addressed the following activities: Monthly and annual reports, general office auditing, unit evaluation, onsite auditing, nonconformance control, design change control and contractor program reviews. No items of noncompliance were identified.

Management policies appear to be adequately stated and understood. Audits are generally complete, timely and thorough. Corporate management was usually involved in site activities. Procedures and policies are rarely violated in the areas inspected. Procurement is generally well controlled and documented. Key positions are identified and authorities and responsibilities are defined in the areas inspected. The training and qualification program contributes to a generally adequate understanding of work and fair adherence to procedure with a modest number of personnel errors.

The resident staff inspection activities in this area focused on field implementation of program requirements and identified one problem relating to implementation of QA manual requirements related to QA involvement in startup testing activities. The licensee was performing the required activities but had not established a program to ensure that all activities were accomplished.

2. Conclusion

The licensee is rated Category 2 in this functional area.

3. Board Recommendations

None.

N. Electrical & Instrumentation Equipment and Cables

1. Analysis

Licensee activities in this area were observed in ten inspections. The areas inspected included observation of electrical and instrumentation installations, review of storage, maintenance and QA/QC records, allegations and followup on one Licensee Event Report (373/84-143).

- a. Severity Level V - Quality Assurance Level 1 requirements were not established and implemented for the installation of cables of the Standby Liquid Control System motor and auxiliary equipment (50-374/83-36).
- b. Severity Level V - Several examples of failure to follow procedures to separate safety-related cables and failure to correctly identify instrument sensing lines. One

example of failure to establish a procedure specifying minimum separation for cables after they exit cable trays (50-374/83-18).

- c. Severity Level V - Failure to establish and execute adequate requirements to inspect and document the inspection results of safety-related electrical conductor splices (50-374/84-08).
- d. Severity Level V - Failure to follow procedures relative to the installation of electrical jumpers (50-374/84-08).
- e. Severity Level V - Failure to verify that up to date electrical drawings were maintained in accordance with Procedure LAP-810-5, Revision 9 (50-374/84-04).
- f. Severity Level V - Electrical equipment installations as-built configuration not in accordance with design drawings and specifications (50-374/84-04).
- g. Severity Level IV - Failure to have adequate cable separation (50-374/83-14).
- h. Severity Level V - Failure to have adequate housekeeping practice in cable trays (50-374/83-14).
- i. Severity Level V - Failure to have adequate housekeeping practices in cable trays (50-373/83-16).

During the previous SALP period, the licensee was not rated specifically in this area because of limited electrical inspections directly attributed to Unit 2.

During this SALP period (16 months) a significant amount of NRC inspection effort was used on the investigation of allegations and review of as-built configurations. More than 20 allegations were examined. A significant allegation that was substantiated involved improper electrical cable splices and terminations. As a result of NRC determination that improper electrical splices existed, CECO was required to perform a 100% reinspection of the identified electrical equipment for this attribute. All discrepancies were identified and corrected. NRC provided 100% coverage of this reinspection activity. The level of NRC inspection activity was significantly increased as a result of this and a number of other allegations. The nature of the individual noncompliance identified is of minor safety significance and the number is not considered unusual in the context of the level of construction and NRC inspection activity. In each instance the licensee has taken or is taking an appropriate corrective action and has been fully responsive to NRC concerns.

Overall, the licensee's performance as assessed in part by ten NRC inspections in this area during this SALP period, was substantially in conformance with NRC and design requirements. Licensee management was adequately and effectively involved in quality assurance, and the identification and resolution of technical and administrative issues.

2. Conclusion

The licensee is rated Category 2 in this area. The licensee's performance in this area has been essentially the same over this SALP assessment period.

3. Board Recommendations

None.

0. Containment and Other Safety-related Structures

1. Analysis

Examination of this functional area consisted of three routine inspections (50-373/83-10, 50-374/83-04; 50-373/83-13, 50-374/83-03; 50-374/83-43). The inspections examined installation and records for the spent fuel storage racks and a field as-built walkdown and related record review for the fabrication and erection of structural steel in the Auxiliary Building, the Diesel Generator Building and in the containment for Unit 2. The walkdown included a review of special bolting requirements for expansion connections in response to a finding identified in Unit 1 in early 1982. No items of noncompliance or deviations were identified. The work activities in this area were limited because construction was essentially complete. The activities observed, the management controls used, and the records and record control systems in place met requirements. Personnel involved in the areas reviewed were properly trained and certified.

2. Conclusions

The licensee is rated Category 2 in this area.

3. Board Recommendations

None.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

1. During the period January 1, 1983 through January 1, 1984, Unit 1 proceeded through the initial startup testing program. The unit was declared in commercial service on January 1, 1984. The power and outage histories are shown in Figure 1.
2. The Unit 2 preoperational testing program was in progress at the beginning of the assessment program and continued through low power license issuance on December 16, 1983. Initial fuel loading was performed during the period December 30, 1983 through January 11, 1984. Initial criticality occurred on March 10, 1984. Startup testing continued through the end of the assessment period including full power license issuance on March 23, 1984.

B. Inspection Activities

The inspection program at LaSalle consisted of routine resident and region-based inspections. No major team inspections were conducted during the SALP period. Three special inspections were conducted, one to assess operator readiness for Unit 2 license issuance, one to assess Technical Specification - FSAR - as-built conformance, and one to follow up on Engineered Safeguard Reset Testing Activities.

TABLE 1
INSPECTION ACTIVITY AND ENFORCEMENT

FUNCTIONAL AREA	NO. OF VIOLATIONS IN EACH SEVERITY LEVEL				
	I	II	III	IV	V
Plant Operations			1	11	3
Radiological Controls				1	4
Maintenance				3	5
Surveillance and Calibration				6	5
Fire Protection				3	3
Emergency Preparedness				1	1
Security and Safeguards			1	9	2
Fuel Loading					1
Licensing Activities					
Preoperational and Startup Testing				5	7
Piping Systems and Supports					
Contractor Quality Assurance					
Quality Programs and Administrative Controls Affecting Quality					1
Electrical Equipment and Cables				1	7
Containment and Other Safety- Related Structures					
TOTAL			2	40	39

C. Major Investigation and Allegations Review

During the assessment period two sets of allegations were received by the NRC. The first set concerned inadequate welder qualifications. Only one of the allegations in this area was substantiated; however, the licensee had previously identified the problem and taken adequate corrective actions.

The second set of allegations (approximately 25) concerned improper electrical construction practices in Unit 2. These were investigated by resident and region-based inspectors during March 1984. As a result of these inspections numerous discrepancies were identified in cable splices in Units 1 and 2. No other substantial problems were identified. These discrepancies were corrected prior to Unit 2 full power issuance.

D. Escalated Enforcement Actions

1. Civil Penalties

- a. A civil penalty in the amount of \$40,000 was issued for a Severity Level III violation involving operation of Unit 1 with an inoperable primary containment vacuum breaker for a period of time in excess of that permitted by the Technical Specifications (IE Inspection Report No. 50-373/83-26).
- b. A civil penalty in the amount of \$10,000 was issued for a Severity Level III violation involving a degraded vital area boundary (IE Inspection Report 50-373/83-45).

2. Orders

None.

E. Management Conferences Held During the Appraisal Period

1. Conferences

- a. January 26, 1983 A management meeting was held in the NRC Region III offices to discuss proposed Commonwealth Edison Company guidelines for Commonwealth Edison Company personnel to be used for providing information to NRC Region III inspectors.
- b. February 17, 1983 A management meeting was held in the NRC Region III offices to discuss future improvement of the regulatory performance of Commonwealth Edison Company.
- c. May 12, 1983 SALP 3 meeting.

- d. May 13, 1983 Enforcement Conference to discuss Unit 1 surveillance program deficiencies.
- e. June 30, 1983 Enforcement Conference to discuss a Severity Level III violation involving circumstances that resulted in a mispositioned drywell to suppression chamber vacuum breaker isolation valve and resulted in a civil penalty.
- f. July 26, 1983 A management meeting was held in the Commonwealth Edison Company corporate offices to discuss improvement of licensee regulatory performance and enhancement of communications between the NRC and Commonwealth Edison Company.
- g. September 9, 1983 A management meeting was held at the Commonwealth Edison Company corporate offices to continue discussions on improvement of licensee regulatory performance and enhancement of communications between Commonwealth Edison and the NRC.
- h. September 30, 1983 Enforcement Conference to discuss the circumstances surrounding the inadvertent heatup event occurring on August 24, 1983.
- i. October 19, 1983 A management meeting was held at the Holiday Inn in Aurora, Illinois to continue discussions on improvement of licensee regulatory performance and enhancement of communications between Commonwealth Edison and the NRC.
- j. November 10, 1983 Enforcement Conference concerning unresolved potential enforcement actions with respect to Engineered Safety Feature reset problems, and an inoperable primary containment isolation valve.
- k. November 10, 1983 Enforcement Conference to discuss a Severity Level III violation involving a degraded vital area boundary and resulting in a civil penalty.
- l. February 28, 1984 Enforcement Conference to discuss deficiencies in Engineered Safety Feature reset submittals.
- m. September 27, 1983 Management meeting to discuss cable separation issues.

- n. March 23, 1984 Commission meeting for full power license issuance for LaSalle Unit 2.
- o. March 28, 1984 Informational meeting with NRR on certain fire protection issues under appeal.

2. Confirmation of Action Letters (CAL)

On November 28, 1983, a CAL was issued to confirm licensee commitments with respect to accelerated leakage testing of feedwater check valves and qualification of the valves' soft seat material following a series of valve leakage test failures. All testing requirements have been satisfied. The licensee is in the process of qualifying the valves' soft seat material.

F. Review of Licensee Event Reports (LER)

Licensee Event Reports (LERs) submitted were adequate in all important aspects including technical accuracy, completeness, and intelligibility. The LERs provided clear descriptions of the cause and nature of the events as well as adequate explanations of the effects on both system function and public safety. Most of the LERs provided supplemental information in attachments to the LER forms, thereby facilitating evaluation of the safety significance of the events.

The following table presents a summary of Licensee Event Reports categorized by proximate cause. It should be noted that on January 1, 1984, the Commission's regulations were amended to include a new section, 10 CFR 50.73 "Licensee Event Report System," which superseded existing requirements contained in Technical Specifications. The intent of the new regulation was to eliminate reporting of those items of little interest to the Commission. As a result, the table below has been separated into two sections for SALP 4. The first section contains a summary of those LERs issued prior to January 1, 1984. The second section contains those LERs issued after December 31, 1983. Comparison of SALP 3 and SALP 4 data is valid only for those LERs issued before January 1, 1984.

<u>Proximate Cause</u>	<u>SALP 3 (04/17/82 - 12/31/82)</u>	<u>SALP 4 (01/01/83 - 12/31/83)</u>	<u>SALP 4 (01/01/84 - 04/30/84)</u>
Personnel Error	41	38	7
Design, Mfg., Construction/Installation	16	11	3
External Cause	1	1	0
Defective Procedures	6	0	1
Component Failure	78	90	17
Other	7	15	0
TOTALS	149	155	32

Analysis of the rate of reportable events for the comparable periods in SALP 3 and SALP 4 shows a net overall decrease of 26%. Significant reductions have been made in the rate of events due to personnel errors (33% improvement), design, manufacturing, construction/installation errors (53% improvement), and component failures (18% improvement).

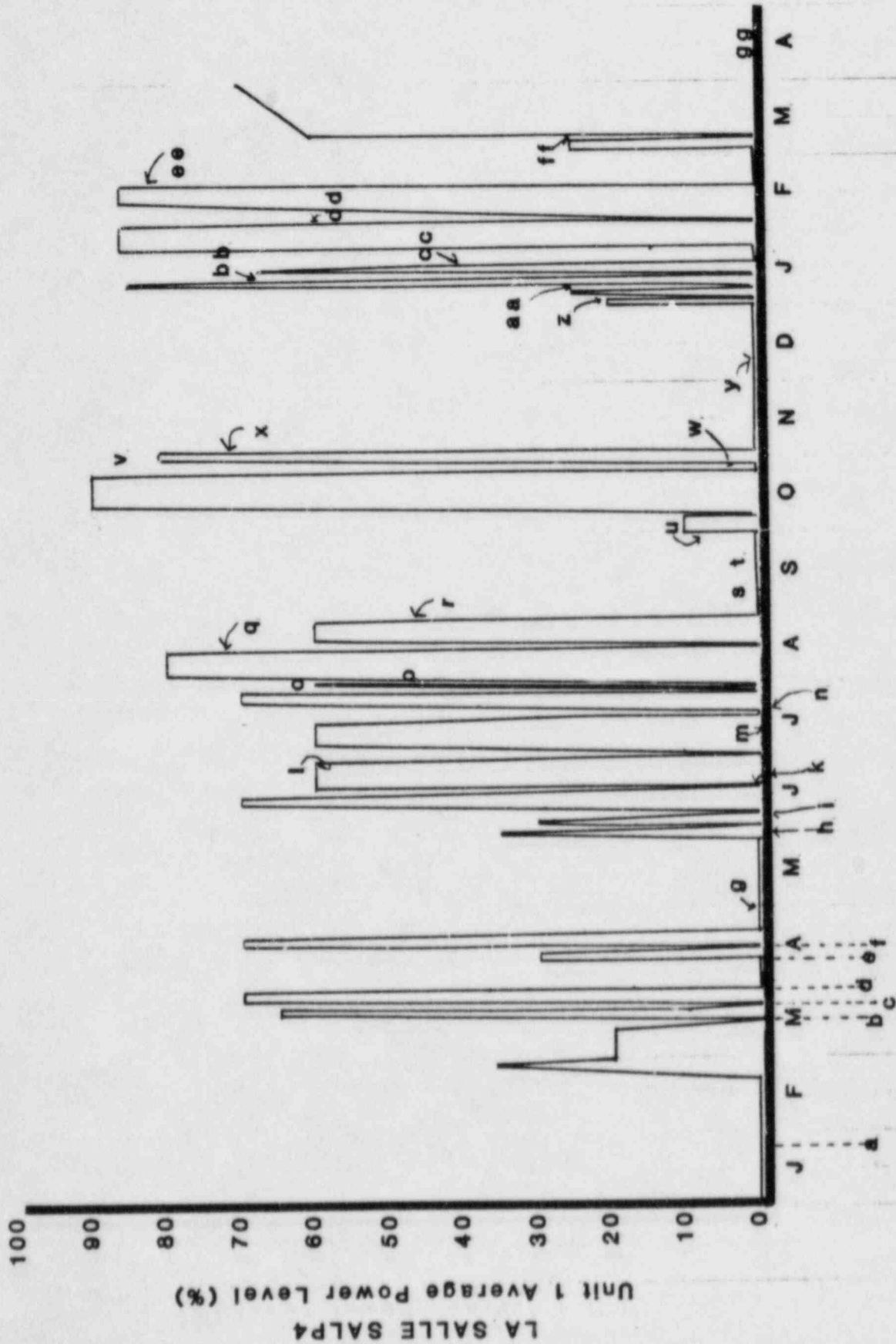
The overall reduction in the rate of personnel errors is attributable to two factors:

1. Personnel are becoming acclimated to the units in operation instead of construction.
2. Management attention has been focused on attention to detail and personal responsibility for actions taken.

The reduction in the rate of component failures and problems caused by design, manufacturing, construction/installation errors is reflective of the fact that many of the Unit 1 deficiencies in existence at the time operations commenced have been corrected and adequate preplanning and foresight prevented recurrence on Unit 2.

While the trend in the overall rate of LERs and personnel errors is encouraging, it should be noted that the rate of personnel errors in maintenance and surveillance activities has increased. In the case of maintenance, this increase is significant (one versus eight events). This is indicative of a need to focus additional attention on personnel performance in these areas and is supportive of a change in the rating category in the maintenance area.

FIGURE 1



January 1, 1983 thru April 30, 1984

Attachment to Figure 1 Outage Summary

- a. Equipment outage - relief valve failure
- b. Scram on high steam tunnel differential temperature
- c. Scram on spurious Turbine Stop Valve closure signal
- d. Scram due to Intermediate Range Monitor (IRM) Power Supply spike
- e. Scram due to spurious hydraulic transient on an instrument line during surveillance
- f. Autoscrum on reactor vessel low level - feed pump trip
- g. Outage for condenser repairs
- h. Scram due to surveillance error
- i. Scram due to turbine trip on spurious high water level
- j. Scram during startup due to IRM spike while changing ranges
- k. Scram due to turbine trip on spurious high water level
- l. Planned scram for startup testing
- m. Scram due to maintenance error on the Electro-Hydraulic Control System
- n. Scram due to maintenance error on startup
- o. Scram due to spurious main steam line low pressure
- p. Scram due to spurious main steam line low pressure
- q. Scram due to surveillance error
- r. Scram on loss of feedwater flow
- s. Outage for recirculation pump seal replacement and modifications to Turbine Control
- t. Scram during startup due to leaking "O" rings on scram solenoids
- u. Scram due to generator trip on neutral ground - water leakage
- v. Planned scame for startup testing
- w. Scram during startup due to loss of instrument air
- x. Planned scram for startup testing
- y. Outage due to drywell overheating problem
- z. Manual planned scram for surveillance
- aa. Loss of feedwater scram - overheated feed pump
- bb. Scram due to loose generator fuse
- cc. Scram due to condenser boot seal failure
- dd. Scram due to Reactor Core Isolation Coating surveillance error
- ee. Scram due to condenser boot seal failure
- ff. Shutdown due to potential drywell ventilation overstress
- gg. April 14 - Scram due to low reacto vessel level while paralleling feed pumps

<u>Planned</u>	<u>Operating</u>	<u>Maintenance</u>	<u>Surveillance</u>	<u>Material</u>
4	3	2	4	15



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

3

AUG 28 1984

Docket No. 50-254
Docket No. 50-265

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

Enclosed for your review, prior to our scheduled meeting of September 17, 1984, is the SALP Board Report for the Quad Cities Nuclear Generating Station, covering the period January 1, 1983 through May 31, 1984.

Overall, we found your performance acceptable and directed toward safe facility operation. While we do not wish to minimize the many functional areas which were rated Category 1, the decreased rating in the area of reactor operations from Category 1 in SALP II, to Category 2 in SALP III, to Category 3 in SALP IV detracts from the overall regulatory performance record at Quad Cities. Notwithstanding, we are encouraged by the improved performance in this area at Quad Cities during the last portion of the appraisal period and we believe your overall Regulatory Improvement Program will be a major factor in bringing about continued improvement in regulatory performance.

You will note that I changed the SALP Board ratings in the functional areas of radiological controls and fire protection from a Category 1 to a Category 2. While I respect the Board's position and acknowledge the improvements made in the area of radiological controls, I believe a Category 1 rating in this area should not be a "borderline" decision. Accordingly, I have changed this rating to Category 2. With respect to fire protection, I have lowered the SALP rating to 2 as a result of the many open issues related to Appendix R.

While you will have sufficient opportunity to present your comments at the meeting on September 17, 1984, we also solicit written comments within 30 days after the meeting to enable us to thoroughly evaluate your comments and provide you with our conclusions relative to them.

In accordance with Section 2.790 of NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the SALP Report will be placed in the NRC's Public Document Room.

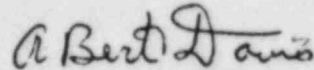
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AUG 28 1984

No reply to this letter is required at this time; however, should you have any questions concerning the SALP Report, we would be pleased to discuss them with you.

Sincerely,



for James G. Keppler
Regional Administrator

Enclosure: SALP Report
No. 50-254/84-05; 50-265/84-04

cc w/encl:

D. L. Farrar, Director
of Nuclear Licensing

N. Kalivianakis, Plant
Superintendent

DMB/Document Control Desk (RIDS)
Resident Inspector, RIII

Phyllis Dunton, Attorney
General's Office, Environmental
Control Division

R. C. DeYoung, IE

H. R. Denton, NRR
NRR Project Manager

INPO

Regional Administrators
RI, RII, RIV, RV

SALP BOARD REPORT

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

Commonwealth Edison Company

QUAD-CITIES NUCLEAR POWER STATION

Docket Nos. 50-254; 50-265

Reports No. 84-05; 84-04

Assessment Period

January 1, 1983 through May 31, 1984

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operation.

A NRC SALP Board, composed of the staff members listed below, met on July 26, 1984, to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee safety performance at Quad-Cities Nuclear Power Station from January 1, 1983, through May 31, 1984.

SALP Board for Quad-Cities Nuclear Power Station:

<u>Name</u>	<u>Title</u>
J. A. Hind	Director, Division of Radiological Safety and Safeguards
C. E. Norelius	Director, Division of Reactor Projects (DRP)
R. L. Spessard	Director, Division of Reactor Safety (DRS)
L. R. Greger	Chief, Facilities Radiation Protection Section
J. R. Creed	Chief, Physical Security Section
J. Foster	Technical Support Staff, DRP
N. J. Chrissotimos	Chief, Division of Reactor Projects Section 2C
R. Bevan	Quad-Cities Project Manager, NRR
A. L. Madison	Senior Resident Inspector, Quad-Cities
A. Morrongiello	Resident Inspector, Quad-Cities
T. Ploski	Emergency Preparedness Analyst

II. CRITERIA

The licensee performance is assessed in selected functional areas depending whether the facility is in a construction, preoperational or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement in assuring quality.
2. Approach to resolution of technical issues from safety standpoint.
3. Responsiveness to NRC initiatives.
4. Enforcement history.
5. Reporting and analysis of reportable events.
6. Staffing (including management).
7. Training effectiveness and qualification.

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definition of these performance categories is:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used such that a high level of performance with respect to operational safety or construction is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective such that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used such that

minimally satisfactory performance with respect to operational safety or construction is being achieved.

Trend. The performance gradient over the course of the SALP assessment period.

III. SUMMARY OF RESULTS

Overall, during this period, the licensee's performance was found to be generally acceptable and directed toward safe facility operation. At the close of the previous SALP rating period the licensee's performance in the Operation functional area had shown a downward trend. This trend continued during the first part of the SALP rating period and accounts for the reduced rating in that area. Improvement in Operations was noted in the latter part of the evaluation period due in a large part to the implementation of a regulatory improvement program. In addition, improvement was reported in the Radiological Controls functional area and significant strengths were noted in Emergency Preparedness and Security with reduced inspection effort being recommended in the latter.

<u>Functional Area</u>	<u>Rating Last Period</u>	<u>Rating This Period</u>	<u>Trend Within the Period</u>
Plant Operations	2	3	Improved
Radiological Controls	2	1 2*	Improved
Maintenance/Modifications	2	2	Same
Surveillance	1	1	Improved
Fire Protection	1	1 2*	Same
Emergency Preparedness	2	1	Improved
Security	1	1	Improved
Refueling	1	1	Same
**Quality Programs and Administrative Controls	Not Rated	2	Same
Licensing Activities	1	1	Same

* Rating changed by Regional Administrator

**This is a new functional area for SALP period IV.

IV. PERFORMANCE ANALYSES

A. Plant Operation

1. Analysis

Portions of twelve inspections were performed by the resident inspector covering direct observation of operating activities, review of logs and records, verification of selected equipment lineups and operability, and followup of significant operating events to verify that facility operations were in conformance with the Technical Specifications and administrative procedures. Five items of noncompliance were identified as follows:

- a. Severity level III - Failure to follow shutdown procedures (254/83-11-01)
- b. Severity level III - Failure to follow administrative procedures (254/83-11-02)
- c. Severity level III - Failure to maintain accurate records (254/83-11-03)
- d. Severity level IV - Exceeding technical specification limiting condition for operation for secondary containment integrity (254/83-31-01)
- e. Severity Level V - Failure to have procedures that addressed actions necessary to change status of main steam isolation valve room (254/83-31-02)

Items a. through d. were the result of personnel errors.

Items a., b., and c. were issued as a result of the March 10, 1983 rod insertion error. An Abnormal Occurrence Report was issued due to the significance of this event. Escalated enforcement action was taken in the form of a civil penalty of \$150,000. Multiple enforcement conferences were held with members of corporate and plant management as well as with the operating staff.

The rod insertion error was considered by NRC to be very serious and a continuance of the downward trend in plant operations performance that was noted at the end of the SALP III assessment period.

Following the Enforcement Conference, aggressive corrective action was initiated by site management to ensure procedure adherence, operator attentiveness, and direct management involvement. Improvement in performance was noted by the resident inspectors; however, the corrective actions were apparently not fully effective because further problems were experienced as noted in item d. above.

The secondary containment event of November 10, 1983 was considered for escalated enforcement and an Enforcement Conference was held with corporate and site management; however, due to a change in NRC enforcement policy, this issue was classified a Severity Level IV violation, not warranting a civil penalty.

At the January 24, 1984 Enforcement Conference, site management presented a regulatory improvement program that had been instituted for Quad-Cities and several proposals that had been made to corporate management including the construction of an operations center to better coordinate plant operations. NRC regional management remarked at the lack of corporate involvement and the failure of corporate management to search out root causes and requested the submittal of a formal corporate-wide Regulatory Improvement Program (RIP). This plan was submitted on February 24, 1984. Pertinent aspects of the program included:

- (1) Corporate directives for improving operating performance covering identification of potentially significant events, post-trip analysis prior to plant restart, and conduct of operations.
- (2) Improved communications at all levels.
- (3) Corporate site visits and a station management shift overview function.
- (4) Corrective actions for personnel errors.

Subsequent to the implementation of the corporate-wide Regulatory Improvement Program, the resident inspectors noted significant improvement in this area. Corporate management is frequently involved in site activities. Site management's attitude and attention to regulatory matters and inspector concerns was very good. Events were promptly reported and corrective actions were timely and well thought out. There is consistent evidence of prior planning and assignment of work priorities. Staffing appears to be adequate although some occasional difficulties with backlog of procedures are experienced. The training program is well defined and is implemented with dedicated resources for a large portion of the staff. Regulatory performance improved along with a decrease in personnel errors.

Sixty-three LERs were submitted in the operations area during the assessment period. Five of these were attributed to personnel error of which two resulted in the events noted above. Six were the result of procedure deficiency and the remainder were caused by equipment malfunction. This distribution appears to be consistent with previous SALP periods; however, the significance of the procedure deficiencies and personnel errors was considered during enforcement actions. It is noted that no personnel errors were reported subsequent to the November secondary containment event.

Six reactor trips occurred on Unit 1 and four on Unit 2. Two of the ten trips were caused by contractor personnel inadvertently striking sensitive instrumentation, one by a procedure deficiency, three by personnel error, and four were caused by mechanical malfunctions. Only one of the scrams due to personnel error occurred subsequent to the secondary containment event, none following implementation of the RIP.

During the assessment period four Reactor Operator (RO) and twenty-two Senior Reactor Operator (SRO) examinations were administered to personnel at Quad-Cities station. Six of the candidates were retake examinations. Two RO and fifteen SRO candidates passed, which is below the national average passing rate of approximately 80%.

2. Conclusions

The licensee is rated Category 3 in this area. Although the improved performance and management involvement noted during the latter portion of the assessment period has been encouraging, the licensee is rated Category 3 in this area. The significance of the rod insertion error event and the downward trend in plant operations performance that was observed to carry over into the beginning of the Appraisal Period from SALP III were the major considerations in this rating. Continuation of the aggressive management involvement as noted in the latter portion of this assessment period coupled with no additional significant violations will result in an improved rating in this area.

3. Board Recommendations

Licensee management efforts should continue and should include methods of assessing affected improvements at the working level.

B. Radiological Controls

1. Analysis

Five inspections were performed during the assessment period by region-based inspectors. These inspections included environmental monitoring, confirmatory measurements, operational radiation protection, radwaste management, and refueling radiation protection. The resident inspectors also inspected in this area, concentrating on implementation of the ALARA program. No violations or deviations were identified.

In the radiation protection area, there was consistent evidence of prior planning, assignment of priorities, and timely resolution of NRC concerns during the assessment period. Management of the radiation protection program at the plant appears largely responsible for the licensee's good performance in this area. Resolution of problems noted in SALP 3 in this area have been adequate and timely.

Program support has been increased by addition of radiation protection foremen on all shifts, and additional engineering assistant and coordinator positions have been staffed to provide assistance in the radiation protection and ALARA programs. Additional improvements were made during this assessment period in survey instrument quality assurance controls.

Effectiveness of the ALARA program has significantly improved during this assessment period. The program now includes review of proposed plant modifications and work requests, and closer scrutiny of radiation work permits. Also, associated ALARA related matters such as general decontamination of facilities and decontamination of circulating system piping has resulted in significant dose reduction. As a result of circulating system piping decontamination, dose rates in the drywells were reduced by factors of two to twenty depending on location. Overall contamination control has improved.

Total worker dose (person-rems) during 1983 was less (20%) than the licensee's average annual dose over the last five years, and about average for U.S. boiling water reactors for 1983. This is a notable improvement.

The licensee's radiological effluents continue to be about average for U.S. boiling water reactors; there were no unplanned releases or transportation incidents during the assessment period.

Of forty comparisons in confirmatory measurements, the licensee had only one clear disagreement, for gross beta in waste water. A subsequent comparison on a spiked sample gave a possible agreement. This was a considerable improvement from the previous period when seven disagreements were observed. Three possible agreements reflected weaknesses in peak stripping software associated with the Automated Analytical Instrumentation System (AAIS) identified in 1982. The licensee's corporate office has agreed to have these deficiencies corrected by midyear 1984. Analysts at Quad-Cities are aware that there may be problems with some of the analytical results produced by these programs and perform an adequate review of the AAIS output. Additional training in this regard was provided by the corporate office at the request of NRC inspectors.

Overall, laboratory equipment was reasonably well maintained and analysts were generally competent and willing to correct identified problems.

Station analysts did appear somewhat uncertain regarding the alpha counting system originally established and maintained by corporate personnel. They appeared unable to explain the basis of amplifier and discriminator settings which resulted in an unusually low alpha efficiency. This problem was addressed by acquiring counters of a different type and by initiating comparisons between counters and with two outside laboratories.

The environmental monitoring program appears well-implemented, largely under contract. Plant personnel were able to locate and get into the sampling stations although they are normally serviced by contractor personnel. A problem with improperly installed and missing flow meters on environmental air samplers were noted by the inspectors. The meters were somewhat redundant in that the samplers were regulated constant flow devices which are field checked monthly for proper calibration. Nevertheless, this finding indicated some weakness in program oversight, and the licensee agreed to ensure that the flow meters are properly installed and that readings are recorded when samples are changed.

2. Conclusion

The licensee is rated Category 1* in this area. Worker radiation doses are more reflective of Category 2 performance, but licensee efforts to reduce the plant radiation environment and a substantial downward trend in worker doses during this assessment period are indicators of better performance.

3. Board Recommendations

The Board notes that the recent inspection concerning confirmatory measurements, although outside this evaluation period, reflects positively on the licensee's overall performance in this area. Normal inspection frequency should continue.

C. Maintenance/Modifications

1. Analysis

The resident inspectors routinely inspected the licensee's activities in this area, concentrating on implementation of procedures and design modifications. The resident inspectors also, by direct observation, verified that the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were

*Rating changed by Regional Administrator to Category 2.

properly certified; radiological controls were implemented; and, fire prevention controls were implemented.

Work requests were reviewed to determine status of outstanding jobs and to assure that priority was assigned to safety related equipment maintenance which may affect system performance.

Two special inspections and four routine inspections were conducted by regional-based inspectors. The scope of one special inspection included review of activities surrounding the attempted removal of torus containment penetration X-215 and routine inspection of maintenance activities.

During the review of the licensee's maintenance and design analysis program, one item of noncompliance and one unresolved item were identified:

Severity Level IV - Failure to ensure that measures were established to assure that the design basis for those structures, systems and components are correctly translated into drawings and instructions. (50-254/83-19-01)

Unresolved Item - No station personnel possessing adequate plant operational knowledge were involved in review of work packages for operating plant interfaces. (50-254/83-19-02)

The inspectors determined that this was an isolated occurrence following review of approximately 1400 other modifications in which no other problems were identified.

The licensee has taken action to improve performance for both of the above items in a timely and effective manner.

The second special inspection addressed licensee action on IE Bulletin 80-11: "Masonry Wall Design." Several walls (32) required strengthening. The structural modifications were being accomplished at the time of the inspection.

No items of noncompliance were identified and proper management attention was evident.

Five violations were identified during routine inspections of the licensee's actions concerning IE Bulletin 83-02 (Items (1), (2), and (3)) and 79-14 (Items (4) and (5)) as follows:

- (1) Severity level V -- Failure to establish adequate design procedures for torus penetration piping and support base plate analysis. (254/83-04-05; 265/83-04-05)
- (2) Severity Level V -- Failure to maintain adequate document control in that procedures were implemented prior to formal review and approval. (254/83-04-06; 265/83-04-06)

- (3) Severity Level V -- Failure to conduct adequate QA audits of consultant activities. (254/83-04-09; 265/83-04-09)
- (4) Severity Level V -- Failure to conduct adequate IE Bulletin 79-14 walkdown inspections and engineering reviews of as-built data. (254/83-13-01; 265-83-11-01)
- (5) Severity Level V -- Failure to follow design procedures in the evaluation of branch anchor seismic movements. (254/83-13-02; 265/83-11-02)

The licensee's corrective actions for the above noncompliances were reviewed and the items closed during subsequent inspection. These noncompliances were of minor safety significance and they did not appear to indicate any programmatic problems.

The examination into IE Bulletin 83-02 inspection activities included a review of UT procedures, personnel certifications, material and equipment certifications, data reports and observation of several ultrasonic examinations at the site. Based on these efforts the inspectors determined that UT procedures, calibration standards, equipment and Intergranular Stress Corrosion Cracking detection capabilities were satisfactorily demonstrated in accordance with IE Bulletin 83-02 and that the same procedures and techniques were used in the UT examinations. The inspectors also observed the welding of some overlays and determined that the weld overlay repairs were performed in accordance with qualified and approved procedures. In addition, the decon and the induction heating stress improvement treatment performed on the recirculation system piping was observed to confirm that these activities were conducted in accordance with approved procedures. The licensee's actions in response to this Bulletin constituted a program of major proportions resulting in extended outages for both units and the expenditure of significant manhours over many months. Only minor items of noncompliance were identified (Items (1), (2), and (3) above) and no programmatic problems were reported.

The matter concerning control of off-site design contractors through effective and timely audits identified in Item (3) above was discussed at the Commonwealth Edison corporate offices on May 23 and June 29, 1983. In addition, implementation of the licensee's design audit program was examined at the contractors offices during this SALP assessment period. There was significant improvement in this area over the previous inspection indicating the licensee's responsiveness to NRC concerns.

Inspections conducted to review the licensee's implementation of the IE Bulletin 79-14 piping re-evaluation program are complete. The licensee's efforts in this area were substantial and have satisfied the bulletin requirements. During a review of the piping re-evaluation program which included followup on the licensee's actions to comply with a Confirmatory Action Letter (CAL) issued July 14, 1982, the licensee stated that they were going to perform additional evaluations on 950 "no action supports". Supports installed in piping systems that met the original Blume rigid span criteria during the piping stress analysis review and as a result, required no further evaluation to comply with IE Bulletin 79-14 requirements are classified as "no action supports". At the conclusion of a meeting held at Region III on July 8, 1983, to discuss "no action supports" the licensee agreed to provide certain additional information. The above CAL will remain open pending our followup inspection of the licensee's evaluation/information provided for the "no action supports". Only minor items of noncompliance were identified (Items (4) and (5) above) and no programmatic problems were reported.

On April 13, 1983 a Confirmation of Action Letter (CAL) was issued to all Commonwealth Edison facilities to confirm actions regarding the introduction of foreign materials and the sealing surfaces of the main steam isolation valves. This issue had been identified at Dresden Station and upon further investigation was found not to occur at Quad-Cities Station. The licensee instituted measures to ensure that it would not occur in the future. Thus, this issue is considered closed at this facility.

On May 2, 1984 it was determined by the resident inspectors that the 125V station batteries were loaded in excess of their design electrical capacity by the addition of various loads created by several modifications over an extended period of time. On May 7, 1984 a Confirmation of Action Letter was issued to confirm licensee actions to reduce electrical loads on the batteries during normal operations, necessary additional reductions in the event of an incident, and required licensee reviews and submittals to resolve NRC concerns. This issue is currently under review by NRR to determine safety significance and possible generic implications. Enforcement action may be taken pending this review.

Except as stated above, the activities observed, the management controls used, and the records and record control systems in place met requirements. There was evidence of prior planning and assignment of priorities. Policies were adequately stated and generally understood. Personnel involved in the areas reviewed were properly trained and certified. Although multiple violations

were identified, they were minor in nature and not an indication of programmatic breakdowns. Responses to NRC initiatives and identified concerns were generally timely with viable, sound, and thorough. The licensee's audit reports were found to be generally complete and thorough.

Several initiatives have been accomplished or are planned by the maintenance staff to improve their maintenance performance and their ALARA performance. These include:

- (1) Placing work requests on a computer for ease of tracking.
- (2) Quick disconnect on main steam isolation valve limit switches for dose reduction.
- (3) Foremen required to tour plant daily to observe maintenance being performed.
- (4) Modified scoop tube and bearings on the Recirculation pump drive motor to yield smoother flow characteristics.
- (5) First trip annunciator installed on turbine to help identify turbine trips.
- (6) Traveler form added to work requests to ensure better management oversight, improved communications, and better definition of the scope of work to be performed for safety related, reliability related and ASME Code related modifications.

Items (3) and (6) above are in response to weaknesses noted in SALP III.

One LER was issued as a result of personnel error which is a significant improvement over the last assessment period. The safety significance of the error was not severe and the licensee took prompt and effective corrective actions.

2. Conclusions

The licensee is rated Category 2 in this area. This rating is unchanged from the previous assessment period. The licensee's performance has remained essentially constant over the SALP assessment period.

3. Board Recommendations

None.

D. Surveillance

1. Analysis

During the assessment period, the resident inspectors routinely inspected this area, concentrating on implementation of procedures. The resident inspectors also, by direct observation, verified that procedures were adequate, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test results conformed with Technical Specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel. Also, two inspections by regional-based inspectors were performed.

One inspection was conducted in the area of containment integrated leak rate (CILRT) testing. No items of noncompliance were identified. The CILRT was well conducted by qualified personnel and no significant issues were identified.

The second inspection performed by regional-based inspectors examined the current program and procedures, material and equipment certifications, personnel certifications, data reports and audit reports. In addition, work was observed and discussions were held with personnel performing inservice inspection activities. This inspection consisted of multiple reviews at several locations over a seven month period. No items of noncompliance were identified. The management control systems met regulatory requirements; and personnel, equipment and material certifications were current and complete. Records were found to be complete, well-maintained and available. Discussions with licensee and contractor personnel indicated that they were knowledgeable in their job; records indicate they were properly trained and certified. The licensee's audit reports were found to be generally complete and thorough.

The resident inspectors identified one item of noncompliance with two examples (Severity Level IV - 50-265/83-18-01) where contrary to Technical Specification requirements, isolation valves were left in improper positions both during and after surveillance testing. The corrective action was effective as indicated by the lack of subsequent repetition. This item is not considered a significant problem and the enforcement record has improved from the previous SALP assessment.

One LER was issued concerning missed surveillances found during a supervisory review by the Operating Engineers. The safety significance of these missed surveillances was minimal in that several were being performed by other departments concurrently

and others had been performed, but, were not documented. This does not appear to be a problem at this facility; however, the resident inspectors will continue to monitor this area.

Surveillance procedures are strictly adhered to. Also, surveillance records were found to be complete, well maintained and readily available for review. Response to NRC initiatives, inspector-identified concerns and safety issues were timely, technically sound and thorough in almost all cases. Events and deviations are promptly and completely reported. Staffing is adequate at this time, although consideration should be given to increasing staff levels to accomplish more "balance of plant" requirements.

2. Conclusions

The licensee is rated Category 1 in this area as in the previous assessment period. While this is the same rating as last assessment period, additional improvement in performance was noted.

3. Board Recommendations

The Board notes that subsequent to the assessment period the resident inspectors have identified a potential weakness in the surveillance program concerning calibration of safety related equipment and instruments used for safety related surveillances. Resolution of these concerns is pending further review by the inspectors and the licensee, and will be considered in the next assessment period.

E. Fire Protection and Housekeeping

1. Analysis

Throughout the assessment period, the resident inspectors have observed the implementation of the licensee's program in these areas.

During the assessment period, the licensee has been involved in two major maintenance outages. Daily observations of general site conditions indicate that a very effective housekeeping program continues as a result of management's involvement and attention in this area.

The resident inspectors also observed that routine fire prevention is practiced at the facility. During any maintenance outage many more fire protection related procedures are involved (welding, cutting, etc.) than during normal operation. However, during the two major maintenance outages experienced this assessment period, no items of noncompliance were identified. This is a result of management's aggressive attitude toward fire prevention.

Two fire protection related LERs were reported; one involving the diesel fire pump (battery failed) and the other involving a personnel error where two fire stops were found to be not intact during the annual firestop inspection. The first event was resolved by replacement of that diesel's batteries. As a conservative measure, the battery for the other diesel was also replaced. For the second event, the licensee immediately repaired the fire stop and performed an intensive investigation to determine the exact cause. After an inconclusive search, the licensee assumed personnel error and counseled/trained all employees and contractors in the importance of fire stops.

Management's continued attention and workers' cooperative attitude have resulted in a very effective program.

Concerns have arisen with respect to the scheduling and implementation of specific requirements of 10 CFR 50 Appendix R. Although substantial efforts have been expended by the licensee in this regard, Quad-Cities Station is pursuing full conformance with the applicable requirements. Appraisal of this aspect of the Fire Protection program has accordingly been held in abeyance.

2. Conclusion

The licensee is rated Category 1* in this area. The licensee's performance in housekeeping and other aspects of fire protection essentially remained constant over the course of the SALP assessment period.

3. Board Recommendations

The licensee is encouraged to continue the current level of management involvement in the existing fire protection program and to extend that involvement as necessary to the implementation of the broader fire protection issues contained in Appendix R to 10 CFR Part 50. An Appendix R inspection should be scheduled consistent with the licensee's final implementation of applicable requirements.

F. Emergency Preparedness

1. Analysis

Four inspections were conducted to evaluate compliance with 10 CFR Part 50, Technical Specifications, and procedures. One item of noncompliance was identified during these inspections:

Severity level V -- Failure to submit controlled copies of several Emergency Plan Implementing Procedure revisions to the NRC within 30 days of their issuance. (50-254/83-26; 50-265/83-25)

*Rating changed by Regional Administrator to Category 2.

The noncompliance was due to inadequate records keeping regarding procedure distribution to offsite holders of procedures manuals by the corporate office.

Followup inspections were conducted to evaluate licensee actions on items identified during the 1982 Emergency Preparedness Implementation Appraisal. Adequate corrective actions had been completed on all items. The emergency planning staff and management had a positive attitude towards improving the already acceptable state of onsite emergency preparedness. Responses to NRC concerns typically were prompt and adequate, sometimes being completed prior to issuance of the NRC report. Corporate actions to address the generic concerns identified in our previous SALP report have been implemented, and resulted in substantial upgrading of offsite preparedness. In addition, corporate staff is continuing to work with the State of Illinois to upgrade the notification process, although Quad-Cities Station personnel had acted promptly upon emergency declarations to ensure that offsite notifications were completed within regulatory requirements. Sufficient numbers of staff had received excellent training for appropriate emergency response positions. Timely staff augmentation had been demonstrated by several off-hours drills. The licensee's overall performance during the 1983 exercise was a significant improvement over that observed in the previous exercise. An improved working relationship between the licensee and offsite emergency response organizations was evident from several scenario development meetings. The performance of exercise participants was among the best for all exercises conducted in the Region.

2. Conclusion

The licensee is rated Category 1 in this area.

3. Board Recommendations

This area should be considered for reduced inspection effort.

G. Security and Safeguards

1. Analysis

Two physical protection and one material control and accountability inspections were conducted by region-based inspectors during the evaluation period. Also, the resident inspectors routinely conducted observations of security activities, concentrating on implementation of procedures. No items of noncompliance were identified for this evaluation period.

The inspection conducted during this evaluation period showed improvement in the areas of training, communication, and understanding towards correcting material control and accountability practices.

The licensee continues to have a strong management program at the site level. Security policies and procedures are uniformly implemented and security awareness at the site appears higher than in the previous evaluation period.

Corporate involvement in site activities has increased and corporate and site management are frequently involved in decision making and reviewing actions that are taken or planned. Licensee management responses are technically sound and thorough and respond to NRC concerns in a timely manner. Corporate involvement should continue to be increased to relay analyses of security deficiencies, incidents, and potential impact of such instances from other Commonwealth stations to the Quad-Cities station in order that similar incidents or deficiencies may be reviewed by site management and acted on in an appropriate and timely manner.

Licensee reports of safeguards events are promptly and completely reported. The events are properly identified and analyzed and corrective action is effective as indicated by lack of repetition.

Safeguard staffing at both the corporate and site level is ample to implement the security program. Positions are identified, and authorities and responsibilities are well-defined. The staffing and management of the onsite contract guard force is adequate. The licensee has stressed and implemented excellent communication between security personnel and site management. The benefits of this are evidenced by an increase in guard morale over the last evaluation period.

The licensee implemented the personnel training and qualification plan on schedule (March 19, 1983). The licensee's program makes a positive contribution. This training program was demonstrated by adherence to security procedures with few personnel errors. Security personnel onsite are qualified and have a good understanding of security practices.

Comparisons with the previous SALP evaluation showed an increase in the effectiveness of the security system as evidenced by, for example, a decrease in the number of identified noncompliances.

2. Conclusion

The licensee is rated Category 1 in this area. This is the same rating as in the previous SALP period.

3. Board Recommendations

Consideration should be given towards continuing to reduce the level of routine inspection effort.

H. Refueling

1. Analysis

During the assessment period, NRC examination of this area consisted of portions of four resident inspections. No significant areas of concern and no items of noncompliance were identified in this area during either of the refueling outages experienced. The inspections indicated that licensee management's attention and involvement were oriented toward nuclear safety.

Work performed during the outages included recirculation system weld examinations and overlay repairs as well as repairs to the reactor water cleanup system. Other work involved turbine inspections, Mark 1 containment modifications, and work related to TMI action items and IE bulletins. The total outage time was 13 weeks for Unit 1 and 24 weeks for Unit 2. (Unit 1 remained in an outage status at the close of this assessment period.)

The resident inspectors noted that refueling operations were conducted very smoothly from plant shutdown through post refueling startup. With the extensive nature of the outages, no handling problems were noted, no overexposures or medical emergencies occurred, and startup of Unit 2 after refueling was without many of the problems frequently experienced after extended outages.

There is consistent evidence of prior planning and assignment of priorities. Well stated, controlled and explicit procedures exist for the control of refueling activities. Personnel staffing is adequate; positions are well identified as well as the authority and responsibility of each position.

2. Conclusion

The licensee is rated Category 1 in this area. The licensee has maintained the same high level of performance as in previous SALP assessments.

3. Board Recommendations

None.

I. Quality Programs and Administrative Controls

1. Analysis

Routine observations by resident inspectors were made in this area as well as one special inspection concerning followup of licensee response to allegations of improper operation. The resident also performed followup inspections on various events and reportable occurrences. No items of noncompliance were identified specifically for this area, although aspects of noncompliances in other functional areas may be considered in this section.

The special inspection verified that the licensee had established and implemented programs as described in their response to improve the weaknesses identified by the NRC. These weaknesses were identified and considered in the last SALP assessment period and were generic to all Commonwealth Edison facilities. No items of noncompliance were identified.

As a result of a large number of civil penalties issued to Commonwealth Edison Company during 1983 and 1984, a Regulatory Improvement Program was instituted on a company-wide basis. Steps were taken in the areas of management organization and personnel error reduction to improve regulatory performance. Specific aspects of the program are discussed in Section IV.1.a. The program went into effect in February 1984, however, Quad-Cities Station had already implemented various aspects of the program as early as November 1983. While personnel errors appear to be less frequent, it is too early to evaluate the program's effectiveness.

Some positive aspects of the licensee's management and quality program administration include: (1) Quality Assurance (QA) and Quality Control (QC) groups have ample staffing to support their workloads, (2) QC hold points coverage appears to be increasing, (3) Backshift coverage by QC and QA auditors is more evident, and (4) the QA audit program is well run.

In general, the quality programs examined during the assessment period appeared well established and well administered.

2. Conclusion

The licensee is rated Category 2 in this area. Although this is a new functional area and was not rated in the last assessment period, the licensee's performance appears to have been steady during this rating period.

3. Board Recommendations

None.

J. Licensing Activities

1. Analysis

This evaluation was based on review of the following licensing activities:

Project Management Administration, Units 1/2
Response to NUREG 0737 items, Units 1/2
Reload for Cycle 7, Unit 2
Pipe crack issue, Unit 2
Decontamination of recirc. pipe, Unit 2

Pipe crack issue, re-examination of Unit 1
Decontamination of recirc. pipes, Unit 1
Dose reduction study program, Unit 1/2
Pipe-lock demo program, Unit 1
Barrier fuel program, Unit 2
Inservice inspection program, Units 1/2
NUREG 0737 Tech Specs, Units 1/2
Economic Generation Control, Units 1/2
SPDS, Units 1/2
Environmental qualification, Units 1/2
125V DC power supply issue, Units 1/2
Masonry wall design, Units 1/2
Fire protection program, Units 1/2
DeMinimus radioactivity releases, Units 1/2
Shutdown margin demonstration
("Unplanned Criticality"), Unit 2
Eight additional Tech Spec Change Licensing Actions

The licensee's approach to resolution of technical issues demonstrates a mature knowledge of licensing issues. They have extensive experience in the industry and have acquired a scope and depth of technical expertise in all important areas. They participate actively in roles of leadership in Owner's group and professional organization activities.

Evaluations by the NRC technical review staff indicate that the licensee has a good understanding of all technical issues, and generally works constructively with the NRC staff to resolve such issues. Meetings and conference calls with the licensee are usually very productive and are characterized by excellent preparation on the part of the licensee. Of several examples that could be cited, the ongoing issue of large pipe crack inspection and repair is a good example. The licensee's expertise brought to bear on the problems, and the licensee's approach to resolution of these complex issues, has been effective.

When issues occasionally arise when it is found that the Quad-Cities Station does not conform to current design specifications, criteria or procedures, the licensee can generally readily demonstrate justification for continued operation or propose modifications to achieve or restore the desired level of conformance with current standards.

There has been a history of open and effective communication between NRC and the licensee's staffs. This situation promotes prompt and technically sound responses to NRC initiatives. Commonwealth Edison invariably meets all established commitment dates or provides a timely written submittal explaining the circumstances and establishing a new firm date. When a conference call or meeting is requested by the NRC staff to pursue an NRC initiative, the licensee is prompt and cooperative in making available the most appropriate and best informed individuals to discuss and pursue resolution with the NRC staff.

The licensee's responsiveness to NRC initiatives is typified by their actions taken to resolve nearly all of the NUREG 0737 action items. More specific recent examples are the timely and quality responses to our stated concerns regarding their 125V DC power supply, and the shutdown margin test when starting up Unit 2 after the last refuel outage. Other examples of the licensee's responsiveness to NRC initiatives have been their cooperation in several special studies involving Quad-Cities Station; e.g., the dose reduction study, the "truck bomb" survey/study, the decontamination evaluation. In these and other NRC-initiated actions, station and corporate resources were of invaluable aid.

A most characteristic feature of the interaction between NRC/licensing and Commonwealth Edison as a licensee has been the licensee's openness and positive attitude in responding to NRC initiatives. The timeliness and quality of responses related to licensing action suggest that staffing is adequate to accomplish the required work.

2. Conclusion

The licensee is rated Category 1 in this area. This level of performance is consistent with that of the previous SALP.

3. Board Recommendations

None.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

Units 1 and 2 engaged in routine power operation throughout most of SALP 4. A major scheduled outage for plant refueling, modification, maintenance and inspection of recirculation piping pursuant to Commission Order 7590-01 was conducted from September 4, 1983, to February 18, 1984, for Unit 2 and a similar outage began on March 6, 1984, with a scheduled completion date of July 31, 1984 for Unit 1.

The remaining outages throughout the period are summarized below:

Unit 1

March 10 to 15, 1983	Clean main condenser tubes
May 21 to 22, 1983	Repair leak on continuous reactor head vent line
September 15 to 21, 1983	Routine maintenance

Unit 2

January 28 to February 3, 1983	Repair 2C circulating water pump
March 25 to 30, 1983	Clean main condenser tubes
February 19 to 20, 1984	Repair valve packing leaks
February 25 to 27, 1984	Replace 'B' recirculation pump suction valve
April 27 to May 8, 1984	Replace 2A circulating water pump discharge valve

Unit 1 was scrammed six times and Unit 2 was scrammed four times. Two of the Unit 1 scrams and two of the Unit 2 scrams were attributed to equipment malfunctions that required minor maintenance prior to returning the units to service. The remaining trips (four for Unit 1 and two for Unit 2) were attributed to personnel error and are further discussed in Section IV.1.a. Licensee management corrective actions following these trips were appropriate. The above personnel errors were taken into account when considering the licensee's Regulatory Improvement Program. In all cases, the plant responded as designed.

B. Inspection Activities

Noncompliance Data

Facility Name: Quad-Cities Nuclear Power Station, Units 1 and 2
Docket Nos. 50-254; 50-265.

Inspections: No. 83-01 through 84-04

Functional Areas Assessment	Noncompliances and Deviations Severity Levels				
	I	II	III	IV	V
A. Plant Operations			3	1	1
B. Radiological Controls					
C. Maintenance				1	(5)
D. Surveillance and Inservice Testing				1*	
E. Fire Protection and Housekeeping					
F. Emergency Preparedness					(1)
G. Security and Safeguards					
H. Refueling Activities					
I. Licensing Activities					
J. Quality Programs and Administrative Controls					
TOTALS	0	0	3	3	1(6) 0

Numbers in parenthesis indicate noncompliance common to both units.
* indicates noncompliance specific to Unit 2. (The balance were docketed to Unit 1)

No major team inspections were performed during this evaluation. However, FEMA did issue a report addressing the May 11, 1983, emergency exercise which concluded that an adequate level of offsite radiological preparedness had been demonstrated to protect the public in the event of a radiological accident at the Quad-Cities Nuclear Power Station.

C. Investigation and Allegation Review

None.

D. Escalated Enforcement Actions

1. A Civil Penalty in the amount of \$60,000 was issued in 1983 for noncompliance involving operation in the previous SALP period outside a limiting condition for operation (LCO) when sufficient information was available to recognize that an LCO existed.
2. A Civil Penalty in the amount of \$150,000 was issued in 1983 for noncompliances involving improper insertion of rods during shut-down. Details are to be found in inspection report 50-254/83-11.

E. Management Conference Held During Appraisal Period

1. Confirmation of Action Letters (CAL)

- a. A CAL was issued April 13, 1983, to confirm licensee actions regarding the introduction of foreign materials onto the sealing surfaces of the main steam isolation valves. This issue was generic to all Commonwealth Edison facilities identified at Dresden Station.
- b. A CAL was issued May 7, 1984, to confirm licensee actions regarding the 125 volt station batteries and actions to be taken in case of emergencies. Evaluations are still ongoing to determine final resolution.

2. Management Conferences

- a. January 26, 1983 (Glen Ellyn, Illinois): Management meeting to discuss proposed CECO guidelines for CECO personnel to be used for providing information to NRC Region III inspectors.
- b. February 17, 1983 (Glen Ellyn, Illinois): Management meeting to discuss Region III staff views on root causes of past problems and suggestions of regulatory improvement.
- c. March 18, 1983 (Glen Ellyn, Illinois): Management meeting to discuss the status of offsite emergency planning at Quad-Cities.
- d. March 29, 1983 (Glen Ellyn, Illinois): Enforcement Conference to discuss operator actions taken during a controlled shutdown (improper rod sequence).
- e. April 8, 1983 (Quad-Cities Site): Enforcement Conference with licensed operators. Operator errors which resulted in incorrect control and sequencing during a recent Unit 1 shutdown.
- f. May 12, 1983 (Glen Ellyn, Illinois): Management meeting to review Systematic Assessment of Licensee Performance (SALP III).
- g. May 23, 1983 (CECO Corporate Offices): Meeting to discuss recent inspection findings that indicate CECO QA audits are not being conducted in sufficient depth to verify the technical adequacy of design.
- h. July 26, 1983 (CECO Corporate Offices): First of a series of management meetings to discuss ways to improve overall CECO regulatory performance.

- i. August 19, 1983 (Glen Ellyn, Illinois): Management meeting to discuss safety related pipe supports which were originally analyzed by using the Blume criteria.
- j. September 9, 1983 (CECO Corporate Offices): Second in a series of meetings to discuss ways to improve overall CECO regulatory performance.
- k. October 19, 1983 (Aurora, Illinois): Third in a series of meetings to discuss ways to improve overall CECO regulatory performance.
- l. October 21, 1983 (Quad-Cities Site): Enforcement Conference to discuss incorrect operator performance during rod sequencing during a recent shutdown.
- m. January 24, 1984 (Glen Ellyn, Illinois): Enforcement Conference to discuss personnel errors resulting in a loss of secondary containment integrity.

F. Review of Licensee Event Reports and 10 CFR 21 Reports

1. Licensee Event Reports

On August 29, 1983, the NRC published an amendment clarifying its regulations regarding Licensee Event Reports (LERs) required by 10 CRF 50.73. Details of the new reporting system were published as NUREG 1022 (Licensee Event Report System.) The effective date of this amendment was January 1, 1984. The new rule deleted reporting requirements for several types of LERs which had been found, through experience, to be of little value to the Commission. Therefore, LER data for this SALP period are not comparable with previous statistics.

<u>Unit 1</u>	<u>Unit 2</u>		
LERs No.	LERs No.		
83-01 through 83-48	83-01 through 83-25		
84-01 through 84-05	84-01 through 84-04		
<u>Proximate Cause Code</u>	<u>SALP II*</u>	<u>SALP III**</u>	<u>SALP IV***</u>
Personnel Error A	12	8	12
Design Deficiency B	4	3	4
Defective Procedures D	0	0	6
Component Failure E	70	40	46
Others X	3	10	14
	<u>89</u>	<u>61</u>	<u>82</u>

* SALP II was an 18 month evaluation.
 ** SALP III was a 12 month evaluation.
 *** SALP IV was a 17 month evaluation.

LERs were issued at approximately the same rate during the SALP 4 assessment period as during SALP 3, except for those caused by personnel error. Additional discussion on personnel errors is discussed in Sections IV.1, IV.3, and IV.4. LERs due to defective procedures occurred more frequently during the assessment period; however, the numbers involved are so small as to make statistical comparison difficult.

In addition, changes in the LER system have made LER data for this SALP period not completely comparable with previous statistics.

The Office of Analysis and Evaluation of Operational Data reviewed the LERs for this period and concluded that the information given presented a clear and adequate description of each event; the entries reviewed appeared to be essentially correct and the system code agreed with the information in the narrative. Supplementary information was provided for most of the LERs. The licensee promised 18 followup LERs and provided 15. The remaining 3 are expected during the next assessment period. The licensee appropriately referenced similar prior occurrences as necessary. No significant deficiencies were found in the LERs reviewed.

2. 10 CFR 21 Reports

No 10 CFR 21 reports were submitted during the assessment period.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

(4)

AUG 09 1984

Docket No. 50-295
Docket No. 50-304

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

Enclosed for your review, prior to our scheduled meeting of August 23, 1984, is the SALP Board Report for the Zion Nuclear Generating Station, covering the period January 1, 1983 through April 30, 1984.

Overall, during the reporting period, your performance was acceptable and generally showed an improving trend, with improvements in the ratings for both Maintenance and Licensing.

Your rating in Security and Safeguards declined from a Category 2 to 3 due primarily to the two Severity Level III violations early in the assessment period. We noted, however, that due to increased attention since these violations, your trend during the period was improving (See Section III).

While you will have sufficient opportunity to present your comments at the meeting on August 23, 1984, we also solicit written comments within 30 days after the meeting to enable us to thoroughly evaluate your comments and provide you with our conclusions relative to them.

In accordance with Section 2.790 of NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the SALP Report will be placed in the NRC's Public Document Room.

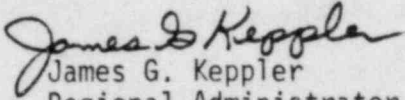
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A-4

AUG 09 1984

No reply to this letter is required at this time; however, should you have any questions concerning the SALP Report, we would be pleased to discuss them with you.

Sincerely,


James G. Keppler
Regional Administrator

Enclosure: SALP Report
No. 50-295/84-06; 50-304/84-06

cc w/encl:

D. L. Farrar, Director
of Nuclear Licensing
K. L. Graesser, Station
Superintendent
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
Phyllis Dunton, Attorney
General's Office, Environmental
Control Division
Mayor, City of Zion
R. C. DeYoung, IE
H. R. Denton, NRR
NRR Project Manager
INPO
Regional Administrators
RI, RII, RIV, RV

SALP BOARD REPORT

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

REPORTS NO. 50-295/84-06; 50-304/84-06

COMMONWEALTH EDISON COMPANY

ZION NUCLEAR POWER STATION

ASSESSMENT PERIOD

JANUARY 1, 1983 THROUGH APRIL 30, 1984

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operation.

A NRC SALP Board, composed of the staff members listed below, met on June 28, 1984, to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee's safety performance at Zion Nuclear Station for the period January 1, 1983 through April 30, 1984.

SALP Board for Zion:

<u>Name</u>	<u>Title</u>
J. G. Keppler	Regional Administrator
A. B. Davis	Deputy Regional Administrator
C. E. Norelius	Director, Division of Reactor Projects (DRP)
R. L. Spessard	Director, Division of Reactor Safety (DRS)
R. H. Vollmer	Director, Division of Engineering, NRR
W. D. Shafer	Chief, Projects Branch 2, DRP
G. C. Wright	Chief, Projects Section 2A
L. R. Greger	Chief, Facilities Radiation Protection Section
J. R. Creed	Chief, Physical Security Section
T. N. Tambling	Chief, Technical Support Staff, DRP
J. A. Norris	Zion Project Manager, NRR
M. M. Holzmer	Senior Resident Inspector, Zion
F. R. Dunaway, III	Resident Inspector, Zion
P. C. Lovendale	Senior Radiation Specialist
J. L. Belanger	Physical Protection Specialist
T. Ploski	Emergency Preparedness Analyst

II. CRITERIA

The licensee performance is assessed in selected functional areas, depending whether the facility is in a construction, preoperational, or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement and control in assuring quality.
2. Approach to resolution of technical issues from a safety standpoint.
3. Responsiveness to NRC initiatives
4. Enforcement history.
5. Reporting and analysis of reportable events.
6. Staffing (including management).
7. Training effectiveness and qualification.

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definition of these performance categories is:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety or construction is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective so that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety or construction is being achieved.

Trend. The Performance gradient over the course of the SALP assessment period.

III. SUMMARY OF RESULTS

<u>Functional Areas</u>	<u>January 1 - December 31, 1982</u>	<u>January 1 - April 30, 1984</u>	<u>Trend During Current Re- porting Period</u>
A. Plant Operations	2	2	Improved
B. Radiological Controls	2	2	Improved
C. Maintenance	2	1	Improved
D. Surveillance	2	2	Same
E. Fire Protection	2	2	Improved
F. Emergency Preparedness	2	2	Same
G. Security	2	3	Improved
H. Refueling	1	1	Same
I. Quality Programs and Administrative Controls	Not Rated	2	Same
J. Licensing Activities	2	1	Improved

IV. PERFORMANCE ANALYSES

A. Plant Operations

1. Analysis

Portions of eleven inspections were performed by the resident inspectors covering direct observation of operating activities, review of logs and records, verification of selected equipment lineups and operability, and followup of significant operating events to verify that facility operations were in conformance with the Technical Specifications and administrative procedures. Four items of noncompliance were identified as follows:

- a. Severity Level V - Failure to make required notification of an unplanned release (Inspection Report No. 50-295/83-02).
- b. Severity Level IV - Station procedures did not contain provisions to account for changes in plant conditions after authorization by the shift was given for instrument calibration (Inspection Report No. 50-304/83-04).
- c. Severity Level V - Procedure violation (one of two examples; see Section IV.5 for other example) resulting from reactor coolant system temperature exceeding 200°F prior to returning safeguards systems to operation (Inspection Report Nos. 50-295/83-26; 50-304/83-27).
- d. Severity Level IV - Procedure violations (three examples) which resulted in a reactor trip from full power and two inadvertent safety injections while shutdown (Inspection Report Nos. 50-295/83-26; 50-304/83-27).

In all cases the licensee's corrective actions were appropriate and generally timely. In addition, for the first of these noncompliances, changes to reporting requirements contained in a revision to 10 CFR 50.72 no longer require immediate NRC notification for releases of this magnitude. The remainder of these noncompliances involved either failure to adhere to station procedures (examples c. and d.) or a lack of procedures to control and coordinate instrument calibrations during periods of changing plant conditions (example b.). Improvements in plant procedures are also discussed in Section 9.

The previous assessment (SALP 3) discussed the need for increased awareness of regulatory requirements. During the current assessment there was only one instance which indicated lack of operator awareness of requirements (LER 304/84-06).

Eleven reactor trips occurred on Unit 1 and nine on Unit 2; of these, ten trips occurred at power levels below 20%. Five of the twenty trips were due to personnel error, thirteen due to equipment problems, and one each due to design and severe weather. About half (11) of the total number of trips resulted from feed

system or EHC problems. During the assessment period, the average number of reactor trips and the proportion of trips due to personnel errors and equipment problems were about the same as during SALP 3. Three inadvertent safety injections (SI) occurred, two of which resulted from personnel errors during an outage and one from equipment problems. This represents an increase in SIs from SALP 3 during which only one SI occurred (due to personnel error).

During January 1984 personnel errors which caused reactor trips or inadvertent safety injections (SI) occurred on January 2 (SI), January 6 (trip from 100% power) and January 20 (SI). A concern about the frequency of these significant personnel errors was raised by the resident inspectors. Since that time, there have been no SIs and only one trip due to personnel errors. This appears to be a result of increased management attention in this area.

As discussed in Section V.F.1, LER data indicates that personnel errors occurred at a rate over twice as high as that noted in the previous assessment period. Seventeen out of twenty-eight (61%) of all such LERs were caused by operators. This is about the same as during SALP 3 (55%), however six of these LERs originated as a result of a lack of understanding by operators of a new radiation monitoring system (SPING). Operator awareness of SPING operations has improved over the period.

As a result of several management meetings between NRC and Commonwealth Edison Company covering the company's enforcement history at all nuclear stations, a Regulatory Improvement Program (RIP) was instituted in February 1984. Pertinent aspects of the program included:

- (1) Corporate directives for improving operating performance covering identification of potentially significant events, post-trip analysis prior to plant restart, and conduct of operations.
- (2) Improved communications at all levels.
- (3) Corporate site visits and a station management shift overview function.
- (4) Corrective actions for personnel errors.

Positive observation by the resident inspectors include:

- (1) A continuation of the tendency by management to take a more conservative approach in operational situations rather than emphasize continued operations.
- (2) Excellent operator response to abnormal plant transients such as the seal table leak during heatup and the component

cooling water leak. Response to plant trips and other transients was also excellent.

During the assessment period four Reactor Operator (RO) and eight Senior Reactor Operator (SRO) examinations were administered to personnel at the Zion Station. All of these but two SRO candidates passed their examinations. These results are consistent with examination results at other facilities.

2. Conclusion

The licensee is rated Category 2 in this area. Performance was improving during the assessment period.

3. Board Recommendations

The licensee should continue efforts to reduce the number of plant trips and safety system challenges.

B. Radiological Controls

1. Analysis

Five inspections were performed during the assessment period by regional inspectors. These inspections included outage radiation protection, radwaste management, confirmatory measurements and environmental monitoring, operational radiation protection, and waste generator requirements. The resident inspectors also inspected in this area. Seven violations and one deviation were identified as follows:

- a. Severity Level V - Failure to maintain a high radiation area access point locked in accordance with 10 CFR 20.203(c)(2) (Inspection Report Nos. 50-295/83-04; 50-304/83-04).
- b. Severity Level IV - Failure to adhere to radiation control procedures (3 examples) (Inspection Report Nos. 50-295/83-07; 50-304/83-06).
- c. Deviation - Failure to implement an alpha surveillance program as committed (Inspection Report Nos. 50-295/83-07; 50-304/83-06).
- d. Severity Level IV - Failure to adhere to radiation control/maintenance procedures (3) examples (Inspection Report Nos. 50-295/83-27; 50-304/83-28).
- e. Severity Level IV - Failure to perform evaluations of radiation hazards as necessary to ensure compliance with 20 CFR 20.201(b) (2 examples) (Inspection Report Nos. 50-245/83-27; 50-304/83-28).

- f. Severity Level IV - Failure to maintain a high radiation area access point locked in accordance with 10 CFR 20.203(c)(2) (Inspection Report Nos. 50-295/83-27; 50-304/83-28).
- g. Severity Level V - Failure to meet required sensitivity for gross alpha analysis of Lake Discharge Tank releases (Inspection Report Nos. 50-295/83-18; 50-304/83-19).
- h. Severity Level V - Failure to quantify in liquid releases those gamma emitting isotopes that were classified as Class 3 by the Automatic Analytical Instrumentation System (AAIS) (Inspection Report Nos. 50-295/83-18; 50-304/83-19).

These items, which include repetitive violations for high radiation area controls and procedural adherence, appear indicative of continuing problems with the radiation protection program. In addition to the repetitive violations, airborne monitoring and radiation hazard evaluation violations appear indicative of minor programmatic breakdowns in these areas.

Inadequate evaluations of radiation hazards were evidenced by: (1) an incident where workers were allowed to wire brush highly contaminated steam generator parts without evaluation of the need for engineering controls to limit airborne radioactivity, without evaluation of the consequences of the wire brushing operation on other workers in close proximity to this area, and without evaluation of the adequacy of respiratory equipment provided workers performing the wire brushing operation; (2) an incident where a radiation chemistry technician (RCT) picked up a cesium-137 source with his hand in order to return it to its shielded container from which it had fallen, and then handled the source a second time with his hand in order to reorient the source within the shielded container; and (3) an incident which resulted in an unplanned gaseous release when a valve was partially removed from the gaseous waste system without evaluating the need to isolate the waste gas header. The two examples of failure to collect representative air samples during work involving highly contaminated materials included in the violations for this assessment period involved the steam generator wire brushing incident, which resulted in minor surface contamination of about fifty workers, and a fuel transfer canal job, which resulted in minor surface contamination of several workers.

The deviation concerned the failure to implement an alpha surveillance program as committed following the Health Physics Appraisal in March 1980.

Other radiation protection program weaknesses identified during this assessment period include: problems with storage, main-

tenance, and issuance of respiratory equipment; problems with timely evaluation and review of job specific air samples; programmatic and equipment problems related to the licensee's ability to determine alpha activity in liquid and air samples; inadequate documentation of TMI Action Plan Item II.F.1 monitor calibrations; low RCT and health physicist experience levels; lack of continuous air monitors for work which has a high potential for creating airborne radioactivity problems; improper personal contamination monitoring (frisking) techniques; inoperable or improperly located friskers; and improper labeling of sealed source remote handling tools.

Significant among these problems was the lack of calibration documentation for the high range (accident) noble gas monitors specified in NUREG-0737. Only after considerable time and effort could the adequacy of the calibrations be determined. This matter appears indicative of management weaknesses for this portion of the health physics program. Management weaknesses also appear responsible for some of the other violations and problems discussed earlier, and may indicate that weaknesses concerning planning and control of radiologically significant activities, identified during the previous SALP period, continues.

A continuing lack of management stability within the health physics program appears contributory to these management weaknesses. During this assessment period, the Lead Health Physicist was replaced after twenty months in that position. Of the four professional health physicists at the plant at the completion of the assessment period, only two were in these positions at the beginning of the assessment period. Similarly, the average technician experience is relatively low, about two and one-half years. Management and technician staffing levels appear adequate. An additional professional health physicist position was added during this assessment period. There have been no changes regarding a graded RCT qualification program or diversification of RCT job skill requirements; however, licensee evaluation of these problem areas continues.

Radiation protection program improvements noted during the assessment period to correct previously identified SALP weaknesses include: continued progress in implementation of an effective ALARA program, continued progress in implementation of a permanent radiation work permit system for improving access control, and continued close scrutiny of the waste gas system for early identification and repair of system leakage. Also, inclusion of the Lead Health Physicist in the RCT/foreman management chain appears to have improved coordination within the radiation protection group.

Additional improvements to correct program weaknesses were made as follows: (1) several continuous air monitors have been purchased and are being used in containment for monitoring steam generator platforms and other areas where the potential for high airborne activity exists; (2) during major outages, plant tours are conducted each shift by assigned rad/chem technicians and daily by radiation protection and maintenance supervisors to identify and resolve radiation protection problems; (3) shielded personal contamination monitoring booths combined with a whole body frisk policy for persons exiting contaminated areas has reduced the number of personal contamination caused portal monitor alarms; (4) a trial program is planned to determine if an audible or visual alarm installed on one of the frequently used high radiation area doors will reduce the number of incidents of high radiation area doors left ajar; and (5) a comprehensive training and qualification program for the health physicists has been implemented.

Total worker radiation exposures (person-rems) during 1983 were slightly below (15%) the licensee's average annual exposures over the last five years, but were slightly above (15%) the average for U.S. pressurized water reactors for 1983. Over the last five years, annual worker radiation exposures have increased at about the same rate as the U.S. average for pressurized water reactors, but have remained slightly above (15%) that five year average.

Eleven unplanned gaseous releases were reported during the assessment period. Except for two of these releases, all were less than one percent of the technical specification limit; some were erroneously classified as unplanned when they were actually expected operational releases. The two releases were five and eight percent of the technical specification limit, respectively, and were associated with waste gas system valve leakage. No unplanned liquid releases were reported.

Liquid and gaseous effluents and solid waste production remained about average for pressurized water reactors. No problems related to radioactive material transportation activities were reported during the assessment period.

In confirmatory measurements, the licensee had 22 agreements in 24 comparisons. One disagreement, antimony-124 in liquid, occurred because the licensee's automated software system (AAIS) could not resolve its peak (603 keV) from that of cesium-134 (605 keV). Problems with this system have been previously noted and the licensee has agreed to complete improvements for multiplet resolution by mid year 1984.

The second disagreement, iodine-133 in charcoal, resulted from poor review of analytical data. The first count of the chemical samples did not show the dominant peak (530 keV) and

the licensee's system quantified based on a secondary peak (1238 keV) having poor statistics. Furthermore, a peak at the same energy also occurs in bismuth-214 which is present in natural background. Good review by an analyst would have rejected the iodine-133 interpretation in this case, based on statistical uncertainty.

Poor review of data appeared to be a rather pervasive weakness at the station. It resulted in the violation for failure to properly quantify cesium-137 concentration in liquid release on occasions when the Automated Analytical Instrumentation System did not resolve the cesium-137 (662 keV) and silver-110 (658 keV) peaks. It also resulted in the violation for not meeting technical specification sensitivity requirements for gross alpha analysis. The licensee has ordered a more sensitive alpha counter and has emphasized complete review of release quantification to chemistry personnel. While this response appears appropriate for the immediate problem, a possibly wider problem involving data review may still exist.

In 1982, regional inspectors observed breakthrough of a particulate filter to the charcoal adsorber and that particulate activity on charcoal was not quantified. In response, the licensee indicated the occurrence was an isolated event corrected by replacement of a gasket. Subsequent inspector review of 1983 effluent reports indicated that particulate activity on charcoal was being reported but was not such a rare occurrence. Again, better review of sampling data with followup examination of the sampling system appears needed.

Several laboratory improvements were noted. Reagents were current and all instruments were labeled and within calibration. Procedures had undergone intensive revision. A quality control program for calibration and instrument performance checks was under development. Blind and spiked samples were being used to check chemistry technician performance.

No significant problems were noted in the radiological environmental monitoring program. The licensee's contractor maintained a satisfactory QA/QC program and responded promptly to deficiencies identified in audits. Data recovery appeared satisfactory.

The licensee's program for implementation of 10 CFR 61 and 10 CFR 20 requirements on waste generators is still being developed. However, the interim program being followed appears adequate to ensure compliance while operational experience in waste classification and detailed analyses from waste streams are being accumulated.

2. Conclusion

The licensee is rated Category 2 in this area. Although the improved management involvement and responsiveness noted during the latter portion of the preceding assessment period has continued, substantial improvement was not evident in the implementation of the radiation protection program. Performance in the radiation protection area was borderline Category 2/3 during this assessment period, as it was during the previous assessment period.

3. Board Comments

Inspection effort should be increased in the radiation protection area to evaluate the effectiveness of licensee efforts at improving performance. Licensee management efforts should continue and should include methods of assessing affected improvements at the working level. Failure to effect substantial improvements should be cause for licensee and NRC concern.

C. Maintenance and Modifications

1. Analysis

Portions of eleven inspections were performed by the resident inspectors of selected maintenance and design change activities to verify that these activities were performed in accordance with Technical Specifications and quality assurance requirements. Followup inspections were performed on significant equipment problems. In addition, one special investigation was performed by a regional specialist in response to alleged inadequacies of piping stress analysis. One item of noncompliance was identified as follows:

Severity Level IV - Failure to use and follow the approved written procedure for adjusting the "0" Diesel Generator overspeed trip setpoint (Inspection Report Nos. 50-295/83-21; 50-304/83-22).

The licensee has made efforts in several areas to improve equipment performance and reliability. In many of these areas, efforts have continued from the previous assessment period. Reductions in secondary cation conductivity as well as actions to reduce condenser air leakage and a program for S/G chemical control have resulted in excellent eddy-current test

results (eddy current testing is done on 100% of all tubes each outage). In addition, the licensee has completed overhauls for their 5 diesel generators (DG). These major overhauls have significantly improved DG reliability. Other improvements have been made in the areas of RCP seals, vibration monitoring of rotating equipment and radiation monitors. The licensee also performed an ultrasonic inspection of rod control cluster assembly guide tube split pins during the Spring 1984 refueling outage due to splint pin cracking problems encountered at other Westinghouse PWRs. The results of the inspection revealed 25 indications on 23 split pins. All retaining nuts were verified in place visually. Possible corrective actions are being analyzed.

Administrative improvements in the maintenance area have been taken as part of the licensee's efforts to improve procedure adherence. These efforts include revision and development of maintenance procedures, elimination of work done under the craft capability concept (i.e. without work procedures), and discussions at various station organization levels to emphasize procedural adherence. Since work under craft capability has been eliminated, instructions are either provided by procedures attached to the work package or by work instructions on the work request form. This corrects a weakness noted in the previous assessment.

As discussed in Section V.F.1, LER data indicates that personnel errors occurred at a rate over twice as high as that noted in the previous assessment period. Six out of twenty-eight (21%) of all such LERs were caused by maintenance mechanics. This is about the same as during SALP 3 (22%).

There were thirteen reactor trips during the assessment period which were caused by equipment problems; most of these were attributed to feedwater or EHC problems (see Section IV.1). The licensee generally has promptly identified and corrected the causes of these trips; however, system age and component end of life have begun to contribute to the total number of trips. In addition, feedwater system control has been a common cause of trips for PWRs.

The investigation by the regional specialist of alleged design problems related primarily to stress intensification factors used for tees in the piping stress analyses performed for the licensee by Stone and Webster Engineering Corporation. The allegation was substantiated; however, the inspection indicated that Stone and Webster had corrected their design procedures to include proper stress intensification factors for tees. From the sample of calculations reviewed, there was no apparent system safety impact when correct stress intensifications were applied, and all of the remaining affected piping and analysis

packages were given a detailed review by the licensee's consultant. The observations in this area indicate that overall performance was satisfactory and the findings had little or no impact upon the quality of the final product.

The resident inspector investigated alleged forged signatures on a safety-related work package. The allegation was found to be unsubstantiated and other concerns identified by the inspector (not related to the allegation) were promptly corrected.

2. Conclusions

The licensee is rated Category 1 in this area. This is an improvement since the previous assessment period, and is due to a good enforcement history and improvements in equipment reliability and management controls.

3. Board Recommendations

None.

D. Surveillance

1. Analysis

Twelve inspections of surveillance, calibration and inservice inspection activities were performed by resident and region based inspectors. Two items of noncompliance were identified as follows:

- a. Severity Level V - Surveillance testing interval was exceeded for the fire pump diesel engine and its starting battery bank and charger (Inspection Report Nos. 50-295/83-13; 50-304/83-13).
- b. Severity Level IV - (Two examples) Surveillance testing interval exceeded for the 2A, 2B and 0 diesel generators and a Unit 2 operated with the 2A, 2B and 0 diesel generator inoperable due to exceeding test intervals (Inspection Report Nos. 50-295/83-17; 50-304/83-18).

The surveillance on the fire pump diesel was late because of an oversight on the part of the personnel assigned to perform the test. A work request was written by the individual who scheduled the surveillance, but the personnel assigned did not recognize that a deadline was associated with the test. The diesel generator (DG) surveillances were missed due to an inadequate tracking system. (DG surveillance frequency depends on the total number of failures in the previous 100 valid tests). An enforcement conference was held on August 11, 1983

covering DG testing. Corrective actions for these noncompliances have been taken and appear to be effective. Test procedures and administration of routine surveillances are adequate.

A surveillance scheduling system exists; however, a sampling of station deficiency reports indicates that the increase in the number of missed or improperly performed surveillances identified in the previous SALP has continued.

The licensee recently made several personnel changes, which included replacement of the Surveillance Engineer due to the retirement of the incumbent, as well as the assignment of two clerical staff personnel to the surveillance office. These increased resources should allow a more timely review of tests for completeness and accuracy. Additionally, the lessening of such administrative demands on the Surveillance Engineer should permit establishment of a closer liaison with shift personnel and foster an enhanced awareness of surveillance performance requirements.

Some problems were encountered concerning the adequacy of acceptance criteria for PT-11 "Diesel Generator Loading Test", the monthly DG surveillance. Considerable NRC involvement was necessary to resolve the differences between actual DG start times, acceptance times in PT-11 and TSS-15.6.35 "Manual Actuation of the Safety Injection and Safe Shutdown System and Diesel Generator Loading Test", and an analysis by the licensee's consultant. In another instance, a required report of containment integrated leak rate test results which was to be submitted to NRC ("approximately 3 months after the conduct of each test" as required by 10 CFR 50 Appendix J) took just over 5 months to be issued despite several requests by the resident inspectors. These examples are not considered typical of licensee responsiveness to NRC concerns. Recent efforts by the licensee have been more responsive.

In the area of ISI, procedures, material and equipment certifications, personnel certifications, data reports and audits were examined. The management control systems assured that regulatory requirements were met and personnel, equipment and material certifications were current and complete. Records were found to be complete, well maintained and available. Discussions with licensee and contractor personnel indicated that personnel were knowledgeable in their job; records indicate they were properly trained and certified. The licensee's audit reports were found to be generally complete and thorough.

2. Conclusion

The licensee is rated Category 2 in this area. Performance during the period was the same.

3. Board Recommendations

None.

E. Fire Protection

1. Analysis

Portions of eleven inspections were performed by the resident inspectors of licensee activities in the area of general implementation of the existing fire protection and housekeeping programs to verify that activities were performed in accordance with Technical Specifications and applicable procedures. Additionally, a detailed inspection of licensee fire protection and suppression activities was performed by the resident inspectors. Two items of noncompliance were identified as follows:

- a. Severity Level V - Procedure violation (one of two examples; see Section IV.1 for the other example) failure to properly control flammable material in the Auxiliary Building (Inspection Reports Nos. 50-295/83-21; 50-304/83-22).
- b. Severity Level V - Failure to comply with approved procedures for control of combustible materials in the Auxiliary Building (Inspection Report Nos. 50-295/83-26; 50-304/83-27).

Although both noncompliances dealt with control of flammable or combustible materials, the circumstances, particulars and required actions of each occurrence were disparate. Accordingly, these violations are not considered to be repetitive in nature. Corrective actions for these noncompliances were taken in a very timely manner, and appear to have been effective.

The licensee has continued to pursue a detailed training program for all personnel in the area of fire protection. Among the specific actions noted were:

- (1) Assignment of a senior licensed operator to the position of Station Fire Marshal as a primary duty in order to provide more detailed supervisory attention and plant specific knowledge within this area.
- (2) Completion by all shift supervisory employees of a fire-fighting course taught by the University of Maryland.
- (3) Continued effective interaction with the Zion Fire Department, specifically by providing basic radiological training and plant layout orientation tours, to assist those personnel should they respond to a fire.

- (4) Training for all employees in fire suppression techniques with use of an onsite smoke house for fire brigade training. Although the building used early in this evaluation period is no longer available, a new facility is under contract for construction onsite this year. The licensee has, additionally, made this facility available to local fire departments for their training use.

General plant housekeeping has continued to improve throughout the assessment period and is currently very good.

As indicated in Section IV.10, significant concerns have arisen with respect to the scheduling and implementation of specific requirements of 10 CFR 50 Appendix R. Although substantial efforts have been expended by the licensee in this regard, Zion Station has not yet achieved full conformance with the applicable requirements. Appraisal of this aspect of the Fire Protection program has accordingly been held in abeyance.

2. Conclusions

The licensee is rated Category 2 in this area, specifically reflecting the incomplete implementation of 10 CFR 50 Appendix R. Performance in housekeeping and other aspects of fire protection during the period has been improving.

3. Board Recommendations

The licensee is encouraged to continue the current level of management involvement in the existing fire protection program and to extend that involvement as necessary to the implementation of the broader fire protection issues contained in Appendix R to 10 CFR Part 50. An Appendix R inspection should be scheduled consistent with the licensee's final implementation of applicable requirements.

F. Emergency Preparedness

1. Analysis

Four inspections have been conducted to evaluate compliance with 10 CFR Part 50, Technical Specifications, and procedures. No items of noncompliance were identified in these inspections.

Two exercises were conducted during the rating period, one early and the other late in the period. While improvement items were identified during both exercises, only one item was common to both exercises. This indicates that licensee management has generally been responsive to resolving NRC concerns. Items for improvement identified during the 1984 exercise included habitability monitoring in the Operational Support Center (OSC)

and the quality of briefings provided to persons assigned to the OSC, Emergency Operations Facility, and field monitoring teams. These items indicated the need for additional training to persons given such tasks.

A routine inspection was conducted in June 1983. At that time the licensee was developing and implementing corrective actions on several generic deficiencies for which responsibility had been assigned to corporate staff. These deficiencies involved timeliness of initial offsite notifications and the annual review of Emergency Actions levels with offsite agencies.

Additional improvements were also identified regarding the Acting Station Director's initial notification procedure and the staff augmentation procedure. Although the licensee has identified and trained sufficient personnel for appropriate emergency response positions, specialized training should have been better documented. The licensee has demonstrated the capability to provide timely shift augmentation through several drills. While corporate and station emergency preparedness staffs have ensured that all required drills have been conducted and critiqued, corrective actions identified during drills should be formally tracked to ensure completion. Licensee management agreed to consider all improvement items identified during the 1984 exercise and 1983 routine inspections. Their responses will be evaluated during a future inspection.

Discussions were held with the licensee regarding conduct of the pilot Emergency Response Facility Appraisal at the Zion Station. Corporate and station management agreed to cooperate in this effort; however, unresolvable schedule conflicts resulted in the initial appraisal being conducted at another facility.

While the licensee had completed acceptable corrective actions to weaknesses and improvement items identified during the 1983 exercise, corrective actions are in progress on several generic deficiencies and a number of improvement items identified during subsequent exercise and routine inspections. The licensee's overall attitude towards improving the Station's emergency preparedness program has, thus far, been favorable.

2. Conclusion

The licensee is rated Category 2 in this area. Performance during the period was the same.

3. Board Recommendation

None.

G. Security and Safeguards

1. Analysis

Four safeguards inspections (one routine security, one routine MC&A and two special security inspections) were completed by regional based inspectors during the assessment period. The special inspections involved a review of significant security events reported by the licensee under 10 CFR 73.71. In addition, the resident inspectors routinely conducted observations of security activities. Three items of noncompliance were identified relative to the security program. All three items were identified during the two special inspections. No items of noncompliance were identified during routine inspections.

The noncompliances involved:

- a. Severity Level III - The licensee failed to adequately control access into the Protected Area and Vital Area. (Inspection Report Nos. 50-295/83-06; 50-304/83-07).
- b. Severity Level IV - The licensee failed to make a timely report to the NRC on the event noted in item 1 above. (Inspection Report Nos. 50-295/83-06; 50-304/83-07).
- c. Severity Level III - A visitor was unescorted in both a protected and vital area. (Inspection Report Nos. 50-295/83-12; 50-304/83-12).

The two Severity Level III noncompliances represented major violations of the licensee's access control procedures and resulted in Civil Penalties of \$10,000 and \$40,000 respectively. These items were a significant degradation in the level of protection described in the approved security plan; however, there was no immediate threat to the public.

Licensee corrective actions on these matters were prompt. The first of the two civil penalty violations was reduced by 50 percent because of prompt identification and extensive corrective actions. The second civil penalty resulted in actions which included the establishment of stringent, restrictive visitor escort requirements which notably exceed the visitor controls at other licensees. Both security incidents were caused by contractor personnel who were trained in an adequate security orientation program but who failed to follow established procedures.

The two civil penalty violations occurred during the first six months of the SALP evaluation period. A routine security inspection conducted 6 months after the second Severity Level III

violation showed a heightened security consciousness by individuals authorized unescorted access to the protected and vital areas. Since the civil penalties, station management has taken an extremely active role in the security decision making process ensuring adequate management review of plant protection matters. The Station Superintendent personally reviews personnel access control violations. Station policies regarding "tailgating" and visitor escorting are adequately stated and better understood as a result of the licensee's corrective actions to the civil penalties imposed. Such policies and procedures are now strictly adhered to.

With the sole exception of the first item of noncompliance noted above, security-related events are properly identified, analyzed, and reported in a timely manner. The licensee has been extremely conservative in their approach to reporting items when the potential for security significance exists. Corrective actions, following the civil penalties, have been effective as indicated by a lack of repetition.

Key positions within the security organization are identified and responsibilities defined. Staffing is ample as indicated by control of backlog and overtime.

The training and qualification program has contributed to an adequate understanding of security procedures and post orders with a modest number of personnel errors. A defined program for site security has been implemented for individuals granted unescorted access to the protected and vital areas.

2. Conclusion

The licensee is rated Category 3 in this area. The licensee was rated Category 2 in the past two SALP periods. This rating is based primarily on the two Severity Level III noncompliances which followed a programmatic weakness identified in the previous SALP reports. These occurrences in the same functional area during one SALP evaluation period clearly demonstrate that more licensee attention and effort were needed to maintain performance above the acceptable level. During the latter portion of the assessment period, improved performance was evident due to the licensee's actions in response to civil penalties. Continuation of this aggressive management involvement coupled with no additional significant violations in this area will result in an improved rating in this area.

3. Board Recommendation

The Board notes that subsequent to the SALP period, a routine security inspection was conducted. The results indicated that improvements in this area were continuing.

H. Refueling Activities

1. Analysis

Four inspections of refueling activities were performed during the assessment period covering direct observation of refueling activities, verification of refueling equipment operability and surveillance testing, verification of containment integrity, and followup of significant events. No items of noncompliance were identified.

The licensee's performance in the area of refueling activities continues to be good. As stated in previous SALP reports, a specific strength of the licensee is the existence of a permanent refueling group which is responsible for all activities involving the handling and storage of new and spent fuel. The group can thus maintain a high level of knowledge of the refueling equipment and procedures.

The high levels of both knowledge and experience within this group were of specific note during the Unit 1 10-year In-Service Inspection (ISI). All fuel modules were removed from the vessel, inspected and stored in the spent fuel pool. During the core reload, the problems of minor fuel module deformation were minimized by the actions of the fuel handlers, resulting in the expeditious and correct completion of the reload.

2. Conclusion

The licensee continues to be rated Category 1 in this area. Performance was the same during the period.

3. Board Recommendations

None.

I. Quality Programs and Administrative Controls

1. Analysis

Routine observations by resident inspectors were made in this area as well as special inspections in the areas of design changes and modifications and audit program implementation. The residents also performed followup inspections on various events. No items of noncompliance were identified, although aspects of noncompliances in other functional areas may be considered in this section.

Since the beginning of the evaluation period the licensee has taken steps to improve procedural adherence. Plant management has emphasized the need for strict procedural adherence at all organizational levels; instituted a new classification for

certain procedures (Mandatory-in-Hand) which establishes requirements for these procedures to be at the job site; conducted training in procedure use and development; and instituted review and revision of all maintenance procedures.

As a result of a large number of civil penalties issued to Commonwealth Edison Company during 1983, a Regulatory Improvement Program was instituted on a company-wide basis. Steps were taken in the areas of management organization and personnel error reduction to improve regulatory performance. Specific aspects of the program are discussed in Section IV.1.a. The program went into effect at the Zion Station in February, 1984, and while personnel errors appear to have been less frequent, it is too early to evaluate the program's effectiveness.

Areas where more licensee attention appears necessary include:

- (1) Shift Engineers (SE), Shift Foreman (SF), and Shift Control Room Engineers (SCRE) can all authorize work to begin. The potential exists for simultaneous authorization of conflicting work. For example, LER 304/83-10 reported that after the SE had authorized a purge of the Unit 2 containment, two of the radiation monitors required during the purge were authorized for removal service for calibration.
- (2) Certain individuals on the licensee staff appear to have no ready replacement. For example, one engineer on the Technical Staff handles all work associated with the diesel generators, and only one maintenance foreman has been assigned to supervise reactor coolant pump seal work. Both of these individuals perform in an excellent manner, but no others appear to be available to fill in if they became unavailable.

Positive aspects of the licensee's management and quality program administration include:

- (1) Quality assurance (QA) and quality control (QC) groups have ample staffing to support their workloads.
- (2) QC hold point coverage appears to be increasing.
- (3) QA audit program is well run.
- (4) Plant management has provided training for RO and SRO licenses or for RO certification in excess of regulatory requirements in a variety of plant departments including chemistry, radiological controls, instrument mechanics, maintenance, QA audit section, and technical.

In general, the quality programs examined during the assessment period appeared well established and well administered.

2. Conclusion

The licensee is rated Category 2 in this area. Performance has been the same during the period.

3. Board Recommendations

None.

J. Licensing Activities

1. Analysis

The assessment of licensee performance was based on an evaluation of 32 licensing activities including 6 amendments to the license. Thirty of the 32 selected activities were closed, two remain open. The licensing activities including the following:

- Project Management Administration
- Response to NUREG-0737 Items
- Appendix R
- Environmental Qualification
- Control of Heavy Loads
- Containment Purge and Vent
- Auxiliary Feedwater (AFW)
- Rod Urgent Alarm
- Main Steam Line Break (MSLB) with Feedwater Addition
- Quality Assurance
- Natural Circulation Cooldown
- AFW Seismic Qualification
- Containment Purge
- Neutronic Methods
- Containment Leakage Test
- Preventive Maintenance of Diesels
- Coolant Chemistry

Within this evaluation period in all licensing actions there was evidence of direct management involvement demonstrated by numerous meetings and telephone calls. Management involvement was particularly evident in the closure of a large number of NUREG-0737 items and attention given to diesel generators. Total absence of requests for technical specification changes on an emergency or exigency basis clearly demonstrated prior planning. Staffing of licensing personnel with well qualified and technically competent individuals reflects correct assignment of priorities.

There appears to be a clear understanding of most issues and workable approaches are taken to resolve them. The operation of purge and vent valves and the performance of extensive preventive maintenance on the swing diesel generator are just two examples of conservatism and proper regard from the standpoint of safety. The excellence of the submittal on environmental qualification of electrical equipment is a good example of the understanding of the technical issues involved and the sound approach to resolution. Sound technical basis and conservatism are generally provided to support the licensee's position.

The relatively small number of requests for additional information sent to the licensee clearly demonstrated thoroughness of the initial responses and acceptability of proposed resolution. In most cases the licensee sent advance copies of submittals by overnight express service and, when urgent matters were involved, they were telecopied to the Division of Licensing the same day. In a few instances where responses were delayed, the licensee usually provided advance notice to the project manager. The licensee cooperated willingly with the NRC on non-licensing issues.

A total of 32 licensing actions were included in the evaluation of licensee performance. Several examples of excellent licensee performance on important licensing issues have been noted, i.e. on environmental qualification of electrical equipment and diesel generator maintenance.

While licensee performance in this area has been very good, it is clouded by the licensee's poor performance on the Appendix R - Fire Protection issue. Significant delays occurred in the licensee's identification of problems in complying with his previous commitments and in arriving at a corrective action plan. Although the licensee indicated his intention to request a schedule exemption from 10 CFR 50.48 in July, 1983, it was not until November, 1983 that the request was filled, about one month before it was needed. Significant staff concerns involved the delay by the licensee in resolution of acceptable interim actions, a lack of understanding by the licensee of the issues involved in some areas and poor responsiveness to a safety concern.

2. Conclusions

The licensee is rated Category 1 in this area. Performance has improved during the assessment period.

3. Board Recommendations

The Board recommends increased licensee attention in the area of fire protection. Should the licensee fail to show significant improvement in fire protection, a Category 1 rating will be difficult to maintain.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

1. Unit 1 operated under an administratively imposed 80% power limitation between January 1, 1983 and March 25, 1983 and a 55% power limitation between March 25, 1983 and June 7, 1983 to conserve fuel and avoid a summer 1983 refueling outage.
2. Unit 2 began a scheduled refueling outage February 14, 1983.
3. Unit 1 suffered damage to the 1 East main transformer on April 14, 1983 when a power surge shattered the insulator on one phase of the transformer. As a result, until repairs were completed June 17, 1983, Unit 1 power was limited to 650 MWE (62.5 percent), the capacity of the 1 West transformer.
4. Unit 2 was restored to power operation on May 27, 1983 following a 104 day refueling and maintenance outage.
5. Unit 1 began a scheduled refueling outage on August 9, 1983.
6. A 10-year In-Service Inspection (ISI) was performed on Unit 1 between August 9, 1983 and February 6, 1984.
7. During testing of the 1A Diesel Generator on December 23, 1983, the "floating" turning gear failed, causing extensive damage to the engine, which was restored to operability January 8, 1984.
8. A primary-to-atmosphere leak from a broken swagelock fitting at the Unit 1 incore fission detector seal table resulted in declaration of a Site Alert on January 20, 1984. The Site Alert was terminated when leakage was reduced below limits following a reactor cooldown.
9. Unit 1 was restored to power operation on February 6, 1984 following a 153 day outage.
10. Unit 2 began a scheduled refueling outage March 27, 1984.
11. A scheduled 45 day overhaul of the 0 Diesel Generator, under the provisions of license amendments 84 (Unit 1) and 74 (Unit 2), dated March 12, 1984, was begun on April 18, 1984.
12. An ultrasonic and visual inspection of the Unit 2 Rod Control Cluster Assembly (RCCA) guide tube support pins (split pins) was performed between April 20 and April 25, 1984. Twenty-five indications on twenty-three pins were identified ultrasonically, and all split pin retaining nuts were verified in place.

B. Inspection Activities

Except as noted in Section V.C. and V.D., the inspection program at Zion during the evaluation period consisted of routine resident and region-based inspections. No major team inspections were conducted during the SALP period.

1. Noncompliance Data

Enforcement Activity

Zion Nuclear Power Station Unit 1, Docket 50-295

Functional Area	No. of Violations in Each Severity Level					
	Dev.	V	IV	III	II	I
A. Plant Operations		1(1)*	(1)			
B. Radiological Controls	(1)	(3)	(4)			
C. Maintenance			(1)			
D. Surveillance Inservice Testing		(1)	(1)			
E. Fire Protection		(2)*				
F. Emergency Preparedness						
G. Security and Safeguards			(1)	(2)		
H. Refueling Activities						
I. Quality Programs and Administrative Controls						
J. Licensing Activities						
TOTALS	(1)	1(7)*	(8)	(2)		

Numbers in parentheses indicate noncompliances or deviation common to both units.

*One Severity Level V violation, common to both units, included examples in both the Plant Operations and Fire Protection areas and is therefore reflected under both.

Enforcement Activity

Zion Nuclear Power Station Unit 2, Docket 50-304

Functional Area	No. of Violations in Each Severity Level					
	Dev.	V	IV	III	II	I
A. Plant Operations		(1)*	1(1)			
B. Radiological Controls	(1)	(3)	(4)			
C. Maintenance			(1)			
D. Surveillance		(1)	(1)			
E. Fire Protection		(2)*				
F. Emergency Preparedness						
G. Security and Safeguards			(1)	(2)		
H. Refueling Activities						
I. Quality Programs and Administrative Controls						
J. Licensing Activities						
TOTALS	(1)	(7)*	1(8)	(2)		

Numbers in parentheses indicate noncompliances or deviation common to both units.

*One Severity Level V violation, common to both units, included examples in both the Plant Operations and Fire Protection areas and is therefore reflected under both.

C. Investigations and Allegations Review

1. On June 15 and 16, 1983 a special inspection was conducted regarding alleged inadequate stress intensification factors used for piping tee stress analyses (see Section IV.3).
2. Between March 14, 1984 and March 20, 1984, the Resident Inspectors inspected an allegation of improper maintenance practices and forged signatures on work packages. The allegations were not substantiated, however, two concerns unrelated to the allegations were identified for licensee attention (see Section IV.3).

D. Escalated Enforcement Actions

1. Civil Penalties

- a. As a result of an inspection conducted on March 15, 1983, the NRC issued an order imposing a Civil Penalty in the amount of \$10,000 for the events surrounding a failure to adequately control access to the protected and vital areas of the facility. The licensee paid the Civil Penalty on August 12, 1983.

- b. As a result of an inspection conducted on June 20, 1983, the NRC issued an order imposing a Civil Penalty in the amount of \$40,000 for the events surrounding a failure to adequately control access to the protected and vital areas of the facility. The licensee paid the Civil Penalty on December 7, 1983.

2. Orders

No orders were issued during the SALP period.

E. Management Conferences Held During Appraisal Period

1. On January 26, 1983, a management meeting was held in the NRC Region III offices to discuss proposed Commonwealth Edison Company guidelines for Commonwealth Edison Company personnel to be used for providing information to NRC Region III inspectors.
2. On February 17, 1983, a management meeting was held in the NRC Region III offices to discuss future improvement of the regulatory performance of Commonwealth Edison Company.
3. On April 11, 1983, an enforcement conference was held in the NRC Region III offices to discuss failure to adequately control access to protected and vital areas of the facility (see Section V.D.2.).
4. On May 12, 1983, a management meeting was held in the NRC Region III offices to present the licensee with the findings of the SALP Cycle 3 Report.
5. On July 8, 1983, an enforcement conference was held in the NRC Region III offices to discuss a failure to adequately control access to protected and vital areas of the facility (see Section V.D.6.).
6. On July 26, 1983, a management meeting was held in the Commonwealth Edison Company corporate offices to discuss improvement of licensee regulatory performance and enhancement of communications between the NRC and Commonwealth Edison Company.
7. On August 11, 1983, an enforcement conference was held in the NRC Region III offices to discuss a failure to conduct diesel generator surveillances at the required frequency and failure to take proper actions when test parameters were exceeded.
8. On September 9, 1983, a management meeting was held at the Commonwealth Edison Company corporate offices to continue discussions on improvement of licensee regulatory performance and enhancement of communications between Commonwealth Edison and the NRC.

9. On October 19, 1983, a management meeting was held at the Holiday Inn in Aurora, Illinois to continue discussions on improvement of licensee regulatory performance and enhancement of communications between Commonwealth Edison and the NRC.

F. Review of Licensee Event Reports and 10 CFR 21 Reports

1. Licensee Event Reports (LERs)

On August 29, 1983, the NRC published an amendment clarifying its regulations regarding Licensee Event Reports (LERs) required by 10 CFR 50.73. Details of the new reporting system were published as NUREG-1022 "Licensee Event Report System". The effective date of this amendment was January 1, 1984. The new rule deleted reporting requirements for several types of LERs which had been found, through experience, to be of little value to the Commission.

LICENSEE EVENT REPORTS

<u>NUMBER</u>		<u>PROXIMATE CAUSE*</u>
	SALP Period 3 (12 months) <u>12/31/81 - 01/01/83</u>	SALP Period 4 (16 months) <u>01/01/83 - 04/30/84</u>
9 (0.8)**		Personnel Error
4 (0.3)		Design, Manufacturing and Construction/ Installation
0		External Cause
7 (0.6)		Defective Procedure
51 (4.3)		Component Failure
<u>8 (0.7)</u>	<u>7 (0.4)</u>	Other
79 (6.6)	121 (7.6)	

*Proximate cause is the cause assigned by the licensee according to NUREG-0161, "Instructions for Preparation of Data Entry Sheets for Licensee Event Report (LER) File," or NUREG-1022, "Licensee Event Report System."

**Number in parentheses are the average number of events per month.

LERs were issued at approximately the same rate during the SALP 4 assessment period as during SALP 3, except for those caused by personnel errors. The number of LERs per month due to personnel errors more than doubled. Additional discussion on

personnel errors is provided in Sections IV.1 and IV.3. LERs due to defective procedures occurred less frequently during the assessment period, however the numbers involved are so small as to make statistical comparisons difficult.

In addition, changes in the LER system have made LER data for this SALP period not completely comparable with previous statistics.

The licensee submitted 5 LERs for Unit 1 and 6 LERs for Unit 2 in the assessment period from January 1, 1984 to April 30, 1984. The information in the narrative sections was generally sufficient to provide the reader with a good understanding of the event. The descriptions of events were clear and adequate. The apparent cause of the occurrences was well explained and documented. Corrective actions were also mentioned.

References to previous events were appropriate and timely updates were submitted when necessary.

2. 10 CFR 21 Reports

No Part 21 reports were submitted by the licensee during the evaluation period.



NUCLEAR REGULATORY COMMISSION
REGION I
831 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

JUN 28 1983

Docket No. 50-311

Public Service Electric and Gas Company
ATTN: Mr. Richard A. Uderitz
Vice-President - Nuclear
P. O. Box 236
Hancock's Bridge, New Jersey 08038

Gentlemen:

Subject: Inspection No. 50-311/83-14

This refers to the special safety inspection conducted by Mr. R. L. Nimitz of this office on April 17, 18, 21, and 22, 1983, at the Salem Nuclear Generating Station, Hancock's Bridge, New Jersey, of activities authorized by NRC License No. DPR-75 and to the discussions of our findings held by Mr. Nimitz with Mr. J. Driscoll at the conclusion of the inspection.

Areas examined during this inspection are described in the NRC Region I Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. These violations have been categorized by severity level in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C) published in the Federal Register Notice (47 FR 9987) dated March 9, 1982. You are required to respond to this letter; and in preparing your response, you should follow the instructions in Appendix A.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room unless you notify this office, by telephone, within 10 days of the date of this letter and submit written application to withhold information contained therein within 30 days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). The telephone notification of your intent to request withholding, or any request for an extension of the 10-day period which you believe necessary, should be made to the Supervisor, Files, Mail and Records, USNRC Region I, at (215) 337-5223.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

Your cooperation with us in this matter is appreciated.

Sincerely,



Thomas T. Martin, Director
Division of Engineering and
Technical Programs

Enclosures:

1. Appendix A, Notice of Violation
2. NRC Region I Inspection Report Number 50-311/83-14

cc w/encls:

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APPENDIX A

NOTICE OF VIOLATION

-- Public Service Electric and Gas Company
Salem Nuclear Generating Station, Unit 2

Docket No. 50-311
License No. DPR-75

As a result of the inspection conducted on April 17, 18, 21, and 22, 1983, and in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C), the following violations were identified:

- A. 10 CFR 20.103(a)(3) requires that licensees use suitable measurements of concentrations of radioactive materials in air for detecting and evaluating airborne radioactivity for purposes of determining compliance with the requirements of 10 CFR 20.103. 10 CFR 20.103(a)(1) provides quarterly limits for intake of airborne radioactivity.

Contrary to the above, on April 16, 1983, during three separate drilling and cleaning operations of a nozzle dam stud located inside the No. 22 Steam Generator, no measurements of the concentrations of radioactive materials present therein were made for purposes of determining compliance with 10 CFR 20.103. Personnel entered the steam generator immediately before and after the drilling to clean the area being drilled with an air gun.

This is a Severity Level IV violation (Supplement IV).

- B. 10 CFR 20.103 states in paragraph (b), in part, "The licensee shall, as a precautionary procedure, use process or other engineering controls, to the extent practicable, to limit concentrations of radioactive materials in air to levels below those which delimit an airborne radioactivity area as defined in 20.203(d)(1)(ii) . . ."

Contrary to the above, on April 16, 1983, an installed airborne radioactivity removal system was not used to limit airborne radioactivity concentrations inside the No. 22 Steam Generator or in the vicinity thereof. Airborne radioactivity concentrations measured in the work vicinity ranged from 52 to 168 times the value specified in 20.203(d)(1)(ii).

This is a Severity Level IV violation (Supplement IV).

Pursuant to the provisions of 10 CFR 2.201, the Public Service Gas and Electric Company is hereby required to submit to this office within 30 days of the date of the letter that transmits this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending this response time.

U. S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 50-311/83-14

Docket No. 50-311

License No. DPR-75 Priority - Category C

Licensee: Public Service Electric and Gas Company
P. O. Box 236
Hancocks Bridge, New Jersey 08038

Facility Name: Salem Nuclear Generating Station, Unit 2

Inspection at: Hancocks Bridge, New Jersey

Inspector: R. L. Nimitz
Ronald L. Nimitz, Senior Radiation Specialist

6/8/83
date

Approved by: M. M. Shanbaky
M. M. Shanbaky, Ph.D., Chief, Facilities
Radiation Protection Section

6/8/83
date

Inspection Summary:

Inspection on April 17, 18, 21, and 22, 1983 (Report No. 50-311/83-14)

Areas Inspected: Special safety inspection of the circumstances, licensee evaluations, and corrective actions involving a personnel contamination event on April 16, 1983, including: description, notifications, airborne radioactivity intake estimates, engineering controls, airborne radioactivity sampling, procedures, allegations related to the event, and a review of a spill of contaminated water. The inspection involved 30 inspector-hours onsite by one region-based inspector.

Results: No violations were identified in six areas. Two violations were identified in two areas (failure to use engineering controls in accordance with 10 CFR 20.103, Section 5; failure to perform airborne radioactivity measurements in accordance with 10 CFR 20.103(a)(3), Section 6).

Details

1. Persons Contacted

1.1 Public Service Electric and Gas

- *W. Britz, Manager, Radiation Protection Services
- H. Bergendahl, Health Physicist
- *J. Clancy, Senior Engineer, Radiation Protection Services
- R. Aslo, Technical Supervisor
- *A. Dareluis, Quality Assurance
- *J. Driscoll, Assistant General Superintendent
- W. Ferguson, Technical Supervisor, Radiation Protection
- *J. O'Connor, Radiation Protection Engineer
- J. Pearson, Senior Shift Supervisor, Unit 2
- W. Hunkele, Technical Supervisor, Radioactive Waste

1.2 NRC

L. Norrholm, Senior Resident Inspector

*Denotes those individuals attending the exit meeting on April 22, 1983.

The inspector also contacted other licensee and contractor personnel.

2. Purpose of Inspection

The purpose of this special inspection was to review the circumstances, licensee evaluations, and corrective actions involving an event on April 16, 1983, at the Salem Nuclear Generating Station Unit 2 in which a number of individuals sustained intakes of airborne radioactive materials.

3. Event Description

Due to a broken stud on the Number 22 Steam Generator Cold Leg nozzle dam, it was decided that a steam generator entry would be required to drill out the stud and re-tap the hole.

At about 10:00 a.m. on April 16, 1983, a briefing for the job was held. A Westinghouse representative discussed how the job would be performed, while radiation protection personnel distributed dosimetry and subsequently discussed how the job was to be covered from a radiological standpoint.

At about 11:00 a.m. on April 16, 1983, the work crew dressed out in protective clothing and proceeded to the steam generator work area. The crew on the No. 22 Steam Generator work platform consisted of three Westinghouse personnel, one contractor tool control individual, and one Radiation Protection Technician. The individuals entering the steam generator tent wore air-supplied full face respiratory protective equipment. Those individuals on the platform but not entering the tent wore full face filter respiratory protective equipment.

Prior to entry into the Steam Generator waterbox, the Radiation Protection Technician collected a eight-minute grab air sample inside the waterbox by use of a two cubic foot per minute (CFM) air sample pump. The air sample was analyzed at about 3:00 p.m. on April 16, 1983. A steam generator jumper time keeper was positioned above No. 22 Steam Generator to keep a record of each individual's time in the generator. A second radiation protection technician was positioned at the bottom of the ladder leading to the steam generator platform for purposes of assisting individuals in donning additional protective clothing and equipment. These two individuals did not wear respiratory protective equipment.

At about 1:00 p.m. on April 16, 1983, a Westinghouse worker entered the waterbox to set up lighting and drill out the broken stud. A second Westinghouse worker entered after the first individual's exit to verify drill alignment. The drilling was performed from outside the waterbox tent. The exhaust air from the air-powered drill exhausted into the waterbox.

At about 1:30 p.m. on April 16, 1983, the first segment of drilling was stopped. A Westinghouse worker entered the waterbox to blow out shavings from the hole with an air gun and install a second, larger drill bit. No airborne radioactivity samples were collected in the waterbox during this entry. The drilling proceeded for about 10 minutes and was performed from outside the waterbox tent.

At about 1:45 p.m. on April 16, 1983, a Westinghouse worker entered the waterbox to blowout shavings from the hole with a air gun and to install a third, larger drill bit.

During drilling with the third bit, problems were encountered. It was believed the bit was broken. At about 2:00 p.m. on April 16, 1983, the third drill was backed out and an attempt was made to tap the broken stud.

While in the generator attempting to tap the stud, the Westinghouse individual's stay time elapsed, and he exited the generator.

The Health Physics crew for the job was changed between 2:00 and 2:30 p.m. At about 2:30 p.m. on April 16, 1983, it was determined that the taping could proceed.

During the taping and at about 2:30 p.m., the No. 22 Reactor Coolant Pump motor started. The motor was started for purposes of vibration testing. While the motor was running, Westinghouse personnel completed the taping of the stud and cleaned out the hole by use of the air gun. The air gun was also used to blow out the grooves and bolt holes in the nozzle dam. The waterbox was then wiped out with a rag. Quality Assurance personnel performed an inspection of the waterbox at about 3:00 p.m., on April 16, 1983. At about 4:00 p.m., the No. 22 Reactor Coolant pump motor was shut off, and the motor began its coast down.

At about 5:00 p.m., a technician performing whole body counting of individuals who had worked in the area identified cobalt-58 (Co-58) intakes. A second individual was counted and also found to have an intake of Co-58. The workers indicated they had been in the vicinity of the No. 22 Reactor Coolant Pump and Steam Generator respectively. In addition, personnel who had worked in the vicinity were identified as having contamination about the face.

An investigation was initiated at about 5:15 p.m. on April 16, 1983. Air samples collected in the vicinity were qualitatively measured with a thin window GM detector system and were found to indicate high airborne radioactivity. An air sample collected in the vicinity of the No. 22 Reactor Coolant Pump during the period 5:05 to 5:10 p.m. measured 40 millirad/hour with an end window ion chamber survey meter. The area within the bioshield was evacuated at about 5:45 p.m. on April 16, 1983. The entire containment was evacuated at about 6:15 p.m.

During the investigation, it was determined that the ventilation system, used to remove airborne radioactivity from the No. 22 Steam Generator, was not in operation. The ventilation system was started at 7:00 p.m. on April 16, 1983.

General access to the containment was resumed at about 2:00 a.m. on April 17, 1983.

3. Notifications

The inspector reviewed the notifications made by the licensee concerning the personnel contamination. The review was with respect to the following:

- 10 CFR 50.72, "Notification of Significant Events"
- Salem Nuclear Generating Station Emergency Procedure EP I-0, "Accident Classification Guide"

No violations were identified.

4. Airborne Radioactivity Intake Estimates

The inspector reviewed the airborne radioactive material intake estimates of those individuals who were in the containment during the time of the high airborne radioactivity. The review was with respect to 10 CFR 20.103, "Exposures of Individuals to Concentrations of Radioactive Materials in Air In Restricted Areas."

The licensee identified 230 individuals who were in the containment during the afternoon of April 16, 1983 event. The individuals were whole body counted by the licensee during the period April 16 - 20, 1983. The majority of the individuals were counted on either April 16 or 17, 1983.

10 CFR 20.103 requires that no licensee possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale quantity of radioactive material air in excess of the limits specified therein. For purposes of complying with the quarterly limits specified therein, a value of 520 MPC-hours* is used.

The inspector review of the licensee's whole body count data summary indicated no individual sustained an exposure in excess of the quarterly airborne radioactivity intake limits specified in 10 CFR 20.103(a)(1).

The inspector selected individuals from the summary and compared their assigned airborne radioactivity exposure, sustained during the event, in MPC-hours to that indicated by whole body count data. The inspector noted that one individual indicated <0.1 MPC-hour on the summary while his whole body count indicated 5.9 MPC-hours. A second individual indicated 24.3 MPC-hours on the summary. However, this second individual's whole body count data indicated 65 MPC-hours. This matter was brought to the attention of licensee radiation protection representatives in a telephone conversation on May 12, 1983.

NOTE: All exposure was assumed to have occurred during the event. The inspector found no indications to the contrary.

Licensee representatives indicated the summary would be reviewed, corrected as necessary, and made available by June 30, 1983.

In addition, the inspector selected those individuals who had been working in the vicinity of No. 22 Steam Generator and No. 22 Reactor Coolant Pump when the pump motor started (about 2:00 p.m. - 4:00 p.m. on April 16, 1983) and reviewed their whole body count data.

The inspector noted that of 15 people in the area, one individual sustained an exposure of about 65 MPC-hours. This value was noted to be 12.5% of the quarterly quantity intake limit. The remaining individuals sustained exposures of <10 MPC-hours.

The licensee sent air samples collected inside the steam generator tent and at the No. 22 Reactor Coolant Pump to a contractor for analysis. The sample results were provided to the inspector on May 26, 1983. The data did not indicate the presence of significant alpha emitters.

No violations were identified.

*One MPC-hr is that exposure sustained by an individual who inhales airborne radioactive material for one hour at the applicable concentration specified in Table 1, Column 1, of Appendix B to 10 CFR 20.

5. Engineering Controls

The inspector reviewed the event with respect to the requirements of 10 CFR 20.103.

10 CFR 20.103 requires in paragraph (b)(1) that the licensee use, as a precautionary procedure, process or engineering controls to the extent practicable to limit concentrations of airborne radioactive material below those which define an airborne radioactivity area, as defined in §20.203(d)(ii). This section defines an airborne radioactivity area as any area in which the airborne radioactivity concentrations exceed 25 percent of the applicable values specified in Appendix B, Table 1, Column 1 of 10 CFR 20 averaged over the number of hours in any week during which individuals are in the area.

The review of the event indicated that the licensee had installed a ventilation system to remove airborne radioactivity from the steam generator waterbox. During the work in the cold leg of the steam generator, air was to be drawn in through the cold leg, up through the steam generator tubes, out the cold leg manway, and finally exhausted into the containment atmosphere outside the biological shield. The air was filtered by an iodine removal unit prior to its being exhausted into containment.

The inspector noted, however, that the iodine removal unit was not turned on prior to the work in the No. 22 cold leg. The unit was placed in operation at about 7:00 p.m. on April 16, 1983.

The review of licensee airborne radioactivity sample analysis data indicated the airborne radioactivity concentration ranged from about 13 times the 10 CFR 20, Appendix B, values in the area of No. 22 Reactor Coolant Pump to about 41 times these concentration values in the No. 22 Steam Generator tent area (i.e., 52 and 164 times the value specified in 10 CFR 20.203(d)(ii)).

The inspector discussed the above with licensee representatives and indicated that failure to use engineering controls to the extent practicable to limit intake of airborne radioactive material was a violation of 10 CFR 20.103(b) (50-311/83-14-01).

6. Airborne Radioactivity Sampling

The inspector reviewed selected airborne radioactivity surveys made by the licensee during the contamination event.

10 CFR 20.103(a)(3) requires that licensees use suitable measurements of concentrations of radioactive materials in air for detecting and evaluating airborne radioactivity for purposes of determining compliance with the requirements of 10 CFR 20.103. 10 CFR 20.103(a)(1) provides quarterly limits for intake of airborne radioactivity.

10 CFR 20.103(a)(1) requires that no licensee possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale, in any calendar quarter, a quantity of radioactive material greater than the quantity specified therein.

6.1 Waterbox Surveys

The inspector review of airborne radioactivity measurements made by the licensee during the drilling and taping of the steam generator nozzle dam on April 16, 1983, indicated that a pre-work air sample was collected. This sample (No. 83-12296) was collected at about 11:17 a.m. for eight minutes and was counted about four hours later. The air sample indicated no significant airborne radioactivity.

The review of airborne radioactivity measurements performed during the work inside the generator indicated no airborne radioactivity samples were collected therein for the entire duration of the job. The inspector noted that during the job, three separate drilling and cleaning (i.e., by use of an air gun) operations were performed.

The inspector noted that an air sample was collected during the period 12 noon to 5:00 p.m. in the No. 22 Steam Generator Tent area. This sample indicated 800 mrad/hour when measured with a survey meter and about 42 times the appropriate 10 CFR 20, Appendix B, concentration limits when analyzed.

The inspector noted that failure to perform measurements of airborne radioactivity concentrations for purposes of determining compliance with 10 CFR 20.103 was noncompliance with 10 CFR 20.103(a)(3) (50-311/83-14-02).

6.2 General Area

The review of general area airborne radioactivity sampling indicated that airborne radioactivity samples were collected in the No. 22 Steam Generator Tent and in the vicinity of the No. 22 Reactor Coolant pump. The inspector noted, however, that these samplers were continuous samples collected during the entire work activity. No short duration grab samples were collected and analyzed. In addition, no continuous air monitor (CAM) was operated in the vicinity. The licensee did have one CAM operating in the containment. However, the monitor was operating on the Refueling Floor and was later determined to be not operating properly. As a result, the licensee had no timely indication of increasing airborne radioactivity.

The inspector also noted that the licensee's Technical Supervisor, Radiation Protection, issued a memorandum on January 14, 1983, to all radiation protection technicians concerning air sampling in containment. The memorandum indicated that air sampling was either to be performed on a 12-hour or 24-hour basis inside the containment, depending on conditions.

The routine air samples collected inside the biological shield had been pulled around noon, and the next samples were not apparently scheduled to be collected for at least another 12 hours. As a result of the above, the licensee was unaware of the increasing airborne radioactivity in the vicinity of the No. 22 Steam Generator and No. 22 Reactor Coolant Pump. The licensee became aware of it when individuals were identified by whole body counting to have sustained intakes of radioactive material and individuals were identified as sustaining nasal contamination.

The inspector discussed the above with licensee representatives. Licensee representatives indicated that means would be immediately implemented to provide a more timely indication of personnel exposure to airborne radioactivity. This will be examined during a subsequent inspection. (50-311/83-14-03).

In addition to the above, the inspector noted that no routine maintenance program existed for CAMs. The licensee had an informal checklist; however, the licensee determined after the event that the checklist was not implemented. The individual responsible for routinely checking the CAM had not done so. The licensee terminated the individual.

The inspector noted that a number of deficiencies in this area had been brought to the licensee's attention in the NRC's Health Physics Appraisal (performed during January and February of 1980). The appraisal indicated that instrument calibration programs had been turned over to a contractor with little, if any, technical review of their work by the licensee. The inspector noted that the individual who was to perform the CAM maintenance was a contractor.

The calibration and maintenance of airborne radioactivity sampling and analysis equipment is an unresolved item (50-311/83-14-04).

7. Procedures

The inspector reviewed the event with respect to Technical Specification 6.8, "Procedures and Programs."

Technical Specification (T.S.) 6.8.1 requires that written procedures be established, implemented, and maintained covering the activities referenced therein. T.S. 6.8.1 references the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Appendix A of Regulatory Guide 1.33 recommends in section 9.e that general procedures for the control of maintenance, repair, replacement, and modification be prepared before reactor operation is begun. In addition, section 9.e states that these procedures should include information on areas such as factors to be taken into account, including the necessity for minimizing radiation exposure to workmen in preparing the detailed work procedures.

The following procedures were reviewed with respect to the above:

- Procedure No. T-86, Revision 1, "Steam Generator Primary Nozzle Dam Installation and Removal," dated April 4, 1983
- Procedure RP 1.013, Revision 8, "Radiation Exposure Permit/Extended Radiation Exposure Permit"
- Procedure RP 1.021, Revision 0, "ALARA Program"

The review of Procedure No. T-86 used for the installation, repair, and removal of the nozzle dams indicated that limited guidance for minimizing radiation exposure to workmen was contained therein. Section 8 of the procedure stated that personnel engaged in the installation and removal of nozzle dams shall have received instructions in, and have full understanding of, the radiation protection rules and guidelines in effect on the plant site. Also, the section indicated that personnel shall wear protective clothing to the extent and of the type. The inspector noted that this was the total radiological control guidance contained in the 35-page procedure.

This procedure was revised on April 14, 1983, to provide guidance for removal of broken studs from the steam generator nozzle ring. No guidance dealing with radiological control matters was included in the six-page field change service activity procedure.

The inspector noted that the procedure included Process Control signoffs. However, no signoffs dealing with radiological control matters, such as ensuring that the installed ventilation system was operable, were included in the procedure.

The inspector review of Procedure No. 1.021 indicated that section 2 provides guidance for ALARA reviews. Paragraph 1.a. of section C states that all work conducted in radiologically controlled areas should be reviewed for ALARA consideration to minimize personnel exposures, the spread of contamination, and to prevent or minimize releases to the environment. This paragraph also states that the review shall be conducted via the Radiation Exposure Permit (REP) System (R.P.I. 1.031).

The review of Procedure RP 1.013 indicated that Section D provides guidance for ALARA review. Paragraph 3.e of Section D states that an ALARA review shall be documented for each REP.

The ALARA review was performed per licensee representatives, but was not readily available. Licensee representatives stated that the ALARA review for the REP would be provided by June 30, 1983 (50-311/83-14-05).

The purpose of this review, per paragraph 3.e, is to identify problems that could ultimately result in unnecessary radiation exposure. Paragraph 3.f states that the assigned radiation protection individual completing Section B of the REP shall do so by indicating protective clothing, dosimetry, monitoring, and special requirements necessary to ensure the radiological safety of personnel performing work. Sound judgement is to be exercised in completing this section.

The licensee utilized REP No. 0500, dated April 15, 1983, for drilling out the broken bolt in the nozzle ring. The review of Section B of the REP indicated that no special requirements to ensure that the steam generator ventilation system was operable prior to work in the steam generator were included in Section B of the REP.

In addition, the review of REP 0500 indicated that the cleaning out of the holes in the nozzle dam with air, after the drilling, was not described on the permit. The permit stated that the work to be performed was the drilling out of a broken bolt in the nozzle ring of each steam generator.

The inspector discussed the above with licensee representatives and indicated that the procedures and REP covering the nozzle dam work did not contain any steps to ensure that the steam generator ventilation system was operating prior to personnel entry and work in the waterbox. The inspector indicated that the lack of this guidance contributed to the violation for failure to use engineering controls discussed in section 5 of this report.

8. Allegations Related to the Personnel Contamination Event

8.1 General

On April 19, 1983, an individual contacted the NRC to express concerns pertaining to the adequacy of the licensee's Radiation Protection Program.

On April 20, 1983, the individual was interviewed in depth by a representative of the NRC Region I Office of Field Investigation.

The allegations were provided to the inspector on April 21, 1983. At that time, a review of the licensee's Radiation Protection Program with respect to the allegations was initiated.

8.2 Review of Allegation

The following provides the allegations and the inspector's findings:

8.2.1 Allegation 1

The Portal Monitor has been alarming on its own, and the licensee's radiation protection technicians ignore the alarm.

Findings (Allegation 1)

The licensee utilizes a National Nuclear Corporation Gamma-10 Portal Monitor to monitor personnel exiting the main and contractor control point.

The review of the instruction manual for the monitor indicate that the sensitivity of the monitor is to be adjusted to provide one false alarm about every 10 minutes with the occupancy monitors inactivated. The licensee uses the portal monitor in walk through mode. Therefore, the monitor is continually counting, even when not occupied and would, therefore, periodically alarm. The frequency of this alarm would be related to selected sensitivity. This is consistent with the monitor's design.

The review of radiation protection technician response to alarms from the portal monitor located at the main control point indicated that the technicians were responsive to the alarms.

The portal monitor at the contractor exit point was examined by NRC resident inspectors. The monitor was of the same design as previously discussed. The resident inspectors noted that the portal monitor was not in close proximity to the health physics contractor control point; therefore, alarms would not be immediately responded to. No instructions were posted on the monitor to indicate what action should be taken if the monitor was found in alarm condition or if it alarmed as an individual was passing through the monitor. However, it was noted that hand held friskers were provided at the health physics contractor control point for use in checking for personnel contamination prior to reaching the portal monitor. Therefore, the health and safety of workers was not compromised.

Licensee representatives contacted the inspector on May 25, 1983, and indicated that health physics personnel respond to any alarms of this portal monitor when notified of such alarms. Licensee representatives further indicated that instructions would be posted on the portal monitor to inform workers of what actions to take if the monitor alarms. This action is temporary in that the licensee has initiated action to move the monitor to a health physics dosimetry control point.

Based on the above, this item is resolved.

In reviewing calibration data for the Portal Monitor, the inspector was unable to interpret the data presented on the data sheet with respect to the acceptance criteria presented in the calibration procedure. The acceptability of the calibration of the Portal Monitor is unresolved (50-311/83-14-06).

8.2.2 Allegation 2

All radiation protection technicians working in Unit 2 containment are trainees.

Findings (Allegation 2)

The training and qualifications of selected radiation protection technicians working in Unit 2 Containment was reviewed during Combined Inspection Nos. 50-272/83-14; 50-311/83-11. No violations were identified during the review.

Based on the above, this item is resolved.

8.2.3 Allegation 3

Personnel working on the Unit 2 Refueling Floor were not provided respiratory protection equipment, while those individuals working inside the Reactor Cavity railing were. Personnel inside the cavity were washing down the sides of the cavity.

Findings (Allegation 3)

The inspector reviewed Radiation Exposure Permit (REP) No. 0448, dated April 4, 1983, which provided radiological controls for the Unit 2 Reactor Cavity Decontamination. The inspector also reviewed airborne radioactivity surveys collected during the work.

The work of the REP indicated that personnel working inside the cavity were required to wear airline supplied respirators, pending review of air sample data, while those working at the top of the cavity were to wear filter respirators. No requirements for use of respiratory protective equipment on other areas of Refueling Floor were specified on the REP.

The review of the use of respiratory protective equipment with respect to 10 CFR 20.103(b)(2) indicated that based on work duration and airborne radioactivity concentration values, respiratory protective equipment was not required to be used either at the edge of the cavity or on the Refueling Floor.

Based on the above, this item is resolved.

8.2.4 Allegation 4

An individual who performed respirator mask fit tests at the contractor mask fit area was not qualified.

Findings (Allegation 4)

The inspector reviewed training documentation for those individuals who were performing mask fit tests. The review indicated that the five individuals performing the testing were trained and qualified to perform this task.

Based on the above, this item is resolved.

8.2.5 Allegation 5

During the contamination event, a radiation protection technician turned off the alarm on a Refueling Floor air monitor and ignored it.

Findings (Allegation 5)

The inspector interviewed the individual who said that he saw the alarm being turned off.

This individual had documented his concerns in a letter to his supervisor which was subsequently investigated by the licensee's Radiation Protection organization.

The licensee's investigation and the inspector's discussion with the individual indicated that the instrument which alarmed was an instrument used for testing piping stress relief (Cooper Heat Machine). The instrument was in the process of being calibrated.

Based on the above, this item is resolved.

8.2.6 Allegation 6

The individual sustained an apparent high intake of airborne radioactivity.

Findings

The review of the licensee's summary of whole body count data indicated the individual sustained an airborne radioactivity intake of less than 1% of the 10 CFR 20 quarterly quantity intake limit.

Based on the above, this item is resolved.

9. Spill of Contaminated Water

9.1 General

At about 3:40 p.m. on April 18, 1983, a radioactive liquid leak was found in the yard area next to the nonradioactive waste basin. The leak measured about 2 liters per minute (lpm) and was coming from a flange in the discharge piping of the nonradioactive Clear Water pumps.

The licensee's review of the leak indicated that an authorized discharge from the No. 21 Chemical Volume Control System Monitor Tank had apparently pressurized the leak location. The release was terminated at 3:41 p.m. on April 18, 1983.

9.2 Notification

The inspector reviewed the event with respect to the notification requirements of 10 CFR 50.72, "Notification of Significant Events."

No violations were identified.

9.3 Description of Spill and Licensee Actions

The inspector review of the spill indicated an area about 10 feet by 10 feet was contaminated. The licensee estimated about 250 gallons of liquid measuring 3.5×10^{-5} uCi/ml was spilled to the soil. The activity consisted of cobalt-58, cobalt-60, and manganese-54. Contact measurements of the soil indicated up to 2200 counts per minute.

The licensee collected airborne radioactivity samples in the area. Licensee analysis of the samples did not indicate an airborne release of radioactive material.

The licensee covered the area with sand and herculite to prevent the possibility of rain washing the material deeper into the soil.

The spill area was barricaded and properly posted.

The licensee made a change to the liquid discharge procedure to prevent a recurrence.

9.4 Modification

Prior to the release, the licensee had made a modification to the discharge path of the waste basin effluent to eliminate the Clear

Water Pumps. Temporary lines were installed between the Waste Basin pumps and the Clear Water Pumps' discharge line.

The effect, if any, of this modification on the circumstances of the spill will be examined by the NRC Resident Inspector.

10. Exit Interview

The inspector met with licensee representatives (denoted in section 1) at the conclusion of the inspection on April 22, 1983. The inspector summarized the purpose, scope, and findings of the inspection.