U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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Licenses No:	DPR-39; DPR-48
Reports No:	50-295/96016(DRS); 50-304/96016(DRS)
Licensee:	Commonwealth Edison Company (ComEd)
Facility:	Zion Generating Station, Units 1 & 2
Location:	105 Shiloh Boulevard Zion, IL 60099
Dates:	September 23 - October 24, 1996
Inspectors:	S. K. Orth, Radiation Specialist R. L. Glinski, Radiation Specialist K. J. Lambert, Radiation Specialist
Approved by:	Thomas J. Kozak, Chief, Plant Support Branch 2 Division of Reactor Safety

EXECUTIVE SUMMARY

Zion Generating Station, Units 1 & 2
NRC Inspection Reports No. 50-295/96016, 50-304/96016

This inspection included an announced review of the radiation protection program. One violation was identified concerning the failure to follow procedures directing the response to personnel contamination monitor alarms (Section R8.6). Three violations were identified concerning the failure to take appropriate actions when radiation monitors were inoperable (Section R4.1).

Plant Support

- The radiological condition of the plant was poor. Access to many areas containing safety related equipment was impeded by high radiation levels and/or high contamination levels. No clear plan for addressing these conditions was identified by the inspector. (Section R1.1)

- During the Unit 2 refueling outage, radiation worker contamination control practices and the control of radiological postings and boundaries were good; however, the licensee continued to identify radiation worker ALARA issues. Although pre-job ALARA briefings were very detailed, problems were identified concerning the content of some ALARA plans and radiation work permits. (Section R1.2)

- The licensee did not use the appropriate environmental lower limit of detection (LLD) for liquids when analyzing liquid samples for licensed radioactivity prior to unconditional release. Licensee documentation did not indicate that licensed material was unconditionally released from the restricted area. (Section R1.3)

- The operability of the liquid and gaseous effluent radiation monitoring system continued to be poor. Several monitors had chronic and repetitive operability problems. Although the licensee achieved some limited progress in improvements to the system, the ineffective resolution of long term operability problems resulted in a continued deficiency in monitor reliability. (Section R2.1)

- Problems were identified concerning the licensee's calibrations of the radiation monitoring system. The reliability of the Control Room radiation monitoring display system and the licensee's control of the system's configuration was poor. (Section R2.2)

- Three violations were identified concerning the failure to implement required actions for inoperable radiation monitors. (Section R4.1)

- The licensee provided effective control and documentation of effluent releases. Offsite dose calculations for radioactive releases were performed in accordance with the licensee's Offsite Dose Calculation Manual. (Section R1.4)

- The Control Room and Fuel Building/Auxiliary Building ventilation testing program was well implemented by the engineering staff. The material condition was good as evidenced by satisfactory testing results and high operability. The inspectors identified a single occurrence of incorrect information in the licensee's Electronic Work Control System concerning a Technical Specification surveillance. (Section R2.3)

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Plant Radiological Conditions and Source Term Reduction

a. Inspection Scope (83750)

The inspectors reviewed the radiological conditions of the plant and assessed the effect of radiological contamination and high radiation levels areas on access to safety related equipment. The inspectors also reviewed the current status of the licensee's progress in the reduction of radiological source term.

b. Observations and Findings

The inspectors accompanied an auxiliary operator on his rounds to identify radiological impediments encountered by the operations staff. During the tour, the operator entered two contaminated areas and one high radiation area, in addition to the reactor containment building. The operator indicated that on other tours additional contaminated areas and high radiation areas were encounted.

One aspect of the licensee's source term reduction program was to improve conditions in the Auxiliary Building (AB), including the reduction of radiological hot spots and sources of plant contamination. Aithough the licensee's identification of the problems was good, the licensee's progress in eliminating these radiological conditions has been limited. During the current Unit 2 refueling outage, the licensee's efforts in source term reduction were focussed on cobalt reduction. Non-cobalt containing parts were installed when identified cobalt containing valves were repaired. However, the licensee did not have a clear plan to reduce the number of hot spots or radioactive contamination in the plant.

c. Conclusions

The inspectors concluded that the radiological condition of the plant was poor. Access to certain areas containing safety related equipment was impeded by high radiation levels and/or high contamination levels. No clear plan for addressing these conditions was identified by the inspector.

R1.2 Unit 2 Outage Work Control and ALARA Implementation

a. Inspection Scope (83750)

The inspectors reviewed the radiolcgical controls implemented and the ALARA goals for the Unit 2 1996 refueling outage (ZR214). The inspectors also reviewed ALARA plans and radiation work permits (RWPs) and observed pre-job briefings and

worker practices. The following high dose or potential high dose jobs were observed in progress (either remotely or on location):

- Steam generator (SG) scaffolding installation,
- C loop stop isolation valve (LSIV) repair, and
- Reactor coolant system (RCS) filter replacement.

b. Observations and Findings

Based on original work scope, the licensee developed a refueling outage dose goal of 218 rem. Due to emergent work on the C cold leg LSIV and significantly expanded SG work scope, the radiation protection (RP) staff estimated that they would exceed the goal by about 90 rem. Subsequent to the inspection, the inspector was informed that rework had also contributed to the increase in the licensee's dose estimate. The licensee identified that personnel had installed a check valve (RC22) backwards. The removal and re-installation contributed to the actual dose for the job exceeding the projected dose of 2.5 rem by 5 rem. The RP staff acknowledged the performance problems and were adequately monitoring job progress.

The inspectors reviewed ALARA plans and RWPs for several high dose jobs, including SG manway removal, LSIV repair work, SG scaffolding installation, and removal of an RCS filter. The inspectors identified that the licensee's initial ALARA plan and RWP for the C cold leg LSIV repair contained several typographical errors that affected the radiological hold points and contained certain unclear instructions to workers. The RP staff acknowledged these problems and revised the ALARA plan and RWP. During additional reviews of the above activities, the inspectors also observed that radiological information and hold points contained in other ALARA plans were not well reflected in RWPs. The RP staff planned to review the relationship between ALARA plans and RWPs, to ensure that information was effectively communicated to the workers.

The inspectors attended several ALARA pre-job briefings, which provided detailed information to the workers on radiological conditions, dosimetry, and required protective clothing. The RP staff communicated RWP requirements and radiological hold points and ensured that the workers had the proper tools and equipment available. Discussions between work groups ensured that the job scope and worker responsibilities were well understood.

The inspectors observed activities in the reactor containment building and noted that radiological postings and boundaries were well maintained. The inspectors also noted an improvement in the labelling of radioactive materials. Two minor exceptions concerning labelling were brought to the attention of the RP staff who resolved the problems. The inspectors also observed good contamination control practices. Workers demonstrated adequate use of ALARA techniques and were aware of the radiological conditions. With some minor exceptions, personnel generally donned and removed protective clothing correctly. However, the licensee identified additional issues concerning radiation worker practices. Although the

licensee was effective in identifying these issues, the issues indicated continued problems in this area.

The inspectors noted that the entrance to the inside missile barrier (IMB) area was very congested on several occasions. In addition to personnel waiting to enter the area, the licensee was utilizing this access area to bring equipment into the IMB area. Although the area was adequately controlled by Radiation Protection Technicians (RPTs), the congestion decreased the ability to communicate with the RPTs and distracted the RPTs. The RP staff acknowledged this concern and, subsequently, reduced the congestion by having equipment brought into and out of the IMB through a second access point and by having one person represent each work group at the RP access area, while the remaining group waited in a designated area. Once the workers were logged in, they proceeded from the holding area, away from the RP desk, to the IMB. Following the process change, the inspectors noted better conditions at the IMB access area.

The inspectors observed, by remote camera, the removal of the C cold leg LSIV. During the plant shutdown, the valve had failed to completely close as designed. During the removal, personnel demonstrated good communication. The RP staff performed radiation surveys in accordance with the RWP, to ensure that radiological hold points were not exceeded. Additional RP staff monitored workers exposures remotely and viewed the work via closed circuit television. The workers proceeded with the tasks and had a good understanding of their work assignments. Work group supervisors were present to assist the workers if complications in their assignments arose or additional guidance was needed.

c. Conclusions

During the Unit 2 refueling outage, radiation worker contamination control practices and the control of radiological postings and boundaries were good; however, the licensee continued to identify problems concerning radiation worker ALARA practices. Although pre-job ALARA briefings were very detailed, some problems were identified concerning ALARA plans and radiation work permits.

R1.3 Control of Material Released from the Radiological Posted Area (RPA)

a. Inspection Scope (83750)

The inspectors reviewed the station procedures and survey records for the unrestricted release of potentially contaminated, bulk materials (e.g. liquids and granular solids) from the RPA. The inspectors also interviewed station staff regarding current practices and discussed this issue with licensee corporate representatives.

b. Observations and Findings

The licensee properly implemented Zion Administrative Procedure ZAP 620-05, "Unconditional Release of Liquids From the RPA," Revision 4, when performing a

survey to ensure licensed material was properly controlled. The chemistry staff analyzed samples of the bulk materials via gamma spectroscopy, and the RP staff reviewed the gamma isotopic results in accordance with Nuclear Radiation Procedure NRP 5710-2, "Control of Materials for Conditional or Unconditional Release from Radiologically Posted Areas," Revision 0, and Zion Radiation Protection Procedure ZRP 5710-2, "Control of Materials for Conditional or Unconditional Release from Radiologically Posted Areas," Revision 0. Although NRP 5710-2 and ZRP 5710-2 generally stated that the samples be analyzed at a limit of detection (LLD) consistent with the LLDs used in the licensee's environmental monitoring program, they specifically required that both liquids and granular solids be analyzed at the LLD used for sediment (i.e. nominal LLD of 150 picocuries per liter (pCi/l) for manganese-54, cobalt-58, cobalt-60, and cesium-134 and 180 pCi/l for cesium-137). This sediment LLD is a factor of ten higher than the LLD used by the licensee to analyze liquid environmental samples. The licensee planned to upgrade its analytical equipment by January 1997 to fully implement the use of the appropriate environmental LLDs. The licensee's actions concerning the implementation of environmental LLDs will be reviewed in a future NRC inspection (IFI 50-295/96016-01(DRS); 50-304/96016-01(DRS)).

The inspectors reviewed a selection of surveys and documentation for unconditionally released bulk material. Based on the licensee's detection limit, the inspectors verified that no detectable licensed material had been improperly released. However, the inspectors identified some discrepancies in ZRP 5710-2 concerning the licensee's evaluation of gamma isotopic results, including subtracting background radioactivity, interpreting software parameters such as resolution and percent error, and interpreting activity which was less than the LLD. The RP staff indicated that they had also found problems concerning the evaluation criteria. During the inspection, the licensee implemented a temporary procedure change to ZRP 5710-2 to provide clearer direction for interpreting isotopic results.

c. Conclusions

The licensee did not use the appropriate environmental lower limit of detection (LLD) for liquids when analyzing liquid samples for licensed radioactivity prior to unconditional release. There were no indications in the licensee's documentation that indicated licensed material was inadvertently unconditionally released from the restricted area.

R1.4 Calculation of Radioactive Effluent Releases and Offsite Dose Commitments

a. Inspection Scope (84750)

The inspectors reviewed the licensee's control of radioactive effluent releases including the licensee's calculations of the activity of effluent releases and the offsite dose from effluent releases. The inspectors reviewed release calculations and documentation for selected liquid and gaseous releases, the licensee's monthly dose commitment calculation, and the 1994 and 1995 Annual Radioactive Effluent Reports.

b. Observations and Findings

The licensee's calculations and documentation of liquid and gaseous radioactive releases were performed as required. Prior to the release of liquid or gaseous radioactive effluents, the licensee obtained and analyzed the required samples. The activity of the release was determined from the sample analysis and radiation monitors. During periods when the gas decay tank (GDT) radiation monitor was out of service, the inspectors verified that gaseous release documentation for GDTs contained required duplicate, independent isotopic results and reviews.

As documented in the 1994 and 1995 Annual Effluent Reports, offsite doses from radioactive effluent releases were maintained below regulatory requirements. The inspectors verified, via independent calculations using the NRC PCDOSE computer code, that the licensee's offsite dose calculations were performed in accordance with the methodology of the licensee's Offsite Dose Calculation Manual (ODCM). The licensee performed monthly reviews of offsite dose commitments; however, the inspectors identified some minor problems concerning the licensee's documentation of these reviews.

c. Conclusions

The licensee provided effective control and documentation of effluent releases. Offsite dose calculations for radioactive releases were performed in accordance with the licensee's Offsite Dose Calculation Manual.

R2 Status of RP&C Facilities and Equipment

R2.1 Operability of Process Radiation Monitors

a. Inspection Scope (84750)

The inspectors reviewed the operability of the liquid and gaseous radiation monitoring system (RMS). The inspectors reviewed the licensee's trending of radiation monitor operability and progress in repairing/modifying radiation monitors. The inspectors also discussed the system reliability with operations, chemistry, and RP personnel.

b. Observations and Findings

The licensee's RMS, as designed, monitors process and effluent streams to control radioactive releases generated during normal operations and postulated accidents. As documented in NRC Inspection Reports No. 50-295/94018; 50-304/91018; 50-295/92019; 50-304/92019, and 50-295/95016; 50-304/95016, the operability of the RMS has been a long standing licensee weakness. In July 1992, a management meeting between the licensee and the NRC was conducted to discuss the licensee's actions in this area. Subsequently, the licensee evaluated the failure mechanisms and developed action plans to resolve the problems. Since the 1992 management meeting, the licensee began to implement corrective actions including

upgrades to the radiation monitor display system (RMDS) in the control room (CR), design changes to gaseous radiation monitor blowers, and evaluations and deletions of select radiation monitors from license requirements. However, the licensee's progress in implementing these corrective actions was fragmented and slow.

During the current inspection, the inspectors continued to identify significant weaknesses with the radiation monitor operability during 1995 and 1996 and in the implementation of licensee improvement plans. The responsible system engineer maintained monthly trends of monitor out-of-service (OOS) times which indicated that in 1995 and 1996 the number of radiation monitors OOS for corrective maintenance each month ranged from 7 to 15 (average of 11 radiation monitors per month). Several radiation monitors (e.g. the containment air monitor, class I pipe tunnel gaseous monitor, and the condenser air ejector particulate monitor) had continual operability problems. The inspectors noted the following trends in performance and resulting conditions:

- Several radiation monitors had repetitive operability problems:

  (0RIA-PR10) GDT radiation monitor, which automatically isolates releases upon alarm, had not been consistently operable since early 1995. The licensee had replaced the monitor in November of 1995; however, the licensee had not resolved system malfunctions. As a compensatory measure, the ODCM requires duplicate independent samples, analysis, and calculation reviews for releases under these conditions.

  System particulate iodine noble gas (SPINGs) radiation monitors had a high OOS rate, (e.g. (2RIA-PR40) containment air monitor, which automatically isolates containment releases upon alarm, failed 7 times over a 12 month period).

- Numerous RMS failures were attributed to sediment deposits, blower motors/fan belt failures, and detector/check source problems. Each of these failure modes had been identified in the licensee's improvement plan. Although originally planned to begin in July 1996, the system engineer stated that blower modifications had been deleted from the station's schedule twice.

- On September 22 - 23, 1996, two radiation monitors were in local instrument fail mode but the Control Room RMDS incorrectly indicated that the radiation monitors were functioning properly. The incorrect CR indication contributed to a missed compensatory measure (Section 4.1). The inspectors also identified that several instrument calibrations indicated "as found" values on RMDS which were over 30 percent in error (Section R2.2).

- The inspectors reviewed the maintenance rule implementation for the RMS. The licensee has conducted the initial scoping and has categorized the entire RMS as (a)(1) due to low reliability and availability. The licensee has set

goals and developed corrective actions (Zion Management Action Plan (ZMAP)). The ZMAP, which was drafted by the system engineer on May 9, 1996, had not yet received authorization. As a result of the lack of commitment to the ZMAP, the completion date for the installation of new blowers/switches had elapsed.

During 1996, the licensee achieved a small measure of progress: one of ten blower modifications was installed and six monitors have been deleted from licensee requirements. Members of the RP, operations, instrument maintenance, and chemistry staff indicated that the continual problems with the monitors required intensive resources to perform maintenance and to perform compensatory measures. The staff also indicated that the continued problems resulted in a lack of confidence in the monitor's indications with respect to both normal and accident conditions.

c. Conclusions

The operability of the liquid and gaseous effluent radiation monitoring system continued to be poor. Several monitors had chronic and repetitive operability problems. Although the licensee achieved some limited progress, the ineffective resolution of long term operability problems resulted in a continued deficiency in monitor reliability.

R2.2 Calibration of the Radiation Monitoring System (RMS)

a. Inspection Scope (84750)

The inspectors reviewed the licensee's calibrations and functional testing of the process and area RMS. The inspectors also interviewed various station personnel regarding the RMS and observed sampling of a vent stack effluent SPING monitor.

b. Observations and Findings

The inspectors reviewed the current full channel calibrations for a selection of radiation monitors. Although the calibrations were performed at the required frequency, the inspectors noted some discrepancies between Control Room indications and some problems concerning the results of the calibrations for certain monitors.

The inspectors observed problems concerning the reliability of CR indications. Several calibration documents contained entries noting differences between the "as found" and the "as left" RMDS indications. In one case, the inspectors observed that the "as found" indications of the RMDS differed from the "as left" value by as much as 30 percent. As described in Section 2.1, the RMDS also did not properly indicate flow failures for two monitors in September 1996. The system engineer indicated that the RMDS had been modified in March 1996. However, the inspectors' observations indicated a lack of effective resolution of RMDS reliability issues.

The inspectors also identified a problem concerning control of the RMDS computational variables. During the current calibration of the containment SPING (1R-PR40), the licensee documented that the RMDS was found with an incorrect internal conversion constant. The purpose of this constant was to convert counts per minute (cpm) at the CR SPING console to microcuries per cubic centimeter (uCi/cc) at the CR RMDS console. The error in the constant was non-conservative by a factor of about 2.25, which resulted in two conflicting indications in the CR: the correct SPING console indication and an erroneously low RMDS indication. Although this error did not affect the control functions of the monitor nor the licensee's effluent release calculations, it resulted in a discrepancy in CR indications.

Documentation for the June 21, 1995 calibration of the containment purge monitor (2R-PR09C) contained discrepancies concerning the monitors setpoint response, an automatic termination of containment releases. Although the recorded data did not meet the licensee's acceptance criteria, the individual performing the calibration incorrectly noted that the conditions were within the acceptance criteria. Due to this error, the licensee did not perform the corrective actions specified in procedure 2R-PR09C, "Non Safety Related/Non Tech. Spech. Containment Purge Monitor (APD) 2R-PR09C (617 Aux. Bldg. U2 Purge Room)," revision 17. In addition, the inspectors noted that the "as found" and "as left" document entries were corrected during a supervisory review without field verification. The inspectors reviewed the subsequent functional test (September 1995) and verified that the trip setpoint was found within tolerance. In addition to the inspectors' observations, the licensee had also identified an incorrect particulate alarm constant (set point) for the vent stack air sampling SPING (1R-PR49). The incorrect set point, which was about a factor of one hundred low, caused the SPING to alarm unnecessarily. The licensee performed these calibrations as part of its routine surveillance program. However, these monitors and their respective calibrations were not required by licensee TS, so no violations were identified. However, the inspectors identified a lack of attention to detail and field verification in the performance of calibrations.

c. Conclusions

Weaknesses were identified concerning the licensee's calibrations of the radiation monitoring system. Problems were also identified concerning the reliability of the control room radiation monitoring display system and the licensee's control of the system's configuration.

R2.3 The Control Room and Fuel/Auxiliary Building Ventilation Systems

a. Inspection Scope (84750)

The inspectors reviewed the testing of the CR and the Fuel Building (FB)/AB ventilation systems. Specifically, the inspectors reviewed selected in-place ventilation test results for charcoal adsorber filter trains and high efficiency particulate air (HEPA) filters and laboratory charcoal test results. In addition, the

inspectors evaluated the material condition of the CR and FB/AB ventilation equipment.

b. Observations and Findings

The inspectors noted that the in-place tests (freon testing of the charcoal adsorber filter trains and dioctylphthalate (DOP) testing of the HEPA filters) for the ventilation systems were conducted at the required frequency and in accordance with licensee requirements. The licensee also submitted required charcoal samples from the charcoal beds for laboratory iodine-131 retention tests. With the exception of a single failure of a cubicle exhaust HEPA test in June 1996, ventilation filters results were found to be within the licensee's acceptance criteria. Following the June 1996 test failure, the licensee replaced the HEPA filter and successfully tested the system in July 1996.

The inspectors identified that the engineering staff had not tested the AB miscellaneous vents HEPA (OAV069) since December 1994, which was beyond the 18 month TS required surveillance frequency. Although the licensee was not aware of this situation, the TS allowed for a 25 percent extension of surveillance frequencies, and this extension period (total of 22.5 months) had not yet elapsed. In response to the inspectors' observations, the licensee scheduled and tested the OAV069 HEPA in October 1996, which met the TS requirement.

The licensee identified that the cause of this scheduling problem was incorrect information in the electronic work control system (EWCS). The EWCS incorrectly indicated that the last test of the OAV060 HEPA was May 1995 and that the next test was due on November 19, 1996. The surveillance coordinator informed the inspectors that the incorrect information was an anomaly caused by a data entry error crediting the OAV069 HEPA test to an incorrect work order.

The inspectors noted that the overall material condition of both ventilation systems was good, and the staff indicated that the systems were reliable.

c. Conclusions

The CR and FB/AB ventilation testing program was well implemented by the engineering staff. The material condition was good as evidenced by the testing results and high operability. The inspectors identified a single occurrence of incorrect information in the licensee's electronic work control system concerning a Technical Specification surveillance.

R2.4 Chemistry Primary Sample Room Ventilation Control (84750)

During observations of inplant activities in the AB on September 25 and 26, 1996, the inspectors observed an anomaly in air flow from the primary sample room on the 592' elevation of the AB. The inspectors observed air flowing out of the sample room which contradicted Section 9.3.2.1.2.2.3 of the licensee's Updated Final Safety Analysis Report (UFSAR). To control airborne contamination, the

ventilation system was designed such that air flows from the primary sample room to the sample panels, and then through the AB ventilation system. The licensee performed a preliminary investigation and determined that an imbalance between makeup and exhaust AB ventilation flow created sufficient negative pressure in the AB to draw air from the Turbine Building (TB) through an elevator shaft (between the chemistry laboratory and primary sample room) into the primary sample room and, ultimately, through the primary sample room into the general areas of the AB. As immediate corrective actions, the licensee documented the problem in a problem identification form (PIF), initiated an action request for the seals on the chemistry elevator shaft, and monitored the differential pressure in the AB. During the inspection, the licensee was evaluating the effect of the air flow anomaly with respect to both normal and postulated accident conditions. Pending the completion of the licensee's evaluation, this issue will remain unresolved (URI 50-295/96016-02(DRS); 50-304/96016-02(DRS)).

R4 Staff Knowledge and Performance in RP&C

R4.1 Surveillance Activities for Process Radiation Monitors

a. Scope (84750)

The inspectors reviewed the licensee's effectiveness in providing compensatory measures for inoperable radiation monitors. The inspectors reviewed Licensee Event Reports (LERs) and reviewed licensee documentation of OOS radiation monitors.

b. Observations and Findings

The inspectors reviewed records which indicated that on four occasions the licensee failed to take the appropriate actions required by TS and/or the ODCM when radiation monitors were inoperable within the last 12 months. Although the licensee identified these failures, the root cause of the following problems was the poor operability of the RMS.

(1) LER 95-019: On September 24, 1995, both containment monitors (1RIA-PR40 and 1RT-PR09) were inoperable during reactor core alterations.

On September 24, 1995, Unit 1 was in an outage, and the operations staff was conducting core alterations and purges of the containment atmosphere. Between containment purges, an RPT performed a routine filter replacement on 1RIA-PR40. However, the RPT incorrectly positioned the filter paper and caused the SPING to enter into a low-flow fail mode. Since 1RT-PR09 was OOS, the licensee did not have an operable radiation monitor capable of automatic isolation of the containment purge/vents. Core alterations and containment purges continued until this situation was recognized.

The licensee attributed the root cause to (1) a failure of the RPT to take appropriate correct actions and (2) a failure of the CR staff to acknowledge

the SPING console alarm. The licensee's corrective actions included counseling and training of personnel, the revision to procedure ZRP 6021-33, "Documentation of Containment Radioactive Releases," and a modification to the CR SPING console. With the exception of the latter, the licensee had completed the corrective actions. According to the system engineer, the uncompleted corrective action (modification to the SPING console to raise the failed monitor alarm level and to require a physical acknowledgement) was under engineering review.

TS 3.13.3.C. requires that an effluent monitor which isolates the containment vent and purge system be operable during core alterations. The failure to have an effluent monitor which isolates containment vent and purge systems operable during core alterations on September 24, 1995 is a violation of TS requirements (VIO 50-295/96016-03(DRS); 50-304/96016-03(DRS)).

(2) LER 96-019: On July 5, 1996, the licensee failed to obtain and analyze samples of the component cooling system at least once per shift when the component cooling loop liquid radiation monitor (0R-PR07) was OOS.

On July 5, 1996, the licensee's chemistry and RP staff completed the analysis of component cooling system samples at 1130 hours, as required by Action 26 of TS Table 3.14-1. Following that analysis, the chemistry department's high purity germanium detector computer failed. The chemistry staff obtained the next required sample but was unable to perform the analysis. Chemistry personnel understood that the sample analyses were required by Action 26 of TS Table 3.14-1 at a frequency of 12 hours. However, the chemistry staff incorrectly believed that the TS interpreted 25 percent grace period could be applied to the action statement. Consequently, chemistry personnel believed that they had 15 hours from the previous sample analyses (12 hours + 25 percent) to have the sample analyzed. The chemistry staff attempted to repair the detector and delayed sending samples to Byron Generating Station for analysis until 2130 hours. The sample results were obtained at 0155 hours on July 6, 1996, about 13.5 hours after the previous samples were analyzed. Following an inquiry from NRC inspectors, the licensee re-evaluated the TS requirements and acknowledged that a 25 percent grace period was not applicable to Action 26 of TS Table 3.14-1. Similar examples of the licensee incorrectly applying the TS interpreted 25 percent grace period were discussed in NRC Inspection Reports No. 50-295/96014; 50-304/96014. The failure to analyze the required samples on July 5, 1996 when monitor 0R-PR07 was inoperable within the required time frame, is a violation of TS requirements (VIO 50-295/96016-04; 50-304/96016-04(DRS)).

(3) On July 26, 1996, the condenser air ejector gas radiation monitor (1R-0015) was OOS. TS 6.2.6.A requires, in part, that a program to control radioactive effluents which conforms to 10 CFR 50.36(a) and is contained in the ODCM shall be implemented and maintained. Action 6 of ODCM Table

12.2-3 requires that grab samples be obtained at least once per shift and analyzed for gross activity within 24 hours when radiation monitor 1R-0015 has less than 1 operable channel. However, due to personnel error and inadequate supervisory review, RP personnel did not obtain a required sample between 0045 hours and 1615 hours. The failure to obtain the required samples on July 26, 1996 when monitor 1R-0015 was inoperable, is an example of a violation of TS requirements (VIO 50-295/96016-05A(DRS); 50-304/96016-05A(DRS)).

(4) On September 22, 1996, the Unit 2 AB vent stack monitor (2R-PR25) was OOS with a broken blower belt. During plant inspections on September 22, 1996, an equipment operator recorded that the belt had failed on 2RT-PR25 and initiated an action request to correct the problem; however, the supervisor incorrectly thought that compensatory actions had previously been initiated. In addition, the operations staff did not obtain proper indications from the CR RMDS system, which indicated that the monitor was operable. On September 25, 1996, the RP staff noted the problem, identified the deficiency to operations, and commenced compensatory sampling. The inspectors noted that this monitor had been scheduled for blower modifications in July 1996, but the work request had been deleted from the station's schedule.

TS 6.2.6.A requires, in part, that a program to control radioactive effluents which conforms to 10 CFR 50.36(a) and is contained in the ODCM shall be implemented and maintained. Action 6 of ODCM Table 12.2-3 requires that grab samples be obtained at least once per shift and analyzed for gross activity within 24 hours when radiation monitor 2R-PR25 has less than 1 operable channel. The failure to obtain the required samples on September 22-25, 1996 when monitor 2R-PR25 was inoperable, is an example of a violation of TS requirements (VIO 50-295/96016-05B(DRS); 50-304/96016-05B(DRS)).

Although some examples of this violation were identified by the licensee, enforcement discretion is not being applied because these violations should have been prevented by previous licensee corrective actions. During the review of LER 95-019, the inspectors noted that a similar failure to acknowledge a SPING alarm occurred in 1994 and was documented in a 1994 LER (LER 94-009). As a corrective action for that event, the licensee planned to develop a modification to the SPING console, similar to the ongoing evaluation described above. In addition, the licensee's ineffective resolution of radiation monitor operability problems appeared to be a root cause of each example of the violation.

c. Conclusions

Four violations were identified concerning the failure to implement required actions for inoperable radiation monitors.

R8 Miscellaneous RP&C Issues

R8.1 (Closed) Licensee Event Report (LER) 95-010: On July 5, 1995, the licensee identified that fission detectors were not leak tested in accordance with TS 4.24 prior to installation. The licensee investigated the deficiency and did not observe any evidence of contamination from handling the detectors, which contained special nuclear material in a sealed chamber within the detector. As corrective actions, the licensee communicated the event to applicable personnel and the licensee planned to revise procedure ZAP 300-4, "Responsibilities, Movements, and Reporting Related to Safeguarding Fuel and Non-fuel Special Nuclear Material," to provide prior RP notification when detectors were removed from the warehouse for plant installation or for shipment to another site. Personnel were instructed on the importance of notifying RP prior to moving the detectors, and stored detectors were labeled with the above instructions. No further problems were identified concerning this issue. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Manual (NCV 50-295/96016-07(DRS); 50-304/96016-07(DRS)). This issue is closed.

R8.2 (Closed) LER 95-013: Drumming station HEPA and charcoal filter bank dampers were partially open. During the routine, scheduled TS required HEPA and charcoal filter bank test surveillance performed on June 6, 1995, the licensee's contractor identified that the inlet and outlet dampers were partially open to the filter bank while the ventilation control switch was in the normal, bypass mode. Following the testing, a member of the engineering staff returned the system to bypass mode; however, the individual failed to document the deficiency and to recognize that the malfunctioning dampers left the filters in operation. On July 31, 1995, the system engineer obtained the contractor's testing report and realized that the open dampers had allowed sufficient flow through the filter banks to consider the filter banks in operation in excess of 720 hours. Because of the failed dampers, the charcoal filters had not been tested every 720 hours of operation as required by TS 4.17.1.C.

On August 3, 1995, the filter bank was tested with satisfactory results. In addition, the engineering staff adjusted the linkages on the dampers, verified that the dampers closed in the bypass mode, and inspected other damper linkages for similar deficiencies. The licensee also revised testing procedures to include verification of damper positioning and placed damper operation on the preventative maintenance program. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Manual (NCV 50-295/96016-08(DRS); 50-304/96016-08(DRS)). This issue is closed.

R8.3 (Closed) LER 95-019: On September 24, 1995, both containment monitors (1RIA-PR40 and 1RT-PR09) were inoperable during a containment purge and during core alterations. This item is discussed in Section R4.1 and is the subject of Violation Nos. 50-295/96016-03(DRS); 50-304/96016-03(DRS). This item is closed.

R8.4 (Closed) LER 96-014: Control Room Ventilation System (CRV) unable to maintain differential pressure. In April 1996, while in an accident configuration, the CRV was unable to maintain a positive pressure relative to the TB. Due to an inadequate understanding of the design basis, the licensee had secured all three of the Auxiliary Building Ventilation System (ABV) supply fans while having two exhaust fans in operation. The lack of supply air to the AB resulted in a significant reduction in pressure in the AB. As the AB became more negative, the CR pressure decreased from the movement of air from the CRV to the ABV. As a result, the differential pressure between the CR and TB decreased, and the CR ventilation system was unable to maintain the UFSAR design basis differential pressure of +0.125 inches of water. The engineering staff determined that at least one operating ABV supply fan was required to enable the CRV to maintain the required pressure differential.

The licensee revised the Zion Operability Determination Manual: (1) to ensure that at least one ABV supply fan is operating at all times and (2) to enter a limiting condition of operation (LCO) if none of the ABV supply fans is operating. The inspectors determined that the corrective actions were appropriate. This item is closed.

R8.5 (Closed) LER 96-019: On July 5, 1996, the licensee failed to obtain and analyze samples of the component cooling system at least once per shift when the component cooling loop liquid monitor (0R-PR07) was out of service. This item is discussed in Section R4.1 and is the subject of Violation Nos. 50-295/96016-04(DRS); 50-304/96016-04(DRS). This item is closed.

R8.6 (Closed) Unresolved Item (50-295/96008-06(DRS); 50-304/96008-06(DRS)): On June 10, 1996, a licensee contract supervisor failed to follow RP procedures after alarming a personnel contamination monitor (PCM). Licensee administrative procedure ZAP 620-7, "Proper Operation and Response to Contamination Monitors," January 5, 1996, requires that personnel notify RP personnel immediately after contamination has been detected by a single alarm on any radiation device and that removing and quantifying contamination shall only be performed by a qualified RPT.

On June 10, 1996, a contract supervisor alarmed a PCM. Because of biological needs and the inability to obtain the attention of an RPT, the individual isolated and removed the contamination and disposed of the contamination in a trash receptacle for contaminated material. The individual then proceeded through a PCM without any subsequent alarms. Subsequently, the individual notified his management of his actions.

During a review of the event, the inspectors determined that the licensee had conspicuously posted the requirements of ZAP 620-7 in the area of the PCMs and the decontamination room, which should have provided clear instructions to the individual concerning the procedural requirements. In addition, the individual had last received Nuclear General Employee Training on December 31, 1995. The inspectors reviewed the training lesson plan which included information concerning the proper response to PCMs.

Although the safety consequences of the event were not significant, the contract supervisor was aware of the licensee's requirements. The failure of the contract supervisor to notify RP after alarming a PCM was a willful violation of procedure ZAP 620-7. (VIO 50-295/96016-09(DRS); 50-304/96016-09(DRS))

The inspectors reviewed the licensee's corrective actions. The RP staff recovered the contamination and performed an appropriate review of the incident. The licensee immediately restricted the individual's access to the RPA and counseled the individual on the proper response to PCM alarms. No further incidents were identified concerning the individual. The unresolved item and violation are closed.

R8.7 (Closed) Violation (50-295/95018-08(DRP); 50-304/95018-08(DRP)): Failure to adequately don protective clothing and to prevent the spread of contamination as required in RP procedure ZRP 5000-7, "Unescorted Access To and Conduct in Radiologically Posted Areas." The following licensee's corrective actions were completed:

- The licensee's enhanced radiation worker training was completed for applicable personnel on September 13, 1996, and, in addition, initial Nuclear General Employee Training (NGET) was revised to include the enhanced radiation worker training.

- Observation training for first-line RP and maintenance supervisors was completed on September 3, 1996.

- The revised RP procedure ZRP 5000-7 was implemented on September 11, 1996.

- During Z2R14, the inspectors observed improvements in radiation worker practices (Section R1.1).

Based on the above, this violation is closed.

R8.8 (Closed) Violation 50-295/96006-10; 50-304/96006-10: The failure to provide a posting in the area of the 1C SG gasket on March 7 as required by Technical Specification (TS) 6.2.2.B.2. The inspectors verified that the licensee had completed its corrective actions: counseling the RPTs directly involved; implementing a procedure review matrix which required a periodic review of radiological procedures; and providing detailed pre-job meeting notes to include radiological hold points, contingency plans, and stop work conditions.

The inspectors also reviewed the ALARA plan and RWP for the SG manway and gasket removal for the Z2R14 outage. The ALARA plan included a detailed discussion concerning the handling of the gaskets. The RWP included instructions for handling the gasket and include radiological hold points. The inspectors observed the gasket storage areas and verified that the containers for the gaskets were properly labelled, locked, and shielded. The SG logs and survey records

adequately documented SG diaphragm and gasket dose rates and locations. This violation is closed.

V. Management Meetings

X1 Exit Meeting Summary

On October 24, 1996, the inspectors presented the inspection results to licensee management. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

J. Mueller, Site Vice President
G. Schwartz, Station Manager
G. Vanderheyden, Operations Manager
B. Giffin, Engineering Manager
W. Strodl, Health Physics Supervisor
K. Hansing, Site Quality Verification Director
M. Lesnet, Engineering
R. Laburn, Health Physics
M. Phelan, Health Physics
R. Schuster, Health Physics

INSPECTION PROCEDURES USED

IP 83750:	Occupational Radiation Exposure
IP 84750:	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 92904:	Followup - Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-295/304-96016-01	IFI	Licensee planned to fully implement environmental LLDs for free release program
50-295/304-96016-02	URI	Control of Primary Sampling Room Ventilation
50-295/304-96016-03	VIO	Failure to have required radiation monitors during core alterations
50-295/304-96016-04	VIO	Failure to obtain and analyze grab samples for inoperable radiation monitor
50-295/304-96016-05A, B	VIO	Failure to obtain and analyze grab samples while radiation monitor IR-0015 was inoperable and again when monitor 2R-PR25 was inoperable
50-295/304-96016-09	VIO	Failure to follow radiation controls procedure

Closed

50-295/304-96008-07	NCV	Drumming station HEPA and charcoal filter banks not tested after 720 hours of operation
50-295/304-96008-08	NCV	Fission detectors not leak tested prior to installation
50-295/304-96008-06	URI	Failure to follow radiation controls procedure

50-295/304-95018-08	VIO	Failure to follow radiation controls procedure
50-295/304-96006-10	VIO	Failure to provide a localized posting for a high radiation area within containment
50-295/304-96016-04	VIO	Failure to follow radiation controls procedures
50-295/304-96-19	LER	Failure to obtain samples while component cooling loop monitor was out of service
50-295/304-95-010	LER	Fission detectors not leak tested
50-295/304-95-013	LER	Drumming station HEPA and charcoal filter bank dampers were partially open
50-295/304-95-019	LER	Both containment monitors were inoperable
50-295/304-96-14	LER	Control room ventilation system unable to maintain differential pressure.

Discussed

None.

LIST OF ACRONYMS USED

AB	Auxiliary Building
ABV	Auxiliary Building Ventilation
ALARA	As-Low-As-is-Reasonably-Achievable
CFR	Code of Federal Regulations
Ci	Curies
CPM	Counts Per Minute
CR	Control Room
CRV	Control Room Ventilation
DOP	Dioctylphthalate
EWCS	Electronic Work Control System
FB	Fuel Building
GDT	Gas Decay Tank
HEPA	High Efficiency Particulate Air
IFI	Inspection Followup Item
IMB	Inside Missile Barrier
LCO	Limiting Condition of Operation
LER	Licensee Event Report
LLD	Lower Limit of Detection
LSIV	Loop Stop Isolation Valve
NGET	Nuclear General Employee Training
ODCM	Off-site Dose Calculation Manual
OOS	Out-of-Service
PCI/L	picocuries per liter
PCM	Personnel Contamination Monitor
PIF	Problem Identification Form
RCS	Reactor Coolant System
RMDS	Radiation Monitor Display System
RMS	Radiation Monitoring System
RP	Radiation Protection
RPA	Radiologically Posted Area
RPT	Radiation Protection Technician
RP&C	Radiation Protection and Chemistry
RWP	Radiation Work Permit
SG	Steam Generator
SPING	System Particulate Iodine Noble Gas
TS	Technical Specification
UCI/CC	Microcuries Per Cubic Centimeter
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation
ZMAP	Zion Management Action Plan

Partial List of Documents Reviewed

ALARA Plan 960026 (Revisions 0 and 1) "2MOV-RC8002B Loop Stop Isolation Valve (LSIV) C-Loop Cold Leg"

Nuclear Radiation Procedure (NRP) 5710-2, Rev. 0, "Control of Materials for Conditional or Unconditional Release from Radiological Posted Areas"

Problem Identification Form (PIF) 96-1664, "Missed Surveillance of 1RE-0015"

PIF 96-2719, "Missed Surveillance on 2RT-PR25"

Zion Administrative Procedure (ZAP) 620-05, Rev. 4, "Unconditional Release of Liquids from the RPA"

ZAP 620-07, Rev. 1, "Proper Operation and Response to Contamination Monitors"

Zion Chemistry Procedure (ZCP) ZCP-305, Rev. 2, "Documentation of Gas Decay Tank Releases"

ZCP 308, Rev. 1, "Procedure for Gas Decay and Hold-Up Tanks"

Zion Radiation Protection Procedure (ZRP) ZRP 5710-2, Rev. 0, "Control of Materials for Conditional or Unconditional Release for Radiologically Posted Areas"

ZRP 5820-12, Rev. 4, "Out of Service Surveillance for Radiation Monitors"

ZRP 6021-33, Rev. 1, "Documentation of Containment Radioactive Releases"

ZRP 6110-3, Rev. 1, "Calculation and Trending of Dose From Radioactive Liquid Releases to the Environment"

ZRP 6110-4, Rev. 1, "Calculation and Trending of Dose From Particulate, Gaseous, and Iodine Radioactive Airborne Releases to the Environment"

Zion Radiation Work Permit (RWP) No. 964808

1R-PR40, Rev. 10, "Containment Air Sampling SPING"

2R-PR09C, Rev. 17, "Containment Purge Monitor"

1R-PR49, Rev. 10, "Vent Stack Air Sampling SPING"

Radiation Monitoring System (RMS) Maintenance Rule Memorandum, 6/96

RMS Zion Management Action Plan, dated 5/9/96

Commonwealth Edison Production Training Department course module for Nuclear General Employee Training module "Contamination Control Supplement Material," Rev. 0

Zion System Engineering's Radiation Monitoring System Report for June 1995 through July 1996

Exempt Change Number E22-1/2-96-205 (Installation of oil-less blowers for selected radiation monitors)