U.S. NUCLEAR REGULATORY COMMISSION

REGION III

REPORTS NO. 50-373/95010; 50-374/95010

FACILITY
LaSalle County Station, Units 1 and 2

Licenses No. NPF-11; NPF-18

LICENSEE
ComEd
Executive Towers West III
1400 Opus Place Suite 300
Downers Grove, IL 60515

DATES
October 14 through December 1, 1995

INSPECTORS
P. Brochman, Senior Resident Inspector
K. Ihnen, Resident Inspector
H. Simons, Resident Inspector
G. Replogle, Reactor Engineer
A. Walker, Lead Engineering Inspector
C. Brown, Resident Inspector - Byron Station
N. Shah, Radiation Specialist
R. Zuffa, Illinois Department of Nuclear Safety

APPROVED BY

Brent Clayton
Brent Clayton, Chief
Reactor Projects Branch 5

Jan. 16, 1996
Date

AREAS INSPECTED

A routine, unannounced inspection of operations, engineering, maintenance, and plant support was performed. A detailed inspection of safety assessment and quality verification activities was conducted in accordance with NRC Inspection Procedure 40500. Additionally, Temporary Inspection Procedure 2515/128 was performed to determine the adequacy of reactor vessel level modifications. Follow-up inspection was performed for non-routine events and for certain previously identified items.

RESULTS

Assessment of Performance

Within the area of **OPERATIONS**, human performance issues were evident. Control room personnel failed to respond promptly to the 1D condensate booster pump after receiving high temperature alarms. In addition, three radwaste tanks' level instruments were inappropriately isolated. During a surveillance, inattention to detail led to an engineered safety feature actuation. Finally, uncertainty about technical specification requirements resulted in the inoperability of the reactor core isolation cooling system.

Material condition problems continued to affect plant operations. The reactive response required due to poor material condition continued to set the priorities for the station. However, noteworthy improvements in the radwaste system's material condition were accomplished.

Within the area of **MAINTENANCE**, rework continued to affect ComEd's ability to implement their plan for improving material condition. Major rework was required on the 1D condensate booster pump, 1B control rod drive pump, and to a lesser degree, the 1C motor driven reactor feedwater pump. Additionally, the initial root cause of the traversing incore probe (TIP) drive chain failure appeared to be improper assembly of the chain.

Within the area of **ENGINEERING**, reactive responses to material condition problems were considered to be good. However, weaknesses associated with a reactor vessel level indication modification included a deficient check valve leak rate testing procedure, and the failure to perform an appropriate evaluation of a non-conventional piping configuration until prompted by the NRC.

Within the area of **RADIATION PROTECTION**, ALARA planning for the upcoming outage appeared to be good. Source term reduction efforts were improved and were well implemented. Furthermore, personnel exposure was well below the established goal and overall station dose continued to decrease. However, minor problems continued to exist in radiological housekeeping and radworker practices.

Within the area of **EMERGENCY PREPAREDNESS** (EP), ComEd properly implemented their emergency plan and declared an Alert when a TIP unexpectedly withdrew beyond its shielded position, which resulted in high radiation levels in the area. The operating crew's response was considered good with weaknesses in crew communications and simulator training. Also, various aspects of the administrative portions of the emergency preparedness program were deficient and warrant continued management attention.

Within the area of **SAFETY ASSESSMENT/QUALITY VERIFICATION**, a detailed inspection was performed using Inspection Procedure 40500. The inspectors concluded that, overall, ComEd's assessment and corrective action methods were effective. However, several weaknesses were noted. For example, internal self-assessments were only recently implemented and were limited in value;

corrective actions were slow in response to a long-standing problem with an inefficient system for tracking problems; and departmental specific trending information was not effectively utilized.

<u>Summary of Open Items</u>
<u>Inspection Follow-up Items:</u> One was identified in Section 2.2

INSPECTION DETAILS

1.0 OPERATIONS

NRC Inspection Procedure 71707 was used in the performance of an inspection of ongoing plant operations. No violations were identified. Material condition problems continued to affect plant operations. The reactive response required due to poor material condition continued to set the priorities for the station. In addition, human performance issues continue to impact the operations area.

1.1 Summary of Operations

Both units operated at or near full power during the inspection period. Unit one began a coastdown in preparation for the up-coming refueling outage that is scheduled for January 25, 1996.

1.2 Description of "Alert" Declared due to High Radiation Levels in the Reactor Building

At 10:10 a.m. on October 31, 1995, with Unit 1 at 96 percent power, a mechanical failure on a traversing incore probe (TIP) drive unit caused the TIP detector to retract fully into the drive unit. The drive unit was in an unshielded location in the reactor building. Operators in the control room received indication of elevated dose rates ($\geq$1 rem (10 mSv)/hr) from plant area radiation monitors (ARMs). Control room operators responded to the ARMs and entered the emergency operating procedure for secondary containment control (LGA-02). Personnel access was restricted to the 740' elevation and at 10:24 a.m. the decision was made to evacuate the reactor building. At 10:35 a.m., an Alert was declared and the Technical Support Center (TSC) and Operational Support Center (OSC) were activated.

Radiation protection (RP) personnel performed surveys and established control boundaries. Radiological surveys revealed dose rates of 7 rem (70 mSv)/hr on the bottom surface of the platform supporting the 1B drive unit, and 0.5-1 rem (5-10 mSv)/hr in an adjacent corridor. These areas were also contaminated (about 1,000-7,000 dpm/100 cm^2). There were no abnormal personnel radiation exposures identified.

After evaluating the conditions, plant management concluded the best course of action was to wait for the radiation levels to decay off and then determine the cause of the TIP failure. With plant conditions stable, the Alert was terminated at 4 p.m. on October 31. The cause of the TIP drive unit failure is discussed in paragraph 2.2. Assessment of ComEd's immediate response to the event is discussed in Section 4.3.

1.3 Design Vulnerability Again Challenges Operations

The loss of the reactor protection system (RPS) motor generator (MG) set on November 28, 1995, and subsequent loss of reactor building ventilation (VR) again challenged the operators and required them to bypass safety systems to prevent a reactor scram and main steam isolation valve closure. This design vulnerability was discussed in detail in NRC inspection report 95009. The RPS MG set tripped due to a failure of the control power relay. The response by operations to this event was good, showing again that they were trained extensively on the actions required for a loss of VR.

1.4 Operations' Slow Response to Alarms Contributes to Condensate/Condensate Booster (CD/CB) Pump Damage

The 1D condensate/condensate booster (CD/CB) pump was damaged when it was returned to service on October 19, 1995. The pump was returned to service after extensive maintenance and was being started to support engineering efforts at alignment. An equipment operator (EO) was dispatched to the pump prior to starting for a visual check, but left after the checks were complete and the pump had been started. After the pump had run for approximately 30 minutes, the control room received computer alarms on the outboard bearing temperature high and the thrust bearing temperature high. The control room staff did not notify the EO of these indications of degrading material condition, but instead called the engineer who was to perform the alignment check. When the engineer arrived at the pump approximately 15 minutes later, he informed the control room that the pump seals had failed and requested that the pump be secured. The licensee's evaluation of this event determined that had the control room staff notified the EO to check the pump immediately upon receiving the alarms, extensive damage likely would have been prevented. The maintenance errors associated with this CD/CB pump are discussed in Section 2.1.1.

1.5 Human Performance Issues Negatively Affect Operations

Inattention to detail led to two instances of poor human performance during this inspection period. In October, level instrumentation for three tanks was found to be inappropriately isolated. In November, during a surveillance of the reactor core isolation cooling (RCIC) system, inattention to detail led to an engineered safety features (ESF) actuation.

1.5.1 Level Instruments Found Isolated After a Tank Overflowed

In October, level instrumentation for three tanks was found to be inappropriately isolated. The waste neutralization tank level detector was found to be isolated when the tank overflowed. Further investigation by the operations department discovered that the level instruments for two other tanks, the laundry sample tank and the ultrasonic resin cleaning sludge tank, were also isolated. ComEd was unable to determine the cause for the instrument isolations.

1.5.2 **Inattention to Detail Led to an ESF Actuation**

On November 27, 1995, during the performance of LIS-RI-401, "Unit 2 Steam Line High Flow RCIC Isolation Functional Test," the control room operator (NSO) failed to reset the logic prior to closing the breaker for the valve. This caused an ESF actuation due to an invalid signal.

During performance of the surveillance, a Static O-Ring (SOR) switch failed the diaphragm integrity test. The IM technician notified the NSO and the Unit Supervisor. The IM was at the NSO desk reviewing the surveillance paperwork when an operator in the field asked if a breaker could be turned back on. The breaker was turned off as part of the surveillance to prevent movement of the RCIC Inboard Steam Isolation Valve. The IM told the NSO that the breaker could be turned back on and when this occurred the valve isolated, as the isolation signal was still present. The NSO did not verify that the isolation signal was reset and the annunciator window was reset before the breaker was turned back on. A root cause investigation was in progress and the inspectors will follow up on this issue when reviewing the LER.

1.6 Uncertainty About Technical Specifications (TS) Resulted in Unit 2 RCIC Inoperability

Following the failure of the Static O-Ring (SOR) switch (see above), an oncoming Unit Supervisor (the second shift after the SOR failure) was reviewing the applicable TS relating to actuation instrumentation and operability requirements. These TS had recently been changed.

During his review it appeared the Unit Supervisor incorrectly read the TS and concluded that a 6-hour timeclock was applicable. Due to the uncertainty of the Shift Engineer regarding which TS applied, he took the more conservative actions required by that TS (to close the RCIC steam supply isolation valves and open their power supply breakers) when they were really in hour 11 of a 24-hour clock. This was considered an unplanned event due to its urgent nature and a 4-hour ENS phone notification was made based on RCIC's inoperability.

The Shift Engineer took conservative action based on the uncertainty of several individuals on the interpretation of the TS; however, the inspectors were concerned with other aspects of the event, such as shift turnover adequacy, training on TS changes, and the shift's understanding of reportability requirements. ComEd initiated a root cause evaluation which the inspectors will review when it becomes available. The inspectors will track and followup their concerns through the LER.

1.7 Radwaste Material Condition Improvements were Considered Positive; However, Emergent Work Continues to Slow the Progress

ComEd made several modifications to the radwaste system to improve material condition, improve system performance and reduce operator workarounds. In addition, several other improvements were scheduled to improve water quality and waste processing efficiency. The following modifications were performed to improve material condition:

- The as built makeup demineralizer system (MUDS) was replaced with a filtration system. The MUDS had long standing performance problems and was in poor condition. It will be abandoned in place, pending the development of long term dismantling plans.

- A filtration/reverse osmosis system will be installed to replace the radwaste evaporators. These evaporators were difficult to maintain and had numerous associated operator workarounds.

- The phase separator tank level indicator will be replaced. The previous level indicator was not reliable and caused tank overflows and operator workarounds.

- The equipment drain, floor drain, and chemical waste inlet valve control switches will be modified. These modifications will correct a long standing system deficiency which resulted in several overflows of floor drains into the chemical waste laboratory.

During this inspection period, ComEd identified wall thinning and leakage on the radwaste equipment drains system. Although ComEd was making good progress in the radwaste area, continued emergent work (such as this new problem) continued to challenge, and slow, the overall material condition improvement initiatives.

2.0 MAINTENANCE

NRC Inspection Procedures 62703 and 61726 were used to perform an inspection of maintenance and testing activities. Maintenance rework continued to affect ComEd's ability to implement their plan for improving material condition. Major rework was required on the 1D CD/CB pump, 1B control rod drive (CRD) pump, and the 1C motor driven reactor feedwater pump (MDRFP). Additionally, the initial root cause of the TIP drive chain failure appeared to be improper assembly of the chain.

2.1 Maintenance Rework Continued to Affect LaSalle's Ability to Implement Their Plan for Improving Material Condition

During this inspection period inadequate maintenance was performed on several plant components, which subsequently required rework. This rework interfered with ComEd's efforts to improve the material condition of the plant. Three instances of inadequate maintenance, which resulted in rework, are discussed below.

2.1.1 **1D CD/CB Pump Double Thrust Bearing Installed Backwards**

On October 19, 1995, the 1D CD/CB pump was started for a test run. Initial pump checks indicated the pump was running normally. About 30 minutes later, the control room received a high temperature alarm on the 1D CD/CB Pump outboard bearing and thrust bearing. The pump remained running until engineering personnel notified the control room that the seals on the pump had failed and that water was leaking from the pump. The root cause investigation revealed that the Kingsbury double thrust bearing was improperly installed with the outboard set of the thrust shoes orientated backwards. This mis-orientation of the thrust shoes allowed the pump's shaft to move axially, which resulted in the extensive damage to the pump. The pump's expected return to service date is January 25, 1996. As a result of this maintenance error ComEd was unable to take the 1B CD/CB pump out of service for scheduled maintenance for material condition improvements.

2.1.2 1B CRD Pump Vibrations Not Improved After Corrective Maintenance

During this inspection period, the 1B CRD pump was taken out of service for maintenance due to high vibrations which were identified through the vibration testing program. When the pump was returned to service following maintenance, the vibrations were not significantly reduced. The failure to correct the pump vibrations caused rework for both maintenance and engineering.

Upon disassembly of the pump and removal of the pump's rotating assembly, it was discovered that a wear ring attached to the tenth stage of the impeller was cracked. The pump was reassembled with a new shaft and impellers from the 2B CRD pump. When the pump was started for a post-maintenance acceptance test on November 17, 1995, the vibrations on the pump were still five times above normal. The pump was shutdown and a root cause team was formed to investigate the problems with the pump. The pump was scheduled to be disassembled in early December. Due to the ongoing problems with the 1B CRD pump, ComEd was unable to overhaul the 1A pump. The inspectors will continue to follow ComEd's root cause investigation.

2.1.3 Seal and Oil Leaks Persist After Maintenance on the Unit 1 MDRFP

Corrective maintenance was performed on the MDRFP to replace the seals. When the pump was returned to service and tested, seal leakage persisted. In addition, oil leaks had developed. Maintenance personnel made minor adjustments and minimized the seal leakage. However, oil leakage continued to be a problem and constituted an operator work around. Specifically, operators were required to check this oil level twice per shift.

2.2 Improper Assembly of the TIP Drive Chain Was Apparent Cause of TIP Drive Failure

On November 7, 1995, system engineering and instrument maintenance personnel performed an inspection of the B TIP machine to determine why the TIP was retracted beyond its shielded position. The inspection revealed that the drive chain between the drive motor and the feed and take up reel had separated at the master link, apparently due to improper assembly. This caused the take up reel to recoil due to a tensioner spring on the reel, and to pull the TIP detector all the way out onto the reel, an unshielded area. The root cause investigation as to why the master link separated is ongoing, and will be tracked as an inspection followup item (373/95010-01).

3.0 ENGINEERING

NRC Inspection Procedure 37551 was used to perform an onsite inspection of the engineering function. No violations were identified. Reactive responses to material condition problems were considered to be good. However, weaknesses associated with a reactor vessel level indication modification included a deficient check valve leak rate testing procedure and a failure to perform an appropriate evaluation of a non-conventional piping configuration until prompted by the NRC.

3.1 Reactive Responses to Material Condition Problems were Good.

Several emergent material condition problems caused ComEd to be reactive in their approach to corrective maintenance. On the positive side, the response to these emergent issues was good. In particular, the responses to the scram solenoid pilot valve (SSPV) hardening, high vibration levels of the 1A diesel generator (DG) cooling water pump, and high stator liquid cooling water conductivity were noteworthy.

During scram time testing, ComEd identified that some control rods had slower scram times than previously observed. ComEd determined that these slower scram times were due to hardening of the SSPVs. Although this issue was previously addressed by ComEd, this was the first time the SSPVs had exhibited hardening with less than 3 years of service life.

On October 5, 1995, ComEd identified an increase in vibration levels on the Unit 1A DG cooling water pump during a quarterly surveillance. Although the vibrations were not in the "alert" range, system engineering was proactive and pursued repairs. Repairs occurred on October 31, 1995, and were completed in 30 hours. The root cause of the increase in vibrations was determined to be foreign material in the pump's impeller (a piece of sandstone). Vibrations and bearing temperatures were satisfactory following repairs.

The main generator stator liquid cooling system (GC) conductivity increased due to a broken vent line on the system. On November 12, the Unit 1 GC conductivity increased with an associated increase in dissolved copper. An investigation into the trend identified that the vent line for the system was broken due to inadequate support. This in turn allowed air in-leakage into the system, which disturbed the corrosion layer and caused copper to be released into the water. The vent line was patched and the conductivity and copper levels returned to normal.

3.2 Reactor Vessel Level Indication System (RVLIS) Modification Weaknesses

The inspectors utilized NRC Inspection Procedure 2515/128 to evaluate ComEd's RVLIS modifications which were installed in response to NRC Bulletin 93-03, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs." The modifications provided approximately 0.5 gallons per hour of back-fill to the RVLIS lines, using the CRD system as a source of water. The safety/non-safety interface consisted of two check valves (in series) installed in each back-fill line. A total of six keep-fill units were installed in each reactor unit. The inspectors identified that, in some instances, the leak testing of the check valves did not provide meaningful information and additionally identified that engineering had failed to perform an appropriate evaluation of a non-conventional piping configuration until prompted by the NRC.

3.2.1 **Leak Testing Not Meaningful**

The inspectors identified that one of the leak checks performed on the installed check valves did not render meaningful information. As part of the post-installation, and periodic surveillance testing of the modification, ComEd leak tested the check valves to verify that leakage was less than 3.8 cubic centimeters (cc) per hour. The intent of the testing was to verify that leakage was sufficiently limited to ensure that the RVLIS remained operable during an accident. The leakage testing was performed in addition to local leak rate testing, which was accomplished in accordance with 10 CFR 50, Appendix J requirements.

The inspectors were concerned because each leak test was conducted for only 5 minutes and the acceptance criterion was .32 cc/test (about a drop of water). Considering the configuration of the test equipment; the fact that the minimum graduations on the test beaker were 1.0 cc (which made measuring .32 cc very difficult); and the fact that the surface tension of water could keep one drop of water from leaving the system and entering the collection beaker, the inspectors determined that ComEd could not consistently ensure that leakage was within acceptance limits by performing the test that was conducted. In response to the inspectors' concerns, ComEd agreed to revise the leak test procedure to require that leakage be measured for at least 15 minutes during each test (.96cc/test). The corrective actions were acceptable.

The safety significance of the deficient testing procedure was minor because the valves were new and in good condition; other testing was performed prior to installation to ensure functionality; and only one valve in each train was required to work to ensure the safety function was performed. The significance of the problem would have been greater if ComEd had utilized the same procedure for required surveillance tests, which was ComEd's intent at the time of the inspection. The failure to provide an appropriate test procedure for this testing was a weakness.

3.2.2 **Un-Analyzed Non-Conventional Piping Configuration**

The inspectors identified that ComEd had failed to appropriately analyze a non-conventional section of piping which was located in back-fill modification panel 2C11-P005. Specifically, the section of piping was configured in the shape of an upside down "U", which measured approximately 4 feet on each side. There was no way to vent the high point in the piping and the configuration was conducive to collecting air bubbles at the high point (other licensee's had reported air bubbles in the back-fill system at lower system pressures). Normally, the back-fill piping would be installed with a continuous upward slope to ensure that small air bubbles, that may form in the system's piping, migrate up and out of the RVLIS. The inspectors were concerned that potentially trapped air could affect the operability of the RVLIS during a rapid de-pressurization event, such as a loss of coolant accident.

In response to the inspectors' concerns, ComEd performed an evaluation and determined that any potentially trapped air would go into solution when the system pressure was increased (during a plant startup, for example). This would result in a slug of water within the system that would have an increased concentration of non-condensable gases (air). The slug would travel through, and out of, the RVLIS line in approximately 12.0 hours. From this information, the inspectors concluded that a rapid plant de-pressurization during this period could cause the air to come out of solution and could affect the operability of the one affected RVLIS division.

Considering the short duration that RVLIS could be affected by the postulated slug of water with a potentially high concentration of non-condensable gases; the fact that only one division of RVLIS could be affected by the noted conditions; and the remote chances that an event would occur during the first 12.0 hours of operation after a startup, the inspectors (after consulting with experts in NRR) concluded that the noted configuration of the piping was acceptable. However, the failure to appropriately analyze the questionable piping configuration prior to installation and NRC review was considered to be a weakness.

3.3 Follow-up on Previously Opened Items: NRC Inspection Procedure 92903 was used to perform a review of two previously opened items. The following item was closed and the other item will remain open:

(Closed) Unresolved Item 373/94005-07(DRS): Reduced Seismic Spectra: This item referred to an instance where ComEd applied a reduction factor to the seismic response spectra when evaluating the operability of recirculation piping with a snubber removed. The basis for this approach used a concept of equating the probability for short duration conditions to the yearly probability of exceeding design basis accelerations, based on published seismic hazard curves. Although a subsequent analysis, using a full seismic response spectra, determined that the subject piping met Code allowables, the inspectors were concerned with the potential wide spread application of the reduced seismic spectra methods.

The technical bases for the approach were submitted to the NRC in ComEd's March 23, 1994, letter to W. T. Russell, NRR. In response, the NRC concluded that a well-governed program that includes temporary reductions in seismic requirements could be implemented without introducing an unacceptable reduction in plant safety. Nonetheless, given the complexities of the issue, NRC approval would be appropriate before implementing the noted methodology because of the potential for creating an unreviewed safety question.

Except for the one noted (and subsequently analyzed) example, ComEd had not implemented the reduced seismic spectra methods at LaSalle. Additionally, ComEd agreed to discontinue the use of the methods at all of its nuclear facilities until NRC approval could be obtained.

(Open) Unresolved Item 50-373/374-95009-01(DRS): Turbine Building positive pressure contrary to the UFSAR and GDC. A regional health physics inspector reviewed the licensee's calculation regarding potential unmonitored releases from the turbine building; no problems were identified. The licensee was pursuing a long term repair for the problem and in the interim, was performing weekly air sampling (noble gases and iodines) at the turbine building trackway door. Contingency plans were also being developed, for any identified releases. This item will remain open pending a review of the licensee's contingency plans.

4.0 PLANT SUPPORT

NRC Inspection Procedures 71750 and 83750 were used to perform an inspection of plant support activities. No violations were identified.

Within the area of RP, ALARA planning for the upcoming outage appeared to be good. Source term reduction efforts were improved and appeared to be well implemented. Overall station dose continued to decrease; however, minor problems continued to exist in radiological housekeeping and radworker practices. No major problems were noted with the gaseous and liquid radwaste program. Effluent monitors were operable and well maintained.

Within the area of emergency preparedness (EP), ComEd properly implemented their emergency plan and declared an Alert due to high radiation levels in the reactor building. The operating crew's response was considered good with areas for improvement in initial control room communications in assessing and classifying the event, and simulator training. However, various aspects of the administrative portions of the emergency preparedness program were deficient and warrant continued management attention.

4.1 Radiation Protection

NRC Inspection Procedure 83750 was used to perform an inspection of RP activities. No violations were identified.

4.1.1 ALARA Planning for L1R07 Appeared to be Good

Overall, ComEd appeared to have good ALARA planning for L1R07. The outage exposure goal was 270 rem (2.7 sievert (Sv)), with the following significant activities (and associated exposures) identified:

- 1B Reactor Recirc (RR) Pump Refurbishment: 48 rem (0.48 Sv)
- Inservice Inspection: 26 rem (0.26 Sv)
- Vessel Re/Disassembly: 23 rem (0.23 Sv)
- CRD Replacement: 22 rem (0.22 Sv)
- Safety Relief Valve Replacement: 13 rem (0.13 Sv)
- Motor-Operated Valve Work: 12 rem (0.12 Sv)
- 1 B RR Pump Suction Valve: 7.2 rem (0.07 Sv)
- Shutdown Cooling Valve Work: 6.5 rem (0.06 Sv)
- 1A RR Pump Discharge Valve Work: 4.5 rem (0.04 Sv)

As in L2R06, ALARA project managers were assigned to each of these jobs. Lead contacts were also designated for major work areas (i.e., drywell, refuel floor, etc.) and as liaisons to other plant departments. The ALARA managers appeared to have good "ownership" of their respective tasks and maintained good communication with other plant departments. Outage planning will be reviewed further during routine inspections.

4.1.2 Source Term Reduction Efforts Improved

The source term reduction plan appeared to be well implemented. Several source term reduction activities were planned for L1R07, including:

- Replacement of 20 control rod blades with non-stellite components.
- Chemical decontamination of the residual heat removal, reactor water cleanup and RR systems.
- Hydrolazing of several high exposure components.
- Removal of crud in the suppression pool via robotics and/or divers.

A "soft shutdown" was not planned, due to less than expected results during L2R06. Also, a station policy change was recently implemented, requiring that purchased replacement components have ≤ 0.05 percent cobalt content by weight. A related policy for using these components during plant maintenance was still being developed. These efforts will continue to be reviewed during routine inspections.

4.1.3 Radwaste System Modification Work Accomplished With Less Dose Than Estimated

Several improvements in work planning and ALARA were noted in recent radwaste system modification work (Section 1.7). ALARA initiatives included the use of dedicated RP technicians, lead shielding, video camera surveillance, and special tooling and equipment. Additionally, a Work Management Control Center was established near the work site (inside the radiation protected area (RPA)), where workers could review radiological surveys and engineering drawings. Altogether, these initiatives resulted in a total accrued dose of 5 rem (0.05 Sv) compared to the 12 rem (0.12 Sv) goal. No abnormal personnel contamination events or exposures were noted. Some of these initiatives came from a recent site visit to the Limerick station and appeared to improve worker efficiency and communication.

However, two problems were identified. First, a lack of knowledgeable personnel at the job site, and poor communication with engineering, caused confusion during shielding installation. This unnecessarily delayed the work. Additionally, poor coordination by site construction delayed supplying available tools to workers at the job site. These problems also occurred during the last unit 2 refueling outage (L2R06), and corrective actions were being developed for L1R07.

4.1.4 Station Dose Continued to Decrease While Minor Problems Still Exist With Radworker Performance

Station radiological improvement efforts have so far met with mixed success. Although station dose was decreasing (about 500 rem (5 Sv) to date), continued problems were noted with radworker performance and material condition. ComEd was concentrating on increasing plant supervisory presence and emphasizing worker knowledge of ALARA through training.

During tours, the inspectors noted several deficiencies in radiological housekeeping, contaminated area control, maintenance of work areas and standing liquids (oil and water). Similar observations were also documented in station problem identification forms (PIFs). There were also several negative observations with radiological surveys posted in the RPA. The inspector noted some radiological survey tags that were expired and/or difficult to read. Also, not all informational surveys were labeled "For Info Only" which may mislead workers into thinking that they were current. ComEd corrected these problems prior to the end of the inspection.

4.2 Gaseous and Liquid Radwaste Programs

NRC Inspection Procedure 84750 was used in the performance of an inspection of ongoing radwaste programs. Gaseous effluent releases were steadily declining and effluent monitors were operable and well maintained. Although the surveillance tests for the control room ventilation (VC) and standby gas treatment (SBGT) systems were acceptable, engineering oversight was lacking.

4.2.1 **Effluent Releases Declining**

Activity in gaseous effluent releases were steadily declining since 1993, and were about 2.15E-2 Ci (777 megaBq), to date. No activity was released via liquid effluents. The low activity totals were attributed to good reactor water chemistry and recent radwaste system improvements.

4.2.2 Effluent Monitors Well Maintained

Effluent monitors were operable and appeared well maintained. However, the inspectors identified one discrepancy with the calibration frequency of the unit 2 reactor building component cooling water monitor. Specifically, the RP department database incorrectly specified a 24-month calibration frequency. However, the instrument maintenance department records correctly listed the frequency as being 18 months and ComEd had performed the surveillance at the appropriate interval. Additionally, ComEd verified that the calibration frequencies for the other monitors were listed correctly, and has subsequently corrected the RP database.

4.2.3 Surveillance Tests for the VC and SBGT Systems were Acceptable

The inspector reviewed routine surveillance test data for the VC and SBGT systems. The tests met TS requirements but some problems with system engineering oversight were identified. For example, the actual flow rate used during methyl iodide testing of charcoal cartridges differed from that specified in the TS. Although the tests were later determined to be conservative, engineering was not aware of the discrepancy until it was identified by the NRC. Additionally, system engineering notebooks did not always identify the testing standard (ASTM D3803-1979 or ASTM D3803-1989) used for the tests which were performed for informational purposes only. This resulted in some confusion over which tests were, and were not, performed to meet TS requirements. System engineering oversight was a general weakness that was being addressed by the LaSalle Course of Action Plan.

4.3 Emergency Preparedness

The Operations' and RP responses to the high radiation levels caused by the withdrawal of a TIP were good, with areas for improvement in control room organization and simulator training. Additionally, the overall staffing and operation of the TSC was very good. However, various aspects of the administrative portions of the emergency preparedness program were deficient and warrant continued management attention.

4.3.1 Operators Response to the High Radiation Levels Caused by the Withdrawn TIP was Good

Overall, the operating crew's response to the TIP event was good. Teamwork, briefings, and noise levels in the control room were all excellent. Although entry into the emergency operating procedures, classification of the emergency, and notifications were acceptable, weaknesses were identified in training and in communications among the crew during event classification.

The operating crew response to the annunciator indicating high radiation in the reactor building was acceptable. Although the entry into the emergency operating procedure, LGA-02, for secondary containment control was initially slow, it had no impact on the event response. In addition, upon entry, LGA-02 was followed very well.

The crew properly declared an Alert per the Generating Station Emergency Plan (GSEP). It took the crew approximately 25 minutes to declare the Alert from the time of the initiating conditions. This was considered acceptable with respect to timeliness based on other actions the crew had to accomplish, such as diagnosis of the alarm, evacuation of the reactor building, and positioning of security to control access.

The operating crew effectively implemented the GSEP including activating the TSC and OSC. The crew was quick to make plant announcements to warn workers of the potential radiation hazard.

The notification of the State and local officials was completed within the required 15 minute time frame. The NRC was notified approximately 50 minutes following the Alert classification. Although this was considered acceptable, improved communication among crew members and overall command and control, as noted in greater detail below, could improve the timeliness of the NRC notification.

Discussions with operations department management after the event disclosed that during simulator training, event classification was not stressed while the scenarios were unfolding but was typically addressed after the scenarios had ended. Additionally, the way the shift supervisor interacted with the unit supervisor and approached his command and control function in the simulator did not mirror the approach that management wanted during actual events (especially during event classification).

4.3.2 Performance in the TSC was Very Good

The TSC was staffed and activated in a timely manner. Command and control was transferred from the control room to the TSC in an orderly fashion. The TSC did a very good job performing their function.

One area for improvement was noted in the TSC. Some TSC personnel were preoccupied with termination of the event. Extensive discussion was needed to determine if the conditions for termination were met. Emergency plan implementing procedures for terminating the emergency and de-activating the emergency response facilities lacked clear guidance.

4.3.3 RP's Response to the TIP Event was Good

Overall, the RP response to this event was prompt and effective both prior to and after staffing of the OSC. The OSC was staffed with RP technicians and RP supervision in addition to maintenance personnel. After evacuating the reactor building, RP established a locked high radiation area and set up a high efficiency particulate air filter around the affected drive unit.

Within 24 hours, radioactive decay had significantly reduced the dose rates (about 500 mrem (5 mSv)/hr on the bottom surface and 1-5 mrem (10-50 microSv)/hr in the corridor) and the area was de-posted to an HRA. ComEd had also decontaminated the area.

While reviewing the TIP withdrawal event, ComEd noted some apparent problems with operation department procedures. Specifically, there were numerous RP requirements in these procedures that RP was not aware of. These requirements were in the procedures, as corrective actions for past events. Although this did not impact RP response to the TIP event, it could impact RP oversight of plant activities. Procedural control was a general weakness that was being addressed by LaSalle's Course of Action plan.

4.3.4 Administrative Aspects of the EP Program Still Deficient

Site Quality Verification (SQV) performed a review of the GSEP program and determined that several programmatic deficiencies existed within the program. For example, inventories of emergency equipment were not properly performed and EP procedures were not revised to be consistent with the GSEP.

EP personnel were slow in responding to an SQV concern over the "A Model" program, which is ComEd's simplest dose assessment model to be used initially by operations personnel to assess offsite releases. Additionally, Operations was not aggressive at getting the problem resolved. Specifically, the SQV auditor questioned some of the parameters in the program. Approximately four weeks after the issue was raised, EP personnel determined that a problem did not exist with the A-model program itself, rather a procedural problem existed.

4.4 Follow-up on Previously Opened Items: NRC Inspection Procedure 92903 was used to perform a review of one previously opened item.

4.4.1 (Open) Unresolved Item 50-373/374-95009-01(DRS): **Turbine Building Positive Pressure Contrary to the UFSAR and General Design Criteria (GDC)**: A NRC regional health physics inspector reviewed ComEd's calculation regarding potential unmonitored releases from the turbine building; no problems were identified. ComEd was pursuing a long term repair for the problem and in the interim was performing weekly air sampling (noble gases and iodines) at the turbine building trackway door. Contingency plans were also being developed for potential releases. At the time of the inspection the apparent noncompliance with the GDC was still under evaluation by ComEd Corporate Licensing. This item will remain open pending further NRC review of ComEd's evaluation and corrective actions.

5.0 SAFETY ASSESSMENT/QUALITY VERIFICATION

NRC Inspection Procedure 40500 was used to evaluate ComEd's internal assessments; the methods used for identifying and documenting problems or weaknesses; and the controls used for tracking, follow up, root cause investigation and corrective action. The inspectors also reviewed various committee functions, tracking systems and methods, and operating experience feedback.

The inspectors concluded that, overall, ComEd's assessment and corrective action methods were effective. Although no violations or deviations were identified, several weaknesses were noted. For example, internal self-assessments were only recently implemented and were limited in value; corrective actions were not timely in response to a long-standing problem with a cumbersome and inefficient system for identifying and tracking problems; and departmental specific trending information was not effectively utilized.

5.1 <u>SQV Audits were Acceptable but Internal Self-Assessments were Sometimes Limited in Value</u>

SQV had the formal responsibility for internal assessments. SQV audits and surveillances were conducted periodically and generally covered plant organizations, as well as other areas. SQV findings appeared to be generally consistent with other station and NRC assessments.

Most plant departments had established internal self assessment programs; however, in most cases, these programs were only recently developed or were in the developmental stage. An exception appeared to be Site Engineering, which had an established self-assessment program for approximately a year. The inspectors considered these self-assessments to be somewhat limited in value because, often times, the reports only provided a listing of findings and contained no overall assessment of performance.

5.2 <u>Corrective Actions to Address an Inefficient Corrective Action Tracking Process were Slow</u>

ComEd identified approximately two years ago that the process for identifying and correcting problems was cumbersome and inefficient. However, they had not taken effective steps to correct this deficiency. A contributor to the concern was the numerous documents that were utilized to document and track problems. These documents included PIFs, Deviation Reports, Corrective Action Records (CARs), Action Requests, Root Cause Evaluation (RCE) forms, and the Nuclear Tracking System. This often resulted in documentation of the same problem several times, with the documents being reviewed by several different groups or individuals. This sometimes caused a duplication of efforts and had resulted in delayed corrective actions. The failure to take effective steps to address this longstanding concern was considered to be a weakness.

ComEd personnel stated that the problem identification program was being revised to require that all problems be documented on PIFs. This would enable a single evaluation process and database to be used for problem identification and corrective action. However, this change was not implemented by October 1995, as planned, and no new schedule date had been determined.

5.3 Departmental Trending Information Not Utilized

The inspectors identified that the individual departments were not effectively utilizing departmental specific trending information that was available from the SQV. Trend charts (based on CARs, PIFs and field observations) could be generated that addressed both station and individual department problems. However, department trending information had to be specifically requested and many of the departments were not aware that this information was available. The failure to appropriately utilize the departmental trending information limited ComEd's ability to effectively address adverse trends.

5.4 Operational Experience Program (OPEX) not Always Working as Expected

The inspectors identified that the OPEX did not have information related to the DG problems that were recently experienced at the Quad Cities facility. ComEd's OPEX was established, in part, to identify operational occurrences, or problems, that were experienced at other facilities and to evaluate that information for applicability to LaSalle. However, as previously noted, the Quad Cities DG problems were not in the system, although the cognizant LaSalle system engineer was aware of the difficulties. At the time of the inspection, it was believed that the Quad Cities OPEX had failed to forward the necessary information to the LaSalle site.

With the exception of the one identified concern, the OPEX appeared to be properly implemented.

5.5 Root Cause Investigation and Corrective Action Were Acceptable and ComEd Continued to Implement Improvements to the Program

Root cause evaluations (RCEs) for major (high visibility) items were well handled, with a root cause investigation team of knowledgeable individuals assigned to these items.

ComEd previously identified that RCEs were not always thorough and did not consistently identify the root causes for problems. ComEd recently revised their RCE process to address these concerns. A station RCE team was formed with responsibility for developing and reviewing root cause reports. The team members had applicable plant experience and had received special training in RCE techniques. Although the team approach was implemented, specific performance issues (RCE effectiveness feedback, standardized methods of review, worker training, etc) were still being developed. Additionally, a recent station self-assessment indicated that the RCE process was still a weakness.

6.0 PERSONS CONTACTED AND MANAGEMENT MEETINGS

The inspectors contacted various ComEd operations, maintenance, engineering, and plant support personnel throughout the inspection period.

At the conclusion of the inspection on November 30, 1995, the inspectors met with ComEd representatives (denoted by *) and summarized the scope and findings of the inspection activities. ComEd did not identify any of the documents or processes reviewed by the inspectors as proprietary.

R. Querio, Site Vice President
D. Ray, Station Manager
*L. Guthrie, Operations Manager
*P. Smith, Maintenance Superintendent
*R. Jacobs, System Engineering Supervisor
*P. Antonopoulos, Site Engineering and Construction Manager
D. Boone, Health Physics Supervisor
*R. Crawford, Work Control Superintendent
*J. Burns, Regulatory Assurance Supervisor

7.0 DEFINITIONS

7.1 Inspection Follow-up Items

Inspection follow-up items are matters which have been discussed with the licensee which will be reviewed further by the inspectors and which involve some action on the part of the NRC or licensee or both. An inspector follow-up item which was disclosed during this inspection is discussed in Section 2.2.