U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/92011(DRSS)
EA No. 92-110

Docket No. 50-461 License No. NPF-62

Licensee: Illinois Power Company
500 South 27th Street
Decatur, IL 62525

Facility Name: Clinton Power Station

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: June 1-5, 1992

Inspectors: William Snell
William Snell, Chief
Radiological Controls Section 2 — Date 6/22/92

D. W. Nelson
Radiation Specialist — Date 6-19-92

Approved By: William Snell for
Cynthia D. Pederson, Chief
Reactor Support Programs Branch — Date 6/22/92

Inspection Summary

Inspection on June 1-5, 1992 (Report No. 50-461/92011(DRSS))
Areas Inspected: Routine unannounced inspection of the radiation protection and effluent monitoring programs, including: organization, management controls, audits and surveillance, internal exposure control, contamination, maintaining occupational exposures ALARA, and station off-gas monitoring (IP 83750, IP 84750). Also included in this inspection was a followup on a concern regarding training (IP 99024) and followup to incidents involving the Reactor Core Isolation Cooling (RCIC) storage tank, an unplanned uptake, and a traversing incore probe (TIP).
Results: Two apparent violations were identified involving the adjustment of a TIP mechanical stop (Section 10). One was for performing an inadequate survey and the other was for a failure to inform workers of the radiological hazards involved with the work to be performed.

Areas that appear to merit improvement include communication both within the radiation protection (RP) department and between RP and other groups, job scheduling, housekeeping in the radwaste building, the ALARA review process and ALARA work plan and the

training given to workers to set up and employ portable High Efficiency Particulate Air (HEPA) filter units.

Program strengths were identified in the minimal levels of gaseous radioactive materials releases, housekeeping in the generally accessible areas of the turbine and auxiliary buildings, the continuing effort to keep personnel contamination events (PCE) at very low levels, the 1992 audit of the RP program and the technical competency of the operational RP technicians (RPT)s.

DETAILS

1. Persons Contacted

* W. Bousqurt, Director, Plant Support Services
* E. Bader, Supervisor, Control and Instrumentation
* R. Campbell, Radiation Protection Shift Supervisor
* W. Clark, Director, Plant M intenance
* J. Cook, Manager, Clinton Power Station
* K. Dittman, Licensing
* M. Daw, Project Engineer
* M. Dodds, Supervisor, Radiological Operations
* L. Everman, Director, Radiation Protection
* K. Graf, Director, QA
* S. Hall, Director, NPAG
* G. Kephart, Supervisor, Radiological Support
* R. Kerestes, Director, Engineering Projects
* R. Klinzing, QA Auditor
* J. Lewis, Principle Assistant to Vice President
* J. Miller, Manager, NSED
* R. Morgenstern, Director, Nuclear Training
* J. Niswander, Supervisor, Radiological Environmental
* J. Palchak, Manager, Nuclear Planning and Support
* S. Perry, Vice President
* M. Reandeau, Licensing Specialist
* R. Ritter, Assistant Supervisor, Facility Group
* F. Spangenberg, Manager, Licensing and Safety
* R. Weedon, Assistant Director, Radiation Protection
* J. Withrow, Supervisor, Audits
* R. Wyatt, Manager, Quality Assurance
* P. Brochman, Senior Resident Inspector

The inspectors also interviewed other licensee and contractor personnel during the course of the inspection.

* Denotes those present at the exit meeting on June 5, 1992.

2. General

This inspection was conducted to review aspects of the licensee's radiation protection and gaseous effluent monitoring programs. The inspection included tours of radiation controlled areas, auxiliary, turbine and radwaste buildings, observations of licensee activities, review of representative records and discussions with licensee personnel.

3. Licensee Action on Previous Inspection Findings (IP 83750)

(Closed) Violation No. 461/92004-01: Failure to authorize excessive amounts of overtime per technical specification (TS) requirements. The licensee noted that procedures were in place to conform to the requirements of the TS. The licensee will restrict all technicians to a 72 hour per

seven consecutive day period and turnover time should be restricted to conform to this limit. In addition, upper management will be informed whenever the limits are approached as apposed to approving the limits once they have been exceeded. This item is closed.

(Closed) Open Item No. 461/92004-02: Evaluate corrective actions taken for deficiencies observed during the steam separator transfer. As a result of the corrective actions taken, total dose dropped from .580 man-rem for the original transfer to .231 man-rem for the reinstallation of the separator. This item is closed.

4. Organization and Management Controls (IP 83750)

The inspectors reviewed the licensee's organization and management controls for the radiation protection (RP) program including: organizational structure, staffing, delineation of authority and management techniques used to implement the program and experience concerning self-identification and correction of program implementation weaknesses.

The recent organizational change that incorporated a Director of RP and RP Manag. appears to be working well. Their individual responsibilities are adequately defined and they appear to be making changes necessary to improve the program. The RPM, who was the former RP Assessor, appears to have a good grasp of the deficiencies within the program and has developed a list of recommendations for improvements. That list includes: revamping the Radiological Work Permit (process and document), reviewing and revising all RP procedures on a systematic basis, developing more effective methods for scheduling work activities and refining systems within the program for the effective transfer of information.

Once the outage ended on May 31, 1992, staffing levels within the radiation protection department returned to the pre-outage levels, which reflected the normal loss of contractor support for an outage. However, subsequent to the outage, RP was allocated an additional 6 technical staff positions and the plant was recruiting to fill those positions. Another position, that of Supervisor of Radiological Engineering, has been open since November 1991 and the licensee was seeking candidates to fill the position. If the search for a replacement continues to be unsuccessful, RP management may cons reorganizing the group and eliminating the position. Overall, staff turnover within the department remains low.

The ALARA staff has changed significantly since the end of the Refueling Outage-3 (RF-3). The staff has dropped from a outage high of 1 coordinator, 4 technicians and 3 engineers

to a staff of 1 coordinator and 1 engineer. There was no plans for augmenting the number of personnel in ALARA.

No violations or deviations were identified.

5. Audits, Surveillance and Self Assessments (IP 83750)

The inspectors reviewed the results of Quality Assurance (QA) audits and surveillances conducted by the licensee since the last inspection. Also reviewed was the extent and thoroughness of the audits and surveillance.

The inspector reviewed the draft copy of the audit Q38-92-12 conducted May 5-15, 1992 on the radiation protection program. The inspector noted a significant improvement in this audit over the audit conducted in 1991. While the 1991 audit concentrated on procedural adherence and the technical skills of radiation protection personnel, the 1992 audit had a good mix of how well the technical staff was performing their duties as well as how effective the radiation protection program was in providing a service to the plant. For example, the auditors observed work performed under a variety of Radiation Work Permits for procedural adherence and technician competence as well as conducting interviews to determine if RP technical support was sufficient in the turbine and auxiliary buildings, the refuel floor and the drywell. With this mix QA is effectively providing management with information on how well RP is performing its functions.

Findings of the 1992 audit include: the RP operational technical staff was very competent and performed their duties well; RP technician staffing during the outage was adequate on the refuel floor; auxiliary building and drywell, but inadequate in the turbine building, during heavy work periods in the auxiliary building and during the first part of RF-3; communication problems existed between groups within the RP department; problems occurred with recording the issuing and calibration of survey instruments; and the effectiveness and quality of procedures and work instructions varied significantly. During the audit eight Condition Reports (CR) were issued by the team to document specific violations of procedures or lack of control over activities. In addition, 19 recommendations were offered for consideration.

The inspector reviewed three surveillances conducted in 1992. Surveillance Q-15198 examined the temporary shielding procedure (old and revised) for implementation and verification. The surveillance found that although at times steps in the process for requesting and removing temporary shielding were not documented, procedural requirements were being met. Q-15185 examined various activities of the RP department. The surveillance found: turnover activities (RP log book and meetings) were adequate for shift turnover;

Radiological Improvement Reports (RIR)s were not being closed out in a timely manner; RP staffing was inadequate to cover the first weeks of RF-3; training records for technicians were difficult to access and in some cases did not reflect the technician's current status. For example, two technicians were found to have performed activities that they had not been trained to perform and that information was not readily available to the RP shift supervisor (RPSS) who was responsible for assigning technician activities. Q-15187 determined whether or not the work practices developed for implementing the onsite thermoluminescent dosimeter (TLD) program were adequate. The surveillance found that the processing of TLDs was acceptable. Each surveillance clearly stated its goal and in all three cases met those goals.

In summary, the 1992 audit of the RP program was a significant improvement over the previous audit and surveillances continued to be based on performance and provided valuable information to the groups involved.

No violations or deviations were identified.

6. Maintaining Occupational Exposure ALARA (IP 83750)

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA including: ALARA group staffing and qualifications; changes in ALARA policy and procedures and their implementation; worker awareness and involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them.

As noted in Section 4, the ALARA staff was reduced to two individuals following RF-3. The current staff has one ALARA coordinator and one staff ALARA engineer. The inspector noted that with this reduction ALARA no longer has an engineer in the planning group and with the exception of high risk jobs, ALARA has little if any input into job planning. Per procedure, high risk jobs (1 R/hr, 1 Man Rem, etc) must have an ALARA review and that review can take place at the planning level. For other jobs there are no requirements that ALARA become involved.

Workers performing high risk jobs must conform to the requirements of three documents: the specific radiation work permit (RWP), the ALARA work plan (AWP) and the work package detailing the specifics of the job. The RWP describes the radiological conditions in the work area, the protective measures (respirators, protective clothing (PC), etc) required and the extent of RP coverage. The work package provides minimal if any RP information. The ALARA work plan is a living document intended to inform both the workers as well as RP about conditions that must be met during the performance of the job. The work plan sets the prerequisites for performing work, describes how the job is

to be set-up, how the job is to be performed including stop and hold points and how the site is to be restored once the job is complete. Each step in the process must be signed off as each task is completed. The plan can be changed as conditions change and all parties involved are briefed. Although this system is generally adequate it is necessary to ensure that all appropriate information and precautions are included in the document and this information is conveyed to the workers performing the task.

For example, the ALARA work plan (AWP) developed for the steam separator transfer (Section 2) restricted access to the pool to only nine essential personnel. Security personnel at the access point were not given a list of those essential personnel and 23 individuals were present during transfer. Also, the plan failed to clearly define what activities RP technicians would perform during the transfer. Two of the three RP technicians present received approximately two thirds of the total dose for the job while standing adjacent to the separator continually monitoring surface dose rates. The technicians could have intermittently monitored the dose rate and received less dose. In another example, a review of the ALARA WP for the TIP "C" mechanical stop adjustment (Section 10) indicated that decisions made during the ALARA review were not documented in the ALARA WP or discussed in subsequent pre-job briefings. Both examples indicate that discussions and decisions made during the creation of the ALARA WP are not always incorporated into the document, the provisions of the document are not always conveyed to all the parties involved, the provisions may not be as detailed as required, and too many people have the authority to change the document without the ALARA coordinator's or management's approval. The WP can be a useful document if the planning involved is extensive, all parties are involved in the process and the decisions made about the job are incorporated into the document.

Total dose for RF-3 was 342 person-rem. This was slightly less than the projected dose of 350 person-rem and was significantly less than the RF-2 total dose of 498 person-rem. Two factors appear to have contributed to this decrease: plant management has actively supported the source term reduction program and the enhancements made in the ALARA program for the outage, especially the training given the engineers and having an ALARA engineer in the planning group. The low number of personnel contamination events for RF-3 (53) continues to demonstrate the licensee's good performance in this area.

No violations or deviations were identified.

7. Gaseous Radioactive Wastes (IP 84750)

The inspector reviewed the radiological concerns raised concerning the May 1992 fire in the off-gas charcoal absorber bed. On the first day of the inspection the fire in the bed had been extinguished, the plant was at 18 percent power and off-gas was being routed through the charcoal beds. The inspector noted that the steps by the plant during the fire were appropriate from a radiological viewpoint and no further action was required.

No violations or deviations were identified.

8. Liquid Radioactive Wastes (IP 84750)

The inspector reviewed the steps taken by the plant when the RCIC storage tank overflowed during the later stages of RF-3. The tank had over flowed when a valve had inadvertently been left open. The RCIC tank is open at the top and before the valve was shut approximately 5000 gallons of slightly contaminated water had spilled into the surrounding moat. The moat is surrounded by a three foot high berm and all of the water was contained. Upon discovery, the water was immediately pumped into the radwaste water system. Water samples were collected and analyzed. The licensee reviewed the results of the analysis and determined that because the activity levels were below 10 CFR 20 Appendix B limits no further action was required. Since the activity levels in the water were below 10 CFR 20 limits RP management decided not to collect moat soil samples for analysis. After discussions with the inspector, RP management indicated that they would consider periodically collecting and analyzing soil samples from the moat within the scope of their environmental monitoring programs. This issue was discussed at the exit meeting and no further action is required.

No violations or deviations were identified.

9. Internal Exposure Control (IP 83750)

The inspector reviewed an incident concerning the uptake of radiative material by a worker in the steam tunnel. On April 9, 1992 a worker entered the auxiliary building steam tunnel area to inspect a bonnet. The contaminated bonnet was wrapped in plastic and temporarily stored in a tent. During the course of the inspection the worker unwrapped the bonnet and was internally contaminated. Upon exiting the radiologically controlled area (RCA) the worker set off the personnel contamination monitors (PCMs) three times before gaining egress. It should be noted that setting off the PCMs is a common occurrence at this plant due to high ambient levels of radon. Upon exiting the plant, the worker set off the portal monitor on his first pass through and passed on the second attempt. Plant policy calls for RP

attention if a worker fails two passes through the portal monitor. The next day the worker entered the plant without incident but failed twice on his attempt to pass the portal monitor when exiting the plant. A whole body count was performed and detectable amounts of Co-60 and Mn-54 were found. The worker was questioned about his activities and released. Two days later another whole body count was performed and the results were negative. RP conducted a dose assessment on the individual and determined that the initial uptake was approximately 150 nanocuries of Co-60 and Mn-58. The material was excreted quickly and the total whole body dose was approximately 2.5 mrem. Although the steps taken by the licensee appear to be appropriate, one concern about this incident was raised in the RP audit. The audit indicated that inadequate staffing may have contributed to the incident in that the worker may not have been adequately briefed about opening wrapped contaminated material.

No violations or deviations were identified.

10. External Exposure Control (IP 83750)

a. Traversing Incore Probe Event Overview

On Friday May 29, 1992, during the day shift, two calibration and instrumentation technicians (CIT)s and one RPT entered the TIP "C" drive mechanism area of containment to adjust the mechanical stop on the drive mechanism. They had been briefed by RP prior to entering the RCA and proceeded to withdraw the TIP to see if, indeed, the mechanical stop was out of adjustment. As the CIT withdrew TIP "C" the RPT noticed the dose rate jump to about 40 R/hr at the drywell wall and immediately stopped the job.

On Tuesday June 2, 1992, at approximately 5:30 pm two CITs and one RPT entered the same area to adjust the mechanical stop on TIP "C". They had been briefed by RP immediately before entering the RCA and carried with them the ALARA work plan developed specifically for the job. The plan stipulated that all work must stop if the dose rate on the cable or at the drywell wall exceeded 30 R/hr, the general area dose rate exceeded 1 R/hr or any ALNOR electronic dosimeter (set at 50 mrem) alarmed. The CIT inserted the TIP into the core, readjusted the mechanical stop mechanism and began withdrawing the TIP. As the TIP was withdrawn the RPT noted that within seconds his instrument went off scale (50 R/hr maximum setting), all three ALNORs alarmed and work was stopped immediately. One CIT received 170 mrem, the other CIT received 60 mrem and the RPT received 70 mrem.

The following is a detailed chronology of the two events and includes the actions taken before, during and after the events.

b. Chronology of Events

May 26 - New TIP "C" detector and cable installed.

May 28 - The Clinton work schedule contained a work task to manually adjust the mechanical stop mechanism on the newly installed TIP "C". The ALARA group was not informed that this job had been scheduled even though it had high risk potential. Therefore an evaluation of possible dose was not done, an ALARA assessment was not performed and an ALARA work plan was not prepared. A work package was prepared, a job prebrief by RP was conducted, and two CITs and a RPT proceeded to carry out the job. To adjust the mechanical stop mechanism, the cable needs to be completely removed from the TIP drive spool, the adjustment made, and the cable reattached. To completely remove the cable from the spool, the TIP was inserted into the core. Because of another plant evolution that occurred, the job was halted while the TIP was still in the core, where it was left when the workers departed the area. The reactor was at about one percent power at the time.

May 29 - To complete the task of adjusting the mechanical stop mechanism on the TIP "C" that had been started the day before, two CITs and a RPT received appropriate authorization, went to the TIP room, and proceeded to withdraw the TIP from the vessel. Again, an ALARA assessment had not been performed and an ALARA work plan had not been developed. The TIP had been in the core for 12-14 hours. As a CIT was withdrawing the TIP, the RPT noted the dose rate jump to about 40 R/hr at the hole in the drywell wall where the cable came through. The technicians assumed the high dose was due to streaming from the TIP. The TIP was approximately three feet from the other side of the five foot thick wall. The RPT stopped the job and everyone exited the area. They reported the results of their efforts to Radiation Protection personnel and the ALARA Coordinator. Reactor power at this time was about 14 percent.

The ALARA Coordinator discussed this with a RP day shift supervisor (RPSS) and a RPT, and determined that more review was warranted. They pulled a procedure for the removal of an incore detector to use as a guide to revise the work plan for continued work on the TIP. Three methods to do this job were formulated at this meeting.

Plan A - Bring TIP to the inshield position and spool cable off spool and onto the floor.
Plan B - Insert TIP to just below invessel position and back spool the slack off.
Plan C - Insert TIP all the way into the vessel.

Due to the likelihood of very high dose rates due to activation of the detector and cable, the decision was made not to insert the TIP into the core (Plan C). If Plan A or B did not work, they would have to rethink the job.

June 2 (Morning) - C&I was prepared to adjust and set mechanical TIP stop and requested the required prejob briefing. The prejob briefing was set for 1:30 p.m.

1:30 p.m. prejob briefing - Attendees: RPSS (one of several on duty; the RPSS involved in the May 29 meeting was in training and unable to attend), three CITs, the supervisor of Rad Engineering, a RPT, and an ALARA Engineer. None of the three persons who attended the May 1 meeting (ALARA Coordinator, RPSS and RPT) attended this prejob briefing.

At the prejob briefing personnel discussed the three Plans, no one knew that Plan C was not to be performed. The ALARA representative had not been told by the ALARA Coordinator that they were not to insert the TIP as in Plan C. The supervisor rad engineering stated that even if the TIP were inserted for a short period of time, fairly high dose rates could occur. Subsequent interviews revealed that others at the briefing did not fully understand that the TIP included the cable as well as the detector, what the specific dose levels would be since they were not discussed, and they did not appreciate how radioactive it could have become when activated even for short periods of time.

The only caution statements in the ALARA work plan were, "Movement of TIP Drive Assembly (TIP and cable) can result in extremely high radiation dose rates. Extreme Caution is to be used when moving irradiated incore TIP/cable assemblies." It also stated, "Dose rates of 30 Rem/hr contact at the containment wall or .. dose rates of 1 rem/hr general area at the drive box or .. any ALNOR alarming dosimeter .. work must stop and workers must exit the area." This ALARA plan was developed after the May 29 meeting between the ALARA coordinator, the RPSS and a RPT.

The first step in the work package was to disconnect the TIP cable. There was no statement in the ALARA work plan stipulating that the TIP and cable were not to be inserted into the core, i.e., there was no discussion as to how the cable was to be removed from the spool before disconnecting, or the need to let it decay after insertion into the core. The work plan did state the cable was to be monitored continuously while being withdrawn. The 30 Rem/hr limit had been established based on decay that had occurred from the 40 R/hr measured three days earlier.

~2:00 p.m. Individuals attending the job briefing were authorized to conduct the job. They left to carry out the job and accomplished setting up the job and removing the cover from the drive mechanism before the day shift ended at 4:00 p.m. Due to a recent fire in the charcoal beds, the plant was holding at 18 percent power at this time. If not for the charcoal fire, they would have gone up in power approximately one week earlier.

~5:00 p.m. The RPSS who attended the May 29 meeting returns from training. He begins the paperwork for turnover to swing shift, and is briefed by the other RPSS who was at the 1:30 p.m. prejob briefing. At about this time the swing shift CITs show up at the RP window and state they want to be authorized onto the appropriate RWP to complete the mechanical stop work on the TIP. The window RPT breaks into the turnover meeting between the two RPSSs with this information. The RPSS who had attended the 1:30 p.m. briefing stated he thought the job was going to be delayed until the next day. (He apparently thought there

were insufficient resources to complete this job on the swing shift.) The RPSS who was in training said to go ahead if they could support it. He assumed the issue of not inserting the TIP into the vessel had been discussed at the 1:30 p.m. meeting.

An RPT was assigned, and he was briefed by the RPT who was on the job previously that afternoon. Another briefing was held with both of these RPTs and two CITs, but none of them knew the TIP was not to be inserted into the vessel. They were signed in on the RWP and went to do the work. The electronic dosimetry they wore (ALNOR) was set to alarm at 50 mrem total dose; the dose rate alarms are inactivated on all the ALNORs at Clinton.

~6:00 p.m. The CIT inserted the TIP into the core, disconnected the cable, reconnected it in a different location to set the stop, and proceeded to reel in the cable manually (at about 1-1½ feet per second). One CIT performed the spooling while the other did the disconnecting and reconnecting. The TIP was in the core approximately 10 minutes. The CIT used an extended wrench to reel the cable in and out: this was not specified in the work plan, but allowed him to stand about two feet further from the spool. The RPT on the job stated he was not aware they were going to insert the TIP into the core. The CIT knew he was going to insert the cable into the core, but was unaware the cable could get highly activated. The RPT noticed dose rates increasing as the TIP was withdrawn and at about 600-700 mrem/hr, he instructed the CIT to stop and told him to spool the TIP back the other direction. When they did this, dose rates started to climb slightly before dropping. They put it back in about nine feet before radiation levels dropped off to background and they stopped reeling.

They jointly decided to spool the TIP all the way onto the reel since they could go to 30 R/hr before they had to stop, and only had a few feet left when they measured the levels of 600-700 mrem/hr before. The RPT monitored the cable and read off radiation levels verbally while they CIT withdrew it. With the levels climbing, they reeled the TIP out of the vessel. As the detector reached its inshield position the RP Tech's meter jumped

off scale. The CIT stopped withdrawing the TIP and attached a chain with a hook onto the spool. He did this because of concern that the tension on the cable could cause the spool to pull the TIP all the way into the TIP room. They then left the room as quickly as possible. It was later confirmed by the control room operator that the TIP had been fully withdrawn.

Approximately one and a half hours later, the RPT reentered the room with a teletector, and read 300 R/hr on contact on the cable.

The CIT working the spool received a dose of 170 mrem, the RPT received 70 mrem, and the other CIT received 60 mrem.

c. Apparent Violations

As defined in 10 CFR 20.201(a), "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal or presence of radioactive materials or other sources of radiation under a specific set of conditions. As of May 28, 1992 an evaluation was not made to determine the level of hazard associated with withdrawing a traversing incore probe (TIP) from the reactor core that been inserted into the core for at least 12 hours. A calculation was not made to determine the level of activity on either the TIP detector or cable and an ALARA assessment of the job was not performed. (Escalated Enforcement Item 461/92011-01)

All individuals working in a restricted area should be instructed in the precautions and procedures to minimize exposure to radioactive materials. Individuals who were working in the TIP drive mechanism area, a restricted area, on MAY 28, May 29 and June 2 1992 had not been instructed in the precautions and procedures to be used if the TIP had been inserted into the core and immediately withdrawn. Specifically, they were not informed of the potential for extremely high radiation fields due to neutron activation of the TIP cable. (Escalated Enforcement Item 461/92011-02)

d. Root Cause Summary

Inadequate ALARA Assessment Set Point, ALARA Work Plan and Procedures

A ALARA assessment was not performed prior to performing work on May 28, 1992, even though the job had a high risk potential. No special procedure was available that addressed manually setting the

mechanical stop mechanism on the TIP drive unit. The work on June 2, 1992, was conducted using an ALARA work plan, which had two precautionary statements on the potential radiological hazards, and the vendor manual. The work plan did not specify that the TIP was not to be inserted into the core and if inserted the need for decay. Operating under the vendor manual, the CITs decided to insert the TIP into the core and the radiation protection staff on duty provided a RWP for the job. The work plan did not contain the ALARA Coordinator's decision that the job was not to be conducted by inserting the TIP into the core.

Lack of Communication Among Individuals and Work Groups

The ALARA group was not told that C&I would be adjusting the TIP mechanical stop mechanism on May 22. ALARA was asked to do an assessment only after the May 29 attempt had failed and the technician noted a 40 R/hr dose rate at the drywell wall. Failure to adequately document the radiological hazards of this work in the ALARA work plan written for the June 2 work necessitated that all pertinent information be communicated orally. As a result of numerous failures to orally convey pertinent decisions and information regarding this job between individuals within workgroups and between work groups, the job was not delayed as was intended and workers conducting the job were not adequately informed of the potential for extreme radiological hazards to exist.

Specifically, the ALARA Coordinator made the decision to delay the job so that radiological concerns for this work could be further evaluated, and made the additional decision that the job would be carried out without placing the TIP into the core. These decisions were based on a May 29 initial attempt to complete this work. However, the ALARA Coordinator was unable to attend a June 2 prejob briefing to discuss this work, and the individual who attended in his place was unaware of his decision. The decision at the job briefing was to conduct the job by inserting the TIP. The potential for the TIP cable to become highly activated was addressed, but did not adequately convey the possible levels that could be expected and the associated hazard. The job was initiated by day shift C&I personnel with support from RP, but the majority of the work was completed by swing shift C&I and RP personnel. Swing shift personnel were also not adequately informed of the radiological hazards to be expected with this job, and were also not aware of the decision not to conduct this job by inserting the TIP into the core.

e. Safety Significance

The events of May 28, May 29 and June 2, 1992 represented a potential for individuals to receive significant doses. When a TIP is inserted into the reactor core, the TIP cable can become extremely activated by neutrons (typically due to manganese-56 in the cable), although it decays fairly rapidly (manganese-56 has a 2½ hour half-life). In this incident, the TIP and cable were new, having been installed on May 26, 1992. The TIP was inserted into the core on May 28, 1992 to initially set the mechanical stop mechanism, but the job was halted due to other plant considerations. The TIP left inserted in the core. An attempt was made to set the stop again on May 29, but readings of 40 R/hr were read on the cable as it was withdrawn so the job was stopped. A decision was then made to conduct this job without inserting the TIP into the core. On June 2, 1992, due to a communications breakdown, to complete this job the TIP was again reinserted into the core for approximately 10 minutes and then removed. In this short period of time the TIP and cable became highly activated, and when removed from the core resulted in exposures of 170, 70 and 60 mrem to the three workers. One and a half hours after this event, a contact dose rate of 300 R/hr was measured on the cable. Had the TIP been inserted into the core longer, or if the power level had been higher, the TIP and cable could have had a significantly higher source strength.

Two apparent violations were identified.

11. Concern Follow-up (IP 99024)

Discussed below is a specific concern raised about the lack of training given workers for installing and operating portable HEPA filter units. The evaluation consisted of record and procedural reviews and interviews with licensee personnel.

(Closed) Concern (AMS No. RIII-92-A-0034)

Concern: Workers were not adequately trained to install and operate portable HEPA filter units.

Discussion: During the evaluation, the inspector noted that this concern had been addressed in the 1992 QA audit of the RP program and a condition report had been issued to address the deficiency. During the evaluation the inspector noted the following: craft personnel were responsible for obtaining, installing and operating the units; there were no procedures for installing, operating, inspecting or calibrating the units; RP was performing the initial acceptance inspections of the units under Radiological

Operations Group Work Instruction 4.6 but were not directing the installation of these units and RP would only inspect the installation and operation of the units upon request by craft personnel; plant personnel were not trained to install, operate or calibrate the units; units were not being routinely calibrated (air flow and differential pressure) or surveyed. This is a weakness in the licensee's internal exposure and training programs. When interviewed, RP management acknowledged the weakness and is writing procedures for obtaining, installing, operating, surveying and calibrating the units. In addition, if the crafts are to continue installing and operating the units they will be trained. This issue was raised at the exit meeting and will be tracked during subsequent inspections. (Inspection Follow-up Item 461/92011-03)

Finding: This concern was substantiated, however, no regulatory or procedure requirement was violated.

12. Plant Tours (IP 83750, 84750)

During a tour of the turbine, auxiliary and radwaste buildings the inspectors noted the following: postings, labeling and radiological controls in the turbine and auxiliary buildings were in accordance with regulatory and licensee procedural requirements; housekeeping in the readily assessable areas of the auxiliary and turbine buildings were excellent and housekeeping in the radiologically controlled areas had improved; housekeeping in the radwaste building was adequate to poor; in the turbine building empty containers with radioactive labels and shipping markings attached were observed, material stacked in a posted radiation area had spilled under the boundary and into a corridor, and material in a posted contamination area had spread into an adjacent clean area. No other problems were observed.

No violations or deviations were identified.

13. Exit Interview (IP 83750, 84750)

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on June 5, 1992 to discuss the scope and range of the inspection.

During the exit interview, the inspector discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. Licensee representatives did not identify any such documents or processes as proprietary. The following were specifically addressed at the exit meeting.

a. Two apparent violations (Section 10).

b. The Open Item that was closed concerning the questions raised during steam separator transfer (Section 3).

c. Observations made during the plant tour including the problems noted in the radwaste building (Section 12).

d. The evaluation of the licensee's actions during and subsequent to the charcoal bed fire (Section 7).

e. Significant improvement seen in the QA audit (Section 5).

f. Findings of the evaluation of the concern raised about the training given to install and operate portable HEPA units (Section 11).