U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-333/92-07

Docket No. 50-333

License No. DPR-59

Licensee: New York Power Authority
123 Main Street
White Plains, New York 10601

Facility Name: James A. FitzPatrick Nuclear Power Plant

Inspection At: Scriba, New York

Inspection Conducted: March 30 - April 3, 1992

Inspector: [signature] 4/13/92
S. Sherbini, Senior Radiation Specialist — date
Facilities Radiation Protection Section

Approved by: [signature] 4-16-92
W. Pasciak, Chief, Facilities Radiation Protection Section — date

Inspection Summary: Inspection on March 30 - April 3, 1992
(Report No. 50-333/92-07)

Areas Inspected: A routine, announced, inspection of the radiological controls program was conducted. Areas inspected included status of previously identified items, tours of the radiological controls areas and observation of ongoing work, and reviews of the audit and self-assessment program, changes in organization and personnel, the radiological occurrence reporting system, and the ALARA program.

Results: Tours and observation of work indicated good control of radiological areas and conformance to sound radiological practices. Audits were found to be good, but some weakness was noted in the self-assessment program. Weaknesses were also noted in the radiological occurrence and the ALARA programs. The health physics technician staff appeared well trained and knowledgeable of conditions in the work areas and of ongoing work in the plant. Staffing levels were found to be good. Within the scope of this inspection, no violations were identified.

DETAILS

1.0 Personnel Contacted

1.1 Licensee Personnel

E. Alberts, ALARA Supervisor
J. Bracy, Action Plan Coordinator
R. Brown, Radiation Protection Training
* M. Colomb, Services Manager
* J. DeRoy, Maintenance Manager
* J. Flaherty, Planning Manager
* C. J. Gannon, Manager, Radiological and Environmental Services
T. Humphreys, Radiological Protection Technician
* D. Kieper, I&C Manager
* D. Lindsey, General Manager, Maintenance
* R. Liseno, General Manager, Operations
* M. McMahon, Health Physics General Supervisor
K. Pepper, Radiological Engineer
* J. Rogers, Computer Manager
* J. Solini, Radiological Engineering General Supervisor
G. Tasick, QA Superintendent
* A. Zaremba, Operations Review Manager

1.2 NRC Personnel

J. Caruso, Acting Resident Inspector

* Denotes attendance at the exit meeting on April 3, 1992.

2.0 Status of Previously Identified Items

Several items identified in a previous inspection report (50-333/92-04) were addressed and resolved by the licensee. These items included the following.

- Training material had indicated that the licensee was using a quality factor of three for the neutron spectrum on site. The source of this value was questioned, particularly since it was substantially different from the value of 10 specified in 10 CFR Part 20. In their response, the licensee stated that the neutron spectrum on site was measured in 1981, and the results of these measurements indicated that the appropriate spectrum-weighted quality factor for their reactor was 3.8. The licensee also stated that although the quality factor is discussed during training, it is not used by the technicians on site because the neutron measuring instruments read directly in units of dose equivalent. Calibration of the neutron instruments and personnel neutron dosimetry will be reviewed during a future inspection.

- The use of yellow catch containers on both contaminated and non-contaminated systems was an item of concern. The licensee stated that yellow catch containers continued to be used on contaminated systems but that green containers have been purchased and are being used on non-contaminated systems.

- Some inconsistency was observed in the manner workers taped some items of protective clothing (PC) in place after they were put on, as well as in the placement of personnel dosimetry when PCs were in use. Some of these practices were not in accordance with procedural requirements. The licensee has subsequently issued a clarification notice to all radiation protection personnel in which these inconsistencies were pointed out and the acceptable practices were described.

- A question was raised regarding the effectiveness of frisking contaminated trash that is picked up from step-off pad areas. The concern applied specifically to two areas referred to as the East and the West Crescent areas. The practice of frisking trash at step-off pads was reviewed during this inspection and was found to be good. Trash was being frisked properly, and proper contamination control measures were being used. Regarding the two specific areas, the licensee stated that they have recently changed the manner in which trash from these areas is collected. Both these areas are high radiation areas, as well as contaminated areas. The contamination area boundaries were well within the high radiation area boundaries, and trash collection had to be done by entering the high radiation areas to reach the step-off pads. The licensee stated that the step-off pads have been moved to the entrances to the high radiation areas. In this manner, the technicians who pick up the trash bags, as well as the HP technicians who frisk these bags, no longer need to enter the high radiation area. The licensee stated that this measure represents an ALARA improvement. No further concerns were identified.

- A concern was also expressed regarding possible poor practices used in taking smears in the radiological controls areas. The training of technicians on taking smear was reviewed, as well as the procedure describing the acceptable techniques. Both were found to be good. Some field observations of smear techniques were also made, but no problems were identified. Although this does not necessarily mean that some technicians do not use poor technique, there were no indications of poor practices. However, survey techniques will continue to be reviewed during future inspections.

3.0 Organization and Staffing

Several changes in key positions within the health physics organization (Radiological and Environmental Services, RES) were made since the previous NRC inspection. The changes consisted mainly in re-assignment of department staff to different positions within the department. The main changes involved the following personnel: the acting General Health Physics Supervisor (GHPS) was assigned to oversee special projects and his place was taken by the Radiological Engineering General Supervisor. The GHPS position is equivalent to the HP operations supervisor in other power plant organizations, the supervisor in that position being responsible for overseeing the activities of the in-plant HP technician staff. The Radiological Engineering General Supervisor position was filled by the former Health Physics General Supervisor who, until this reorganization, had been on special assignment. The ALARA Supervisor was assigned to the position of Health Physics Supervisor in charge of the drywell on back shifts, and a Health Physics Supervisor was assigned to the ALARA Supervisor position. The licensee stated that these changes were made partly because of a lack of a sufficiently rapid improvement in performance in the RES Department, and also as a result of several recent incidents that suggested that significant weaknesses remained in several RES program areas. The licensee stated that the changes should prove beneficial because the persons newly assigned to these positions bring a different perspective that may prove helpful. The newly appointed personnel are all qualified to fill their respective positions, and the success of this reorganization will be evaluated during future inspections.

Another recent reorganization involved transferring responsibility for the respiratory protection and instrumentation programs from the ALARA supervisor to a supervisor dedicated to this task. The licensee stated that these programs had taken up a substantial amount of the ALARA supervisor's attention, to the detriment of the ALARA function. The transfer will free the ALARA supervisor to devote all of his attention to ALARA activities.

In an attempt to improve the effectiveness of the ALARA liaisons, the liaison positions were redefined as ALARA planners, and the planners were assigned to work full time in the departments to which they are assigned. ALARA planners are experienced HP technicians who are assigned, one to each of the site departments, to assist these departments in any activity that may involve planning, preparation, or implementation of work involving radiation exposure. The licensee stated that the change from liaison to planner was designed to ensure a closer integration of the planners into the activities of their assigned departments. Operationally, the change means that the planners became more a part of their assigned department's staff than the liaisons had been in the past, but the planners still ultimately report to the ALARA supervisor. The licensee also stated that, although the ALARA planners were initially intended to serve their function only during outages, they are considering extending this function to a continuous one, or at least to bring the planners to their assignments during the early phases of outage planning and preparations.

The staffing level during the outage has been increased substantially, particularly the number of field senior HP technicians. The permanent senior HP technician staff is 15, and this number was augmented by 55 senior contractor technicians. The ALARA technician staff was also increased by over ten contractor technicians. This number of technicians appeared adequate to support outage activities.

4.0 Tours of the Radiological Controls Areas (RCA)

Several tours of the RCA were conducted during this inspection. The tours included verification of postings, assessment of housekeeping, observation of access control activities, and observation of ongoing work. Observations during the tours showed that the radiological areas were well posted with clearly visible and well maintained signs. Random verification of radiation fields showed that the postings were also appropriate. Housekeeping was found to be good, with all areas being routinely and frequently cleaned. Protective clothing supply bins were well stocked, and contaminated trash and protective clothing were regularly picked up from step-off pad areas at frequencies that prevented excessive accumulation or overflow.

Observation of work activities in radiation and contamination areas showed that radiation workers were following good radiological practices. Protective clothing was properly put on and removed and properly taped, as was respiratory protection equipment. Dosimetry was also found to be properly used. HP technician presence in the field was quite evident, and the HP technicians were present at all high exposure potential work observed during the tours. The HP technicians were also found to be knowledgeable about the radiological conditions in their areas and of the details of the work they were charged with monitoring. HP technicians providing access briefings were also found to be technically competent and aware of the radiological conditions within the RCA and of the details of ongoing work activities.

The above observations indicated that the HP technicians appeared to be competent, well trained, and dedicated. Radiation workers also appeared to be well trained and to observe good radiological practices. These observations, however, do not warrant the conclusion that radiological work always proceeded without problems. As will be discussed in a later section of this report (Section 6.0), problems did develop, but it appeared that many of these problems were caused by improper planning and preparations, or poor procedures, rather than by poor worker practices.

5.0 Audits and Surveillances

The self-assessment program on site consists of two components, one being the audits and surveillances conducted by the QA department, and the other is a self-assessment conducted by the RES department. A review of the audits and surveillances conducted by the QA department showed that these activities were properly conducted, and that the audits and surveillances were of good quality and identified important program weaknesses. The identified weaknesses were also being tracked by RES and actions had been taken or were pending to address the findings.

The self-assessment program for RES is described in the site's Radiation Protection Manual. According to the Manual, periodic surveillances of the various program elements of the radiation protection program are to be performed at a frequency that will ensure that each functional area of the program is reviewed annually. Although the Manual uses the word surveillance in describing the program, the description of the aims of the program makes it clear that the intent is to perform audits or assessments rather than surveillances. Furthermore, the program is not well defined in the Manual, and there is no implementing procedure to supply the necessary details. Undefined elements of the program included the requirements regarding the qualifications and affiliation of the person or persons who should audit each program element, the distribution of the findings, and the system to be used to ensure that the findings lead to actions to correct the identified weaknesses.

A major assessment of RES was recently undertaken by a team of contractor specialists. This assessment identified major weaknesses in the RES Department, and the licensee has developed a plan to correct these weaknesses. Some of the elements of this plan have already been implemented. The licensee stated that this major audit is considered part of the department's self-assessment effort, and that a program is currently being developed to ensure that periodic assessments of RES continue to be performed. The licensee also stated that the new program will include a substantial role for the corporate health physics group. Progress in this area will be reviewed during a future inspection.

6.0 Radiological Incident Reporting Program

The Radiological Incidence Reporting (RIR) program is described in the Radiation Protection Manual, Chapter 18, and is implemented in Procedure RPP-7, "Radiological Incident Investigation and Reporting". The procedure, as well as implementation of the program, was reviewed in a previous NRC inspection report (50-333/91-19), and the program was found to have some weaknesses. A review of the current status of the program showed that the previously identified weaknesses remained. One weakness was the restricted scope of the corrective actions. As an example, a recent audit identified a problem with contamination control in a tool storage location. Although corrective actions were taken, that action was not extended to all tool storage locations that may have the same type of problem. The existence of a contamination problem at a different tool storage area was discovered following a contamination incident that resulted from use of one of these areas. Another weaknesses in implementation of the RIR system was the occasional lack of an adequate analysis of incidents to identify program weaknesses. A review of the RIRs generated during 1992 showed that this continued to be a problem. As an example, RIR #92-005 described an incident in which unexpected high airborne radioactivity was encountered when a contaminated system was opened. The description of the incident was found to be unclear in many respects. In addition, the analysis of the incident did not address a number of important issues. One of the conclusions of the analysis was that the persons involved in planning the work did not have sufficient experience. However, it was not clear whether this lack of experience was a matter of training, poor qualifications, or the unusual or rare nature of the incident. It was not clear if this was the first time a situation of this kind occurred on site (to explain the lack of experience). The analysis also concluded that the work review was inadequate, but it was also not clear what in the review was inadequate. This example was not unique, and some other RIRs showed the same type of deficiency.

The RIR procedure was revised recently, and the new procedure was reviewed during this inspection and was found to be a substantial improvement over the older version. The new procedure is more easily implemented and the process less subject to individual decisions than was previously the case. It also provides more detailed guidance on generating RIRs and on conducting investigations and critiques. The procedure was implemented recently, and its effects on the RIR process are still not clear. However, a review of some recent RIRs showed substantial improvements and higher sensitivity to indications of programmatic weaknesses. Some of these recent RIRs have in fact led to important changes in the radiological controls program. As an example, an RIR connected with poor control of a locked high radiation area key led to changes in the key control program. Another RIR that indicated a weakness in the ALARA review process led to important changes in the format of ALARA reviews and in the manner in which pre-job briefings are conducted. Other changes in progress that were triggered by RIRs include better definition of radiological hold points in procedures, better training of HP technicians on the meaning and implementation of hold points, and a better system to verify the effectiveness of engineering controls. The licensee also stated that the persons charged with investingating incidents will be more carefully chosen to avoid conflicts of interest that result when persons are charged with investigating problems within their own areas of responsibility.

Some weak points in the revised RIR procedure were noted. According to the Radiation Protection Manual, although an RIR is generally initiated by an RES technician, anyone may initiate the RIR. However, the RIR procedure requires the initiator to provide information on the RIR form that is not normally readily available to persons outside the HP field operations organization. This information includes the names of personnel involved, survey numbers, hot particle log number, air sample results, and similar information, including immediate corrective actions. Such requirements may discourage persons from initiating RIRs. Another possible weakness in the RIR program is the classification system in use for the RIRs. In accordance with the procedure, all RIRs are classified into one of three severity levels, Level I being the most severe. Level I incidents are essentially incidents that require some type of notification to the NRC or other regulatory body, and represent severe incidents that rarely occur at any site. Guidance is provided on the method to be used to classify incidents into Level II or Level III, the guidance being in the form of lists of classes of events that fall into each category. Level I RIRs are reviewed by management up to the General Manager for Operations Level II RIRs go up to the RES Manager, and Level III RIRs up to the Health Physics General Supervisor.

It is clear from the classification system in use that the levels reflect the importance with which these incidents are to be viewed by site management. However, Level III incidents include events that may be important indicators of significant program weaknesses. For example, violations of RWP and procedural requirements, as well as poor radiological practices, are classified as Level III events. A review of the RIRs showed that although some of the Level III incidents were in fact minor in their programmatic implications, such as a minor mistake on the part of the worker involved, others were not minor. For example, there were two incidents that involved workers entering and working in areas where the dose rates were later found to have been significantly higher than expected, the workers having essentially worked in unsurveyed areas. In both cases, the reason was an activity by the Operations Department that caused a change in the radiation fields in the work area. These activities included draining a system and transferring radioactive water from one storage area to another. In both these cases, the HP Department failed to incorporate the effects of such actions into their preparations for entries into the affected areas, and failed to survey the areas after these actions were taken by Operations. The reasons for these failures, at least in one case, were either a failure on the part of HP to understand the significance of the actions taken by Operations, or a failure to transmit the information to the persons responsible for planning the entries. Both RIRs addressing these incidents were classified as Level III incidents, indicating the lowest level of significance. Yet, both incidents indicate a significant deficiency in the manner information is transmitted and understoood between departments.

The licensee stated that the RIR system was revised only recently and that the progress of the revised system will be monitored and changes will be made based on the results. This area will therefore be reviewed during future inspections.

6.0 ALARA

The cumulative radiation exposure for 1991 was 292 man-rem, and the goal for that year was 293 man-rem. Although not a refueling outage year, the plant was shut down for a considerable period of time (over three months total), once in connection with a release of radioactive material from an auxiliary boiler, and a second time to replace a major valve in the safety injection system. Only minor general maintenance was done during these shutdown periods.

The goal for 1992 is 650 man-rem, and the goal for the ongoing refueling outage is 508 man-rem. The exposure to-date for the outage is 235 man-rem (based on direct reading dosimetry data, which generally tends to be on the high side), and the outage was in its 82nd day at the time this figure was current. The licensee estimated that refueling will be complete in about two months, but the outage will probably extend beyond that date to accommodate some other work.

The licensee initiated hydrogen water chemistry several years ago in an attempt to prevent intergranular stress corrosion cracking. They also started zinc injection at the same time. The licensee stated that experience in the industry had demonstrated that hydrogen water chemistry produces a substantial increase in shutdown radiation fields, and that zinc injection reduces or reverses this trend. The licensee stated that their experience was disappointing in that the radiation fields did increase following hydrogen water chemistry/zinc injection. However, the fields did not increase as much as would have been expected under hydrogen water chemistry alone. The licensee also stated that a significant fraction of their current shutdown radiation fields are due to Zn-65 in the system. The Zn-65 is generated by the activation of Zn-64, which makes up about half of the natural zinc injected into the system. In an attempt to reduce this component of the radiation field, and also to reduce the volume of radioactive waste generated, the licensee stated that they intended to use depleted zinc during the next cycle. The depleted zinc will initially have less than 10% of the Zn-64 isotope, and the zinc concentration will be raised to about 7 ppb (parts per billion. The currently used level is 5 ppb). Eventually, depleted zinc with less than 1% Zn-64 will be used and the concentration will be raised to about 10 ppb. The higher concentration is hoped to produce a greater beneficial effect. The licensee stated that they currently perform chemical decontamination of major parts of their system at refueling outages. They felt the decontamination performed this outage was successful, with a decontamination factor for general area dose rates of about three. It is anticipated that the use of depleted zinc may make the periodic chemical decontaminations unnecessary, or at least make a reduction of decontamination frequency acceptable.

Other ALARA efforts on site are concentrated on job-specific efforts. The licensee stated that they found the ALARA reviews to have been difficult to read and to understand by the workers who used them. The ALARA pre-job briefings were also found to have been too brief and too incomplete to serve their intended purpose. As a result, the licensee has recently changed the format of the ALARA review forms, and the ALARA pre-job briefings are conducted in a manner designed to ensure that the worker clearly understood the requirements for the job. The licensee also stated that they found that exposure tracking for individual jobs, as well as post-job reviews, were not being done properly, and these two functions have also been improved. The ALARA staff has also been augmented for the duration of the outage by the addition of 13 contractor technicians. These changes in the ALARA program are new, and it is too early to assess their impact, but the results will be reviewed during future inspections.

Discussions with the site staff suggested that ALARA efforts in the area of design modifications and materials and equipment procurement were still weak, as was ALARA input into planning activities. The licensee stated that they intended to accelerate changes in these area. Discussions with corporate personnel indicated that much activity in this area was in progress at the corporate level. Corporate engineers associated with plant design and modifications have been trained in the principles of ALARA, and a procedure has been developed for use during design reviews to ensure incorporation of ALARA measures in these reviews. The licensee stated that large design packages were being reviewed at the corporate offices but that smaller projects were being sent to the site for review. However, it appeared that the site reviews of these smaller packages had until recently been limited to implementation reviews and did not include an adequate design review. The licensee stated that the changes in the corporate ALARA program have been in progress for several years and that they have only very recently been developed to a satisfactory level, and that a corresponding site effort was forthcoming. The licensee also stated that they have been actively developing a corporate cobalt reduction program, and that this program was also still in its final stages of development. However, some progress has been made in cobalt reduction. For example, the licensee stated that about two thirds of the control rod blades, which are major sources of cobalt, have already been replaced with cobalt-free blades. Some progress has also been made in reducing the cobalt contribution from valves containing stellite, a high-cobalt alloy. A system to identify components that contain cobalt with a view to possible replacement is also being developed. Since these programs have only recently reached their well-developed forms, and have not had sufficient time to produce their full impact, progress in these areas will be reviewed during future inspections.

7.0 Exit Meeting

A meeting was held with licensee representatives at the end of this inspection on April 3, 1992. The inspector reviewed the purpose and scope of the inspection and discussed the inspection findings.