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REGION II
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Report No.: 50-302/94-13

Licensee: Florida Power Corporation
3201 34th Street, South
St. Petersburg, FL 33733

Docket No.: 50-302 License No.: DPR-72

Facility Name: Crystal River 3

Inspection Conducted: May 16-20, 1994

Inspectors: D. B. Forbes for
F. N. Wright — June 10, 1994 Date Signed

D. B. Forbes for
B. A. Parker — June 10, 1994 Date Signed

Approved by: William H Rankin
W. H. Rankin, P. E., Chief — June 10, 1994 Date Signed
Facilities Radiation Protection Section
Radiological Protection and Emergency Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection of the licensee's radiation protection (RP) program involved the review of occupational exposures and implementation of new 10 CFR Part 20 requirements. The occupational exposure review included: audits and self-assessments; changes to the program; outage planning and preparation; training and qualifications; external and internal exposure controls; control of radioactive materials and contamination surveys and monitoring; and maintaining occupational exposure As Low As Reasonably Achievable (ALARA). The implementation of the new 10 CFR Part 20 requirements was evaluated utilizing Temporary Instruction 2515/123, "Implementation of the Revised 10 CFR Part 20." The review focused primarily on the areas of: high and very high radiation areas; Total Effective Dose Equivalent/ALARA program implementation; planned special exposures; and dose to the embryo/fetus for declared pregnant women.

Results:

Based on interviews with licensee personnel, records review, and observation of work activities in progress, the inspector found the RP program to be adequately managed. Internal and external exposure control programs were effectively implemented with all exposures within 10 CFR 20 limits. ALARA activities appeared to be receiving management support as evidenced by budget appropriations for equipment beneficial in dose reductions. Program strengths included: the use of personnel with Health Physics (HP) experience on RP program audits; General Employee Computer Based Training; and training provided to contract HP technicians.

Revisions to the RP program incorporating new requirements of 10 CFR Part 20 were made effective October 1, 1993. The new requirements, as focused by the inspection procedures, were appropriately incorporated into the RP program.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*D. Barker, Health Physics Supervisor/Instructor
*D. Bates, Nuclear Quality Control Supervisor
*S. Burns, Site Engineer
*R. Davis, Nuclear Plant Maintenance Manager
*P. Ellsberry, Nuclear Technical Training Supervisor
S. Garry, Corporate Health Physicist
*P. Genoa, Nuclear Support Specialist
*S. Johnson, Chemistry and Radiation Protection, Manager
W. Lagger, Health Physics Supervisor
*J. Maseda, Nuclear Operations Engineering Manager
*B. McLaughlin, Nuclear Regulatory Specialist
*P. Rubio, Principal Electrical Engineer
S. Sullens, Quality Programs Lead Auditor
*D. Wilder, Radiation Protection Manager
*K. Wilson, Nuclear Licensing Manager
*R. Yost, Quality Systems Supervisor

Other licensee employees contacted during the inspection included technicians, maintenance personnel, and administrative personnel.

Nuclear Regulatory Commission

*R. Butcher, Senior Resident Inspector
*T. Cooper, Resident Inspector

*Attended May 20, 1994 Exit Meeting

Abbreviations used throughout this report are defined in the last paragraph.

2. Audits and Appraisals (83750)

10 CFR 20.1101(c) requires that the licensee periodically review the RP program content and implementation at least annually.

Licensee activities, audits, and appraisals were reviewed to determined the adequacy of licensee's identification and corrective action programs for deficiencies or weaknesses related to the control of radiation or radioactive material.

The licensee had recently completed the 1994 annual audit in the RP program area. Licensee audit "94-04 Chemistry, Radiation Protection, Environmental and Waste," was conducted during the period of March 28, 1994 through April 22, 1994. The audit was led by a qualified auditor and included 10 team members for various periods of the review. The audit team was comprised of four qualified auditors of the QA staff, a

radiological instructor, a licensing engineer, three representatives from other utilities, and a consultant. The inspector determined that many of the audit team members possessed technical backgrounds in the areas they audited including HP. The inspector reviewed the scope, objectives, and checklist for the audit and determined that the audit plans were adequate for program assessments.

The audit report for the most recent HP review had not been issued at the time of the inspection. However, the inspector reviewed a draft of the report and discussed the findings with the lead auditor. Four findings were identified during the audit requiring documentation in licensee Problem Reports and corrective action. Approximately 18 recommendations were also included in the report. Recommendations were identified for management to consider for enhancements in compliance, efficiency, and cost effectiveness of an activity or process. The recommendations addressed technical and quality issues.

The licensee's audit staff had recently obtained an individual with HP experience to audit RP activities. Since the individual had just transferred from the site's HP staff the individual was excused from participation in the 1994 HP audit. The inspector reported that the use of auditors and consultants having technical backgrounds in the areas under review indicated the licensee was making efforts to improve the quality of the chemistry and HP programs.

The inspector reviewed the licensee's method for capturing and documenting radiological problems and potential generic issues, which was in the form of PRs. The inspector noted that the PR system was plant-wide and could be initiated by anyone for a variety of problems/concerns, including radiologically-related issues. After initiation, a PR was then assigned to the appropriate discipline(s) for disposition and tracked to ensure followup. The inspector noted that only a few PRs had been assigned to HP since the last inspection. During review of selected PRs, the inspector noted that the licensee was identifying substantive items of concern and was following through with appropriate corrective actions to prevent recurrence. No significant concerns arose from the review of PRs.

No violations or deviations were identified.

3. Changes (83750)

Changes in organization, personnel, facilities, equipment, programs, and procedures, from the previous inspection, were reviewed to assess their impact on the effective implementation of the occupational RP program.

The inspector reviewed and discussed with licensee representatives changes made to the HP organization and staffing levels since the last inspection of this area. The last inspection was conducted December 1993, and documented in IR 50-302/93-29. The licensee had not made any additional changes in the HP organization since the previous inspection. However, the licensee had made significant changes in the

number of contract HP technicians utilized during the RFO-9. In the previous RFO, the licensee had utilized approximately 127 contract HP technicians and the licensee utilized only 77 HP technicians in RFO-9. The inspector determined through interviews with licensee personnel that the reduction had caused some delays in HP response during periods of peak outage activity. However, HPs reported that the periodic shortages had not resulted in inadequate RP coverage or significant outage delays. At the time of the inspection, outage dose appeared to be significantly less than projected. No problems with a lack of proper HP coverage were identified by the inspector in the areas reviewed.

No violations or deviations were identified.

4. Outage Planning and Preparation (83750)

Licensee activities and documents were reviewed to determine the adequacy of management and staff efforts in planning and preparation of radiation work.

At the time the inspection concluded, the licensee was in day 44 of 60 days allotted for RFO-9 and about 30 hours behind in the schedule. The inspector determined that the HPs had worked closely with the site planning staff in planning the outage activities. HP technicians were assigned to work with the planning organization several months prior to the outage. The HPs worked to reduce the collective personnel exposures and rework with the outage task. Outage planning activities included the contract of additional HP support, providing outage task information to HP technicians on the nature of specific outage work, and preparation of ALARA considerations such as, the use of shielding and engineering controls, training, and mock-ups. The licensee also attempted to limit the amount of emergent work throughout the outage.

The HP supervisory and management personnel maintained 24 hour supervision of RP activities to monitor implementation of the outage plan. The inspector determined that there was adequate management support for planning and implementing effective radiological control measures for the RFO.

No violations or deviations were identified.

5. Training and Qualifications (83750 and TI 2515/123)

Training and qualifications were reviewed to determine whether HP technicians were qualified in accordance with the licensee's standards and procedures, that radiation workers were receiving appropriate instructions for their work assignments, and that the licensee had incorporated the changes of 10 CFR Part 20 in the various training programs.

The inspector reviewed the training records for selected radiation workers, contract HPs, and plant HPs. All reviewed training records were in order.

a. General Employee Training

10 CFR 19.12 requires, in part, that the licensee instruct all individuals working in or frequenting any portion of a restricted area in the health protection aspects associated with exposure to radioactive material or radiation; in precautions or procedures to minimize exposure; in the purpose and function of protection devices employed; in the applicable provisions of the Commission regulations; in the individual's responsibilities; and in the availability of radiation exposure data.

The inspector reviewed the GET lesson plan GT-001, "Green Badge/Fitness for Duty/Yellow Badge," Rev. 20, dated April 25, 1994, for radiation workers. The training could be provided by classroom lecture or Computer Based Training. The inspector reviewed portions of the computer based training and noted that the course material was logically presented and user friendly. The inspector determined that the instructions provided to individuals working in or frequenting a restricted area were appropriate.

No violations or deviations were identified.

b. Health Physics Technician Training

The inspector reviewed continuing training presented to the HP technicians. Licensee procedure TDP-303, "Health Physics Technician Training Program," Rev. 12, dated April 15, 1994, described the initial and continuing training programs for HP technicians. The inspector noted that the training material included a review of new equipment, procedural changes, observed weaknesses, industry events, hazardous materials, ALARA activities at the facility, various plant systems, and emergency response.

The inspector also discussed with licensee representatives their methods for receiving and incorporating feedback and plant needs into the training program. The licensee improved and maintained the training program current through assignments of HP personnel to the training department, input from corporate HP, training staff's reviews of industry events, and IE Notices.

No violations or deviations were identified.

c. Contractor Radiation Control Technician Qualifications

The inspector reviewed training records and qualifications (resumes) for selected HP contract technicians involved in RFO-9 activities. The inspector reviewed ST-1024, "Plant Specific

Training," Rev. 1, dated January 24, 1994. The lesson plan was part of the HP Contractor Technician Training program and appeared to be thorough and contained useful information concerning requirements, procedures and industry events. The training provided to the technicians began with a review of the requirements for a particular activity and was followed with the licensee's policy and procedures for implementing the specific requirement. The training for the contract HP technicians in RFO-9 was approximately five days in length with approximately two days on new 10 CFR Part 20 requirements and three days on the licensee's implementing procedures. Interviews with HP technicians were made concerning the training provided and all comments concerning the content, method of presentation and instructors' abilities were very good. For the records reviewed, the inspector determined that the contractor technicians met or exceeded ANSI Standard N18.1-1971 qualifications and had completed GET, indoctrination training, examinations, and procedural reviews in accordance with licensee requirements.

No violations or deviations were identified.

d. Implementation of Revised 10 CFR Part 20 Requirements in Training Programs

The inspector reviewed various aspects of the licensee's HP and GET training programs with respect to incorporation of information related to implementation of the revised 10 CFR Part 20.

The inspector determined that the licensee had began developing training procedures for the new 10 CFR Part 20 requirements in 1991. The inspector reviewed the following "Special Training" lesson plans for implementation of 10 CFR Part 20 requirements:

- ST-1177, "10 CFR 20 Rev. Changes for GET," Rev. IC-2, dated October 27, 1993. The training was provided to radiation workers through the Computer Based Training or classroom lecture. The training was initially offered in July 1993 and prior to the licensee's implementation of the new 10 CFR Part 20 requirements in October 1993. All personnel that had not received their training prior to the October 1 implementation date had their security access badges removed from service until the training was completed. The presentation of the ST-1177 procedure required approximately 1.5 hours.

- ST-1174, "Revision to 10 CFR 20," Rev. 0, dated May 18, 1993. The training was provided to technical and management staffs prior to implementation of the new requirements October 1, 1993. The ST-1176 lesson plan required approximately four hours to complete.

- ST-1176, "Revision To 10 CFR 20," Rev. 0, dated August 10, 1993. The training was provided to HP technicians, prior to implementation of the new 10 CFR Part 20 requirements. The ST-1176 lesson plan was very detailed and required approximately 40 hours to complete.

- ST-1024, contained the site specific information on licensee procedures for implementing the new 10 CFR Part 20 requirements and was provided to contract HP technicians.

The lesson plans contained the necessary elements for implementation of the revised 10 CFR Part 20. The inspector noted that the training material appropriately included an introduction to revised 10 CFR Part 20 terminology, definitions, and regulatory limits. The training also included information concerning PSE, TEDE ALARA considerations, doses to embryo/fetus, requirements for declared pregnant women and VHRA controls and posting requirements. The licensee also made available handouts, containing information about specific radiation protection practices, that were provided near the main RCA access point. Some of the handouts addressed new 10 CFR Part 20 requirements including HRA and VHRAs, TEDE ALARA considerations, PSEs, prenatal radiation exposure policy, dose limits and dose terms. The handouts provided radiation workers with an additional source information concerning 10 CFR Part 20 changes that could be quickly referenced and reinforce training objectives.

The inspector reported to licensee representatives that the training program for both general employees and licensee HP technicians appeared to adequately address the facility's procedural changes associated with the revised 10 CFR Part 20 requirements and no concerns were noted with the training material. The licensee's Computer Based Training GET that was provided for the instruction of the revised 10 CFR 20 requirements appeared to be a good training tool and was considered a program strength.

No violations or deviations were identified.

6. External Exposure Control (83750 and TI 2515/123)

This area was reviewed to determined whether personnel dosimetry, administrative controls, and records and reports of external radiation exposure met regulatory requirements.

10 CFR 20.1201(a),(b),(c),(d),(e), and (f) requires that the licensee shall control the occupational dose to individual adults to annual limits specified.

a. Personnel Dosimetry

10 CFR 20.1502(a) requires each licensee to monitor occupational exposure to radiation and supply and require the use of individual monitoring devices for:

(1) Adults likely to receive, in one year from sources external to the body, a dose in excess of 10 percent of the limits in 10 CFR 20.1201(a);

(2) Minors and declared pregnant women likely to receive, in one year for sources external to the body, a dose in excess of 10 percent of any of the applicable limits of 10 CFR 20.1207 or 10 CFR 20.1208; and

(3) Individuals entering a HRA or VHRA.

10 CFR 20.1501(c) requires that dosimeters used to comply with 10 CFR 20.1502(a) shall be processed and evaluated by a processor accredited by the NVLAP for the types of radiation for which the individual is monitored.

During tours of the plant, the inspector observed proper use of TLDs and PICs. Based on direct observation, discussion and review of records the inspector determined that the licensee's personnel dosimeters were being effectively utilized.

No violations or deviations were identified.

b. Administrative Controls for External Exposures

10 CFR 20.1201(a) requires each licensee to control the occupational dose to individual adults, except for planned special exposures under 10 CFR 20.1206, to the following dose limits:

(1) An annual limit, which is the more limiting of:

(i) The total effective dose equivalent being equal to 5 rems; or
(ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems; and

(2) The annual limits to the lens of the eye, to the skin, and to the extremities, which are:

(i) An eye dose equivalent of 15 rems; and
(ii) A shallow-dose equivalent of 50 rems to the skin or to any extremity.

The inspector reviewed and discussed with licensee representatives external exposures for plant and contract personnel for the period December 1993 through May 1994. The highest external exposure totals for individuals at Crystal River in 1993 were 560 mrem (whole body), 3,155 mrem (skin), 3,155 mrem (extremity), and 560 mrem (lens of eye). The highest external exposure totals for individuals at Crystal River in 1994, at time of inspection, were 2,002 mrem (whole body), 2,681 mrem (skin), 5,994 mrem (extremity), and 2,006 mrem (lens of eye). All exposures were below regulatory and licensee administrative exposure limits.

The inspector reviewed licensee procedure, HPP-106A, "Radiation Work Permit Procedure," Rev. 3, dated March 12, 1994. The inspector reviewed selected RWPs for their work activity and determined that they appeared to prescribe adequate RP requirements for the assigned task. The inspector observed plant workers being interviewed by the HP technicians at the main control points. HP technicians were asking workers appropriate questions to determined the nature and scope of the worker's specific task. The technicians would review recent radiological survey information, discuss the radiological hazards that might be encountered by the workers, and provide appropriate radiological protection coverage and guidance for the work.

The licensee maintained RWPs on a computer system titled RDMS. RDMS provided RCA entry eligibility verifications, dose and dose margin information for individuals entering a RWP and an automated data acquisition system for characterizing and reporting RWP information such as collective dose. The system tracked personnel exposures to ensure adherence to procedural administrative allowances as well as 10 CFR Part 20 limits. The inspector observed personnel utilizing the RDMS to review RWP requirements and log PIC values into the system.

The inspector observed HPs in the plant monitor worker activities in their assigned locations, perform radiation and contamination surveys, and advise workers on appropriate radiological protection procedures.

No violations or deviations were identified.

c. High Radiation Areas

Licensee TS 5.8.1 required, in part, that each HRA with radiation levels greater than or equal to 100 mrem/hr but less than 1,000 mrem/hr (measured at 30 cm) be barricaded and conspicuously posted as a HRA. In addition, any individual or group of individuals permitted to enter such areas were required to have a RWP and be provided with or accompanied by: (1) a radiation monitoring device which continuously indicated the radiation dose

rate in the area, (2) a radiation monitoring device which continuously integrated the dose rate in the area, or (3) an individual qualified in RP procedures with a radiation dose rate monitoring device.

Licensee TS 5.8.2 required, in part, that each HRA with radiation levels greater than or equal to 1,000 mrem/hr (measured at 30 cm) be locked or continuously guarded to prevent unauthorized entry. Keys for the locked HRA doors shall be maintained under the administrative control of the Shift Supervisor on duty or HP supervision and remained locked except during periods of access by personnel.

Licensee TS 5.8.3 required that individual HRAs with radiation levels greater than or equal to 1,000 mrem/hr at 30 cm, accessible to personnel, that are located within large areas such as reactor containment, where no enclosure exists for purposes of locking, or that are not continuously guarded, and where no enclosure can be reasonably constructed around the individual area, shall be barricaded and conspicuously posted, and a flashing light activated as a warning device.

During tours of the Auxiliary and Intermediate Buildings, the inspector noted that all HRAs were locked and/or posted as required. During tours of the Containment Building, the inspector noted that all HRA were locked and/or posted as required and when locking of HRAs was not practicable the areas were barricaded, posted, and a flashing light was utilized as a warning device. During discussions with licensee representatives, the inspector determined that the HP staff maintained HRA keys in a key cabinet at the HP station near the main RCA access point. The licensee maintained records for each use of a Locked HRA to ensure adequate key control for the Locked HRAs. The inspector also determined that the Shift Supervisor in the main Control Room maintained a set of keys with a master key to HRAs at his work station.

No violations or deviations were identified.

d. Very High Radiation Areas

10 CFR Part 20.1602 requires, in addition to the requirements for entry into a HRA, the licensee institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads or more in 1 hour at 1 meter.

Section 6.2.2.3 of the "Radiation Protection Standard," Rev. 1, dated February 17, 1994, and HPP-214, "Very High Radiation Area Controls," Rev. 0, dated August 26, 1993, provided the licensee's policy and detailed procedures for access controls and protective measures required to regulate access to VHRAs. The procedures were detailed and provided sufficient guidance for adequate

controls of VHRAs. The procedures defined VHRAs in accordance with requirements, described entry requirements, measures to control access into VHRAs (administrative and engineering controls), radiation protection staff responsibilities and described posting requirements. Licensee procedure HPP-214 stated that there were no accessible VHRAs at the plant when the unit was operating within licensee parameters. The procedure also listed areas known to be VHRAs during RFOs and areas having the potential for becoming VHRAs during specified events. The inspector determined that the requirements for controlling access to VHRAs were adequately described in site training programs for radiation worker and HP technicians. The inspector inspected access postings and controls for areas controlled as VHRAs and found the areas were appropriately posted and secured.

No violations or deviations were identified.

e. Notices to Workers

10 CFR 19.11(a) and (b) require, in part, that the licensee post current copies of 10 CFR 19, 20, the license, license conditions, documents incorporated into the license, license amendments and operating procedures, or that a licensee post a notice describing these documents and where they may be examined.

10 CFR 19.11(d) requires that a licensee post NRC Form-3, Notice to Employees. Sufficient copies of the required forms are to be posted to permit licensee workers to observe them on their way to or from licensee activity locations.

During the inspection, the inspector verified that NRC Form-3 was posted properly at various plant locations permitting adequate worker access.

No violations or deviations were identified.

7. Internal Exposure Control (83750 and TI 2515/123)

This area was reviewed to determine the adequacy of licensee's use of process and engineering controls to limit exposures to airborne radioactivity, adequacy of respiratory protection program, licensee's administrative controls for assessing the TEDE in radiation and airborne radioactive materials areas, assessments of individual intakes of radioactive material, and records of internal exposure measurements and assessments.

a. Use of Process or Engineering Controls

The licensee's RWP procedure, HPP-106A, required engineering controls be prescribed, when feasible and/or practical, to control the concentrations of radioactive material in air. The use of process and engineering controls to limit airborne radioactivity

concentrations in the plant were discussed with licensee representatives. During tours of the facility, the inspector observed the use of engineering controls such as containments and HEPA filters.

No violations or deviations were identified.

b. Respiratory Protection Program

The inspector reviewed the licensee's training program, policy, procedures to initiate the implementation of 10 CFR Part 20.1702, "Use of Other Controls," focusing on the requirement to maintain worker TEDE ALARA while performing work in radioactive material areas.

Section 6.6 and the Technical Bases Number 7 of the RPS and HPP-106A required the licensee maintain TEDE ALARA barring other risk considerations, by use of: access control; limitation of exposure time; or the use of respiratory protection equipment. Enclosure 3 of the HHP-106A procedure, "Total Risk Assessment Guidelines For Respiratory Protection Selection," outlined a method of performing a total risk assessment when determining the need for respiratory protection. The inspector determined that the licensee had been reducing respirator usage for several years as a result of the total risk evaluations. The licensee had realized that in many cases the use of respirators could result in a greater health risk, considering hazards such as physical stress or falls to the individual, than the radiological risk without the respirator. As a result, the licensee began considering total risk for a radiation worker whenever respiratory protection was being considered. As stated in the licensee's procedure, "When the total risk has been assessed and the radiation dose has been determined to be the prime risk component, then maintaining the TEDE ALARA becomes a major consideration." The procedure provided appropriate guidance for the HP staff to use in determining whether respirators were appropriate considering the radiological conditions. The inspector reviewed selected licensee records of risk assessments and TEDE ALARA reviews for respirator usage and verified that the procedures were being implemented.

Through discussions with licensee representatives, the inspector determined that the licensee appeared to be gaining worker acceptance for a general re-evaluation of its respiratory protection program and the reduction of respirator use consistent with TEDE ALARA. The number of respirators utilized in RFOs continued to decline. Licensee representatives reported that approximately 5,500, 2,400, and 1,000 respirators had been utilized in RFOs 7, 8, and 9, respectively. The numbers included the issuance of respirators for non-radiological purposes. The licensee was unable to promptly quantify a total collective dose reduction for the TEDE ALARA program. However, the licensee reported that some task completed without respirators had resulted

in some dose savings. Based on those reviews and discussions with licensee representatives, the inspector determined that the licensee had made efforts to maintain TEDE exposures ALARA.

No violations or deviations were identified.

c. Internal Exposure Assessments

10 CFR 20.1204 stated that for purposes of assessing dose used to determine compliance with occupational dose equivalent limits, the licensee, when required to monitor internal exposure, shall take suitable and timely measurements of concentrations of radioactive materials in air, quantities of radionuclides in the body, quantities of radionuclides excreted from the body, or combinations of these measurements. When specific information on the behavior of the material in an individual is known, that information may be used to calculate the CEDE.

The inspector reviewed and discussed the licensee's program for monitoring internal dose. The inspector reviewed the results of assessments for personnel having indications of positive intakes of radioactive material. The highest number of DAC-hrs assigned to any one person in 1993 was 14 DAC-hrs and the highest to date in 1994 was less than 13 DAC-hrs. No problems were found during a review of the procedures or of selected bioassay records. The inspector concluded that the licensee's program for monitoring, assessing, and controlling internal exposures was conducted in accordance with regulatory and procedural requirements with no exposures in excess of 10 CFR Part 20 limits identified.

No violations or deviations were identified.

8. Control of Radioactive Materials and Contamination, Surveys, and Monitoring (83750)

This program area was reviewed to determine whether survey and monitoring activities are performed as required and control of radioactive materials and contamination met requirements.

a. Posting and Labeling

10 CFR 20.1904(a) requires the licensee to ensure that each container of licensed material bears a durable, clearly visible label bearing the radiation symbol and the words "Caution, Radioactive Material," or "Danger, Radioactive Material." The label must also provide sufficient information (such as radionuclides present, and the estimate of the quantity of radioactivity, the kinds of materials and mass enrichment) to permit individuals handling or using the containers, to take precautions to avoid or minimize exposures.

The inspector reviewed the licensee's procedure, HPP-213A, "Area and Equipment Postings," Rev. 3, dated March 12, 1994, for posting of radiological areas and the labeling of radioactive material. During tours of the plant and selected outside radioactive material storage areas, the inspector independently verified that selected radioactive material areas were appropriately posted and that selected containers were labeled consistent with regulatory requirements. The inspector noted that the licensee's postings for contaminated, radiation, HRAs and VHRAs were adequate to warn personnel of the radiological hazards in the areas and met posting requirements.

No violations or deviations were identified.

b. Personnel and Area Contamination

The licensee's threshold for documenting personnel contaminations was low. The licensee used 100 cpm above background to define PCEs. The total PCEs for 1993 included 43 skin and 80 clothing contaminations. The total number of PCEs for 1994, as of May 20, included approximately 95 skin and 70 clothing contaminations. The significant increase was primarily due to the differences in work activities of the two periods. The licensee did not have a RFO in 1993. However, the RPM reported that some of the PCE increases were due to respirator reduction activities and approximately 50 percent of the PCEs were due to facial contaminations. Review of selected contamination events noted that licensee documentation and follow-up on the individual events were appropriate, and skin dose assessments were performed, when required. For reports reviewed, resultant exposures were minor.

Surface contamination was aggressively controlled at its source. During tours of the facilities the inspector observed the use of catch basins to minimize the spread of contamination. The licensee maintained approximately 4,000 ft^2 of floor space as contaminated as of the date of the inspection. During plant tours, the inspector observed adequate housekeeping and contamination control practices. The inspector observed handling, packaging, and surveying of contaminated equipment for movement and found radioactive materials were properly controlled as required.

The inspector reviewed the licensee's actions to date in response to an event that occurred on April 15, 1994. The event was initially reviewed by the NRC during an inspection conducted April 18-21, 1994, and documented in NRC IR 94-10 as IFI 94-10-01. The event involved an unexpectedly high number of apparent PCEs. The licensee's investigation into the matter determined that the apparent PCEs were caused by a large amount of I-132 gas (2.29 hour half-life) from the RCS dispersing throughout containment and adhering to workers' clothes, hair and skin. Upon

exiting containment, dozens of individuals alarmed the personnel contamination monitors, although greater than 100 cpm could not be detected on any of the individuals with a frisker to meet the licensee's threshold for a documented PCE. A majority of the "contaminated" individuals received WBCs, with no significant results (less than two millirem CEDE for any one individual). At the time of this inspection, the licensee was still investigating the root cause of the event, and indicated that the investigation should be completed after the refueling outage. The licensee indicated that no additional problems had been experienced with the I-132 gas. The licensee's assessment of the event and the corrective actions will be reviewed in a future inspection.

No violations or deviations were identified.

c. Radiation Surveys, Personnel Monitoring, and Instrumentation

10 CFR 20.1501(a) requires each licensee to make or cause to be made such surveys as (1) may be necessary for the licensee to comply with the regulations and (2) are reasonable under the circumstances to evaluate the extent of radiological hazards that may be present.

During tours of the plant, the inspector noted that portable radiation detectors, air samplers, friskers, and contamination monitors were operable and had up-to-date calibration stickers and had been source-checked as required. In addition, the licensee appeared to possess an adequate number of survey instruments and related equipment. No concerns were identified.

During tours of the plant, the inspector observed HP technicians performing radiation and contamination surveys. The inspector independently verified radiation levels in selected areas of the facility. No concerns with the adequacy or frequency of the radiological survey activities were identified.

No violations or deviations were identified.

9. Planned Special Exposures (83750 and TI 2515/123)

This area was reviewed to determine whether the licensee's program for PSEs met the regulatory requirements.

10 CFR 20.1206 permits the licensee to authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in 10 CFR 20.1201 provided that certain conditions are satisfied. Such exposures cannot exceed the dose limits in 10 CFR 20.1201(a) in any year or five times the annual dose limits during an individual's lifetime.

The inspector reviewed the licensee's procedure HPP-217 titled, "Planned Special Exposures," Rev. 0, dated October 1, 1993.
10 CFR Part 20.1206(a) permitted the use of PSEs only in an exceptional situation when alternatives that might avoid the higher exposures are unavailable or impractical. HPP-217 stated:

> "A planned special exposure is an authorized process, that can be used in exceptional circumstances, which will allow an adult occupational worker to receive a dose in addition to and accounted for separately from the individuals routine occupational dose limits."

The inspector determined that the licensee had planned to use the procedure only in special conditions when alternatives that could avoid the higher doses were unavailable or impractical. However, the inspector pointed out to the licensee that the condition "... when alternatives are unavailable or impractical" was not clearly documented in the licensee's implementing procedure. Licensee representatives reported that the procedure would be reviewed and revised to clearly document the licensee's policy for use of PSEs.

In general, the procedure was consistent with 10 CFR Part 20 requirements. The licensee had not initiated any PSEs.

No violations or deviations were identified.

10. Dose to the Embryo/Fetus and Exposures of Declared Pregnant Women (83750 and TI 2515/123)

This program area was reviewed to determine that the licensee's program for Declared Pregnant Woman met the regulatory requirements and that doses to the embryo/fetus were within the regulatory limits.

10 CFR 20.1208(a) requires that the dose to the embryo/fetus not exceed 500 mrem during the entire pregnancy due to occupational exposure of a declared pregnant woman.

Section 8 of the licensee's RPS and HPP-300, "Federal Dose Equivalent Limits, Administrative Dose Equivalent Levels and Health Physics Dose Goals," Rev. 3, dated September 30, 1993, detailed the licensee's program and policies regarding declaration of pregnancy as well as exposure monitoring and dose limits for the declared pregnant woman and embryo/fetus. The inspector noted that the procedures were consistent 10 CFR Part 20 requirements and RG provisions. There had not been any declarations made since the licensee implemented the new requirements in October 1993. No concerns were noted with the licensee's declared pregnant woman policy or procedures.

No violations or deviations were identified.

11. Program for Maintaining Exposures As Low As Reasonably Achievable (83750 and TI 2515/123)

10 CFR 20.1101(b) states that the licensee shall use to the extent practical, procedures and engineering controls based upon sound radiation protection procedures to achieve occupational doses to members of the public that are ALARA.

RGs 8.8 and 8.10 provide information relevant to attaining goals and objectives for planning and operating light water reactors and provide general philosophy acceptable to the NRC as a necessary basis for a program of maintaining occupational exposures ALARA.

The inspector reviewed and discussed with cognizant licensee representatives ALARA program initiatives. Areas reviewed included organization support, training, goals and objectives, radiation source reduction, worker awareness and involvement, ALARA plans and reviews, use of mockups, temporary shielding, and ALARA results in the implementation of the licensee's ALARA program.

The inspector determined that the licensee's ALARA policy and objectives were clearly described in GET. ALARA concepts and dose reduction techniques were also presented in the training program.

The licensee had a full-time ALARA specialist to work on ALARA activities. The ALARA specialist was periodically supported with a Senior RP Engineer. The organizational structure and responsibilities for the ALARA staff were clearly defined in organizational charts and licensee procedures.

Activities to reduce collective dose during the RFO-9 included use of equipment to enable the remote monitoring of work activities for high dose task such as vessel work and steam generator inspection and maintenance. The licensee had purchased and contracted remote camera systems with multiple cameras and monitors and telemetric electronic dosimetry. ALARA representative reported that the video cameras were also helpful for some fire watch and supervisor monitoring. The licensee was also able to utilize remotely operated cutters and welders for some valve work. The licensee utilized specially constructed shielding for reactor CRD work and pre-approved temporary shielding packages for various locations. Radioactive source reduction activities included chemical decontamination of RCS with early boration.

The HP organization for the outage work was divided into four major work groups. Groups were established for long term maintenance program task, valves and ISI work, BOP activities and HP support functions such as dosimetry and instrumentation. The licensee established the organization structure to improve job efficiency, with HP expertise and awareness in the planning and operation of the specific assignments of the group. Licensee representatives reported that the HP outage

structure had improved outage planning, efficiency and communications which in turn resulted in lower collective personnel exposures. Interviewed HP technicians reported the organization structure had helped the licensee meet outage objectives.

The inspector reviewed a listing of active RWPs for the period January 1, 1994 to May 19, 1994, and found the actual person-rem was consistently controlled below the estimated person-rem. The outage dose at the end of the inspection was approximately 235 person-rem (Measured by PIC). The outage goal had been established at 285 person-rem and the 1994 ALARA goal for the station was 310 person-rem. The activities of the ALARA staff with the apparent support of site management appeared to be advancing the effectiveness of the sites ALARA program.

No violations or deviations were identified.

12. Action on Previous Inspection Findings (92701)

This area was not reviewed during the inspection as there were no open items to review.

13. Exit Meeting (83729)

The inspector met with licensee representatives indicated in Paragraph 1 at the conclusion of the inspection on May 20, 1994. The inspector summarized the scope and findings of the inspection. The licensee did not identify any such documents or processes as proprietary. Dissenting comments were not received from the licensee.

14. Index of Abbreviations Used in this Report

ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
BOP	Balance Of Plant
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
cm	Centimeter
cpm	Counts Per Minute
CRD	Control Rod Drive
DAC	Derived Air Concentration
dpm	Disintegration Per Minute
ft^2	Square Feet
GET	General Employee Training
HEPA	High Efficiency Particulate Air-filter
HP	Health Physics
HPP	Health Physics Procedures
hr	Hour
HRA	High Radiation Area
IE	Inspection and Enforcement
IFI	Inspector Followup Item
IR	Inspection Report

ISI	In-Service Inspection
mrem	Milli-Roentgen Equivalent Man
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary laboratory Accreditation Program
PCE	Personal Contamination Events
PIC	Pocket Ion Chambers
PSE	Planned Special Exposure
QA	Quality Assurance
rad	Radiation Absorbed Dose
RCA	Radiological Control Area
RCS	Reactor Coolant System
RDMS	Radiological Data Management System
Rev.	Revision
RG	Regulatory Guide
RP	Radiation Protection
RPM	Radiation Protection Manager
RFO	Re-Fueling Outage
RPS	Radiological Protection Standard
RWP	Radiation Work Permit
TEDE	Total Effective Dose Equivalent
TI	Temporary Instruction
TLD	Thermoluminescent Dosimeter
TS	Technical Specifications
VHRA	Very High Radiation Area