

NRC INSPECTION MANUAL

IOLB

INSPECTION PROCEDURE 83725

INTERNAL EXPOSURE CONTROL AND ASSESSMENT

PROGRAM APPLICABILITY: 2515

83725-01 INSPECTION OBJECTIVE

To determine the adequacy of the licensee's control of internal occupational exposure and the internal dosimetry program.

83725-02 INSPECTION REQUIREMENTS

This procedure is implemented to independently assess licensee conclusions regarding extent of condition of issues, when selected as a part of supplemental inspections using IP 95002, "Supplemental Inspection For One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area."

Inspection requirements completed as part of the baseline need not be repeated, at the discretion of the Regional Branch Chief.

02.01 Audits and Appraisals. Review the results of audits performed by or for the licensee since the last inspection and the adequacy of the licensee's commitments and corrective action.

02.02 Changes. Review changes in facilities, equipment, personnel, respiratory protection training, and procedures that affect internal exposure control and personal dosimetry.

02.03 Planning and Preparation for Outages. Determine whether necessary planning and preparation for maintenance and refueling outages are adequate.

02.04 Assessing Individual Intakes of Radioactive Materials. Determine whether provisions for assessing individual intakes of radioactive materials meet requirements.

02.05 Engineering and Administrative Controls

- a. Determine whether process or other engineering controls are used to the extent practicable to limit concentrations of airborne radioactive materials.
- b. Determine whether administrative controls of internal radiation exposure meet requirements and maintain the total effective dose equivalent (TEDE) as low as is reasonably achievable (ALARA).

02.06 Respiratory Protection Equipment

- a. Determine whether use of respiratory protection equipment meets requirements.
- b. Determine whether the respiratory protection equipment dedicated for emergency use meets regulatory requirements, and is operable, maintained, and readily available for emergency workers.

02.07 Records, Reports, and Notifications. Determine whether records, reports, and notifications of internal exposures during normal and emergency operations meet regulatory requirements.

83725-03 INSPECTION GUIDANCE

General Guidance

Additional guidance can also be obtained by reviewing the EPRI TR-107991, "Radiation-Field Control Manual - 1997 Revision and NCRP report number 120, "Dose Control at Nuclear Power Plants," (issued December 30, 1994).

Specific Guidance

03.01 Audits and Appraisals

- a. Review reports of required audits since the last inspection. Verify timeliness and effectiveness of licensee corrective actions.

Requirements for reviews and audits normally are contained in the technical specifications. Audit teams should include someone knowledgeable in internal dose control and evaluation (Regulatory Guide 1.146 and ANSI/AS ME N45.2.23-1978, Section 2.2).

- b. Review reports of other audits, appraisals, assessments, evaluations etc., that may provide information on program quality.

03.02 Changes

- a. By observation and discussion with cognizant management personnel, determine whether changes (facilities, equipment, personnel and procedures) have adversely affected the licensee's program for control of internal exposures. Determine whether changes are in accordance with 10 CFR 50.59.
- b. By direct observation and discussion, determine whether workers are aware of, and understand, the changes.

03.03 Planning and Preparation for Outages. Determine whether planning and preparation to control and limit intake of airborne radioactive materials are adequate. Such planning and preparation should include provisions for engineering control, such as auxiliary ventilation systems, to minimize the need to use respiratory protection equipment (Regulatory Guide 8.8).

03.04 Assessing Individual Intakes of Radioactive Materials

See the following references for technical information relative to this inspection requirement. Note that the while NRC has not, as yet, endorsed these consensus standards, these standards do provided useful information. These include HPS N13.30-1996, "Performance Criteria for Radiobioassay"; and N13.42-1997, "Internal Dosimetry for Mixed Fission and Activation Products". NUREG/CR-4884, "Interpretation of Bioassay Measurements" provides practical methods for establishing intakes from bioassay data.

- a. Records of the results of bioassays, including whole body counting, are the principal source of information for intakes of radioactive material. Consider the licensee's comparisons of whole-body or organ-burden data obtained from bioassays with estimates based on air sampling data.
- b. During tours of the facility, observe work in progress to determine whether air sampling is representative of air in zones occupied by workers. (See ANSI N13.1 Section 4.2.1.1 and Section 6.) Observe techniques used to evaluate air samples for radiological hazards. As applicable, this may include observation of count room practices, DAC-hour correlations and assignment of DAC-hours, correlation to internal dose, or a determination that internal dose assignment is not necessary.
- c. During tours of the facility, observe work to determine if the licensee has implemented proper equipment, use of procedures, and appropriate locations of equipment to determine the adequacy of provisions for bioassays of workers.
- d. During whole body counting as part of site access processing, observe (whenever possible) whole body counting equipment operation and discuss counting and calibration methods with equipment operators.

- e. For selected individuals whose whole body counts exceed the licensee's action level for investigation, review the results and corrective actions for such investigations.
- f. Review records to determine how the licensee complied with 10 CFR 20.1502(b) in determining which individuals are required to be monitored for occupational intake of radioactive material.
- g. Intakes of radioactive material may result in the alarming of high sensitivity automated personal contamination monitors (used to detect external contamination). Workers who expect to have intakes that may be detected by these monitors should be prepared for these alarms. See question and answer #145 (under the heading for 10 CFR 20.1702) in NUREG/CR- 6204 for additional guidance concerning situations of this type.
- h. Determine if the licensee's program has provisions for transuranic airborne radioactive materials controls. Focus on work controls that alert and take into account the potential sources, and work activities that could produce these hazards. Review the licensee 10 CFR Part 61 radionuclide scaling factor data to ensure hard-to-detect nuclides (transuranics and pure beta emitters) are included.

03.05 Engineering and Administrative Controls. 10 CFR 20.1702 requires that the use of respiratory protection equipment (and other controls) to limit intakes of radioactive material be consistent with maintaining the TEDE ALARA. Evaluations and (records of these evaluations) for the use of respiratory protection equipment made in accordance with this requirement are acceptable if they are consistent with the guidance provided in the answer to Question 60 (under the heading for 10 CFR 20.1703) in the questions and answers on the new Part 20; however, other means of meeting this ALARA requirement may also be acceptable.

Note that 10 CFR 20.1702 now allows the licensee to consider non-radiological safety factors (industrial hygiene hazards) and their impact on worker safety, when performing TEDE ALARA evaluations(see C.2.1.3, R.G. 8.15, Rev.1)

03.06 Respiratory Protection Equipment

- a. Guidance on use of respiratory protection equipment is given in Regulatory Guide 8.15, Rev. 1 and NUREG-0041, Rev. 1(when published).
- b. Review procedures and selected records, hold discussions with cognizant individuals, and observe representative samples of equipment and any routine or special maintenance of equipment. Focus on any testing and maintenance of self-contained breathing apparatus (SCBA) and maintenance of air or oxygen supplies used for SCBA and air-supplied respirators. Ensure that the licensee has an adequate number

of SCBAs and spare air cylinders available for emergency conditions.

03.07 Records, Reports, and Notifications

- a. Review records of the results of evaluations and actions taken when an individual has been exposed to concentrations of radioactive material greater than licensee administrative limits.
- b. Based on a selected sample of records of individuals for whom individual monitoring of intakes of radioactive material was required, have the committed effective dose equivalent and total effective dose equivalent been properly assessed and recorded? See regulatory Guides 8.7 (Instructions for Recording and reporting Occupational Exposure Data) and 8.34 (Monitoring Criteria and methods to Calculate Occupational radiation doses) for additional guidance.
- c. Determine if minors have been permitted to work in restricted areas, and if so, review records to determine compliance with requirements.
- d. Determine if overexposures of individuals to radioactive materials have been appropriately reported to NRC and to the exposed individual.

83725-04 RESOURCE ESTIMATE

It is anticipated that 25 to 30 inspector-hours on-site will be needed to complete the requirements of this procedure. Multiple-unit sites require the same amount of time.

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