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June 9, 1987
JAFFP-87-0469

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

SUBJECT: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Inspection No. 86-06

Gentlemen:

The subject inspection, transmitted by your letter dated June 6, 1986, identified a number of program weaknesses in the implementation of our dosimetry program for personnel radiation monitoring at the James A. FitzPatrick Nuclear Power Plant. This letter transmits the status of inspection follow-up items identified in the inspection conducted by Dr. S. Sherbini and Mr. T. Tuccinardi of the Division of Radiation Safety and Safeguards, Region I.

Dose Assessment Methodology (333/86-06-01)

As stated in the inspection report, the Power Authority has developed an improved algorithm for calculating doses from dosimeter readings for the Panasonic UD-812 dosimeter. In developing this revised dosimeter algorithm, the Authority has conducted more extensive beta irradiations using strontium-yttrium-90 (Sr/Y-90), thallium-204 (Tl-204) and promethium-147 (Pm-147) beta sources. As a result of these tests, the dosimeter algorithm has been slightly modified to extend the linear correction factor obtained from the Sr/Y-90 and Tl-204 results. This modification consists of a linear extrapolation of the beta correction factor to the energy of the Pm-147 beta particles. The use of Pm-147 irradiation data results in a large beta correction factor that distorts the dosimeter algorithm results for other mixed radiation fields similar to those encountered in the plant. Since a pure low energy beta field would not be encountered in the plant, this data has not been incorporated into the revised algorithm. This optimizes accuracy for mixed beta-gamma fields encountered under actual field conditions.

The results obtained from this algorithm exceed the level of performance required in the revised 10 CFR 20.202 as published in the February 13, 1987 issue of the Federal Register (50FR4601). Based on a survey of other facility licensees using similar dosimetry processing equipment, the current dosimeter algorithm represents prevailing industry practice. While the Authority recognizes that further technical improvements in

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dosimeter algorithms and dosimeter performance may be desirable, such improvements are a generic issue for which appropriate regulatory and technical guidance should be provided. These upgrades were complete prior to placing the new Panasonic UD-812 dosimeter into service on October 1, 1986. The Authority considers this item resolved.

Extremity Dosimetry (333/86-06-02)

The Authority has reevaluated extremity dosimetry practices and made changes to both the methods used to calibrate extremity dosimeters as well as personnel protective equipment requirements for conditions that may require extremity dosimetry. Anomalies identified in irradiation data have been evaluated and have been determined to be the result of TLD fading due to a long time interval between irradiation and processing in one of the irradiation tests. This work was completed June 10, 1986.

In addition to reevaluation of irradiation data, the Authority has reassessed the influence of protective clothing on dosimeter response as well as the actual shallow dose equivalent received by workers' extremities. As a result of this review, the radiation work permit procedure (RPOP-4) has been revised to require workers to wear rubber gloves when extremity dosimeters are required. Based on the construction of the dosimeter used at the FitzPatrick Plant as well as the thickness of protective clothing, no beta correction factor is required for determining the shallow dose equivalent for those beta energies typically encountered. The Authority considers this item resolved.

Quality Control and Calibration (333/86-06-03)

The quality control and calibration procedure (PDP-7) has been upgraded to include control charts, action and alert levels. The action level is a level which, if exceeded, indicates degraded TLD system performance. Dosimeter processing shall be stopped if the action level is exceeded. Processing may only resume upon evaluation by appropriate supervisory personnel and successful retest. The alert level is a level which, if exceeded, indicates a potential degradation in system performance requiring investigation.

Using the performance algorithm in ANSI N13.11, the action level is either $|\bar{B}| + S \geq 0.3$ for any one test or a step change of 0.2 from the preceding test. The alert level is $|\bar{B}| + S \geq 0.15$ for three consecutive tests. The alert and action levels are more conservative than those established in ANSI N13.11 and represent reasonable performance levels for the dosimetry system. The alert level was selected on the basis of the maximum expected standard deviation for dosimeters tested in the NVLAP program through December 1985 as reported in NBSIR 86-3350, "The National Personnel Radiation Dosimetry Accreditation Program".

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In addition, the quality control program has been revised to include the use of QC dosimeters distributed randomly throughout a batch of dosimeters. The number of QC dosimeters used is at least 2% of the batch size, but not less than three QC dosimeters for any batch. Upgrades to the QC program were completed in September 1986. Based on additional operating experience with the UD-812 system, further refinements were initiated in April 1987. The Authority considers this item resolved.

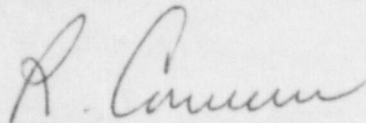
Irradiation Facility (333/86-06-04)

This item was closed during inspection 333/86-12 and re-opened as 333/86-12-02. The modified inspection follow-up item was closed during inspection 333/87-06.

Procedures (333/86-06-05)

Dosimetry procedures have been reviewed for accuracy and clarity. As a result of this review, several procedures have been revised and upgraded in accordance with a new procedure writer's guide. This upgrade was completed prior to November 30, 1986. Based on further discussions with your staff, however, it was decided that an independent review of these procedures would be desirable. This review is in progress and will be completed by June 30, 1987.

Should you have any questions regarding these matters, please contact Mr. Eric Mulcahey of my staff at 315-349-6701.



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