

LWR PRESSURE VESSEL IRRADIATION SURVEILLANCE
DOSIMETRY PROGRAM MONTHLY STATUS LETTER

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JANUARY MONTHLY STATUS LETTER: LWR PRESSURE VESSEL IRRADIATION SURVEILLANCE
DOSIMETRY PROGRAM

The objective of this program is to make measurements in neutron fields ["Benchmark" and reactor "Test and Surveillance Regions"] for the subsequent validation/calibration of available state-of-the-art data and procedures of dosimetry and damage analysis for light-water reactor (LWR) pressure vessel (PV) steel test irradiation and surveillance programs. The task includes selection of the neutron fields, the validation/calibration of dosimetry and damage exposure and correlation procedures in these fields, and the establishment of ASTM recommended practices and procedures.

PROGRAM REVIEW AND DEFINITION

W. N. McElroy, G. L. Guthrie, and C. Serpan held brief program review meetings at Richland, Washington, the evening of January 14 and 15, 1979. The discussions centered on a revised FY-79 NRC Program Brief and the associated changes in the scope of work to be accomplished under Tasks A, B, and C. A key decision was made that most of the NRC supported metallurgical testing for Task C would be accomplished at NRL.

TASK A - NEUTRON FIELDS

ORNL-PCA-Dosimetry PV Mockup

Procedures for precise control of the etching of mica Solid State Track Recorders (SSTR) have been under development. These standardized etching techniques will be employed in processing and analyzing the large number of mica SSTR (~ 150) exposed at the Pool Critical Assembly (PCA). Scanning of these SSTR should be initiated in the coming month.

NRC Research and Technical
Assistance Report

Mr. Charles Z. Serpan

TASK B - RECOMMENDED ASTM STANDARDS

Subcommittee E10.05 met and discussed at the ASTM meeting of December 4-7, 1978, held in Bal Harbour, Florida, ASTM Practices relating to the Light Water Reactor Pressure Vessel Surveillance Dosimetry project. New drafts relating to "Sensor Set Design" and "Irradiation for Reactor Surveillance" and "Multiple Sensor Flux-Spectral Determination in Reactor Dosimetry" were reviewed by this group. Committee E10.05 membership comments were obtained for the practices on "Characterizing Neutron Exposures in Ferritic Steels in Terms of Displacements per Atom". These comments will be used to make necessary revisions prior to balloting by committee E10.

TASK C - DAMAGE EXPOSURE AND CORRELATION PROCEDURES

Preliminary reevaluation of the data on change in ductile brittle transition temperature, which will be used in damage function analysis, shows that improved correlation can be obtained if the neutron fluence dependence of the data is altered. Only a few neutron spectra appear to be questionable at this time. The correlation of the neutron energy dependence of damage appears to favor an interstitial cluster model.

Compiled by:

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