AEC-NASA TECH BRIEF

Procedure Developed for Reporting Fast-Neutron Exposure

The problem of reporting fast-neutron exposure in a meaningful and unambiguous fashion has existed since the first radiation damage studies. A method of reporting data was needed so that meaningful correlations could be made between data gathered by different investigators.

A report has been prepared which presents a method of reporting fast neutron exposure. The method involves determination of the spectrum shape and absolute magnitude, selection of an energy weighting for the neutrons, and definition of a unit for reporting exposure. Various methods for performing the procedure are described, and explanations of the reasoning behind the approaches are given. Using the outlined method, comparisons of irradiation data from different reactors will be free from errors resulting from differences between the spectra.

The procedure for determining and reporting fast-neutron exposure involves four steps:

(1) Determination of the shape of the neutron energy spectrum.

(2) Measurement of the neutron flux rate by activation detectors to fix the magnitude of the spectrum.

(3) Choice of an appropriate energy weighting for the neutrons (i.e., relative effectiveness in producing damage as a function of energy).

(4) Determination of time-integrated reactor power during the period of the irradiation, multiplying this by the flux rate, and reporting the exposure in meaningful units. The report outlines the procedures for performing these steps.

Each step must be accomplished to arrive at a useful result. Current knowledge contains numerous gaps where assumptions must serve in the place of factual data, but the use of assumptions does not alter the logic of the overall approach. It is expected that these gaps will be filled, so the procedure is written to permit direct substitution of numbers without changing the actual method.

Notes:

1. Additional information is contained in *Dosimetry for Radiation Damage Studies*, by A. D. Rossin, ANL-6826, Argonne National Laboratory, Argonne, Illinois, March 1964. The report is available from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151; price: $3.00; microfiche $0.65.
2. Inquiries concerning this innovation may be directed to:

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Source: A. D. Rossin
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Patent status:

Inquiries about obtaining rights for commercial use of this innovation may be made to:

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