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LAWRENCE LIVERMORE LABORATORY

University of California/Livermore, California

DT Fusion Neutron Irradiation of
Two BPNL Particle Release Experiments
Unclassified

Susan C. MacLean

January 30, 1975

MASTER

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DT Fusion Neutron Irradiation of
Two BPNL Particle Release Experiments

Susan C. MacLean

January 30, 1975

Drs. Otto Harling and M. T. Thomas of Battelle Pacific Northwest Laboratory (BPNL) scheduled two particle release experiments at the LLL Rotating Target Neutron Source (RTNS) in January, 1975. They requested cross calibration of niobium dosimetry between LLL, BPNL and Argonne National Laboratory (ANL).

During each of the two runs, a half-inch diameter, 1 mil thick niobium dosimetry foil was centered on the front of the experimental apparatus. The dosimetry foil for the first run was designated TT-10. The first irradiation was carried out by the LLL E-Division Accelerator Staff during the period of January 16 to 17, 1975. The total beam-on time for this run was 30.58 hours. An autoradiograph of the front of the apparatus after the irradiation showed the centering to be within about 1 mm of the center of the neutron source.

The second irradiation was performed by the LLL E-Division Accelerator Staff on January 20, 1975. The total beam-on time was 15.60 hours. TT-8 was the dosimetry foil for the second run.

Neutron production was monitored continuously during both irradiations with a proton recoil counter and recorded each hour. Dose records for both runs are attached.

Dr. Thomas left both niobium foils at LLL for the dosimetry work. They were stored a few days before being delivered to the LLL Radiochemistry Division where Ruth Anderson performed the gamma ray counting.

The average fluence on each foil was calculated as described in UCRL-51393, Rev. 1. The LLL results were as follows:

<u>Dosimetry Foil Number</u>	<u>Fluence (neutrons/cm²)</u>
TT-10	5.55×10^{16}
TT-8	2.62×10^{16}

The estimated overall uncertainty of these results is $\pm 7.5\%$. The relative uncertainty between any two values is about $\pm 2\%$. The values given here represent average fluences over the volume of each dosimetry foil.

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IRRADIATION OF JANUARY 20, 1975

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IRRADIATION OF JANUARY 16 AND 17, 1975

23 JAN 75
12:37:55