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SUBJECT: MAY 1963 PROGRESS REPORT - ASD CONTRACT AF 33(657)-10584

Prepared by: NUCLEAR RADIATION EFFECTS SECTION, LITTON INDUSTRIES, INC.
WOODLAND HILLS, CALIFORNIA

KEWB IRRADIATION

The KEWB irradiation test commenced per schedule on May 16th, 1963. After three bursts, a failure in the scram system required that the reactor be shut down. One of the four scram rods failed to scram intermittently and as three are required for shutdown, no safety margin remained. Examination of the scram rod and its release mechanism, after a three day reactor cool off period, failed to reveal the cause of the malfunction. After rod cleaning and repair of other miscellaneous components which might have caused the problem, the reactor was reactivated. On May 23rd, seven additional bursts were secured. On the basis of 3×10^{14} nv.t for the first burst, it appears that 10^{15} nv.t was secured for the series. Dosimetry data reduction for all ten bursts has not been completed. Earlier A.I. exposure estimates were low, indicating an excessive number of bursts (and on site test time) would be required at KEWB. It should be noted that the exposure secured at TRIGA and KEWB is not feasible at Sandia SPRF because of its low nv.t per burst, and its low rep rate.

The data secured in this series of irradiation bursts indicated no permanent amplifier degradation, but the amplifiers did exhibit a much higher degree of transient effects than secured at TRIGA. There were no temporary effects observed, the interruption in the amplifier outputs lasting only as long as the burst, whose half amplitude width was ~ 3 milliseconds.

Unlike the TRIGA series, there was noise introduction into the amplifier inputs, which would account for a portion of the amplifier output transient.

At TRIGA it was noted that the transient effects disappeared after an exposure of $\sim 3 \times 10^{14}$ nv.t. Preliminary analysis of KEWB data does not indicate such an occurrence, in this environment. However, both at TRIGA and KEWB the d.c. current drawn by the amplifiers exhibited a transient during the irradiation pulse which at TRIGA decreased with succeeding bursts. Photo-oscilloscope pictures were taken of this phenomena for several KEWB bursts.

Photographs and tabular data illustrating the results obtained at KEWB were unavailable for this progress report due to the slippage in irradiation schedule caused by the reactor malfunction. This data may be presented in the June progress report.

REACTOR SCHEDULE

General Dynamics has slipped the GTR irradiation schedule by one week. It is anticipated that this steady state irradiation will commence on June 17th.

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