Gamma Irradiation Facility (GIF)

Fact Sheet

The new GIF project was conceived in the early 1990's as a single dedicated structure to consolidate several Sandia gamma irradiation facilities including the existing GIF, which is a two cell dry irradiator located in the ACRR reactor high bay and the Low Intensity Cobalt Array (LICA), which is the in-pool irradiator.

The new GIF provides a single structure for performing a wide diversity of gamma irradiation experiments with various test configurations and at different dose and dose rate levels. It is divided into two types of irradiation facilities, in-cell dry and in-pool wet, based on the type of test to be performed.

In-Cell Dry Irradiation:
The in-cell facilities are large, dry, shielded rooms in which irradiations are performed with a high intensity gamma-ray source located in the room. There are two test cells sized at 10'x10'x10' and a larger cell sized at 18'x30'x13.5' and an 18' deep GIF pool containing demineralized water to provide radiation shielding for the submerged radioactive sources. After an experiment is set up in a cell, an elevator raises radioactive sources into the cell to start the irradiation. To terminate an irradiation, the source is lowered back to its shielded location in the water pool and personnel access into the cells is again permitted via the entry maze hallway which prevents direct radiation emission from the cell. Typical irradiations performed in these facilities are at very high dose rates (100 to 1000 kilorads/hr) and for short to intermediate durations lasting less than a day.

The types of experiments performed cover many disciplines as shown in the following list of current and past experiments:

In-Cell Irradiation Capabilities
- Electronic component hardness, survivability, and certification tests for military and commercial applications.
- Radiation effects on material properties.
- Radiation effects on organic materials.
- Designed for mixed environment testing (e.g. steam and radiation, heat and radiation, etc.).
- Microbiological and food irradiations

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In-Pool Wet Irradiation: In the in-pool facilities, radioactive sources are held in an irradiation fixture in a deep pool of water where they remain stationary. Experiment canisters containing test units are immersed in the pool and positioned in preset locations in the irradiation fixture. Typical irradiations performed in these facilities are at moderate and low dose rates (<10 kilorads/hr) and for long durations lasting days, weeks and months.

In-Pool Irradiation Capabilities
- Simultaneous thermal and radiation effects studies.
- Electronic components degradation testing.
- Material aging tests.
- Electronic component certification.

For more information on capabilities and facilities, please contact
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