Project Descriptions

Subcritical Experiment Diagnostics

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In the summer of 2002, the SCEs, Mario and Rocco, and two confirmatory shots were fired in the U1a complex at NTS. An earlier confirmatory shot was fired at LANL in December 2001. On those shots, P-22 fielded three diagnostics. A series of optical pins were used to record the arrival time of the expanding metal surface at preset distances. Free-surface optical pyrometry was used to measure the surface temperature of the plutonium at shock breakout. Four Asay windows (a VISAR diagnostic viewing the plutonium surface through a lithium-fluoride window) were used to diagnose the spall behavior of the plutonium.

The Armando SCE and its confirmatory shot are scheduled for April 2004. Both will be fired in the U1a complex. P-22 has played a significant role in the development and fielding of the Cygnus flash xray machines, which will be the primary diagnostic for the Armando shot. P-22 will also field free-surface optical pyrometry as a secondary diagnostic.

The Krakatau and Unicorn SCEs and their confirmatory shots are scheduled for FY 2005. Krakatau will be fired in the U1a complex, and Unicorn will be fired in a hole at U6c (which is in the Yucca Flats area of the NTS). The current plan for Krakatau calls for P-22 to field optical pins, free-surface pyrometry, multipoint VISAR, and possibly Asay windows. On Unicorn, P-22 will field a *reaction-history-like* gamma-ray-flux diagnostic, using field-test neutron generators to interrogate the package.

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