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Optical isolation of weapons firing sets is an integral component of modern surety themes. Sandia researchers are investigating laser triggering of the small vacuum switches called Sprytrons in the firing sets. By optimizing the laser focus and the Sprytron design, researchers reduced the laser energy required by a factor of 1,000 to 10 micro-joules. This allowed the research team to demonstrate triggering of a Sprytron through an optical fiber using a microlaser developed in Division 1000. (1100, 2100, 2600) (NWSBU/ST SMU)

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The Advanced Firing/Detonation Systems Project has demonstrated a range of advanced firing system technologies that will provide a significant increase to the level of surety for the stockpile. Recent successes include demonstrations of (1) a "Micro Firing System," an optically charged and isolated miniature firing system; (2) a "Slapper Stronglink," a miniature mechanical detonator safing stronglink; and (3) a "Direct Optical Initiation System," an advanced version of a laser-based firing set. These options are currently being considered by the Phase 6.2 studies for the W76 and W80. (2100, 2600, 2200)

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ASCI-enabled analysis is supporting W76-1 development and has significantly impacted the fireset mechanical design. Simulations identified design deficiencies and subsequent modifications for meeting requirements. In combination with analysis, a 22-foot drop test in September provided experimental discovery data to reduce modeling uncertainties for the W76-1/Mk4A. Acquired data will also define AF&F (arming, fuzing and firing) component environmental specifications for future qualification testing. This highly instrumented test successfully met all objectives under an aggressive schedule to complete the project before the end of FY03. (9100, 2100)