

Explosion Monitoring Research at the Nevada National Security Site

The Nevada National Security Site conducts experiments aimed at increasing capabilities in explosion monitoring. The Source Physics Experiment (SPE) objectives are understanding the prompt-signal phenomenology of the explosion source, including shear wave generation, and improving numerical modeling codes. Since 2010, the SPE project has conducted eight (8) chemical explosions in both well-characterized granite and alluvium emplacement media. The SPE experiments have been recorded on a wide range of diagnostics, including borehole accelerometers, seismic, infrasound, magnetic, video, and photogrammetry. SPE is incorporating state-of-the-art diagnostics systems, including Large-N and distributed fiber optics, to provide unprecedented resolution of the seismic phenomena. The Underground Nuclear Explosion Signatures Experiment (UNESE) is an NNSS project that has focused on improving models for late-time signals produced by underground explosions. The UNESE research included studying remote sensing and geophysics methodologies to detect change in the surface and subsurface after historic explosions. UNESE also conducted experimental studies to measure and model tracer gas migration in different emplacement scenarios of previous nuclear explosions. This work was done by Mission Support and Test Services LLC, under Contract No. DE-NA0003624 with the U.S. Department of Energy. DOE/NV/03624–0357.

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