



Joint Characterization, Analysis, and Testing conducted at the TA-16-340 complex (JCAT-340).

The objectives for the HE safety tests were to execute full-scale testing to

- qualify safety engineering controls used to mitigate a blast,
- validate HE facility design criteria, and
- validate tools used to quantify the safety margin in the DOE authorization basis.

The JCAT-340 Project consisted of 17 detonation experiments that used 0.03–300 lb of PBX 9501 within the processing bays of buildings 340 and 342. Detonation experiments at various heights and locations assessed the dynamic response of the Laboratory's HE operations buildings. The test sequence was designed to increase understanding of the potential operational safety hazards and associated physics of internal explosions, focusing on the blowout walls' and buildings' structural response.

- Blowout wall response—The 3-in.-thick blowout walls consisted of two aluminum sheets that encased insulation. Interlocking panels of this material formed the blowout walls, which were designed to protect the interior of the building

from the weather, but dislodged at an applied load of approximately 1.5 psi to rapidly dissipate an explosion away from the building and its occupants. The JCAT-340 test series studied the dislodging characteristics of the blowout walls and effects of the wraparound pressure on an abutting bay. In addition, a test was conducted to reduce wraparound effects by implementing a wedge deflector to mitigate wraparound pressures. This wedge was designed to reflect the initial pressures at the end of the bay wall back into the explosives bay, thereby reducing the pressure that turns the corner and affects the abutting bays.

- Structural response—This test series was designed to characterize the structures' dynamic response (spallation, cracking, displacement, etc.) to overpressure generated by detonating HE. Buildings 340 and 342 were constructed in the early 1950s with 2-ft-thick, highly reinforced concrete walls that contained a vast web of rebar, roughly 3.5% by volume. Structural models will be calibrated from the results of a series of 5-lb test shots; larger charges were detonated to examine various structural effects.

Large hydrodynamic computational models provided the data to set the ranges on the instruments for the pressure we expected to measure during