DEVCOM ARMAMENTS CENTER

BREECH FATIGUE SIMULATION FACILITY

LABORATORY INFORMATION FACT SHEET

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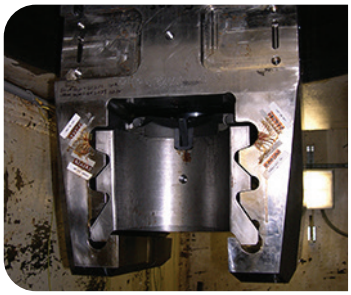
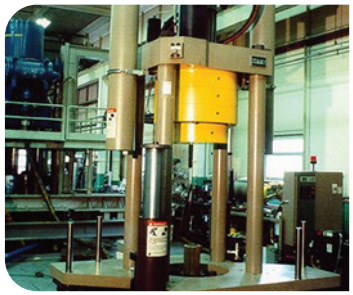
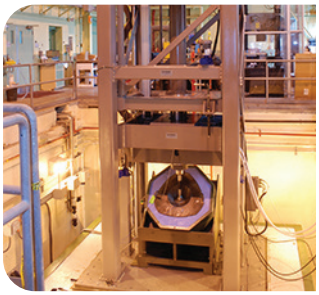
The Breech Fatigue Simulation Facility is a dedicated Department of the Army facility established to provide cost effective, safe fatigue life determinations of all large caliber armament breech assemblies through dynamic hydraulic medium pressure cycling.

TECHNOLOGY/FACILITY DESCRIPTION:

The lab consists of three impact test systems each capable of reaching different pressure ranges up to a maximum of 135,000 psi in under 10 ms. Testing is conducted over enclosed seismic mass test pits in the ground that contain the destructive energy produced during testing and any catastrophic failures of test assets. Dynamic high pressure testing utilizes custom pressure transducers that are fabricated and calibrated in-house with a NIST-traceable dead weight test system capable of reaching up to 200,000 psi. Quasi-static hydraulic testing is also available for up to 200,000 psi. Data acquisition of pressure, strain, and other sensors is conducted in a control room that allows for monitoring of equipment and assets during testing. A dedicated machine shop provides quick turnaround for minor test hardware modifications and fabrication of test support components. A large cold room in the back of the building provides testing of items down to -40 °F.







EQUIPMENT AND EXPERTISE AVAILABLE:

- A compressed air driven Vulcan 512 impact system consisting of a 12,000 lb weight capable of being dropped up to a 5 feet located over an enclosed seismic mass test pit
- A compressed air driven Vulcan 06 impact system consisting of a 6,500 lb weight capable of being dropped up to 3 feet situated over an enclosed test pit
- A MTS Impact Test System containing up to 5,000 lb that is fired at high velocity to generate dynamic pressure pulses
- Two Ingersoll Rand 125 HP Rotary Screw air compressors with VFD soft starts
- A Harwood Engineering double acting intensifier capable of quasi-static testing up to 200 ksi
- In addition, there are two Harwood Engineering dead weight test systems capable of quasi-static pressure sensor calibration and an attached dynamic pressure generator
- A large cold room capable of reaching -40 °F
- Data acquisition instrumentation and PTZ cameras
- Dynamic high pressure hydraulic simulation
- Mortar baseplate acceptance testing
- Pressure sensor calibrations

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