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**NNSA Adds New Tool to Stockpile Stewardship Program
JASPER Gas Gun Successfully Fired at Nevada Test Site**

The National Nuclear Security Administration's (NNSA) Nevada Site Office and Lawrence Livermore National Laboratory achieved a major milestone today with the successful firing of the Joint Actinide Shock Physics Experimental Research (JASPER) gas gun at the agency's Nevada Test Site.

Scientists fired a projectile, at a speed of five kilometers per second, at a plutonium target. Upon impact, it produced a high-pressure shock wave. The shock wave passed through the target within a fraction of a microsecond. Diagnostic equipment measured the properties of the shocked material inside the target during this extremely brief period.

"Our national laboratories now have at their disposal a valuable asset that enhances our due diligence to certify the nuclear weapons stockpile in the absence of underground nuclear testing," NNSA Administrator Linton Brooks said after the landmark experiment.

A vital experimental technique for determining the properties of materials at high pressures, temperatures, and strain rates is to shock the material and measure the material response. JASPER experiments support these goals, which are key elements of the NNSA Stockpile Stewardship Program. Additionally these experiments complement the on-going Subcritical Experimental Program currently in place at the Nevada Test Site

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*JASPER FAST FACT: 8 kilometers per second = 17,895.49 miles per hour
At nearly 18,000 miles per hour that is 24 times the speed of sound
Pressure achieved = 6 Megabars or 6 million times atmospheric pressure*

The JASPER gas gun is a 30 meter (approximately 90 foot) long two stage gas gun. Hot gases from burning gunpowder drive a heavy piston down the first stage of the gun, compressing a light gas, typically hydrogen. The gas, built up to extremely high pressures, breaks a metal barrier and enters the second stage, a narrower barrel, propelling the projectile housed in the barrel towards the target.

A series of 20 shots were conducted with the gun to qualify it for use with nuclear materials.

While operated by Lawrence Livermore National Laboratory, the JASPER gas gun will see multi-laboratory use. The gun is capable of about 24 experiments per year over its ten-year life.

One of the key principles behind the Stockpile Stewardship Program is to assess the effects of aging on nuclear weapons components and to verify that as these weapons age they will continue to perform as designed. This is accomplished, in the absence of underground testing, through such programs as JASPER and Subcritical Experiments.

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