

Failure Analysis of .50 Caliber M20 API-T Bullet Burst

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The Lake City Army Ammunition Plant has produced and certified military specification ammunition in support of our nation's defense since September 1941. .50 Caliber Armor Piercing Incendiary (API) ammunition is susceptible to Bullet Burst events and has been documented for nearly 70 years. The term "bullet burst" refers to the phenomenon wherein an API bullet explodes and disintegrates before reaching its target. The bullet burst event initiates inside the weapon and is expelled out of the barrel by the force from the propellant and is visible within 2 meters of the weapon. This project was successful in identifying and confirming the root cause as a multiple factor interaction resulting in the event. The presentation will provide a summary of the techniques used to reproduce the bullet burst phenomenon through a series of design of experiments which focused on common cause variation within the design tolerance for all factors considered.

Biography for Mr. Stubler:

Mr. Stubler graduated from GMI Engineering and Management Institute (Kettering University) in 1995 with a BS in Mechanical Engineering and Rockhurst University in 1997 with a Masters in Business Administration. His career with ATK began in 2009 at the Lake City Ammunition Division as a Manufacturing Engineer for 7.62mm and .50 caliber production. Certified as a Design for 6-Sigma Green Belt, Shainin Red X Journeyman, and General Motors Statistical Engineering Master, Mr. Stubler developed and taught statistical engineering classes throughout General Motors Asia Pacific region.

Biography for Mr. Spears:

Mr. Spears graduated from University of Missouri-Rolla in 1994 with a BS in Chemical Engineering and in 2006 with an MS in Statistics from Colorado State University. He currently holds an ASQ Black Belt certification. Mr Spears began working for ATK in 2006 as manufacturing engineer at the Lake City Army Ammunition Plant in 50 Cal

ammo manufacturing. Mr. Spears has 15 years of experience in the application of Design of Experiments and Statistical Process Control.