MK 146 and 152 Warhead Manufacture Scale-Up Using Multiple Small Casting Bells for the 420 Gallon Mixer

A2380 - Scale-up the Manufacture for the MK146 and 152 High Explosive Warhead

OBJECTIVE

The Marine Corp is currently using the MK146 Mod 0 Warhead in Iraq and Afghanistan. Program Office requirements are to deliver 8100 ea MK146 warheads and 24000 ea MK152 warheads. The original manufacturing process explosive loaded MK146 warheads with PBXN-110 from the 150-gallon vertical mixer and cast independently in each of four small vacuum bells. Each warhead was handled individually. Every warhead filled required the dedicated full time attention of an operator. There were additional personnel required to transport empty and full warheads to and from these operators. Loading time was seven hours, sometimes more. The process of using multiple small casting bells, determined the lot size (335 ea) and it was not suited for scaling beyond the 150-gallon mixer. The 420 gallon mixer casting facility does not have room to accommodate a large number of bells to cast warheads individually.

PAY OFF

The development of a new scale-up production process for MK146 and MK152 warheads significantly maximized production efficiency, and reduced labor requirements and cost of manufacture. This new manufacturing process yields a higher number of units with resultant lower production costs. The scale-up production of the MK146 and MK152 warheads is critical to the success of warfighter operations and fleet delivery requirements. As part of the 2.75-Inch rocket motor and the APKWS guided motor systems, these warheads provide a reliable weapon that is safe for shipboard operations. This MANTECH effort will directly benefit the warfighter.

IMPLEMENTATION

The 420 gallon mixer bowl is be suspended above the chamber and piping used to transfer explosive from the bowl into the warheads. This process is based upon explosive loading 28 warheads as a single process unit on a standard cast plant casting cart. There is not a valve to shut off explosive flow to individual warheads, only a valve for the warheads as a group. The key to this approach is a sufficiently tight fit of the explosive injector into each warhead during casting. This process is now fully implemented at NSWC Indian Head Division. Manufacturing has now produced 7500 ea MK146 warheads and 1200 MK152 warheads.

Period of Performance
July 2010 to May 2011

Stakeholder
PMA-242

Performing Activity
EMTC

Point of Contact
Mr. Charles R. Painter
(301) 744-6772

MK 146 Warhead

Total ManTech Investment
$400,000

Please visit the EMTC Web site:
http://www.navsea.navy.mil/nswc/indianhead/codeCA/EMTC/main.aspx
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