TRANSFORMING THE ARMY'S AMMUNITION

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Introduction

Near the middle of the United States, in a secluded area in Southeastern Oklahoma, is one of DOD's premier strategic assets—McAlester Army Ammunition Plant (MCAAP). MCAAP is leading the way in ammunition life-cycle operations. From ammunition production through demilitarization, MCAAP performs a myriad of ammunition projects while applying a broad spectrum of technologies. The plant uses a wide range of techniques—from "dumb-bomb" production to cutting-edge precision munitions production. More than an industrial complex, MCAAP provides strategic ammunition logistical support to warfighters.

With a passion to develop and maintain the latest manufacturing techniques, MCAAP works with private businesses such as Boeing, Lockheed Martin, General Dynamics, PB/Nammo Demil LLC, Austin Powder Co., Pendulum Management Co. LLC, Raytheon, World Wide Demil LLC, and ML Marketing. Partnering with these businesses also allows MCAAP to maintain use of its facilities and remain current in the latest production techniques.

Covering almost 45,000 acres, the plant has the largest ammunition storage capacity in the United States, with more than 2,400 explosive and component storage facilities covering 7 million square feet. MCAAP is one of the first installations called upon to load and ship ammunition during a contingency. MCAAP's ability to meet national requirements of shipping 400 military vans a day for 30 days was greatly improved after completion of several strategic mobility programs costing $35 million.

MCAAP is able to accomplish its strategic responsibility because of its highly trained and motivated workforce, established emergency loading and shipping procedures, critical equipment maintained at high-readiness rates, and a well-maintained ammunition stockpile.

About The Plant

McAlester's leadership in applying modern manufacturing techniques makes it America's flagship ammunition plant, one of the few government-owned, government-operated (GOGO) facilities in the United States. As a GOGO facility, McAlester provides a flexible and experienced workforce capable of responding to the immediate needs of warfighters. MCAAP is considered the premier bomb-loading facility for DOD.

At MCAAP's subordinate facility, the Red River Munitions Center (RRMC) in Texarkana, TX, skilled technicians perform the maintenance and fabrication of training systems for a variety of missiles, including the Maverick and Stinger. In addition, RRMC also renovates high-explosive projectiles, 2.75- and 3.5-inch rockets, mortars, grenades, and other small-caliber munitions.

Production

MCAAP mixes explosives for all types of bombs including conventional explosives such as Tritonal (a mix of TNT and aluminum powder) and H6 as well as the less sensitive plastic-bonded explosive. During the production process, the plant can also apply a thermal coating to the thermal arc spray. This thermal coating is designed to delay explosion in the event of a fire, a safety feature that emphasizes protecting the Navy's ammunition handlers.

MCAAP's production lines can load and assemble explosive bombs as well as inert bombs, which can be loaded with concrete or Filler E, a mixture used to simulate explosive-loaded munitions. Other production-line work includes loading assembled warheads for Harpoon missiles; loading, packing, and shipping propelling charges for naval munitions; disassembly and demilitarization of Maverick missiles; and integration of the Joint Stand Off Weapon and High Speed Anti-Radiation Missiles.

Behind the activity of the production line is the production planning office that is responsible for each project, from job estimate to its completion. Production planning's job begins with an estimate that includes costs of labor and consumable supplies. After funding is received, office personnel are involved in technical reviews to ensure that the product is built to customer specifications. They also write standard operating procedures for item production and take care of movement of all materials to and from the production lines.

The plant produces bombs that are either cast-filled or melt-poured. Cast fill is a process by which the plastic-bonded explosive is injected into bombs from giant mixing bowls. Melt pour is achieved by pouring liquid explosive into the bomb body. Both processes require strict quality control and attention to safety.

When the bombs are completed, they must be prepared for shipment. MCAAP produces its own metal and wooden pallets to specification for shipping. The current dunnage mill facilities have 17,000 square feet and an outload capability of 92,000 board feet per day. Dunnage is necessary to block and brace munitions to prevent movement during shipment.

Operations

MCAAP has a number of facilities that allow the plant to perform operations associated with most types of ammunition. These operations include production, modification, conversion, maintenance, disassembly, and demilitarization. A multipurpose maintenance facility is used to renovate anything from 105mm cartridges for the Army to 5-inch projectiles for the Navy.

MCAAP is implementing "lean thinking" throughout its processes. The basic tenet of the lean process is to eliminate "nonvalue" activities including wasted motion, excess paperwork, inventory, and setup times. By fully implementing lean thinking, MCAAP can reduce wasteful processes, thus saving money and hastening response time to warfighters.

MCAAP has two primary missions: ammunition production and ammunition logistics. Currently, 36 percent of MCAAP's workforce is involved in producing and renovating munitions, while 28 percent of the workforce is engaged in ammunition storage and receiving operations. Power projection and storage capabilities are directly tied to the installation's logistics operations. MCAAP's power-projection mission is to rapidly load and ship ammunition stocks to warfighters. The combination of ammunition production with ammunition logistics provides the strength of power projection and makes MCAAP a vital DOD asset.

Environment

The plant is also a steward for our Nation's environment. Under an environmentally friendly program developed in conjunction with the Joint Munitions Command at Rock Island, IL, and the Army Research, Development and Engineering Center at Picatinny Arsenal, NJ, MCAAP is reusing explosives melted out of obsolete munitions. Instead of burning these explosives, MCAAP has designed a system that allows it to recycle quality TNT flakes, within military specifications, that can be reused in new munitions. Based on the projected quantity of TNT that was needed to support munition requirements 3 years ago, an economic analysis determined that reclaiming TNT melted out of obsolete munitions versus reactivating an old Army facility to manufacture new TNT would save $50.8 million over a 5-year period.

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MCAAP also performs demolition of unserviceable and obsolete munitions, working with the Defense Ammunition Center (DAC) and leading industrial companies to develop safer and more efficient methods of demilitarization to reuse, recover, or recycle valuable resources. In fact, MCAAP's ratio of environmentally preferred processes to reclaim, recycle, reuse, or renovate (R4) versus open burn/open detonation (OB/OD) is at 75 percent for R4 and 25 percent for OB/OD.

One example is MCAAP's ongoing recovery of Tritinol from 750-pound bombs and old TNT from 8-inch howitzer shells that will be used to produce new bombs. MCAAP has invested more than $83 million since 1996 on mission improvements such as TNT recovery systems.

A second program, scheduled to begin in 2004, involves using a cryofracture process to demilitarize obsolete munitions. The cryofracture process in general involves the freezing of munitions in liquid nitrogen and eventually transporting to a furnace for burning. The DAC, General Atomics, and MCAAP partnered to design and build this fully automated facility that will provide an environmentally friendly method to decrease the stockpile of obsolete munitions. This process is aligned with the Joint Munitions Center's goal to increase use of new technology to rid DOD of unusable and obsolete munitions in an environmentally friendly manner.

Strategy

The strategic role MCAAP plays in the Army's joint mission is best demonstrated by its support of the war in Iraq and the global war on terrorism. Since the terrorist attacks of September 11, 2001, MCAAP has grown from 850 employees to almost 1,200. In addition, the number of production-line workers has tripled. In fact, MCAAP, which has not used a night shift since the Vietnam War, is now working multiple shifts on an extended workweek. Logistics operations have seen a comparable increase in workload. The chart below compares shipping and receiving figures in two categories: FY01/02 and the first 6 months of FY02 versus the first 6 months of FY03.

Timeline	Shipping (Short Tons)	Percentage Increase or Decrease	Receiving (Short Tons)	Percentage Increase or Decrease
FY 01/02	FY01 FY02 56,796 60,523	6.60% increase	FY01 FY02 42,541 55,510	30.5% increase
First 6 months of FY02 versus First 6 months of FY03	FY02 FY03 27,038 48,800	80.5% increase	FY02 FY03 24,854 41,025	65.1% increase

The first row shows a significant increase in shipping and receiving for FY02 (which incorporates post-September 11, 2001, activity) as compared to the previous FY. The second row shows a more dramatic increase as the global war on terrorism heated up with combat action in Afghanistan and Iraq.

Conclusion

With its world-class shipping and receiving operations and its flexible and responsive workforce, MCAAP lives up to its reputation as the premier bomb-making facility in DOD. In summary, McAlester Army Ammunition Plant's technology-driven cradle-to-grave munitions management is proof positive that MCAAP is on the cutting edge in joint munitions production and renovation. Its strategic power projection, logistics operations, and environmentally friendly demilitarization strengthen its position. More importantly, as a responsive and versatile GOGO installation, MCAAP is prepared to respond to any crisis at any time as a major strategic player in our Nation's overarching defense strategy.

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