

The image features a tall flagpole with an American flag flying against a cloudy sky. In the foreground, the silhouettes of three people are visible, with two of them saluting. The text is overlaid on the image in a bright yellow, bold, sans-serif font.

THE LONE STAR STORY

**SIXTY-EIGHT YEARS
OF EXCELLENCE**

AND IN THE BEGINNING....

Great Britain, France, Germany . . . the sources of US military ammunition at the start of World War I. It took nineteen months from the time the US joined the fight until full production of our ammunition was accomplished. Then, after “The War To End All Wars” was completed, the thirty-two ammunition plants that were built became one or two. As has often been the case, they were too expensive to keep open without a significant requirement.

Throughout the Twenties and Thirties, the six military arsenals supplied those munitions and ordnance items that couldn't be bought on the market to meet the limited War Department needs.

But, The Great Depression and the resulting nationalistic political evolvment in the world began to cause concern at the War Department and within Congress. In response to the growing world-wide unrest, Congress passed the Neutrality Act on 31 August 1935. This statute was passed to provide “...for the prohibition of the export of arms, ammunition, and implements of war to belligerent countries; the prohibition of the transportation of arms, ammunition, and implements of war by vessels of the United States for the use of belligerent states; for the registration and licensing of persons engaged in the business of manufacturing, exporting, or importing arms, ammunition, or implements of war...” Only problem was, the US didn't produce many arms, ammunition or implements of war.

The growing war clouds in Europe and Asia began to bother President Roosevelt, the War Department and Congress. While expressing total neutrality to the world, the President and the War Department began to do planning about what would happen if war did occur and the US got drawn into the fray. Obviously, the requirement to be able to manufacture explosives, arms and munitions needed to be addressed in some way.

By 1939, the local area was slowly digging its way out from the economic malaise of the Great Depression. Numerous Work Progress Administration (WPA) projects in the area, to include the only federal building located in two states – Texarkana Court House – and the Texarkana Federal Prison helped, but more was wanted and needed. So, the Texarkana Chamber of Commerce formed a team consisting of Robert Maxwell, partner in Offenhauser Insurance; Estil Vance, Texarkana State First National Bank; H. T. Wiegel, Texarkana National Bank; J. E. Wood, Texarkana Water Board; and automobile dealer, L. C. Cargile. Goal of the team was to energize the region and help the area recover.

This team heard the government was starting to fund projects to support the War Department and prepare the US to better protect itself given the situation in Asia and Europe. Original goal was to find any program that would result in the creation of at least 100 jobs in the area.

Texarkana was lucky enough to have a native son or two prominent in the Congress and with access to President Roosevelt's ear. Senator Morris Sheppard served as chairman on the Senate Finance Committee. He contacted

Maxwell and told him about the government's plan to build several ammunition production and storage facilities. In addition, the local Congressman, Wright Patman, was able to use his ten years of seniority to open doors and influence decision makers.

Maxwell and the team visited Washington, DC and contacted the Secretary of War, Henry L. Stimpson; the Army Chief of Staff, George C. Marshall; Army Air Corps Colonel Henry H. "Hap" Arnold; and Colonel Francis Miles, Chief, Army Munitions Board. The initial contacts resulting in what Maxwell called "mild interest" in a proposal to build one of these facilities in the Texarkana area.

Backdoor pressure from Senator Sheppard and Congressman Patman eventually resulted in the Army Munitions Board asking for additional information from the Chamber of Commerce on the features of the Texarkana area. For almost two years, the Chamber responded to Army requests for information – studies on the local geography, natural gas availability, availability of electrical power, local labor conditions, etc. Colonel Miles made several visits to the area to look at land in Bowie and Cass counties in Texas and in Little River County in Arkansas and to gather additional information. He was met at Union Station, but always rejected assistance in finding what he wanted to see, telling the team members that "he knew what he wanted to see" and then disappearing for three or four days before returning to Washington.

When not in the area, he asked the Chamber for odd pieces of information such as how many cemeteries were within a particular area and how deep were natural gas pipelines buried on a certain tract of land. Enough to cause hope, but not enough to make the team confident of anything ever coming from it.

Things really looked dark when Senator Sheppard died on 9 April 1941. Complicating the situation, shortly thereafter, it was announced that Minden, Louisiana was going to be the home of a new ammunition production facility. Gone was the influence a powerful leader in the Senate. Knowing there were only a limited number of these ammunition plants to be built, the general attitude was that there little hope to have two located as close together as one in Texarkana would be to the one being built in Minden.

But, Maxwell said that he was almost certain that the Minden plant wasn't what Miles had been looking into in this area. He remembered seeing a map that Miles had indicating a project requiring 40,000 acres which was much larger than the Minden plant location. When asked about this acreage, Miles refused to elaborate or comment on it.

Depression and sorrow ruled the day, and several more that followed, when J. Q. Mahaffey, the Texarkana Gazette's editor, ran into General Manager Henry Humphry's office telling him and Maxwell that a story was just coming in over the wire announcing that a \$45.5 million facility was to built to produce 100,000 artillery shells a day in Bowie County. A few weeks later, the Army announced that a munitions supply depot would be built next door to the Lone Star facility.

Depression and sorrow turned into elation and excitement. A new chapter in the history of Texarkana was being written.

By 1941, due to the worsening world situation, Congress authorized an additional 50 plants to be built. There would be twenty-three for the load/assemble/pack (LAP) of bombs and artillery rounds (a comparable mission to Lone Star's); twelve for the manufacture of ammonia, magnesium, oleum and ammonium pellets; nine for the production of TNT; two for RDX and four for the manufacture of smokeless powder. A total of one hundred-twelve plants were ultimately authorized and eighty-four actually built. In addition, more munitions capacity was established at the various War Department arsenals and thirteen small arms ammunition plants were built and placed into production. By the end of 1943 (peak production), more than twelve million Americans were employed supporting the Allies war efforts. This was no small undertaking; nor was it inexpensive.

CAN'T BUILD BULLETS WITHOUT BUILDINGS AND EQUIPMENT

Okay, government says we're going to build bullets at Lone Star Ordnance Plant. So what's the next step?

You can't build anything without having something to build it on, so the first step had to be getting the land. Solution? Send buyers to the local owners to get the land. When rumors that Lone Star might be closed under BRAC started, descendents began calling to see when they could claim the old family farm site. They swore that their grandfathers or great-grandfathers were told that when the government had no more use for the farm, they would get it back. Alas, what they might have been told didn't marry up directly with what actually took place. It's really hard to tell what the buyers told the owners of the 712 farms, houses, businesses and timber stands about selling their property to the government. But, one has to assume they were effective as very few condemnation proceedings were required. For the 337 tracts that became Lone Star Ordnance Plant, the average price paid per acre was \$27.19. Yes, that doesn't sound like much. But since this was actually about a 30 percent premium for what the land was selling for before the decision to build the depot and plant was made, it can be assumed the extra money offered was very effective in eliminating most reluctance to sell. Whatever was said or done, the land necessary to build Lone Star and Red River Ordnance Depot was under US government ownership by mid-1941.

Meanwhile the War Department had contracted out for a design of Lone Star Ordnance Plant and was working on lining up construction contracts. This task is really enormous in scope. Imagine designing and building a new city within a year. All utilities and their distribution systems need to be laid out. This is driven by what work will be accomplished where on the plant. Deciding what ordnance items will be assembled at Lone Star and when they will be needed to support a war effort that everyone hopes will never happen. Then multiply that by other eighty-three ordnance plants that were going to be built by the end of World War II. Now imagine doing it without computers, CAD systems, etc. Economy of scale is evident if you ever visit any of the other plants built. All have similar basic buildings which had minor design changes made to handle local conditions and different product mixes.

Not much was available in the way of automated equipment, so almost everything was to be assembled by hand. Labor was cheap and the products pretty simple in nature. Enough safety advances had been made in handling explosives that the buildings were divided into individual bays separated by substantial concrete walls. Processes may have been as safe as you could make them, but no sense trusting that nothing was going to happen. So buildings were then separated by empty space to ensure that an accident in one location couldn't spread to another location.

Having a safe place to store the explosives that were going to be used in the manufacturing process as well as the finished products was a necessity. So

earth covered igloos were built (201 at Lone Star and 675 at Red River Ordnance Depot) as were above ground magazines for bulk packed material. Warehouses for inert components; support shops to make the parts necessary to keep the place running; administrative space; hospital; firehouses; sewer lines; electrical distribution system; water lines for both process usage, employee comfort and fire protection; boiler plants for heat and steam; and anything else you can imagine being needed to support 10,000 employees working around the clock, 24-7. Oh, and don't forget we need all of that RIGHT NOW!

So, it began in mid July 1941. While not a lot of specific information on the construction of Lone Star Ordnance Plant is available (it seems to be buried in the contract documents that gave the construction and subsequent production operation to Lone Star Defense Corporation, a wholly owned subsidiary of B. F. Goodrich Rubber Company), it can be assumed that the design and construction process was similar to that used to produce other new War Department ordnance facilities. What is known is that Lone Star Defense Corporation was given a contract to design and build Lone Star Ordnance Plant and that the design work was subcontracted to Prack & Prack Architects – The Chester Engineers and that Lone Star Defense Corporation was able to impress the War Department sufficiently to warrant the award of the production/operations contract in early 1942.

Primary construction contractor was Brown and Root. By September 1941, basic administrative facilities were starting to rise out of the dust at the end of a typical hot East Texas summer. With little rain to slow things down, the first buildings literally sprang out of the dirt at both installations. At the start of fall, the main railroad lines were under construction as were the main roads. Production line surveying and staking was well under way, foundations were being formed and poured and the construction crews were growing daily. The old adage about making hay while the sun shines had real meaning.



First you knock everything down and then you build what you want.

Completed igloos started to show up in October and November. And the walls and iron work for some of the production lines were being thrown up. Orders for the hollow glazed tiles for the production building walls were starting to arrive and were being staged for use. Weather continued to be good with little rain and other weather conditions to slow things down.



**What's a little rain when you have a war to win?
Building the rail connection between Lone Star and Red River**

Winter started arriving in early December and, of course, the world turned upside down on the seventh. For the locals and workers, Pearl Harbor showed them exactly why they were trying to build Lone Star and the importance of doing a good job quickly. Everyone responded with maximum effort and complete dedication to the desired end result. Construction of the plant was completed in June 1942 at a final cost to the American taxpayer of \$33,265,606.00, which included all construction and the purchase and installation of all production equipment.



Johnson Loop – military family housing

HELPING THE WAR EFFORT

A WORKERS PLEDGE

- *I pledge to do my utmost in the prosecution of the war effort –*
- *To keep myself physically fit to carry out my part of the national obligations to our fighting forces —*
- *To remain ever vigilant at all times in the unending fight against possible saboteurs and espionage agents —*
- *To keep silent regarding my work and the operations of my company –*
- *To budget my family requirements to strict needs –*
- *To systematically purchase victory bonds in an amount commiserate with my means –*
- *To do my best to create and maintain unity of thought and purpose for the duration of this war fostered and forced upon us by a group of nations whose leaders are prompted by greed, lust for power and a desire for domination over the American people.*

*-- Excerpt from statement made to employees
on April 10, 1942 by H. E. Treichler, General
Manager of Texas Gulf Sulphur Company)*

Even before the concrete had been poured for all the foundations and all the buildings have been finished, the war effort needed measureable results. If the purpose of the plant was to make bullets, then it was time to get started.

On the 26th of May, 1942, the first rounds moved down the production line in Area G. By September 1943, twelve of the fourteen production lines were in operation. At peak production during World War II, Lone Star employed 12,000 of the 22,000 defense workers in the Texarkana area. While many were locals drawn from the housewives, farmers and ranchers in the area, a great many also migrated to the area because there were jobs to be had. This put considerable pressure on the local housing market which responded by not only building an entire town (Wake Village), but also a housing construction boom in Texarkana and the surrounding towns of New Boston, Hooks, Leary, Redwater and Nash.

The twelve active lines included two for major caliber artillery ammunition rounds; two for minor caliber ammunition (larger than 20mm but less than 50mm), two for detonators, two for primers, one for fuzes, one for boosters, one for Group III bombs and one for the manufacture of ammonium nitrate. The two "inactive" lines (both designed for fuze production) were use sporadically to support production operations at other locations within the plant.

Perhaps it might be easy to overlook the facts that not only were there production lines, but also plenty of other things that were included in the building of the plant. On the 21,328.15 acres making up Lone Star, besides the production lines, there were:

270,441 square feet of earth-covered explosive storage space (201 igloos);
392,730 square feet of explosive storage magazines (38 structures);
15 rail loading docks;
5,184,000 square feet of inert storage warehouses (20 structures);
High explosive demolition and burning grounds;
A product testing facility;
Both light and heavy machine shops;
Tool and gage laboratory;
Chemical laboratory;
Maintenance shops to support the maintenance staff;
Automotive maintenance shops;
A salvage yard for recycling excess or damaged material;
52.6 miles of asphalt roadway;
0.58 miles of concrete roadway;
69.66 miles of improved gravel roadway;
Three fire houses;
Six boiler houses;
A rail classification yard and 45.2 miles of trackage;
More than 150,000 square feet of administrative space;
A hospital with X-ray capabilities, medical laboratory and 16 beds;
A gymnasium and social club facility;
A cafeteria seating 120 with food support to smaller cafeterias on all production lines;
A family housing area with 17 units; and
Two barracks units (dedicated to housing WACs assigned to Red River Ordnance Depot);
Four additional barracks units (dedicated to the military security forces assigned to the plant)
Water distribution system;
Sewer collection system and sewage treatment plant;
Electrical power distribution system; and
Natural gas distribution system.

While complete production records for Lone Star during World War II are buried somewhere in the government files, it is known that Lone Star, even then, was a plant that produced a wide variety of munitions end items and explosive components. Group III bombs, medium and large caliber artillery rounds, detonators, supplementary charges, primers, fuzes to name a few.

On August 15, 1945, Lone Star was directed to cease production. The instructions contained a cancellation of all future schedules except for those in process at the time of the order and to eliminate any hazards on the plant resulting from explosive materials. The original operating contract did not call for any decontamination or facility layaway work. A change order to Lone Star Defense Corporation outlining what was necessary detailed these requirements

and all the requirements were completed by October 15, 1945 with the exception of the ammonium nitrate plant which had production orders to be completed before the cease production order was received. Those orders were completed on October 24, 1945 and all plant facilities were inspected and accepted on November 1, 1945.

On November 5, 1945, the War Department ordered the consolidation of Red River Ordnance Depot and Lone Star Ordnance Plant for "administrative and supply purposes," but maintained both installations as separate entities. Thus started the "Lost Years," at least as far as Lone Star was concerned.

IN LIMBO

From November 6, 1945 until May 1, 1951, Lone Star was a part of Red River Arsenal. On January 1, 1946, the four hundred ninety-nine employees (42 government and 457 contractor) of Lone Star Ordnance Plant were either hired by or transferred to Red River Ordnance Depot which was renamed Red River Arsenal at the same time.

All work on the plant was in support of the Arsenal's mission with the exception of the operation of the ammonium nitrate plant in Area A which was leased to Lion Oil Company who used the facility to produce agricultural grade ammonium nitrate. The lease was administered by the Louisiana Ordnance Plant. Lion closed down production, cleaned up the buildings and graining facilities, returned all motor vehicles to arsenal stocks and removed all personal property from the property on July 11, 1947. An inspection of the facility 17-18 May 1948 by the Field Director of Ammunition Plants revealed Lion Oil failed to adequately preserve the facility and Silas Mason Company was hired to place the nitrate plant in standby condition.



Refurbished vehicles awaiting storage and reissue

The end of WWII resulted in extensive amounts of war materiel being owned by the government with no apparent use in sight. Red River Arsenal was tasked with either preserving and storing some of this materiel or offering substantial amounts to the public through public sales and auctions. Vehicles, jeeps, tires, automotive parts, scrap metal – you name it and the War Department had it to get rid of. Sale days at Red River Arsenal (held on both the old depot and plant) sometimes required support from security guards and the fire department to keep the crowds calm and under control.



Crowd control at a salvage sale.



Vehicles waiting storage or sale

But, there were substantial amounts of war materiel that couldn't be sold to the public, either because the Army wanted to keep it for contingency purposes or because it was too hazardous to allow the public to own.

Most of the plant was left idle with minimal facility maintenance being performed – just enough to keep the place from falling down and trees from growing in the roads. But, several lines were used to renovate munitions being

returned from both the Pacific and European theaters. In addition, significant volumes of munitions that were no longer needed or were unserviceable were being dismantled and destroyed. While done in accordance with generally accepted practices of the times, it would be learned many years later that just because it is blown up and buried, doesn't mean that it isn't an environmental problem.

On November 5, 1945, Red River Ordnance Depot was given an order to deband 600,000 57 mm artillery rounds. To perform this task, Area C was activated with 133 employees. BB-15 was also reactivated to provide machine and tool support for maintaining the production efforts. In addition, it was necessary to reactivate the High Explosive Burning Ground in a limited scale to provide for the elimination of excess/unsalvageable propellant from the rounds.

The volume of munitions to be demilitarized was sufficient that much was stored in open storage until there it could be scheduled into the demilitarization process. The demilitarization itself could be dangerous, obviously, but stringent safety rules were in place to minimize potential incidents and injuries. But despite the intense safety considerations, some of the rounds occasionally took it upon themselves to help speed the process along by spontaneously bursting into flames.

One such incident occurred on 23 May 1946 in Area C. A boxcar load of 57 millimeter anti-aircraft rounds caught fire (probably the powder in a cartridge self-ignited, but no one knows for sure) which in turn caused some of the remaining rounds to cook-off. The fire was responded to and in the ensuing fire fighting, three firemen suffered minor injuries. A few rounds were scattered about the T-barricade at the south end of C-40. Apparently the rounds had been stored outside for more than six months prior to being transported to Area C for demilitarization.

The Army also placed an order for 25,000 practice hand grenades. These grenades were produced in Building C-2 rather than reactivate any of the inactive lines.

By December 1945, production schedules had been assigned covering demilitarization of more than 8,000,000 rounds of ammunition ranging from 12" Naval projectiles to small fuzes. The rate of demilitarization increased so that during the last two months of 1946, 1,144,339 rounds were destroyed. Scrap from this operation was \$213,438.

A new production schedule for additional demilitarization and renovation was received in January 1946. It was sufficiently large that it was necessary to reactivate both Area E (February 5, 1946) and Area G (June 5, 1946). A new high explosive burning ground and a demolition area were required to handle the increased workload. On June 30, 1946, there were five hundred ninety-six employees involved in these operations.

In March 1947, the Chief of Ordnance curtailed all munitions demilitarization with the exception of those items which were "...so dangerously deteriorated that immediate destruction was necessary to protect life or property." On hand at the Arsenal were quantities of 20 mm, 37 mm and 40 mm projectiles.

The 20 mm rounds were stored in igloos that were required to meet munitions storage requirements. These rounds were torn apart, the primers fired, the warheads detonated (the primary cause of Lone Star being honored by being placed on the initial National Priority List issued by the Environmental Protection Agency), the brass sent to salvage for sale and the burning of the packing crates.

The 37mm projectiles, stored in both igloos and open storage, had deteriorated to the point the fuzes were falling apart, exposing the firing pins, therefore these joined the 20 mm warheads in the open demolition field. Not to be outdone, the 40 mm projectiles had deteriorated to the point that the tracer mixture was prone to spontaneous combustion. These too joined the 20s and 37s in the demolition field. All destruction was completed in July 1947.



Renovation of 155 mm howitzer rounds

Ammunition renovation was performed in Area E on a sporadic basis until June 1951, being limited primarily to salvageable rounds found during ammunition surveillance activities of the munitions stored at the arsenal, although an occasional extensive renovation order was received. A harbinger of future Lone Star production activities occurred in late 1949 with the order to renovate 124,000 155 mm artillery rounds, which was finished up in July 1951.

An extensive bit of workload in this period resulted from the Chief of Ordnance ordering the disassembly of all 105 mm propelling charges, salvaging the propellant as bulk powder. This project started in January 1948 and was

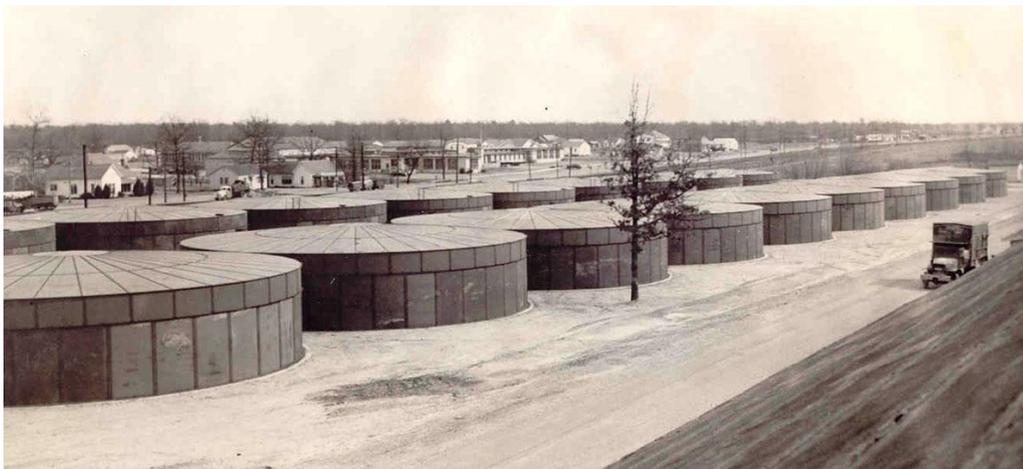
completed in September 1949, once again utilizing the facilities within Area C. 2,886,035 pounds of bulk powder was recovered and stored for long term storage.

Another program was the recovery of scrap TNT. 18,360 155 mm howitzer rounds were demilitarized and more than 181,000 pounds of TNT was recovered.



TNT meltout operations

Not wanting to store some materiel outside, the War Department decided to try building special structures to provide long-term storage for armored vehicles and tanks. As a result in 1947, 117 round storage tanks were constructed in the northwest corner of the plant – Areas 1500 and 1600 in Red River Arsenal language; Area BB in the Lone Star vernacular. Some of these “tanks” were designed and constructed to be humidity controlled structures, while most were weather-tight structures where the contents were individually preserved.



Looking east over the Tank Farm at Hooks, 1947

About this time, the Army started putting rubber pads on treads and still performed tire recycling by retreading them. Needing a place to accomplish this new workload, the Arsenal established a rubber facility in Area BB. Over the years, the Arsenal, and later the Depot, upgraded and modified the Rubber Plant many times before constructing a state-of-the-art facility on the current depot footprint in the early 1990s and abandoning the old facility which was demolished in 2006.

In early 1950, the world situation made it apparent that the Lone Star production facilities would be required for loading operations and in September 1950, Areas B, C, E, F and G were reactivated. It was also obvious that the existing facilities needed to be rehabilitated if they were to be used effectively. On January 26, 1951, Mr. George E. Shepherd, Resident Engineer, Tulsa District Engineers opened his office in I-5 and the "First Wave" rehabilitation work began. The plan was to have Areas E and G rehabilitated by March 10, 1951, Areas C and B rehabilitated by April 1, 1951 and Area F and all other associated work completed by May 1, 1951.

In February 1951, the Army started negotiations with Day and Zimmermann, Inc. who operated Iowa Ordnance Plant during WWII, to become the operating contractor of the reestablished Lone Star Ordnance Plant. Red River Arsenal tried very hard to argue that all the Lone Star assets were too deeply entwined with depot operations to allow for separation and that the reactivation should remain under their auspices as a government operation. The Chief of Ordnance decided that the original decision to maintain the Lone Star facility identity as an industrial facility still held and a contract was signed with Day and Zimmermann as of May 1, 1951. And at the same time, the decision was made that the entire Lone Star facility would be required and a "Second Wave" rehabilitation effort would be required.

A NEW WAR

*“Huge Lone Star Ordnance Divorces Sprawling Red River Arsenal Plant”
-- January 4 1952 headline in the Texarkana Gazette*

In February 1951, the Army made contact with Day and Zimmermann, Inc. of Philadelphia, Pennsylvania, with regards to the possibility of accepting a Cost-Plus-Fixed Fee contract for “...design and consulting services, training operational personnel and the operation of facilities for loading, assembly and packaging of ammunition and components thereof.” Despite strenuous objections by the Commanding General, Red River Arsenal, negotiations were completed and a contract signed with an effective date of May 1, 1951.

The first Day and Zimmermann employees arrived at Lone Star Ordnance Plant on February 26, 1951 to make a pre-contract survey, furnishing design and consultant service in connection with plant rehabilitation, determining and procuring equipment requirements, supervising installation of equipment, establishing an organization, and preparing for production under the contract. Most of the senior plant staff were members of the team and had experience in munitions stemming from Day and Zimmermann’s operation of Iowa Ordnance Plant during WWII.

Actual transfer of plant assets from Red River Arsenal to Day and Zimmermann control was phased to allow the removal of arsenal assets and shifting of arsenal activities to the depot’s footprint. During this transition, Day and Zimmermann employees were trying to retool the lines for production while the Tulsa District Engineers contractors were trying to rehabilitate the facilities. This presented jurisdictional problems as the Day and Zimmermann employees were not union and the Tulsa District contractor’s employees were. There were not clear cut definitions of construction work and maintenance work under the rehabilitation and reactivation program. It all boiled to the surface in mid-June with numerous minor stoppages of work by the craftsmen of the Corp of Engineer projects.

Release of the facilities to the contractor was extremely slow and impeded his progress in rehabilitation. There were no vehicles nor office equipment or furniture available for the contractor’s staff or the Contracting Officer’s Representative staff. All official publications were maintained in the arsenal library over seven miles from the plant headquarters and were not allowed to be checked out for use at the plant.

Further delay was experienced by the lengthy of time required to secure necessary equipment. Much of the load line equipment utilized during WWII had been transferred to other installations; had been converted from loading equipment to demilitarization and renovation equipment, or had become obsolete. Existing equipment on site was reluctantly and slowly released to the contractor for his use in production. In addition, the arsenal was extremely slow in rewarehousing assets to provide both explosive and inert storage space to the contractor. The Ammunition Division of the arsenal continued operations and maintained their offices in I-5 until late 1951. The arsenal also retained control of

storage and provided line supply to the contractor which caused considerable friction between arsenal and contractor personnel. The arsenal insisted that Industrial Service stocks and Field Service stocks were so integrated that it was impossible to assign control of any storage assets to the contractor until extensive rewarehousing could be accomplished.

The contract required production to begin 30 days after the effective date of the contract. Despite the initial problems in the contractor gaining control of what he was to be responsible for, the first of a 5,000,000 supplementary charge production order started down the Area F production line on June 18, 1951, eighteen days late. The remainder of the year was spent bringing the remaining production lines on line.

Area E was released by the arsenal in July 1951 and production of 105 mm howitzer rounds commenced on August 10, 1951. Considerable difficulty was experienced in this operation: shortages of components, projectiles, metal containers and the condition of some of the TNT were significant inhibitors of production. The TNT was shipped from Longhorn Ordnance Plant and contained some pretty bizarre contamination. Bed springs, sea shells and mud wasp nests in addition to the normally expected trash and dirt was found. It was necessary to repair and renovate the shipping containers. Despite the problems, a production rate of 5,000 shells per shift was accomplished by the end of 1951.

To complicate the operations, there was an urgent need to produce 4.2" mortar rounds. This item was scheduled to be done in Area C, but the slow release of this production facility required the production to be done concurrent with the 105 mm production in Area E. The first of many 4.2" mortar rounds started down the production line with the first completed lot shipped on October 19, 1951.

Concurrent with the production of supplementary charges in Area F, the MK2 hand grenade was being renovated (removal and replacement of the fuze and repacking for immediate shipment overseas). The poor condition of the equipment and grenades themselves made this a difficult order to fill. However, James Cargile in the Engineering Department designed a machine which increased the production output by more than 40% and the order was completed on schedule.

Production in Area M began on September 24, 1951 and started what would become one of Lone Star's greatest assets – the ability to do small production requirements on a variety of low requirement explosive items quickly and efficiently. First of these jobs was the demilitarization of the AN-M126 Nose Bomb Fuze. By October 9, 1951, the entire order of 38,000 was completed. This order was followed by an order to recondition 48,000 M51A5 artillery fuzes. These were kicked out in seven work days.

Production of the MK IIIA2 Offensive Hand Grenade (an unfuzed TNT charge, sealed and encased in an asphalt impregnated pressed fiber container) was also started. The item was difficult and resulted in the start of a second great Lone Star attribute – the ability to improve the ability to produce a newly designed item. The original design called for four TNT pellets with tapered holes to form a fuze well. Lone Star provided an improvement to the pellet design

which proved invaluable in producing this item efficiently and with few quality rejects.

M44 detonator production began in Area P on October 27, 1951 and was followed on November 7, 1951 by the T4E1 detonator and on December 13, 1951 by the M19A2 detonator. Initially these items were loaded by hand using WWII production methodology. Lone Star experimented with the use of the Jones Loader and found that production throughput and quality could be greatly improved. While considerable adjustments and modifications were necessary, the automated loading equipment quickly replaced the hand operation which also greatly improved the operator safety as well.



Day & Zimmermann raising the colors for the first time.

At exactly 7:04 AM, Monday, February 11, 1952, Day and Zimmermann Security raised the Stars and Stripes for the first time to the top of the flag pole in front of the Administration Building, I-5. Guard Lieutenant Paul Gunter led guards Roy Frix, S. W. Land, W. L. Martin and L. H. Terral in rendering the honors.

At 2300 hours, July 22, 1952, Red River Arsenal relinquished control of plant security to the Day and Zimmermann Security Department. This transition essentially removed Red River Arsenal's control of the facility – all necessary assets were now Lone Star's and Lieutenant Colonel John McDonald gained complete control of his command.

By the end of 1952, the contractor had 5594 employees supporting the Korean War effort. 3,640 from Texas (2612 from Bowie County; 504 from Cass; 240 from Red River; 114 from Morris and the remaining 178 spread between Franklin, Harrison, Gregg, Lamar, Wood, Marion, Titus, Camp and other Texas

counties); 1862 from Arkansas (1,065 from Miller County; 365 from Little River; 112 from Hempstead; 101 from Sevier; 81 from Howard; and the remaining 138 from other Arkansas counties; 35 from Oklahoma (11 from McCurtain, and the remaining 24 from other Oklahoma counties; and 35 from Louisiana (24 from Caddo Parish and the remaining from other Louisiana parishes); the last 22 employees listed states other than those in the Ark-La-Tex as their permanent residences.



Mrs. Isabelle Jenkins, first local Day & Zimmerman hire

For those who may be interested the first local hired by Day and Zimmermann, Inc. was the attractive Mrs. Isabelle Jenkins. She was interviewed and hired during the pre-contract survey. She was soon followed by several thousand more from the local communities surrounding the plant. The first high explosive operator was Harry Hall. Other notable hires during 1951 (they managed to survive at least forty years of dedicated service to the plant) included: Pauline Barfield, Marvin Burleson, Owen Clemmer, LeVone Davis, Bill Flowers, John M. Fondos, Jerry Gray, Claude Hays, Henry B. Keener, Willie C. Keener, Pressley D. Starks, Bonnie Selman, Frank Schoen, Virgil Lewis and Allen Jordan. All would be honored at the 40th Anniversary of Day and Zimmermann initial contract award in 1991.

An employees' association was started with funding obtained through the operating contract and various admissions fees for events to support the recreational needs of the Lone Star employees. The Four-States Employees Association started their existence by providing for nine basketball teams, two softball teams, a baseball team and six bowling teams that participated in local leagues. In addition, they sponsored nine dances for white employees, two dances for colored employees, eight bingo parties, ten square dances and all departmental holiday dances and parties.



Miss Jean Pool (left) accepts part of her prizes from Daisy Yeager of the Four States Employee Association

On July 25, 1952, Lone Star's Miss Jean Pool was selected as Miss Baseball of Texas and would represent Texas at the National Baseball Congress national tournament in Wichita, Kansas when the D & Z Stars, Texas champions, played in the tournament. Miss Pool, daughter of Mr. and Mrs. O. P. Pool, was a recent graduate of North Texas State College and was a temporary summer hire. As described by the Powder Horn, "The newly-elected 'Miss Baseball of Texas' has whistle-bait measurements: bust, 35"; waist, 22"; hips, 35"; thigh, 17-1/2"; calf, 13-1/2"; and ankle, 8-1/2". She received a 5 day expense-paid plane trip to the national tournament. She would be leaving the plant at the end of the summer to become a first grade teacher in Port Arthur, Texas.

An East Texas farmer plowing with only one mule kept houting, "Giddap Jack giddap, giddap Jim, gidday Joe."

A passerby listened for a few moments and asked, "How many names does your mule have?"

"Just one," answered the farmer. "But he doesn't know his own strength, so I put blinders on him and yell a lot of names and he thinks a lot of other mules are helping him."

On June 4, 1954, Miss Mary Cooper was named "Beauty Queen of the Lone Star Ordnance Plant." Miss Cooper, the first female employee and three year veteran of Pickett Cafeteria at the plant, was selected at the Beauty Pageant in the Recreation Hall in front of more than 200 employees and their families and friends. She was awarded and a \$75 savings bond. She won over eight other contestants. Miss Sue Barber from the Steno Pool was runner-up and received a \$50 savings bond. Mrs. Jackie Roper from Production Planning won a \$25 savings bond for third place.



Miss Mary Cooper being crowned Miss Lone Star by Plant Manager O. M. Janik

By the end of 1952, Day and Zimmermann was firmly in charge of all assets necessary to operate the plant and producing whatever the Army asked to have produced. Various detonators, artillery primers, hand grenades, artillery and bomb fuzes, and medium caliber artillery rounds made up the bulk of the workload with various sundry odds and ends thrown in because no other plant wanted the work or no one else had been able to actually produce it. Lone Star's reputation of doing the hard stuff was started and would continue well into the future.

In 1953, ten of the thirteen production lines were in production. Only Areas B, J and S were inactive. Area B had been retained by Red River Arsenal initially, but was released to Lone Star in mid-1953. Immediately Lone Star started rehabilitation of the line to accommodate the production of 155 mm howitzer rounds. By early May 1954, the rehabilitation was nearly complete, but by this time, the Korean War was winding down and the need for this capability became doubtful.

“Oh, look, there's some of our ammunition!” It was the excited voice of Jayne McMahill, Colonel Janks', Day and Zimmermann's Plant Manager, secretary.

While sitting in the Paramount Theater in Texarkana watching the movie, “Cease Fire,” she poked the stranger next to her in the ribs. She had just seen a box of ammunition stenciled Lot LS13-204 on the screen.

Obtaining a single frame of the film, the Lone Star Photo Lab was able to blow it up and the Inspection Division was able to determine the box in the movie was from Lot LS13-204 which left Lone Star on January 30, 1953 headed for the Port of Embarkation in New Orleans and then, after a short stay in the San Francisco area, left for Korea.

“The movie is a battlefield documentary/drama played with the realism of life itself. Its stars are the American fighting men who dared death before, during, and even after the filming of the picture. The film valiantly relates the last heroic efforts of ‘Easy Company’ on what is described on communiqués as a ‘quiet’ day at the Korean front. The 3-D stereoscopic cameras record every act of the patrol as they probe behind enemy lines on this last day of fighting. The shell fire, the rifle and machine gun bullets that whiz past the cameras are real. The human drama, the violence, the soldiers’ reactions to the holocaust, the fighting itself – they’re all real.”

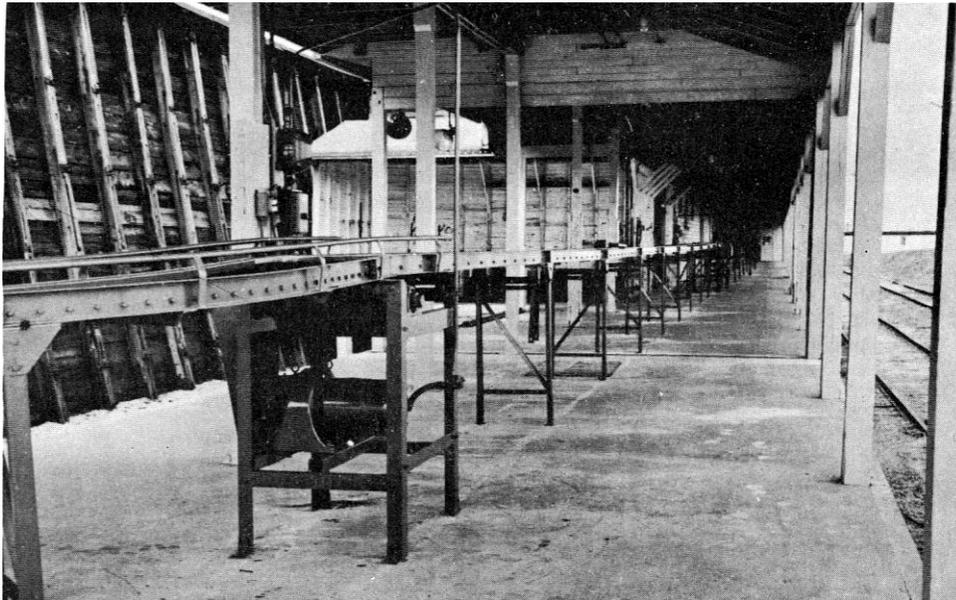
-- Lone Star Ordnance Plant “Powder Horn”, March 5, 1954

Almost immediately after the signing of the truce in Korea, production cutbacks began to arrive at the plant. While gradual, they were consistent and by 1960, only five of the ten active lines were still producing. Most of the facilities in the inactive areas, and portions of the active areas as well, were being maintained in a layaway condition. In addition, Day and Zimmermann was on their third Plant Manager, A. A. Rowland. O. M. Janik, COL (Ret) (1951-1956), the first Plant Manager, and J. Stewart Peterson (1956-1959), the second Plant Manager, had accomplished what they were hired to do, namely get the plant back into production and start the necessary traditions that would establish Lone Star as a competent quality producer of munitions for the Defense Department and were now figures in the plant’s history. Mr. Rowland faced a significant challenge – how to enable Lone Star to survive in an era when no one was shooting at any one and the Cold War was settling into the constant low-level threat.

WANDERING IN THE DESERT

While employment levels in the late 1950s and early 1960s were dismal (with a low of slightly less than 600 in 1958), somehow Lone Star managed to get enough production work to avoid closing. During this period, Lone Star began experimenting with automation at every opportunity. While there were some failures, most weren't and this improved efficiency and the resulting item cost reductions helped to build the internal structure on the plant that would be put to an extreme test in the near future. It also cemented the reputation that Lone Star was a facility never satisfied at doing it the same way, but intent on finding a way to make it better, faster and cheaper.

Some improvements were as simple as improving product flow, use of powered conveyors instead of manual push carts for moving product and consolidating production functions. For example, the use of powered conveyors in Areas C and E allowed for consolidation of production processes for both the 4.2" mortar and the 105 mm rounds. This, in turn, allowed for the rearrangement of the production equipment which allowed for the concurrent production of a second melt-poured item in Area E. Just this conveyor program resulted in the elimination of more than 31,200 man-hours per year on a 3-8-5 basis for the 4.2" mortar round.



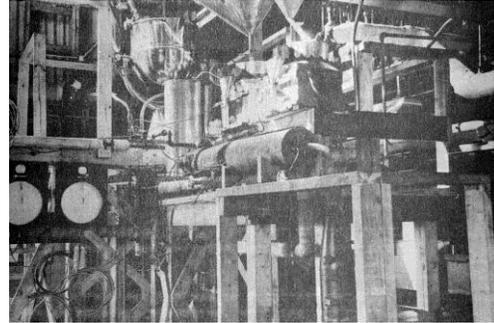
Simple conveyors vice hand-pushed buggies sped up all phases of production operations

In early 1954, a project originated for the development of a continuous TNT pouring capability. The hope was to replace the then current method that required the weighing and flaking of the TNT and then melting by batches for pouring into the projectile body. This methodology was slow and required

frequent pauses to wait for another Dopp kettle full of TNT to melt before continuing the production process. This was not only time consuming, but also resulted in significant production TNT waste. A prototype melt pour unit was designed, installed and placed into limited operation in Area O. By 1959, a production model had been designed, fabricated and installed in Area C. It had been successfully used to pour both the 4.2" mortar and 105 mm rounds.

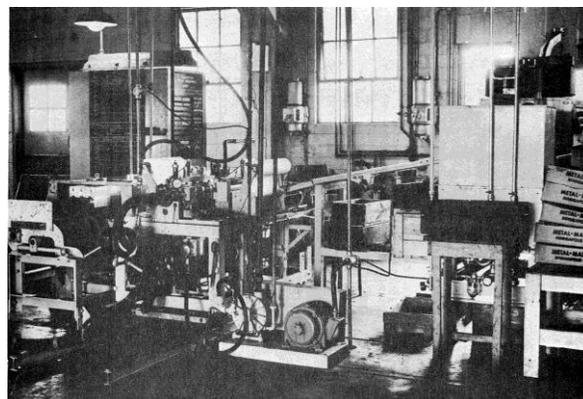


Batch pouring off of TNT



Working model of continuous melt pour unit

Demand for black powder artillery primers was relatively constant. This continuing production made the automated loading of these items an attractive proposition. By the end of 1959, an automated line for the production of the M57 percussion primer was functional in Area R. This line placed all production steps within a single building with the exception of powder preparation and distribution which continued to be a separate backline operation. The primer bodies were automatically fed into the machines and conveyors where inspection; stenciling; head assembly; cutting, coiling and insertion of the paper foil; lacquering and drying of the bodies; volumetric loading and final lacquering of the item were performed. Minimal hand operations were limited to transfer and supply operations, final inspection and packing for shipment. Initial production runs indicated that almost \$200,000 per shift per year in cost savings were achievable.



Automated M-57 primer equipment

A significant step forward was made in the volumetric loading of various powders and mixes used in the production of primers and fuzes. DZI was able to design and fabricate several automatic volumetric loaders which reduced the number of operators that were previously needed to either manually load primers or make delay pellets for fuze assemblies. The use of volumetric loaders allowed the delay mixtures to be directly placed into the delay cavity of the fuze and then consolidated in situ, eliminating the need to produce individual pellets of delay mix and then having them reconsolidated into the delay cavity. And, as with most of the other production improvements developed by Lone Star, not only was manpower saved, but personnel safety was increased by eliminating operator exposure to explosive powders.



105 mm brass returned from Korea for reuse

Towards the end of the Korean War, literally millions of brass 105 mm cartridge cases were being shipped back from the war zone for potential reuse. The reclamation of these assets was performed in Area G and was completed in the mid-1950s with a total of 5,090,060 cartridge cases being reclaimed for reuse and a savings of \$23,130,990 to the Army.

Unfortunately, the process generated considerable toxic production waste that was pumped to settling and treatment ponds just outside Area G's northwest corner. These "G Ponds" would come back to bite the plant when environmental regulations were written and the plant had to start living with them in the 1970s. But, more on that later.

The labor intensive production of detonators was attacked in 1953 by experimenting with the use of Jones loaders to reduce 25 operators from the old hand operations with the side benefit of reducing operator exposure to extremely sensitive initiating explosives. This proved to be a very successful experiment. By 1960, Lone Star had completed the installation of nineteen of the loaders in Areas P and Q. These loaders proved so versatile that by 1960, they had been used to produce more than 35 different detonators.



Hand line operations



Jones Loader making detonators

Despite the limited production activities (compared to the levels experienced during the Korean War), Lone Star's concern about safety and personnel welfare was not reduced. This was borne out when on February 23, 1957, Day and Zimmermann, Inc. held a plant-wide celebration to honor the efforts of all employees who worked 2,424,162 hours between January 20, 1956 and January 21, 1957 without a lost time accident. The celebration included a plant-wide luncheon put on by the Four States Employees' Association with the presence of Congressman Wright Patman, Mayors A. P. Miller of Texarkana, Texas and Haskell Hay of Texarkana, Arkansas, state and national representatives of all fourteen unions representing the Lone Star employees and more than a thousand Day and Zimmermann employees.

With the increased support to Vietnam with military aid and American advisors in the early 1960s, production requirements gradually increased after the low employment levels in 1958 reaching almost 5,000 employees in 1963. The escalation of American involvement in Vietnam beginning in late 1964, employment levels began to explode as mobilization for the Vietnam War began.

THANKS JFK AND LBJ

The worsening situation in Southeast Asia was forcing the United States to look that direction. President John F. Kennedy began to seriously consider providing support to the South Vietnamese government to prevent the takeover of the South by the North. Initially this support was in the form of military aid and small numbers of advisors and training personnel. Of course, military aid included supplying weapons and ammunition. Since the US was still facing the possibility of engagement of the USSR in Europe, most ammunition stocks were already dedicated to that theater. As a result, orders for munitions at the existing ammunition plants began to increase. Lone Star started receiving increased production orders and hiring workers to deliver them. By 1963, the plant population was approaching 5,000 employees. Once again it was necessary to search for skilled workers and strong backs.

Complicating the situation was the birth of a new generation of both weapons and munitions for production along side the old standbys. Maybe the most significant one given to Lone Star was the first Improved Conventional Munitions (ICM) artillery round, the M449. This round was so unique that it was classified as a confidential item and all employees on the production line and in other areas of the plant involved with this item required at least a confidential clearance. A portion of Area W igloos was double fenced and higher security requirements imposed.

A 155mm round, it was filled with smaller payload units (grenades) which were ejected from the round in flight allowing it to provide highly effective anti-personnel support. Its effectiveness and potential for improvements led to the development of second, third and fourth generation artillery rounds and air delivery systems capable of not only suppressing troop concentrations but also offering anti-materiel aspects as well.

As effective as these were against the enemy, they proved to be equally dangerous to the builder. On July 8, 1963, a defective safety on one of the grenades allowed it to function and when it did, it caused an additional eight grenades to detonate as well. The resulting explosion and shrapnel killed the operator and injured twenty-two other operators in the bay. This was the worst explosive accident that Lone Star had experienced since Day and Zimmermann began operating the plant. An investigation determined the cause and proposed additional safety enhancements to the production process and components for the round. A sad lesson was learned the hard way – the items we produce to kill people – WORK! Emphasis on safety was redoubled and production resumed.

Production orders started dropping off in late 1963, probably due to the assassination of JFK and the resetting of the government under now President Lyndon B. Johnson. While LBJ kept support to the South Vietnamese, it took a back seat to several other governmental initiatives that were pressed on the domestic front. The Civil Rights Act of 1964 and the Voting Rights Act of 1965 were commitments that LBJ insisted of completing. They would arguably have a greater effect on American life than Southeast Asia would. But, LBJ was not

abandoning the South Vietnamese. In late 1964, the draft was expanding and more and more of those serving were heading towards Southeast Asia. We were no longer advising and training, we were beginning to take an active part in the war.

More than eight million American soldiers, sailors, marines and airmen eventually participated in the Vietnam War with a peak strength of a little more than 500,000 being in country in 1968. More than fifty-seven thousand lost their lives, making it the most expensive war the US has fought in terms of lost American lives with the exception of the Civil War. 15,500,000 tons of munitions were used by US forces during the war; 12,000,000 tons in South Vietnam alone. There were 7,500,000 tons of ground munitions used; 7,800,000 tons of air ordnance dropped and 200,000 tons of naval gun ordnance used. Sound like a lot? Well, compare it to the slightly more than 6,000,000 tons the US used in all of World War II. So, yeah, it was a lot. But this time, there weren't 84 ammunition plants running to keep the pipeline full which, of course, meant that those plants that were active were expected to produce a lot more bullets, a lot faster.

As the production load grew at Lone Star, the process improvements that were developed and implemented in the late 1950s and early 1960s began to pay dividends. And being able to maintain a cadre of trained skilled workers through the lean years helped as well. By 1968, Lone Star had more than eleven thousand employees working around the clock. Try to imagine those and the 8,000 employees at Red River Army Depot trying to enter the two installations when the only access roads were US-82 along the northern edge and US-67 on the southern edge of the facilities. Not only were there three shifts, but also staggered start times on the lines to help reduce traffic flows and ease the congestion.

As mentioned earlier, the munitions being used in Southeast Asia were not just the standard hand grenades, mortars, artillery rounds, but also unique items that demanded special equipment which in turn demanded skilled production and maintenance workers, not to mention engineers, draftsmen, chemists, explosive experts and sundry other special skills and talents. While some were found on the labor market, most were trained in-house by Day and Zimmermann. Of course, there was also a demand for strong backs and plenty of sweat, especially during the late spring through early autumn months. East Texas isn't exactly beach front property. For at least six months out of the year, ambient conditions put the Lone Star worker in about the same conditions as the grunts on the ground in Southeast Asia – both doing their best to win a war.

Sometimes the results of those efforts were not entirely successful. At 10:30 PM, February 15, 1967, an explosion rocked one of the buildings on E Line. Fire erupted which normally would have been fought from the exterior by the plant fire department. But this night was different. There were people inside, so the firemen attacked the fire and managed to extinguish the blaze about 12:15 AM. Due to the construction of the building, the explosive and shrapnel damage was confined to just the single bay where the incident occurred. Unfortunately, that bay contained twelve people. Ten were killed immediately and another died

in the local hospital seven hours after the blast. An additional fifteen employees were injured with four requiring hospitalization.

The worst accident in Lone Star's history was thought to have been caused when an M564 fuze was being spun onto a 105mm artillery round. It was thought that speed of the air wrench had been sufficient to cause the fuze to arm and an inadvertent jarring of the round caused the fuze to function. This accident resulted in a decision to no longer ship fuzed rounds, but rather to ship fuzes separate from the loaded projectiles. All the rounds within this lot of projectiles were pulled from the supply system and stored at Lone Star until automated equipment could be design to remotely open the packaging and remove the fuzes from all the rounds. This was accomplished in the late 1970s.

While the February 15, 1967 accident was devastating to the plant population, it wasn't allowed by either management or the workers to greatly slow the flow of munitions from Lone Star to Vietnam and then only briefly. In 1968, while the plant population reached the highest level ever (11,683 employees), production output also received record highs. During 1968, Lone Star produced 428,073,789 individual explosive items which didn't include more than 1,000,000 "special" items needed for special testing, developmental work and "black" operations.

Despite apprentice and training programs, Day & Zimmermann had great difficulty getting sufficient manpower to meet production requirement. During the Korean War, most jobs in the munitions production arena were relatively low skilled, requiring physical dexterity rather than hard-to-learn skills. But with the increased automation of the production processes and complexity of the items being produced, it was no longer enough to have good hand-to-eye coordination and a willingness to learn while working hard. Now there was a need for the average worker to be able to read and understand work instructions, safety requirements, interpret machine readings. The millwrights didn't have to be just good mechanics, but had to be able to understand and adjust to changing product specifications and modified equipment. Skilled labor such as accounting, engineering, drafting, explosive technicians and similar jobs demanded the cream of the crop and there wasn't that much crop in the Ark-La-Tex community.

Day & Zimmermann was forced to search well outside the immediate area to fill both the hands on labor force and the skilled support staff. Recruiting started at first area colleges and technical institutes (Oklahoma State University, University of Arkansas, Arkansas Polytechnical College, Arkansas AM&N to name a few) and then spread across the nation.

Want ads were placed in papers in Dallas, Houston, Chicago, Saint Louis, New Orleans, Memphis, Denver, Los Angeles, San Francisco, Seattle and many medium sized towns as well. Production workers were offered starting wages of \$2.46 an hour with excellent fringe benefits. Skilled workers were promised above average wages, excellent benefits and ample opportunity for advancement. The effort was successful and many of these employees formed the essential cadre at the plant for the next forty years.

NORTHEAST TEXAS LOCATION

DAY & ZIMMERMANN, INC.

Lone Star Division, Texarkana, Texas

DAY & ZIMMERMANN, INC., Lone Star Division, Texarkana, Texas, offering excellent benefits, above average wages and opportunity for advancement.

Location is excellent, golf hunting, fishing lakes and other recreation facilities with moderate cost of living.

WE ARE INTERESTED IN PEOPLE WHO
WANT TO MOVE TO THE
TEXARKANA AREA

QUALIFIED PERSONNEL ARE NEEDED
IN THE FOLLOWING CATEGORIES:

MACHINISTS—Journeyman
Understands grinds, set-up, and operate machine shop equipment.

MILLWRIGHT
Installs, repairs and adjusts precision production equipment. Must be "precision appreciative." Prefer experience on small equipment; i.e. garment production machines, technical automotive machines, etc.

AUTOMOTIVE MECHANIC
Minimum 6 years experience in all phases of automotive maintenance.

PROFESSIONAL POSITIONS

INDUSTRIAL ENGINEER

Prefer BSIE. Will consider degree in related sciences, with experience in field of production, set-up and cost relating to production outlay and other such systems of manufacturing.

MECHANICAL ENGINEER

BSME, knowledge of machinery and tool design including installation, maintenance and machinery modifications. Recent graduate with experience.

WRITE OR CONTACT

MR. BILLY D. ROBISON—Employment Mgr.

TELEPHONE COLLECT A/C 214 838-1421

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Lone Star Army Ammunition Plant
TEXARKANA, TEXAS

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Lone Star Army Ammunition Plant

Qualifications Are:

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RATE \$2.46 PLUS
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Location is excellent, golf, hunting, fishing lakes and other recreation facilities with moderate cost of living.

We Are Interested In People Who Want
to Move to the Texarkana Area

QUALIFIED PERSONNEL ARE NEEDED
IN THE FOLLOWING CATEGORIES:

INDUSTRIAL BUYER TRAINEE —
No experience necessary; we will train. 4 years college desirable; we will consider minimum of 2 years.

TRUCK DRIVERS —
Minimum 21 years of age. State license to operate tractor-trailer vehicles. Must be able to pass company driving test and be in good physical condition.

WRITE OR CONTACT
MR. BILLY D. ROBISON—Employment Mgr.
TELEPHONE COLLECT A/C 214-838-1421
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Lone Star Army Ammunition Plant
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Hey, come work for us in a great place doing a very meaningful job!

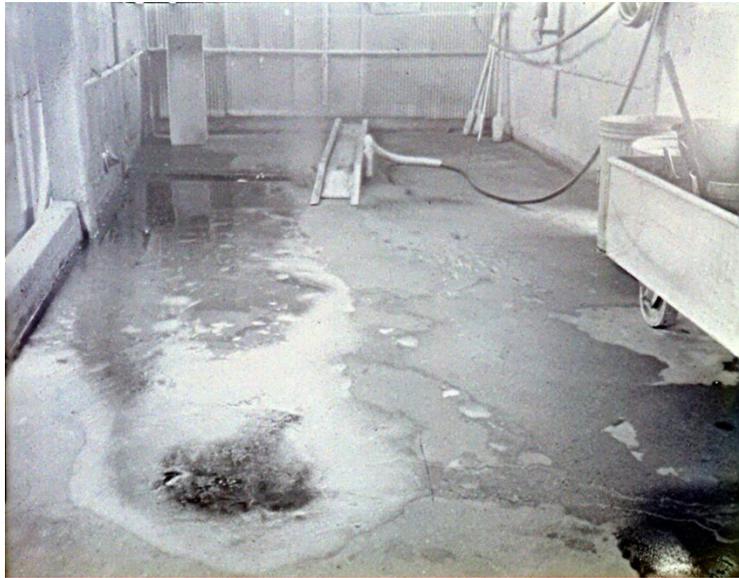
However, the pressure to meet production requirements did not keep Lone Star from being a valued neighbor to the local community. On February 18, 1968, the Lone Star Fire Department assisted the Hooks Volunteer Fire Department in putting out a fire at the Hooks High School. While the west end of the building was totally destroyed, Lone Star's assistance prevented the fire from spreading to the east half of the building, limiting property loss to \$500,000 vice losing the entire \$1,250,000 building.

And, the employees and Day and Zimmermann corporate provided assistance to local charities through 90+ percent participation in the local United Fund annual donation drives from 1964 through 1975. And the Four States Employee Association expanded to help keep up worker morale and help provide valuable recreational activities. Golf tournaments, Fishing Rodeos, bowling, bingo, baseball, softball, basketball, bridge, canasta, chess leagues, holiday festivities and dances were supported. In fact, the Association spent more than \$56,500 on these activities in 1968 alone.

During the same period, extensive production equipment upgrades and automation was also occurring. This was a prelude to even more investment by the Army at not only Lone Star, but all active ammunition plants. These investments were needed to reduce exposure of workers to explosives and thereby improve personnel safety, increase product quality by eliminating as much as possible the human error factor in the production processes and increase production output. By the end of hostilities and return of all US troops in Vietnam and the resulting reduction of production requirements in 1973, Lone Star was entering into an extensive program of modernization and expansion of its production capabilities.

NOT BIGGER, BUT CLEANER

By the late 1960s, the US was beginning to becoming concerned about the environment. Concerns about water and air quality were starting to impact on production processes and operations. These concerns were exacerbated by the volume of production at Lone Star during this period.



E-9 105mm projectile washout rack

One of the most obvious potential problems, and literally most visible, was the generation of red water – water contaminated with TNT – generated from meltpour operations, shell washout, shell washoff, meltpour equipment cleaning and building cleanup. In the past this water was basically swept out of the buildings on to the adjoining ground. While the high nitrogen content of the water was good for grass just outside the building doors, it wasn't good for anything else.

By 1968, this water was being collected and transported to leaching and evaporating ponds. While better than just pouring it on the ground, this would still cause environmental problems later as the regulations became more stringent. Lone Star began to use closed recirculating wash systems in C-4, E-4, E-9 and G-23 in 1968. These systems reduced red water sent to the ponds from the 87,000 gallons per week generated in 1967 to 36,200 gallons per week in 1968 even though production output from these locations was more than 150% in the same period. Obviously this was better for the environment, but also presented a significant reduction in water usage and therefore plant operating expenses.

Remember G Ponds? Well, things started improving there as well. The old cement piping to the ponds was replaced in 1968 with vitreous clay tiles which resisted the low pH of the effluent from the cartridge case renovation work

better. In addition, concrete catch basins were replaced with stainless steel tanks. Leakage from the previous system accounted for significant pollution being released into the drainage ditches in the north G area. Still not a total solution, but better.

Concerns about the plant's waste leaving the plant site resulted in the establishment of a surface water sampling program at all points where water was released to public areas. While primitive by today's standards, the program alerted the plant to potential discharges that could adversely affect the public and allowed for immediate reaction to problems.

Collection and treatment of initiating explosives residue and washdown water had been done since initial use of these explosives in WWII. The residue was collected into sumps, chemically treated to neutralize their explosive characteristics and, when rendered safe, the water was released to the plant drainage system. However, in 1968, an employee was fatally injured while performing this desensitizing operation. A new look at the operation resulted in the redesign of the sumps and the addition of catwalks and remote controls eliminated the need for employees to physically add desensitizing agents and perform the mixing operations. This greatly reduced employee exposure to the initiating explosives and made the operation much safer and more environmentally friendly.

Congress passed the Clean Air Act of 1955, followed by more comprehensive rewrites in 1963, 1967, 1970 and 1990. These laws required increasingly more stringent monitoring requirements and regulatory restrictions on the emission of air pollutants by industry and governmental units. Congress also attacked water pollution and water quality with the Clean Water Act of 1972 and subsequent additions and rewrites. Add to those very comprehensive statutes the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 and the Resource Conservation and Recovery Act (RCRA) of 1976 and the plant had a new area of responsibility that had to be met.

By the early 1970s, the Army was taking these environmental responsibilities very seriously. In 1973, they conducted an overview and baseline of the environmental problems on the plant. Sampling of ground and surface water as well as soils at areas that interviews with older employees indicated might represent problems were performed. These baseline numbers have over the years lead to more detailed surveys and studies and projects to clean the problem areas.

One such location was the Old Demolition Area (ODA) which was used as a site to destroy various pieces of old ammunition that were no longer serviceable and couldn't be renovated. Remember those 20mm, 37mm, 40mm and 57mm rounds from the late 1940s. They were placed in piles in an open area and detonated. The quick way to destroy them and render them safe – well, render most of them safe anyway. The initial investigation of the site resulted in contamination levels sufficiently high enough to warrant placing the site on the National Priority List (NPL – the DOD equivalent of the Superfund). Extensive site evaluations were undertaken with the end result being the surface cleanup of

the site, installation of ground water monitoring wells and covering of the site with sufficient soil as to prevent exposure of the remaining unexploded ordnance (UXO) to the public. With the possibility of the public having access to the site after closure, it is unknown what additional requirements might emerge now.

But the ODA is only one of more than 500 individual Solid Waste Management Units (SWMUs) on the plant. Each of which has had to be addressed and will be addressed again under the plant closure. Some of these have never really been located, but exist because an employee thought he remembered something being buried in a particular site. Some have already been cleaned up and represent no threat to the public. And some will require additional investigation, characterization and remediation before the site can be used for any purpose. This is where the past acceptable practices will greatly affect the cost of environmental cleanup.

Another difficult site is the G Ponds previously mentioned. While ground water contamination is minimal due to the impermeable soils, the surface water runoff has caused some of the heavy metals and acid residues to be washed into the drainage system surrounding the old pond sites. The ponds themselves were pumped dry with the water treated to acceptable levels. Contaminated piping and soils were placed in the old ponds and then the ponds capped with an impermeable clay cap. Ground water monitoring wells surround the site and are constantly monitored to ensure no pollution escapes from under the cap.

Still another site is the O Ponds. These pond located south of Area O were used as leaching and treatment impoundments for red water. These ponds have also been closed, filled in, capped and ground water being monitored to ensure nothing escapes. Surface water and sediments within the drainage system from this area of the plant have shown no migration of the TNT residue contained within the old ponds.

The plant is both blessed and cursed to sit atop several hundred feet of tight packed clay and shale. This has prevented much past pollution from entering aquifers used for drinking water or other purposes. But, at the same time, the perched water tables and non-porous soils make clean up extremely difficult and costly. It is anticipated that complete environmental clean up of the plant will require many years and some portions of the plant may never be released for use by the public, but rather limited to industrial uses or permanently left in fallow.

In 1991, Lone Star constructed the first fully Subtitle D compliant municipal landfill in Texas to handle waste generated by both Lone Star and Red River Army Depot. This landfill is fully lined and has a leachate collection system that prevents contamination of the surround land and subsurface soil and water. Lone Star has been commended many times by the State of Texas for the exemplary operation of this facility.



Lining one of the cells in the municipal landfill at Area A

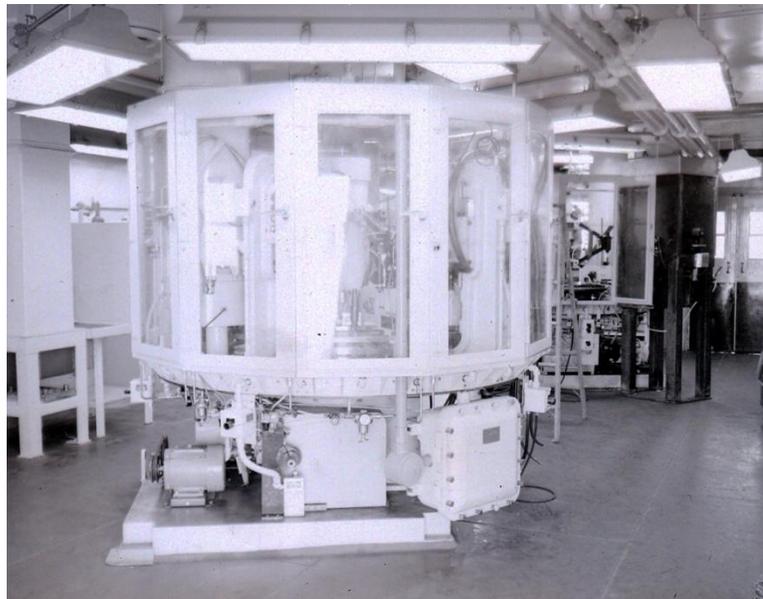
Over the years, Lone Star has removed all subsurface POL storage tanks and cleaned up any contamination caused by leaking tanks. Gasoline and diesel is dispensed by a fully automated self-service gas station with above ground tanks, containment and leakage monitoring alarm systems. Boiler fuel supply tanks have been emptied and cleaned and present no environmental threat. All production processes are catalogued and monitored to ensure compliance with all permit requirements. Day and Zimmermann's rapport with the regulators is good and few if any problems have surfaced with the way they meet their environmental responsibilities. So, while there are cleanups that will have to be done, the day-to-day environmental issues are well in hand.

AS WELL AS FASTER AND BETTER

The Army invested more than \$5,100,000 in 1968 to modernize and improve existing production equipment and production lines. Two of these projects would prove to be critical to Lone Star's reputation and existence.

One was a project to design, fabricate and establish a production capability for the XM483, 155mm ICM round, a second generation replacement for the M449 round. \$3,100,000 was provided to Lone Star by the Army for this effort. This artillery round contained 88 small grenades, which were pressed in a shaped charge configuration that allowed the grenade to penetrate up to five inches of mild steel and also provided anti-personnel attributes as well. Like the M449 which it was replacing, the grenades were ejected during the flight of the round after firing and the grenades dispersed over a fixed target area – literally "Steel Rain" which proved to be devastating to enemy concentrations of troop and materiel. This round would generate enough demand within the Army community that by 1980, three existing ammunition plants (Lone Star, Kansas and Milan) and the first new ammunition plant since WWII, Mississippi AAP, would be built to meet this demand.

The second was a \$1,220,000 project to replace the venerable Jones Loader with a newer generation of automated detonator loading machines. The project provided for three production systems and the necessary building modifications needed to have them installed in Area P. These Wheaton Loaders offered increased production rates, improved safety considerations and reduced labor requirements (both production and maintenance). The success of this improved process would result in a complete renovation of detonator production within the ammunition complex.



Wheaton detonator loading machine

These projects were just the beginning of a wave ammunition production modernization and expansion that resulted from the Army recognizing that more was going to be needed at each of the remaining ammunition plants within the complex. The formation of the Project Manager for Production Base Modernization, located at Picatinny Arsenal, NJ, demonstrated that the Army was intent on completely upgrading the munitions manufacturing base. By the end of the 1980s, the Army had expended more than \$1,500,000,000 on new equipment and facilities. Lone Star got its share.

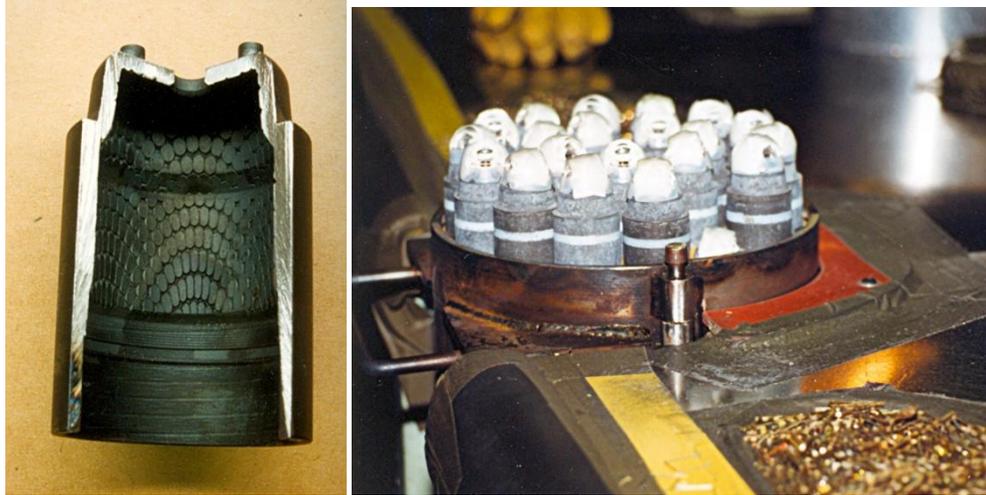
Major modernization and expansion of capability projects would be directed to Lone Star throughout the 1970s and 1980s. These would include projects for the expansion of ICM capability, detonator loading modernization, and automation of the load, assembly and pack (LAP) of fuzes. Modernized capability for electric and percussion primers, LAP of the Family of Scatterable Mines (FASCAM), improvement of pyrotechnic blending and mixing, continuous meltpour operations, and LAP of both 60mm and 81mm mortars. Smaller projects were designed and implemented to improve shipping capabilities and improve safety and quality within the various production lines.

Perhaps one of the most significant projects was the development of ICM round production capability. Originally limited to the replacement for the M449 round, the capability to produce the M483 ICM 155mm artillery round has been expanded and improved since about 1969 to present to include the 155mm base bleed ICM round (M864), a new family of 105mm ICM rounds for use by rapid deployment forces, the eight inch ICM round (M509), the Multiple Launch Rocket System (MLRS) and even, before the Navy retired the last of their battleships, a sixteen inch ICM round.

A constantly improving family of munitions, the ICMs have proven to be invaluable to today's modern warfare. Used extensively during the 1991 Gulf War and in both Afghanistan and Iraq in the early 2000s, they provided a tremendous force multiplier for the grunts on the ground. Highly effective at causing chaos in troop concentrations and for inflicting substantial damage to massed materiel, the ICM family has earned the very descriptive moniker of "Steel Rain." However, there is one problem with these munitions – the dud rate of the sub munitions could be as high as 5%. Doesn't sound like a lot, but when you multiply that 5% times the estimated 30,000,000 ICM sub munitions that were estimated to be expended in Desert Storm, you end up with about 1,500,000 of these deadly chunks of explosives lying around in the sand. So, while the munitions are tremendously effective, the leftovers are pure death waiting for a child to pick it up or a soldier to step on it or a camel to shuffle by it. Built to kill, when they function, there are few items more deadly.

Several refinements and improvements have been made to grenades to reduce or eliminate the duds evolving from the use of ICMs. Lone Star, in general, and Day & Zimmermann, in particular, have been in the forefront of these efforts. Improved LAP procedures and tighter quality requirements on the fuzes used on these grenades have helped. But, the Army has placed considerable resources to bear in developing a fuze that will function in any environment and even detonate when the grenade fails to go off on impact with

the ground after ejection from the round. The problem is not yet solved, but dud rates have been dramatically decreased and several potential modifications to permanently safe duds appear to be close to solving the problem.



Cutaway of M42 grenade and M509 prestack

A project to modernize the production of detonators resulted in a unique facility that virtually eliminates the handling of dry initiating explosives by employees. It has limited personnel exposure to dry powder and primer blends to one ounce increments – while still dangerous, substantially less so than the two pound increments that previously had to be handled. Human exposure to quantities larger than one ounce is limited to handling the initiating explosives in a wet condition, where the sensitivity of the powder is greatly reduced. These explosives are now dried remotely in barricades specifically design to contain any potential blast resulting from a premature functioning of the explosives. Experience has shown that these barricades work extremely well as several times two or more pounds have detonated with no exterior damage occurring.



P-76 Accumulation Bay

P-76 Drying Barricade

Previously the dry powder was distributed to the detonator loading lines/machines by hand buggies. This is now accomplished with a remote automated distribution system which delivers slightly more than a pound of dry powder to the loading bays contained behind substantial barricading and traveling on isolated conveyor systems. One ounce increments that were automatically weighed and tubed in the process barricades are removed from these storage barricades and transported to the detonator loading machines thereby reducing personnel exposure and greatly increasing personnel safety.

The automated production line for the M57 primer designed and implemented in the 1960s made way for even more sophisticated production equipment for black powder primers. A project started in 1970 resulted in a facility that exceeded production design rates sufficiently that three of the four lines were never placed into production.



M567 Point detonating fuze

Automation of the M567 artillery fuze took raw materials and completely manufactured all components at Lone Star, from the various springs, firing pins, delays, detonators and the complete assembly at the plant. A later decision by the Army resulted in this equipment being transferred to commercial facilities with only the final boosting of the fuze being left to Army ammunition plant. Likewise, the M732 mortar fuze.

In the early 1970s, the Army proposed a complete 105mm HE artillery facility for Lone Star. This facility would include the forging of the round itself, production of the cartridge, melt pour of the round and final assembly and packout. Originally envisioned to cost more than \$160,000,000, the project was ultimately reduced to just the LAP portion. But, even then, this \$50,000,000 plus project was vast in scope. It required the complete rebuilding of the melt pour and LAP facility used for 105mm M1 projectile as it was used as a demonstration of a new continuous "porcupine" melt tower and continuous pouring technology. Alas, shortly after proving out the new line, the Army's artillery philosophy shifted to the virtually exclusive use of 155mm artillery rounds due to their greater explosive content, greater versatility and greater effective range on the battlefield. The facility was stripped of equipment and left in an inactive state to slowly deteriorate over the years.



M67 Hand grenade

The old “pineapple” hand grenade of WWII and the Korea War was replaced with the new M67 hand grenade – the baseball. Smaller, easier to throw and having a better shrapnel pattern, it became the sole hand grenade for all the US services and most of the rest of NATO as well. Capability to produce this item was originally incorporated in Area E which was the 105mm artillery meltpour area. It was automated and rebuilt in Area O. Once again, the automation allowed for greater personnel safety by reducing exposure of employees to those operations which might cause premature functioning of the item.



Volcano cutaway model

GATOR Dispenser

A continuing problem in the world was the extensive use of land mines to shape the battlefield and provide anti-personnel and anti-tank protection for ground troops. But, the mines once laid were and are forever. Literally thousands of unintended victims have been maimed or killed due to the continued dispersal of these items. Once in place, they present not only protection but also a continuing danger to friendly and enemy troops as well as innocent civilians. In an attempt to provide a better way to use these weapons, the Army developed the Family of Scatterable Mines (FASCAM) which provided the anti-tank and anti-personnel assets needed to shape the battlefield, but then self-destructed at a prescribed time to remove the danger from the area. This family of weapons consists of the Volcano mine system deployed by helicopter and land mobile units and the GATOR mine system deployed by airdrop. These items have been exclusively produced at Lone Star for both US and US allies.

The recurring theme of this modernization and expansion program, at all the ammunition plants, not just Lone Star, was the improvement of safety and the reduction of human error in the manufacture of explosive items for the military services. While safety was perhaps the primary drive in this program, the real financial payback was a result of increased production output with lower personnel requirements. Not only was the output increased greatly, but the quality of the items improved exponentially which decreased scrap costs and improved cost efficiency even more.

The advent of the family of ISO 9000 quality management criteria quickly drove all manufacturing facilities, DOD as well as commercial, to strive for certification of their quality programs. Lone Star was a leader in this effort within DOD. Originally certified in 1999, Lone Star has continued to meet or exceed all subsequent changes to requirements and has maintained its certification ever since. Truly a paradigm shift in quality thinking, it required tremendous effort to achieve, but the corporate mindset has now been forever changed and even the production worker on the line thinks about continuous process improvement and making a great product always.

While a quantum shift in HOW quality is accomplished, it really has its Lone Star roots in the Plant Economy Program implemented by Day & Zimmermann in 1951, shortly after they became the operating contractor. Originally thought up by Joseph F. Gigliotti of the Army COREP Staff and symbolized by Scotty Sam and his able assistant Bonnie, this program has been continuously updated and improved ever since. Zero Defects, Continuous Improvement, Value Engineering – call it what you will, the purpose has always been to produce the highest possible quality product at the lowest possible cost when it was needed by the plant's customers.



Scotty Sam



Bonnie

Scotty Sam and his able assistant, Bonnie

A SLOWDOWN AND ANOTHER SPEEDUP

As Vietnam ended and the modernization and expansion of production capabilities progressed, Lone Star's reputation for being able to produce almost anything began to establish the secondary reputation of as the "Odds and Sods" plant in the ammunition complex. For the next thirty plus years, if there was a small volume special explosive product needed that no one else seemed to be able to produce, Lone Star was tapped on the shoulder and challenged. Some pretty unique single-use items ended up working their way through the various production lines on the plant.

Need a way to attach limpet mines to ship's hulls, get Lone Star to produce some MK22 Explosive Drivers. How about a way to get through anti-submarine nets or release ships from anchors? No problem, just order some MK3 Cable Cutters. Want to sting some arms dealers? Why not have some inert hand grenades or LAW rockets made at the plant? Got a detonator no one else can make work, send the order to northeast Texas. Got an experimental item you want to play with – ask Lone Star to figure out how to put it together and make it work.

This can-do attitude by Lone Star helped keep the plant doors open and employees paid, even when defense money began to disappear with the collapse of the Union of Soviet Socialist Republics, our Cold War foe for more fifty years. While Cold War munitions stocks were being used up in training and destroyed, these minimal orders of training ammunition and special explosives items kept the industrial engine at the plant humming. Perhaps not at a really loud pitch, but running nonetheless.

Then on August 2, 1990, Saddam Hussein invaded the Nineteenth Province – Kuwait. Operation Desert Shield, followed by Operation Desert Storm, was a UN approved operation to remove Iraq from Kuwait. Initially Desert Shield began with a build up of more than 959,600 troops from the US and 34 other countries, primarily located in Saudi Arabia. But, not only troops were being moved to the Middle East. Vast amounts of ammunition and other war materiel were being staged for what might be a protracted struggle between the Iraqi military, comprised of 1.2 million ground troops, 5,800 tanks, 5,100 other armored vehicles, 3,850 artillery pieces, 750 fighters and bombers, 200 other aircraft and extensive missile and gun defenses and the US and their coalition.

General Schwarzkopf and General Powell's plan was to stage an overwhelming force to ensure a victory. To do so would require substantial ammunition supplies and Lone Star was in the forefront of providing some of the more important items in this build up. All sub munitions used in the MLRS were produced at Lone Star. Likewise, all M509, 8" ICM rounds were produced at Lone Star as well as all M67 hand grenades. All the electric primers used in the 105mm and 120mm tank rounds were produced by Day & Zimmermann at Lone Star and their Camden, Arkansas facility. Not to mention many of the mortar and artillery fuzes and primers. Shortages were ordered and produced on very tight schedules with many being trucked to Barksdale AFB in Shreveport, LA for direct air shipment to Saudi Arabia. All this culminated in the 100 hour war.

After the defeat of the Iraqi military, many of the depleted ammunition stocks had to be refilled. Small, but steady production orders were sent to Lone Star to meet these requirements. This work load coupled with developmental work on various new weapon systems and their required munitions maintained a fairly constant plant population, albeit at the lowest levels the plant had ever seen in its history. However, the end of hostilities in the Middle East and the end of the Cold War allowed the reaping of the peace dividend that manifested itself as a drastic reduction in the size of the US military establishment. With smaller troop strengths and less anticipated military involvement throughout the world, the need for munitions was greatly reduced. While the US was involved in military operations and support activities in the Balkans, the extent required little of the ammunition complex's total capacity. Competition between the plants was intense and money was tight.

The Army attempted to offset some of the fixed costs for maintaining the complex by a couple of initiatives. First, they began to allow the operating contractors to look for work outside the normal US military channels. Successful contractors were able to find munitions and other similar types of products that they could sell to customers other than DOD, keeping, of course, within the legal requirements of export licensing and federal laws. These "Third Party" contracts were expected to be performed on a non-interference basis with assigned work load and bear a pro-rated share of plant maintenance and overhead costs. Lone Star pursued this initiative vigorously. Soon third party work load was approaching Army assigned work load.

The next logical step was for the Army to allow the operating contractors to "lease" out unused facilities to commercial entities as another source of revenue to reduce upkeep costs and spread the overhead costs of the plants over a wider range of activities. Lone Star again was in the lead on this effort. The famous dog food guy – American Dehydrated Foods – was one of the first such partnerships within the complex. Followed by Arkansas Hardwood, a lumber drying company who supplied hardwood to the furniture industry. And then Lone Star Rail Storage Company who leased the 45 miles of railroad trackage for use in storing tank and box cars for various railroads. The revenues generated, both money and in-kind services, helped reduce plant operational costs and maintain plant facilities.

This experiment in public-private partnerships was formally implemented with the passage of Public Law 102-484, the Armament Retooling and Manufacturing Support Act of 1994. Since the implementation of the program, more than a thousand proposals have been presented to the Army with more than \$100,000,000 in overhead costs being absorbed by the income generated. This does not include in-kind benefits such as maintenance of buildings, roads, trackage, employing skilled labor, etc. Revenues generated are utilized by the individual plants for environmental remediation, facilities maintenance, and other overhead expenses.

But, even ARMS and other attempts to reduce plant costs were not enough. So, in 1998, the Army decided that the answer was to offer the plants to contractors under "no cost facility use" contracts. Basically the operating contract

required the contractor to maintain the facility at no cost to the government – at least as far as normal operations went. The contractors were expected to maintain the facility at a prescribed level and to collect the costs associated with this effort through their overhead applied to the various contracts they were able to obtain to provide product and services to both government and private customers. This put the onus on the contractor to control plant costs while still making a profit as well as reducing the cost to the Army to maintain the plants.

The age of the plant was showing. Fifty year old facilities have problems that might be anticipated, but can't be accurately predicted as to when the failures might occur. About 6:20 PM, August 20, 2000, a short in an electrical connection box attached to one of the backline buildings in Area Q caused a grass fire. The fire was spotted by a security guard who reported it to the dispatcher. The dispatcher placed a call to the Red River Army Depot Fire Department who provided after work hours fire service to the plant. He also called the Lone Star firemen.



No fiddle playing, but plenty of fire

Red River arrived first and under the rules of fire engagement became in control of the fire fighting effort by virtue of being the first responder. A considerable amount of misinformation was bandied around where a Red River fireman told the Chief that a man had been killed in the area because he stepped off the ramp and stepped on some initiating explosives. The Chief chose to believe his man rather than the Lone Star staff who tried to tell him that the man

actually stepped into one of the sumps. He made the decision to fight the fire by keeping it from spreading outside the perimeter fence of Area Q.

The fire slowly spread from building to building by burning along the covered wooden ramps. By the time the fire was put out at 8:30 AM, a total of twenty-three buildings had burnt to the ground. An investigation by AMC and DA Fire Marshalls determined that the decision made by the Chief had been appropriate. The resulting investigation also determined that the scope of damage would have been greatly reduced if the wooden ramps were to have metal sections placed in them to prevent the lit fuse effect that allowed the spread of the fire. Subsequent modifications were made to active production lines to incorporate this suggestion.



Detonator loading buildings, or rather what is left on the morning of August 21, 2000



Area Q backline area after August 20, 2000 fire.

The cleanup of the fire was complicated by the fact that most of the buildings, due to the sensitive nature of the explosives used, had lead sheeting installed on the floors. The intensity of the fire caused the lead to melt and flow off the floor slabs and on to the bare earth outside the building footprints. But, the positive aspect was that all the explosives on the line were incinerated and presented no safety hazard in that respect.

NO MORE SAFE HAVENS

September 11, 2001 turned our world upside down. A normal day at the bullet mill became a frantic exercise to secure the plant from who knew what. Lone Star reacted in a very professional manner, quickly securing all entrances to the plant and implementing emergency security procedures as if a drill were called instead of the start of the Global War on Terror. Within 45 minutes, the plant was locked down. All non-essential government employees were sent home and the contractor asked to do the same with his employees. However, Day and Zimmermann opted to keep the work force on the job to accomplish two objectives: maintain sufficient eyes on the plant to provide a blanket of security and to ensure that the plant was ready for whatever might be required. Lone Star provided an enhanced security plan and continuity of operations plan to their headquarters within four hours and was authorized to restart operations on September 13, 2001.

Within days, National Guard and Army Reserve troops were activated and used to supplement facility security at both Lone Star and Red River Army Depot. These troops would stay and assist for almost a year. During this time extensive additional force protection and anti-terrorist procedures were implemented. The plant experienced perhaps the most stringent security requirements since WWII. But, production was no longer just refilling munitions stockpiles by replacing training expenditures. Operations in Afghanistan were demanding assets for use against the Taliban and al Qaeda. Every item produced had real meaning to the employees as well as the troops receiving them as many had sons, daughters, grandsons and granddaughters in harm's way.

Then in 2003 the invasion of Iraq increased the need for war materiel. Increases in hand grenades and detonators for various munitions items increased the demand for Lone Star's unique production capabilities. And, she responded as she always has when she was asked to. Keeping the pipeline full required dedication of all the employees at the plant. The purchasing folks pushed to find qualified suppliers for needed components; production workers did the hard and dangerous work of putting the items together; engineers and draftsmen improved equipment; and the maintenance department kept the facility in a position to react to the changing demands on the ammunition complex.

But, truthfully, outside M67 hand grenades and some primer production, little Lone Star produced was being used in either Iraq or Afghanistan. Developmental work continued on self-destruct fuzes for the ICMs and some production to keep the training ammunition levels high enough to handle the training of the increase size of the military is about all the work Lone Star was able to get directly. Day and Zimmermann hustled foreign sales and provided extensive quantities of small components such as various detonators, delays, relays, etc. to various prime contractors and managed to keep the plant operational.

However, in late 2004, the Army began to collect data to be provided to the Base Realignment and Closure Commission for consideration under BRAC

2005. It quickly became evident that at least two of the four active LAP plants (Lone Star, Milan, Kansas and Iowa) would probably face closure. Mountains of data were generated and provided for consideration. Nerves were strained and tempers frayed waiting for the announcement of who would get the axe. Finally on September 15, 2005 it was announced that the two losers were Kansas AAP and Lone Star AAP.

Shortly thereafter, Day and Zimmermann made an unsolicited proposal to buy the entire plant with the intent of attempting to survive in the Texarkana area through a combination of commercial sales, direct supply contracts with DOD and subcontracts with DOD prime contractors.

At the same time, the Red River Reuse Authority (RRRA) was preparing to make a proposal for the entire plant as well. RRRA had a track record for handling BRAC property as a result of the 1995 BRAC which realigned Red River Army Depot and resulted in the transfer of more than 700 acres from the depot to the RRRA.

Competition for the plant (or at least some portion of the plant) between the two entities was intense with both pressing their positions hard to the Army and the local public. Both wanted an early conveyance of the plant to facilitate a quick reuse. On May 5, 2008 both parties met with Congressman Ralph Hall who brokered an agreement – the Cinco de Mayo Agreement – which provided a framework for both parties to achieve their separate goals. Day and Zimmerman would purchase approximately 5500 acres on the eastern side of the plant, Area W storage and some smaller parcels which contained facilities Day and Zimmermann required to be able to become a commercial entity directly from the Army while the RRRA would purchase the remainder of the plant for development under their auspices.

Many months of hard negotiations between Day and Zimmermann, the RRRA and the Army would still be required to work out the fine print and price to be paid by each party and who would be responsible for various environmental and decontamination costs necessary to allow the Army to actually release the parcels. Negotiations had to also include the Texas Commission on Environmental Quality (TCEQ) and the EPA, since as the environmental regulators, they would determine what must be cleaned up and to what level.

While these efforts were on-going, the Joint Munitions Command, Lone Star's parent command, was in the process of ensuring the movement of equipment, stocks and other assets to other installations which the BRAC law said would receive the discontinued production capabilities from Lone Star. The decision was made by JMC that all directed production workload and all government owned stocks would be removed from the plant or disposed of by September 30, 2009. This included Lone Star providing training to some of the receiving activities on safety, maintenance and production processes associated with these ammunition items, since many of them had never been produced at those sites before or similar items had been produced many years before. In addition, Day and Zimmermann was tasked with disposing of all the unusable items that had accumulated over the years and were not needed at other sites within the complex.

While a demanding series of tasks, Day and Zimmermann was able to meet the JMC goal of moving all equipment, stocks and materiel by the September 30, 2009 deadline. However, the original goal of actually conveying the plant to both parties on the same date proved unachievable. The plant was officially deactivated on September 30, 2009 and command and control of the installation was passed to Fort Hood Army Garrison who will maintain a small cadre of personnel on site to oversee the final conveyance and all necessary decontamination and cleanup plus continuing environmental monitoring requirements. Actual conveyance will be accomplished on or about March 31, 2010.

AND IN THE BEGINNING – REPRISE

Thus a proud and meaningful history comes to a close. But, a new history is waiting to be written. Day and Zimmermann will attempt to move into the commercial world and be as successful there as they were within the complex. No longer limited to just explosive work, many new doors will become available to them. Sufficient land and facilities will be available to allow for significant expansion if they are successful in their plans.

The Red River Reuse Authority has some terrific assets that they will be able to market to the world and move investments and jobs into the area to help fuel the Ark-La-Tex's continued growth.

While sad that a fixture in the region is disappearing, the future is potentially very bright.