

# FUELING THE FRONT LINES: ARMY PIPELINE UNITS - PART II

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*This is the second of a two-part history of the Army pipeline units. The first part appeared in the October-December 2007 issue of **Engineer** and covered the beginning of the military pipeline system and units, from shortly before World War II through 1945.*

On 15 August 1946, the 697th Petroleum Distribution Company was reactivated and the unit then bounced around the Philippine-Ryukyus Command in the western Pacific until 26 May 1949, when it was again deactivated. No records of its activities for that time have been found.

During the Korean War, the 83d, 388th, and 700th Engineer Pipeline Companies lent their efforts to the fight. Their assignments were familiar—to build and maintain pipelines, tank farms, and distribution facilities.

On 15 November 1954, the 697th again was stood up, designated the 697th Engineer Company (Pipeline), assigned to the 5th Army, and stationed at Fort Leonard Wood, Missouri, where it spent about three years. On 14 February 1957, it moved to Fort Polk, Louisiana, where it participated in Operation Sledgehammer from 24 April to 24 May 1957. That exercise was probably the most important assignment United States Army pipeline companies had during the 1950s and early 1960s. Attached to the 1st Armored Division, the 697th again met the challenge of delivering fuel to combat forces in the field, but this time with a new system for pipeline fuel delivery. The fast deployment of pipeline, quick

fuel storage devices, and concealment were emphasized. This would be the most important operation involving the 697th until the unit deployed to Thailand in 1965. The 697th received a meritorious unit commendation for its efforts during Operation Sledgehammer.

With the new system, the pipeline was no longer a rigid steel pipe but a flexible hose similar to a fire hose. Hundreds of feet of hose were folded up tightly in large crates and loaded onto a truck. In a deployment process called “flaking,” the loose end of the hose was fastened temporarily to the ground so when the truck pulled away, the hose rapidly unwound from the crate. When one crate of hose was strung out, a coupling crew connected the end to the hose in the next full crate and the truck would drive off again, dispensing the hose out the back as it went. The hose was meant as a temporary pipeline to deliver fuel to the front lines more quickly than, but just as dependably as, the steel pipelines. When not in use, the hose could be repacked and moved to another location. Terrain was easier to navigate with the new system. At streams, the hose was simply strung along the sides of a bridge. Sometimes a log set across the stream was enough to support the hose. In open territory, the hose was laid along the road grade.

The accompanying pump stations, tank farms and manifolds, and fuel-dispensing racks were also much simpler with this system. The pump stations along the line used marine-style engines and pumps, which were smaller and simpler to operate but spaced closer together. The flexible hose was laid out and hooked up to one side of the pump. The next section of line was hooked up to the other side of the pump, and then the truck would drive away, flaking as fast as practicable.

The tank farms were a series of 10,000-gallon blister bags that lay flat on the ground when empty but inflated when filled with liquids. The blister bags shortened the time needed to install a storage unit. First, the ground was leveled and all sharp objects removed, usually by men with rakes. Then the blister bags were pulled from their crates and laid out flat on the ground and connected to the manifold, which controlled the flow of fluids to and from the blister bags.



**The system using inflatable blister bags was developed in the 1950s and was still in use during the 2003 invasion of Iraq.**

The dispensing racks were simplified also. During Operation Sledgehammer, the 697th completed a filling station for tanker trucks, which in turn was used to fill canisters at points set up along the line. Vehicle fill points could also be set up there, or at any other point, by tapping into the pipeline. Since the 697th was working with the 1st Armored Division, a tank refueling station was also constructed. Another segment of the operation involved building a tank farm with a 10,000-barrel steel storage tank and two smaller tanks, including the conventional pump station and manifolds. Three other tank farms using blister bags and flexible pipeline were also built. To add to this mix, it was decided to try camouflaging the different systems and the company vehicles and men.

This system was also deployed for the current war in Iraq. It was critical that the main pipeline be built into Iraq as quickly as possible, so a flexible hose was used to deliver fuel to a tank farm a few miles from the main line. Although this system was more labor intensive and was unable to deliver the same volume of fuel as a regular coupled pipeline, it kept the tank farm adequately supplied until a regular coupled pipeline could be installed.

After the mid-1950s, there were only three pipeline companies in the Regular Army:

- The 697th Engineer Company (Pipeline) was based at Fort Leonard Wood from December 1954 to February 1957; Fort Polk from February 1957 to April 1959; Fort Hood, Texas, from April 1959 to January 1962; and Fort Wolters, Texas, from January 1962 until it deployed to Thailand in July 1965. It was deactivated in Thailand in August 1969.
- The 515th Engineer Company (Pipeline) was at Fort Belvoir, Virginia, before being attached to the 5th Engineer Battalion at Fort Leonard Wood. It went on to participate in the first Gulf War and then became a Missouri National



**Pipeline engineers attach redesigned couplings that made laying pipelines much easier.**

Guard pipeline unit until it was deactivated in 1995. It has recently been reactivated but as an engineer construction company.

- The 543d Engineer Company (Pipeline) was stationed in France and was deactivated there in 1970.



**Soldiers from a pipeline company repair matting that buckled in the extreme desert heat.**

Since the early 1990s, the Regular Army has not had a pipeline company.

The 515th developed a reputation for its ability to complete projects in an exemplary manner while at Fort Leonard Wood. The 543d operated, maintained, and oversaw petroleum distribution in five distribution districts in France and parts of Germany. The 697th worked in a “behind the lines” environment in Thailand for four years during the Vietnam War and completed innumerable projects on both company- and platoon-level missions in Thailand, Vietnam, and Korea. This part of the article will again focus on the 697th.

During the 1950s and 1960s, career pipeline noncommissioned officers (NCOs) rotated among the three companies and soon became a “pipeline family.” This made for



**A crew positions the pipe before installing a gate valve.**

a close-knit operation and support system. According to the career NCOs, true pipeline Soldiers need to have served in all three companies. The Soldiers were so close that officers were considered of no consequence unless they were affiliated with pipeline engineering in some form. The first assignment for the 697th Engineer Company (Pipeline) when it arrived in Thailand in 1965 was to build a base camp for itself and the 9th Logistics Command, which was head of all engineering activities in Thailand. The base camp, built at the outskirts of the inland city of Korat, was named Camp USARTHAI—short for “United States Army Thailand.” To the chagrin of most of the men there, later camps were given more impressive names, such as Camp Lightning or Camp Essayons.

The first task for the 697th was to build shelters (known as hooches) for Camp USARTHAI and other camps being set up at the time. The 2d Platoon was sent to the Sattihip Cantonment Area to build storage tanks and ship-unloading facilities at the new deepwater port there. The company also evaluated the roads leading to the major camps and air bases in the area and found that they were in dire need of improvement. For the first few months in 1965, the 697th built bases, scouted roads, constructed a helicopter pad and then turned it into a tennis and basketball court, and completed other small construction jobs. In the spring of 1966, the engineers were called on to start a major project: build six 10,000-barrel storage tanks at the Royal Thai Air Force Base (Camp Friendship) at Korat.

It was a job for the entire company and the first of a series of assignments to challenge the company’s mettle. The tank farm was already large by the usual standards, but the air base was expanding rapidly to keep pace with the war in Vietnam. The 561st Engineer Battalion cleared the jungle and set the level grade. Concrete was used for the tank foundations and as one foundation was set and ready, another was being built. The tanks were put up one after another as the foundations

were finished. As many as three tanks were in various stages of construction at one time. In three months, despite technical problems with the materials, the tanks were completed and water-tested on schedule.

Building the six tanks was the last company-sized project the 697th performed until July 1969, when all the platoons came together at the Sattihip Cantonment Area to work on a new installation—Camp Samae San. The platoons completed many widely scattered projects; the main assignments included the following:

- In mid-1966, 2d Platoon went to Vietnam to build a 52.6-mile pipeline from Anke to Quin Yon.
- In October 1966, 1st and 3d Platoons built a tank farm at the Royal Thai Air Force Base at Nakon Phanom, Thailand.
- In January 1967, 2d Platoon returned from Vietnam and many of its men rotated home, to be replaced with new personnel. Along with 1st Platoon, they built the most elaborate movie theater in Thailand. Although a 697th electrician pointed out a wiring problem during construction, no action was taken. The theater almost burned down the same night it was dedicated.
- In March 1967, 1st Platoon returned from Nakon Phanom and joined 2d Platoon at Camp USARTHAI to build the movie theater. Road construction and repair to the adjoining air base were also on the hot list. Remaining at the Nakon Phanom Royal Thai Air Force Base, 3d Platoon performed an impressive list of tasks, including construction of three 10,000-barrel storage tanks at the farm, two 10,000-barrel storage tanks at the water purification plant, a pump station at the reservoir, and several miles of 8-inch pipeline to the base water purification plant to the south, a 4-inch water pipeline to

the tank farm from the water plant, and the start of the tank farm manifold system.

- In September 1967, the platoons changed places and 2d Platoon went to Nakon Phanom Royal Thai Air Force Base to build two more 10,000-barrel fuel storage tanks in the tank farm and complete the tank farm manifold. Meanwhile, 3d Platoon went back to Camp USARTHAI for much-needed equipment repair and to continue area construction projects, and 1st Platoon convoyed to the Sattihip Cantonment Area to build two 10,000-barrel storage tanks for the water system and begin installing water lines to the new camp. This was the start of a two-year project building Camp Samae San, which ended up with the entire company present and working on it in July 1969.
- For the four years that the 697th was in Thailand, the motor pool personnel had worked hard under less-than-perfect conditions. The mechanics did an outstanding job of supporting the line platoons, and never was there a breakdown or need for emergency road service on any of the company's vehicles.
- In March 1968, the 697th was alerted that it would be assigned to a project in Korea. All the company's experienced Soldiers with more than 90 days to rotation were put into 3d Platoon to bring it up to full strength, except for a small contingent of experienced Soldiers left behind in 1st Platoon. This platoon would be based in Camp USARTHAI to perform tank farm maintenance throughout Thailand for the following year.
- After losing most of its experienced Soldiers to 3d Platoon, 2d Platoon was sent to the Sattihip Cantonment Area in March 1968 to install more water lines.

Building the Sattihip Cantonment Area was probably the 697th's largest and most time-consuming project. Delta Company, 538th Engineer Battalion, arrived at the site in May 1967 and built hooches and a water pipeline from nearby Utapoe Air Base. The 697th sent 1st Platoon there in September 1967 to build two 10,000-barrel storage tanks for the water system. The tanks were high on the side of a very large hill and would supply adequate pressure to the camp below, acting as a water tower. For two years the 697th worked, often in deplorable conditions, to complete the camp water and sewer systems.

While 2d and 3d Platoons worked at Camp Samae San, 1st Platoon had been doing repair work at the major air base tank farms and petroleum, oil,

and lubrication (POL) facilities around Thailand for almost a year. From February to July 1969, 1st Platoon sealed and tested four 10,000-barrel tanks and refurbished the manifold system in the tank farm at Udorn Royal Thai Air Force Base. The platoon installed 1,200 feet of welded steel pipe and another 2,500 feet of coupled pipe. For their hard work and ability to do the job without shutting down the base tank farm, the platoon was awarded a unit commendation by United States Air Force officials, who do not lightly give out awards to Army units. At the end of this assignment, 1st Platoon also went to the Sattihip Cantonment Area.

In August 1969, the 697th Engineer Company (Pipeline) was deactivated. The following quote is from an e-mail by Captain Joe Wagda, the last company commander:

*By the way, at the time, we were told that the 697th was the first unit in the Vietnam theater to be deactivated, so we were to be the model for other units that followed. It was amazing to go through the deactivation process while concurrently working our projects right until the deactivation date when we transferred responsibilities over to the 538th. Quite a performance!*

Quite a performance indeed!

But this is not the end of the pipeline story. The wars in Iraq and Afghanistan marked another time and another need for fuel to be delivered to the front lines. Some of the needs of World War II are the same in the new conflicts. The Abrams M1 tank is considered to be one of the world's best, but it guzzles fuel. According to an article in the July-September 2003 issue of *Engineer*, "The pipeline was essential, as one of the Combined Forces Land Component Command's prestart



**At crossing sites, the pipeline is buried deep enough that the weight of passing vehicles won't affect it.**

conditions for the war with Iraq was the completion of the [inland petroleum distribution system] to Breach Point West on the Kuwait-Iraq border.”<sup>1</sup> Fuel delivery was now seen as a prerequisite rather than a secondary consideration of war. What was learned in previous wars was now applied once again. Long expansions of the pipeline, the location of pump stations, staggered workloads, and the relocation of the pipeline unit’s headquarters at intervals along the route were still the same. Packaging, advances in delivering materials, and the use of skid loaders and other labor-saving machines increased productivity tremendously.

The most important mechanical improvements in the pipeline system were the use of aluminum to make the pipeline tubes lighter and easier to handle and the redesign of the Victaulic coupler. The coupler is now hinged and pressed over the pipe tube with a special tool and then “pinned” into place rather than bolted. This improvement saves time during both installation and repair.

The use of several companies to construct and test the lines was incorporated to a higher degree than before. Regular combat engineer companies built the pipeline while Reserve pipeline companies did the follow-up line testing, repair, and pump station construction. Several hundred miles of pipeline were constructed and delivered enormous amounts of fuel to frontline vehicles. The 62d Engineer

Battalion (Combat)(Heavy), 226th Engineer Company (Combat)(Heavy), and the 808th Engineer Company (Pipeline) (a United States Army Reserve unit) helped complete this project. Before the Abrams M1 tanks even rolled, the pipeline was planned, laid out, and operating right up to the border of Iraq. This may very well be the face of pipeline construction in the future, with Active Army engineer units doing the bulk of the work and specialized Army Reserve and National Guard pipeline units lending their expertise where needed.

Essayons! Pipeline rules!



*Mr. Petty was a farm boy from Iowa when he enlisted in the Army in 1966. He spent his Army career in pipeline companies. After leaving the Army, he graduated magna cum laude from a community college that offered a farm equipment mechanic’s course. He has been a mechanic for 34 years and is still very interested in the pipeline experience. For more information about pipeline unit history, contact him at <tom697th@gmail.com>.*

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#### Endnote

<sup>1</sup> Captain Anthony De Simone and Major Normand Gauthier, “The Inland Petroleum Distribution System in Kuwait and Iraq,” *Engineer*, July-September 2003, pp. 13-18.