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Washington, D.C. 20548

**National Security and
International Affairs Division**

B-283379

August 13, 1999

The Honorable Ike Skelton
Ranking Democratic Member
Committee on Armed Services
House of Representatives

Subject: Depot Maintenance: Maintenance of T700 Series Engines for U.S. Forces in Korea

Dear Mr. Skelton:

This letter responds to your request that we study a proposal to have a Korean contractor perform depot-level maintenance of U.S. Forces Korea helicopter engines on the Korean peninsula. It summarizes information presented at a briefing we provided to your representative on July 15, 1999, concerning Army plans to (1) increase U.S. Forces Korea engine war reserve stocks and improve their management within the Korean theater, (2) increase aviation repair and maintenance capabilities on the Korean peninsula, and (3) continue performing complete T700 series engine overhauls in the United States.

RESULTS IN BRIEF

The Commander in Chief of the United Nations Command (CINCUNC) has emphasized the need to meet surge and sustainment requirements during the initial stage of a contingency situation should one occur in Korea. The Army has increased its local war reserve stocks of T700 series engines. Army activities in Korea are taking management actions to ensure that war reserve records are maintained accurately in theater and that the engines on hand are ready for issue. Further, the Army plans to expand the capabilities of an in-theater U.S. Army maintenance facility so that it can handle more extensive depot repairs for T700 series engines and other systems and equipment. It also plans to establish a "forward" supply activity that will stock additional parts for engines and other critical systems. Engines and engine modules in need of complete overhaul will continue to be shipped to the Corpus Christi, Texas, Army Depot, with overflow going to a contractor facility. Army officials believe that the Corpus Christi Army Depot workload will not be significantly affected. The issue of whether this work should be done in theater by a Korean contractor or in a U.S. Army facility in theater, using contract employees, is one that has been the subject of discussions between Army officials and officials in the Office of the Deputy Under Secretary of Defense for Acquisition and Technology. Since CINCUNC agrees that the Army's plans will meet surge and sustainment requirements, the proposal to have a Korean contractor perform helicopter engine depot-level maintenance has been set aside.

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BACKGROUND

T700 series engines are used in Apache and Blackhawk helicopters positioned with the Eighth U.S. Army in Korea. Under current procedures, a limited range of depot repairs for U.S. Forces Korea T700 series engines is performed by Eighth Army activities in Korea. The remaining depot-level work, including the more extensive rebuilds and overhauls, is performed at the Corpus Christi Army Depot or a commercial contractor facility. According to Army officials, the level of depot work done in Korea is based on the skill level of maintenance personnel and the availability of required facilities, tools, and parts. Some tasks are done at aviation intermediate maintenance facilities through special authorization, but most tasks have been done at the Aviation Logistics Management Division in Korea, which is considered a limited depot facility. This activity, which has been in existence for about 2 to 3 years, is managed by the Eighth Army and uses contractor labor from a U.S.-based firm.

Since 1997, the Republic of Korea's Ministry of National Defense has proposed that T700 series engines for the Army's helicopters in Korea be repaired by a Korean firm. Korean officials hoped that adopting their proposal would assist the Korean economy while reducing costs and shortening turnaround times.

In March 1997, the Eighth Army requested authorization from the Industrial Operations Command to perform complete depot-level repair on the T700 series engines on the Korean peninsula using a Korean firm.¹ In January 1998, the Command denied the request, saying that, given the incurred costs of the Corpus Christi Army Depot and the existing 2-year supply of repairable engines, the plan to localize repairs would not be economical. The Republic of Korea's Ministry of National Defense raised the issue again in June 1998 at the Logistics Cooperation Committee meeting and in July, first with the Secretary of Defense and then with the Under Secretary of Defense for Acquisition and Technology. After discussing the issue with the CINCUNC, the Under Secretary asked Army Headquarters to study the feasibility of a proposal to conduct repairs, including some tasks previously considered as overhaul work traditionally performed in depots, on the Korean peninsula in support of up to 20 T700 series engines.² Army Headquarters studied the issue and favored continuing the work at the Corpus Christi Army Depot, with overflow going to a contractor facility. It cited the existing supply of engines and the potential impacts on the working capital fund³ and on Corpus Christi's workload.

The tenor of discussions over engine maintenance changed in late 1998, when the CINCUNC, cited—as one of several major warfighting issues—the need for greater U.S. Forces Korea

¹The Army's Aviation and Missile Command and Industrial Operations Command are responsible for depot-level repair of U.S. Army aircraft. They must approve "local" depot-level maintenance programs.

²Under an evolving change to Army maintenance policy, overhaul will consist of a wide range of tasks that will result in the engine being rebuilt to a like-new condition.

³Contracting out this work removes it from the wholesale supply system, which is supported by the working capital fund. Reducing workload under the fund causes overhead costs to be spread over a smaller number of items, resulting in higher overhead costs for each item in the wholesale supply system.

aviation repair and maintenance capabilities on the Korean peninsula.⁴ U.S. Forces Korea and Eighth Army had determined that under current arrangements, support for aircraft in Korea would not be adequate to meet the surge in requirements that would likely exist during the initial stages of hostilities between North and South Korea. Accordingly, the discussions shifted to determine how to best meet increased support requirements in theater.

ARMY EFFORTS TO INCREASE U.S. FORCES KOREA ENGINE
WAR RESERVE STOCKS AND IMPROVE THEIR MANAGEMENT

Based on a reassessment of requirements, the Eighth Army recalculated its war reserves requirement for the T700 series engine and found that it needed to increase the authorized number. In response, the Aviation and Missile Command sent additional war reserves to the Korean theater of operation. The Command also plans to reassess the war reserve requirement during its routine Army War Reserve Automation Process cycle and then further adjust the quantity as necessary. According to Army officials, the reassessment may be completed before the end of this fiscal year.

Moreover, Army activities in Korea are taking steps to improve the condition and management of their T700 series engines. During our fieldwork in March 1999, we found some anomalies between records and actual numbers of engines on hand as well as with the condition of those engines.⁵ Although the number of engines on hand were the number authorized, an administrative error resulted in a larger number of engines being recorded in the inventory records maintained by the War Reserve Support Command, Combat Equipment Battalion-Northeast Asia—the activity responsible for managing the war reserves within the Korean theater of operations. Additionally, some engines needed to be inspected because questions existed about their condition. When we pointed out these anomalies to U.S. Forces Korea and Army Materiel Command officials, they agreed to take corrective action. In July 1999, the Army Materiel Command's Combat Equipment Battalion entered into a memorandum of agreement with an Aviation and Missile Command activity in Korea for maintenance of its T700 series engine war reserves. Under the agreement, the activity, known as Project OLR,⁶ will inspect and maintain aviation war reserve assemblies, components, and modules in Korea and Japan. According to Combat Equipment Battalion officials, Project OLR is currently inspecting the condition of all T700 series engine war reserves on the Korean peninsula and will soon begin inspections of the war reserves in Japan.

⁴The need for increased aviation maintenance and repair on the Korean peninsula, including that of the T700 series engine, was one of several support requirements identified.

⁵ Standard Army costs for engines in the T700 series range from about \$532,000 to about \$583,000.

⁶ OLR, which stands for "Organizational Line Repairable" is the name of an Army Materiel Command activity doing airframe modifications for Eighth Army.

ARMY PLANS TO INCREASE AVIATION REPAIR AND
MAINTENANCE CAPABILITY ON THE KOREAN PENINSULA

To address CINCUNC's concerns regarding the adequacy of in-theater repair and maintenance capabilities that would be available during the initial stages of war, the Army Materiel Command and the Eighth Army are working on plans to establish an Army Materiel Command Logistics Center of Excellence in Korea. The Army Materiel Command and Eighth Army had approved the support plans for the Logistics Center as of July 23, 1999. According to the support plans, within the Logistics Center, the Army will expand various repair activities on the Korean peninsula to support aviation systems as well as other Army system and equipment items. For repair of Army aviation systems, the Aviation Logistics Management Division, which performs authorized depot-level repairs for the T700 series engines and other aviation systems, is being expanded, transferred from the Eighth Army to the Army Materiel Command, and renamed the Aviation Maintenance Repair Activity. According to Army Materiel Command officials, the repair activity will continue to employ the contractor workforce now working at the Aviation Logistics Management Division. The current workforce performs some intermediate-level maintenance and some depot-level repairs through special authorization. The plans also state that the repair activity manager will set maintenance priorities, as required, to meet Eighth Army readiness goals.

The Army plans to have U.S. Forces Korea T700 series engine depot-level repair and maintenance, with the exception of complete overhaul work, conducted at the repair activity. According to the Aviation and Missile Command's Chief of the T700 Series Engine Team, work short of an overhaul consists of specific tasks to maintain sufficient performance for an engine, a module, or a component to remain in the field for an extended period of time, pending overhaul. An overhaul returns the engine to a "like new" condition. More specifically, an overhaul consists of a preliminary analysis, disassembly, and inspection of an engine or module to determine the extent of work to be performed to bring the engine or module up to full depot serviceability standards; repair; reassembly; and an acceptance test, including a test cell run.

According to the repair activity support plan, the activity will include capabilities that extend the life of components, as well as expand upon the current depot maintenance capabilities. The support plan lists the repairable items to be covered and 53 initial depot-level tasks to be performed at the repair activity, many of which are already done under the Aviation Logistics Management Division. Under the plan, the repair activity will be expected to (1) pursue and carry out repair programs using existing or emerging technologies and capabilities that will improve theater readiness and reduce costs; (2) improve the handling and shipping of aviation components to improve credit returns to the theater and wholesale supply systems; and (3) pursue expanded capabilities to support theater transition-to-war requirements to include additional contractor skills, personnel manning requirements, and the incorporation of existing industrial operations capabilities. However, the details on how the repair activity will accomplish each goal are not yet available.

As an additional measure to increase aviation repair and maintenance capability, the Army Materiel Command and the Eighth Army have finalized a support agreement to set up a forward wholesale supply activity on the peninsula. This activity will be known as the

Centralized Distribution Activity. According to the support plan, the distribution activity's major goals will be to respond faster to Eighth Army requisitions and to provide in-theater surge support should there be an armistice-to-war transition. According to the plan, the distribution activity will encompass the procedures whereby the receipt, stock, storage, and issue processes normally conducted in a rear area by a depot are collocated with the retail customer. The distribution activity will initially stock engine parts for the Blackhawk helicopter, among other items.

ARMY PLANS FOR OTHER
T700 SERIES DEPOT LEVEL WORK

As of July 1999, the Army's plan was to continue sending T700 series engines and modules in need of complete overhaul back to the Corpus Christi Army Depot or a contractor facility. According to the Aviation and Missile Command's T700 Engine Chief, as in the past, some of the work will be competitively contracted when the depot cannot meet program requirements.

It is presently unclear how the Army's plans to expand the T700 series engine depot work on the Korean peninsula will affect the number of T700 series engines and modules returned to the United States for repair and overhaul. Aviation and Missile Command officials expect the impact on the Corpus Christi Army Depot to be negligible. According to an Aviation and Missile Command official, the amount of work coming to the Corpus Christi depot from Korea in 1998 was a small percentage of the depot's total workload. He said the total Command-generated workload for all customers at the depot in fiscal year 1998 was about 2.3 million labor hours. Although demand varies annually and trend data is not available, the Eighth Army's fiscal year 1998 demand for T700 series engines and modules from the wholesale supply system constituted 5 engines and 11 modules, which would equate to about 4,213 labor hours (or less than 1 percent of the fiscal year 1998 workload.) According to several Army officials, the amount of overhaul work returned to the U.S. could increase initially and then level off. They noted that the Army Materiel Command management of the repair activity in Korea could determine that more engines or components require overhaul in a U.S. facility to assure component or engine reliability is maintained at the required standard.⁷

As of July 15, 1999, the Republic of Korea had made no further proposals concerning the overhaul of the T700 series engines. However, it has asked for more information from the Under Secretary of Defense (Acquisition and Technology) regarding the repair activity and the potential for assigning some of the depot work in the repair activity to a Korean contractor or having the repair activity hire local nationals. In early July, the Under Secretary formally requested information on the Logistics Center from the Army. In commenting on a draft of this report, DOD officials stated that because the Army's plans will meet surge

⁷ Recent proposals for restructuring Army maintenance are expected to result in all items repaired in the field for return to the Army supply system being overhauled to a single overhaul standard. This change has been initiated to assure equipment reliability and reduce ownership costs. Related issues are discussed in our recent draft report, Depot Maintenance: Army Report Provides Incomplete Assessment of Depot-type Capabilities.

requirements in Korea, the proposal to have a Korean contractor perform helicopter engine depot-level maintenance has been set aside.

AGENCY COMMENTS

DOD officials provided official oral comments to a draft of this letter. They concurred with the information presented. They noted that the Army anticipates the combination of increased stockage of engine spares, improved repair and maintenance capability on the Korean peninsula through the use of the Logistics Center of Excellence, and continued depot-level engine overhaul support by Corpus Christi Army Depot will meet the CINCUNC's surge and sustainment requirements. Further, they said that the proposal to consider a Korean contractor to support CINCUNC's surge requirement is not required and will be set aside, since the Army will satisfy the requirement. DOD officials also provided several technical comments that have been incorporated into the letter as appropriate.

SCOPE AND METHODOLOGY


To develop information on changing warfighting requirements, we interviewed officials and/or reviewed documentation from CINCUNC; U.S. Forces Korea; Eighth Army; the Office of the Deputy Chief of Staff of Logistics, the Army Materiel Command; the Army Aviation and Missile Command; Corpus Christi Army Depot, and the Office of the Under Secretary of Defense (Acquisition and Technology). To develop information on Army plans to increase U.S. Forces Korea's engine war reserve stocks and improve their management, we also interviewed officials and reviewed documentation from the War Reserve Support Command, the Combat Equipment Command North-East Asia, and the Material Support Command-Korea. We also visited facilities and inventoried the T700 series engines and modules in the war reserves in the Republic of Korea and reviewed condition codes listed on containers. To develop information on Army plans to increase aviation repair and maintenance capabilities on the Korean Peninsula and plans to continue performing T700 series engine overhauls in the United States, we interviewed officials of Samsung and Korean Air in the Republic of Korea and visited their facilities, as well as those of the Corpus Christi Army Depot. We also visited Eighth Army and Army Materiel Command aviation repair facilities.

We performed our work from January to August 1999 in accordance with generally accepted government auditing standards.

B-283379

As agreed with your office, based on the information developed, we are planning no further work on this issue at this time. If you have any questions concerning this letter, please contact Julia Denman or me on (202) 512-8412. Key contributors to this assignment were Kathleen Monahan and Ruth-Ann Hijazi.

Sincerely yours,



David R. Warren, Director
Defense Management Issues

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