Audit Report

TACTICAL MISSILE MAINTENANCE CONSOLIDATION—
TUBE-LAUNCHED, OPTICALLY TRACKED, WIRE
COMMAND MISSILE LAUNCHER FOR THE
BRADLEY FIGHTING VEHICLE SYSTEM

Report No. 99-065 January 5, 1999

Office of the Inspector General
Department of Defense

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Acronyms

BRAC	Base Realignment and Closure
DMWR	Depot Maintenance Work Requirement
TOW	Tube-Launched, Optically Tracked, Wire Command
VATE	Versatile Automatic Test Equipment

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202

January 5, 1999

MEMORANDUM FOR DEPUTY UNDER SECRETARY OF DEFENSE (LOGISTICS)
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on Tactical Missile Maintenance Consolidation – Tube-Launched, Optically Tracked, Wire Command Missile Launcher for the Bradley Fighting Vehicle System (Report No. 99-065)

We are providing this report for information and use. This report is the second in a series of reports on the consolidation of tactical missile maintenance work loads at Letterkenny Army Depot in response to a request from the Assistant Deputy Under Secretary of Defense (Maintenance Policy, Programs and Resources).

Information provided by the Army was used in preparing this report.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Stephen T. Hampton at (703) 604-9630 (DSN 664-9630) (shampton@dodig.osd.mil). See Appendix F for the report distribution. The audit team members are listed inside the back cover.

David K. Steensma

David K. Steensma
Deputy Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 99-065 **January 5, 1999**
(Project No. 7LB-5031.01)

Tactical Missile Maintenance Consolidation – Tube-Launched, Optically Tracked, Wire Command Missile Launcher for the Bradley Fighting Vehicle System

Executive Summary

Introduction. This report is the second in a series of reports on the consolidation of tactical missile maintenance work loads at Letterkenny Army Depot (Letterkenny). This audit was performed in response to a request by the Assistant Deputy Under Secretary of Defense (Maintenance Policy, Programs and Resources). The first report, Inspector General, DoD, Report No. 98-165, "Modifications to the Tube-Launched, Optically Tracked, Wire-Command Missile Launcher for the Bradley Fighting Vehicle System," June 25, 1998, discussed concerns regarding field execution of a modification to the tube-launched, optically tracked, wire command (TOW) missile launcher.

Objectives. The overall audit objective was to evaluate the cost and benefits associated with the consolidation of tactical missile guidance and control maintenance work loads at Letterkenny. We also evaluated the transition of work load for the TOW subsystems used on the Bradley Fighting Vehicle System from Red River Army Depot to Letterkenny. Further, we evaluated the management control program as it related to the audit objectives.

Results. Total nonrecurring base realignment and closure costs associated with the transitioning of tactical missile maintenance missions to Letterkenny, including military construction costs, was approximately $28.7 million. Potential benefits resulting from the consolidation include efficiencies gained through process initiatives, sharing of test equipment, and the use of a multi-trained work force (Appendix C).

The Red River Army Depot performed unauthorized maintenance repairs on the TOW subsystem used on the Bradley Fighting Vehicle System. The repairs resulted in higher repair rates charged by Letterkenny and, consequently, lost savings of approximately $1.8 million to tactical missile maintenance customers. Also, failure to complete the consolidation of TOW subsystem work loads by July 1999 could result in noncompliance with the 1993 base realignment and closure decision to consolidate tactical missile maintenance at Letterkenny. See the Finding section for details.

Management controls were adequate in that we found no material weaknesses.

Management Actions. Accelerated corrective actions by the Army resulted in the prompt removal of unique depot level test equipment and all depot level spare and repair parts for the TOW subsystem from Red River to Letterkenny in early October 1998. As a result of management's actions, this report makes no recommendations.

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Background

This report is the second in a series of reports on the consolidation of tactical missile maintenance work loads at Letterkenny Army Depot (Letterkenny). This audit was performed in response to a request by the Assistant Deputy Under Secretary of Defense (Maintenance Policy, Programs and Resources). The first report, Inspector General, DoD, Report No.98-165, "Modifications to the Tube-Launched, Optically Tracked, Wire-Command Missile Launcher for the Bradley Fighting Vehicle System," June 25, 1998, discussed concerns regarding field execution of a modification to the tube-launched, optically tracked, wire command (TOW) missile launcher.

1993 Commission on Defense Base Closure and Realignment. The 1993 Commission on Defense Base Closure and Realignment report to the President made the following specific recommendation concerning Letterkenny and tactical missile maintenance.

> Letterkenny Army Depot will remain open. Consolidate tactical missile maintenance at the depot as originally planned by the Department of Defense in the *Tactical Missile Maintenance Consolidation Plan for Letterkenny Army Depot*, 31 January 1992 (revised 30 April 1992). Add tactical missile maintenance workload currently being accomplished by the Marine Corps Logistics Base Barstow, California, to the consolidation plan.

The Commission's recommendation became effective in July 1993 and is required to be completed no later than July 1999.

Tactical Missile Maintenance Consolidation Plan. The Tactical Missile Maintenance Consolidation Plan for Letterkenny Army Depot specifically identified the weapon systems for which depot maintenance work load consolidations were probable. The work loads included guidance and control section repair for all current and future air and ground launched missiles and ground support equipment including launchers and radars. Ultimately, maintenance work loads for 16 weapon systems were consolidated at Letterkenny (see Appendix B). The Industrial Operations Command, a major subordinate command of the Army Materiel Command, was responsible for ensuring that work load was directed to Letterkenny in consonance with the consolidation decision.

Objectives

The overall audit objective was to evaluate the cost and benefits associated with the consolidation of tactical missile guidance and control maintenance work loads at Letterkenny (see Appendix C). We also evaluated the transition of work load for the TOW subsystems used on the Bradley Fighting Vehicle System from Red River Army Depot (Red River) to Letterkenny. Further, we evaluated the

management control program as it related to the audit objective. See Appendix A for a discussion of the scope and methodology, a summary of prior coverage, and the results of our review of the management control program.

Consolidation of TOW Missile Launcher Maintenance Work Load for the Bradley Fighting Vehicle System

The Red River Army Depot performed unauthorized maintenance repairs on the TOW subsystems used on the Bradley Fighting Vehicle System. The repairs occurred because Red River did not follow the direction of the Industrial Operations Command to cease unauthorized activity and the Industrial Operations Command did not effectively ensure compliance with its direction. The unauthorized repairs resulted in higher repair rates charged by Letterkenny and, consequently, lost savings of approximately $1.8 million to tactical missile maintenance customers. Also, failure to complete the consolidation of TOW subsystem work loads by July 1999 could result in noncompliance with the 1993 base realignment and closure (BRAC) decision.

TOW Subsystem for the Bradley Fighting Vehicle System

The TOW subsystem used on the Bradley Fighting Vehicle System has two configurations, the basic TOW subsystem and the TOW2 subsystem. Each configuration comprises an integrated sight unit, missile launcher, guidance set, and interconnecting cables. Depot maintenance for the TOW subsystem, except for the integrated sight unit, was to be consolidated at Letterkenny in accordance with the 1993 BRAC decision.

Consolidation of Maintenance Work Load for the TOW Subsystem

The TOW subsystem consolidation combined the depot level maintenance mission from Mainz and Red River Army Depots and transferred the mission to Letterkenny. Letterkenny received maintenance equipment from Mainz following its closure. This enabled Letterkenny to develop a skill base without significant disruption in depot maintenance support. When Letterkenny became certified as the depot source of repair on January 5, 1995, the remaining equipment was to be removed from Red River.

Criteria

Technical Manual for the TOW. Technical Manual 9-1425-453-24P, for the TOW, TOW2, and their corresponding guidance sets, lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment; and other special support equipment required for the performance of organizational, direct support, general support, and depot maintenance. The Technical Manual authorizes the requisition, issue, and disposition of spares,

repair parts, and special tools as indicated by the Source, Maintenance, and Recoverability codes. The Source, Maintenance, and Recoverability code is a 5-position code containing supply and requisitioning information, maintenance level authorization criteria, and disposition instructions. The maintenance code in the third position provides the lowest maintenance level authorized to remove, replace, and use an item.

Depot Maintenance Work Requirement 9-1440-453-1. Depot Maintenance Work Requirement (DMWR) 9-1440-453-1, January 1997, contains the instructions for performing depot maintenance on the TOW missile launcher to include technical support requirements, pre-shop analysis, overhaul procedures, and quality assurance requirements. The DMWR further stipulates that when work can be accomplished only in a manner other than specified, prior approval must be obtained by submitting a request for deviation or waiver. The DMWR instructions are for the use of contractor or depot personnel, and the instructions take precedence in the case of conflict with any other documents pertinent to depot maintenance.

Memorandum of Agreement. A memorandum of agreement, effective October 1, 1994, between Letterkenny and Red River established an interdepot repair and return program for TOW subsystem components. Under this program, Red River was to forward faulty TOW subsystem components to Letterkenny for repair. Letterkenny would perform the depot level repairs necessary, and return the repaired components to Red River. The memorandum of agreement provides direction for the planning, programming, budgeting, and execution of the repair and return program. The specific components covered are in the following table.

Components Addressed by the Memorandum of Agreement

Nomenclature	National Stock Number
Basic TOW Missile Launcher	1440-01-178-1141
Basic Command Guidance Electronics	1430-01-233-2768
TOW2 Missile Launcher	1440-01-167-7514
TOW2 Missile Guidance Set	1420-01-329-8870

Depot Maintenance Performed by Red River

Red River performed unauthorized maintenance repairs on the TOW subsystem used on the Bradley Fighting Vehicle System. In addition, Red River had retained TOW-unique depot maintenance test equipment for which it had no authorized mission, used the test equipment to perform unauthorized depot maintenance, and maintained an inventory of depot level repair parts.

TOW Depot Maintenance Test Equipment. Red River had retained depot maintenance test equipment unique to the TOW subsystem, despite losing that

mission in January 1995, when Letterkenny became certified as the depot source of repair. We specifically identified a boresight alignment fixture and Versatile Automatic Test Equipment (VATE) at Red River.

Boresight Alignment Fixture. The boresight alignment fixture is a depot level test fixture required, in accordance with the DMWR, to perform final assembly and testing procedures on the launcher assembly. Red River personnel claimed that they did not use the fixture and that it belonged to the on-site Raytheon Field Service representative. When we questioned the Raytheon representative about the fixture, he stated that he had no use for the fixture and did not know why it was sent to him.

VATE. The VATE is used to perform only depot level testing of circuit cards resident in both the command and missile guidance sets. Red River is not authorized to perform any of the tests associated with the VATE. However, when we questioned the shop representative about its use, the representative admitted using the VATE to test circuit cards.

Red River no longer has the mission of performing depot maintenance on the TOW subsystem and does not need depot unique test equipment Therefore, all depot level test equipment unique to the TOW subsystem should be removed from Red River and either transferred to Letterkenny or disposed of appropriately.

Depot Maintenance Actions Performed. Red River used the depot test equipment to perform unauthorized depot maintenance on the TOW subsystem. It performed unauthorized maintenance on circuit cards, missile guidance sets, and at least one TOW2 launcher after the mission of depot maintenance was transitioned to Letterkenny.

Circuit Card Repairs. In our discussions with electronics shop personnel concerning the VATE, they admitted performing repairs on faulty circuit cards. We reviewed test data sheets before and after repairs and witnessed circuit cards being repaired. The Technical Manual designates circuit card repairs as depot level maintenance. Therefore, any faulty circuit cards that Red River identified should have been forwarded to Letterkenny for repair.

Missile Guidance Set Repairs. We identified several missile guidance sets that Red River overhauled. An overhaul is the most extensive depot level repair action. The DMWR for the missile guidance set requires that overhaul stamps be shown on overhauled equipment indicating the date of the overhaul and the letter symbol signifying the depot performing the overhaul. Several of the missile guidance sets we observed at Red River in August 1998 had Red River overhaul stamps on them. The overhaul stamps indicated that overhauls had been performed in July and August 1998. The missile guidance sets should have been forwarded to Letterkenny to be overhauled.

TOW Missile Launcher Repair. In addition to repairs of the circuit card and missile guidance sets, Red River had overhauled a TOW2 missile launcher. The launcher arrived at Letterkenny in October 1997 for repair. When it was inducted into the maintenance shop, the Letterkenny technicians observed an

overhaul stamp on the launcher. The overhaul stamp indicated that Red River had performed an overhaul in July 1995, 7 months after Letterkenny took over the TOW subsystem depot maintenance mission.

Depot Maintenance Repair Parts. As identified during our visit to Red River in November 1997, the depot retained a large quantity of spares and repair parts for the TOW subsystem. The majority of the repair parts are used only in the performance of depot maintenance of the TOW subsystem. When we questioned the electronics shop manager about the parts, we were told that the parts were not recorded in any inventory of record. At our request a physical inventory was performed and disclosed that approximately 36 different depot level repair parts, costing more than $585,000, were unauthorized and on hand. Red River had no use for the repair parts in the execution of its authorized mission.

When we notified Red River officials of our concerns, they pledged to take corrective actions. However, on our return to Red River in August 1998, we determined that only $247,000 of the parts had been returned to the Defense Logistics Agency stock. Nothing had been done with the remaining $338,000 of parts. The remainder of repair parts should be removed from Red River and repositioned at Letterkenny; turned in to supply; or salvaged, as appropriate.

Admission of Depot Maintenance Actions. In our November 1997 exit conference, Red River officials admitted performing depot level maintenance on the TOW subsystem components. They claimed that their actions were justified for two reasons. First, Red River asserted that Letterkenny's performance on the repair and return program was not timely and adversely affected Red River's production line for the Bradley conversion effort. Second, Red River believed that its performance of TOW subsystem depot maintenance was authorized by the 1995 BRAC decision.

Timeliness of the Letterkenny Repairs. Red River officials claimed that Letterkenny's untimely performance in executing the repair and return program resulted in an adverse impact on the Bradley production line. According to Red River officials, repaired launchers must be returned and remounted on the Bradley vehicle within 30 days of their removal to avoid any interruption in the Bradley conversion effort. The officials claimed that they had to purchase new launchers from supply because of Letterkenny's failure to meet the 30-day requirement. To avoid an adverse impact on the Bradley conversion effort, Red River officials stated that they purchased 28 basic and 10 TOW2 missile launchers between 1996 and 1997, at a total cost of $201,730. We were unable to validate the purchase of new launchers or the associated cost from the documentation provided by Red River.

Interpretation of 1995 BRAC. Red River officials believed that their actions complied with the 1995 BRAC decision. The 1995 BRAC decision directed that Red River perform all Bradley Fighting Vehicle System depot

maintenance. Red River argued that because the TOW subsystem was a part of the Bradley System, Red River could perform TOW subsystem repairs as a part of the Bradley work load.

Red River's justifications for performing depot maintenance on the TOW subsystem were unsupportable. Delays experienced with TOW launcher repairs and returns were caused largely because Red River did not fulfill its responsibilities under the memorandum of agreement. Review of the repair and return program disclosed that Red River's actions did not fully comply with the terms of the memorandum of agreement, which hampered Letterkenny's ability to meet production requirements. Specifically, Red River:

- did not provide Letterkenny with work load requirements 90 days before the year in which repairs were to be performed,
- did not always provide timely funding for the repair of equipment, and
- did not always provide adequate shipping and billing instructions.

The supportability of Red River's interpretation of the 1995 BRAC decision is discussed later in this report.

Compliance With Consolidation Decision

Red River did not follow the Industrial Operations Command direction to cease unauthorized activity and the Industrial Operations Command did not effectively enforce the consolidation requirements.

Noncompliance With Industrial Operations Command Direction. Unauthorized depot maintenance of the TOW subsystem occurred, in part, because Red River did not follow the guidance of the Industrial Operations Command on BRAC implementation, and more specific direction to cease unauthorized depot maintenance activities. The Commander, U.S. Army Industrial Operations Command issued a memorandum on August 25, 1995 (see Appendix D), to clarify the 1993 and 1995 BRAC decisions concerning the consolidation of depot maintenance for the TOW subsystem. In the memorandum, the Commander stated that the tactical missile maintenance consolidation aspect of the 1993 BRAC decision was not changed by the 1995 decision. The Industrial Operations Command directed that Red River complete its work in process, abide by its memorandum of agreement with Letterkenny immediately, and not induct any additional TOW subsystem work. The 1995 memorandum clearly dispelled any confusion regarding the responsibility of Red River in executing the consolidation and invalidated Red River's November 1997 claim that continuing TOW subsystem depot maintenance was allowed by the 1995 BRAC decision.

Continued Noncompliance. Despite the direction of the Industrial Operations Command in 1995, Red River continued to conduct unauthorized depot maintenance actions on the TOW subsystem. When we began our review in October 1997, Letterkenny still had not received TOW subsystem components

from Red River commensurate with the Bradley conversion effort. Red River's continued noncompliance was also evidenced in its repair of circuit cards, missile guidance sets, and a TOW2 launcher, as discussed previously.

Industrial Operations Command Enforcement of Consolidation Requirements. In addition to Red River not complying with the direction that the Industrial Operations Command set forth, the Industrial Operations Command did not effectively enforce its consolidation directions. A key responsibility of the Industrial Operations Command is to ensure that depot work loads are programmed to the appropriate authorized depot. In May 1996, 17 months after the transition of the TOW depot maintenance mission had occurred, Letterkenny wrote a memorandum to the Industrial Operations Command concerning Red River's continued noncompliance. In the memorandum, Letterkenny requested the Industrial Operations Command's assistance in completing the execution of the consolidation for the TOW subsystem work load.

In December 1997, we contacted the Industrial Operations Command to determine what actions, if any, it had taken following its August 1995 memorandum or in response to Letterkenny's May 1996 memorandum The Industrial Operations Command was unable to report any specific actions taken as a result of either of the two memoranda. We informed the Industrial Operations Command that our preliminary audit results showed that unauthorized depot maintenance at Red River was continuing.

Effects of Unauthorized Depot Maintenance Actions

The unauthorized depot maintenance that Red River performed resulted in higher repair rates charged by Letterkenny and, consequently, lost savings of approximately $1.8 million to tactical missile maintenance customers. Red River reported that approximately 44,000 direct labor hours of TOW subsystem depot maintenance had been performed over 4 years. Had the work load been performed at Letterkenny, as directed, the increase in work load would have resulted in labor rate reductions at Letterkenny. The reductions multiplied by the total Letterkenny work load over the same 4-year period would have yielded $1.8 million in savings to Letterkenny customers. Further, failure to complete the consolidation of TOW subsystem work loads by July 1999 could result in noncompliance with the 1993 BRAC decision.

Management Actions

As a result of our preliminary findings, the Industrial Operations Command initiated corrective actions. In March 1998, the Industrial Operations Command issued a memorandum (see Appendix E) providing Red River with further direction concerning TOW subsystem work load. In that memorandum, the Industrial Operations Command emphasized that:

- Red River was authorized to perform only direct and general support maintenance on the TOW subsystem,
- Letterkenny is to perform all depot level maintenance for the TOW subsystem, and
- the 1995 BRAC decision did not change or conflict with the 1993 BRAC decision.

In addition to its March 1998 memorandum, the Industrial Operations Command addressed the TOW subsystem issue during a July 1998 inspection at Red River. During the inspection, Industrial Operations Command officials confirmed the existence of both TOW depot level repair parts and unique test equipment at Red River. Using the results of our audit, Red River officials took prompt action to transfer depot level spares and repair parts inventory to Letterkenny in late September 1998. On October 6, 1998, the inventory was received at Letterkenny. In addition, at the direction of the Industrial Operations Command, all unique depot level test equipment for the TOW subsystem was removed from Red River. On October 13, 1998, the unique depot level test equipment arrived at Letterkenny.

As a result of the prompt and comprehensive measures taken by Army management, the recommendation in the draft report was deleted.

Appendix A. Audit Process

Scope and Methodology

We reviewed the application of DMWR 9-1440-453-1 to the TOW missile launcher at Letterkenny and Red River. We reviewed the report of the 1993 Commission on Defense Base Closure and Realignment report, the DoD Tactical Missile Study (January 18, 1991), the Tactical Missile Maintenance Consolidation Plan for Letterkenny Army Depot (revised April 30, 1992), and the Transition Plan for the Bradley Fighting Vehicle. We also reviewed the Technical Manual 9-1425-453-24P for the TOW Missile Launcher and the DMWR 9-1430-450-1 for the Missile Guidance Set. In addition, we interviewed depot maintenance technicians at Letterkenny and Red River; managers from the Army Materiel Command and the Industrial Operations Command; and a field technician from Raytheon Systems Company. We reviewed the depot maintenance production line and familiarized ourselves with the TOW unique test equipment. We also reviewed various other documents associated with the consolidation of tactical missile maintenance, dated from 1990 through 1998.

DoD-Wide Corporate Level Goals. In response to the Government Performance Results Act, DoD has established 6 DoD-wide corporate level performance objectives and 14 goals for meeting these objectives. This report pertains to achievement of the following objective and goal.

> **Objective:** Fundamentally reengineer the DoD and achieve a 21st century infrastructure. **Goal:** Reduce costs while maintaining required military capabilities across all DoD mission areas. **(DoD-6)**

DoD Functional Area Reform Goals. Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objective and goal.

> **Logistics Functional Area. Objective:** Streamline logistics infrastructure. **Goal:** Reduce weapon system cost of ownership. **(LOG-3.3)**

High Risk Area. The General Accounting Office has identified several high risk areas in the DoD. This report provides coverage of the Defense Infrastructure high risk area.

Use of Computer-Processed Data. We did not use computer-processed data or statistical sampling in developing this report.

Use of Technical Assistance. Our Quantitative Methods Division assisted us by evaluating the TOW subsystem maintenance procedures and the use of depot level test equipment on the production line.

Audit Type, Dates, and Standards. We performed this economy and efficiency audit from September 1997 through January 1998 and July through October 1998

in accordance with auditing standards that the Comptroller General of the United States issued, as implemented by the Inspector General, DoD. Accordingly, we included tests of management controls considered necessary.

Contacts During the Audit. We visited or contacted individuals or organizations within DoD and within the Raytheon Systems Company. Further details are available upon request.

Management Control Program

DoD Directive 5010.38, "Management Control Program," August 26, 1996, requires DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of Review of Management Control Program. We reviewed the adequacy of the Army's controls over the execution of the tactical missile maintenance consolidation at Letterkenny. Specifically, we reviewed the Army controls over directing depot work load to the authorized source of repair. We did not assess the adequacy of management's self-evaluation of those controls because we identified no material weaknesses.

Adequacy of Management Controls. Management's controls over directing depot work load to the authorized source of repair were adequate as they applied to the audit objectives but the controls were not enforced.

Summary of Prior Coverage

During the last 5 years, the Inspector General, DoD, issued the following related reports.

Inspector General, DoD, Report No. 98-165, "Modifications to the Tube-Launched, Optically Tracked, Wire-Command Missile Launcher for the Bradley Fighting Vehicle System," June 25, 1998.

Inspector General, DoD, Report No. 98-130, "Costs and Savings for 1993 Defense Base Realignments and Closures," May 6, 1998.

Inspector General, DoD, Report No 95-189, "Status of the Effort to Consolidate Tactical Missile Maintenance at Letterkenny Army Depot," May 8, 1995.

Appendix B. Consolidated Missile Maintenance Work Loads

The following is a list of the 16 tactical missile systems for which the maintenance work loads were consolidated at Letterkenny.

Army Tactical Missile System
Air to Air Stinger
Avenger
Dragon
Hellfire
Homing All the Way Killer
Land Combat Support System
Maverick
Multiple Launch Rocket System
Phased Array Tracking to Intercept of Target
Phoenix
Sidewinder (Navy and Air Force)
Sparrow
TOW Bradley
TOW Cobra
TOW2

Appendix C. Transition Costs and Benefits

Transition Costs of the Consolidation

Initial BRAC Cost Estimate. In 1993, the nonrecurring costs of transitioning tactical missile maintenance missions to Letterkenny was estimated at $39.1 million. The estimate was based on the assumption that 25 missile systems maintenance missions would transition. Ultimately only 16 of the 25 systems would actually transition and be consolidated at Letterkenny.

Cost of Consolidation. According to the Industrial Operations Command, the total nonrecurring BRAC costs associated with the consolidation of tactical missile maintenance at Letterkenny, including military construction costs, was approximately $28.7 million, as of September 1998. The following table shows a breakdown of the costs by fiscal year.

Nonrecurring Costs of the Consolidation

Fiscal Year	BRAC Funds Expended (million)
1993	$ 4.0
1994	9.6
1995	8.5
1996	5.7
1997	0.8
1998	0.1
Total	**$28.7**

Costs That Could Have Been Avoided. More than $1 million in transition costs for the High Speed Anti-Radiation Missile and the Advanced Medium Range Air to Air Missile could have been avoided. The Defense Depot Maintenance Council excepted those two systems from the consolidation in June 1997. However, the exceptions were granted after costs had already been expended. Expenditures for logistics and engineering planning totaled $160,815. Expenditures for renovation costs were approximately $900,000. The renovation would have been unnecessary had the exceptions been granted earlier in the planning of the consolidation.

Benefits of the Consolidation

The economic benefits of the consolidation were to be achieved primarily by eliminating costs associated with maintaining duplicate depot maintenance facilities, maximizing underused capacities, and realizing benefits resulting from greater economies of scale.

We focused our review on identifying benefits achieved at Letterkenny that resulted from the consolidation of tactical missile depot maintenance. Benefits included efficiencies gained through process initiatives, sharing of test equipment across multiple missile systems, and use of a multitrained workforce.

Process Initiatives. Letterkenny initiated an examination of the maintenance processes associated with each of the transitioned systems to determine whether greater efficiencies could be realized. For example, Letterkenny reviewed the diagnostic testing requirements for the Sparrow missile system to determine whether a more efficient test could be established. Letterkenny proposed a more efficient test of the guidance and control sections that did not degrade the quality of the product. The new process was approved and resulted in a $6,221 per unit savings in repair costs. The new procedure has been applied to approximately 75 percent of the Navy work load. Letterkenny plans to propose the same process improvement to the Air Force Sparrow program.

Letterkenny also claimed similar benefits had been achieved on a number of other systems as compared to the previous sources of repair. It reported a 15-percent and a 25-percent reduction in unit repair costs for the Phoenix and the Multiple Launch Rocket Systems, respectively. However, we were unable to validate the Letterkenny claims because of insufficient supporting documentation.

Shared Test Equipment. The consolidation provided Letterkenny an environment whereby common test equipment could be shared across multiple maintenance production lines. For example, the Integrated Family of Test Equipment is used in support of the production lines for the Avenger, Homing All the Way Killer, and Multiple Launch Rocket System. The use of test equipment across production lines is cost-effective because it reduces the high costs associated with individual missile support equipment, increases equipment supportability, and reduces training requirements.

Another example of shared equipment resulting in reduced overhead costs and increased efficiencies is directly related to the use of a central tactical missile maintenance facility. The central facility at Letterkenny is equipped to provide the following support for multiple systems: clean rooms, hydraulic supply, liquid nitrogen supply, low pressure air, and radio frequency shielded rooms. The sharing of centralized maintenance support equipment eliminates duplicative costs that would have been incurred if provided separately for each missile system.

Use of Multitrained Workforce. The consolidation promoted the development of a multiskilled workforce. A multiskilled workforce provided management with the flexibility to position its technicians in areas where the work load was more abundant and reduced losses normally associated with production shortfalls. Letterkenny has 306 highly skilled technicians who are trained on two or more tactical missile systems.

Appendix D. Commander, Industrial Operations Command August 1995 Memorandum

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND
ROCK ISLAND, ILLINOIS 61299-6000

REPLY TO ATTENTION OF
AMSIO-CG (700)

25 AUG 1995

MEMORANDUM FOR Commander, Red River Army Depot, 100 Main Drive, Texarkana, TX 75507-5000

SUBJECT: Packing and Shipping of Bradley Fighting Vehicle System (BFVS) Launcher Test Station, Part Number 3765284

1. Reference your memorandum, RRAD, SIORR-X, 31 Jul 95, subject as above (encl).

2. I have reviewed the situation and considered various factors, including:

a. This test equipment is utilized for repair of TOW-BFVS missile system components for which depot repair was consolidated at Letterkenny Army Depot (LEAD) under BRAC 93 law. The current interpretation is that the consolidation aspect was not changed by BRAC 95 recommendations.

b. LEAD depot repair capability was certified by MICOM on 5 Jan 95. The MICOM IMMC confirmed that LEAD is capable of supporting RRAD's TOW-BFVS component repair requirements.

c. A Memorandum of Agreement, dated 28 Jun 94, and signed by RRAD/LEAD/MICOM establishes the inter-depot support procedures to be utilized.

3. It is my considered opinion that the subject test station and related equipment at RRAD should be sent to Hughes as requested by MICOM in their memorandum.

4. The work in process, supported by the test station and related equipment, should be completed and the equipment shipped as soon as feasible due to MICOM's contractual requirements. Your inter-depot support MOA procedures with LEAD (para 2c) should be executed immediately and no additional work be inducted.

5. Point of contact is Mr. Bill Halke, AMSIO-IOI-L, DSN 793-7980, FAX 793-3976.

Encl

Fish
Let's get moving
this as planned.
DB

Dennis L. Benchoff
DENNIS L. BENCHOFF
Major General, USA
Commanding

Appendix E. Commander, Industrial Operations Command March 1998 Memorandum

DEPARTMENT OF THE ARMY
HEADQUARTERS, U S ARMY INDUSTRIAL OPERATIONS COMMAND
ROCK ISLAND, ILLINOIS 61299 6000

REPLY TO ATTENTION OF
AMSIO-LS (700(A))

22 MAR 1998

MEMORANDUM FOR

Commander, Anniston Army Depot, ATTN: SIOAN-CO, 7 Frankford Avenue, Anniston, AL 36201-4199

Commander, Red River Army Depot, ATTN: SIORR-C, 100 Main Drive, Texarkana, TX 75507-5000

SUBJECT: BRAC 93 Compliance for TOW Cobra Workload at Anniston Army Depot (ANAD) and TOW Bradley Launcher Workload at Red River Army Depot (RRAD)

1. References:

a. Tactical Missile Maintenance Consolidation Plan for Letterkenny Army Depot, 31 January 1992, (revised 30 April 1992).

b. Memorandum, DESCOM, AMSDS-MN-CM, 12 May 1995, subject: Request for Authorization for Completion of Navy TOW2B Modification Program at Anniston Army Depot (ANAD)

2 The purpose of this memorandum is to provide guidance on subject workloads. Preliminary findings indicate that RRAD was performing unauthorized maintenance actions on TOW Bradley Launchers and ANAD was performing unauthorized maintenance actions on TOW Cobra assets

3. Regarding TOW Cobra workload at ANAD:

a. ANAD will only repair the 11 TOW Cobra NSNs (and subassemblies thereof), which were exempted from BRAC 93 Law which stated "Consolidate tactical missile maintenance at the depot as originally planned by DoD in the Tactical Missile Maintenance Plan for Letterkenny Army Depot, 31 Jan 92 (revised 30 Apr 92)". That plan, reference 1a, directed that these 11 items would remain at ANAD.

b. It is understood that ANAD will no longer be accepting bulk Procurement Request Order Numbers (PRONs) to execute TOW Cobra workload for Kollsman Corporation. Both AMCOM and IOC will establish individual NSN-based PRONs in order to divide the Kollsman Corporation workload between ANAD and LEAD according to their respective workload authorizations.

c The ANAD has recently completed a Navy TOW 2B workload for 239 Missile Command Amplifiers which was authorized per reference 1b.

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4. Regarding TOW Bradley workload at RRAD:

a. RRAD is only authorized to perform DS/GS maintenance on the TOW Launchers. This includes swap-out of components as necessary IAW with DS/GS test procedures; however, test/repair of those components by RRAD is not authorized.

b. Letterkenny Army Depot (LEAD) will perform depot-level maintenance on the TOW Launchers, including component repairs. Specifically, concurrent tests/repairs on TOW Bradley Launcher Missile Guidance Set, the Command Guidance Electronics, the Armament Control Unit, or their respective components using the Versatile Automated Test Equipment Console, EQUATE, or other DLM capabilities, is not in compliance with BRAC 93 Law.

c. The BRAC 95 Law does not change this guidance. The TOW Bradley Launcher workload is TOW workload to be done by LEAD, and not to be considered Bradley workload to be done by RRAD.

5. The IOC will abide with the BRAC 93 and BRAC 95 Laws. We have coordinated this memorandum with AMCOM, LEAD, and the Department of Defense Inspector General.

6. The POC is Mr. Jeff Schaaf, HQ, IOC, AMSIO-LSL, DSN 793-4091 or (309) 782-4091, email jschaaf1@ria-emh2.army.mil

FOR THE COMMANDER:

JAMES P. FAIRALL, JR.
Colonel, GS
Chief of Staff

CF:
Office of the Assistant Inspector General for Audits, Readiness & Logistics Directorate, ATTN: OAIG-OD-RLS (Mr. Hampton), 400 Army Navy Drive, Room 929, Arlington, VA 22202-2884
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