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# Depot Maintenance Consolidation Study



## APPENDIXES

### A through N

January 1993

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## APPENDIX A

### Executive Working Group

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## APPENDIX B

### TERMS OF REFERENCE

#### FOR

#### DEPOT MAINTENANCE CONSOLIDATION STUDY

##### **I. BACKGROUND.**

a. The demise of the Soviet Union and the Warsaw Pact promulgated a major shift in the focus of our national military strategy from global conflict to regional contingencies. Consistent with this shift in strategy, the Base Force concept was adopted which provides for a reduced force structure that is capable of meeting challenges to our regional interests. This downsizing, however, has not been limited exclusively to combatants. In recent years the Services have taken unilateral as well as collaborative measures to improve combat support efficiency to include their respective depot systems. Most recent measures were initiated in response to Defense Management Report Decisions (DMRD) 908 and 908C, both titled *Consolidating Depot Maintenance*, dated 17 November 1990, and 12 January 1991, respectively. While successful in achieving their objectives, they have not kept pace with the changes that have taken place in the world or the impact of these changes on our national military strategy. Accordingly, the Department of Defense (DOD) and the Services must consider further consolidation of our military depot maintenance systems. Each Service maintains its own depot maintenance system that includes management structures, overhead, and facilities to plan, program, and perform assigned missions. As force structure and equipment densities shrink, so must the depot level maintenance infrastructure required to maintain them.

b. On 17 August 1992, the Director, Joint Staff, issued a tasker, with guidance, for the development of an issue paper on Depot Maintenance Consolidation. Suspense for completion of the issue paper was 4 September 1992.

c. Additionally, the US Coast Guard, which is a component of the Department of Transportation and maintains a depot maintenance complex similar to the Services, albeit smaller, was invited to participate in this study and share in its benefits.

**II. PURPOSE.** These terms of reference establish the mission, organization, operation and duration of the Depot Maintenance Consolidation Study.

**III. MISSION.** To review the existing depot maintenance structure in each of the DOD Services and the Coast Guard; identify and analyze alternatives for reducing costs, duplication, overlap and overall depot maintenance capacity; recommend cost effective alternative(s) to existing maintenance structures that will continue to support peacetime readiness, sustainment

of force during crisis response and contingency operations, and immediately return equipment to established readiness standards upon redeployment.

#### **IV. ORGANIZATION.**

- a. The Directorate for Logistics (J-4), will serve as the Joint Staff lead agency for the Depot Maintenance Consolidation Study. J-4 representatives will be responsible for administrative support functions of the study group including the consolidation and ordering of input when required.
- b. The Depot Maintenance Consolidation Study will be composed of an Executive Working Group, a staff group, staff group facilitators and a support staff.
- c. The Executive Working Group will be formed from retired general/flag officers and one private sector industry executive of commensurate stature. The Executive Working Group will include retired general/flag officers from each of the following Services: Army, Navy, Air Force, and Marine Corps. One member will be designed as the Director, Executive Working Group.
- d. The staff group will be formed and consist of the representatives from each of the Services and the Coast Guard. The staff group will be assigned representatives from J-4 who will serve as the group facilitators. There will be a separate facilitator for each of the alternatives under consideration. The facilitators will meet with the staff group in turn to lead analysis of their respective alternative. A J-4 Division Chief will serve as the coordinator for the staff group, however, each Service representative is responsible for keeping their respective Service Chiefs apprised of the findings and conclusions of the Executive Working Group.
- e. Each Service representative is responsible for informing the study executives of past or current actions or thoughts that they deem important to the study effort. In addition, Service representatives will advise J-4 of their input to facilitate record keeping.

#### **V. OPERATIONS.**

- a. Staff group facilitators will meet periodically with the J-4 Division Chief Coordinator on an as required basis for workloading, coordinating issues, etc., with respect to tasking issued by the study executives or collectively determined essential by the Service leaders.
- b. The staff group will meet as required to formulate, analyze, and discuss separate alternatives.
- c. The staff group facilitators will then brief the results of staff group findings to the J-4 Division Chief and other staff group facilitators. The initial product of the staff group will

be an issue paper with a set of alternatives for changing the existing depot maintenance structure. The paper will be provided to the Executive Working Group for evaluation. This does not preclude Service leaders/facilitators from direct communications with the study executives.

d. The Executive Working Group will receive briefings from the staff group representatives, review and analyze alternatives, and present their assessment and recommendations for cost effective depot maintenance consolidation to the Joint Chiefs of Staff. The Executive Working Group is not limited to the specific set of alternatives developed by the staff group.

**VI. DURATION.** The Depot Maintenance Consolidation Study Group will brief the Joint Chiefs of Staff by 9 November 1992. These terms of reference will remain in effect for a period of 1 year to allow for additional taskings as required unless specific action is taken sooner to negate them.

Enclosure

## DEFINITION

### **Depot Maintenance.**

The maintenance performed on materiel requiring major overhaul or a complete rebuild of parts, assemblies, subassemblies, and end items, including manufacturing, modification, modernization, repair, testing, and reclamation as required. Depot maintenance provides stocks of serviceable equipment by using a combination of special skills, equipment, and facilities for repairs that are not available in lower level maintenance activities.

## APPENDIX C

### CONCEPT PAPER

#### I. DESCRIPTION OF ISSUE

With the demise of the Soviet Union and the Warsaw Pact, our military strategy has changed from global to regional scenarios and has moved away from prolonged conflict to shorter, decisive conflicts. In this environment, the focus of maintenance depots must be to support, in a cost effective manner: peacetime readiness, buildup of forces in response to contingencies, sustainment of forces during conflict, and the immediate return of equipment to established readiness standards. In a regional contingency environment, decreases in stockage levels require a highly responsive depot maintenance capability for both major end item equipment and components.

The Base Force goal for FY95 represents a DOD decrease of up to 25 percent of the FY91 force levels in both the active duty and reserve components. As weapon system inventories are decreased, so too must the depot level maintenance infrastructure needed to support them. Each Service maintains a separate depot maintenance capability as well as a separate management structure to plan, program and perform separate Service depot work. In many instances, more than one Service is performing depot maintenance on the same or similar equipment. As force structure and total depot maintenance requirements decrease, overhead costs become a larger percentage of the cost unless action is taken to restructure depot maintenance.

There are a number of alternatives for restructuring the Services' current depot maintenance organizations and workloading methodology. These alternatives provide a spectrum of possible solutions to align the depot structure with future Service requirements.

#### II. ALTERNATIVES

##### Alternative A Individual Service Management

Each Service retains its own separate depot maintenance operations in accordance with DMRD 908 directions to increase interservicing, streamline depot operation, reduce management staffs at all levels, increase competition, team with private industry for remanufacturing/manufacturing, etc. Additional depot closures and realignments will be accomplished through the Base Realignment and Closure (BRAC) process. The Defense Depot Maintenance Council (DDMC) will provide limited oversight.

**Alternative B Individual Service Management (Consolidation into "Centers of Excellence")**

Each Service retains its own separate depot maintenance operations. Under DMRD 908 streamlining guidance, weapon system platforms, DLRs, components<sup>1</sup> and non-weapon system equipment<sup>2</sup> will be consolidated into "Centers of Excellence" within the using Service to the maximum extent possible. Depot maintenance could be performed by a contractor or in another Services' facilities.

**Alternative C Consolidate Weapon System Platforms into Joint Service "Centers of Excellence"**

Depot maintenance management of common or similar weapon system platforms, (e.g., ships, fixed wing aircraft, rotary wing aircraft, large missiles, etc.) would be accomplished by single Services in "Centers of Excellence." Maintenance will be performed in the single Service's facilities, another Service's facilities or contractor facilities. Depot maintenance responsibility for DLRs, components<sup>1</sup> and non-weapon system equipment<sup>2</sup> will remain in using Service's "Centers of Excellence."

**Alternative D Individual Service Management of Weapon System Platforms in "Centers of Excellence" with DLRs, Components<sup>1</sup> and Non-Weapon System Equipment<sup>2</sup> Consolidated in Single Service "Centers of Excellence"**

Each Service retains its own separate depot maintenance operations for weapon platforms under the "Centers of Excellence" concept. Similar DLRs, components<sup>1</sup> and non-weapon system equipment<sup>2</sup> will be consolidated to the maximum extent possible in single Service "Centers of Excellence."

**Alternative E Consolidation of Similar/Common Platforms, DLRs, Components<sup>1</sup> and Non-Weapon System Equipment<sup>2</sup> Under Single Executive Service**

A single Executive Service will be responsible for the maintenance of similar/common platforms, and their DLRs, components<sup>1</sup> and non-weapon system equipment<sup>2</sup> to the maximum extent possible under the "Centers of Excellence" concept. The "Centers of Excellence" may be located in the Executive Service's facilities, another Service's facilities or contractor facilities. Total weapon system management will be the responsibility of the using Service.

**Alternative F DOD Consolidation**

All depot maintenance functions will be consolidated under a single organization external to the Services. Individual weapon platforms, DLRs, components<sup>1</sup> and non-weapon system equipment<sup>2</sup> will be maintained in government owned depots or contracted out. Government owned depots could be government operated (GOGO) or contractor operated (GOCO).

### Alternative G Commercialize Maintenance

Contract out all depot maintenance requirements. Contract management would be maintained at either the Service level or by a single organization external to the Services. The ultimate goal would be to include contract maintenance as part of the weapon system acquisition costs of new systems throughout their life cycle.

- Footnotes:
1. Components: hydraulic actuators, gas turbine engines, aircraft landing gear, inertial navigation systems, etc.
  2. Non-Weapon System Equipment: automatic test equipment, ground support equipment, general purpose vehicles, etc.



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## APPENDIX D

### STUDY PLAN

- I. Approve Terms of Reference.
- II. Receive baseline briefings on Service depot maintenance programs, and historical items.
- III. Review concept paper to establish a common understanding of problems and alternatives; agree on baseline alternatives to be analyzed.
- IV. Define current business environment; how we perform depot maintenance now? How the world situation, collapse of communism, Base Force and shift to a regional focus have changed the volume and timing of what depots must produce. Collect data on:
  - Financial Aspect (Appendix F)
  - Facility Characteristics (Appendix F)
  - Depot Commodity Workload (Appendix F)
- V. Evaluate/assess current business environment; how can we better perform depot maintenance?
  - Identify the following:
    - Excess capacity
    - Duplicative capability
    - Overhead cost
- VI. Assess each alternative in concept paper IAW Director for Strategic Plans and Policy, J-5, guidelines (Appendix C). Develop estimates of cost savings for each alternative (Appendix E). Criteria for selection of alternatives should include both military and business considerations:
  - Military considerations. Any recommended change must preserve or enhance military capability and readiness by:
    - Preserving or enhancing Service Chiefs' ability to rapidly satisfy changes in priorities of primary weapon system depot level maintenance.

- Decreasing rather than increasing downtime of equipment.
  - Improving or sustaining (rather than degrading) the quality of the repair process.
  - Enhancing rather than degrading peacetime, contingency response, regional war, mobilization, and reconstitution capabilities.
- Business considerations. Any recommended change must result in significant net savings and:
- Justify turbulence associated with change (judgment call).
  - Ensure that near term investment costs are not prohibitive.

VII. Reach conclusions.

VIII. Develop recommendations.

## APPENDIX E

### Workload Consolidation Calculation

1. **Introduction.** The procedures used to determine potential cost savings resulting from migrating workloads among the depots were taken from established references and previously accepted methodologies. Recurring and non-recurring costs associated with a movement of work were identified. The transition of work from one depot to another was spread over a 2 year period. The following primary references were used during this effort:
  - a. DOD Depot Maintenance and Maintenance Support Cost Accounting Handbook, DOD 7220.29-H, Table 18 computer runs.
  - b. DDMC Corporate Business Plan FY 1992-1997, October 1992 (FY 1993 data).
  - c. JDMAG Depot Profiles 1991, May 1991, Depot Profile Size Attribute.
  - d. National Defense Budget Estimates for FY 1993, OSD(C) March 1992.
  - e. Service POM 94 MILCON Submissions data.
  - f. DDMC Joint Service Engine Study, January 1991.
  - g. Marine Corps Option Paper, 11 April 1990.
  - h. DDMC DOD Tactical Missile Study, 18 January 1991.
  - i. Joint Services Update of the Tactical Missile Maintenance Consolidation Savings and Cost Analysis, 1 August 1992 (rev. 26 August 1992).
  - j. Air Force Logistics Command (AFLC) Air Logistics Center (ALC) Closure and Relocation Model, 2 March 1992.
  - k. Service Commodity Matrix-Appendix F, Depot Maintenance Consolidation Study.
  - l. Service Budget Estimate Submissions, FY 1994/1995.
  - m. Analysis of Depot Maintenance Consolidation Proposals (Green Book), Naval Aviation Depot Corporate Board, 22 February 1990.

## 2. Analysis and Computations.

a. Each alternative sought to increase capacity utilization throughout DOD. In doing this, most alternatives contained a series of options that could be characterized as: centralizing the workload by pulling up the work from the smaller depots, decentralizing the work by pushing down the work from the larger depots, and the movement of work from mid-size depots to others.

b. The cost spreadsheets ran all options using the actual FY91 financial data from the transferring depot(s) and the gaining depot(s). FY91 actual hours attributed to the migrating work and the cost associated with that work were extracted from Reference 1a, listed on the previous page. The gaining depot is assumed to pick up the work at the gaining depot's labor rates. The total FY94 depot maintenance personnel levels from Reference 1b, were used to determine non-recurring costs. The cost calculations provide a relative cost measure of work moved from one location to another using FY91 actual accounting costs. These relative costs are not "budget quality" cost estimates.

c. The calculations accounted for non-recurring costs of severance pay, unemployment, early retirement, relocation, TDY, movement of equipment, facility/equipment shutdown, cost of disruption, recruitment of personnel, training, MILCON avoidance, productivity loss at the gaining site, and plant equipment. Recurring costs included operations overhead, and general and administrative (G&A). All costs were adjusted to FY93 constant dollars for comparison.

3. Recurring. Total direct labor costs for the migrating workload were determined by commodity direct labor hours (DLH) multiplied by the direct labor rates of the gaining depot(s). Recurring costs (labor, material, other, G&A, and operations overhead) are determined by two methodologies that provide a range of costs. The Low method assumed 35 percent of the total work cost at the losing depot(s) does not transfer (Reference 1f). The High alternative transferred 100 percent of the labor, material, and other and assumed that 30 percent of both G&A and operations overhead did not transfer (from Reference 1j). Savings were gained from workload consolidations and improvements to the repair process through the use of Technology Repair Centers (TRCs) and "Centers of Excellence" (COE).

## 4. Non-recurring.

a. MILCON Avoidance. MILCON avoidance includes the cost of approved and scheduled MILCON that would no longer be required as a depot closes or a workload specifically impacted by the MILCON is repostured. MILCON avoidance is determined in two ranges with one being the transfer of none of the MILCON

requirement (total cost avoidance), the other with all of the requirement (all MILCON costs transferred to the gaining depot). The study team utilized data from References 1b, 1e, 1k and 1l. No projects listed as "unfunded requirements" were used.

b. Industrial Plant Equipment (IPE) Avoidance. This area includes the cost of approved and scheduled IPE from Reference 1k, that would no longer be required as a depot closes. Costs are computed in two ranges with one being the transfer of none of the equipment (total cost avoidance), the other with all of the plant equipment requirements (all cost transferred to gaining depot). Where partial workload transfers, a proportional amount (based on relative DLHs) of future equipment purchases is costed in a like manner. Future, more detailed studies might more closely tie specific equipment purchases directly to commodities.

c. Severance Pay.

(1) The ratio of involuntary-to-voluntary separations will vary with many factors, most notably the availability of other government activities in the area. Fifteen and 55 percent (References 1f and 1g) of the total depot employment was used to estimate the low and high range of involuntary separations respectively.

(2) Severance pay costs are derived by taking the range of personnel that would be involuntarily separated multiplied by the average direct labor rate multiplied by 640 hours. (Based upon an average Federal Service time of 13.4 years, with one week's pay for up to 10 years of service and 2 weeks pay for every year after ten.)

d. Early-Out Retirement. This cost is based on data used in Reference 1j. The calculation uses 10 percent of the work force multiplied by 17,604 dollars, the annual annuity, multiplied by 5.9 years which represents the number of years the annuity is paid because of early-out retirement.

e. Unemployment Compensation. Unemployment compensation is based on a reemployment percent of 25. The computation was based on 212 dollars per week for 39 weeks multiplied by the number of unemployed as a result of workload movement. The cost is based on data used in Reference 1j.

f. Relocation Costs. Based on data used in the DDMC Joint Service Engine Study (Reference 1f), relocation costs were estimated as 31,600 dollars multiplied by 15 percent of the civilian personnel originally dedicated to that workload. Where military personnel are direct workers at the losing depot, it is assumed that they were replaced on a one-for-one basis at the gaining depot by civilian labor. Where partial depot transfer (work/commodity) occurs, special Defense Manpower Data Center (DMDC)

Table 18 (Reference 1a) reports were generated allocating appropriate cost categories and DLHs to the work/commodities selected for transfer. Direct labor personnel assigned to each commodity were assumed to equal the ratio of the commodity DLH to depot total DLH.

g. TDY Costs. Cost of TDY associated with a smooth and orderly transfer of the workload was estimated to be 150,000 dollars to cover travel and expenses for each gaining depot.

h. Movement of Equipment. This area measures the cost associated with the removal, shipment, and installation of equipment necessary to perform maintenance on the migrated workload. Based on the DDMC Joint Service Engine Study, Reference 1f, the total transfer cost is estimated as 22 percent of the total book value of the plant equipment at the transferring depot. The factor of 22 percent is the sum of 2 percent to de-install, 6 percent for packing, crating, and handling, 4 percent for transportation and 10 percent for unpacking, uncrating, and installation. The book value of the equipment is obtained from Reference 1c.

i. Recruitment Cost. The number of new hires was based on References 1f and 1j. The methodology assumes 85 percent of the civilian workers dedicated to the migrating workload would be recruited at the new facility. The recruitment cost is this number of people times 200 dollars.

j. Training Costs. The cost associated with the training of new hires is determined by multiplying the number of new hires times 33 percent times the direct labor rate times 5.6 months (References 1f and 1j).

k. Facility/Equipment/Equipment Shutdown Costs. This item includes costs for closing buildings and other production facilities because of closure or reposture of single site workload. The current recognized value for this is 1.13 dollars per square foot. This value was used per OSD direction in BRAC-91 and represents only the cost to mothball the facility. Source is Reference 1m.

l. Productivity Loss. Loss of productivity results from the realignment of work to new activities. Two sources were used to provide a high and low estimate. Based on the Joint Services Update of the Tactical Missile Study (Reference 1i) a 3 year effect was used with the first year productivity loss being 26 percent of the direct labor cost, the second being 12 percent and the third year 5 percent (High). Based on Reference 1f, the team took a 1 year loss in productivity of 10 percent of the direct labor cost (Low).

m. Cost of Disruption (Losing Depot/Workload). Completion of work-in-process will become increasingly inefficient at a closing or losing facility because of low morale, supply and material shortages, tear down of equipment, etc. Based on Reference 1m, disruption cost was determined based on the following formula; (0.25 multiplied by the hours transferred multiplied by the losing depot's labor rate) multiplied by 2. This cost was based on a 2 year transition.

5. **Miscellaneous.** Additional MILCON and equipment, above that currently programmed for a losing or gaining depot, may be required but were not priced.



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## APPENDIX F

### DEPOT COMMODITY MATRIX

I. A depot commodity matrix was created for this study to provide a quick reference of each maintenance depot's mission by commodity, financial data and facility characteristics. These factors are oriented vertically. Depots, which are listed horizontally, are grouped into three categories: Aviation, Shipyards and Ground Equipment depots. An "x" was placed in the commodity section for a depot only if that commodity represented 5 percent or more of that depot's workload. As a result, all the work performed at a depot may not be reflected in the matrix.

II. The matrix consists of 27 pages. When properly arranged, it will form a 3 x 9 page document. Individual pages should be oriented as indicated in Table F-1.

Table F-1 Commodity Matrix Orientation Scheme

F-1-A	F-2-A	F-3-A	F-4-A	F-5-A	F-6-A	F-7-A	F-8-A	F-9-A
F-1-B	F-2-B	F-3-B	F-4-B	F-5-B	F-6-B	F-7-B	F-8-B	F-9-B
F-1-C	F-2-C	F-3-C	F-4-C	F-5-C	F-6-C	F-7-C	F-8-C	F-9-C

III. The information contained in the matrix was provided by OSD, JDMAG and the Services.

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## Depot Commodity Matrix - Appendix F

Aviation		AGMC	ALC	ALC	ALC
		Newark	Ogden	Oklahoma City	Sacramento
<b>Financial</b>					
Budget (91 actual/92 budget)	S	84/77.2	437.1/436.4	536.1/497.8	458.7/423.3
Civilian Personnel (# people/%)		1120	5457	5935	5337
Direct	J	785	4120	4613	4038
Indirect	J	335	1337	1322	1299
Military Personnel (# people/%)		10	136	45	49
Direct	J	0	94	14	25
Indirect	J	10	42	31	24
Utilization (%)					
1 Shift	S	71.00%	81.20%	84.00%	90.00%
2 Shifts	S	19.40%	15.90%	11.10%	9.00%
3 Shifts	S	9.60%	2.90%	4.90%	1.00%
5 Day Workweek	S	100.00%	100.00%	100.00%	100.00%
7 Day Workweek	S	0.00%	0.00%	0.00%	0.00%
Overtime	S	2.30%	7.60%	7.30%	5.50%
Interservicing (\$/%) FY91					
Army	J	3408	366	75	967
Navy	J	8313	4008	3455	11561
Air Force	J	N/A	N/A	N/A	N/A
Marine Corps	J	0	54	0	454
Coast Guard	S				9.4
FY91 Workload Value (\$K)	O	123126	454002	716597	434434
<b>Facility</b>					
Depot Size (sqft) (covered)	J	472M*	3.7M*	5.2M*	3.546M*
Acreage	J	72*	6698*	4885*	2949*
Storage Space					
covered	J	100K*	1208K*	253K*	539K*
uncovered	J				2917
Equipment Value(\$M)	J	301.8*	663.6*	526.2*	503.5*
Facility Value(\$M)	J	243.5*	351.8*	1,133.4*	633.6*
Access					
Air (distance to airport)	S	0.25	8	15	14
Rail (y/n)	S	Y	Y	Y	Y
Water (y/n)	S	N	N	N	15M
Road (miles to Interstate)	S	I-70(10Mi)	I-15,I-80(.25Mi)	I-35,I-40(.25Mi)	I-5,I-80(.25Mi)
MILCON (past 10 yrs, prod related)(\$K)	S	6,700	73,200	129,100	72,100
MILCON (SYDP)(\$K)	S	0	8,600	14,900	59,500
Plant Equipment (past 10 years)(\$K)	S	57,400	140,668	172,251	177,446
Plant Equipment (SYDP)(\$K)	S	9,700	58,600	127,939	91,600
Capacity Utilization(%)	J	75%	96%	93%	84%
Workload (DLH)	J	1,232	6,875	7,072	6,495
Capacity (DLH)	J	1,644	7,150	7,644	7,705
<b>S= Service provided, O= OSD provided, J= JDMAG provided</b>					
* Service vice JDMAG provided					
** Figures reflect 3 years (93-95)					
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**F-1-A-1**

		AGMC Newark	ALC Ogden	ALC Oklahoma City	ALC Sacramento
<b>Commodity (at least 5% of workload)</b>					
<b>Aircraft</b>	S				
Aircraft, Fixed Wing	S				
Engine	S			X	
Propeller	S				
Landing Gear	S		X		
Airframe	S				
Small (<=2 engines)	S		X		X
Large (>2 engines)	S		X	X	X
Comm/Nav Equipment	S		X		
Instruments	S	X			
Mechanical Systems	S				X
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
<b>Aircraft, Rotary Wing</b>	S				
Engine	S				
Blade	S				
Landing Gear	S				
Airframe	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
Remote Piloted Vehicles	S				
<b>Missile</b>	S				
Strategic Airframes	S		X		
Tactical Airframes	S				
Propulsion/Payload/Explosive	S				
Support & Launch Equip	S				
Guidance & Control	S	X			
<b>Ship</b>	S				
Carrier	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Surface	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
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**F-1-B-1**

		AGMC Newark	ALC Ogden	ALC Oklahoma City	ALC Sacramento
Submarine	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Service Craft	S				
<b>Vehicles</b>	S				
Armored Vehicles	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon/Gun	S				
Wheeled Vehicles	S				
Chassis	S				
Powertrain	S				
Weapon/Gun	S				
Artillery	S				
Towed	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Self-propelled	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Construction Vehicles	S				
Powertrain	S				
Chassis	S				
General	S				
Powertrain	S				
Chassis	S				
Rail	S				
<b>Communications-Electronic</b>	S				
Ground	S				X
Satt	S				
<b>Ordnance/Weapons/Munitions</b>	S				
Torpedos/Mines	S				
Chemical	S				
Small Arms	S				
Conv. munitions	S				
<b>Metrology</b>	S	X			
<b>Automatic Test Equipment</b>	S				
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F-1-C-1

<b>Depot Commodity Matrix</b>					
Aviation		ALC	ALC	NADEP	NADEP
		Warner-Robins	San Antonio	Alameda	Jacksonville
<b>Financial</b>					
Budget (91 actual/92 budget)	S	467.1/493.4	618.5/550.2	?/378.0	?/319.6
Civilian Personnel (# people/%)		5780	6602	3284	2539
Direct	J	4326	4807	1718	1507
Indirect	J	1452	1795	1566	1032
Military Personnel (# people/%)		54	38	32	30
Direct	J	30	16	0	0
Indirect	J	24	22	32	30
Utilization (%)					
1 Shift	S	87.00%	88.00%	86.00%	89.00%
2 Shifts	S	10.00%	11.00%	14.00%	10.00%
3 Shifts	S	3.00%	1.00%	0.00%	1.00%
5 Day Workweek	S	69.00%	100.00%	100.00%	100.00%
7 Day Workweek	S	31.00%	0.00%	0.00%	0.00%
Overtime	S	8.30%	12.40%	8.60%	11.91%
Interservicing (\$/%) FY91					
Army	J	1608	70	3673	626
Navy	J	4149	5238	N/A	N/A
Air Force	J	N/A	N/A	53207	4947
Marine Corps	J	9	0	0	0
Coast Guard	S		21.2		
FY91 Workload Value (\$K)	O	566352	873715	354339	258565
<b>Facility</b>					
Depot Size (sqft) (covered)	J	3.371M*	3.784M*	2.3M	1.6M
Acreage	J	8720*	4660*	138	96
Storage Space					
covered	J		1065		
uncovered	J				
Equipment Value(\$M)	J	850.1*	646.9*	183	250
Facility Value(\$M)	J	257.5*	372*	246	393
Access					
Air (distance to airport)	S	10	15	Y	Y
Rail (y/n)	S	Y	Y	N	N
Water (y/n)	S	N	N	Y	Y
Road (miles to Interstate)	S	US129,I-75(8 Mi)	I-10,I-35(.25Mi)	I-80,I-880	I-10,I-295
MILCON (past 10 yrs, prod related)(\$K)	S	51,400	81,600	72,100	41,400
MILCON (SYDP)(\$K)	S	32,800	27,200	2,400**	0**
Plant Equipment (past 10 years)(\$K)	S	159,530	192,103	73,300	62,100
Plant Equipment (SYDP)(\$K)	S	59,815	136,405	20,001**	13,378**
Capacity Utilization(%)	J	87%	92%	90%	90%
Workload (DLH)	J	7,046	8,193	2,626	2,426
Capacity (DLH)	J	8,075	8,935	2,915	2,693
* Service vice JDMAG provided					
** Figures reflect 3 years (93-95)					
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		ALC	ALC	NADEP	NADEP
		Warner-Robins	San Antonio	Alameda	Jacksonville
<b>Commodity (at least 5% of workload)</b>					
<b>Aircraft</b>	S				
Aircraft, Fixed Wing	S				
Engine	S		X	X	X
Propeller	S				
Landing Gear	S				
Airframe	S				
Small (<=2 engines)	S	X		X	X
Large (>2 engines)	S	X	X	X	X
Comm/Nav Equipment	S	X			
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S	X			
Simulators	S				
GSE/AGE	S				
Aircraft, Rotary Wing	S				
Engine	S				
Blade	S				
Landing Gear	S				
Airframe	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
Remote Piloted Vehicles	S				
<b>Missile</b>	S				
Strategic Airframes	S				
Tactical Airframes	S				
Propulsion/Payload/Explosive	S				
Support & Launch Equip	S				
Guidance & Control	S				
<b>Ship</b>	S				
Carrier	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Surface	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				

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F-2-B-1

		ALC	ALC	NADEP	NADEP
		Warner-Robins	San Antonio	Alameda	Jacksonville
Submarine	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Service Craft	S				
<b>Vehicles</b>	S				
Armored Vehicles	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon/Gun	S				
Wheeled Vehicles	S				
Chassis	S				
Powertrain	S				
Weapon/Gun	S				
Artillery	S				
Towed	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Self-propelled	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Construction Vehicles	S				
Powertrain	S				
Chassis	S				
General	S				
Powertrain	S				
Chassis	S				
Rail	S				
<b>Communications-Electronic</b>	S				
Ground	S				
Satt	S				
<b>Ordnance/Weapons/Munitions</b>	S				
Torpedos/Mines	S				
Chemical	S				
Small Arms	S				
Conv. munitions	S				
<b>Metrology</b>	S				
<b>Automatic Test Equipment</b>	S				
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F-2-C-1





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		NADEP Norfolk	NADEP North Island	NADEP Pensacola	NADEP Cherry Point
<b>Commodity (at least 5% of workload)</b>					
<b>Aircraft</b>	S				
Aircraft, Fixed Wing	S				
Engine	S				X
Propeller	S				
Landing Gear	S				
Airframe	S				
Small (<=2 engines)	S	X	X		X
Large (>2 engines)	S				X
Comm/Nav Equipment	S		X		
Instruments	S		X		
Mechanical Systems	S	X	X		X
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				X
Aircraft, Rotary Wing	S				
Engine	S				X
Blade	S				X
Landing Gear	S				
Airframe	S			X	X
Comm/Nav Equipment	S			X	
Instruments	S			X	
Mechanical Systems	S		X	X	X
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
Remote Piloted Vehicles	S				
<b>Missile</b>	S				
Strategic Airframes	S				
Tactical Airframes	S				
Propulsion/Payload/Explosive	S				
Support & Launch Equip	S				
Guidance & Control	S				
<b>Ship</b>	S				
Carrier	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Surface	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				

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**F-3-B-1**

		NADEP Norfolk	NADEP North Island	NADEP Pensacola	NADEP Cherry Point
Submarine	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Service Craft	S				
<b>Vehicles</b>	S				
Armored Vehicles	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon/Gun	S				
Wheeled Vehicles	S				
Chassis	S				
Powertrain	S				
Weapon/Gun	S				
Artillery	S				
Towed	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Self-propelled	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Construction Vehicles	S				
Powertrain	S				
Chassis	S				
General	S				
Powertrain	S				
Chassis	S				
Rail	S				
<b>Communications-Electronic</b>	S				
Ground	S				
Satt	S				
<b>Ordnance/Weapons/Munitions</b>	S				
Torpedos/Mines	S				
Chemical	S				
Small Arms	S				
Conv. munitions	S				
<b>Metrology</b>	S	X	X		
<b>Automatic Test Equipment</b>	S	X			
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F-3-C-1

<b>Depot Commodity Matrix - Appendix F</b>			
Aviation		Army Depot	USCG
		Corpus Christi	Elizabeth City
<b>Financial</b>			
Budget (91 actual/92 budget)	S	328.5/358.2	42.7/43.8***
Civilian Personnel (# people/%)		3137	301
Direct	J	1945	251/83.4%
Indirect	J	1192	50/16.6%
Military Personnel (# people/%)		2	53
Direct	J	0	36/67.9%
Indirect	J	2	17/32.1%
<b>Utilization (%)</b>			
1 Shift	S	95.00%	83.00%
2 Shifts	S	2.00%	17.00%
3 Shifts	S	3.00%	0.00%
5 Day Workweek	S	100.00%	100.00%
7 Day Workweek	S	0.00%	0.00%
Overtime	S	15.30%	5.00%
<b>Interservicing (\$/% FY91)</b>			
Army	J	N/A	0
Navy	J	16803	0
Air Force	J	8713	0
Marine Corps	J	0	0
Coast Guard	S		N/A
FY91 Workload Value (\$K)	O	417565	43915
<b>Facility</b>			
Depot Size (sqft) (covered)	J	2.2M	283K*
Acreage	J	186	39*
Storage Space			
covered	J		51.7K*
uncovered	J	1.5M	4.8K*
Equipment Value(\$M)	J	93	2*
Facility Value(\$M)	J	362	25.4*
<b>Access</b>			
Air (distance to airport)	S	Y/0mi	Y
Rail (y/n)	S	Y/12mi	Y
Water (y/n)	S	Y/15mi	N
Road (miles to Interstate)	S	I-37/14mi	Y/4mi
MILCON (past 10 yrs, prod related)(\$K)	S	34,000	TBD
MILCON (SYDP)(\$K)	S	21,200	TBD
Plant Equipment (past 10 years)(\$K)	S	117,200	1,141
Plant Equipment (SYDP)(\$K)	S	122,700	1,501
Capacity Utilization(%)	J	78%	0.9982*
Workload (DLH)	J	4,042	499*
Capacity (DLH)	J	5,155	500*
* Service vice JDMAG provided			
** Figures reflect 3 years (93-95)			
*** Reflects FY92 Actual/FY93 Budget			
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		Army Depot Corpus Christi	USCG Elizabeth City
<b>Commodity (at least 5% of workload)</b>			
<b>Aircraft</b>	S		
Aircraft, Fixed Wing	S		X
Engine	S		X
Propeller	S		X
Landing Gear	S		X
Airframe	S		
Small (<=2 engines)	S		X
Large (>2 engines)	S		
Comm/Nav Equipment	S		X
Instruments	S	X	X
Mechanical Systems	S		X
Ord/Guns	S		
Radar	S		X
Simulators	S		X
GSE/AGE	S		X
Aircraft, Rotary Wing	S	X	X
Engine	S	X	X
Blade	S	X	X
Landing Gear	S	X	X
Airframe	S	X	X
Comm/Nav Equipment	S	X	X
Instruments	S	X	X
Mechanical Systems	S	X	X
Ord/Guns	S		
Radar	S		X
Simulators	S		X
GSE/AGE	S		X
Remote Piloted Vehicles	S		
<b>Missile</b>	S		
Strategic Airframes	S		
Tactical Airframes	S		
Propulsion/Payload/Explosive	S		
Support & Launch Equip	S		
Guidance & Control	S		
<b>Ship</b>	S		
Carrier	S		
Nuclear Propulsion	S		
Conventional Propulsion	S		
Radar	S		
Comm/Nav/Electronics	S		
Fire Control System	S		
Weapons/Guns	S		
Surface	S		
Nuclear Propulsion	S		
Conventional Propulsion	S		
Radar	S		
Comm/Nav/Electronics	S		
Fire Control System	S		
Weapons/Guns	S		
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		Army Depot Corpus Christi	USCG Elizabeth City
Submarine	S		
Nuclear Propulsion	S		
Conventional Propulsion	S		
Radar	S		
Comm/Nav/Electronics	S		
Fire Control System	S		
Weapons/Guns	S		
Service Craft	S		
<b>Vehicles</b>	S		
Armored Vehicles	S		
Chassis	S		
Powertrain	S		
Fire Control System	S		
Weapon/Gun	S		
Wheeled Vehicles	S		
Chassis	S		
Powertrain	S		
Weapon/Gun	S		
Artillery	S		
Towed	S		
Chassis	S		
Powertrain	S		
Fire Control System	S		
Weapon	S		
Self-propelled	S		
Chassis	S		
Powertrain	S		
Fire Control System	S		
Weapon	S		
Construction Vehicles	S		
Powertrain	S		
Chassis	S		
General	S		
Powertrain	S		
Chassis	S		
Rail	S		
<b>Communications-Electronic</b>	S		
Ground	S		
Satt	S		
<b>Ordnance/Weapons/Munitions</b>	S		
Torpedos/Mines	S		
Chemical	S		
Small Arms	S		
Conv. munitions	S		
<b>Metrology</b>	S		
<b>Automatic Test Equipment</b>	S		
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F4-C-1

<b>Depot Commodity Matrix</b>					
Ships		NSY Portsmouth	NSY Philadelphia	NSY Norfolk	NSY Charleston
<b>Financial</b>					
Budget (91 actual/92 budget)	S	412.3/382.2M	518.8/452.4M	676.0/680.1M	485.2/423.2M
Civilian Personnel (# people/%)		6027	6199	9997	5766
Direct	J	3301	3903	5999	3455
Indirect	J	2726	2296	3998	2311
Military Personnel (# people/%)		105	42	103	59
Direct	J	0	14	0	0
Indirect	J	105	28	103	59
Utilization (%)					
1 Shift	S	100.00%	100.00%	100.00%	100.00%
2 Shifts	S				
3 Shifts	S				
5 Day Workweek	S	100.00%	100.00%	100.00%	100.00%
7 Day Workweek	S				
Overtime	S	9.70%	14.00%	4.90%	12.10%
Interservicing (\$/%)					
Army	J	0	0	0	0
Navy	J	N/A	N/A	N/A	N/A
Air Force	J	0	0	0	0
Marine Corps	J	0	1	38	420
Coast Guard	S				
FY91 Workload Value (\$K)	O	94453***	81771***	1029415	447318
<b>Facility</b>					
Depot Size (sqft) (covered)	J	3.9M	7M	3.6M	
Acreage	J	298	904	1275	590
Storage Space					
covered	J				
uncovered	J				
Equipment Value(\$M)	J	388.1*	189*	216.3*	220.5*
Facility Value(\$M)	J	1,123*	2,371*	2,497*	1702*
Access					
Air (distance to airport)	S	4M	3M	Y	5M
Rail (y/n)	S	Y/0	Y	Y	Y
Water (y/n)	S	Y/1	Y	Y	Y
Road (miles to Interstate)	S	I-95	I-70,I-95	I-64	I-26
MILCON (past 10 yrs, prod related)	S	52.2M**	25.1M**	36.3M**	12.9M**
MILCON (SYDP)	S	14.9M	0	36.4M	2.8M
Plant Equipment (past 10 years)	S	107.4M	116.3M	207.4M	121.5M
Plant Equipment (SYDP)	S	34M	6.3M	35.2M	37.6M
Drydock Utilization(%)	J	36%	90%	103%	84%
Workload (DLH)	J	6,130	8,308	12,755	7,565
Capacity (DLH)	J				
<b>S= Service provided, O= OSD provided, J= JDMAG provided</b>					
* Service vice JDMAG provided					
** Reflects past 7 years vice 10					
*** Apparent reporting error					
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		NSY Portsmouth	NSY Philadelphia	NSY Norfolk	NSY Charleston
<b>Commodity (at least 5% of workload)</b>					
<b>Aircraft</b>	S				
Aircraft, Fixed Wing	S				
Engine	S				
Propeller	S				
Landing Gear	S				
Airframe	S				
Small (<=2 engines)	S				
Large (>2 engines)	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
Aircraft, Rotary Wing	S				
Engine	S				
Blade	S				
Landing Gear	S				
Airframe	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
Remote Piloted Vehicles	S				
<b>Missile</b>	S				
Strategic Airframes	S				
Tactical Airframes	S				
Propulsion/Payload/Explosive	S				
Support & Launch Equip	S				
Guidance & Control	S				
<b>Ship</b>	S				
Carrier	S		X	X	
Nuclear Propulsion	S				
Conventional Propulsion	S		X		
Radar	S		X		
Comm/Nav/Electronics	S		X		
Fire Control System	S				
Weapons/Guns	S				
Surface	S			X	X
Nuclear Propulsion	S			X	
Conventional Propulsion	S		X		
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				

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		NSY Portsmouth	NSY Philadelphia	NSY Norfolk	NSY Charleston
Submarine	S	X		X	X
Nuclear Propulsion	S			X	
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Service Craft	S				
<b>Vehicles</b>	S				
Armored Vehicles	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon/Gun	S				
Wheeled Vehicles	S				
Chassis	S				
Powertrain	S				
Weapon/Gun	S				
Artillery	S				
Towed	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Self-propelled	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Construction Vehicles	S				
Powertrain	S				
Chassis	S				
General	S				
Powertrain	S				
Chassis	S				
Rail	S				
<b>Communications-Electronic</b>	S				
Ground	S				
Satt	S				
<b>Ordnance/Weapons/Munitions</b>	S				
Torpedos/Mines	S				
Chemical	S				
Small Arms	S				
Conv. munitions	S				
<b>Metrology</b>	S				
<b>Automatic Test Equipment</b>	S				
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F-5-C-1

<b>Depot Commodity Matrix</b>					
		NSY	NSY	NSY	NSY
		Mare Island	Long Beach	Pearl Harbor	Puget Sound
<b>Financial</b>					
Budget (91 actual/92 budget)	S	483.8/497.2M	288.7/310.1M	385.7/363.2M	754.0/759.2M
Civilian Personnel (# people/%)		6033	4292	4541	11571
Direct	J	3742	2379	2366	6863
Indirect	J	2291	1913	2175	4708
Military Personnel (# people/%)		106	26	52	134
Direct	J	0	0	0	0
Indirect	J	106	26	52	134
Utilization (%)					
1 Shift	S	100.00%	100.00%	100.00%	100.00%
2 Shifts	S				
3 Shifts	S				
5 Day Workweek	S	100.00%	100.00%	100.00%	100.00%
7 Day Workweek	S				
Overtime	S	7.90%	9.20%	6.00%	11.10%
Interservicing (\$/%)					
Army	J	0	0	0	0
Navy	J	N/A	N/A	N/A	N/A
Air Force	J	0	712	0	0
Marine Corps	J	1	0	52	0
Coast Guard	S				
FY91 Workload Value (\$K)	O	531932	287528	298006	598696
<b>Facility</b>					
Depot Size (sqft) (covered)	J	10.7M*	2.5M*	3.6M*	5M*
Acreage	J	5548	214	160	1367
Storage Space					
covered	J				
uncovered	J				3.9M
Equipment Value(\$M)	J	331.8*	281.4*	222.6*	302.4*
Facility Value(\$M)	J	2,253*	2,235.6*	1,195.5*	2,011.1*
Access					
Air (distance to airport)	S	36M	23M	Y	30M
Rail (y/n)	S	Y	Y	Y	Y
Water (y/n)	S	Y	Y	Y	Y
Road (miles to Interstate)	S	CA37,I-80	I-710	H-1	US3,I-5
MILCON (past 10 yrs, prod related)	S	32.9M**	10.8M**	2.66M**	167.15M**
MILCON (SYDP)	S	10.8M	4.0M	2.9M	57.58M
Plant Equipment (past 10 years)	S	146.4M	66.1M	97.5M	203.0M
Plant Equipment (SYDP)	S	38.1M	17.4M	45.1M	71.3M
Drydock Utilization(%)	J	142%	38%	76%	203%
Workload (DLH)	J	7,153	4,389	4,569	13,917
Capacity (DLH)	J				
* Service vice JDMAG provided					
** Reflects past 7 years vice 10					
*** Apparent reporting error					
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		NSY Mare Island	NSY Long Beach	NSY Pearl Harbor	NSY Puget Sound
<b>Commodity (at least 5% of workload)</b>					
<b>Aircraft</b>	S				
Aircraft, Fixed Wing	S				
Engine	S				
Propeller	S				
Landing Gear	S				
Airframe	S				
Small (<=2 engines)	S				
Large (>2 engines)	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
Aircraft, Rotary Wing	S				
Engine	S				
Blade	S				
Landing Gear	S				
Airframe	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				
Remote Piloted Vehicles	S				
<b>Missile</b>	S				
Strategic Airframes	S				
Tactical Airframes	S				
Propulsion/Payload/Explosive	S				
Support & Launch Equip	S				
Guidance & Control	S				
<b>Ship</b>	S				
Carrier	S				X
Nuclear Propulsion	S				X
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Surface	S		X	X	X
Nuclear Propulsion	S				X
Conventional Propulsion	S		X		
Radar	S		X		
Comm/Nav/Electronics	S			X	
Fire Control System	S		X		
Weapons/Guns	S				
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**F-6-B-1**

		NSY	NSY	NSY	NSY
		Mare Island	Long Beach	Pearl Harbor	Puget Sound
Submarine	S	X			X
Nuclear Propulsion	S	X		X	
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Service Craft	S				
<b>Vehicles</b>	S				
Armored Vehicles	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon/Gun	S				
Wheeled Vehicles	S				
Chassis	S				
Powertrain	S				
Weapon/Gun	S				
Artillery	S				
Towed	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Self-propelled	S				
Chassis	S				
Powertrain	S				
Fire Control System	S				
Weapon	S				
Construction Vehicles	S				
Powertrain	S				
Chassis	S				
General	S				
Powertrain	S				
Chassis	S				
Rail	S				
<b>Communications-Electronic</b>	S				
Ground	S				
Satt	S				
<b>Ordnance/Weapons/Munitions</b>	S				
Torpedos/Mines	S				
Chemical	S				
Small Arms	S				
Conv. munitions	S				
<b>Metrology</b>	S				
<b>Automatic Test Equipment</b>	S				
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## Depot Commodity Matrix

		NESEC Portsmouth	NESEC San Diego	USCG Curtis Bay
<b>Financial</b>				
Budget (91 actual/92 budget)	S	?/21945	?/20454	53.2M/59.1M****
Civilian Personnel (# people/%)		325	222	630
Direct	J	277	205	462/73.3%
Indirect	J	48	17	168/26.7%
Military Personnel (# people/%)		0	0	140
Direct	J	0	0	77/55%
Indirect	J	0	0	63/45%
Utilization (%)				
1 Shift	S	100%	100%	100%
2 Shifts	S			5%
3 Shifts	S			0%
5 Day Workweek	S	100%	100%	100%
7 Day Workweek	S			
Overtime	S	2%	8%	20%
Interservicing (\$/%)				
Army	J			0
Navy	J	N/A	N/A	0
Air Force	J			0
Marine Corps	J			0
Coast Guard	S			N/A
FY91 Workload Value (\$K)	O			59,100
<b>Facility</b>				
Depot Size (sqft) (covered)	J	83K	72K	1M
Acreage	J	3.25	3.5	113
Storage Space				
covered	J			250K
uncovered	J			20 Acres
Equipment Value(\$M)	J	6.4	40	50
Facility Value(\$M)	J	3.3	36	87
Access				
Air (distance to airport)	S	5mi	Y	y/10mi
Rail (y/n)	S	Y	Y	y
Water (y/n)	S	5mi	Y	y
Road (miles to Interstate)	S	I-64	I-5,I-8	Y/1mi
MILCON (past 10 yrs, prod related)	S	4200	814	7M
MILCON (SYDP)	S			26M
Plant Equipment (past 10 years)	S			6M
Plant Equipment (SYDP)	S			6M
Drydock Utilization(%)	J	82%	92%	95%
Workload (DLH)	J	503	606	1M
Capacity (DLH)	J	615	660	
* Service vice JDMAG provided				
** Reflects past 7 years vice 10				
*** Apparent reporting error				
**** Reflects FY92 Actual/FY93 Budget				
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**F-7-B-1**

		NESEC Portsmouth	NESEC San Diego	USCG Curtis Bay
Submarine	S			
Nuclear Propulsion	S			
Conventional Propulsion	S			
Radar	S			
Comm/Nav/Electronics	S			
Fire Control System	S			
Weapons/Guns	S			
Service Craft	S			
<b>Vehicles</b>	S			
Armored Vehicles	S			
Chassis	S			
Powertrain	S			
Fire Control System	S			
Weapon/Gun	S			
Wheeled Vehicles	S			
Chassis	S			
Powertrain	S			
Weapon/Gun	S			
Artillery	S			
Towed	S			
Chassis	S			
Powertrain	S			
Fire Control System	S			
Weapon	S			
Self-propelled	S			
Chassis	S			
Powertrain	S			
Fire Control System	S			
Weapon	S			
Construction Vehicles	S			
Powertrain	S			
Chassis	S			
General	S			
Powertrain	S			
Chassis	S			
Rail	S			
<b>Communications-Electronic</b>	S			
Ground	S			
Satt	S			
<b>Ordnance/Weapons/Munitions</b>	S			
Torpedos/Mines	S			
Chemical	S			
Small Arms	S			
Conv. munitions	S			
<b>Metrology</b>	S			
<b>Automatic Test Equipment</b>	S			
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**F-7-C-1**

## Depot Commodity Matrix

Ground		Army Depot Anniston	Army Depot Letterkenny	Army Depot Red River	Army Depot Tooele
<b>Financial</b>					
Budget (91 actual/92 budget)	S	265.8/253.8	163.4/155.1	160.8/250.4	146.8/128.5
Civilian Personnel (# people/%)		2739	1818	2152	1742
Direct	J	1808	1127	1356	1132
Indirect	J	931	691	796	610
Military Personnel (# people/%)		4	13	8	9
Direct	J	0	0	0	0
Indirect	J	4	13	8	9
Utilization (%)					
1 Shift	S	88.00%	90.00%	89.00%	94.00%
2 Shifts	S	10.00%	1.00%	8.00%	1.00%
3 Shifts	S	2.00%	9.00%	3.00%	5.00%
5 Day Workweek	S				
7 Day Workweek	S				
Overtime	S	8.90%	6.60%	13.40%	5.10%
Interservicing (\$/%)					13
Army	J	N/A	N/A	N/A	N/A
Navy	J	1619	669	156	667
Air Force	J	337	116	0	3461
Marine Corps	J	2021	1378	9	1834
Coast Guard	S				
FY91 Workload Value (\$K)	O	355671	41565	216128	178229
<b>Facility</b>					
Depot Size (sqft) (covered)	J	1.5M	1.4M	1.4M	.9M
Acreage	J	18113	19511	19081	44096
Storage Space					
covered	J	5.8M			2.5M
uncovered	J	2.3M			
Equipment Value (\$M)	J	117	150	137	23
Facility Value (\$M)	J	138	600	855	1700
Access					
Air (distance to airport)	S	60mi	60mi	20mi	35mi
Rail (y/n)	S	y	y	Y	Y
Water (y/n)	S	n	80mi	N	N
Road (miles to Interstate)	S	I-20	I-81	I-30	UT36,I-80
MILCON (past 10 yrs, prod related)	S	15000	0	58000	37000
MILCON (SYDP)	S	1150	6820	29000	0
Plant Equipment (past 10 years)	S	104300	70000	110700	112100
Plant Equipment (SYDP)	S	45700	65700	62200	33500
Capacity Utilization(%)	J	85%	83%	81%	82%
Workload (DLH)	J	3,670	2,157	2,786	2,197
Capacity (DLH)	J	4,330	2,590	3,454	2,670

S= Service provided, O= OSD provided, J= JDMAG provided

\*Service vice JDMAG provided

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		Army Depot Anniston	Army Depot Letterkenny	Army Depot Red River	Army Depot Tooele
<b>Commodity (at least 5% of workload)</b>					
<b>Aircraft</b>	S				
Aircraft, Fixed Wing	S				
Engine	S				
Propeller	S				
Landing Gear	S				
Airframe	S				
Small (<=2 engines)	S				
Large (>2 engines)	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				X
GSE/AGE	S				
Aircraft, Rotary Wing	S				
Engine	S				
Blade	S				
Landing Gear	S				
Airframe	S				
Comm/Nav Equipment	S				
Instruments	S				
Mechanical Systems	S				
Ord/Guns	S				
Radar	S				
Simulators	S				
GSE/AGE	S				X
Remote Piloted Vehicles	S				
<b>Missile</b>	S				
Strategic Airframes	S				
Tactical Airframes	S	X			
Propulsion/Payload/Explosive	S	X			
Support & Launch Equip	S	X		X	X
Guidance & Control	S	X			
<b>Ship</b>	S				
Carrier	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Surface	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
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F-8-B-1

		Army Depot Anniston	Army Depot Letterkenny	Army Depot Red River	Army Depot Tooele
Submarine	S				
Nuclear Propulsion	S				
Conventional Propulsion	S				
Radar	S				
Comm/Nav/Electronics	S				
Fire Control System	S				
Weapons/Guns	S				
Service Craft	S				
<b>Vehicles</b>	S				
<b>Armored Vehicles</b>	S				
Chassis	S	X	X	X	
Powertrain	S	X	X	X	
Fire Control System	S	X	X	X	
Weapon/Gun	S	X		X	
<b>Wheeled Vehicles</b>	S		X		
Chassis	S				X
Powertrain	S				X
Weapon/Gun	S	X			
<b>Artillery</b>	S				
<b>Towed</b>	S		X		
Chassis	S		X		
Powertrain	S		X		
Fire Control System	S		X		
Weapon	S		X		
<b>Self-propelled</b>	S				
Chassis	S		X		
Powertrain	S		X		
Fire Control System	S		X		
Weapon	S		X		
<b>Construction Vehicles</b>	S				
Powertrain	S				X
Chassis	S				X
<b>General</b>	S				
Powertrain	S				X
Chassis	S				X
<b>Rail</b>	S				X
<b>Communications-Electronic</b>	S				
Ground	S				
Satt	S				
<b>Ordnance/Weapons/Munitions</b>	S				
Torpedos/Mines	S	X			X
Chemical	S	X	X		X
Small Arms	S	X			
Conv. munitions	S	X	X	X	X
<b>Metrology</b>	S				
<b>Automatic Test Equipment</b>	S	X	X	X	X
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## Depot Commodity Matrix

		Army Depot Tobyhanna	MCLB Albany	MCLB Barstow
<b>Financial</b>				
Budget (91 actual/92 budget)	S	153.4/173.2	79.3M/51.3M	60.7M/63.7M
Civilian Personnel (# people/%)		2525	756	822
Direct	J	1793	373	494
Indirect	J	732	383	328
Military Personnel (# people/%)		3	135	123
Direct	J	0	45	100
Indirect	J	3	90	23
Utilization (%)				
1 Shift	S	97.50%	99.40%	91.30%
2 Shifts	S	2.30%	0.60%	8.30%
3 Shifts	S	0.20%	0.00%	0.40%
5 Day Workweek	S		100.00%	100.00%
7 Day Workweek	S			
Overtime	S	4.80%	25.20%	15.60%
Interservicing (\$/%)		126		
Army	J	N/A	1633	811
Navy	J	422	633	180
Air Force	J	3086	20	13
Marine Corps	J	1730	N/A	N/A
Coast Guard	S		0	0
FY91 Workload Value (\$K)	O	156392	66906	59989
<b>Facility</b>				
Depot Size (sqft) (covered)	J		.48M	.69M
Acreage	J	1193	89	355
Storage Space				
covered	J		.19M*	.13M*
uncovered	J		1.4M	1.7M
Equipment Value (\$M)	J	90	35	23
Facility Value (\$M)	J	220	26	47
Access				
Air (distance to airport)	S	22mi	10mi	5mi
Rail (y/n)	S	Y	Y	Y
Water (y/n)	S	120MI	N	N
Road (miles to Interstate)	S	I-380	US19(2),US82(2)	I-40(1),I-15(1)
MILCON (past 10 yrs, prod related)	S	34600	11.8M	1.53M
MILCON (SYDP)	S	0	12M	27.5M
Plant Equipment (past 10 years)	S	65500	25.1M	16.5M
Plant Equipment (SYDP)	S	69900	5.1M	14.3M
Capacity Utilization(%)	J	64%	145%	128%
Workload (DLH)	J	3,336	1,582	1,501
Capacity (DLH)	J	5,207	1,091	1,169
*Service vice JDMAG provided				
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		Army Depot Tobyhanna	MCLB Albany	MCLB Barstow
<b>Commodity (at least 5% of workload)</b>				
<b>Aircraft</b>	S			
Aircraft, Fixed Wing	S			
Engine	S			
Propeller	S			
Landing Gear	S			
Airframe	S			
Small (<=2 engines)	S			
Large (>2 engines)	S			
Comm/Nav Equipment	S			
Instruments	S			
Mechanical Systems	S			
Ord/Guns	S			
Radar	S			
Simulators	S			
GSE/AGE	S			
Aircraft, Rotary Wing	S			
Engine	S			
Blade	S			
Landing Gear	S			
Airframe	S			
Comm/Nav Equipment	S			
Instruments	S			
Mechanical Systems	S			
Ord/Guns	S			
Radar	S			
Simulators	S			
GSE/AGE	S			
Remote Piloted Vehicles	S			
<b>Missile</b>	S			
Strategic Airframes	S			
Tactical Airframes	S			
Propulsion/Payload/Explosive	S			
Support & Launch Equip	S	X		X
Guidance & Control	S			
<b>Ship</b>	S			
Carrier	S			
Nuclear Propulsion	S			
Conventional Propulsion	S			
Radar	S			
Comm/Nav/Electronics	S			
Fire Control System	S			
Weapons/Guns	S			
Surface	S			
Nuclear Propulsion	S			
Conventional Propulsion	S			
Radar	S			
Comm/Nav/Electronics	S			
Fire Control System	S			
Weapons/Guns	S			
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		Army Depot Tobyhanna	MCLB Albany	MCLB Barstow
Submarine	S			
Nuclear Propulsion	S			
Conventional Propulsion	S			
Radar	S			
Comm/Nav/Electronics	S			
Fire Control System	S			
Weapons/Guns	S			
Service Craft	S			
<b>Vehicles</b>	S			
<b>Armored Vehicles</b>	S		X	X
Chassis	S			
Powertrain	S			
Fire Control System	S			
Weapon/Gun	S			
<b>Wheeled Vehicles</b>	S		X	X
Chassis	S			
Powertrain	S			
Weapon/Gun	S			
<b>Artillery</b>	S			
Towed	S			
Chassis	S			
Powertrain	S			
Fire Control System	S			
Weapon	S			
Self-propelled	S		X	
Chassis	S			
Powertrain	S			
Fire Control System	S			
Weapon	S			
<b>Construction Vehicles</b>	S			
Powertrain	S			
Chassis	S			
<b>General</b>	S			
Powertrain	S			
Chassis	S			
<b>Rail</b>	S			
<b>Communications-Electronic</b>	S			
Ground	S		X	
Satt	S			X
<b>Ordnance/Weapons/Munitions</b>	S			
Torpedos/Mines	S			
Chemical	S			
Small Arms	S			
Conv. munitions	S			
<b>Metrology</b>	S		X	
<b>Automatic Test Equipment</b>	S			
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## APPENDIX G

### ANALYSIS OF ALTERNATIVE A

1. **Overview.** Alternative A assumes that each Service will retain its own separate depot maintenance operations in accordance with DMRD 908. DMRD 908 directs the Services to increase interservicing, streamline depot operations, reduce management staffs at all levels, increase competition, team with private industry for remanufacturing/manufacturing, etc. Additional depot closures and realignments will be accomplished through the Base Realignment and Closure (BRAC) process. The Defense Depot Maintenance Council (DDMC) will provide management oversight.

2. **Corporate Business Plan.** The DDMC Corporate Business Plan (CBP), FY92-97, October 1992 (draft) is the source document for the analysis of Alternative A in Chapter IV. Savings/projected savings are presented in this draft plan that describe the joint Service strategy for managing the organic depot maintenance industrial base during the remainder of the 1990s and beyond. The main focus is on achieving the 6.36 billion dollar savings during FY91 through FY97 called for in DMRD 908 and DMRD 908C. The plan details savings attributable to both near-and long-term Service actions. Near-term savings are downsizing of both the direct and indirect work force at depot installations, closure of facilities, cancellation of facility projects, and internal Service workload consolidations. Long-range actions are interservicing, competition, and capacity utilization. In addition to describing the strategy for achieving DMRD 908 savings, this plan also provides the joint Service *Depot Maintenance Vision Statement of the Future for FY95 and Beyond*, (CBP, Appendix A).

3. **Summary.**

a. Cost savings. Table G-1 provides the details of Services' projected savings.

**Table G-1 Service Projected Savings FY91-FY97**  
(\$ Millions)

	ARMY	NAVAIR	NAVSEA	AIR FORCE	MARINES
Near-term	339.2	448.8	1755.2	664.4	0.0
Interservicing	8.9	52.6	0.7	70.0	2.5
Competition	138.7	555.9	69.8	943.3	25.8
Capacity Utilization	579.0	391.5	282.3	30.6	0.4
<b>Total</b>	<b>1065.8</b>	<b>1448.8</b>	<b>2108.0</b>	<b>1708.3</b>	<b>28.6</b>

Alternative A establishes a standard against which to measure the other alternatives, except for cost savings. The other alternatives provide cost savings projections relative to each other only.

b. Capacity Reduction. The CBP facility consolidations maintain the current inventory of depots, other than the previously scheduled closings of Sacramento Army Depot and Philadelphia Naval Shipyard. After these closings, the DOD capacity utilization rate will be 64 percent, the baseline for all other alternatives.

c. Unnecessary Duplication. Even after all initiatives of DMRD 908 are complete, substantial unnecessary duplication and excess capacity will exist within each Service as well as among all Services. This provides for the highest level of unnecessary duplication of all the alternatives.

## APPENDIX G

### ANALYSIS OF ALTERNATIVE B

1. Overview. Alternative B consolidates within Service boundaries. As a result, consolidation computations will be treated sequentially for each Service, beginning with the Army. It should be noted that FY87 capacity figures were used in the analysis of Alternatives B through F since it was a peak year with larger overall employment and more accurately reflects what work a depot facility could absorb during workload consolidation. The FY87 capacity figures were used to determine excess capacity and utilization rates for Army, Air Force, and NAVAIR depots. Marine Corps capacity was based on FY93 figures, NAVORD capacity was based on the maximum reported capacity between FY91 and FY97. Capacity of depots earmarked for closure was not considered in this study.

2. Army.

a. Capacity vs. Workload.

(1) As shown in Table G-2, the six Army depots are projected by JDMAG to have a workload of 16,500 KDLH in FY95.

(2) The FY87 capacity of Army depots was 26,700 KDLH, a capacity excess of 10,200 KDLH over the FY95 workload projection. Based on this capacity, Army depot utilization would be 62 percent. The Army has concentrated most technologies into "Centers of Excellence" with the exception of a few specific systems where the cost of moving specialized facilities would exceed the savings potential over the remaining life of the system. ANAD is the sole Army facility configured for heavy combat vehicles and all Services' small arms. CCAD performs Army and Air Force helicopter depot maintenance. LEAD is responsible for all Services' tactical missiles, RRAD for light combat vehicles and artillery, TEAD for automotive and rail, and TOAD for all Army electronics.

**Table G-2 Comparison of Army Depots**  
(Thousands of Direct Labor Hours)

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
ANAD	2000	4600	2600
CCAD	4400	4800	400
LEAD	2700	3800	1100
RRAD	2700	4800	2100
TEAD	1100	3200	2100
TOAD	3600	5500	1900
<b>Total</b>	<b>16500</b>	<b>26700</b>	<b>10200</b>

b. Potential Consolidations. Excess Army depot capacity was reduced by consolidating automotive and other relatively low-tech commodities maintained at four Army depots into three of the above facilities.

c. Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the work of six Army depots into five has the potential to achieve depot maintenance cost reductions ranging from 142 to 548 million dollars during FY94 through FY03, as shown in Table G-3. An in-depth study of Army munitions depots may yield additional savings through consolidation.

**Table G-3 Alternative B (Army) -- Projected Relative Savings**  
(Constant FY93 \$Million)

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(35)	3	(35)	3
95	(27)	9	(62)	12
96	23	69	(39)	81
97	26	68	(13)	149
98	26	68	13	217
99	26	67	39	284
00	26	66	65	350
01	26	66	91	416
02	25	66	116	482
03	26	66	142	548
<b>Total</b>	<b>142</b>	<b>548</b>		

(2). Capacity Reduction. Assuming the workload of one depot is absorbed by three others, projected utilization will increase by 8 percent from 62 percent to 70 percent.

(3) Unnecessary Duplication. Unnecessary duplication within the Army is reduced by highly specialized "Centers of Excellence" for each commodity.

3. NAVAIR.

a. Capacity vs. Workload.

(1) As shown in Table G-4, the six Naval aviation depots are projected to have a workload of 14,700 KDLH in FY95.

(2) The capacity of these depots in FY87 was 26,400 KDLH, a capacity excess of 11,700 KDLH over the FY95 workload projection. Based on this capacity, NAVAIR depot utilization would be 56 percent.

(3) NADEP-PNCLA provides specialized support to Navy and Air Force helicopters. The others primarily support fixed-wing aircraft. NADEP-CHYPT primarily supports Marine Corps aviation platforms. The Navy maintains two other depots for the depot maintenance of Space and Naval Warfare Systems Command (SPAWAR) electronics. These depots are not considered NAVAIR depots but do have a combined projected FY95 electronics depot maintenance workload of 1,200 KDLH and FY87 capacity of 1,100 KDLH. A portion of this work is avionics depot maintenance.

**Table G-4 Comparison of NAVAIR Depots**  
(Thousands of Direct Labor Hours)

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
NADEP-ALMD	2400	4800	2400
NADEP-CHYPT	2000	3000	1000
NADEP-JAX	2200	3400	1200
NADEP-NORVA	2800	5800	3000
NADEP-NORIS	2500	5800	3300
NADEP-PNCLA	2800	3600	800
<b>Total</b>	<b>14700</b>	<b>26400</b>	<b>11700</b>

b. Potential Consolidations. Excess NAVAIR depot capacity at six facilities was reduced by consolidating the workload at four remaining facilities along the following lines:

(1) Airframes and Airframe Accessories/Components.

(a) NADEP-PNCLA has large fixed facilities required for helicopter dynamic components and rotor blades. It is also located in close physical proximity to high priority Air Force Special Operations Forces (SOF) operational units and is well suited to continue to provide Air Force and Navy helicopter support.

(b) The fixed-wing airframe and airframe accessories/components workload of five depots was consolidated into three depots.

(2) Engines and engine accessories/components. The engines and engine accessories/components workload of NADEP-ALMD, NADEP-JAX, NADEP-CHYPT, NADEP-NORVA and NADEP-NORIS was consolidated into three depots.

(3) Avionics. The avionics workload of all NAVAIR depots was also consolidated into three depots. Additionally, the SPAWAR electronics depot maintenance workload should be reviewed with a goal of transferring the avionics workload from these NAVAIR depots to the SPAWAR depots, or consolidating the SPAWAR depot maintenance workload at NAVAIR depots. If the latter alternative were considered, further SPAWAR consolidation would be possible. Additional study is required in this area.

c. Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the work of six NAVAIR depots into four has the potential to achieve depot maintenance cost reductions ranging from 343 to 1,747 million dollars from FY94 through FY03, as shown in Table G-5. Consolidation of SPAWAR electronics depots may yield additional savings.

**Table G-5 Alternative B (NAVAIR) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(159)	(40)	(159)	(40)
95	(142)	(32)	(301)	(72)
96	75	227	(226)	155
97	81	228	(145)	383
98	82	228	(63)	611
99	81	228	18	839
00	82	228	100	1,067
01	81	226	181	1,293
02	81	227	262	1,520
03	81	227	343	1,747
Total	343	1,747		

(2) Capacity Reduction. With work from two depots absorbed by the others, projected utilization increases by 25 percent from 56 percent to 81 percent.

(3) Unnecessary Duplication. Unnecessary duplication within NAVAIR is reduced by highly specialized "Centers of Excellence."

#### 4. NAVSEA.

##### a. Capacity vs. Workload.

(1) A long-term shipyard capacity limitation is its physical limitation expressed in drydock-equivalents. A drydock-equivalent is the number of drydocks at a facility multiplied by the drydock utilization index for that shipyard. The drydock utilization index used is the annual index provided by OPNAV N-431 to JDMAG, which includes annual days for ship docking/undocking and drydock maintenance. When the total of drydock-equivalents for all Navy shipyards is divided by the number of Navy drydocks, a Navy drydock utilization rate results. As shown in Table G-6, the seven NAVSEA shipyards are projected by JDMAG to have an average drydock utilization rate of 71 percent in FY95. A check of projected utilization through FY97 shows this rate to be relatively constant as older, maintenance-intensive ships are retired and the naval force is restructured. A conservative goal for drydock utilization would be a factor of 1.0 or (100 percent), representing one ship-year for each drydock. Contingency capacity is available by acknowledging that more than one small ship can be docked in each drydock when required. This may reduce schedule flexibility as both ships must be docked and undocked at the same time. Floating drydocks available at shipyards offer further contingency capacity. Subjective limitations on shipyard capacity in addition to the facilities include the skills of the work force, complexity of the work, and the maximum concurrent work a shipyard can manage. Some of these factors can be overcome in the long-term by expanding work forces and management staffs. Because a measure of the limit imposed by these factors over the long-term was not available, drydock utilization was the only factor used in this analysis.

(2) Puget Sound and Norfolk are considered essential shipyards for their nuclear carrier drydocking capabilities. Because other nuclear capable sites can service submarines, they offer a more flexible capability, although much of the projected workload reduction is due to the retirement of nuclear powered cruisers and attack submarines. Long Beach is not staffed with nuclear capable personnel but has one large, modern drydock located near major southern California homeports that is capable of docking nuclear carriers. There are three other Navy drydocks not included in this analysis (two at Norfolk and one at Pearl Harbor) that are no longer in use.



Table G-6 Comparison of NAVSEA FY95 Drydock Utilization Rates

SHIPYARD	DRYDOCKS	UTILIZATION INDEX (%)	DRYDOCK-EQUIVALENTS
Portsmouth	3	20	0.60
Norfolk	4	28	1.12
Charleston	3	67	2.00
Puget Sound	6	156	9.36
Mare Island	4	58	2.32
Long beach	3	42	1.26
Pearl Harbor	3	56	1.68
Total	26	71	18.34

b. Potential Consolidations. The utilization rate of 71 percent indicates that almost one of every three drydocks is unused, on the average, at all times. Acknowledging the priority of nuclear capable and carrier capable shipyards on each coast, the work of at least two shipyards, one on each coast, was consolidated into the other five shipyards to improve this utilization rate by 21 percent to a projected 92 percent. Excess capacity in the two remaining east coast shipyards would still remain above 45 percent. Further consolidation or reduction of a shipyard capability to a Ship Repair Facility could be made if the remaining facility is adequate for all nuclear work projected.

c. Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the work of seven shipyards into five has the potential to achieve depot maintenance cost reductions ranging from 702 to 2,701 million dollars from FY94 through FY03 as shown in Table G-7.

**Table G-7 Alternative B (NAVSEA) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(350)	(130)	(350)	(130)
95	(302)	(95)	(652)	(225)
96	174	386	(478)	161
97	169	363	(309)	524
98	169	363	(140)	887
99	168	363	28	1,250
00	169	363	197	1,613
01	168	363	365	1,976
02	169	362	534	2,338
03	168	363	702	2,701
<b>Total</b>	<b>702</b>	<b>2,701</b>		

(2) Capacity Reduction. With the work of two shipyards absorbed by the other facilities, the projected FY95 drydock utilization rate will increase by 21 percent from 71 percent to 92 percent.

(3) Unnecessary Duplication. Unnecessary duplication within NAVSEA is reduced, particularly when commodity and component consolidation is pursued following consolidation of shipyards.

5. Air Force.

a. Capacity vs. Workload.

(1) As shown in Table G-8, the six Air Force depots are projected by JDMAG to have a workload of 34,000 KDLH in FY95.

(2) The FY87 capacity of Air Force depots was 53,100 KDLH, an excess capacity of 19,100 KDLH over the FY95 workload. Based on this capacity, Air Force depot utilization is 64 percent.

(3) The Air Force has concentrated many technologies into Technical Repair Centers (TRC), similar to the Army's "Centers of Excellence" concept. Nonetheless, many redundant sources of repair are retained at other facilities. AGMC's highly accurate Type I precision measuring equipment capability, made possible by its geographic

location, provides a capability to repair precision inertial navigation systems that does not exist elsewhere in DOD.

**Table G-8 Comparison of Air Force Depots  
(Thousands of Direct Labor Hours)**

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
OC-ALC	6800	12400	5600
OO-ALC	6300	9900	3600
SA-ALC	7200	12900	5700
SM-ALC	6000	8500	2500
WR-ALC	6600	8100	1500
AGMC	1100	1300	200
Total	34000	53100	19100

b. Potential Consolidations. The maintenance workload of one ALC was consolidated at the remaining facilities along the following guidelines:

(1) Airframes and Airframe Accessories/Components. Airframe and airframe accessories/components depot maintenance conducted at OO-ALC, OC-ALC, SA-ALC, SM-ALC and WR-ALC was consolidated into four of these five depots. Source of Repair (SOR) responsibilities for specific aircraft was transferred to depots with excess capacity that are currently SOR for other aircraft of the same or similar size, mission and technology.

(2) Engines and Engine Accessories/Components. Engine accessories/components depot maintenance was consolidated at two depots where engine maintenance is conducted to extend the initiative already undertaken by the Air Force for engines.

(3) Avionics and Ground Electronics. Electronics and technologies related to maintenance of sensors and communications were consolidated at one electronics maintenance TRC. This required consolidation of many widely varying technologies (infrared, microwave, flight instruments, etc.), in addition to electronics used in several environments (air, land, space).

(4) Instruments and Metrology. These commodities were consolidated at the one small specialized, non-airframe depot.

(5) General Purpose Equipment. Support of Air Force electronic general purpose equipment was consolidated at one depot.

c. Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the work of six Air Force depots into five has the potential to achieve depot maintenance cost reductions ranging from 368 to 1,317 million dollars from FY94 through FY03, as shown in Table G-9.

**Table G-9 Alternative B (Air Force) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(164)	(41)	(164)	(41)
95	(147)	(41)	(311)	(82)
96	127	230	(184)	148
97	79	175	(105)	323
98	79	174	(26)	497
99	79	174	53	671
00	78	161	131	832
01	80	162	211	994
02	78	162	289	1,156
03	79	161	368	1,317
Total	368	1,317		

(2) Capacity Reduction. When the work of one large ALC is absorbed by the projected excess capacity of the other depots, the utilization will increase by 12 percent from 64 percent to 76 percent.

(3) Unnecessary Duplication. Like Army "Centers of Excellence", the Air Force TRC concept provides a framework for eliminating duplication. Consolidation of six depot maintenance activities into five and a concurrent review of workload assignments at those five will reduce duplication within the Air Force.

6. Marine Corps.

a. Capacity vs. Workload.

(1) As shown in Table G-10, the two Marine Corps depots are projected by JDMAG to have a workload of 2,400 KDLH in FY95.

(2) The FY87 capacity of Marine Corps depots was over 2,400 KDLH, exactly the workload of FY95. No excess capacity results in a computed utilization rate of 100 percent.

(3) Both depots have similar, redundant capabilities, although restrictive environmental laws may make one site preferable to the other. MCLBA directly supports the Maritime Pre-positioning Force through its Blount Island facility in Jacksonville, Florida.

**Table G-10 Comparison of Marine Corps Depots**

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
MCLBA	1200	1100	None
MCLBB	1200	1300	100
Total	2400	2400	None

b. Potential Consolidations. The projected post-Operation DESERT STORM workload for each Marine Corps depot is 1,700 KDLH in FY93. This demonstrates an ability to expand capability more than 35 percent above computed capacity figures. Following the completion of Operation DESERT STORM reconstitution, the FY96 workload of the two depots declines to a total of 2,200 KDLH. This figure is 35 percent greater than the workload of FY90, the last year unaffected by Operation DESERT STORM requirements. Considering Base Force reductions, this projection of future workload may be high due to the inclusion of other-than-depot-level maintenance. Taking advantage of the additional capacity demonstrated during Operation DESERT STORM reconstitution, and expanding capacity by transfer of production equipment from one depot to the other, all projected Marine Corps depot maintenance was consolidated at one "Center of Excellence".

c. Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the work of two Marine Corps depots into one has the potential to achieve depot maintenance cost reductions ranging from 33 to 170 million dollars from FY94 through FY03 as shown in Table G-11.

**Table G-11 Alternative B (Marine Corps) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(21)	(7)	(21)	(7)
95	(18)	(5)	(39)	(12)
96	8	23	(31)	11
97	10	23	(21)	34
98	9	23	(12)	57
99	9	23	(3)	80
00	9	23	6	103
01	10	22	16	125
02	8	22	24	147
03	9	23	33	170
<b>Total</b>	<b>33</b>	<b>170</b>		

(2) Capacity Reduction. If one depot assumes the entire Marine Corps workload of 2,200 KDLH, excess capacity will remain zero.

(3) Unnecessary Duplication. Unnecessary duplication within the Marine Corps is eliminated by having one "Center of Excellence."

**7. NAVORD.**

**a. Capacity vs. Workload.**

(1) As shown in Table G-12, NAVORD has Naval Surface Weapons Centers, Naval Underwater Weapons Centers, and Naval Weapons Stations at nine separate sites. The nine sites are projected by JDMAG to have a workload of 4,550 KDLH in FY95.

(2) The FY87 depot maintenance capacity of NAVORD facilities was 27,925 KDLH. This capacity has been significantly reduced by the effects of the transfer of much of the ordnance maintenance workload to the Army, reduced requirements for depot maintenance on new weapon systems, and the smaller fleet size. Computation of utilization based on this FY87 capacity would yield a utilization rate of 15 percent, an inaccurate representation of capabilities of depots which have been permanently downsized. A more accurate reflection of capacity of NAVORD facilities is the maximum recent capacity demonstrated since FY91 and in projections through FY97. This capacity is projected to be 5,590 KDLH, 1,330 KDLH over the FY95 workload

projection. Based on this capacity, NAVORD depot utilization is 81 percent.

(3) NSWC Louisville supports Navy surface gunnery. NUWC Keyport is the sole site for support of the Navy's underwater weapons. NWS Yorktown is the sole site for support of Navy mines. NSWC Crane is resident on a Army facility and primarily an electronics depot. Depot maintenance work is a relatively minor function of NAVORD facilities. They primarily perform research, development, intermediate maintenance, and ordnance storage/issue. The equipment used for depot maintenance is a very small fraction of NAVORD facilities, and no cost of consolidating this equipment was included in this analysis.

**Table G-12 Comparison of NAVORD Depots**  
(Thousands of Direct Labor Hours)

DEPOT	FY95 WORK	MAX CAPACITY	EXCESS
NSWC-Indian Head	210	200	None
NSWC-Louisville	1440	1170	None
NUWC-Keyport	1840	2600	760
NWS-Charleston	30	50	20
NWS-Concord	10	150	140
NWS-Earle	30	50	20
NWS-Seal Beach	230	460	230
NWS-Yorktown	70	60	None
NSWC-Crane	690	850	160
<b>Total</b>	<b>4550</b>	<b>5590</b>	<b>1330</b>

b. Potential Consolidations. Excess NAVORD capacity was used to consolidate the ordnance depot workload into three depots along the following lines.

(1) The NUWC is a unique facility required to support the development, test and maintenance of naval underwater weapons.

(2) One NSWC absorbed the workload of the other two.

(3) The depot maintenance workload of the five NWS's was consolidated at one NWS with additional support provided by NUWC and the remaining NSWC.

(4) The ordnance electronics depot maintenance of all NAVORD depots was consolidated into other depots supporting Navy electronics, NADEP-NORVA and

NADEP-NORIS, and the two SPAWAR depots at Portsmouth, VA, and San Diego, CA.

c. Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the depot maintenance work of nine NAVORD depots into three has the potential to achieve depot maintenance cost reductions of 1 to 178 million dollars from FY94 through FY03, as shown in Table G-13.

**Table G-13 Alternative B (NAVORD) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(23)	(5)	(23)	(5)
95	(18)	(2)	(41)	(7)
96	4	24	(37)	17
97	5	24	(32)	41
98	6	24	(26)	65
99	5	24	(21)	89
00	5	22	(16)	111
01	6	22	(10)	133
02	5	23	(5)	156
03	6	22	1	178
Total	1	178		

(2) Capacity Reduction. This consolidation of nine depots into three eliminates FY95 capacity excess.

(3) Unnecessary Duplication. Unnecessary duplication within NAVORD is eliminated by the consolidation of nine depots into three.

8. Summary.

a. Cost Savings. Aggregating the above Service cost reductions, for comparison to Alternatives C through F, Alternative B consolidations have the potential to achieve depot maintenance cost reductions ranging from 1,589 to 6,661 million dollars during FY94 through FY03, as shown in Table G-14.



**Table G-14 Alternative B (DOD) -- Projected Relative Savings**  
(Constant FY93 \$Million)

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(752)	(220)	(752)	(220)
95	(655)	(167)	(1,407)	(387)
96	412	959	(995)	572
97	370	881	(625)	1,453
98	371	881	(254)	2,334
99	368	878	114	3,212
00	368	863	482	4,075
01	373	862	855	4,937
02	365	861	1,220	5,798
03	369	863	1,589	6,661
<b>Total</b>	<b>1,589</b>	<b>6,661</b>		

b. Capacity Reduction. The total utilization of DOD depots after the consolidations recommended under Alternative B rises from 64 percent to 82 percent.

c. Unnecessary Duplication. The "Centers of Excellence" concept reduces or eliminates unnecessary duplication within each Service, but significant duplication will exist among the Services after the consolidations recommended in this alternative.

## APPENDIX G

### ANALYSIS OF ALTERNATIVE C

1. Overview.

a. Alternative C consolidates depot maintenance responsibility for each major type of weapon system platform (fixed/rotary wing aircraft, ships/underwater ordnance, ground vehicles/equipment, missiles) under an Executive Service. The using Service of each weapon system retains responsibility for depot maintenance of depot-level reparable (DLR)/components of the weapon system platforms.

b. Following these guidelines, the weapon system platform and DLR/component commodity responsibilities were distributed as shown in Table G-15.

**Table G-15 Alternative C Distribution of Commodity Responsibilities**

COMMODITY	RESPONSIBLE SERVICE
Aircraft Fixed/Rotary Wing Airframes All Aircraft Components/DLRs	Air Force Using Service
Ships/Underwater Ordnance Hulls and All Components	Navy
Ground Vehicles/Equipment Vehicles Hull/Body/Frame Artillery/Vehicles Armament Vehicle Components Ground Comm-Electronics General Purpose Equipment (GPE) Ordnance	Army Army Using Service Using Service Using Service Using Service
Missiles Tactical Strategic	Army Air Force

c. Capacity and work projections provided by JDMAG did not distribute commodities in detail for other-than-aviation maintenance. FY91 workload, distributed by Work Breakdown Structure categories in DOD 7220.9-M, was used to establish a workload baseline in each commodity. The FY91 percentage of work in each commodity was applied to the FY95 total workload and the FY87 capacities. If an airframe/hull/body/frame commodity generated less than 8 KDLH work at any depot, that work was not transferred to the Executive Service depots.

2. Aircraft.

a. Capacity vs Workload.

(1) As shown in Table G-16, fixed wing/rotary wing aircraft depots were projected by JDMAG to have an airframe workload of 19,700 KDLH in FY95.

(2) The FY87 capacity of the aviation airframe depots was 29,600 KDLH, a capacity excess of 9,900 KDLH over the FY95 workload projection. Based on this capacity, depot airframe utilization would be 67 percent. As stated above, the Air Force would be the Executive Service for all aviation airframe depot maintenance while the using Services would retain DLR/component maintenance in their depots. Since the total FY95 airframe depot maintenance workload is projected to exceed the FY87 capacity of the existing Air Force depots, airframe work was transferred to appropriate Air Force depots until it reached FY87 capacity limits. The remaining workload was left at using Service depots.

**Table G-16 Comparison of Aviation Depot Airframe Capacity and Workload**  
(Thousands of Direct Labor Hours)

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
OC-ALC	2900	4400	1500
OO-ALC	2200	4300	2100
SA-ALC	2000	3100	1100
WR-ALC	3300	3700	400
SM-ALC	2400	3100	700
NADEP-ALMD	500	1000	500
NADEP-CHYPT	600	1400	800
NADEP-JAX	800	1100	300
NADEP-NORVA	1300	1900	600
NADEP-NORIS	1200	2400	1200
NADEP-PNCLA	1200	1500	300
CCAD	1300	1700	400
<b>Total</b>	<b>19700</b>	<b>29600</b>	<b>9900</b>

b. Potential Consolidations.

(1) Army. No consolidation of Army aviation depot activities was possible since the Army requires its only aviation depot for DLR/component repairs.

(2) Navy. To obtain a range of potential savings, three analyses of potential consolidations were conducted. They compared consolidation of residual airframe work and Navy DLR/component work into:

- (a) two large NADEPs;
- (b) three mid-size NADEPs; and
- (c) four small NADEPs.

c. Aircraft Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of aviation airframe depot maintenance into all existing Air Force depots to the maximum extent possible, with consolidation of aircraft DLR/components within depots of the using Service has the potential to achieve depot maintenance cost reductions ranging from 351 to 1,511 million dollars during FY94 through FY03, as shown in Table G-17. The maximum savings were obtained by consolidating the six NADEPs into four.

**Table G-17 Alternative C (Aviation) -- Projected Relative Savings  
(Constant FY93 \$M)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(197)	(380)	(197)	(380)
95	(181)	(53)	(378)	(433)
96	88	248	(290)	(185)
97	91	243	(199)	58
98	92	242	(107)	300
99	92	242	(15)	542
00	91	242	76	784
01	92	242	168	1,026
02	91	243	259	1,269
03	92	242	351	1,511
<b>Total</b>	<b>351</b>	<b>1,511</b>		

(2) Capacity Reduction. Assuming the workload of the Air Force depots is maximized for airframes, CCAD is retained after migrating aviation airframe work, and six NADEPs are consolidated into four, the projected total Air Force depot capacity utilization will increase from 64 to 76 percent and Navy depot capacity utilization from 56 to 76 percent.

(3) Unnecessary Duplication. Reduced duplication in the aircraft airframe commodity is eliminated although substantial duplication still remains within and among the Services for depot maintenance of aviation DLRs/components.

3. Ships/Underwater Weapons. The methodology employed in Alternatives C, D, and E differs from Alternative B in that Alternative B's capacity analysis was based on drydock capacity vice direct labor hours as in Alternatives C, D, and E. These separate paths lead to the same conclusions. Capacity utilization figures for Alternative B and Alternatives C, D, and E differ since they have different foundations. Ship and underwater weapons commodities offer no potential for consolidation under any Service other than the current using Service--the Navy. A summary of those conclusions follows.

a. Capacity vs. Workload.

(1) As shown in Table G-18, shipyards were projected by JDMAG to have a workload of 50,200 KDLH in FY95.

(2) The FY87 capacity of the shipyards was 75,500 KDLH, a capacity excess of over 25,300 KDLH over the FY95 workload projection. Based on this capacity, shipyard capacity utilization would be 67 percent.

**Table G-18 Comparison of Shipyard Capacity and Workload  
(Thousands of Direct Labor Hours)**

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
Portsmouth	4000	7800	3800
Philadelphia	4000	10200	6200
Norfolk	9100	14300	5200
Charleston	6400	8800	2400
Puget Sound	12000	12600	600
Mare Island	6800	8900	2100
Long Beach	3600	6200	2600
Pearl Harbor	4300	6700	2400
Total	50200	75500	25300

b. Potential Consolidations. In addition to the Philadelphia shipyard which will be closed by FY96, the workload at two additional shipyards was consolidated into the remaining five.

c. Shipyard Summary.

(1) Cost Savings. The savings resulting from the consolidation of the work of seven shipyards into five is the same for Alternatives B, C, D, and E, and has the potential to achieve depot maintenance cost reductions of from 702 to 2,701 million dollars from FY94 through FY03. A summary chart of these reductions is shown in Table G-7.

(2) Capacity Reduction. With the work of two shipyards absorbed by the other facilities, the projected capacity utilization rate will increase by 33 percent from 67 to 100 percent based on direct labor hour workload requirements.

(3) Unnecessary Duplication. Unnecessary duplication within NAVSEA is reduced, particularly when commodity and component consolidation is pursued following consolidation of shipyards.

d. NAVORD Depots.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the depot maintenance work of nine NAVORD depots into three has the potential to achieve depot maintenance cost reductions of 1 to 178 million dollars from FY94 through FY03.

(2) Capacity Reduction. This consolidation of nine depots into three eliminates the FY95 capacity excess and brings them to 100 percent capacity utilization.

(3) Unnecessary Duplication. Unnecessary duplication within NAVORD is virtually eliminated by the consolidation of nine depots into three.

4. Ground Vehicles/Equipment.

a. Capacity vs. Workload.

(1) As shown in Table G-19, and as broken down in Table G-15, the depots performing ground equipment platform maintenance were projected by JDMAG to have a workload of 1,700 KDLH in FY95.

(2) The FY87 capacity for ground vehicle/equipment platforms was 2,600 KDLH, a capacity excess of 900 KDLH over the FY95 workload projection. Based on this capacity, ground vehicle/equipment platform capacity utilization would be 65 percent. As stated above, the Army would be the Executive Service for all ground vehicles and equipment while the using Services maintain responsibility for vehicle DLRs/components. The Army has concentrated most technologies into "Centers of Excellence" with the exception of a few specific systems where the cost of moving

specialized facilities would exceed the savings potential over the remaining life of the systems. ANAD is the sole Army facility configured for heavy combat vehicles and all Services' small arms. LEAD is responsible for all Services' tactical missiles, RRAD for light combat vehicles and artillery, TEAD for automotive and rail, and TOAD for all electronics. Marine Corps depots are virtually identical in depot maintenance capabilities to provide independent support to operating forces based on geographic location.

**Table G-19 Comparison of Ground Vehicles/Equipment (Platform) Depots**  
(Thousands of Direct Labor Hours)

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
ANAD	200	600	400
LEAD	100	200	100
RRAD	200	300	100
TOAD	200	400	200
TEAD	100	100	0
MCLBA	500	500	0
MCLBB	400	500	100
Total	1700	2600	900

b. Potential Consolidations.

- (1) Army. The five Army ground depots were consolidated into four.
- (2) Air Force. No Air Force depots were consolidated due to their support of aviation commodities.
- (3) Marine Corps. As discussed in Alternative B, the Marine Corps has projected the workload for each of their depots to be 1,700 KDLH in FY93. This figure exceeds the FY87 capacity by 35 percent. Therefore, in the case of the Marine Corps, the FY93 workload projection figure was used as the baseline for depot capacity. Taking advantage of this additional capacity and with the migration of 37 percent of the Marine Corps workload to the Army, all the Marine Corps' workload was consolidated into a single depot.

c. Ground Vehicle/Equipment Summary.

- (1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of land hull/body/frames, and artillery/vehicle armament into

Army depots has the potential to achieve depot maintenance cost reductions ranging from 240 to 751 million dollars during FY94 through FY03, as shown in Table G-20.

**Table G-20 Alternative C (Ground) -- Projected Relative Savings**  
(Constant FY93 \$Million)

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(62)	(11)	(62)	(11)
95	(44)	4	(106)	(7)
96	40	97	(66)	90
97	44	95	(22)	185
98	43	96	21	281
99	44	95	65	376
00	44	94	109	470
01	44	93	153	563
02	43	94	196	657
03	44	94	240	751
<b>Total</b>	<b>240</b>	<b>751</b>		

(2) Capacity Reduction. Consolidating the Army ground equipment maintenance depots from five to four, the projected capacity utilization will increase by 5 percent from 62 percent to 67 percent. Marine Corps capacity utilization will drop from 100 percent to 88 percent.

(3) Unnecessary Duplication. Unnecessary duplication in ground vehicle/equipment platform maintenance is eliminated although some duplication still remains among the Services for depot maintenance of DLRs/components

5. Missiles.

a. Tactical Missiles. Ongoing initiatives have consolidated much of the tactical missile work at LEAD. Some Navy work remains at NAVORD depots. After the consolidation into three NAVORD depots above, the transfer of this tactical missile work to LEAD would not permit further consolidation of NAVORD depots. Cost reductions from this transfer were negligible although the consolidation would decrease the unit costs for tactical missile maintenance.

b. Strategic Missiles. This commodity has already been consolidated under the Air Force at OO-ALC and no cost reductions were found.



6. Summary.

a. Cost Savings. For the purpose of comparing Alternatives B through F, Alternative C consolidations have the potential to achieve depot maintenance cost reductions ranging from 1,294 to 5,141 million dollars during FY94 through FY03, as shown in Table G-21.

**Table G-21 Alternative C FY94-FY03--Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F -

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(631)	(527)	(631)	(527)
95	(546)	(145)	(1,177)	(672)
96	306	756	(871)	84
97	309	724	(562)	808
98	310	725	(252)	1,533
99	309	724	57	2,257
00	309	721	366	2,978
01	309	721	675	3,699
02	310	721	985	4,420
03	309	721	1,294	5,141
<b>Total</b>	<b>1,294</b>	<b>5,141</b>		

b. Capacity Reduction. The total capacity utilization of DOD depots after the consolidations recommended under Alternative C rises from 64 percent to 88 percent.

c. Unnecessary Duplication. As discussed for each of the commodities above, Alternative C reduces much of the duplication among the Services for maintenance of similar weapon system platforms. By requiring each Service to provide its own support for DLRs/components of those platforms, duplication among the Services remains for these commodities. Adoption of the "Centers of Excellence" concept by every Service will help reduce the total duplication, but total elimination is not possible under this alternative for the DLRs/components.

## APPENDIX G

### ANALYSIS OF ALTERNATIVE D

1. Overview.

a. Alternative D consolidates depot maintenance responsibility for depot-level reparable (DLRs)/components of weapon system platforms along similar technology lines under an Executive Service. The using Service of each weapon system retains responsibility for depot maintenance of the weapon system platforms. The Executive Service is usually the Service with the largest inventory of the DLR/component.

b. Following these guidelines, the weapon system platform and DLR/component commodity responsibilities were distributed as shown in Table G-22.

**Table G-22 Alternative D Distribution of Commodity Responsibilities**

COMMODITY	RESPONSIBLE SERVICE
Aircraft Fixed/Rotary Wing Airframes All Aircraft Components/DLRs	Using Service Air Force
Ships/Underwater Ordnance Hulls and All Components	Navy
Ground Vehicles/Equipment Vehicles Hull/Body/Frame Artillery/Vehicles Armament Vehicle Components Ground Comm-Electronics General Purpose Equipment (GPE) Ordnance	Using Service Using Service Army Army Army Army
Missiles Tactical Strategic	Army Air Force

c. Capacity and work projections provided by JDMAG did not distribute commodities in detail for other-than-aviation maintenance. FY91 workload, distributed by Work Breakdown Structure categories in DOD 7220.9-M, was used to establish a workload baseline in each commodity. The FY91 percentage of work in each commodity was applied to the FY95 total workload and the FY87 capacities. If a DLR/component commodity generated less than eight KDLH work at any depot, that work was not transferred to the Executive Service depots.

2. Aircraft.

a. Capacity vs. Workload.

(1) As shown in Table G-23, Service depots were projected by JDMAG to have an aircraft DLR/component workload of 28,900 KDLH in FY95.

(2) The FY87 capacity of the aircraft DLR/component depots was 53,900 KDLH, a capacity excess of 25,500 KDLH over the FY95 workload projection. Based on this capacity, depot aircraft DLR/component utilization would be 54 percent. As stated above, the Air Force would be the Executive Service for all aircraft DLR/component depot maintenance while the using Services would retain airframe maintenance in their depots. After all aircraft DLR/component work was consolidated to Air Force depots, the other Service depots were consolidated to the maximum extent possible using FY87 capacities.

**Table G-23 Comparison of Depot Aircraft DLR/Component Capacity and Workload**  
(Thousands of Direct Labor Hours)

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
OC-ALC	3900	8100	4200
OO-ALC	3000	5500	2500
SA-ALC	4400	9800	5400
WR-ALC	3200	4400	1200
SM-ALC	1800	5500	3700
NADEP-ALMD	1900	3800	1900
NADEP-CHYPT	1400	1600	200
NADEP-JAX	1400	2300	900
NADEP-NORVA	1400	4000	2600
NADEP-NORIS	1200	3400	2200
NAPED-PNCLA	1700	2100	400
CCAD	3100	3400	300
LEAD	200	None	None
RRAD	100	None	None
TOAD	200	None	None
<b>Totals</b>	<b>28900</b>	<b>53900</b>	<b>25500</b>

b. Potential Consolidations.

(1) Army. No consolidation of Army aviation depot activities was possible as the Army required its sole source of airframe repair.

(2) Navy. The work of six NADEPs was consolidated into three for airframe repair, and one other NADEP, performing only helicopter maintenance.

c. Aircraft Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of aircraft DLR/component depot maintenance into existing Air Force depots and consolidation of the airframe commodity within depots of the using Service has the potential to achieve depot maintenance cost reductions ranging from 420 million dollars to 3,641 million dollars during FY94 through FY03, as shown in Table G-24.

**Table G-24 Alternative D (Aviation) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(318)	(63)	(318)	(63)
95	(291)	(35)	(609)	(98)
96	128	497	(481)	399
97	129	464	(352)	863
98	129	464	(223)	1,327
99	128	463	(95)	1,790
00	129	463	34	2,253
01	129	463	163	2,716
02	128	462	291	3,178
03	129	463	420	3,641
<b>Total</b>	<b>420</b>	<b>3,641</b>		

(2) Capacity Reduction. The fixed-wing airframe workload of six NADEPs was consolidated into three. The projected aviation depot aircraft DLR/component capacity utilization rate increased by 8 percent from 54 percent to 62 percent. Total Navy aviation depot capacity utilization increased from 56 to 82 percent and Air Force depot capacity utilization will increase from 64 to 80 percent.

(3) Unnecessary Duplication. Unnecessary duplication in the aircraft DLR/component commodities is reduced although substantial duplication still remains within and among

the Services for depot maintenance of airframes.

3. Ships/Underwater Weapons. The methodology employed in Alternatives C, D, and E differs from Alternative B in that Alternative B's capacity analysis was based upon drydock capacity vice direct labor hours as in Alternatives C, D, and E. These separate paths lead to the same conclusions. Capacity utilization figures for Alternative B and Alternatives C, D, and E differ since they have different foundations. Ship and underwater weapons commodities offer no potential for consolidation under any Service other than the current using Service--the Navy. A summary of those conclusions follows.

a. NAVSEA Shipyards.

(1) Cost Savings. The savings resulting from the consolidation of the work of seven shipyards into five is the same for Alternatives B, C, D, and E, and has the potential to achieve depot maintenance cost reductions ranging from 702 to 2,701 million dollars from FY94 through FY03. A summary of these cost reductions is shown in Table G-7.

(2) Capacity Reduction. With the work of two shipyards absorbed by the other facilities, the projected capacity utilization rate will increase by 33 percent from 67 to 100 percent based on direct labor hour workload requirements.

(3) Unnecessary Duplication. Unnecessary duplication within NAVSEA is reduced, particularly when commodity and component consolidation is pursued following consolidation of shipyards.

b. NAVORD Depots.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the depot maintenance work of nine NAVORD depots into three has the potential to achieve depot maintenance cost reductions of 1 to 178 million dollars from FY94 through FY03.

(2) Capacity Reduction. This consolidation of nine depots into three eliminates FY95 capacity excess, bringing them to 100 percent capacity utilization.

(3) Unnecessary Duplication. Unnecessary duplication within NAVORD is virtually eliminated by the consolidation of nine depots into three.

4. Ground Vehicles/Equipment.

a. Capacity vs. Workload.

(1) As shown in Table G-25, ground vehicle/equipment DLR/components depots were

projected by JDMAG to have workload of 15,500 KDLH in FY95.

(2) The FY87 capacity of the ground vehicle/equipment DLR/components depots was 26,900 KDLH, a capacity excess of 11,500 KDLH over the FY95 workload projection. Based on this capacity, ground vehicle/equipment depot utilization would be 58 percent. As stated above, the Army would be the Executive Service for all vehicle and equipment DLRs/components. Army depots would also assume Executive Service responsibilities for general purpose equipment and ordnance while the using Service would retain depot maintenance of vehicle hull/body/frame. The Army has concentrated most technologies into "Centers of Excellence" with the exception of a few specific systems where the cost of moving specialized facilities would exceed the savings potential over the remaining life of the systems. Anniston is the sole Army facility configured for heavy combat vehicles and all Services' small arms. LEAD is responsible for all Services' tactical missiles, RRAD for light combat vehicles and artillery, TEAD for automotive and rail, and TOAD for all electronics. Marine Corps depots are virtually identical in depot maintenance capabilities.

**Table G-25 Comparison for Ground Vehicles/Equipment  
(DLR/ Components) Depots  
(Thousands of Direct Labor Hours)**

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
ANAD	1700	4000	2300
LEAD	2400	3600	1200
RRAD	2500	4500	2000
TOAD	3200	5100	1900
TEAD	1000	3100	2100
MCLBA	700	600	None
MCLBB	800	900	100
OO-ALC	500	500	None
SA-ALC	800	1700	900
SM-ALC	1800	2800	1000
WR-ALC	100	100	None
<b>Total</b>	<b>15500</b>	<b>26900</b>	<b>11500</b>

**b. Potential Consolidations.**

(1) Army. The workload of the five Army ground depots were consolidated into four.

(2) Air Force. Although ground communications-electronics and general purpose equipment are consolidated at Army depots, no Air Force depots could be consolidated due to their support of aviation commodities.

(3) Marine Corps. As discussed in Alternative B, the Marine Corps has projected the workload for each of their depots to be 1,700 KDLH in FY93. This figure exceeds the FY87 capacity by 35 percent. Therefore, in the case of the Marine Corps, the FY93 workload projection figure was used as the baseline for depot capacity. Taking advantage of this additional capacity and with the migration of 37 percent of the Marine Corps workload to the Army, all the Marine Corps workload was consolidated into a single depot.

c. Ground Vehicle/Equipment Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of land vehicle DLR/components, ground communications-electronics, and general purpose equipment into Army depots has the potential to achieve depot maintenance cost reductions ranging from 366 to 1,628 million dollars during FY94 through FY03. The cumulative annual distribution of these potential reductions is shown in Table G-26.

**Table G-26 Alternative D (Ground) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(182)	(58)	(182)	(58)
95	(154)	(41)	(336)	(99)
96	81	222	(255)	123
97	89	221	(166)	344
98	88	220	(78)	564
99	89	220	11	784
00	89	211	100	995
01	89	211	189	1,206
02	89	211	278	1,417
03	88	211	366	1,628
Total	366	1,628		

(2) Capacity Reduction. Assuming the workload of the Army depots are consolidated from five to four and two Marine Corps depots are consolidated into one, the projected ground Army depot utilization will increase by five percent from 82 percent to 87 percent. Since the work remaining at the one Marine Corps depot was a small portion

of their overall workload requirement, the Marine Corps depot utilization dropped from 100 percent to 53 percent.

(3) Unnecessary Duplication. Unnecessary duplication in the ground vehicle/equipment commodity is reduced although some duplication still remains among the Services for depot maintenance of commodities common to land vehicles and artillery.

5. Missiles.

a. Tactical Missiles. Ongoing initiatives have consolidated much of the tactical missile work at LEAD. Some Navy work remains outstanding at NAVORD depots. After the consolidation into three NAVORD depots discussed in sub paragraph 3.b., above, the transfer of this tactical missile work to LEAD would not permit further consolidation of NAVORD depots. Cost reductions from this transfer were negligible although the consolidation would decrease the unit costs for tactical missile maintenance.

b. Strategic Missiles. This commodity has already been consolidated under the Air Force at OO-ALC and no cost reductions were found.

6. Summary.

a. Cost Savings. For the purpose of comparing Alternatives B through F, Alternative D consolidations have the potential to achieve depot maintenance cost reductions ranging from 1,490 to 8,148 million dollars during FY94 through FY03 as shown in Table G-27.

**Table G-27 Alternative D FY94-FY03--Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(872)	(256)	(872)	(256)
95	(766)	(174)	(1,638)	(430)
96	387	1,130	(1,251)	700
97	392	1,072	(859)	1,772
98	392	1,071	(467)	2,843
99	391	1,070	(76)	3,913
00	391	1,059	315	4,972
01	392	1,059	707	6,031
02	391	1,058	1,098	7,089
03	392	1,059	1,490	8,148
<b>Total</b>	<b>1,490</b>	<b>8,148</b>		



b. Capacity Reduction. The total utilization of DOD depots after the consolidations recommended under Alternative D rises by 23 percent from 64 percent to 87 percent.

c. Unnecessary Duplication. As discussed for each of the commodities above, Alternative D reduces much of the duplication among the Services for maintenance of similar weapon system platform DLR/components. By requiring each Service to provide its own support for the hull/body/frame of similar weapon system platforms, duplication among the Services remains for these commodities. Adoption of the "Centers of Excellence" concept by every Service will help reduce the duplication.

## APPENDIX G

### ANALYSIS OF ALTERNATIVE E

1. Overview.

a. Alternative E consolidates complete depot maintenance responsibility for similar weapon system platforms and their depot-level reparable (DLRs)/components under an Executive Service. The Executive Service is usually the Service that has the largest inventory of the DLR/component. Work distributions among depots were made using the best information on commodities and depot capabilities available to the analyst.

b. Following these guidelines, the weapon system platform and DLR/component commodity responsibilities were distributed as shown in Table G-28. Metrology was added as a commodity because consolidation of metrology support would be a logical extension of this alternative that consolidates all types of depot maintenance under a minimum number of Executive Services.

**Table G-28 Alternative E Distribution of Commodity Responsibilities**

COMMODITY	RESPONSIBLE SERVICE
Aircraft	Air Force
Strategic Missiles	Air Force
Metrology	Air Force
Tactical Missiles	Army
Combat Vehicles	Army
Automotive	Army
Construction Equipment	Army
Ground Communication and Electronics	Army
Ordnance, Weapons & Munition	Army
General Purpose Equipment	Army
Ships	Navy
Underwater Ordnance	Navy

c. Capacity and work projections provided by JDMAG did not distribute commodities in detail for other-than-aviation maintenance. FY91 workload, distributed by Work Breakdown Structure categories in DOD 7220.9-M, was used to establish a workload baseline in each commodity. The FY91 percentage of work in each commodity was applied to the FY95 total workload and the FY87 capacities. If a DLR/component commodity generated less than 8 KDLH work at any depot, that work was not considered.

2. Aircraft.

a. Capacity vs. Workload

(1) As shown in Table G-29, Service depots were projected by JDMAG to have an aviation workload of 47,200 KDLH in FY95. AGMC was not a candidate for consolidation in the aircraft analysis but was considered separately under metrology.

(2) The FY87 capacity of the aviation depots was <sup>75,400</sup>~~75,100~~ KDLH, a capacity excess of 28,200 KDLH over the FY95 workload projection. Based on this capacity, depot aircraft DLR/component utilization would be 62 percent. As stated above, the Air Force would be the Executive Service for all aviation depot maintenance. After all aircraft DLR/component work was consolidated to Air Force depots, the other Service depots were consolidated to the maximum extent possible using FY87 capacities. Unique capabilities of depots were considered and retained such as SA-ALC large aircraft hangars, "Technology Repair Centers" (TRCs), and CCAD/NADEP-PNCLA and CHYPT rotary wing facilities.

**Table G-29 Comparison of Depot Aviation  
Capacity and Workload  
(Thousands of Direct Labor Hours)**

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
OC-ALC	6800	12400	5600
OO-ALC	5100	8000	2900
SA-ALC	6400	11200	4800
WR-ALC	6500	8000	1500
SM-ALC	4200	6000	1800
NADEP-ALMD	2400	4800	2400
NADEP-CHYPT	2000	3000	1000
NADEP-JAX	2200	3400	1200
NADEP-NORVA	2800	5800	3000
NADEP-NORIS	2400	5800	3400
NADEP-PNCLA	2800	3600	800
CCAD	3100	3400	300
LEAD	200	None	None
RRAD	100	None	None
TOAD	200	None	None
<b>Total</b>	<b>47200</b>	<b>75400</b>	<b>28200</b>

b. Potential Consolidations. Analysis was conducted on consolidation of workloads from large depots into small depots, consolidation of a large depot and several small depots, and consolidation of all small depots into the large depots. The analysis concluded that consolidation of a number of small depots and one large depot was the most feasible. This consolidation took advantage of the Technology Repair Centers (TRCs) resident in larger depots and the unique capabilities of three smaller depots. The consolidation includes the following.

(1) Army. Army's aviation depot activities consisted solely of rotary wing airframe and dynamic components. The Air Force acquired this depot as part of the Executive Service for all aviation.

(2) Navy. The workload requirement of four NADEPs was consolidated into the remaining depots.

(3) Air Force. The aviation workload from one depot is consolidated into the remaining depots.

c. Aircraft Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of aviation depot maintenance into four existing Air Force depots, two NADEPs, and CCAD has the potential to achieve depot maintenance cost reductions ranging from 776 to 4,700 during FY94 through FY03. The cumulative annual distribution of these potential reductions is shown in Table G-30. Note that the break even point for the low savings extreme is seven years.

**Table G-30 Alternative E (Aviation) -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(512)	(143)	(512)	(143)
95	(493)	(135)	(1,005)	(278)
96	258	699	(747)	421
97	221	620	(526)	1,041
98	220	619	(306)	1,660
99	220	619	(86)	2,279
00	215	605	129	2,884
01	216	605	345	3,489
02	215	606	560	4,095
03	216	605	776	4,700
Total	776	4,700		

(2) Capacity Reduction. Assuming the workload of four NADEPs and one ALC are consolidated, the projected utilization will increase from 62 to 94 percent.

(3) Unnecessary Duplication. Duplication in the aviation commodities is significantly reduced.

3. Ships/Underwater Weapons. The analysis of ships/underwater weapons for this Alternative were identical to that of Alternatives C and D as ship and underwater weapons commodities offer no potential for consolidation under any Service other than the current using Service, the Navy. A summary of those conclusions is as follows.

a. NAVSEA Shipyards.

(1) Cost Savings. For the purpose of comparing Alternatives B through G, consolidation of the work of seven shipyards into five has the potential to achieve depot maintenance cost reductions ranging from 702 to 2,701 million dollars from FY94 through FY03.

(2) Capacity Reduction. With the work of two shipyards absorbed by the other facilities, the projected FY95 utilization rate will increase from 67 to 100 percent based on direct labor hour workload requirements.

(3) Unnecessary Duplication. Unnecessary duplication within NAVSEA is reduced, particularly when commodity and component consolidation is pursued following consolidation of shipyards.

b. NAVORD Depots.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of the depot maintenance work of nine NAVORD depots into three has the potential to achieve depot maintenance cost reductions of 1 to 178 million dollars from FY94 through FY03.

(2) Capacity Reduction. This consolidation of nine depots into three eliminates FY95 capacity excess.

(3) Unnecessary Duplication. Unnecessary duplication within NAVORD is reduced by the consolidation of nine depots into three.

4. Ground Vehicles/Equipment.

a. Capacity vs. Workload.

(1) As shown in Table G-31, ground vehicle/equipment depots were projected by JDMAG to have workload of 17,300 KDLH in FY95.

(2) The FY87 capacity of the ground vehicle/equipment depots was 29,500 KDLH, a capacity excess of 12,300 KDLH over the FY95 workload projection. Based on this capacity, ground vehicle/equipment depot utilization would be 58 percent. As shown in Table G-26, the Army would be the Executive Service for all ground vehicles and equipment. Army depots would also assume Executive Service responsibilities for general purpose equipment, artillery, and ordnance. ANAD is the sole Army facility configured for heavy combat vehicles and all Services' small arms. LEAD is responsible for all Services' tactical missiles, RRAD for light combat vehicles and artillery, TEAD for automotive and rail, and TOAD for all electronics. Marine Corps depots are virtually identical in depot maintenance capabilities.

**Table G-31 Comparison of Ground Vehicles/Equipment Depots**  
(Thousands of Direct Labor Hours)

DEPOT	FY95 WORK	FY87 CAPACITY	EXCESS
ANAD	2000	4600	2600
LEAD	2500	3800	1300
RRAD	2700	4800	2100
TOAD	3400	5500	2100
TEAD	1100	3200	2100
MCLBA	1200	1100	None
MCLBB	1200	1400	200
OO-ALC	500	500	None
SA-ALC	800	1700	900
SM-ALC	1800	2800	1000
WR-ALC	100	100	None
<b>Total</b>	<b>17300</b>	<b>29500</b>	<b>12300</b>

b. Potential Consolidations.

(1) Army. The work of five Army depots were consolidated into four.

(2) Air Force. Ground communications-electronics and general purpose equipment depot maintenance was consolidated at Army depots. Since this work was conducted at the same depot which was consolidated under aviation, no further depots were consolidated.

(3) Marine Corps. The work of two depots was consolidated into the Army depots to take advantage of the "Centers of Excellence" concept.

c. Ground Vehicle/Equipment Summary.

(1) Cost Savings. For the purpose of comparing Alternatives B through F, consolidation of land vehicles, ground communications-electronics, and general purpose equipment into Army depots has the potential to achieve depot maintenance cost reductions from 281 to 1,600 million dollars during FY94 through FY03. The cumulative annual distribution of these potential reductions is shown in Table G-32. Note that the break even point for the low savings extreme occurs after seven years.

**Table G-32 Alternative E (Ground Vehicles/Equipment) -- Projected Relative Savings (Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(201)	(68)	(201)	(68)
95	(162)	(40)	(363)	(108)
96	74	221	(289)	113
97	81	218	(208)	331
98	81	217	(127)	548
99	82	218	(45)	766
00	82	209	37	975
01	80	208	117	1,183
02	82	208	199	1,391
03	82	209	281	1,600
Total	281	1,600		

(2) Capacity Reduction. Assuming the workload of five Army depots is consolidated into four, and two Marine Corps depots are consolidated into the Army, the projected utilization will increase from 58 to 92 percent.

(3) Unnecessary Duplication. Unnecessary duplication in the ground vehicle/equipment commodity is eliminated.

5. Missiles.

a. Tactical Missiles. Ongoing initiatives have consolidated much of the tactical missile work at LEAD. Some Navy work remains outstanding at NAVORD depots. After the consolidation into three NAVORD depots, the transfer of this tactical missile work to

LEAD would not permit further consolidation of NAVORD depots.

b. Strategic Missiles. This commodity has already been consolidated within the Air Force at OO-ALC.

6. Metrology.

a. Capacity vs Workload. There are three metrology laboratories. The Air Force lab is at AGMC, the Navy lab is being consolidated at NADEP-NORIS, and the Army lab is at Redstone Arsenal, AL. Specific capacity and workload statistics were not available for all locations.

b. Potential Consolidations. A 29 January 1991, JLC/DDMC report titled "*A Study of the Services' Primary Standards Laboratories for the Joint Logistics Commanders and the Defense Depot Maintenance Council*", was reviewed to obtain costs for consolidation analyses. The most cost effective consolidation was to establish the Air Force as the Executive Service and consolidate metrology support at AGMC.

c. Metrology Summary.

(1) Cost Savings. After a consolidation cost of 8 million dollars, annual savings of 1.54 million dollars would begin accruing in the sixth year. Cumulative savings through FY03 are 8 million dollars.

(2) Capacity Reduction. AGMC metrology capacity would be expanded during consolidation. The facility would operate very close to 100 percent capacity.

(3) Unnecessary Duplication. All unnecessary metrology duplication within and among the Services would be eliminated.

7. Summary.

a. Cost Savings. For the purpose of comparing Alternatives B through F, Alternative E consolidations have the potential to achieve depot maintenance cost reductions ranging from 1,761 to 9,180 million dollars during FY94 through FY03 as shown in table G-33.



**Table G-33 Alternative E FY94-FY03 -- Projected Relative Savings  
(Constant FY93 \$Million)**

NOTE: Only for comparison with Alternatives B through F

FY	Annual		Cumulative	
	Minimum	Maximum	Minimum	Maximum
94	(1,085)	(346)	(1,085)	(346)
95	(976)	(272)	(2,061)	(618)
96	510	1,330	(1,551)	712
97	476	1,225	(1,075)	1,937
98	476	1,223	(599)	3,160
99	476	1,225	(123)	4,385
00	472	1,200	349	5,585
01	469	1,197	818	6,782
02	472	1,200	1,290	7,982
03	471	1,198	1,761	9,180
<b>Total</b>	<b>1,761</b>	<b>9,180</b>		

b. Capacity Reduction. The total utilization of DOD depots after the consolidations recommended under Alternative E rises from 61 percent to 95 percent.

c. Unnecessary Duplication. As discussed for each of the commodities above, Alternative E reduces virtually all duplication among the Services for maintenance of similar weapon system platforms and DLR/components.

## APPENDIX G

### ANALYSIS OF ALTERNATIVE F

1. **Overview.** Alternative F considers the creation of a single manager to control all depot maintenance within DOD. Two different and distinct options are examined. One is a Defense Maintenance Agency (DMA) reporting to OSD and the other is a Joint Depot Maintenance Command (JDMC), a unified command, reporting to the National Command Authority (NCA) through the CJCS. The basic difference between Alternative E and Alternatives F(DMA) and F(JDMC) is who is in charge. In Alternative E, there are three separate Service Executives in charge of depot maintenance. In Alternative F(DMA), there is a central agency in charge of all depot activities. In Alternative F(JDMC), there is a unified commander in charge of four separate Service components. It is assumed for the purpose of this analysis that both options under Alternative F would result in no less consolidation and elimination of duplication than is possible in Alternative E. Therefore, the analysis developed for Alternative E is also applied to both options in Alternative F.

2. **DMA.** A DMA involves the creation of a central authority that is superimposed over the existing depot maintenance system with full responsibility and authority to change, manage, and operate the depot maintenance effort DOD-wide. A DMA implies removing the responsibility for depot maintenance from the Services and placing it in the hands of a central authority. Basically, the Services would purchase depot level maintenance from the DMA. A DMA would:

- a. Directly own, control, and operate applicable depot level maintenance facilities, other than theater assigned depot assets.
- b. Be responsible for consolidations, competition initiatives, workload assignments, capital investment decisions, and standardization of systems and work processes, as appropriate, to maximize the efficiency of the depot system.
- c. Work to Service specified technical aspects of work packages.
- d. Negotiate with the Services on time schedules and costs.
- e. Ensure adequate depot capacity for peacetime and surge requirements.
- f. Submit and defend depot budget requirements. The Services would control the funds authorized for depot level maintenance.
- g. Develop BRAC recommendations (post BRAC-93).

3. **JDMC.** A JDMC would be the central authority for depot maintenance with full responsibility and authority to change, manage, and operate the depot maintenance effort. In this case, however, the Services would have a fully participating role through their Service components, including ownership and operation of those depots that remain active after consolidation decisions are made by the Joint Commander. A JDMC would:

- a. Be responsible for consolidations, competition initiatives, workload assignments, capital investment decisions, and standardization of systems and work processes, as appropriate, to maximize the efficiency of the depot system. The ownership and day-to-day control of the individual depot facilities would remain with the appropriate Services.
- b. Negotiate time standards and costs with the users.
- c. Work to Service specified technical aspects of work packages.
- d. Ensure adequate depot capacity for peacetime and surge requirements.
- e. Coordinate consolidated submission of depot budget requirements. The Services would control the funds authorized for depot level maintenance.
- f. Develop BRAC recommendations (post BRAC-93).

## APPENDIX G

### ANALYSIS OF ALTERNATIVE G

1. **Overview.** Alternative G considers contracting the entire depot maintenance workload to private industry either through industry facilities or government-owned/contractor-operated (GOCO) facilities. Depot maintenance management and contract coordination would be provided by a new OSD-level organization or Service organizations. In either case, the contracting agency would:

- a. Assess contractor capabilities before awarding a contract.
- b. Provide pricing and negotiation support.
- c. Support source selection.
- d. Manage the contract after award.
- e. Provide technical support.
- f. Accept the contractor's work and assure payment.

2. **Effect on Competition.** Competition is one of the principal strategies of DMRD 908. Public-private and public-public competition improves efficiency by stimulating overhead cost reduction and improved productivity.

a. **Competition Pilot Program Results.** In response to the FY91 congressional authority for a competition pilot program described in Chapter II, each Service opened selected depot maintenance work to competition. Some competition involved private bidders, as well as public bidders from more than one Service. Of the 18 workloads awarded with an annual value of 87 million dollars, organic depots won 14 awards. Table G-34 displays the results of FY91 competition, including projected savings resulting from the awards. In FY92, of fourteen workloads awarded, organic depots won eight. The projected savings from competition for FY91 through FY97 are 22.76 million dollars.

b. **Competition Without Public Depots.** The public-private pilot program demonstrated that organic depots are competitive with private industry and probably provide an incentive for private industry to improve efficiency and submit competitive bids. This alternative eliminates organic public depots and leaves only private-private competition. Without the competition of the depots to drive industry to cut costs commercialized maintenance would probably result in much lower savings than those resulting from public-private savings realized in FY91. The competitive environment that produces savings today could evolve into a sole-source environment with significantly greater costs.

Table G-34 Depot Maintenance Competition FY91 Pilot Program Results

Service	Workload	Previous Work Site	Award Winner	FY91-97 Savings (\$M)
Army	T63-700 Engine	CCAD	CCAD	3.13
	PATRIOT Launch Station	LEAD	LEAD	-0.09
	M113 Engine	RRAD	Detroit Diesel	0.42
	M44 1-1/2 Ton Engine	TEAD	TEAD	0.36
	MILVANS	ANAD	Genco	-0.03
	AN/TPQ-36/37	SAAD	SAAD	-0.38
	RT-524	TOAD	TOAD	1.49
			<hr/>	4.90
Air Force	G-5615 Gearbox	SA-ALC	Standard Aero	6.40
	F-16 Software IV&V	OO-ALC	Logicon	0.70
	TF33 Vanes & Shrouds	Contract	Chromalloy	1.30
	AN/TRC-97A	SM-ALC	SM-ALC	0.70
	AN/ARC-186-UHF	WR-ALC	WR-ALC	1.70
			<hr/>	10.80
Marine Corps	M923 5-Ton Truck	MCLBB	TEAD	6.89
	AN/TPB-1D	MCLBA	Loral	0.17
			<hr/>	7.06
<b>DOD Total</b>				<b>22.76</b>

Source: DDMC CBP (FY92-97)

3. Limits of Contractor Maintenance. This alternative will create several new limitations that are discussed in the following subparagraphs.

a. Old Technology Maintenance. Service depots maintain many weapon systems built with older technology. Such systems often require reverse engineering to produce parts no longer available from commercial vendors. This situation will become even more prevalent as lower defense procurement budgets necessitate extending weapon system life cycles. Work on older systems is often too small in volume or too difficult to be attractive to private industry. It is also very difficult to predict the scope and details of work required on older systems before the actual effort is begun, thereby resulting in costly, non-competitive contract revisions. After the attractive and high profit work is awarded to private industry, the Services can be expected to be left with essential work on older weapon systems that has traditionally been performed by the organic depots. For this reason, some GOCO facilities on cost-plus contracts will probably be essential.

b. Capacity Expansion. Commercial industries can be expected to size their capacity to peacetime requirements. It would be expensive to maintain excess capacity for short-term surges in output which are critical to meeting military contingencies.

c. Weapon System Management. Unlimited competition would substantially complicate weapon system management. Instead of dealing with one or a small number of military commands for depot maintenance of a weapon system platform, a manager may have to balance the efforts of a large number of contractors throughout the country, each of which has been awarded the maintenance of components of the platform.

d. Exposure to Unplanned Interruptions. Service depots are seldom, if ever, exposed to work stoppages caused by problems with labor, such as strikes or job actions. They are also virtually immune to bankruptcies and corporate reorganizations which can bring output of private industry to a complete and unexpected halt. At most, Service depots experience these problems when their vendor suppliers have unplanned interruptions. The depots counter these temporary delays with alternate sources of supplies or internal reconfigurations to produce components organically. Complete contractor depot maintenance exposes the entire maintenance function to these problems which can interrupt output for long periods and severely degrade readiness and warfighting abilities in a very short order.

e. Contract Flexibility. Service depots experience frequent changes to programmed output and system maintenance requirements. Modifications to contracts to support program changes could be costly and time consuming.

#### 4. Summary.

a. Cost Savings. Cost savings for Alternative G were not computed. The cost savings from competition using the current system of public-private competition are highly variable depending on the source used. Eliminating the public element from competition will result in even greater variability which is not predictable. Contract maintenance may yield initial cost savings, but actually become more expensive as duplicate capabilities are discontinued and contracts tend to become sole-source. No dollar comparison of Alternative G can be made relative to Alternatives B thru F.

b. Capacity Reduction. Since all Service depots are closed or become GOCO, any unnecessary capacity within the Services is eliminated. Service capacity will be zero.

c. Duplication. As with capacity reduction, all Service depots are eliminated along with all duplication.

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DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS  
WASHINGTON, DC 20310-0500



DALO-SMM

26 OCT 1992

MEMORANDUM FOR THE CHAIRMAN, JCS DEPOT MAINTENANCE STUDY GROUP

SUBJECT: Army's Input to the JCS Depot Maintenance  
Study--Information Memorandum

SIR -

1. This is in response to your request that each service evaluate the seven alternatives proposed to achieve even greater depot maintenance efficiencies and prepare an issue paper on the role of Army depots at reduced service levels (Tabs A & B).
2. As you well know, we submitted an alternative to the study group, which in essence provides for single service management of a weapon system, all its components, and depot level reparable. We think this alternative creates a logical management strategy and supports the system management approach to depot maintenance. It also maximizes cost savings while maintaining responsiveness to contingency requirements, peacetime readiness, sustainment and reconstitution of our forces.
3. We are looking forward to the outcome of your study.

LEON E. SALOMON  
Lieutenant General, GS  
Deputy Chief of Staff  
for Logistics

2 Encl

CF:  
AMCCG  
DAMO-ZA  
ASA (I, L&E)  
DALO-PLZ-A  
JCS (J4)



## APPENDIX H

### ARMY ALTERNATIVE REVIEW

#### Alternative A Individual Service Management

**Effectiveness:** What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?

**PRO:** Proven capability to support life cycle management of materiel, peacetime readiness, sustainment and reconstitution of redeployed forces. Fully integrated approach to integrated logistics system support (ILS) management to include requirements, specifications and configuration control being centralized under a single materiel manager. Integrated with all aspects of the Army's logistics structure. Depot maintenance is a vital element of the Army's maintenance policy and doctrine, facilitating coordination between requirements, development, engineering, maintenance and financial management for improving/upgrading equipment which will be increasingly important in the future budgetary environment. Facilitates program execution with work specifications, production standards and depots centralized under a single industrial manager, Depot Systems Command, where end items and depot level repairables are rebuilt/remanufactured/ modified at Centers of Technical Excellence (CTX) providing a integrated weapon systems approach to maintenance.

**CON:** Does not allow for maximum technology transfer between services, adoption of best industrial processes across DOD or attain best depot maintenance costs for end items and DLRs.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

It is reasonable to expect some savings can be made without jeopardizing peacetime readiness, sustainment and reconstitution which are three critical factors in the depot maintenance military effectiveness equation. It is essential those factors be weighed carefully against any cost savings that will clearly reduce military effectiveness in evaluating every alternative.

**Efficiencies:** Maintenance Council (DDMC) and Army Management Review Decisions (AMRD) have initiated a wide range of actions to improve efficiency of depot maintenance and are producing positive results. It is recognized additional actions can be taken to further reduce costs, excess capacity and duplication under this alternative; however, it will not achieve maximum savings potential without degrading military effectiveness.

**Alternative B Individual Service Management (Consolidation into "Centers of Excellence")**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

**PRO:** Best alternative in terms of readiness, sustainment, reconstitution and cost savings. Depot maintenance cost for end items and DLRs would decline without the negative impacts of other alternatives. Avoids system and depot management problems of splitting management of end items and DLRs as Alternatives C, D, E, F and G do. Logical management strategy based on Executive Agent/ Single Service Manager for both weapon and non-weapon systems and associated DLRs and achieves maximum effectiveness from Center of Excellence concept. Supports weapon systems management and "One face to the customer".

**CON:** Service could lose control of all depot maintenance for some systems. This loss of control is also applicable to varying degrees for Alternatives C, D, E, F, and G.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Yes, assuming Executive Agent assignment based on predominant operator eg. ships, fixed wing, rotary wing, ground commo and electronics, ground vehicles etc.

**Implementation: Is this alternative realistic?**

Management strategy is logical, supports systems management approach and maximizes cost savings while maintaining responsiveness to peacetime readiness, sustainment and reconstitution. Supports other services on a systems basis which facilitates support of PEOs/PMs and service maintenance managers in acquisition, modification, field support etc. Implementation of the depot maintenance strategy should be included in the BRAC 93 process even if this requires some delay, e.g. 30-60 days so any required closures/realignments can be initiated quickly to maximize savings potential vice waiting for the BRAC 95 window. Depot maintenance management of Executive Agent/Single Manager assignments and transfer of ownership of any depots/facilities would be phased in during FY93 and completed before/at start of FY94. Easier to manage than alternatives splitting end items and DLRs.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

The Army would continue to exercise centralized command and control over organic depots through the Depot System Command; where workloading, workload priorities, facilities maintenance/modernization, funding, coordination with other services etc., would be focused. The Army, as Executive Agent, and the other services have successfully participated for a

number of years in joint staffing of the Executive Director for Conventional Ammunition (EDCA) Office. This could be a useful model in developing joint staffing at appropriate levels in the depot maintenance arena. Assignment of supported service personnel to key staff and management positions at HQ DESCOM and appropriate commodity commands, eg. Aviation Troop Support Command (ATCOM) and Tank Automotive Command (TACOM) would facilitate the coordination and cooperation required to achieve maximum potential benefits from this alternative. Such an initiative could also meet professional development requirements for military personnel. Details of this type arrangement would be worked out with each supported service and formalized in a memorandum of understanding (MOU).

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Executive Agent meet Army requirement for peacetime readiness, repair/preparation of equipment to support deploying forces, sustainment to include providing personnel/equipment to provide a forward depot capability in contingency areas and reconstitution of redeploying forces.

Input to materiel acquisition process so depot maintenance can be considered in design and depot resources (DMPE, specifications, training) can be provided.

Periodic progress/status reports.

Support Army Program Executive Officers (PEO), Project and Product Managers (PM) in the development and management of integrated logistics support for materiel throughout the life cycle management process to include research, development, testing, production, fielding, modification and disposal.

Participation in workload scheduling and prioritization.

Fabrication, manufacture and reclamation of parts and equipment.

Operation of world class industrial facilities in terms of cost, quality and schedule.

**Efficiencies: Are there near or long-term business efficiencies to be gained by this alternative?**

Will minimize depot maintenance costs for end items and DLRs via the Centers of Excellence Concept and facilitate closing depots to reduce excess capacity. Achieving this may require transferring ownership of some depots to another service. Long term benefits include minimizing operating, MILCON and new capital equipment costs to operates world class industrial facilities.

**Alternative C Consolidate Weapons System Platforms into Joint Service "Centers of Excellence"**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

**PRO:** No clear contribution and it is not an improvement over Alternative A where owning service is depot maintenance manager for weapon and non weapon systems and their associated depot level repairables (DLR).

**CON:** Breaks weapons systems management approach which has a proven track record in developing, acquiring, operating, modifying, sustaining and performing depot maintenance on a systems basis. This advocates consolidating the hull/chassis/airframe of weapons under a single service but leaving weapon system DLRs with the owning service and also leaves non-weapon systems and their associated DLRs with the owning service. Unnecessarily complicates depot maintenance and its management for weapon systems and their associated DLRs. Will likely increase costs to maintain a given level of military effectiveness. The service operating the depot responsible for removable and reinstallation of DLRs has no control over anything that happens to the DLRs in between when the end item is owned by another service. This requires the service owning that end item to purchase DLRs from supply or establish repair and return DLR programs at DLR repair depots run by the other services. The results include: additional supply transactions, longer repair cycle times, increased inventory levels, and higher end item repair costs. No one in charge of weapon system depot maintenance and no clear logic to this approach.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized from this alternative?**

No, this management strategy breaks weapon system management which is central to peacetime readiness, sustainment, reconstitution, life cycle management and ILS.

**Implementation: Is this alternative realistic?**

There are no clear benefits to be gained from this alternative since it would complicate the management of depot maintenance and would likely increase costs while creating additional problems in configuration control, engineering and other linkages between the field, developer, service management and depot maintenance. In the absence of clear benefits and given obvious adverse impacts, this alternative is not considered realistic.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

The Army would continue to exercise centralized command and control over organic depots through the Depot System Command; (DESCOM) where workloading, workload priorities, facilities maintenance/modernization, funding, coordination with other services etc., would be focused. The Army, as Executive Agent, and the other services have successfully participated for a number of years in joint staffing of the Executive Director for Conventional Ammunition (EDCA) Office. This could be a useful model in developing joint staffing at appropriate levels in the depot maintenance arena. Assignment of supported service personnel to key staff and management positions at HQ DESCOM and appropriate commodity commands, eg. Aviation Troop Support Command (ATCOM) and Tank Automotive Command (TACOM) would facilitate the coordination and cooperation required to achieve maximum potential benefits from this alternative. Such an initiative could also meet professional development requirements for military personnel. Details of this type arrangement would be worked out with each supported service and formalized in a memorandum of understanding (MOU).

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from this manager?**

The Executive Agent meet Army requirements for peacetime readiness, repair/preparation of equipment to support deploying forces, sustainment to include providing personnel/equipment operating under Army control to provide a forward depot capability in contingency areas and reconstitution of redeploying forces.

Input to materiel acquisition process so depot maintenance can be considered in design and depot resources (DMPE, specifications, training) can be provided.

Periodic progress/status reports.

Support Army Program Executive Officers (PEO), Project and Product Managers (PM) in the development and management of integrated logistics support for materiel throughout the life cycle management process to include research, development, testing, production, fielding, modification and disposal.

Participation in workload scheduling and prioritization.

Operation of world class industrial facilities in terms of cost, quality and schedule.

Fabrication, manufacture and reclamation of parts and equipment.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Any overall efficiencies are unclear given the issues addressed in the (CON) paragraph. The efficiencies from weapon system end item consolidations would increase capacity utilization of some depots; however, that would not necessarily result in closing any depots since owning services would still maintain weapon system DLRs, non weapon systems and their associated DLRs. Overhauling an end item would require it be shipped to a depot where the DLRs were removed and returned to the owning service for repair in an organic depot or shipped to a contractor facility. Repairing those DLRs and then returning them to the original depot for reassembly into the end item hull/chassis/airframe would significantly increase repair cycle times and probably end item rebuild costs. If DLRs are requisitioned from the supply system to replace those shipped off to the owning service for repair, this will require more supply transactions, management overhead and procurement of additional DLRs to support the depot maintenance cycle.

**Alternative D Individual Service Management of Weapon System Platforms in "Centers of Excellence" with DLRs, Components and Non-Weapon System Equipment Consolidated in Single Service "Centers of Excellence"**

**Effectiveness: What are the impact of this alternative on the military effectiveness of your Services' maintenance process?**

**PRO:** Limited impact on effectiveness for weapon and non-weapon systems when end items and associated DLRs are maintained by the same service via "Centers of Excellence Concept".

**CON:** When end items and DLRs are split between services on a wholesale basis (weapon systems) there are significant adverse impacts without clear offsetting benefits. This is a limited business approach to depot maintenance overall, particularly for weapon systems, and breaks the weapon system management approach which has a proven track record in developing, acquiring, operating, modifying, sustaining and performing depot maintenance of weapon systems. Unduly complicates depot maintenance management for weapon systems and DLRs when split between multiple services and would likely increase end items rebuild costs. Nobody in charge of weapon system depot maintenance and no clear logic to this approach.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

No, this management strategy breaks weapon system management which is central to readiness, sustainment, reconstitution, life cycle management and ILS.

**Implementation: Is this alternative realistic?**

Any proposal to split depot maintenance management of systems and their associated DLRs on a wholesale basis as this does will adversely impact many elements of life cycle management, peacetime readiness, sustainment, reconstitution, etc. There is no compelling case to do this and doing so would suboptimize the overall process in order to optimize some pieces.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

The Army would continue to exercise centralized command and control over organic depots through the Depot System Command; (DESCOM) where workloading, workload priorities, facilities maintenance/modernization, funding, coordination with other services etc., would be focused. The Army, as Executive Agent, and the other services have successfully participated for a number of years in joint staffing of the Executive Director for Conventional Ammunition (EDCA) Office. This could be a useful model in developing joint staffing at appropriate

levels in the depot maintenance arena. Assignment of supported service personnel to key staff and management positions at HQ DESCOM and appropriate commodity commands, eg. Aviation Troop Support Command (ATCOM) and Tank Automotive Command (TACOM) would facilitate the coordination and cooperation required to achieve maximum potential benefits from this alternative. Such an initiative could also meet professional development requirements for military personnel. Details of this type arrangement would be worked out with each supported service and formalized in a memorandum of understanding (MOU).

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Executive Agent meet Army requirement for peacetime readiness, repair/preparation of equipment to support deploying forces, sustainment to include providing personnel/equipment operating under Army control to provide a forward depot capability in contingency areas and reconstitution of redeploying forces.

Input to materiel acquisition process so depot maintenance can be considered in design and depot resources (DMPE, specifications, training) can be provided.

Periodic progress/status reports.

Support Army Program Executive Officers (PEO), Project and Product Managers (PM) in the development and management of integrated logistics support for materiel throughout the life cycle management process to include research, development, testing, production, fielding, modification and disposal.

Participation in workload scheduling and prioritization.

Fabrication, manufacture and reclamation of parts and equipment.

Operation of world class industrial facilities in terms of cost, quality and schedule.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Any overall efficiencies are unclear given the issues addressed in the above CON paragraph. The efficiencies from weapon system and end item consolidations would increase capacity utilization of some depots; however, that would not necessarily result in closing any depots since owning services would still maintain weapon system DLRs and non-weapon systems and their associated DLRs. Overhauling an end item would require it be shipped to a depot where the DLRs were removed and returned to the owning service for repair in an organic depot or shipped to a contractor facility. Repairing these DLRs and then returning them the original depot for reassembly into the end item hull/chassis/airframe will significantly increase repair cycle times and probably end item rebuild cost. If DLRs are requisitioned from the



supply system to replace those shipped off to the owning service for repair, this will require more supply transactions, management overhead, and procurement of additional DLRs to support the depot maintenance cycle.

**Alternative E Consolidation of Similar/Common Platforms, DLRs, Components and Non-Weapon System Components Under Single Executive Service**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

**PRO:** Impact on effectiveness would be dependent on Executive Agent assignments. Assuming assignment based on dominant user for ships, fixed wing aircraft, rotary wing aircraft, ground vehicles, ground command and electronics etc there should be limited impact when depot maintenance of systems and associated DLRs are managed by the same service.

**CON:** When end items and DLRs are split between services on a wholesale basis (weapon systems) there are significant adverse impacts without clear offsetting benefits. This is a limited business approach to depot maintenance overall, and particularly for weapon systems, and breaks the weapon system management approach which has a proven track record in developing, acquiring, operating, modifying, sustaining and performing depot maintenance of weapon systems. Unduly complicates depot maintenance management from every aspect when split between multiple services and would likely increase end item rebuild costs for those systems. Nobody in charge of weapon system depot maintenance and no clear logic to this approach.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

No, this management strategy breaks weapon systems management which is central to peacetime readiness, sustainment, reconstitution, life cycle management and ILS.

**Implementation: Is this alternative realistic?**

Any proposal to split depot maintenance management of systems and their associated DLRs on a wholesale basis breaks the weapon systems approach to management and will adversely impact many elements of life cycle management, peacetime readiness, sustainment, reconstitution etc. There is no compelling case to do this and doing so would suboptimize the overall process in an effort to optimize some portions (limited purely business approach).

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

The Army would continue to exercise centralized command and control over organic depots through the Depot System Command; (DESCOM) where workloading, workload priorities, facilities maintenance/modernization, funding, coordination with other services etc., would be focused. The Army, as Executive Agent, and the other services have successfully participated for a number of years in joint staffing of the Executive Director for Conventional Ammunition

(EDCA) Office. This could be a useful model in developing joint staffing at appropriate levels in the depot maintenance arena. Assignment of supported service personnel to key staff and management positions at HQ DESCOM and appropriate commodity commands, eg. Aviation Troop Support Command (ATCOM) and Tank Automotive Command (TACOM) would facilitate the coordination and cooperation required to achieve maximum potential benefits from this alternative. Such an initiative could also meet professional development requirements for military personnel. Details of this type arrangement would be worked out with each supported service and formalized in a memorandum of understanding (MOU).

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Executive Agent meet Army requirement for peacetime readiness, repair/preparation of equipment to support deploying forces, sustainment to include providing personnel/equipment operating under Army control to provide a forward depot capability in contingency areas and reconstitution of redeploying forces.

Input to materiel acquisition process so depot maintenance can be considered in design and depot resources (DMPE, specifications, training) can be provided.

Periodic progress/status reports.

Support Army Program Executive Officers (PEO), Project and Product Managers (PM) in the development and management of integrated logistics support for materiel throughout the life cycle management process to include research, development, testing, production, fielding, modification and disposal.

Participation in workload scheduling and prioritization.

Operation of world class industrial facilities in terms of cost, quality and schedule.

Fabrication, manufacture and reclamation of parts and equipment.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

When end items and DLRs are managed by the same service there are significant cost savings because this management approach facilitates closing depots to reduce excess capacity, duplication etc. When end items and DLRs are managed by separate services, there are numerous negative impacts to systems management, plus end item rebuild programs are greatly complicated.

## **Alternative F DOD Consolidation**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

**PRO:** It is difficult to rationalize how removing depot maintenance from the services will enhance effectiveness of Army maintenance either within depots or the overall maintenance process from developer to user to depot.

**CON:** Major impact on Title 10 responsibilities and would likely require changes to existing federal statutes. Would place either a DOD staff element or the JCS in charge of an organization directly impacting readiness, sustainment, reconstitution. This would break the weapon system management approach by disrupting the linkages between field, developer, service maintenance/resource management and the depot. It would be extremely difficult for service managers to reach through the DOD or JCS to the depots and work the life cycle management process on a weapon system management basis. This would be particularly difficult when engineering, configuration management and specifications are involved which require close coordination over sustained periods of time to support new system development, fielding of new equipment, and modification of fielded end items and DLRs. It would also complicate the overall maintenance management process of services developing maintenance doctrine and policy. DOD or JCS involvement would add several additional organizational layers (DOD or JCS, some type depot command headquarters, some number of subordinates command elements, e.g., land, air and sea or regional) between service managers and supporting depots and would make the depot virtually unreachable from the field level. Centralization of critical operational functions at the very top levels of large organizations is not the most effective or efficient management methodology as Sears and Roebuck, General Motors and many other organizations have learned the hard way. Staffs at the top of such organizations tend to be overly bureaucratic, lack the proper sense of urgency, are far removed from the impact of their poor decisions and in general lack the operational level experience required. Not at all clear what the value added would be from DOD or JCS operating depots that cannot be achieved from Alternative B with far less adverse impacts.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

This alternative has potential for savings but also for significantly adversely impacting military effectiveness. Greater benefits are achievable under Alternative B with less adverse impacts; therefore, this alternative is not supportable.

**Implementation: Is this alternative realistic?**

No, this would break the systems management approach by removing the service role in depot maintenance, adding additional organizational layers to the process, centralizing and calling it increased efficiency. Implementation would be a lengthy, complex process due the

requirement to "stand up" a new command with subordinate elements, etc. and the learning curve those organizations would undergo. Any closure and realignment decisions would likely be delayed until the BRAC 95 window resulting in no significant savings or closure until the year 2000 or beyond. The objective can be achieved with far less disruption and adverse consequences, e.g., Alternative B.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Not applicable.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Yes, however, they do not offset the numerous adverse impacts or achieve the efficiencies and saving potential of Alternative B. This alternative creates another massive bureaucracy that further isolates the field, developer and service manager from supporting depots. Will take longer to implement than Alternative B thereby delaying attainment of significant savings.

## Alternative G Commercialize Maintenance

**Effectiveness:** What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?

**PRO:** Theoretically at least, this type competition would result in reduced costs of depot maintenance and support peacetime readiness at lower costs; however, this has not been proven.

**CON:** Commercial industry would size capacity based solely on peacetime requirements and paying them to maintain excess capacity would be cost prohibitive. Difficulty and cost of competing and awarding depot maintenance contracts would be greatly exacerbated; for example, last year the Army had some 6,000 program changes in its organic depot workload. Modifying, renegotiating contracts to support changes of this magnitude would be a crushing administrative/overhead cost and it would be impossible to maintain reasonable control over costs with quantities, condition of assets, etc. continually changing.

Industry is primarily interested in high volume and high dollar contracts. The Army has relatively few programs with an annual value of over \$1M and industry is just not interested in bidding on small programs. For example, of 10 ea FY92 competition items awarded to date, there were no industry bids on three items. It should be noted Army organic depots won 5 each of 7 each programs competed in FY91 and 8 ea of 10 ea competed to date in FY92.

Unlimited contracting out would break the weapon system management approach for all currently fielded systems since unlimited competition would result in depot maintenance for end items and associated DLRs scattered across private industry.

Contracting for maintenance as part of weapon system acquisition costs for new systems would result in services not buying technical data packages leaving them at the mercy of original equipment contractors in regards to costs in the future. This is an extremely short-sighted and dangerous concept given that systems may be in the inventory 30-40 years or longer, especially in the current budget environment. In that period companies would go bankrupt, merge, sell off some units, be bought by foreign companies, discontinue operations in certain equipment areas, etc., etc.

Total commercialization of depot maintenance would likely encounter strong congressional opposition and generate prohibitive legislation.

Worker strikes at commercial contractor facilities could have devastating impacts on readiness, sustainment and reconstitution. Organic depots, the "Core" maintenance workload concept and reasonable competition levels offer clear advantages over unrestricted competition.

Not at all clear what the advantages of this alternative are in regards to military effectiveness.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

No, is a fatally flawed strategy.

**Implementation: Is this alternative realistic?**

No, it gives up a proven depot maintenance management strategy that can be restructured e.g., Alternative B to achieve reductions in capacity, duplication, overlap and rebuild costs for end items and DLRs without the adverse impacts of Alternative G.

It is likely a new command structure would need to be created for effective individual service or DoD management of the numerous contracts required to accomplish this alternative. "Standing up" this command, its learning curve and the long periods of time required to contract out significant workload would delay attainment of major savings for a lengthy period of time. Such actions could not be completed by the BRAC 95 window; thereby greatly complicating any future closure of depots. Estimate it would take 10 years or longer to actually close any significant number of depots using this strategy. An associated major problem at our multi-mission depots with major ammunition storage missions e.g., Letterkenny, Tooele, Red River and Anniston is the munitions mission remains, requiring significant ownership costs to keep the installations open and to manage and execute outload in support of major contingencies. It is noted all services are dependent on those munitions.

Any substantial savings would be purely theoretical at best, not provable, if achievable at all would take a very long time to do so (cost and time competition), would not resolve the problems with low volume/dollar programs and of support equipment originally manufactured by companies no longer in existence, etc.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Joint staffing of the contracting headquarters would be appropriate with other supported services personnel being assigned to key staff and management positions to coordinate priorities, technical requirements, etc. Staffing details would be worked out with each supported service and formalized in a memorandum of understanding (MOU).

**If your Service became a customer of an Executive Agent/Single manager, what would you expect from that manager?**

The Army would expect:

The Executive Agent meet Army requirements for peacetime readiness, repair/preparation of equipment to support deploying forces, sustainment to include providing personnel/equipment operating under Army control to provide a forward depot capability in contingency areas and reconstituion of redploying forces.

Input to materiel acquisition process so depot maintenance can be considered in design and depot resources (DMPE, specifications, training) can be provided.

Periodic progress/status report.

Support Army Program Executive Officers (PEO), Project and Product Manager (PM) in the development and management of integrated logistics support for materiel throughout the life cycle managment process to include research, development, testing, production, fielding, modification and disposal.

Participation in workload scheduling and prioritization.

Fabrication, manufacture and reclamation of parts and equipment.

Operation of world class industrial facilities in terms of cost, quality and scheudle.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

No, it is expected the near and long term implications of totally commercializing maintenance would be increased overall costs.



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DEPARTMENT OF THE NAVY  
OFFICE OF THE CHIEF OF NAVAL OPERATIONS  
WASHINGTON, DC 20350-2000

IN REPLY REFER TO  
4700  
Ser N4/2U593855  
27 Oct 92

MEMORANDUM FOR THE EXECUTIVE GROUP, JCS DEPOT MAINTENANCE  
CONSOLIDATION STUDY

Subj: JCS DEPOT MAINTENANCE CONSOLIDATION STUDY

1. In response to the request from Executive Group Director, General Went, Tab A is forwarded as Navy's response to the alternatives under study. Specifically, Alternative I is clearly the preferred choice because it maintains the vital command and control linkage through the life cycle between Navy depots and the operating forces they support; and retains the vital engineering and emergency support capabilities which must be available to meet fleet safety and readiness objectives. This alternative preserves Service oversight to ensure maintenance meets mission and readiness requirements.
2. A second alternative is derived from a combination of Alternative I and IV. In addition to maintaining command accountability for the mission of the Service, the establishment of Centers of Excellence for a specific commodity would offer significant opportunity for productivity improvements.
3. There is no clear consensus to other alternatives beyond I and IV.

A handwritten signature in black ink, appearing to read "S. F. Loftus", is positioned above the typed name.

S. F. LOFTUS  
Vice Admiral, U.S. Navy  
Deputy Chief of Naval  
Operations (Logistics)

## APPENDIX I

### NAVY ALTERNATIVE REVIEW

#### Alternative A Individual Service Management

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

Continued effectiveness of the Navy's maintenance process was planned into the Navy's response to DOD's "Defense Management Review Decision-908" (DMRD-908). This alternative directs continuation of the efforts begun in response to DMRD-908. Current co-location of depot level and production facilities allows efficient utilization of expensive unique test equipment, engineering synergism, access to design and production experts, and reduced repair costs. Costs avoidance is achieved by not having to pay for retraining/resystemization costs associated with changing to a new alternative. Any impact attendant to this DMRD has been subsequently identified and resolved to the satisfaction of the Navy.

The Services' control over mission readiness requirements would be maintained as a counter balance to maintenance process sub-optimization. This alternative preserves Service oversight to ensure maintenance meets mission and readiness requirements. The Seven Step Process ensures cost effectiveness of interservicing decisions, and competition or the potential for competition will provide incentive for savings over the pre-DRMD 908 budgets.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Alternative A retains service control over total logistics support of the weapon systems and components thereby causing the least decrement. An existing plan, the "DDMC Corporate Business Plan", outlines initiatives and presupposes that each service has factored in and has developed appropriate contingencies for potential military effectiveness impacts.

**Implementation: Is this alternative realistic?**

This is considered the best alternative given the savings goals already included in DRMD 908. Cost savings goals and objectives have already been identified and implemented under DRMD 908, and their impact have not yet been fully assessed. Current operations attest to the realistic nature of this alternative.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

An Executive Agent for this alternative would be in an administrative role, coordinating the operation of such joint oversight organizations as the Defense Depot Maintenance Council, the meetings of the Joint Logistics Commanders and the supporting organizations. The infrastructure to support this alternative is already in place.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

See above.

**Efficiencies: Are there near or long-term business efficiencies to be gained by this alternative?**

The efficiencies to be gained by this alternative are defined within the "DDMC Corporate Business Plan". Each Service would use their existing expertise in performing DOD maintenance, and fine-tune existing operations.

**Comments:** Alternative A continues the progress made through the efforts of the Defense Depot Maintenance Council and demands steady and consistent business planning discipline be applied and maintained across all of the DOD depot industrial base. It maintains the link between acquisition and life cycle management within the Services for engineering, maintenance, integrated logistics support, and modernization; and provides for graceful emergency depot surge capability. It focuses Services' management attention on individual Service-unique product-line efficiency; and maintains the customer/provider, operator/maintainer direct relationship.

**Alternative B Individual Service Management (Consolidation into "Centers of Excellence")**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative expands Alternative C. Including components of the weapons systems for consolidation with the platform only exacerbates the problems identified in the second alternative. A single Service enables the providing Service to control the total support posture necessary to produce the platform; however, separating the operator from the support organization may degrade military effectiveness. This alternative also disables the Navy's interdependent O/I/D (three level) maintenance program.

The same concerns expressed on Alternative C (same question) apply here; however, this would be less disruptive than Alternative E.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

The Navy is skeptical about the savings potential of this alternative. It does not appear that this alternative changes the present operating methods of the independent Services or requires continuation of the initiatives attendant to DMRD 908 any other productivity thrust.

Remarks under Alternative C, same question, apply here.

**Implementation: Is this alternative realistic?**

This alternative is highly idealistic and probably unrealistic. Transfer of logistics support to a single Service, often not the requiring Service, breaks the synergy between the operator and the repairer. Mission issues will become secondary as the responsibility to meet mission oriented priorities become more distant and disconnected from the depot. The depot optimizes the repair process, not the total weapons system employment process.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

As a designated "DOD Center of Excellence" for a specific commodity, the increased volume would offer opportunity for productivity improvements. Additionally, concentrating management visibility on reduced range of products as well as an increased depth of like and similar commodity items, overhead cost of operations would decline. This would allow for a more focused customer relationship and lead to an enhanced "Reliability/Maintainability Centered" analysis and response.

For ships, the Navy is the sole Service customer of ship depot maintenance in the DOD. As such, it would expect to be named executive agent for ship depot maintenance, and experience little change in its present role.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Performance in accordance with commodity throughput, cost and quality agreements, visibility in advance of problems, so as to allow adjustments if necessary, repair priorities maintained equally across Services and a responsive point of contact.

**Efficiencies: Are there near or long-term business efficiencies to be gained by this alternative?**

None foreseen. Near-term benefits from consolidation would be overcome by cost to implement and maintain. Long-term forecast is dependent upon unstated efficiencies by the executive agency which would have a virtual monopoly on the managed platform/commodity.

**Comments:** There appears to be no "Business Imperative" to improve or no compelling interest toward productivity. This alternative alters the commodity mix between the Services, but does nothing to alter the fundamental business precepts of the Services.

**Alternative C Consolidate Weapons System Platforms into Joint Service "Centers of Excellence"**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative mandates a break in the synergy between the "weapon" and the "system" and a division of repair focus such that Service mission responsibilities would be secondary to the maintenance process and, thus, could be impaired. For example, under the alternative the Air Force maintains all missiles but does not have the knowledge of nor experience with, the unique ship-missile system integration nor with the marine environment which faces Navy equipment. The default position would be one which does not recognize the different employment of the Service systems. Conflicting priorities, relocation, and transportation costs would be significantly affected. The total logistics support integration would increase the size of the logistics "layin" in support of pipeline and thereby necessitate either reduction in military effectiveness or increased total cost of operations.

This alternative breaks the synergy between weapons and the maintenance system. It would create a division between the repair function and the overall mission responsibility of each Service. Layering between the operator and the maintainer would ensure that operational problems and needs would seldom be heard. It would be a tremendous if not expensive undertaking to maintain mission/asset readiness when systems maintenance and management are consolidated for their physical generic similarities rather than the performance and employment requirements which the individual systems must meet and which set them apart from each other.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

This alternative will not provide substantial savings. Any savings potential must first be viewed within the overall context of mission performance by the Services. It is possible to set forth the alternatives to provide least cost for a given maintenance program or organization, or the best maintenance program or organization for a given funding level. The Navy is currently pursuing the former approach in order to meet current maintenance guidance. This will ensure ship and operator safety in a highly risky operational environment.

**Implementation: Is this alternative realistic?**

This alternative is realistic, but lessons learned from the establishment of Single Manager for Conventional Ammunition in the late 1970's should be reviewed.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

The Navy presently integrates interservicing workload into the routine "Work in Process" and only applies extraordinary management visibility when there are exceptional, warranting conditions. "Executive Agency" would require extraordinary management visibility. It would require exceptional sensitivity to the other Services' mission and role within the broader context of defense priorities and unique requirements that emerge from their mission and role responsibilities.

The Navy is the sole Service customer of ship depot maintenance in the DOD. As such, it would expect to be named executive agent for ship depot maintenance, and experience little change in its present role.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Adaptation of the other Services' support posture to meet the unique mission and responsibility of the Navy, repair priorities maintained equally across Services, and a responsive point of contact. A joint service charter defining roles and responsibilities of all involved parties, prioritization, cost sharing, etc. should be established. The establishment of Single Manager for Conventional Ammunition as a baseline.

For ships, the Navy would expect to be named executive agent for ship depot maintenance, and experience little change in its present role.

**Efficiencies: Are there near or long-term business efficiencies to be gained by this alternative?**

Theoretical long-term efficiencies are possible. This, however, depends upon the extent of "Special Handling" that is required of the "Executive Agent". With a reduction in management staff, "Special Handling" could cause increased inefficiencies over time. Near-term efficiencies are not projected to offset the cost of capability relocation or any of the other "Non-recurring" attendant costs.

From the Navy ordnance perspective, there would be no near or long-term efficiencies. Tactical missile maintenance has been consolidated at Letterkenny effective FY93; Torpedoes and Mines are unique to the Navy; Air-launched Ordnance and Surface Munitions are performed jointly with the Army; TOMAHAWK is 100% commercial; Standard Missile is 65% commercial.

There are no long-term business efficiencies expected from this alternative for ship depot maintenance.



**Comments:** There is a moderate potential for increased savings - mostly aircraft. There is excess capacity at all ALCs. Efficiency would improve due to activities doing like jobs, one location (series of location) for shipment of materials and stability of workforce in a central area. However, this alternative breaks some customer/provider, operator/maintainer direct links through the life cycle. This alternative also presents conflicting priorities as well as a significant investment cost to relocate workload which may not be offset by lower recurring costs. Separation of platform and component repair will require additional cost for reduced repair turn-around time or increased inventory levels to offset shipment time for components. This alternative may require additional turn-around time for platform because of the need to ship, open, and inspect components. Fate of non-industrial support services provided by Navy depots (e.g., in-Service engineering, ILS support to Headquarters, battle damage repair teams, etc.) is in question. This alternative would eliminate concurrent repair platform sites. Site selection for the lead maintenance activity would be a "political football".

**Alternative D Individual Service Management of Weapon System Platforms in "Centers of Excellence" with DLR's, Components and Non-Weapon System Equipment Consolidated in Single Service "Centers of Excellence"**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

The creation of Center of Excellence for system components could produce economies of scale, but the savings would have to offset additional facilitization, transportation/handling, scheduling, training, and associated costs. The separation of accountability is present; however, responsibility for the integrity of the platform is retained within the parent Service and therefore the command linkage to accountability for the mission of the Service is maintained. Conflicting priorities, relocation and transportation would be significantly affected.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Service management of the platform may preclude any significant decrease in military effectiveness. Adjustments within the logistics support posture of the platform manager would offset any effectiveness decrement attendant to this alternative. The little adjustments which might be made necessary would be more than offset by the cost savings potential.

Remarks under Alternative C, same question, apply here.

**Implementation: Is this alternative realistic?**

This alternative combined with the initiatives already identified in Alternative A could provide the most realistic chance of success. By selecting the most labor intensive functions to be performed at COE's, the individual Services would still maintain the necessary ownership over the weapon systems/platforms.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

As a designated "DOD Center of Excellence" for a specific commodity, the increased volume would offer significant opportunity for productivity improvements. Additionally, by concentrating management visibility on reduced range of products as well as an increased depth of like and similar commodity items, overhead cost of operations would decline. This would allow for a more focused customer relationship and lead to an enhanced "Reliability/Maintainability Centered" analysis and response.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Customer would expect performance in accordance with commodity throughput, cost and quality agreements, visibility in advance of problems, so as to allow adjustments if necessary. Repair priorities must be maintained equally across Services and a responsive point of contact that could meet critical short-fused needs of the Fleet operators would all be expected from a single manager. The Service providing the support of components would have to provide equal or better scheduling and quality from present practice. This support includes scheduling to meet the critical short-fused needs of the Fleet operators as required.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

It is presumed that selection of "DOD Centers of Excellence" would be made utilizing competitive analysis. Therefore, the costs attendant to initial establishment of this alternative would potentially be absorbed by productivity returns. Near-term efficiencies would therefore be possible or, at very least, break even. By selecting appropriate components to be accomplished at COE's, long-term savings could be achieved, but initial investment cost will be required in the short term. There is a business advantage in reducing the range of different types of products and increasing the specialization and depth of product operations.

From the Navy ordnance perspective, there would be no near or long-term efficiencies. Tactical missile maintenance has been consolidated at Letterkenny effective FY93; Torpedoes and Mines are unique to the Navy; Air launched Ordnance and Surface Munitions are performed jointly with the Army; TOMAHAWK is 100% commercial; Standard Missile is 65% commercial.

**Comments:** Alternatives A and D offer the best opportunity to enhance the depot industrial business enterprise of the Joint Services by accelerating the tempo of the initiatives outlined in the "DDMC Corporate Business Plan".

**Alternative E Consolidation of Similar/Common Platforms, DLR's, Components and Non-Weapon System Components Under Single Executive Service**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

The Navy's ability to support sustained periods of operations at sea is dependent on the interactions of three levels of maintenance operating as one. This alternative builds a disjointed process to achieve depot maintenance. It separates total and integrated logistics support. In doing so, accountability for the mission of the service is diffused. The resultant responsibility for the commodity is no substitute for the direct linkage between operations and integrated logistics which is the underpinning of the Services' mission accountability. It would increase the scheduling/logistics by an order of magnitude at a significant cost and risk. Conflicting priorities, relocation, and transportation would be significantly affected.

The same remarks as under Alternative C (same question) apply here. However, Alternative E would create an even more disjointed approach to the task of effectively managing DOD maintenance requirements. This one would probably be too difficult and too risky.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

This alternative deals with consolidation at the component level. The resultant cost would be enormous. Again, see Alternative C remarks, same question.

**Implementation: Is this alternative realistic?**

This alternative is realistic, but lessons learned from the establishment of Single Manager for Conventional Ammunition in the late 1970's should be reviewed. There is no clear benefit set forth for centralization other than centralization, itself.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

The Navy presently integrates interservicing workload into the routine "Work in Process" and only applies extraordinary management visibility when there are exceptional, warranting conditions. "Executive Agency" would require extraordinary management visibility. It would require exceptional sensitivity to the other Services' mission and role within the broader context of defense priorities and unique requirements that emerge from their mission and role responsibilities. The Navy would solicit weapon system support information from user activities, then develop support requirements. A structure capable of being responsive to requirement documents would be developed as well as an implementation plan.

For ships, the Navy is the sole Service customer of ship depot maintenance in the DOD. As such, it would expect to be named executive agent for ship depot maintenance, and experience little change in its present role.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Adaptation of the other Services' support posture to meet the unique mission and responsibility of the Navy, repair priorities maintained equally across Services, and a responsive point of contact.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Theoretically, some long-term efficiencies are possible. This, however, depends upon the extent of "Special Handling" that is required of the "Executive Agent". With a reduction in management staff, "Special Handling" could cause increased inefficiencies over time. Near-term efficiencies are not projected to offset the cost of capability relocation or any of the other "Non-recurring" attendant costs.

There are no long-term business efficiencies expected from this alternative for ship depot maintenance.

**Comments:** Separation of platform and component repair will require additional cost for reduced repair turnaround time or increased inventory levels to offset shipment time for components. See comments under Alternative C.

## Alternative F DOD Consolidation

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

Establishing a new Service for depot maintenance would create a new bureaucracy and additional layer of management. It would eliminate current Service responsibility/pride of ownership, and the associated technical synergism/cost efficiency of co-located production/depot facilities. It will ultimately reduce quality by attempting to achieve cost savings and facility consolidations as a priority over logistics support of the operating forces. Separating the operator from the support organization may degrade military effectiveness and would require several layers of staffing to breakdown major systems to depot working levels. This alternative also disables the Navy's interdependent O/I/D (three level) maintenance program.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Potential for savings is somewhat unclear in this alternative.

**Implementation: Is this alternative realistic?**

This alternative is realistic; however, it would destroy the DOD material management structure for the goal of consolidation. It would be difficult to implement.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Individual Service as "Executive Agent" is not proposed in this alternative.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The "Executive Agent" (presumably DOD) would coordinate commodity production without regard to inter-conflicting and independent Service priorities. This solution eliminates Service partiality.

For ships, the Navy is the sole Service customer of ship depot maintenance in the DOD. As such, it would expect to be named executive agent for ship depot maintenance, and experience little change in its present role.

**Efficiencies: Are there near or long-term business efficiencies to be gained by this alternative?**

Many of the near-term efficiencies might be overcome by costs to implement; however, there are some long-term business efficiencies and potential savings across all of the Services.

**Comments:** If platform management responsibility is removed from the parent Services, then Alternative F would be the viable way to, at least partially, preserve the critical linkage between operator, the logistics pipeline, and the depot maintenance support structure.

## Alternative G Commercialize Maintenance

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative proposes to separate the logistics support from military operations and place contract officers in line with the command and control function and between the product necessary to perform the mission. It would require a larger contracting bureaucracy to manage the private sector contracting and oversight. Contracts cannot sustain continued surge/mobilization responsibility. The alternative would reduce military effectiveness due to total reliance on the private sector and loss of expertise and capability in the Navy.

The primary issue of this alternative is the definition and quantification of what it will take to keep the private sector "in the business" during periods of low workload, so that necessary repair capability is preserved and available when needed. The focus of the corporate Board Room is profit, whereas the focus of the public sector facilities is readiness. Once public sector capability is closed, it is essentially lost. When the private sector decides to leave the market place for economic or profitability reasons, there is no alternative of last resort except extremely high premium payments of exorbitant re-capitalization costs. The current public sector organic activities provide facilities and expertise not available in the private sector (e.g., submarine refueling, large dry docks, propeller shop, recycling, etc.). This alternative would not provide the necessary surge capability required for mobilization.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

It is possible to set forth the alternatives to provide least cost for a given maintenance program or organization, or the best maintenance program or organization for a given funding level. The Navy is currently pursuing the former approach in order to meet current maintenance guidance.

It must be pointed out, that this alternative would most likely not produce substantial savings in the long run. The fact that there would always be the threat of a lack of competition, if not the actual disappearance of competition, would make substantial savings elusive, and higher costs than experienced at present, a more likely outcome.

**Implementation: Is this alternative realistic?**

This alternative is not realistic.



**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Not Applicable

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Not Applicable

**Efficiencies: Are there near or long-term business efficiencies to be gained by this alternative.**

If the same contractor wins after two or more competitions, his competitors could very easily be driven out of the business, thereby creating a sole source situation. (In fact, in periods of low workload, there would not be any certainty of sufficient competition.) This would almost invariably lead to excessive profits which would offset possible savings gained from elimination of civil service personnel.

Any potential near or long-term gain would be more than offset by cost of establishing extensive Corps of Contract Officers, Negotiators, DPRO personnel, etc. There is a potential of higher overall costs without a check/balance system and higher life-cycle costs are probable. Total reliance on private sector is not acceptable.



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
WASHINGTON, D.C. 20380-0001

IN REPLY REFER TO  
5000  
LP  
27 OCT 1992

MEMORANDUM FOR DIRECTOR EXECUTIVE WORKING GROUP FOR DEPOT  
MAINTENANCE CONSOLIDATION STUDY

Subj: DEPOT MAINTENANCE CONSOLIDATION STUDY

Encl: (1) Information Papers  
(2) Marine Corps Assessment of Alternatives I - VII

1. Enclosures (1) and (2) are forwarded.
2. While efforts to reduce costs and eliminate excess depot maintenance capacity are supported, I am convinced that it is vital to retain an adequate capability within the Marine Corps to satisfy the National Military Strategy and to provide the Commandant with the ability to effectively exercise his Title 10 responsibilities (ie; maintenance and repair of equipment in support of amphibious missions).
3. The Marine Corps multi-commodity maintenance centers are small, effective organizations geographically positioned to reduce costs and optimize responsive support to the operational commanders. These activities, primarily in direct support of Fleet Marine Force (FMF) and Maritime Prepositioning Force (MPF) readiness commitments, devote more than 80% of their direct labor hours to a maintenance/repair workload that is an extension of FMF capabilities and is less than total rebuild. Marine Corps maintenance centers conduct only one percent of the total annual Department of Defense depot maintenance workload. Of this effort 54 percent is in support of unique Marine Corps weapons systems. The remaining workload consists of a variety of small quantity, low dollar value items which if distributed to other maintenance facilities would neither increase their utilization percentage nor decrease their overhead costs.
4. I support increased levels of competition, other productivity enhancing programs and stronger utilization of the JPCG-DM organization; however, the Marine Corps must retain the capability to satisfy our statutory "force-in-readiness" mission and be able to surge in compliance with the National Military Strategy and the Defense Planning Guidance.

*R.A. Tibout*

R. A. TIBOUT  
LIEUTENANT COLONEL, U.S. MARINE CORPS  
DEPUTY CHIEF OF STAFF FOR  
INSTALLATIONS AND LOGISTICS

## APPENDIX J

### MARINE CORPS ALTERNATIVE REVIEW

#### PREFACE

The two Marine Corps Multi-Commodity Maintenance Centers (located at Marine Corps Logistics Base, Albany, Georgia, and Marine Corps Logistics Base, Barstow, California) are uniquely different from the depot maintenance facilities of the other services. They are an extension of the Fleet Marine Force (FMF) operational maintenance capabilities. As depicted below, our maintenance centers support various customers; however, 98 percent of their workload is in support of Marine Corps programs:

#### WORKLOAD DISTRIBUTION CHART

CUSTOMER	PERCENT
FMF END ITEMS*	68.8
FMF SDR'S	4.5
OTHER DOD	1.1
OTHER FMF SUPPORT	3.0
SHIPMENTS	10.2
CARE-IN-STORE	2.8
OTHER CUSTOMERS	.3
TECH ASSISTANCE	.4
FOREIGN MILITARY SALES	.3
SPECIAL PROJECTS	<u>8.6</u>
TOTAL	100.0

\* Includes an FMF repair and return program.

The maintenance centers are small, effective organizations geographically positioned to provide responsive maintenance (repair) support to active FMF components, the Marine Reserve forces, and the Maritime Prepositioning Force (MPF). The maintenance centers are geographically positioned and uniquely configured to reduce costs and optimize responsive support to operational commanders. They are considered an integral part of our overall logistics process and are key components in the Marine Corps ability to fulfill its global commitments.

The continuous reconstitution of the MPF is an example of the unique support provided by our maintenance centers. Responsiveness is the key to maintaining this capability. Based on the recent employment of MPF in Southwest Asia and the massive regeneration effort

currently underway (which will continue through April 1994), the maintenance centers are critical to supporting this global capability. It is a 60-day cycle from the moment an MPF ship docks at the leased facilities at Blount Island, Florida, to the time that ship sails. Fifteen of these days are dedicated to offload and backload of equipment and supplies. The remaining days allow for the equipment and supplies to be inspected, reworked as needed, and repaired. Without the direct support and priority given to MPF at the maintenance centers, meeting the ship's schedule would be virtually impossible. MPF has "head of the line" privilege at the maintenance centers as the Marine Corps has determined that MPF is the number one priority of our total logistics support system. All equipment removed from MPF ships can be worked at our maintenance centers except ammunition. If consolidated depots were adopted, the equipment removed from MPF ships would be parceled to various locations and, in turn, would be returned from these locations at varying times. The Marine Corps currently has sole management control over this vital program. This is extremely important; and it must be emphasized that Blount Island is not merely a customer of the maintenance centers (primarily the one at Albany), but an integral part of the Marine Corps "force in readiness" mission. This direct link enables immediate support and responsiveness to changing priorities as each of the 13 MPF ships is on a 30-month maintenance cycle. This process is one that will continue indefinitely beyond the surge augmentation effort required as a result of Desert Shield/Storm.

As demonstrated in Desert Shield/Storm, MPF provided a new dimension in mobility, readiness, and global responsiveness.

Three squadrons of maritime prepositioning ships are deployed strategically, prepared to immediately provide Marine forces with the equipment necessary to respond to regional contingencies around the globe. Provisioning and maintaining the equipment embarked aboard these ships are vital to the overall mission of these forces. At our modern and uniquely capable leased facilities at Blount Island, Florida, our maintenance centers extend their reach by providing highly trained maintenance personnel to conduct maintenance cycles that modify, rotate, and service embarked equipment.

The following capabilities and facilities of our maintenance centers insure quality support of not only unique Marine Corps equipment but also service common items:

- Capability to repair night vision devices (one of only two facilities in DoD)
- Capability in areas of fiber optics and electro-optics 4 axle chassis dynamometer unique for LAV rebuild
- 3.75 million gallon test pond for speed testing amphibious vehicles
- 1 mile oval paved test track for wheeled and tracked vehicles
- Cross drive transmission dynamometer that is capable of testing M109/M110 Self-Propelled Howitzers, M60A1 Tanks, M88A1/M578 Retrievers, and the AAV7A1 family of vehicle transmissions
- Taylor 2000 hp computer-controlled engine dynamometers
- Class 100 and class 1000 clean rooms
- Nondestructive testing capabilities

- 420 kV X-ray facilities
- Magnetic particle
- Dye penetrant
- Hardness
- Profilometer
- Large scale uninterrupted power capabilities
- Laser capabilities
  - Indoor laser safe facility for the repair, test, and calibration of class 3 and 4 lasers and laser systems
  - Outdoor laser safe boresight range for testing of class 3 and 4 lasers and laser systems
- Laser dimensional measurement capability
- Full range metrology and radiac capabilities
- Flexible computer integrated manufacturing technology
- Engineering laboratory capabilities
  - Wet scanning electron microscope
  - X-ray fluorescence
  - Gas chromatograph
  - Spectrometer
  - Spectrophotometer
- High degree of expertise in the repair and rebuild of surveying and astronomic theodolites
- Automated and manual calibration of dc to 18 GHz equipment
- Alpha, Beta, Gamma test, measurement, and diagnostic equipment repair and calibration to include liquid scintillation measurements
- Semiautomated linearity rail used for test and calibration of various infrared and laser-based electronic distance measuring devices
- Special Projects Section chartered to provide design, development, prototyping, and manufacturing of ground equipment requirements when no other ready source of supply is available
- Highly skilled technicians and engineers who are experts in automated test equipment. MCLB Albany is designated as the Marine Corps central point for design/development of automatic test equipment and test program sets to test weapon systems and equipment.
- Horizontal external honing and lapping machine, a horizontal internal honing and lapping machine, mechanical gymnasticators, a vertical honing and lapping machine, and a vapor honing machine for rebuild of gun mounts for self-propelled and towed artillery
- Horizontal magnetic particle inspection machine for testing gun tubes up to 8 inches and beyond

### Alternative A Individual Service Management

Each service retains its own separate depot maintenance operations with accelerated DMRD 908 actions, to include interservicing, internal streamlining of depots, reduced depot management staffs at higher headquarters, increased competition, teaming with private industry for remanufacturing/manufacture, increasing productivity of the direct labor work force, etc. Additional depot closures and realignments would be accomplished through the base realignment and closure process. The Defense Depot Maintenance Council will provide management oversight.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative would retain the Marine Corps proven capability.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

While some small degradation in materiel readiness may be acceptable, the ability to support two major regional contingencies requiring total Marine Corps commitment must be retained.

This alternative will allow the Marine Corps to maintain command and control of the maintenance centers, satisfy the National Military Strategy requirements, and provide the Commandant the capability to exercise his Title 10 responsibilities.

**Implementation: Is this alternative realistic?**

This alternative is realistic and preferred by the Marine Corps. It will allow us to realize or exceed our current DMRD 908 targets in all categories by increasing public/private competition interservicing, and total quality leadership (TQL) improvements which will ensure efficiency and the capability to satisfy a surge wartime environment in support of the National Military Strategy.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-Up projects," etc.?**

Although not applicable to this alternative, the Marine Corps has a streamlined, centralized logistics command structure that provides the flexibility to quickly realign resources to satisfy the National Military Strategy. Our weapon system/equipment management concept centralizes control of logistics elements to eliminate redundancy while providing a single point of contact for operational commanders.

We would apply our management expertise and concepts to meet other service depot maintenance requirements and provide the responsiveness and flexibility for which the Marine Corps is noted. Achieving the highest state of peacetime combat readiness, within fiscal constraints, and quickly adapting to changing requirements during times of conflict are proven capabilities of the Marine Corps logistics system. Our focus continues to be on optimizing the entire logistics process, vice optimization of any single element.

Some additional resources would be required to provide maintenance management for any areas where the Marine Corps is selected as executive agent. Our philosophy of pushing the responsibility and authority down to the lowest level allows us to minimize Headquarters' overhead. Our current Headquarters' overhead ratio to the maintenance centers is the lowest in DoD. We would attempt to apply this same ratio to any additional maintenance management responsibilities for which we would be selected.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Although not applicable in this option, the Marine Corps would expect to receive the same or better responsiveness from any maintenance manager as we currently receive from our own organization. A single manager must guarantee that surge capabilities exist to meet the Marine Corps mobilization and MPF requirements. A single manager would be required to provide rapid turnaround to continuously changing requirements as demonstrated by the Marine Corps maintenance centers during Desert Shield/Storm. This flexibility would require the single manager to concurrently support unique Marine Corps-configured equipment in small quantities with short turnaround times and at the same time continue to provide the assembly line support of common items. Also, the ability to accept reprioritization of requirements and resources in order to adapt to quickly changing environments is mandatory. Total costs must not exceed current expenditures and must include areas such as repair, transportation, overhead, and inventory requirements.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Yes. The Marine Corps has exceeded DMRD 908 targets in all categories and continues to realize significant savings as TQL principles are implemented. Increased public/private competition, interservicing, and TQL improvements will ensure that we are militarily effective and operationally efficient.

#### **PROS**

- Allows the Commandant to fulfill his Title 10 responsibilities
- Marine Corps retains its centralized logistics command structure
- Ensures a Marine Corps depot maintenance "core" capability

- Retains organic surge capabilities as utilized during Desert Shield/Storm as well as continuously supporting the MPF
- Retains reconstitution capabilities as demonstrated during post-Desert Shield/ Storm
- Accelerates and increases savings
- Necessitates increased competition and interservicing
- No loss of direct support to FMF operational requirements
- Realistic implementation without increased cost
- Allows tailoring of equipment and concepts to suit Marine Corps mission
- No degradation to readiness
- No additional investment in inventories to fill the pipeline
- Minimal transportation costs
- Minimizes equipment maintenance turnaround time
- Supports Marine Corps Base Force
- Supports National Military Strategy
- Least disruptive to the work force
- Minimizes overhead costs

#### **CONS**

- Savings resulting from the efficiencies achieved through this alternative will be taken away from the service and will not be available for utilization to increase service readiness
- Slight personnel increases in support of competition



### **Alternative B Individual Service Management (Consolidation into "Centers of Excellence")**

In conjunction with single service maintenance management of weapon systems platforms (Alternative C), depot maintenance of depot level repairables (DLRs) and components installed in these weapon system platforms would be managed by the same service that manages the weapon system. This provides single service management of a weapon system platform and all its components. Maintenance facilities for weapon system platforms and DLRs and components as well as for nonweapon system equipment would be consolidated into "centers of excellence" within the managing service to the maximum extent possible but could be also performed at a contractor's plant or, in exceptional cases, in other services' facilities.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Service's maintenance process?**

The Marine Corps maintenance process would be disrupted at all levels. Our maintenance centers provide total weapon system repair of principal end items and their associated components. The maintenance centers support not only depot level requirements but also enhance the Marine Corps intermediate level maintenance effort by accepting FMF workload which exceeds the capacity of the lower echelons of maintenance. Any reduction to this maintenance capability will directly impact the readiness of our FMF operating forces. Maintenance centers support the majority of Marine Corps ground combat equipment and do not specialize in support of specific commodities. This has proven to be the most effective means of support, given the diversity of weapon systems and the small numbers of each type repaired annually. We have also embraced the inspect and repair only as necessary maintenance concept vice the traditional total overhaul focus of depot maintenance. To further maximize efficiencies, maintenance center personnel are cross-trained to work on a variety of equipment in different commodities. Cross-training provides the flexibility to rapidly realign the work force to meet changing FMF requirements.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

While some small degradation in readiness could be accepted, our worldwide commitments continue; and surge capabilities in support of the National Military Strategy must be retained. Predicting the time, place, and circumstances where the Marine Corps will be committed will continue to be difficult as was demonstrated in our recent involvement in Liberia, Kuwait, Somalia, and Iraq, as well as humanitarian assistance operations for natural disasters in Florida, Hawaii, Bangladesh, and the Philippines.

As was proven in an April 1990 Defense Depot Maintenance Council (DDMC) workload consolidation study, the Marine Corps would not gain any savings by moving workload out of Marine Corps depots and spreading it to other service facilities. Furthermore, this approach could also potentially jeopardize our military effectiveness.

Materiel readiness is a responsibility of command, and this alternative does not allow the Commandant to satisfy National Military Strategy requirements or effectively exercise his Title 10 responsibilities.

**Implementation: Is this alternative realistic?**

This alternative may be realistic for the other Services; however, if the Marine Corps had to depend entirely on external maintenance support, the program would be cost prohibitive, ineffective, and unmanageable due to the large number of low density multicommodity items which would require interservicing.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-Up projects," etc.?**

The Marine Corps has a streamlined, centralized logistics command structure that provides the flexibility to quickly realign resources to satisfy the National Military Strategy. Our weapon system/equipment management concept centralizes control of logistics elements to eliminate redundancy while providing a single point of contact for operational commanders. Although small in comparison to the other services, the Marine Corps currently provides executive agent management for weapons systems, such as amphibious assault vehicles, light armored vehicles, SB-3614 Switchboards, and AN/TPB-1D, Radar Sets.

We would apply effective management expertise and concepts to meet other service depot maintenance requirements and provide the responsiveness and flexibility for which the Marine Corps is noted. Achieving the highest state of peacetime combat readiness, within fiscal constraints, and quickly adapting to changing requirements during times of conflict are proven capabilities of the Marine Corps logistics system. Our focus would continue to be on optimizing the entire logistics process, vice optimization of any single element.

Some additional resources would be required to provide maintenance management for those areas where the Marine Corps is selected as executive agent. Our philosophy of pushing the responsibility and authority down to the lowest level allows us to minimize Headquarters' overhead. Our current Headquarters' overhead ratio to the maintenance centers is the lowest in DoD. We would attempt to apply this same ratio to any additional maintenance management responsibilities for which we would be selected.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Marine Corps would expect to receive the same or better responsiveness from any maintenance manager as we currently receive from our own organization. A single manager must guarantee that surge capabilities exist to meet the Marine Corps mobilization and MPF requirements. A single manager would be required to provide rapid turnaround to

continuously changing requirements as demonstrated by the Marine Corps maintenance centers during Desert Shield/Storm. This flexibility would require the single manager to concurrently support unique Marine Corps-configured equipment in small quantities and short turnaround times and at the same time continue to provide the assembly line support of common items. Also, the ability to accept reprioritization requirements and resources in order to adapt to quickly changing environments is mandatory. Total costs must not exceed current expenditures and must include areas such as repair, transportation, overhead, and inventory requirements.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Realignment of the relatively small amount of workload performed at the Maintenance Centers (less than 1 percent of the total FY 91 DoD depot maintenance workload) would not have a significant impact on overall DoD depot maintenance capacity utilization or significantly reduce the overhead within the Marine Corps. However, such a realignment would have a serious negative impact on the Marine Corps ability to meet its operational commitments within current fiscal constraints.

As proven in a April 1990 DDMC workload consolidation study, as depicted below, there would be a net cost of \$195 million over a 5 year period and a recurring cost of \$25 million per year if workload (68.8 percent major equipment, 4.5 percent secondary depot level reparable, and 27.7 percent all other) was realigned from Marine Corps depots and spread among other service facilities. Therefore, realignment or consolidation is impractical from a business perspective. We will continue to assess the requirement for, and effectiveness of the two Marine Corps Maintenance Centers and will propose changes and realignments as appropriate.

SUMMARY OF  
 COST ANALYSIS OF PROPOSAL TO CLOSE  
 DMA'S ALBANY AND BARSTOW  
 (\$000)

COSTS:

<u>ELEMENTS</u>	<u>YEAR CLOSED</u>					<u>TOTAL</u>
	<u>FY-91</u>	<u>FY-92</u>	<u>FY-93</u>	<u>FY-94</u>	<u>FY-95</u>	
Move IPE	9,930					9,930
Move/Sever People	19,802					19,802
Facilities	8,775					8,775
Weapon System Management	1,225	1,262	1,300	1,339	1,379	6,504
Transportation	7,306	7,525	7,751	7,983	8,223	38,789
Inventory	35,623	3,562	3,672	3,786	3,903	50,546
New Hires	5,652					5,652
Production	11,911	12,268	12,636	13,015	13,406	63,237
Alt. Training	<u>1,149</u>	<u>1,183</u>	<u>1,219</u>	<u>1,255</u>	<u>1,293</u>	<u>6,099</u>
Totals	101,373	25,800	25,578	27,378	28,204	209,334

SAVINGS:

<u>ELEMENTS</u>	<u>FY-91</u>	<u>FY-92</u>	<u>FY-93</u>	<u>FY-94</u>	<u>FY-95</u>	<u>TOTAL</u>
MILCON	5,910					5,910
BOS	<u>1,600</u>	<u>1,648</u>	<u>1,697</u>	<u>1,747</u>	<u>1,799</u>	<u>8,491</u>
Totals	7,510	1,648	1,697	1,747	1,799	14,401

NET SAVINGS: (93,863) (24,152) (24,881) (25,631) (26,405) (194,932)

- Notes: 1. Multiyear costs escalated at 3 percent per year.  
 2. Numbers may not add due to rounding.

## **PROS**

- Enhances interservicing
- Consolidates workload

## **CONS**

- Would not satisfy the Defense Planning Guidance
- Could prohibit the Commandant from fulfilling Title 10 requirements
- Marine Corps could lose its centralized logistics command structure
- Jeopardizes Marine Corps depot maintenance "core" capability
- Could lose organic surge capabilities
- Could lose reconstitution capabilities
- Savings questionable
- Could eliminate competition
- Loss of direct support to FMF operational requirements
- Unrealistic implementation with increased cost
- Could inhibit tailoring of equipment and concepts to suit Marine Corps mission
- Could degrade readiness if the single manager was not responsive to requirements
- Additional investment required in wholesale and retail inventories to fill pipeline
- Environmental regulations at center of excellence sites would result in increased turnaround times
- Loss of a center of excellence could result in total DoD loss of capability
- Increased production costs
- Increased transportation costs
- Disrupts the concurrent repair of components and principal end items
- Could eliminate up to 75 percent of total current workload
- Increases equipment rebuild turnaround time
- Disruptive to work force
- Saving resulting from the efficiencies achieved through this alternative will be taken away from the Service and will not be available for utilization to increase Service readiness

**Alternative C Consolidate Weapons System Platforms into Joint Service "Centers of Excellence"**

Maintenance management of common or similar weapon system platforms (e.g., ships, large missiles, fixed wing aircraft, and rotary wing aircraft) would be accomplished by a single service. depot level reparables (DLRs) and components (e.g., hydraulic actuators, gas turbine engines, aircraft landing gear, and inertial navigation systems), depot maintenance responsibilities, as well as depot maintenance of nonweapon system equipment (e.g., automatic test equipment, ground support equipment, and general purpose vehicles) would continue to be individual using services' responsibilities.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

The Marine Corps maintenance process would be disrupted at all levels. Our maintenance centers provide total weapon system repair of the principal end items and their associated components. The maintenance centers support not only depot level requirements but also enhance the Marine Corps intermediate level maintenance effort by accepting FMF workload which exceeds the capacity of the lower echelons of maintenance (overflow). Any reduction to this maintenance capability will directly impact the readiness of our FMF operating forces. Maintenance centers support the majority of Marine Corps ground combat equipment and do not specialize in support of specific commodities. This has proven to be the most effective means of support, given the diversity of weapon systems and the small numbers of each type repaired annually. We have also embraced the inspect and repair only as necessary maintenance concept vice the total overhaul focus of traditional depot maintenance. To further maximize efficiencies, maintenance center personnel are cross-trained to work on a variety of equipment in different commodities. Cross-training provides the flexibility to rapidly realign the work force to meet changing FMF requirements.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

While some small degradation in readiness could be accepted, our worldwide commitments continue; and surge capabilities in support of the National Military Strategy must be retained. Predicting the time, place, and circumstances where the Marine Corps will be committed will continue to be difficult as was demonstrated in our recent involvement in Liberia, Kuwait, Somalia, and Iraq, as well as humanitarian assistance operations for natural disasters in Florida, Hawaii, Bangladesh, and the Philippines.

As was proven in an April 1990 Defense Depot Maintenance Council (DDMC) workload consolidation study, the Marine Corps would not gain any savings by moving workload out of Marine Corps depots and spreading it to other service facilities. Furthermore, this approach could jeopardize our military effectiveness.

Maintaining command and control of the Marine Corps maintenance centers allows the Commandant to satisfy the National Military Strategy requirements while effectively exercising his Title 10 responsibilities.

**Implementation: Is this alternative realistic?**

This alternative would be inefficient, ineffective, and unmanageable.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-Up projects," etc.?**

The Marine Corps has a streamlined, centralized logistics command structure that provides the flexibility to quickly realign resources to satisfy the National Military Strategy. Our weapon system/equipment management concept centralizes control of logistics elements to eliminate redundancy while providing a single point of contact for operational commanders. Although small in comparison to the other services, the Marine Corps currently provides executive agent management for weapons systems, such as amphibious assault vehicles, light armored vehicles, SB-3614 Switchboards, and AN/TPB-1D, Radar Sets.

We would apply effective management expertise and concepts to meet other service depot maintenance requirements and provide the responsiveness and flexibility for which the Marine Corps is noted. Achieving the highest state of peacetime combat readiness, within fiscal constraints, and quickly adapting to changing requirements during times of conflict are proven capabilities of the Marine Corps logistics system. Our focus would continue to be on optimizing the entire logistics process, vice optimization of any single element.

Some additional resources would be required to provide maintenance management for those areas where the Marine Corps is selected as executive agent. Our philosophy of pushing the responsibility and authority down to the lowest level allows us to minimize Headquarters' overhead. Our current Headquarters' overhead ratio to the maintenance centers is the lowest in DoD. We would attempt to apply this same ratio to any additional maintenance management responsibilities for which we would be selected.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Marine Corps would expect to receive the same or better responsiveness from any maintenance manager as we currently receive from our own organization. A single manager must guarantee that surge capabilities exist to meet the Marine Corps mobilization and MPF requirements. A single manager would be required to provide rapid turnaround to continuously changing requirements as demonstrated by the Marine Corps maintenance centers during Desert Shield/Storm. This flexibility would require the single manager to concurrently support unique Marine Corps-configured equipment in small quantities and short turnaround times and at the

same time continue to provide the assembly line support of common items. Also, the ability to accept reprioritization requirements and resources in order to adapt to quickly changing environments is mandatory. Total costs must not exceed current expenditures and must include areas such as repair, transportation, overhead, and inventory requirements.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Realignment of the relatively small amount of workload performed at the maintenance centers (less than one percent of the total FY-91 DoD depot maintenance workload) would not have a substantial impact on overall DoD-depot maintenance capacity utilization or significantly reduce the overhead within the Marine Corps. However, such a realignment would have a serious negative impact on the Marine Corps ability to meet its operational commitments within current fiscal constraints.

As proven in an April 1990 DDMC workload consolidation study, as depicted below, there would be a net cost of \$195 million over a 5-year period and recurring costs of \$25 million per year if workload (68.8 percent major equipment, 4.5 percent secondary depot level reparable, and 27.7 percent all other) were realigned from Marine Corps depots and spread among other service facilities. Therefore, realignment or consolidation is impractical from a business perspective. We will continue to assess the requirement for and effectiveness of, the two Marine Corps maintenance centers and will propose changes and realignments as appropriate.



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- Notes: 1. Multiyear costs escalated at 3 percent per year.  
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## PROS

- Enhances interservicing

## CONS

- Would prohibit the Commandant from fulfilling his Title 10 responsibilities
- Marine Corps could lose its centralized logistics command structure
- Jeopardizes Marine Corps depot maintenance "core" capability
- Could lose organic surge capabilities
- Could lose reconstitution capabilities
- Savings questionable
- Could eliminate competition for major end items
- Loss of direct support to FMF operational requirements
- Unrealistic implementation with increased cost
- Inhibits task organizing of equipment and concepts to suit Marine Corps mission
- Could degrade readiness if the single manager were not responsive to requirements
- Additional investment required in wholesale and retail inventories to fill the pipeline
- Increases transportation costs
- Increases equipment maintenance turnaround time
- Disruptive to work force
- Increases overhead costs
- Disrupts the concurrent repair of components and principal end items
- Could eliminate up to 60 percent of the total current workload
- Savings resulting from the efficiencies achieved through this alternative will be withdrawn from the service and will not be available for utilization to increase service readiness

**Alternative D Individual Service Management of Weapon System Platforms in "Centers of Excellence" with DLR's, Components and Non-Weapon System Equipment Consolidated in Single Service "Centers of Excellence"**

In conjunction with individual using services depot maintenance management of weapon system platforms (as in Alternative A), depot level reparables (DLRs) and components and nonweapon system equipment will be consolidated via a "center of excellence" concept, in most cases in a single service.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Service's maintenance process?**

After Alternative A, this alternative has the least disruptive impact on the Marine Corps maintenance process. Our maintenance centers provide total weapon system repair of the principal end items and their associated components. The maintenance centers support not only depot level requirements but also enhance the Marine Corps intermediate level maintenance effort by accepting FMF workload which exceeds the capacity of the lower echelons of maintenance (overflow). Any reduction to this maintenance capability will directly impact the readiness of our FMF operating forces. Maintenance centers support the majority of Marine Corps ground combat equipment and do not specialize in support of specific commodities. This has proven to be the most effective means of support, given the diversity of weapon systems and the small numbers of each type repaired annually. We have also embraced the inspect and repair only as necessary maintenance concept vice the traditional total overhaul focus of depot maintenance. To further maximize efficiencies, maintenance center personnel are cross-trained to work on a variety of equipment in different commodities. Cross-training provides the flexibility to rapidly realign the work force to meet changing FMF requirements.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

While some small degradation in readiness could be accepted, our worldwide commitments continue; and surge capabilities in support of the National Military Strategy must be retained. Predicting the time, place, and circumstances where the Marine Corps will be committed will continue to be difficult as was demonstrated in our recent involvement in Liberia, Kuwait, Somalia, and Iraq, as well as humanitarian assistance operations for natural disasters in Florida, Hawaii, Bangladesh, and the Philippines.

As was proven in an April 1990 Defense Depot Maintenance Council (DDMC) workload consolidation study, the Marine Corps would not sustain any savings by moving workload out of Marine Corps depots and spreading it to other service facilities. Furthermore, this approach could jeopardize our military effectiveness.

Maintaining command and control of the Marine Corps maintenance centers allows the Commandant to satisfy National Military Strategy requirements while effectively exercise his Title 10 responsibilities.

**Implementation: Is this alternative realistic?**

Although not the most desirable alternative for the Marine Corps, this is a viable alternative.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-Up projects," etc.?**

The Marine Corps has a streamlined, centralized logistics command structure that provides the flexibility to quickly realign resources to satisfy the National Military Strategy. Our weapon system/equipment management concept centralizes control of logistics elements to eliminate redundancy while providing a single point of contact for operational commanders. Although small in comparison to the other services, the Marine Corps currently provides executive agent management for weapons systems, such as amphibious assault vehicles, light armored vehicles, SB-3614 Switchboards, and AN/TPB-1D, Radar Sets.

We would apply effective management expertise and concepts to meet other service depot maintenance requirements and provide the responsiveness and flexibility for which the Marine Corps is noted. Achieving the highest state of peacetime combat readiness, within fiscal constraints, and quickly adapting to changing requirements during times of conflict are proven capabilities of the Marine Corps logistics system. Our focus would continue to be on optimizing the entire logistics process, vice optimization of any single element.

Some additional resources would be required to provide maintenance management for those areas where the Marine Corps is selected as executive agent. Our philosophy of pushing the responsibility and authority down to the lowest level allows us to minimize Headquarters' overhead. Our current Headquarters' overhead ratio to the maintenance centers is the lowest in DoD. We would attempt to apply this same ratio to any additional maintenance management responsibilities for which we would be selected.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Marine Corps would expect to receive the same or better responsiveness from any maintenance manager as we currently receive from our own organization. A single manager must guarantee that surge capabilities exist to meet the Marine Corps mobilization and MPF requirements. A single manager would be required to provide rapid turnaround to continuously changing requirements as demonstrated by the Marine Corps maintenance centers during Desert Shield/Storm. This flexibility would require the single manager to concurrently support unique Marine Corps-configured equipment in small quantities and short turnaround times and at the

same time continue to provide the assembly line support of common items. Also, the ability to accept reprioritization requirements and resources in order to adapt to quickly changing environments is mandatory. Total costs must not exceed current expenditures and must include areas such as repair, transportation, overhead, and inventory requirements.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Realignment of the relatively small amount of workload (4.5 percent secondary depot level reparable) performed at the maintenance centers would not have a substantial impact on overall DoD depot maintenance capacity utilization or significantly reduce the overhead within the Marine Corps. We will continue to assess the requirement for, and effectiveness of, the two Marine Corps maintenance centers and will propose changes and realignments as appropriate.

## **PROS**

- Enhances interservicing
- Allows the Commandant to fulfill his Title 10 responsibilities
- Marine Corps retains its centralized logistics command structure
- Marine Corps retains depot maintenance "core" capability for principal end items
- Retains organic surge capabilities as demonstrated during Desert Shield/Storm and in continuous support of MPF
- Retains reconstitution capabilities as demonstrated during post-Desert Shield/Storm
- Retains competition for principal end items
- Least disruptive to work force

## **CONS**

- Reduces direct support to FMF operational requirements
- Could degrade readiness if the single manager were not responsive to requirements
- Some additional investment required in wholesale and retail inventories to fill the pipeline
- Some increased transportation costs
- Savings resulting from the efficiencies achieved through this alternative will be withdrawn from the service and will be available for utilization to increase readiness
- Loss of a center of excellence would result in the total loss of total DoD capability
- Environmental regulations at center of excellence sites could result in increased maintenance turn around time

**Alternative E Consolidation of Similar/Common Platforms, DLR's, Components and Non-Weapon System Components Under Single Executive Service**

In conjunction with single service maintenance management of common or similar weapon system platforms (as in Alternative C ), depot level reparable (DLRs) and components and nonweapon system equipment will be consolidated via a "center of excellence" concept. In most cases, this will be a single service but not necessarily the same single service that manages the weapon system.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Service's maintenance process?**

The Marine Corps maintenance process would be disrupted at all levels of maintenance by segregating the maintenance management of principal end items and secondary depot reparable (see Marine Corps issue paper on maintenance policy and procedures). Our maintenance centers provide total weapon system repair of the principal end items and their associated components. The maintenance centers support not only depot level requirements but also enhance the Marine Corps intermediate level maintenance by accepting FMF workload which exceeds the capacity of the lower echelons of maintenance (overflow). Any reduction to maintenance capability will directly impact the readiness of our FMF operating forces. Maintenance centers support the majority of Marine Corps ground combat equipment and do not specialize in support of specific commodities. This has proven to be the most effective means of support, given the diversity of weapon systems and the small numbers of each type repaired annually. We have also embraced the inspect and repair only as necessary (IROAN) maintenance concept vice the traditional total overhaul focus of depot maintenance. To further maximize efficiencies, maintenance center personnel are cross-trained to work on a variety of equipment in different commodities. Cross-training provides the flexibility to rapidly realign the work force to meet changing FMF requirements.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

While some small degradation in readiness could be accepted, our worldwide commitments continue; and surge capabilities in support of the National Military Strategy must be retained. Predicting the time, place, and circumstances where the Marine Corps will be committed will continue to be difficult as was demonstrated in our recent involvement in Liberia, Kuwait, Somalia, and Iraq, as well as humanitarian assistance operations for natural disasters in Florida, Hawaii, Bangladesh, and the Philippines.

As was proven in an April 1990 Defense Depot Maintenance Council (DDMC) workload consolidation study, the Marine Corps would not gain any savings by moving workload out of Marine Corps depots and spreading it to other service facilities. Furthermore, this approach of the Marine Corps jeopardize our military effectiveness.

Maintaining command and control maintenance centers allows the Commandant to satisfy National Military Strategy requirements while effectively exercise his Title 10 responsibilities.

**Implementation: Is this alternative realistic?**

This alternative would be cost prohibitive, ineffective, and unmanageable due to the large number of low density multi-commodity items which would require interservicing.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-Up projects," etc.?**

The Marine Corps has a streamlined, centralized logistics command structure that provides the flexibility to quickly realign resources to satisfy the National Military Strategy. Our weapon system/equipment management concept centralizes control of logistics elements to eliminate redundancy while providing a single point of contact for operational commanders. Although small in comparison to the other services, the Marine Corps currently provides executive agent management for weapons systems, such as amphibious assault vehicles, light armored vehicles, SB-3614 Switchboards, and AN/TPB-1D, Radar Sets.

We would apply effective management expertise and concepts to meet other service depot maintenance requirements and provide the responsiveness and flexibility for which the Marine Corps is noted. Achieving the highest state of peacetime combat readiness, within fiscal constraints, and quickly adapting to changing requirements during times of conflict are proven capabilities of the Marine Corps logistics system. Our focus would continue to be on optimizing the entire logistics process, vice optimization of any single element.

Some additional resources would be required to provide maintenance management for those areas where the Marine Corps is selected as executive agent. Our philosophy of pushing the responsibility and authority down to the lowest level allows us to minimize Headquarters' overhead. Our current Headquarters' overhead ratio to the maintenance centers is the lowest in DoD. We would attempt to apply this same ratio to any additional maintenance management responsibilities for which we would be selected.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Marine Corps would expect to receive the same or better responsiveness from any maintenance manager as we currently receive from our own organization. A single manager must guarantee that surge capabilities exist to meet the Marine Corps mobilization and MPF requirements. A single manager would be required to provide rapid turnaround to continuously changing requirements as demonstrated by the Marine Corps maintenance centers during Desert Shield/Storm. This flexibility would require the single manager to concurrently support unique Marine Corps-configured equipment in small quantities and short turnaround times and at the

same time continue to provide the assembly line support of common items. Also, the ability to accept reprioritization requirements and resources in order to adapt to quickly changing environments is mandatory. Total costs must not exceed current expenditures and must include areas such as repair, transportation, overhead, and inventory requirements.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Realignment of the relatively small amount of workload performed at the maintenance centers (less than 1 percent of the total FY 91 DoD depot maintenance workload) would not have a substantial impact on overall DoD depot maintenance capacity utilization or significantly reduce the overhead within the Marine Corps. However, such a realignment would have a serious negative impact on the Marine Corps ability to meet its operational commitments within current fiscal constraints.

As proven in an April 1990 DDMC workload consolidation study, as depicted below, there would be a net cost of \$195 million over a 5 year period and recurring costs of \$25 million per year if workload (68.8 percent major equipment, 4.5 percent secondary depot level reparable, and 27.7 percent all other) were realigned from Marine Corps depots and spread among other service facilities. Therefore, realignment or consolidation is impractical from a business perspective. We will continue to assess the requirement for, and effectiveness of, the two Marine Corps maintenance centers and will propose changes and realignments as appropriate.



SUMMARY OF  
 COST ANALYSIS OF PROPOSAL TO CLOSE  
 DMA'S ALBANY AND BARSTOW  
 (\$000)

COSTS:

<u>ELEMENTS</u>	<u>YEAR CLOSED</u>					<u>TOTAL</u>
	<u>FY-91</u>	<u>FY-92</u>	<u>FY-93</u>	<u>FY-94</u>	<u>FY-95</u>	
Move IPE	9,930					9,930
Move/Sever	19,802					19,802
People						
Facilities	8,775					8,775
Weapon System	1,225	1,262	1,300	1,339	1,379	6,504
Management						
Transportation	7,306	7,525	7,751	7,983	8,223	38,789
Inventory	35,623	3,562	3,672	3,786	3,903	50,546
New Hires	5,652					5,652
Production	11,911	12,268	12,636	13,015	13,406	63,237
Alt. Training	<u>1,149</u>	<u>1,183</u>	<u>1,219</u>	<u>1,255</u>	<u>1,293</u>	<u>6,099</u>
Totals	101,373	25,800	25,578	27,378	28,204	209,334

SAVINGS:

<u>ELEMENTS</u>	<u>FY-91</u>	<u>FY-92</u>	<u>FY-93</u>	<u>FY-94</u>	<u>FY-95</u>	<u>TOTAL</u>
MILCON	5,910					5,910
BOS	<u>1,600</u>	<u>1,648</u>	<u>1,697</u>	<u>1,747</u>	<u>1,799</u>	<u>8,491</u>
Totals	7,510	1,648	1,697	1,747	1,799	14,401

NET SAVINGS: (93,863) (24,152) (24,881) (25,631) (26,405) (194,932)

- Notes: 1. Multiyear costs escalated at 3 percent per year.  
 2. Numbers may not add due to rounding.

## PROS

- Enhances interservicing

## CONS

- Would prohibit the Commandant from fulfilling his Title 10 responsibilities
- Marine Corps could lose its centralized logistics command structure
- Jeopardizes Marine Corps depot maintenance "core" capability
- Could lose organic surge capabilities
- Could lose reconstitution capabilities
- Could eliminate competition for major end items and depot level reparable
- Loss of direct support to FMF operational requirements
- Unrealistic implementation with increased costs
- Inhibits task-organizing of equipment and concepts to suit Marine Corps mission
- Could degrade readiness if the single manager were not responsive to requirements
- No cost savings would be realized
- Additional investment required in wholesale and retail inventories to fill the pipeline
- Increases transportation costs
- Increases overhead costs
- Increases personnel costs
- Increases production costs
- Increases facilities costs
- Disrupts the concurrent repair of components and principal end items
- Could eliminate up to 75 percent of total current workload
- Increases equipment rebuild turnaround time
- Disruptive to the work force
- Savings resulting from the efficiencies achieved through this alternative will be withdrawn from the service and will not be available for utilization to increase service readiness
- Environmental regulations at "center of excellence" facilities will result in increased maintenance turnaround time for customers
- Loss of a center of excellence could result in the loss of a total DoD capability

## **Alternative F DOD Consolidation**

Consolidate all depot maintenance functions under one organization external to the Services. This alternative would eliminate Service ownership of depot maintenance. Individual weapon systems, DLRs and components, and non weapon system equipment could be maintained organically, contracted out, or a combination of both. Individual depots could be organic or government owned, contractor operated (GOCO).

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Service's maintenance process?**

The measurement of effectiveness for the Marine Corps cannot be determined without defining the organizational structure of the DoD controlled depot maintenance agency and their vision of the future of maintenance within the Marine Corps.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

While some small degradation in readiness could be accepted, our worldwide commitments continue; and surge capabilities in support of the National Military Strategy must be retained. Predicting the time, place, and circumstances where the Marine Corps will be committed will continue to be difficult as has been demonstrated in our recent involvement in Liberia, Kuwait, Somalia, and Iraq, as well as humanitarian assistance operations for natural disasters in Florida, Hawaii, Bangladesh, and the Philippines.

Maintaining command and control of the Marine Corps maintenance centers allows the Commandant to satisfy the National Military Strategy requirements while effectively exercising his Title 10 responsibilities.

**Implementation: Is this alternative realistic?**

This alternative may be realistic from a centralized management point of view; but, in fact, with the distinctive missions of each service, it becomes unrealistic to implement. It adds layering and decreases the ability of service chiefs to maintain control of their resources as well as to and influence their services' readiness.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-Up projects," etc.?**

The Marine Corps has a streamlined, centralized logistics command structure that provides the flexibility to quickly realign resources to satisfy the National Military Strategy. Our weapon system/equipment management concept centralizes control of logistics elements to eliminate redundancy while providing a single point of contact for operational commanders. Although

small in comparison to the other services, the Marine Corps currently provides executive agent management for weapons systems, such as amphibious assault vehicles, light armored vehicles, SB-3614 Switchboards, and AN/TPB-1D, Radar Sets.

We would apply effective management expertise and concepts to meet other service depot maintenance requirements and provide the responsiveness and flexibility for which the Marine Corps is noted. Achieving the highest state of peacetime combat readiness, within fiscal constraints, and quickly adapting to changing requirements during times of conflict are proven capabilities of the Marine Corps logistics system. Our focus would continue to be on optimizing the entire logistics process, vice optimization of any single element.

Some additional resources would be required to provide maintenance management for those areas where the Marine Corps is selected as executive agent. Our philosophy of pushing the responsibility and authority down to the lowest level allows us to minimize Headquarters' overhead. Our current Headquarters' overhead ratio to the maintenance centers is the lowest in DoD. We would attempt to apply this same ratio to any additional maintenance management responsibilities for which we would be selected.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Marine Corps would expect to receive the same or better responsiveness from any maintenance manager as we currently receive from our own organization. A single manager must guarantee that surge capabilities exist to meet the Marine Corps mobilization and MPF requirements. A single manager would be required to provide rapid turnaround to continuously changing requirements as demonstrated by the Marine Corps maintenance centers during Desert Shield/Storm. This flexibility would require the single manager to concurrently support unique Marine Corps-configured equipment in small quantities and short turnaround times and at the same time continue to provide the assembly line support of common items. Also, the ability to accept reprioritization requirements and resources in order to adapt to quickly changing environments is mandatory. Total costs must not exceed current expenditures and must include areas such as repair, transportation, overhead, and inventory requirements.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

From a purely business perspective, this appears to be an efficiency based on centralized management concepts. But, from a user's perspective, this is creating additional management layers which will cause inefficiencies through layering. Any savings which may be realized through the reduction in individual service headquarters management overhead will, in fact, increase costs in other overhead areas such as materiel management. It is questionable that the Marine Corps would realize a reduction in headquarters management overhead due to the fact that we are extremely streamlined in the management of our maintenance facilities.

**PROS**

- Centralizes DoD management
- On the DoD level it may produce savings at the headquarters organizational level for some services

## **CONS**

- Would prohibit the Commandant from fulfilling his Title 10 responsibilities
- Marine Corps could lose its centralized logistics command structure
- Could jeopardize Marine Corps depot maintenance "core" capability
- Could lose organic surge capabilities
- Could lose reconstitution capabilities
- Could eliminate competition for major end items and DLRs
- Loss of direct support to FMF operational requirements
- Unrealistic implementation with increased costs
- Could increase overhead costs

### Alternative G Commercialize Maintenance

Contract out all depot maintenance requirements. Contract management would be maintained at either the Service or DoD level. The ultimate goal would be to include contract maintenance as part of the weapon system acquisition costs of new systems throughout its life cycle.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Service's maintenance process?**

Reliance on private industry to support the Marine Corps total maintenance workload would jeopardize our ability to retain readiness at the level which must be maintained to support the "force-in-readiness" mission. The uncertainties of private industry to support our dynamic workload changes, as we are able to do today, will drastically affect our mission and readiness. We see only the decrease in military effectiveness with this alternative.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

While some small degradation in readiness could be accepted, our worldwide commitments continue; and surge capabilities in support of the National Military Strategy must be retained. Predicting the time, place, and circumstances where the Marine Corps will be committed will continue to be difficult as has been demonstrated in our recent involvement in Liberia, Kuwait, Somalia, and Iraq, as well as humanitarian assistance operations for natural disasters in Florida, Hawaii, Bangladesh, and the Philippines.

Maintaining command and control of Marine Corps maintenance centers allows the Commandant to satisfy National Military Strategy requirements and effectively exercise his Title 10 responsibilities.

**Implementation: Is this alternative realistic?**

Implementation of this alternative is not realistic. Private industry has neither the industrial base nor the desire to support maintenance for the Marine Corps. Our small portion of the total DoD workload requirement consists of small quantities of low dollar value items. Contracting out costs would be excessive as compared to the current organic costs. Also, contracting of workload does not accommodate the frequent instantaneous requirement changes required to support our mission. Any amendment to the contract would increase the cost. This alternative is totally unacceptable due to cost and nonavailability of the industrial base capability.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-Up projects," etc.?**

The Marine Corps has a streamlined, centralized logistics command structure that provides the flexibility to quickly realign resources to satisfy the National Military Strategy. Our weapon system/equipment management concept centralizes control of logistics elements to eliminate redundancy while providing a single point of contact for operational commanders. Although small in comparison to the other services, the Marine Corps currently provides executive agent management for weapons systems, such as amphibious assault vehicles, light armored vehicles, SB-3614 Switchboards, and AN/TPB-1D, Radar Sets.

We would apply effective management expertise and concepts to meet other service depot maintenance requirements and provide the responsiveness and flexibility for which the Marine Corps is noted. Achieving the highest state of peacetime combat readiness, within fiscal constraints, and quickly adapting to changing requirements during times of conflict are proven capabilities of the Marine Corps logistics system. Our focus would continue to be on optimizing the entire logistics process, vice optimization of any single element.

Some additional resources would be required to provide maintenance management for those areas where the Marine Corps is selected as executive agent. Our philosophy of pushing the responsibility and authority down to the lowest level allows us to minimize Headquarters' overhead. Our current Headquarters' overhead ratio to the maintenance centers is the lowest in DoD. We would attempt to apply this same ratio to any additional maintenance management responsibilities for which we would be selected.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Marine Corps would expect to receive the same or better responsiveness from any maintenance manager as we currently receive from our own organization. A single manager must guarantee that surge capabilities exist to meet the Marine Corps mobilization and MPF requirements. A single manager would be required to provide rapid turnaround to continuously changing requirements as demonstrated by the Marine Corps maintenance centers during Desert Shield/Storm. This flexibility would require the single manager to concurrently support unique Marine Corps-configured equipment in small quantities and short turnaround times and at the same time continue to provide the assembly line support of common items. Also, the ability to accept reprioritization requirements and resources in order to adapt to quickly changing environments is mandatory. Total costs must not exceed current expenditures and must include areas such as repair, transportation, overhead, and inventory requirements.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

The Marine Corps does not see any near or long term business efficiencies to be gained from the implementation of this alternative.

**PROS**

- Increases contracting out of workload to private industry

**CONS**

- Industrial base is not sufficient to support the DoD maintenance requirements
- Could prohibit the Commandant from fulfilling his Title 10 responsibilities
- Eliminates Marine Corps depot maintenance "core" capability
- Would lose organic surge capabilities
- Could eliminate competition for major end items and DLRs
- Loss of direct support to FMF operational requirements
- Unrealistic implementation with increased costs
- No cost savings would be realized
- Additional investment required in wholesale and retail inventories to fill the pipeline
- Increases transportation costs
- Increases overhead costs
- Increases personnel costs
- Increases equipment rebuild turnaround time
- Disruptive to the work force
- Materiel readiness would probably decrease



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DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS UNITED STATES AIR FORCE  
WASHINGTON, D.C. 20330

30 OCT 1992

MEMORANDUM FOR JCS/J-4 (Depot Consolidation Study)

SUBJECT: USAF Assessments of the JCS Depot Consolidation  
Alternatives

The attached documents are provided as requested. My  
POC is Lt Col Morrill (AF/LGMM, 73523).

A handwritten signature in black ink, reading "Trevor A. Hammond", is positioned above the typed name.

TREVOR A. HAMMOND, Lt Gen, USAF  
Deputy Chief of Staff/Logistics

2 Atch

1. USAF Asmt of Dep Alts
2. AF Depot Maint Summary

## APPENDIX K

### AIR FORCE ALTERNATIVE REVIEW

#### PREFACE

As the world evolves, the DOD's organic depot maintenance structure must evolve so it will continue to best support military readiness, sustainability, and regeneration--all of which are key Service roles most directly supporting the Services' core missions.

Some of the alternatives below reflect conservative responses to this need for evolution. While the Services are rightfully conservative or evolutionary entities, they must also be progressive if not revolutionary in anticipating and responding to change. For this reason, alternatives that reflect any variation on the status quo are unacceptable.

In selecting an alternative in response to this change, the Services must serve three masters: national security, economics, and politics. Foremost, the nation's organic Service depot maintenance system must support its customers--the Base Force collectively--in peacetime, contingencies, and war.

Within constraints imposed by this appropriately preeminent national security focus, the Service depot system must be economically viable and progressive such that Service depot operating costs are continually reduced relative to production. Two points are key.

First, the difference between private and public sector "business" is often misunderstood or underappreciated. Private sector business activities are profit and market share oriented. They depend on having production capabilities which duplicate but improve upon a competitor's capabilities--thereby permitting them to gain market share and dominance over another. Conversely, public sector "business" activities are not typically profit oriented. Their object is to break even, reduce costs, and increase quality and throughput--while providing "products" ranging from aircraft landing gear to "national security." In short, they seek to avoid duplicate capabilities.

Second, in deciding to close a Service depot, environmental costs are not considered. These costs are neither included in this study nor a factor in the Base Realignment And Closure (BRAC) process--even though such costs are often of a magnitude that would make an installation's closure fiscally imprudent. For example, the environmental clean up costs associated with closing the Sacramento Air Logistics Center range from \$2-10 billion.

In addition to military and economic factors, those restructuring the Service depot system must also be responsive to the concerns and interests of Members of Congress, especially as they relate to the impact installation closures, facility and equipment divestiture, streamlining, and workload consolidation and transfer have on jobs in a Member's state or district.

The DOD Service depot system restructuring alternatives below reflect a range of approaches. Some are variations on a status quo. Others--one in particular--is disturbing in that it continues the unfortunate trend of divesting the Services of their ability to provide for their own readiness, sustainability, and regeneration. Since the inception of the military departments, these were key Service roles in support of core Service missions. This disturbing trend is manifest in Alternative "F"--the so-called "Defense Depot Maintenance Agency." This alternative reflects a lack of appreciation of the critical differences between private and public sector business processes, and a lack of appreciation of the military necessity for the Services to field and support a total force structure that is combat ready, sustainable, and capable of regeneration. This alternative is one more example of an increasing number of Defense agencies, agencies whose unconstrained growth has resulted in the *de facto* creation of a "fifth Service."

With the JCS-sponsored Defense Depot Maintenance Consolidation Study, the Department of Defense and its component Services have an opportunity to posture themselves to best support national security needs via increasingly efficient means as they achieve increasingly economical defense operations. Given the rapidly evolving political-military-economic environment, the status quo is clearly too little too late. However, the "Defense Depot Maintenance Agency" reflects the opposite extreme--the trend toward extreme centralization, the inappropriate division of the integrated responsibilities concerned with fielding and sustaining ready forces, and the continued unconstrained growth of defense agencies in size and number--witness the Defense Logistics Agency.

Given these factors, it is likely most appropriate to continue to vest in the Services the responsibilities and resources they need to organize, train, and equip ready, sustainable forces capable of responding to any situation affecting the national security of the United States. These roles and responsibilities must be carried out in a progressive and aggressive manner pursuing business economies and efficiencies appropriate to public sector defense production activities. In this regard, Alternative "E" clearly offers the greatest short and long term opportunities and benefits.

### Alternative A Individual Service Management

Each service retains its own separate depot maintenance operations with DMRD 908 actions to include interservicing, internal streamlining of depots, reducing depot maintenance staffs at higher headquarters, increasing competition, teaming with private industry for remanufacturing/manufacture, increasing productivity of direct labor work force, etc. Additional depot closures and realignments would be accomplished through the Base Realignment And Closure (BRAC) process. Defense Depot Maintenance Council (DDMC) will provide management oversight.

**Effectiveness: What are the impacts on the military effectiveness of your Services' maintenance process?**

This alternative results in few progressive improvements to the effectiveness of the Air Force's maintenance process since it essentially preserves the status quo. Capabilities and facilities remain within the current maintenance management structure. However, using Service-controlled reductions and continued rightsizing will result in some evolutionary improvements and constant turbulence across the spectrum of activities. This status quo alternative continues current depot maintenance practices and philosophies, e.g., the Integrated Weapons System Management (IWSM) and the Technology Repair Center (TRC) concepts.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Not if such savings prevent the Air Force's full implementation of the aerospace doctrine associated with the "Global Reach, Global Power" concept, which in turn supports the Base Force. So-called "savings" that impair the Services' readiness, sustainability, and reconstitution reflect a false economy, as was evident in the "Hollow Force of the 1970s."

**Implementation: Is this alternative realistic?**

No. Since this alternative essentially continues status quo, and given national security, economic, and political realities, this alternative is no longer viable.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, Service unique equipment, "Pop-up projects," etc.?**

The Air Force currently performs maintenance for eighty-one foreign nations and other Services. This would not change, i.e., the customer would continue to be supported in accordance with their wishes (work package specifications).

**Are there near or long term efficiencies to be gained by this alternative?**

Short term efficiencies result from competition, and the banking of facilities and equipment. No significant, sustained efficiencies will be realized without major depot workload consolidations and installation closures.

**Military Effectiveness: Pro.**

This alternative retains individual Service control of the readiness, sustainability, and reconstitution of its forces, i.e., production capabilities and priorities supporting the Air Force's contribution to the Base Force. It also satisfies the individual Services' unique maintenance requirements by preserving a Service's existing maintenance concept. From the Air Force perspective only, it supports the Integrated Weapon System Management (IWSM) and the Technology Repair Center (TRC), i.e., the "Center of Excellence," concepts. Moreover, it permits each Service to continue to determine its own priorities, and fund its own modernization and technology requirements. With respect to facilities and equipment, this alternative gives the Services flexibility to absorb critical workloads available due to contract and competition shortfalls or defaults. It also retains billets and critical skills due to non-competed core workloads, while fostering Service-specific depot management staff reductions resulting from DMRD competition.

**Military Effectiveness: Con.**

By essentially continuing the status quo, known inefficiencies and uneconomical processes are continued. This increases force support (readiness and sustainability) costs--which detracts from funds that can be made available for combatant forces (weapon systems/platforms) or other segments of the Federal government. Management of DOD's depot maintenance capability, facilities, and technologies remains fragmented and redundant.

**Business Efficiency: Pro.**

This alternative results in reduced maintenance costs on facilities and equipment due to banking and divestiture. Over the long term, competition promotes savings, which reduces costs. In the production and surge arenas, depots may improve processes and become more competitive. Multiple sources of repair can help sustain the civilian defense industrial base. Competition promotes improvements in business and production practices.

**Business Efficiency: Con.**

Continued redundancy, with its requisite inefficiency and reduced economies, occur. Manpower turbulence resulting from shifted workloads and personnel realignments will occur. Workload that is contracted will result in continued government vulnerability to labor disputes and contractors' demonstrated difficulty in responding to surge requirements--as was seen in Desert Storm. Multiple sourcing of depot maintenance capabilities is expensive. Competitions are manpower intensive, costly, and time consuming, and do not guarantee any return on investment for the depot(s) competing.

**Alternative B Individual Service Management (Consolidation into "Centers of Excellence")**

Under individual using Service management, weapon systems/platforms, DLRs, components, and non-weapon system equipment would be consolidated into "Centers of Excellence" within the using Service to the maximum extent possible, but could be also performed by a contractor or, in exceptional cases, in an other Service's facility.

**Effectiveness: What are the impacts on the military effectiveness of your Services' maintenance process?**

This alternative results in few significant improvements to the effectiveness of the Air Force's maintenance process since it essentially preserves the status quo. Capabilities and facilities remain within the current maintenance management structure. However, using Service-controlled reductions and continued rightsizing will result in some evolutionary improvements and constant turbulence across the spectrum of activities. This alternative continues current depot maintenance practices and philosophies, e.g., the Integrated Weapons System Management (IWSM) and the Technology Repair Center (TRC) concepts.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Not if such savings prevent the Air Force's full implementation of the aerospace doctrine associated with the "Global Reach, Global Power" concept, which in turn supports the Base Force. So-called "savings" that impair the Services' readiness, sustainability, and reconstitution reflect a false economy, as was evident in the "Hollow Force of the 1970s."

**Implementation: Is this alternative realistic?**

No. Since this alternative is essentially a modified status quo, and given national security, economic, and political realities, this alternative is no longer viable.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, Service unique equipment, "Pop-up projects," etc.?**

The Air Force currently performs maintenance for eighty-one foreign nations and other Services. This would not change, i.e., the customer would continue to be supported in accordance with their wishes (work package specifications).



**Are there near or long term efficiencies to be gained by this alternative?**

Short term efficiencies result from the competition, the banking of facilities and equipment. No significant, sustained efficiencies will be realized without major depot workload consolidations and installation closures.

**Military Effectiveness: Pro.**

This alternative appropriately retains individual Service control of the readiness, sustainability, and reconstitution of its forces, i.e., production capabilities and priorities supporting the Air Force's contribution to the Base Force. It also satisfies the individual Services' unique maintenance requirements by preserving a Service's existing maintenance concept. From the Air Force perspective only, it supports the Integrated Weapon System Management (IWSM) and the Technology Repair Center (TRC), i.e., the "Center of Excellence," concepts. Moreover, it permits each Service to continue to determine its own priorities, and fund its own modernization and technology requirements. With respect to facilities and equipment, this alternative gives the Services flexibility to absorb critical workloads available due to contract and competition shortfalls or defaults. It also retains billets and critical skills due to non-competed workloads, while fostering Service-specific depot management staff reductions resulting from DMRD competition.

**Military Effectiveness: Con.**

By essentially continuing the status quo, known inefficiencies and uneconomical processes are continued. This increases force support (readiness and sustainability) costs--which detracts from funds that can be made available for combatant forces (weapon systems/platforms) or other segments of the Federal government. Management of DOD's depot maintenance capability, facilities, and technologies remains fragmented and redundant.

**Business Efficiency: Pro.**

This alternative results in reduced maintenance costs on facilities and equipment due to banking and divestiture. Over the long term, competition promotes savings, which can reduce costs. In the production and surge arenas, depots improve processes--thereby becoming more competitive. Multiple sources of repair can help sustain the civilian defense industrial base. Competition promotes improvements in business and production practices.

**Business Efficiency: Con.**

Continued redundancy, with its requisite inefficiency and reduced economies, occurs. Manpower turbulence resulting from shifted workload and personnel movement and realignment will occur. Workload that is contracted will result in increased government vulnerability to labor disputes and contractors' demonstrated difficulty in responding to surge requirements--as was seen in Desert Storm. Multiple sourcing of depot maintenance

capabilities is expensive. Competitions are manpower intensive, costly, and time consuming--without guaranteeing any return on investment for the depot(s) competing.

**Alternative C Consolidate Weapons System Platforms into Joint Service "Centers of Excellence"**

Depot maintenance management of common or similar weapon system platforms, (e.g., ships, large missiles, fixed wing aircraft, rotary wing aircraft) would be accomplished by single Services. Depot maintenance responsibility for Depot Level Repairables (DLR) and components (e.g. hydraulic actuators, gas turbine engines, aircraft landing gear, inertial navigation systems) as well as depot maintenance of non-weapon system equipment (e.g. automatic test equipment (ATE), ground support equipment, general purpose vehicles) would continue to be the individual using Services' responsibilities.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative has no clear military advantage. The potential of dividing the responsibility for the maintenance of weapon systems/platforms and exchangeables between single and using Services allows the status quo to continue at component repair depot maintenance activities. However, it creates opportunities for enhanced support in the weapon system/platform areas. Since sustainment of the Base Force would only be improved on the margins, this alternative has minimal military value.

**Are you willing to accept some decrement in military effectiveness if substantial saving could be realized by this alternative?**

Not if such savings prevent the Air Force's full implementation of the aerospace doctrine associated with the "Global Reach, Global Power" concept, which in turn supports the Base Force. So-called "savings" that impair the Services' readiness, sustainability, and reconstitution reflect a false economy, as was evident in the "Hollow Force of the 1970s."

**Implementation: Is this alternative realistic?**

No. The implementation of this alternative produces no substantial enhancements to military readiness or increases in fiscal benefit. Moreover, it unnecessarily complicates the depot repair priority process.

**If your Service were selected as the Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipment, "Pop-up projects," etc.?**

The Air Force Materiel Command (AFMC) is dedicated to total quality management principles and continuous process improvement in support of its customers' missions. These philosophies focus on total and complete customer satisfaction. Selected applications of our existing management relationship between weapon systems and TRCs, i.e., "Centers of Excellence" (COE), would continue to be used. This customer service relationship would be

facilitated through clear work specification/packages that are agreed upon by all parties and detailed customer knowledge as demonstrated in proven quality principles. Priorities and the needs associated with special projects would be of great interest, and would be fully supported via well-defined work packages, memoranda of agreement, and customer liaison officers at weapon system/platform depot repair facilities.

**If your service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Measures of value for depot support would be calculated by the depot maintenance system's ability to increase product throughput and quality on a sustained or surge basis, reduced operating costs, and compliance with agreed-upon work packages. These metrics must support the customer Service's readiness, sustainability, reconstitution, priorities, lifecycle data, and product quality.

**Are there near or long term business efficiencies to be gained by this alternative?**

Potentially some near term efficiencies could be gained by consolidating weapon system/platform depot maintenance activities. However, such gains would be offset by the continued existence of redundant Service component depot maintenance activities.

**Military Effectiveness: Pro.**

This alternative promotes a single focal point for weapon system/platform maintenance to customers while it allows the Services to retain mission control of the maintenance of their exchangeables. The retention of critical depot maintenance skills at weapon system/platform facilities is a vital ingredient in the surge capability of the facility and thus, the Services. Expertise is not lost and is concentrated for contingency production (mission) needs.

**Military Effectiveness: Con.**

This alternative divides maintenance management responsibilities, which impairs the Services' ability to sustain and reconstitute ready forces. This divided management responsibility exacerbates data system interface problems between the Services--resulting in multiple inquiries as to the status of a total weapon system's readiness. At non-consolidated component repair sites, support equipment, DLRs, and component inventories, remain unchanged. Since this alternative does not combine all elements of maintenance management, the cost-benefits resulting from technology insertion initiatives (capability enhancements) are reduced at the non-consolidated component depot maintenance facilities. Thus, overall implementation is more difficult due to this divided responsibility.

**Business Efficiency: Pro.**

Consolidation of weapon systems/platforms under an Executive/Single Service reduces the weapon system/platform management structure at the losing (supported) Service, thus reducing the latter's overhead expenses. Duplication of personnel skills for weapon system/platform depot maintenance are minimized DOD-wide, thereby reducing direct labor required. Additionally, consolidation minimizes the duplication of ATE and support equipment required at weapon system/platform depot maintenance activities. Capital investments necessary for weapon system/platform facilities and equipment are reduced due to the elimination of redundant facilities and equipment. However, since this consolidation does not totally eliminate duplicate functions at losing facilities, savings are diminished. This same rationale applies to facilities and equipment maintenance at the losing site. These factors promote increased efficiencies and economies of scale at remaining weapon system/platform depots, which result in reduced customer costs.

**Business Efficiency: Con.**

This alternative impairs mission accomplishment in that a divided management chain of responsibility is not effective from a business perspective. This is true since such an approach does not confer a uniform level of responsibility with either maintenance agent. Consequently, duplicate equipment purchases between Services for components maintained by using Services continue an uneconomical business practice.

**Alternative D Individual Service Management of Weapon System Platforms in "Centers of Excellence" with DLR's, Components and Non-Weapon System Equipment Consolidated in Single Service "Centers of Excellence"**

In conjunction with individual using Services' depot maintenance management of weapon system/platforms (as in Alternative B), Depot Level Repairables (DLR), components, and non-weapon system equipment will be consolidated via a "Center of Excellence" concept, in most cases a single Service.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Service's maintenance process?**

This alternative has no clear military advantage. The potential of dividing responsibility for the maintenance of weapon systems/platforms and exchangeables between single and using Services allows the status quo to continue at weapon system/platform depot maintenance activities. However, it creates opportunities for enhanced support in the component repair areas. Since sustainment of the Base Force would only be improved on the margins, this alternative has minimal military value.

**Are you willing to accept some decrement in military effectiveness if substantial saving could be realized by this alternative?**

Not if such savings prevent the Air Force's full implementation of the aerospace doctrine associated with the "Global Reach, Global Power" concept, which in turn supports the Base Force. So-called "savings" that impair the Services' readiness, sustainability, and reconstitution reflect a false economy, as was evident in the "Hollow Force of the 1970s."

**Implementation: Is this alternative realistic?**

No. The implementation of this alternative produces no substantial enhancements to military readiness or increases in fiscal benefit. Moreover, it unnecessarily complicates the depot repair priority process.

**If your Service were selected as the Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipment, "Pop-up projects," etc.?**

The Air Force Materiel Command (AFMC) is dedicated to total quality management principles and continuous process improvement in support of its customer's missions. These philosophies focus on total and complete customer satisfaction. Selected applications of our existing management relationship between weapon systems and TRCs, i.e., "Centers of Excellence" (COE), would continue to be used. This customer service relationship would be facilitated through clear work specifications/packages that are agreed upon by all parties, and detailed customer knowledge as demonstrated in proven quality principles. Priorities and the

needs associated with special projects would be of great interest, and would be fully supported via well-defined work packages, memoranda of agreement, and customer liaison offices at TRC/COE repair facilities.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Measures of value for depot support would be calculated by the depot maintenance system's ability to increase product throughput and quality on a sustained or surge basis, reduced operating costs, and compliance with agreed-upon work packages. These metrics must support the customer Service's readiness, sustainability, reconstitution, priorities, life cycle data, and product quality.

**Are there near or long term business efficiencies to be gained by this alternative?**

Potentially some near term efficiencies could be gained by consolidating component depot maintenance at TRC/COE locations. However, such gains would be offset by the continued existence of redundant Service weapon system/platform depot maintenance activities.

**Military Effectiveness: Pro.**

This alternative promotes a single focal point for component maintenance to customers while it allows the Services to retain mission control of the maintenance of their weapon systems/platform. The retention of critical maintenance skills at component TRC/COE facilities is a vital ingredient in the surge capability of the facility and thus, the Services. Expertise is not lost and is concentrated for contingency production (mission) needs.

**Military Effectiveness: Con.**

This alternative divides maintenance management responsibilities, which impairs the Services' ability to sustain and reconstitute ready forces. This divided management responsibility exacerbates data system interface problems between the Services--resulting in multiple inquiries as to the status of a total weapon system's readiness. At non-consolidated weapon system/platform repair sites, support equipment, DLRs, and component inventories remain unchanged. Since this alternative does not combine all elements of maintenance management, the cost-benefits resulting from technology insertion (capability enhancement) initiatives are reduced at the non-consolidated weapon system/platform depot maintenance facilities. Thus, overall implementation is more difficult due to this divided responsibility.

**Business Efficiency: Pro.**

Consolidation of component repair under an Executive/Single Service reduces the management structure at the losing (supported) Service, thus reducing the latter's overhead expenses. Duplication of personnel skills for component depot maintenance are minimized DOD-wide,

thereby reducing direct labor required. Additionally, consolidation minimizes the duplication of ATE and support equipment required at component TRCs/COEs. Capital investments necessary for component depot maintenance facilities and equipment are reduced due to the elimination of redundant facilities and equipment. However, since this consolidation does not totally eliminate duplicate functions at losing facilities, savings are diminished. This same rationale applies to facilities and equipment maintenance at the losing sites. These factors promote increased efficiencies and economies of scale at remaining component TRC/COE facilities, thereby reducing customer costs.

**Business Efficiency: Con.**

This alternative impairs mission accomplishment in that a divided management chain of responsibility is not considered effective from a business perspective. This is true since such an approach does not confer a uniform level of responsibility with either maintenance agent. Consequently, duplicative equipment purchases between Services for weapon systems/platforms maintained by using Services continue an uneconomical business practice.



**Alternative E Consolidation of Similar/Common Platforms, DLR's, Components and Non-Weapon System Components Under Single Executive Service**

In conjunction with single Service maintenance management of common or similar weapon systems/platforms (as in Alternative "C"), Depot Level Repairables (DLRs) and components, and non-weapon system equipment will be consolidated via a "Center of Excellence" concept. In most cases, this will be a single Service, but not necessarily the same single Service that manages the weapon system. Total weapon system management will continue to be the responsibility of the using Service.

**Effectivness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative has clear military advantage. It unites responsibility for the maintenance of weapon systems/platforms and exchangeables under a unified management structure. This significantly enhances the readiness, sustainment, and reconstitution of the Base Force on all levels. This approach preserves a proven Service capability to organically support its combatant forces in peace and in war. This alternative also maintains the basic tenets of command and control, with responsibility and execution authority for depot level maintenance vested in a single manager. Just as today's interservicing does not alter or restrict a supported Service's maintenance process or philosophy, neither will this alternative. Rather, work specifications/packages will continue to be used regularly by supported and supporting Services. For the same reason, this alternative does not place at risk any critical mission item for the customer Service--since the single manager functions only as a provider of a depot maintenance service (product).

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Not if such savings prevent the Air Force's full implementation of the aerospace doctrine associated with the "Global Reach, Global Power" concept, which in turn supports the Base Force. So-called "savings" that impair the Services' readiness, sustainability, and reconstitution reflect a false economy, as was evident in the "Hollow Force of the 1970s."

**Implementation: Is this alternative realistic?**

Yes, as this alternative combines the best elements of military effectiveness enhancements and public sector business efficiencies. Since it does not include the unnecessarily extreme, conservative, or incomplete constructs found in several of the other alternatives under consideration, it is easier to understand, implement, and support from public (uniformed) and private (contractor) sector perspectives. This alternative also has rapid implementation potential with the greatest probability for near and long term savings.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipment, "Pop-up, projects," etc.?**

The Air Force (AFMC) is dedicated to total quality management principles and continuous process improvement in support of its customers' missions. These philosophies focus on total and complete customer satisfaction. Our practice of Air Force weapon system single siting and commodity repair at TRC's duplicate elements of this approach in our system now. Selected applications of our existing management relationship between weapon systems/platforms and TRCs, i.e., "Centers of Excellence" (COE), would continue to be used. This customer Service relationship would be facilitated through clear work specification/packages that are agreed upon by all parties and detailed customer knowledge as demonstrated in proven quality principles. Priorities and the needs associated with special projects would be of great interest, and would be fully supported by well-defined work packages, memoranda of agreement, dominant supported-Service representation in selected command and key staff billets proportionate to that Service's workload, and customer liaison officers at weapon system/platform and component depot maintenance facilities.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from the manager?**

Measures of value for depot support would be calculated by the depot maintenance system's ability to increase product throughput and quality on a sustained or surge basis, reduced operating costs, and compliance with agreed-upon work packages. These metrics must support a customer Service's readiness, sustainability, reconstitution, priorities, life cycle data, and product quality.

**Are there near or long term business efficiencies to be gained by this alternative?**

Yes. This alternative best support current and anticipated DMRD initiatives. It also reduces investments in duplicate facilities and equipment, maximizes Executive/Single Service flexibility in using existing resources, and reduces facility and equipment maintenance through consolidation. Moreover, it reduces overhead and direct labor costs, and it reduces customer costs based on centralized weapon system/platform maintenance, consolidation of like workloads under a Technology Repair Center (TRC)/Center of Excellence (COE) focus, and workload volume. Additionally, this alternative facilitates seamless technology insertions and integrations within the Services. It also reduces costs by providing a larger workload base over which to distribute expenses. This alternative promotes economies and efficiencies by unifying command by commodity and centralizing maintenance management to the component level--thus easing integration. Moreover, this alternative standardizes aviation depot maintenance production metrics, and promotes harmonized depot maintenance support of several Services' aircraft. Finally, it reduces the workforce yet retains an expert skills base.

**Military Effectiveness: Pro.**

This alternative appropriately retains support of combatant forces within and by the Services vice relinquishing the key Service roles of readiness, sustainability, and reconstitution to non-Service staff or contractor activities, or rather than piecemealing such responsibilities to disparate organizations. This alternative promotes a single, uniformed focal point for the customer, thereby reducing support response times--an especially critical benefit during contingencies or war. As important, it reduces Service parochialism because representatives from the supported Services are assigned to co-manage the Executive/Single Service structure as outlined above. This structure maximizes the flexibility of resources while enhancing process control. It also satisfies unique Service requirements for quality by keeping workloads aligned with expertise within TRCs/COEs. During production/surge scenarios, it allows more flexibility in workload response, it retains a vital surge capability, and it increases throughput of under-utilized facilities.

**Military Effectiveness: Con.**

Initially, a Service may fear that it may lose control over workloading and priorities. A Service may also fear that another Service cannot meet its "unique" depot maintenance/modification needs, and that another Service will end up "managing" its total weapon system/platform. Finally, a Service may be concerned that its optempo and maintenance philosophy will be unacceptably altered, and that it will lose command billets.

**Business Efficiency: Pro.**

This alternative meets the test of current and likely DMRDs. From a national objective perspective, this alternative clearly maximizes DOD flexibility in using its resources. It also provides a single, uniformed customer focal point, lowers overhead cost, and minimizes proliferation of support equipment and facilities. From an economic perspective, it reduces customer costs based on volume/economies of scale, reduces expenditures for duplicate equipment, maximizes cost-benefits from technology insertion, and it lowers facilities/equipment maintenance cost. While achieving infrastructure-related benefits, it also retains critical skills, reduces the overhead to direct labor ratio, provides more opportunities for productivity and efficiency initiatives, and increases throughput to meet surge and mobilization requirements of customers. It also provides a unified source of depot maintenance support by major weapons system/platform, DLRs, etc. In doing so, it centralizes weapons system management of maintenance production to the component level, thereby improving the DOD's ability to deal with integration issues.

**Business Efficiency: Con.**

Divestiture of DOD industrial installations may be difficult (a Base Realignment And Closure task). Moreover, morale and productivity problems result from Reductions in Force (RIF), which follow from workload consolidation and transfer.

## **ALTERNATIVE F DOD Consolidation**

Consolidate all depot maintenance functions under one organization external to the Services. This alternative would eliminate Service ownership of depot maintenance. Individual weapons systems, Depot Level Repairables (DLRs) and components, and non-weapon system equipment could be maintained organically, contracted out, or a combination of both. Individual depots could be organic or government-owned/ contractor-operated (GOCO).

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative has no clear military advantage in the readiness, sustainment or reconstitution of military forces. This approach removes the Services' ability to organically support their combatant forces and instead vests this core Service role to an external, non-military agency. Significantly, this concept violates basic tenets of command and control, and inappropriately divides responsibility and execution authority.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Not if such savings prevent the Air Force's full implementation of the aerospace doctrine associated with the "Global Reach, Global Power" concept, which in turn supports the Base Force. So-called "savings" that impair the Services' readiness, sustainability, and reconstitution reflect a false economy, as was evident in the "Hollow Force of the 1970s."

**Implementation: Is this alternative realistic?**

While this alternative can be implemented, it is not realistic in that this approach inhibits the Services' from organically supporting their own combatant forces' logistics requirements. This alternative puts the safety and success of fielded forces in jeopardy by separating the responsibility for executing the mission from the responsibility (capability) to sustain forces supporting the mission.

**If your Service were selected as the Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipment, "Pop-up projects", etc.?**

Since this alternative assumes none of the military departments would be the Executive Agent/Single Manager for this alternative, this question is not applicable.

**If your service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Measures of value for depot support would be calculated by the depot maintenance system's ability to increase product throughput and quality on a sustained or surge basis, reduce operating costs, and comply with agreed-upon work packages. These metrics must support a customer Service's readiness, sustainability, reconstitution, priorities, life cycle data, and product quality.

**Are there near or long term business efficiencies to be gained by this alternative?**

No long term efficiencies are involved beyond the ability to consolidate depots as per Alternatives D or E. Actually, it decrements any efficiencies due to the likely vertical nature of this organization and the likely dramatic increases in overhead labor that would result from its implementation--if the Defense Logistics Agency can be used as a model.

**Military Effectiveness: Pro.**

This alternative promotes single focal point for the customer. It potentially can result in the standardization of processes and data management systems which, in turn, can result in expedited support of fielded forces.

**Military Effectiveness: Con.**

This alternative has no clear military advantage in the readiness, sustainment or reconstitution of military forces. This approach removes the Services' ability to organically support their combatant forces and instead vests this core Service role to an external, non-military agency. Significantly, this concept violates basic tenets of command and control, and inappropriately divides responsibility and execution authority. The addition of a depot maintenance management agency external to the Services creates an overhead function that further complicates an already complex OSD-JCS-DLA-Service-Major Command relationship. This unnecessary overhead layer could prompt bureaucratic responses to Service priority changes and directly impact (impair) readiness. Further, while economic considerations are key, this alternative presupposes that they should consistently prevail over military effectiveness and support of the Base Force.

**Business Efficiency: Pro.**

This alternative provides no clear business advantage that could not be achieved through an Executive/Single Service approach.

**Business Efficiency: Con.**

No long term economies and efficiencies are involved beyond the ability to consolidate depots as per Alternative E. In fact, this alternative decrements any economies and efficiencies due to the likely vertical nature of this organization and the likely dramatic increases in overhead labor that would result from its implementation--if the Defense Logistics Agency can be used as a model. In the management area, oversight of this central agency is ambiguous. Potential increases in contract oversight requirements would occur if GOCO/contractors were selected as the consolidated facilities. This alternative in no way reflects the lean/flat business organization concepts that have proven to be most competitive and efficient--compare a General Motors with a far leaner and more profitable Ford Motor Company.

## **ALTERNATIVE G Commercialize Maintenance**

Contract out all depot maintenance requirements. Contract management would be maintained at either the Service or DOD level. The ultimate goal would be to include contract maintenance as part of the weapon system/platform acquisition costs of new systems throughout its life cycle.

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

Implementation of this alternative puts at risk the military effectiveness of the United States. This alternative offers no clear military advantage in the readiness, sustainment or reconstitution of military forces. Similarly, this approach removes the Services' ability to organically support their combatant forces and instead vests this core Service role to an external, non-military agency. As is the case with Alternative F, this concept violates basic tenets of command and control, and inappropriately divides responsibility and execution authority.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Not if such savings prevent the Air Force's full implementation of the aerospace doctrine associated with the "Global Reach, Global Power" concept, which in turn supports the Base Force. So-called "savings" that impair the Services' readiness, sustainability, and reconstitution reflect a false economy, as was evident in the "Hollow Force of the 1970s."

**Implementation: Is this alternative realistic?**

While this alternative can be implemented, it further distances the Services' combatant forces from its combat service support. This untenable military support structure is not realistic in that it inhibits the Services' from organically supporting combatant forces' logistics requirements. This alternative clearly puts the safety and success of fielded forces in jeopardy by separating the responsibility for executing the mission (Services) from the responsibility (capability) to sustain forces supporting the mission (disparate commercial activities).

**If your Service were selected as the Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipment, "Pop-up projects", etc.?**

Since this alternative assumes none of the military departments would be the Executive Agent/Single Manager for this alternative, this question is not applicable.

**If your service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Measures of value for depot support would be calculated by the depot maintenance system's ability to increase product throughput and quality on a sustained or surge basis, reduced operating costs, and compliance with agreed-upon work packages. These metrics must support a customer Service's readiness, sustainability, reconstitution, priorities, life cycle data, and product quality.

**Are there near or long term business efficiencies to be gained by this alternative?**

No long term efficiencies are anticipated. In fact, efficiency decrements are likely due to the public-private contractual ("arms length") relationship, increased organizational distance between the contractor(s) and the customers (supported Services), and the likely dramatic increases in overhead labor that would result from requirements preparation, proposal evaluation, contract oversight, and potential litigation.

**Military Effectiveness: Pro.**

This alternative does not enhance military effectiveness.

**Military Effectiveness: Con.**

This alternative has no clear military advantage in the readiness, sustainment or reconstitution of military forces. This approach removes the Department of Defense's ability to organically support its combatant forces and instead solely vests this core Service role to private sector contractors. The structure implied by this alternative is less flexible in response to dynamic mission requirements and is not responsive to mobilization. There is significant potential for mission impact if the overhaul contractor(s) is owned or purchased by foreign interests. Significantly, this concept violates basic tenets of command and control, and inappropriately divides responsibility and execution authority. In addition, it is not axiomatic that solely by transferring individual organic depot maintenance capability to contractors, DOD/Service effectiveness and *USAF* efficiency will be increased. Moreover, the addition of a contractor management agency external to the Services creates an additional overhead function largely responsible for contract "monitorship" further complicating an already complex OSD-JCS-DLA-Service-Major Command relationship. This unnecessary overhead layer could prompt a bureaucratic response to Service priority changes and directly impact (impair) readiness. Further, while economic considerations are key, this alternative is based on the notion that private sector depot maintenance activities are more cost effective than are their organic Service counterparts--witness recent aviation depot maintenance contracts won by Service depots over their private sector competitors.



**Business Efficiency: Pro.**

This alternative provides no clear business advantage that could not be achieved through an Executive/Single Service approach.

**Business Efficiency: Con.**

No long term economies and efficiencies are involved. In fact, this alternative decrements any economies and efficiencies due to the likely convoluted organizational structure of the resulting oversight ("monitorship") organization. Moreover, dramatic increases in overhead labor would potentially result from its implementation. This alternative in no way reflects the lean/flat business organization concepts proven to be most competitive and efficient--compare General Motors with a leaner and profitable Ford Motor Company. Additionally, if this approach were to fail, the expense necessary to reconstitute the DOD depot maintenance infrastructure would be prohibitively expensive, and the schedule to accomplish the same would extend far beyond any potential conflict-driven response time.



0 3 NOV 1992

From: Commandant  
To: Chairman, Executive Working Group, JCS Depot Maintenance  
Consolidation Study

Subj: COAST GUARD ANALYSIS OF THE DEPOT MAINTENANCE  
CONSOLIDATION ALTERNATIVES

1. Provided as enclosure (1) is the Executive Summary of the Coast Guard's position on the seven alternatives for consolidating service depot maintenance. Enclosure (2) is our detailed analysis of each alternative.
2. Our role in a future shared maintenance scheme is driven by two basic realities. First, we want to continue and possibly to expand our interservice role. Second, because we are small it is virtually impossible for us to absorb large portions of selected depot level maintenance along single platform or component lines. The danger of becoming overextended would threaten quality and our ability to meet interservice commitments on time and within budget.
3. I see the Coast Guard's part in the resultant alignment as a willing participant but measured by our capabilities. I also believe that the resultant structure will ultimately reflect the special expertise resident in the various services. There are three areas where I believe the Coast Guard can make a comfortable and realistic fit. As a customer, we would like to see more aviation components interserviced and believe that the Navy shipyards have the capacity to provide depot level repair of our 378 High Endurance Cutters and our Polar Class Icebreakers. As a provider, the Coast Guard Yard can provide depot level repairs for a community of interservice watercraft under 3000 tons and 200 feet LOA in the range from Hatteras to New York. In all three the advantage of price must be demonstrated.
4. The Coast Guard looks forward to a successful outcome of this most important effort.

*P. A. Bunch*

P. A. BUNCH  
Chief, Office of Engineering,  
Logistics and Development

Encl: (1) Executive Summary  
(2) Analysis of Seven Alternatives

## APPENDIX L

### COAST GUARD ALTERNATIVE REVIEW

#### Alternative A Individual Service Management

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative assumes an accelerated DMRD 908 process. The Coast Guard, an agency within the Department of Transportation, is not within the scope of DMRD 908. Conceptually, the Coast Guard has long relied upon actions that DMRD 908 directs DOD services to implement. Coast Guard depot maintenance is dependent upon commercial and DOD activities. Coast Guard organic depot maintenance cannot meet the needs of our service without commercial and DOD support.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Any attempt to increase the Coast Guard depot infrastructure to meet all Coast Guard depot maintenance requirements would reduce our operational effectiveness. The total Coast Guard depot maintenance requirements are not large enough to justify the capital investment necessary for total organic depot repair. This investment would suboptimize resource allocation within the Coast Guard.

**Implementation: Is this alternative realistic?**

Yes, but greater savings are possible if Centers of Excellence among the services were created, and if DOD cost competitiveness and pricing models for agencies external to DOD were improved.

**If your service was selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Not applicable to this alternative.

**If your service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Not applicable to this alternative.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Yes, but more economies and responsive support to the Coast Guard are possible under other alternatives.

**Comment**

The Coast Guard has moved beyond internal depot maintenance. A large percentage of our workload, including HC-130H aircraft Programmed Depot Maintenance, most of our aviation component depot level repair, most of our boat depot level repair and major cutter shipyard availabilities, is conducted in DOD and commercial activities. We seek improvements that make DOD depots a more competitive source of depot repair.

**Alternative B Individual Service Management (Consolidation into "Centers of Excellence")**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

The Coast Guard's operational effectiveness would be greatly reduced if this alternative was implemented. While the Coast Guard already has consolidated depots, one for aviation maintenance and one for vessel maintenance, we rely upon external commercial and DOD sources for most of our depot maintenance. Coast Guard facilities are optimized for the workload that they can best execute, and to mesh with our heavy use of external depot maintenance. Production that requires heavy capital investment or high levels of throughput is outsourced.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

The Coast Guard cannot afford the investment necessary for this alternative.

**Implementation: Is this alternative realistic?**

No.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements, e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Not applicable for this alternative.

**If your service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Not applicable for this alternative.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

No, this alternative does not allow the Coast Guard to optimize what we do best, and consolidate our workload with external sources where appropriate.

**Comment**

This alternative would provide benefits to an organization that is much larger than the Coast Guard, and that had an existing depot system with duplicative capabilities and excess capacity.

**Alternative C Consolidate Weapons System Platforms into Joint Service "Centers of Excellence"**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative, if fully implemented, would degrade Coast Guard operational effectiveness. Full implementation would require Navy support of our High Endurance Cutters and Icebreakers, Air Force support of our fixed wing aircraft, Army support of our rotary wing aircraft, and possible Coast Guard support of all small (less than 3000 tons) vessels for all services. The Coast Guard workload gained from DOD would dominate our internal vessel workload and overwhelm our shipyard and infrastructure. The result would be an improper focus of our maintenance community on service to DOD rather than supporting Coast Guard operations. The Coast Guard HC-130H fleet is already supported by the Air Force. Coast Guard HU-25A/B/Cs and HH-65As, which comprise most of Coast Guard aviation, are commercial derivative, foreign sourced aircraft unique to the Coast Guard. We have built a depot system to support these two platforms that has progressed upon the learning curve for these midlife systems. HH-60J support via a Center of Excellence is possible, but a recent Coast Guard study concluded that component and airframe crash repair should be conducted in DOD facilities, while the labor intensive basic airframe depot maintenance is most economically conducted organically. Our experience in seeking DOD depot maintenance for our platforms is that we cannot afford to pay DOD depot costs.

A partial implementation of this alternative may be desired. The Coast Guard would continue to seek the lowest cost source of depot maintenance for our platforms (High Endurance Cutters, Icebreakers and aircraft) from all sources including DOD Center of Excellence. Vessel depot maintenance would need to be consistent with the Coast Guard's Homeport Policy. The Coast Guard could become the Center of Excellence for repair of DOD watercraft under 3000 tons and 200 feet LOA at the Coast Guard Yard. Repair candidates would be limited to those within the geographic range from Hatteras north to New York. The vessel owning service would continue to provide program oversight, planning, specification and work package development, etc. The Coast Guard Yard would provide repair services under an interservice agreement with the service customer as part of the Yard's normal depot maintenance support for the Coast Guard fleet. The total combined interservice repair and Coast Guard fleet depot level maintenance support would be constrained by the capacity of the Coast Guard Yard.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

The Coast Guard is willing to accept the decrement inherent in the partial implementation described above. We are not willing to accept the large decrement inherent in full implementation.

**Implementation: Is this alternative realistic?**

Only for the partial implementation described above. Full implementation of a Coast Guard Center of Excellence for small vessels would overwhelm our Naval Engineering program. Coast Guard platforms should only receive platform depot maintenance at DOD Centers of Excellence when these facilities are cost competitive.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Workload for the Coast Guard Yard is scheduled at capacity through 1995. After that, interservice workload could be phased in. Total workload mix of Coast Guard and interservice repairs would be negotiated and set in advance. The Yard plans its workload in detail in the near term (12 months) based on long term customer commitments. A five year long term workload plan assures individual project flow, prioritization and preparation. Overall platform management would remain with the customer service. The Yard would work with all its customers to assure that total needs are met within its facility and staffing constraints.

The Yard has a good record in managing emergencies and special requirements both within the Coast Guard and with other government agencies. These are addressed on an individual basis; and if there is a fit with existing workload, workforce, trade mix, and facilities, the work is accepted.

There are several limitations on the Yard. First, the capacity of its two floating drydocks is fixed. Although they came from the Navy, these WWII vintage assets are no longer Navy certified. Technically, they cannot handle Navy vessels without a waiver. The Yard plans to replace both drydocks in 1996 with a shiplift which will transfer ships ashore to an upland area close to the industrial ship complex. Since repair work will not have to compete for available floating drydock space, emergencies will be more readily accommodated. Capacity at the Yard would then be constrained only by workforce unless the Coast Guard can obtain relief from existing personnel ceilings.

**If your service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

More than any other element, the Coast Guard is sensitive to cost. Budget constraints would make it difficult for the Coast Guard to participate in support that is more expensive than our current system of organic, commercial and interservice depot maintenance. Coast Guard cutters and aircraft do not need, nor can we afford, the expensive technical infrastructure necessary to support nuclear ships and high performance tactical aircraft. If Coast Guard platforms were transferred to DOD Centers of Excellence for depot maintenance, processes would need to be established to ensure appropriate resource allocation, especially during



mobilization. The Coast Guard, and other customers, should have the opportunity to place joint staff at the facilities conducting their work. These positions should have management, rather than liaison, responsibilities over joint workload. Overall platform management should remain with the Coast Guard and other customers.

Coast Guard High Endurance Cutters and Icebreakers currently receive commercial shipyard support. Except for two High Endurance Cutters, all operate on the U.S. West Coast. However, all cutters are subject to the Coast Guard's geographic restrictions which could limit the Naval shipyards under consideration for support. There are 12 High Endurance Cutters and 2 Icebreakers. In terms of each class' depot maintenance cycle, the number of cutters undergoing repairs annually averages about five. As with Navy ships, schedules are set well in advance. Because all work is performed commercially, the windows of opportunity for docking becomes part of the bid criteria in our selection process. As a customer, the Coast Guard would expect the same consideration in scheduling repairs for these cutters as Navy vessels. Since we are dealing with a small number of Naval shipyards and five ships per year, the scheduling process should be better than commercial sources. This would however, require close coordination with the Navy in setting our priorities. Except for the Icebreakers which are Coast Guard unique, the needs for special or peculiar technical support are largely non-existent. Emergencies always present problems, but as a steady customer, the Coast Guard would expect the same consideration and concern in fitting such a need into existing schedules as would occur in the private sector or for a Navy vessel.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Yes, but significant disruptions of all parties' business practices would occur in transition.

#### **Comments**

The Coast Guard believes that our mix of platform and component workload is better served by Alternative D.

**Alternative D Individual Service Management of Weapon System Platforms in "Centers of Excellence" with DLR's, Components and Non-Weapon System Equipment Consolidated in Single Service "Centers of Excellence"**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

This alternative would maximize Coast Guard operational effectiveness for a given level of resources. The most opportune target for increased interservice support of Coast Guard requirements is in increasing DOD depot level repair of Coast Guard aviation reparable components. Coast Guard aviation platforms consist of rotary wing and maritime patrol aircraft. These type aircraft generate most of their depot maintenance workload in component repair versus the greater expense of performing depot level maintenance on the exotic, highly stressed structures of tactical jet aircraft. Component rework is most efficiently accomplished in facilities with high throughput and capital investment. The Coast Guard's total component repair requirements do not justify such facilities. In FY92, DOD facilities accomplished \$14.5M of Coast Guard aviation component maintenance, another \$75.6M was accomplished at commercial facilities. A consolidated depot maintenance system, with efficient, full capacity Centers of Excellence that specialize in classes of components, could capture and execute Coast Guard component workload at a savings compared to current commercial costs.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Properly implemented, this alternative will increase Coast Guard operational effectiveness.

**Implementation: Is this alternative realistic?**

Yes. The Coast Guard would shift aviation component depot level repair from commercial to DOD facilities as the DOD facilities became competitive with the commercial sector in terms of cost, quality and reliability of supply.

**If your service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

The Coast Guard would not become a provider under this alternative, we would be a customer.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Coast Guard needs a process to insure that our workload can compete for a proper allocation of depot resources. Based on our experience interservice support functions well in peacetime, but during mobilization executive agents tend to allocate resources towards their own requirements. We would expect that a properly functioning consolidated system would have an established process to both allocate resources and address appeals from customers. Centers of Excellence should have staffing in significant managerial roles from all customers. Liaison officers do not have the ability to effect proper resource allocation, joint managers do.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

This alternative offers the greatest long term improvement in efficiency for the Coast Guard. Our depots would focus on what they do best, execution of basic labor intensive depot maintenance on airframes and vessels. Our costs and quality of performing platform maintenance are competitive. Capital investment component repair would migrate to DOD Centers of Excellence as these activities prove competitive with the private sector.

#### **Comments**

DOD depot labor rates, as billed to the Coast Guard on FY93 Depot Maintenance Interservice Support Agreements (DMISAs), range from \$66.49/hr to \$107.25/hr with a median of \$85/hr. Commercial rates are typically \$60+/hr. The internal Coast Guard rate at our aviation depot is \$43/hr, although our depot is not well suited for component repair. Removing excess depot capacity and concentrating component workload should make DOD depots the provider of choice for aviation component rework.

**Alternative E Consolidation of Similar/Common Platforms, DLR's, Components and Non-Weapon System Components Under Single Executive Service**

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

The Coast Guard position on consolidation by platforms is discussed in our analysis of Alternative C. Our position on consolidation by components is discussed in our analysis of Alternative D.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

The Coast Guard believes that consolidation of components, subject to cost of repair, will improve operational effectiveness. Consolidation of platforms, as proposed in Alternative C, may degrade operational effectiveness by an unacceptable decrement. Our position is discussed in detail in our analysis of Alternatives C and D.

**Implementation: Is this alternative realistic?**

Not for the Coast Guard. A detailed discussion is available in our analysis of Alternatives C and D.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Refer to the Coast Guard analysis of Alternatives C and D.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Refer to the Coast Guard analysis of Alternatives C and D.

**Efficiencies: Are there near or long term business efficiencies to be gained by this alternative?**

Refer to the Coast Guard analysis of Alternatives C and D.

**Comment**

The Coast Guard believes that our platforms, with their mix of platform and component workload, are best served by Alternative D.

## Alternative F DOD Consolidation

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

The two Coast Guard depots fall under the Department of Transportation. This makes it impractical, and probably unlikely, that they would be consolidated into a civilian Department of Defense agency. Our analysis assumes that this alternative would require the Coast Guard to interact with a Defense Depot Maintenance Agency built from the individual DOD services' depot infrastructure. Our comments regarding consolidation at a platform and component level as expressed in our analysis of the other alternatives apply to this alternative as well. In general, the Coast Guard favors consolidating component depot repair, but not platform depot repair. This alternative offers different organizational opportunities and challenges. A new organization might be free of individual service bias tend thus more likely to conduct appropriate asset allocation, but a civilian defense agency would likely present another layer of management over existing organizational structures. The new management would also, by concept, be farther removed from operations and mission requirements. The issue seems to be whether a defense agency is necessary to implement consolidation. If not, why create additional management overhead that is farther removed from its customers?

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

If this alternative was the necessary means to implement DOD depot maintenance consolidation, the Coast Guard would seek support for aviation components and selected platforms when, and if, the organization was competitive in terms of cost and reliability of supply.

**Implementation: Is this alternative realistic?**

Yes, but only if depot consolidation cannot occur within and between the services.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

This alternative assumes than an executive agent other than the Coast Guard is created. The Coast Guard would be a customer.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

The Coast Guard comments from Alternative D apply.

**Efficiencies:** Are there near or long term business efficiencies to be gained by this alternative?

Production efficiencies should result from depot consolidation. Management would be farther removed from its customers, possibly with additional layers relative to other alternatives.

**Comments**

This alternative should be reserved for use only if depot consolidation is not possible within the services.

### Alternative G Commercialize Maintenance

**Effectiveness: What are the impacts of this alternative on the military effectiveness of your Services' maintenance process?**

Total commercial depot maintenance of all Coast Guard platforms and components would be difficult to execute with enough economy and responsiveness to meet our operational requirements. Most of the Coast Guard's current depot maintenance is conducted at commercial activities including over 80% of our shipyard availabilities. Our HC-130H fleet receives aircraft depot maintenance at a commercial facility under an Air Force contract, and most of our aviation components get commercial depot level repair. Commercial support works well when workload is steady state or has an ample planning horizon, it does not respond well, nor is it economical, for emergent requirements. A large portion of the Coast Guard aviation inventory is commercial derivative and foreign sourced. These aircraft, the HH-65A and the HU-25A/B/C, do not have a mature domestic support infrastructure, especially the HH-65A. Thus, the Coast Guard has been forced to create an organic infrastructure, and act as the catalyst for the creation of commercial infrastructure to support these aircraft. Without organic Coast Guard support, these aircraft would not receive adequate support.

**Are you willing to accept some decrement in military effectiveness if substantial savings could be realized by this alternative?**

Despite the Coast Guard's heavy use of commercial depot maintenance, total commercial support is not advisable. The decrement to Coast Guard operational effectiveness would be where we cannot afford it, to economic and responsible changes in support for changes in missions or operational requirements. This has restricted the Coast Guard from an even greater use of commercial depot maintenance.

**Implementation: Is this alternative realistic?**

No.

**If your Service were selected as an Executive Agent/Single Manager for this alternative, how would you handle special requirements; e.g., setting priorities, service unique equipments, "Pop-up projects," etc?**

Not applicable for this alternative.

**If your Service became a customer of an Executive Agent/Single Manager, what would you expect from that manager?**

Not applicable for this alternative.

**Efficiencies:** Are there near or long term business efficiencies to be gained by this alternative?

Yes. Where responsive commercial support exists, it tends to be less expensive than DOD support for a non-DOD agency. Some DOD pricing models for Coast Guard support have resulted in our use of commercial depot maintenance. High throughput that justify heavy capital investment in plant and process are common among the best sources of commercial (and DOD) support. But all workload is not capital intensive, and barriers to responsive commercial support exist.

**Comment**

Excellent alternative for supplementary use. Small production run, specialized platforms should be acquired with system lifecycle commercial support.



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## APPENDIX M

### CONUS Facilities With Weapons and Munitions Depot Maintenance Missions

#### Army CONUS Facilities With a Munitions Depot Maintenance Mission

<u>Depot</u>	<u>Acronym</u>	<u>Location</u>
Seneca Army Depot	SEAD	Romulus, NY
Lexington Blue Grass Army Depot	LBAD	Lexington, KY
Savanna Army Depot	SVAD	Savanna, IL
Sierra Army Depot	SIAD	Herlong, CA
Crane Army Ammunition Plant	CAAP	Crane, IN
McAlester Army Ammunition Plant	MCAAP	McAlester, OK
Pine Bluff Arsenal	PBA	Pine Bluff, AR
Pueblo Depot Activity	PDA	Pueblo, CO
Navajo Depot Activity	NDA	Flagstaff, AZ
Fort Wingate Depot Activity	FWDA	Gallup, NM
Umatilla Depot Activity	UDA	Umatilla, OR
Iowa Army Ammunition Plant	IAAP	Burlington, IA
Milan Army Ammunition Plant	MAAP	Milan, TN
Hawthorne Army Ammunition Plant	HAAP	Hawthorne, NJ
Newport Army Ammunition Plant	NAAP	Newport, IN
Aberdeen Proving Ground	APG	Aberdeen Proving Ground, MD

#### Army CONUS Multipurpose Depots With a Munitions Depot Maintenance Mission

<u>Depot</u>		<u>Location</u>
Anniston Army Depot	ANAD	Anniston, AL
Letterkenny Army Depot	LEAD	Chambersburg, PA
Red River Army Depot	RRAD	Texarkana, TX
Tooele Army Depot	TEAD	Tooele, UT

#### Navy CONUS Facilities With a Weapons or Munitions Depot Maintenance Mission

<u>Depot</u>		<u>Location</u>
Naval Weapons Station Earle	NWSEL	Earle, NJ
Naval Weapons Station Yorktown	NWSYK	Yorktown, VA
Naval Weapons Station Charleston	NWSCH	Charleston, SC
Naval Weapons Station Concord	NWSCO	Concord, CA
Naval Weapons Station Seal Beach	NWSSB	Seal Beach, CA
Naval Undersea Warfare Center Keyport	NUWCK	Keyport, WA
Naval Surface Warfare Center Louisville	NSWCL	Louisville, KY
Naval Surface Warfare Center Crane	NSWCC	Crane, IN
Naval Surface Warfare Center Indian Head	NSWCIH	Indian Head, MD

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## APPENDIX N

### Open Meeting Attendees

1300, 26 January 1993

Name	Organization	Phone Number
Gen J. J. Went, USMC(Ret)	Depot Consolidation Study	
Gen B. Poe II, USAF(Ret)	Depot Consolidation Study	
Gen L.J. Wagner, USA(Ret)	Depot Consolidation Study	
VADM E.A. Grinstead, SC, USN(Ret)	Depot Consolidation Study	
Mr. J. McCarthy	Depot Consolidation Study	
Col T.B. Slade, USAF	Joint Staff/J-4/SCAD	1-703-695-9212
COL J.T. Burton, USA	OJCS/Legal Counsel	1-703-697-1137
CDR J. Fink, USN	Joint Staff/J-4/SCAD	1-703-695-9234
Lt Col T. Wegemer, USAF	Joint Staff/J-4/SCAD	1-703-695-9234
CDR J. Barrett, SC, USN	Joint Staff/J-4/SCAD	1-703-695-9234
Mr. Enemencio Sanchez	GAO	1-210-521-7960
Mr. Larry Junek	GAO	1-210-521-7960
Mr. Al Barbero	Sondstrano/AIA	1-703-276-1626
Mr. Alex Yellin	Defense Base Closure Commission(A/F)	1-703-696-0504
Mr. Frank Cirillo	Defense Base Closure Commission(USN)	1-703-696-0504
Mr. Bill Egen	McDonnell Douglas	1-703-412-3877
Mr. Bill Carrier	McDonnell Douglas	1-314-234-6549

**Open Meeting Attendees**

<b>Name</b>	<b>Organization</b>	<b>Phone Number</b>
Mr. Bob Mason	OASD(P&L) L/MD	1-703-697-7980
Capt Tom Hancock, USN	OPNAV Aviation Maint Policy	1-703-697-5507
Ms. Pat Dalton	U.S. Marine Corps (LPP)	1-703-696-1057/8
Col Mark Roddy, USAF	HQ, USAF/LGMM	1-703-697-8775
LTCOL Clarence Newby, USA	HQ, DA(DALO-SMM)	1-703-614-6752
Mr. Barry Steinberg	Jordan, Coyne, Savits & Lopata	1-202-371-6392
Mr. Henry Schultz	Lockheed	1-703-413-5750
Mr. Wimpy Pybus	OASD(P&L) MD	1-703-614-0862
Ms. Genevieve Meyer	DoD Comptroller (MS/DMI)	1-703-697-8630
Ms. Linda Peter	General Dynamics	1-703-876-3337
Mr. JoNathan Tyson	General Dynamics (consultant)	1-301-604-2243
Lt Col Ron Coleman	HQMC (I&L)	1-703-696-1059
Capt L. C. Mitchell, SC, USN	OPNAV (N-43)	1-703-695-6256
Mr. Jeffrey Dodson	Boeing	1-703-558-9648
Mr. Jack Nunn	Office of Technological Affairs	1-202-228-6446
Mr. Joel Marsh	United Technology Corporation	1-202-336-7406
Mr. Robert Earl	General Dynamics	1-703-876-3485
Mr. Michael Mitchell	Lockheed	1-703-413-5613