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REPORT TO THE CONGRESS

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

UNITED STATES GENERAL ACCOUNTING OFFICE
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The Air Force Could Reduce War Reserve Requirements Of Spares And Repair Parts For Combat-Ready Units

Department of the Air Force

The cost of acquiring spares and repair parts, considered by the Air Force as needed for war reserves, far exceeds available funds. This report discusses procedures for reducing requirements and improving the readiness of combat units.

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WASHINGTON, D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

The Air Force maintains stocks of spares and repair parts for aircraft and equipment as war reserves, in addition to maintaining stocks for peacetime operations. This report discusses procedures for reducing war reserve requirements for spares and repair parts and improving the readiness posture of combat units.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of Defense; and the Secretary of the Air Force.

ACTING Comptroller General
of the United States

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ABBREVIATIONS

BLSSs	base level self-sufficiency spares
CFY	current fiscal year
DOD	Department of Defense
GAO	General Accounting Office
LRUs	line replaceable units
SFY	subsequent fiscal year
WRSKs	war readiness spares kits

COMPTROLLER GENERAL'S REPORT
TO THE CONGRESS

THE AIR FORCE COULD REDUCE WAR RESERVE REQUIREMENTS OF COMBAT-READY UNITS FOR SPARES AND REPAIR PARTS

Department of the Air Force

D I G E S T

The Air Force maintains spares and repair parts for aircraft and equipment as part of its war reserves. Included, for the most part, are major avionics assemblies which can be removed and replaced by maintenance personnel on the flight line. Through fiscal year 1975 the Air Force investment in such war reserves was $618 million.

The cost of acquiring war reserves has increased greatly, and the cost of acquiring stocks to meet the requirements computed by the Air Force far exceeds available funds. GAO proposed several alternatives for reducing investments in spares and repair parts and, at the same time, providing effective support.

REDUCING THE 30-DAY WAR RESERVE SUPPLY SUPPORT PERIOD

The Air Force has consistently used a 30-day support period in determining the number of spares and repair parts needed to support deploying combat units pending resupply. In contrast, fewer spares and repair parts are provided to units already deployed. The deployed units rely on air resupply based on Department of Defense air delivery standards of not more than 17 days. (See p. 6.)

GAO points out that a 13-day support period is the Department of Defense's standard for priority shipments to overseas bases and Defense was meeting this time frame. GAO also noted that Defense, in justifying programs to enhance airlift capability, refers principally to a need for additional cargo space to move large equipment. Cargo space

for spares and repair parts exceeds known requirements. Moreover, the Air Force has embarked on a number of programs which are intended to more than double strategic airlift capability.

In response to GAO's preliminary report, Defense maintained that the 30-day support period used by the Air Force is needed to establish resupply in a wartime environment. It is not feasible to compute wartime support based on peacetime operations because there will be situations in which some units would be deployed to limited capability bases and supported by a main operating or preestablished base. Further, transporting spares and repair parts would increase the requirement of airlift capability that would already be taxed during the initial period of hostilities.

GAO points out that the standard delivery times it proposes for consideration in determining the resupply support for deployable units are the same as those applied to resupply of already deployed units and are based on the overall logistics systems limits Defense promulgated for peacetime and wartime operations. The need for a 30-day resupply time for deployable units has not been fully evaluated by the Air Force. GAO believes, moreover, if additional days of supply support are required to supply airfields with limited facilities, these should be added to the Department's standards for overseas shipments instead of using an arbitrary 30-day period.

In line with U.S. national policy of maintaining a combat-ready conventional force in case of contingencies, the Air Force must have ample spares and repair parts to maintain a high readiness posture during a contingency. GAO believes, however, that a high readiness posture for units to be deployed could be obtained with less than a 30-day war reserve by planning to resupply those units within Defense's established wartime resupply period.

A thorough study is needed to assess all pertinent factors affecting requirements for war reserve spare parts. The study should include anticipated aircraft attrition which would reduce spare parts requirements and the potential increased capacity that will result from the Air Force's airlift enhancement programs. Such a review is essential from both a readiness and economy standpoint.

RECOMMENDATION

GAO recommends that the Secretary of Defense evaluate the reasonableness of the Air Force's practice of providing a 30-day supply of spares and repair parts for units to deploy overseas, giving consideration to the fact that units already deployed in Europe are provided fewer supplies based on an air resupply standard of 17 days. (See p. 13.)

OTHER ALTERNATIVES TO REDUCE WAR RESERVE REQUIREMENTS

GAO proposed other alternatives to reduce war reserve spares and repair parts requirements, such as:

--Deploying with additional maintenance equipment and personnel for more effective onsite repair capability. (See p. 29.)

--Establishing a central repair capability in the theater of operations to use field maintenance equipment and personnel more effectively. (See p. 32.)

--Relying on U.S. depots and existing field maintenance capabilities at U.S. bases for increased maintenance support. (See p. 32.)

GAO also called attention to the Air Force's need to resolve numerous discrepancies between the quantities of war reserve spares and repair parts reported by combat units and those authorized by the Department of the Air Force. (See p. 17.)

Defense agreed that ways to provide additional maintenance support for wartime deployments should be studied. Two examples of the Air Force's attempt to use more cost-effective field maintenance concepts were cited.

Defense said that war reserve reporting procedures had been expanded to include identifying and explaining the differences between reported and authorized equipment.

The Air Force action to study and use more cost-effective field maintenance concepts offers potential for big reductions in investments in equipment and spares. Improved war reserve reporting procedures should reduce requirements for war reserves and result in more effective control over war reserve material and improve the readiness of combat units. GAO plans to follow up on these matters in the future to assess the Air Force's progress to implement these actions.

GAO also examined Air Force procedures for computing spares and repair parts for the F-111D aircraft and found that the number of electronic equipment modules in war reserve spares kits needed to be reduced to include only the quantities needed for the established initial support period. (See p. 20.)

Defense agreed with GAO's proposal to eliminate the quantities of electronic modules in war readiness spares kits exceeding the required support period.

To further reduce requirements for the F-111D aircraft, GAO recommends that the Secretary of Defense require the Secretary of the Air Force to

--use a high air transportation priority for order and shipping time in calculating requirements for critical and expensive electronic components needed as war reserves to support overseas combat units (see p. 26),

--eliminate the procedure of computing separate safety levels for peacetime and

war reserve stocks for overseas combat units. (See p. 26.)

Overseas units commingle peacetime and war reserve stocks. Computing one safety level to support the total quantity can reduce the investment in spares considerably because of the high unit cost of aircraft electronic components. (See p. 23.)

Defense said those requirements could not be reduced because

--resupply of critically needed spares and repair parts for combat units would not rate the highest priority transportation and

--the provision of separate peacetime and war reserve safety levels is necessary to meet the different risks inherent in the two operating environments.

GAO points out that the Air Force regulation pertaining to war reserve material states that bases supporting operational units should requisition war reserve requirements under the highest air transportation priority. The items in question are essential to the effectiveness of combat units and include numerous expensive electronic components that can cost over $500,000 each. The rationale for this requirement is sound since the support of the Air Force's firstline aircraft should rate priority treatment. (See p. 26.)

GAO noted that over 50 percent of the Air Force's $1.3 billion peacetime investment in reparable equipment represents safety levels and feels that some reduction in war reserve safety levels should be considered at those overseas locations where the same parts are stocked as safety level items in both operating stocks and war reserves. Since the same formula is used in both computations, the present method only serves to increase an already large safety level inventory. (See p. 26.)

CHAPTER 1

INTRODUCTION

War reserves are material required in addition to peacetime assets to support planned wartime activities. Air Force war reserve requirements are determined on the basis of the war and mobilization plan, which is prepared by the Deputy Chief of Staff, Plans and Operations, in Air Force headquarters. This plan specifies the number and type of units in each major command that will either conduct activities within their assigned theater of operations or deploy to another in wartime.

The number of units is initially determined by the contingency situation that would pose the greatest security threat. Then the plan calls for the same units to meet other contingency situations.

The Deputy Chief of Staff, Systems and Logistics, in Air Force Headquarters prepares a document that authorizes major commands to establish and maintain stocks of spares and repair parts as war reserves for specified weapons and equipment in support of the war and mobilization plan. War reserves of spares and repair parts for primarily overseas units that will conduct activities within their assigned theaters are called base level self-sufficiency spares (BLSSs). For units that will deploy within or to another theater, they are called war readiness spares kits (WRSKs).

BLSSs

BLSSs insure that a unit has parts immediately available to support the first month of activity in accordance with the war and mobilization plan. BLSS quantities are limited to those necessary to supplement peacetime stock levels. Factors used to compute quantities for each part are the programed wartime flying hours during the first month, anticipated use of the part, and the part or percentage of inoperable parts that can be repaired. BLSS parts may be mingled with peacetime operating stocks at the bases, but inventory records should show the portion of the stock that is retained as BLSSs, to prevent unauthorized use.

WRSKs

WRSKs are air transportable packages of spares and repair parts and related maintenance supplies required to

support the first month of activity identified in the war and mobilization plan. WRSKs are only authorized for units that will deploy during the first month of a war. The types and quantities of parts in WRSKs should be adequate to support activities at the deployment site pending resupply. The primary factors used to select parts and compute quantities are the programed wartime flying hours during the first month, anticipated use of the parts, and the maintenance capability at the deployment site.

WRSKs are normally prepositioned with the deploying unit and transported to the deployment site at the same time the unit deploys. WRSK parts are not mingled with peacetime operating stocks at the bases. The parts may be used to support vital emergency operations, other than those identified in the war and mobilization plan, but they must be replenished immediately.

WAR RESERVE REQUIREMENTS FOR AVIONICS SYSTEMS

Newer aircraft used by the Air Force have a modular design concept for the avionics 1/ systems. On F-111 aircraft, for example, avionics systems are made up of as many as 134 "black boxes" called line replaceable units (LRUs) which can be removed and replaced when they fail. An LRU is in turn made up of a chassis and 10 to 40 plug-in components (modules) which are usually easily removable. The modules contain bit and piece parts which make up the various electronic circuits. Pictures of a complete LRU and the same LRU disassembled showing the modules are on page 4.

The basic maintenance concept developed around these design features was to insure a minimum repair time on the LRU and to provide for more leisurely repair of the modules. Accordingly, when an item of avionics equipment on an aircraft breaks down in the field, the faulty LRU can be identified and replaced with a serviceable unit. LRUs are sent to a field maintenance shop, located on the same base as the aircraft, for testing and repair. The module causing the failure is identified and replaced with a serviceable module,

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1/Avionics--a contraction of the words "aviation electronics"--refers to the various flight guidance, defense, and fire control systems in military aircraft. It includes radars, computers, cockpit control panels and displays, navigation and other flight aids, and communications equipment.

and the LRU is returned to service. Modules requiring repair beyond the capability of the field maintenance shop are sent from the base to a depot. Part of the LRU illustrated on page 4 cannot be removed at a field maintenance shop, and failures in that part require that LRUs be sent to a depot.

This maintenance concept requires only a limited number of spare LRUs in the field because they can generally be repaired by replacing faulty modules. For modules, the situation is almost reversed. The field maintenance shop needs a much larger inventory of modules to replace faulty ones to keep LRUs operational. Depot maintenance activities require few spares of either type since their function is to test modules and repair them by replacing bits and pieces, which are needed in large quantities.

Spares and repair parts for avionics systems of newer aircraft are a major portion of war reserve requirements. For example, about 75 percent of the WRSK cost for F-15 aircraft is for avionics requirements.

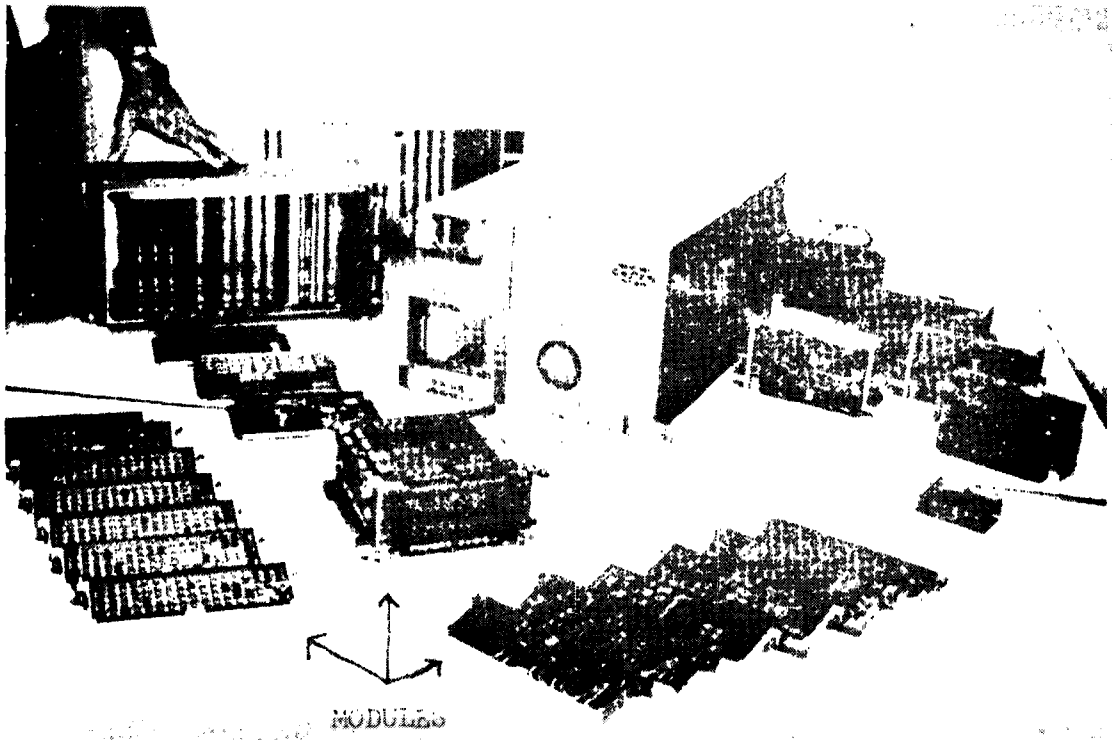
A criterion for selecting WRSK parts, in accordance with Air Force policy, is whether the part can be removed and replaced with organizational level maintenance capability. For avionics systems, only LRUs are normally stocked because faulty LRUs can readily be identified, removed, and replaced. The deploying unit does not have to ship field maintenance equipment to the deployment site during the initial stage of the deployment to identify faulty modules. However, it is considerably more expensive to stock WRSKs with LRUs than with modules.

The criterion was changed for F-111D and F-15 avionics systems to provide for deployment with field maintenance capability so that LRUs can be removed, repaired, and replaced in the field. This reduces the number of replacement LRUs needed and allows the stockage of less expensive modules. The deploying unit, however, has to deploy with field maintenance personnel and equipment.

INCREASING COSTS OF WAR RESERVES

The cost of war reserves to support newer aircraft has increased significantly. As an illustration, WRSK costs for selected aircraft models listed in the sequence of their introduction into the Air Force are as follows:

TC-2 COMPUTER (LRU) AND DISPLAY PANEL



TC-2 COMPUTER DISASSEMBLED SHOWING MODULES

Aircraft	Cost of each WRSK
F-100C	$ 411,505
F-100D	542,174
F-105B	1,601,072
F-105G	5,524,598
F-111A	14,669,838
F-111F	24,180,377

Congressional appropriations are usually inadequate to meet the total war reserve requirement computed by the Air Force. Through fiscal year 1975, the WRSK and BLSS requirement for all aircraft was $813 million. As a result of Air Force funding priorities, the total amount invested in WRSKs and BLSSs through fiscal year 1975 was $618 million, leaving a funding deficit of $195 million primarily for new aircraft.

The Air Force has taken certain actions to reduce the cost of war reserves of spares and repair parts. WRSK requirements for newer aircraft are normally initially based on a 15-day period, rather than the 30 days specified by Air Force policy, because modifications may cause parts procured for WRSKs to become obsolete. Also, the cost of sufficient parts for the entire support period may be prohibitive due to abnormally high failure rates for some systems of the aircraft during the early part of their service life. For example, the estimated cost of WRSKs to support the entire F-111 aircraft program for 30 days was initially about $114 million, and the estimated cost for only 16 days was about $55 million. The support period for each aircraft is subsequently extended to 30 days when modifications are completed and systems become stable. As can be seen by the above table, these costs have increased considerably with a single F-111F kit costing $24 million.

As mentioned above and discussed in more detail in chapter 5, the Air Force also greatly reduces the cost of war reserves of spare and repair parts by using a different maintenance concept to determine WRSK avionics requirements. For example, the cost of WRSKs to support F-111D aircraft, a later configuration, was originally computed to be about $302 million with LRUs that could be removed and replaced. By modifying the maintenance concept to replace modules rather than LRUs, the cost of WRSK support was reduced to about $86 million.

CHAPTER 2

NEED TO REVISE POLICY ON WAR RESERVE SUPPORT PERIOD FOR DEPLOYABLE UNITS

Although exceptions have been made in the case of certain newer aircraft, Air Force policy on the period for which war reserve support is provided for deployable units has remained consistent, and the feasibility of generally resupplying such units in less than 30 days after deployment has not been reviewed in recent years. Considering that (1) the standard delivery times for supplying overseas bases ranges between 12 and 17 days, (2) BLSS stock levels are based on these standards, and (3) the Air Force intends to maintain its aerial supply lines to overseas bases during the initial wartime period, the inclusion of 30 days supply in WRSKs seems to be unduly conservative.

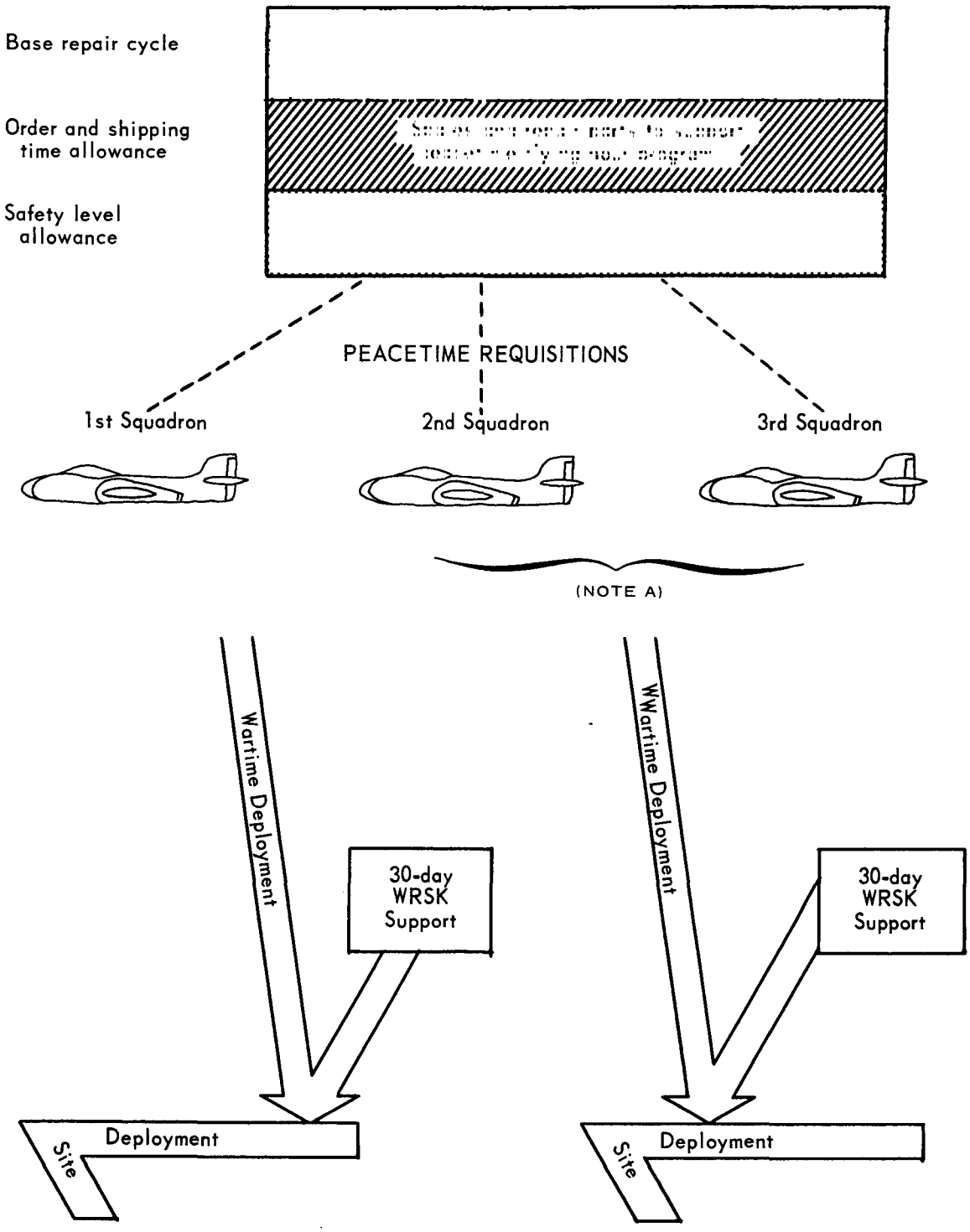
EFFECT OF WRSK POLICY ON SPARES AND REPAIR PARTS REQUIREMENTS

The Air Force has consistently used a 30-day support period for WRSKs. It is based on the projected time needed to establish a supply line to the deployment site after a unit deploys. WRSK requirements contribute substantially to the magnitude of investment in spares and repair parts because WRSKs are segregated at Air Force bases for ready deployment and are not normally considered available to meet peacetime stock requirements. Also, it is not anticipated that certain peacetime assets will be available at the time of deployment to reduce WRSK investments. As discussed in chapter 1, another reason WRSKs substantially increase the investment in spares and repair parts is the requirement that they be stocked with more expensive avionic assemblies which can be used by organizational level maintenance personnel.

As illustrated below, a typical wing stationed at an Air Force base in the United States may be authorized WRSKs for one or two and, in some instances, all three of its squadrons. The squadrons use base stocks of spares and repair parts to support peacetime operations but would deploy with only their assigned WRSK stocks in event of war.

The costs of a 30-day WRSK stock of expensive components, in addition to spares and repair parts for peacetime operations of modern aircraft, are prohibitive. For example, the estimated cost of WRSKs alone for F-15 aircraft in accordance with existing policy would be about $1 billion, which is more

BASE OPERATING STOCKS



A/ Illustrates a two location deployment possibility. A wing can also deploy to three locations.

than the current cost of WRSK requirements for all aircraft presently in the Air Force inventory.

POTENTIAL FOR REDUCING WRSK SUPPORT PERIOD BASED ON STANDARD DELIVERY TIMES

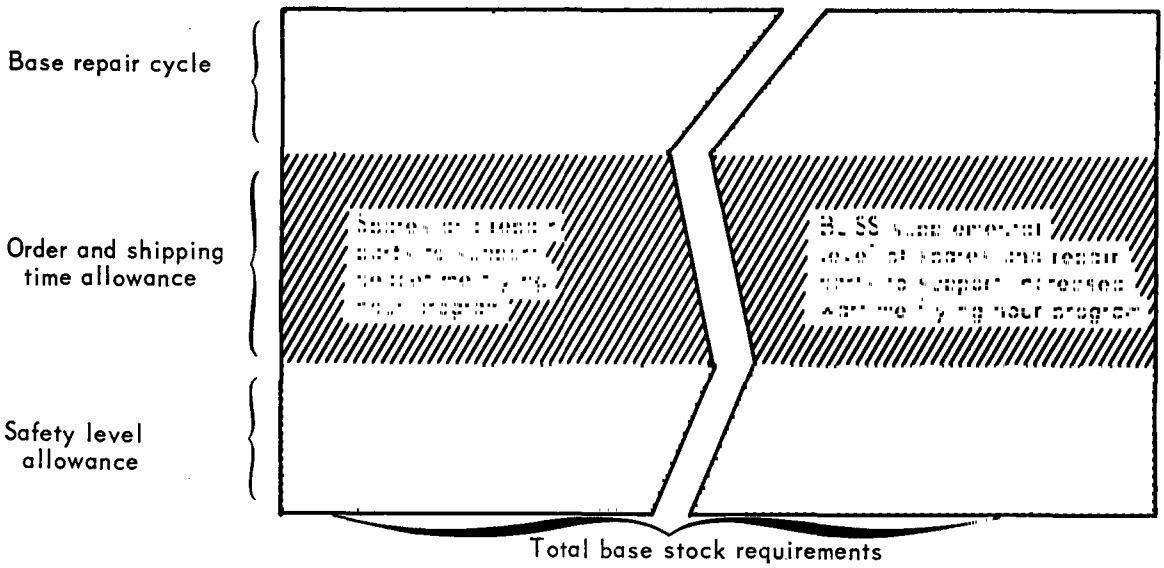
The 30-day WRSK support period is based on the projected time needed to establish a supply line to a deployment site, but Department of Defense (DOD) standards for supplying overseas bases are considerably shorter. Maximum allowable time limits under designated priorities have been established to effect delivery of supplies to requisitioners, under DOD's uniform material movement and issue priority system. Air Force material management activities are encouraged to improve the time limits wherever possible.

In accordance with Air Force guidance, bases supporting operationally ready units committed to support wartime plans are required to requisition war reserves under the highest priority. The standard delivery time for supply shipments to overseas bases under the highest priority is 12 to 13 days and, as discussed in chapter 4, the actual delivery time to an overseas base covered by our review under the highest priority has been averaging only 9 days. Furthermore, the standard delivery time for any overseas shipment by air transport is not more than 17 days.

Supply lines by air transport would also be needed throughout the initial wartime period to overseas bases that support squadrons authorized BLSSs. By definition, base operating stocks at overseas installations are computed on the presumption of air transportation resupply. The formula for determining the stock level of reparable items consists of allowances for the base repair cycle, order and shipping time, and a safety level for minor interruptions of the supply system.

As illustrated below, BLSS stocks are mingled with base stocks and supplement peacetime stocks to support the increased flying-hour program. However, as discussed in chapter 4, support for both peacetime and war-reserve levels is computed on the basis of the expected order and shipping time for requisitions on supply depots in the United States. In the case of F-111D aircraft a 17-day order and shipping time was being used. Also, some spares and repair parts require depot level maintenance, and an exchange of such parts between the bases and depots in the United States is mandatory.

BASE OPERATING STOCKS



In view of the standard delivery times and intention of the Air Force to maintain in wartime its own supply lines to overseas bases, we discussed the basis for the WRSK support period with Air Force headquarters officials. One official said that the supply of deployed units in less than 30 days after their deployment was not possible due to the lack of sufficient airlift capability during the initial period of a war. However, another official responsible for airlift studies and analysis said that the feasibility of supplying such units in less than 30 days had not been reviewed in recent years.

Concerning sufficiency of airlift capability, in our recent report entitled "Information On the Requirement For Strategic Airlift" (PSAD-76-148, June 8, 1976), we concluded that the bulk cargo capability of DOD's Civil Reserve Air Fleet exceeds Air Force anticipated needs in reacting to a European contingency and the Air Force plans to expand this capability. During a balanced deployment the Air Force proposes to transport 17,300 tons of bulk cargo in a 30-day period. Under its airlift enhancement program the Air Force plans to increase the use of bulk cargo capability to transport 17,300 tons in 15 days or 47,300 tons of cargo in 30 days. This does not include space for large equipments.

The Air Force has embarked on a number of programs which are intended to more than double strategic airlift capability.

In terms of overall cargo capability, the objective of the programs is to permit airlift of 180,000 tons of cargo to Europe in 15 rather than 30 days or to increase the 30-day airlift capability to 370,000 tons.

CONCLUSION

A 30-day supply of expensive avionics components represents a significant investment, and there are obviously limitations on the amount of funds the Air Force can expect to receive annually. Since support requirements as currently computed by the Air Force continually exceed funding levels, the Air Force should review its policy on war reserves for deployable units, considering expected capabilities for air resupply in light of current priority and standard delivery times for supplying overseas bases and anticipated enhancement of airlift capacity.

While the basis for the 30-day support period is an assumed lack of airlift capability, the feasibility of reducing the support period has not been reviewed in recent years. The primary limitation identified on airlift capability is cargo space for transporting large equipments in event of war in Europe. Outsize cargo space is not needed to transport spares and repair parts.

WRSK costs as computed in accordance with existing Air Force policy are high. Reducing the support period would in turn reduce the investment that must be made in war reserves and help insure that limited funds are spent for truly critical requirements.

In our January 20, 1976, preliminary report, we proposed that the Secretary of Defense require the Secretary of the Air Force to determine the feasibility of reducing the WRSK support period in accordance with standard delivery times for supplying overseas bases by air.

AGENCY COMMENTS

The Principal Deputy Assistant Secretary of Defense (Installations and Logistics) did not concur. He maintained that the 30-day support period used by the Air Force is the projected time needed to establish resupply in a wartime environment. Standard delivery times, on the other hand, apply to established supply lines to maintain operating bases in peacetime. It is not feasible, in his opinion, to compute wartime support based on peacetime operations because there

would be situations in which some units would be deployed to limited capability bases and supported by a main operating or preestablished base.

He maintained that a reduction of the WRSK support period would increase the requirement for airlift capability that would already be taxed during the initial wartime period.

We recognize that in the early days of a conflict there would be a heavy strain on DOD's airlift resources. A reduction of the WRSK support period would increase airlift requirements. The Air Force would, however, increase the use of its aircraft as well as designated commercial airlift. Moreover, the primary limitation on airlift capability is outsize cargo space for transporting large equipment, not spares and repair parts. As indicated on page 9, the bulk cargo capability of DOD's Civil Air Reserve Fleet exceeds Air Force needs in reacting to a European contingency.

The Air Force has not analyzed the 30-day support period requirement. We asked Air Force officials to determine the rationale for this requirement, which is almost twice the peacetime delivery standard, and to study the adequacy of their supporting documentation. These officials were not able to provide us with such a study. This was confirmed by the Deputy Assistant Secretary when he noted in his response to our preliminary report that

> "the availability of airlift to support spares and repair parts shipments during the first 30 days of conflict has not yet been fully evaluated."

The standard delivery times, which we propose as a basis for determining the WRSK support period, are overall logistics systems limits DOD promulgated for peacetime and wartime operations. Units currently assigned to established overseas bases would anticipate resupply in wartime within the time frames DOD stipulated, which serve as a basis for determining the number of assets required. Therefore, wartime planning must provide sufficient airlift to resupply these units in less than 30 days.

The net effect of the present DOD position may be summarzed as (1) the Air Force has differing contingency support policies and practices for its deployed and deployable units; (2) although the deployed units have a lower reserve, DOD seems satisfied that it can provide adequate resupply by air for the deployed units, but has doubts that it can resupply

by air, deployable units that may be shipped overseas; (3) the Air Force capability for supplying either deployed or deployable units has not been specifically established; (4) repair parts for aircraft would command the highest priority for airlift in times of contingencies; and (5) DOD stated airlift requirements generally indicate that there is adequate contingency airlift capacity for the types of items represented by WRSKs, and the airlift capacity is to be further expanded to provide additional outsize cargo capability.

It is apparent from the above that the differing requirements for deployable units in relation to resupply capabilities have not been established by any identifiable studies leading to the conclusion that the high investment in 30-day reserves for deployable units is necessary; instead, this has been established on a somewhat arbitrary basis.

There is also a basic contradiction in DOD's position that the availability of airlift to support spares and repair parts shipments during the first 30 days of the conflict would be taxed. Since the 30-day reserves for deployable units must themselves be airlifted with the units as they deploy, they are by definition part of the very cargo to be airlifted in the early stages of conflict. To the extent that these reserves exceed those required by deployed units, it is the WRSK material itself which will contribute to the "taxing" of the airlift capability referred to by DOD.

We agree that although a number of units would deploy and operate from established overseas bases, others would use airfields with more limited facilities. If a unit is to operate from a limited capability base, however, the additional days of supply support required could be added to the Department's standards for a main operating base instead of using the arbitrary 30-day period which, as we indicated previously, has not been validated by Air Force studies.

We are mindful of the need for combat units to have sufficient quantities of spare parts for effective support during the initial wartime period pending resupply. In this regard we would prefer that the Air Force err on the high side in computing requirements to assure that adequate quantities of spares are available. But, since funding shortages prevent the Air Force from buying enough spares to fill all its computed requirements, it is essential, from a readiness standpoint, for it to calculate its resupply capability carefully rather than use an arbitrary 30-day figure.

What is needed, in our view, is a thorough study questioning all pertinent factors affecting requirements for spare parts in addition to the number of days it will actually take to resupply units by air transport. The study should consider the effect of the airlift enhancement programs which are intended to more than double strategic airlift capability.

The study should also consider, for example, anticipated wartime attrition of aircraft. This is not a factor in the 30-day computation. While the Air Force computes the increase in spare part requirements based on the anticipated wartime surge in flying hours per aircraft, there should be an offsetting factor to account for aircraft attrition and the resulting decrease in spare part requirements.

The Principal Deputy Assistant Secretary of Defense (Installations and Logistics) also maintained that a reduction of the WRSK support period would not reduce the total war reserve requirement for spares and repair parts. He contended that the total assets needed at the start of war remain constant, and if they are not in WRSKs, they must be stocked in depots or bases.

We believe, however, that the war reserve requirement for spares and repair parts is not a finite quantity but one which has its basis in the application of judgment in interpreting the effect of various factors on probable needs. The WRSK and BLSS computations establish the war reserve requirements and the types and quantities of items acquired to meet these requirements are further limited by such factors as availability of funds and availability of the material. Accordingly, we cannot agree that total Air Force war reserves of spare parts would be unaffected by reduced WRSK stocks.

In summary, the Air Force requirements are computed based on an arbitrarily established resupply time. As indicated by the Deputy Assistant Secretary, the availability of airlift to support spares and repair parts in the first 30 days has not yet been fully evaluated. Further, the Air Force in determining its requirements has not considered all factors such as anticipated aircraft attrition in wartime.

RECOMMENDATION

We recommend that the Secretary of Defense evaluate the reasonableness of the Air Force practice of providing a 30-day supply of spares and repair parts for units to deploy overseas, considering the fact that units already deployed in Europe have fewer supplies based on an air resupply standard of 17 days.

CHAPTER 3

COORDINATION AND REVIEW OF WAR RESERVE SPARES REQUIREMENTS FOR DESIGNATED UNITS

The war and mobilization plan prepared by the Air Force Deputy Chief of Staff, Plans and Operations, is the basis for determining the war reserve materiel needed to meet the mobilization requirement. The war reserve material authorization documents for WRSKs/BLSSs prepared by the Deputy Chief of Staff, Systems and Logistics, to support the war plan are not consistent with the plan. In some cases, material needed to support the plan is excluded and, in other cases, material not required according to the plan is included.

There were also discrepancies between authorization documents and material status reports. Status reports from five major commands disclosed instances of unauthorized material reported on hand, authorized material not reported, improper types of war reserves reported, and incorrect equipment quantities reported.

COORDINATION OF THE WAR AND MOBILIZATION PLAN WITH MATERIAL AUTHORIZATIONS FOR WAR RESERVE SPARES

The war and mobilization plan is revised annually and, until recently, the material authorization for war reserves of spares and repair parts derived from the plan, called WRSK/BLSS authorizations, was revised every 6 months. The Air Force now expects to revise authorizations only when the plan is revised. Before the WRSK/BLSS authorizations are published they are reviewed by all affected Air Force Headquarters elements, including the office of the Deputy Chief of Staff, Plans and Operations. Both documents identify the type and quantity of equipment in each major command that is to be supported by either WRSKs or BLSSs, and the major command designates individual units that will maintain the WRSKs/BLSSs to support wartime activities. WRSK and BLSS requirements are established for the current year and projected for 4 subsequent fiscal years to help plan for changes in the force structure.

To evaluate the coordination of the WRSK/BLSS authorizations document with the war and mobilization plan, we made two sample comparisons. First, we compared the authorizations document with the war and mobilization plan that was current at the time the document was prepared and was supposed to be based on the plan. This showed the following types of discrepancies.

Aircraft type	WRSK requirements based on war and mobilization plan (note a)	WRSKs actually authorized
A	No requirement (CFY)	1 WRSK for 18 of type A aircraft
B	2 WRSKs, each to support 18 of type B aircraft (CFY)	None authorized
C	2 WRSKs, each to support 18 of type C aircraft (SFY)	1 WRSK for 6 aircraft 1 WRSK for 12 aircraft 1 WRSK for 18 aircraft
D	6 WRSKs, each to support 24 of type D aircraft (SFY)	2 WRSKs for 24 aircraft each; 2 WRSKs for 48 aircraft each
E	3 WRSKs, each to support 24 of type E aircraft (SFY)	2 WRSKs for 28 aircraft each

a/Requirement for current fiscal year (CFY) or requirement for subsequent fiscal year (SFY).

By authorizing a WRSK for aircraft A that was not required by the plan, an unnecessary expenditure could have been made for spares and repair parts to stock the WRSK. The lack of an authorization for two aircraft B WRSKs as required by the plan indicates a possible readiness deficiency because the aircraft would not be able to carry out sustained operations at the deployment sites without the WRSK.

WRSKs were authorized for the total number of C aircraft required by the plan, but an unnecessary expenditure could have been made because the cost of three WRSKS authorized could be greater than the cost of the two required. This is probably because the failure rates of some items that would warrant the stockage of one unit in each of the two WRSKs may also warrant one-unit stockage in each of the three WRSKs. Also, some parts are included in each WRSK even though the failure rates do not warrant stockage because their failure would jeopardize the capability to accomplish the assigned mission. To illustrate the effect that the number of aircraft supported by a WRSK has on spares and repair parts requirements, we compared the costs of a 24-unit WRSK with a 48-unit WRSK for F-4D aircraft. The cost of two WRSKs for 24 F-4D aircraft each, for example,

is $4.7 million, and the cost of one WRSK for 48 F-4D aircraft is $3.6 million.

WRSK was also authorized for the total number of D aircraft required to support the plan, but a readiness deficiency could occur if deployment to six separate sites was required because only four WRSKs were authorized. A similar readiness deficiency could occur for E aircraft if deployment to three separate sites was required because only two WRSKs were authorized.

Although the discrepancies for C, D, and E aircraft involved requirements for subsequent years, they could adversely affect current procurements and future readiness capabilities. Air Logistics Centers must initiate the procurement of some WRSK items years before delivery due to the extended production leadtimes involved. Even if the discrepancies are subsequently rectified, item excesses and shortages could result from the inappropriate procurements that had been initiated.

We discussed the discrepancies with officials of the Deputy Chief of Staff, Plans and Operations, and the Deputy Chief of Staff, Systems and Logistics, at Air Force Headquarters. The Systems and Logistics official attributed the discrepancy with D aircraft to a change in deployment plans that would occur. He said he knew that the number of planned deployment sites was to be reduced from six to four. The officials could not explain the other discrepancies.

Our second comparison with the same WRSK/BLSS authorizations document and the war and mobilization plan as published 3 months later showed even more discrepancies. The Air Force Headquarters officials said that this resulted from numerous revisions to the war and mobilization plan after the WRSK/BLSS authorizations document was prepared. The number of WRSKs to support the plan for some aircraft was decreased while the number for other aircraft increased. We were told that interim revisions of the WRSK/BLSS authorizations document were not normally made to reflect changes in the war plans.

The increase in discrepancies further illustrates the desirability of updating WRSK/BLSS authorizations concurrent with the plan. This would insure that appropriate procurements are made for items with extended production leadtimes and help to avoid future excesses and shortages.

After we completed our work at Air Force Headquarters, officials implemented a procedure for concurrent publication

of the plan and the authorization document. This calls for the Plans and Operations officials to provide a list of WRSKs and BLSSs needed to support the plan to the Systems and Logistics personnel.

REVIEW OF MATERIAL STATUS REPORTS ON WAR RESERVES

Units which the respective major commands designate to establish and maintain WRSKs and BLSSs are required to submit monthly material status reports. The number of reported shortages in relation to the parts authorized provide a basis for rating a unit's ability to carry out its assigned wartime activities. The reports list any shortages of authorized spares and repair parts that bring the unit's rating below a certain rating standard. Reports from individual units are forwarded through major commands to the Air Force Logistics Command, where the data is collated and distributed in bound reports to major commands, Air Force Headquarters, and Air Logistics Centers of the Logistics Command. According to regulation, monitors of war reserves in the Air Logistics Centers compare the quantities reported with current authorizations for each item. Any discrepancies noted and corrective actions taken are reported to the Logistics Command.

Our comparison of the WRSK/BLSS authorizations document with material status reports from units of five major commands for 1 month showed numerous discrepancies, including

--reports not submitted for authorized WRSKs,

--reports submitted for unauthorized WRSKs,

--BLSSs authorized and WRSKs reported,

--more or less WRSKs reported to support the total authorized quantity of equipment, and

--more or less equipment reported as supported by WRSKs than authorized.

Units of one major command, for example, reportd nine WRSKs which were not authorized, two WRSKs instead of BLSSs, more WRSKs than required to support the total authorized quantity of equipment in two instances, and more or less equipment supported by WRSKs than authorized in five instances. Furthermore, they submitted no reports for 17 authorized WRSKs and BLSSs. More limited comparisons for other months showed similar discrepancies. We found no

specific Air Force regulation to make the type of comparison that we did. On the other hand, a regulation requires the Air Logistics Centers to compare the quantity of spares and repair parts reported to current WRSK and BLSS authorizations for each item.

An official at Air Force Headquarters said that, if the Air Logistics Centers were making the comparison required by regulation, the types of discrepancies we found would have been disclosed. Even though the regulation only requires the Air Logistics Centers to compare individual spares and repair parts authorized and reported, discrepancies involving entire WRSKs and BLSSs would have been noted. Officials at the Air Force Logistics Command said, however, that the Air Logistics Centers were not submitting discrepancy reports, and they discussed this problem during conferences on war reserve material.

Another Air Force Headquarters official said that there were valid reasons for some of the discrepancies we found. A unit may not submit a report for a recently authorized WRSK or BLSS because the Air Logistics Center for the unit's aircraft has not developed a list of the necessary spares and repair parts. Also, a unit may continue to submit a report on a WRSK or BLSS that is no longer authorized because the spares and repair parts cannot immediately be returned to the supply system for other uses. Other discrepancies could be attributable to units being activated and deactivated throughout the year and major commands requesting deferments of changes to their WRSK and BLSS authorizations because of changes in Air Force planning documents.

Although some discrepancies may be attributable to such circumstances the material status reports do not identify them; this reduces the efficacy of the reporting system.

CONCLUSIONS

Discrepancies between the war and mobilization plan, the WRSK/BLSS authorizations, and material status reports indicate that some units may not have sufficient war reserve material to carry out assigned wartime activities while other units have too much. Omission of war plan requirements from authorizations documents means failure to authorize what is needed in the event of war. The lack of adequate reporting for authorized WRSKs means uncertainty that units are maintaining material required for deployment in the event of war.

On the other hand, authorizing WRSKs not required to support the war and mobilization plan indicates that some material is needlessly requisitioned. Reporting of unauthorized WRSKs implies that combat units are unnecesarily maintaining equipment and material that could be released to fill other requirements.

Air Force Headquarters officials' actions to provide for concurrent publication of the war and mobilization plan and WRSK/BLSS authorizations should substantially reduce the discrepancies between the two documents.

We proposed that the Secretary of Defense, however, require that the Secretary of the Air Force implement guidance and procedures that will insure (1) comprehensive reporting from all units authorized WRSKs and BLSSs and (2) the review and resolution of significant deficiencies between authorizations and status reports.

AGENCY COMMENTS

The Principal Deputy Assistant Secretary of Defense (Installations and Logistics) concurred. He stated that procedures were implemented to expand material status reporting to include identification of and explanation for differences between reported and authorized WRSKs/BLSSs.

This action and the steps previously taken by the Air Force to improve coordination of the war plan and authorization documents should insure more effective control over war reserve material and improve the readiness of combat units. We plan to follow up on this matter at a future date to determine how effectively the actions taken are implemented.

CHAPTER 4

EXCESSIVE SPARES AND REPAIR PARTS REQUIREMENTS COMPUTED FOR WAR RESERVES

Certain procedures for computing quantities of spares and repair parts for WRSKs and BLSSs cause overstated requirements and excessive expenditures for war reserves. The procedures are used mostly for requirements of F-111D aircraft.

The Sacramento Air Logistics Center of the Air Force Logistics Command provides logistical support for the F-111D, a tactical fighter aircraft assigned to the Tactical Air Command. The Center is responsible for determining peacetime and wartime support requirements for the aircraft.

WRSK SUPPORT FOR THE F-111D AVIONICS SYSTEM

Avionics requirements for F-111D WRSKs are computed on the concept of deploying with intermediate test equipment for field maintenance and stocking WRSKs with modules and a minimum of the more expensive "black boxes," or LRUs. Enough LRUs are required to set up a field maintenance facility at a deployment site and initially repair the first defective modules in the base repair cycle. The Center determines the number of LRUs required to support activities for 7 days--5 days for setting up the field maintenance facility, 1 day for the initial base repair cycle, and 1 day for a contingency period. The Center then determines the required number of modules for the entire 30-day WRSK support period. Since the LRUs will support activities for 7 days, providing module support for 30 days will result in provisioning for a wartime flying hour program at least 7 days greater than the 30 days called for under Air Force policy.

We selected eight high-value LRUs and computed the associated module support requirements for 30 days less the days of LRU suport already provided in F-111D WRSKs. For 195 modules, requirements could be reduced by about $3.1 million, as shown below.

Excessive module WRSK support

LRU	Associated modules analyzed (note a)	Potential reduction in requirements	Potential excess currently under procurement
Radar antenna	7	$ 722,822	$ 60,288
Converter unit	10	189,078	-
Electronic processor	27	684,650	603,118
Inertial reference unit	43	225,606	214,356
Navigation computer	20	68,992	1,932
Digital data indicator	24	305,228	50,838
Radar data converter	19	800,304	530,841
Signal data converter	45	146,178	117,629
Total	195	$3,142,858	$1,579,002

a/Modules for the radar antenna, for example, consist of such parts as gimbal support assembly, tilt transmitter, azimuth transmitter, pump, rate gyro, transmitter, and reflector feed assembly.

After concluding our fieldwork, we discussed this matter with Center officials and proposed that they review it.

In view of the procedure used for F-111D WRSKs, we reviewed computations of avionics requirements for F-15 WRSKs at the Warner Robins Air Logistics Center. We found that the number of modules was determined for only that portion of the period not supported by LRUs. Therefore, the Warner Robins Air Logistics Center had computed F-15 requirements in the way we suggested for the F-111D.

ORDER AND SHIPPING TIME FOR F-111 BLSS REQUIREMENTS

Unlike the WRSK, which is a 30-day stock without any provision for resupply or depot maintenance, the BLSS computation includes an order and shipping time for the number of days it takes for a user to requistion and receive a serviceable part from a maintenance depot in the United States. This time is considered in computing the BLSS requirements for parts that have to be repaired in maintenance depots,

such as electronic modules. As this time increases, the number of parts needed to support the wartime flying hour program for a 30-day period increases.

The Center used a 17-day order and shipping time for computing F-111D BLSS requirements at an overseas base. This was based on the standard delivery time for air transportation shipments with the lowest priority, from a maintenance depot in the United States to Air Force bases overseas.

The Center's use of the lowest priority was in accordance with a portion of the basic logistics manual of the Air Force concerning the development and use of order and shipping times. However, another portion of the manual pertaining to war reserves material states that bases supporting operationally ready units should requisition WRSK and BLSS requirements under urgency of need designator "A". For bases with F-111 aircraft, this entails the highest air transportation priority. The actual average order and shipping time for high priority shipments to the overseas base with the BLSS requirement is about 9 days.

We computed F-111D BLSS requirements for 195 modules, first on the basis of a 17-day order and shipping time and then on the basis of 9 days. By using the lower order and shipping time, requirements could be reduced by about $2.7 million, as shown below.

Excessive order and shipping times used in BLSS requirements computations

LRU	Associated modules analyzed	Potential reduction in requirements	Potential excess currently under procurement
Radar antenna	7	$ 268,112	$ 37,250
Converter unit	10	127,460	-
Electronic processor	27	561,340	488,067
Inertial reference unit	43	167,793	164,479
Navigation computer	20	73,950	42,692
Digital data indicator	24	428,333	34,725
Radar data converter	19	663,567	530,180
Signal data converter	45	408,604	318,766
Total	195	$2,699,159	$1,616,159

Center officials said that the use of the lowest air transportation priority was based on their interpretation of the manual.

STOCK SAFETY LEVELS FOR BASES SUPPORTING UNITS AUTHORIZED BLSSs

A safety level is an additional increment of spares and repair parts included in peacetime and wartime stock levels maintained by bases. Safety levels are necessary to assure continuous operation with a specific degree of confidence if resupply is interrupted or demand varies. Air Logistics Centers determine safety level quantities for requirements computations by referring to a table in an Air Force Logistics Command manual. The safety level quantities shown in the table vary according to a number of factors, including the order and shipping time, the repair cycle time and the number of locations that stock the part. However no recognition is given in the table to whether locations stock the part for both peacetime and war reserve needs. Accordingly, for those bases supporting units authorized BLSSs, the Air Logistics Center computes the safety level requirement twice using the same formula--first for peacetime stocks and then for BLSSs. Computing the requirement separately causes the total peacetime and BLSS safety level requirements to be higher than if they were computed together.

To illustrate the computation process, the peacetime order and shipping time plus base repair cycle quantity for a part is two units, and the BLSS order and shipping time plus base repair cycle quantity for the same part is one unit. The total safety level based on separate computations is:

Peacetime safety level (quantity of two units and one user)	2.1
BLSS safety level (quantity of one unit and one user)	1.5
Total safety level	3.6

The total safety level based on a combined computation is:

Peacetime and BLSS safety level (quantity of three units and one user)	2.6

Therefore, the combined computation would reduce the safety level by one part. The safety level computed on a combined

basis would be adequate because peacetime and BLSS stocks are mingled at the bases and provide total wartime support.

We computed the safety level requirements for eight high-value F-111D reparable parts on a combined basis and compared the results to the Center's separate computations. Our computation showed the following potential savings could be achieved.

Peacetime and BLSS
safety level requirements computation

LRU	Unit cost	Number of units As computed by Air Force	GAO	Difference	Potential savings
Electronic processor	$500,233	6	4	2	$1,000,466
Radar data converter	437,330	a/6	5	1	437,330
Radar antenna	169,950	7	5	2	339,900
Converter unit	112,521	a/6	4	2	225,042
Microwave receiver	225,640	a/6	5	1	225,640
Pulse generator	64,890	a/6	4	2	129,780
Digital data processor	264,550	6	4	2	529,100
Transmitter	139,554	7	6	1	139,554
					$3,026,812

a/Currently being procured.

The method of determining safety level quantities was subsequently changed, according to officials at Air Force Headquarters. Instead of the fixed quantities set forth in the table, the quantities can vary depending on item values, the desired level of protection, and item demands. Separate safety levels were, however, still being computed for peacetime and BLSS requirements.

CONCLUSIONS

The Air Force should make the following revisions in procedures for computing WRSK and BLSS requirements. These revisions would substanitially reduce war reserve expenditures and have no adverse effect on the readiness posture.

For F-111D WRSKs, the number of modules needed only during the portion of the 30-day period that is not supported by LRUs should be determined. Requirements computed this way would still provide adequate support for the 30-day period.

The order and shipping times should be based on air transportation priority Group I for computing BLSS requirements. The portion of the logistics manual which directs the use of air transportation priority Group III should indicate that a higher priority is authorized for WRSK and BLSS requirements. This procedure may apply to other aircraft, as well as the F-111D, and responsible Air Logistics Centers should therefore review BLSS requirements for these aircraft.

The total peacetime and BLSS stock requirements should be used to compute the safety level quantity for bases. The computation should be used for all aircraft authorized BLSSs.

We proposed that the Secretary of Defense require the Secretary of the Air Force to determine the feasibility of revising procedures for computing WRSK and BLSS requirements to insure that

--the quantity of modules in F-111D WRSKs does not provide support exceeding 30 days,

--order and shipping times used in BLSS requirement computations are based on air transportation priority Group I, and

--peacetime and BLSS stock requirements are combined to determine base safety level quantities.

AGENCY COMMENTS

The Principal Deputy Assistant Secretary of Defense (Installations and Logistics) stated that the computation of modules in F-111D WRSKs has been corrected to limit the quantity to 30 day support.

He did not agree, however, that BLSS requirement computations should be based on the highest priority for air transportation. During wartime, shipments requiring the highest priority should be reduced. Therefore, the normal replenishment of BLSSs would be afforded a lower priority, to afford higher priority to more urgent wartime requirements.

We agree that high priorities should only be given to more urgent wartime requirements. However, it is difficult to comprehend that many requirements would be considered more critical to the Air Force than BLSS spares and repair parts. A criterion for BLSSs is that the items are essential to the operational effectiveness of combat units that would perform wartime missions in a theater of operations. Furthermore, BLSS requirements, which total about $73 million and include items costing over $500,000 each, represent one of the more expensive supply support requirements of DOD. Therefore, it would appear that BLSS requirements should be afforded high priority transportation.

We noted that the portion of the basic logistics manual on the priority for BLSSs does not indicate that a lower priority should be used in wartime.

The Principal Deputy Assistant Secretary of Defense (Installations and Logistics) also did not agree that peacetime and BLSS stock requirements should be combined to determine base safety level quantities. The base safety level is needed to cope with supply interruptions or demand variation in peacetime. The additional safety level for BLSSs is to cover the increased risks inherent in supporting wartime operations. He stated also that the formula for the BLSS safety level is based on wartime risk factors which are greater than peacetime risk factors.

We agree with the concept of specifically tailoring safety levels for BLSSs to meet wartime needs. This is not being done, however, under present Air Force procedures. Contrary to the Principal Deputy Assistant's understanding, the same formula is used in computations of peacetime and BLSS safety level quantities. The Air Force Logistics Command manual does not distinguish between peacetime and wartime operations. Furthermore, the safety level formula provides for such large quantities of safety stocks that the separate computation of peacetime and BLSS requirements seems unduly conservative. We also note that over 50 percent of the Air Force's $1.3 billion peacetime investment in reparable equipment represents safety levels.

RECOMMENDATION

In light of the essentiality and cost of BLSS spares and repair parts and the magnitude of the overall allowance for safety levels, we recommend that the Secretary of Defense require the Secretaray of the Air Force to

determine the feasibility of revising procedures for computing BLSSs to (1) base the order and shipping times used in BLSS requirement computations on air transportation priority Group I and (2) compute the safety level for peacetime and BLSS stocks based on the total requirement.

CHAPTER 5

ALTERNATIVE PROCEDURES FOR MAINTAINING DEPLOYED AIRCRAFT

The costs of war reserves for modern aircraft have become extremely high primarily due to requirements for supporting avionics systems. When a relatively large portion of funds available for spares and repair parts procurements is needed to satisfy war reserve requirements, funds may not be available to meet those needs nor to procure stocks needed to support peacetime operations. This degrades overall readiness. Therefore, alternative procedures for supporting aircraft avionics systems in event of deployment should be explored to reduce requirements.

One alternative is to use the procedure adopted for F-111D and F-15 aircraft. This entails the deployment of intermediate maintenance for the aircraft's avionics system to reduce the number of expensive LRUs needed in WRSKs. Other alternatives include establishing a central intermediate maintenance capability in the theater of operations or depending on more extensive use of existing maintenance activities in the United States.

ALLOCATION OF APPROPRIATIONS FOR SPARES AND REPAIR PARTS

Congressional appropriations are usually inadequate to meet all spares and repair part requirements as computed by the Air Force. As a result, the Air Force Logistics Command must allocate available funds on a priority basis. Normal operations are funded first, WRSK and BLSS requirements are funded second, and other war reserve requirements are funded third. 1/

The WRSK and BLSS requirements for cargo aircraft are considered first because adequate airlift is needed to support other weapon systems and, under certain contingency plans, the aircraft will have to operate out of bases that are not on

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1/The priorities for fund allocations conflict with priorities for requisitions in that requirements for spares to fill or replenish established WRSKs are satisfied before peacetime operating requirements when bases submit requisitions.

established routes. The maturity of aircraft systems is another consideration. New aircraft may require several modifications of certain systems to achieve maturity. Therefore, only limited funds are allocated to procure parts for unstable sytems because modifications may cause parts to become obsolete and parts failure rates may be abnormally high. As a result of the allocation process, the Air Force Logistics Command computed a funding deficit of about $195 million for WRSK and BLSS requirements of primarily new aircraft in fiscal year 1975.

REVISION OF DEPLOYMENT MAINTENANCE CONCEPT FOR F-111D AND F-15 AIRCRAFT

The maintenance concept for deploying F-111D and F-15 aircraft was revised to reduce the magnitude of WRSK requirements. The F-111D has the most sophisticated avionics system used in the F-111 aircraft series. With organizational maintenance support--the normal deployment concept--the cost of F-111D WRSKs as computed in 1972 was about $302 million. This requirement was considered excessive, and the Air Force revised the deployment concept to include transporting the next higher level of maintenance support--field maintenance, for the avionics system. Field maintenance should enable air bases to replace modules rather than LRUs, thus reducing the cost of WRSKs to about $86 million.

A similar determination was made in 1975 for F-15 aircraft which are currently being introduced into the Air Force. WRSK costs, with full organizational level maintenance, totaled about $1 billion. With field maintenance support for the avionics system, the cost was about $465 million.

We visited Cannon Air Force Base, Clovis, New Mexico, the assigned base for F-111D aircraft, to compare requirements for deploying field maintenance support with other equipment and supplies. On the basis of a recent practice deployment at the base, 11 hours were required to assemble and position WRSK spares and repair parts for loading onto cargo aircraft. This did not include the time needed to fill any WRSK part shortages, which base officials estimated would require at least 24 additional hours in event of actual deployment. Records of the practice deployment also showed that field maintenance personnel and equipment were assembled and positioned for loading within 14 hours. Base officials estimated that in event of actual deployment, intermediate test equipment could be reassembled at the deployment site and be operational within 36 hours.

Logistics support for a deployed squadron of F-111D aircraft includes WRSKs; aerospace ground equipment; spare engines; tool boxes; miscellaneous parts, such as fastenings; intermediate test stations; and 450 personnel with personal and combat gear. Base officials estimated that 21 C-141 cargo aircraft would be required to transport the material and personnel. Field maintenance equipment would occupy all the cargo space on one aircraft and one-half of the space on a second aircraft. An Air Force Headquarters official, however, said that five aircraft would be required to transport field maintenance personnel and equipment.

PROPOSED REVISION OF DEPLOYMENT MAINTENANCE CONCEPT FOR F-111A AND F-111F AIRCRAFT

WRSKs for the other series of F-111 aircraft were relatively less expensive than for the F-111D aircraft, and the requirements were based on deployment with organizational maintenance support. In August 1974, however, representatives of the Tactical Air Command and the Air Force Logistics Command agreed that the cost of WRSKs for the A, D, and F series of F-111 aircraft should be determined on the basis of a revised maintenance concept.

The revised maintenance concept was similar to that used for F-111D aircraft, in that the squadron would deploy with field maintenance capability. It was considered to offset the adverse effects of funding constraints on spares and repair parts procurements. The shortages of funds caused requisitions submitted by the bases for WRSK requirements to be filled while requisitions for peacetime operating stocks were deferred because WRSK and other war reserve requirements are given priority. As a result, supplies available to support peacetime operations at the bases were reduced.

The lack of supplies, in turn, increased (1) the percentage of aircraft inoperable due to a lack of parts, (2) the instances of parts removed from one aircraft to make another aircraft ready for operations, and (3) the number of parts removed from WRSKs to make an aircraft ready for operations. The terms "degraded mobility capability" and "decreased logistics effectiveness" were used to describe the overall impact.

The decision to use the revised maintenance concept was to be based on reduced WRSK costs that would be achieved. On the basis of information available at the time, the

Materiel Requirements Directorate of the Air Force Logistics Command described the revised maintenance concept as "* * * the most advantageous concept considering cost savings as well as operational capability, flexibility, and responsiveness * * *."

The comparative costs of WRSK and BLSS requirements for each series of F-111 aircraft were computed as of October 1974. As shown below, the revised maintenance reduced the total cost by about $27 million.

Aircraft	Cost under current maintenance concepts	Cost under revised maintenance concepts
F-111A	$ 39,514,335	$ 22,826,656
F-111D	a/56,801,594	79,476,146
F-111E	29,063,315	29,924,614
F-111F	52,117,516	18,449,255
	$117,496,760	$150,676,671

a/Between 1972 and 1974 the overall WRSK requirements on the F-111D were reduced from the $86 million shown on page 29.

The cost of F-111D WRSKs increased, even though the current maintenance concept for the aircraft was already based on field maintenance support for the avionics system. This was attributable to a requirement of the revised maintenance concept for LRUs to support operations 5 additional days while an intermediate maintenance facility was being set up at a deployment site. F-111E WRSKs and BLSSs remained substantially the same because no revision of the maintenance concept had been considered.

The cost comparison did not include factors in addition to spares and repair parts that would be affected by the current and revised maintenance concepts, such as personnel, equipment, and airlift requirements.

Air Force Headquarters reviewed the revised maintenance concept for WRSKs of the A, D, and F series of F-111 aircraft in light of comments from major commands and directed that it should not be adopted in June 1975. An official of the Deputy Chief of Staff, Systems and Logistics, said that the decision was based primarily on the limitations imposed by the revised maintenance concept. The normal maintenance concept for WRSKs provides greater flexibility and allows for planning to meet the worst contingency situations. A squadron

can deploy immediately and carry out operations for a sustained period with organizational maintenance support.

OTHER ALTERNATIVES TO REDUCE WAR RESERVE REQUIREMENTS

Other alternatives, in addition to deployment with field maintenance capability, should be considered for supporting avionics systems in event of deployment. One alternative would be to establish a central capability in the theater of operations to use field maintenance equipment and personnel more efficiently. Under this concept, deployed squadrons would rely on a central maintenance facility to test and repair LRUs. This would enable the squadrons to deploy with less field maintenance equipment and personnel of their own and would require more LRUs to offset the increased repair cycle time. However, it would require less of an investment in LRUs than under the present concept.

Europe already has an extensive capability to repair LRUs for most aircraft, including the F-111 and the F-15. If the Air Force can anticipate increased use of this equipment to service units that would deploy to Europe in an emergency, these units could reduce their investment in LRUs, test equipment and maintenance personnel.

Another alternative would be to rely on U.S. depots and existing field maintenance capabilities at U.S. bases for increased maintenance support. By using the full capacity available in the United States to reduce maintenance turnaround times and maintaining supply lines to deployment sites during the initial 30-day period, current LRU requirements for deployable squadrons could be reduced. This would require greater airlift capability and LRU investment than the other alternatives discussed but less field maintenance equipment and maintenance personnel in a theater of operations.

The Air Force should review these alternatives to determine the most effective and economical approach in terms of requirements for personnel, equipment, and airlift resources, as well as spares and repair parts.

CONCLUSIONS

Considering the adverse effect of current war reserve requirements on overall readiness, an alternative maintenance procedure for supporting deployed aircraft should be implemented. This would reduce the amount of funds needed for war

reserves, making it possible for the Air Force to invest more of its limited resources in parts to support peacetime operations. The feasibility of providing field maintenance support for the aircraft's avionics systems by deploying with additional personnel and equipment, establishing a centralized capability in the theater of operations, or increasing the reliance on maintenance activities in the United States should be reviewed. The alternatives should be reviewed in light of all factors that would affect cost as well as readiness.

The Air Force Headquarters' decision not to adopt a revised maintenance concept for deploying F-111 aircraft was not consistent with the concept for F-111D and F-15 aircraft. For these aircraft, deployment with field maintainance capability was considered an acceptable interim alternative to reduce requirements. A similar alternative for other series of F-111 aircraft was, however, considered too great a constraint on deployment.

We proposed that the Secretary of Defense require the Secretary of the Air Force to

--review alternatives for providing field maintenance support for avionics systems of aircraft in event of deployment and

--implement the alternative that provides the greatest cost effectiveness with the least constraint on deployment.

AGENCY COMMENTS

The Principal Assistant Secretary of Defense (Installations and Logistics) agreed with our proposals and stated that the Air Force constantly reviewed and modified wartime maintenance and supply concepts to insure attainment of maximum combat capability in the most cost-effective manner.

Two current Air Force efforts to reduce war reserve requirements for deployed aircraft were cited. One entailed additional field maintenance support for F-111 aircraft to reduce the investment in LRUs. The other entailed establishing a centralized field maintenance capability in a theater of operations.

These are worthwhile projects and the Air Force actions are a step in the right direction. In our opinion, evaluating

and testing the various alternatives to provide field maintenance support for deploying aircraft offers great potential for reducing investment in equipments and spares and, at the same time, providing effective support. We intend to follow through in the future to assess Air Force progress in exploring new concepts, testing these concepts and implementing those that offer potential for more effective and efficient deployable operations.

CHAPTER 6

SCOPE OF REVIEW

Our audit was made primarily to evaluate Air Force spares and repair parts requirements for war reserves. We examined the policy, criteria, and procedures for determining and managing the requirements, and we tested the implementation of certain procedures.

We worked at the following installations.

--Headquarters, United States Air Force, Washington, D.C.

--Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio.

--Sacramento Air Logistics Center, McClellan Air Force Base, California.

--Cannon Air Force Base, Clovis, New Mexico.

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

SR
INSTALLATIONS AND LOGISTICS

22 APR 1976

Mr. Fred J. Shafer
Director, Logistics and
Communications Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Shafer:

This is in reply to your letter, dated January 20, 1976, to the Secretary of Defense requesting comments on your Draft Report, "Air Force Could Reduce War Reserve Requirements for Combat Ready Units," (OSD Case #4276).

The Draft Report as currently written provides a fresh viewpoint on the critical area of evaluating war reserve materiel requirements. In some instances the Draft Report highlights certain deficiencies in the current Air Force development of War Readiness Spares Kit (WRSK) and Base Level Self-sufficiency Spares (BLSS) requirements. Timely correction of these problems has been effected by the Air Force. In other cases there is some disagreement regarding the appropriateness of the Draft Report conclusions and recommendations. For example, the Department of Defense cannot agree, at this time, on the validity of reducing the 30-day WRSK requirement to equate to the peacetime materiel overseas delivery time, since the availability of airlift to support spares and repair parts shipments during the first 30 days of conflict has not yet been fully evaluated.

The Draft Report provides the Department of Defense with an opportunity to further assess our approach to WRSK stockage. This reevaluation is being accomplished both through special efforts initiated by this Office and by the Department of the Air Force.

Comments on the specific recommendations of the Draft Report are set forth in the enclosure hereto. Responses are keyed to the chapters and page numbers of the Draft Report.

We appreciate the opportunity to comment on this report in draft form.

Enclosure
As Stated

Sincerely,

JOHN J. BENNETT
Principal Deputy Assistant Secretary of Defense
(Installations and Logistics)

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

The war reserve spares total investment may not vary radically based solely on the quantity of assets prepositioned with the operational units. The total assets required to be on-hand at the start of a conflict, necessary to support the forces until production can equal consumption, remains relatively constant. Thus, the assets in a WRSK are partially a function of distribution in that, if they are not in the WRSK to support mobility requirements, they must be on a shelf in a depot or base supply to support total WRM requirements.

Recommendation - Chapter 3, page 23. "In view of the actions taken by Headquarters officials to improve coordination of the plan and authorizations document, we are making no specific recommendation on this matter." (Coordination of the War and Mobilization Plan with WRSK/BLSS authorization)

Response. Concur with the GAO action in not making specific recommendations in this area.

Recommendation - Chapter 3, page 23. "We recommend to the Secretary of Defense, however, that he require that the Secretary of the Air Force implement guidance and procedures that will insure comprehensive reporting from all units authorized WRSK and BLSS and the review and resolution of significant deficiencies between authorizations and status reports.

Response. Concur. Procedures were implemented in October 1975 to expand WRSK/BLSS reporting to include identification of, and explanation for differences between reported and authorized kits.

Recommendations - Chapter 4, page 31. "We recommend to the Secretary of Defense that he require the Secretary of the Air Force to determine the feasibility of revising procedures for computing WRSK and BLSS requirements to insure that:

a. "The quantity of modules in F-111D WRSK does not provide support in excess of 30 days;"

Response. Concur. The computation procedure has been corrected.

b. "Insure that order and shipping times used in BLSS requirement computations are based on air transportation priority Group I;"

Response. Do not concur. Priority I is used for shipments that require special handling due to the urgency of the requirement. In peacetime this is applicable to the development and maintenance of WRSK and BLSS. During wartime it is important to reduce these special shipments to a minimum. The normal replenishment of a spare part to support BLSS requirements would not require Group I (12-13 days) attention, but is calculated for Group II (16-17 days) reaction. The difference in priorities for BLSS shipments in peacetime as opposed to wartime shipments is based on the fact that in wartime BLSS resupply actions should be given a relatively lesser priority when compared to more urgent wartime requirements.

c. "Insure that peacetime and BLSS stock requirements are combined to determine base safety level quantities."

Response. Do not concur. The additional safety level used in the BLSS formula recognizes the increased risk inherent in supporting a wartime scenario. The base safety level is that quantity of an item needed to permit continuous operations with a specific level of confidence if supply is interrupted or demand varies under peacetime conditions. The safety level formula used in the computation of BLSS requirements is based on wartime risk factors which are naturally greater than the peacetime safety level. Therefore, the BLSS safety level is computed separately and is additive to the base peacetime safety level.

Recommendations - Chapter 5, pages 39/40. "We recommend to the Secretary of Defense that he require the Secretary of the Air Force to:

a. "Review alternatives for providing field maintenance support for avionics systems of aircraft in the event of deployment; and

b. "Implement the alternative that provides the greatest cost effectiveness with the least constraint on deployment."

Response. Concur. The Air Force is constantly reviewing and modifying wartime maintenance and supply concepts to insure maximum combat capability is attained in the most cost-effective manner.

Some specific examples of Air Force actions to utilize more cost-effective field maintenance concepts include:

(1) Evaluation of an "integrated deployment package" concept of mobility planning was initiated in October. This concept considers the WRSK as one factor in a deployment capability package along with equipment and personnel. An optimum mix of these factors is being sought with full consideration for airlift requirements, facility and environmental requirements and cost. As an example, the 1975 F-111 WRSK review was conducted in two phases. Phase one consisted of the development of WRSK composition under currently approved maintenance concepts. In phase two, additional candidates for inclusion of field maintenance equipment in lieu of line replaceable units were identified and are being analyzed for impact on airlift, personnel, facilities and cost.

(2) Centralized in-theater maintenance is currently being tested by Pacific Air Force (PACAF). Repair facilities at Kadena AB, Japan are being adjusted to accomplish intermediate level maintenance for selected avionics and other items for F-4 units at Kunsan and Osan Air Bases in Korea as well as the Kadena assigned units.

Comments on GAO Draft Report Recommendations (OSD Case #4276)

Recommendation - Chapter 2, page 15. "We recommend to the Secretary of Defense that he require the Secretary of the Air Force to determine the feasibility of reducing the WRSK support period in accordance with standard delivery times for supplying overseas bases by air."

Response. Do not concur. The 30-day WRSK support period used by the Air Force is based on the projected time needed to establish resupply. DoD peacetime standards for supplying overseas bases (13 to 17 days) are applicable to an established pipeline. It is also neither feasible nor realistic to compute wartime support based on times experienced in peacetime operations. For example, support planning during the initial stages of conflict envisions materiel support centered at a main operating base, which is a pre-established Air Force Base (AFB), with materiel pipelines extended as the conflict begins to units deployed at limited capability bases, usually North Atlantic Treaty Organization (NATO) operated facilities.

As WRSKs are authorized only to units planned for deployment in the first 30 days of a conflict, the establishment and securing of lines of communications and transportation to multiple new locations, concurrent with increasing requirements at existing bases, must be accomplished during the same period when all available airlift will be concentrating on moving combat forces to the theater. The prestockage of 30 days WRSK support permits available airlift to concentrate on its primary task of transporting combat personnel and equipment to the combat area in the early days of a conflict. Any reduction to the 30-day War Reserve Materiel (WRM) (WRSK and Base Level Self-sufficiency Spares (BLSS)) must consider the transportation impact associated with such a change. Currently, the Planning Factors File (PFF) used for the conduct of the Joint Chiefs of Staff (JCS) FY 1976 Strategic Movement Analysis is based on resupply initiated at D+30. Rationale was that sufficient strategic airlift would not be available any sooner. Therefore, any WRM policy change, and the attendant increase in airlift requirements, will compound an already taxed airlift system during the initial days of a contingency unless additional capability is made available.

Airlift and surface capabilities are being continually reviewed to determine resupply availability. Prepositioned war reserve spares levels will be adjusted to the capability which can be assured, both to and within the theater of operations.

Additionally, a reduction in the WRSK support period would not, of itself, reduce the overall investment in war reserve spares. The current 30-day WRSK represents only a portion of the total wartime spares requirement.

PRINCIPAL OFFICIALS OF THE DEPARTMENT OF DEFENSE RESPONSIBLE FOR ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
SECRETARY OF DEFENSE:		
Donald Rumsfeld	Nov. 1975	Present
James R. Schlesinger	June 1973	Nov. 1975
William P. Clements, Jr. (acting)	Apr. 1973	June 1973
Elliot L. Richardson	Jan. 1973	Apr. 1973
Melvin R. Laird	Jan. 1969	Jan. 1973
DEPUTY SECRETARY OF DEFENSE:		
William P. Clements, Jr.	Feb. 1973	Present
Kenneth Rush	Feb. 1972	Jan. 1973
Vacant	Jan. 1972	Feb. 1972
David Packard	Jan. 1969	Dec. 1971
ASSISTANT SECRETARY OF DEFENSE (INSTALLATIONS AND LOGISTICS):		
Frank A. Shrontz	Feb. 1976	Present
John J. Bennett (acting)	Apr. 1975	Feb. 1976
Arthur I. Mendolia	Apr. 1973	Mar. 1975
Hugh McCullough (acting)	Jan. 1973	Apr. 1973
Barry Shillito	Feb. 1969	Jan. 1973
SECRETARY OF THE AIR FORCE:		
Thomas C. Reed	Jan. 1976	Present
James W. Plummer (acting)	Nov. 1975	Jan. 1976
John L. McLucas	July 1973	Nov. 1975
Vacant	Jun. 1973	July 1973
Dr. Robert C. Seamans, Jr.	Feb. 1969	May 1973
UNDER SECRETARY OF THE AIR FORCE:		
James W. Plummer	Dec. 1973	Present
Vacant	July 1973	Dec. 1973
John L. McLucas	Mar. 1969	July 1973
ASSISTANT SECRETARY OF THE AIR FORCE (INSTALLATIONS AND LOGISTICS):		
J. Gordon Knapp	Mar. 1976	Present
Richard J. Keegan	Feb. 1976	Mar. 1976
Frank A. Shrontz	Oct. 1973	Feb. 1976
Richard J. Keegan (acting)	Aug. 1973	Oct. 1973
Lewis E. Turner (acting)	Oct. 1972	Aug. 1973
Phillip N. Whittaker	May 1969	Sept. 1972