BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Honorable Sam Nunn Ranking Minority Member Committee On Armed Services United States Senate

Measures Of Military Capability: A Discussion Of Their Merits, Limitations, And Interrelationships

This report discusses the problems of measuring military capability and the difficulty of quantifying military capability in a single, definitive measure. It also discusses various indicators of military capability and provides information relative to their use. In addition, the report provides suggestions for improving the Department of Defense's annual Force Readiness Report.

GAO/NSIAD-85-75
JUNE 13, 1985

Request for copies of GAO reports should be sent to:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20877

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are $3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are $1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-217229

The Honorable Sam Nunn
Ranking Minority Member
Committee on Armed Services
United States Senate

Dear Senator Nunn:

This report is in response to your letter of April 18, 1984, requesting us to review current measures used by the Department of Defense (DOD) to report military capability. Specifically, you asked us to

--identify various formal and informal force structure, modernization, readiness, and sustainability measures currently used by DOD;

--analyze selected measures and indicators, and provide observations on their relative merits (what information is actually provided) and their limitations (what information is not provided); and

--recommend ways to improve current readiness and sustainability measures currently used by DOD.

Parts 1 and 2 of your request are addressed in this report. As agreed with your office, we will address the last part of your request, recommended improvements to specific indicators, in a subsequent review; however, we have included in this report several suggested changes to the Force Readiness Report. Our subsequent review will examine military unit training to determine how performance indicators, such as flying hours, may be used to report how the unit's proficiency has improved.

THE QUESTION CONCERNING CHANGES IN MILITARY CAPABILITY

Comparing fiscal year 1980 to fiscal year 1985, the annual DOD budget increased--after adjusting for inflation--about $100 billion, or approximately 50 percent. DOD applied these funds

with the objective of modernizing its forces and making them more combat ready and sustainable.

Although DOD believes military capability has improved after 5 years of growth in the defense budget, it has found it difficult to quantify the extent of this improvement. This results from DOD having to evaluate the myriad of elements comprising military capability because a single indicator does not exist to describe the level of capability achieved. DOD officials have found that developing such single definitive measures of military capability or its subordinate components, is an extremely difficult, if not impossible task. Notwithstanding the difficulties of developing a comprehensive indicator, we believe that DOD's current efforts to develop more representative individual indicators will provide greater visibility concerning changes in military capability.

Many indicators are available to assess, with varying degrees of accuracy, specific elements of military capability. The enclosed three-part briefing document is intended to provide an overview of selected indicators commonly used within DOD to measure military capability. This briefing document does not answer the question of how capable the military is, or the extent that military capability has improved in relation to defense appropriations. It does, however, present information on the relationship between individual indicators and military capability.

MEASURING MILITARY CAPABILITY

In part 1 of the document, we discuss the concept of military capability, its component parts, and the complexity of assessing improvements. We point out that DOD infers military capability through quantitative measures of various elements which comprise the components of military capability.

For example, last year when you and Senator Tower asked DOD to compare the overall warfighting capability of our forces in 1984 with that in 1980, DOD responded with a wide range of statistical information. DOD's conclusion that "U.S. warfighting capability is substantially greater today than it was in 1980" was based primarily on its evaluation of the myriad of changes which occurred within the four components of military capability--force structure, modernization, readiness, and sustainability.

It is important to note that the absence of a single measure of capability does not mean capability has not improved. We believe improvement has occurred. The difficulty is in attempting to quantify the extent of this improvement.

READINESS REPORTING AND THE RELATIONSHIP BETWEEN APPROPRIATION ACCOUNTS AND MILITARY CAPABILITY

In part 2 of the document, we discuss the interrelationship among selected appropriation accounts and three elements of military capability--materiel, people, and training. We also discuss the Unit Status and Identity Report (UNITREP) and the Force Readiness Report, which is probably the most comprehensive readiness reporting medium.

We describe how appropriation accounts interact and contribute to the areas of personnel, materiel, and training and how appropriation decisions that directly affect one component of military capability can also affect other components. In evaluating military capability, we believe it is important to recognize this relationship. For example, when the procurement account is increased to purchase a new weapon system, consideration must also be given to supporting this system through increases in the operations and maintenance, military personnel, and military construction appropriations.

With regard to UNITREP--the primary system for reporting unit level readiness within DOD--we discuss what it does and does not measure. We also discuss the fact that UNITREP is an internal DOD management tool, which by comparing the number and types of personnel and materiel on hand against wartime requirements, measures the ability of a unit to perform its wartime tasks. These comparisons are reported monthly to the Joint Chiefs of Staff and senior DOD officials.

When UNITREP reports are used by persons outside DOD to analyze the readiness of our forces, certain limitations need to be recognized. For example, while UNITREP measures the readiness of all combat, combat support and most combat service support units, including all front line forces, only about 50 percent of the force is assigned to those reporting units, and UNITREP does not report the ability of a unit to deploy at the time of a war. Initiatives are underway within DOD to improve UNITREP, which are described in part 2.

In part 2 we also discuss the Force Readiness Report. This report is submitted annually to the Congress in support of the President's budget, and is intended to give the Congress a description of the current readiness of the force and an overall assessment of the readiness expected to result from passage and execution of the defense budget. We point out that the Force Readiness Report is probably DOD's most comprehensive compilation of readiness indicators. We offer suggestions on how the Force Readiness Report could be improved.

READINESS AND SUSTAINABILITY MEASURES--WHAT THEY MEAN AND HOW TO USE THEM

In part 3 of the document, we discuss selected measures of readiness and sustainability and their relationship to materiel, personnel, and training. We discuss how they are computed; what they measure; some cautions to be aware of when using them; and how they may complement one another. Our purpose is to provide the context in which these indicators should be used. We also provide a series of suggested questions pertaining to each measure discussed, that you may want to ask DOD.

DOD COMMENTS

A draft of this report was submitted to DOD for its review and comment. In general, DOD stated that the report accurately described the problems of measuring military capability within DOD (see page 78). DOD also noted that the report corroborates much of what it has been saying over the past year about the utility of data from UNITREP and the cautions that must be applied when using them, and the difficulty of quantifying military capability into a single, definitive measure. In addition, DOD provided answers to questions concerning various indicators of military capability. While the answers appear responsive, we did not review them for accuracy or completeness.

DOD also provided various suggestions to improve the clarity and technical accuracy of the report, and changes were incorporated where appropriate. The comments provided by DOD related largely to our suggestions for improving the Force Readiness Report. DOD's comments on our suggestions are summarized below:

Suggestion 1: Document the linkage between resources requested and the anticipated enhancement of readiness wherever possible.

DOD stated that it is desirable to identify the changes in readiness that are anticipated as a result of resource increases, and noted that efforts are underway to reach this end. However, they cited the complexities involved in forecasting change, and cautioned that one should not soon anticipate DOD's ability to make this link. Because of these considerations, together with the absence of any single measure of readiness, DOD believes that the present practice of inferring readiness changes based on resource inputs must necessarily continue.

Suggestion 2: Improve the Force Readiness Report to provide a clearer picture of the current state of readiness and year-to-year trends.

DOD stated that it is currently considering modifications to the fiscal year 1987 Force Readiness Report and will consider this suggestion as part of that modification.

Suggestion 3: Incorporate a "theater" readiness perspective since warfighting is executed by theater commanders.

DOD stated that it will examine the availability and quality of data, such as mission capable rates by theater, and carefully consider this suggestion in the course of the proposed modification to the Force Readiness Report. However, it noted that whether such data would be included would depend on its availability, or the cost of making it available, and preliminary consideration of existing differences by theaters.

Suggestion 4: Wherever possible, benchmark reported/projected readiness status against wartime requirements or applicable peacetime goals and objectives for comparative analysis purposes.

DOD did not disagree with the value of benchmarking reported/projected readiness status for comparative analysis purposes. It noted that the Force Readiness Report already provides such information; for example, mission capable rates versus goals and programmed manpower structure and programmed manning. However, it also noted that many readiness indicators such as flying hours, steaming days, and battalion training days have no comparative wartime requirement. In further comments on the selection of a benchmark, it cited the misinterpretation of UNITREP data--which uses wartime requirements as a benchmark--and noted that considerable discretion is needed in selecting benchmarks.

We agree that considerable discretion is needed in selecting benchmarks and that caution must be used in cases where they are used for comparative analysis purposes. In fact, we point out many of these cautions in our report. However, because DOD does not have comparative wartime requirements for readiness indicators such as flying hours, does not mean that comparable peacetime goals or objectives could not be used. The establishment of such benchmarks would provide the basis for determining progress made by DOD relative to its expectations. After considering DOD's comments, we modified suggestion 4 to include the wording "peactime goals and objectives."

Suggestion 5: Whenever possible, project how much better trained crews are expected to be as a result of increased training, as well as provide data relative to the effect increased training has on support capabilities--spares, fuel, ammunition, and maintenance.

DOD commented that a quantitative projection of how much better trained crews would be would require an index of crew training on capability, and such an index is not available; therefore, rarely, if ever will it be possible to make such a projection.

We agree with DOD that an index of crew training on capability does not exist. In addition, we also recognize the difficulty in developing such an index. As noted on page 1, we have initiated a survey to examine possible ways to assess the effect of increased training activity.

. . . . . .

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from the date of the report. At that time, we will send copies to the Secretary of Defense and the Director, Office of Management and Budget. We are also sending copies to the Chairmen, House and Senate Committees on Appropriations, and Armed Services; the Chairmen, House Committee on Government Operations and Senate Committee on Governmental Affairs. Copies will be made available to others upon request.

Sincerely yours,

Frank C. Conahan
Director

Enclosure

MEASURES OF MILITARY CAPABILITY: A DISCUSSION OF THEIR MERITS LIMITATIONS, AND INTERRELATIONSHIPS

(Briefing Paper)

B-217229

Part 2: In this part we discuss the interrelationships among the appropriation accounts and materiel, people and training; the Unit Status and Identity Report (UNITREP)--what it does and does not measure; and, probably the most comprehensive readiness reporting medium, the Force Readiness Report (FRR).

Part 3: In this part we discuss readiness and sustainability in terms of three components--materiel, personnel, and training. We link selected readiness and sustainability indicators to appropriation accounts and factors which may affect requirements and accomplishments. We also describe indicators frequently used by DOD to inform the Congress of current and projected conditions and past achievements, complementary indicators, and suggested questions relevant to the budget decision process.

PREFACE

The mission of the Department of Defense (DOD) is to deter war, and if deterence fails, to win the war. DOD's capability to fulfill its mission has been a topic of congressional debate for years, and it is clear that for DOD to achieve its desired level of military capability, great demands will be placed on the country's resources for years to come. For the period FY 1980-1985, Congress appropriated more than a trillion dollars for defense.

DOD determines the resources required to meet national security needs. It has justified increases in defense appropriations on the need to improve military capability. Since 1980, DOD has expanded its force structure, modernized and upgraded weapons systems and equipment, trained to higher levels of readiness, and procured additional sustainability stocks.

Unprecedented increases in the defense budget since 1980 have resulted in debates on whether military capability has improved in proportion to the money received. This debate continues largely because no series of indices yet devised is entirely suitable for describing the capability of military forces, and according to DOD, the state of the art does not yet permit the linkage of each incremental increase in funding to a corresponding improvement in capability. In addition, budget justifications largely relate <u>effort</u>--numbers of systems to be procured or numbers of personnel to be trained--to funding, rather than relating funding to <u>anticipated capability improvements</u>.

On April 18, 1984, Senator Nunn, the ranking minority member of the Senate Committee on Armed Services, asked the GAO to review current indicators used by DOD to report on the elements that comprise military capability: force structure, modernization, readiness and sustainability. This briefing paper provides the results of GAO's analysis. It is presented in 3 parts, as follows.

Part 1: In this part we discuss the concept of military capability; how military capability is a function of its component parts; and, the complexities of assessing military capability.

Table of Contents (Continued) Page

TABLES

ABBREVIATIONS

ALA	Army logistics assessment
BMAR	Backlog of maintenance and repair
CONUS	Continental United States
DOD	Department of Defense
DOS	Days of supply
FMC	Full mission capable
FRR	Force Readiness Report
GAO	General Accounting Office
JCS	Joint Chiefs of Staff
MC	Mission capable
NCA	National command authority
NMC	Not mission capable
NMCB	Not mission capable both

Table of Contents

ABBREVATIONS (Continued)

NMCM	Not mission capable maintenance
NMCS	Not mission capable supply
OMNIBUS	Operational readiness analysis
OSD	Office of the Secretary of Defense
PMC	Partial mission capable
RPMR	Real property maintenance and repair
SITREP	Commanders' situation report
TFCA	Total force capability analysis
UNITREP	Unit status and identity report
USR	Unit status report
WRM	War reserve materiel

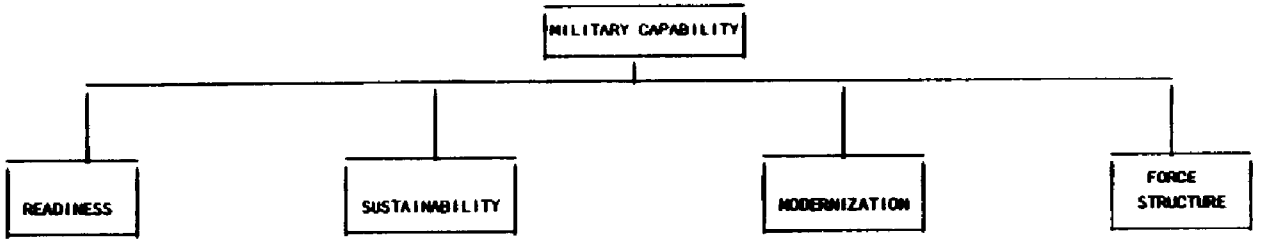
PART 1

MILITARY CAPABILITY:

A DIFFICULT CONCEPT TO QUANTIFY AND MEASURE

Military capability is a difficult concept to quantify and measure. The Congress is asking questions about the current state of military capability and what DOD is getting from the funds being spent for national defense.

DOD defines military capability as the ability of the force to achieve a wartime objective (i.e., to win a battle or a war, destroy a target, etc.). According to DOD, military capability is composed of four subsets or "pillars"--readiness, sustainability, force structure and modernization--as defined below:



READINESS — The collective ability of the force to deliver the outputs for which they were designed to include the ability to deploy and employ without unacceptable delay. It is essentially a pre-D-day measure of the personnel and material health of our force relative to wartime requirements.

SUSTAINABILITY — The staying power of our forces during combat operations. It represents our ability to resupply engaged forces with replacement manpower, equipment, and other supplies during combat.

MODERNIZATION — The qualitative, technical capabilities of our weapon systems and equipment. Depending upon the services, this can include both new procurement and modification, or only new procurements.

FORCE STRUCTURE — The numbers, size, and composition of the units that comprise our defense forces (i.e., divisions, ships, wings, etc.)

MEASURING MILITARY CAPABILITY

Measuring capability encompasses evaluating, simultaneously, the various components which comprise the four pillars. While, short of going to war, measuring force capability in absolute terms is not possible, DOD attempts to evaluate how well it could accomplish military missions.

The services and the Joint Chiefs of Staff (JCS) conduct assessments--narrative, modeling, and exercises--to capture the capabilities of a combined force or that of an individual service to perform it's mission. Examples of significant attempts to measure force capability follow:

--The Commanders' Situation Report (SITREP) - A JCS designed and operated reporting system, whereby commanders (Unified Commands, Specified Commands and the Readiness Command) evaluate the capability of the combined forces under their command.

--Operational Readiness Analysis (OMNIBUS) - An annual Army warfighting simulation for internal Army use.

--Total Force Capability Analysis (TFCA) - A JCS analysis of the capability of the force projected at the end of the 5-year defense plan.

There is no quantitative measure that describes the general warfighting capability of our forces, and DOD doubts that a meaningful single measure can be developed. DOD infers levels of capability by combining the results of its evaluations of readiness, sustainability, force structure, and modernization using indicators appropriate to these elements of capability. For example, in response to a request from Senators Tower and Nunn to compare the overall warfighting capability of our forces today relative to 1980, DOD concluded that "U.S. warfighting capability is substantially greater today than it was in 1980." This conclusion was based on over 150 pages of qualitative and quantitative data addressing subjects such as materiel condition rates, flying hours, C-ratings, and maintenance and repair backlogs.

DOD faces a problem when attempting to describe and quantify military capability for those outside the agency. According to DOD, the indicators it uses to express capability are useful for internal management purposes since this is what the indicators were intended for. However, their use outside DOD to explain military capability and articulate the resource to capability link remains a problem. DOD officials have indicated that developing indicators specifically for external use may not yield the benefit desired. Some of their concerns include:

--DOD and its managers may not be completely frank in assessing readiness, sustainability, or capability if they know that the assessments will be used outside DOD.

--Program goals and objectives for operational units are typically expressed in terms of resources consumed, such as hours flown, rounds fired, and so forth, and are not designed to identify the effect of increasing or decreasing funding levels. While better accountability may be possible if budget justifications were more explicit about performance expectations, some DOD officials believe that more than adequate detail is currently provided to the Congress in the form of budget justifications and backup books.

The pillars of military capability do not stand alone

Military capability cannot be measured without an understanding of the interrelationship and the interdependence of the four pillars. Although each of the pillars can be viewed separately, a change in any one pillar will often affect the others. For example, a change in force structure or modernization will affect readiness and sustainability.

According to the Secretary of Defense, DOD has in recent years emphasized readiness and sustainability in its resource decisions. Most indicators of unit readiness reflect improvements. However, a few indicators of unit readiness do not; in some cases they have reflected just the opposite. In addition, materiel sustainability stockage levels are still far short of DOD's goals.

On the surface, one could conclude that increased funds have not produced the desired results. While, according to DOD actual readiness may be better; we do know that, to some extent, recent downward trends in some unit readiness indicators are in response to increasing and changing requirements that occur simultaneously as new organizational designs are introduced. A military unit can be ready one day and not as ready the next as a result of a change in force structure or the fielding of a modernized weapon system. The equipment and personnel needed to support the new structure or equipment is not always available in the required quantity. When this occurs, the unit commander often reports a reduction in readiness. DOD's recent report on Improvements In U.S. Warfighting Capability, FY 1980 - 1984 illustrates the effect changing requirements have on reported readiness in the short term.

The interrelationships among force structure, modernization, readiness and sustainability and how changes in one component can affect another, as well as overall military capability, will become more apparent as we proceed with our discussion.

Force structure

Force structure, defined as the number, size, and composition of units which make up the defense force, is usually described in terms of numbers of divisions, ships, or wings. For example,

--actual manning levels compared with designed force structure levels and

--service-wide numbers and types of equipment on hand compared with full wartime equipment requirements.

While overall capability assessments, such as the JCS SITREP and the Army's OMNIBUS, incorporate force structure data as part of their overall assessment, force structure data is more often represented quantitatively as shown in the Force Readiness Report (FRR).

Force modernization

Modernization is defined as the qualitative technical capabilities of weapon systems and equipment. Depending on the service, modernization may include fielding new equipment or fielding both new and modified equipment.

No single index exists that captures the total effect of force modernization on military capability. Assessments of modernization may be given as the comparison of a new type of equipment to the item it replaced or as a comparison to the threat. The Congress often receives modernization data in the form of numbers of new equipment/weapon systems. Another common format is the description of cost, schedule, and performance. Examples of modernization data provided to Congress are,

--percent of acquisition objectives,

--selected acquisition reports,

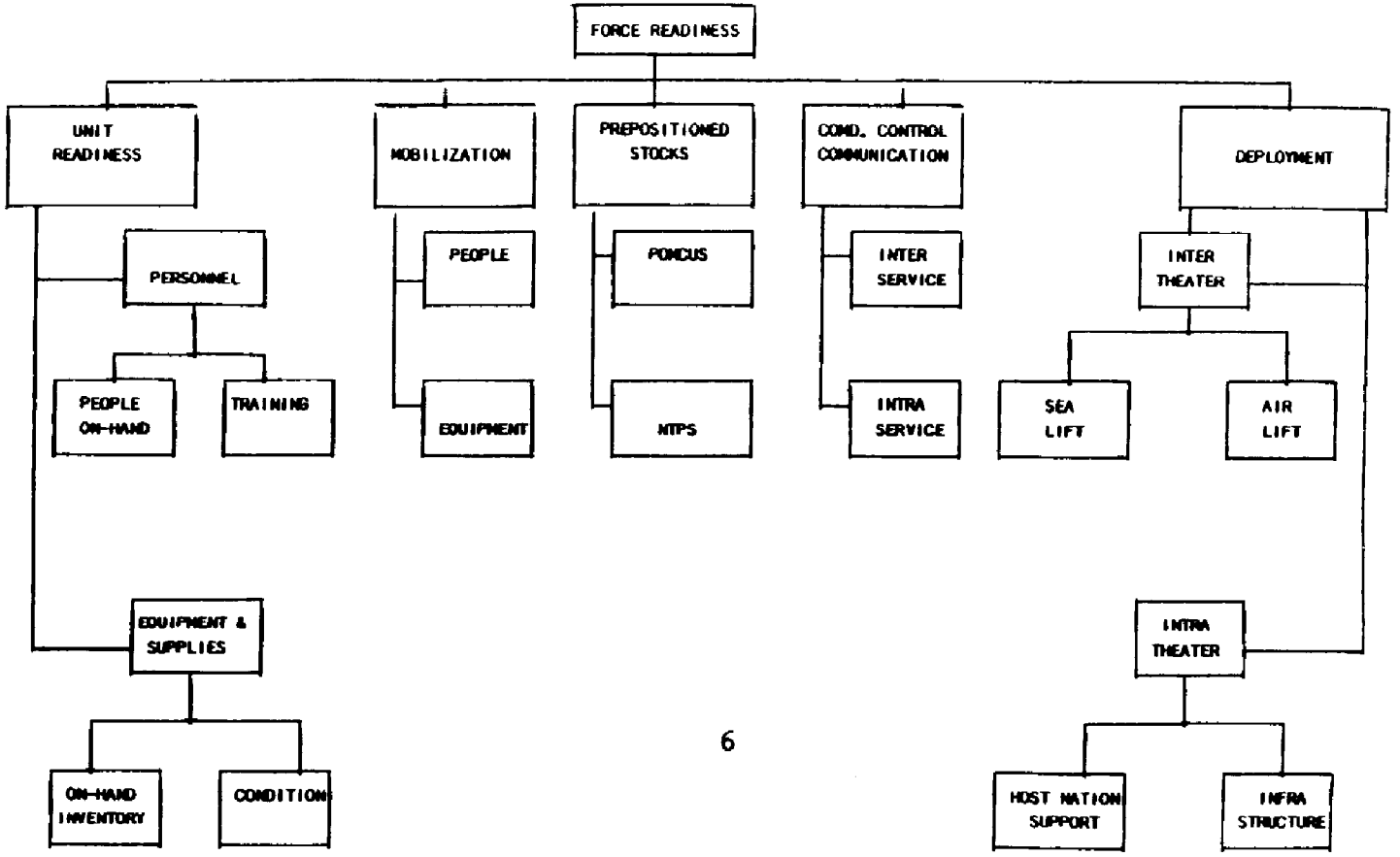
--congressional data sheets, and

--narrative descriptions of new or modernized systems and their costs in the annual Secretary of Defense Report to the Congress.

Information on the effects of modernization is also reflected in UNITREP data provided to Congress. For example, problems in the synchronization of modernized equipment, personnel, and supplies may appear as decreases in readiness levels in UNITREP. However, DOD maintains that any decrease in readiness has been more than offset by the increase in overall capability resulting from the fielding of new and more capable equipment.

Force readiness

Force readiness is defined as the ability of the force, units, weapon systems, or equipment to deliver the outputs for which they were designed. It is measured in terms of manning, equipping, and training the force and the ability of the force to mobilize, deploy, and employ without unacceptable delays. Only through an analysis of each element that contributes to the collective ability of the force to perform a wartime mission can a level of readiness be inferred. The chart below illustrates many elements that should be viewed collectively to assess the force's state of readiness.



Measures of Readiness--There is no single indicator of readiness, yet more indicators pertain to readiness than any other pillar of military capability. However, according to DOD, due to the current state of the art, force readiness must be inferred from its subordinate components.

DOD measures readiness at the total force, unit, and functional area levels. For example,

--total force level through such measures as the SITREP,

--unit level through UNITREP, and

--functional area level through such measures as aggregate personnel and equipment fill rates and materiel condition rates.

There are many indicators that provide insight into what contributes to increases or decreases in readiness. Most of these measures describe one of the following three things:

--the status of the unit or force generally in terms of what it has relative to what it needs;

--whether equipment on hand is operational; and

--consumption data or resources needed to improve readiness, such as training days and flying hours.

In UNITREP, the principal indicator of unit readiness is the C-rating (C-1 fully ready, C-2 substantially ready, C-3 marginally ready, C-4 not ready, and C-5 service programed, not combat ready). For each combat oriented unit and service-selected support unit, a C-rating is computed for each of the following resource areas: personnel, equipment and supplies on hand, equipment condition, and training. Overall C-ratings are assigned to each rated unit based on the lowest C-rating in any of the four resource areas. However, a commander may

upgrade or reduce the unit's overall rating based on his military judgement. The primary purpose of UNITREP is to provide the National Command Authority (NCA) and the JCS with authoritative basic identity and status information concerning units/organizations. UNITREP is a primary source used to consider force availability and is discussed further in part 2. DOD uses other indicators of readiness, as shown in the tables in part 3 of this briefing.

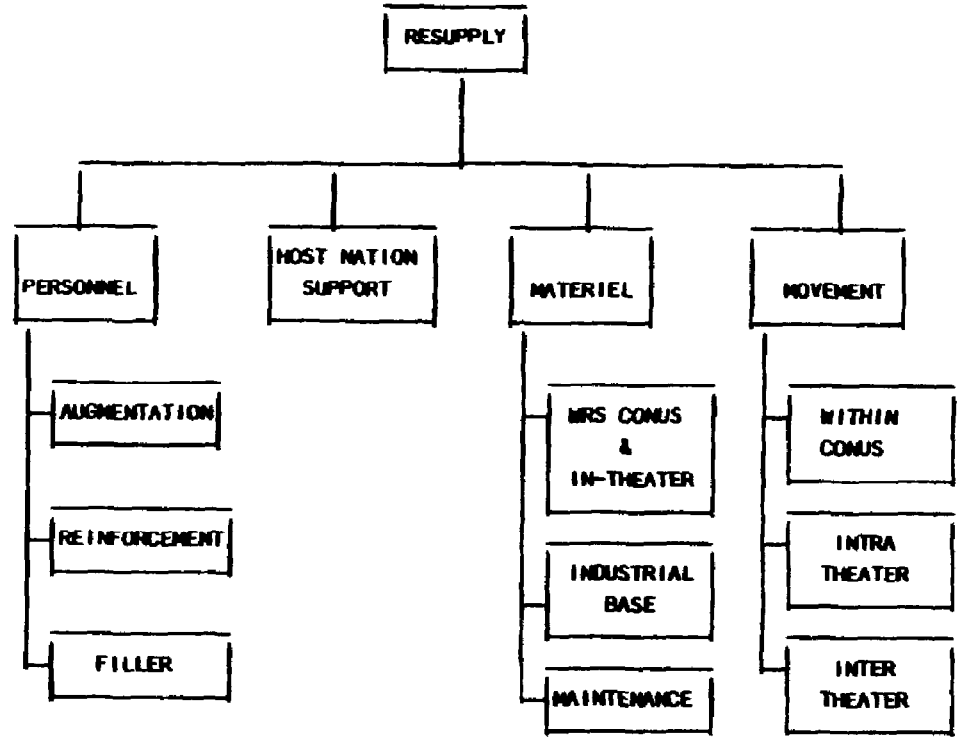
Force sustainability

Sustainability is defined as the staying power of our forces and our ability to resupply engaged forces during combat operations. It is, therefore, a function of,

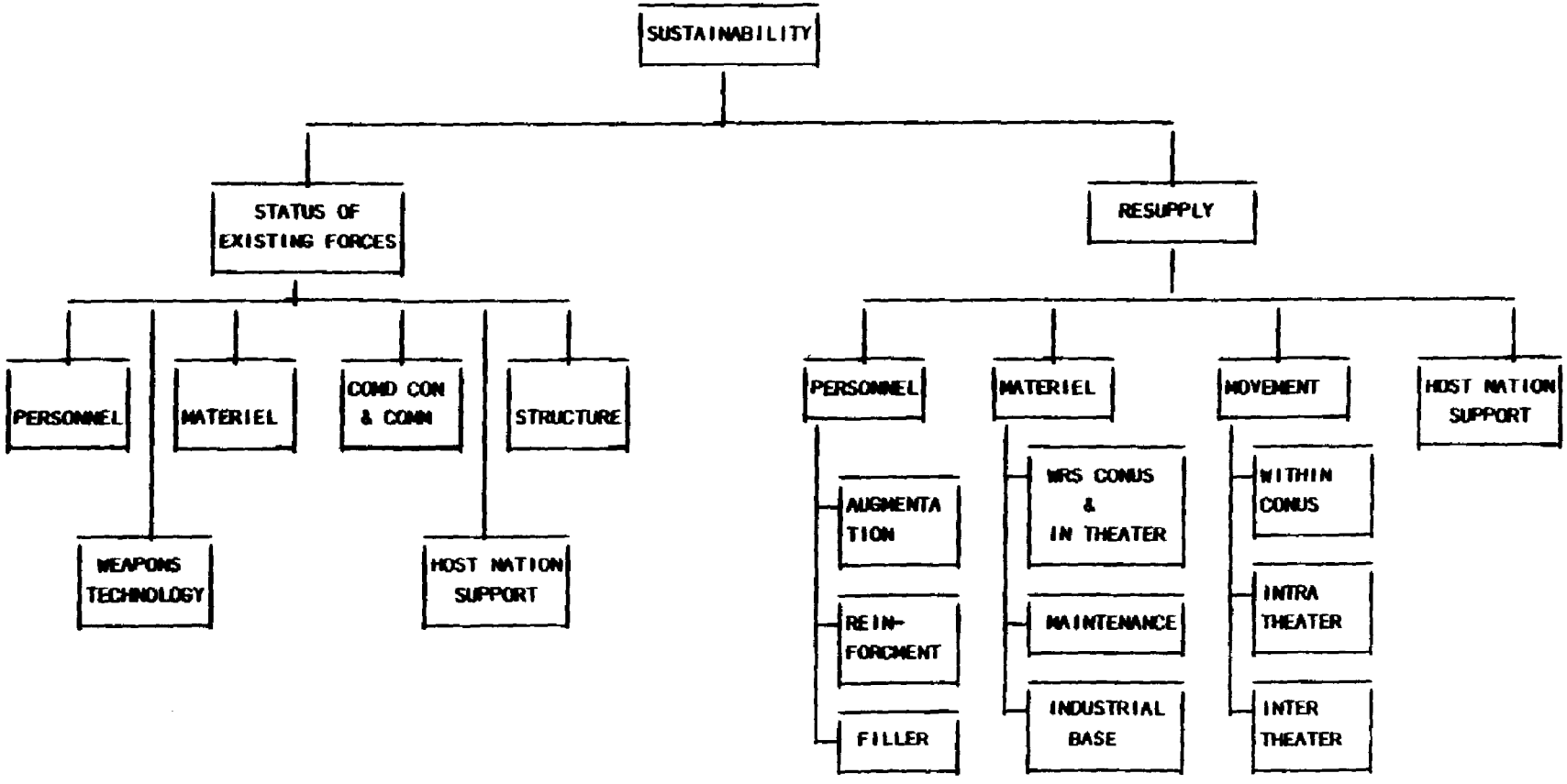
--our ability to resupply engaged forces with sufficient numbers of trained personnel and materiel to replace combat losses and consumption and

--the ability to move these resources to combat areas to include intra and inter continental United States (CONUS) and theater transportation and off-loading and distribution capabilities in the combat theater.

The following table illustrates many of the elements of force sustainability that must be considered in conjunction with one another to assess the ability to resupply engaged combat forces.



Relative to the interrelatedness of the pillars, force sustainability can be viewed as more than resupply. Using DOD's description of "the staying power of the force," force sustainability includes not only how long the force can sustain considering resupply, but also the period of sustainment afforded from supplies possessed by the force at the time of engagement, (i.e., status of forces). If this view is taken, the number of elements that need to be considered in conjunction with one another is greatly expanded as shown in the chart below.



No single indicator is available to reflect the total sustainability of the forces. DOD measures individual parts of sustainability with data such as war reserve stock fill rates, status of the ships and aircraft available for lift requirements, and it attempts to measure force sustainability on a more comprehensive, theater-wide basis with its SITREP and exercises. These comprehensive measures are normally used for internal purposes only.

PART 2

A DISCUSSION OF HOW DEFENSE APPROPRIATIONS INTERRELATE TO SUPPORT PERSONNEL, MATERIEL AND TRAINING AND AN OVERVIEW OF TWO FREQUENTLY CITED DEFENSE READINESS REPORTS

In this part we will discuss:

--The interrelationships among the appropriation accounts and people, materiel, and training. We will demonstrate that appropriation accounts support each and therefore, must be taken into consideration when making funding decisions.

--The most comprehensive DOD prepared readiness document, the FRR. We will comment on what it is supposed to do, what it does, and provide observations on how the document can be improved.

--The most widely known measure of readiness, UNITREP. We will comment on what UNITREP is designed to do and the cautions that should be taken when using UNITREP-generated information for other than internal DOD management purposes.

THE INTERRELATIONSHIPS AMONG THE APPROPRIATION ACCOUNTS WITH MATERIEL, PEOPLE, AND TRAINING

The following two tables illustrate the relationships among several appropriation accounts--operations and maintenance (O&M), investment, and military personnel--and people, materiel, and training. While we only cite three appropriation accounts, other accounts such as research and development appropriations have an important impact. Table 1 provides examples, based on the FY 1985 appropriations hearings, of how these three elements are addressed in support of the DOD budget. Table 2 arrays some of the various appropriation line items and identifies the elements of capability to which they apply.

TABLE 1

HOW PEOPLE, MATERIEL, AND TRAINING NEEDS
ARE DISCUSSED IN THE 1985 DOD APPROPRIATION HEARINGS

	OPERATIONS AND MAINTENANCE	INVESTMENT	MILITARY PERSONNEL
People	• Backlog of Real Property Maintenance vs. Congressional Containment Level • Civilian work force • Recruiting and Advertising costs vs. Objectives • Retention Rates	• Modernized Equipment • Automated Management Systems • Bachelor and Family Housing • Medical Facilities	• Salary and Benefits • Permanent Change of Station
Materiel	• Depot overhaul requirement vs. financed programs • Prepositioned materiel support costs • Unfunded requirements--care of supplies in storage • Maritime prepositioning ships/ near term prepositioning force • Stock fund peacetime inventory augmentation	• End items quantity, cost and scheduling • Ammunition • Spares and Repair Parts • Facilities	• Salary and Benefits
Training	• Units deploying to training ranges • Borrowed military manpower/troop diversion • Flying Hour Program • Steaming Days • Battalion Training Days • Individual Training	• Simulators • Range Upgraded and Instrumentation • Ammunition • Automated Management Systems	• Salary and Benefits

TABLE 2

HOW APPROPRIATION LINE ITEMS
RELATE TO PEOPLE, MATERIEL, AND TRAINING

	OPERATIONS AND MAINTENANCE	INVESTMENT	MILITARY PERSONNEL
People	Civilian Costs —Individual training —Medical support —Recruiting and examining —Overseas dependent education —Base operating support —Central supply and maintenance —Real property maintenance and repair —Unit training —Borrowed Military Manpower —Travel and TDY and transportation	—Modernization and Expansion —Support Equipment and Facilities	—Pay, allowances, bonuses, etc. —PCS and travel expenses —Subsistance —Military Retired Pay —IRR training and management —Active duty for training —ROTC —Full time reservists for administration and training
Materiel	—Civilian pay —Transportation —Spares and repair parts —Real Property maintenance and repair —Utilities, POL, etc.	—Major end items —Support equipment —Spares and repair parts —Initial and replenishment spares —Secondary items	—Pay, allowances, bonuses, etc.
Training	—Training and exercises —Base support operations —Supplies, ammunition and POL —Transportation costs —Temporary duty costs —Training Development costs	—Training equipment and simulators —Ammunition —Initial spares	—Pay and allowances for training bases —Bonuses and other incentives —Pay and allowances for trainees and enlisted levels

In making appropriation decisions, we believe it is important to understand how individual decisions contribute to personnel, materiel, and training conditions and thus affect the balance attainable among the pillars of military capability. This relationship can be inferred from the preceeding matrices. For example, an O&M request to send Army battalions to the National Training Center to measure and improve readiness is only prudent and necessary after investment funds have provided equipment and instrumentation for the training ranges. Similarly, if one is interested in the "materiel" portion of capability, the effect of decisions along all appropriation accounts must be considered.

FORCE READINESS REPORT

The Congress has long expressed an interest in the relationship between defense funding and military readiness. The FRR is the principal document used by DOD to satisfy this interest. The objective of the FRR is not only to tell the Congress what the current readiness is, but to present an overall assessment of the readiness expected to result from passage and execution of the defense budget submitted to the Congress by the President.

The FRR has evolved over the years since the Congress, in 1977, enacted Public Law 95-79 requiring DOD to submit an annual materiel readiness report describing the effect of its appropriations request on materiel readiness. In addition to the materiel readiness report, the FRR now includes a summary, two additional report sections on manpower and training, and an annex of national guard/reserve topics. Thus, the FY 1986 FRR consists of four volumes and an annex.

FRR is a comprehensive source of readiness related information

The FRR is the most comprehensive source of readiness information provided Congress. Within each volume are a myriad of indicators that DOD believes are pertinent to ascertaining a state of readiness, within a given level of

funding. Because no single indicator of force readiness exists, Defense officials say readiness must be inferred by considering the results of these various indicators. The principle readiness indicators included in the FRR fall into the following categories:

--Materiel inventory: measures equipment and supplies on hand.

--Materiel condition: measures materiel condition rates and depot level maintenance funding.

--Personnel inventory: measures numbers, skills, and quality of personnel.

--Training: measures participation in JCS exercises, active and reserve component training, training ammunition, and institutional training.

The link between resource inputs and expected readiness outcomes is not made in the FRR

The primary objective of the FRR, and the reason the Congress mandated its preparation, is to provide an assessment of the readiness expected to result from the passage and execution of the defense budget. It is intended to answer, relative to readiness, the questions of how ready we are, and what additional readiness will we get for our money.

Although, there is no assessment of the effect of funding levels on total force readiness in the FRR, the report attempts to deal with this link from a functional area perspective and provides information such as

--student training loads;

--numbers of equipment or weapon systems to be added to the inventory;

--numbers of units involved in exercises; and

--projected improvements in mission capable rates, by weapon system category.

Although military forces fight by organization, whether at a unit level or some other level of the total force, the FRR does not reflect improvements in readiness, relative to the fighting organization itself. For example, the FRR does not provide insight into the readiness of our forces in the Pacific theater. DOD's attempt to provide a perspective of increased readiness in the FRR is limited to the discrete data provided.

The FRR contains numerous indicators that can be consulted to assess force readiness. However, the FRR does not relate individual indicators and thereby, permit an overall assessment of force readiness. Because the readiness pillar interrelates closely with the other pillars of capability, it is a difficult task to infer readiness levels strictly through an examination of readiness measures alone.

Improving the FRR

Because the product of defense is intangible, DOD doubts that valid indicators can be constructed to link a specific level of funding to a measureable level of performance. We recognize that formulation of appropriate indicators is a difficult task. Notwithstanding these diffculties, we believe that DOD's current efforts to develop more representative individual indicators will provide greater visibility concerning changes in military capability. As part of these efforts DOD should give consideration to changing the FRR to provide the following enhancements.

--Document the linkage between resources requested and the anticipated enhancement of readiness wherever possible.

--Provide a clearer picture of the current state of readiness and year-to-year trends.

--Incorporate a "theater" readiness perspective since warfighting is executed by theater commanders.

--Whenever possible, benchmark reported/projected readiness status against wartime requirements or applicable peacetime goals and objectives for comparative analysis purposes.

--Whenever possible, project how much better trained crews are expected to be as a result of increased training as well as provide data relative to the effect increased training has on support capabilities--spares, fuel, ammunition, and maintenance.

UNITREP: A WIDELY MISUSED READINESS MEASURE

While the FRR is the most comprehensive readiness reporting document received by the Congress, C-ratings, the product of the UNITREP, are probably the single most often cited readiness indicator. UNITREP is the basic automated system for reporting unit level readiness within DOD.

C-ratings are sometimes used by DOD to demonstrate readiness shortfalls in support of appropriation requests and to demonstrate improvements in readiness resulting from past appropriations. Depending on how C-ratings are presented and qualified, their use for these purposes, as well as for internal DOD management purposes, may or may not be appropriate.

UNITREP is an internal DOD management tool which measures the ability of a unit to perform its wartime tasks by assessing the peacetime availability and status of its personnel, materiel, and training. It is a JCS controlled system designed primarily to measure the day-to-day readiness of operating forces, the product of which is used by JCS and the services for a variety of purposes, including

--an input source for the JCS Capability Report and the annual JCS Posture Statement to the Congress,

--a monitor on the status of mission essential equipment,

--a medium for readiness briefings within DOD,

--a source of information on unit resource status prior to mobilization, and

--an indicator of problems and the potential need to reallocate resources.

UNITREP was not intended to be used external to DOD to explain the readiness of U.S. forces. It was developed as an internal DOD management tool. While we did not evaluate the usefulness of UNITREP with regard to internal DOD management, DOD claims that UNITREP is providing the information and serving the purpose intended. However, UNITREP data is often used for purposes other than internal DOD management. In these instances, care should be exercised in using the data. The following cautions are not intended as criticisms of UNITREP, rather they are examples of how UNITREP data may be misused beyond the intended design of the system.

--Not all units C-rate and consequently, only a portion of the total force is represented in any roll up or attempt to combine C-ratings to demonstrate levels of readiness. Aggregate C-rating information is applicable to a force containing only about 50 percent of active duty personnel, and is limited to combat, combat support and certain service selected combat service support units.

--C-ratings only report on selected resources controlled by the unit or its parent unit. Consequently, anyone with the impression that units reporting a C-1 fully combat ready status are capable of performing their wartime tasks wherever a conflict occurs may be misinformed. For example, a unit at Fort Belvior reporting a C-1 fully combat ready status is merely stating that if a war started in Fort Belvior on the day the unit reported, it could perform its wartime tasks. If the war started elsewhere and the unit needed to deploy, UNITREP does not measure whether the

unit can mobilize, deploy, and employ within an acceptable timeframe. Thus, C-ratings for forward deployed units are probably more representative of readiness than ratings from units non-forward deployed.

--C-rating information for materiel on-hand is not intended to be representative of all materiel and supplies the unit needs to accomplish its wartime tasks. Only the most mission essential materiel possessed by the unit is considered in C-ratings. A significant percentage of materiel is not considered. Also, centrally controlled materiel, such as ammunition and fuel, are not included in the assessment.

--C-ratings are often unreliable when used to project accomplishments based on resource inputs because of the numerous assumptions required relative to how assets, once programmed, budgeted, and acquired, are distributed among the units in the force. It must be remembered that future materiel and personnel distributions are sensitive to force structure changes, doctrine changes, and modernization efforts.

--C-ratings do not assess units' ability to operate in a combined service situation such as fulfilling individual service requirements relative to an operational plan. In other words, a C-1 rating does not mean that a unit is capable of performing effectively no matter how it may be employed.

--Care must be taken when comparing like units or when attempting to gain an aggregate readiness perspective by rolling up or combining ratings within or among services. JCS guidance to the services allows considerable discretion and subjectivity in the computation of C-ratings. For the same reasons, C-ratings may not give an accurate view of readiness trends over time--even for a single unit--unless changes in the criteria overtime are factored into the reported data.

--UNITREP data is not intended to be used to develop budgets or outyear financial programs.

--UNITREP does not provide information in sufficient detail to make decisions for correcting deficiencies. C-rating data serve to flag problems and the services supplement UNITREP with other data and analyses.

Initiatives to improve UNITREP

In April 1984, the Secretary of Defense established a task force comprised of representatives from OSD, OJCS, DLA, and each of the military services to develop a more realistic and meaningful assessment of readiness trends. While the Secretary's tasking extended well beyond UNITREP to include relating resource inputs to outputs and linking meaningful measures of force readiness to the other attributes of capability (modernization, force structure, and sustainability), the task force's initial effort was directed toward improving UNITREP.

Task force working group recommendations have been made but have not yet been acted upon. The recommendations are expected to result in:

° Developing more consistent reporting among services,

° Separating sustainability measures from readiness measures in UNITREP reporting, and

° Presenting, over time, a more realistic and consistent portrayal of unit readiness status.

In addition to the task force efforts, the Army has begun a separate review of its means of collecting UNITREP data. In its preliminary stages, the review's goals are to make the Unit Status Report (USR) more reflective of a unit's status, increase the usefulness of the USR to the Army, and increase the Army's ability to use automation for analysis purposes. The target date for change in the USR is September 1985.

PART 3

READINESS AND SUSTAINABILITY INDICATORS--WHAT THEY MEAN AND HOW TO USE THEM

Readiness and sustainability can be described in terms of, among other things, materiel, personnel, and training. Within each component, various indicators are used to describe conditions relative to requirements. For example, personnel indicators exist that show the number of personnel by skill, by grade, by geographical location, and so forth. Individually, these indicators are useful for their designed purpose, but, they must be viewed collectively to estimate the level of overall readiness or sustainability.

DOD's FRR contains numerous indicators that can be consulted when assessing force readiness; however, there is no similar document that contains the measures of sustainability, or, the staying power of the force over time.

Part 3 will provide

--An overview matrix for materiel, personnel and training that outlines factors affecting requirements, identifies available performance indicators and shows how appropriations collectively support the components of readiness and sustainability.

--A discussion of some of the indicators identified in the matrix; what they are, how they are computed, what they measure, some cautions to be aware of when the indicators are being considered, and some other measures that complement the one being discussed, and

--A series of questions for each indicator discussed that should help relate various types of indicators with the area (i.e., pillar) of military capability being assessed. No implication is intended that the services do not have or know the answers. The purpose of these questions

is to identify relevant information needed for authorization and appropriation decisions.

MATERIEL

Materiel readiness and materiel sustainability are probably more amenable to measurement than the other components of readiness and sustainability. The services at a specific point in time, either have what they require to fight a war or they do not; and what they have either works or it does not.

Materiel readiness

Materiel readiness indicators frequently cited by DOD are:

--the percentage that results when the number of selected mission essential equipment items on hand at operational units are compared to units' wartime requirement for the items; this indicator, presented in the JCS UNITREP, is primarily an inventory measure;

--the precentage that results when the number of mission essential equipment items the services possess is compared to the number expected to be acquired as of the last year of the current 5-year defense plan; this indicator, reported in the FRR, is also primarily an inventory measure;
and

--the number of selected mission essential equipment items possessed by operational units that are capable of performing the mission for which they were designed compared with either the total wartime requirement for the item or the units current on-hand inventory. This is primarily a condition measure that is also reported in the JCS UNITREP and the FRR.

Materiel sustainability

Materiel sustainability is basically a measure of the number of days that war reserve materiel (WRM) are expected to last after U.S. forces are engaged in

combat. We found service criteria requiring the condition of items stored for war reserves to be reported; however, we found no examples were any WRM condition data are provided to the Congress.

* * * * * *

The services inform the Congress annually, in the FRR, posture statements, testimony and so forth, on the materiel condition and inventory of equipment needed to perform wartime missions. We have prepared two separate matrices that summarizes this information.

--The first matrix, on page 26, which highlights equipment inventory, is followed by a description of two indicators which report on sustainability rates.

  --War reserve objectives and actual and projected inventories on hand - reported to the Congress by DOD in the FRR.

  --S-rating which are presented in the SITREP which are not provided to the Congress.

The readiness measure--equipment and supplies on-hand--is also an inventory indicator. However, because it is a part of UNITREP, which was discussed in part 2 of the briefing, it will not be described here.

--The second matrix, on page 35, highlights equipment condition, and is followed by a discussion of three indicators, all of which report on readiness.

  --Materiel condition rates which are reported to the Congress in the FRR.

  --Depot maintenance/ship overhaul backlogs which are also reported in the FRR.

--Backlog of maintenance and repair (BMAR) - while not an equipment measure, this indicator reports on the condition of real property facilities which may influence the services' ability to maintain equipment in operational condition. BMAR is reported annually in testimony on the operations and maintenance appropriation, as required by the Congress.

Table 3

Materiel - Inventory Indicators

FACTORS AFFECTING REQUIREMENTS AND ACCOMPLISHMENTS	AVAILABLE INDICATORS	APPROPRIATION ACCOUNTS AFFECTING THE ELEMENTS
--Production lead times/funded delivery periods, e.g., industrial capacity --Doctrine and battle tactics --Inventory and acquisition objective changes, i.e., policy decisions --Force structure changes --Modernization and technology advances --Congressional constraints in funding and direction provided relative to equipment distribution --Levels of prepositioned stocks which compete for available resources --Operating tempo contributes to equipment deterioration and eventual disposal --Resource constraints evidenced by Authorized Levels of Organization --Distribution policies and decisions --Storage area and facility availability --Equipment retirement rates --"Bow wave" effects on procurement --Assumptions made in determining requirements i.e., attrition, consumption, etc.	--Force Readiness Report aggregate information --C-ratings (UNITREP) --SITREP report (S-Ratings) --Gross and net spares effectiveness rates --War Reserve Fill Rates	Procurement Account: --Major end items --Support equipment --Spares and repair parts Operations and Maintenance: --Civilian pay --Utilities --Transportation --Spares and repair parts Military Construction: --Facilities

Indicator: War Reserve Inventories

War reserves are stockpiles of equipment and materiel that are positioned around the world. These stocks are intended to sustain our forces from the day of engagement until the industrial base can meet demand. DOD directives, instructions, and annual Defense Guidance provide direction to the services for the management and control of the war reserve program. Each of the services compare existing war reserve stock levels with total requirements and prepare reports on existing levels of sustainability.

Annually the DOD identifies the requirements for war reserves in the Defense Guidance. According to DOD officials, the services develop their budget requests and acquisition programs accordingly. War reserve stock levels are stated in days-of-supply (DOS) and are predicated on anticipated order and shipping times. For example, DOD may prescribe a 100-day stockage level for the defense of NATO.

Each service converts the DOS objective into requirements for specific items, such as, equipment, munitions, and secondary items. The requirements change, and stock level objectives are adjusted as the force structure and other factors change.

War reserve stocks are either maintained with the unit (Air Force war readiness spares kits), stored in various CONUS locations, or prepositioned in a theater of operations. Unit-held stocks stay in the possession and control of the unit and move with the unit. Unit reserves are used prior to drawing on theater war reserve stocks.

War reserve stocks that have been prepositioned in theaters of operation are intended to last until CONUS stocked reserves can be transported to the theater. War reserves stocked in CONUS are intended to augment theater requirements until the industrial base can support the war needs for materiel.

War reserve stock levels are reported in various ways. For example, the materiel readiness report portion of the FRR refers to war reserve stocks both by type and dollars requested and programmed. DOD's Warfighting Capability Report, prepared in response to questions submitted by Senators Tower and Nunn, expresses war reserve inventory levels as a percentage of the procurement objective in terms of dollars. However, the most frequently cited measure is DOS.

Cautions

DOD recognizes the difficulties in measuring sustainability. In any assessment, certain assumptions must be made and the reliability of the assessment hinges, to a significant degree, on the validity of these assumptions. For example, DOD faces difficulties in accurately determining requirements--a problem sufficiently commented on by both internal DOD audit organizations and the GAO.

DOD has consistently used DOS indicators which show that the forces have sustainability shortages in war reserve munitions, equipment, and secondary items. While shortages do exist, assessments of war reserve stock positions, as represented by DOS, should be viewed cautiously.

--War reserve stock fill positions are static measures reflecting a specific point in time. "Fills" are affected by the dynamics of the equipment management process that authorizes loans, exchanges, and direct issues from war reserve stocks to meet operational requirements. Such practices may be considered good management because they improve current readiness; however, it must be understood that the improvement can be at the expense of sustainability.

Using DOS as an indicator of war reserve stock fill levels can lead to a misinterpretation of sustainability.

--The Army aggregates dissimilar assets (e.g., tanks vs. M-16 rifles) within a class of supply by weight. For example, the Army may report 30 days of supply in class VII equipment items (500,000 short tons on-hand divided by a 1 million short ton requirement times a 60-day stockage objective). This method gives equal status to old and modern equipment, assumes a linear level of consumption over time (i.e., 1/60th of the equipment will be used each day), and does not recognize the diversity of equipment items (i.e., a tank weighs more than a jeep). This aberation can give an inaccurate reading of war reserve stock fill levels.

--The Navy aggregates dissimilar assets by cost. In addition to the same problems cited above, this technique assumes that substitutability is proportional to relative cost. For example, if a modern munition costs 5 times as much as the old one, it takes 5 old ones to make up the absence of one new one. Therefore, this method makes it appear that we are less or more capable than we actually are.

--Reliance on aggregated DOS information masks critical shortages of equipment within and among classes of supply. For example, a force may have a 60-day supply of sophisticated air munitions and only 30 days of supply of JP-4 aviation gasoline. Similarly, a force may appear capable of lasting, based on the artillery munitions in stock, but only have 10 days of replacement gun tubes.

--War reserve reporting does not provide information on the quantity or condition of individual materiel items and consequently, it is unknown whether they are operational. Our recent work with the U.S. Army in Europe demonstrated that war reserve materiel condition codes were not reliable, and essentially all assets are reported as usable, regardless of its condition.

--The reported value of stocks is conservative because the on-hand stocks are valued at purchase cost rather than replacement cost. This tends to understate the value of current inventory.

--Theater reporting does not factor in the increased sustainability that may be gained (1) if assets stored in other theaters are moved, or (2) from stocks provided by allies. Nor does it reflect the potential loss from demands on such stocks from allies.

Complementary indicator

The S-rating, included in the SITREP, is the only other assessment of war reserve stock levels we are aware of. The S-rating is discussed on page 31.

Questions

Because war reserve fill levels are aggregated to DOS for an entire class of supplies, there is limited visibility over what are considered to be the most essential supplies and equipment within each class.

--In addition to reporting stockage on-hand versus requirements in terms of weight, costs, and DOS, could not additional visibility be derived by reporting the fill rate and materiel condition of all assets which are considered pacing or mission essential, such as those reported in the JCS UNITREP equipment condition report? Has DOD considered expanding its reporting criteria for essential war reserve stocks? What impediments exist that would prevent implementing this criteria?

Current war reserve stock levels are significantly different from class to class and from location to location.

--Considering the imbalances that exist among classes of supply prepositioned around the world and considering both the interdependence of the stock classes and the fact that cross leveling may be a possibility, how long can the force sustain, on a theater-by-theater basis against the threat outlined in the Defense Guidance?

Based on today's guidance, war reserve requirements are extensive and are constantly changing due to the dynamics of the force structure.

--Assuming today's requirements and industrial capacity remain constant, and based on FY 1985 cost estimates, what would it cost and how ling would it take to acquire and perposition the needed assets? Which specific mission essential assets cannot be met within the anticipated time frame and what are the specific implications of this?

Indicator: S-Rating

The annual SITREP is a JCS required assessment of the military capability of Unified and Specified Commands and serves as the primary input into the annual JCS Capability Report to the Secretary of Defense. As part of the SITREP, commanders provide sustainability ratings, or S-ratings, for each class fo supply prepositioned as theater war reserve stocks.

Service components of Unified Commands compute S-ratings by applying JCS criteria to stockage levels based on service computed inventory data. For example, for most items Army components base S-ratings on weight while Navy components base S-ratings on dollars.

The S-rating is designed to provide information on the theater prepositioned war reserve stocks which are not reported under UNITREP. The S-rating is an indicator of the theater forces ability to sustain. Because the S-rating is an indicator of on-hand assets versus required assets, it is much like the C-rating which is designed to be an indicator of a units peacetime readiness, relative to its wartime personnel, equipment, and training requirements.

The numerical S-rating is assigned to theater war reserve stock levels by the commander of a Unified or Specified Command. The rating represents the quantity of stocks currently prepositioned compared with the prepositioned war reserve requirement. S-ratings are assigned as follows:

--S-1 Fully Combat Sustainable. At least 90 percent of the prepositioned requirement is satisfied.

--S-2 Substantially Combat Sustainable. Between 75 and 89 percent of the requirement is prepositioned.

--S-3 Marginally Combat Sustainable. Between 50 and 74 percent of the requirement is prepositioned.

--S-4 Not Combat Sustainable. Less than 50 percent of the requirement is prepositioned.

Cautions

When using S-ratings to assess the staying power of our forces on a theater basis, the following cautions should be considered.

--S-ratings only apply to prepositioned war reserve stocks and do not include all war reserve assets in CONUS--only those stocks in CONUS the CINC's have identified as essential to combat and Marine Corps mount-out stocks--nor do they include war reserve stocks held by units in that theater (e.g., Air Force war readiness spare kits).

--Because of the various methods used to calculate the base for S-ratings, the ratings provide only a general indication of sustainability. For example,

(1) The use of tonnage and dollar values to determine fill percentage gives equal status to old and new equipment, could assume a linear consumption rate, and does not take into consideration the diversity of items reported on.

(2) Visibility is lost over the condition of the stocks. Our report on the U.S. Army in Korea[1] demonstrated potential materiel condition and control problems. For example, at the 19th Support Command and the 6th Support Center, we found that the storage quality control reports contained notations that some vehicles had been reclassified from unserviceable to serviceable without any maintenance being performed.

(3) S-ratings without accompanying narratives provide only partial information. Commanders, when assigning S-ratings, are required to elaborate, in a narrative, on all ratings of S-3 or S-4.

(4) Subjectivity is used in determining S-ratings. Commanders may change the rating for a class of supply if they believe the rating is misleading.

Initiatives

We were told by JCS officials responsible for developing policy for the S-ratings that some significant changes are forthcoming in a soon to be published change to JCS Memorandum of Policy 172. For example, one of the changes requires that mission essential equipment now stored in CONUS, as well as in theater, be considered in the SITREP. Prior to this change, CONUS-stored assets were not reported.

Questions

The Congress is being asked to fund increasing support to correct war reserve shortfalls. However, it is not provided S-ratings to help assess actual

[1]GAO/C-PLRD 83-2, The Readiness And Sustainability of U.S. Forces in Korea: Considerations For Decisionmakers, May 1983.

program needs. The S-ratings, with accompanying commander's comments, would seem to offer a broader perspective of the forces' staying power because they are measures of a theater commander's ability to sustain, based on each class of stock reported by the military components.

--Is the S-rating a better assessment of sustainability than DOS? If not, why does the JCS require the computation? If it is, why isn't the Congress provided this information in annual budget requests?

Because the S-ratings do not include war reserves held by operating units or the total CONUS-stocked war reserve materiel, there is a significant amount of sustainability support that is not being reported to the JCS.

--How much additional sustainability is attainable considering the unit held stocks and stocks stored in CONUS earmarked for theaters? Is such information vital to JCS allocation of resources for unified operations? Do other reports include this information? If so, what are they and how is the information brought together to show the full picture of sustainability?

Each of the services utilize different methods to compute their war reserve position and commanders use the service criteria to develop inventory levels before computing the S-rating.

--Given the fact that computational methodology differs from component to component, what precautions are taken to ensure that reliability is not sacrificed?

This concludes our discussion on materiel inventory, and we will now address materiel condition.

Table 4

Materiel - Condition Indicators

FACTORS AFFECTING REQUIREMENTS AND ACCOMPLISHMENTS	AVAILABLE INDICATORS	APPROPRIATION ACCOUNTS AFFECTING THE ELEMENTS
—Changing maintenance philosophies; i.e., fix forward, extensions of time between overhauls —Various operational and financial reasons for maintenance backlogs —Production base lead times —Availability of qualified maintainance personnel and turnover of maintenance technicians —Availability of spares, components, test equip., maintenance facilities, etc. —Reliability and maintainability levels of equipment and the operating tempo —Adequacy of the logistics support base as a whole —Modernization and technological advances —Funding constraints; supply and maintenance —Force structure changes —Unanticipated changes in peacetime operational commitments —Equipment age coupled with operating tempos	—C-ratings (UNITREP) —Force Readiness Report aggregate information —Depot Level Maintenance Backlogs —Cannibalization Rates —MRN withdrawal Rates —Supply Fill Rates —Materiel Condition Rates —Backlog of Maintenance and Repair	Procurement Account: —Maintenance float —Secondary items —Peacetime operating stocks of secondary items Stock Fund Operations and Maintenance: —Spares and repair parts —Civilian pay —Real Property maintenance and repair —Utilities, POL, etc. —Training Military Construction: —Storage facilities —Maintenance facilities Military Personnel: —Military personnel pay and allowances

Indicator: Materiel Condition Rate

DOD requires the Army, Navy, Air Force, and the Marine Corps to maintain materiel condition information and compute mission capable rates for selected mission essential equipment items for the purposes of

--reviewing maintenance and supply effectiveness and

--identifying the primary causes for high downtimes or excessive support costs.

The materiel condition rate is a ratio of the time that mission essential equipment is mission capable compared to total equipment in service at that time. For example, if a unit is assigned 3 each of item X, then total available time each day is 72 hours. If during a given 24-hour period one of the items was fully mission capable, one of the items was not mission capable for 15 hours, and the third was not mission capable for 21 hours then the mission capable rate for the item in question is 50 percent. The mission capable rate achieved is compared with materiel condition goals.

DOD directs the services to develop materiel condition goals for each equipment item based on the maximum achievable time the equipment is expected to be available for operational use given planned peacetime usage, full funding, and optimum manpower and logistic support.

Four condition status codes are used to indicate the degree of mission capability attained for each system or equipment item being evaluated.

--Full Mission Capable (FMC) - The system or equipment is safe and capable of performing all missions it was designed to accomplish.

--Partial Mission Capable (PMC) - The system or equipment is safe and capable of accomplishing at least one, but not all, of the missions it was designed to accomplish.

--Mission Capable (MC) - The sum of the FMC and PMC.

--Not Mission Capable (NMC) - The system or equipment is not capable of performing any of the missions it was designed to accomplish. Two additional codes were created to isolate the reasons for this condition

(1) Not Mission Capable Supply (NMCS). This status is indicated when maintenance is required to correct the system or equipment discrepancy and cannot continue due to a supply shortage.

(2) Not Mission Capable Maintenance (NMCM). This status is indicated when unit level maintenance is required or is in progress.

Materiel condition rates are used as a management tool by each service. The rates actually attained or projected are performance indicators or source data for several defense reports, including the annual FRR. As a rule, each of the services interpret and use the materiel condition status reports in consonance with the DOD instruction, however, each has tailored the information they collect and how they use it to fit their own circumstances.

Army--It reports materiel condition rates for selected equipment items. Data are routinely collected and reported on over 400 separate items.

Materiel Condition Status Reports are submitted monthly by active Army units and quarterly by reserve components. The reports are forwarded through the chain of command to the Army Materiel Command's Readiness Support Activity which consolidates the data and prepares two separate, but related documents.

--The Unit Equipment Status and Serviceability Report is a quarterly summary of the materiel status reports for each division, separate brigade, armored cavalry regiment, and other special commands.

--The Equipment Historical Availability Trends Report, produced quarterly, provides two-year trend data by major command, for all Army units.

Army officials at all command levels use these reports for insight into problems and areas/equipment items that are showing a tendency to become future problems. The Materiel Condition Reports also serve as the basis for JCS UNITREP equipment readiness reports and input to the FRR. In addition, the Assistant Secretary of the Army and the Deputy Chief of Staff for Logistics are briefed quarterly on overall Army supply performance. Materiel condition rates are a major topic at this briefing.

Army materiel condition goals are not established for each individual item in accordance with DOD criteria because, according to the official we interviewed, it is not feasible to create separate FMC goals for over 400 separate reportable items. Army's FMC goals are 75 percent for all aircraft and 90 percent for all other equipment--the minimum levels a unit can report and achieve a C-1 condition for JCS UNITREP.

Navy--It establishes materiel condition goals for aircraft but not for ships or submarines. These goals are established for aircraft based on their current position in the deployment cycle. Deployed aircraft, aircraft preparing to deploy, and shore-based aircraft are given resourcing priority in that order, and goals are established accordingly.

The Subsystem Capability Impact Reporting System arrays and reports materiel condition data to the Chief of Naval Operations, System Commands, Naval Air System Command, Fleet Headquarters, and Type Commands.

NAVAIR meets periodically to review the mission capability position of Naval aviation. The data provided is used to assess probable causes for non-mission capable conditions, such as overall management, supply support, maintenance practices and depot maintenance.

Air Force--The Air Force generally follows the DOD instruction for reporting mission capability. However as discussed below, the Air Force has made certain modifications to meet its own needs.

--Not Mission Capable Both (NMCB) is a unique Air Force status indicating that a system is down for both unsatisfied maintenance and supply requirements. For example, if an aircraft is reported NMCM and during maintenance, a part is needed but not available, the materiel condition status will be changed to NMCB to ensure accountability for the supply requirement.

--Overall Air Force materiel condition goals are established for each aircraft, however major commands create materiel condition goals for each weapon system they possess based on local environments and past experience. Day-to-day performance is compared with command goals rather than overall Air Force goals.

Materiel condition rates are one of several factors considered during recurring weapon system reviews conducted by the Air Staff.

Cautions

Because materiel condition rates are used for many different purposes, there are some basic cautions that must be considered when using them.

--The rates are often used to make statements about funding requirements and to project future mission capability trends. These statements and forecasts should be viewed with caution because mission capability can be

attained even when the supply system is unable to respond to NMC demand requisitions. Commanders can and do bring equipment and systems to mission capability by withdrawing needed parts from war reserve stocks or cannibalizing other NMC equipment.

--Materiel condition rates are sometimes used as measures of warfighting capability. This use is not appropriate because MC rates are based solely on peacetime support systems. Wartime exigencies will likely result in extraordinary actions that will routinely circumvent peacetime processes, and mission capability may be redefined to meet wartime circumstances. Responding to our recent report[2], DOD stated MC rates are not measures of warfighting capabilities.

--Materiel condition rates often are used to compare current supply support conditions to service established materiel condition goals. However, the goals established by the services are not based on the criteria outlined in the DOD instructions. Because the services do not structure goals using common criteria, one cannot compare the materiel condition performance being reported by the services.

Complementary indicators

Based on the cautions we have identified, additional information should be consulted to gain a broader perspective of the meaning and impact of materiel condition rates. Following are other indicators that can be consulted.

--The C-rating in the JCS UNITREP, for equipment readiness is a measure of mission capability which compares the number of combat ready mission essential equipment items to the number of wartime item requirements.

[2]GAO/C-NSIAD-84-11, Navy Tactical Air Forces--Readiness, Deployability, And Implications for Decisionmakers, Oct. 1983.

This contrasts with the materiel condition rates which are computed based on equipment inventory on hand rather than the full wartime requirement. It is important that both these indicators be consulted when assessing materiel condition because the number of items reported as operational should be identical for both indicators.

--Commanders may work around inadequacies of the logistics system to bring equipment to mission capable status. There are two indicators that may indicate the extent that work arounds are used.

  --War Reserve Materiel (WRM) withdrawal - the frequency that WRM is reduced to support peacetime training requirements.

  --Cannibalization rates - the rate in which parts or components are removed from NMC equipment items and installed on a similar item to allow it to be reported MC.

--Depot maintenance backlogs - the number of reparable equipment components that are not available to the supply system primarily because of insufficient depot maintenance funding. This is important because DOD states that maintenance backlogs have an indirect relationship to MC rates--as backlogs decrease, there should a corresponding increase in MC rates.

--Navy Casualty Report - while materiel condition rates are applicable to aircraft as well as weapon systems, ships and submarines are not similarly reported. Casualty Reports are submitted when on-board equipment items for ships and submarines that cannot be repaired within 48 hours. The overall condition of a ship or submarine may be inferred by a comprehensive analysis of all current casualty reports.

Questions

According to DOD criteria, materiel condition rates are developed to review maintenance and supply effectiveness and to identify the primary causes of high downtime or excessive support costs. However, they are also used for many other purposes such as a factor in computing equipment readiness reported in UNITREP and as a primary indicator in the FRR.

--Cannibalization and withdrawals from war reserve stocks are alternatives to the supply system and both are frequently used to bring equipment/systems to full or partially mission capable status when the supply system cannot provide spare parts in a timely manner. What percent of the FMC and MC status reported in the fiscal year 1986 FRR was attained because needed parts were either obtained by cannibalizing or withdrawing from war reserves?

DOD's directive requires the services to establish equipment/system unique goals for materiel conditions. The goals are to be based on the best possible manpower and logistic support systems' performance during peacetime operations. These goals, and a record of how the services have performed and how they expect to perform in the future relative to them, are published in the annual FRR.

--The services do not always establish their materiel condition goals in accordance with the DOD criteria. For example, the Army's goals are the same for all equipment/systems--at the lowest possible percentage that will allow a report of C-1 under JCS UNITREP equipment readiness criteria. How can the Congress get a consistent reading among services of the effectiveness of the supply and maintenance systems and adequacy of the level of funding that is being provided if materiel condition goals are not established in accordance with DOD's criteria?

Materiel condition rates are not included in the UNITREP for equipment/systems allocated to the training base. The FRR does not include rates for equipment/systems in depot maintenance, prepositioned in POMCUS or theater war reserves.

--A significant amount of equipment is included in these categories that, if needed, will be available for combat operations. Why are these assets excluded from materiel condition reporting? What percentage of the total inventory of reportable equipment is included in these three categories?

Indicator: Depot Maintenance/Ship Overhaul Backlog

To help maintain a high state of materiel readiness, DOD has established a goal to fully fund depot maintenance requirements, where feasible, and eliminate maintenance backlogs.

The services determine the total amount of unserviceable assets requiring depot work for the budget year and then establish a level of funding for maintenance. If the level of funding is less than the total requirement for unserviceable assets, a backlog exists--unfunded unserviceable assets constitute a maintenance backlog.

According to DOD, the availability of equipment and reparable components is an important link in the chain that makes up materiel readiness. Therefore, as maintenance backlogs increase, materiel readiness may be adversely affected due to the decreasing availability of equipment and depot reparable components.

An awareness of the following definitions is essential for understanding the computation and effect of backlogs in the depot maintenance program.

--Depot maintenance requirement - a major end item or significant component that is due for inspection, repair, or overhaul during the budget year.

--Funded requirement - a major end item or significant component that will be placed into a depot for inspection, repair, or modification during the budget year.

--Backlog - the amount by which total depot maintenance requirements exceed total funded requirements.

--Carryover - funded maintenance requirements which were not completed during the current budget year.

While full funding and elimination of backlogs are DOD goals, elimination of backlogs does not necessarily mean that everything that is broken or scheduled for overhaul will be inducted into a depot. Zero backlog is a management level which each of the services try to attain, using somewhat different criteria.

Cautions

While depot maintenance plays an important part in providing materiel readiness, DOD's goal of full funding for depot maintenance will not always result in improved materiel readiness rates because:

--The materiel readiness is influenced by other factors such as maintenance scheduling, changes in planned levels of activity such as steaming days and flying hours, and the skill and manning status of maintenance and support personnel may not be as favorable as anticipated.

--Although depot maintenance backlogs are identified as a factor in determining materiel readiness in the FRR, there is no framework in the FRR to link depot maintenance funding levels and the levels of readiness that are expected to result.

Complementary indicators

--Activity indicators, such as flying hours, road miles, steaming days, play an important role in determining depot maintenance requirements. For example, if the number of hours/days the equipment is operated

exceeds the number planned, depot rework may be required sooner than anticipated. Because the depot workload is partially scheduled based on a planned level of operations, increased operational tempos result in a larger requirement than is budgeted and funded, and a backlog of unfunded work may occur.

--Achieving materiel condition rate goals can be affected by depot maintenance backlogs. For example, materiel condition goals may not be achievable if reparable components are backlogged at the depot, thus limiting their availability in the supply system.

Questions

To increase readiness and sustainability, DOD has established a zero maintenance backlog goal for their depot programs, when feasible.

--A DOD goal is to eliminate maintenance backlogs. Have the services quantified the relationship between the size of depot maintenance backlogs and materiel condition rates? If so, what are DOD's plans to provide this information in the FRR?

Depot maintenance backlogs result when valid requirements exceed available funding. GAO has reported that even when sufficient funding is provided work cannot always be completed as planned and must be carried over.

--Is depot industrial capacity saturated due to increased workload resulting from increased funding? Are funded backlogs becoming a problem? What are the funded backlog levels expected to be at the end of FY 1985?

Indicator: Backlog of Maintenance and Repair

The Backlog of Maintenance and Repair (BMAR) is the end of the fiscal year measurement of real property maintenance and repair work that remains a firm requirement but which will not be accomplished due to a lack of resources.

The BMAR, computed annually, is used by the services to help justify annual base operations funding requirements and as an indicator of the condition of existing real property.

BMAR levels increase when real property maintenance and repair requirements, validated in the services annual work plans, exceed the total amount of funding available to fund the requirements in that year. The BMAR levels decrease when available funding exceeds current annual work requirements and prior year backlogged projects are funded.

Congressional concern for the BMAR level dates back to the early 1960s. To encourage DOD to control continued deterioration of real property, the Congress:

--established a statutory minimum amount of operations and maintenance funding that services use only for real property maintenance and repair;

--provided funds in excess of those requested by the services for real property maintenance and repair; and

--issued several directives to reduce the backlog, including adopting a containment policy which established the FY 1978 backlog as the baseline not to be exceeded in the future.

In its budget presentation, DOD compares the current BMAR with the containment baseline and its prior year expenditure for real property maintenance and repair with the mandated minimum funding levels.

The services interpret and report the composition of BMAR differently.

--The Army and Marine Corps generally report the total value of all unfunded projects as backlogs.

--The Navy reports only operational projects that, if deferred, may result in increased costs.

--The Air Force reports only that part of its real property deficiencies to be corrected by commercial contract.

Cautions

Real Property Maintenance and Repair (RPMR) programs are largely discretionary. This means immediate military capability will not be affected if funding decisions are changed or delayed. The BMAR level may be affected by funding decisions made necessary when the Congress delays passage of annual appropriations, as well as by the following conditions which are created solely by the services:

--The services report that they annually spend more for real property maintenance than they budgeted. However, such spending may not always result in a reduction of the BMAR. Early in the fiscal year, RPMR programs are a source of funds that are frequently reallocated to cover other obligations not included in a continuing resolution or to fund emerging higher priority programs. At the end of the year the opposite occurs, funds that cannot be obligated for other budgeted purposes migrate to RPMR to be obligated before the close of the fiscal year. Generally, more money is added than removed. However, as we previously

reported[3], as funds are added late in the fiscal year, the rush to obligate the year end money may not result in funding of projects in the BMAR.

--BMAR levels are a function of the amount of work required versus available funding. Work requirements are derived from annual work plans which are developed from inspections and schedules. Defense auditors and the GAO have questioned the accuracy of the services annual plans and consequently, the reported BMAR level.

--DOD reports its BMAR to the Congress annually, however, because the Navy and the Air Force do not count a significant part of their unfunded work, defense's BMAR may be much higher than is being reported to the Congress.

Complementary indicators

We are aware of no other indicators that correlate with BMAR. However, following are some that may give an insight into the result of the BMAR:

--C-Rating - deficiencies in the training area may be the result of RPMR work being delayed for facilities at training ranges.

--Reenlistment and disciplinary rates - problems identified by these indicators are often ascribed to the service member's quality of life. BMAR, which includes a significant amount of work on barracks, recreational facilities, and so forth, can have an adverse or positive impact on these indicators.

--Military construction program backlogs - many of today's real property facilities are beyond the economic life of the structures. Extending the

[3]GAO/PLRD-83-62, The Defense Budget: A Look at Budgeting Resources, Accomplishments and Problems, Apr. 27, 1983.

life of the structures with increased RPMR may be a cause for the high BMAR rates. Also, reduced levels of BMAR may be the result of military construction rather than BMAR funding.

Questions

The number of projects that have not been funded in prior years is considered a symptom of inadequate funding. However, prior GAO and internal DOD reviews have found that reported backlog levels are inaccurate and thus questionable as an indicator of need for increased funding.

--What actions have the services taken to improve the validity of the backlog levels contained in the defense budget?

--How much confidence can be placed in the reported backlog?

PERSONNEL

Many indicators are used to describe and analyze DOD's personnel force. However, we found no single indicator designed to assess the contribution of the personnel function to overall readiness and sustainability. Usually, the existing indicators are discrete and specific, and collected for particular purposes. Such data can be used, for example, to answer the following types of questions.

--How many officer accessions were planned over a three year period?

--How many recruits have no prior military service?

It can also be used to compare and contrast goals and accomplishments such as:

--How did recruitment results compare to goals for a particular type of recruit?

--How did the number of persons in a given disciplinary category compare to the numbers for past years?

The following table identifies some of the factors that affect personnel requirements and accomplishments, lists performance indicators DOD uses to describe personnel conditions, and highlights appropriations required to support military personnel.

Table 5

PERSONNEL

FACTORS AFFECTING REQUIREMENTS AND ACCOMPLISHMENTS	AVAILABLE INDICATORS	APPROPRIATION ACCOUNTS AFFECTING THE ELEMENTS
--DOD Total Force policy, e.g., active/Reserve component mix and responsibilities, manpower distribution policies, etc. --Congressional constraints relative to funding, manpower ceilings, etc. --Adequacy of pay, allowances and bonuses to attract and maintain qualified personnel --Availability of both qualified civilian personnel and youth manpower pool --The stability of the force; accession, retentions, leadership, etc. --Force modernization and its impacts on the force in terms of experience and mental capabilities --Force structure changes; e.g., 600-ship Navy, 40 airwings, light infantry divisions, etc. --Private sector employment and general economic conditions --Adequacy of the individual and unit training base --Availability of Host Nation Support --Adequacy of the manpower requirements determination process --Resource constraints evidenced by Authorized Levels of Organization --Morale influenced by living and working conditions	--Borrowed military manpower (effect of civilian work force ceilings) --Accession and recruitment rates, number and quality --Retention and recruitment rates --Reenlistments, career, mid-level and initial term --Grade shortages and overages --Stability measures; in the aggregate, by unit, inventory imbalances by grade and occupation, and experience and grade mixes --Operating strengths --Programmed manpower structures vs. programmed manning --Programmed manning vs. operating strength --C-ratings --SITREPS --Career content of the force	Military personnel: --Pay, allowances, bonuses, etc. --PCS and travel expenses --Subsistance --Individual clothing Defense Family Housing: --Cost to lease, construct and maintain family housing --Pay to civilians to maintain and operate family housing Military Retired Pay Reserve and Guard Personnel: --Inactive duty drills --Active duty for training --ROTC --Full time reservists for administration and training --IRR training and management Civilian Costs (spread over many accounts) Personnel Support Costs: --Individual training --Medical support --Recruiting and examining --Overseas dependent education --Base operating support Operations and Maintenance: --Central supply and maintenance --Real property maintenance and repair --Unit training --Borrowed Military Manpower --Travel and TDY and transportation MILCON: --Bachelor and family housing

Force composition indicators

Indicators of force composition are usually stated as numbers of persons in a given personnel category at a point in time, or averaged over a period of time. Some of the common categories used are:

- °End strength
- °Retention rates
- °Stability measures (e.g., career content of the force and grade mix)
- °Programmed manning vs. operating strength
- °Accession rates
- °C-ratings (UNITREP)
- °Programmed manning vs. programming manpower structure

Two indicators frequently used to describe force composition are end strength and accession/recruitment rates. These are discussed below.

Indicator: End Strength

End strength is the total number of persons in the military calculated as of the end of the fiscal year. End strength data are presented for DOD in total, by individual service, and for various "slices" of the force. For example, end strength may be computed for the Air Force's reserve component, Navy enlisted members, active duty personnel DOD-wide, or women in the Army. Also, end strength is sometimes compared to programmed manning or other end strength goals to determine how well the force's personnel programs are working and if goals and objectives are being achieved.

DOD uses end strength indicators internally in the planning, programming, and budgeting process; and externally in the FRR, posture statements, and testimony before Congress to justify its total personnel costs, and in the illustrating the success or problems associated with its personnel programs.

Cautions

--End strength should be compared and contrasted over time with other data, such as changing manpower goals and requirements, to measure progress in improving total force composition. Although increases in end strength may indicate that manpower goals are being met or that total strength in a specific category is improving, it does not provide visibility over force imbalances or whether the mix of individual skills and experience within the force is adequate.

Complementary indicators

Combining other indicators with end strength data can provide a better description of force composition relative to what is needed. End strength indicators should be examined in the context of goals, requirements, grades, skills, and experience mix. The following DOD indicators may be used to complement end strength indicators.

--Top five enlisted strength/shortages--an indicator which compares requirements for persons in the top five grades to the number on hand. If the overall end strength goals are met, but there is a shortage in the top five category, this may indicate an excess of inexperienced individuals in the force.

--Recruiting rates--a group of indicators describing the numbers and various characteristics of individuals entering the force which provides information on the likely aptitude level of the force.

--Disciplinary rates--an indicator of force content and stability. These compare the incidence of absence without leave/unauthorized absence, desertion, violent crime, and crimes against property over a period of years.

--Retention rates--an indicator of stability and experience.

--Skill imbalances--an indicator of the ability to operate and maintain sophisticated and technologically advanced weapon systems.

Questions

The services are currently engaged in a massive force modernization effort. Modernization involves the introduction of new equipment and technologies, and places additional demands on personnel skills.

--Based on current modernization efforts by the services, has DOD identified its critical skill needs for the years to come? If so, how does DOD plan to obtain these required skills, and can they be obtained at a reasonable cost?

--What steps are the services taking to correct current imbalances in technologically sophisticated skill positions? To what extent will current and projected skill imbalances impede the services' efforts to fill existing force structure needs and implement modernization initiatives?

Indicator: Accession Rates

Accession (recruiting) rates represent the number of newly acquired personnel in various categories for a given period of time. Generally, accession rates are stated in terms of annual goals.

Accession rates have become increasingly important to the services since the advent of the all volunteer force, and the services have placed an emphasis on attracting high quality enlistees and officers. Statements made in congressional hearings indicate a strong concern about the quality of accessions, and successes have been used by DOD to support its position that military capabilities have improved in recent years.

The following are types of enlisted accession data commonly provided to the Congress for the services' active and reserve components:

- Enlistees with or without prior military service
- Males
- By mental category
- Females
- High school graduates

Cautions

The following points should be kept in mind when reviewing accession rates.

--Recent favorable accession rates may be due to increases in military pay as well as an unfavorable job market. The Congress should be aware that accession trends may reverse as job opportunities increase in the private sector.

--Accession rates report on the success the services have had in recruiting the right types and quantities of people. An equally important piece of information, in light of requests for increased pay and benefits, is how the talent is being distributed and how efficiently it is being utilized.

Complementary indicators

Combining other indicators with accession rate indicators can provide a better description of force composition relative to what is needed. The following indicators may be used to complement accession rate indicators.

--Retention indicators, which relate to the experience and technical skill levels of the force, can be used by the Congress to satisfy itself that DOD targets proper skill and experience shortage areas for concentration of funds.

--Skill imbalance indicators, when combined with accession and retention indicators, can provide the Congress a basis for assessing the quality

and technical proficiency of the force today and how today's accessions may affect the force mix in the future.

Questions

Over the past few years, the services have improved their accession rates for high school diploma graduates. The services regard these higher quality accessions as an important element in modernization, technology use and support, and force discipline.

--As the population of eligible youths decline and DOD's requirement for higher mental category recruits increases due to the introduction of sophisticated weapon systems, is it reasonable to expect that DOD can continue to attract the quality of recruits needed and at a reasonable cost?

Force Distribution Indicators

DOD uses several indicators to assess how well available personnel are distributed throughout the force. The indicators usually reflect the distribution of both numbers and skills, and they provide statistics that highlight the percentage of personnel who are available, compared with wartime total or peacetime constrained requirements. Some frequently used force distribution measures are:

- °C-rating (UNITREP)
- °Programmed manning compared to operating strength
- °Manpower by active and reserve forces
- °Programmed manning to programmed structure
- °Commander's narrative rating in the SITREP Report
- °Occupational skills balance by organization

DOD uses distribution indicators in budget request testimony and in posture statements. DOD also uses distribution indicators as planning, programming, and budgeting tools and as contributing indicators for readiness and sustainability assessments.

The personnel C-rating in UNITREP is an example of a force distribution indicator.

Indicator: C-rating

Personnel C-ratings are used to determine units' overall combat readiness ratings, and is one part of the JCS UNITREP reporting system. C-ratings for personnel are based on flexible JCS guidance which allows the service to, among other things, decide which resources to include. For example, the services determine which skills they will include in the reporting base.

JCS guidance also allows flexibility in the calculation of personnel ratings. JCS requires that the services report

--total personnel strength compared to structured strength and

--the number of qualified persons available in selected critical skills compared to the structured strength for those selected critical skills.

An additional indicator dealing with personnel in critical skills, by grade, is optional. The lowest rating determines the unit's personnel C-rating.

Caution

Flexibility in guidance for personnel C-ratings criteria and methods for determining C-ratings varies from service to service. Consequently, it is difficult to compare like units and ratings or to gain an overall cross-service perspective of personnel from C-rating. For example:

--the services may choose to use either wartime or peacetime structure as a basis for the personnel indicators;

--the services decide which critical skills to include in C-rating; and

--two of the services use the optional indicator, two do not.

Complementary indicators

Personnel C-ratings at a unit level consider primarily total personnel strength and selected critical skills. Indicators dealing with personnel stability and experience and with operational strength and personnel sustainability factors, are all complementary to C-ratings.

--C-ratings for training compare the existing level of training to the standards for a fully trained unit. However, it should be noted that a commander's subjective evaluation is a major part of this rating.

--Population stability rates reflect unit continuity. These rates indicate not only individual time-in-service, but also the rate of personnel stability within units. A unit with a high C-rating due to total strength and numbers of personnel in critical skill categories, might be less ready than the C-rating would indicate due to high personnel turnover.

--Personnel sustainability indicators found in the annual SITREP complement the readiness orientation of C-ratings. They also include the commander's narrative overview, percent fill for various skills, and operation plan supportability.

--Skill imbalance indicators.

Certain indicators which relate primarily to materiel may be used as complementary force distribution indicators. For example, depot maintenance

backlogs may provide an indirect indicator of personnel problems. Given stable requirements, unacceptable or rising backlogs could signal personnel problems, such as a lack of experienced personnel in the proper skills.

Question

Personnel C-rating are designed to provide a measure of the personnel-on-hand against the applicable requirement. However, only limited personnel data are included, and methods and data used vary among services.

--Since C-ratings are unit specific indicators and aggregate personnel data provided in the FRR are force level indicators, how can the two be used in conjunction with each other to provide a more comprehensive picture of personnel readiness?

TRAINING

How well the services carry out their mission depends on how well their people are trained.

Training is a never-ending requirement encompassing on-the-job and classroom instruction for individuals and combat mission unit training for all types, sizes, and mixes of units. Individual training, conducted at schools and training centers, is conducted for the purpose of teaching basic skills or furthering individual skill development. The purpose of unit training is to develop military personnel into cohesive combat units. This type of training involves on-the-job training, military exercises, and training conducted at local and specially constructed and instrumented training ranges and maneuver areas.

This part of the briefing will cover selected indicators for both individual and collective unit training. The following chart arrays some factors affecting training levels, some indicators that measure training accomplishments, and the appropriation accounts that support the training.

Table 6

TRAINING - A FACTOR OF MILITARY CAPABILITY

FACTORS AFFECTING REQUIREMENTS AND ACCOMPLISHMENTS	AVAILABLE INDICATORS	APPROPRIATION ACCOUNTS AFFECTING THE ELEMENTS
--Accessions which increase individual training requirements --Retentions which decreases individual recruit training but increases advanced training needs --Force structure and modernization changes which affect individual, unit level and individual skill training requirements --Status of the reserve component enlistments and retention --Base operating support capabilities and the availability of ranges and other facilities --Unit level strengths and equipment status which influences availability for unit training --Personal turnover which increases the need for all levels of training --Quality of trainers and leadership capabilities --Capability to learn, i.e., the quality of the personnel in training --Availability of spares, equipment, ammunition, etc. to support training tempos --Training standards, methods, and measures of achievements --Transportation availability --Realism in training, e.g., availability of high tech. training devices --Advances in training requirements	--Training loads/Graduates --Flying hours --Steaming days --Battalion training days --C-ratings (UNITREP) --JCS and service-sponsored Training exercises --Combat arms battalion training days	Procurement Account: --Training devices and simulators --Equipment for training centers --Spare and repair parts --Initial spares --Operations and Maintenance: --Training and exercises --Base support operations --Spares, ammunition and POL --Contract civilians --Range upgrade Military Personnel: --Pay and allowances for training bases --Bonuses and other incentives Military Construction: --Facilities and ranges --Operations and training

Individual training

Individual training provides personnel with the skills required to perform their military duties. The projected or approved force structure and authorized positions within the force serve as the basis for determining a point-in-time total requirement for specific manpower skills. Skill requirements are measured against personnel on hand in each skill and expected losses due to discharge, promotion, retirement, and other causes. Shortages are projected. The shortage represents the graduates needed to fill-out the operational and support forces. Training loads, which describe the average student strength per course is an approximate level of man-years of training and are computed to produce this desired number of graduates.

Training loads are used by DOD principally for manpower accounting purposes to project the numbers of personnel which will be undergoing individual training and education. External to DOD, they are used to support the President's budget and DOD's request for individual training funds.

Indicators: Training load/graduates

The common measure of individual training outputs is graduates; the workload required to produce the graduates is the training load.

Throughout their military service, personnel participate in and graduate from one or several of the following formal individual training and education courses:

--Recruit training - initial military training for enlisted personnel.

--Officer acquisition training - prepares civilians or non-commissioned military personnel for commissions as officers in the armed forces.

--Specialized skill training - prepares military personnel for specific jobs.

--Flight training - for prospective pilots, navigators and Naval flight officers before they receive an initial operational assignment.

--Professional development education - provides both advanced professional and academic training.

Training loads needed to produce the desired number of graduates are usually computed based on the best information available on anticipated vacancies in the force such as discharges, deaths, disciplinary trends, training attrition rates, force expansion or modernization. However, events do not always work out as planned.

Cautions

When considering aggregate indicators such as training loads/graduates, the Congress should be aware that individual personnel achievements and changing requirements may affect aggregate statistics for the following reasons:

--Individual decisions to enlist or reenlist may lead to unanticipated changes in the skill inventory and attrition rates; and patterns may change from those used to develop the training load; and, force structure changes may be introduced sooner or later than anticipated when the training load was developed. Any of these or other variables may affect the certainty or accuracy of the projected training loads being funded in the DOD budget.

--Training loads as provided in documents such as the FRR do not represent total needs. The training loads reflected in the FRR are constrained by considerations such as funds and space available in classes. Therefore, fully funding individual training requirements, outlined in the President's budget, does not mean that the number of graduates produced during the fiscal year will satisfy the total force requirement for trained personnel.

Questions

The quality of people entering the services has improved significantly since 1980. This is evidenced by the higher mental category of recruits, along with increased numbers of high school graduates.

--What percentage of change in individual training attrition rates occurred as a result of better qualified personnel entering the services?

--Has the number of higher quality recruits kept pace with the growth in critical skill requirements? If yes, what are the priorities for retaining these people in the career force as the private economy competes for their military acquired technical skills? If not, what effect has this has or will this have on overall force capability?

--What are the unconstrained individual training requirements? How do the constrained figures match with total needs, and what is the immediate effect of individual training shortfalls on total force readiness? How many units are reporting less than C-1 for training in JCS UNITREP because adequate numbers of graduates are not available to support total requirements?

Collective unit training

More closely associated with readiness than individual training, collective unit training prepares personnel to operate in cohesive combat units. Military conflict is fought by units and collections of units, therefore, units training together under simulated battlefield conditions is essential if DOD's forces are to be ready.

The remainder of this part of the briefing is devoted to identifying and discussing some of the types of training and indicators used by military units.

Indicators: Flying hours, steaming days, battalion training days, JCS and service-sponsored exercises.

Each of the above indicators are similar, in that they measure a level of activity. They indicate trends in a particular activity such as hours flown or days steamed. They do not, by themselves, indicate the effectiveness of the training.

Flying hours

Flying hours is an aggregate figure that represents the hours that crews must fly to complete training standards and attain a specific state of readiness. Minimum standards have been established in terms of flying hours per crew, per month, in order to maintain individual and unit level technical and tactical proficiency. Although intended to gauge the amount of flight training accomplished, in practice, the measure records hours without regard for the training content or training effectiveness.

Steaming days

Steaming days is similar to flying hours, in that it is a measure of activity. For non-deployed ships, steaming time is largely devoted to training. For deployed ships, however, steaming days are also devoted to non-training activities such as contingency operations and transits required by a forward presence.

Battalion training days

Battalion training days is used by the Army as a measure of collective unit training. Defined as the sum of field training days designed to improve individual and collective technical and tactical proficiency, battalion training days also provides a general index of time devoted to individual and collective training in units and reflects the level of effort expended toward achieving and

maintaining a state of readiness. As an aggregate indicator of training accomplished, battalion training days does not reflect the nature or type of training conducted nor is it useful for determining the effectiveness of such training. Thus, this indicator has the same inherent limitations as flying hours and steaming days.

Combat arms battalion field training days

The Marine Corps' principal indicator for collective training is combat arms battalion field training days. Like battalion training days, it is an aggregate indicator of time spent training and is not a measure of proficiency or effectiveness.

Exercises

Another indicator in this category is JCS and service sponsored exercises away from home station. Service sponsored training exercises are designed to simulate wartime conditions and allow the services to improve doctrine, combat tactics, training methods, and unit operating procedures. This type of training is conducted at facilities such as the Army's National Training Center, the Marine Corps' Air-Ground Combat Center, and the Air Force's Nellis Range Complex. JCS directed and coordinated exercises are designed to provide opportunities to use and evaluate joint doctrine, tactics, techniques, procedures and command and control in a realistic environment. Indicators related to this type of training are measures of the number of exercises conducted and participated in.

Cautions

Some cautions should be kept in mind when reviewing the service indicators for collective unit training. As previously discussed, the major caution is that these indicators are useful for measuring levels of activity. They cannot be used to infer a level of accomplishment resulting from completion of the activity. Other cautions include:

--The implicit assumption that readiness increases as the activity level increases can not be relied upon. The quality of training is a key factor that may not be achieved even with more training time.

--The indicators include a number of activities other than training. For example, the Navy's tactical air/antisubmarine warfare flying hour budget is based on what is needed to train aircrews to a peacetime primary mission readiness level and to provide limited flying hours for personnel assigned to staff positions. However, the Navy's flying hour budget also funds a significant amount of operational and support flying hours. These hours are not shown as part of the flying hours program.

--Collective unit training indicators are statistical measures of effort required or expended, and not a measure of progress toward a better trained force. Individual tasks or components of a training program are not usually weighted, thus less complex maneuvers are assigned the same credit as more difficult to master combat related maneuvers.

Complementary indicators

A variety of indicators can be consulted when assessing collective unit training. These include spare parts fill rates, war reserve withdrawal rates, equipment readiness rates, C-ratings and ammunition availability.

Spare parts fill rates

The Congress can use spare parts fill rates to help determine if budgeted training rates are attainable. The DOD purchases spare parts to satisfy operational, training, and war reserve requirements. Of concern is that as requirements increase, there should be commensurate increases in funding for spare parts. In addition, because of long-lead times for many spare parts, accelerated levels of training must be closely coordinated with scheduled deliveries. If adequate quantities of spare parts are not available, training

could be curtailed even though funded. For example, the Army had to scale back its flying hour program when it discovered it did not have enough parts to support the number of flying hours it had budgeted for and funded.

War reserve withdrawal rates

The Congress can use this indicator to observe the trade offs being made to satisfy short term readiness goals at the expense of sustainability. When parts are not available in the supply system and the services believe it is essential to train to a given level of activity, such as flying a specific number of hours, spare parts that have been set aside as war reserve stocks may be withdrawn and used for peacetime training support. The positive effect of such withdrawals on current readiness and its negative effect on sustainability is difficult to measure.

Equipment readiness rates

The Congress can use this indicator, in combination with those previously discussed to determine the services' ability to execute the level of training being requested in the budget. Equipment readiness rates indicate the percentage of a unit's mission essential equipment that is available to accomplish the unit's mission, which in peacetime is primarily training.

C-rating

Unit training is one of the major reporting areas in JCS UNITREP. Depending on the service reporting, the C-rating is the commander's assessment of either (1) the number of weeks of training required to make the unit ready, (2) the percent of aircrews assigned to the unit that are combat ready, or (3) the percent of a unit's training program that has been completed. We have previously identified several cautions the Congress should be aware of when it is offered C-ratings as an indicator of condition, progress, or need. When these cautions are considered, the C-rating may offer some insight into the training aspect of force readiness.

Ammunition availability

The level of ammunition available for training purposes is another indicator that may be consulted. In recent years, the level of funding has increased for the purchase of training ammunition, however, this may be the result of introducing new weapon systems which use more expensive ammunition. Thus, fewer rounds may actually be available for training. The DOD should ensure that a correlation exists between the level of training requested and the numbers and types of ammunition available to support the level of effort.

Questions

Programs such as flying hours that are critically dependent upon logistical support must be closely coordinated to ensure all essential support is on hand in the needed quantities at the time needed.

--How do the services ensure that flying hour budgets are thoroughly coordinated with support functions, such as personnel, spare parts, and maintenance?

--Has DOD established procedures to provide an oversight capability?

The purpose of flying at predetermined levels is to maintain combat readiness. The Navy's goal for peacetime primary mission readiness is to train aircrews to 88 percent of standards, including 2 percent simulator time. The Air Force has established three levels of pilot proficiency for tactical units. To assure that proper combat readiness is achieved with mission resource expenditures, the services should continually evaluate and test the validity of events and standards contained in aircrew training manuals.

--To what extent has this been accomplished and what are the results?

Training ranges are areas where combat units/aircrews can safely practice live fire combat maneuvers and tactics. They also enhance training by providing targets and threats resembling the postulated combat environment. The ranges also provide areas and facilities the services need to develop and analyze warfare tactics and command and control procedures. Some ranges are large enough to provide for operational testing and large-scale exercises.

--What initiatives do the services currently have on-going or recently completed to develop the management information necessary to properly evaluate this type of training?

APPENDIX I

EFFORTS BY DOD AND THE SERVICES TO IMPROVE READINESS MEASUREMENT, REPORTING, ANALYSIS, AND MANAGEMENT

DOD is attempting to improve its ability to measure the components of military capability. Both the Office of the Secretary of Defense and Joint Chiefs of Staff, in conjunction with the services, are pursuing a number of projects to develop methods to improve readiness management, reporting, measurement and analysis. This appendix presents some current efforts. Additional information is provided in the executive summary of the FRR.

Office of the Secretary of Defense (OSD)

OSD began a series of semi-annual readiness information exchanges in April 1983. The sessions bring together readiness analysts and managers from the federal government, academia, reseach firms, and industry to exchange information concerning readiness measurement, reporting, analysis, and management.

Other OSD efforts include:

--A product aimed at changing planning, programming and budgeting data systems to allow better visibility of budget resources which affect readiness.

--A model relating readiness and sustainability of Army firepower and maneuver units to resources.

--An aviation materiel readiness model which includes more comprehensive depot operations considerations (in conjunction with the Navy and the Air Force). A separate, but related, effort adapts a less detailed Air Force model to Army and Navy aviation readiness and sustainability.

--A project to develop indicators of the wholesale logistics system's ability to transition to, and sustain, the increased workloads of crisis or combat conditions.

Army

Army improvement efforts include:

--"The Army Plan 1986-2000," contains policy and resource planning guidance through the end of the century. It links the four pillars of military capability, total Army goals and objectives, and the nine Army functional areas such as manning, equipping, training, and structuring.

--The Army Logistic Assessment (ALA) identifies organic warfighting constraints.

--The continued improvement of the Army Operational Readiness Analysis (OMNIBUS) evaluates the force's capability to mobilize, deploy, fight, and sustain in support of the Defense Guidance scenario.

--Measuring Improved Capability of Army Forces (MICAF), provides a model for measuring, reporting, and monitoring increases in warfighting capability as new items, units, and organizations are introduced into the force. MICAF measures increased unit potential and projected equipment fill and produces a relative Combat Organization Potential (COP) value for each unit evaluated.

--The Total Army Force Readiness System (TAFRES) and Total Army Strategic Management System (TASMS), two proposed systems now under evaluation, would define force readiness in greater detail and provide a new strategic level management system for resourcing readiness.

Materiel-related efforts include:

--Improvements in the Total Army Equipment Distribution Program (TAEDP), and its feeder systems, to enhance visibility and management of Army equipment programs.

--The Transition Management System (TMS), a program for modeling equipment distribution.

--Materiel condition reporting which has been increased from quarterly to monthly.

--Regularly scheduled comparisons of equipment distribution projections to to requirements performed to ensure that materiel inventory readiness is balanced across the force.

Training-related efforts include:

--The Army Training Management Control System (TMACS) which will help commanders evaluate the effect of changes in training resources.

--The Training Resource Model (TRM) initiative which will quantify training cost and tie it to training requirements. A future tie-in between TRM and the Unit Status Report will help commanders compare training status to wartime requirements.

--The Standards in Training Commission (STRAC), established to determine an effective ammunition level to insure adequate training levels. STRAC is now working to identify core training requirements and their associated cost resources; develop battalion training models; develop cost-effective training strategies; and, eventually, tie dollars to readiness.

Navy

Navy improvement efforts include:

--Two research efforts attempting to measure the effect of personnel manning levels on ship readiness.

--Developing methods to compute peacetime readiness and wartime sustainability for Naval aviation as a function of spares, activity levels, personnel quantity and quality, and test equipment.

--A new data base system which tracks funds affecting readiness back to 1974.

--A readiness tracking system for surface ships.

--A readiness reporting system, similar to UNITREP, for base support. Initial efforts attempt to tie facility condition to resource expenditures.

--The new Naval Reserve Wartime Planning and Support Improvement Program which identifies Naval Reserve wartime requirements, planning deficiencies and current capabilities, and areas needing improvement.

Air Force

Current system/studies and efforts in progress include:

--The Logistics Capability Measurement System (LCMS) which relates readiness and sustainability through the use of three models--the aircraft availability model; the overview model, which relates availability of spares to sorties; and the munitions model.

--The Wartime Assessment and Requirements Simulation Model (WARS) which will determine aircraft recoverable spares requirements for a given scenario and assess impact on sortie generation.

--The Air Force Integrated Readiness Measurement System (AFIRMS), now being developed, is intended to provide commanders at all levels a means to assess readiness and to perform dollars-to-readiness budget analyses.

Air Force efforts to improve spare parts acquisition include:

--Corona Require, a study of the spares forecasting and requirements process. Implementation of recommendations will produce improved spares forecasting and logistical support for operational units.

--Air Force Management Analysis Group (AFMAG) study of spare parts acquisition from weapon system design through post production support.

Marine Corps

Marine Corps efforts include:

--The Marine Corps Combat Readiness Evaluation System (MCCRES) which determines the combat readiness of Fleet Marine Force units, including reserve units, to accomplish missions.

Materiel-related efforts include:

--A review of the Marine Corps Automated Readiness Evaluation System (MARES).

--Improvements in the Marine Corps Integrated Maintenance Management System (MIMMS).

--An automated reporting system that stratifies in-stores assets against prioritized requirements. This improves the service's ability to measure materiel readiness and sustainability relative to specific OPLANS.

Initiatives in the personnel readiness area include:

--PREPAS, the Precise Personnel Assignment System, which uses a systems approach to training and assignment of first term enlisted personnel.

APPENDIX I

--The recently implemented Manpower Program and Budget Development Process which determines manpower requirements including early identification of current and future critical skill shortages.

--Implementation of the Unit Deployment Program for stabilization of deployed units.

Training-related efforts include:

--Establishment of formal schools or training for light armored vehicle crews, heavy anti-armor missile gunners, bulk fuel specialists, and field artillery batterymen.

--Procurement and fielding of training devices for several weapon systems, maintenance, tactical decisionmaking, command and control, and fire support coordination.

--Several projects relating to the development of performance oriented individual training standards.

Initiatives to improve training management, include:

--The Instructional Management System (IMS) development used to provide automation support to formal schools.

--The Training Requirements and Resources Management System (TRRMS) development which will provide a management information and decision support system for training management.

APPENDIX II

OBJECTIVES, SCOPE, AND METHODOLOGY

Based on an April 18, 1984, request from Senator Nunn, the ranking minority member of the Senate Committee on Armed Services, and subsequent agreements with the committee staff, the objectives of our analysis were to:

--Identify various formal and informal readiness, sustainability, force structure and modernization measures and indicators currently used by DOD.

--Analyze selected measures and indicators and provide observations on their relative merits (what information is actually provided) and their limitations (what information they do not provide).

--Begin developing a methodology for a follow-on, narrowly focused, assignment. The objective would be to determine if existing internal management indicators could be modified to allow the Congress to compare capability enhancement with the level of resources appropriated.

We performed this analysis during the July-November 1984 period, using generally accepted government auditing standards. The work was done in the Washington, D.C. area, and included data gathering and interviews with responsible officials in the Office of the Secretary of Defense, the Office of the Joint Chiefs and Staff, and the headquarters offices of the Army, Navy, Air Force, and Marine Corps.

Our work was limited to identifying and analyzing the indicators the services consider most important in their assessment of military capability. We did not attempt to determine the capability of U.S. military forces, nor did we assess the accuracy of measurement systems currently used or under development by DOD. Although the indicators discussed in this briefing document may indirectly reflect the contribution of DOD's civilian work force we did not identify any indicators that are unique to the civilian population's contribution to military capability.

APPENDIX II

In addition, the nation's warfighting capability, although focused in DOD, is also comprised of people and materiel of the Coast Guard, Merchant Marine, civil airlines, Public Health Service and many other non-DOD organization and activities. To assess the U.S. warfighting capability, these resources, as well as the military services, would need to be considered. However, this assignment only considered the indicators DOD uses to assess its internal capability.

APPENDIX III

THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

MANPOWER,
INSTALLATIONS
AND LOGISTICS

19 APR 1985

Mr. Frank C. Conahan
Director, National Security & International
Affairs Division
United States General Accounting Office
Washington, D. C. 20540

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "Measures of Military Capability: A Discussion on Their Merits, Limitations, and Interrelationships," dated March 4, 1985 (OSD Case 6660/GAO assignment Code 390023).

DoD has reviewed the report and finds it a good and generally fair report. In general, it accurately and clearly lays out the problems of measuring military capability within DoD and corroborates much of what DoD has been saying over the past year about the utility of UNITREP data, the cautions that must be applied when using it, and the difficulty of quantifying military capability into a single, definitive measure.

Enclosed are DoD's comments on the report's suggestions for improving the Force Readiness Report. Also enclosed are the Department's answers to specific questions that GAO suggested Senator Nunn might ask the DoD concerning the various indicators. In addition, DoD has some concern with certain items discussed in the letter to Senator Nunn, which is a part of the draft. Those are set forth in the following paragraphs:

1. On page 2, could be misinterpreted as implying that DoD has been unresponsive to requests for information concerning changes in military capability. This would be a serious misinterpretation because the Department has provided extensive information to the Congress documenting improvements in military capability, and much of that information has been in the form of quantitative measures or indicators. At the bottom of page 2, GAO stated that DOD questions the utility of a definitive measure of military capability or its subordinate components. This is incorrect. If such a definitive measure could be developed, DOD would certainly use it. The Department's position,

accurately stated in that same paragraph, is that such a measure is extremely difficult, if not impossible, to develop. The emphasis on the absence of a comprehensive measure, which also is repeated throughout the report, could be incorrectly interpreted to imply that the Department has been remiss in failing to develop such a measure. It is important to keep clearly in focus that the difficulties of developing a single indicator have not been used as a shield against providing information on military capability and that there are numerous indicators for the various components of capability which are used in the Department and provided to the Congress.

2. On page 3, where GAO discussed UNITREP's limitations, it is stated that "UNITREP only measures the readiness of about 50 percent of our forces and it does not report the ability of the unit to deploy at the time of a war." DOD agrees with the intent of this observation -- namely, that UNITREP is not all-encompassing, either in terms of military units or in terms of missions. But to preclude misinterpretation, a more precise statement is that only about half of all military personnel are assigned to units that report through UNITREP. This set of reporting units does include, however, virtually all of the front-line capability and its immediate support: all combat units, all combat support units, and most combat service support units. With regard to mission, UNITREP considers only those resources organic to a reporting unit. The ability to deploy (airlift or sealift capability), cargo-handling capability, and other similar missions are reported in UNITREP only by those units tasked to provide the service, not by those units designated to receive the service. Thus, in DoD's view, GAO's example of UNITREP's limitations should be deleted. In our mark-up of the letter to Senator Nunn, alternative comments on UNITREP have been provided for your consideration.

3. On page 3 you appear to criticize the Force Readiness Report because it "does not provide a definitive statement on the current state of readiness, nor does it fully provide projections of the future state of readiness if the budget request is approved." While DoD does not have a single definitive statement on current and projected readiness, the Department does have a selection of definitive readiness indicators. Mission Capable (MC) rates, for example, are very specific measures of what percent of a weapon system can perform one or more of its combat missions. Furthermore, the Force Readiness Report does project MC rates based on DoD budget requests. Also, DoD quantifies its training programs and identifies the pieces of the budget that pay for increased training readiness.

APPENDIX III

4. Page 1 of the letter may give a biased picture of DoD funding trends. While the FY 85 DOD budget authority increased 100 percent over FY 80 in then-year dollars, the real growth in budget authority (measured in constant FY 86 dollars) is only 50 percent ($196.9B in FY 80 to $296.1B in FY 85). Furthermore, the real growth in FY 85 outlays (actual DOD expenditures in these years) will increase by only 36 percent over FY 80 ($188.7B in FY 80 to $256.2B in FY 85). It is the annual outlay, not the budget authority, that impacts combat capability in that year.

DOD has provided, for your staff's consideration, suggested wording changes to overcome the items discussed above. Other technical corrections were also provided.

Sincerely,

Jerry L. Calhoun
Principal Deputy Assistant Secretary of Defense
(Manpower, Installations & Logistics)

Attachment

GAO DRAFT REPORT - DATED MARCH 4, 1985
(GAO CODE NO. 390023) OSD CASE No. 6660

"MEASURES OF MILITARY CAPABILITY: A DISCUSSION ON THEIR MERITS, LIMITATIONS AND INTERRELATIONSHIP"

DEPARTMENT OF DEFENSE RESPONSE TO SUGGESTIONS TO IMPROVE FORCE READINESS REPORT

Improving the FRR. Because the product of defense is intangible, GAO reported that DoD doubts that valid indicators can be constructed to link a specific level of funding to a measurable level of performance. While recognizing that formulation of appropriate indicators is a difficult task and will take some time, GAO concluded it is an essential task that should be undertaken. In this light, GAO suggested that DoD give consideration to redesigning the FRR to provide the following enhancements:

- Suggestion 1: GAO suggested that, whenever possible, DoD document the linkage between resources requested and the anticipated enhancement of readiness. (p. 17)

Comment. DoD concurs in the view that wherever possible it is desirable to identify the change in readiness that is anticipated as a result of resource increases. In fact, DOD not only concurs, it is actively pursuing a series of research efforts aimed toward just that end. These efforts are discussed in the Appendix to Volume I of the FRR.

These efforts are worthwhile because they will aid the Department in assessing the expected marginal effect on readiness that would result from changes in selected resource inputs, other things being equal. The forecasting problem, however, is considerably more complex than simply estimating and manipulating relationships between selected resource inputs and readiness. This increased complexity results from two primary sources: (1) the existence of necessary but not sufficient conditions, and (2) the complementary and indirect effects of the resource inputs.

Knowing of the existence of these complexities, it should not be anticipated that the ability to set forth authoritative and accurate forecasts tying increases in readiness to changes in resource inputs will be developed quickly. Nonetheless, DoD is able to identify resource inputs in which increases are necessary, if readiness is to increase, and also is able to responsibly estimate a balanced program of increases for that set of inputs.

These considerations, together with the absence of any single measure of readiness, dictate the present practice of presenting the necessary and desirable resource input increases individually and then inferring whether readiness has increased by making reference to several separate indicators. Efforts now underway, however, are yielding new and more quantifiable insights into the linkage of resources to readiness and will continue.

- **Suggestion 2:** GAO suggested that DoD improve the FRR to provide a clearer picture of the current state of readiness and year-to-year trends. (p. 17)

Comment. DoD is considering modifications to the FY 87 FRR and will consider just such an improvement as part of that modification.

- **Suggestion 3:** GAO suggested that DoD incorporate a "theater" readiness perspective, since warfighting is executed by theater commanders. (p. 18)

Comment. DoD will examine the availability and quality of data such as mission capable rates by theater and give careful consideration to this suggestion in the course of the proposed modification to the FRR. Whether such data would be included would depend on their availability, or the cost of making them available, and a preliminary consideration of existing differences by theater.

- **Suggestion 4:** GAO suggested that, whenever possible, DoD benchmark reported/projected readiness status against wartime requirements, for comparative analysis purposes. (p. 18)

Comment. The statement of mission capable rates and the goal for those rates is essentially the sort of benchmark comparison suggested here. The comparisons of the programmed manpower structure and programmed manning similarly satisfies this suggestion. For many other indicators of readiness, as distinguished from sustainability, there is no logically comparable wartime requirement; for example, flying hours, steaming hours, or battalion training days. Conversely, the UNITREP Report in many instances does benchmark against wartime requirements (e.g., equipment fill), leading to easily misinterpreted time series data as a result of a changing benchmark. Thus, considerable discretion is necessary in selecting a benchmark and in some cases a comparison to prior years is preferable to comparison to a time-dependent benchmark.

APPENDIX III

- **Suggestion 5:** GAO suggested that, whenever possible, DoD project how much better trained crews are expected to be as a result of increased training, as well as provide data relative to the effect increased training has on support capabilities--spares, fuel, ammunition, and maintenance. (p. 18)

Comment. The effect on support capabilities for many systems already is reflected in the analysis of the funding for peacetime operating stocks. It should be noted that while increased weapon systems usage for the purpose of training crews increases the maintenance requirement, that increase in maintenance is not necessarily bad; the maintenance personnel also must be trained. Increased training for crews also provides increased maintenance training. Thus, the analysis of peacetime operating stocks captures a more significant portion of the costs of increased training than is at first obvious. A quantitative projection of how much better trained crews would be would require an index of crew training or capability, and that index is not available; therefore, it rarely, if ever, will be possible to make such a projection.

APPENDIX III

GAO DRAFT REPORT - DATED MARCH 4, 1985
(GAO CODE NO. 390023) OSD CASE NO. 6660

"MEASURES OF MILITARY CAPABILITY: A DISCUSSION ON THEIR MERITS, LIMITATIONS AND INTERRELATIONSHIPS

DEPARTMENT OF DEFENSE RESPONSE TO QUESTIONS RELATIVE TO INDICATORS

GAO raised a series of questions which, according to GAO, were not intended as an indication that DoD does not have or know the answers. Their purpose was to identify relevant information needed for authorization and appropriation discussions.

- **QUESTION 1: Indicator: War Reserve Inventories.** Because war reserve fill levels are aggregated to Day of Supply (DOS) for an entire class of supplies, there is limited visibility over what are considered to be the most essential supplies and equipment within each class. In addition to reporting stockage on-hand versus requirements in terms of weight, costs and DOS, could not additional visibility be derived by reporting the fill rate and materiel condition of all assets which are considered pacing or mission essential, such as those reported in the JCS UNITREP equipment condition report? Has DOD considered expanding its reporting criteria for essential war reserve stocks? What impediments exist that would prevent implementing this criteria? (p. 30)

ANSWER: At the DoD level, management of war reserve stocks is not based on aggregated days of supply (DOS). The Defense Guidance (DG) to the Services specifies objectives, in days of supply, to be achieved at certain points in time. That DOS objective is, however, (as noted in the report) applied against individual items in developing the Service programs. The aggregate DOS measures are typically developed to respond to direct questions (such as Question 2 below) of "How long can we last?" The GAO review is quite correct in saying that any aggregation over classes of supply is fraught with difficulty and has very little meaning. A DoD working group composed of representatives of each Service, OJCS, and OSD, is working to develop improved measures of sustainability. These measures will undoubtedly be multi-dimensional, to include, as a minimum, an assessment of effectiveness over time. For example, the Services compute the mix and magnitude of munitions stockpiles to fight for various periods of time. That computed X-day stockpile is the stockpile that would allow our force structure to fight at full effectiveness against the estimated threat for X days. A shortage to that stockpile does not necessarily mean that the force could not continue to fight for X days, but rather that it would be forced to ration munitions and, thus, would fight less effectively than it otherwise could.

APPENDIX III

Any meaningful measure must attempt to get at the capability embedded in the requirement and compare that with the capability inherent in a given stockpile. The DoD does receive information from the field (for example, in the CINCs reports) on the Commanders' estimates of what the critical shortages are, and these assessments become a critical part of the program and budget review processes.

- QUESTION 2: Indicator: War Reserve Inventories. Current war reserve stock levels are significantly different from class-to-class and from location-to-location. Considering the imbalances that exist among classes of supply prepositioned around the world, and considering both the interdependence of the stock classes and the fact that cross leveling may be a possibility, how long can the force sustain, on a theater-by-theater basis, against the threat outlined in the Defense Guidance? (p. 30)

ANSWER: The draft report provides a very good discussion of the difficulties of developing a single number representing how long a force can sustain, and points out the fallacies of aggregating across dissimilar categories of supply. There are also many other difficulties not mentioned in the report. Days of sustainability and days of supply are not necessarily synonymous. Sustainability is also a function of force structure (particularly support force structure), storage, transportation, and many other factors. Assessing how long a force can sustain on a theater-by-theater basis would require many, many man-years of effort; and then the answer would only be valid under the one specific set of assumptions made in that analysis. Any simple answer to the question could only be misused and would be counterproductive. About the most that can be said is that current stockpiles of munitions have a capability roughly one-half of the requirement stated in the Defense Guidance. (This response only addresses only munitions because of the OJCS assessment that munitions supply is the current driver of sustainability.)

- QUESTION 3: Indicator: War Reserve Inventories. Based on today's guidance, war reserve requirements are extensive and are constantly changing due to the dynamics of the force structure. Assuming today's requirement and industrial capacity remain constant, and based on FY 1985 cost estimates, what would it cost and how long would it take to acquire and preposition the needed assets? Which specific mission essential assets cannot be met within the anticipated time frame and what are the specific implications of this? (p. 31)

APPENDIX III

ANSWER: The requirement for sustainability is to be able to fight indefinitely in any foreseeable conflict. To meet that requirement would require massive stockpiles of war reserves and significant expansion of our production base. The cost of achieving that capability is prohibitive in the near and mid-term, and is measured in the many hundreds of billions of dollars. Even the fiscally-constrained objective in the Defense Guidance is in serious doubt, since it will cost approximately 70 billion dollars beginning in FY 86 for war reserves of munitions and spares. The implication of not meeting these objectives is that US forces must be prepared to ration scarce resources if they are to continue to fight beyond the first few weeks of a full-scale conventional war. Some specific problem areas are precision-guided anti-armor munitions and air-to-air missiles.

- **QUESTION 4: Indicator: S-rating.** The Congress is being asked to fund increasing support to correct war reserve shortfalls; however, it is not provided S-ratings to help assess actual program needs. The S-ratings, with accompanying commander's comments, would seem to offer a broader perspective of the forces staying power because they are measures of a theater commander's ability to sustain, based on each class of stock reported by the military components. Is the S-rating a better assessment of sustainability than DOS? If not, why does the JCS require the computation? If they do, why isn't the Congress provided this information in annual budget requests? (pp. 33,34)

ANSWER: The purpose of the S-rating is to provide the JCS with a simplified management indicator of logistic resource status. It categorizes each class of supply for each theater component into one of four rating groups: S-1 through S-4.

The S-rating is initially calculated upon the amount of stocks prepositioned against the Service-calculated prepositioning requirements, and then modified by the CINC to account for shortages or malpositioning of essential materials within that class of supply. Consideration of essential items stocked in CONUS which the CINC may reasonably plan to receive is also included in this calculation. The resulting S-rating relates to specific OPLAN prepositioning requirements for each CINC'S most logistically demanding OPLAN. Since the S-rating relates directly to OPLANS, its distribution beyond JCS is restricted by MOP39. In addition, in the aggregate, the S-ratings would indicate essentially the same shortage levels as does DOS. Thus, for purposes of sizing the overall resource requirement, the S-ratings contain no or little more information than does DOS; conversely, for the JCS's task of managing today's capabilities, the S-rating does have added information content.

APPENDIX III

- **QUESTION 5: Indicator: S-rating.** Because the S-ratings do not include war reserves held by operating units or the total CONUS-stocked war reserve materiel, there is a significant amount of sustainability support that is not being reported to the JCS. How much additional sustainability is attainable, considering the unit held stocks and stocks stored in CONUS earmarked for theater? Is such information vital to JCS allocation of resources for unified operations? Do other reports include this information? If so, what are they and how is the information brought together to show the full picture of sustainability? (p. 34)

ANSWER: The S-rating reflects the prepositioned (in-theatre) war reserve material stockpile, which is intended to support combat operations until resupply can be established. In short, it is a measure of relative risk as to whether the CINC can survive logistically until the CONUS stocks are available to him.

While the S-rating does not include all material in CONUS, it does include items stored in CONUS which the CINCs have identified as essential to combat sustainability. The remaining CONUS materiel is a measure of national capability to sustain forces prior to the industrial base responding to an industrial mobilization, and thus relates to the "D-to-P" capability as opposed to CINC capability for independent action prior to resupply. The determination of the CINC's warfighting sustainability is made during the development of each specific operations plan and during the detailed OPLAN development process.

Because the Services, not JCS, allocate assets to their components for unified operations, the CONUS stocks not addressed in the S-rating would be distributed by the Services in accordance with their procedures and joint priorities.

- **QUESTION 6. Indicator: S-rating.** Each of the Services utilize different methods to compute their war reserve position, and unified-component commanders use the Service criteria to develop inventory levels before computing the S-rating. Given the fact the computational methodology differs from component to component, what precautions are taken to ensure that reliability is not sacrificed? (p. 34)

ANSWER: The latest revision to the S-rating methodology includes a standard method to calculate the percent of fill (most often by determining the fill of each line item in each class of supply). While Services and components may not now be able to convert to the new methodology due to ADP limitations, a requirement exists to explain the calculation methodology when reporting the S-rating. Since the S-rating provides a Macro look at each class of supply for each component, across-Service reporting

APPENDIX III

consistency is not the limiting factor in the utility of the initial S-rating calculation.

- **QUESTION 7. Indicator: Materiel Condition Rate.** According to DOD criteria, materiel condition rates are developed to review maintenance and supply effectiveness and to identify the primary causes of high downtime or excessive support costs. However, they are also used for many other purposes, such as a factor in computing equipment readiness reported in UNITREP, and as a primary indicator in the FRR. Cannibalization and withdrawals from war reserve stocks are alternatives to the supply system and both are frequently used to bring equipment/systems to full or partially mission capable status when the supply system cannot provide spare parts in a timely manner. What percent of the FMC and MC status reported in the fiscal year 1986 FRR was attained because needed parts were either obtained by cannibalizing or withdrawing from war reserves? (p. 42)

ANSWER: DoD cannot provide data to answer this question. Such a statistic would not be useful to OSD or the Service headquarters in policy formulation, budget preparation, or program oversight. Thus, no reporting system collects this statistic. Nor would it, in DoD's view, be cost effective to develop such a reporting capability.

Cannibalization and war reserve removal data are meaningful in two ways -- and DoD has systems that collect and report such data.

First, a customer demand for a replacement component or a repair part that is satisfied by cannibalization or a war reserve removal could be a symptom of inadequate retail stocks. Thus, this information is captured and becomes a part of the supply management data base. If the cannibalization or war reserve removal for a particular item proves to be a recurring event -- rather than merely an aberration due to temporary stock outages -- then this information is used to increase retail stockage levels for that item.

Second, DoD watches very carefully the trends in cannibalization and war reserve removals per weapon system as an indicator of the overall supply support posture being provided. This information is especially important for new systems being phased into the inventory where initial stockage requirements are established using theoretical rates which may require adjustment under operational conditions.

o **QUESTION 8: Indicator: Materiel Condition Rate:** DOD's directive requires the Services to establish equipment/system unique goals for materiel conditions. The goals are to be based on the best possible manpower and logistic support systems' performance during peacetime operations. These goals, and a record of how the Services have performed and how they expect to perform in the future relative to them, are published in the annual FRR. The Services do not, however, always establish their materiel condition goals in accordance with the DoD criteria. For example, the Army's goals are the same for all equipment/system--at the lowest possible percentage that will allow a report of C-1 under JCS UNITREP equipment readiness criteria. The Air Force allows its major commands to establish materiel condition goals taking into consideration differing operating environments and support structures. How can the Congress get a consistant reading of the effectiveness of the supply and maintenance systems and adequacy of the level of funding that is being provided if materiel condition goals are not established in accordance with DoD's criteria? (p. 42)

ANSWER: DoD Instruction 7730.25 states that "military services shall establish quantitative materiel condition goals for their mission-essential systems and equipment. These goals shall be estimates of the maximum that is available with the design characteristics (especially reliability and maintainability) of the equipment, with planned peacetime usage, with full funding and optimal operation of the peacetime manpower and logistic support systems under existing DoD policy." This policy governs the establishment of mission capable goals for the Department of Defense. OSD reviews the FMC/MC goals annually to ensure compliance with DoD policy. Additionally, OSD reviews changes in the Services' reporting system(s) that may have a positive or negative impact on achieved FMC/MC rates.

The Air Force and Navy have specific models that are based on DoD Instruction 7730.25. The Army's goal, which has traditionally used the JCS criteria for determining that a unit is Fully Combat Ready as a basis, has proven to be a consistent, convenient measure. Through the years, it has avoided confusion and has been used as a reliable measure on the myriad of systems that the Army has. It has also proven to be an effective goal for newer systems such as the M-1.

It is unclear why the necessity for Service and weapon system-unique goals might cause some problems in understanding within Congress, as DoD has never received a Congressional inquiry on that issue. In any case, Congress can get a consistent effectiveness reading by focusing on FMC/MC trend lines with respect to programmed goals and associated levels of funding.

APPENDIX III

- **QUESTION 9: Indicator: Depot Maintenance/Ship Overall Backlog.** To increase readiness and sustainability, DoD has established a zero maintenance backlog goal for their depot programs, when feasible. A DoD goal is to eliminate maintenance backlogs. Have the Services quantified the relationship between the size of depot maintenance backlogs and materiel condition rates? If so, what are DoD's plans to provide this information in the FRR? (p. 45)

ANSWER: The materiel condition rates reported for a particular weapon system or other equipment item in the FRR apply only to the inventory of that weapon system or item that is possessed by user units. When a system or item is forwarded to the depot it is no longer possessed by the unit. Therefore, backlog of depot maintenance for weapons systems or other principal end items has no impact on materiel condition rates.

On the other hand, depot maintenance backlogs for weapons systems and principal items could result in degradations to the "equipment on-hand" status of some units. If equipment shortages due to depot maintenance backlogs were severe enough to move a unit's "equipment on hand" status from one C-rating to another, then the readiness impact of depot maintenance backlogs consisting of weapons sytems and/or principal end items would become evident in the UNITREP reporting system.

Materiel condition rates can -- under certain circumstances -- be affected by depot maintenance backlogs of exchangeable components. Whereas weapons' systems and principal end items are issued immediately to a user when a depot overhaul is completed, exchangeable components move from depot maintenance into the wholesale-level supply system where they are stocked until requisitioned. Thus, under normal peacetime operating circumstances, only in those instances where the total inventory of an exchangeable component is insufficient to maintain adequate retail and wholesale stockage levels would a depot maintenance backlog result in a degradation of materiel condition rates.

DoD does not program exchangeable component depot maintenance backlogs for those items with severe inventory deficiencies. Rather, such items get priority treatment by the depot maintenance system so that the materiel condition rates of the weapons systems or principal end items that use these components will not be degraded beyond mission capable constraints otherwise imposed by inadequate supply inventories.

In summary, because of the depot maintenance funding requested for FY 86 -- 95% of requirements -- there is no relationship between the size of the depot maintenance backlog projected for FY 86 and the projected materiel condition rates reported in the FRR. On the other hand, should the fiscal

APPENDIX III

situation in future years require significant depot maintenance backlogs, estimates of the impact on projected materiel condition rates would be provided in the FRR. This would not be a simple task. A detailed by-item plan would first have to be prepared.

- **QUESTION 10: Indicator: Depot Maintenance/Ship Overhaul Backlog.** Depot maintenance backlogs result when valid requirements exceed available funding. GAO has reported that even when sufficient funding is provided, work cannot always be completed as planned and must be carried over. Is depot industrial capacity saturated due to increased workload resulting from increased funding? Are funded backlogs becoming a problem? What are the funded backlog levels expected to be at the end of FY 1985? (p. 45)

ANSWER: Question A: Is depot industrial capacity saturated due to increased workload resulting from increased funding?

At the present time, and for the foreseeable future, DoD capacity is not, and is not expected to be, saturated due to increased workload resulting from increased funding.

Due to the time involved in modifying a contract for depot maintenance by commercial sources, the most readily available source of additional depot maintenance capacity during the period of transition from a peacetime to a wartime situation is within the DoD organic facilities. Thus, by policy, peacetime utilization rates in DoD's maintenance depots are established at a level sufficient to provide an economical operation, yet permit rapid expansion via use of overtime or additional shifts. Current plans call for utilization of between 83% and 96% of one-shift, 5-day per week peacetime capacity, depending on the specific commodity.

Question B: Are funded backlogs becoming a problem?

DoD does not recognize the terminology "funded backlog" when referring to depot maintenance backlog. In that regard, a depot maintenance backlog is an unfinanced depot maintenance requirement that cannot be executed due to the lack of funding; an unfinanced depot maintenance requirement that cannot be executed due to operational commitment of the assets requiring depot maintenance; or an unfinanced depot maintenance requirement that cannot be executed due to systemic constraints

APPENDIX III

such as lack of organic or contractor capacity, facilities, parts, or manpower. If GAO, when using the term "funded backlog", means that portion of the funded program that has not been completed, (i.e.; work in process) then DoD does not view "funded backlog" as a problem. The times required for maintenance actions are of varying lengths, depending on the commodity, and begin at various times of the fiscal year. It would not be possible or practical for all maintenance actions to begin at the start of the fiscal year and finish by the end. At the beginning of fiscal year 1984, a number of maintenance actions funded in FY 1983 were incomplete. In fact, some maintenance actions are even longer than a complete fiscal year; e.g., an 18-month ship overhaul or a 24-month modernization program.

- QUESTION 11: **Indicator: Backlog of Maintenance and Repair.** The number of projects that have not been funded in prior years is considered a symptom of inadequate funding. However, prior GAO and internal DoD reviews have found that reported backlog levels are inaccurate and thus questionable as an indicator of need for increased funding. What actions have the Services taken to improve the validity of the backlog levels contained in the Defense budget? (p. 49)

ANSWER: The size of the backlog of maintenance and repair (BMAR) has proven to be directly proportional to the management emphasis placed on it. With the prospect of better funding, the Services find it worthwhile to spend more time reviewing facility requirements, with a resultant growth in backlog. This represents a more detailed knowledge by our installation level personnel of the condition of our physical plant, but the validity of the backlog as an exhaustive measure of the maintenance requirement remains in question.

Therefore, DoD does not view the backlog as a tool to determine funding levels. History has shown that DoD requires at least a three percent annual real growth in real property maintenance (RPM) funding to prevent further deterioration of facilities: one percent for inventory growth, one percent for aging and one percent for sophistication. Funding below this level has proven insufficient to maintain DoD facilities in a proper state of readiness.

There is a close relationship between the military construction funding level and the RPM funding level. Both must

APPENDIX III

be adequate to maintain our facilities in their present condition. DoD continually evaluates ways of measuring the funding required for excellent installations. The Department currently supports a minimum of three percent real growth to RPM funding and a maximum 50-year renewal of our physical plant through the MILCON program as funding guidelines.

- **QUESTION 12: Indicator: End Strength.** The Services are currently engaged in a massive force modernization effort. Modernization involves the introduction of new equipment and technologies, and places additional demands on personnel skills. Based on current modernization efforts by the Services, has DoD identified its critical skill needs for the years to come? If so, how does DoD plan to obtain these required skills and can they be obtained at a reasonable cost? (p. 54)

ANSWER: The Department and the Services recognize the need for an integrated personnel planning, programming, and management system to ensure that personnel inventories are achievable and based on requirements. To that end, the revised Objective Force methodology was developed. The Services are required to report the personnel inventories that they intend to develop by grade and year of service for the current through the fourth program year along with the by-grade authorizations they are attempting to meet in response to manpower requirements. Beginning next year, the Services also will report at the occupational-field level of detail for the current through the first program year, while they will retain specialty level of detail at the Service. The Services will use the specialty level data to support bonus and skill incentive requests. This approach will highlight problem skills and the costs of achieving the programmed manning level. It will also point clearly to the magnitude and length of any disparity between manpower requirements and inventory to include the time required to reshape the inventory. DoD Directive 1304.20 (December 19, 1984) and DoD Instruction 1300.14 (January 29, 1985) contain details on the revised Objective Force and the reporting system.

- **QUESTION 13: Indicator: End Strength.** What steps are the Services taking to correct current imbalances in technologically sophisticated skill positions? To what extent will current and projected skill imbalances impede the services' efforts to fill existing force structure needs and implement modernization initiatives? (p. 54)

APPENDIX III

ANSWER: Each Service has policies and programs which are used to reshape existing inventories toward changing manpower requirements over time. Using accession, promotion, reenlistment, and reclassification controls, the Services tailor their existing inventories toward future personnel force structures. The revised Objective Force methodology provides the basis for an integrated personnel planning, programming, and management system which can enhance greatly the Services' ability to state the impact of skill imbalances and the time needed to correct the current situation. However, reshaping the career force requires action five to ten years prior to the needed change. If the Navy needs a new ship in 1990, building is not begun on it in 1989. Likewise, the inventory to man that ship cannot be developed by beginning in 1989. Inventories cannot be reshaped over night or over one year. Thus, the impediment to meeting force modernization requirements is the absence of a long-term procurement program which ties manpower and materiel requirements together. DoD cannot eliminate imbalances otherwise; it can only report their magnitude and the time required to correct them.

- **QUESTION 14: Indicator: Accession Rates.** Over the past few years, the Services have improved their accession rates for high school diploma graduates. The Services regard these higher quality accessions as an important element in modernization, technology use and support, and force discipline. As the population of eligible youths declines and DoD's requirement for higher mental category recruits increases, due to the introduction of sophisticated weapon systems, is it reasonable to expect that DoD can continue to attract the quality of recruits needed, at a reasonable cost? (p. 56)

ANSWER: The Services do consider adequate accession quality as a crucial element in continuing to successfully provide for the defense needs of our nation. The significant improvements made in the last five years in the quality of new recruits can be seen from the charts below.

QUALITY INDICATORS OF ACTIVE DUTY
ENLISTED NON-PRIOR SERVICE ACCESSIONS

	HIGH SCHOOL DIPLOMA GRADUATES AS A PERCENTAGE OF TOTAL NPS					AFQT CATEGORIES I THRU III AS A PERCENTAGE OF TOTAL NPS				
SERVICE	FY80	FY81	FY82	FY83	FY84	FY80	FY81	FY82	FY83	FY84
ARMY	54	80	86	88	91	50	69	81	88	90
NAVY	75	76	79	91	93	82	88	89	92	92
MARINE CORPS	78	80	85	92	95	73	87	91	94	96
AIR FORCE	83	88	94	98	99	91	93	94	98	99
TOTAL DOD	68	81	86	91	93	69	82	87	92	93

APPENDIX III

Last year, the Senate Armed Services Committee (SASC) directed that a study be conducted to determine the enlisted accession quality requirements for the next five years. The Services have submitted their reports on future manpower quality requirements and the OSD staff currently is evaluating their inputs and preparing a detailed report to Congress. It is too soon to attempt to draw any specific conclusions on this important subject. Generally speaking, however, the Services did their very best with the time they had, but the overall effort suffered because of the lack of a validated methodology to determine accurately the costs and benefits associated with incremental increases in quality. Furthermore, until DoD concludes its research to link job performance with enlistment standards, absolute quality requirements cannot be defined with any precision. What is known is that recruit quality should not be allowed to deteriorate to the levels experienced by the Army in the late 1970s (i.e., 40-50 percent non-high-school graduates and 40-50 percent AFQT Category IVs). On the other hand, DoD would be ill-advised to construct a military capability that requires a minimum recruit quality level that is higher than the qualified population from which it draws, e.g., 75 percent high-school graduates and 70 percent AFQT Categories I-III (average range and above). DoD should, however, continue to recruit the highest quality it can, given market conditions and allocated recruiting resources, in order to take advantage of the substantial benefits of higher quality recruits. Will the Services be able to achieve adequate accession quality in the coming years? Some manpower observers have suggested that the declining population of age-eligible youth will put extreme pressure on the Department's ability to recruit. It is the Department's view, however, that the effect will be much less severe, and that the population decline will not significantly reduce the Services' ability to recruit volunteers. Continued success in recruiting will hinge on remaining committed to fair and competitive compensation and adequate recruiting resources. This is necessary and can be achieved at a reasonable cost.

- **QUESTION 15: Indicator: C-rating.** Personnel C-ratings are designed to provide a measure of the personnel on hand against the applicable requirement. However, only limited personnel data is included, and methods and data used vary among the Services. Since C-ratings are unit specific indicators and aggregate personnel data provided in the FRR are force level indicators, how can the two be used in conjunction with each other to provide a more comprehensive picture of personnel readiness? (p. 59)

APPENDIX III

ANSWER: Vol III of the Force readiness Report, the Defense Manpower Requirements Report (DMRR), contains two major types of data useful in assessing and managing personnel readiness.

The first type is manpower program data. These data are presented at the Defense Planning and Programming Category level of detail by Service and Component. This information provides the basic manpower program structure. It shows how the Services have allocated manpower to their force structures in the past, and how they intend to do it in the Execution and Budget Year. This information is key to determining compliance with Defense Guidance to program manning at a minimum of 90% of programmed structure at the Service level. It also allows for an assessment of any shifts in structure or manning from one category to another. For example, have "support" activities increased at the expense of "tactical/mobility" forces. Imbalances in Service manpower programs or non-compliance with Defense Guidance could be indicators of problems that could lead to personnel readiness shortcomings.

The second major type of data in the DMMR indicates how well the Service personnel systems are functioning. These data include skill imbalances, experience, accessions and retention. Although these data are at the component level of detail for each Service, they do provide indications of problems if they are outside of acceptable limits or have trends which continue to move in the wrong direction. If this should occur, then management attention can be directed at the problem area.

The C-ratings of units covered by the UNITREP system should be viewed as an output of both Service manpower programs contained in the DMRR and Service personnel systems. If Service force structures are balanced, Defense Guidance is being followed, and indicators such as skill imbalances are within acceptable limits, then C-ratings should be at the appropriate levels also. If, in spite of acceptable data in the DMRR, C-ratings continue to be unsatisfactory for certain types of units, then management attention can be focused on these units to identify and correct the problem.

- **QUESTION 16: Indicator: Training Load/Graduates.** The quality of people entering the Services has improved significantly since 1980. This is evidenced by the higher mental category of recruits, along with increased numbers of high school graduates. What percentage of change in individual training attrition rates occurred as a result of better qualified personnel entering the Services? (p. 63)

APPENDIX III

ANSWER: Individuals entering the military service upon an initial enlistment receive recruit training which introduces them to military life. Following this introductory training, most enlistees are given initial skill training which prepares them for their first duty assignment. Some individuals may fail to complete their training for medical reasons, inability to absorb the instruction, lack of motivation, disciplinary problems or a variety of administrative causes such as discharge for fraudulent enlistment or family hardship.

During the fiscal years 1980 through 1983, the average DoD attrition rate for recruit training remained relatively stable, ranging from 7.4% for the FY 1980 accession cohort to 8.5% for the 1983 cohort. Attrition rates for initial skill training show a downward trend in each of the Services. In the Army attrition rates declined from 13% in FY 1980 to 6.4% in FY 1984. The Navy and Marine Corps dropped from 17.2% to 11.1% and 8.7% to 5.4% respectively. In the Air Force, the rate declined from 10.3% to 4.8%.

Recent studies which relate personnel characteristics and first term attrition behavior continue to verify the positive correlation between high school graduation status and training/first term success. Likewise, individuals in higher mental categories attrit at lower rates than individuals in lower categories. The extent to which the above cited changes in attrition rates are directly attributable to these factors, however, is not known, given the variety of other factors which also can affect attrition. Among these are policy changes which are designed to improve the motivation of students to complete training and management initiatives to improve the quality of effectiveness of instruction. Specific examples of such initiatives include making bonuses and promotion contingent on graduation, improved screening for entry to technical specialties, increasing standards of school performance, raising the quality of instructors, and using better instructional methods.

- **QUESTION 17**: **Indicator: Training Load/Graduates**. Has the number of higher quality recruits kept pace with the growth in critical skill requirements? If yes, what are the priorities for retaining these people in the career force as the private economy competes for their military acquired technical skills? If not, what effect has this has or will this have on overall force capability? (p.63)

APPENDIX III

ANSWER: In general, the number of quality recruits has kept pace with the growth in critical skill requirements. DoD employs a variety of programs that have proven effective in retaining people in critical skills. The Military Departments use each program to the fullest extent of its effectiveness as situations dictate.

Management actions taken to improve retention include: varying promotional opportunities for certain enlisted grades to enhance the promotion of members in critical skills, allowing eligible members to retrain or reclassify into critical skills, and making improvements to the quality of life for military members and their families. The Department also relies heavily on the use of the Selective Reenlistment Bonus as the primary monetary incentive to retain members in critical shortage skills. Priorities for application of those incentives are based on a number of factors, notably the importance to the force of the skills in question and the dimension of the projected shortage in each skill.

If the personnel inventory of experienced noncommissioned officers were not to keep pace with requirements, it is reasonable to expect that this condition would contribute to a lower overall force capability.

- **QUESTION 18: Indicator: Training Load/Graduates.** What are the unconstrained individual training requirements? How do the constrained figures match with total needs, and what is the immediate effect of individual training shortfalls on total force readiness? How many units are reporting less than C-1 for training in JCS UNITREP because adequate numbers of graduates are not available to support total requirements? (p. 63)

ANSWER: With few exceptions, the Services train the number of individuals needed to fill the projected job vacancies in each skill in the force structure. Consequently, the individual training program provided to Congress in the annual Military Manpower Training Report (Volume IV of the Force Readiness Report) approximates the "unconstrained individual training requirement."

All military personnel receive individual training of some type before joining operational units. First, all enlistees receive recruit training. All but a few then receive school training in an entry-level skill before assignment to the field or fleet; the exceptions are mostly people with civilian-acquired

APPENDIX III

skills. Occasionally, skill training cannot be provided because of a shortage of training capacity, but this is fairly rare and is usually corrected expeditiously, sometimes by augmenting in-house schools with contract instruction. In general, the number of people trained equals, or comes very close to equaling, the total needs. Consequently, individual training is not constrained in a significant way with respect to numbers of people trained in required skills.

It is true that only part of the tasks an individual will probably need for full performance of a job in the field or fleet are taught in individual training courses. The Services use Instructional Systems Development (ISD) procedures to determine which tasks are best taught in school and which can be performed through on-the-job training. Initial skill training produces apprentices who can perform some work while they learn on the job, not journeymen who are fully qualified. Since producing apprentices is normal practice, it does not normally have an immediate effect on readiness levels. Skill progression training, either in school or on-the-job, is provided to insure higher skill level technical competence. If training in specific skills is below standard, mechanisms exist for the field to report deficiencies to the school system and get them corrected.

As GAO notes in the discussion on p. 89 of the draft report, C-ratings for training are based on the status of collective unit training rather than on the availability of school-trained individuals in the unit. A shortage of school-trained personnel would be reported through personnel channels for correction and might, if it were large enough, cause a lower C-rating in personnel. In general, training C-rating would not be affected unless the shortage of trained people prevented proper execution of the prescribed collective unit training program.

o **QUESTION 19: Indicator: Collective Unit Training.** Programs such as flying hours that are critically dependent upon logistical support, must be closely coordinated to ensure all essential support is on hand in the needed quantities at the time needed. How do the Services ensure that flying hour budgets are thoroughly coordinated with support functions, such as personnel, spare parts, and maintenance? Has DoD established procedures to provide an oversight capability? (p. 68)

ANSWER: Computed costs per flying hour include costs for POL, maintenance, repair parts and other supporting functions. The flying hours in a budget are not created in isolation; they are built up during the programming phase along with the required

APPENDIX III

supporting resources. Budget submissions from subordinate Service commands include both flying hours and the various resources required to support them. These requests are reviewed and adjusted at each level, including the Service headquarters. In the final Service budget submission, there should be no disconnect between flying hours and supporting resources. The Services have a strong incentive to present flying-hour programs that can be executed.

CSD reviews Service five-year programs each summer and Service budget submissions each fall, and proposes appropriate adjustments for decision by the SecDef. One major purpose of these reviews is to insure consistency between activities proposed in the budget and resources required to support them. Flying-hour programs are one principal activity subjected to these two annual reviews. These two reviews, following multiple reviews within the Services, constitute a sound system for developing flying-hour programs that are properly supported. Errors have occurred from time-to-time, but the system of program and budget development and review normally eliminates errors before the budget is submitted to the Congress.

- **QUESTION 20: Indicator: Collective Unit Training.** The purpose of flying at predetermined levels is to maintain combat readiness. The Navy's goal for peacetime primary mission readiness is to train aircrews to 88 percent of standards, including 2 percent simulator time. The Air Force has established three levels of pilot proficiency for tactical units. To assure that proper combat readiness is achieved with mission resource expenditures, the Services should continually evaluate and test the validity of events and standards contained in aircrew training manuals. To what extent has this been accomplished and what are the results? (p. 68)

ANSWER: Events and standards in aircrew training manuals are experientially developed. Using the experience gained from thousands of combat and simulated combat hours and sorties, training developers, working with highly experienced aircrew members, systematically develop aircrew training programs which reflect the training required to perform specific mission tasks.

In addition, each Service has units tasked specifically to determine new capabilities developed by potentially hostile countries. This information is provided to the elements within each command responsible for tactics, weapon development and evaluation.

APPENDIX III

When a new tactic or weapon to counter an existing threat has been developed and tested, that new tactic or weapon is passed on to command aircrew training personnel. The training personnel, highly experienced in a specific weapon system and supported by in-house or contract training specialists, then determine how to train aircrew members in the most effective use of the new tactic or weapon. Events and standards in aircrew training manuals are then updated.

Development and refinement of the new training is part of an iterative process. Unit instructors and aircrews use a well-established feedback loop to make suggestions to improve the training. These suggestions are evaluated for effectiveness and, if approved, incorporated into aircrew training manuals.

Evaluation of how well the aircrews can perform mission tasks is carried out via inflight evaluation, which includes how well tactics were performed and accuracy of weapon delivery. Simulators are used to evaluate how well the aircrew can perform actions which are dangerous or impossible to perform in flight. Exercises such as RED FLAG evaluate aircrews for combat effectiveness in conditions very similar to actual combat.

The units responsible for aircrew evaluation monitor the trends in their evaluation data and make recommendations to the training developers if they discover an area of weakness. The trainers then determine if the weakness could most effectively be addressed by additional ground or inflight training and incorporate the new requirements in the appropriate training manual.

- **QUESTION 21: Indicator: Collective Unit Training.** Training ranges are areas where combat units/aircrews can safely practice live fire combat maneuvers and tactics. They also enhance training by providing targets and threats resembling the postulated combat environment. The ranges also provide areas and facilities the Services need to develop and analyze warfare tactics and command and control procedures. Some ranges are large enough to provide for operational testing and large-scale exercises.

  What initiatives do the Services currently have on-going or recently completed to develop the management information necessary to properly evaluate this type of training? (p. 69)

APPENDIX III

ANSWER: The question can be addressed from two aspects: (1) what is being done to manage range improvements; and (2) what is being done to improve evaluation of unit performance on ranges?

As examples of systems for managing range improvements, the Army and Air Force have long-term range improvement plans which can be updated systematically to accommodate new weapons and to take advantage of recently available technology for range instrumentation, targets, threat emitters, and other developments. On the DoD level, the recently established Defense Training Data and Analysis Center is beginning a long-term project to develop a centralized range data base capable of providing a descriptive inventory of ranges and training areas together with capacities, limitations, costs and utilization rates.

A number of examples of improvements in systems to evaluate unit performance on ranges can be cited, especially certain automated ranges now coming into use. The Navy is developing a training area for air combat tactics at NAS Fallon, Nevada, which will have similar capabilities to the Air Force's Red Flag facilities at Nellis AFB. Both of these facilities will have increasing ability to capture all air-to-air activity for the evaluation of crew and unit performance and the development of lessons learned.

The Army has designed Multipurpose Range Complexes (MPRCs) for live-fire training of individual tank and fighting vehicle crews, platoons, and combined-crews teams. These ranges, which will replace a multiplicity of conventional range types, will allow automated scoring of hits and rounds fired. This capability will give commanders an immediate read-out of results and a firm basis for planning future training. The Army is now constructing the first three MPRCs. The Army plans to construct 15 MPRCs in all, and the Marine Corps plans to build two.

(390023)

For sale by:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Telephone (202) 783-3238

Members of Congress; heads of Federal, State, and local government agencies; members of the press; and libraries can obtain GAO documents from:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760

Telephone (202) 275-6241