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**READY FOR WAR BUT NOT FOR PEACE: THE  
APPARENT PARADOX OF MILITARY PREPAREDNESS**

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**INTRODUCTION: THE CURRENT PARADOX OF READINESS**

The purpose of a military organization is to enable the nation's political leadership to apply or, when useful as a negotiation strategy, threaten to apply force in the pursuit of national security objectives.<sup>1</sup> The U.S. experience since the end of the Cold War is clear on one thing: A great nation with worldwide strategic, political, and economic relations cannot avoid situations in which challenges to its interests require the application of force. A strong—and ready—military capability has proven essential for providing national leadership a wide range of options for supporting national objectives.

There is no discernible political disagreement on this fundamental starting point for a discussion of readiness. Whatever problems may occur relating to readiness—and real and serious problems exist in the current environment—it seems safe to state that they are not primarily political. Most of the polity supports the notion of a ready military (although this means different things to different people), and the only exceptions are a minority of isolationists in both major political parties. But in periods of prolonged peace without a clear

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and immediate threat, there will always be a discussion of exactly how ready the U.S. military needs to be and how much the American people should be willing to pay for that readiness. Therein lies the seed corn of readiness problems: Readiness is a very worthy goal, but does it really have to be at such a high level at all times?

In the post–Cold War era, the United States has fielded capabilities designed to respond to the outbreak of two geographically separated major theater wars (MTWs), each of a magnitude roughly comparable to Operation Desert Storm, which led to the liberation of Kuwait in 1991 after Iraq’s invasion. These basic planning scenarios have been in place since the first Bush administration, with some important changes in assumptions about their relative timing, the military capabilities and strategies enemy forces may be able to bring to the fight, and the strategies the United States would employ. These changes have helped bring about reductions in force structure (the number of units fielded), which have been accompanied by cutbacks in personnel, equipment, and training.

At the same time, the nation became embroiled in various contingencies, found it difficult to say no when called upon, and found it even harder to extract itself from the seemingly never-ending commitments that often resulted. The military now has to operate in a new era of peacetime preparation for major wars *and* continuous engagement in various smaller operations. In this era of “Boiling Peace,” a new set of pressures on the military emerged. One writer on military affairs (Peters, 1999) expressed the pressure as follows: “The mathematics of readiness have altered radically, but we have not deciphered the new formula. The deployment of a reinforced brigade cripples multiple corps.” One side of the new equation was that it was no longer sufficient to plan only for MTWs; it was also necessary to plan for many types of operations, some of very long duration.

But the new equation turned out to be an inequality instead, and its other side was that budget resources were not sufficient to pay for both activities. The United States could fight and win the major wars, but it had trouble *preparing* for the big ones *while* executing a variety of small operations. In the mathematical terms of set theory, the set of small contingencies was no longer contained inside the set of larger ones; they were complementary or additive. The military thus executed a combined peacetime mission: training for major war and simultaneously performing peacekeeping and peace enforcement in

multiple locations around the world for extended periods. This would imply new resource requirements, more force structure in certain areas, and a set of new management challenges within the services, in the Office of the Secretary of Defense (OSD), and in Congress. Yet the resources were not available, and the nation was slow to tackle the management challenges.<sup>2</sup>

There is broad agreement that readiness has been declining over the last several years and that the cause is a mismatch between resources and new taskings, as suggested above. But this is only the beginning of a complex and subtle story. Readiness is not a simple concept that can be measured by some index that is reported day by day.<sup>3</sup> Some of what is at the heart of readiness *cannot* be adequately quantified, although it can be assessed in various qualitative ways. Also, readiness has many dimensions, and a central difficulty is that all these dimensions interact and change over time.

Since readiness is at the very heart of military activities in preparing to support national security objectives, the difficulty of expressing and measuring the readiness of the armed services objectively has been a source of unceasing frustration for all involved. Over the last few years, the desire to define and build appropriate readiness assessment and management systems has grown significantly inside and outside the military services. The concern over how to allocate very scarce resources is only one of the reasons. At the heart of the issue lies the problem of determining when readiness has sunk below an acceptable standard, and there is increasing suspicion that much of the U.S. military recently crossed that threshold.

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<sup>2</sup>At the time of writing, the DoD was engaged in a top-to-bottom review of the national military strategy under Secretary of Defense Donald Rumsfeld. The outcome of the review was not yet clear.

<sup>3</sup>There have been calls for a readiness index that would measure short-term changes in the status of the force, a “Dow Jones for readiness.” Apparently, there is a belief that such an index would represent a more objective statement than current readiness reporting. Technically, it would of course be feasible to compute an index for readiness. All that is required is to select a suitable number of quantifiable indicators and assign them appropriate weights in a monthly or quarterly index. However, that does not remove the subjectivity. The Dow Jones is likewise not an objective number but a subjective selection of stock prices; the daily weights and prices reflect the subjective evaluations of buyers and sellers in the stock market. The same would have to be true for an index of readiness—it cannot be “objective.”

Surprisingly, assessments of whether the four services would be capable of fulfilling the objectives of the commanders in chief (CINCs) in the two MTW scenarios have not indicated significant shortfalls. That is, readiness, as DoD defines it, has not fallen so much that the service secretaries and the Joint Chiefs of Staff have had to inform the President and the Secretary of Defense that it is no longer possible to execute the war plans. Yet, as suggested above, there are still significant readiness problems around the force. Thus, the DoD is conveying a mixed message: Yes, we are prepared and capable of fighting the nation's wars; still, we have readiness problems.

A very important task for this chapter is to explain why this seeming paradox still conveys a coherent message: How can there be readiness problems when the armed forces are prepared to meet the objectives of the war plans? Recent RAND research indicates that there are significant readiness problems in several areas—which implies that we need a better definition for the term *readiness* and precise explanations of how and why readiness problems are currently manifesting themselves. Such diagnoses then permit discussion of what is to be done about the problems. This chapter begins by explaining how current operational readiness assessments are made, then discusses why this notion of readiness is too limited. We then describe why focusing on operational readiness is actually misleading because it misses how military leaders react to budget cuts, and it misses why the result has been a severe mismatch between requirements and resources in some major areas. The chapter concludes with a discussion of why this mismatch persists and of how the remedy lies in setting better operational and functional standards.

A word of caution is appropriate. We have focused much of our readiness-related research on Air Force readiness within RAND's Project AIR FORCE. Many of the specific examples of readiness issues in this chapter thus have an Air Force flavor. However, we believe that the themes in this chapter are common to all the military services, with specific manifestations that reflect differences in service roles and organizations. This belief has been borne out in many discussions with personnel from all the services. The intention of this chapter is to highlight certain very difficult, general themes in managing readiness, not to criticize one service unduly for causing prob-

lems that could have been avoided. Readiness may be a simple concept, but remains difficult to manage in practice. Problems are bound to emerge, and diagnosing them can help the DoD identify better management tools.

### **OPERATIONAL READINESS AND HOW IT IS CURRENTLY ASSESSED**

Traditionally, readiness measures the ability to go to war and carry out certain assignments in a timely manner. The standard DoD definition of readiness is as follows:

The ability of US military forces to fight and meet the demands of the national military strategy. Readiness is the synthesis of two distinct but interrelated levels: a. unit readiness—The ability to provide capabilities required by the combatant commanders to execute their assigned missions. This is derived from the ability of each unit to deliver the outputs for which it was designed. b. joint readiness—The combatant commander's ability to integrate and synchronize ready combat and support forces to execute his or her assigned missions. (DoD, 2001, p. 360.)

The requirements are set by combatant commanders who expect certain standards of performance so that their assigned missions can be met. Readiness is then an estimate of whether those who are to perform relevant tasks are capable of successfully completing them.

Since warfighting tasks exist at different echelons of responsibility, readiness metrics and assessments must also apply at different levels (see, for example Betts, 1995, Ch. 1). The nation may be ready to meet any military challenge even if one of the military services is less than ready, and each service may be ready to fulfill its roles in any one immediate operation even if some of its units or capabilities are not ready to carry out assignments in other operations. This discussion is limited to the question of how to assess the readiness status of a particular military service and does not address whether the war plans for a particular region are sufficient to defeat an aggressor and whether the military services jointly can carry out both planned and currently unforeseen contingencies. Clearly, readiness at the national or joint level is not simply additive; the services bring both synergistic and overlapping capabilities to the fight.

Nevertheless, it is necessary to begin with separate assessments of each service, because these will have profound implications for the national and joint assessments. The services base their readiness assessments on reports from their units that are identified in existing war plans.<sup>4</sup> For Army and Marine Corps land forces, these are battalions; for sea borne Navy and Marine units, they are ships; and for naval aviation and most of the Air Force, they are squadrons. The answers to two basic questions help determine the readiness status of units.

The first question is: When is the unit required to be ready? In deliberate war plans, units are ordered into a deployment schedule called Time Phased Force Deployment List (TPFDL). The TPFDL gives the planned mobilization day for when a unit is to be ready to deploy to a particular theater, that is, it sets a specific time at which the unit must be available for deployment. Thus, the unit has to be ready when the plans require it to be prepared to deploy to a theater of operations. For example, some Army units must be ready to go immediately after a deployment decision has been made, but many reinforcing and support units may not be required for several weeks or months after the initial combat units have deployed. The Army therefore organizes its units into a readiness hierarchy, with the units in the XVIII Airborne Corps at the top, through the remainder of the active units, and into the combat and support units in the Guard and Reserve. The Navy keeps all deployed units at peak readiness, but generally has a cycle of approximately 18 months with six months each in maintenance, preparation and training, and then deployment. The Marine Corps strives to keep all units ready for deployment on short notice, but keeps some at heightened alert and allows others a period of somewhat lower readiness during periods of recuperation after deployments. The Air Force keeps all combat squadrons and combat support assets at sufficiently high readiness to deploy them very early in any contingency.

The second question is: What is the unit supposed to be able to do when called on by a theater commander? Each unit has a written mission statement that specifies the capabilities it is supposed to

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<sup>4</sup>Many units in the services perform support roles and are not in the war plans, so they do not report their readiness status.

bring to the fight. The amount of discretion left to the unit commander in designing a training schedule differs between the services, as does the specificity of the mission assignment. Since the ground services may face very different conditions on various deployments, their mission statements usually enumerate more very-specific tasks and capabilities than a unit ever could become proficient at in peacetime. On the other hand, an Air Force statement typically gives a very general mission (provide precision strike, conduct air superiority missions, transport required materiel, etc.) while also being very specific about how many pilots within the unit must have certain special qualifications. Suffice it to say that the written mission statements for all units are designed to leave considerable leeway for unit commanders (and the major service commands that provide them resources) to manage their own training schedules given the resources available to them.

The combination of planned wartime deployment schedules (the “when”) and unit mission statements (the “what”) is the basis of the current standard readiness reporting system, the Status of Resources and Training System (SORTS). Each unit prepares a monthly report that is a snapshot of the status and availability of equipment, personnel, and training. Using this snapshot and his own personal assessment, the unit commander assigns a “C” rating to the unit, a summary measure that states whether a unit has all the resources required to go to war. All flying units in the Air Force are programmed to be C-1—that is, they are assigned resources in personnel, equipment, and training funds to reach at least 90 percent of wartime requirements. If a unit falls below 90 percent for any one resource—personnel, equipment, or training—the commander rates the unit as less than C-1 (for example, a C-2 rating indicates that a resource is between 80 and 90 percent) until the shortfalls have been corrected. But it is possible for a unit to have all the resources available to it—all the equipment, all the personnel, and all training may be current—and still receive a rating lower than C-1.<sup>5</sup> While this

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<sup>5</sup>An additional complexity is that not all units are supposed to be C-1 at all times. The Marine Corps and the Air Force resource all their units at C-1 status because they are expected to deploy on very short notice. The Army designates certain units as first-to-go and resources them at C-1, but later-deploying units, especially support units, may be resourced at C-2, C-3, or in some exceptional cases as low as C-4 and would still be expected to deploy. SORTS reports are based on whatever resources a unit is assigned,

could be because the commander knows of some specific shortfall that may be upcoming (aircraft going into depot, foreseen personnel rotations, training plans that cannot be executed), it is also his or her prerogative to make the ultimate judgment of whether the unit is ready. In principle, a commander could have all the resources required and still state that the unit is not ready to go to war. This is highly unlikely, but the system allows for it to happen.

Many of the questions concerning the use of SORTS as a readiness assessment system lie beyond our present purposes. Suffice it to note that SORTS is a standard input into an overall DoD readiness assessment system, the Joint Monthly Readiness Review (JMRR), which the Joint Staff, OSD, and the four military services execute together. JMRR is a procedure for determining whether the current war plans can be carried out. This review looks at all the units in the deployment schedules for each war scenario and checks whether the units are reporting a sufficient readiness status in SORTS to be available to fight the war. The assessment looks at each of the warfighting scenarios separately. It also examines them sequentially because some units are designated to “swing,” that is, deploy to the first major war and, then, after a suitable period, have to be free to join the fight in the second. Note that this high-level readiness assessment is an attempt at reconciling a warfighting CINC’s demand for forces with the supply of forces the military services can provide. However, the assessment does not actually fight the war under different assumptions about enemy capabilities and tactics; this operational analysis is the responsibility of each theater commander. All JMRR really does is determine whether deployable units report their readiness status as deployable. If they do, the CINC is assumed to be able to win the fight; if they do not, the affected service has to explain why the units are not reporting as ready, what remedial actions are being taken, and when restoration will be complete.

It is worth emphasizing how MTW-centric current operational readiness assessments are. In spite of the fact that the military services have become increasingly engaged in smaller-scale contingencies, readiness is still measured against the major wars in the Defense Planning Guidance. The reason is that there are no deliberate war

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which in most cases—even for units designated to stay at C-1—is less than 100 percent of the resources required for high C-1 status.

plans for anything but two MTWs. A decision to alter the planning guidance to base force structures and operating budgets on new strategic concepts, including a steady-state level of smaller-scale contingencies, would undoubtedly affect the processes for assessing operational readiness. But the substance is likely to be very similar: Readiness will only be measured against deliberate plans not against the unforeseeable contingencies for which war plans have not been developed or analyzed.

The following sections discuss how the military services base their programming for readiness-related activities on a separate set of criteria altogether. Under Title 10 of the United States Code, the services are responsible for manning, equipping, and training their forces. This will raise issues that, of necessity, go beyond immediate operational warfighting assessments.

## **TOWARD A MORE-ENCOMPASSING NOTION OF READINESS**

At present, at least two of the military services (the Air Force and the Army) face the seeming paradox mentioned in the introduction: Using the above approach to readiness (i.e., JMRR based on TPFDLs and SORTS), they report that they are able to carry out their assigned wartime tasks—yet they repeatedly state in public speeches and congressional testimony that they have significant readiness problems. Thus, there must be more to readiness assessments than simply whether warfighting tasks can be executed satisfactorily. The implication is unavoidable: Current readiness assessments do not include all service responsibilities that should be considered part of readiness.

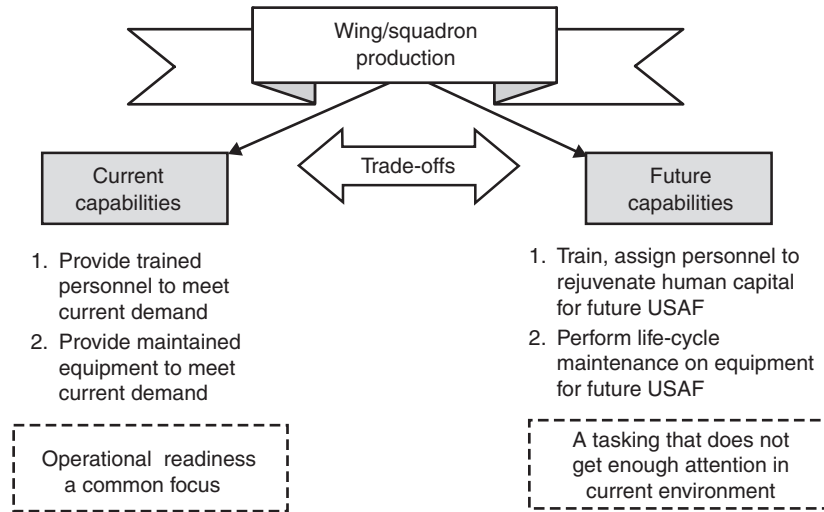
Recent RAND research for the Air Force has focused on this particular question in considerable detail (see Dahlman and Thaler, 2000). Fundamentally, *readiness is the relationship between the tasks assigned to a unit and its ability to perform those tasks*; this is the heart of SORTS. The idea is then that units are assigned tasks and the resources to perform them to certain standards. Readiness is achieved when the resources—equipment, personnel, supporting processes, and funding—are sufficient for the unit to produce to the standards. If there is more to readiness than producing operational

capabilities for a warfighting CINC, one must look at the tasks assigned to units and ask what more they are supposed to do. Figure 12.1 conceptually represents two tasks that *in practice* are expected of all military units: maintaining operational readiness *and rejuvenating the human and physical capital of the force*.

The left side of the figure represents the traditional focus of readiness assessments, as just discussed. The right side represents the other essential function of unit activities: ensuring the continuous recreation of the necessary knowledge and tools to produce and execute military operations. All organizations—commercial or governmental, service or goods producing—perform these two functions. That is, they produce some current output and simultaneously train their people and maintain their equipment to sustain the organization over time. These tasks are linked temporally: Today's rejuvenation efforts affect tomorrow's levels of production and output. What sets military organizations apart is that they are characterized by an extraordinarily high rate of flow-through of personnel. Military careers are short, averaging five to six years in the enlisted force and ten to eleven in the officer corps, and assignments to various duties are much shorter still. By design, this demands a level of on-the-job training (OJT) that simply has no parallel in the private sector or in other governmental institutions. Because this is such an integral element of military activities, it tends to be taken as a given, a cost of doing business. It therefore receives less attention to it than it deserves.

Continuous OJT is a unit task separate from producing current warfighting capabilities. Assume, for a moment, that the personnel flow-through were suddenly to stop. If all currently assigned personnel were to stay for a very long time in their current jobs, experience would allow them to perform their individual tasks at a peak level of proficiency. Since very few junior personnel would be needed to replenish the work force, continuous OJT would not be required. The unit could then focus on its ability to deliver the warfighting capability for which it was designed. Now, let the personnel flow-through restart. There is rapid turnover, with experienced personnel vacating their jobs and junior personnel entering the unit to take the place of departing people. OJT then becomes critical to passing the knowledge of senior personnel to the junior personnel who would replace them.

RANDMR1314-12.1



**Figure 12.1—Unit-Level Readiness Related Taskings and Outputs**

This task, in essence, is “relay training.” Over time, the military services have all established their own professional expertise in their particular branches of warfighting. The only way an organization can preserve this knowledge—the baton, to use the relay parallel—is to ensure that it is handed over from one generation to the next, in a continuous training cycle that lasts the entire professional career of every member of the military. In the Air Force, the knowledge of how to conduct successful air and space operations must be recreated every moment—by assigning units the responsibility for OJT in many occupations, combined with formal training outside of units, as appropriate and necessary. Thus, in flying units, senior pilots teach junior pilots how to become effective warfighters and train their own successors as flight leaders and instructor pilots. The same is true in aircraft maintenance: Senior maintenance personnel spend a great deal of time teaching young enlisted airmen to become qualified maintainers and—just like pilots—train their own successors as senior enlisted managers and trainers. This is the essence of relay training and is an element of all military units that is just as critical as the task of producing warfighting capabilities.

Life-cycle maintenance of equipment and facilities is also a key activity that helps to sustain a capable force over the long term. Outside observers often think of maintenance in terms of generating sorties and repairing broken parts to support only current operations. However, just as changing the oil in a car helps ensure its engine hums smoothly both now and over time, regular maintenance actions also enhance the long-term health of aircraft and tanks. In addition, a great deal of effort goes into the inspection and refurbishment of major items of equipment and their components. A large portion of these activities takes place in central depots, but operational units complete a significant amount. A number of technicians in Air Force squadrons are dedicated to life-cycle maintenance, sometimes drawing maintainers from the flight line or the backshops when necessary.

The tasks of teaching personnel how to perform all their individual assignments and of conducting life-cycle maintenance of equipment, then, must be accomplished *in addition* to maintaining current operational readiness. This view of readiness is more comprehensive than the traditional view because it better represents the day-to-day activities of military units. As noted, this is exactly the environment of military units, by design.<sup>6</sup>

Thus, a more complete assessment of the readiness of military units must focus on two separate tasks:

- the production of operational capabilities
- the continuous rejuvenation and upgrade of human and physical capital—the expertise and the tools required to deliver operational capabilities.

We have concluded that current readiness problems are primarily associated with the recreation of human capital. This is the key to

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<sup>6</sup>There are exceptions, of course. For example, Air National Guard fighter units have a high complement of former active duty pilots with high levels of experience, and they tend to stay with their units for a very long time. Thus, these units are able to attain very high levels of operational capabilities and readiness status with far fewer flying hours than comparable active duty units. Much of their training is concentrated on continuation, i.e., the maintenance of high skills, as opposed to an active unit, which must pay much more attention to both continuation and upgrade training, i.e., the acquisition of higher-level skills, to create pilots capable of replacing skills lost when senior pilots rotate out of the unit and/or leave the service.

understanding why it is perfectly legitimate to have serious readiness problems despite being prepared to handle ongoing and contemplated warfighting contingencies. There is, of course, a fundamental relationship between the two elements of readiness. If the DoD does not pay sufficient attention to the need to recreate the human capital lost through rapid personnel turnover, there will be a potentially severe effect on operational capabilities of the future.

As previously noted, inadequate funding for some support items, such as maintenance and parts, can be compensated for by adjusting working hours. It is common to cover for such deficiencies through extra work, and in the absence of definitive standards for maintainers' working hours, the net result is considerable unpaid overtime. This interplay between management of material and human resources affects the readiness status of both—and affects the ability of a unit to meet all its taskings.

### **THE GREAT MISCONCEPTION ABOUT READINESS**

JMRR is an elaborate system for making assessments regarding operational capabilities based on the monthly SORTS reports from units. However, senior service leadership lacks a comparable system for monitoring the continuous rejuvenation of human and physical capital that would allow them to intervene when necessary. Why is this? Why are so many expert observers convinced that the single most important question to ask about readiness is whether or not the services can execute current war plans?

We suggested above that this view of readiness is incomplete, but it is, in fact, misleading. The probable reason OSD, Congress, and the wider public tend to focus on operational readiness is that they believe this most demanding of all requirements will be the first to show the symptoms if readiness problems begin to emerge. If people cannot train enough, if their equipment is not of the highest standard, if too few personnel have been assigned, if supporting processes in maintenance and supply fall short, will not the immediate and most obvious effect be a reduction in the finely honed tools of war? This seems such a natural inference that one seldom stops to question it. *But it is false.* Indeed, readiness would be much simpler to monitor and manage if the highest warfighting skills were the first to indicate readiness problems. They are easier to track and measure,

and the DoD would have an easier time avoiding unreadiness than it does in reality.

The reason one cannot expect to see operational readiness decline first lies in how the military services, by long tradition and deeply embedded culture, react to pervasive problems that gradually may affect their ability to go to war. If a unit commander has to choose between sacrificing the unit's operational status and slowing down and postponing the continuation and upgrade training of his personnel, he or she is conditioned by experience and collective military values to give the highest priority to the operational status of the unit. In fact, his superiors would probably redress him severely if he even tried to reverse those well-established priorities. The first priority of any military organization is to ensure that it is prepared to carry out any urgent operational tasks assigned. Almost everything will yield to this principle. Therefore, when taskings grow and budgets do not follow suit, units come under pressure. To protect their warfighting capabilities, they do not have much choice because they control very little in their environment. Equipment, personnel, facilities, support budgets, materiel, etc.—all the critical inputs they need to perform their duties—are handed to them and cannot easily be augmented. The only resource they typically can control is the working hours of unit members. So when asked to produce more with less, units turn to their personnel and ask for a more-intense work effort. They can do nothing else.

The result is that the entire chain of command, from unit leaders to the most senior decisionmakers in major commands and central staffs, shelters the production of current operational capabilities as far as possible. What must give, then, is the rejuvenation of capital, the other significant task assigned to units. Thus, when resources are not sufficient to allow the unit to perform all its tasks, the tasks that are not immediately required for operational performance are delayed or set aside. Over time, this will degrade operational capabilities, but it is possible to keep the traditional notion of readiness from showing signs of weakening at the expense of rejuvenating the force.

In sum, one of the great misconceptions about readiness is that the first place to look for readiness problems is the operational areas. This reflects a misunderstanding of how military organizations man-

age themselves, how they set their priorities when pressured, and the totality of tasks assigned to units. The implication is that readiness problems will manifest themselves first and foremost in hours of work inside units and in the pace and quality of upgrade training, especially of junior personnel. The next section summarizes recent RAND research on these issues as they relate to fighter wings in the Air Force.

### **ESTIMATING SOME CURRENT MAJOR READINESS PROBLEMS**

To identify shortfalls in how the military preserves its knowledge base through unit training, the relevant activities must be measured against functional standards. Some of these activities lack such standards. And when standards do exist, they do not adequately capture the exigencies of day-to-day operations. The following discussion outlines observations and analyses that can help determine the right standards against which to measure the health of the force.

Operational units manage a pipeline that begins with junior, inexperienced trainees and ends with highly skilled, experienced pilots and maintainers. Personnel gain their skills through formal education and less-formal OJT. Senior pilots and maintainers serve as OJT trainers, imparting their knowledge and experience to junior personnel so the latter can eventually take the places of the former when they are reassigned or separate from military service. Therefore, maintaining a healthy personnel inventory requires having *personnel of all levels of experience at all times*. A unit having only top-notch, highly experienced pilots and maintainers may be a superb warfighting machine but it is not healthy. A unit must maintain enough senior pilots and maintainers to train junior personnel while meeting the workload (flying operational sorties, fixing the jets, and generating the sorties). Moreover, the unit must be able to absorb enough junior personnel to take the places of exiting senior personnel when the time comes.

To maintain this delicate balance between experienced and inexperienced personnel and in the mix of training and operational activities, the unit must have adequate levels of the following:

- a proper ratio of qualified instructor pilots to junior trainees

- flying-hour funding and aircraft availability rates to sustain sortie levels required for pilot training
- maintenance manning and materiel to support the requisite sortie rates
- a proper ratio of senior maintainers to provide adequate OJT for junior maintenance personnel.

Imbalances will arise when there are too few experienced pilots and maintainers training too many junior personnel while trying to meet stressing operational demands. Such imbalances are today common throughout the Air Force. Setting the right standards is the first step the Air Force must take to correct these imbalances.

### **Pilot Training and Flying Hours**

The USAF bases the flying hours it assigns fighter units on the Ready Aircrew Program (RAP), which defines the minimum number of sorties per year per pilot based on his experience and classification. While RAP is a significant improvement over older methods for computing flying hours, it falls short in three areas.

First, it does not account for changes in individual and unit sortie requirements when the experience mix in the unit changes. In a single-seat jet, such as the F-16, every time an inexperienced pilot flies, an experienced instructor pilot or flight lead flies with him in a separate aircraft. Thus, the higher the proportion of inexperienced to experienced pilots in the unit, the more the experienced pilots must fly, thereby increasing total unit sorties required just to maintain the initial experience mix. Second, RAP is constrained by shortfalls in unit maintenance resources. Thus, rather than basing flying hours on what the existing inventory of pilots actually needs, RAP bases hours on what available maintenance resources dictate, thereby allowing planners to lose sight of what the actual requirement is. Finally, the attrition rate RAP assumes—the rate at which scheduled sorties must be aborted due to maintenance problems, inclement weather, and other factors—significantly underestimates observed rates at many wings.

RAND has developed a model for determining pilot training standards that are unconstrained by maintenance; use observed attrition rates; and, most importantly, *are adjusted according to pilot experi-*

*ence mix in the squadron* (see Taylor, Moore, and Roll, 2000). Using this model and adding an adjustment factor for ineffective sorties showed that a squadron with 18 aircraft requires an estimated 40-percent increase in required sorties over and above current allotments just to sustain its existing level of experience.<sup>7</sup> A significant portion of this increase is due to the need for senior pilots to fly more as trainers when the experience mix falls below a break point of around 52-percent experienced pilots. In sum, the current standard the USAF uses to determine flying hours required for fighter pilot training is inadequate. Under reasonable assumptions regarding the present experience mix and sortie attrition rates, the Air Force's current planning assumption that peacetime flying requires *fewer* sorties per available flying day than wartime operational missions is false.<sup>8</sup> Our analysis suggests that the standard for health *actually involves a higher peacetime tempo of daily operations than that in the current war plans*.

Unfortunately, fighter wings today are challenged even to execute the hours programmed, as the 388th Fighter Wing at Hill Air Force Base, Utah, exemplifies.<sup>9</sup> The wing fields three squadrons, each equipped with 18 F-16 Block-40 jets.<sup>10</sup> In fiscal year (FY) 1994 the wing's monthly sortie rate approached 21 per aircraft; by FY 1999, the rate had fallen over 25 percent, to about 15.3. This diminished sortie rate means that it takes a 100-hour pilot about 40-percent longer than it should to achieve the 500 hours of cockpit time necessary to be considered experienced. This means that, even though it should only take about 70 percent of a pilot's first assignment to become

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<sup>7</sup>Official flying-hour planning assumes that 99 percent of all sorties are effective in meeting training objectives. While this is undoubtedly too high, there is no official estimate of the attrition rates of effective sorties. From pilot training records in one nondeploying F-16 wing, we found a 12-percent attrition rate—this will vary with local conditions. To this must be added the training backlog built up in units that deploy to peacetime contingencies.

<sup>8</sup>This analysis is reported in Dahlman, Thaler, and Kerchner (2002).

<sup>9</sup>For an in-depth discussion of these issues, see Dahlman and Thaler (2000). Our current research investigates the challenges facing airlifters and tankers at the 60th Air Mobility Wing at Travis Air Force Base, California.

<sup>10</sup>Block-40 jets are equipped with Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) systems for ground attack; they also have air-to-air capability. At the time of writing, the 388th was in the process of increasing two of its three squadrons to 24 primary aircraft each.

experienced, it now takes well over 90 percent. This creates a follow-on training burden for the next unit to which the pilot is assigned. This means that the experience level of the fighter force will continue to fall precipitously over the next several years without substantial increases in flying hours. Thus, failing to rejuvenate the human capital as required will in turn yield a drop in operational capabilities, or readiness as commonly understood, over the coming years.

### **Maintainer Production and Training**

As the 388th Fighter Wing's sortie rate has fallen over the past several years, Total Non-Mission Capable rates for the aircraft have soared from about 3 percent in FY 1994 to over 21 percent in FY 1999. The connection is clear: The sortie rate has dropped because jets have been increasingly unavailable while waiting for necessary maintenance and parts. Inadequate maintenance manning levels and experience mix are key factors in diminishing sorties available for pilot training.

The USAF bases maintenance manpower requirements on a computer simulation model that combines such inputs as wartime sortie rates and durations, break rates, and man-hours for repair tasks to estimate the maintenance manpower needed to support sorties in all kinds of aircraft.<sup>11</sup> Our research indicates that the manpower standards in maintenance are significantly below what would be required to support the sorties needed for adequate pilot training.

First, the computer simulation does not recognize the three factors that cause the Air Force to program too few flying hours for fighters to begin with: that training plans are already based on assumed constraints in maintenance, that a falling experience mix of pilots has raised sortie requirements, and that training plans assume too little attrition of training sorties both on deployments and at home station. Thus, the model is still based on the very suspect assumption that peacetime is less demanding than wartime.

Second, the computer simulation inadequately addresses the experience mix among maintainers, which exactly parallels the pilot

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<sup>11</sup>This model is extensively examined and analyzed in Dahlman, Thaler, and Kerchner (2002).

seniority problem.<sup>12</sup> Skill mix can deteriorate quickly through unanticipated personnel losses, and in the last few years, highly skilled people have left and have been replaced by less-skilled junior personnel. This will reduce the productivity of the workforce and increase the amount of training senior maintainers must to.

These two shortfalls provide a maintenance manpower standard that underestimates what squadrons need on a day-to-day basis to generate sorties for pilot training *in conjunction with* properly absorbing junior maintainers and graduating them to higher skill levels. This problem is further compounded in that *personnel assignments* (the actual “faces” to fill the “spaces”) do not suffice to fill the authorizations in many areas.

For example, since FY 1994, the number of maintenance personnel assigned to the 388th’s flying squadrons has decreased by 12 percent.<sup>13</sup> The 5-level journeymen and 7-level craftsmen—those who do the bulk of the maintenance production *and* teach the 3-level apprentices—have decreased by 6 percent and 27 percent, respectively. The experienced maintainers contend that they are undermanned by 23 percent, while the 3-levels in their squadrons are overmanned by 42 percent. Undermanning and lack of experience have been particularly acute in avionics specialists, crew chiefs, and engine mechanics. The undermanning is even worse than it appears, because there are a number of tasks for which no positions have been authorized, so the persons who do the jobs must be taken away from other work.

These smaller numbers of experienced maintainers are spending 27 percent more time producing (maintaining aircraft, generating sorties) and 48 percent less time teaching than they did three to five years ago. The number of “trainer equivalents” (the number of 5- and 7-levels multiplied by the time they spend training others) has

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<sup>12</sup>Junior maintainers enter operational units as 3-level apprentices and, through a combination of OJT, formal training, and promotion, become 5-level journeymen, 7-level craftsmen, and 9-level supervisors.

<sup>13</sup>Because of the difficulty of expressing the effects of maintainer shortfalls systematically, RAND asked the maintainers of the 388th a number of questions about manning, experience mix, absorption capacity, and how they spend their time under varying circumstances (contingencies, exercises, etc.). The results are documented in Dahlman and Thaler (2000). For further research into the effects of operational tempo on Air Force units, see Fossen et al. (1997).

dropped from an average of 27 to about 12 per flying squadron; trainees have doubled from three to six per trainer. The result is a 50-percent increase in the average time it takes for a 3-level to become a productive 5-level. Not surprisingly, the competing pressures seem to favor generating sorties to the extent possible—for pilot training as well as contingency and other operational demands. So, the 388th has too few experienced maintainers teaching and supervising too many 3-levels while trying to meet a highly demanding sortie generation schedule.

Under these circumstances, fighter wings face severe imbalances in pilot and maintainer training and production, and thus the USAF's ability to rejuvenate its human capital, and by extension its near- and far-term health, has degraded significantly. A key ingredient to reestablishing balance and a measure of health lies in remedying the maintainer shortfall. RAND has computed a rough but conservative estimate of its magnitude for the fighter units across the Air Force.

First, we estimated the additional maintenance manpower needed to sustain a higher peacetime sortie rate to support pilot training. Sustaining this higher sortie rate in peacetime would require a third maintenance shift, but it could be much smaller than the other two shifts.<sup>14</sup> A 4-percent increase in maintenance manpower across the fighter force would meet an estimate of peacetime flying that is similar to planned wartime flying.

Next, we computed the number of the additional authorizations needed to account for manpower engaged in OJT, which represents a significant workload. Under conservative assumptions, we estimated that this would require an additional 11 percent in authorizations.

These estimates do not account for the productivity shortfall created by inadequate experience or the need to meet the increasing requirement for teachers as the proportion of junior personnel in the unit increases. The results indicate that 5- and 7-level authorizations should increase by about 6 percent to compensate for the lower productivity of a less-experienced workforce and by an additional 7 percent to provide trainers for healthy absorption of the proportionally higher junior personnel.

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<sup>14</sup>Fighter wings are authorized two shifts five days a week in peacetime.

Overall, authorizations for maintenance manpower in fighter units would need to be raised by about 28 percent to support pilot training requirements. Out of an FY 1999 maintenance force of about 22,000 in fighter and maintenance squadrons, this implies an increase of over 6,000 authorizations.

The magnitude of this shortfall in maintenance manpower suggests that the Air Force is having trouble training its pilots and sustaining their experience because of an inadequate flying-hour program and because of inadequate maintenance manning and diminishing experience. The maintainers have trouble gaining the needed experience because too few teachers are spending too little time teaching too many junior technicians. Thus, we found that current standards for pilot training and maintenance manning are not appropriate and cause a significant readiness shortfall. As a consequence, the USAF has been unable to define a readiness metric that can communicate its readiness problems to external decisionmakers.

### **Shortages of Parts**

For aircraft, the status of the physical capital is determined by units' abilities to conduct sufficient maintenance to support the required sorties during peace and war, on home station and during deployments. Two interrelated areas, maintenance and supply, and two interrelated processes, setting functional requirements and funding them adequately, have to be properly established and monitored for units to meet their tasking to keep the physical capital healthy. Unfortunately, the Air Force has significant problems in both supply and maintenance, caused by difficulties both in the determination of functional requirements and in the supporting processes involving service organizations and financial management.

Maintenance requirements are, in principle, set by aircraft break rates associated with the most demanding sortie scenario, typically wartime. Given these break rates, demands for repairs and spare parts should be computable. Knowing the demand for spare parts should allow the Air Force to determine appropriate spares inventories for all items. And given the cost and lead-time for procurement, the annual budget for spares should be easy to estimate. Finally, internal financial management principles can be added so that

incentives for economizing on parts can be introduced into maintenance.

Unfortunately, none of this works as described in practice. There are many intractable problems in the materiel processes that support the preservation of physical capital in the Air Force. These problems manifest themselves in chronic shortages of supplies. It is not possible to give these problems as much treatment as they deserve here, but we will describe a few of the most difficult material processes.

First, it has long been known that the stochastic variability of the break rates of various parts on aircraft is extraordinarily high. This makes it very hard to predict demand rates. One can add to this the effects of changing operating conditions, in particular the transition from peace to war. The effect of this is on different aircraft systems is different, but insufficient data are available for proper analysis. Automated Air Force data systems for tracking aircraft break rates are inadequate, providing incomplete and biased estimates of actual breaks and thus affecting estimates of both the mean and the variance of true break rates (see Dahlman, Thaler, and Kerchner, 2002).

Second, the Air Force uses a sophisticated set of inventory models to estimate the requirements for spare parts.<sup>15</sup> Since there is a significant but unknown gap—which varies by aircraft type—between aircraft break rates caused by sorties and demands for spares from the parts inventory, the connection with the operational demand for parts is not well established. Yet another important factor that is not well understood is the effect of aging aircraft on the demand for maintenance man-hours and spare parts. Thus, because of the intensive data requirements and inadequate analysis of variable demands, Air Force inventory models that determine spare parts procurements (the DO-41 models) only quantify a small subset of all required parts. For the remainder, budget considerations are determinative.

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<sup>15</sup>Known as the DO-41 family of models, they include the Aircraft Availability Model and the Aircraft Sustainability Model, both of which are based on the Dynametric modeling approach. Spares budgets are further allocated through a model called DRIVE, designed to buy parts and allocate repair actions to the activity that maximizes the increase in the probability of making an aircraft mission-capable, per dollar spent. These are conceptually sophisticated models, which unfortunately cannot be fully implemented because of data problems.

The Air Force further lacks precise models to determine the size of War Reserve Spares Kits (an inventory of parts assigned to deploying flying squadrons), the requirement for spare engines, and the number of required backup aircraft. Hence, the funding in these critical areas is determined not by carefully analyzed requirements but by available budgets, which the Air Staff determines in the programming phase—which is the best anyone can do under the circumstances.

Finally, under the working capital fund concept, budgetary funds from congressional appropriations are allocated to the consuming units (wings). Wing maintenance organizations then purchase parts and maintenance services from provider organizations—supply and maintenance depots in the Air Force, and the Defense Logistics Agency for various consumable items. Customers have complained for a long time about prices being too high and too unstable. Providers have complained for an equally long time that customers of support maintenance and supply operations do not pay enough. And programmers have for years attempted, with limited success, to improve the efficiency and lower the budgets of support operations. The management and financial processes supporting such critical readiness activities and maintenance and supply are wanting.

In sum, requirements are not stated with sufficient reliability to ensure that adequate resources can be provided when and where they are needed. Again because of the budget cuts during the last decades, there is little doubt that the state of the capital assets is declining—and this is probably true for all the services, not just the Air Force.

### **REASONS FOR READINESS PROBLEMS: PLANNED AND UNPLANNED**

This section diagnoses the broad manifestations of readiness problems across the service as a whole. The following is a list of the major readiness issues, representing a consensus view of managers, operators, and analysts inside and outside the Air Force:

- Programmed operations and maintenance savings have not materialized or cannot be sustained as envisioned.

- Anticipated Transportation Working Capital Fund revenues have not materialized because military customers have turned to commercial transportation.
- Aircraft throughout the fleet are aging, with numerous structural and corrosion problems, and require expensive upgrade programs for engines and avionics.
- There is a shortage of spare parts that is due both to shortfalls in funding and to technological problems.
- Ranges and airspace are increasingly constrained.

Some shortfalls have emerged as the Air Force has experienced force drawdowns while becoming more heavily tasked to various deployments around the world. For example,

- Home station units and units returning from deployments have suffered various materiel, personnel, and training shortfalls that cannot be made up when they return home.
- The net continuation and upgrade training of both pilots and maintainers has decreased.
- The effects of temporary duty assignments on deployments have been uneven and unacceptably long in some occupations and units.
- A strong economy has had negative effects on recruiting and retention of personnel.

While the lists above focus on major Air Force readiness problems, there is every reason to believe that they have counterparts in the other services, especially the Army. Budget pressures have affected all the services, and the readiness problems that relentless but largely unsuccessful attempts at infrastructure reductions have caused therefore manifest in all the services. However, the Navy and the Marine Corps have been less affected by the many deployments since Operation Desert Storm, for two major reasons: One is that the maritime services have, for a long time, structured themselves to cyclical deployments and so have a rotation base that makes them better prepared for the increased operational tempo of recent years. The other is that, because of the associated requirements, much of the burden for supporting the deployments has fallen on the Army

and the Air Force. This is not to say that the Navy and the Marine Corps have been unaffected by deployments, only that they have been affected somewhat less than the other two services.

### **Planned Readiness Shortfalls**

To understand why overall readiness has slipped in recent years, it is useful to make a distinction between planned and unplanned readiness problems. It may come as a surprise to some that certain readiness problems are actually *planned*, yet this is an important factor in all military planning and operations. Very few military units are at peak readiness, i.e., programmed and resourced to all known requirements. In the Army, units in the 82nd Airborne Division are authorized more than 100 percent of their required personnel to ensure that they can deploy at full strength, given that absences occur at all times. Special operations units in all the services are authorized to operate at full requirements. Submarines, by virtue of their harsh operating conditions, are also fully funded.

But this is not the norm for the rest of the military: *It is the exception for all known requirements to be funded.* Programmers and budget planners in the services, in consultation with operational and functional experts from the warfighting side of the house, deliberately plan funding to be less than the analytically known, accepted requirements. Deliberate risk is built into peacetime funding for the very simple reason that the defense budget is not—and never has been, not even in the heyday of the Reagan administration’s deliberate support of a military buildup—capable of supporting all known requirements. The bill is simply too large. Military operations are so costly that it is not possible to allow all units to attain their highest level of proficiency.

In the Air Force, the practice is as follows, and there are parallels in the other services: First, a great deal of effort goes into determining operational and functional requirements (although, as indicated earlier, we believe that important requirements are not set correctly and, in some areas, seem to be nonexistent or forgotten). These analytically based operational and functional requirements are then presented to the resource planners and managers at the Air Staff. Through a process involving several teams of professional experts, the Air Staff arrives at something called “validated requirements.” In

many cases, these validated requirements are smaller than the analytically supported functional and operational requirements arrived at in the field. Sometimes, the reason is that the Air Staff may not accept the analytical models as the best representation of actual requirements; at other times, the reason may be that they deliberately find a workaround that saves money. For example, a unit may be assigned fewer backup aircraft and fewer maintenance personnel than strictly required because the Air Staff instructs war planners to move aircraft and personnel from certain training units if they are needed for a mobilization. Whatever the reasons, the planning process is designed to identify opportunities for building “acceptable” risks into resource determinations.

Then, decisionmakers on the Air Staff decide which validated requirements the USAF can afford to fund (authorize). At this point in the programming process, very difficult and sensitive judgments are necessary, *because the anticipated top line in the presidential or congressional budget cannot possibly fund all the validated requirements*. There are still too many requirements for the budget sack to hold, and decisionmakers have to decide what the bag can actually carry and what they have to leave out. Since all requirements, at this stage, have been validated—that is, they *should* be funded if the Air Force is to be as capable and ready as desired, given the best judgment of the organization as a whole—decisionmakers face only very difficult decisions. All accounts get shaved, including readiness.

In practice, this means that not even first-to-go warfighting units, and the units that support them, receive full funding. As noted above, SORTS designates units at C-1 status when resources managers have provided funding at 90 percent or better of all validated requirements. The Air Force makes it a practice to fund most units at *low* C-1 (close to 90 percent)—the only major exceptions being certain critical activities for which risks are simply not allowed, such as special operations and nuclear-capable units. Shortfalls are spread like peanut butter across most operational units.

This is the essence of *planned* readiness problems. Readiness cannot be funded to the extent desired. Top-line budget constraints force deliberate risk-taking, even in such a critical area. This is how and why the Air Force (and its sister services) actually plans for certain readiness shortfalls. There is nothing absolute about readiness when resource programmers and financial managers look through all the

program elements; at that stage, everything is a “requirement,” and almost everything will take a beating because almost every activity must be fair game when there is a top line that simply *cannot* be exceeded.

One very important implication for readiness management and readiness assessments immediately follows from the fundamental programming and financial management principle of balancing shortfalls by allocating resources as prudently as possible: *There will never be only one reason for readiness shortfalls.* There will be many. If programmers and financial managers have done their job correctly, it should, in principle, be impossible to determine *the* reason for planned readiness shortfalls. In the Air Force, for example, there should be equivalent shortfalls in pilot training, backup aircraft, flying hours, training munitions, range availability, aircraft availability, maintenance manpower, maintenance funding, depot repair times, part supply, upgrades and modernization of the aircraft, and base facilities. Real problems in resource management occur if one account has too much, while others have too little. Of what use are abundant ranges or beautiful facilities if they come at the cost of even more cutbacks in flying hours? Why have a supply system with shelves full of expensive items if the price is an even more severe shortage of maintenance personnel to put the parts in the aircraft?

Notice what this means: At any one time, there may be one absolutely pressing issue to fix—a binding constraint on readiness. Maintenance manpower may be such a binding constraint—this seems to be the most important readiness problem for the Air Force right now. But if one takes care of that single issue, one immediately runs into another. Perhaps it will be parts—not enough parts to fix the aircraft. Well, that too can be fixed, with more funding. This will not, however, fix the readiness problem because there is an engine problem right behind the parts problem.

Thus, there will never be just one readiness problem. The only way to address readiness problems is to look at a long series of interrelated functional and operational activities as an integrated whole. Each of the activities is complicated and subject to stochastic variability in performance. When many subactivities form an integrated chain from inputs through stages of production to a final output, the statistical variances at each stage compound. Ensuring readiness therefore requires deliberately building in buffers at every stage. This

is not possible in the present budget climate. Instead every stage is squeezed to the minimum. The result is a sensitive and complex chain of interrelated activities that has no robustness designed into it. Even planned readiness problems will then crop up in many places, by the nature of the uncertainty in each stage.

### **Unplanned Readiness Problems**

If planned readiness problems were the only issue, the military services would face a daunting task. But there is much more. The services have also been caught off guard by various unforeseen events that have caused a new set of readiness and resource issues. One area already mentioned is poorly understood, often unarticulated requirements (such as in pilot and maintainer training, as well as material processes), which tend therefore to be underfunded. It is an unfortunate but elementary fact that any activity that cannot clearly articulate the pain associated with too few resources will end up paying for it when the program and the budget are put together. This has, for too long now, been the case with unit-level human capital rejuvenation. Because of a poor understanding of the analytical requirement, the validated requirement is too low, and the funding is even lower. The result is an unintended and hitherto unappreciated level of pain in all unit activities that manifests itself through excessive overtime especially for senior personnel. This suggests that the USAF needs to pay much closer attention to the determination of functional and operational requirements. It is unfortunate that even senior decisionmakers have an incomplete understanding of some critical activities inside their own services. Without pretending to exhaust all other unforeseen causes of readiness problems, we will discuss four of the most obvious.

**Wages and Working Conditions.** The gap between wages in the military and those in the civilian economy continues to grow quickly. Until recently, a rip-roaring economy had raised all employment-related factors in the commercial sector—plentiful jobs, good wages, added benefits, excellent training opportunities, good promotion prospects, job stability, and high returns to higher education, to name a few. These factors would put enormous pressure on military recruiting and retention even under the best of circumstances. This means that even if the military environment had been able to offer the same quality of working conditions as ten years ago, there would

still be recruiting and retention problems, because the commercial sector has raised its offers of employment and pay that much faster.<sup>16</sup> By running harder, that sector would have been ahead even if the military had been running at a steady pace.

But a steady pace has proven impossible. In fact, the burden on military personnel increased significantly during the 1990s.<sup>17</sup> Not only have many of them been required to deploy to various difficult places around the world for extended periods, but *all of them* have been asked to perform their jobs with less. The relentless budget pressures, combined with more taskings, have created a situation in which the working conditions in the military in reality have deteriorated relative to those of ten years ago. It is no longer the same place to work. This makes the effects of an improving workplace in the commercial sector that much more severe. The relative gap has increased both because the economy has been roaring ahead and because the military has become a less desirable working environment. Thus, recruiting is more difficult, and it is much harder to retain skilled personnel.

**The Effects of Deployments.** The more-frequent contingencies have created a variety of readiness problems. Perhaps it comes as a surprise to some that deployments hurt readiness. How can deployments, a version of going to war, hurt warfighting capabilities? In particular, when a unit participates in a shooting war, such as Operation Allied Force in Kosovo, surely that *improves* warfighting skills? Yet deployments can actually hurt both operational readiness and rejuvenation.

Let us first look at rejuvenation. Squadrons in the USAF are deployed to contingencies in full or in part; when only part of a squadron is

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<sup>16</sup>In a working paper from 2000, Richard Fullerton of the Air Force Academy has demonstrated that the falling retention rate of pilots is primarily due to the wage gap, not to deployments, as often stated.

<sup>17</sup>During the drawdown in the early 1990s, the Air Force deliberately pursued a policy of retaining senior personnel, both pilots and aircraft maintainers. This caused an increased seniority mix for both categories. Many pilots have been coming to the ends of their service commitments, which has, quite predictably, aggravated the current problems (although the intense demand for pilots from airlines could not have been fully predicted). For maintainers, the exit rate among career technicians has been significantly higher than predicted. Now, in both communities, the Air Force has to deal with a shortfall in senior grades that is much greater than anticipated.

deployed, it engages in “split operations,” whereby part of the unit remains at home station. The deploying part of the squadron will bring the squadron’s best jets (and, if needed, it may borrow from another squadron), a full complement of pilots, and the more experienced maintainers. They leave behind the less-robust aircraft and an undermanned, less-experienced maintenance crew and pilots who still need sorties for training. To strengthen the deploying part of the squadron, the part at home station is “broken,” a perennial problem with split operations across the Air Force. Under these circumstances, the ability of the squadron to produce training sorties at home station is substantially reduced. In addition, the deployed detachment, for natural and understandable reasons, is given clear priority for local parts, as well as in requisitions submitted through the supply system. The experience mix of maintenance personnel becomes more imbalanced at home station, and maintainers at home work harder to generate fewer sorties, but even this curtails maintainer training. This is in addition to the systemic problems facing the units on a day-to-day basis.

Deployments also affect the warfighting capabilities of deploying units, often degrading certain operational capabilities. Air Force units actually being employed against an enemy do have the opportunity to deliver missiles on specific targets in a hostile environment under challenging conditions, thus sharpening many important facets of their warfighting skills. The units return much more skilled at planning and executing missions involving strikes. But during an extended deployment, the units also miss various other required training opportunities. When a dual-capability aircraft deploys, one of its missions tends to suffer; for example, the air-to-air mission of the F-16 typically degrades because of the lack of a suitable threat and the lack of training ranges. This holds true also for air superiority aircraft, such as the F-15. Most Air Force weapon systems have elements that cannot be kept current during deployments, such as nuclear missions or simulator work on procedures relating to degraded systems. Thus, deployments may help some units acquire higher skills in some—often essential—capabilities but may simultaneously cause other essential skills to atrophy to some degree.

The way the Air Force has been structured plays an important role in the difficulties it faces with contingency deployments. The service has not been structured or designed for repeated deployments but

for MTWs. This means that the Air Force expects to prepare for war in peacetime and to make an all-out effort during a (one hopes) short war. All continuation and upgrade training would virtually cease during the war, and USAF units would return home “broken” and in need of a long period of reconstitution. But when the USAF must deploy more or less continuously, there is little time for reconstitution, and whatever recovery can be made is in addition to the unit’s ongoing peacetime training and is mostly drawn from resources organic to the unit (especially, working people harder). So, it becomes ever more challenging to make a dent in any backlog in training and maintenance.<sup>18</sup> To help ease this burden, the Air Force has developed a concept called the aerospace expeditionary force (AEF). Of the ten AEFs—packages of USAF platforms and capabilities—two would be on call every 90 days (forming a 15-month cycle). A two-week recovery period is built into the schedule.<sup>19</sup>

**Budget Rules.** The third unplanned source of readiness problems relates to the budget rules, as well as to the contentious game between Congress and the president over control of military operations abroad. This tends to create resource shortfalls that inevitably result in readiness problems. Congressional funding for contingency operations is usually insufficient and almost always too late. The president, using his powers as commander in chief, authorizes support of a peacetime contingency. The Secretary of Defense immediately authorizes transfer funding from internal sources in the defense

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<sup>18</sup>There is an additional problem that is not addressed here: A rotating deployment schedule must also account for the possibility that a large percentage of people will not be available for deployment. This percentage is small in wartime, a few percentage points mostly caused by medical conditions, but can be very large in peacetime contingencies. In the Army, estimates range from 35 to 40 percent of the people assigned to deployable units (see Polich, Orvis, and Hix, 2000). Because of different deployment concepts, there are reasons to believe that the percentage would be smaller in the Air Force and even smaller in the Navy and the Marine Corps.

<sup>19</sup>The effects of the AEF concept on readiness are likely to be minimal. Ordering flying units into a structure of numbered AEFs will not do anything, per se, to reduce the demand for deployments and does not change total assets available for deployments. Thus, if there is a gap between taskings and available resources, the AEF construct will do nothing to close it. The effects on home-station parts of a split unit and the training cycle problems discussed in the text above will remain. Even the extent to which AEFs will improve predictability of deployments for individuals is in question, as it has always been Air Force practice to spread out deployment tasks as evenly as possible among available units. Furthermore, the Air Force has not yet decided how to report the readiness status of the ten expeditionary forces.

budget. This means that deploying and supporting activities get priority for funds and that all other accounts get to be short-term bill payers within a given defense budget. The administration then asks Congress for a supplemental budget authorization, to restore the funds just diverted to the recent contingency. Congress, which faces competing claims for scarce budget resources no less than the military services do, usually provides funds (if it supports the operation in principle), but usually less than requested. Depending on how popular the president's action is, the degree of support can be a high share of the total cost of the contingency deployments, but it may be significantly less. That is, the military services are typically asked to support a significant share of the cost of the contingency from their previously appropriated funds.

This means that many of the funds that were moved from various accounts, including those that support readiness and operations, will never be restored. The effect of the unplanned contingency is to force an unanticipated cutback in readiness, much beyond what was contemplated when the president's budget was presented to Congress. Service decisionmakers now have to recompute all their carefully balanced accounts to determine which activities will be bill payers—and some of that will inevitably come out of readiness again.

Add to this the institutional difficulty rooted in the budget process that any congressional supplemental appropriation typically cannot be enacted until at least half the budget year is already past. That means that the additional funds often reach the military services only in the last quarter of the fiscal year. Since the funds are one-year appropriations, they do not carry over but have to be committed before the end of the fiscal year. The result may be a spending frenzy within the military services, with no possibility of actually putting the funds to use where they would do the most good for readiness. It is simply not possible to recover all the lost training or maintenance in such a short time, and the discretionary funds Congress had provided then migrate to other worthy activities.

One solution to this dilemma would of course be to put into the annual defense budget a contingency account that could be drawn on only if the president authorizes an overseas deployment. That is not feasible for several reasons. First, Congress would not cede that degree of budgetary authority to the executive branch. Doing so

would be tantamount to relinquishing Congress's constitutional role in funding all overseas engagements, a prerogative naturally guarded jealously by those who, over the years, have supported the War Powers Act. Secondly, Congress is not enamored of appropriated but unexpended funds. If it appropriated contingency funds, but no contingencies emerged, the result would be that total expenditures during the fiscal year would be less than they could have been, a situation absolutely abhorrent to most members of Congress. That money could have been used somewhere, by some committee with unfunded projects, and there would be much anguish if the money were not spent.

A better solution would be for Congress to appropriate all the costs of the contingencies early in the budget process. That is clearly what the military services would prefer and would benefit from the most. Again, such a simple proposal runs afoul of the constitutional reality that Congress may not wish to support every president's engagement in foreign contingencies. Congress does not view its institutional responsibility as simply opening the checkbook every time a president decides to do something that some may consider to be foreign adventurism. Therefore, the budget process will always cause unforeseen readiness problems when contingencies and deployments occur. This simply cannot be avoided.

**Consequences of Budget Decisions.** Finally, the DoD often is itself inadvertently the cause of many unforeseen readiness problems. This is not to suggest that there is either ill will or incompetence among defense managers; rather, the problems are institutional and perhaps even intractable.

One problem is in the way the DoD has approached budget cuts over the last ten years or so. As a public activity that produces an output that can be measured only qualitatively—deterrence of and victory in war through superiority in equipment, training, and concepts of operation—the DoD has no “bottom line” in terms of a “profit statement.” All it has is a top line, a total budget that it must justify and spend as wisely as possible.

Budget pressures grew at the end of the Cold War to reduce all nonessential expenditures. In particular, a series of defense management initiatives focused on “infrastructure” activities. This led to

cuts in the Future Years Defense Budget being taken in a number of accounts, such as base support, number of bases, real property maintenance, supply operations, maintenance activities, civilian personnel, support personnel in many areas, and staff cuts. These anticipated savings were thought to be achievable through a series of “efficiencies” that could be instituted through improved management at all levels throughout the department.

Few of these savings actually materialized, and the effects have been felt throughout all activities in the military services. One of the most important reasons for the relentless drive to take out anticipated savings in the top line was not to *reduce* the total budget; rather, the stated goal was always to protect the funds for needed modernization of weapon systems. Modernization is the heart of future capabilities, but unfortunately, the programmed but unrealized savings could only be financed by reducing the pace of modernization. All the military services have been forced to scale back their acquisition plans.

But the cuts have not worked out as planned. Readiness was never supposed to be a bill payer, yet when the forecast budget savings never showed up, readiness accounts were cut as well. In the Air Force, maintenance and supply in particular have been hurt because they were reduced to deliver savings, and the realized shortfalls have not been made up once it became clear that the savings would not materialize.

There is a great lesson here, one that is extremely difficult to assimilate because it is the source of disappointment and frustration: Planned management efficiencies deliver perhaps a third to a half of anticipated savings, if experience is to be a guide to the future. That is all that can be expected, no more. Thus, if decisionmakers in DoD plan to protect modernization and readiness by taking undiluted savings from better management of infrastructure, it might be better to rethink this plan. With the lessons of the 1990s as background, this is now foreseeable, predictable, and quantifiable and should become part of the budget planning process. Management initiatives that anticipate large future savings should be carefully reviewed outside the DoD, because the institutional incentives for accepting these difficult and hard-hitting implications are simply too deep.

## **PROGRAMMERS VERSUS OPERATORS: WHO SHOULD BE IN CHARGE?**

This leaves some additional factors that actually are within the purview of internal service management prerogatives. One relates to mobilization practices, whereby deploying units improve their organic capabilities by borrowing resources from sister units who remain at home station in a state of reduced readiness. This practice—termed *robusting* in the Air Force, *cross-leveling* in the Army, and *cross-decking* in the Navy—is caused by the habit of providing peacetime resources at less than the full amount of resources needed in wartime—programming at low C-1 (or even less in certain cases) but deploying at the equivalent of high C-1.

One thing is eminently clear: The deployment standards will not be compromised. If that requires moving resources from nondeployers to protect deployers, that will be done. All the services abide by this overriding principle. Readiness problems are diverted so that operational standards can be met, and other force elements will have to suffer the consequences. There is an institutional reason that makes this practice endemic: Programmers determine resource levels during peacetime, but operators decide what will deploy to contingencies—and these two communities operate under different and sometimes incompatible principles. Programmers want to spread problems around the force, as noted above, but operators will not allow deploying units to go with anything less than a full complement of experienced people and reliable equipment. This creates a resource disconnect, both in total budgets and in the allocation of resources across units.

When these practices cause significant problems, the service leadership could contemplate two actions. First, the leadership can issue guidance that programming priorities will be reordered and that peacetime programming levels for operational units must be at higher levels—closer to high C-1 for personnel, equipment, and dollars in operations and maintenance. The guidance would naturally also have to identify the bill payers within the service budget—where are the extra resources for readiness going to come from within a given budget top line? Second, the leadership could order deployment planners to cease robbing deploying units and instead to act in accordance with the programming guidance already in place.

Units resourced at 90 percent of known requirements should deploy at 90 percent, no more, and operators should accept whatever risks are attendant to that level of contingency resourcing. Thus, when the top line is too low, the choices are either to tell the programmers to resource as operators habitually deploy or to tell the operators to deploy as programmers have resourced them.

The simple choice put so starkly—program as you go or go as you program—is actually an extraordinarily difficult one to make, given the institutional and cultural factors in the military. Peacetime budget pressures force economies in programming, which means telling operators to tighten their belts for the sake of the service’s overall goals in all areas of the budget. At the same time, there is a very understandable attitude in wartime that whatever the operator states as a requirement, the service will do its utmost to provide. The contradiction between telling military operators to live with peacetime frugality and wartime largesse is perhaps not so painful if one only has to contemplate the odd major war. The signals get crossed only when troops are sent to a series of costly peacetime deployments, because the units then have to adjust to the contradictory signals every day rather than having a clear break between peacetime rules and wartime rules. It is time to face this as an ongoing reality that needs a better resolution, and only the senior service leadership can do this.

Failure to do so can skew assessments of the operational readiness of the Air Force. Using the current two-MTW construct, suppose that a major war breaks out in one theater. The theater’s combatant commander will certainly demand as much as he can get to prosecute a quickly evolving shooting war, and the National Command Authorities will provide him what he needs in this dire situation. It is not unlikely that, as planned, the responding force would include roughly half the fighter force (ten fighter wing equivalents). As is its custom, the USAF will answer the call by deploying well-equipped squadrons with highly experienced personnel by robbing from nondeploying units—*units that are tagged to fight in a second MTW*.

Now suppose that, while U.S. forces are fully engaged in the first MTW, a second MTW starts brewing. On the face of it, the USAF should be well positioned to respond to the second MTW as well (is this not what it was sized for?). *But the half of the force that is dedicated to fighting the second MTW was drawn down by robbing units*

*that deployed to the first MTW.* Units responding to the second MTW will then take longer to deploy and will likely be short of needed capabilities once they arrive. It is crucial to acknowledge that, despite the fact that the need to fight two MTWs is the sizing criterion of the fighter force, the ability of the USAF to respond to the second MTW may currently be at grave risk. The reason lies in a combination of inadequate resourcing of squadrons relative to current requirements and the deeply ingrained custom of unit and wing commanders to ensure that units they send to war are at peak capability. As we discussed at the beginning of this chapter, the readiness assessment the Joint Chiefs of Staff and OSD use—JMRR—*is not capable of identifying this problem because it is based on SORTS rather than on actual deployment practices.* JMRR fights the programmers', not the operators', war.<sup>20</sup>

Related to this is the requirement to build a more robust force that can sustain ongoing deployments. Even if peacetime operations were resourced to the same level at which operators prefer to deploy, deployments would still have unavoidable readiness implications. Training would still suffer; equipment would still wear out faster; and personnel would still require some recovery period after return to home station. The Navy has adapted to this, even if budget pressures have made it more and more difficult for it to protect its shore-based activities and keep them healthy as budgets have declined. But the Army and the Air Force (the AEF concept notwithstanding) are nowhere near having a healthy base for important elements of their forces. In the Air Force, this affects a number of weapon systems, especially but not exclusively low-density, high-demand units.<sup>21</sup> In the end, this is a force structure issue, and new force structures are very expensive.

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<sup>20</sup>There are additional significant problems in JMRR. One is that it gives a potentially very inadequate view of how the warfighting CINC actually plans to fight the war. Another is that the services are quite likely to alter the TPFDL, perhaps significantly, by adding or moving units around when the war starts. Thus, the JMRR does not represent either the demand or the supply side of the force equation very well—it does not even do the old math well.

<sup>21</sup>These are, at present, intelligence and information gathering aircraft, airborne command and control, combat search and rescue, special operations, and some other systems.

### **MANAGING READINESS: REQUIREMENTS, RESOURCES, AND PROCESSES**

If revised management priorities ultimately are the key to improved readiness, better information will be necessary in many areas than is currently available. Readiness problems arise when operators lack the tools they need to perform their tasks and assignments—another gap between requirements and resources. If requirements have a large stochastic element, budgets must be cushioned and/or proper resource reallocation processes must be developed.

Managing readiness requires

1. setting the standards of desired performance in particular areas
2. defining the metrics to measure actual performance
3. assessing whether actual performance is less than, equal to, or greater than the performance desired
4. defining and implementing remedies for matching actual performance with the standards, or, if that is impossible, at least systematically tracking and reporting shortfalls.

If a task is precise and given to evaluation, it may be easy to set the standards and derive simple and quantitative metrics. Then, the third step, the assessment, can be quick and automatic. However, if the task is complex and comprises many sequential steps, the number and complexity of standards and corresponding metrics could be daunting. Moreover, the standards and metrics could be qualitative, thereby requiring a larger degree of expert judgment. It may not be possible to set simple rules for how the assessment should be made, and it could be very difficult to make an integrated, “objective” assessment when *objective* may simply mean that different experts looking at the same data come to roughly the same conclusion.

RAND’s readiness research has identified the need to set standards in many areas where they are painfully inadequate. For example, pilot training and maintenance manpower standards in the Air Force do not telegraph the appropriate requirements such that the personnel system that supplies the manning gets the right signals to act on, and the result is overwork and inefficiencies in maintenance units throughout the force. But once again, one may resolve the manpower

problems in maintenance, only to find that supply problems immediately emerge as the next binding constraint or that maintenance equipment, facilities, and processes cannot adequately support operations even if manning is increased. The solution to this problem is to ensure that the standards are set in each area so that decisionmakers know precisely the amount of resources needed. At present, there is a series of severe disconnects in setting these standards.

There are great conceptual difficulties in setting the correct warfighting standards. In many cases, the CINC requirements are not, and possibly cannot be, stated in very precise operational terms. Targets and timetables must be flexible, and standards for various capabilities must be set at levels that afford operational flexibility to the combatant commanders. This places great responsibility on each military service to set its own internal standards of performance so that it can give the combatant commander enough to accomplish his assigned missions.

Yet, war plans are, in actuality, constrained by available resources. For longer-term planning, the Planning, Programming, and Budgeting System is supposed to provide the budget resources necessary to prepare for and execute the war plans. But in practice, this works the other way around: Available resources constrain execution. The CINC will take what he can get and allocate it to best effect. Thus, over the short term, there is very little guidance to be gleaned from war plans about the “correct” operational readiness standards. In effect, the plans require the service to provide what it can from what it already has, and hopefully this is enough to accomplish the missions.

The reality, then, is that operational standards are really determined by available budget resources. Instead of readiness standards setting the rules for what resources should be made available, available resources determine actual readiness standards. The services actually determine warfighting capabilities when they build their budgets each year, with the CINCs’ inputs about their priorities.<sup>22</sup>

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<sup>22</sup>There are many examples of this, such as the 1992 Air Force decision to mothball the F-111. This aircraft provided a unique capability, being able to fly at low level, in bad weather, for long distances, with a medium-weight bomb load. This aircraft would have been a great asset in the kinds of peacetime contingencies we have witnessed

This suggests a critical flaw in the way SORTS is used today. SORTS was designed to report on *authorized* levels of resources provided to a unit—people, aircraft, parts, etc. It was *not* designed as a readiness assessment system, even though it is used that way. SORTS provides insight into whether a unit is using the resources made available to it throughout the year. The system does not report on a unit's ability to meet true operational requirements. The baselines driving "C-status" may fluctuate with changes in authorized resources. When budgets decline, a unit may have fewer capabilities because it is authorized fewer resources, yet it can still report a "C-1" status, meaning that readiness can remain unchanged. In relation to operational requirements, however, readiness should have declined as well.

Actual budget practice is not as consistent as it should be. A logical chain of decisions should lead to certain capabilities being provided to the CINC. Once the size and composition of the force structure are determined, a series of decisions should be made that flow from numbers of aircraft to pilots and their training and to the monthly sortie rate of the aircraft for pilot training in peacetime. This should in turn drive the amount of maintenance needed, which then would determine the number of maintainers needed and the associated training. The technical characteristics of the aircraft, as well as its operations, should drive the requirement for supply and the supporting logistics center and contracting. Pilot training and all the supporting activities in maintenance and supply should then drive a requirement for infrastructure, i.e., bases and training areas. Such a logical sequence of computations from operational to functional standards and supporting activities could only be done by integrating the standards at one level with the implied ones at the next supporting level.<sup>23</sup>

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over the last few years but was sent to the boneyard for one reason: It was too costly to maintain. The cost per flying hour was the highest of any weapon system at the time. This is but one example of how budgets determine operational capabilities and standards, popular belief to the contrary.

<sup>23</sup>The accounting principles required to support these steps exist in principle but have not been developed to a level of detail at which they can be applied to the budgeting of Air Force weapon systems. Called Activity Based Costing, these principles are at present used only at lower levels, typically at the initiative of some enterprising local individual. Efforts are under way in all the services to develop these accounting techniques further, but this is a slow and delicate process.

In practice, the Air Force does not compute resource requirements in this logical, analytical fashion. Rather, resource requirements are typically computed in one functional area separately from all others. Thus, within the major commands, operational divisions analyze the requirement for flying hours to support pilot training—across all weapon systems within the command. The logistics division computes resource requirements for maintenance manpower, equipment, facilities, and supplies—across all weapon systems within the command. The civil engineering division computes the requirements for ranges and facilities—across all activities within the command. The security forces division computes requirements for security guards and their supporting needs—across all weapon systems and facilities. And on and on in this fashion. Budgeting is, in reality, done by function across weapon systems, not by computing the total requirement for each weapon system separately.

This results in various anomalies. For example, some weapon systems have not been able to fly out all their allocated flying hours during the fiscal year because pilot training requirements had been funded without guaranteeing that the supporting activities in maintenance and supply were also adequately funded to ensure that the flying hours could actually be executed. Thus, in releasing the resources that controlled one binding constraint, no one ensured that the next binding constraint did not make it impossible to reach the goals of releasing the first constraint. Such stovepiping of resource management creates inefficiencies.

The answer is to set an integrated set of standards across functional stovepipes, within single weapon systems, and then to manage across the functional areas accordingly. The most obvious starting point is when setting integrated functional standards. Readiness will never be resolved without these. Once these have been defined in the correct areas, with considerable attention to the overlap and interrelations between functions, the metrics will suggest themselves. Standards for performance imply the appropriate metrics. The metrics will then allow evaluation of readiness and identification of bottlenecks, which will allow management to take corrective action. In practice, this may prove to be difficult and time-consuming, but there is no doubt that it can be done.

To implement an appropriate mechanism for readiness assessments, it is also necessary to revise the *processes* by which these assessments

are made. At present, a unit's commanding officer assesses whether it is ready or not. This system has two significant shortcomings. First, as noted in the discussion of robusting and deployment practices, it is not typical that a unit goes to war just as it is. The typical *modus operandi* is to assess immediate warfighting requirements and then provide these resources by calling on other units to provide the missing elements of the package. In effect, the readiness of any one unit is determined by all the resources available to the entire weapon system across all units. It is therefore ultimately misleading to assess readiness on a unit basis—this does not reflect actual modes of deployment and operation. Second, it follows that it is also not appropriate to rely on the judgment of any one squadron commander to assess the readiness of the weapon system's capabilities. A squadron commander may be perfectly capable of assessing his or her unit's status, but since the readiness of any one unit ultimately depends on the resources that can be made available through robusting from other units, only a higher-level manager can make the correct assessment by collating information from all the units of that weapon system. In addition, the resource requirements must be determined and assessed from operations through support, and this implies informational processes and management prerogatives that cut across organizations and functions.

Clearly, the setting of operational and functional standards, the determination of appropriate metrics, the assessment of readiness (both operational and rejuvenation related), and the management of resources for deployments should be organized in a new and innovative way. The aim would be to reduce the effects of unplanned readiness problems and to leave the DoD only with as appropriately planned and executed a level of readiness as possible—in short, to minimize the “unreadiness” that it can never completely avoid.

### **CONCLUSION: THERE IS NO PARADOX**

The introduction to this chapter posed a paradox of readiness: that the military services can be ready for war and still have ongoing peacetime readiness problems. One goal of this chapter was to show that this is not really a paradox at all. Readiness is the ability of units to perform all their tasks, of which the execution of wartime assignments is only one. Thus, unit personnel may face a daily struggle to

keep human and physical assets at acceptable levels, seeing their capabilities slowly eroding, yet still be able to meet wartime taskings. This seems to be the state of much of the military today. Capturing these effects demands a different and expanded set of metrics than SORTS offers. Addressing the underlying causes of readiness problems requires a new set of management principles, focused on the need to define requirements better and to prepare budget submissions that cushion against the frequent occurrence of stochastic disturbances that affect the ability of units to carry out all their assigned functions.

In summary, four central tenets must be understood about the readiness complex. First, readiness is about matching resources to known operational and functional requirements, but severe disconnects can occur because resource programmers do not manage the execution of resources, and managers in charge of execution have so far proved unable to define minimum operational and functional standards adequately to resource programmers. Defining requirements is one of the greatest challenges even the most experienced functional managers face. There are extraordinarily difficult analytical and technical problems in almost every area—capabilities, equipment, personnel, training, and support functions, to name a few.

Second, readiness typically declines without immediately affecting warfighting capabilities. Recent research shows that what is termed “rejuvenation” will show the first signs of declining readiness; operational readiness will be the last to give. The widely held assumption that readiness will first affect warfighting capabilities is mistaken yet is the basis for existing readiness assessment systems. By implication, the services, the Joint Staff, and the Under Secretary of Defense for Readiness have much to accomplish.

Third, readiness problems *never* occur in just one single area but always in several interrelated areas in surprising and unforeseen ways. Resource programmers attempt—quite reasonably—to spread the pain and minimize excess resources at any one point in the chain of activities that produce readiness. This makes it very difficult, if not impossible, to predict where and how significant readiness problems will occur. This fact of defense management explains one of the most frustrating issues congressional and DoD resource managers face: If

they put money against what seem to be the most important readiness problem today, why does readiness not improve significantly? The reason is that the only way to improve readiness is to add extra dollars to most or even all readiness-related accounts, as they will all be close to binding on readiness.

Finally, deployments diminish readiness—all kinds of deployments, including those that involve actual fighting. They use up resources, delay training, degrade equipment, and exhaust people. This will continue unless there is a proper rotation base and appropriate resourcing to avoid robbing and cross-leveling from home station units.

These central tenets point strongly to a question of resources and management. Resource managers own the programming, but operators own the execution—this is a significant management disconnect inside the military services. Couple that with an even more critical disconnect between the president's power to order deployments without congressional approval, on one hand, and Congress's disinclination to fund fully and promptly the budget costs of the president's decisions, on the other, and the result is an inevitable mismatch between resources and requirements.

Maintaining high levels of readiness is very expensive and must always compete for funding with both military (e.g., modernization) and nonmilitary expenditures.<sup>24</sup> Until recently, total defense budgets have been declining in real dollar terms. This has left a defense budget full of goals, some readiness related, that cannot be adequately funded within the overall spending targets set in legislation. As the heavy deployment demands of the 1990s have borne out, the military still plays a very active role in pursuing national security objectives. However, planning and future budget estimates in OSD and in Congress have not yet caught up with this reality.

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<sup>24</sup>Exactly how expensive depends on one's definition of readiness. A simplistic number often suggested is "all of the operations and maintenance account." This would amount to over \$100 billion, or about one-third of the defense budget. This does not count all the personnel costs and much of the acquisition budget that are driven by readiness considerations. Another overly simplistic estimate of the cost of readiness would be "the entire defense budget" because it represents the deterrent value of U.S. military capabilities. But above all, the budget really supports military activities, such as retiree benefits. The true cost depends on definitions.

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