In this chapter, we discuss effectiveness: how well RC units serve military needs relative to similarly configured AC units. To answer this question, we considered two aspects of effectiveness: the readiness of a unit to perform its intended military functions and the availability of a unit for employment by national command authorities. Readiness depends on the unit’s access to resources (personnel and equipment) and to processes (training and maintenance) needed to keep these resources combat-ready. Availability combines elements of responsiveness (how soon is a unit available) and duration (for how long is it available). If AC and RC units systematically differ in either of these two aspects, effectiveness will be affected by the force mix.

**READINESS**

Generally, modern RC air assets receive much praise for their combat effectiveness. For example, RC units and aircrews served during operations Desert Shield and Desert Storm with little readiness differences between them and their AC counterparts (RAND, 1992, pp. 56–57). Similar evidence exists that RC units perform well when deployed for current peacetime contingency operations.¹

¹A current joint force combat operations center director said that there was no discernible difference between RC and AC units deployed in his area of responsibility. He claimed that only minimal local area checkout was required for experienced RC units. Another observer attributed only average or below-average performance to RC combat rescue units, some of which arrived at forward operating areas lacking basic combat rescue skills. This observer said RC rescue units may not have adequate access to
Although actual performance in combat is the best readiness indicator, it cannot be observed during peacetime. Thus, we must look at available peacetime readiness indicators to determine how RC units compare with AC units. Some measures of readiness are available from the joint readiness reporting structure—the Status of Resources and Training System (SORTS). Other indicators include operational readiness inspections (ORIs) and exercises where RC units perform with their active counterparts. SORTS measures inputs to readiness—personnel status, equipment status, and training—whereas inspections and exercises tend to measure outputs or outcomes more akin to actual combat capabilities.

**Peacetime Readiness Indicators**

As an input measure, SORTS provides a limited means for benchmarking units. Air Force units generally maintain a higher natural state of readiness than the other services in both the AC and RC, and SORTS reveals little difference between RC and AC air units.

ORI results also show little difference between AC and RC units, although the process for RC units can be somewhat different from that for AC units. The inspection team includes augmentees from the gaining command and much effort is invested in making sure that the process mirrors the active process for like units. Few differences between the AC and RC were found in ORI results for the years 1992–1996 (see Figure 4.1). Overall ratings (on a scale of 1 to 11) are slightly lower for RC units, although they are still well in the satisfactory range. For fighter units, the overall scores are somewhat higher for RC units than for AC units.

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1. Doing well on the ORI in most RC units is highly desired, just as it is in the active force. One reservist told RAND that the first question asked during his initial hiring interview was his willingness (and ability, given civilian employment) to make himself available for the unit ORI.

RC units have historically done very well in various combat crew competitions. This could be the result of an RC unit having higher average total career and mission design series (MDS) flying time and greater experience overall than a sister AC unit has. But competitions may not be an appropriate readiness gauge for RC or AC performance, because the flight and maintenance crews who participate are the best-of-the-best. However, a higher average number of total career flying hours and more time with the unit are major strengths that RC aircrews bring to the total force. This difference in experience will increase as anticipated shortages of AC pilots emerge.4

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4Operations personnel at a mixed-force active wing told RAND that some combat fighter squadrons had 40–50 percent of personnel with less than two years of active flying experience beyond their initial mission qualification (RAND interviews, April-May 1998).
Underlying Factors—Experience, Training, and Operational Integration

We identified three factors that underlie the RC’s readiness parity with the AC. First, as mentioned above, RC personnel generally have more unit-specific and aircraft-specific experience than their AC counterparts. Second, RC aircrews, despite having fewer available duty days, come close to achieving qualitatively what AC units achieve with higher numbers in their training programs. Third, relatively small RC elements can be readily integrated with other RC and AC elements to form provisional units for employment.

Experience. Experience levels in RC units are generally significantly higher than they are in AC units for several reasons. First, many members of RC units have prior AC experience. Second, RC aircrews tend to remain in cockpit flying duties far longer than AC aircrews, who must rotate between staff and cockpit assignments. As an example, Table 4.1 shows indicators of experience for pilots in two B52 squadrons, one in the RC and one in the AC.

Training. The training program for an RC unit generally contains the same categories of training missions as the training program of an AC unit with a similar mission, but with fewer missions required in some cases. Table 4.2 shows, for example, the number of annual training missions for comparable RC and AC units. Annual mission requirements are identical to maintain a basic mission-capable status (for pilots in staff positions), but combat mission-ready status (for pilots in line cockpit positions) requires fewer missions in the RC. Some observers believe that generally higher experience levels

Table 4.1

<table>
<thead>
<tr>
<th>Indicator</th>
<th>RC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total hours</td>
<td>3266</td>
<td>1809</td>
</tr>
<tr>
<td>B52 hours</td>
<td>2244</td>
<td>1446</td>
</tr>
<tr>
<td>Instructor/evaluator hours</td>
<td>621</td>
<td>464</td>
</tr>
<tr>
<td>Proportion of pilots with combat experience</td>
<td>60%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Table 4.2
Ready Aircrew Program (RAP) Annual Training Missions

<table>
<thead>
<tr>
<th>Basic Mission Capable</th>
<th>Combat Mission Ready</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inexperienced</td>
</tr>
<tr>
<td>F16, Block 40</td>
<td></td>
</tr>
<tr>
<td>AC</td>
<td>72</td>
</tr>
<tr>
<td>ANG</td>
<td>72</td>
</tr>
<tr>
<td>A10</td>
<td></td>
</tr>
<tr>
<td>AC</td>
<td>72</td>
</tr>
<tr>
<td>ANG</td>
<td>72</td>
</tr>
</tbody>
</table>


Experienced pilots are those who exceed an established flying-hour threshold that varies by MDS.

permit RC units to maintain the same proficiencies as AC aircrews even with fewer training missions.

**Operational Integration.** To be considered ready in the prevailing environment of contingency deployments, RC units must be able to function effectively in the package sizes at which they are commonly available. As discussed in more detail below, RC participation in most contingency deployments depends on voluntary participation rather than mobilization. Deployable packages of RC personnel and equipment therefore tend to be of less than full squadron scale.

Fortunately, air operations and their direct support allow smaller packages from multiple units to be assembled to form provisional units at employment sites without unacceptably losing operational effectiveness. An example is the ANG RAINBOW deployment of ANG Block 42 F16C/Ds. Aircraft, manpower, and resources are combined from three units to deploy in-theater in a unified mission package. Each unit commander has flexibility in meeting his deployment commitments while enabling the ANG to deploy a sufficiently sized unit in peacetime.\(^5\)

\(^5\)The RAINBOW concept demonstrates that integration of smaller units is possible without major problems. However, unless units are exercised on a regular basis, unit commanders may feel more comfortable with members of their own squadrons and logistics support. Recent RAINBOW deployments have concentrated on deploying
**AVAILABILITY**

In the past, availability was relatively easy to define for RC units. RC units were written into operational plans in a manner similar to AC units. RC units generally flow into a deployment schedule alongside AC units, assuming timely mobilization of the RC units. After mobilization, RC units become full-time assets for a specified duration. However, this is not a complete picture of how joint force commanders are using forces today. Recurring and long-duration peacetime force employments require the RC to participate in a nonmobilized status. Thus, availability of reservists under both mobilized and nonmobilized conditions must be considered.

**Availability When Mobilized**

Legal limits on mobilization are contained in Title 10, US Code, Section 12301-12305. The main provisions, which apply to all reserve components collectively (Army, Navy, Air Force, Marine Corps, and Guard), are as follows:

- In time of war or national emergency declared by Congress, reserve units and individuals not assigned to units may be ordered to active duty for the duration of the war or emergency and for six months thereafter.
- At any time, a reserve unit or individual not assigned to a unit may be ordered to active duty for not more than 15 days a year.
- In time of national emergency declared by the President, Ready Reserve units and individuals not assigned to units may be ordered to active duty for not more than 24 consecutive months.\(^6\) Not more than 1,000,000 members of the Ready Reserve may be on active duty at any one time under this provision.

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\(^6\) The Ready Reserve consists of all reservists except those in an inactive or retired status.
When the President determines it is necessary to augment the active force, Selected Reserve units and individuals not assigned to units and a special mobilization category of the Individual Ready Reserve may be ordered to active duty for not more than 270 days.\(^7\) Not more than 200,000 members of the Selected Reserve may be on active duty under this provision at any one time, of whom not more than 30,000 may be members of the Individual Ready Reserve.

The provision to recall the Selected Reserve for periods up to 270 days was a liberalization, in 1994, of previous law that allowed a call-up of 90 days plus a 90-day extension. The provision for a special mobilization category within the Individual Ready Reserve was added in 1998.

These provisions limit the availability of reservists in several ways. Limits on the duration of call-ups and on the numbers allowed on active duty are such that the AC must be used to meet many contingencies, especially those in which declaration of a national emergency is deemed inappropriate or undesirable. Although it is only natural that the AC should be the first option considered to meet most contingencies, decisionmakers should consider the legal limitations on RC availability in determining the force mix. In general, the total force should be sized so that the AC can meet all but 200,000 manpower requirements in a peacetime contingency or 1,000,000 manpower requirements in a national emergency short of declared war.

Another limitation on availability is the requirement that reservists who are organized and trained in units must be recalled with their units rather than individually. As a practical matter, relatively small unit packages (unit type codes, or UTCs) can be specified in mobilization plans. Still, this provision could impede the flexible and efficient use of reservists in some circumstances.

\(^7\)The Selected Reserve consists of individuals who participate in inactive-duty training periods and annual training. The Individual Ready Reserve consists of Ready Reserve members who are not in the Selected Reserve. The special mobilization category of Individual Ready Reservists subject to call-up under the provision cited here must be within 24 months of separation from active duty, volunteers for entry into the special mobilization category, and in grades and skills designated by the service secretary concerned.
Availability When Not Mobilized

In his FY 1999 Air Force Posture Statement to Congress, Acting Secretary of the Air Force F. W. Whitten Peters stated that the service had helped to reduce operational tempo rates for active units through the creative use of the Reserve and Guard units and increases in manning in highly stressed specialties. However, these efforts have placed a new burden on the RC. During 1997, RC aircrews served an average of 110 days in uniform, with their support teams serving 80 days. (Department of the Air Force, 1998, pp. 2–3.)

Although those 110 days in uniform were not all days deployed overseas, they were days that may have been spent away from a full-time job, home, and family. Assuming that the RC is currently responding at or near its capacity to alleviate heavy deployment demands, this number of days in uniform may be an approximate upper limit on participation for the part-time RC force. Given time required for training and other administrative needs, availability of part-timers for deployment is considerably less than the 110 days in uniform stated above.

Thaler and Norton (1997) estimated the number of contingency deployment days available for AC and RC aircrews. Assuming a desired maximum of 120 temporary duty (TDY) days per year is established for active aircrews, they calculated that AC aircrews in the continental United States spend around 50 TDY days per year participating in individual training, joint exercises, and other activities not related to contingency operations. This leaves 70 days available for contingency operations. Thaler and Norton also postulate that RC crews are available for 50 days of TDY per year, of which 15 days are available for overseas contingencies after noncontingency training, exercise, and other needs are satisfied. This limit has been validated through our own interviews with RC representatives at the headquar-

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8Thaler and Norton postulate that aircrews in Europe require slightly more noncontingency TDY (60 days), leaving slightly fewer days available for contingencies (60 days).
Readiness and Availability 43
ters and unit level.9 AC aircrew deployments to Southwest Asia have been reduced to 45 days, which may be close to a minimum rotation duration to permit effective continuity of operations for fighters or command and control aircraft. Although a 45-day overseas deployment fits within the postulated 50-day limit for RC aircrews, such a deployment would not allow enough additional TDY for a RED FLAG or other unit training deployment after return to the home station. RC units can rotate aircrews to deployment sites in increments of fewer than 45 days, but the impact of shorter rotations on operational effectiveness remains to be examined.

The ANG has collected aircrew activity data that help to put Thaler and Norton’s postulated level of availability in perspective. Figure 4.2 shows the number of TDY days experienced by active flying aircrews in ANG wings during FY 1997. The average number of TDY days is 37 days, somewhat fewer than the 50 days postulated by Thaler and Norton (1997).

TDY by reservists is included within total time spent in uniform. Figure 4.3 shows the number of days in uniform for active flying aircrews in ANG wings (all pay periods for traditional guardsmen and periods beyond the normal duty day for full-time technicians and active Guard/Reserve status individuals). We supply these data to help put the TDY data in perspective.

There is evidence that length of a TDY assignment is as important as the total yearly time away in determining the availability of RC aircrews. AFR volunteer rates for normal operations, small contingencies, and large contingencies during 1996 are shown in Figure 4.4. The data show a steep dropoff in volunteers for TDYs of 10 days or more. According to these data, the reserve strategic airlift pilot, who is offered shorter TDYs, may be more likely to volunteer than a fighter pilot or civil engineer who must volunteer in chunks of 45 days or more.

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9Interviewees have said that for some personnel, 50 days per year is at the high end of what they can expect to provide given their full-time work and family responsibilities. However, except as constrained by law, full-time reservists may have the same availability as AC members.
Figure 4.2—FY 1997 TDY Days by ANG Aircrews

Average = 37 days


Figure 4.3—FY 1997 Days in Uniform by ANG Aircrews

Average = 81 days

IMPLICATIONS FOR THE FORCE MIX

The evidence indicates that RC units are as ready as AC units for use in a major theater war, and have approximately the same availability, assuming mobilization. RC units maintain a high level of readiness, notwithstanding fewer training missions than AC units, because they have higher experience levels. However, for major operations short of declared war and for current peacetime contingency operations, RC units have limited availability relative to AC units.

Given readiness parity, 100 percent of the force could be in the RC with no loss of effectiveness, as indicated by the locus of the readiness constraint in Figure 4.5. This finding offers no guarantee that the RC could maintain its current high state of readiness in the long run if it had no AC as a source of experienced accessions. This personnel flow constraint will be considered separately in Chapter Five.

Availability, on the other hand, is limited for the RC because of its predominantly part-time workforce. Because of limits on mobiliza-
Figure 4.5—Locus of Availability and Readiness Constraints on the Force Mix

tion, the RC cannot satisfy certain short-notice or long-duration requirements specified in operational plans. Greater limits on cumulative deployment time and duration of deployment relative to the AC mean that the RC is less available for meeting contingency requirements. As the total force declines in size, assuming these force employment demands remain constant, the availability constraint, as depicted in Figure 4.5, permits a decreasing proportion of the total force to be placed in the RC.\footnote{To illustrate why the line is sloped for major contingencies, consider a hypothetical MTW requirement for 2,000,000 military personnel, of whom a maximum of 1,000,000 may be mobilized reservists. If the total force consists of 3,000,000 military members, at least 1,000,000 must be in the active component in order to meet the MTW requirement. This limits the RC to no more than 67 percent of the total force. If the total force were larger—4,000,000—the requirement could be met with an RC of up to 75 percent of the total. To illustrate why the line is sloped for smaller peacetime contingencies, consider a hypothetical fighter force mix. Assume that AC squadrons can...} However, the specific locus of this...
constraint varies by mission or function. The availability constraint for a high-tempo asset such as an AWACS unit will be far different from the constraint for a low-tempo asset such as an air defense or space operations unit.

Support 1200 deployed aircraft-days per year and RC squadrons can support 360. (These availability estimates are derived in Chapter Six.) If the total force must be sized at 20 fighter wing equivalents (FWEs), each consisting of three standard-sized squadrons, to support a two-MTW scenario and must supply, say, 50,000 deployed days per year, it can consist of, at most, 8.73 RC FWEs, or 43.6 percent of the total fighter force. The computations are:

RC contribution
\[ 8.73 \text{ FWE} \times 3 \text{ squadrons} \times 360 \text{ deployed aircraft-days} = 9428 \text{ deployed aircraft-days} \]

AC contribution
\[ (20 - 8.73 \text{ FWE}) \times 3 \text{ squadrons} \times 1200 \text{ deployed aircraft-days} = 40,572 \text{ deployed aircraft-days} \]

The sum of the RC and AC contributions to deployed aircraft-days is 50,000. Any substitution of more RC FWEs for fewer AC FWEs results in fewer than 50,000 deployed aircraft-days.

If the total force is reduced to 16 FWEs but faces the same deployment demand, it can consist of, at most, three RC FWEs, or 19 percent of the total fighter force.