Strategic Airlift Operations for the Gulf War
An Assessment of Operational Efficiency

The deployment of U.S. combat forces to the Persian Gulf on 7 August 1990 was made possible by the greatest airlift in history. Over a period of seven months, the Military Airlift Command (MAC)\(^1\) moved more than a half-million short tons of cargo and almost a half-million passengers. Daily ton-miles were ten times the rate of the 1947–1948 Berlin Airlift and four times the rate of the 1973 airlift to Israel. For the most part, this unprecedented operation was highly successful. Yet by many measures the airlift system seemed to fall short of its expected performance levels. Daily throughput, utilization rates, percentage of aircraft available, and average payloads all failed to meet planning expectations. Such shortfalls suggest either that capabilities were overestimated in planning or that operations were not efficient.

A recent RAND study assesses strategic airlift operations during Operation Desert Shield/Desert Storm (ODS). Based on interviews with participants and on a comparison of data from the airlift operation with expectations derived from planning factors, the study concludes that operational performance of the airlift system was affected by a variety of problems, many of them beyond MAC’s control. The study analyzes these problems by grouping them into four broad categories: planning, aircrew availability, bases, and aircraft performance.

**Planning**

Operation Desert Shield began without an executable transportation plan. The first units started deploying with only general guidance on the total lift requirement and frequently had to update their estimates during deployment, making it impossible to use the airlift fleet efficiently. The problem was exacerbated by the fact that unit databases were often out of date, listing phased-out equipment and sometimes overlooking newer pieces. Furthermore, as the situation in the theater developed, the Central Command (CENTCOM) kept reassessing its priorities and reallocating lift needs. Continual changes by CENTCOM and supporting commands upset MAC’s detailed planning, making it impossible for MAC to keep its assets working at planned performance levels, which, according to the study, were overly optimistic because they counted on all elements within the airlift system to perform optimally both during the buildup and during the war. Finally, after the war was over, new problems created by inadequate planning arose: CENTCOM’s lack of a redeployment plan and a redeployment office led to chaos during the first weeks of the effort to bring personnel home.

**Aircrew Availability**

Standard, published utilization rates assume that all aircrews, both active and reserve components, are available for Air Mobility Command’s (AMC’s) use. They also assume that stage facilities will be available where needed for optimal performance. In ODS, both of these assumptions proved false.

Roughly half of MAC’s/AMC’s strategic aircrews are in the reserves. No reserves were called up until 16 days into the deployment, and, although there were volunteers from the beginning, it was impossible to efficiently incorporate them until the activation. The call-up proceeded slowly. It continued for seven months but even then was not complete. The resulting crew shortages prevented MAC from achieving full utilization of the fleet. Adding to the problem was CENTCOM’s decision to deny MAC a stage base in the Southwest Asian theater, which forced MAC to use augmented crews—three rather than two pilots per aircraft—for the round-trip from Europe to the theater. The use of augmented crews consumed crew hours at such a rate that the monthly limit was reached after about three weeks. Given the limited availability of crews, the lack of a stage base in the theater may have led to a 20 to 25 percent shortfall in airlift system performance. The call-up of reserves came just in time to avoid a serious degradation of the system, but mission delays due to crew rest requirements remained a significant problem for both the C-141 and C-5 fleets.

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\(^1\)As of June 1992, MAC was reconstituted as the Air Mobility Command (AMC).
Bases

MAC experienced a broad range of problems at onload, enroute, and offload bases. Most deploying units were unable to generate cargo within the time assumed in onload planning. Some units had little or no mobility experience, inadequate mobility load plans, and no single identified point of contact for mobility operations, a situation that made communications between deploying units and MAC extremely inefficient. These difficulties, combined with insufficient and unreliable material handling equipment (MHE), meant that many missions were delayed or postponed, thereby reducing the utilization rate of the airlift fleet.

Another constraint on the airlift flow was the relatively small number of enroute bases used. The entire system was sensitive to disruption at these bases caused by weather, air traffic control, or ramp congestion. Because MAC was no longer running a stage operation for peacetime channel flights to Europe, there was a learning curve for personnel at European command posts. (Channel flights are established logistics flights between major installations with clear cargo/passerenger transportation requirements.)

Finally, airlift flow was substantially constrained because onload operations were largely confined to one airfield—Dhahran. This limitation reduced throughput potential and increased the sensitivity of the entire operation to delays at a single base. Such problems as fuel system limitations, ramp space constraints, pallet congestion, and MHE shortfalls and breakdowns not only disrupted onload schedules but also created backups in Europe.

Aircraft Performance

Neither the C-5 nor the C-141 performed up to expectations. On the average, 33 percent of the C-5 fleet was unavailable, primarily because of maintenance problems. Of those aircraft that were available, the delay per mission due to logistics averaged 9.0 hours. Consequently, the C-5 fleet could not always meet demand for outsize cargo capability. The C-141 had a better maintenance record, but its average payload fell 26 percent below planning factors, primarily because concerns about aircraft fatigue problems led to load weight restrictions. Yet, in evaluating areas of apparently poor aircraft performance, the study found that some examples actually reflect sensible operational decisions: Desert Express, medevac withholds, and the use of narrow-body Civilian Reserve Air Fleet (CRAF) aircraft for smaller movements.

Implications

The experience of Operation Desert Shield/Desert Storm highlights the fact that airlift is a system, and that a system functions efficiently only if each of its components works well and all components are kept in balance. To upgrade the performance of the airlift system for future operations, the study recommends specific improvements in all four of the problem areas.

Planning. Many airlift problems could be avoided if, at an early stage, contingency planning incorporated knowledgeable transporters who could provide a basis for making feasible transportation plans. Transporters, meanwhile, should develop more flexible planning tools in order to be able to react effectively to orders for rapid deployment of forces. In addition, AMC should reexamine planning factors, lowering unrealistic expectations of optimal performance.

Aircrrews. The Department of Defense should strive to ensure that the Air Mobility Command has sufficient aircrews in a crisis and that these crews have adequate staging facilities. Consideration should be given to granting the AMC commander limited authority to call up airlift reserve personnel in a transportation emergency, as now can be done with Stage I of the Civil Reserve Air Fleet.

Bases. As U.S. forces are withdrawn from overseas areas, the enroute structure could erode. Similarly, the absence of reliable access to good bases enroute and in the theater will adversely affect combat operations. The United States needs to work on appropriate agreements with allies to ensure maintenance of key bases and quick access to them in a crisis. At home, every unit and every base should have mobility load plans and a single identified point of contact for mobility operations. In addition, all bases should acquire reliable new MHE. Finally, coordination between bases, units, and airlift commands should be increased.

Aircraft. The Department of Defense should replace the aging C-141 fleet with newer aircraft. This modernization is essential if the United States is to maintain a capability for mounting large-scale operations. The ODS experience also suggests that the existing fleet may not be able to supply sufficient outsize cargo capability. The C-17 should be able to address both of these problems as well as provide greater throughput when access is limited.

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