

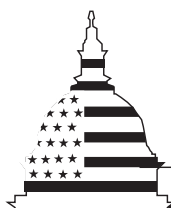
GAO

Report to the Chairman of the
Subcommittee on Defense, Committee on
Appropriations, House of
Representatives

November 1999

DEFENSE COMPUTERS

U.S. Transportation Command's Management of Y2K Operational Testing



G A O

Accountability * Integrity * Reliability

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Abbreviations

AMC	Air Mobility Command
CINC	Commanders-in-Chief
DOD	Department of Defense
JCS	Joint Chiefs of Staff
MSC	Military Sealift Command
MTMC	Military Traffic Management Command
MTW	major theater war
OPEVAL	operational evaluation
TRANSCOM	U.S. Transportation Command
Y2K	Year 2000



United States General Accounting Office
Washington, D.C. 20548

Accounting and Information
Management Division

B-282545

November 15, 1999

The Honorable Jerry Lewis
Chairman
Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

Complete and thorough Year 2000 (Y2K) end-to-end testing is essential to provide reasonable assurance that new or modified systems used to collectively support a core business function or mission operation will not jeopardize an organization's ability to deliver products and services as a result of the Y2K computing problem. This is especially true for the Department of Defense (DOD) because it relies on a complex and broad array of interconnected computer systems—including weapons, command and control, satellite, inventory management, transportation management, health, financial, personnel and payment systems—to carry out its military operations and supporting business functions.

At your request, we are reviewing DOD's management of its various Year 2000-related end-to-end testing activities. As part of our efforts, we assessed the U.S. Transportation Command's (TRANSCOM) management of its end-to-end test of its ability to plan and execute joint major theater war (MTW) deployment operations, and determined what the results of this test show with respect to operational risks and readiness.¹ We briefed TRANSCOM officials on our findings on August 24, 1999, and made recommendations to correct the management weaknesses that we found. TRANSCOM took immediate action to address our recommendations, and on September 14, 1999, we briefed your office on our findings and TRANSCOM's actions. The purpose of this letter is to summarize our briefing to your office. The briefing slides that we presented to your office are in appendix I, and the objectives, scope, and methodology of our review are detailed in appendix II. TRANSCOM provided oral comments on our briefing slides at the August 24, 1999, briefing, and we have incorporated

¹DOD refers to its combatant commands' end-to-end tests as operational evaluations (OPEVAL).

them as appropriate. We performed our audit work from March through September 1999 in accordance with generally accepted government auditing standards.

Results in Brief

Year 2000 end-to-end testing is an essential component of an effective Year 2000 testing program since Y2K-related problems can affect so many of the systems owned and operated by an entity as well as systems belonging to business partners and infrastructure providers. Moreover, to be effective, end-to-end testing should be approached in a structured and disciplined fashion. Both the Joint Chiefs of Staff (JCS) guidance to its combatant commands on managing Year 2000 operational evaluations,² (the term JCS uses to refer to Year 2000 end-to-end testing) and our Year 2000 test guidance³ define a number of key management controls to employ when planning, executing, analyzing, and reporting on these tests and evaluations.

We found that TRANSCOM's deployment operational evaluation satisfied most of the key processes that JCS' guidance specifies. For example, TRANSCOM established a Y2K task force to guide the evaluation effort, which included surface and airlift experts, test and evaluation experts from the Joint Interoperability Test Center and the Defense Office of Test and Evaluation, component command and service representatives, and a public affairs representative. Further, TRANSCOM performed a rehearsal before conducting the test to ensure that all critical systems and interfaces were operating correctly and that all staff knew their roles and responsibilities.

However, TRANSCOM had not satisfied key steps that are pivotal to (1) fully disclosing and appropriately addressing risks associated with limitations in the defined scope of the operational evaluation and (2) accurately reporting on mission readiness and impacts. The result was that the Year 2000 readiness of critical tasks associated with conducting a MTW deployment—namely the use of commercial carriers and port operations to deploy goods and people—was not known with sufficient certainty to support TRANSCOM's May 1999 reported position that it can

² *Joint Staff Year 2000 Operational Evaluation Guide*, Version 3.0, April 1, 1999.

³ *Year 2000 Computing Crisis: A Testing Guide* (GAO/AIMD-10.1.21, issued as an exposure draft in June 1998; issued in final in November 1998).

conduct a MTW deployment in a Year 2000 environment with no material impact on operations.

TRANSCOM has since either implemented or initiated appropriate actions to address our recommendations for correcting these weaknesses. For example, it amended its final reports on the evaluation to disclose the scope limitations. It is also working with its component commands to identify their major commercial carrier business partners, to assess their readiness and risks, and to develop risk mitigation strategies. Because TRANSCOM has initiated these and other actions, we are not making further recommendations at this time.

Background

As the single manager of Defense transportation, TRANSCOM's mission is to coordinate the use of air, sea, and land transportation to deploy and sustain U.S. forces. To perform this mission, TRANSCOM relies on a wide array of information technology systems, including command and control systems, physical and human asset visibility and tracking systems, transportation feasibility and port analysis tools, and intelligence systems. TRANSCOM also depends heavily on partnerships with commercial transportation service providers such as Civil Reserve Air Fleet carriers, the commercial maritime industry, and railroad and trucking carriers. In total, these partners provide about 85 percent of Defense's transportation needs.

In August 1998, the Secretary of Defense directed the Commanders-in-Chief (CINC) to require its combatant commands, including TRANSCOM, to plan, execute, analyze, and report on a series of simulated Year 2000 operational evaluations. The evaluations, which were to assess whether DOD can continue to perform critical military operations in a Year 2000 environment, are one of three DOD end-to-end testing efforts.⁴

The purpose of end-to-end testing is to verify that a defined set of interrelated systems, which collectively support an organizational core business area or function, interoperate as intended in an operational

⁴In addition to conducting operational evaluations, the military services are conducting system integration testing and the functional business areas, such as personnel and health affairs, are conducting functional end-to-end tests. Each of these end-to-end testing activities is discussed in detail in *Defense Computers: Management Controls Are Critical to Effective Year 2000 Testing* (GAO/AIMD-99-172, June 30, 1999).

environment (either actual or simulated). These interrelated systems include not only those owned and managed by an organization, but also the external systems with which they interface or that otherwise support the business area or function. The CINC core business areas or functions are referred to as “thin lines.”

The boundaries for end-to-end tests can vary depending on a given business function’s system dependencies and criticality to the organizational mission. Therefore, in managing end-to-end test activities, it is important to analyze the interrelationships among core business functions and their supporting systems and the mission impact and risk of date-induced system failures and to use these analyses to define test boundaries. It is also important to work early and continually with functional partners to ensure that related end-to-end test activities are effectively coordinated and integrated. Table 1 highlights key processes recommended by JCS’ Year 2000 operational evaluation guidance, which is consistent with our Year 2000 test guide.

Table 1: Highlights of Key DOD-Recommended Year 2000 Testing Processes

Planning	<ul style="list-style-type: none"> • Specify test assumptions and limitations • Establish a Year 2000 Task Force • Identify critical missions/tasks/systems • Verify that systems essential to the mission are Year 2000 compliant • Develop an operational evaluation plan to guide event planning and execution • Identify and schedule support from other commands, DOD components, etc. • Determine relevant and necessary resources (e.g., funding, personnel, equipment) • Ensure that approved Year 2000 contingency plans are prepared • Develop risk management plan • Identify simulation needs and establish supporting testing environment • Develop data collection and analysis plan or approaches
Execution	<ul style="list-style-type: none"> • Conduct operational evaluation rehearsal • Follow configuration management policy • Perform baseline test for operational evaluation • Execute required Year 2000 date rollover tests • Collect and archive all Year 2000-relevant data and ensure that systems are reset to current day operations
Analysis	<ul style="list-style-type: none"> • Categorize, document, and report failures • Determine mission impact of Year 2000 failures • Ensure that exit criteria are met
Reporting	<ul style="list-style-type: none"> • Prepare Year 2000 reports describing mission impact and readiness • Provide reports to Joint Staff within required time frames

TRANSCOM has already carried out two operational evaluations—the first, conducted in April 1999, assessed its ability to manage a MTW deployment operation and the second, conducted in May and June 1999, assessed its ability to manage a MTW sustainment operation.⁵ A third evaluation, which will retest the same 23 systems included in the May and June sustainment

⁵Deployment refers to all activities associated with systematically transporting personnel, material, and other elements from a home station or origin through destination. Sustainment refers to all activities associated with maintaining or supporting the deployed personnel, material, and other elements.

evaluation, is planned for October 1999. In addition to these events, TRANSCOM has taken part in other DOD Year 2000 exercises.

TRANSCOM Implemented Many Important Management Processes on Its Deployment Operational Evaluation

As noted in table 2, we found that TRANSCOM had satisfied the majority of the management process controls (17 of 21) specified in JCS' operational evaluation guidance.

Table 2: Summary of TRANSCOM Satisfaction of JCS Evaluation Criteria on Deployment Evaluation

Phases	Number of primary evaluation criteria	Number of primary criteria satisfied
Planning	11	9
Execution	5	5
Analysis	3	2
Reporting	2	1
Total	21	17

Consistent with JCS guidance governing operational evaluation planning, TRANSCOM established a Year 2000 task force, which included surface and airlift experts, test and evaluation experts, system analysts, component and service representatives, and a public affairs representative. It identified 15 critical tasks needed to carry out a MTW deployment mission and identified a total of 23 "thin line" systems that support its capability to manage the deployment mission. TRANSCOM also verified that the 23 systems were certified as Year 2000 compliant. Further, TRANSCOM developed a test plan that documented participant roles and responsibilities, critical missions and tasks, test cases, and reporting requirements.

TRANSCOM also took effective steps in executing and reporting its evaluation. For instance, before executing the operational evaluation, TRANSCOM performed a rehearsal to ensure that all critical systems and interfaces were operating correctly and that all staff knew their roles and responsibilities. Before resetting systems to present day operational conditions, TRANSCOM officials determined that the defined "thin line" was completely exercised, all items in the master scenario events list were performed, and that all data needed to make an assessment of the command's ability to perform its deployment mission were collected and

archived. Also, TRANSCOM ensured that required reports were submitted on time and that they addressed specified reporting requirements.

TRANSCOM Did Not Satisfy Some Key Steps Related to Testing Limitations and Deviations

While TRANSCOM followed most JCS-specified criteria needed to effectively manage its evaluation, it did not adequately satisfy certain planning, analysis, and reporting criteria associated with the evaluation's scope. Specifically, when planning the evaluation, TRANSCOM concluded that it was not feasible or affordable to actively engage commercial transportation providers and ports in its evaluation. As a result, TRANSCOM decided to rely on its commercial partners to ensure the readiness of their respective transportation systems, and thus to assume these partners' ability to perform their military deployment and sustainment support roles and responsibilities. Further, while TRANSCOM officials stated that they communicated this assumption orally to JCS, TRANSCOM's operational evaluation plan did not specify this scope limitation nor did it address the exclusion of these partners as a risk that could adversely affect its ability to draw conclusions about TRANSCOM's mission readiness. Moreover, TRANSCOM did not verify the validity of this assumption through any assessment of its key business partners' readiness, and in fact did not consider information available at the time of the operational evaluation that raised concerns about the Year 2000 readiness of the nation's transportation sector. Despite this scope limitation, TRANSCOM reported to JCS that critical deployment tasks could be performed during calendar and leap year date rollovers with no significant impact on its mission readiness.

As stressed in our briefing to TRANSCOM officials, Defense transportation services for deployment and sustainment are provided primarily by the commercial transportation sector. For example, Civil Reserve Air Fleet carriers account for 90 percent of long-range passenger capability and 40 percent of long-range cargo capability. The commercial maritime industry provides nearly all wartime sustainment capability. In addition, commercial rail and truck carriers provide virtually all continental U.S. surface transportation capability. TRANSCOM also depends on commercial systems that support and maintain air and water port operations to fulfill its deployment and sustainment missions. Therefore, without knowing commercial carrier and port Year 2000 readiness, TRANSCOM's conclusion that all its critical missions and tasks could continue to be performed into the Year 2000 without material disruption was not justified. Also, without disclosing the scope limitation and related risks, TRANSCOM did not provide DOD leadership with complete and reliable information upon

which to assess DOD's institutional Year 2000 readiness to execute military operations.

To address these concerns, we recommended in our August 24, 1999, briefing that TRANSCOM amend its final reports to JCS to disclose the scope limitations and related risks. We also recommended that TRANSCOM assess and selectively verify the readiness of transportation systems belonging to its commercial partners.

TRANSCOM Is Addressing Our Recommendations

TRANSCOM agreed with our recommendations and is responding to them. First, TRANSCOM amended its final reports to JCS to disclose the scope limitations of its operational evaluation and to qualify its previous conclusion about Year 2000 readiness. In brief, the amended report states that TRANSCOM's ability to perform its full deployment and sustainment missions requires a yet-to-be confirmed assumption that the commercial transportation industry can perform its part of the missions.

Second, to assess commercial carrier readiness, TRANSCOM has been seeking confirmation letters from commercial carriers whose systems exchange data with TRANSCOM's Global Transportation Network. The Global Transportation Network is a system that provides in-transit visibility of transportation assets, passengers, and cargo. As of August 24, 1999, TRANSCOM had received confirmations on Y2K readiness from 20 of 27 of the network's data exchange partners.

Third, TRANSCOM has been working with other federal agencies, such as the Department of Transportation, to assess transportation sector readiness by reviewing industry assessments and Internet web sites. It also plans to verify the reported readiness of selected transportation partners.

Fourth, TRANSCOM is working with its component commands (i.e., Air Mobility Command, Military Traffic Management Command, and Military Sealift Command)⁶ to identify their major commercial carrier business partners, identify these partners' Year 2000 readiness and associated risks, and develop risk mitigation strategies. The first of these status reports was due September 15, and showed that significant progress had been made by TRANSCOM in determining the Year 2000 readiness of its domestic commercial transportation partners. For example, TRANSCOM determined that 89 percent of its Civil Reserve Air Fleet carriers, all major rail carriers, and 196 of 199 trucking carriers have reported that they are Year 2000 compliant. In addition, most North American ports have compliance programs in place and all military active and ready reserve fleet ships are certified Year 2000 compliant. However, TRANSCOM is still in the process of determining the Year 2000 readiness of international ports, airfields, and other international commercial carriers that are key to accomplishing its deployment and sustainment missions.

Conclusions

By acting swiftly to address our recommendations made during the August 24, 1999, briefing, TRANSCOM is increasing the effectiveness and value of its operational evaluation and is mitigating the risks associated with being able to operate effectively in the year 2000. Further, it has ensured that DOD managers have complete and reliable information to use in making informed military decisions. As a result, they have largely satisfied the intent of those recommendations, and we are not making any further recommendations at this time.

We are sending copies of this report to Representative John P. Murtha, Ranking Minority Member, Subcommittee on Defense, House Appropriations Committee; Senator John Warner, Chairman, and Senator Carl Levin, Ranking Minority Member, Senate Committee on Armed Services; Senator Ted Stevens, Chairman, and Senator Daniel Inouye,

⁶TRANSCOM consists of three military service-level component commands, including the Army Military Traffic Management Command (MTMC), the Air Force Air Mobility Command (AMC), and the Navy Military Sealift Command (MSC). MTMC manages both land (truck and rail) transportation and water port operations. AMC provides strategic airlift and aerial refueling services, performs aeromedical evacuation, and operates special assignment aircraft (such as Air Force One). MSC employs a combination of government-owned and commercial ships to carry out sea transportation operations and also manages prepositioned ships.

Ranking Minority Member, Subcommittee on Defense, Senate Committee on Appropriations; Representative Floyd Spence, Chairman, and Ike Skelton, Ranking Minority Member, House Committee on Armed Services.

We are also sending copies to the Honorable John Koskinen, Chair of the President's Year 2000 Conversion Council; the Honorable William Cohen, Secretary of Defense; the Honorable John Hamre, Deputy Secretary of Defense; General Henry Shelton, Chairman of the Joint Chiefs of Staff; Arthur Money, Assistant Secretary of Defense for Command, Control, Communications, and Intelligence; and the Honorable Jacob Lew, Director, Office of Management and Budget. Copies will also be made available to others upon request.

Should you or your staff have any questions concerning this report, please contact me at (202) 512-6240. I can also be reached by e-mail at *brockj.aimd@gao.gov*. Other points of contact and key contributors to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink, appearing to read "J. Brock, Jr.", with a stylized, cursive flourish extending to the right.

Jack L. Brock, Jr.
Director, Governmentwide and Defense
Information Systems

Briefing on Results of GAO Review of TRANSCOM Turbo Y2K-Part A OPEVAL



Results of GAO Review of TRANSCOM Turbo Y2K-Part A OPEVAL

House Appropriations Committee

September 14, 1999



Introduction

- In August 1998, the Secretary of Defense directed the Commanders-in-Chief (CINC), who are responsible for Defense's unified combatant commands, to plan, execute, and report on a series of simulated Year 2000 operational evaluations (Y2K OPEVALs).
- The CINC Y2K OPEVALs are one of three Defense Y2K end-to-end test and evaluation efforts. GAO's Y2K test guide advocates end-to-end testing, which is testing performed to verify that a defined set of interrelated systems (i.e., systems that collectively support an organizational core business function or operation) interoperate as intended in a Y2K environment.
- The CINC core business functions/operations are referred to as "thin lines."



Objectives

- At the request of the Chairman, House Appropriations Committee, Defense Subcommittee, GAO is reviewing selected OPEVALs to determine
 - (1) if the OPEVAL was planned, executed, and documented in accordance with DOD guidelines and
 - (2) what the OPEVAL results indicated concerning readiness and risks.
- OPEVALs GAO reviewed included those conducted by TRANSCOM and SPACECOM and were selected in collaboration with the Defense Inspector General (IG) to ensure
 - appropriate coverage of all CINC OPEVALs and
 - no duplication of effort.



Scope and Methodology

- This briefing addresses the TRANSCOM Turbo Y2K - Part A (major theater war (MTW) deployment) OPEVAL. To satisfy objective (1), we
 - reviewed the OPEVAL plan, testing documents/records, and test results/reports,
 - interviewed TRANSCOM officials responsible for Y2K OPEVAL planning, execution, and reporting tasks,
 - observed the century date rollover test for the MTW deployment execution function, and
 - compared TRANSCOM's planning, execution, analysis, and reporting actions against Defense OPEVAL guidance.



Scope and Methodology

- To satisfy objective (2), we
 - reviewed TRANSCOM's OPEVAL results, 7- and 30-day reports, and system problem tracking reports and
 - interviewed TRANSCOM officials and analysts responsible for developing OPEVAL assessment methodologies, interpreting evaluation metrics, and ensuring that evaluation exit criteria were met.
- On August 24, 1999 we briefed TRANSCOM leadership on the results of our review and made recommendations to address our findings. TRANSCOM immediately acted on these recommendations. These actions are described where appropriate in this briefing.
- We performed our work from March through September 1999 in accordance with generally accepted government auditing standards.



Background

DOD OPEVAL Overview

- To assist the CINCs in planning, documenting, executing, analyzing, and reporting OPEVALs, the Joint Staff issued OPEVAL guidance. The guidance is divided into phases:
 - identification and planning
 - execution
 - analysis
 - reporting
- The OPEVAL guidance is consistent with GAO's end-to-end testing guidance and DOD's Y2K management plan.



Background

TRANSCOM and Its OPEVAL Events' Status

- As the single manager of Defense transportation, TRANSCOM coordinates the use of air, sea, and land transportation to *deploy* and *sustain* U.S. forces.
- To fulfill its *deployment* and *sustainment* missions, TRANSCOM depends on and partners with commercial transportation service providers. These partners provide about 85% of Defense's transportation needs. For example,
 - Civil Reserve Air Fleet (CRAF) carriers account for 90% of long-range passenger capability and 40% of long-range cargo capability.
 - the commercial maritime industry provides nearly all wartime sustainment capability, and
 - commercial rail and truck carriers provide virtually all continental U.S. surface transportation capability.



Background

- TRANSCOM also depends on commercial systems that support and maintain air and water port operations to fulfill its deployment and sustainment missions.
- TRANSCOM identified an OPEVAL “thin line” within its deployment mission and an OPEVAL “thin line” within its sustainment mission. The deployment “thin line” consists of 15 critical tasks and 23 systems that map to those tasks. The sustainment “thin line” consists of 7 critical tasks and 23 systems.
- The following table describes the status of TRANSCOM’s OPEVAL events.



Background

Evaluation/Readiness Assessment Events	"Thin Line"	Schedule	Results
OPEVAL Part A	MTW deployment management	April 5-30, 1999	1 soft ^c failure and 5 hard ^d failures; no contingency plans invoked.
OPEVAL Part B	MTW sustainment management	May 24-June 4, 1999	1 hard failure; contingency plan invoked.
OPEVAL Part C	MTW sustainment management retest	October 12-27, 1999	
CCA ^a	MTW deployment management	May 3-7, 1999	Global Transportation Network (GTN) ^e contingency plan evaluated.
JMRR ^b	Dual MTW deployment and sustainment	August 1999	Classified assessment on Y2K readiness of international ports and airfields.

^aThe Chairman's Contingency Assessment (CCA) was designed to evaluate the ability of TRANSCOM to perform the MTW deployment mission in an environment degraded by Y2K failures.

^bJoint Monthly Readiness Reviews (JMRR) focus on describing readiness deficiencies and corrective actions and are used by Defense to identify opportunities to improve warfighting effectiveness.

^cA soft failure is a Y2K-related failure that is not immediately discernable. The effect may be cumulative and require several hours, days, or longer to manifest itself.

^dA hard failure is a Y2K-related failure that results in an obvious adverse impact to the system. For example, the system shuts down, erroneous data is displayed, or unexpected actions occur.

^eGTN is an integrated database containing all the data necessary to track the location of deploying units' personnel and equipment, patients, sustainment cargo, and other vital resources as they move between theaters.



Background

Turbo Y2K-Part A OPEVAL

- Turbo Y2K - Part A evaluated TRANSCOM's ability to *manage* a joint MTW deployment operation.
- Turbo Y2K - Part A OPEVAL examined one "thin line"--deployment management--and the capability of the system's "thin line" to operate correctly at Y2K.
- Turbo Y2K - Part A was conducted in collaboration with other DOD organizations, including Central Command (CENTCOM), the military services, and Defense agencies. It was intended to emulate a real-world MTW deployment operation.



Background

- Turbo Y2K-Part A OPEVAL assessed century rollover and leap year critical dates.
- Turbo Y2K-Part A OPEVAL was conducted during April 5-30, 1999.
 - Rehearsal: March 29 - April 2, 1999.
 - Baseline: April 5-9, 1999.
 - Calendar year rollover: April 19-23, 1999.
 - Leap year rollover: April 26-30, 1999.



Background

Turbo Y2K-Part A critical tasks	"Thin Line" systems
1. Determine transportation and support availability	GCCS/JOPE/GDSS/ADANS CMARPS/ACFP
2. Coordinate and match transportation resources and requirements	GCCS/JOPE/JFAST/ADANS
3. Provide for enroute support and clearances	No "thin line" systems used
4. Integrate deployment systems	GTN/GCCS/JOPE/CMOS/DAAS TCACCIS/GDSS/ADANS/RCAPS CAPSII/C2IPS/Broker/CAMS-G081/IBS WPS/GOPAX/IC3/CFM/AMS
5. Provide forces and mobility assets	C2IPS/GDSS/Broker/CAMS-G081 IC3/AMS/WPS/CFM
6. Provide terminal operations at ports of embarkation	CAPSII/RCAPS/GDSS/WPS/AMS GCCS/JOPE
7. Move forces and sustainment from origin to port of debarkation	GCCS/JOPE/GDSS/ADANS/ACFP C2IPS/GTN/TMDS/IBS/IC3/CFM GOPAX/AMS/TCACCIS
8. Coordinate global strategic refueling	CMARPS/ADANS/GDSS/C2IPS/GTN
9. Provide global patient movement aeromedical evacuation	No "thin line" systems used
10. Produce strategic and theater strategic intelligence and prepare intelligence products	IDHS
11. Disseminate and integrate theater strategic intelligence	IDHS
12. Manage national military C4 systems worldwide for communicating strategic decisions and information	No "thin line" systems used
13. Provide strategic direction to forces worldwide	GDSS/C2IPS
14. Expand transportation support system	GDSS/ADANS/IC3/JFAST
15. Determine and validate forces and cargo to be deployed or redeployed	GCCS/JOPE



Results of GAO Review



Planning

Defense Test Criteria	Result
Specify and validate test assumptions	Partially satisfied
Establish a Y2K task force and assign responsibilities	Satisfied
Identify critical missions/tasks/systems	Satisfied
Verify systems essential to mission are Y2K compliant/certified	Satisfied
Develop OPEVAL plan to guide event planning and execution	Satisfied
Identify and schedule CINC/Allied/Component/Agency support	Satisfied
Determine relevant and necessary resources (e.g., funding, personnel, equipment),	Satisfied
Ensure approved Y2K contingency plans are prepared	Satisfied
Develop risk management plan	Partially satisfied
Identify simulation needs and establish supporting environment	Satisfied
Develop data collection and analysis plan or approaches	Satisfied



Findings: Planning

Criteria: In planning for OPEVAL, CINCs are to define and validate assumptions concerning the readiness of systems and the ability to evaluate systems in light of real-world limitations.

Finding 1: To prevent potential corruption of live data during Turbo Y2K Part A OPEVAL, TRANSCOM decided to simulate the operational “thin line” systems environment.



Findings: Planning

Finding 2: TRANSCOM determined that it would not be affordable or feasible to include commercial transportation partners in its OPEVAL. Instead, TRANSCOM decided to (1) limit the scope to its deployment management capability, (2) rely on other Defense components to verify the Y2K readiness of Defense transportation assets, and (3) assume the readiness of its commercial partners' assets (carriers and port operations). However, this assumption was not based on assessment and verification of the partners' readiness and was not stated in the OPEVAL plan. According to TRANSCOM officials, this assumption and the limitations it imposed on the scope of the OPEVAL was shared orally with the Joint Staff.

Finding 3: In response to our findings and recommendations, TRANSCOM amended its 30-day reports to Joint Staff to disclose OPEVAL scope limitations, and it strengthened its efforts to verify its assumption about the readiness of commercial partners' assets.



Findings: Planning

Criteria: A CINC Y2K Task Force composed of various knowledgeable Y2K, test, and systems experts should be formed to establish the base for all Y2K planning, coordination, execution, and reporting.

Finding: TRANSCOM established a Y2K Task Force based on the defined scope of OPEVAL and it defined roles and responsibilities for each member. Members of the task force included Y2K subject matter experts, surface and airlift experts, test and evaluation experts from the Joint Interoperability Test Center (JITC) and the Defense Office of Test and Evaluation, system analysts, component command and service representatives, and a public affairs representative.



Finding: Planning

Criteria: CINCs need to analyze critical missions to determine the most critical missions and identify the critical tasks supporting each critical mission. In addition, the minimum number of integrated automated information platforms/systems required to perform each critical task must be identified (the “thin line”).

Finding: Consistent with its defined scope of the OPEVAL, TRANSCOM identified 15 critical tasks that it needed to carry out its management of a MTW deployment mission. In addition, TRANSCOM identified a total of 23 “thin-line” systems that support its capability to manage the deployment mission.



Finding: Planning

Criteria: Ensure that mission-critical “thin line” systems are certified Y2K compliant.

Finding: Consistent with the defined scope of the OPEVAL, TRANSCOM verified that all 23 mission-critical “thin line” systems were certified Y2K compliant.



Finding: Planning

Criteria: The Y2K task force should document how the Y2K OPEVAL will be conducted, how data will be gathered and analyzed, and what information the reports will contain.

Finding: TRANSCOM developed the Turbo Y2K Exercise Directive and Test Plan to

- ensure that mechanisms for evaluating critical dates and contingency plans for mission-critical systems are executed,
- document participant roles and responsibilities,
- link critical missions, critical tasks, architectures, test cases, and data elements, and
- establish Y2K OPEVAL reporting requirements.



Findings: Planning

Criteria: When preparing for a Y2K OPEVAL, determine the extent of participation of other CINCs, allies, components, and agencies and coordinate their participation in the event.

Finding 1: TRANSCOM identified, coordinated, and scheduled OPEVAL with CENTCOM, the transportation component commands, Defense Logistics Agency, Defense Information Systems Agency, Air Force, Army, and JITC to support the OPEVAL.

Finding 2: TRANSCOM did not provide for participation in the OPEVAL of commercial transportation service providers or the commercial systems supporting air and water port operations because neither was part of the defined OPEVAL “thin line.”



Finding: Planning

Criteria: The necessary resources (funding, personnel, training, equipment, time frames, and external organization support) should be identified and included in the plan.

Finding: TRANSCOM identified and planned for the necessary resources. For example, it estimated a \$10.4 million funding requirement and earmarked the funds. In addition, TRANSCOM coordinated the evaluation scenario and scripts with all OPEVAL participants, acquired the systems hardware and software to simulate a real-world MTW deployment operation, and scheduled the appropriate staff to support Turbo Y2K-Part A OPEVAL.



Findings: Planning

Criteria: To ensure that the defined Y2K OPEVAL exercise objectives are met, it is essential to have contingency plans in place prior to executing OPEVAL.

Finding 1: TRANSCOM ensured that approved contingency plans for all specified mission-critical “thin line” systems had been prepared prior to the start of OPEVAL.

Finding 2: During Turbo Y2K-Part A OPEVAL, TRANSCOM invoked an approved contingency plan as a work-around for the medical evacuation function. TRANSCOM officials recognized that the medical evacuation systems were not Y2K compliant and planned to use a contingency plan to address this deficiency.



Findings: Planning

Criteria: CINC-unique risk management plans should be developed to identify and mitigate system-related risks before they adversely affect mission execution.

Finding 1: TRANSCOM developed a risk management plan that identified risks and defined mitigation steps. For example, the plan provided for determining the Y2K compliance of “thin line” systems before conducting the OPEVAL and limiting OPEVAL to Y2K compliant systems or systems with clearly delineated contingency plans.



Findings: Planning

Finding 2: While the plan did not identify the exclusion of commercial carriers and ports from OPEVAL as a risk, TRANSCOM did initiate risk reduction steps by specifying that confirmation letters should be sent to vendors whose systems interface with TRANSCOM's GTN to confirm the Y2K compliance of these interfacing systems. However, confirmation letters alone do not provide sufficient verification of key business partners' readiness. Moreover, limiting the confirmation to systems that interface with GTN excludes the providers' critical systems that actually transport goods and people, as well as the systems used to maintain these systems.



Findings: Planning

Finding 3: TRANSCOM reports that it recently expanded its efforts to address the risk of excluding commercial carriers and ports from OPEVAL. According to TRANSCOM, it is working jointly with other federal agencies (e.g., Department of Transportation) to determine the Y2K readiness of the civilian transportation sector (air, sea, rail, and trucking) and plans to develop risk mitigation strategies to address any Y2K weaknesses in the sector. Further, TRANSCOM continues to seek confirmation letter responses from GTN data exchange partners (20 out of 27 received as of August 24, 1999), and, for selected key commercial carrier partners, TRANSCOM plans to verify readiness.



Finding: Planning

Criteria: CINCs should (1) determine if simulations or manual data input will be needed during the execution of the OPEVAL, and, if needed, (2) ensure that an environment that can support the simulation is planned for and acquired.

Finding: TRANSCOM officials identified the need for simulations and manual data input and ensured that data injection methodologies were included in the OPEVAL master scenario events list (MSEL) and followed. For example, during the evaluation of TRANSCOM's ability to schedule air refueling flights, TRANSCOM manually input data on fighter drag requirements received from the Air Combat Command.



Finding: Planning

Criteria: A plan should be prepared to help coordinate and synchronize all OPEVAL data collection and assessment activities.

Finding: Consistent with the specified scope of the OPEVAL, TRANSCOM developed a data collection and analysis plan that included, for example, (1) specific actions that should be accomplished by OPEVAL participants prior to the start of and at the completion of each OPEVAL, (2) ground rules for collecting and documenting mission-critical system outputs, and (3) direction on reviewing the critical tasks executed during OPEVAL and determining the performance of the mission-critical “thin line” systems.



Execution

Defense test criteria	Result
Conduct OPEVAL rehearsal	Satisfied
Follow configuration management policy	Satisfied
Perform baseline test for OPEVAL	Satisfied
Execute required Y2K date rollover tests	Satisfied
Collect and archive all Y2K-relevant data and ensure that systems are reset to current day operations	Satisfied



Findings: Execution

Criteria: Prior to executing the Y2K OPEVAL, a rehearsal should be conducted to ensure that all critical systems and interfaces identified in the system architecture are operating correctly and that OPEVAL staff know their roles and responsibilities.

Finding 1: TRANSCOM performed a rehearsal of the defined OPEVAL from March 29 - April 2, 1999. During the rehearsal, (1) the test readiness criteria were satisfied, (2) the data collection and analysis methodology was verified, (3) the final baseline system configuration was confirmed and documented, and (4) OPEVAL staff practiced their roles and responsibilities.

Finding 2: A key staff member who participated in the Turbo Y2K-Part A OPEVAL rehearsal did not participate in the actual execution of critical date rollovers, which caused a schedule delay. TRANSCOM officials were able to identify and correct the problem with no significant impact on OPEVAL events.



Finding: Execution

Criteria: The systems configuration established for baseline testing should not be changed unless authorized by the Y2K test director.

Finding: During our observation of Turbo Y2K-Part A OPEVAL, we verified that changes made to the systems configuration were authorized by the Y2K test director. We also confirmed that the approved changes were made, tested, and documented in accordance with configuration management policy.



Finding: Execution

Criteria: A baseline Y2K test should be executed to establish expected results data that will be compared to output data captured during the Y2K date rollover tests to help establish whether or not a failure is Y2K-related.

Finding: TRANSCOM conducted a baseline Y2K test. During this test (1) all critical tasks were performed, (2) data were collected as outlined in the data collection and analysis plan, and (3) automated logging systems were operationally verified.



Finding: Execution

Criteria: The defined mission-critical “thin line” system configuration should be executed using normal operating procedures and a seamless continuity of operations during critical Y2K date rollovers should be observed.

Finding: According to TRANSCOM’s OPEVAL reports, all 23 mission-critical “thin line” systems that TRANSCOM defined for this OPEVAL were executed under normal operating conditions during OPEVAL with no significant interruptions during critical Y2K date rollovers.



Finding: Execution

Criteria: Ensure that all data needed to conduct the evaluation for the Y2K case have been captured prior to resetting the system to current day operations requirements.

Finding: Prior to resetting the systems to present day operational conditions, TRANSCOM officials determined that (1) the “thin-line” was completely exercised, (2) all items in the master scenario events list were performed, and (3) all data needed to make an assessment of TRANSCOM’s ability to perform its MTW deployment mission were collected and archived.



Analysis

Defense test criteria	Result
Categorize, document, and report failures	Satisfied
Determine mission impact of Y2K failures	Satisfied
Ensure Y2K OPEVAL exit criteria are met	Partially satisfied



Finding: Analysis

Criteria: All failures are to be identified and properly categorized as either “hard” or “soft” failures and should be documented and reported in accordance with the data collection and analysis plan.

Finding: TRANSCOM identified six Y2K failures during OPEVAL and categorized one as a soft failure and five as hard failures. All failures were documented in accordance with DOD Y2K requirements and reported to the Joint Staff Y2K office. Examples of the failures include the incorrect display of the year 2000 as 100 and an incorrect time stamp date after the century date rollover.



Finding: Analysis

Criteria: Determine the impact of a system failure on the accomplishment of a critical mission.

Finding: TRANSCOM determined that all six Y2K failures had no impact on its ability to perform the deployment management mission.



Findings: Analysis

Criteria: JCS defined nine exit criteria that OPEVAL results should be measured against to ensure that critical tasks and missions can be performed in a Y2K environment.

Finding 1: TRANSCOM measured its OPEVAL performance against the nine Joint Staff exit criteria and concluded in its May 1999 report that all nine were satisfied and that critical tasks and missions can be performed across the calendar and leap year dates with no significant impact on its deployment mission.



Findings: Analysis

Finding 2: During our August 24, 1999, briefing, we told TRANSCOM that this conclusion reaches beyond, and is not justified by, the defined scope of OPEVAL because (1) TRANSCOM's ability to perform the deployment mission depends extensively on commercial partners' Y2K readiness and (2) OPEVAL did not address, and TRANSCOM did not otherwise know, whether its commercial partners' systems could satisfy the critical tasks involving them. Thus, we recommended that TRANSCOM amend its OPEVAL reports to qualify its conclusion and that it take steps, in collaboration with other federal agencies, to ascertain the Y2K readiness of its critical commercial partners.



Findings: Analysis

Finding 3: In response, TRANSCOM amended its OPEVAL Part A and B 30-day reports to disclose that the scope of the OPEVALs was limited to its ability to perform critical command, control, and synchronization tasks in support of MTW operations in a Y2K environment. The amended reports explicitly state that TRANSCOM's ability to perform its full deployment and sustainment missions requires a yet-to-be confirmed assumption that the commercial transportation sector can perform its part of the missions. Also, as described earlier, TRANSCOM reports that it reemphasized and expanded its efforts to determine the Y2K readiness of the commercial transportation sector in general and selected key carriers in particular.



Reporting

Defense test criteria	Result
Prepare Y2K reports describing mission impact and readiness	Partially satisfied
Provide reports to Joint Staff J7 within required time frames	Satisfied



Findings: Reporting

Criteria: CINCs are to prepare Y2K reports describing mission impact and readiness.

Finding 1: TRANSCOM provided its May 1999 Y2K reports to Joint Staff, which concluded that all critical tasks supporting MTW unit deployment can be performed with no significant impact on readiness caused by potential Y2K failures.

Finding 2: The May 1999 OPEVAL reports did not describe the mission impact of not evaluating or otherwise knowing the Y2K readiness of the commercial transportation providers and port operations. However, TRANSCOM has since amended its OPEVAL Part A and B 30-day reports, as we recommended, to disclose that its missions would be adversely affected if the commercial transportation sector was unable to perform its very important role in TRANSCOM's deployment and sustainment missions.



Finding: Reporting

Criteria: A preliminary report is required within 7 calendar days after the completion of OPEVAL and a final report is required within 30 calendar days. Both reports are to be provided to Joint Staff.

Finding: TRANSCOM completed both reports within the required time frames and provided them to Joint Staff.



Conclusions

- TRANSCOM satisfied many of the Defense OPEVAL requirements for its defined “thin line.”
- However, key steps that are pivotal to (1) fully disclosing and appropriately addressing any risks associated with limitations in the defined scope of OPEVAL and (2) accurately reporting on mission readiness and impacts, were not fully satisfied. The result is that the Y2K readiness of critical tasks associated with conducting a MTW deployment--namely the use of commercial carriers and port operations to deploy goods and people--were not known with sufficient surety to support TRANSCOM’s May 1999 reported position that it can conduct a MTW deployment in a Y2K environment with no material impact on operations.
- TRANSCOM has since either implemented or initiated appropriate actions to address our recommendations to correct these OPEVAL limitations. As a result, we are not making any further recommendations at this time.

Objectives, Scope, and Methodology

At the request of the Chairman, Subcommittee on Defense, House Committee on Appropriations, we selected the TRANSCOM Turbo Y2K-Part A OPEVAL for review to determine (1) whether the OPEVAL was planned, executed, and documented in accordance with DOD and GAO Year 2000 testing guidelines and (2) what the OPEVAL results indicated concerning readiness and risks. This OPEVAL was selected in collaboration with the DOD Inspector General to ensure appropriate coverage of all CINC OPEVALs and no duplication of effort.

To meet our first objective, we reviewed TRANSCOM's OPEVAL plan, testing documentation and records, and test results and associated reports. We also interviewed TRANSCOM officials responsible for Y2K OPEVAL planning, execution, and reporting tasks. Further, we observed the century date rollover test for the MTW deployment execution function and compared TRANSCOM's OPEVAL planning, execution, analysis, and reporting actions against JCS OPEVAL guidance and our Y2K testing guide.

To meet our second objective, we reviewed TRANSCOM's OPEVAL results, including its 7- and 30-day reports and system problem tracking reports. We also interviewed TRANSCOM officials and analysts responsible for developing OPEVAL assessment methodologies, interpreting evaluation metrics, and ensuring that evaluation exit criteria were met.

We requested and received comments on a draft of our briefing, which was delivered on August 24, 1999. We incorporated those comments where appropriate. We performed our audit work from March through September 1999 in accordance with generally accepted government auditing standards.

GAO Contact and Staff Acknowledgements

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