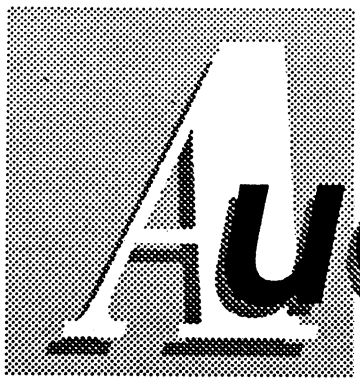

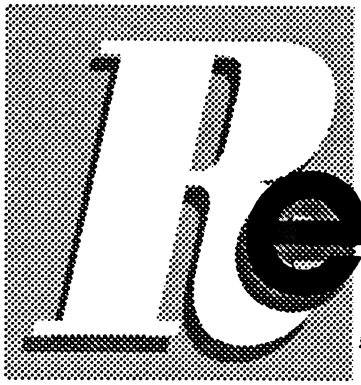

OFFICE OF THE INSPECTOR GENERAL

DOD RESOURCE UTILIZATION MEASUREMENT SYSTEM

Report No. 95-190 May 9, 1995

Department of Defense

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Acronyms

BRAC	Base Realignment and Closure Commission
GAO	General Accounting Office
OSD	Office of the Secretary of Defense
RUMS	Resource Utilization Measurement System
WSMR	White Sands Missile Range

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

May 9, 1995

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION AND TECHNOLOGY
DIRECTOR, TEST, SYSTEMS ENGINEERING, AND EVALUATION
BOARD OF DIRECTORS FOR TEST AND EVALUATION

SUBJECT: Audit Report on DoD Resource Utilization Measurement System (Report No. 95-190)

We are providing this report for your review and comments. We considered management comments on the draft of this report in preparing the final report. As a result of management comments, we redirected one recommendation to the Board of Directors for Test and Evaluation that requires the establishment of Resource Utilization Measurement System as an internal control assessable unit and deleted another recommendation that requires the reporting the lack of establishing Resource Utilization Measurement System in the Annual Statement of Assurance.

DoD Directive 7650.3 requires that all recommendations be promptly resolved. Therefore, the Board of Directors is requested to provide final comments on the recommendations by July 9, 1995.

The courtesies extended to the audit staff are appreciated. If you have questions on this audit, please contact Mr. Raymond Spencer, Program Director, at (703) 604-9071 (DSN 664-9071) or Mr. Roger Florence, Project Manager, at (703) 604-9067 (DSN 664-9067). Appendix G lists the distribution of this report. The audit team members are listed inside the back cover.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 95-190 **May 9, 1995**
(Project No. 4AB-5019.02)

DoD RESOURCE UTILIZATION MEASUREMENT SYSTEM

EXECUTIVE SUMMARY

Introduction. In response to congressional direction, DoD proposed establishing a Resource Utilization Measurement System (RUMS) to report standardized workload information that would assess Major Range and Test Facility Base (test range) capacity and use. The Office of the Secretary of Defense reported to Congress that implementation of RUMS at all test ranges would be accomplished by the end of FY 1994 if the system was feasible and useful.

Objectives. The audit's overall objectives were to evaluate the effectiveness of the implementation of RUMS and associated internal controls.

Audit Results. The DoD compliance with congressional direction to implement a utilization reporting system for test ranges has been unduly slow. The RUMS data collection and reporting methodologies were inconsistent; outdated RUMS definitions, resource categories, and measurement parameters were used despite the issuance of revisions; and the development effort had not been effectively monitored. As a result, the DoD cannot use this management tool to assist in making accurate decisions on expansions, consolidations, and improvements at the test ranges based on assessments of capacity and use. A material internal control weakness existed because DoD had not adequately monitored the implementation of RUMS and the adequacy of information provided. The RUMS will be an integral part of the internal control structure for test range management. Part I of this report discusses the internal controls assessed and Part II discusses the details on the internal control weakness.

Summary of Recommendations. We recommended that the Under Secretary of Defense for Acquisition and Technology direct the implementation of RUMS at the 19 test ranges by the end of FY 1995. We recommended that the Director, Test, Systems Engineering, and Evaluation, take an active role in the establishment of RUMS. We also recommended that the Board of Directors for Test and Evaluation designate the establishment of RUMS as an assessable unit in accordance with the DoD Internal Management Control Program.

Management Comments. Management comments were received from the Director, Test, Systems Engineering, and Evaluation. His comments included responses from the Military Departments. The Director nonconcurred with the recommendation to take an active role in RUMS development and the responses from the Military Department partially concurred with our recommendation. The Director stated that he already actively monitors the RUMS development and believes that oversight provided by the

Board of Directors, the Board of Operating Directors, and other Reliance boards is appropriate. The Director and the Military Departments partially concurred with designating RUMS as an internal control assessable unit. The Director stated that he would recommend that the Board of Operating Directors designate RUMS as an assessable unit. The Director and the Military Departments nonconcurred with reporting the lack of RUMS development as a material internal control weakness because they stated that RUMS was on track with its revised schedule. The Director and the Military Departments agreed with implementing RUMS by the end of FY 1995; however, the Director's comments stated that the Board of Operating Directors should have this responsibility.

Audit Response. Although the management comments either nonconcurred or partially concurred with the audit recommendations, planned management actions were responsive to the recommendations' intent. The comments indicated that RUMS would be implemented by the end of FY 1995 and the Director, Test, Systems Engineering, and Evaluation, agreed that RUMS should be designed as an internal control assessable unit. The basis of the nonconcurrences was either when the action would be taken or who should be responsible for taking the action. As a result of management comments, we redirected one recommendation to the Board of Directors for Test and Evaluation concerning establishing RUMS as an assessable unit and deleted another recommendation to report a material internal control weakness. If RUMS remains nonoperational as of September 30, 1995, however, the Inspector General will recommend to the Secretary of Defense that a material weakness be reported in the Annual Assurance Statement.

We request that the Chairman of the Board of Directors for Test and Evaluation provide comments to the redirected recommendation by July 9, 1995.

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This report was prepared by the Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, Department of Defense.

Part I - Introduction

Background

The Military Departments operate and maintain the 19 Major Range and Test Facility Bases (test ranges); the Office of the Secretary of Defense (OSD) is responsible for providing policy and oversight of the ranges. The six Army, six Navy, and seven Air Force test ranges support DoD Components, U.S. Government Agencies, foreign governments, and private organizations. Test ranges comprise large land and sea areas and air space divided into various test sites. Generic equipment and instrumentation such as tracking radars and threat emitters are located throughout the test ranges, while individual test sites contain equipment and instrumentation required for specific types of tests. Test ranges are used for a variety of test purposes that include aircraft, bombs, missiles, tanks, vehicles, environmental effects on weapon systems, and underwater testing of munitions and submarines. The 19 test ranges represent a DoD investment of $20 billion to $30 billion; have an annual operating budget of approximately $5 billion; and employ more than 54,000 military, civilian, and contractor personnel.

Objectives

The audit's overall objectives were to evaluate the effectiveness of the implementation of a Resource Utilization Measurement System (RUMS) and associated internal controls.

Scope and Methodology

This economy and efficiency audit was made from March through December 1994 in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the Inspector General, DoD, and accordingly included such tests of internal controls as were considered necessary. This audit included one Army, one Navy, and two Air Force test ranges that were selected to participate in the development and field trial of the RUMS. (The Naval Air Warfare Center - Weapons Division was not included in the audit due to other audit effort at that activity). We analyzed the RUMS reports from October 1992 through September 1994 to determine whether workload and utilization data were reported in accordance with applicable guidance. However, we did not perform audit tests to establish the validity of the computer-processed workload and utilization data. Specifically, we did not examine the original utilization records to determine whether the information entered into the computer systems was complete and accurate. We reviewed the mission, function, and management responsibilities of the Tri-Service RUMS Committee (the Tri-Service Committee) that was responsible for completing

RUMS development. We reviewed Tri-Service Committee minutes of meetings to determine whether issues raised were appropriately resolved. Organizations visited or contacted during the audit are listed in Appendix F.

Internal Controls

We evaluated internal controls related to the review process and the adequacy of information in support of RUMS development. We reviewed OSD's and the field trial test ranges' implementation of the DoD Internal Management Control Program as it pertained to the RUMS development. We identified a material internal control weakness as defined in DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987. Specifically, OSD and the Military Departments failed to implement the RUMS, which is an essential element in the internal control structure for range and test facility management. Also, neither OSD nor the field trial test ranges identified RUMS as an assessable unit or had identified internal control weaknesses attributable to the delays in the RUMS development effort. Recommendation 3 will correct these weaknesses. If RUMS remains nonoperational as of September 30, 1995, it should be addressed as a material internal control problem in the DoD Annual Assurance Statement for FY 1995.

The benefits of implementing the recommendations are nonmonetary. However, implementation of Recommendation 3 will result in accurate and timely RUMS reporting and provide a management tool for resource utilization comparisons. A copy of the final report will be provided to senior officials in DoD responsible for internal controls.

Prior Audit

The General Accounting Office (GAO) issued audit report GAO/NSIAD 90-91 (OSD Case No. 8451), "Test and Evaluation: A Proposed Framework for Measuring the Use of Test Facilities," August 8, 1990. GAO examined the capacity and use of the test ranges and assessed whether adequate measures of data collection and reporting were established. GAO proposed a framework that DoD could use to measure capacity and use at test ranges. GAO made no recommendations. GAO discussed the report's conclusions with OSD officials responsible for managing the test ranges; the officials generally agreed that the approach had potential and could be easily implemented.

Part II - Finding and Recommendations

DoD Resource Utilization Measurement System

DoD compliance with congressional direction to implement a utilization measurement system at test ranges has been unduly slow. OSD and the Military Departments had not been effectively monitoring the Resource Utilization Measurement System (RUMS) implementation. Problems with implementation of RUMS at the trial ranges included inconsistent data collection methodologies and the use of outdated RUMS definitions, resource categories, and measurement parameters. As a result, the OSD and the Military Departments cannot yet use this management tool to assist in making accurate decisions on consolidation, expansion, and improvements at the test ranges based on credible assessments of capacity and use. However, implementation is now planned by the end of FY 1995.

Background

In 1988, a DoD Range Commanders Council established a working group to develop a utilization measurement system to identify each test range's capacity and measure usage. However, OSD officials responsible for test range management did not adopt the system because they believed that implementing the system would be labor intensive and costly.

Later congressional concern over DoD's inability to compare workload and utilization at test ranges prompted the House Appropriations Committee, during the appropriations process for FY 1991, to direct the DoD to implement a framework for measuring usage at the test ranges. Specifically, a House of Representatives, Committee on Appropriations Report 101-822 directed that DoD institute the framework suggested in the GAO 1990 audit report, or an equivalent system, and report the results of its efforts to the House Appropriations Committee by June 1991.

In responding to the House Appropriations Committee in July 1991, the Director of Defense Research and Engineering proposed a phased development schedule for implementing a utilization measurement system. The phased approach proposed that during FY 1991, DoD would design RUMS; during FY 1992, field trials would be conducted at five test ranges[1]; during FY 1993,

[1]The five field trial test ranges selected to participate in the RUMS development were the Army's White Sands Missile Range, New Mexico; the Naval Air Warfare Center - Aircraft Division, Patuxent River, Maryland; the Naval Air Warfare Center - Weapons Division, China Lake, California; the Air Force Flight Test Center, Edwards Air Force Base, California; and the Air Force Development Test Center, Eglin Air Force Base, Florida. These test ranges were selected because they were representative of the scope and breadth of missions performed by the ranges.

DoD would assess the feasibility and usefulness of RUMS; and DoD would implement RUMS at all 19 test ranges by the end of FY 1994 if the system was feasible and useful.

The Senate Appropriations Committee also expressed concern over DoD's inability to compare workload and utilization at test ranges. In a Senate Appropriations Committee Report 102-154 concerning the DoD Appropriations Bill for FY 1992, the Committee directed DoD to develop a standard measurement system that would define the use of each Military Department's test facilities to support requested funding for FY 1993. As a result, in May 1993, the Board of Operating Directors[2] (formerly the Joint Commanders Group for Test and Evaluation) directed that a Tri-Service RUMS Committee (the Tri-Service Committee) be formed with two representatives from each Military Department to complete the RUMS development. The Tri-Service Committee was tasked to finalize the RUMS development.

The Tri-Service Committee developed definitions and measurement parameters that enabled the test ranges to perform trend analyses on the use of their test capabilities. Appendix A provides the description of RUMS definitions and parameters. Further, the Military Department representative from the test ranges developed 20 functional categories that represent the majority of test ranges' facilities and capabilities. The 20 functional categories have examples of test facilities that should be in each category or an expanded description of the category. Appendix B provides a list and description of the 20 functional categories.

DoD Directive 3200.11, "Major Range and Test Facility Base," September 29, 1980, assigns responsibilities; functions; oversight of test ranges; and budgetary decisions on range expansion, consolidation, and improvements to the Under Secretary of Defense for Acquisition and Technology (formerly the Under Secretary of Defense for Research and Engineering). The Under Secretary of Defense for Acquisition and Technology designated the Director, Test, Systems Engineering, and Evaluation (formerly the Director for Test and Evaluation), as the official responsible for establishing test range policy. The Secretaries of the Military Departments, under policy guidance and oversight of the Director for Test Systems Engineering, and Evaluation, are responsible for management of test ranges under their cognizance. The Military Departments established the Board of Directors to oversee test and evaluation infrastructure investment, infrastructure consolidation, standards, and policy. The Board of Operating Directors was established to implement the Board of Directors' decisions.

DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987, establishes policies and procedures for DoD organizations for internal management control. These policies and procedures require Federal managers

[2]The Board of Operating Directors is a Tri-Service functional group under the authority of the Board of Directors.

to implement a comprehensive system of internal controls and identify assessable units[3] that will provide reasonable assurance that assets are used properly and programs are effectively and efficiently managed.

Definitions and Measurement Parameters

In developing an approach for RUMS, the Tri-Service Committee developed definitions and measurement parameters. The purpose of the definitions and measurement parameters was to promote standardization in reporting of trial range data. The parameters measure capacity and use efficiency and were intended to assist in identifying under- or over-utilized test facilities.

For test facilities that were reported, trial ranges did not report all measurement parameters. Appendix C shows our analysis of RUMS and identifies the unreported parameters at the four trial ranges included in our review. For example, the Army's White Sands Missile Range (WSMR) reported six test facilities in RUMS and reported the parameters incorrectly. Incorrect parameters were reported because the WSMR used outdated RUMS definitions and parameters. The outdated information was submitted to the Army RUMS Tri-Service Committee representative and its validity was not questioned. WSMR officials told us that while they had expressed their concerns regarding the reporting of RUMS data to their headquarters, the Army Test and Evaluation Command, they had received no revised guidance or response to their concerns.

The Air Force Flight Test Center at Edward Air Force Base was not reporting "unconstrained capacity" in accordance with applicable guidelines. Unconstrained capacity measures the maximum time a resource could be used without personnel limitations. The Air Force Flight Test Center RUMS reported the anechoic chamber and the Integrated Facility for Avionics Systems Testing's unconstrained capacity was 16 hours per day for a 5-day week. According to the definition of unconstrained capacity, this facility should be reported at 16 hours per day for 7 days a week. Officials at the Air Force Flight Test agreed that both test facilities could be used 16 hours per day for a 7-day week. These test facilities are usually limited to 16 hours of operation due to required maintenance or repair and test setup and dismantle. As a result, these facilities' capacities were underreported by 32 hours per week.

[3]An assessable unit is defined as any organization or function capable of being evaluated by internal management control review.

Methodology and Techniques

We reviewed methodologies and techniques for gathering RUMS data at four of the five field trial test ranges (the trial ranges) and found that some test facilities and capabilities were not reported and reporting was inconsistent.

Unreported Test Facilities. Trial ranges were also not complying with the Tri-Service Committee's guidance, resulting in test facilities not being reported. For example, the Naval Air Warfare Center - Aircraft Division did not report 10 out of 20 test facilities, all of which were identified under the functional category detail description as reportable facilities. Also, the Air Force Development Test Center did not report 7 out of 14 test facilities; all of these facilities were identified in the detail description for functional categories. All test facilities at the WSMR and the Air Force Flight Test Center were reported. Appendix C lists the reported and unreported facilities by trial range.

Inconsistent Reporting. The reporting of RUMS data among the trial ranges was inconsistent for similar facilities. Some trial ranges collected RUMS data for functional categories while other trial ranges did not. For example, the Naval Air Warfare Center - Aircraft Division, Patuxent River, Maryland, reported utilization data for its over-water range, the Chesapeake Test Range. However, the Air Force Development Test Center, Eglin Air Force Base, Florida, had not reported utilization data for its over-water range, the Gulf Range Water Test Area. The description of the functional category for Test Range Complex states that "major air and ground space" is a reportable test capability. The Air Force Development Test Center personnel did not report the 86,500 square mile Gulf Range because they considered it a minor test capability. However, the Tri-Service Committee identified the over-water range as a reportable capability.

Also, reporting of facilities that had mission control systems for in-flight operations was inconsistent. The mission control systems provide in-flight safety, data collection processing and display, operation control capabilities, and range communication. The Air Force Flight Test Center and the Naval Air Warfare Center - Aircraft Division reported their facilities for mission control as required in the functional categories. However, the Air Force Development Test Center did not report utilization for the same type of facility. The Air Force Development Test Center did not report this system because it considered the facility to be minor. The detail description of the functional categories specifies that a mission control facility is a reportable capability.

Monitoring Implementation Effort

We met with Tri-Service Committee representatives to discuss the overall RUMS development. Although the Tri-Service Committee identified and documented problems with the RUMS development and issued revised guidance, little evidence showed that program execution was monitored. The

Tri-Service Committee was not aware of reporting inconsistencies that we identified at the trial ranges. These conditions resulted in incorrect resource utilization data and precluded accurate comparison of utilization data between the test ranges.

A Navy official, who was Chairman of the Tri-Service Committee during the RUMS development, stated that it was not the Tri-Service Committee's intention that all test capabilities be reported. He stated that the Tri-Service Committee decided that reporting could be limited to 80 percent of reportable test capabilities. However, the Navy official was unable to provide documentation supporting the Tri-Service Committee's decision to limit reportable test capabilities. We determined that the Naval Air Warfare Center - Aircraft Division was only reporting 50 percent of the testing capabilities.

The Tri-Service Committee official at the Air Force Development Test Center decided that only 85 percent of its test capabilities would be reported. The Tri-Service Committee official stated that the test capabilities that were not reported were considered "minor" capabilities. However, the Air Force Tri-Service Committee official was unable to provide documentation that provided classification of "major" or "minor" capabilities.

Our examination of Tri-Service Committee documentation did not show that facility reporting could be limited to 80 or 85 percent of the 20 functional categories. Reporting less than 100 percent of test capabilities and usage would prohibit OSD and the Military Departments' management from comparing all testing resources.

Use of Utilization Data

The Defense Base Realignment and Closure Commission (the BRAC) is responsible for ensuring a timely, independent, and fair process for realigning and closing DoD installations. In developing Realignment and Closure recommendations, the Test and Evaluation Joint Cross-Service Working Group (a BRAC-related sub-group) used utilization information that was developed independently of RUMS. The sub-group did not use RUMS data because it concluded that the RUMS data were not reliable. Inspector General, DoD, audit report No. 95-134, "Inspector General, DoD, Concurrence With Joint Cross-Service Group Recommendation to Change Methodology Used to Determine Excess Capacity," February 27, 1995, identifies the difficulty the working group experienced in attempting to use RUMS data. To identify range capacity, the working group used a "Historical Peak Workload Method." To ensure that responses to requests for clarification by the working group were accurate, the Deputy Assistant Secretary of Defense for Economic Reinvestment requested that the Inspector General review supporting documentation of information provided to this BRAC working group. In response to this request, the Inspector General had audit teams evaluate documentation at five test

ranges. Had the Military Departments implemented an effective RUMS at all 19 test ranges as planned, an alternative measurement system would not have had to be used and additional validation efforts would have been unnecessary.

Conclusion

Although DoD reported to Congress in July 1991 that the Military Departments would implement RUMS, if feasible, at all test ranges in FY 1994, the Military Departments did not meet this milestone. The development of RUMS for the test ranges has taken too much time. The Military Departments' reluctance to implement an effective measurement system has persisted since 1988. The Military Departments may never achieve a standardized RUMS at the test ranges without the RUMS implementation. Unless the Department of Defense takes a strong position on implementing RUMS and establishing RUMS as an assessable unit in an Internal Management Control Plan, continued delays in RUMS implementation will occur.

Recommendations, Management Comments, and Audit Response

1. We recommend that the Director, Test, Systems Engineering, and Evaluation, take an active role in monitoring the implementation of the Resource Utilization Measurement System at the Major Range and Test Facility Base to ensure its accuracy and completeness.

Management Comments. The Director, Test, Systems Engineering, and Evaluation (the Director), nonconcurred with the draft report recommendation to take an active role in the RUMS development. The Director's response included comments from the Military Departments and the Military Departments partially concurred with draft report recommendation.

The Director and the Military Departments' comments indicated that the Director had taken an active role in RUMS development by receiving frequent briefings. The Director and the Military Departments believed that the Board of Operating Directors, under the authority of the Board of Directors for Test and Evaluation, should be responsible for RUMS implementation. The Director and the Military Departments' comments stated that RUMS will be implemented by the end of FY 1995.

The Military Department comments also stated that RUMS will become another tool for local managers to efficiently manage their facilities, but not a tool that will compare one facility with another for macro decisionmaking. The complete text of management comments is in Part IV.

Audit Response. The intent of the recommendation to the Director, Test, Systems Engineering, and Evaluation, was to provide oversight in the RUMS development. We made this recommendation because RUMS has been in various stages of development since 1988. We believe that this amount of time was excessive. However, we consider management comments to be responsive to the intent of the recommendation because the comments stated that RUMS would be implemented at the test ranges by the end of FY 1995.

We agree that activity managers can use RUMS as a management tool to measure utilization. However, the RUMS can do far more than provide only local managers with a system to determine testing resource utilization. We are not asserting that RUMS data alone would be sufficient to support future BRAC - type processes.

2. We recommend that the Under Secretary of Defense for Acquisition and Technology direct the implementation of a Resource Utilization Measurement System at all test ranges by the end of FY 1995.

Management Comments. The Director provided comments for the Under Secretary of Defense for Acquisition and Technology. The Director stated that RUMS would be implemented at all test ranges by the end of FY 1995. The Military Departments agreed with that commitment.

Audit Response. Comments provided by the Director are responsive to the recommendation.

3. We recommend that the Chairman of the Board of Directors for Test and Evaluation establish the Resource Utilization Measurement System as an assessable unit in accordance with the DoD Internal Management Control Program.

Management Comments. The Director, in response to the draft report, stated that he would recommend to the Board of Operating Directors that RUMS be designated an assessable unit. As a result of the Director's comments, we have redirected this recommendation to the Board of Directors.

The Military Departments partially concurred with the draft report recommendation for establishing RUMS as an internal control assessable unit.

Audit Response. We consider management comments to be responsive to the recommendation. The Director and the Military Departments believed that the Board of Operating Directors, under the authority of the Board of Directors, should have the responsibility for ensuring RUMS implementation. In response to management comments, we redirected the recommendation for establishing RUMS as a assessable unit to the Board of Directors for Test and Evaluation.

The Director and the Military Departments provided additional comments to the issues discussed in the draft report. Appendix D provides a summary of the comments and our response.

Part III - Additional Information

Appendix A. Resource Utilization Measurement System Definitions and Parameters

Definitions

Budgeted Capacity. A measure of the maximum amount of time a test resource is staffed under normal personnel conditions, including the use of contractor personnel. Budgeted capacity excludes overtime.

Nonavailability. The amount of time a test resource is not available for customer use due to external constraints (for example, test cancellations, maintenance, and weather).

Overtime. The amount of resource use in excess of budgeted capacity.

Resource. A test facility or capability (including air, land, and sea space) and associated equipment needed to conduct a test and evaluation.

Surge Capacity. Unconstrained capacity minus budgeted capacity.

Time. A measurement in clock hours, allowing for simultaneous multiple testing at a test facility or a range. If user test hours are defined in multiples (for example, more than one test hour per clock), then capacity must be defined in multiple hours.

Unconstrained Capacity. A measure of the maximum amount of time a test resource could be used with unconstrained personnel conditions.

User Time. A measure of time a test resource is paid for that includes set up and dismantle time if it precludes use of the resource by another customer).

Parameters

o **Use efficiency.** A measure of the percent of time a resource is available for customer use.

$$\text{Use Efficiency} = \frac{\text{Budgeted Capacity minus Nonavailability}}{\text{Budgeted Capacity}}$$

o **Utilization.** A measure of resource use to budgeted capacity (level of funding) plus overtime.

$$\text{Utilization} = \frac{\text{User Time}}{\text{Budgeted Capacity plus Overtime}}$$

o **Surge capacity.** A measure of the maximum capacity potential of a facility given an unconstrained budget and personnel environment (without additional infrastructure investment).

$$\text{Surge Capacity} = \text{Unconstrained Capacity minus Budgeted Capacity}$$

o **Surge.** A measure of the percentage of maximum capacity potentially available for customer use.

$$\text{Surge} = \frac{\text{Unconstrained Capacity minus Budgeted Capacity}}{\text{Unconstrained Capacity}}$$

Appendix B. Resource Utilization Measurement System Functional Categories

1. Acoustic Test Facility (provides the capability to test and evaluate the effects of anti-submarine warfare acoustic sensor signals).

2. Aircraft Anechoic Facility (provides testing of integrated electronics and weapon systems by stimulating the systems sensors).

3. Aircraft Test and Evaluation Facility (provides ground testing of aircraft engine systems and components includes tests. Test may include the effects of heat, rain, and thrust).

4. Avionics Test Facility (provides stimulation, control, and monitoring of individual avionics systems not possible when installed on an aircraft).

5. Catapult and Arresting Gear Facility (simulates ship environment for aircraft take off and landing).

6. Climatic Environment Facilities (provides testing capability under a variety of conditions such as extreme cold and high moisture).

7. Dynamic Environment Facilities (facilities that provide shock, vibration, acoustic, and seismic testing).

8. Electromagnetic Radiation Facilities (provides testing for susceptibility and vulnerability of electronic components).

9. Electronic Warfare Test and Evaluation Range (provides test and evaluation of electronic combat devices, components, systems, and techniques against simulated hostile systems).

10. Guided Weapons Evaluation Facility (provides for tests of precision guided weapons).

11. Landing System Test Facility (provides testing for aircraft automatic, semi-automatic, and visual landing systems).

12. Manned Flight Simulator (provides flight test programs of flight dynamics and aircraft systems that are used to analyze flying qualities and flight control systems).

13. Nuclear Effects Test Facility (simulates effects associated with nuclear weapon detonation).

14. Propulsion Test Facility (testing capability of rocket motors and missile propulsion systems).

15. Radar Cross-Section Range (provides precision radar measurements of components in an outdoor environment).

16. Safety Test Facility (provides weapons safety tests and weapons reactions to various hazards such as fires, bullet, and dropping impacts).

17. Shielded Hangar (provides an electromagnetic environment for electronic testing).

18. Test Range Complex (includes air and ground space areas, instrumentation radars, range and mission control facilities, targets, and tracking systems).

19. Test Track (rail sled system to test systems at subsonic, supersonic or hypersonic speeds).

20. Warhead Test Facility (provides fragment velocity and dispersion, air blast measurements, and warhead effectiveness against various targets).

Appendix C. Analysis of Resource Utilization Measurement System

Table C-1. Army White Sands Missile Range, New Mexico

Resource	Reported	Determined Within Guidelines?					
		Use Efficiency	Surge	Surge Capacity	Unconstrained Capacity	Budgeted Capacity	Utilization
1. Test Range Complex	Yes	NR	NR	NR	NR	No	No
2. Nuclear Weapons Effects Facility	Yes	NR	NR	NR	NR	No	No
3. Environmental Test Facilities	Yes	NR	NR	NR	NR	No	No
4. Electromagnetic Radiation Facilities	Yes	NR	NR	NR	NR	No	No
5. Dynamic Environment Test Facilities	Yes	NR	NR	NR	NR	No	No
6. Warhead Test Facility	Yes	NR	NR	NR	NR	No	No

NR Not Reported

Table C-2. Naval Air Warfare Center - Aircraft Division, Patuxent River, Maryland

Resource	Reported	Determined Within Guidelines?					
		Use Efficiency	Surge	Surge Capacity	Unconstrained Capacity	Budgeted Capacity	Utilization
1. Manned Flight Simulator	Yes	NR	NR	Yes	NR	Yes	Yes
2. Shielded Hangar	Yes	NR	NR	Yes	NR	Yes	Yes
3. Anechoic Chamber	Yes	NR	NR	Yes	NR	Yes	Yes
4. Electromagnetic Environment Generator*	No	N/A	N/A	N/A	N/A	N/A	N/A
5. Offensive Sensors Lab*	No	N/A	N/A	N/A	N/A	N/A	N/A
6. Operations Control Center*	No	N/A	N/A	N/A	N/A	N/A	N/A
7. Communications, Navigation, and Identification Lab*	No	N/A	N/A	N/A	N/A	N/A	N/A
8. Threat Air Defense Laboratory*	No	N/A	N/A	N/A	N/A	N/A	N/A
9. Electronic Warfare Integrated System Test Laboratory*	No	N/A	N/A	N/A	N/A	N/A	N/A
10. Chesapeake Test Range	Yes	NR	NR	Yes	NR	Yes	Yes
11. Real Time Telemetry Processing System	Yes	NR	NR	Yes	NR	Yes	Yes
12. Telemetry Relay Airborne Command System*	No	N/A	N/A	N/A	N/A	N/A	N/A

Table C-2. Naval Air Warfare Center - Aircraft Division, Patuxent River, Maryland (Continued)

Resource	Reported	Determined Within Guidelines? Use Efficiency	Surge	Surge Capacity	Unconstrained Capacity	Budgeted Capacity	Utilization
Carrier Suitability:							
13. Hot Refuel Area*	No	N/A	N/A	N/A	N/A	N/A	N/A
14. Arresting Gear	Yes	NR	NR	Yes	NR	Yes	Yes
15. Landing Aids Test Facility*	No	N/A	N/A	N/A	N/A	N/A	N/A
16. Catapult	Yes	NR	NR	Yes	NR	Yes	Yes
17. Landing Systems Test Facility	Yes	NR	NR	Yes	NR	Yes	Yes
18. Aircraft Electrical and Environmental Evaluation Facility*	No	N/A	N/A	N/A	N/A	N/A	N/A
19. Electromagnetic Pulse Facility	Yes	NR	NR	Yes	NR	Yes	Yes
20. Aircraft Test and Evaluation Facility	Yes	NR	NR	Yes	NR	Yes	Yes

NR Not Reported
N/A Not applicable
* Test facilities with these specific capabilities were identified as reportable under the functional categories.

Table C-3. Air Force Development Test Center, Eglin Air Force Base, Florida

Resource	Reported	Determined Within Guidelines?					
		Use Efficiency	Surge	Surge Capacity	Unconstrained Capacity	Budgeted Capacity	Utilization
1. Climatic Laboratory	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Sled Track Facility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3. Preflight Integration of Munitions and Electronics Systems Facility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. Guided Weapons Evaluation Facility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5. Warhead Arena	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6. Electromagnetic Test Environment Range	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7. Air-to-Surface Test Environment	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8. Gulf Range Water Test Area*	No	N/A	N/A	N/A	N/A	N/A	N/A
9. Fuze Test Facility*	No	N/A	N/A	N/A	N/A	N/A	N/A
10. Structural Dynamics Laboratory*	No	N/A	N/A	N/A	N/A	N/A	N/A
11. Airborne Seeker Evaluation Test System*	No	N/A	N/A	N/A	N/A	N/A	N/A
12. Gun Test Facility*	No	N/A	N/A	N/A	N/A	N/A	N/A
13. Security Systems Test Facility Complex*	No	N/A	N/A	N/A	N/A	N/A	N/A
14. Centralized Control Facility*	No	N/A	N/A	N/A	N/A	N/A	N/A

Table C-4. Air Force Flight Test Center, Edwards Air Force Base, California

Resource	Reported	Determined Within Guidelines?					
		Use Efficiency	Surge	Surge Capacity	Unconstrained Capacity	Budgeted Capacity	Utilization
1. Test Ranges	Yes	Yes	NR	Yes	Yes	Yes	Yes
2. Mission Support Systems	Yes	Yes	NR	NR	Yes	Yes	Yes
3. Large Anechoic Chamber	Yes	Yes	NR	NR	No	Yes	Yes
4. Integration Facility for Avionics Systems Testing	Yes	Yes	NR	NR	No	Yes	Yes
5. Test and Evaluation Mission Simulator	Yes	Yes	NR	NR	No	Yes	No

Appendix D. Analysis of Management Comments to the Draft Audit Report

The Director, Test, Systems Engineering, and Evaluation (the Director) and the Military Departments provided general comments to issues discussed in the draft report. Below is a summary of the issues discussed in the management comments and the audit response. The complete text of the management comments is in Part IV.

Management Comments. The Director stated that the Office of the Secretary of Defense did not report to Congress that RUMS would be implemented by the end of FY 1994. He stated that in response to a GAO report, the Director stated that if the FY 1993 field test validates the feasibility and usefulness of RUMS, the Department of Defense will apply RUMS in FY 1994. However, the field test showed that RUMS as then constituted was not useful.

The Director and the Military Departments also stated that the purpose of RUMS was never intended to make comparisons between test and evaluation facilities. The GAO report accurately stated the purpose as one of a number of tools facility managers have to measure utilization trends within their activities.

Audit Response. The House of Representatives, Committee on Appropriations Report on the DoD Appropriations Bill for FY 1991 directed that the Secretary of Defense institute the type of system recommended by GAO or an equivalent framework by June 1991 and report the results to the Appropriations Committees. In response to this direction, the Department issued the "Range Utilization Measurement Study - Field Trial Report" July 1991. This field trial report indicated to Congress that a range utilization system would be implemented in response to congressional request. However, we agree with management comments that RUMS would have been implemented in FY 1994 if the field tests validated the feasibility and usefulness of the system. The appropriate clarification has been made to the report.

We agree that activity managers can use RUMS as a management tool to measure utilization. However, the intent of RUMS was more than to provide local managers a system to determine testing resource utilization. The GAO report states, "The Office of the Secretary of Defense (OSD) is responsible for centralized management of the ranges and for making budgetary decisions on range expansion, consolidation, and improvements. However, the ranges do not collect and report standard information to assess overall range capacity and use." The GAO report continues, "our proposed framework . . . should be useful to both defense and congressional decisionmakers." The GAO report adds that "although DoD has long recognized the need for a common measurement of its test ranges' capacity and use, the ranges do not collect comparable data. As a result, DoD cannot readily identify either excess testing capacity or the need for additional capacity."

The intent of the Appropriations Committees was to establish a utilization measurement system that Congress and DoD management officials, as well as

local officials, can use in assessing range expansion, consolidation, and improvement proposals. We agree that other factors must be considered besides resource utilization in evaluating such matters.

Management Comments. The Director stated that audit was done in the field without those providing raw RUMS data knowing for what real purpose. The Director stated that this audit was done during the period in FY 1994 when RUMS was in transition from one set of definitions to another so it is not surprising that inconsistences resulted. The IG auditors misstated the purpose of RUMS; its purpose was not to support the Base Realignment and Closure Commission. One of the ground rules for developing the system was the recognition that the system would be a top-level management tool. The Director's comments continued to stated that the data generated by this system should be useful in trend analysis for each test center. The Director's comments stated that RUMS should show year to year utilization profiles and be useful as a flag or possible further analysis.

Audit Response. We agree with the Director's comments that the Military Departments recognized problems with the initial set of RUMS definitions. The RUMS Tri-Service Ad Hoc Committee developed new definitions in August 1993. As identified in the Military Department's comments, the Tri-Service Ad Hoc Committee decided to use the new definitions at the five trial ranges subject to approval by the Board of Operating Directors. We examined RUMS data subsequent to the development of the new definitions and identified inconsistencies in the definitions usage.

In reference to the use of RUMS data during the Base Realignment and Closure Commission, the audit report stated that if a viable system existed, the Commission could have used the information, with other data, during its deliberations. We agree that RUMS is a tool that management could use in evaluating test resource usage but should not be the basis of any decision. Our reference to the Base Realignment and Closure Commission was that, if the system existed, it could have been another tool for the Commission's use.

Management Comments. The Director and the Military Departments comments stated that White Sands Missile Range (WSMR) may not have had the revised guidance during the visit because the Board of Operating Directors approved the guidance in September 1994. The Director and Military Department continued that WSMR and other test centers were informed of the ad hoc committee's recommendations pending final approval. The comments added that the basic data submitted by WSMR to Army Test and Evaluation Command (TECOM) Headquarters was sufficient to calculate both the old and revised parameters and that these calculations were done at TECOM Headquarters.

Audit Response. The new definitions were developed by the RUMS Tri-Service Ad Hoc Committee in August 1993 and the Ad Hoc Committee agreed that the new definitions were to be used subject to approval by the Board of Operating Directors. Our examination was conducted during the summer of 1994, providing the Army ample time to disseminate the new definitions to

WSMR. In reference to the calculations, the RUMS data we obtained for WSMR came from TECOM and not from WSMR. As noted in our report, many data calculations were not determined.

Management Comments. The Director stated that unconstrained capacity for Type B resources is defined as 16 hours per day, 250 days per year, as the Air Force Flight Center reported. While it might be possible to operate 7 days a week, this amount of operation would not be feasible or practical for extended periods during peacetime.

Audit Response. We agree that the Air Force Flight Center is a Type B resource; therefore, its utilization is limited to 16 hours per day due to required maintenance and test preparation. However, under the definition of unconstrained capacity (Appendix A), the measurement of available time is determined with unconstrained personnel conditions. Therefore, we do not agree that this resource should be limited to 5 days per week as opposed to 7 days per week.

Management Comments. The Director stated that the audit report insinuates that 100 percent of test facilities should be reported. He stated that the value of doing so is not worth the additional cost. The Director said the nature of testing is that not all of a range's capabilities are in use at any one time. One can view any test range installation as a tool box for testing and many factors other than utilization alone must be considered to ascertain the cost-effectiveness of these facilities.

Audit Response. We found no guidance during the RUMS audit that identified that all major test resources are not to be reported. The test resources we reported were significant resources that should have visibility. We agree that some resources may have a low utilization because they are unique items. However, RUMS may identify other test resources that have low utilization that justify further management evaluation to determine whether the test resource is still needed. Requiring the reporting of all test resources denies local managers the opportunity for selective reporting.

Appendix E. Summary of Potential Benefits Resulting From Audit

Recommendation Reference	Description of Benefit	Amount and/or Type of Benefit
1.	Economy and Efficiency. Requires the close monitoring of the establishment of the resource utilization system.	Nonmonetary.
2.	Economy and Efficiency. Incorporates a specific timeframe to establish a utilization measurement system at the Major Range and Test Facility Base.	Nonmonetary.
3.	Internal Controls. Establishes appropriate internal controls.	Nonmonetary.

Appendix F. Organizations Visited or Contacted

Office of the Secretary of Defense

Deputy Director, Test Facility Resources, Office of Test Systems Engineering, and Evaluation, Washington, DC

Department of the Army

Headquarters, U.S. Army Test and Evaluation Command, Aberdeen, MD
White Sands Missile Range, Las Cruces, NM
U.S. Army Combat Support Activity, Aberdeen, MD

Department of the Navy

Naval Air Systems Command, Arlington, VA
Naval Air Warfare Center, Arlington, VA
Naval Air Warfare Center - Aircraft Division, Patuxent, MD

Department of the Air Force

Air Force Materiel Command, Wright-Patterson Air Force Base, OH
Air Force Development Test Center, Eglin Air Force Base, FL
Air Force Flight Test Center, Edwards Air Force Base, CA

Appendix G. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology
  Director, Defense Logistics Studies Information Exchange
Under Secretary of Defense (Comptroller)
  Deputy Under Secretary of Defense (Comptroller/Management)
  Deputy Under Secretary of Defense (Comptroller/Program/Budget)
Deputy Assistant Secretary of Defense for Economic Reinvestment and Base Realignment and Closure
Assistant to the Secretary of Defense (Public Affairs)
Director, Test, Systems Engineering, and Evaluation
Deputy Director, Test Facilities and Resources
Director of Defense Research and Engineering
Board of Operating Directors for Test and Evaluation

Department of the Army

Auditor General, Department of the Army
U.S. Army Test and Evaluation Command
Army White Sands Missile Range

Department of the Navy

Assistant Secretary of the Navy (Financial Management)
Comptroller of the Navy
Auditor General, Department of the Navy
Naval Air Systems Command
Naval Air Warfare Center - Aircraft Division

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force
Air Force Materiel Command
Air Force Development Test Center
Air Force Flight Test Center

Defense Agencies

Director, Defense Contract Audit Agency
Director, Defense Logistics Agency
Director, National Security Agency
Inspector General, National Security Agency
Inspector General, Central Imagery Office

Non-Defense Federal Organizations

Office of Management and Budget
Technical Information Center, National Security and International Affairs Division, General Accounting Office

Chairman and ranking minority member of each of the following congressional committees and subcommittees:

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on National Security, Committee on Appropriations
House Committee on Government Reform and Oversight
House Subcommittee on National Security, International Affairs, and Criminal Justice, Committee on Government Reform and Oversight
House Committee on National Security

Part IV - Management Comments

Test Systems Engineering, and Evaluation Comments

Final Report Reference

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

MAR 20 [illegible]

MEMORANDUM FOR DIRECTOR, ACQUISITION MANAGEMENT DIRECTORATE, Dod(IG)

SUBJECT: Draft Audit Report "DoD Range Utilization Measurement System"

We have reviewed the subject draft audit on the Resource Utilization Measurement System (RUMS) report (Project No. 4AB-5019.02), January 18, 1995, and the Service comments. Our specific positions and comments, along with those of the three Services are attached. We endorse the Services' comments. Our non-concurrences and partial concurrences have generally resulted from two primary issues with the audit: conduct of the audit was premature, and a misconception of the auditors as to the purpose and use of RUMS.

First, your report states that this audit was requested by my office. While RUMS would be an appropriate audit subject after its implementation, we did not request an audit of RUMS during the period when it was in development and transition: we would have requested it after FY95, when a final RUMS product is to be available.

Second, the purpose of RUMS was never intended to make comparisons between T&E facilities, which is the premise of your audit. The GAO audit which caused the development of RUMS accurately stated its purpose as one of a number of tools facility managers have to measure utilization trends within their activities.

As a result, there are a number of phrasings and misstatements in the draft audit report that resulted from a misunderstanding of the background, the purpose and the nature of RUMS. Consultation with my staff could have prevented the audit from proceeding to the degree it has. While our detailed comments on the draft audit findings and recommendations are attached, we suggest putting this audit on hold and reaccomplishing it after RUMS has been fully implemented.

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Our point of contact for this audit is Mr. Irvin Boyles, telephone 697-7933.

John A. Burt
Director, Test
Systems Engineering,
and Evaluation

Attachments: a/s

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DTSE&E RESPONSES TO RECOMMENDATIONS AND FINDINGS
DRAFT AUDIT REPORT ON RANGE UTILIZATION MEASUREMENT SYSTEM
(PROJECT 4AB-5019.02)

Comments on Recommendations:

"1. We recommend that the Director for Test, Systems Engineering and Evaluation:

"a. Take an active role in monitoring the implementation of the Range [sic] Utilization Measurement System at the Major Range and Test Facility Base to ensure its accuracy and completeness."

Do Not Concur. Since 1991, when RUMS was first conceived, the Test and Evaluation (T&E) community has undergone a radical change in how it performs functional oversight. Under Project Reliance there now is a Board of Directors (BoD) consisting of the service vice chiefs of staff. They, through the Board of Operating Directors (BoOD) oversee the joint boards that for each T&E function look across all Dod to evaluate T&E facility capabilities and shortfalls and recommend changes as necessary. This participatory management by service staffs and boards of the RUMS initiative may have caused some diminution of oversight at OSD of RUMS particulars. However the Director for Test, Systems Engineering and Evaluation (DTSE&E) is briefed frequently in his position on the Defense T&E Steering Group and is satisfied by RUMS progress to date. More important is the intense oversight of T&E functions throughout Dod provided by the joint BoD, BoOD and other Reliance boards.

Redirected and renumbered to Recommendation 3.

"b. Establish the Range [sic] Utilization Measurement System as an assessable unit to ensure its establishment at the Major Range and Test Facility Base, in accordance with the Dod Internal Management Control Program."

Partially Concur. The BoD through the Board of Operating Directors (BoOD) already has tasked the services to implement RUMS by the end of FY95. The DTSE&E&E will recommend to the BoOD that RUMS be designated an assessable unit.

Deleted

"c. Report in the Annual Statement of Assurance that the lack of establishing the Range [sic] Utilization Measurement

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System is a material internal control weakness."

Do Not Concur. RUMS is on track with its revised schedule. (See service comments.)

"2. We recommend that the Under Secretary of Defense for Acquisition and Technology direct the implementation of a Range [sic] Utilization Measurement System at all test ranges by the end of FY95.

Partially Concur. As stated under 1.b. above, the BoD through the BoOD already has tasked the services to implement RUMS by the end of FY95. There is no need for the USD(A&T) to do this.

General Comments:

General comments are keyed to page numbers and paragraphs in the draft audit.

Exec.Summary-Introduction, and Finding, page 6, last Paragraph

The Office of the Secretary of Defense did *not* report to Congress that implementation at all test ranges would be accomplished by the end of FY94. The Director of Defense Research and Engineering *did* state in a 9 November 1990 letter to the GAO[1], "If analysis of the field test conducted during FY93 validates the feasibility and usefulness of the system, the Department will apply [RUMS] to appropriate Major Range and Test Facility Base activities in FY94." The field test showed that RUMS as then constituted was not useful. The Joint Commanders Group for T&E formed an ad hoc committee which developed a standard set of definitions and measurement parameters which will be implemented throughout the MRTFB by the end of FY95.

Exec.Summary-Objectives

Report states that this audit was part of the audit of "Expanded Uses for the Major Range and Test Facility Base" that the Deputy Director for Test Facilities and Resources requested. This is not correct as an audit of RUMS would not be requested during the period when RUMS implementation was in transition.

[1] Tri-Service *Resource Utilization Measurement Study; Field Trial Report*, July 1991, page A-1.

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Exec.Summary-Audit Results, and Finding, page 6, 1st Paragraph

The audit was done in the field without those providing raw RUMS data knowing for what real purpose they were doing so. This was during the period in FY94 while RUMS was in transition from one set of definitions to another, so it is not surprising that there were inconsistencies.

The IG auditors have misstated the purpose of RUMS. The audit would have one believe that RUMS has failed since its purpose was to support the Base Closure and Realignment Commission (BRAC) and it didn't. Not only was that not its purpose but the initial study responding to the Congress specifically stated the purpose of RUMS to be internal management:

> "One of the ground rules for developing the system was the recognition that the system would be a top-level management tool. The data generated by this system should be useful in trend analysis *for each test center*. It should show year to year utilization profiles and be useful as a flag for possible further analysis. *It will be a gross indicator...* [Emphasis added]" [2]
>
> "The proposed framework contains many compromises to accommodate differences in missions and operating practices among the MRTFB installations. We believe this approach may be most *useful for measuring an activity against itself* by assessing trends based on past performance and future projections... [Emphasis added]" [3]
>
> Thus RUMS was to be, and is now, an internal utilization measurement tool never meant for uses such as BRAC. It was considered for use during BRAC 95, and determined not to be useful for this purpose in its state of development.

Exec.Summary-Internal Controls, and Part I, page 3, 1st Full Paragraph

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[2] Op.cit., page 2

[3] Op.cit., page 3

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The criticism of insufficient internal controls caused by inadequate monitoring appears to be premature, given that the audit occurred during a transitional time. This transition was made necessary because monitoring was effective.

Footnote 2, page 7 — Page 6

The White Sands Missile Range is not at Las Cruces.

Footnote 2, page 7

The Board of Operating Directors (BoOD) is not under the authority nor in the chain of command of the Director for Test, Systems Engineering and Evaluation.

Measurement Parameters, page 8, next to last Paragraph

The Army states that although the individuals contacted by the IG team at WSMR may not have had the revised guidance during the visit, that was during the transition time and before the revised guidance was approved by the Board of Operating Directors in September 1994. "However, WSMR and all other test centers were informed of the ad hoc committee's recommendation pending final BoOD approval and implementation. The basic data submitted by WSMR to [Army] T&E Command (TECOM) Headquarters was sufficient to calculate both the old and revised parameters. These calculations are done at TECOM Headquarters."

Measurement Parameters, page 8, last Paragraph

Unconstrained capacity for Type B resources is defined as 16 hours per day, 250 days per year, as the AF Flight Test Center reported. While it might be possible to operate seven days a week, this would not be feasible nor practical for extended periods in peacetime.

Methodology and Techniques, page 9-10 — Page 9

The draft audit report insinuates that 100% of test facilities should be reported. The value of doing so is not worth the additional cost. Moreover the nature of testing is that not all of a range's capabilities are in use at any one time. This often allows government and/or contractor employees to cover several different test facilities that

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are in use at different times. For example, assume that test cell Z is one-of-a-kind, is used only once per year, and then is "covered" by employees normally working test cell A. What useful information is imparted by reporting the utilization of test cell Z as 0.3% for the year? As stated earlier, the purpose of RUMS is to allow facility managers to evaluate utilization trends of their major test properties, in conjunction with other usage parameters.

One can view any MRTFB installation as a tool box for testing. While only a few tools may be in use at any one time, it is always handy and it is usually efficient to have others on reserve for use at appropriate times. Similarly a test installation has facilities, perhaps on reserve, that are essential if test support is to be provided when needed. Many factors other than utilization alone must be considered to ascertain the cost-effectiveness of these facilities.

"The RUMS should be used in conjunction with other measures to provide a broader and more complete assessment of MRTFB use. Other measures could consist of flight hours, labor, and direct/indirect funding... Use of this group of measurements would reduce misinterpretations of any single measure."[4]

The services' responses, also attached, detail the reasons why certain facilities were not included as "major" facilities for reporting.

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DEPARTMENT OF DEFENSE
BOARD OF OPERATING DIRECTORS FOR TEST AND EVALUATION

Department of the Army	Department of the Navy	Department of the Air Force
HQ, U.S. Army Test and Evaluation Command	HQ, Naval Air Warfare Center	HQ, Air Force Materiel Command
Aberdeen Proving Ground, MD 21005-5055	Arlington, VA 22243-5000	Wright-Patterson AFB, OH 45433-5714

AMSTE-PL

MEMORANDUM FOR LTG Howard W. Leaf, USAF (Ret), Executive Secretariat, T&E Executive Agent Board of Directors, AF/TE, 1650 Air Force Pentagon, Washington, D.C. 20330-1650

SUBJECT: Board of Operating Directors (BoOD) Response to Department of Defense Inspector General (DODIG) Draft Audit Report on "DoD Range Utilization Measurement System (RUMS) (Project 4AB-5019.02)," dated January 18, 1995

The BoOD has reviewed the subject DoDIG draft audit and submits the comments at Enclosure 1 for use in your response to OSD. Point of contact for this action is Mr. Thomas Metz, DSN 664-6033, extension 2245.

Encl

RICHARD W. TRAGEMANN
Major General, USA
Chairman

CF:
Mr. Walter W. Hollis, Deputy Under Secretary of the Army (Operations Research), 102 Army Pentagon, Washington, D.C. 20310-0102
RADM T. D. Ryan, Chief of Naval Operations (N091), 2000 Navy Pentagon, Washington D.C. 20350-2000
RADM William E. Newman, Commander, Naval Air Warfare Center, 1421 Jefferson Davis Highway, Suite 1400, Arlinton, VA 22243-6000
MG Francis C. Gideon, Jr., Director, Operations, HQ AFMC/DO, 4225 Logistics Avenue, Suite 2, Wright-Patterson AFB, OH 45433-5714
Commander, U. S. Army Test and Evaluation Command, ATTN: AMSTE-TA (Mr. Gary Holloway), Aberdeen Proving Ground, MD 21005-5055
Commander, Naval Air Warfare Center Weapons Division, ATTN: 4K0000E/P03C (Mr. George Smith), Point Mugu, CA 93042-5000
AFDTC/CD, ATTN: Dr. D. Stewart, Suite 117, 101 W. D Avenue, Eglin AFB, FL 32542-5495
Mr. Parker Horner, Chief, Air Force Test and Evaluation Resources (AF/TER), 1650 Air Force Pentagon, Washington, D.C. 20330-1650
Dr. John Foulkes, Chief, Policy Division, U.S. Army Test and Evaluation Management Agency (DACS-TE), 200 Army Pentagon, Washington D.C. 20310-0200
CAPT Elmer Halley, Director of Navy Test and Evaluation (N912), 2000 Navy Pentagon, Washington, D.C. 20350-2000

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Executive Summary

The following is a summary of significant items and issues found through a detailed review of the Draft Audit Report (4AB5019.02)

The Draft Audit Report states that DoD had not complied with Congressional direction to implement a utilization reporting system for test ranges. Findings of the audit are essentially correct as to the Resource Utilization Measurement System (RUMS) status within DoD at the time of the audit. However, the premise of the audit and many of the reported details are incorrect or misleading due to the manner in which the audit was conducted.

The audit was conducted during the second half of FY 1994 while RUMS implementation was still in progress. The commitment made by DoD was to have a system in-place by the end of FY 1994. A finished RUMS should not have been expected at the time of the audit.

The Draft Audit Report implies that RUMS should be the DoD tool to allow high level management decisions on the future of it's Test and Evaluation (T&E) facilities. A RUMS that would allow this type of decision making would be prohibitively expensive since it would have to somehow normalize the different capabilities and management methodologies existing at the T&E facilities. RUMS is a common tool that can be used by local managers to manage in their unique environment. It should not be used to make high level decisions.

The Draft Audit Report continually uses RUMS as Range Utilization Measurement System, the acronym now stands for Resource Utilization Measurement System.

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RESPONSES TO SPECIFIC RECOMMENDATIONS CONTAINED IN DRAFT AUDIT REPORT ON DOD RANGE UTILIZATION MEASUREMENT SYSTEM (PROJECT 4AB-9019.02)

RECOMMENDATION 1.a. "We recommend that the Director for Test, Systems Engineering and Evaluation take an active role in monitoring the implementation of the Range Utilization Measurement System at the Major Range and Test Facility Base to ensure its accuracy and completeness."

Partially Concur. The Director for Test, Systems Engineering and Evaluation as the Major Range and Test Facility Base (MRTFB) oversight authority has always had an active role in the monitoring of RUMS implementation. Periodic briefings have been made to him and his staff on the progress and status of RUMS implementation. The Board of Operating Directors (BoOD) is charged with the implementation and reporting of RUMS to the Board of Directors (BoD).

RECOMMENDATION 1.b. "We recommend that the Director for Test, Systems Engineering and Evaluation establish the Range Utilization Measurement System as an assessable unit to ensure its establishment at the Major Range and Test Facility Base, in accordance with the DoD Internal Management Control Program."

Redirected and renumbered to Recommendation 3.

Partially Concur. The BoOD is implementing RUMS at all MRTFB sites during FY 1995. BoOD has tasked the Services with implementing and gathering data in the first quarter FY 1995, reconciliation of data between the services in the second quarter FY 1995, and full implementation of a common RUMS by the end of FY 1995.

DoD Directive 5010.38, "Internal Management Control Program," requires Federal managers to implement a comprehensive system of internal management controls and identify assessable units that will provide reasonable assurance that assets are used properly and programs are effectively and efficiently managed. RUMS will become another tool for local managers to efficiently manage their facility in their unique operating environment. RUMS is not a tool that will compare one facility with another for macro decision making.

RECOMMENDATION 1.c. "We recommend that the Director for Test, Systems Engineering and Evaluation report in the Annual Statement of Assurance that the lack of establishing the Range Utilization Measurement System is a material internal control weakness."

Deleted

Do Not Concur. DDR&E in responding to the General Accounting Office (NSIAD 90-91) laid out the schedule for RUMS process development as follows:

FY 1991 a utilization measurement system would be designed and debugged.

FY 1992 the system would be field tested at several MRTFB activities.

FY 1993 the usefulness and feasibility of the system would be validated.

FY 1994 the system, if useable, would be implemented to appropriate MRTFB activities.

In December 1992 representatives of the three services met to review the data and evaluate the effectiveness of RUMS. All attendees agreed that RUMS as was then implemented did not meet OSD, Service or field level requirements.

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As a result of the shortcomings of the original RUMS, the Joint Commanders Group for T&E (JCG(T&E)) formed an ad hoc committee to modify RUMS into something which would be useful. This ad hoc committee has developed a standard set of definitions and measurement parameters which are now being deconflicted and will be implemented across the MRTFB by the end of FY 1995.

RECOMMENDATION 2. "We recommend that the Under Secretary of Defense for Acquisition direct the implementation of a Range Utilization Measurement System at all test ranges by the end of FY 1995."

Do Not concur. The BoOD, as agents of the Board of Directors (Service Executive Agents responsible for oversight of the T&E Infrastructure), has already directed that the RUMS be fully implemented across the MRTFB by the end of FY 1995.

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RESPONSES TO SPECIFIC FINDINGS CONTAINED IN DRAFT AUDIT REPORT ON DOD RANGE UTILIZATION MEASUREMENT SYSTEM (PROJECT 4AB-5019.02)

FINDING. (Page 6, Paragraph 1, Last sentence) "As a result, the OSD and the Military Departments cannot make accurate decisions on consolidation, expansion, and improvements at the test ranges based on credible assessments of capacity and use."

Do not Concur. A theme is woven throughout the Draft Audit Report that RUMS will allow high level policy makers to make facility closure, consolidation, and investment decisions. This is not true. A RUMS to achieve that goal will be prohibitively expensive since it will have to somehow normalize the various range capabilities and operational methodologies. RUMS can be used by local managers to assist in their facility management. RUMS data for a facility is unique to that facility, taking into account the capability, operational methodology, test complexities, and architecture of that particular facility. Without a through knowledge of what RUMS means at each facility, a side-by-side comparison of similar facilities using only RUMS data is meaningless.

FINDING. (Page 7. first three lines) "...during FY 1993, DoD would assess the feasibility and usefulness of RUMS; and DoD would implement RUMS at all 19 test ranges by the end of FY 1994."

Pages 6 and 7

Do not concur. RUMS would only be implemented if useful. This would be based upon the feasibility and usefulness assessment of RUMS done in FY 1993. In December 1992 representatives of the three services met to review the data and evaluate the effectiveness of RUMS. All attendees agreed that RUMS as was then implemented did not meet OSD, Service or field level requirements.

As a result of the shortcomings of the original RUMS, the Joint Commanders Group for T&E (JCG(T&E) formed an ad hoc committee to modify RUMS into something which would be useful. This ad hoc committee has developed a standard set of definitions and measurement parameters which are now being deconflicted and will be implemented across the MRTFB by the end of FY 1995.

FINDING. (Page 8, Definitions and Measurement Parameters, second paragraph)

Do not concur. The auditors during their visits to the MRTFB sites did not identify themselves as auditing RUMS nor did they inquire directly about RUMS implementation or its status. They stated they were conducting an audit of expanded use of the MRTFB for training purposes and requested RUMS data to assist in this effort. They did not inquire directly about the status of RUMS implementation. They did not inquire about preliminary facility identification and capacity information for the test centers. Their specific request was only for data in RUMS format. They were provided with only relatively raw use data on the designated trial facilities.

White Sands Missile Range (WSMR) was cited for reporting incorrect/outdated parameters because they had received no revised guidance. At the time of the audit, the revised definitions/parameters had not yet been approved for implementation by the BoOD. They were subsequently approved by the BoOD in September 1994. However, WSMR and all other test centers were informed of the ad hoc committee's recommendations pending final BoOD approval and implementation. The basic data submitted by WSMR to T&E Command (TECOM) Headquarters was sufficient to calculate both the old and revised parameters. These calculations are done at TECOM Headquarters.

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FINDING. (Pages 8 and 9, Definitions and Measurement Parameters, third paragraph) "The Air Force Flight Test Center at Edward Air Force Base was not reporting "unconstrained capacity" in accordance with applicable guidelines."

Do not concur. The Air Force facilities mentioned in the Draft Audit Report are Type B Resources whose unconstrained capacity is defined as 16 hours per day for 250 days per year. The rational for 250 days per year instead of 365 days per year is that a 16 hour, 5 day work week is normal for a two shift operation. The facility could be used 7 days a week using overtime, but not for extended lengths of time unless under emergency situations. A revision in the definition to a 7 days per week operation could be done and would affect only unconstrained capacity and surge computations, not utilization or use efficiency computations.

FINDING. (Page 9, Methodology and Techniques, first paragraph) "We reviewed methodologies and techniques for gathering RUMS data at four of the five field trial test ranges (the trial ranges) and found that some test facilities and capabilities were not reported and reporting was inconsistent."

Concur. The trial ranges were continuing to gather data using the original RUMS which, in December 1992, representatives of the three services agreed did not meet OSD, Service or field level requirements. The RUMS being implemented at the present time was changed in part to remove inconsistencies.

FINDING. (Page 9, Methodology and Techniques, Unreported Test Facilities)

Do not concur. The Draft Audit Report refers frequently to a Tri-Service RUMS Committee created in May 1993 and implies it had a written charter to issue policy and implement a system. The auditors are referring to the ad hoc group established by the JCG(T&E) in March 1993. This ad hoc group was tasked to review prior efforts, devise alternative methodologies and parameters, and report back to the JCG(T&E). They were not tasked to issue policy and implement a system.

RUMS is not intended to report every facility: each MRTFB will determine its major capabilities and report on them. Specifically the report cites WSMR for failing to report on five resources that the auditors deemed to be reportable:

> The Electronic Warfare Vulnerability Facility is a scientific and technical facility owned and operated by the Army Research Laboratory, a tenant at WSMR.
>
> The High Speed Test Track is a Holloman Air Force Base facility that was not one of the field test ranges.
>
> The Chemistry and Metallurgy Laboratory at WSMR is a supporting facility, not a stand alone test facility. It is generally used to do post test/failure tasks such as toxic fumes analysis, oil sample analysis, etc.
>
> The Optics Test Laboratory at WSMR belongs to its Instrumentation Development Directorate and is used to calibrate, repair, or develop instrumentation. This laboratory does not test defense hardware.
>
> The Range Control Center is an integral part of the WSMR Test Range Complex. Its utilization is the same as the Test Range Complex. Range and mission control facilities are, by definition, included as part of such complexes (Appendix B, Resource Utilization Measurement System Functional Categories, Number 18).

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FINDING. (Pages 9 and 10, Methodology and Techniques, Inconsistent Reporting)

Concur. The RUMS being implemented at the present time was changed in part to remove inconsistencies.

FINDING. (Page 10, Monitoring Implementation Effort, first paragraph)

Do not concur. The ad hoc committee was tasked to review prior efforts, devise alternative methodologies and parameters, and report back to the JCG(T&E). It was formed to address issues that made RUMS (as defined at that time) unusable, some of which were inconsistencies in reporting.

FINDING. (Page 10, Monitoring Implementation Effort, second and third paragraphs)

Do not concur. RUMS is not intended to report every facility: each MRTFB will determine its major capabilities and report on them.

FINDING. (Page 10, Monitoring Implementation Effort, fourth paragraph) "...Reporting less than 100 percent of test capabilities and usage would prohibit OSD management from comparing all testing resources."

Do not concur. A RUMS to allow comparison of similar capabilities will be prohibitively expensive since it will have to somehow normalize the various range capabilities and operational methodologies. RUMS can be used by local managers to assist in their facility management. RUMS data for a facility is unique to that facility, taking into account the capability, operational methodology, test complexities, and architecture of that particular facility. Without a through knowledge of what RUMS means at each facility, a side-by-side comparison of similar facilities using only RUMS data is meaningless.

FINDING. (Page 11, Use of Utilization Data) Page 10

Do not concur. A RUMS to allow comparison of similar capabilities to make BRAC type decisions will be prohibitively expensive since it will have to somehow normalize the various range capabilities and operational methodologies. RUMS can be used by local managers to assist in their facility management. RUMS data for a facility is unique to that facility, taking into account the capability, operational methodology, test complexities, and architecture of that particular facility. Without a through knowledge of what RUMS means at each facility, a side-by-side comparison of similar facilities using only RUMS data is meaningless.

FINDING. (Pages 11 and 12, Conclusion) Page 11

Do not concur. The MRTFB's, under direction from the BoOD, are implementing RUMS with full implementation due by the end of FY 1995.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC

16 MAR 1995

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING
OFFICE OF THE INSPECTOR GENERAL
DEPARTMENT OF DEFENSE

FROM: HQ USAF/TE
1650 Air Force Pentagon
Washington, DC 20330-1650

SUBJECT: DoDIG Draft Report, "DoD Range Utilization Measurement System," (Project No. 4AB-5019.02)

This is in reply to your memorandum requesting that the Department of Defense provide comments on the subject report.

I have reviewed the draft audit on the Range Utilization Measurement System report and can only partially concur with your recommendations. I believe that the name of the process was changed from "*Range* Utilization Measurement System" to "*Resource* Utilization Measurement System (RUMS)", and suggest the title of the report be corrected.

I concur with the detailed comments provided by the Board of Operating Directors (BoOD), and the Director for Test, Systems Engineering and Evaluation's position which expands on the BoOD comments. My comments on the recommendations for corrective action are as follows:

Recommendation 1.a. - Do Not Concur. Previous efforts to implement the RUMS were accomplished under the auspices of the Joint Commander Group for T&E. A recent improvement, the implementation of the T&E Tri-Service Executive Agent structure, has now taken effect. Recommend that management of the RUMS effort be retained within the Board of Operating Directors responsibility. An increased DoD role monitoring the implementation of RUMS is not required within this new tri-services structure. Plans and status should continue to be provided to the Director or Test, Systems Engineering and Evaluation.

Redirected

Recommendation 1.b. - Partially Concur. The Board of Directors, through the Board of Operating Directors, is already providing sufficient management and oversight for RUMS.

Deleted

Recommendation 1.c. - Do Not Concur. It should be reported that progress has been made, and previous managerial deficiencies within the Military Services regarding oversight of the RUMS effort have been corrected with this implementation of the Board of Operating Directors.

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Recommendation 2. - Partially Concur. The Board of Directors, within the T&E Tri-Service Executive Agent structure, have directed the Board of Operating Directors to work with the Services an implement RUMS by the end of FY 95.

I would emphasize that the finding..."OSD and the Military Departments can not make accurate decisions on consolidation, expansion, and improvements at the test ranges...", page 6, is an extreme overstatement of the value of RUMS. Inter-/intra-Service consolidation efforts through Reliance, T&E Executive Agent, and BRAC have shown that a credible decision making process is complex and multi-faceted. A valid utilization measurement system will be an important part of that process, but should not be the single, primary basis for decisions.

JOHN T. MANCLARK
Deputy Director, Test & Evaluation

cc:
DoD/DTSE&E
AF/CV (BoD Chairman)
SAF/FMP
DDT&E/TFR

Audit Team Members

Donald E. Reed
Raymond A. Spencer
Roger Florence
Earl Van Field
Hezekiah Williams
Gary Dutton
Gary Smith