Joint Mission Environment Test Capability (JMETC)

23rd Annual National Test and Evaluation Conference

Mr. Richard Lockhart

Principal Deputy Director

Test Resource Management Center (TRMC)

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TRMC Functions

Sec. 231, FY 2003 National Defense Authorization Act
DoD Directive 5105.71, March 8, 2004

- **DoD Field Activity**
- **Direct Report to USD(AT&L)**

★★★ **SES Director**

NDAA
Title X
Sec 231

MRTFB
Policy
Oversight

Biennial 10-Year
Strategic Planning

Annual T&E Budget
Certification
(Military Departments
and DoD Agencies)

T&E
Workforce

Administer
T&E Investment
Programs
(CTEIP, T&E/S&T,
JMETC)

Oversee T&E Budgets
and Infrastructure
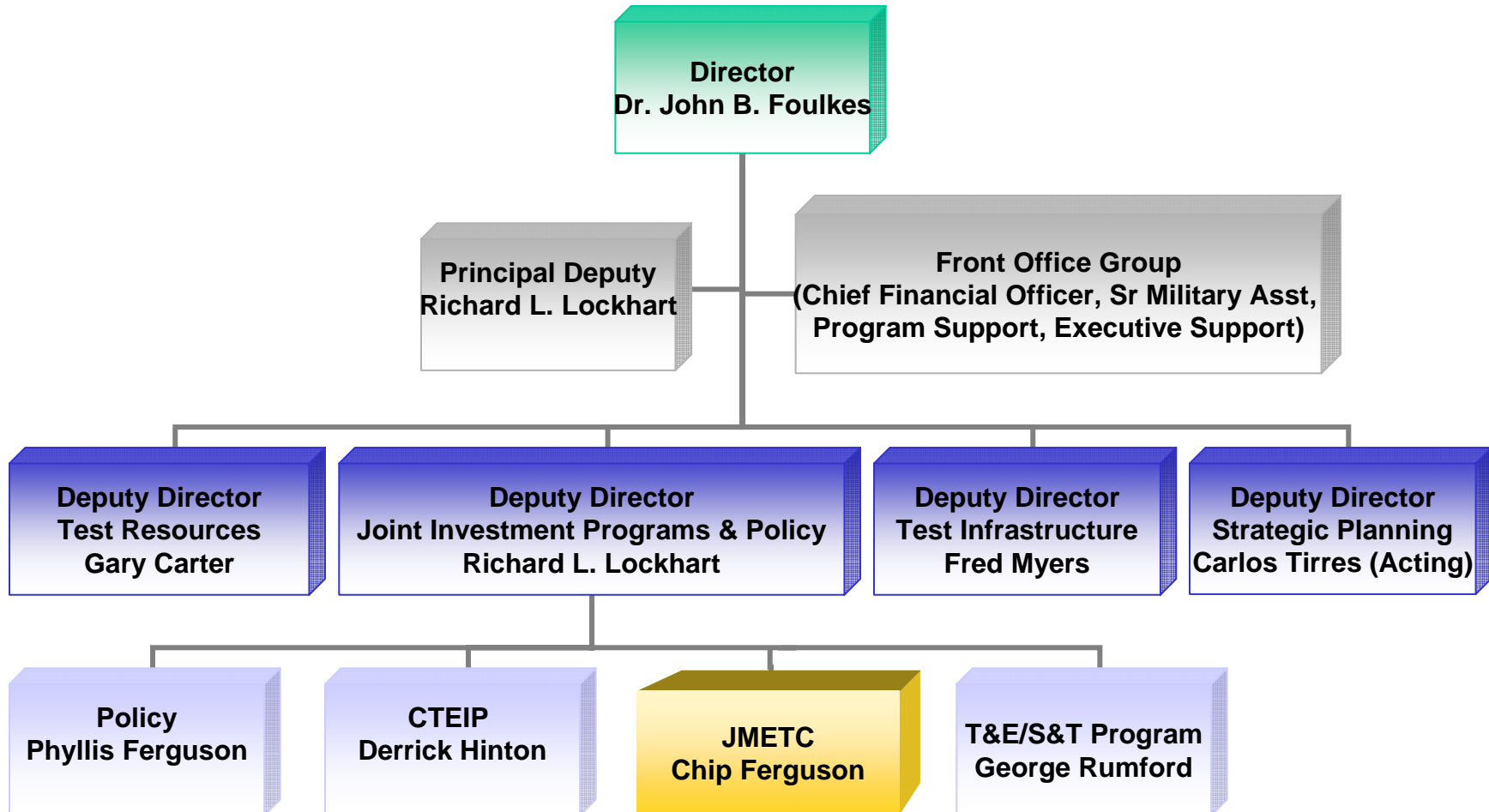(MRTFB and
other test facilities)

TRMC Vision

"The Department of Defense T&E Ranges and Facilities will be fully capable of supporting the Department with quality products and services in a responsive and affordable manner."

We are the stewards of the T&E Infrastructure

TRMC Organization

Director
Dr. John B. Foulkes

Principal Deputy
Richard L. Lockhart

Front Office Group
(Chief Financial Officer, Sr Military Asst, Program Support, Executive Support)

Deputy Director
Test Resources
Gary Carter

Deputy Director
Joint Investment Programs & Policy
Richard L. Lockhart

Deputy Director
Test Infrastructure
Fred Myers

Deputy Director
Strategic Planning
Carlos Tirres (Acting)

Policy
Phyllis Ferguson

CTEIP
Derrick Hinton

JMETC
Chip Ferguson

T&E/S&T Program
George Rumford

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Testing in a Joint Environment
Background

- **March 2004** – SPG: "Joint Testing in Force Transformation"
  - Policy – *Developing and fielding joint force capabilities requires adequate, realistic test and evaluation in a joint operational context*
  - Direction – *DoD will provide new testing capabilities and institutionalize the evaluation of joint system effectiveness*
  - Action – DOT&E lead development of a Roadmap to define changes *to ensure that T&E is conducted in a joint environment and facilitates the fielding of joint capabilities*

- **November 2004** – DEPSECDEF approved Roadmap, validated SPG

- **December 2005** – PB07 PDM approved Change Proposal
  - Joint Mission Environment Test Capability (JMETC) Program Element under USD(AT&L)/ TRMC for execution

- **FY 2006** – Conducted five capability demonstrations of JMETC

- **October 2006** – Establishment of JMETC Program Management Office in Crystal City, VA

Distributed LVC Integration Challenges

- **Problem**
  - No corporate approach
  - Multiple unique solutions – AF-ICE, Navy DEP, JNTC
  - Multiple networks – DREN, DISN-LES, DATUMS
  - Multiple standards – TENA, HLA, DIS
  - Unique program-specific solutions for distributed LVC events

- **Impact**
  - Difficult, time-consuming to conduct distributed LVC events
  - Time consuming to establish security agreements
  - Costly duplication of infrastructure
  - Difficult to conduct joint testing
  - Difficult to integrate Test and Training

What is JMETC?

- A corporate approach for linking distributed facilities
  - Enables customers to efficiently evaluate their warfighting capabilities in a joint context
  - Provides compatibility between test and training

- A core, reusable, and easily reconfigurable foundation
  - Consists of the following products:
    - Persistent connectivity
    - Middleware
    - Standard interface definitions and software algorithms
    - Distributed test support tools
    - Data management solution
    - Reuse repository
  - Provides customer support services

JMETC Responsibility
Product Implementation and Sustainment

- **Persistent Connectivity:** Establish and maintain dedicated VPN on SDREN with standing security agreements.

- **Middleware:** Adopt and sustain downloadable TENA universal data exchange software.

- **Standard Interface Definitions & Software Algorithms:** Adopt and sustain downloadable TENA-established interface definitions and software algorithms (e.g., Radar, TSPI, coordinate and unit conversions, etc.).

- **Distributed Test Support Tools:** Collaborate with CTEIP and the Services to adopt and sustain InterTEC software tools and other existing software tool capabilities that meet JMETC customer needs.

- **Data Management Solutions:** Collaborate with CTEIP to develop new capabilities that meet JMETC customer needs.

- **Reuse Repository:** Establish and maintain on-line web portal with relevant distributed event information (latest middleware, software components, documentation, lessons learned, etc.).

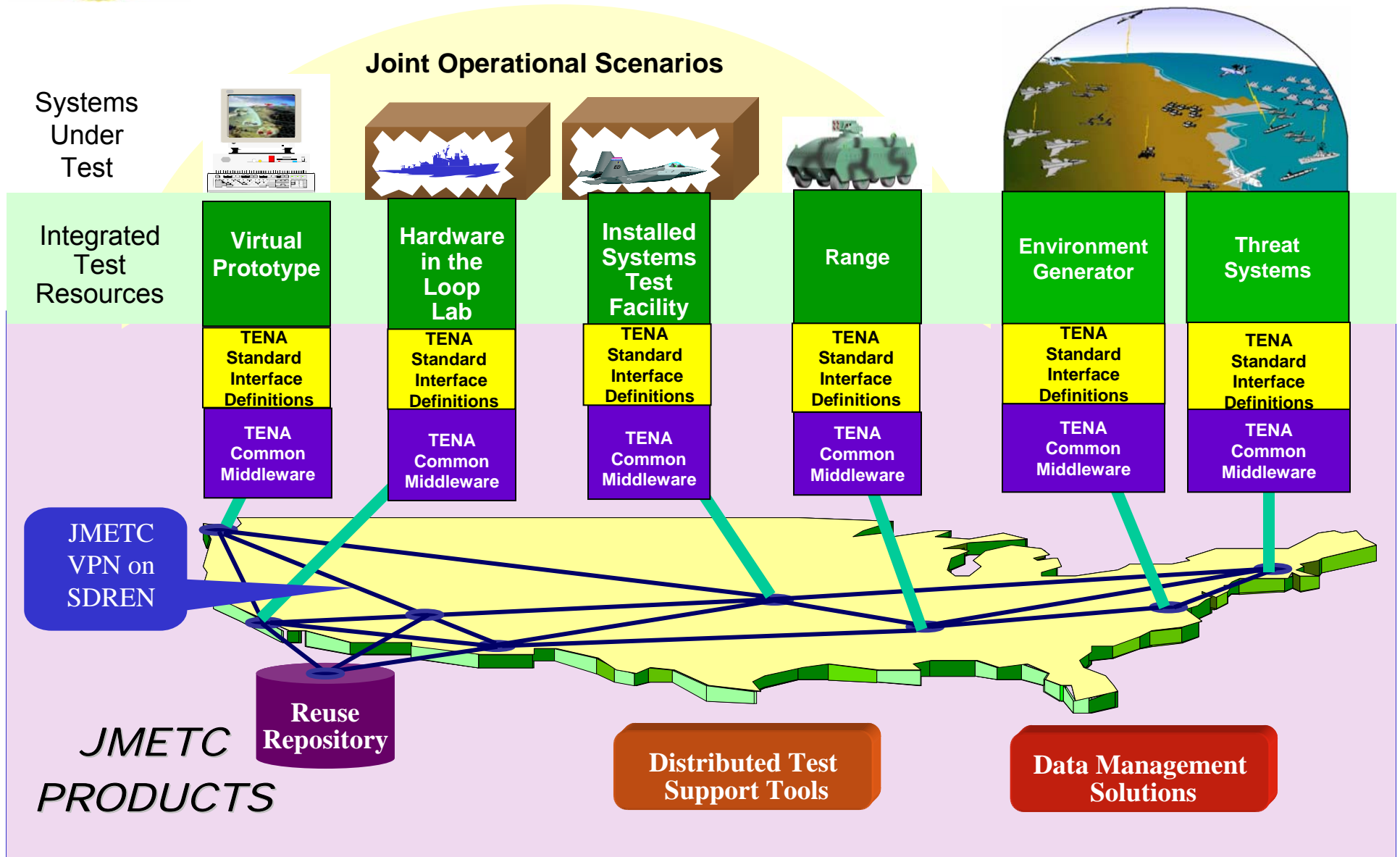*Implementation dependent on funding and customer need*

Test & Training Enabling Architecture (TENA)

- **TENA is:**
  - Developed, upgraded, and sustained by CTEIP and JNTC
  - Middleware that provides a single, universal data exchange solution
  - Common for test and for training (core standard in JMETC and JNTC)
  - Available for download at www.tena-sda.org for free

- **TENA provides:**
  - Interoperability among range systems, hardware-in-the-loop laboratories, and simulations in a quick, cost-efficient manner
  - A capability to rapidly and reliably develop LVC integrations
  - A set of community-agreed object models that define the data elements used in LVC integrations – maximizes reuse from event to event
  - An auto-code generator to drastically reduce TENA incorporation time

- **Next version of TENA (version 6.0) will:**
  - Provide advanced data filtering (only data of interest sent over the wire)
  - Improve fault tolerance and embedded diagnostics
  - Be released in Fall 2007

JMETC Infrastructure

Joint Operational Scenarios

Systems Under Test

Integrated Test Resources

Virtual Prototype	Hardware in the Loop Lab	Installed Systems Test Facility	Range	Environment Generator	Threat Systems
TENA Standard Interface Definitions	TENA Standard Interface Definitions	TENA Standard Interface Definitions	TENA Standard Interface Definitions	TENA Standard Interface Definitions	TENA Standard Interface Definitions
TENA Common Middleware	TENA Common Middleware	TENA Common Middleware	TENA Common Middleware	TENA Common Middleware	TENA Common Middleware

JMETC VPN on SDREN

Reuse Repository

JMETC PRODUCTS

Distributed Test Support Tools

Data Management Solutions

JMETC FY06 Prototype Demonstrations

- **InterTEC Spiral 1+**
  - Conducted Air Combat Mission Thread using Live (8 F-16, 2 F-22, 1 E-2C), Virtual (F-35, F/A-18, F-15, CVN), and Constructive (threats systems)
  - Linked 8 sites: Edwards, Eglin, Pt. Loma, Pt. Mugu, China Lake, Pax River, JITC, Fort Worth
  - Capability accredited by JITC as suitable for interoperability certification of F-35

- **Army 3CE**
  - Integrated M&S resources among 3 Army Commands (TRADOC, RDECOM, ATEC)
  - Linked different data exchange solutions (TENA and HLA) via gateway
  - Linked 6 sites: White Sands, Redstone, Aberdeen, Ft. Sill, Ft. Belvoir, Ft. Knox

- **Information Operations (IO) Range**
  - Distributed multiple video streams of IO effects from remote sites to JFCOM during the Austere Challenge '06 exercise
  - Linked 10 sites, and redistributed video to 35+ observation sites

- **Test & Training collaboration (Technical Alignment with JNTC)**
  - Demonstrated integration commonality with JNTC instrumentation used during Weapons & Tactics Instructor and Red Flag Alaska training exercises (as well as Talisman Sabre)
  - Linked 3 sites: Yuma, Quantico, Suffolk, plus two Alaskan ranges
  - Developed a TENA interface to GCCS (in <1 month) to display range data on GCCS

All events used TENA

Demonstrated the JMETC concept is viable and able to support distributed tests

JMETC Responsibility
Customer Support

The JMETC Team:

- Assists in understanding JMETC and how to use it for testing
- Assists with T&E strategy and requirements
- Supports limited event planning, preparation, and execution
- Reviews and certifies JMETC products for corporate use
- Integrates new nodes onto JMETC VPN with security agreements
- Augments DREN with sites critical for joint testing (maximizing reuse)
- Measures JMETC infrastructure performance
- Provides Help Desk to assist JMETC product users
- Provides semi-annual TENA training classes

Prioritization of effort is based on funding available

Customer Responsibility

- **The customer is responsible for:**
  - Defining requirements

  - Providing test assets and resources

  - Requesting and funding field assistance:
    - Technical integration support, including site verification
    - JMETC product training
    - Detailed event planning, preparation, and execution

  - VPN usage fees for connectivity and bandwidth

  - Unique middleware, object model, and software tool development and upgrades

- **Sites not on JMETC VPN build plan may fund their own addition to JMETC infrastructure**

Industry Involvement

- **Two ways to become a part of the JMETC infrastructure:**
  - Being on government contract to support a program or test event using JMETC
  - Contact the JMETC Program Office

- **TENA middleware and object models freely available – over 27 companies members of TENA Architecture Management Team**
  - Technical forum providing open dialogue between users and TENA developers
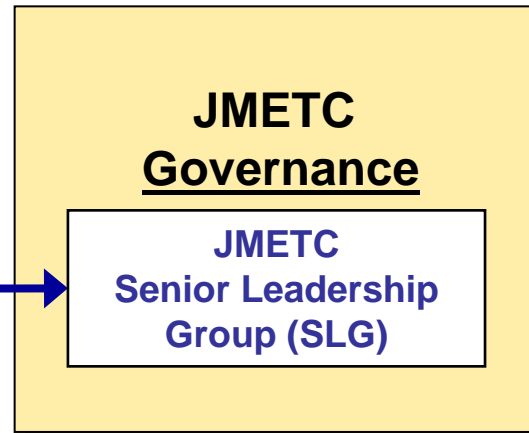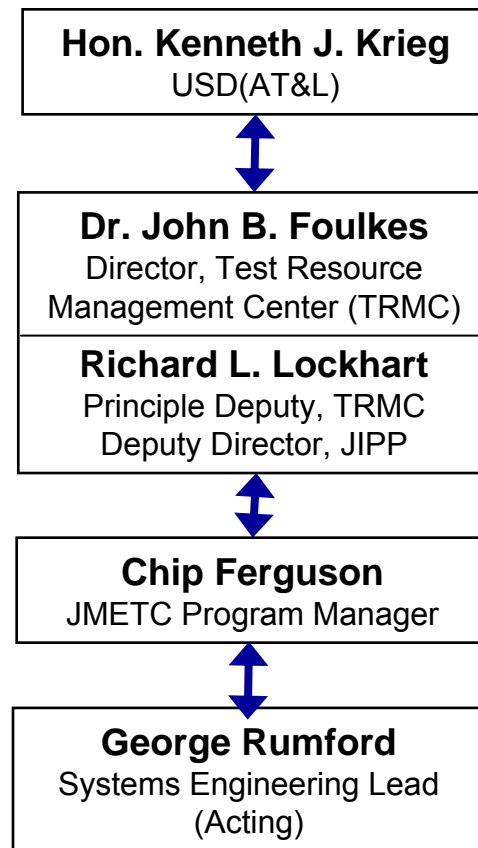 - Used to identify issues, vet concerns, debate solutions, and agree on way forward

*Industry is a key component
in a successful DoD "corporate approach"
to linking distributed facilities*

JMETC Leadership & Governance

JMETC Chain of Command

Hon. Kenneth J. Krieg
USD(AT&L)

↕

Dr. John B. Foulkes
Director, Test Resource Management Center (TRMC)

Richard L. Lockhart
Principle Deputy, TRMC
Deputy Director, JIPP

↕

Chip Ferguson
JMETC Program Manager

↕

George Rumford
Systems Engineering Lead (Acting)

JMETC Governance

JMETC Senior Leadership Group (SLG)

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JMETC Advisory Group

JMETC Users Group

Membership

- JS J8 Co-Chair
- OSD TRMC Co-Chair
- DOT&E
- JFCOM
- JS J6
- Army
- Navy
- Air Force
- USMC
- (OUSD) P&R
- (OASD) NII
- (OSD) PA&E
- (OUSD) I
- DISA
- (OUSD) AT&L

JMETC Support Groups

- **JMETC Advisory Group**

  (GS-15/O-6-level headquarters representatives of T&E community)

  – Focuses is on overall program planning, direction, and priorities

  – Assists in identifying customers and priorities

  – Facilitates collaboration with Service initiatives

- **JMETC Users Group:**

  (Acquisition program offices, technical experts, and ranges that are potential users of JMETC infrastructure and products)

  – Focuses is on technical requirements and solutions

  – Makes recommendations to improve JMETC processes and procedures

  – Advises T&E community on TENA priorities prior to AMT meetings

JMETC FY07 Activities

- **Stand up the Program Management Office**
  - Fill positions
  - Develop Users' Guide and Long-Range Plan

- **Stand up JMETC Users Group**

- **Establish VPN based on customer requirements**

- **Support JCAS 07-03 event – JFCOM/JTEM/AF-ICE**

- **Support InterTEC Spiral 2-Build 1**

- **Support planning for FY08 customers and events**
  - InterTEC (Spiral 2-Build 2)
  - CVN-21
  - FCS
  - SIAP (JCHE-5)

JMETC Benefits

- **Provides Department-wide capability for:**
  - T&E of a weapon system in a joint context
  - DT, OT, Interoperability Certification, Net-Ready KPP compliance testing, Joint Mission Capability Portfolio testing, etc.

- **Provides test capability aligned with JNTC**
  - Both use TENA architecture
  - Enables joint test and training

- **Reduces time and cost by providing**
  - Readily available, persistent connectivity
  - Standing network security agreements
  - Object model auto-code generation tools
  - Tools that allow easy access to previous solutions and lessons learned
  - Corporate data exchange middleware

- **Provides Customer Support**
  - For JMETC products
  - For LVC distributed test expertise

The corporate solution to distributed LVC Testing

JMETC Points of Contact

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Long Range Planning: Cynthia Lindberg-Ross
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Back-Up Slides

Industry Involvement

- **TENA solution is free**
  - Over 27 companies already members of TENA Architecture Management Team

- **Industry participation includes:**

  - AMTEC
  - Anteon Corporation
  - BAE Systems
  - BMH Associates
  - Boeing
  - Computer Sciences Corporation (CSC)
  - Cubic Defense
  - DRS Technologies
  - Electronic Warfare Associates (EWA)
  - Embedded Planet
  - EMC

  - Jacobs Engineering
  - Johns Hopkins University
  - Lockheed Martin
  - MAK Technologies
  - NetAcquire
  - Northrop Grumman
  - Raytheon
  - Samoff Cooporation
  - Science Applications International Corporation (SAIC)

  - Scientific Research Corporation (SRC)
  - Scientific Solutions, Inc. (SSI)
  - SRI, International
  - Trideum Corporation
  - Weibel
  - Wyle Laboratories
  - Virtual Technologies Corporation