National Defense Industrial Association

War-Winning Capabilities…On Time, On Cost

Common Range Integrated Instrumentation System (CRIIS)

Mr. Mike Sorial
CRIIS Program Manager
850-883-3601
mike.sorial@eglin.af.mil

Distribution Statement A:
Approved for public release.
Distribution unlimited.
Evolution of Test and Training Instrumentation

1977
1980
1987
1989
1990
1994
1996
1998
2000
2002
2004
Future

1977
1980
1987
1989
1990
1994
1996
1998
2000
2002
2004
Future

AAC/PA # 10-19-07-609
Memos, Memos Everywhere

Find Common Ground Between Test and Training Instrumentation

Office of the Secretary of Defense

MEMORANDUM FOR SECRETARY OF THE ARMY,
SECRETARY OF THE NAVY,
SECRETARY OF THE AIR FORCE

SUBJECT: Test and Training Interdependency Initiative

The test and training communities require similar capabilities to support their respective missions. Many of these capabilities have been developed separately by both communities, without consideration of potential interdependencies. We seek your support in reviewing the following memorandum.

To realize these benefits, we plan to pursue a corporate investment strategy that includes interdependency initiatives for overlapping functional areas. In order to achieve interdependency, we will develop a corporate investment strategy that seeks to harmonize test and training efforts.

We propose the first application of this approach to be the development of test/evaluation and training capabilities. The Office of the Secretary of Defense (OSD) and the Air Force, through the Test Resource Management Center, will lead this effort and report on its status and objectives within 60 days.

Laura E. D. Brown, Deputy Under Secretary of Defense for Readiness, and the Principal Deputy Director, Operational Test and Evaluation, will be responsible for developing a joint test and evaluation strategy.

We request the OSD and the Test Resource Management Center to develop a joint test and evaluation strategy that addresses the following:

1. Identify areas of overlap and develop a joint test and evaluation strategy.
2. Develop a joint test and evaluation strategy that addresses the following:
   - Test and evaluation capabilities.
   - Operational test and evaluation.

Office of the Secretary of Defense

MEMORANDUM FOR AIR FORCE ACQUISITION EXECUTIVE

Subject: Test and Training Interdependency Initiative—Common Range Integrated Instrumentation System Lead Acquisition Agent

The Office of the Secretary of Defense Test and Training Interdependency Initiative memorandum dated September 7, 2006, directed the development of airborne instrumentation suitable for both test and training as the first application of a corporate strategy to pursue interdependent developments for overlapping functional areas. We request that the Deputy Program Executive Officer for Weapons at the Air Armament Center be designated the lead acquisition agent (LAA) for the development of this system under the Air Force-led Common Range Integrated Instrumentation System (CRIIS) project within the Central Test and Evaluation Investment Program (CTEIP).

The LAA must incorporate the concept of test and training technical interdependency into the acquisition strategy. This is defined as the development and fielding of test and training capabilities that are functionally, technologically, and operationally dependent. We will conduct program reviews on how well this interdependency is integrated into the CRIIS planning and development, as well as the extent to which the project leverages ongoing test and training instrumentation developments and legacy capabilities. The CTEIP will fund developments to meet common test and training requirements and test specific requirements.

We ask the Air Force, as the lead Service for CRIIS, to secure agreements among participating Services to program sustainment and configuration management costs. We also request the LAA to provide information to the CTEIP Program Manager, with a program plan within 60 days of this memorandum.
Requirements Relationships

Test Capabilities Requirements Document (TCRD)

Software Communications Architecture (SCA) &
Test and Training Enabling Architecture (TENA)

P5 Combat Training Systems (P5CTS) Operational Requirements Document (ORD)

Multiple Independent Levels of Security

Range Instrumentation Waveform (RIW)

100%

AF Form 1067 Requirements Modifications

Test Package Directive (TPD)

CRIIS Performance Specification

Managed by Requirements Control Working Group
Major Range and Test Facility Base (MRTFB) and Initial Beddown Location

- Purple Text Denotes Beddown Locations
Where We Train Today

NAS Lemoore

PACAF Locations

CVW-5

SCORE

NAS Fallon

NAS Pax River

Shaw AFB

Mountain Home AFB

Seymour Johnson AFB

Hill AFB

Luke AFB

MCAS Yuma

MCAS Beaufort

USAFE Locations

Gulfport ANG

Eglin AFB

Tyndall AFB

NAS Key West

Fort Polk JRTC

GRMDS Luke AFB

NTC/AW Ft Irwin

MCAS Miramar

China Lake

NAS Oceana

Savannah ANG

NAS Key West

NAS Key West

NAS Key West
Common Range Integrated Instrumentation System

- >20x TSPI Accuracy Improvement Level III
- Miniaturized Internal Mounts
- 20x TSPI Accuracy Improvement Level II
- Training (RIW) Waveform with Training Level TSPI
- Data Throughput 4x Improvement, Software Communication Architecture
- Updated Encryption Technology
- Standardized Protocols and Interfaces
- Improved Reliability
- 3x TSPI Accuracy Improvement Level I
- Ground Station/Live Monitoring (TENA)
- Debrief Station
- Test Ground Subsystem (TENA)

Threat Systems
Program Acquisition Approach

CRIIS
Program Office

Phase I (CPFF)

Contractor 1
Reduce Risk
Mature Technology to TRL 6
Develop System Architecture
Preliminary Design Review

Contractor 2
Reduce Risk
Mature Technology to TRL 6
Develop System Architecture
Preliminary Design Review

DOWN SELECTION

Phase II (CPFF)

Prime Contractor

Increment 1
Configurations 1, 2, 3

Increment 2
Configurations 4, 5, 6

Increment 3
Configurations 7, 8

Ground Subsystem
CRIIS Increments & Configurations

**INCREMENT 1**
Configurations 1, 2, 3
- Level IA TSPI
- Short Range DL
- Config. 1 Dismounted Soldier
- Level IB TSPI
- Mid Range DL
- Encryption
- Config. 2 Low Dynamic Vehicles
- Level IB TSPI
- Extended Range DL
- Config. 3 Ship-to-Shore

**INCREMENT 2**
Configurations 4, 5, 6
- Level II TSPI
- High Throughput DL
- Encryption
- Config. 4 Pod
- Config. 5 Moderate Accuracy Multi-Package Internal Mount
- Config. 6 Moderate Accuracy Single Package Internal Mount

**INCREMENT 3**
Configurations 7, 8
- Level III TSPI
- High Throughput DL
- Encryption
- Config. 7 High Accuracy Multiple Package Internal Mount
- Config. 8 High Accuracy Single Package Internal Mount

Ground Subsystem (GS)

Training and Test

RIW/Training Hooks
## Architecture Approach

### Dismounted Soldier Configuration #1
- **Level I A**
- **Level I B**
- **Level II**
- **Level III**

### Low-Dynamic Vehicle Configuration #2
- **Level I A**
- **Level I B**
- **Level II**
- **Level III**

### Ship-to-Shore Configuration #3
- **Level I A**
- **Level I B**
- **Level II**
- **Level III**

### Moderate Accuracy Configuration #4: POD
- **Level II**
- **Level III**

### High Accuracy Configuration #7: 2-box IM
- **Level II**
- **Level III**

### High Accuracy Configuration #8: 1-box IM
- **Level II**
- **Level III**

### Common Framework
- **Mechanical Interface**
- **Electrical Interface**
- **Data Formats & Protocols**

### Building Blocks
- **TSPI**
- **DATALINK**

### Short Range
- **Encryption Device**
- **RIW**

### Mid Range
- **Recorders**

### Extended Range
- **Participant Interface Controller**

### High Throughput
- **Other Training Hooks (RTKN, Weapon Sims)**

---

### Ground Subsystem

- **Absolute Mode**
- **RTKN, Weapon Sims**
- **Encryption Device**
- **RIW**
- **Recorders**
- **Participant Interface Controller**

---

AAC/PA # 10-19-07-609
Key Technologies

Datalink

Antenna

GPS Receiver Module

Recording Device

Encryption Device

Participant Interface Unit

Inertial Measurement Unit

Ground Subsystem
Key Working Groups

Test & Training Enabling Architecture (TENA)

Integrated Test Team

Joint Tactical Radio System (JTRS)

System Security

Frequency Allocation
# CRIIS Program Schedule

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RPI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source Selection Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDR</td>
<td>△ Down Select</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Phase I
**Risk Reduction**
**Tech Maturity**
**System Architecture**
- Increment 1 - ICS
- Increment 1 Prod
- Increment 2 SDD
- Increment 2 Prod
- Increment 1 - ICS
- Increment 2 - ICS
- Increment 3 - ICS
- Execute Contract Option After CDR

## Sustainment
**Strategic Source of Repair**
**RIW Defn & Spec**
**RIW in JTRS Library**
**Scheduled JSF Integration Needs**
**JSF OT Start (Blk 3)**
**ARD Service Life**
**Potential JSF FOT&E Start**

## Key Events & Drivers
- ARDS
- RIW
- JSF
- Integrated Terminals for JSF
- JSF OT Start (Blk 3)
- JSF FOT&E Start
- Potential JSF FOT&E Start

## Source Selection Activities
- 20 Feb 07 Industry Day I
- 24 Jul 07 Industry Day II
- Release RFP
- Source Selection
- Contract Award

## Contract Award
- Contractor 1
- Contractor 2

## Key Events
- 20 Feb 07 Industry Day I
- Release RFP
- Contract Award
- Source Selection Activities
- 24 Jul 07 Industry Day II
- PDR
- Down Select

## Drivers
- ARDS
- RIW
- JSF
- Integrated Terminals for JSF
- JSF OT Start (Blk 3)
- JSF FOT&E Start
- Potential JSF FOT&E Start
Test & Training Approach

Phase II

INCREMENT 2
Configurations 4, 5, 6
Level II TSPI
High Throughput DL
Encryption

Config. 4 Pod

Config. 5 Moderate Accuracy
Multi-Package Internal Mount

Config. 6 Moderate Accuracy
Single Package Internal Mount

MILS

Basic CRIIS System

"The Hooks"

Participant Interface
Controller (PIC) Delta

DLT RIW Capable

PORT RIW

TSPI

Training Debrief

Enables Testing
(OT/FDE/TDE) in a Training
Environment
"Interoperability"
Summary

- Maturing Technology Readiness
- Lowering Integration Risks
- Maximizing Open Architecture for Future Growth
- Interoperability with Training Achieved Through Datalink