Joint Small Arms Capability Assessment
Analytical Procedure

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Joint Services Small Arms Systems Annual Symposium

John Edwards
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Presentation Outline

1. JCIDS to JSACA
   - (Joint Capabilities Integration and Development System to Joint Small Arms Capabilities Analysis)

2. Analysis Description for:
   a. Functional Area Analysis
   b. Functional Needs Analysis
   c. Functional Solution Analysis

3. JSACA Deliverables

4. JSACA Conclusions

5. JSACA Summary
Joint Service Small Arms Capability Assessment

Background:

• Capabilities Assessment by the JSSAP Application Working Group (AWG) to support the Joint and Individual Service Requirements Generation Process.

• Sponsored by the Joint Service Small Arms Synchronization Team

• Follows the guidelines, as appropriate, of:
  - Chairman of the Joint Chiefs of Staff Instruction – CJCSI 3170.01 E (11 May 2005)
  - Chairman of the Joint Chiefs of Staff Manual – CJCSM 3170.01 B (11 May 2005)

**JSSAP MISSION:**

HARMONIZE REQUIREMENTS ACROSS SERVICES

1978 OSD, review 2004 Army AAE
Function Area Analysis

- Inputs
  - Universal Joint Task Listing
  - Service (unique) Task Listing
  - Lessons Learned

Analysis Tools
- Tasks provide an Activity Network structure
- Multi-Voting/Pareto technique by SME JSSAP AWG
JSACA Content Format
From Functional Area Analysis

US Army
US Marine Corps
US Navy
US Air Force
US Coast Guard
SOCOM

Each survey respondent weights the relative importance of three Time Frames (Near, Mid and Far Term)

7 Tasks of 27 Sub Tasks of 72 Gap Metrics
- Transmit & Receive
- Neutralize
- Suppress
- Breach
- Personal Defense
- Avoid Detection
- Tag & Mark

Far Term
Mid Term
Near Term
DoD CJCSI/CJCSM 3170.01
Four-Step Process

JSACA Process

Document Analysis
- NSS/NMS
- JMG
- JOpsC
  - JOCs
  - Joint Functional Concepts
    - Force
    - Application
    - Protection
- UJTLS
- Service Task Lists
- Lessons learned

Inputs
- Initial Capabilities Document
- PIA
- Non-M-

Outputs
- Final Report
- Integrated DOTMLPF Approach
- MMA
- IMA
- M

FAA
- Functional Area Analysis

FNA
- Functional Needs Analysis

Capability Gaps Prioritized

FAA Process
- NSATC & Gov't Solicitation for Ideas

Post Independent Analysis
- Integrated DOTMLPF Approach
- Functional Solution Analysis

FSA
- Functional Solution Analysis

Tasks, Conditions, & Standards
- Current & Programmed Joint Capabilities
The Gaps in Context; Battlespace Depth—Task Comparison

Transmit & Receive
Personal Defense
Neutralize
Suppress
Breach
Avoid Detection
Tag & Mark

80% of Combat Engagement

Conditions
- Universal... e.g., day, night, all-weather
- Shooter / Target Posture... from defilade
- Battlespace Depth: CQB 0-50m;
  Close 0-100m; Mid 50-600m; Far 300-3000m

Standards
- Respects 3 time periods
  —near-, mid-, and far-term
- Graduated probabilities—
  e.g., Probability of 50%, 70% and 100%
Function Needs Analysis

• Analysis Tool - Check Sheet
  – Comparison of Task-Subtask/Timeframe
    • Current Capability
    • Defined Capability

NO GAP Exists
  – When Current Capability > Defined Capability

GAP Exists
  – When Current Capability < Defined Capability
How

- Gap Prioritization via JSSAP Application Working Group Survey over web
- 21 total participants
  (13 Army, 4 USMC, 1 ea USN, USAF, USCG & SOCOM)
- Survey methods
  - Multi Criteria Decision Analysis (MCDA) via pair-wise rating (Analytical Hierarchy Process)
  - Ad Hoc value rating (9 highest)
Functional Needs Analysis
Gap Priority Techniques

- **MCDA – Multi Criteria Decision Analysis**
  - Pair wise comparisons in an Analytical Hierarchy Process
  - The importance of one Task is compared relative to the importance of another
  - Scored numerically (example below)

<table>
<thead>
<tr>
<th>Transmit &amp; Receive Data</th>
<th>Neutralize Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 8 7 6 5 4 3 2</td>
<td>2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>More important</td>
<td>Equal</td>
</tr>
</tbody>
</table>

- **Ad Hoc rating**
  - No filtered hierarchy
  - Each gap evaluated on its own merit “gut-feeling” prioritization

<table>
<thead>
<tr>
<th>Gap 1</th>
<th>Gap 72</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Sorting" /></td>
<td><img src="image" alt="Sorting" /></td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9</td>
<td>1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>Less important</td>
<td>More important</td>
</tr>
</tbody>
</table>
• Materiel Approaches pre-mapped and readjusted per AWG.
• Analysis Context
  – In relation to Gap Metrics (72 Gap Metrics)
  – Timeframe
  – JCIDS criteria
    • % of attainment of Gap
    • Technical Maturity (TRL)
    • Technical Risk
    • Supportability (adapted per survivability)
    • Affordability
    • Operational Risk
    • DOTLPF impacts

• FSA is an operationally based assessment of all potential DOTMLPF and policy approaches
• For IMA do not describe specific systems for use, rather desired capability, i.e. “UAV with a bomb”.
Analysis of Materiel Approaches

Pool of 65 Ideas

Cap Gap Prioritization & Metrics

Analysis of Materiel Approaches

Respect Prioritization of the Cap Gap Categories
Examine Ideas Relevant to Prioritized Cap Gap Categories

SUB-STEP ONE--ASSESSMENT
Operational Worth: Mitigation Worth and Operational Suitability
Programmatic Worth: Tech Risk, Tech Maturity, Supportability, Affordability

SUB-STEP TWO--ANALYSIS
Operational Worth and then Programmatic Worth
Comparative Analysis of Approaches
Results Presentation

14 More Ideas For Consideration

Approaches Of Clear Merit
Approaches Of Significant Merit
Capability Gap Categories With No Apparent Approaches

Analysis of Materiel Approaches Review
JSACA \textit{Change Recommendations}

\textbf{Deliverables}

- Establishes Joint Capability Requirements
- Opportunities/Basis for Support for the following:
  - Doctrine Change Requirement
  - Initial Capabilities Documents
  - Critical Capabilities Document
  - Critical Production Document

- Provides reference to S&T investment via
  - Evolve Technology for New Soldier Weapon Systems
  - Manage and Execute the Technology Base
  - DTOs (Defense Technology Objectives)
  - ATOs Army Technology Objectives

Further focus on Ideas that effect
Functional Characteristics
Durability / Reliability / Weight/ etc.

Consider Ideas with
Potential for Increased Lethality
High Risk, really S&T ventures
JSACA Conclusions

1. A Joint Service Harmonized document
2. “Guide” to Capabilities the Services desire in the future.
3. Defines gaps for technology base and supports acquisition activities
4. Requires updating periodically

Overall Recommendation – Next Step
Staffing by executive agent – Army
Coincident Review by All Services for Joint awareness at Functional Control Board
JSACA Summary

**JSSSAP-sponsored Analysis:**
Conducted in accordance with CJCS JCIDS guidance

**Products**

JSISA Splinter Effort

- Joint Service Individual Small Arms
- Final Report
- "The deadshot餐廳，the battlefield's best weapon" quote
- August 2004

JSACA FAA & FNA

- Joint Small Arms Capabilities Assessment (JSACA)
- Functional Area Analysis
- Functional Needs Analysis
- June 2005

JSACA FSA

- Joint Small Arms Capabilities Assessment (JSACA)
- Functional Needs Analysis
- November 2005

**The Benefits:**
Form the Basis for Future requirements

Details where investment is needed

Recommendations/Conclusion