Panel 1:
Requirements Generation for Total Battlespace Awareness

JAWS 99

Presented by
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Naval Aviation Systems Team
• Know the environment.
• Know your adversary.
• Know your strengths.
• Know your weaknesses.
• Your strengths and weaknesses, arrayed against your adversary's strengths and weaknesses, should reveal your requirements.

"Know the enemy and know yourself; in a hundred battles you will never peril. When you are ignorant of the enemy but know yourself, your chances of winning or losing are equal. If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril."

Sun Tzu, The Art of War, Sixth Century B.C.
Operational Warfare Drivers

Aircraft ➔ Single seat, multi-mission, smart/programmable

Weapons ➔ Guided, standoff, autonomous

Force Structure ➔ Fewer platforms, people, weapons

Threat ➔ Lethal, mobile, electronically agile

Operational Concepts ➔ Enable rapid, decisive, low loss victory

Improved planning methods and tools required to meet high information demands of modern strike warfare
Emerging threat systems mobile/lethal
- > 90% mobile, main threat to JSF (RADM Steidle)

High interest "time critical" targets
- Relatively few, but can drain JTF resources (1994 DSB)

Battlefield changes dramatically within traditional planning & execution timelines

Mission planning is the pacing function in joint precision interdiction timeliness (1994 DSB)
Network Centric Warfare
Brave New World

- Warfare which derives its power from the robust networking of a well informed but geographically dispersed force, enabled by:
  - Highly webbed information services
  - Timely access to all relevant and appropriate information sources
  - Value-added, automated command and control processes (to include high speed automated assignment of resources to need)
  - Integrated sensors hosted on the information network and closely coupled in time to the shooters and command and control processes
  - Weapons reach with precision and speed of response

Source: VADM Cebrowski, President, Naval War Colleague, October 1998
Network Centric Warfare
Increases Joint Combat Power

Results for Precision Engagement

- **Operational Impact**
  - Dramatic Early Results
  - Greatest Rates of Change in Initial Phase of a Campaign
  - Inflicts Maximum Losses on the Enemy
  - Shortens Timelines
  - Locks out Enemy Options

![Graph showing targets destroyed over time with different combinations of technologies.](image)
Network Centric Warfare
Integrated Planning & Execution

Time-critical-target/mobile SAM targeting data linked to Afloat AOC

National sensor updates mission planning threat data base\cues JSTARS via TRAP

UAV passes time-critical-target location to JSTARS

Mobile SAM engaged using JSTARS targeting

JFACC Afloat real-time tactical picture enables sensor-to-shooter retasking & situational awareness updates

Mission plan update, JSOW targeting data, threat avoidance routing relayed to TACAIR

Time-critical-targets/advanced mobile threats demand integration of theater sensor data into real-time battle management and mission plan updates
Information Warfare

Friendly Systems (IW Protect)

Enemy Systems (IW Attack)

Network Security

(DoD Internet)

(GCCS)

(Link 16)

(CEC)

Weapons Direction

Common Tactical Picture

Common Operational Picture

TCP/IP Backplane

Physical Attacks on Nodes

Jamming

Implanted Viruses
Scope of Land Attack Targeting 2010

<table>
<thead>
<tr>
<th>Missions (day, night, wx)</th>
<th>Sensors</th>
<th>Launch Platforms</th>
<th>Weapons (to 600nm)</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strike</td>
<td>NTM</td>
<td>Manned A/C</td>
<td>Unguided</td>
<td>Soft, Hard, Buried, Camo’d</td>
</tr>
<tr>
<td>Air - Ground</td>
<td>Manned A/C</td>
<td>Manned A/C</td>
<td>Guided</td>
<td>Fixed, Relocatable, Mobile,</td>
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<tr>
<td>Surface - Surface (NSFS)</td>
<td>UAV’s</td>
<td>UCAV’s</td>
<td>INS/GPS-only</td>
<td>Moving, TCT’s</td>
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<tr>
<td>SEAD</td>
<td>Troops</td>
<td>DDG’s/SSN’s</td>
<td>Terminal Sensor</td>
<td>Point, Array</td>
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<tr>
<td></td>
<td>UGS’s</td>
<td>Mapping</td>
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Strike Timeline

Current Strike Timeline:
- Day 1 0600: ATO A
  - Plan
- Day 2 0600: ATO B
  - Gen, Plan
- Day 3 0600: ATO C
  - Strike, Gen, Plan
- Day 4 0600: Assess, Strike, Gen
  - Re-strike Required
- Day 5 0600: Assess, Strike
  - Timeline 12-24 hrs
- Day 6 0600: Assess

Need: Compress "The Timeline"
- Detect
- Decide
- Deliver
- Kill

- Tgt Detection
- Receipt of Target Data IPOB
- Targeteering
- Planning
- Weaponing
- Asset Allocation
- Shooter rec Tgt data
- Ingress
- Missile Launch
- Transfer of Data
- Fire Decision
- Timeline Reduction Required
  - Biggest payoff is Reducing $t_2$ to $t_3$

Today ••••• Tomorrow
Cooperative Engagement Capability

SENSOR BENEFITS
- Near real time exchange of sensor measurement data
- Cueing of remote sensors
- Jam resistance/low probability of intercept

COHERENT, FIRE CONTROL QUALITY TRACK PICTURE HELD BY ALL UNITS IN A COMMON, SHARED DATA BASE
The Future: Seemless Integration

- User Defines Info Needs
- Recognizable Format
- Pushed
- Pulled
- Planning - Pull
- Survival - Push
- Resides at Insertion Point
- Delivered "Just-In-Time"