

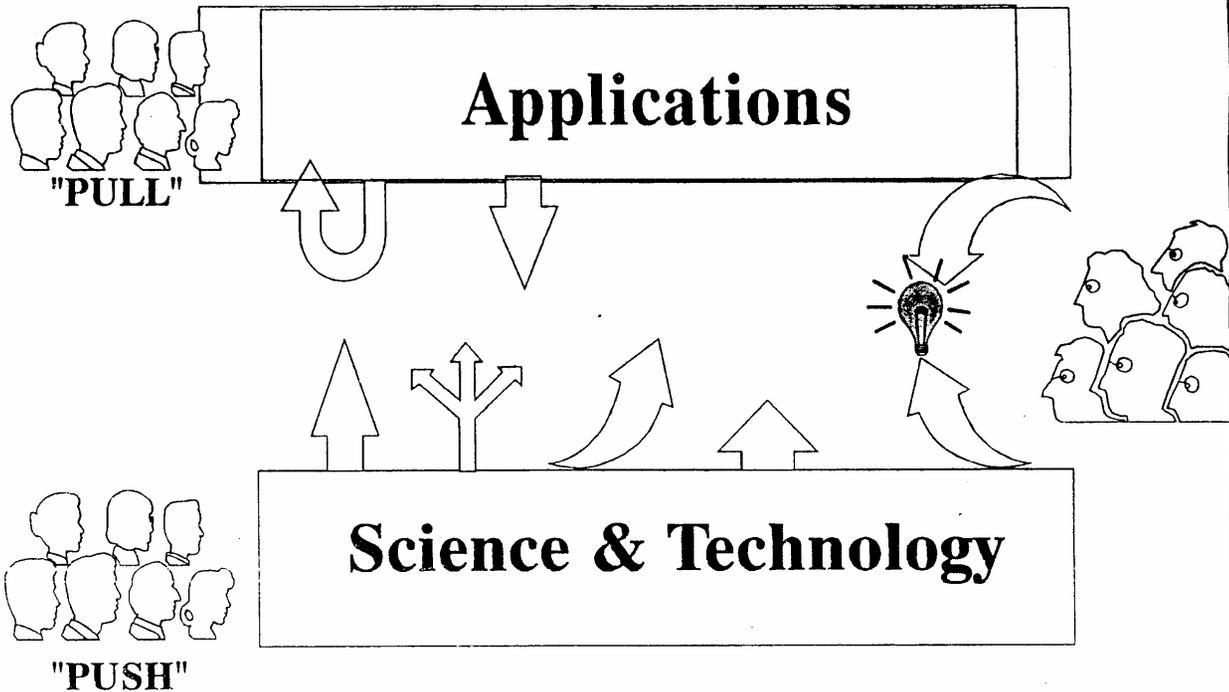


# **Advanced Technology Review Board (ATRB)**

***--Process Overview Brief for  
ONR Partnership Conference--  
5 Aug 2004***

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## *TRANSITION ENDGAME*



*"A hiatus exists between inventors who know what they could invent, if they only knew what was wanted, and the soldiers who know, or ought to know, what they want, and would ask for it if they only knew how much science could do for them. You have never really bridged that gap yet."*

*--Winston Churchill, First Sea Lord, Nov 1916--*



## *Advanced Technology Review Board Concept*

- Common Planning
  - Objectives: Transitions from S&T, Better Comms, Guidance for Technologists
  - Products: Prioritized Technology Options, Technology Roadmaps, Funding Strategies
  - Membership: OPNAV R/O's, PEO (Chair), PMA's, ONR, NAWC
  - Operation/Process: Advanced Technology Review Boards (ATRB's) (2X per year)
  - Common Assessment Criteria/Metrics
- Synchronized Efforts : PEO/PMA, N78 NALG's, N7 NCDP/MCPs, Fleet, ONR FNCs, NAVAIR/NAWC, Industry, University, (Allies)
- Current NAVAIR ATRB Line-up
  - On-going: Strike Platforms, Air ASW, Weapons, Common Systems, Assault, Carrier
  - Proposed: Training, ISR

**N78 Naval Aviation S&T Action Group**  
 (NALG WG's: Common Avionics, Manpower/Trng, Carriers, Strike, Maritime Surv., Amphib, Maint) → Future Naval Capabilities

N75	N76	N77
N4	N6	N2

**Transition Opportunity Board (TOB)**  
 (PEO(A), PEO(T), PEO(W), JSF, 1.0, 3.0, 6.0, 8.0)



**Carrier ATRB**

PMA-213 PMA-251 *PMA-260*  
*PMA-281 PMS-312 PMS-378*

**Common Systems ATRB**

PMA/W-156 PMA-202  
 PMA-209 *PMA-213*  
*PMA/W101/159 (SPAWAR)*

**Air ASW ATRB**

PMA-264 PMA-299  
 PMA-290 *PMA-263*

**Assault ATRB**

PMA-257 PMA-275  
 PMA-261 PMA-276  
 PMA-299 *PMA-263*  
 PMA-207 PMA-274

**Training ATRB**

*PMA-205 PMA-248*  
*PMA-273*

**Strike Platforms ATRB**

PMA-234 PMA-241 *PMA-231*  
 PMA-257 PMA-265 *PMA-263*  
 PMA-272 JSF *UCAV*

**Weapons ATRB**

PMA-201 PMA-242 PMA-259  
 PMA-280 PMA-281 PMA-282

**AIR 30/6.0**

**AVIATION MAINTENANCE ATRB COORDINATING TEAM (AMACT)**

*italics* Proposed

# ATRB Membership

- PEO, Chair
- NAVSTO (AIR-4.0T) Facilitator
- OPNAV Requirement Officer(s)
- PMA's and IPT Leads (*Class Desks*)
- ONR (FNC and D&I Mgrs)
- NAWC (Technologists)
- *NAVAIR Operational Testers*
- *Fleet Reps (NFFTI/Adv Tech Group)*
- *Industry (NDIA)*



# STREAMLINING TECHNOLOGY TRANSITION

**Guidance & Implied Requirements**

DOD/JCS/DDR&E/JROC/Reliance Services/DON/ASN-RDA  
OPNAV/NCDP/Pillars  
PM Future Tech Needs

**NAVSTO/STRIKE PLATFORM**  
234, 241, 257, 265, 272, JSF, UCAV

**NAVAIR Competency T-Codes**

**ICD**  
**CCD**  
Warfighting Requirements

**PEOs**  
Transition Opportunity Board

**Platform & Product PMAs**

PEO(T) F/A-18 Systems Development Roadmap (draft)

FY 95 lot 17	FY 96 lot 18	FY 97 lot 19	FY 98 lot 20	FY 99 lot 21 (LRIP I)	FY 00 lot 22 (LRIP II)	FY 01 lot 23 (LRIP III)	FY 02 lot 24 (PRP)
AAS-38E FLIR	AS-37 (4.5 inch)	SLAM Pro	...	...	...	...	...
LITENIP	OPB (MADCA)	Downlink DLO	...	...	...	...	...
PAO	4th MDC	SMS Upgrade	...	...	...	...	...
SMCO	1st Wing Sys	ACT Dev	...	...	...	...	...
WFCO	Low drag pylon	ALA-87ABR	...	...	...	...	...

**Government Sponsored Science & Technology**  
**ONR NAVSTO**

ATD  
ACTD  
SBIR

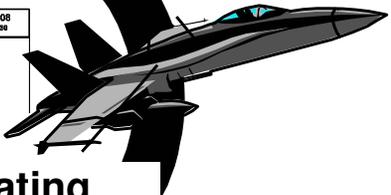
**Pre-ATR**

**Technology Transition**

**Prime Contractors & Sub-Contractors**

IR&D

**Industry Sponsored Science & Technology**  
**New Industry Products**



## ATRB Evaluation Criteria

- Navy Need
- Operational Payoff
- Risk (Technical, Programmatic, & Affordability)
- Life Cycle Cost Analysis
- Supportability
- Transitional Potential
- OPNAV Sponsor Support

# Typical ATRB Results Matrix

SPATRB V October 2002

SPATRB	Technology Title	PMA-234	PMA-241	PMA-257	PMA-265	PMA-272	JSF	N780
V-1	Two-Look Precise SAR-Based Target Geolocation with the Multiple Image Coordinate Extraction (MICE) Algorithm	Pass	Pass	Pass	Endorse	Pass	Interest	Interest
V-2	Rapid ReTargeting	Pass	Endorse	Support	Interest	Support	Interest	*Endorse
V-3	Improved Power Amplifier (PA)Technology	Pass	Pass	Interest	Interest	Pass	Interest	Pass
V-4	Bandwidth Efficient Anti-Jam Waveform	Pass	Pass	Interest	Endorse	Pass	Interest	Interest
V-5	Tactical Dissemination Module (TDM)	Endorse	Endorse	Pass	Interest	Pass	Pass	Interest
V-6	DARPA Unattended Ground Sensors for real-time High Confidence Target ID and Precision Targeting of Time Critical Targets for Tactical Air Strike	Pass	Pass	Pass	Interest	Pass	Interest	Interest
V-7	Generalized Automated Maintenance Environment (gAME)/AME Modules	Pass	Interest	Pass	Concern	Pass	Interest	Interest
V-8	Real-Time Automated Geo-location Enhancements (RAGE)	Pass	Support	Support	Endorse	Pass	Endorse	Interest
V-9	Low Cost EA-6B Anti-Jam Link 16 Aperture	Endorse	Pass	Pass	Interest	Pass	Interest	Interest
V-10	2-Color IR Missile Warning Sensor Technology for Tactical Aircraft Platform Protection Systems, Including TADIRCM	Pass	*Endorse	Interest	Endorse	*Endorse	Interest	*Endorse
V-11	Component Upgrade Recertification Environment-(CURE) [PROCUREMENT SENSITIVE]	Pass	Interest	Pass	Endorse	Interest	Pass	Interest
V-12	Modular Digital EW Suite (MDEWS), AN/ALR-69U [RAYTHEON PROPRIETARY]	Interest	Interest	Pass	Pass	Interest	Pass	Interest
V-13	ATFLIR IR Search and Track [RAYTHEON PROPRIETARY]	Pass	Pass	Concern	Endorse	Pass	Interest	Interest
V-14	Destruction of Enemy Air Defenses using the AESA Radar Integrated with the ALR-63 Receiver - [RAYTHEON PROPRIETARY]	Pass	Pass	Pass	Endorse	Endorse	Pass	Interest
V-15	Reliability/Maintainability for Legacy Systems [EFW PROPRIETARY]	Concern	Interest	Pass	Concern	Concern	Interest	Pass
V-16	Rapid Operational Software Capability [BOEING PROPRIETARY]	Pass	Interest	Pass	Interest	Pass	Interest	Interest
V-17	Tactical Infosphere Connectivity/ Maintenance Infosphere Connectivity [BOEING PROPRIETARY]	Pass	Pass	Pass	Pass	Pass	Interest	Pass
V-18	Link 16 and Datalink Connectivity Management [BOEING PROPRIETARY]	Pass	Interest	Interest	Pass	Interest	Pass	Pass
V-19	Video Target Identification and Verification (VIVID) [PROCUREMENT SENSITIVE]	Pass	Interest	Endorse	Endorse	Pass	Interest	Interest

\*FUNCTIONAL ENDORSEMENT ONLY; Specific Technology not endorsed.

GREEN=SUPPORT VOTE

BLUE=ENDORSE VOTE (\*FUNCTIONAL ENDORSE)

YELLOW =INTEREST VOTE

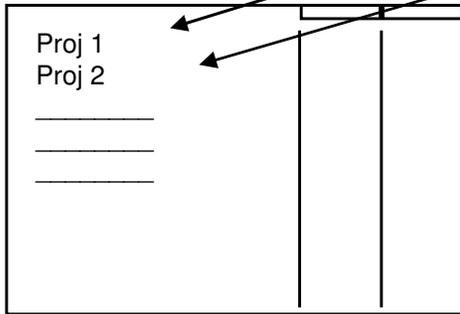
ORANGE=PASS VOTE

RED=CONCERN VOTE

# ATRB Products

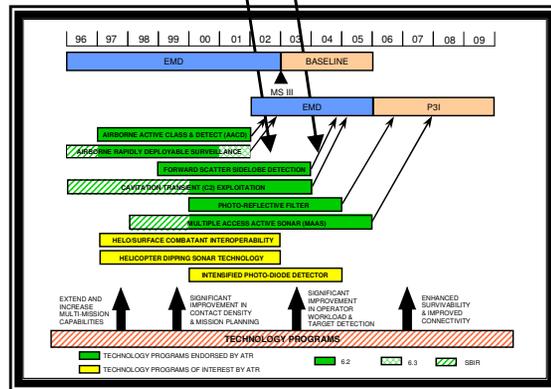
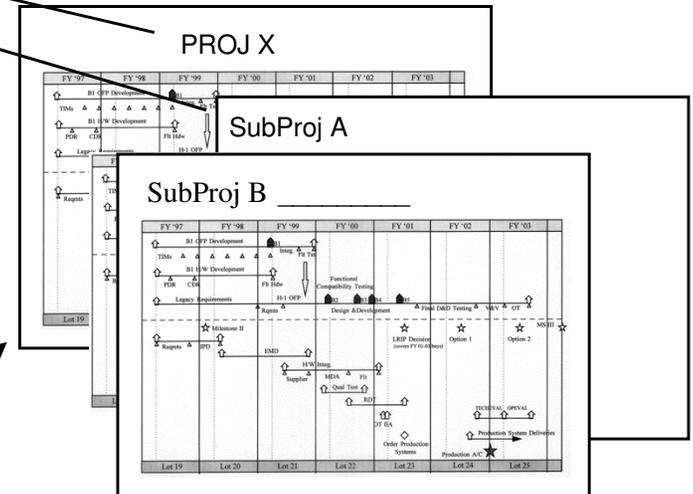
N7 Warfighting Requirements  
(~NCDP)

S&T Priorities



| Proj Name        | Current System   |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Program & Budget |
| ...              | ...              | ...              | ...              | ...              | ...              | ...              | ...              | ...              | ...              |

S&T Support Plan  
(Tech Transition Agreement—TTA)



Technology Transition  
Roadmap

# Sample STRIKE Platform PMA Technology Needs

a/o 28 Jan 2003

PMA	Future Technology Needs
<b>265 (F/A-18)</b>	<ol style="list-style-type: none"><li>1. Receiving and sending real-time imagery and information into and out of the cockpit (RTIC/RTOC); storing, processing and correlating the imagery to support precision strike targeting and sensor data fusion.</li><li>2. A weapons control network capability suitable for high data rate, low latency, composite tracks for long-range fire control against air-to-air and air-to-surface (relocatable and moving) targets.</li><li>3. Real-time image correlation of stored reference data to on-board sensor imagery to achieve precision strike quality targeting solutions.</li><li>4. TOC reduction efforts including: The cost of research, development, acquisition, test and evaluation, operation and support (O&amp;S), and disposal costs.</li></ol>
<b>272 (EW)</b>	<ol style="list-style-type: none"><li>1. Directed IR Countermeasures for TACAIR.</li><li>2. Compact, High Power, Mid Band Laser Technology (Modulators, Photo Diodes).</li><li>3. Reliability / Maintainability Initiatives for Legacy Systems (Automatic end-to-end BIT, Obsolete Processor Upgrades without legacy software encoding).</li><li>4. Advanced RF Towline Technologies (IDECM P3I).</li><li>5. 2-Color IR Focal Plane Manufacturing Processes.</li><li>6. Advanced Countermeasures Expendables for Advanced CCM Threats (TACAIR and ASE).</li><li>7. Enhanced RF Warning / Precision ID (Advanced DSP for Threat ID and Precision Location).</li><li>8. RF Threat Exploitation / Countermeasure Technique Development.</li><li>9. Microwave Power Modules.</li><li>10. Traveling Wave Tubes (Mini-Tubes, Increased Bandwidth, Higher Power, etc.).</li><li>11. DRFM / CRFM Advances.</li><li>12. GPS Jamming Detection / Suppression.</li></ol>

# ATRB Takeaways

## Technologists

## PEO/PMA

## OPNAV R/O's

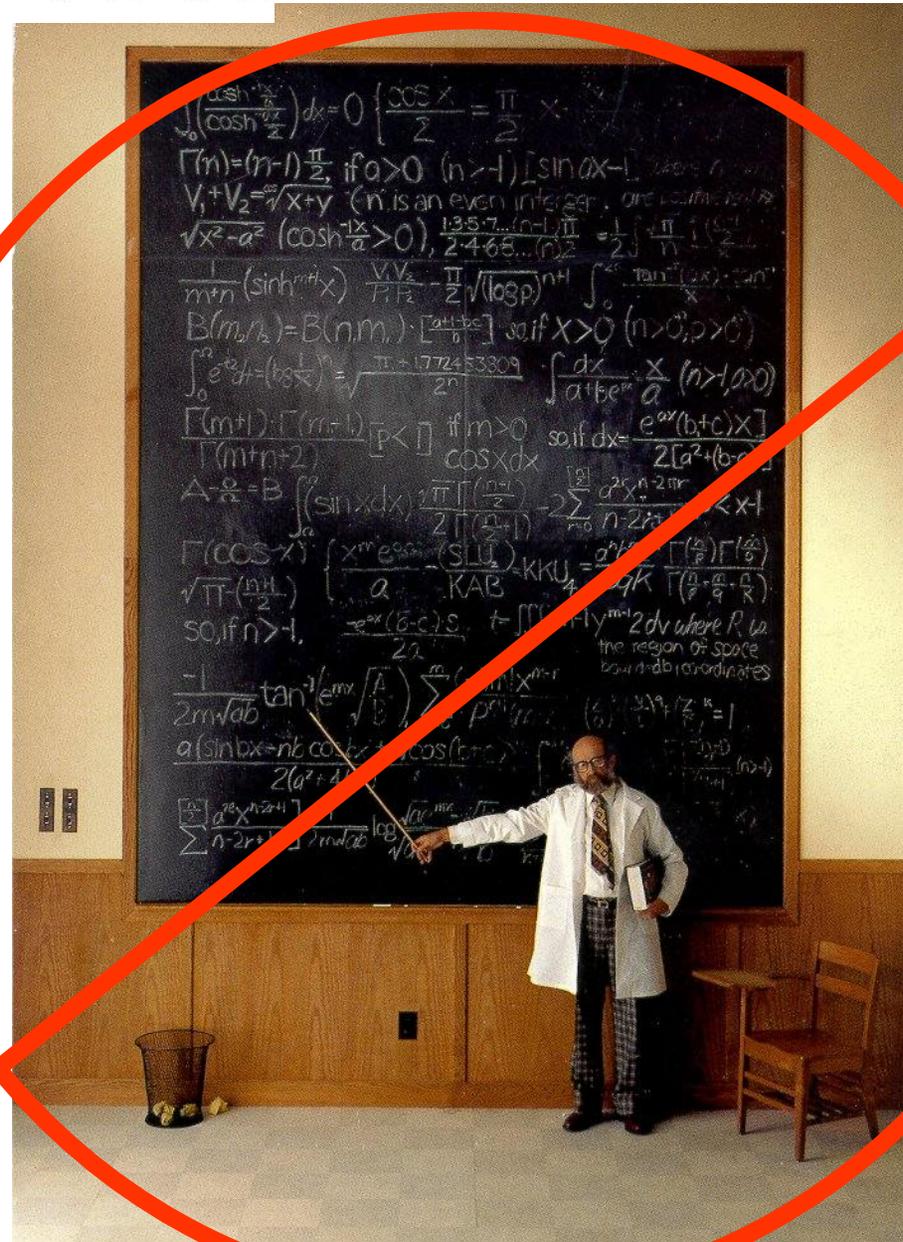
## ONR PM's

<ul style="list-style-type: none"> <li>•“Need” Guidance, esp. mid-far term transition “windows” for technology insertion</li> </ul>	<ul style="list-style-type: none"> <li>•“Lower cost” <i>near-term</i> improvements</li> </ul>	<ul style="list-style-type: none"> <li>•Insight into possible future requirement solutions for aviation planning (e.g. NAP)</li> </ul>	<ul style="list-style-type: none"> <li>•Validated PMA Technology Roadmaps</li> </ul>
<ul style="list-style-type: none"> <li>•User endorsements for initiation/defense of programs/projects (6.1/6.2/6.3)</li> </ul>	<ul style="list-style-type: none"> <li>•S&amp;T “plug-ins” for out-year needs (SBIR, IRAD, MANTECH, NICOP, etc)</li> </ul>	<ul style="list-style-type: none"> <li>•Support for NALG/MCP preparation (e.g. Issue Sheets) and NALG/Pillar Working Group assistance</li> </ul>	<ul style="list-style-type: none"> <li>•Resource for assessing technology project transition potential for Spike candidates</li> </ul>
<ul style="list-style-type: none"> <li>•Notional <i>Operational Concepts</i> for “consideration” purposes</li> </ul>	<ul style="list-style-type: none"> <li>•Notional, <i>integrated system concepts</i> for “consideration” purposes</li> </ul>	<ul style="list-style-type: none"> <li>•Transition evaluation for FNC prospects</li> </ul>	<ul style="list-style-type: none"> <li>•Guidance for Investment Balance Review planning</li> </ul>

Eureka!

We've discovered the answer for technology transition...

but, it's NOT an equation...



It's **common planning...** because successful transition is a *contact sport* !



## **ATRB Website**

- Available for public use
- Contains schedules, minutes, announcements, POCs, etc. for all ATRBs
  - Submissions and other sensitive data will be password protected
- URL: <http://atrb.navair.navy.mil>

## NAVAIR ATRB POC's

- ATRB Manager: Mr. David B. Bailey, NAVSTO (AIR-4.0T)  
(301) 342-0219, [david.b.bailey@navy.mil](mailto:david.b.bailey@navy.mil)
- ATRB Facilitators:
  - Strike Platform—Mr Tom Theis, (301) 757-0456, [thomas.theis@navy.mil](mailto:thomas.theis@navy.mil)
  - Air ASW—Mr. David Bailey, (301) 342-0219, [david.b.bailey@navy.mil](mailto:david.b.bailey@navy.mil)
  - Weapons—Mr. Carlos Falcon, (301) 342-8295, [carlos.falcom@navy.mil](mailto:carlos.falcom@navy.mil)
  - Common Systems—Mr. Rich Muir, (301) 757-6473, [richard.muir@navy.mil](mailto:richard.muir@navy.mil)
  - Assault—Mr. David Bailey, (301) 342-0219, [david.b.bailey@navy.mil](mailto:david.b.bailey@navy.mil)
  - Carrier—Mr. Mark Husni, (732) 323-4081, [mark.husni@navy.mil](mailto:mark.husni@navy.mil)
  - Aviation Maintenance ATRB Coord Team—Mr. Denny Barr, (301) 757-9122,  
[denny.barr@navy.mil](mailto:denny.barr@navy.mil)
- Webmaster:
  - Ms. Elizabeth Smith, (301) 866-2156, [elizabeth.smith@ai-engsvcs.com](mailto:elizabeth.smith@ai-engsvcs.com)

# BACK-UPS

## What Happens With ATRB Results?

- PEO/AIR-00 *Results Letter* to CNR, OPNAV, ASN/RDA, AIR-00/4.0/NAVSTO, NAVAIR Transition Opportunity Board (TOB)
- All ATRB *prioritized ratings* tabulated and reported to all concerned
- *Technology Roadmaps* prepared for each PMA depicting insertion windows for highly rated technologies
- *Support Plans* developed for funding strategies--TTAs (PM/PI/ONR)
- Technologists get “*strengths & weaknesses*” feedback
- Included in “*master matrix*” database for future reference and tracking

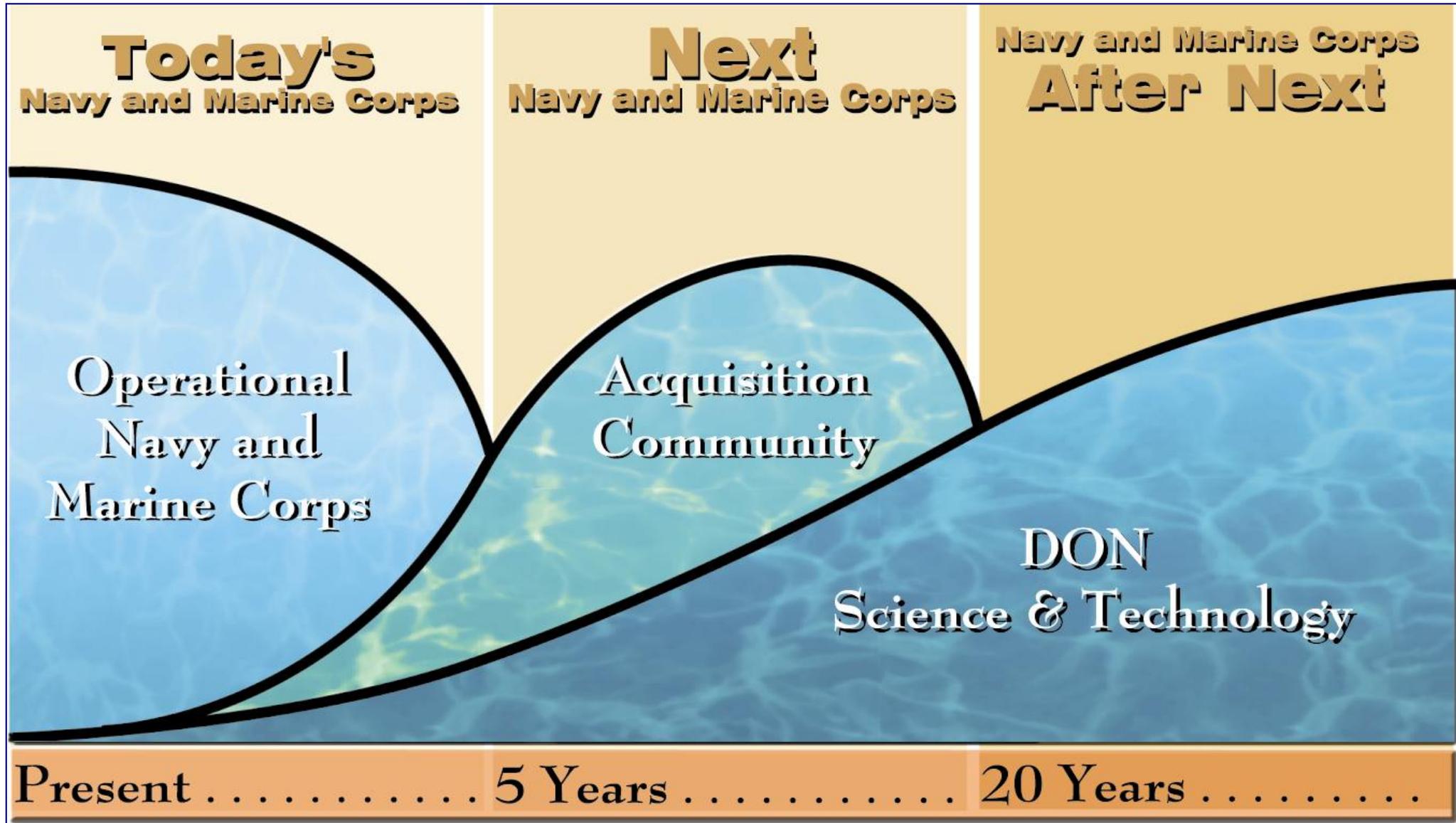
# Genesis of ATRB Process

circa 1996

- Preference for Buyer-owned (PEO/PMA) process
- Contributes to DON/USMC aviation technology transition strategy
- Need driven (Warfighter)
- Start slowly, expand with success
- Simple, consistent, repeatable
- Voluntary—desire, not demand driven
- Include all players (OPNAV, ONR, PEO/PMA, NAWC)
- Assessments of transition potential
- Examines all kinds of S&T programs (6.1-6.3/FNC, IRAD, ACTD, MANTECH, SBIR, etc)
- Use proven criteria as yardsticks
- Entertains submittals from all sources (govt, industry, university)
- Ensure (common) transition plan makes a difference--ROI



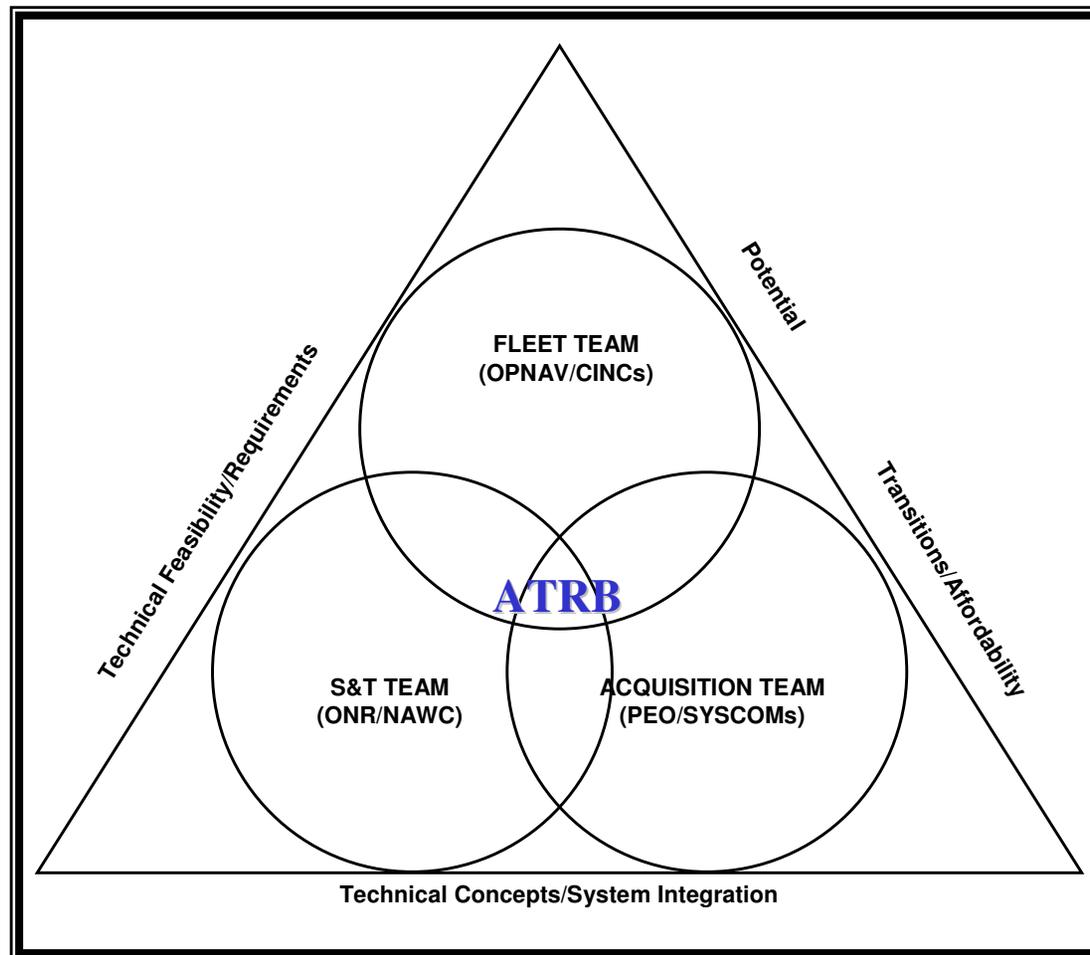
# Towards The Navy-after Next



# Sources for S&T Solutions

- **In-House Navy** (Government-funded: D&I, FNC, SBIR, MANTECH)
- **Navy/Industry Partnerships** (NICRAD, ATD's, ACTD's, Dual Use, etc)
- **Joint Service** (USAF, USA, USMC)
- **Government Agencies** (NASA, DARPA, CIA, FAA, DOT/USCG, etc)
- **National Labs** (Draper, Sarnoff, Los Alamos, ORNL, etc)
- **Industry** (IRAD, CRAD)
- **Universities/FFRDCs** (APL, CNA, MIT, etc)
- **International/Coalition Partners** (NICOP, MOU's, PA's, DEA's)

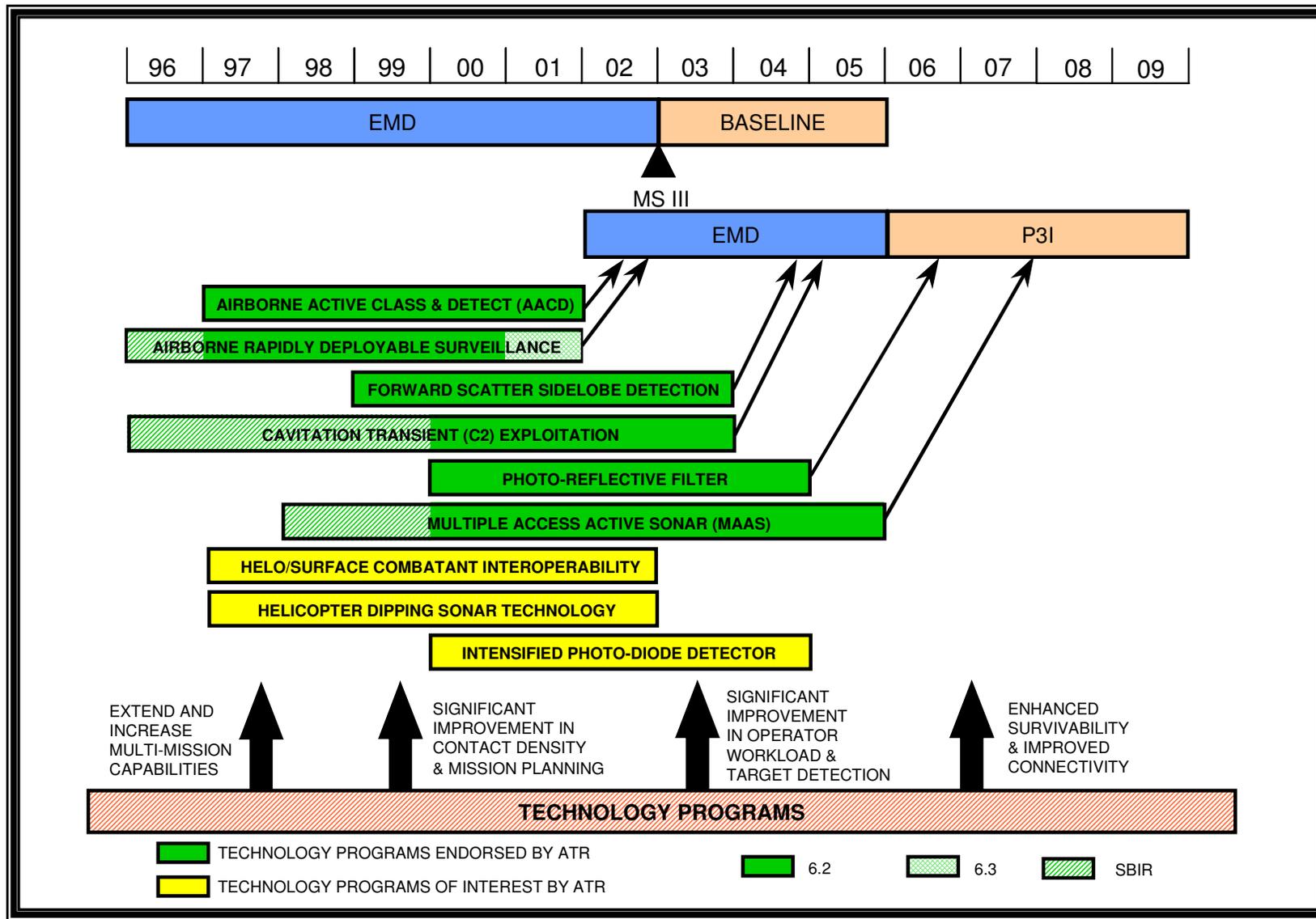
# ATRB Common Planning



## Transition Criteria: *Navy Need*

1. Is there a documented operational need, warfighting shortfall or other (i.e. obsolescence, affordability, supportability) need that this technology could address?
  - 4-5: documented requirement exists (MNS, ORD, JROC, CCI, FNC)
  - 2-3: draft requirement exists, but no budget allocations (should at least be fleet messages, etc)
  - 0-1: no requirement documentation, discussion taking place

# Air ASW ATRB: Sample Roadmap



PEO(A): SH-60 Technology Roadmap (ATRB 99-2)

# ATRB RATINGS

**SUPPORT (*Sponsor*):** The Technology has a high probability of transition to PMA's programs & resources will be budgeted or planned to support transition.

**ENDORSE:** The technology is of high interest and will be placed on the PMA roadmap and followed as it develops. Transition resources will be considered but not budgeted at this time

**INTEREST:** The technology has high potential but is not well enough defined, mature, or focused to warrant endorsement at this time. The PMA will monitor the progress and consider future endorsement as it matures. This category also includes technologies of general interest & importance to Naval Aviation products but not specific enough to this PMA's product line to warrant endorsement

## ATRB RATINGS (Continued)

**PASS:** The technology does not apply or is not well enough defined.

**CONCERN:** The PMA has a concern or conflict with the technology as presented. These concerns will be forwarded to the technology community