



OFFICE OF THE PROJECT MANAGER FOR MINES, COUNTERMINE AND DEMOLITIONS

Anti-Personnel Landmine Alternatives (APLA) Briefing

for the

NDIA International Infantry Symposium

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The Way Forward



- **APL Alternative Policy**
 - POTUS 17 Sep 97 Announcement
 - DepSecDef 21 Oct 97 Directive
 - PDD/NSC-64, 23 Jun 98
 - DepSecDef 23 Mar 99 Directive
- **APL-A Program**
- **Track 1 Status**
 - RADAM
 - NSD-A Concepts & Status
- **Track 2**
- **Track 3 Status**



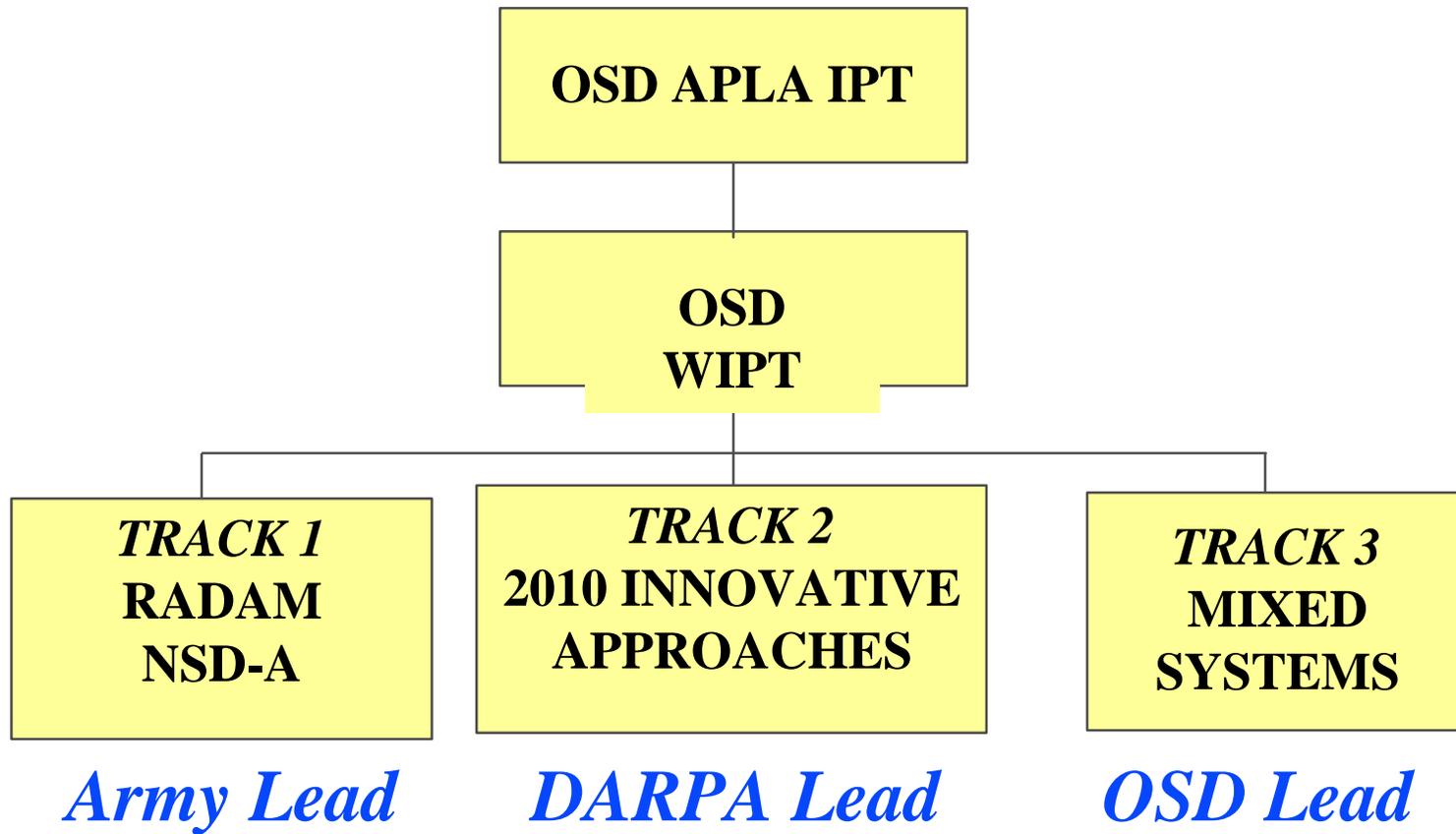
APL Alternative Policy



- **Sep'97 - President issues policy to:**
 - End use of all (pure) APL outside Korea by 2003
 - Aggressively pursue APL alternative for Korea by 2006
 - Allows the use of mixed mine systems
- **Oct '97 - DepSecDef directs OSD to form a two track acquisition program for APL-A (DA lead track 1, DARPA lead Track 2)**
- **Jun '98 - PDD/NSC-64**
 - Search aggressively for alternatives to our mixed mine systems (militarily advantageous, cost effective, safe)
- **Mar '99 - DepSecDef directs OSD to:**
 - Establish Track 3 to explore a wide range of operational concepts as alternatives to our mixed systems
 - Address alternatives that could be developed and fielded within the near term (2006); mid term (2006-2012); and far-term (beyond 2012), with emphasis on the near term



APL-A PROGRAM





ASPLA Program Summary



- **Track 1 - RADAM**
 - Determined projectile mix - 7 AT & 5 AP, SecDef has concurred in mix. Initiated production prove out process
- **Track 1 - NSD-A**
 - Awarded two contracts in Dec '98 for three concepts. One year down select into Milestone I/II decision
- **Track 2 - DARPA**
 - Initiated effort with focus on self-healing minefield concepts
 - Additional concepts to be initiated next year
- **Track 3 - Mixed Mine Systems**
 - Implementation plan for concept exploration approved 13 May 99
 - Signed PBD722 allocates \$228M for RDT&E



Outline



- **Background - Initial Efforts**
 - 1996 Defense Science Board
 - 1996 OSD Working Integrated Product Team (WIPT)
- **Descriptions of WIPT concepts**
- **President Clinton's APL announcement**
- **DoD Directive**
- **Current APL Alternative initiative**
 - NSD-A
 - Prototype Assessment Test
- **Recap**
-



Initial Efforts



- **1996 Defense Science Board Summer Study**
 - Results on APL Alternatives indicate no economical alternative for current APL
- **OSD WIPT reported in Sep 96 they found no analytic basis for recommending any particular solution**
 - Agreed with recommendation for a more in-depth study
 - APL Alternatives IPT formed



WIPT Results



- **Extensive collaboration with National Labs, TRADOC, USMC, Army R&D institutions, OSD, and Industry**
- **Difficult task to achieve:**
 - APL has many roles and effects
 - “Fast Track” pressures and little money up front
 - A key issue: *LEVEL OF DISCRIMINATION*
- **Looked at lethal and non-lethal**
- **The concept which emerged: “Man-in-the-loop”**
- **Good effort, but great challenges remain**



Concepts All Have:



- **Sensors to detect and locate intrusion**
- **Command and control system to direct response**
- **Mechanism to deliver and provide APL effects**

**Essential Feature of Replacement Concepts is
Man-in-the-Loop Control**



DSWIPT Recommendation



- **Developed 4 concepts, pursued concept 1**
- **Pursue following risk reduction strategy:**
 - Determine whether concept 1 can meet all missions in 2 years
 - Partial funding of other concepts' critical path technologies
- **“The IPT notes that the study shows that APL have military benefit, that US self-destructing APL do not contribute to humanitarian crisis posed by long-lived APL, and that APL are more cost effective than alternatives in performing the APL missions”**



President's Speech on APL



17 Sep 97 - Announcement

- ➔ • **Develop alternatives to end use of Self-Destructing (SD) APL by 2003**
 - Retains use of “mixed” Anti-Tank/Anti-Personnel SD systems
- ➔ • **Develop alternatives for SD and NSD in Korea by 2006**
- **Increase funding for de-mining programs**
- **Increase efforts to establish serious negotiations in Conference on Disarmaments**
 - Begin with export/transfer ban

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Our Task

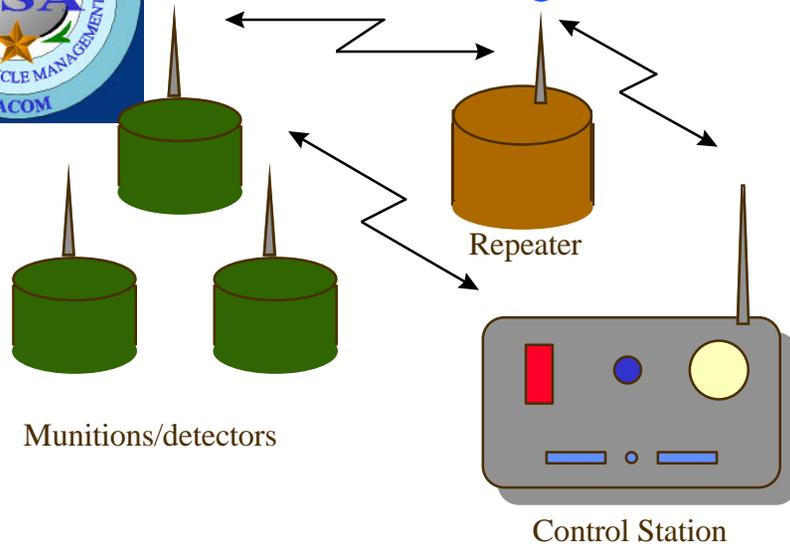


21 Oct 97 - DepSecDef Directs Implementation

- **Develop alternatives to replace NSD APL in Korea**
- **Selected 3 proposals to build prototypes for early user testing**
- **Select best approach for development and production**



Non Self Destruct Alternative



USER

PAYOFF

- Command Destruct/Neutralize
- Reset Self-Destruct/Neutralize
- Re-deployable
- Command Fire
- Location Reporting
- Prevents fratricide

DESCRIPTION

- Alternative to M14/M16
- Man-in-the-loop unless non lethal
- RF control
- Integral intrusion detector
- Hand emplaced
- Hardware & message format compatible with the Tactical Internet

MILESTONES

- Nov 97 - JROC validates MNS
- Nov 97 - MS 0
- Dec 98 - Program Start
- Jan 00 - MS I/II
- 4QFY02 - MS III
- 4QFY04 - IOC

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NSD -A Status



- **Two contracts awarded 3 Dec 98**
 - Textron Defense - Two concepts
 - Alliant Techsystems
 - Initial concept demonstrations 25 May & 2 Jun
- **PAT instrumentation being established**
 - Simulate lethal/no-lethal effects and distinguish “kill” codes in real time/location



NSD-A PAT CHALLENGE



How Do You Collect Meaningful Data?

- Simulates Lethal/Non-Lethal Effects
- Distinguishes “Kill” Codes
- Real Time/Location
- Little or No Development Time

- **Existing Fragmentary Effects Training Systems**

- ➔ NTC, CMTC, DBBL, ARL

- **NTC/CMTC**

- ➔ Use MILES Compatible SAWE Mine

- ➔ SAWE Mine--Time Lag 7-10 Sec

- ➔ Soldier Harness May Have Application w/ARL Mines

- **Demonstration at DBBL**

- ➔ DBBL Equipment (SIMLAS)

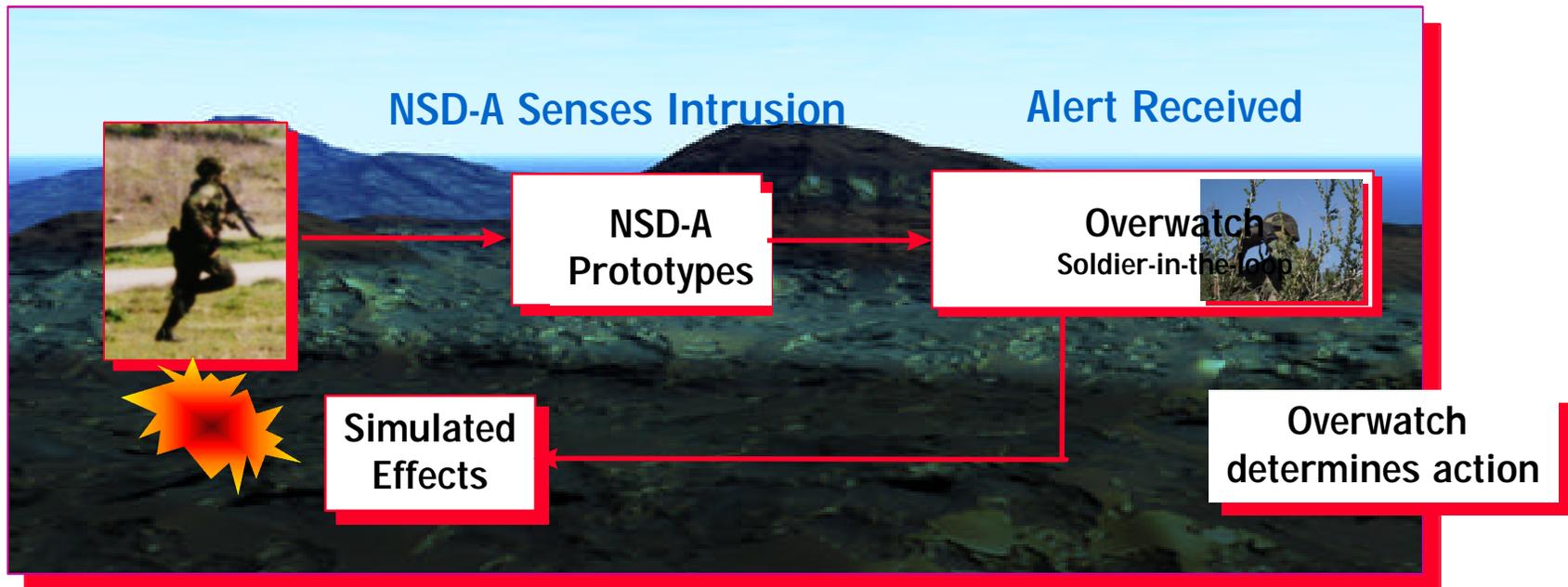
- ➔ ARL Equipment (MILES)

- ➔ Down-select with APL-A Contractor In-put

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NSD-A PAT Live Experiment



Collect Data, Feed Into ORD
Modify Original ModSAF Script
Multiple Model Runs
Assess Results/Down Select



Early soldier training



Live Experiment Plan



- **OPLAN**
 - Battle Lab lead with input
 - B Co/1st Bn/2d Bde/325 Inf Reg, 82d Abn Div
 - USMC, T&E
 - Engineer Annex/para (307th Eng Bn)
- **General tactical scenarios**
 - Hasty Protective
 - Tactical Blocking
 - Platoon defense @ Ft. Benning
- **Soldier involvement**
 - Dismounted Infantry & Engineer platoons



APL-A PAT

Concept of Operations



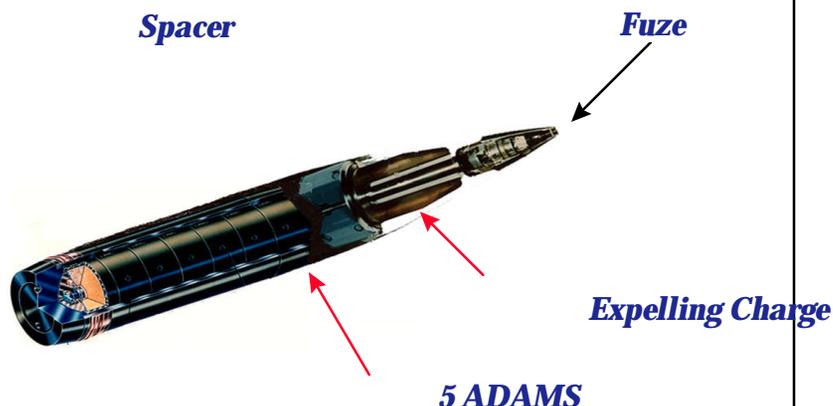
- **PHASE ONE**
 - **INDIVIDUAL TASKS** (Packing, unpacking, road marching, place in/take out of operation (MOPP IV; day & night))
- **PHASE TWO**
 - **COLLECTIVE TASKS** (Construct hasty protective minefield/blocking obstacle, conduct recon patrols through minefield)
 - Determine value-added benefits of minefields with sensor technology
 - One base case; one each prototype
- **PHASE THREE**
 - Defend position (force-on-force) base case and one each prototype
 - Confirmation of tactics, techniques and procedures



MIXED RAAM/ADAM (RADAM)



7
RAAMS



USER PAYOFF

- Reduces Logistics
- Improves AT mine coverage
- Improves minefield effectiveness
- Simplifies aiming
- No new training required

DESCRIPTION

- 155mm Projectile
- Mixed AT/AP payload
- Contain 7 AT and 5 AP mines

MILESTONES

- Nov 97 - MS II
- Nov 97 - JROC validates MNS
- Nov 97 - Program stopped
- Jun 98 - Program restart
- Nov 98 - Design Review
- 3QFY00 - MSIII
- 3QFY01 - IOC



Track 3 Status



- **MNS validated 9 April 1999**
- **Concept Exploration plan developed by WIPT**
 - Approved by OSDIPT - 15 month study effort by two scientific organizations, cost \$6.2M
 - LLNL/LANL
 - National Academy of Science
 - Dr. Hamre approved 13 May 99
- **Congress appropriated \$6M in FY99 for studies but only authorized spending \$2M**
 - DA notified Congress of intent to reprogram \$2.1M
- **PBD 722 provides \$228M for overall R&D effort**
- **Directive from DepSecDef to implement PDD signed 23 Mar 99**



Concept Exploration Objectives

Track 3



- **Identify non-materiel and materiel alternative concepts**
 - to the AP submunition within mixed systems
 - to all mixed systems
 - to the NSD APL
- **Evaluate the military utility, cost, schedule, technical risk, and impact on doctrine, training, force structure, and materiel resources for the most promising alternative concepts**
- **Provide a recommended course of action (15 months after start)**
- **Four primary groups from Services, DoD and DOE**
 - Warfighter/User; Materiel concepts; Technical Assessment and Battlefield Utility
 - Modeling and Simulation working group support to all
- **National Academy of Science will also participate**



Recap



- **Previous studies have shown there are materiel solutions**
 - Long term and not validated operationally
- **The alternative will be expensive**
- **There are significant challenges ahead**
 - Man-in-the-loop increases soldier's burden
 - Non-lethal an integral part of study
- **The United States is committed to an aggressive program aimed at finding effective alternatives to APLs**

We are on track to accomplish our President's goals