

**4th ANNUAL EXPEDITIONARY WARFARE
CONFERENCE**

**SURF ZONE ASSAULT BREACHING
AND VSW ZONE
MINE & OBSTACLE COUNTERMEASURES**



November 4, 1999

Amphibious Warfare - the way it was



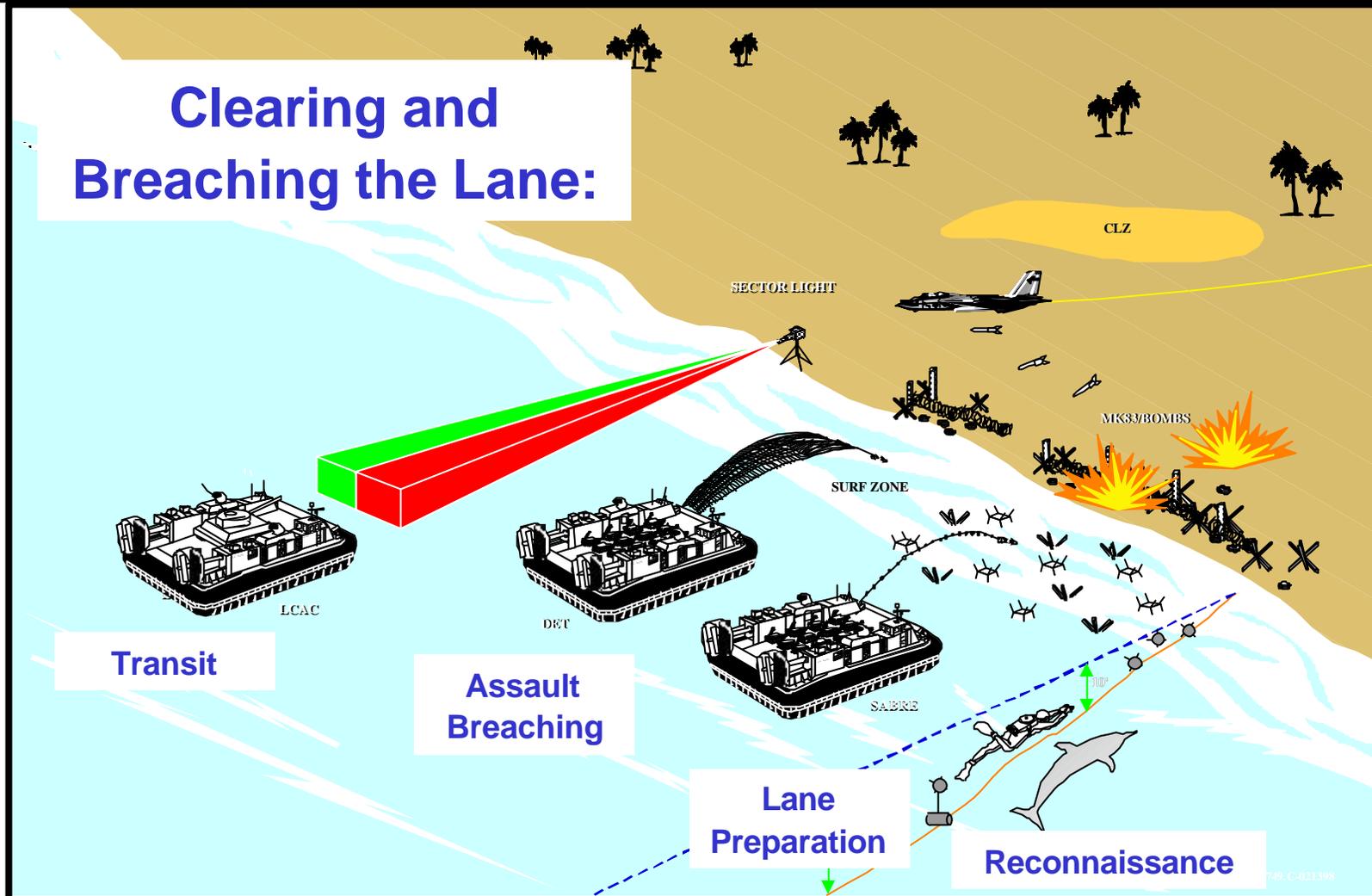
Can we do any better today in a mined environment?





Near Term Very Shallow Water and Surf Zone MCM Concept

Clearing and Breaching the Lane:





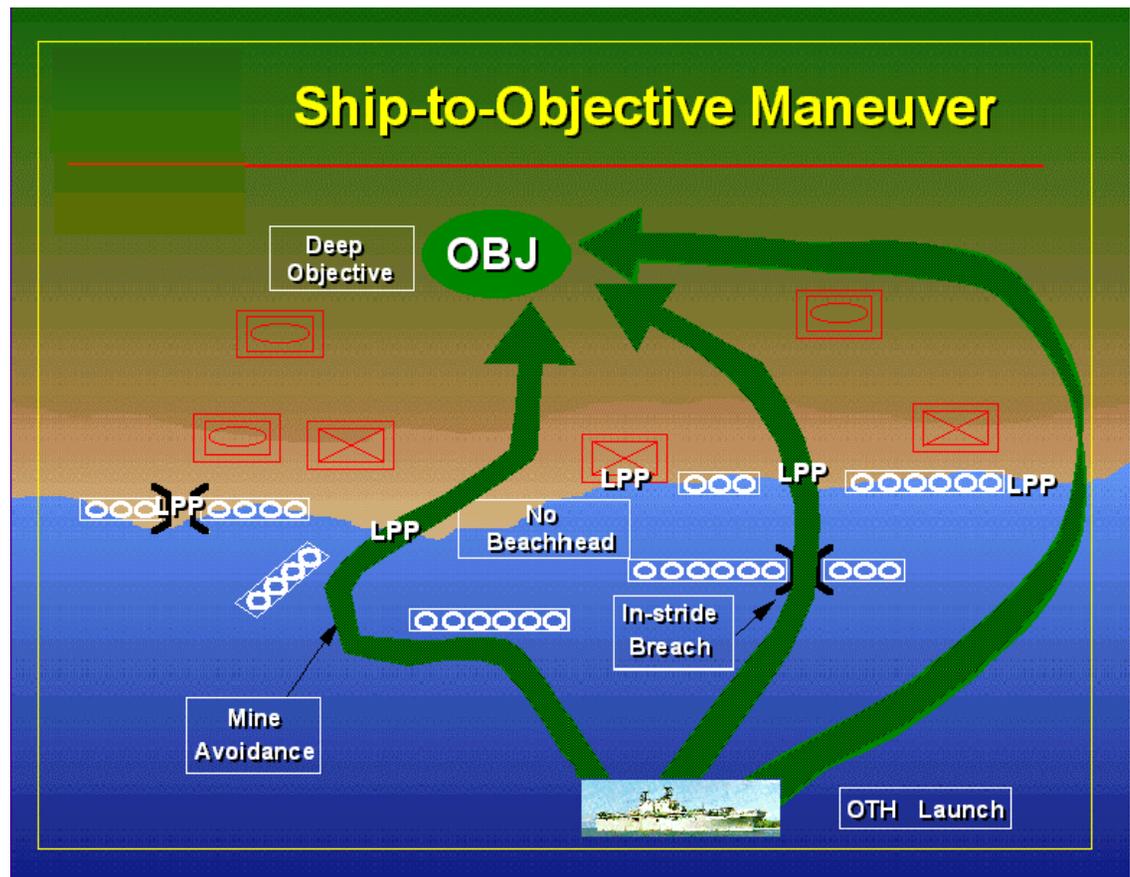
MCM & STOM

OBJECTIVE

In-stride neutralization
of mines and obstacles
in the VSW, surf & beach zones
in support of
Ship to Objective Maneuver

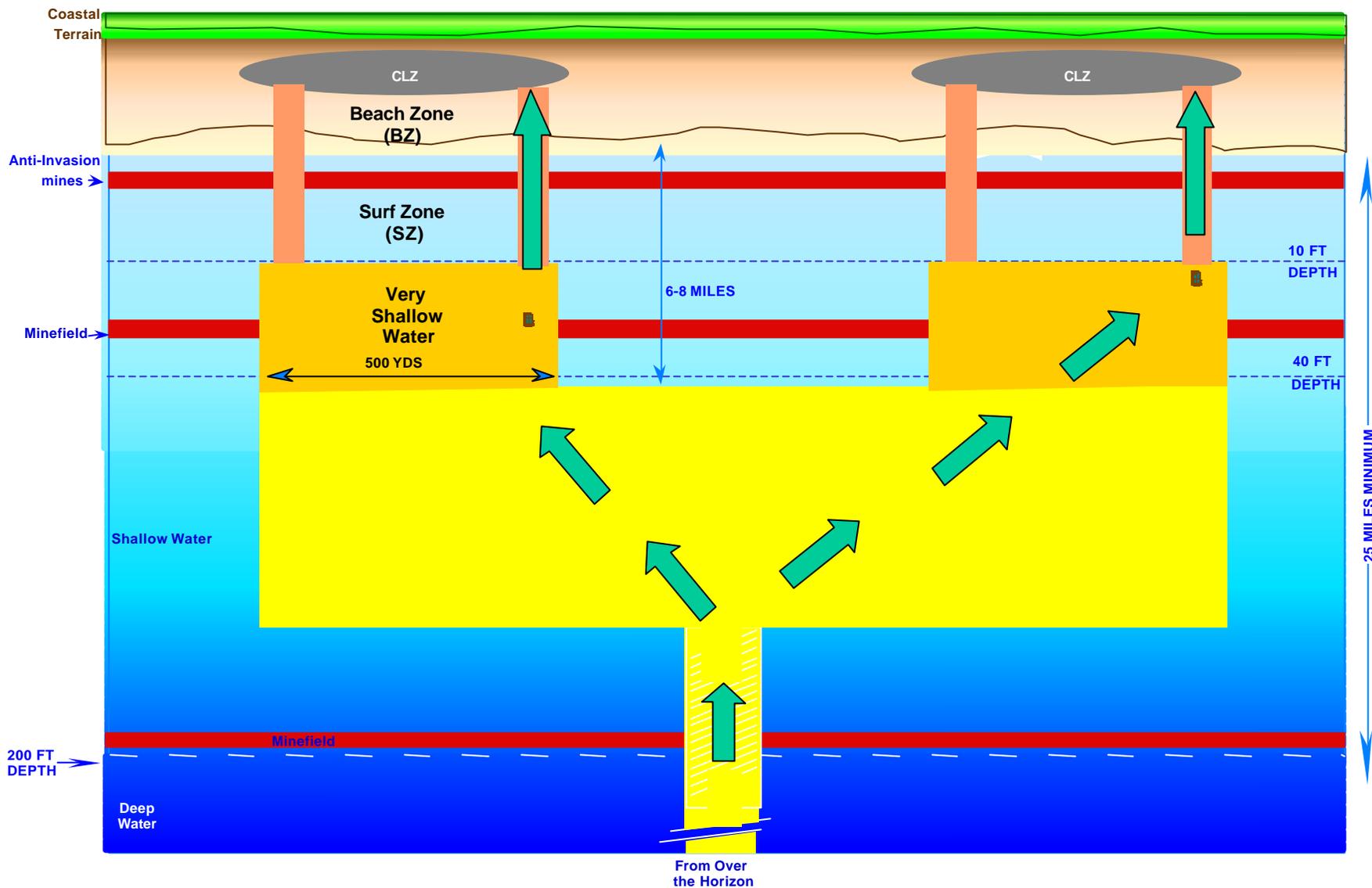
VSW/SZ/BZ GOAL

- Rapid
- Organic
- Minimal impact on lift
- Minimal vulnerability



ASSAULT BREACHING FAR-TERM GEOMETRIES

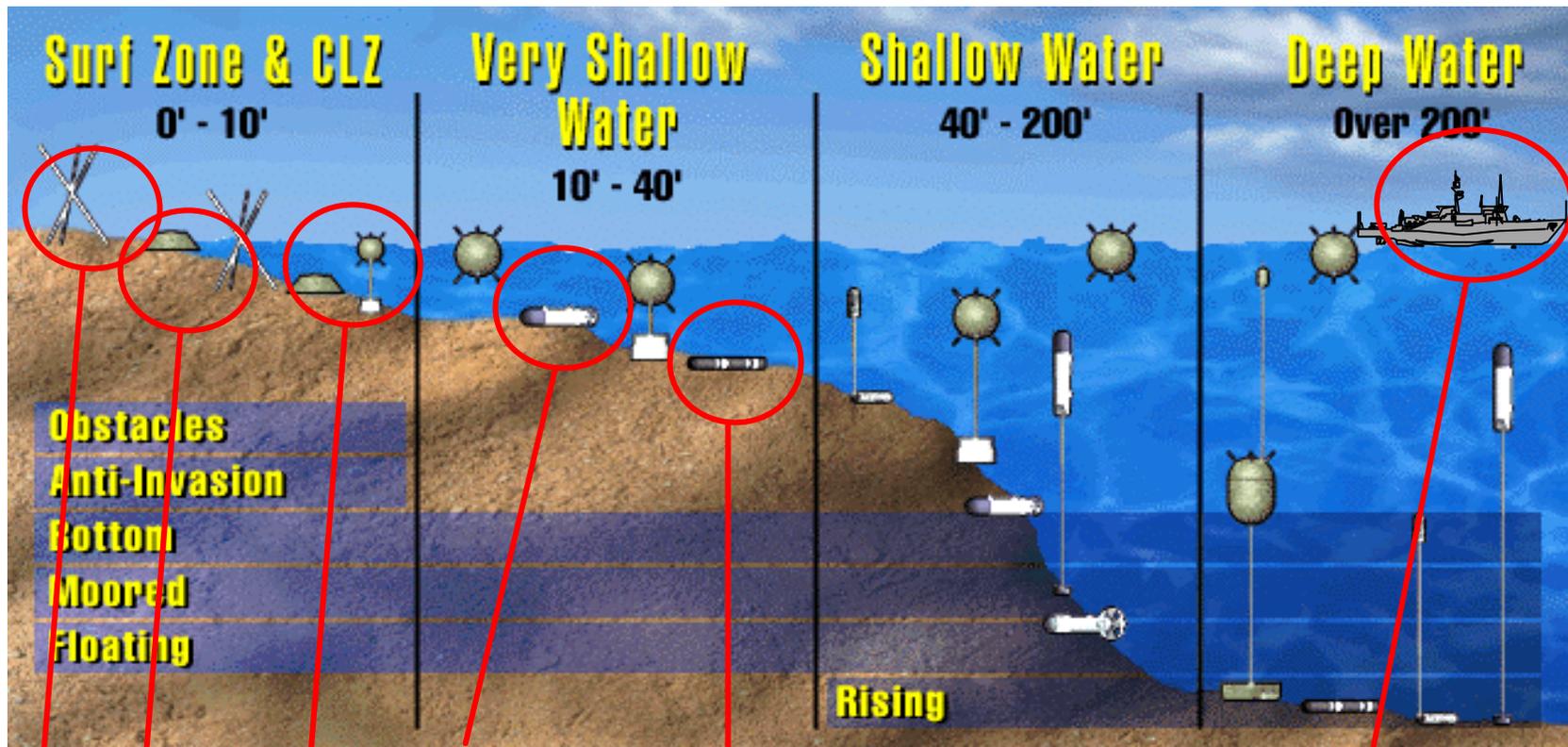
MEF (FWD) LANDING AREA





NAVAL MINE THREAT / ENVIRONMENT

Problem Areas



Obstacles
Anti-Invasion

Buried/
Partially
Buried

Pressure

Man Still In
Minefield



VSW/SZ/BZ MCM CRITICAL FACTORS

- NEUTRALIZE AT MISSION SPEED
- EACH ZONE HAS UNIQUE ENVIRONMENTAL DIFFICULTIES
- HIGH DENSITY OF MINES (VARIOUS TYPES)
- **OBSTACLES COMPLICATE MINE CLEARANCE EFFORTS**
- ASSAULT BREACHING IS UNIQUE - MUST BE INTEGRATED WITH AMPHIBIOUS OPERATIONS AND OTHER MCM EFFORTS FOR SEAMLESS TRANSITION ASHORE
- VULNERABILITY TO HOSTILE FIRE



NEAR-TERM VSW MCM TOOLS

**Tactical Integration of
VSW MCM
Divers and MMS**

Applying the Right Tool for the Right Job



Flexible, highly mobile



EX-8 MMS PLATOON



VSW MCM UBA



**INTEGRATED NAVIGATION
SONAR SENSOR**



**Command
Actuation**



VSW MCM

Near Term Operations Concept





Assault Breaching Systems NEAR TERM



SABRE

NEUTRALIZE SURF ZONE
MINES
& OBSTACLES (10FT TO 3FT)

Autopilot
Precise LCAC
guidance,
navigation
and control



DET

NEUTRALIZE SURF
ZONE MINES
(0FT TO 3FT)

BLN
Breach Lane
Navigation
Sector Light





FAR TERM ASSAULT BREACHING (2010+)

Far term: Systems provide full MCM capability for STOM.

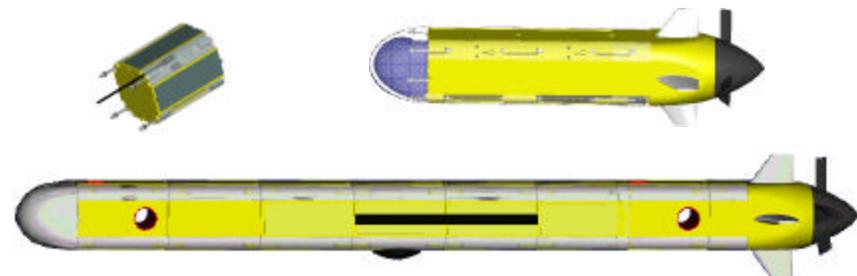
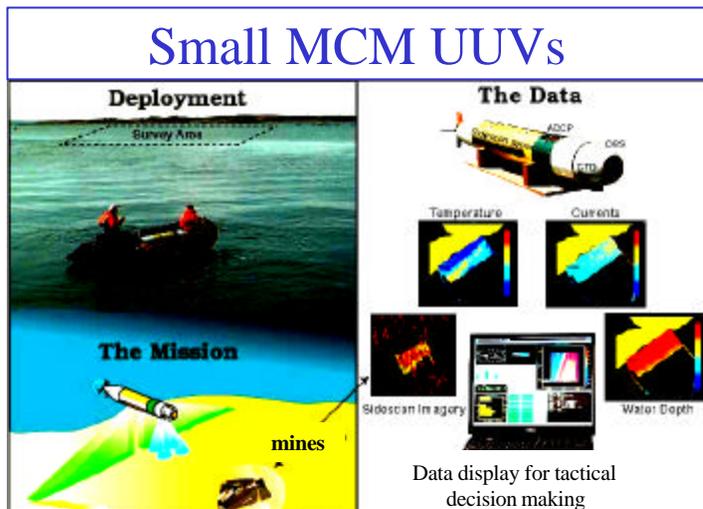
- **Organic to amphibious assault force**
- **Enhanced survivability**
- **Reduced logistics footprint**
- **Reduced mission time**
- **Enhanced system effectiveness (CMCO)**
- **Operation in all assault environments**
- **C3 integration**



VSW MCM FUTURE CONCEPTS

Mid/Far Term Capability Objective

- Remove Divers and MMS from Dangerous VSW/SZ MCM Operations wherever possible
 - AUV Deployed Transponders
 - Area Reconnaissance
 - Data Relay to Command
 - Command Redirection
 - Reacquisition and Inspection of Targets
- Data Relay / Command
- Placement of Markings / Neutralization Devices
- Placement of Lane Markers
- Command Actuation



Modular Mini AUV



VSW MCM and Assault Breaching FUTURE CONCEPTS



Bottom crawlers or hovering UUV platforms to detect, reacquire, identify & neutralize mines and obstacles in the VSW and surf zones.





Assault Breaching Systems FUTURE CONCEPTS

Stand-off Capability

Delivery/Deployment

- Autonomous Surface Craft
- Autonomous Sub-surface/bottom Vehicles
- Autonomous Air Vehicles
- Air-Delivered Ordnance
- Surface Weapons (gun/missiles)

Clearance

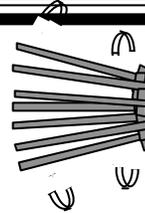
- Bombs
- Submunitions
- Explosive nets
- Line Charges
- Shaped Charges
- Pulsed Power
- Mechanical Methods



Assault Breaching Systems FUTURE CONCEPTS

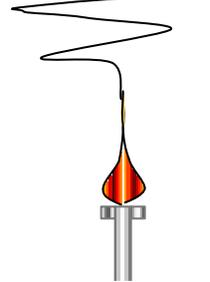
GPS
GUIDANCE

Independent Guidance on Each
Round

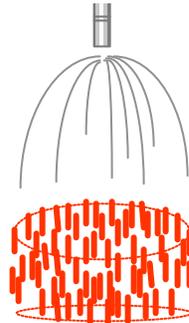


Carried and Deployed
as Multiple Round
Canister

ROCKET MOTOR
BOOST



INCENDIARY
DART
PAYLOAD



MINE
CLEARANCE

Air delivered sub-munitions

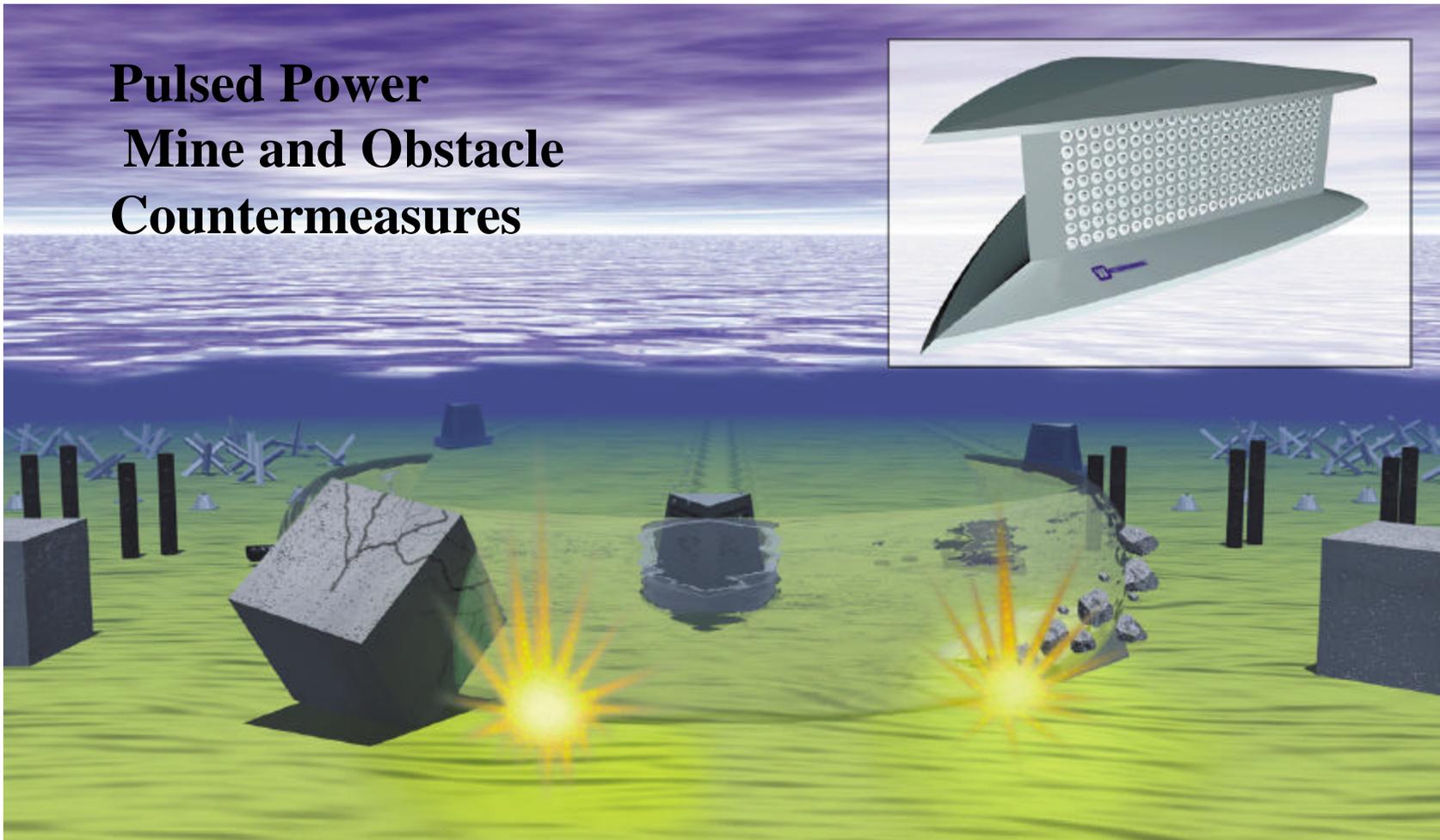
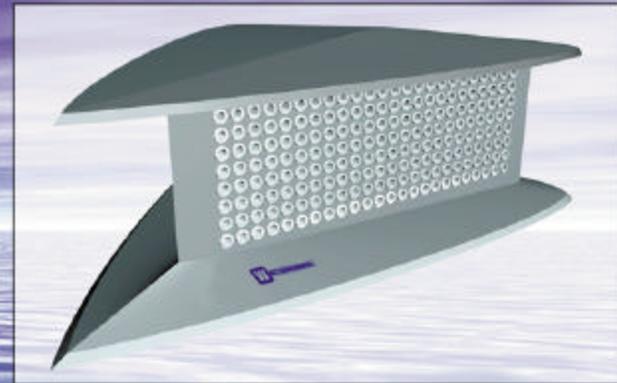
MINE DEFEAT CRITERION

- RENDER MINE HARMLESS
 - DEFLAGRATE
 - DETONATE
 - PULVERIZE
- NEUTRALIZE FUZING MECHANISM



Assault Breaching Systems FUTURE CONCEPTS

**Pulsed Power
Mine and Obstacle
Countermeasures**





PEO Mine Warfare & Office of Naval Research



Partnership in system development

Science &
Technology



Development,
Acquisition and
Life Cycle Support

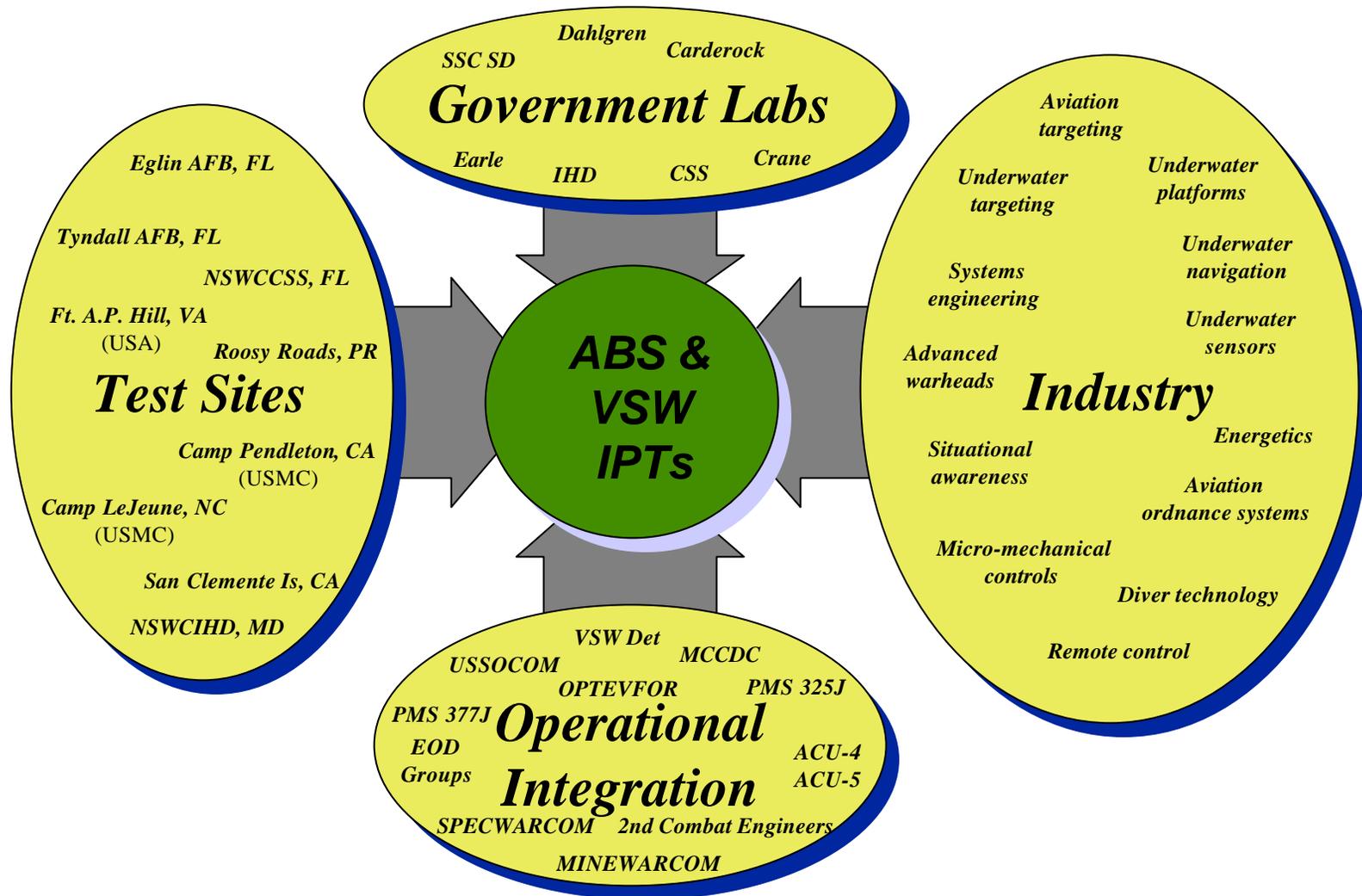


Assault Breaching Systems PROGRAM SCHEDULES SUMMARY

	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12
VSW SYSTEMS	NEAR TERM SYSTEM DEVELOPMENT												
	NEAR TERM PROD. & FIELDING												
	FAR TERM TECHNOLOGY DEVELOPMENT												
	FAR TERM SYSTEM DEVELOPMENT												
SURF ZONE SYSTEMS	NEAR TERM SYSTEM DEVELOPMENT												
	FIELDING												
	FAR TERM TECHNOLOGY DEVELOPMENT												
	FAR TERM SYSTEM DEVELOPMENT												
	FAR TERM PROD. & FIELDING												



ABS & VSW Integrated Product Teams





THE CHALLENGE

**DEVELOP AN AMPHIBIOUS ASSAULT
MCM CAPABILITY THAT WILL
SUPPORT THE NAVY-MARINE TEAM'S
EXECUTION OF SHIP-TO-OBJECTIVE-
MANEUVER**

