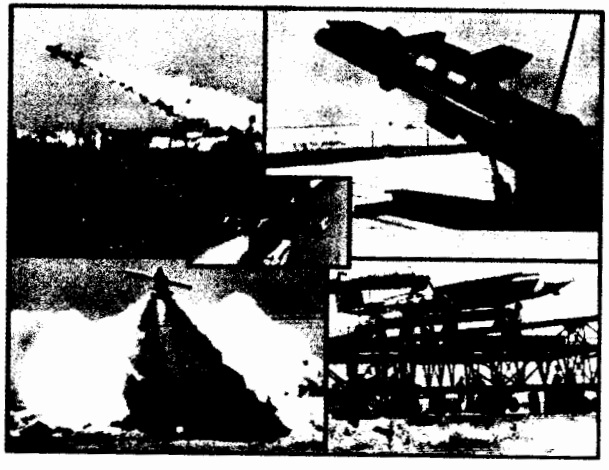
NAVAIR

Point Mugu - 60 Years as the Navy's Premiere Target Operating Site

1945 CNO establishes requirement for missile test center.
Navy pilotless aircraft unit based in Mojave CA

1946 PAU moves to Point Mugu
December 13, 1952 first direct hit intercept of Navy Sparrow missile against QB-17 on Sea Range.

1991 NAVAIR consolidates target development/test at WD.



OUR MISSION IS TO EMULATE THREATS FOR WEAPONS AND EW SYSTEMS, TEST AND EVALUATION AND TO SUPPORT EXPERIMENTATION AND FLEET TRAINING

UNDERSTANDING THE CRITICAL MASS

Generic/Surrogate/Validated/Replica/Actual

(Cost Effective Fidelity for T&E)

Military Value of Point Mugu Targets is High

- **Test &Evaluation**
  - **Combat Ship Trials (CSSQTs)**
    - **Low altitude cruise and supersonic stream raid presentations to determine readiness for deployment**
  - **Spanish and German AEGIS ship trials**
    - **Low altitude cruise and supersonic stream raid presentations to demonstrate successful integration of systems for US allies**
  - **F-22**
    - **Missile firings required high speed dual and quad target raids as well as a large range area (supported major acquisition milestone)**
  - **GQM-163**
    - **Developmental test of urgently required supersonic sea skimming target (acquisition program milestones)**
  - **Classified Programs**
    - **San Nicolas Island attracts classified programs requiring Targetpresentations**
- **Training**
  - **24 aerial target presentations, 602 seaborne operations, 347 threat aircraft flights with threat pods.**

From COMTHIRDFLT:

Please extend my sincere appreciation to the Captains and crews of Atlas, Swiss Ladder 120, Diane G and FACT/HSMSTS for their outstanding support during the Carl Vinson Carrier Strike Group PAC JTFEX 05-2. Your enthusiasm, work ethic and can-do attitude were key to ensuring realistic opposing forces support. We could not have conducted this critical exercise without your outstanding efforts. I look forward to working with you and your crews again in the future.

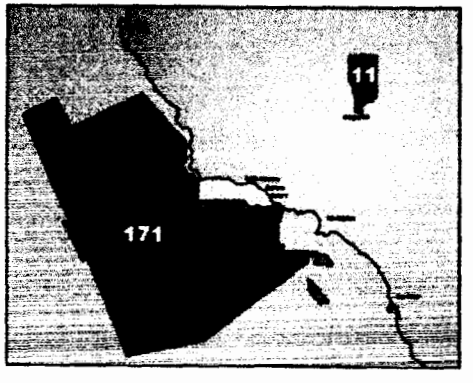
Thank you for a job well done. VADM MCCABE

The Navy's Full Life Cycle Support Activity for Targets and Electronic Threat Systems

- Only site for:
  - T&E of Navy targets
    - GQM-163 Supersonic Sea Skimming Target
    - BQM-74F Subsonic Aerial Target
  - Operates all Navy target and threat systems
    - 9 Surface
    - 2 Subsonic
    - 3 Supersonic
  - Develops and exports target configuration/performance enhancements to other operating sites
    - OPNAVINST 8000.16B
    - Examples (seaborne target swarm capability, LAC, ...)
  - Develops seaborne targets
  - Develops airborne electronic threat systems
- Technical and logistics support to all Navy operating activities
- Navy representative to Targets Reliance Panel
  - Navy leadership in 7 of 13 Reliance areas

Targets are Integral to the Sea Range

- Sea Range requires aerial target ground launch capability
  - Supersonic targets from San Nicolas Island
  - Many subsonic configurations require ground launch
- Subscale target decontamination and engine run facilities
  - Decontamination of salt water from engine and engine run within 4 (for BQM-74) and 6 (for BQM-34) hours from splash down
  - Requires disassembly of BQM-34
- RCS Chamber
  - Customers demand validated Signature information
- Seaborne Targets operate from Port Hueneme
  - Capabilities support range surveillance and clearance
  - Aerial and seaborne engineering and operations personnel shared
- Integration and test of aerial and seaborne target control, threat system and other equipments requires proximity to land and sea targets, their unique test equipment and Range instrumentation.
- 171 aerial target operations at Point Mugu, 11 at China Lake (FY04 to May 05)

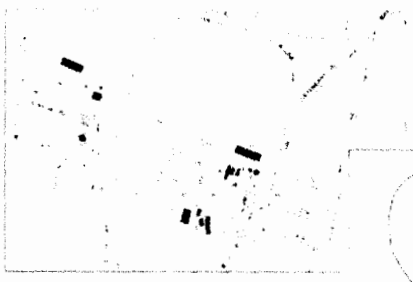


Knowledge and Experience of Our Workforce is Critical to Navy T&E

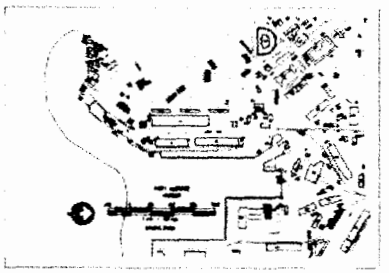
- Expertise in foreign threats and electronic emissions
- Ability to develop high fidelity simulators
  - Some ahead of target vehicles
  - Validated through a formal DoD Process
- Expertise in electronic miniaturization technology
  - To integrate threat systems into anti-ship cruise and supersonic targets
- Target system and range integration expertise
  - Harpoon seeker integration in subsonic target
  - Swarm capability for seaborne targets
  - Development of Common Digital Architecture for avionics integration
    - Classes for industry and government
    - CDA adopted for Army Targets
    - Used in Navy vertical take-off UAV
- Target Operations expertise
  - On NAVAIR ranges and deployments
- Target failure engineering investigation expertise and process

Our Workforce Is Educated, Dedicated, Capable and Experienced

- **Human Capital of Threat/Targets Department**
  - No of personnel impacted: 167 (Civil Service)
  - Avg Years of Expertise in this area: 19.4
  - % of FERS employees: 59.3%
  - % of civilians with 4 year degrees: 61%
    - 25% of these with advanced degrees
- **Impact of Move**
  - Civil Service: 167 at Pt Mugu
  - Facility needs 243K sq ft of:
    - Shop/hanger/Decontamination/Engine run (with access to runway): 61,986 sq ft
    - Office: 41,535 sq ft
    - Labs/Secure facilities: 62,403 sq ft
    - Spares storage: 77,755 sq ft

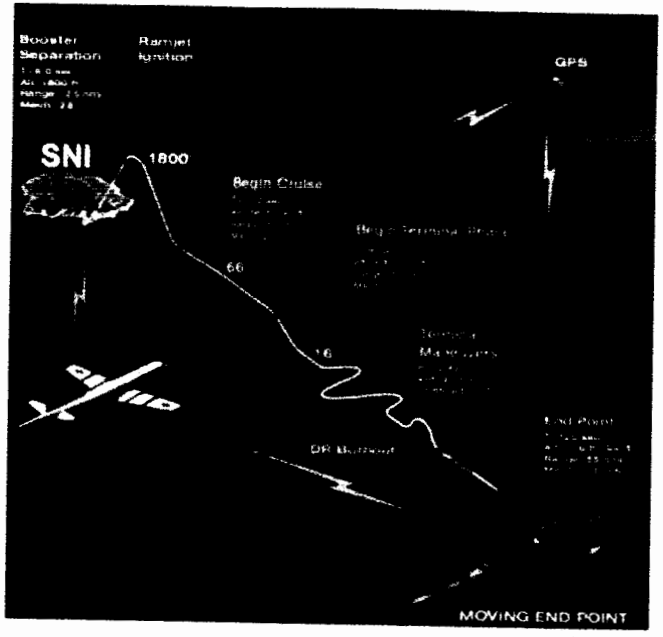


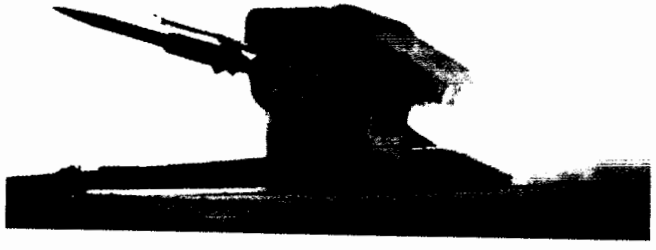
Aerial Targets, Threat Simulators, Pt Mugu



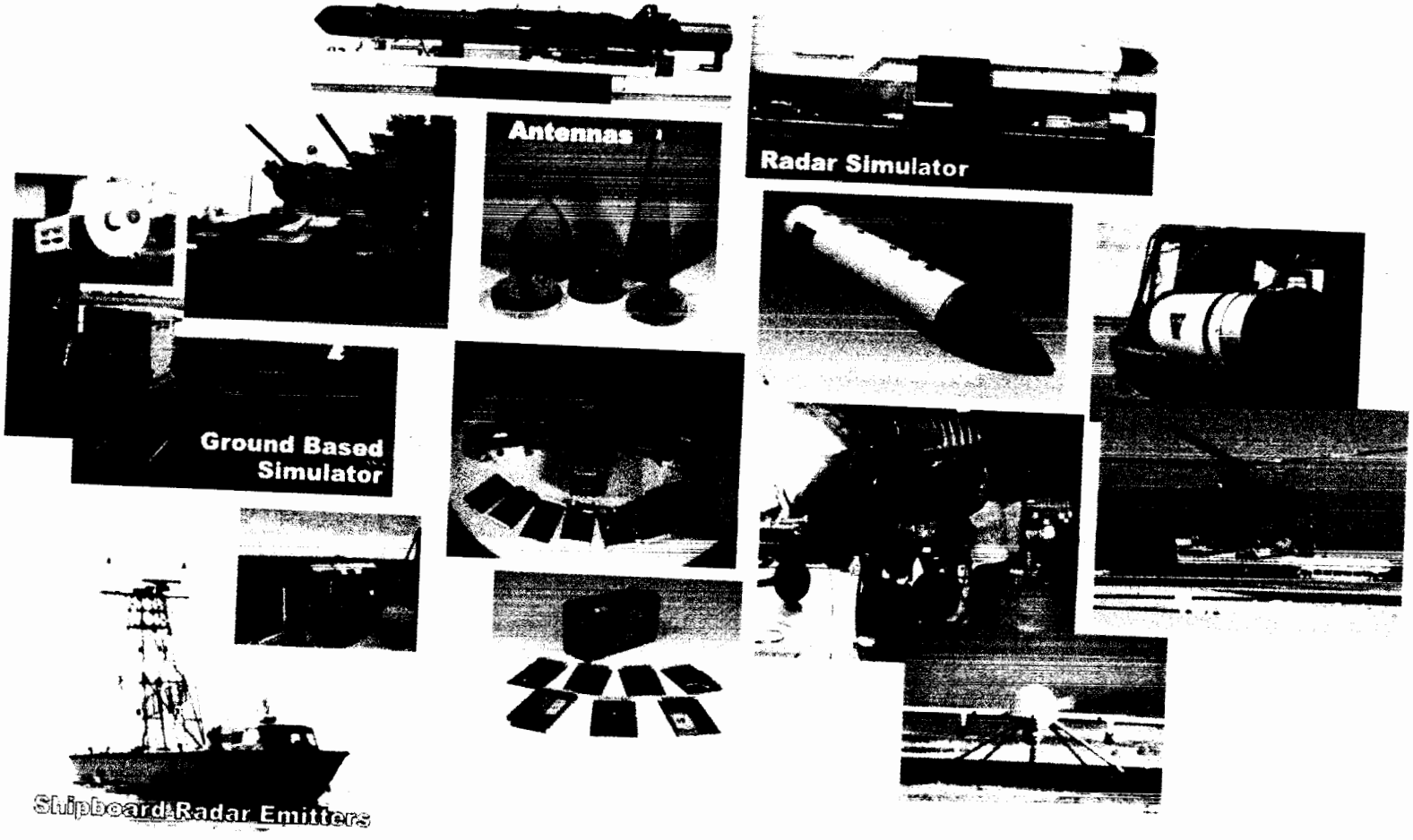
Seaborne Targets, Port Hueneme

Testing and Evaluation of a Sea Skimming Supersonic Target

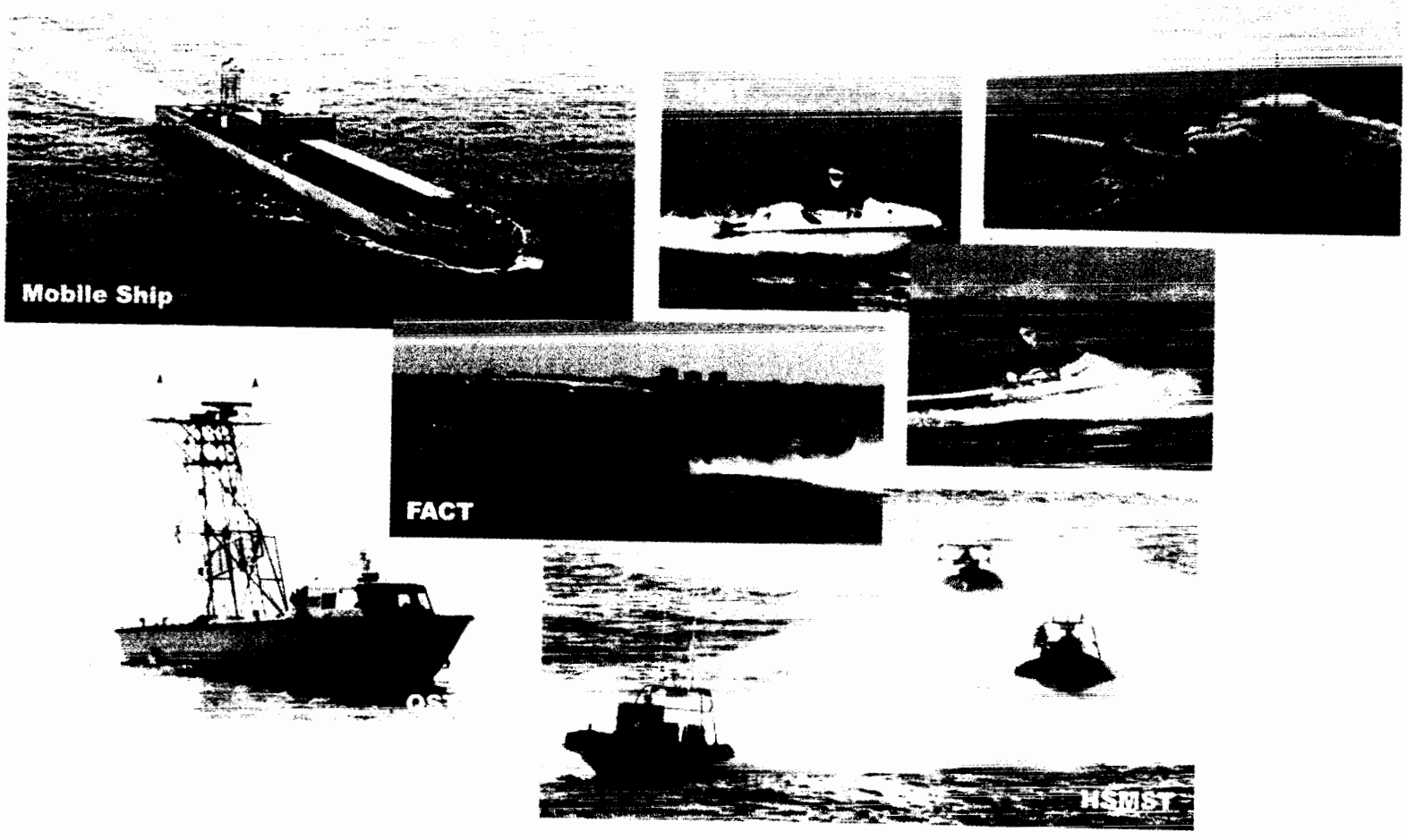




Threat Simulation



Seaborne Targets



Aerial Targets

Summary

- **Threat/Target Systems Department (TTSD) mission requires co-location with the Pt. Mugu Sea Range and RCS facility**
- **TTSD Pt Mugu is the consolidated center for Navy Target/Threat development, test, evaluation, training and operations**
- **Current location of TTSD at NAWC WD Pt Mugu provides critical support to Joint/Allied warfighter readiness, training, homeland security exercises & range surveillance required by customers of the Pt Mugu Sea Test Range**

The War fighter Says Our Value Is High

From COMCARGRU ONE:

Please extend my sincere appreciation to your outstanding cadre of surface units who formed the SUW Opposition Forces and provided target vessels in support of the USS JOHN C. STENNIS carrier Strike Group Comptuex. Surface Warfare Training was significantly enhanced by the support of MIV ATLAS, SL-120, and the HSMSTS. Their deft handling of scenario play exposed the strike group to realistic contacts of interest and was essential to integrated multi-mission training.

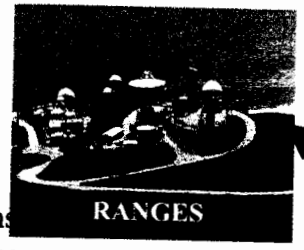
Furthermore, the Electronic Warfare Team...essential in providing realistic Electronic Surveillance Training to the strike group. Their flexibility in loading new, theater specific signals into the simulator pods loaded on OPFOR aircraft and the SL-120, as well as maintaining these pods, allowed the Stennis Strike Group uninterrupted signal training throughout multiple SOE events and all scenario play.

Thank you for a job well done. RDML C. B. Jewett


Weap
DA
T&E

Weapons Test & Evaluation

Weapons RDAT&E Expertise
Air-Warfare
Surface-Warfare
Strike Warfare
Battle Space
Ballistic Missile Defens
Unmanned Air Vehicles



T&E Process

T&E Program Planning

Test Capabilities Development

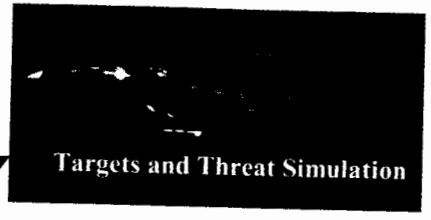
Test Operations Documentation

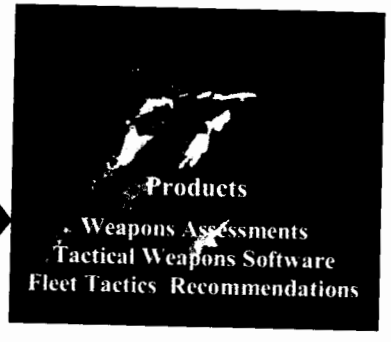
Test Planning/Preparations

Test Execution

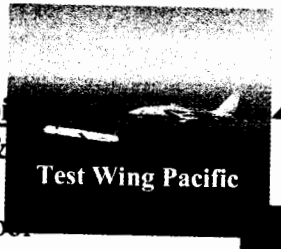
Analysis & Evaluation

Reporting





Intellectual Capi
18 Years Ave T&
Experience
8 Test Pilot Schoo
Graduates



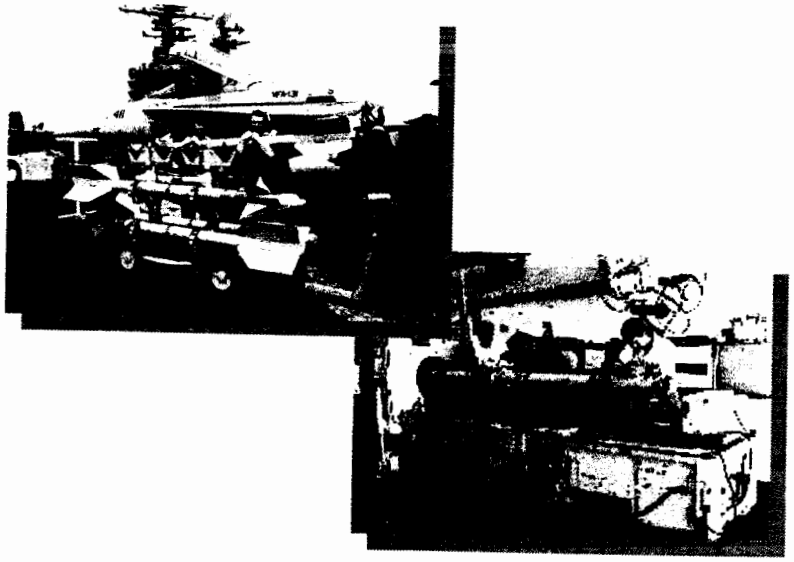
Weapons Systems T&E Intellectual Capital

- The Test and Evaluation discipline is gained by a combination of mentoring by senior test engineers and working side-by-side with other test engineers.
- On average it takes five to seven years to be a Flight Test Engineer.
- There are eight Weapons Lead Test Engineers with an average of 23.9 years experience, all located at Pt. Mugu.
- There's only one Chief Test Engineer at Pt Mugu.
- Our Intellectual Capital is the foundation that makes our process safe and efficient.

Weapons Sustainment

WEAPONS SYSTEMS RDAT&E
WEAPONS SUSTAINMENT SERVICES

- Insure Weapons Readiness
  - Sustain knowledge of the condition of systems in operation
  - Modify logistics elements to assure safety, reliability and readiness is achieved at an affordable cost
- Provide and maintain liaison with Fleet TYCOM and functional wing commanders for weapons problem resolution
- Provide Weapons maintenance management and technical support to Naval Weapons Stations and Navy, Air Force, Army and commercial Depot maintenance facilities
- Implement Cost Wise Readiness
- Maintain, update and revise technical data.
- Provide Weapons Information Management Systems



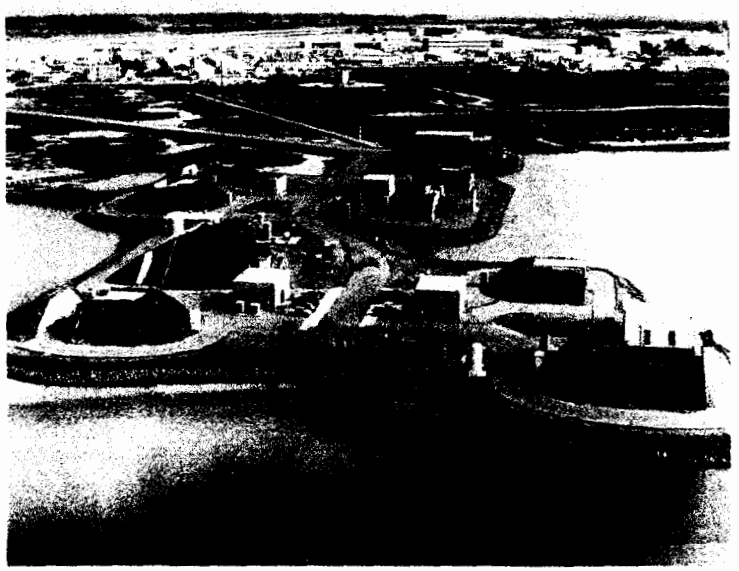
Support Equipment / Ready Missile Test Facility

WEAPONS SYSTEMS RDAT&E SUPPORT EQUIPMENT SERVICES

- Direct fleet support with Engineering investigations into failed weapons test sets (including Sparrow, Harpoon, HARM, JSOW, AMRAAM, and Sidewinder).
- Direct fleet support with software and hardware updates to test equipment as well as developing new test sets.
- FMS support with software and hardware updates to test equipment as well as developing new test sets.
- Direct fleet support with Gun prototype and Linkless Ammunition testing.

WEAPONS SYSTEMS RDAT&E
READY MISSILE TEST FACILITY SERVICES

- Direct fleet support with Engineering investigations into failed weapons (including Sparrow, Harpoon, SLAMER,HARM, and AMRAAM).
- Direct fleet and FMS support with training in the use of test sets.
- Co-location with weapons test allows for rapid configuration of weapons for captive flight and launch tests.
- Co-location with Sea Test Range allows for buildup of special test sets for FMS customers.
- Provide more weapons for the fleet through AMRAAM Inventory Assessment.



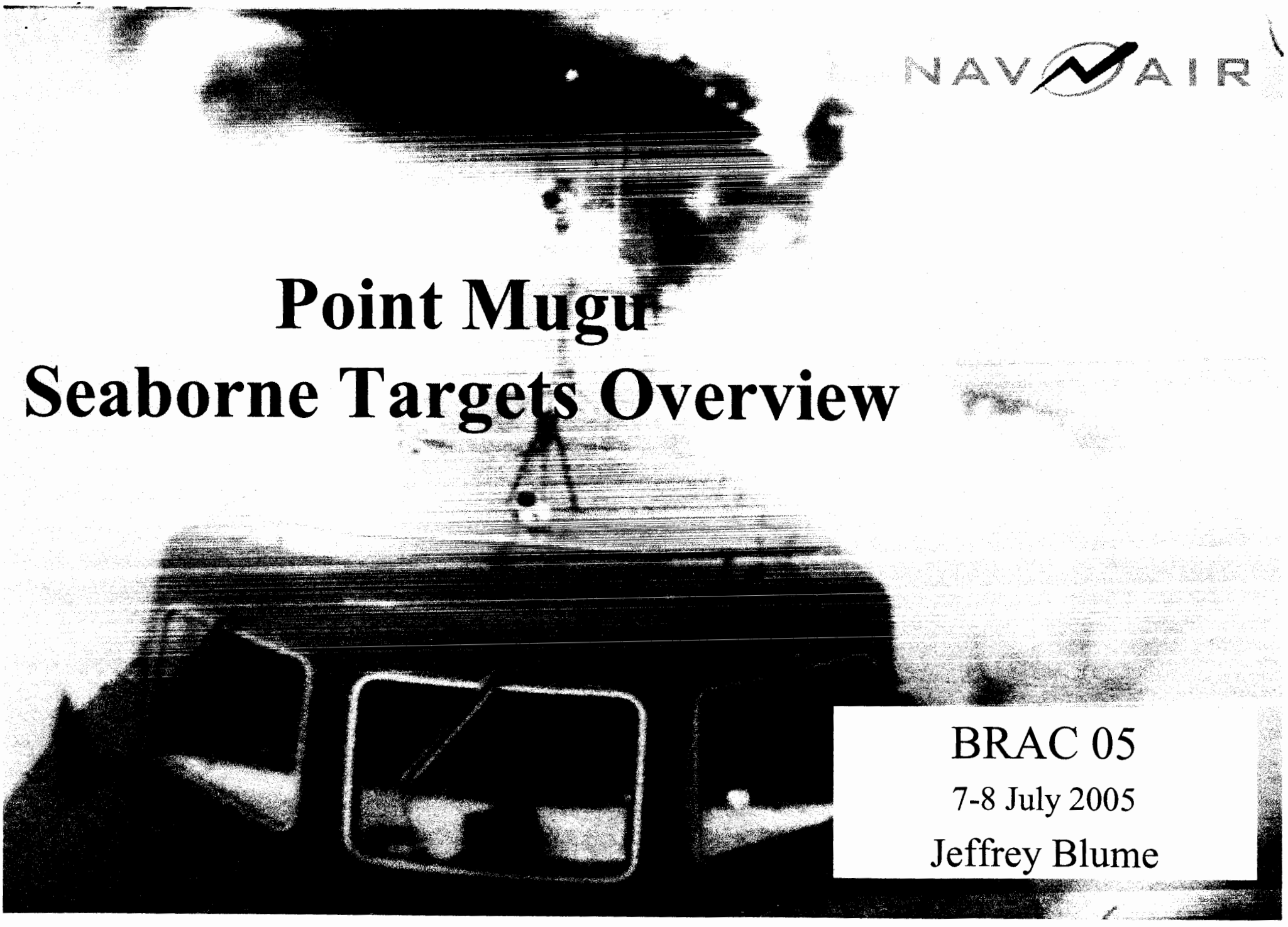
DEMOGRAPHICS

- 343 TOTAL PEOPLE
- EDUCATION
  - 67.7% have a Bachelors or higher degree
  - 10.5% have a Masters degree
  - 8 Test Pilot School Graduates
- AVERAGE AGE OF CIVILIANS IS 49
- CIVILIAN RETIREMENT OPTIONS
  - 19.5% could retire today.
  - 39.1% could retire within 5 years
  - 56.6% could retire within 10 years
  - 62.2% are in FERS retirement system

SUMMARY

- Flight testing is an inherently complex, expensive, and potentially hazardous process that requires a highly trained and experienced workforce.
- The HIL Labs are an expensive, unique, complex and capable tool that requires two shifts per day to support multiple users.
- RMTF is integral to the testing of instrumented captive and all-up-round missiles.
- A Majority of the missile flight test operations are conducted on the Sea Test Range at Point Mugu.
  - 70% AMRAAM
  - 50% SLAMER*
  - 90% HARPOON
  - 100% TOMAHAWK**
- We have been operating for over a decade under a single management structure for China Lake and Point Mugu.

Insuring Weapons W



NAVAIR

Point Mugu
Seaborne Targets Overview

BRAC 05

7-8 July 2005

Jeffrey Blume

Seaborne Targets Overview

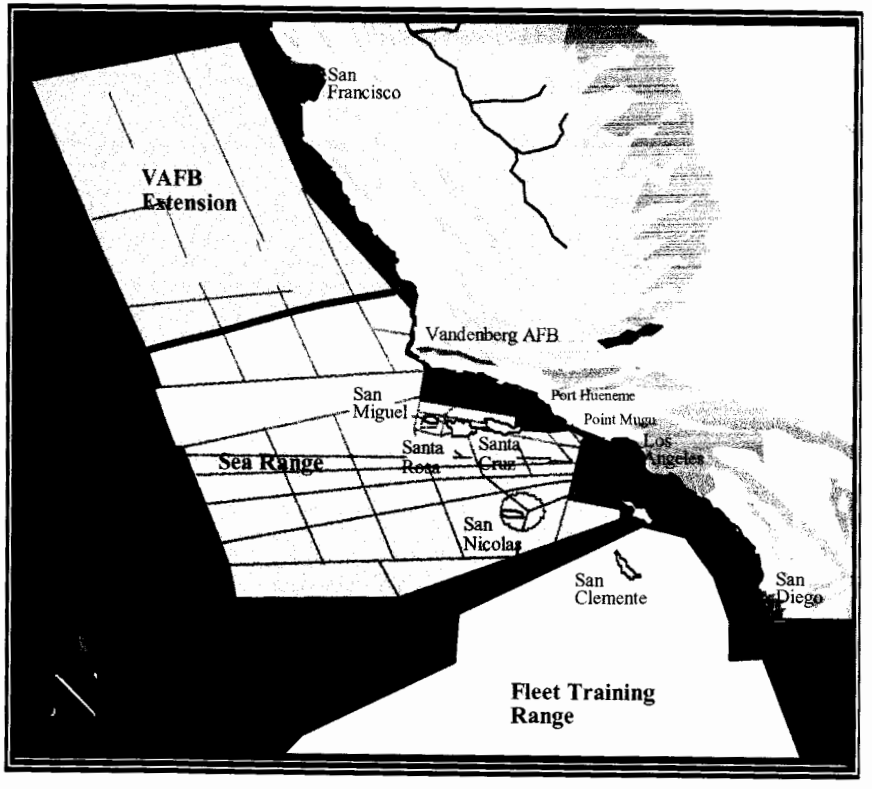
- **FUNCTION**
  - DoD Lead for Life-Cycle support (RDAT&E) for technical development and operational use of Seaborne Target Systems used world wide.
  - Provides seaborne targets and marine resources to support DoD weapons T&E, force training
  - As Navy's lead activity supports field activities worldwide
  - Support Aerial Target Missions at Sea Test Range
- **CAPABILITY**
  - DoD (Project Reliance) singular site for development, acquisition, and life-cycle support of Seaborne Targets
  - Singular site operating all Navy's Seaborne targets
  - Navy's only site for
    - Mobile Ship Target
    - Aerial Target Launch Ship
    - Fast Attack Craft Target
  - Other marine resources to support mission
- **SIGNIFICANT ISSUES**
  - Seaborne Targets capability is integral to weapons systems testing and training on the Sea Range
  - Requires deep-water port with direct access to Sea Range to support Navy and Tri-Service test events
  - Cannot be moved as Port Hueneme offers the only seaborne target harbor facility suitable for Sea Range operations.

NAVAIR

Seaborne Targets Overview

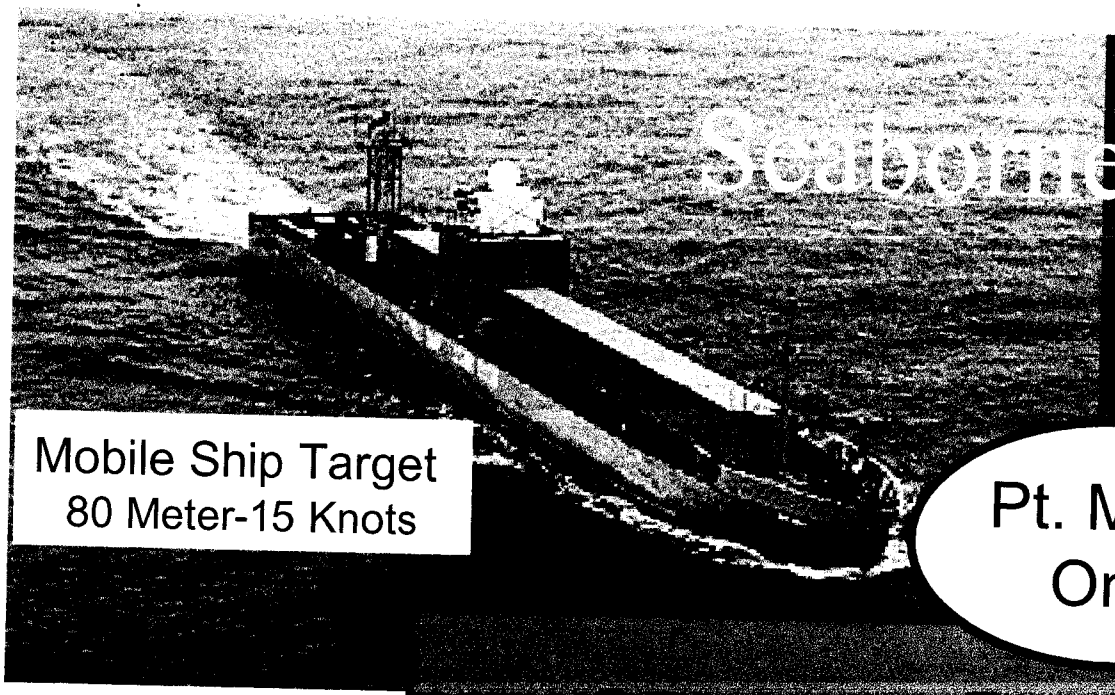
NAWCWD Pt. Mugu Environment

- 36000 sq. mi. (92000 Km^2) adjacent sea range
- Offshore islands
- Adjacent onshore peaks to 500m
- Fully instrumented for surface and aerial TM
- Minimum civilian/commercial interference
- Pt Hueneme critical to mission execution



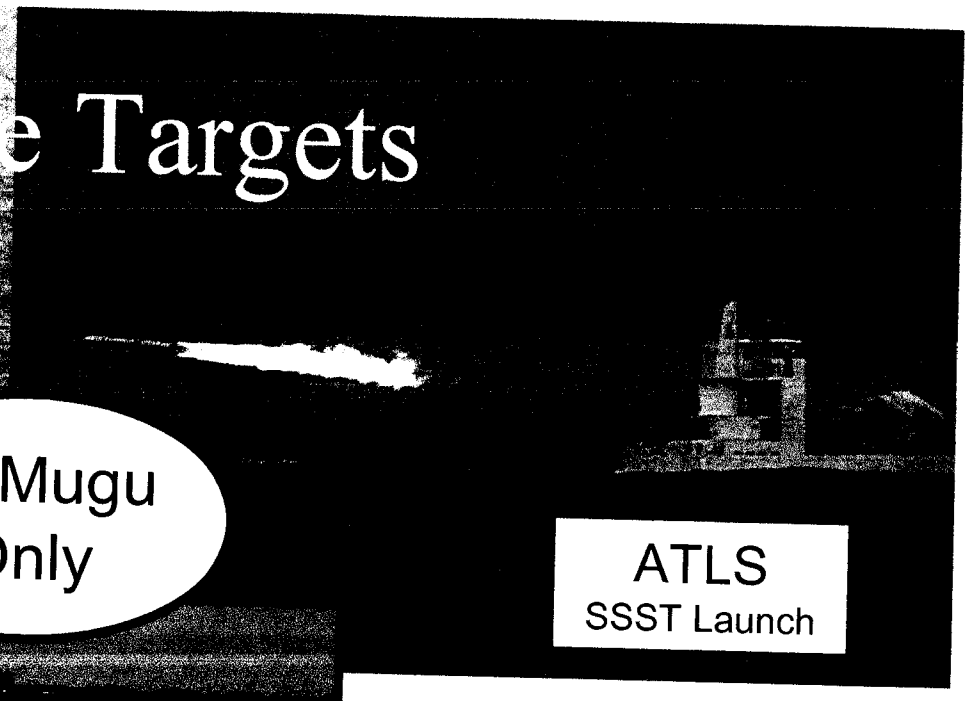
NAVAIR

Seaborne Targets



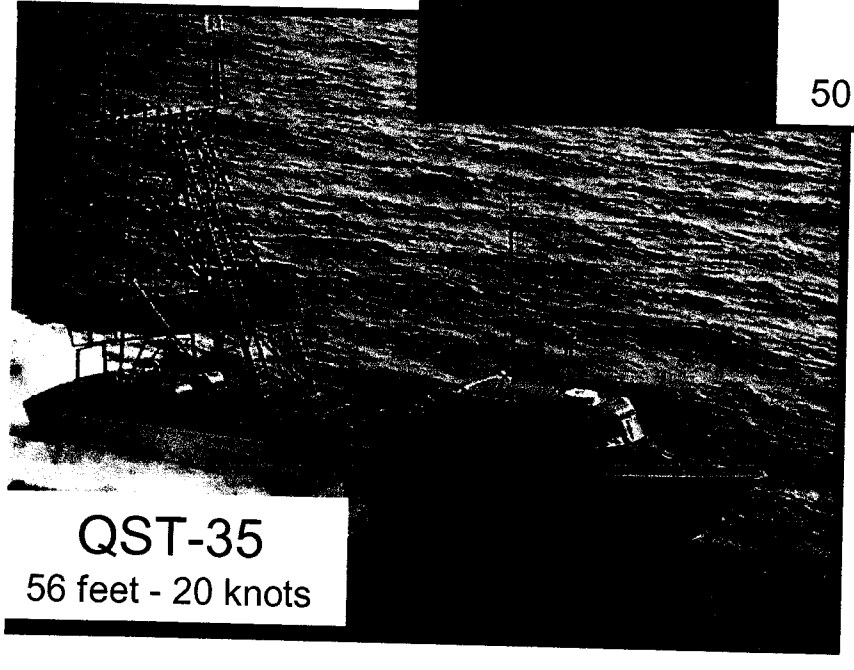
Mobile Ship Target
80 Meter-15 Knots

Pt. Mugu
Only

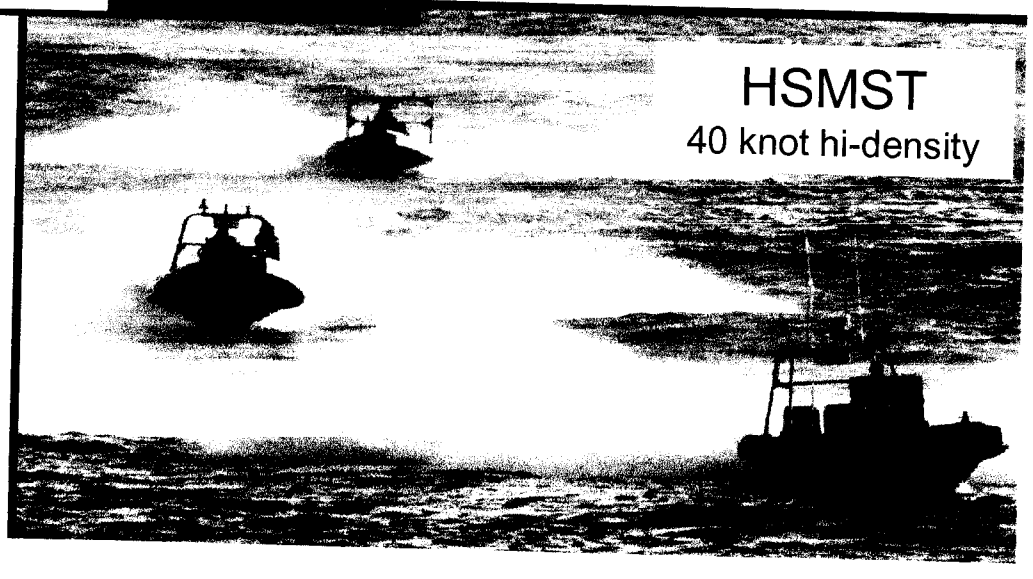


ATLS
SSST Launch

FACT
50 feet - 50 knots



QST-35
56 feet - 20 knots



HSMST
40 knot hi-density

Seaborne Targets Overview

Singular Capabilities

- Life cycle engineering and logistic support to *all* Seaborne Target Operating Activities (10 Sites)
- Operational support to all operating activities
- Hi-density target raids (15 simultaneous targets)
- Development and operation of *DoD's* only Self-Propelled Target Ship
- Development and operation of Fast-Attack Craft Target
- Development and operation of Aerial Target Launch Ship

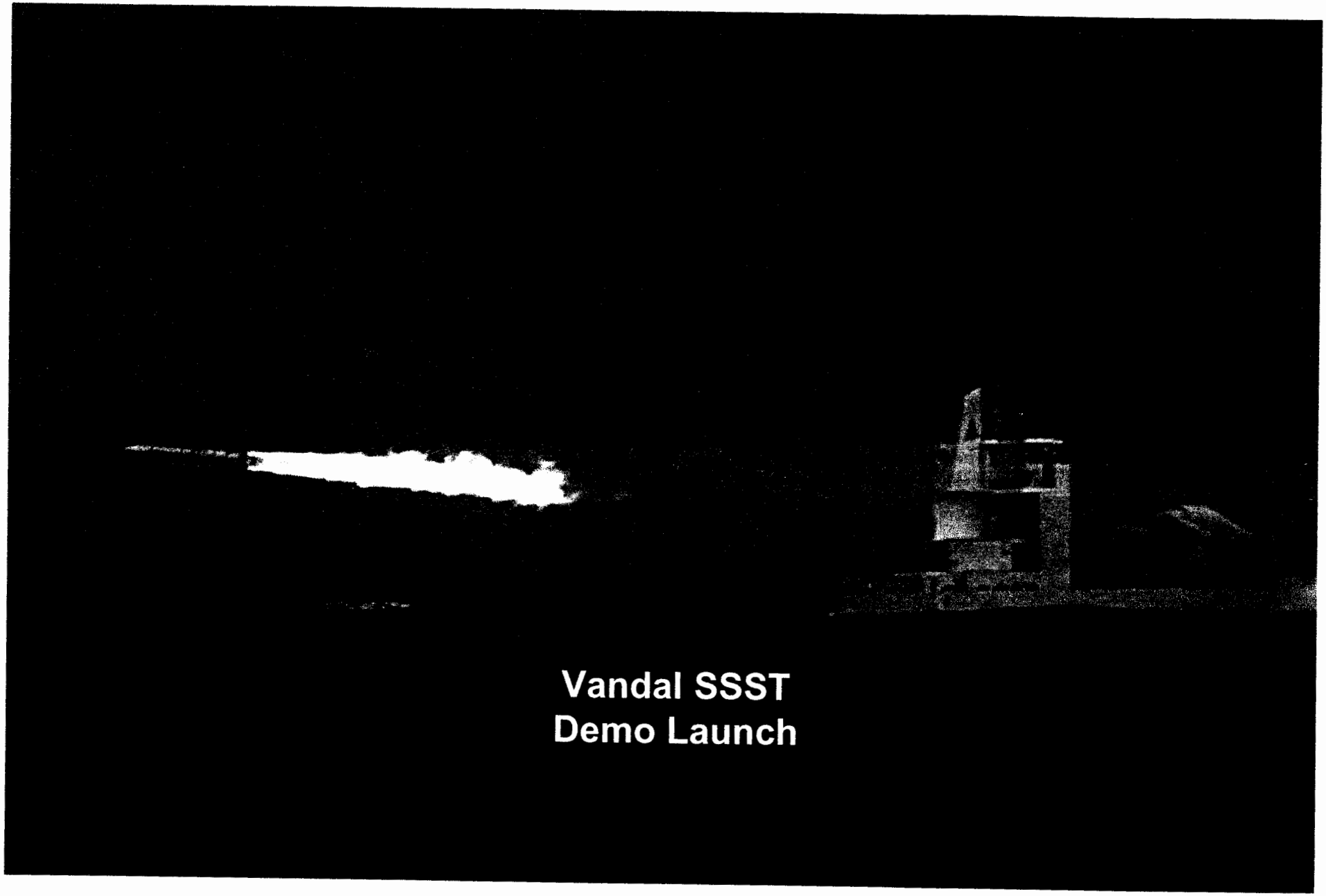
NAVAIR

Seaborne Targets Overview

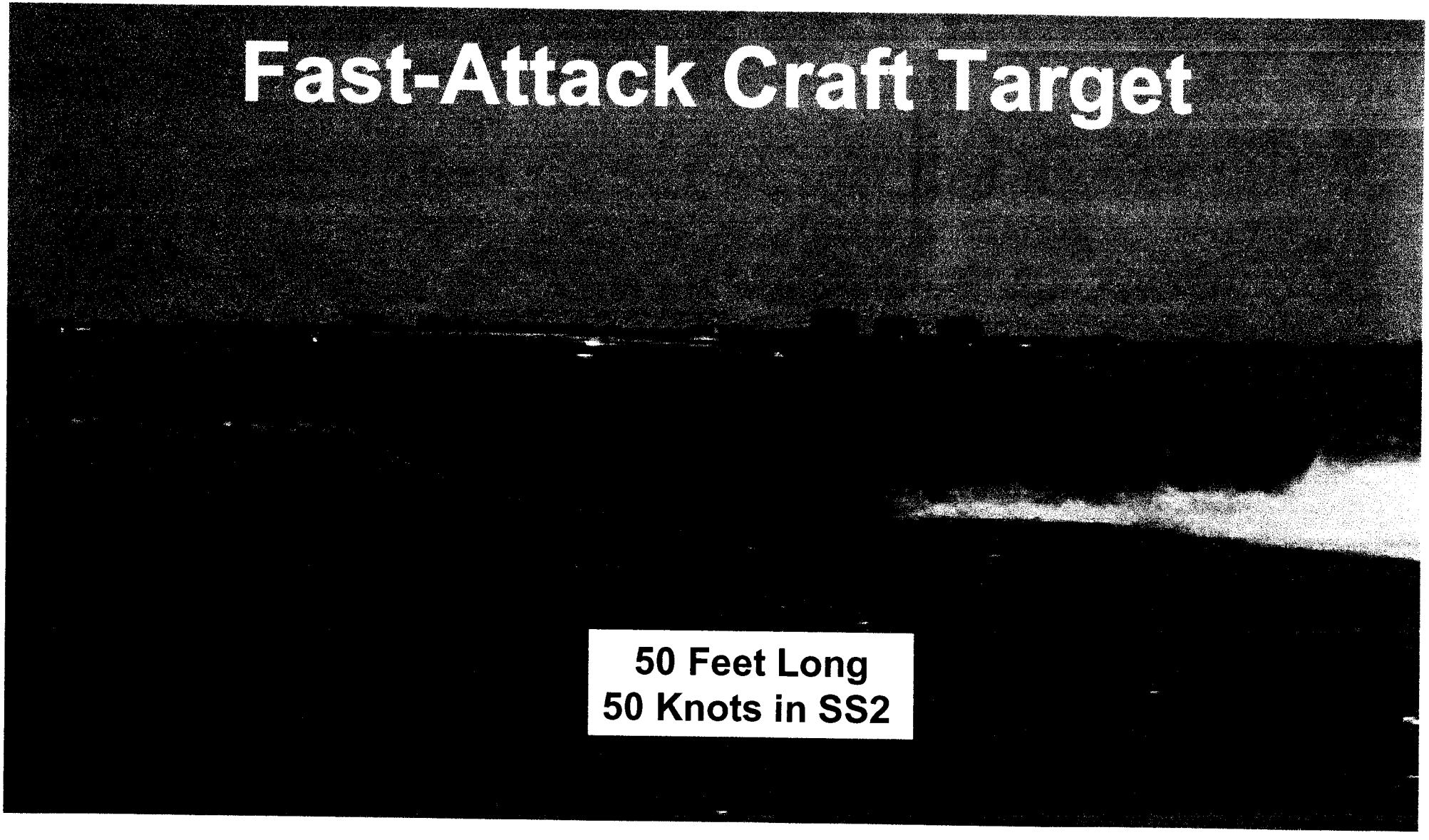
Mobile Ship Target

80 Meters long
15 Knots
Variable superstructure

NAVAIR

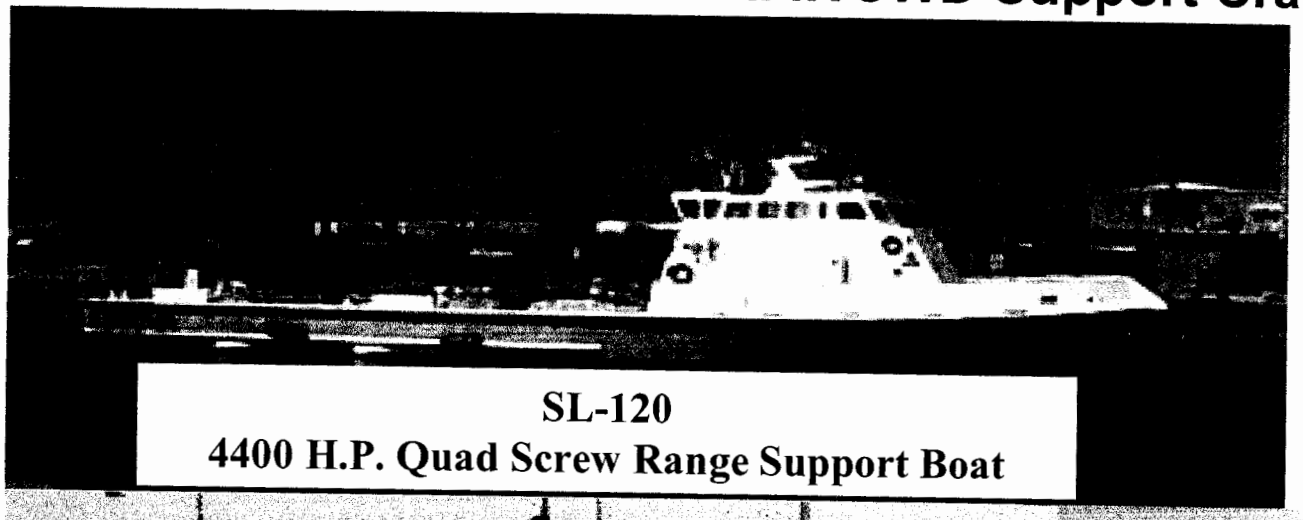


Vandal SSST
Demo Launch


Fast-Attack Craft Target
50 Feet Long
50 Knots in SS2

Seaborne Targets Overview

NAWCWD Support Craft

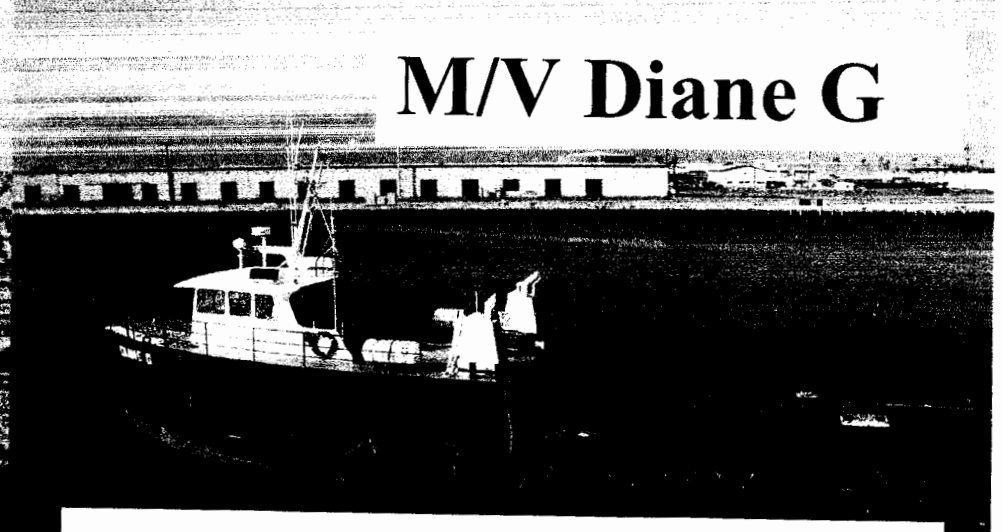


SL-120
4400 H.P. Quad Screw Range Support Boat

Missions Supported
Aerial and Seaborne Target Recovery
Target towing
VBSS
MIO
T&E
Boundary

HM-08
900 H.P. Twin Screw Range Support Boat

M/V Diane G



M/V Diane G
900 H.P. Twin Screw Range Support Boat

Seaborne Targets Overview

Surface Targets Team
Mission Summary (Sea Range)
(FY-04 through May, 2005)

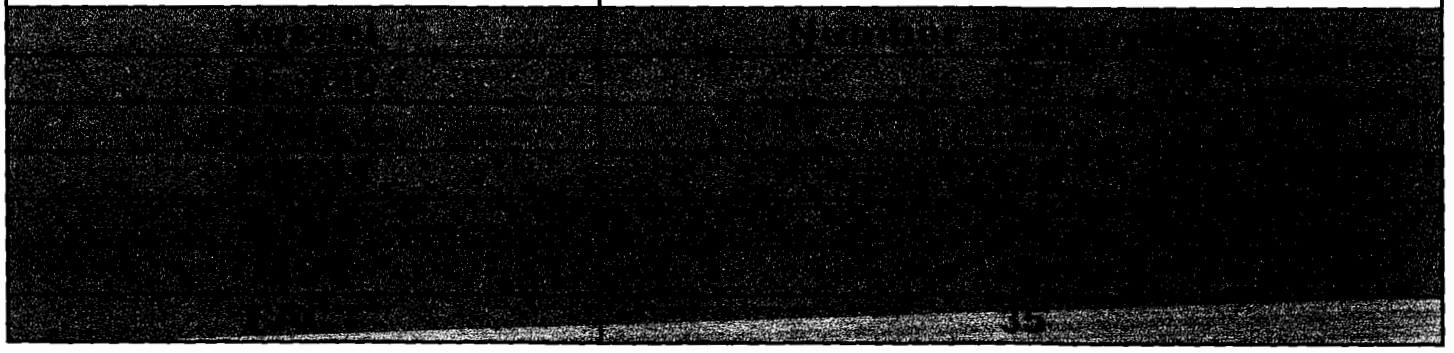
Mission Category	Number of Missions
NOLO Target Operations	57
Manned Target Operations	691
Other (Maritime support missions)	506
Grand Total	1254

NAVAIR

Seaborne Targets Overview

Surface Targets Team
Maritime Support Operations (Sea Range)
(FY-04 through May, 2005)

Customers:
Navy T&E, Fleet Training, Marines, USAF T&E, USCG, FMS
Missions:
Target Presentations, Target Recovery, Pre-Deployment Training Spt for Battle Group Work-up (Maritime Interdiction, Vessel Board Search and Seizure, Fast Inshore Attack)



NAVAIR

Seaborne Targets Overview

Seaborne/Aerial Target Efficiencies

- Post-operational retrieval of Aerial Targets
- At-sea launch capability of Aerial Targets
- Range Surveillance/Clearance
- Navy's lowest operational aerial target loss

NAVAIR

Seaborne Targets Overview

Summary

- The Seaborne Target capability at NAWCWD Point Mugu is the singular source of Seaborne Targets throughout DoD.
- The Seaborne Target mission requires the deep-water facilities of Port Hueneme.
- This capability is of unquestionably high value to Navy and DoD readiness.

NAVAIR

Narrative Description
Of
Electronic Warfare Facilities
At
NAVAIR Point Mugu, CA

Prepared at the request of
BRAC Commission Staff
Mr. Les Farrington
Mr. David Epstein

08 Jul 2005

Sirs

During your tour of the Electronic Warfare Laboratory Building at Point Mugu, you requested a "layman's description" of the laboratories and facilities you had visited. The following is a simple narrative of the facilities you observed with a description of their use. I will also gather and include with this narrative any currently available brochures, which may help in your analysis.

Clifton Evans Electronic Warfare Laboratory
Building 3008
Point Mugu, CA

This building was a MILCON specifically designed to house the Electronic Warfare support efforts at Point Mugu. It was completed in 1988, and cost approximately $15M to construct in then year dollars. While it doesn't house the entire complement of 369 EW personnel at Point Mugu, it does provide for collocation, or close proximity for most of the key laboratory facilities. These personnel and facilities are connected to the 12 EW personnel at China Lake via SIPRNET and other high-speed data links, as well as other pertinent sensor and integration folks that we work with on a routine basis. The building was designed to not only allow full electronic networking but also to facilitate interchange between members of teams doing separate but related functions in the Electronic Warfare arena. An example is the constant interchange of ideas on effective radar jamming techniques between the jammer experts in the Tactical Aircraft EW suite arena and their counterparts in the Airborne Electronic Attack (EA-6B and EA-18G) arena.

EW is to a large degree a responsive science. It is a cat and mouse game, with each side striving to develop systems, tactics, and techniques to allow their own systems free play within and control of the electromagnetic spectrum. So these laboratories and the skilled personnel that utilize them provide not only continuous product flow via a scheduled release cycle for required updates, but also quick reaction responses to urgent Fleet requirements driven by wartime issues. As an example, you heard earlier about how this integrated functional capability allowed us to respond to over 31,000 Fleet requests in FY-03 alone. The depth of the knowledge in our personnel allows us to do both of these with minimum staffing levels and interruption to the scheduled product releases.

You saw three distinct but connected lab complexes. They support separate portions of EW but share a large number of assets and processes. The labs are the ECSEL laboratory, the AEA complex, and the EWDS/ETIRMS labs.

These labs support the development and delivery of a large number of products to Fleet, Joint, and coalition users.

We were not able to show you one of our unique product areas, the JATO vans, as they are currently deployed to a classified location in support of the classified mission we discussed with you. These mobile assets, and more importantly the extremely expert personnel that man them, provide an invaluable function for the warfighter in support of the development and acquisition of new receiver and jamming systems as well as technique development in support of the rapidly changing EW environment.

ECSEL

This is the primary tool we use in the development and integration of the EW systems used on our tactical aircraft (referred to as TACAIR EW). This lab supports TACAIR EW for over 20 different aircraft types. It is in this laboratory where EW products are built and tested for their ability to warn aircrew and protect the aircraft from radar guided missiles and anti-aircraft artillery.

It consists of a number of radio frequency (RF) shielded rooms within an overall shielded enclosure. These "cans within a can" allow us to test highly classified systems as well as provide support to approved FMS customers without the danger of releasing intelligence data outside its intended audience.

ECSEL provides a laboratory environment that gives engineers complete access to every level of the integrated EW suite while the EW equipment believes it is flying in a realistic operational environment. A worldwide threat environment is available to engineers on a daily basis.

The central features of the lab are the avionics "hot benches", which allow us to operate the various EW systems and suites, and the variety of simulators, stimulators and instrumentation allowing us to stimulate the systems and measure their response to the environment. This allows the engineers to assess the response of the systems to the threat as well as the effectiveness of the techniques proposed to thwart the threats.

The hot benches also allow us to integrate the various separate EW systems, such as the Radar Warning Receiver (utilized to survey the environment for enemy threat) and the On-Board Jammer (utilized to supply RF energy and appropriate jamming techniques to spoof the enemy radars) into the suite configuration normally utilized in the actual aircraft.

This lab is essentially a high fidelity indoor range, which allows us to deliver high quality products directly to the Fleet users. These simulations have been determined to be high enough fidelity that we no longer require expensive and time consuming flight test in order to deliver our User Data Files to the Fleet.

The products supported by the ECSEL are conceived, developed, tested, and delivered here. The tools you saw in the SATS portion of the lab allows the engineering level analysis of techniques we are developing to thwart the guidance of enemy missiles. In

this lab you were shown the effectiveness of a particular enemy radar system in tracking and engaging a friendly aircraft without jamming, and then shown the effect of a real EW system, the Integrated Defensive Electronic Countermeasures System (IDECM) injecting a jamming technique into the threat radar. You were shown a similar display depicting the effect of an EA-6B jamming signal on an EW Acquisition radar.

Airborne Electronic Attack Complex (EA-6B/EA-18G)

We transited to the ICAP-III laboratory. This is the lab that was designed and built by the government team at Point Mugu to be a copy of the ICAP-II Block 89A laboratory (the baseline from which the ICAP-III derived). After completion and acceptance testing, the lab was then "sold off" to the prime contractor for the ICAP-III for modification to the new avionics configuration.

This is the lab that has supported the development of the ICAP-III version of the EA-6B. This is the latest version of the aircraft, and includes many new systems to increase the capabilities of the aircraft over its predecessors such as new displays, a new bus structure, and higher speed computers with increased memory. Probably the main new feature is a channelized receiver which allows high speed and highly accurate viewing of the threat environment. It uses a technology called phase interferometry, which essentially has an array of antennas around the airframe, which allow the system to accurately measure the direction of arrival and range of the incoming signal. What that means to the lab is that we had to develop a highly sophisticated stimulator for this system. It's called the AMES III. This is a very complex and expensive (multi-million dollar) piece of equipment, and any future system with capabilities similar to the ALQ-218 receiver will require this simulator for development and evaluation. In addition, AMES III requires significant expertise to calibrate and program. This asset is being shared between the ICAP-III lab and the EA-18G laboratory next door.

During the development of the ICAP-III avionics suite, our expertise was recognized to the point that the prime contractor, Northrop Grumman, actually found a way to utilize some of our people as contributors to the prime development project, almost in a subcontractor role. (At Air Force request, the Point Mugu EW team is participating in the B-52H AEA system definition and source selection process.)

EA-18G

We then transited to the area of the laboratory complex, which houses the EA-18G avionics suite. This lab is very transformational in nature. When PMA-265 (the F/A-18 program manager) was given the task of developing the follow on platform to the EA-6B, they decided that the best development approach was to take full advantage of the intellectual capital at both NAVAIR WD sites. PMA-265 has historically had a strong relationship with the China Lake site, where the F-18 WSSA has been hosted for many years. The PM decided that it was a lower risk approach to build a distributed laboratory structure, which would take full advantage of the expertise at each site. The China Lake site is responsible for all of the portions of the legacy F-18 that are part of the EA-18G.

The EA-18G's AEA suite is essentially a repackaging of the ICAP-III avionics suite. The expertise for that system is here. The lab has been set up with a high-speed fiber optic line between the labs. Each lab will have a small emulation of the "other lab" so that they may operate and develop portions of their subsystem in a stand-alone mode. You saw the F-18 mission computer and cockpit display emulator. This supplies the inputs required by the AEA subsystems for isolated development. When complex interactions or higher-level integration is required, the labs hook up via the high-speed channels, and essentially operate as a whole aircraft spread across the miles. Technology and transformational thinking allow us to leverage the truly high value assets – the people and their expertise – at each site to make an effective solution set for the Warfighter.

I mentioned that the AMES-III we saw next door was shared between the ICAP-III and the EA-18. This EA-18 lab will also share a number of other pieces of fixed hardware. The EA-18G, ICAP-III lab and ICAP II lab will all share access to the pod station gantry, they also share the same RF threat generators, central computer facilities, and remote terminal room used as a quiet development environment by our s/w programmers. These labs were built to be an integrated complex, and were never designed to be easily or cheaply separated.

We next saw the pod gantry. This gantry allows us to radiate high power transmitter signals into dummy loads to allow us to characterize the transmitters and exciters. To do this, the lab must supply not only power and interconnectivity to the various lab configurations, but we actually have a cooling cart in the corner of the lab. We are currently developing a solution for our troops in Iraq by modifying an engineering model of the latest transmitter to ship to Fleet users as a quick reaction fix for the problem I mentioned earlier.

The next stop was the ICAP-II Blk 89A development and integration facility. It is the only one in the world, and is the sole support tool for our deployed EA-6B's. During the early 80's, Grumman had developed the ICAP-II EA-6B. They turned over long-term support to the government, and focused their energy on the next generation of the aircraft, called the ADVCAP. When that update was cancelled, Point Mugu remained as the only support structure for the EA-6B community. In addition to our more traditional role of EW product development and software support, we had to take on the role of full systems developer and integrator. We have added features well beyond the traditional EW roles such as new navigation systems, the ability to communicate with GPS systems, the ability to employ satellite communications and Link 16 messages, as well as other common avionics upgrades. This is in addition to delivering regular s/w product updates and quick reaction capabilities to the fleet users. Any degradation of this capability will directly impact the deployed fleet users, as there simply is no backup capability. Although the Navy will transition in the 2010-2015 timeframe to the EA-18G, our expeditionary Marine Corps squadrons have decided to stick with the EA-6B airframe until they make a decision regarding their EW requirements after 2015 (possibly a JSF variant).

EWDS

We next went to Intel center of our lab complex to see the Electronic Warfare Database Support system (EWDS). This is where a small group of very talented individuals does essentially three tasks. First, they continuously scour the world's intelligence data sets and attempt to determine the current and future threats in areas of interest in the world. They resolve those threats in concert with their intelligence community spread across the country, and build the routine updates that are shipped regularly to all fleet users of their product. Second, they are the front end for all fleet requests for information and updates on a quick reaction basis. The goal of this group is to respond to all fleet requests within 24 hrs. The much more typical time is less than four hours, and we have instances with local response time of 1 hr. This small (6-8 people) dedicated group provides this service on a 24/7/365 basis via a network of pagers and cell phones. Interconnectivity to the fleet is via all methods from secure phone to SIPERNET to naval messages. They are able to accomplish the full task by working in concert with the specialists from other areas of the complex, including the jammer technique group and the s/w programmers. Being collocated with these experts and facilities is vital to rapid turn around time. As an example, on 9/11/2001, we kept one analyst, a jammer expert, and two s/w programmers here while everyone else went home. They were able to produce a whole new HARM file as well as jammer techniques reports and new intelligence files in less than 8 hours. These files readied the fleet to retaliate in areas of interest in the world the same day as the attack had the President ordered that action.

The third product set they produce is a sophisticated set of tools comprising the Electronic Warfare Tactical Information Report Management System (ETIRMS), which are used by multiple communities. The complex architecture they developed has impressed a great many communities outside of their traditional EA-6B customer base. They now produce intelligence-based products for not only the EA-6B but also the E-2C, the MH-60R, and the SH-60S. They are also the producer of the Electronic Order of Battle (EOB) for the Joint Mission Planning system (JMPS) system used by all tactical aircraft and the specific planning module for the EA-18G segment on JMPS. The JSF program has become very interested in their architecture and tools, and is leaning heavily towards adopting it for the EW reprogramming required for that platform.

Naval Air Warfare Center (NAWC)Weapons Division
Point Mugu
Overview

PURPOSE OF BRIEFING

- NAWC UNDERSTANDING OF THE ROLE OF THE COMMISSION
  - "Provide an objective, thorough, accurate, and non-partisan review and analysis, through a process determined by law, of the list of bases and military installations which the Department of Defense (DoD) has recommended be closed and/or realigned....The Commission is required to assess each recommendation to ensure it meets the eight selection criteria set forth by Congress in P.L. 108-375. Recommendations by DoD that substantially deviate from these selection criteria can be modified or rejected by the Commission by a simple majority vote of the Commissioners"
  - Selected criteria list:
    - Current and future mission capabilities and impact on operational readiness of DoD, including impact on joint warfighting, training, and readiness
    - Ability to accommodate contingency, mobilization, surge, and future force requirements at both existing and potential receiving locations to support operations and training.
    - The cost of operations and manpower implications
    - Extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of the closure or realignment, for the savings to exceed costs

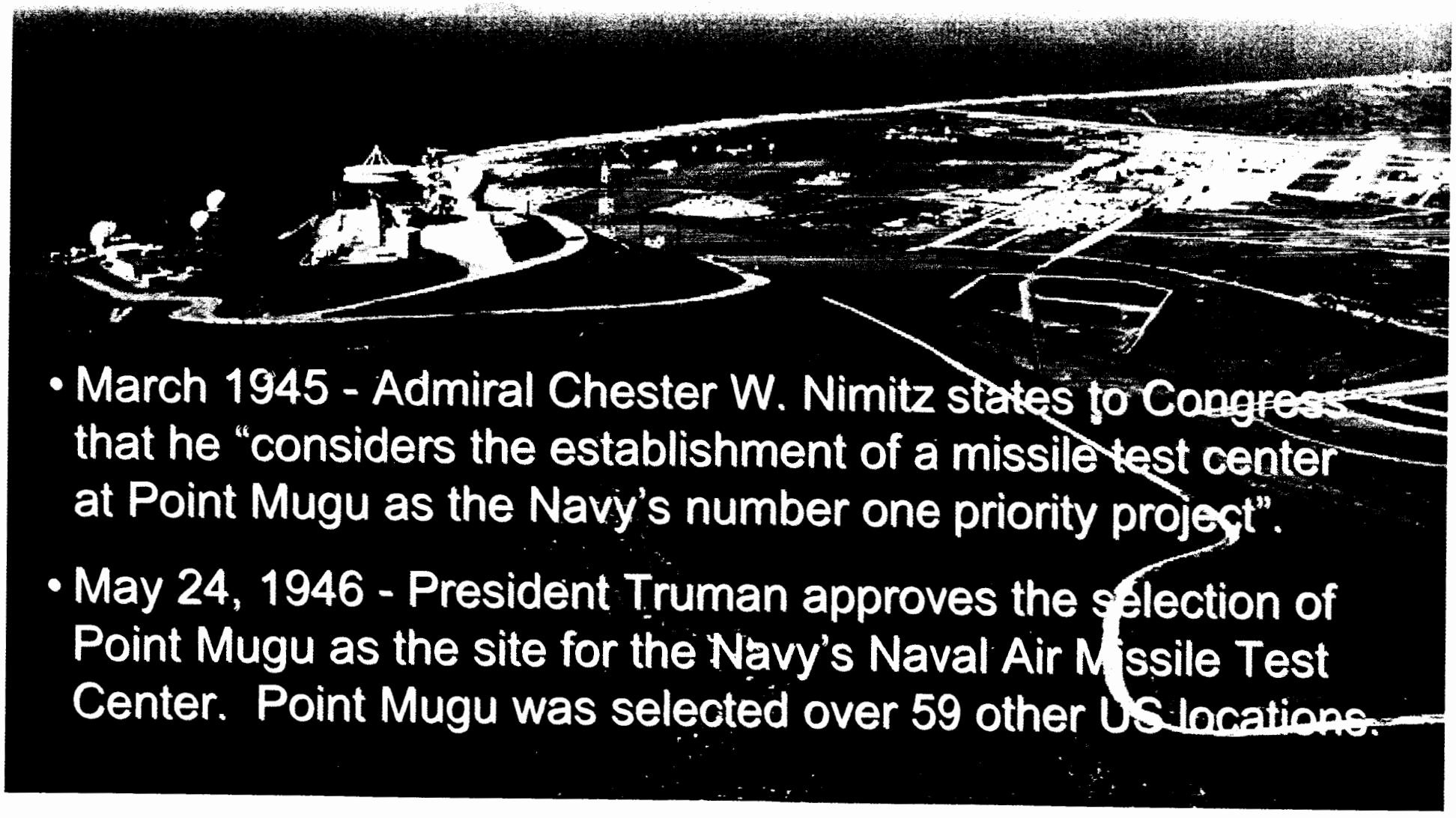
EXPECTED TAKEAWAYS

- NAWC Weapons Division understands and strongly supports the BRAC process goals:
  - Recommendations that facilitate transformation
  - Recommendations that deliver efficiencies
- The recommendations you are reviewing are the result of NAWC input and DoN/DoD analysis.
- Reconciliation of published BRAC Weapons and Armament recommendation data will facilitate implementation actions
  - Reconciliation of NAWC and final DoD data with retention of Sea Range functions at Point Mugu
- Your analysis will validate:
  - the risks are reasonable
  - transformation is achieved and
  - return on investment and efficiencies are substantiated

BRIEFING OUTLINE

- NAWC Weapons Division, Point Mugu history, mission and capabilities
- Existing NAVAIR and NAWC Weapons Division Organizational Construct
  - Competency Aligned Organization/Integrated Product Teams
- Takeaways
- Summary

Point Mugu Origins



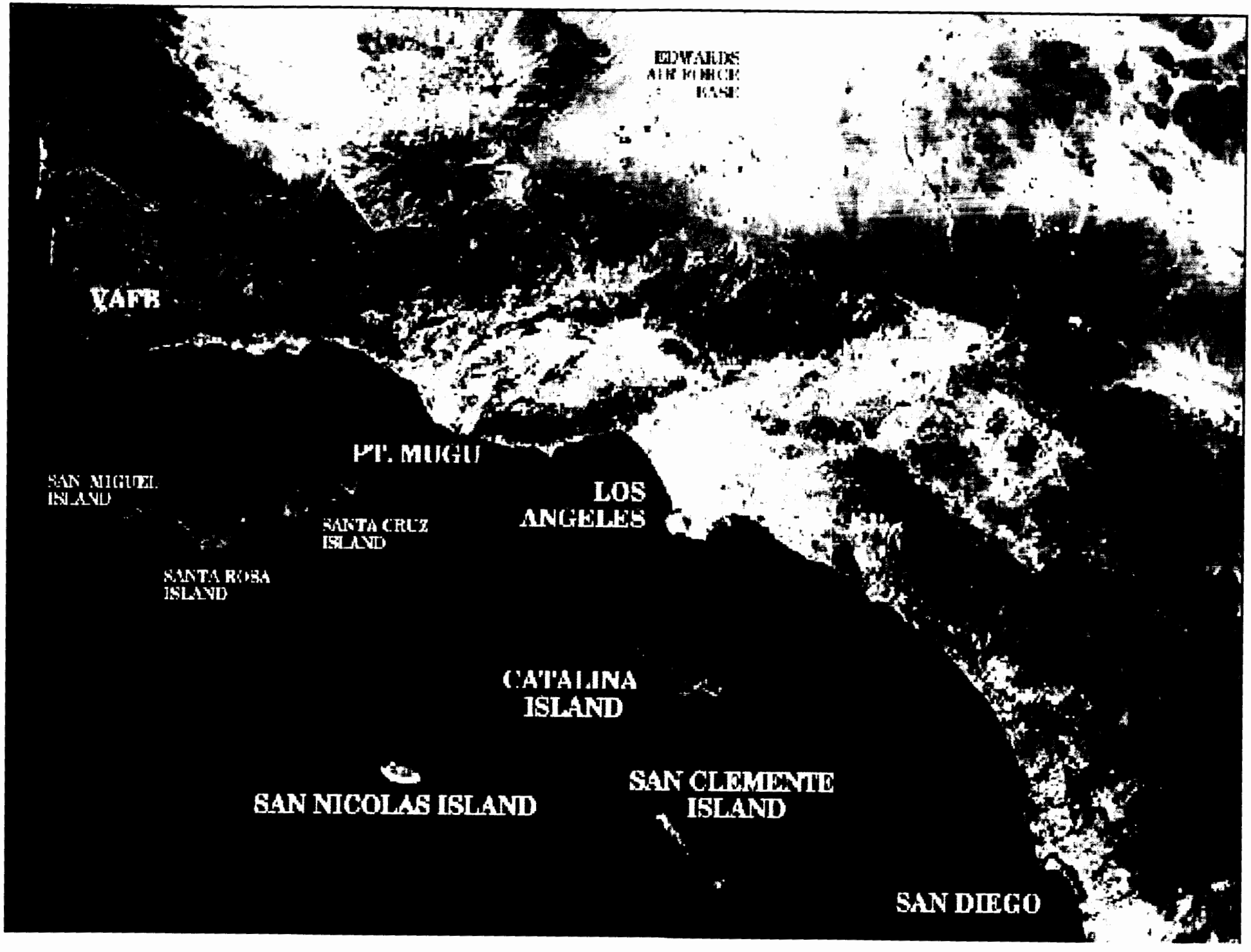
- March 1945 - Admiral Chester W. Nimitz states to Congress that he "considers the establishment of a missile test center at Point Mugu as the Navy's number one priority project".
- May 24, 1946 - President Truman approves the selection of Point Mugu as the site for the Navy's Naval Air Missile Test Center. Point Mugu was selected over 59 other US locations.

Naval Air Warfare Center
Point Mugu

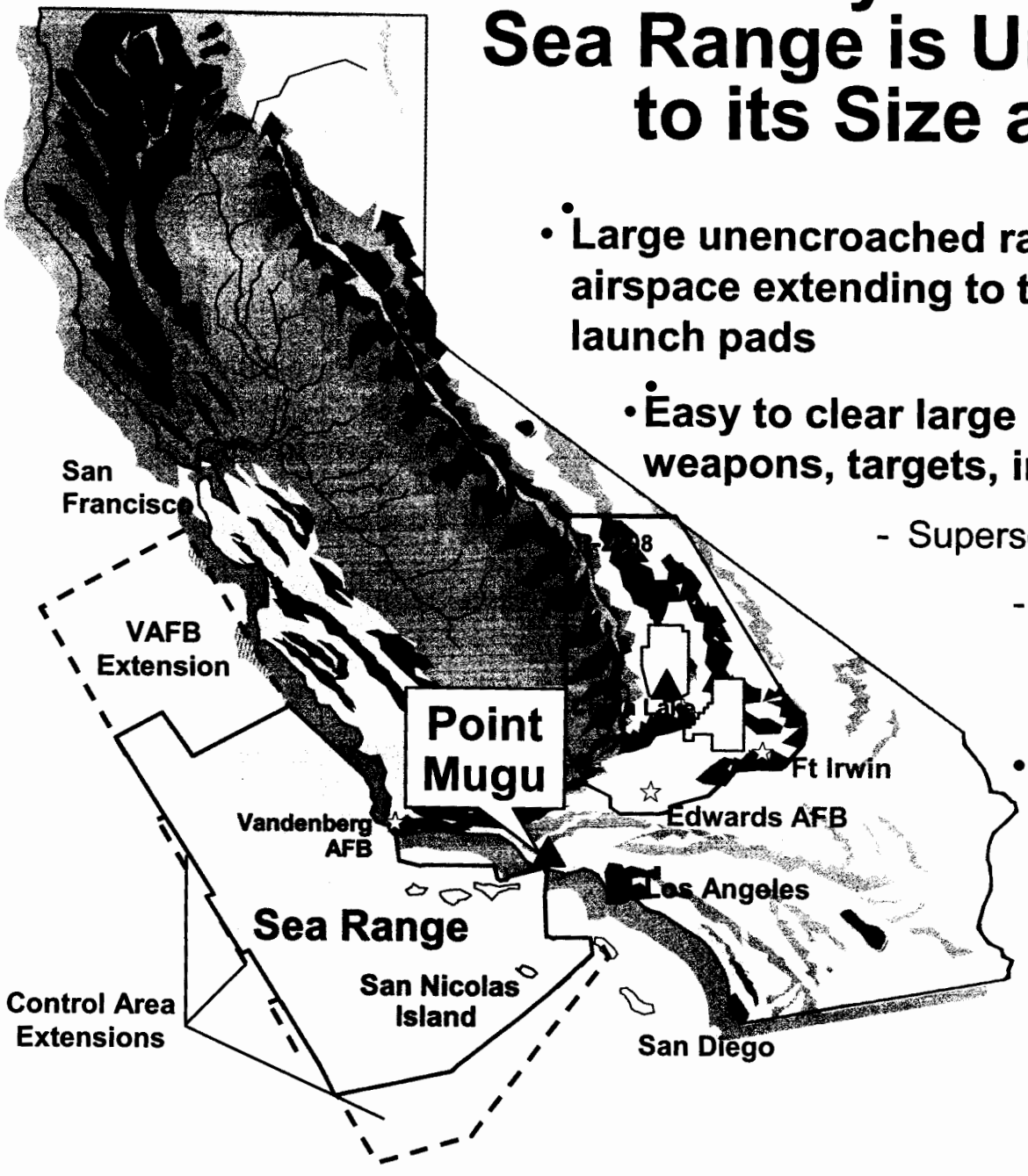
- **Point Mugu's location and geography enable the testing and evaluation of today's complex weapon systems for our Warfighters.**

- **Our technical capabilities in Weapons Test & Evaluation and Electronic Warfare are based on the integration of the geography and management, a highly skilled workforce and advanced laboratories and facilities.**

- **Naval Aviation's EW Center of Excellence for over 50 years.**


EDWARDS
AIR FORCE
BASE
VAFB
PT. MUGU
SAN MIGUEL
ISLAND
SANTA CRUZ
ISLAND
LOS
ANGELES
SANTA ROSA
ISLAND
CATALINA
ISLAND
SAN NICOLAS ISLAND
SAN CLEMENTE
ISLAND
SAN DIEGO

The Military Value of Point Mugu Sea Range is Unquestioned due to its Size and Location

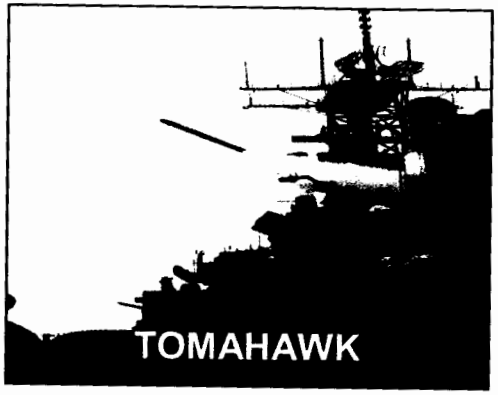


- **Large unencroached range with controlled airspace extending to the runway and adjacent launch pads**
- **Easy to clear large areas for impact of weapons, targets, intercept debris**
  - Supersonic sea skimming missiles
  - AMRAAM live fire against multiple high altitude supersonic targets
- **Large, complex exercises**
  - Proximity to inland ranges
  - Precision Strike
  - Net Warfare Experiments
  - TRIDENT

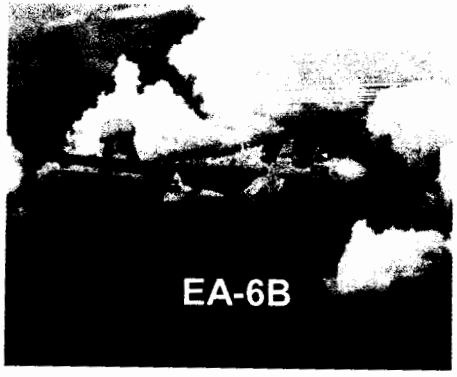
Our Capabilities

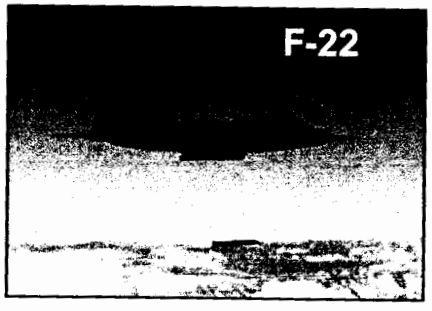
- Navy Electronic Warfare Center Of Excellence
- Largest and most capable Sea Range including worldwide deployable range support aircraft
- Targets and T&E Reliance leadership
- Navy and Joint weapons Test and Evaluation Engineering
- Weapons Sustainment

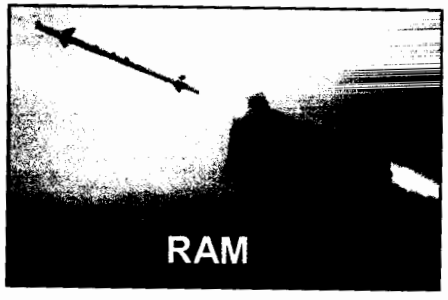
Point Mugu provides critical Warfighter support to:



- Forces in Iraq and Afghanistan
- Deploying Forces (CSSQT, JTFEX)
- Coalition Partners
  - Spain, Germany, England, Japan, Australia
  - Closure of Vieques & AFWTF has increased this work significantly
- Joint Acquisition Programs
  - F-22, AIM-9X, JDAM/JSOW, SLAM-ER, AMRAAM, Tomahawk
  - Classified Programs







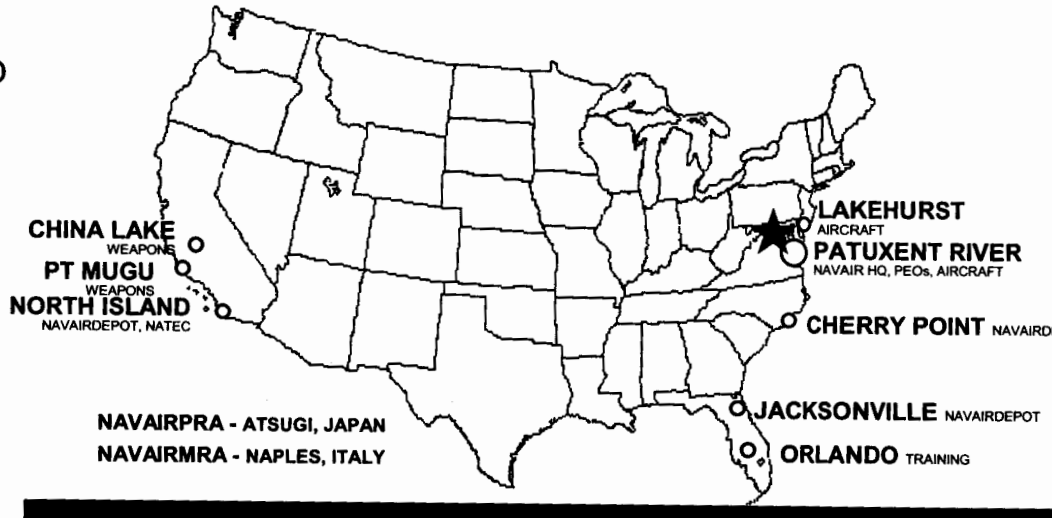
EXISTING NAVAIR AND NAWC WEAPONS DIVISION ORGANIZATIONAL CONSTRUCT

COMPETENCY ALIGNED ORGANIZATION / INTEGRATED PRODUCT TEAMS

INTEGRATED CONCEPT OF OPERATIONS FOR LIFE CYCLE SYSTEMS MANAGEMENT

INTEGRATED PROGRAM TEAMS
(TEAM STRUCTURE TO PERFORM WORK)

- MULTI-DISCIPLINED
- FLEET / PRODUCT FOCUSED
- FULL LIFE CYCLE SYSTEM SUPPORT



COMPETENCY ALIGNED ORGANIZATION
(FORMAL STRUCTURE)

- COMPETENCIES SPAN ALL SITES
- LINKED BY COMMON ORGANIZATION & PROCESSES
- CAPABILITY / ASSET VISIBILITY

SUPPLY

DEMAND

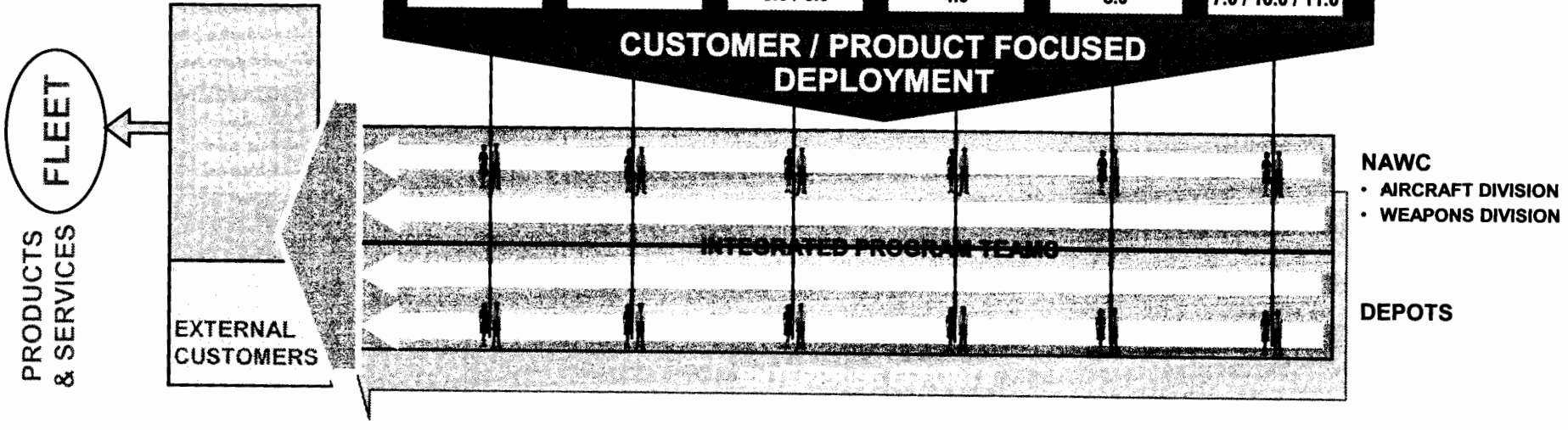
TOTAL WORKFORCE
30 SEP 04
36,839
(NAVAIR & PEOs)

MIL	2,669
CIV	24,548
CSS	9,622

COMPETENCY ALIGNED WORKFORCE

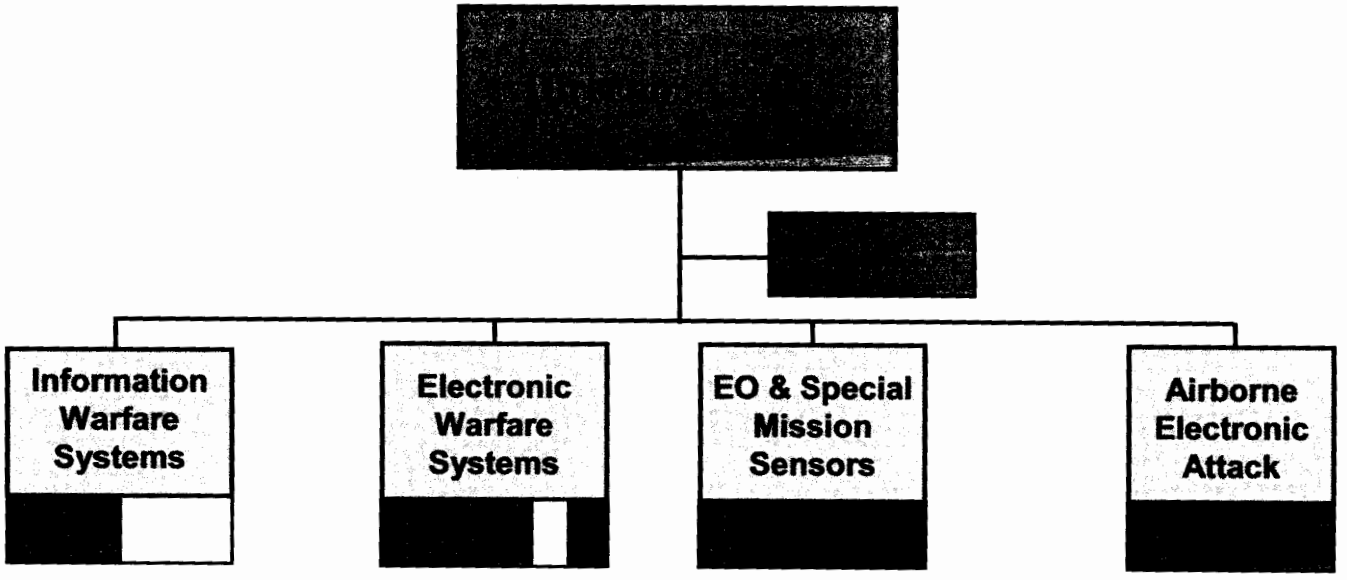
PROGRAM MGMT 1.0	CONTRACTS 2.0	LOGISTICS & INDUSTRIAL 3.0 / 6.0	RESEARCH & ENGINEERING 4.0	TEST & EVALUATION 5.0	CORPORATE OPERATIONS 7.0 / 10.0 / 11.0

CUSTOMER / PRODUCT FOCUSED DEPLOYMENT

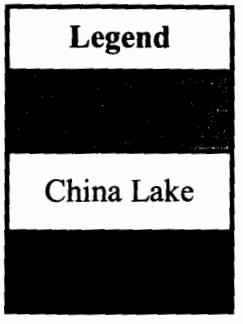


Electronic Warfare & Combat Systems

Point Mugu, China Lake, Patuxent River

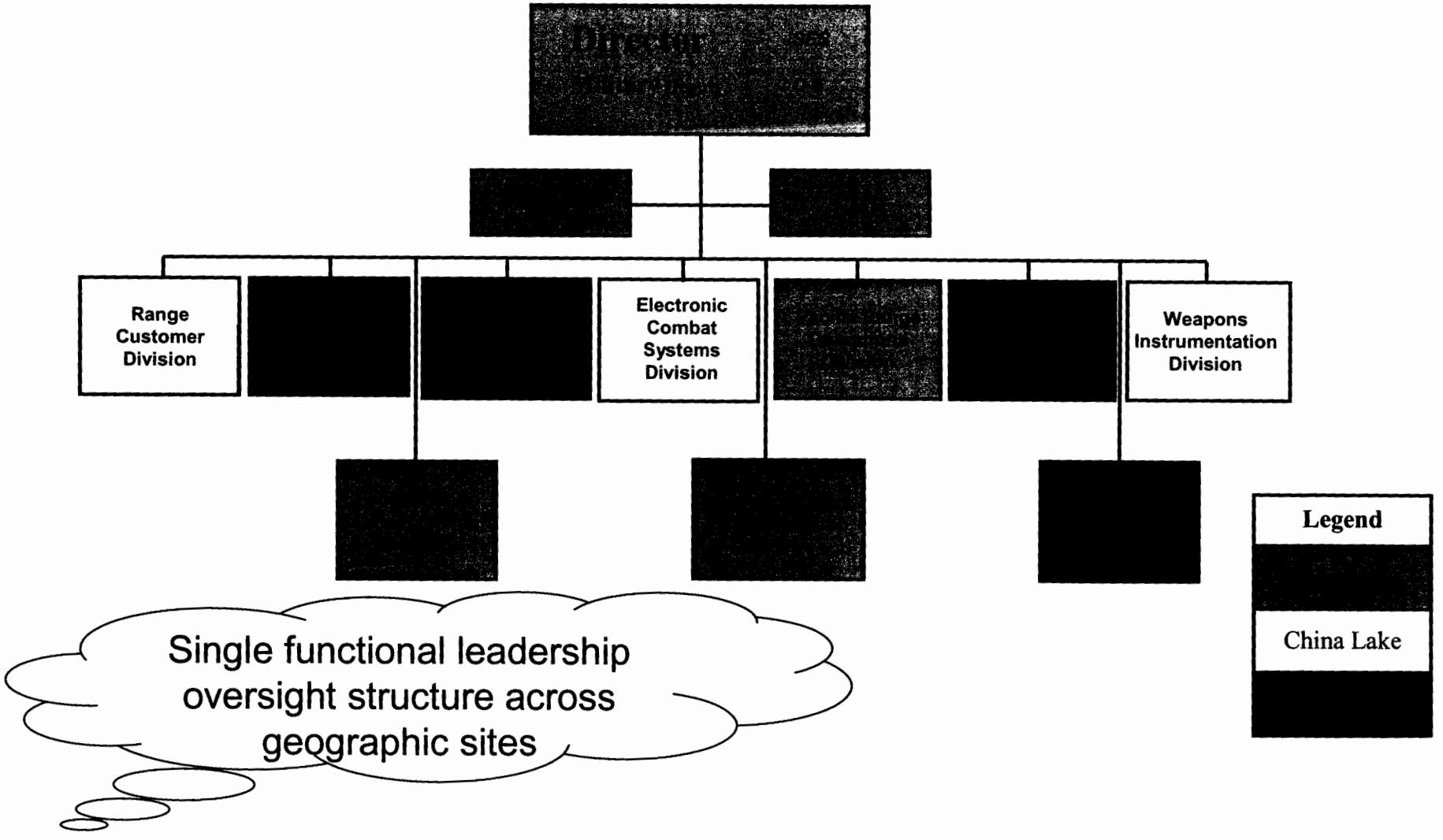


Single functional leadership oversight structure across geographic sites

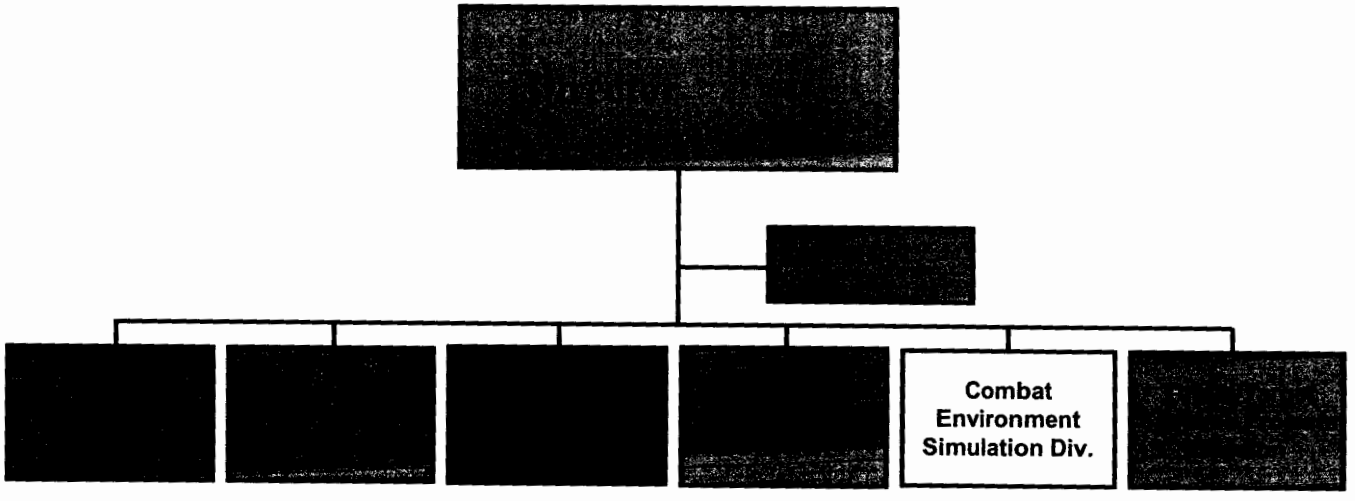


Ranges Department

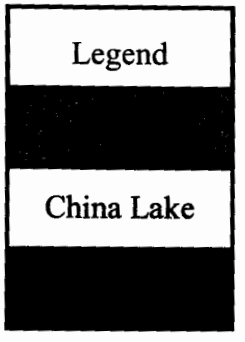
Point Mugu, China Lake & Patuxent River



Threat/Target Systems Department
Point Mugu, China Lake & Patuxent River



Single functional leadership oversight structure across geographic sites

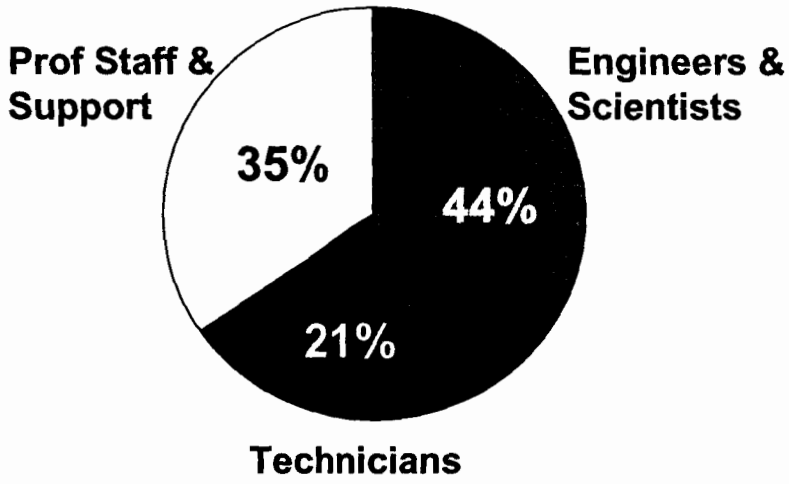


Our Workforce is Educated, Talented, and Experienced

- **Total No. of Personnel:**

Civ:	1,540
Mil:	261
Contractor:	444
Total	2,245*

* December 2004



- **55.0% of Civilians with 4yr (+) degree**
  - **25.3% of Civilians with degrees have advanced degrees**
  - **30 Civilian Test Pilot School graduates plus Military graduates**

- **Average years of service: 18.4 yrs**
- **Average age of Civilians: 49.3 yrs**
- **Avg. age of Retirees in FY03 and 04 59.0 yrs**
- **% of Civilians in FERS retirement system: 61.8%**

66 Private Industry partners located within a 60 mile radius of Point Mugu

TECH 18D Summary Takeaways
Weapons and Armament RDAT&E

HIGHLIGHTS

- **Clearly defined weapons and armament function traceable**
- **Need to clarify other components of recommendation to allow better implementation planning**
  - **Necessary capability remains at Point Mugu for sea range operations**

TECH 54 Summary Takeaways
Relocate Sensors, EW and Electronic RDAT&E

HIGHLIGHTS

- **Scenario Transfers are traceable**
- **NAWC Weapons Division CAO/IPT construct supports efficient RDAT&E operations at this time through single leadership and linked labs**
- **TJCSG assessed enhanced operations through single siting of EW achieving a transformation and associated return on investment as delineated in COBRA analysis**

SUMMARY

- NAWC Weapons Division understands and strongly supports the BRAC process goals:
  - Recommendations that facilitate transformation
  - Recommendations that deliver efficiencies
- The recommendations you are reviewing are the result of NAWC input and DoN/DoD analysis.
- Reconciliation of published BRAC Weapons and Armament recommendation data will facilitate implementation actions
  - Reconciliation of NAWC and final DoD data with retention of Sea Range functions at Point Mugu
- Your analysis will validate:
  - the risks are reasonable
  - transformation is achieved and
  - return on investment and efficiencies are substantiated

Tour Schedule

- The Remainder of today (Thursday) is TECH 54, Electronic Warfare
- Tomorrow (Friday) will be devoted to TECH 18, Weapons and Armament

NAVAIR Sea Range

at

Point Mugu

for

BRAC Commission Staff

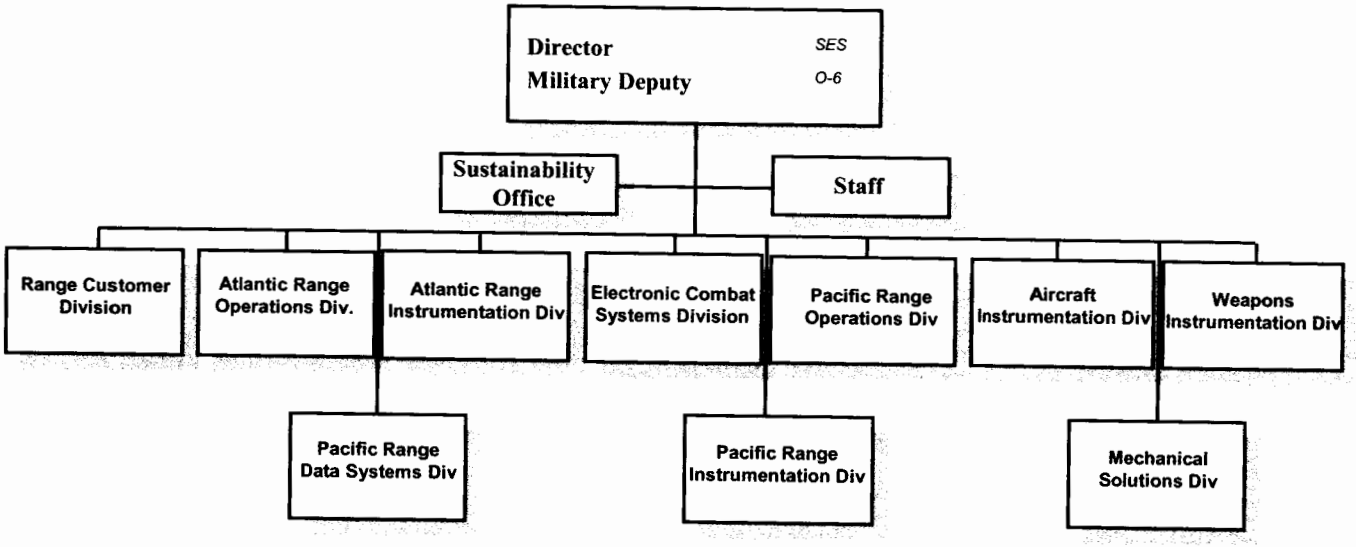
Mr. Steve Mendonca

Director for NAVAIR Ranges

China Lake, Point Mugu, and Patuxent River

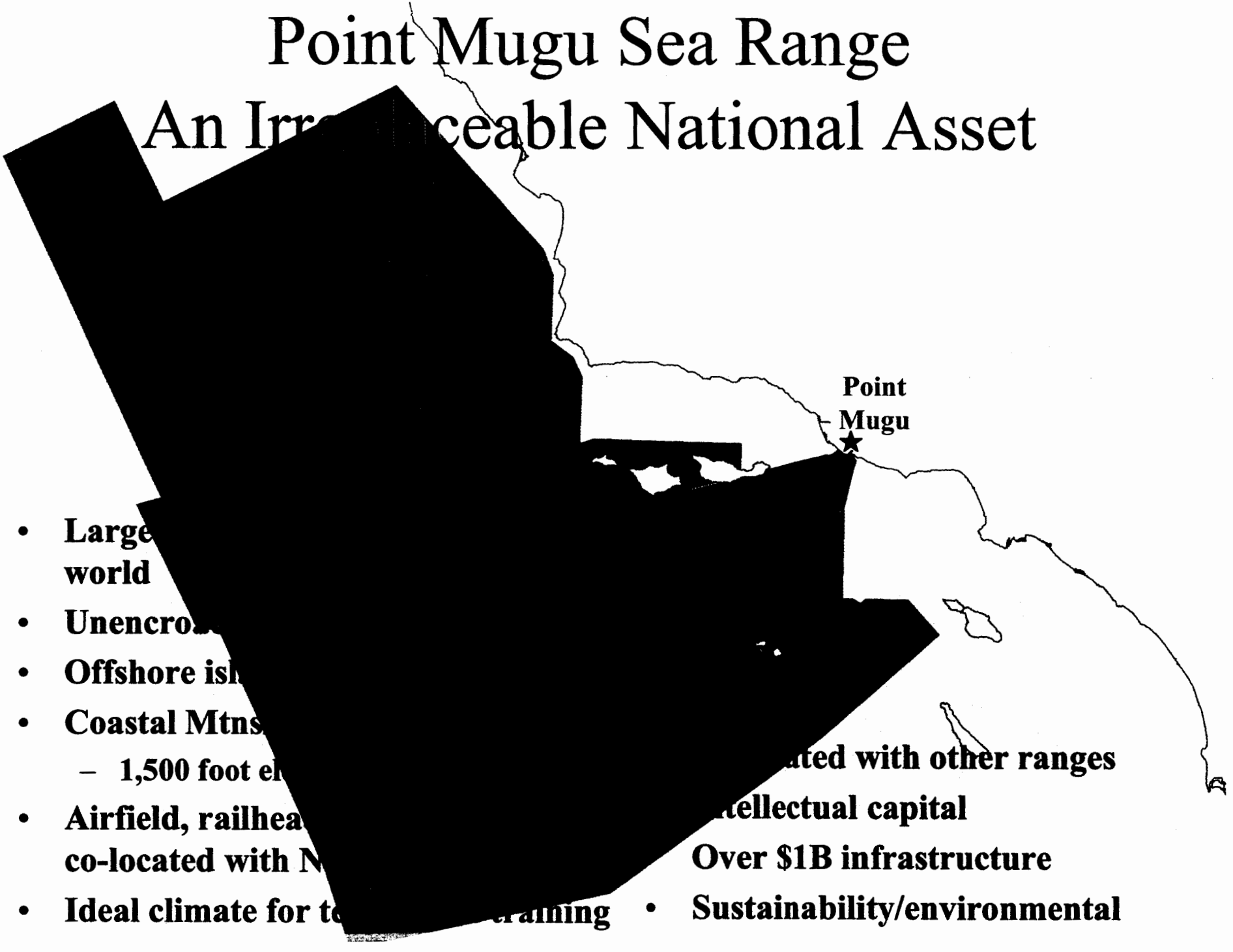
8 July 2005

Ranges Department
China Lake, Point Mugu & Patuxent River



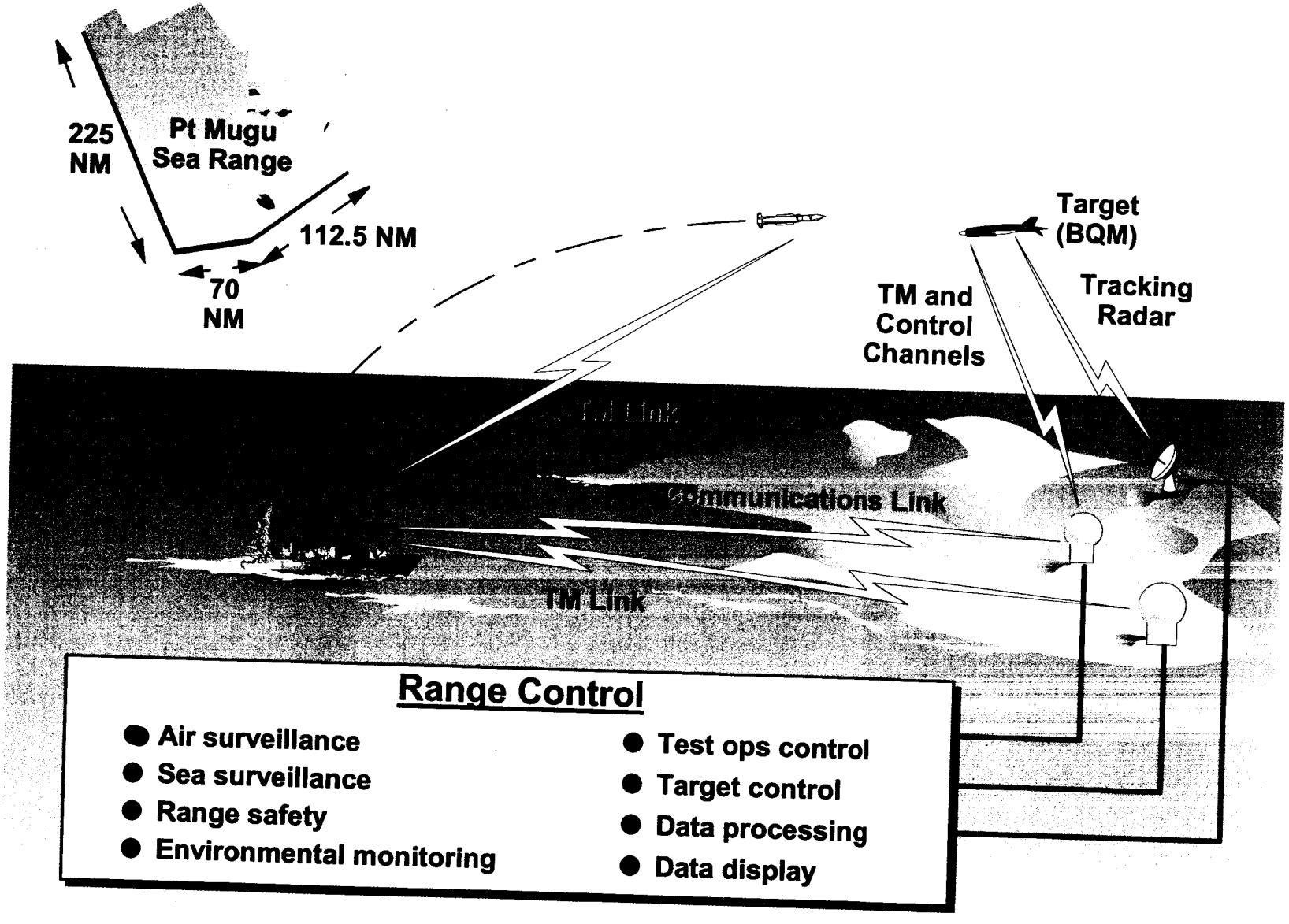
30 June 2005

Point Mugu Sea Range
An Irr[illegible]ceable National Asset



- **Large[illegible] world**
- **Unencro[illegible]**
- **Offshore isl[illegible]**
- **Coastal Mtns[illegible]**
  - **1,500 foot el[illegible]**
- **Airfield, railhea[illegible] co-located with N[illegible]**
- **Ideal climate for te[illegible]raining**
- **[illegible]ated with other ranges**
- **[illegible]tellectual capital**
- **Over $1B infrastructure**
- **Sustainability/environmental**

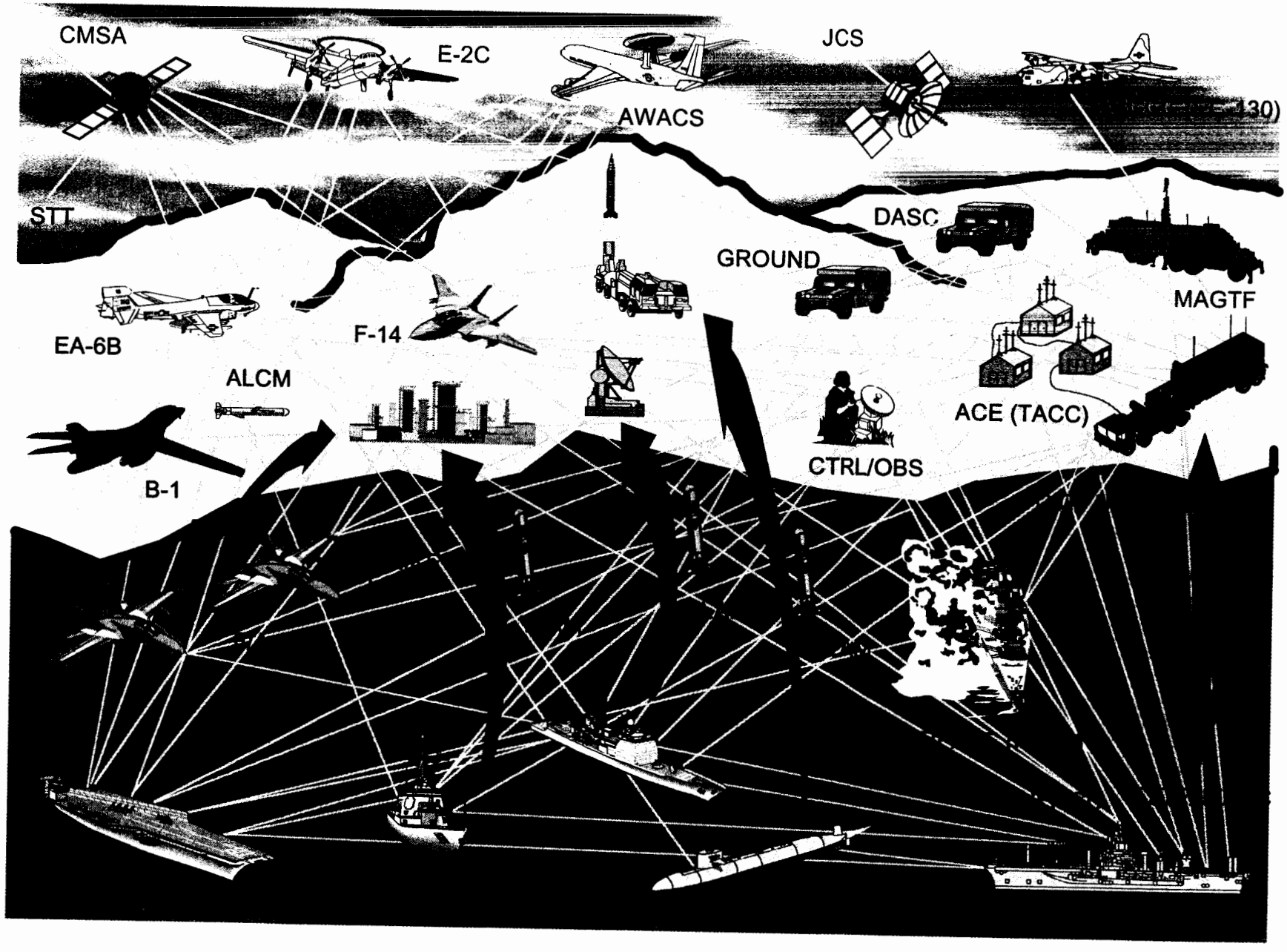
Sea Range Test Basics



Range Control

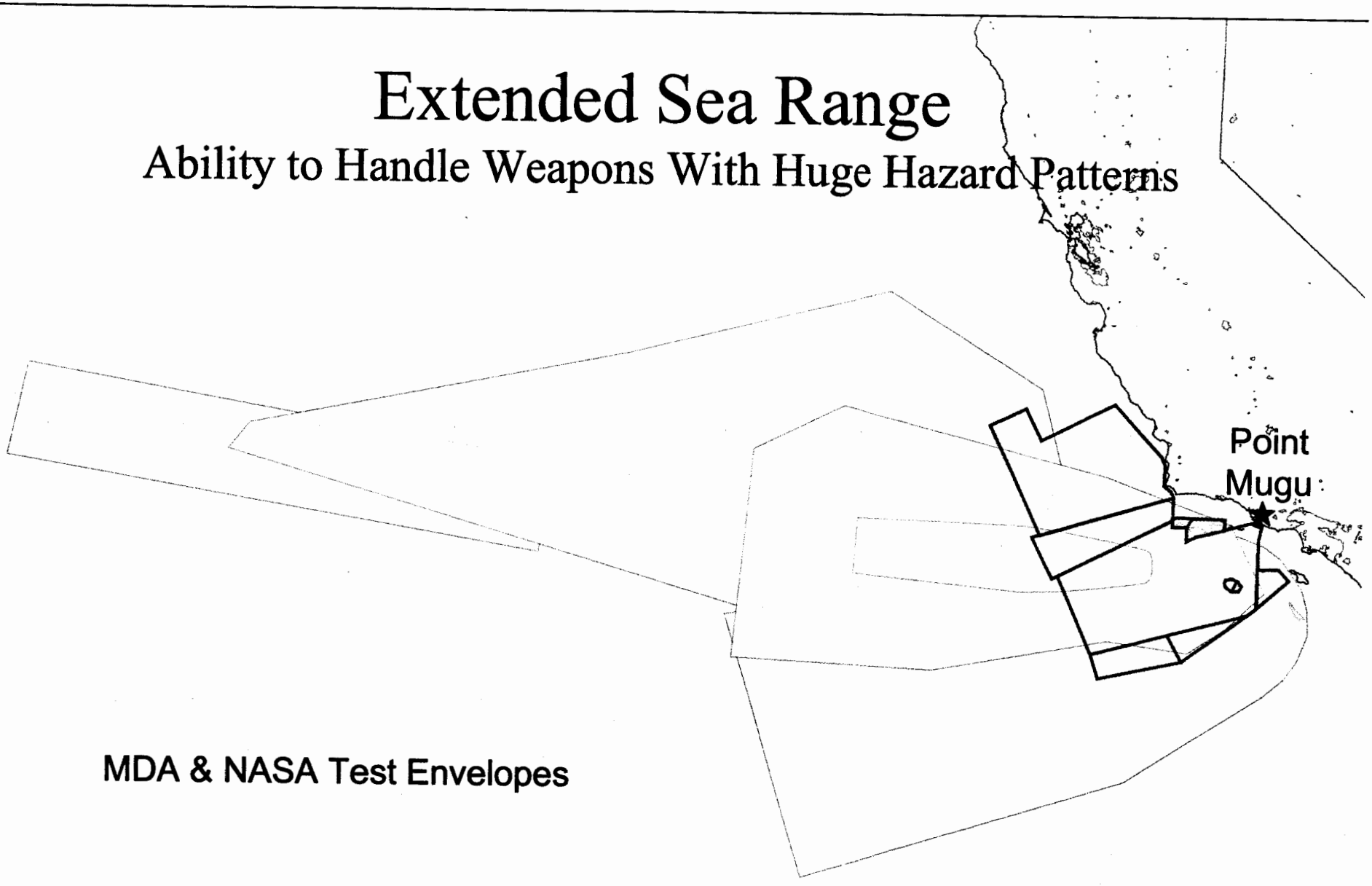
- Air surveillance
- Sea surveillance
- Range safety
- Environmental monitoring
- Test ops control
- Target control
- Data processing
- Data display

Complex Operations



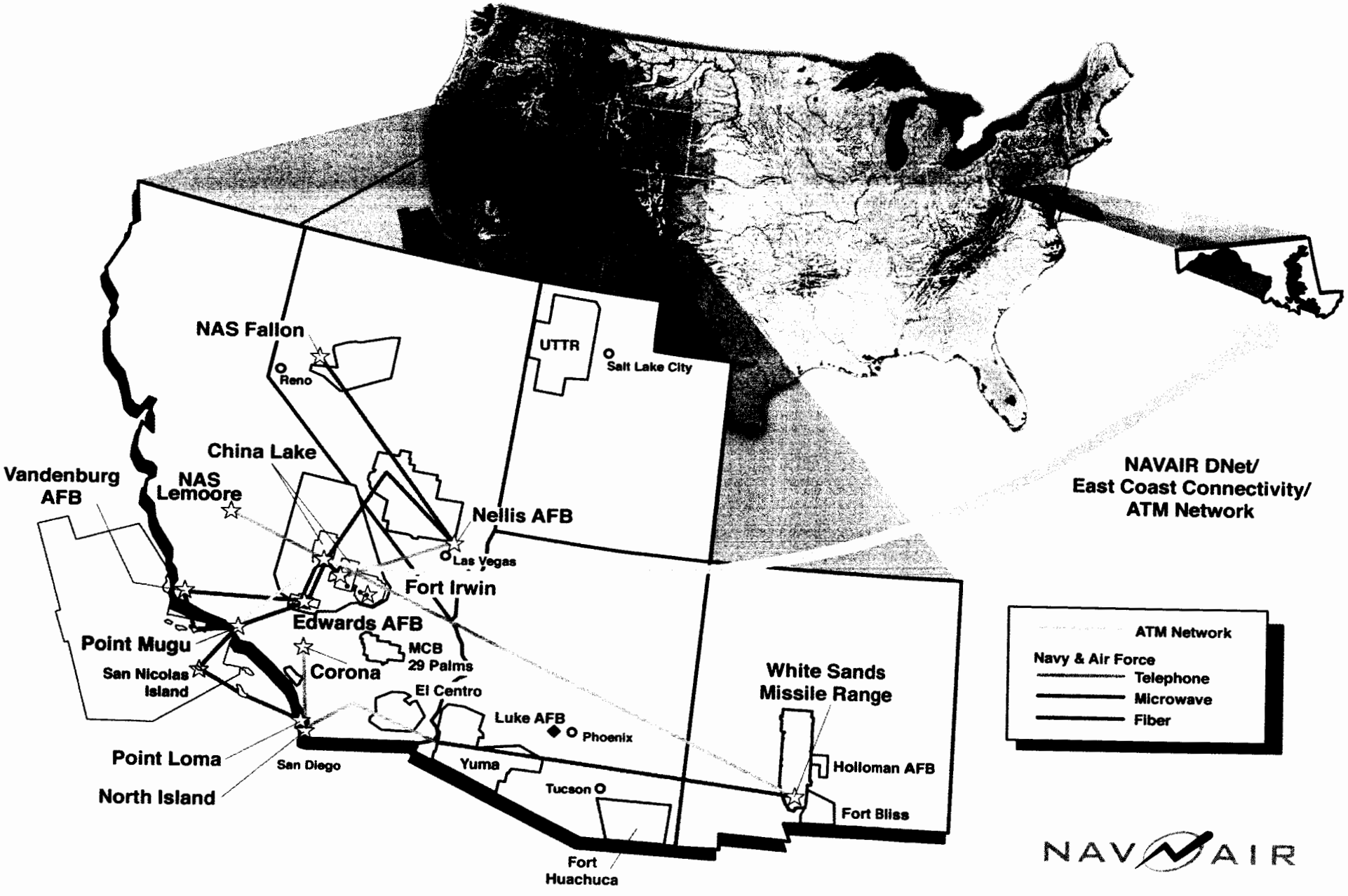
Extended Sea Range

Ability to Handle Weapons With Huge Hazard Patterns



MDA & NASA Test Envelopes

Unique & Linked to Other Ranges & Facilities



The Leader in Joint Force Test and Training Transformation

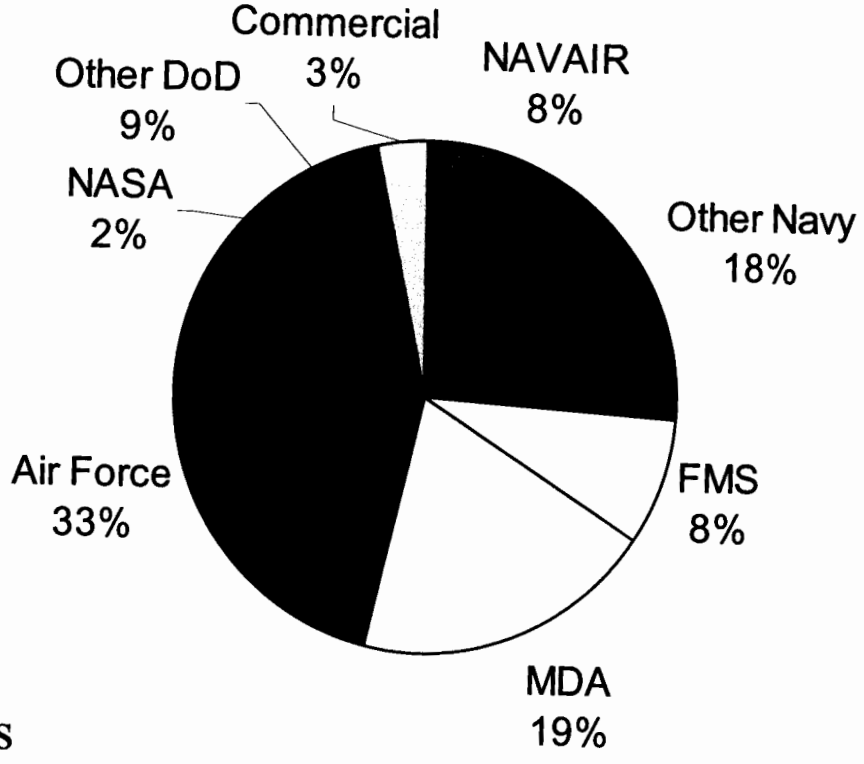
- Center of Excellence for live test and training Range integration for Joint Forces Command
- Integrated ranges, facilities and labs
- Integration of live and simulated combatants to create a realistic battlespace for Test, Training, and Experimentation

Managing Ranges With Efficiency

- Point Mugu & China Lake Ranges combined into single department in 1994
  - Eliminated redundancies
  - Integrated capabilities across sites
  - Effective use of intellectual capital across sites
  - Sharing of personnel and instrumentation assets to support customers and tests
- Savings realized: Reduction in personnel by ~50%

FY04 Sea Range Customer Base

The Sea Range is a Joint DoD, interagency, international use range



Workyears

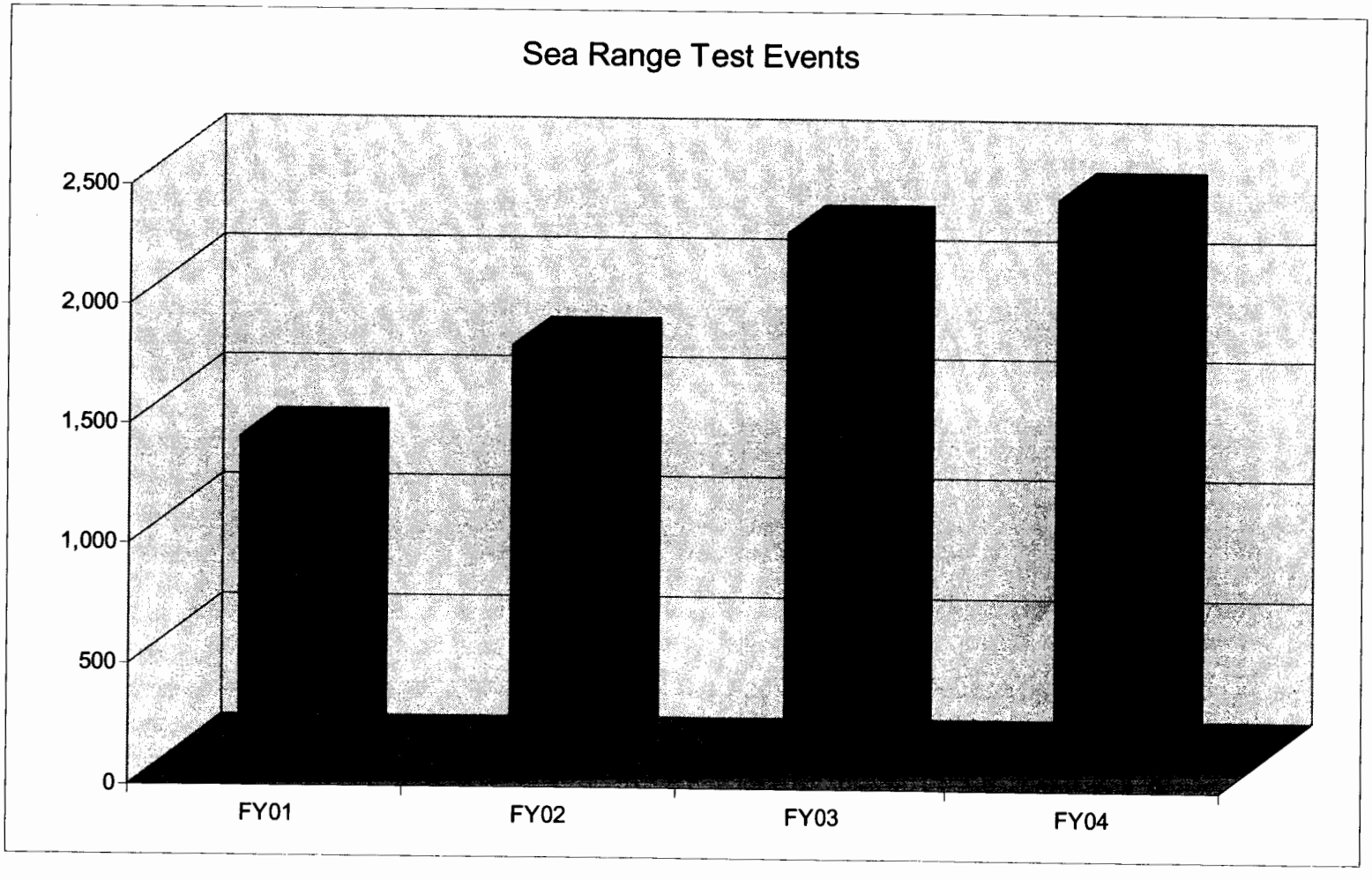
Civilians	333
Contractors	63
Military	25

1138 test events

Funding Levels

Customer	$31.183M
MRTFB	$19.113M
Total	$50.296M

Increasing Demand for the Sea Range



Tech 0018

- 543 personnel in Sea Range & Targets identified as supporting weapons RDAT&E.
- Sea Range operates as an integrated team supporting multiple customers & operations daily. This support requires weekly, daily & hourly coordination. Typical coordination involves:
  - Range: Operations control, safety, instrumentation, test management, communications & data systems
  - Targets - Test Squadron - NBVC
- Operation of the Sea Range is inextricably linked to the geography

Take-Aways

- The Sea Range is an irreplaceable DoD asset
  - Unencroached air and sea space
  - Large, instrumented areas of open ocean, littoral, and military controlled air space
- Infrastructure, personnel and operation are inextricably linked to the geography
- Point Mugu & China Lake Ranges are a single organization
  - Savings realized: reduction in personnel ~50%

NAWCWD Point Mugu
Personnel Impacts

Data Requested by BRAC Commission Staff

NAVAIRWARCENWPNDIV_PT_MUGU Scenarios

- TECH2B (Folded into TECH18 by TJCSG) – Realign Point Mugu Weapons and Armament RDAT&E and relocate to China Lake
- TECH54 - Consolidate Sensors, EW, and Electronics RDAT&E functions at Point Mugu with China Lake
- DON-162 – Close NAS Point Mugu

NAWCWD Point Mugu Scenarios

Tech-0018D PT 4 Relocate Weapons & Armaments to China Lake	589	0
Tech-0054 Relocate Sensors, electronics, and EW to China Lake	379	0
Total of 2 recommended actions	968	0
DON-162 Close NAS Point Mugu (DON did not support)	919	0

NAWCWD Point Mugu Scenarios

Tech-0018D PT 4 Relocate Weapons & Armaments to China Lake	589	0	1625	287
Tech-0054 Relocate Sensors, electronics, and EW to China Lake	379	0	379	0
Total of 2 recommended actions	968	0	2004	287
DON-162 Close NAS Point Mugu (DON did not support)	919	0	158	0

TECH2B (Folded into TECH18 by TJCSG) – Realign Point Mugu Weapons and Armament RDAT&E and relocate to China Lake

The Meaning of Inextricable

- Guidance was given to the losing activities to include workload and facilities that was inextricable to the mission remaining but to explain these in the Q47 response
- In TECH18 none of the Q47 responses submitted by losing activities appear to be taken into account. The net result is that the personnel movements (and associated 15% savings) are overstated by a factor of 3 and facilities support reductions are overstated
- At NBVC alone, these errors result in approximately $30M per year in overstated savings.

TECH18D Point Mugu Q47 Certified Response

The following areas would require a reduction in the number of personnel, equipment, and facilities to be relocated to the receiving site: (1) F-14 weapons system support has been terminated, a reduction of 132 civilians and 24 contractors; (2) An error of 33 civilians performing EW support; (3) personnel, mission equipment, and facilities performing outdoor air range operations. These are an integrated, fixed base capability that must remain at the Point Mugu site to continue sea range operations, net reduction of 505 civilians, 153 contractors, 2667 tons of mission equipment, and 1022.4 KSFT of facility space; (4) Retaining the 3 anechoic chambers whose primary customer is the targets range complex, a net reduction of 14 civilians, 3 contractors, 90 tons of support equipment, and 44.2 KSF; (5) Keeping logistical support for targets with the targets hardware, a net reduction of 24 civilians,; and (6) Not moving the general and administrative support that currently services both China Lake and Point Mugu, a net reduction of 143 civilians and 22 contractors.

NAWCWD Certified Inputs

- TECH 0002B Scenario Data Call
  (Rolled into TECH 0018DR)

SDC Action #	FY03 Baseline Personnel No.	Rationale
14	246	Weapons Test Squadron (32 Civilian, 214 Military)
14	143	Indirect Personnel Supporting Both Sites
14	343	In-extricable Sea Range and Terminated F-14 Support
14	132	EW Support Equipment [illegible] Unified Fleet Weapons
14	33	[illegible]

NAWCWD DONBITs Certified Inputs

SDC Action #	FY03 Baseline	Rationale
[redacted]		

- 343 Missile, Gun, or Energetic Personnel
  - Weapons In service engineering (37)
  - Missile hardware in the loop (HIL) labs (16)
  - Weapons Sustainment Logistics (188)
  - Weapons Support Equipment (39)
  - Installed System Test Engineering (63)
- General First Cut implementation insight
  - Estimated one time unique costs of $36M to establish Missile HIL.
  - COBRA allowed $9M

[redacted]

NAWCWD DONBITs Certified Inputs

SDC Action #	FY03 Baseline	Rationale
14	246	Weapons Test Squadron (32 Civilians,214 Military)
14	143	Indirect Support Personnel Supporting Both Sites

- **Weapons Test Squadron**
  - Cost included:
    - Hanger and ramp MILCON at China Lake
    - Increased recurring operating expenses to transit to Sea Range
  - Savings:
    - COBRA calculated 15% savings of Wing and Squadron personnel
- **Indirect personnel**
  - Duplication and redundancy eliminated since 1992
  - Some functions site specific (facilities, security, STILO, IT, HR, etc)

Yellow – Trying to Understand

NAWCWD DONBITS Certified Inputs

- **TECH 0002B Scenario Data Call (Rolled into TECH 0018DR)**

SDC Action #	FY03 Baseline	Rationale
14	543	Inextricable Sea Range work

- **The following Sea Test Range functions were excluded by Q47 response, and no military construction or dynamic data were input as part of this data call:**
  - 505 personnel in the range and targets competencies
  - 24 personnel performing targets logistics
  - 14 personnel operating the radar reflectivity lab supporting range and targets customers for the majority of their work
- **These personnel are an integrated, fixed base capability that must remain at the Point Mugu site to continue sea range operations**
- **DON-162 (Close NAS Point Mugu) evaluated relocating these functions but were not part of the recommendations**

Summary of TECH18 Impacts

Capability	Personnel included in TECH18	Facilities included In TECH18	Inextricable part of sea range ops
Range	Most	No	Yes
Targets	All	No	Yes
RCS Chambers	All	No	Yes
Test Squadron	All	Yes	Yes
Flight Test	Some	Yes	Some
Weapons Sustainment	All	Yes	No

TECH 18 Summary
Weapons and Armament RDAT&E

Take Away's:

- **Clearly defined weapons functions included and understood**
- **Weapons Test Squadron - Realignment**
  - **Significant MILCON costs understood**
  - **Recurring operating cost increase understood**
  - **Personnel savings not understood**
- **Indirect support - Realignment**
  - **Duplication and redundancy eliminated since 1992**
- **Range and Targets**
  - **Integrated, fixed base capability that must remain at Point Mugu to continue sea range operations**

NAVAL AIR WARFARE CENTER
Weapons Division
Point Mugu, CA

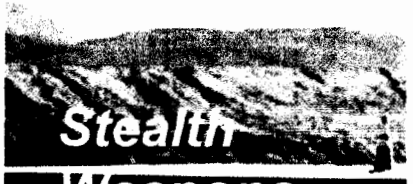
Naval Air Warfare Center Weapons Division On-Board

CIVILIAN	
Point Mugu*	1,540
China Lake	2,658
	4,198
MILITARY	
Point Mugu	261
China Lake	265
	526
TOTAL	4,698

*Includes Port Hueneme

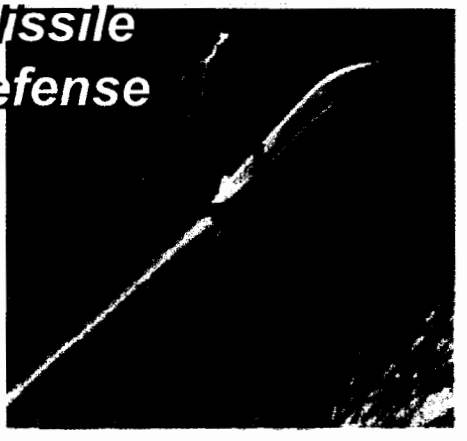
2005 BASE REALIGNMENT AND CLOSURE

NAVAL AIR WARFARE CENTER WEAPONS DIVISION	
POINT MUGU, CALIF	
	VISITED
AIRCRAFT WEAPONS SYSTEM SUPPORT FACILITIES	
EA-6B/AEA WSSA	X
ELECTRONIC WARFARE	
TACAIR EW	X
EWWIS (IRON CROW)	X
WEAPONS & TARGET SUSTAINMENT SUPPORT	
READY MISSILE TEST FACILITY (RMTF)	X
MISSILE HARDWARE-IN-THE-LOOP LABORATORY	X
WEAPONS SUSTAINMENT	X
RADAR CROSS SECTION CHAMBER	X
THREAT SIMULATION AND TARGETS	
THEAT SIMULATORS	X
AERIAL TARGETS	X
SEABORNE TARGETS	
AVIATION SUPPORT	
AIR TEST & EVALUATION SQUADRON - VX-30	X
SEA RANGE COMPLEX	
RANGE INSTRUMENTATION AND FACILITIES	X
MAIN BASE	X
LAGUNA PEAK	
SAN NICOLAS ISLAND	



Major Transformational DOD Programs Depend on Key Unique Expertise and Facilities Synergistically Co-Located at Point Mugu:

- **Radar Reflectivity Laboratory**
- **Sea Test Range**
- **Targets Department**
- **Hardware-in-the-Loop Labs**
- **Electronic Warfare**
- **T&E Engineering**

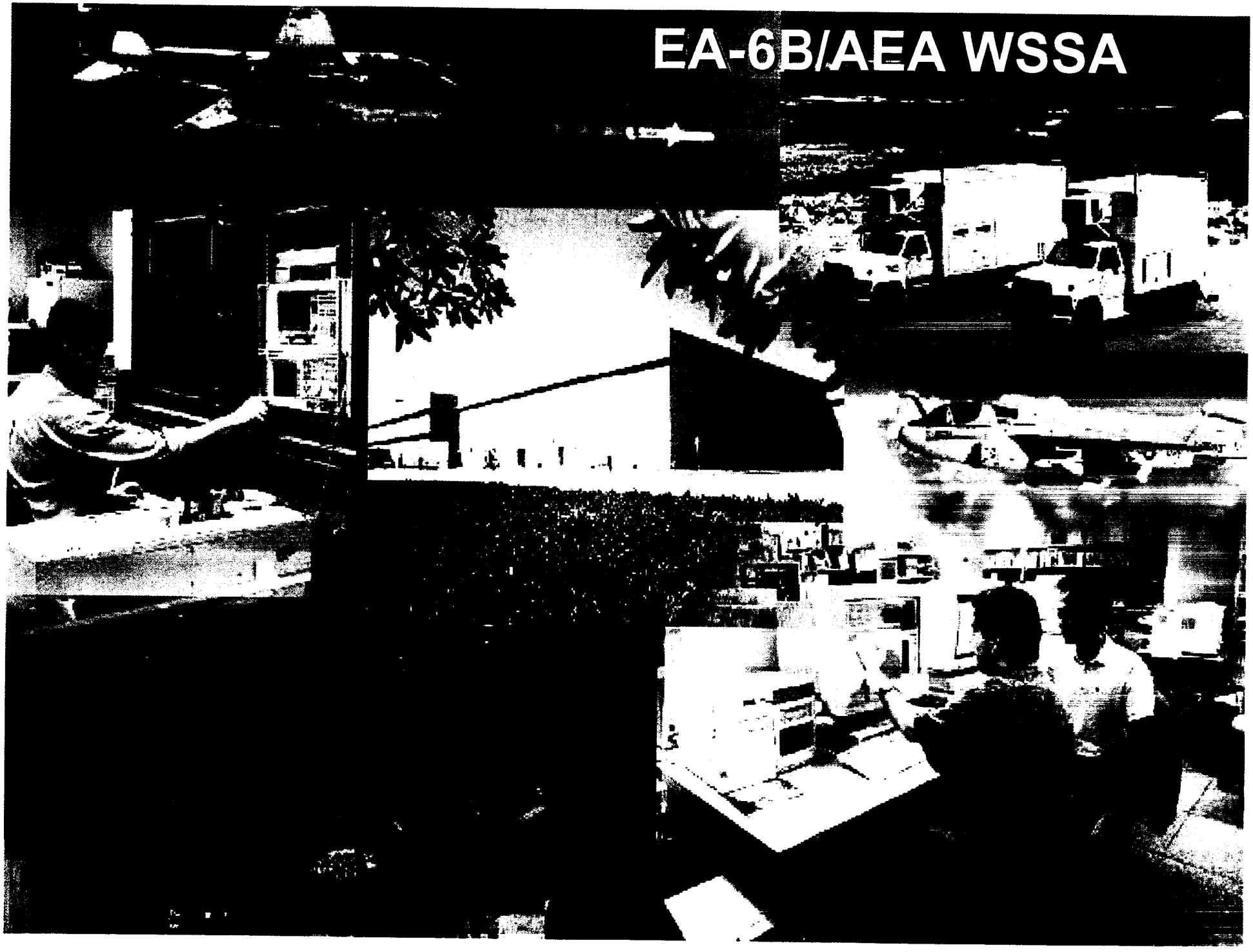


EA-6B/AEA WSSA

- **FUNCTION**
  - Provide Full Life Cycle Research, Development, Integration and In-Service Engineering support for the DoD's only Tactical Jamming Aircraft, the EA-6B.

- **CAPABILITY**
  - EA-6B ICAP-II Block 89 Support
  - EA-6B ICAP-II Block 89A Support
  - EA-6B ICAP-III Support
  - EA-18G AEA System Support
  - 24/7/365 Fleet Reach back Support

- **IMPLEMENTATION CHALLENGES**
  - Continued support needed for the Nation's only EA-6B Mission Systems Capability
  - Deployed Forces Dependent on Support
  - Integrated Capability (JATO/EWDS/Mission System) Required for Fleet Support


EA-6B/AEA WSSA

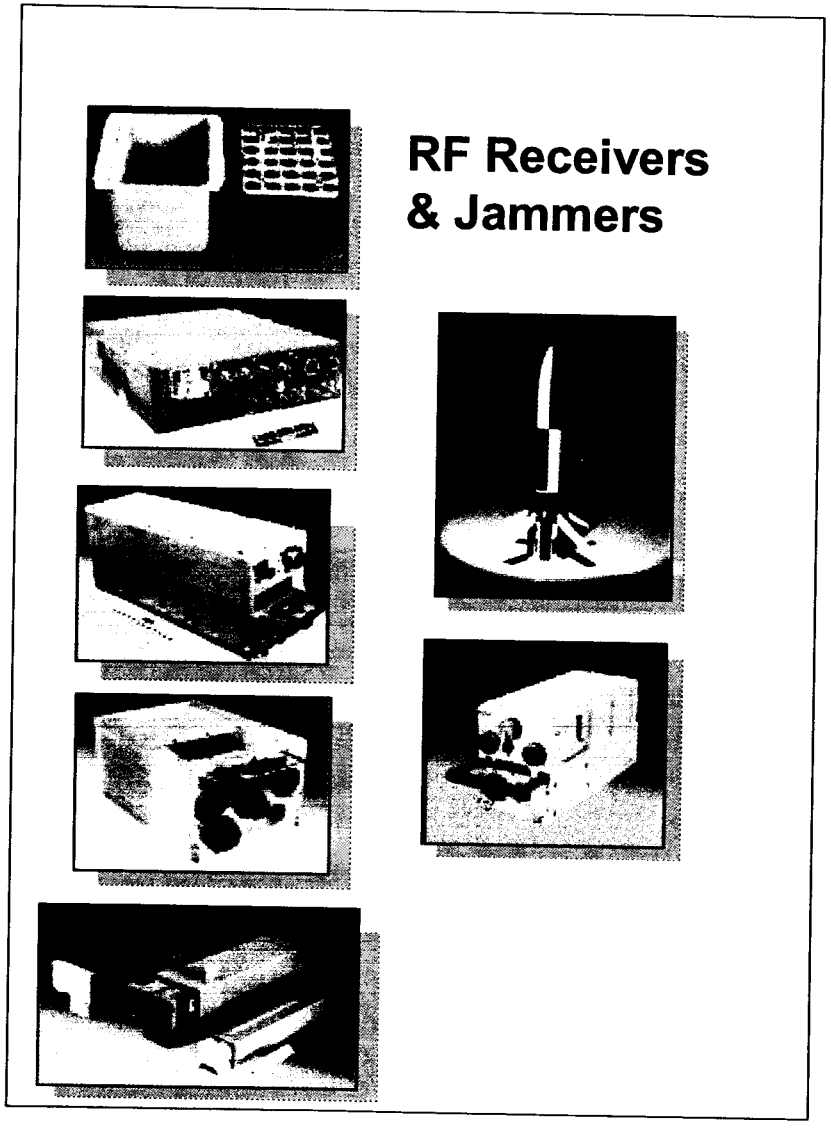
TACAIR Electronic Warfare

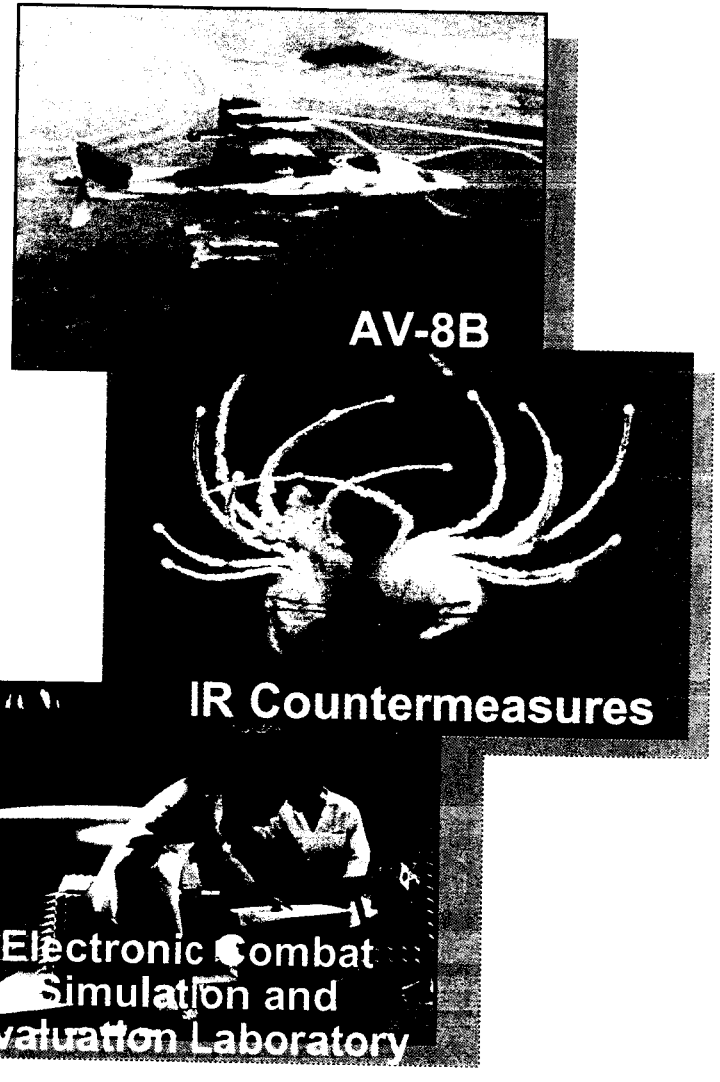
- **FUNCTION**
  - Provide Full Life Cycle Research, Development, Integration and In-Service Engineering support to all Navy Tactical Aircraft Electronic Warfare Systems and Support Systems.

- **CAPABILITY**
  - Full spectrum (RF, EO, IR) EW support
  - 10,000 sq. ft. fully shielded laboratory development environment
  - Foreign Military Sales (FMS) support
  - Navy's only TACAIR EW support capability
  - Experienced EW Workforce (Avg Exp = 20 years)
  - Direct Fleet Reach back and Quick Response Capability during Wartime

- **IMPLEMENTATION CHALLENGES**
  - Navy's only full capability R&D and In-Service Engineering asset
  - Intellectual Capital being highly leveraged for GWOT/HS/HD
  - Need to accommodate FMS and existing International Agreements

TACAIR Electronic Warfare





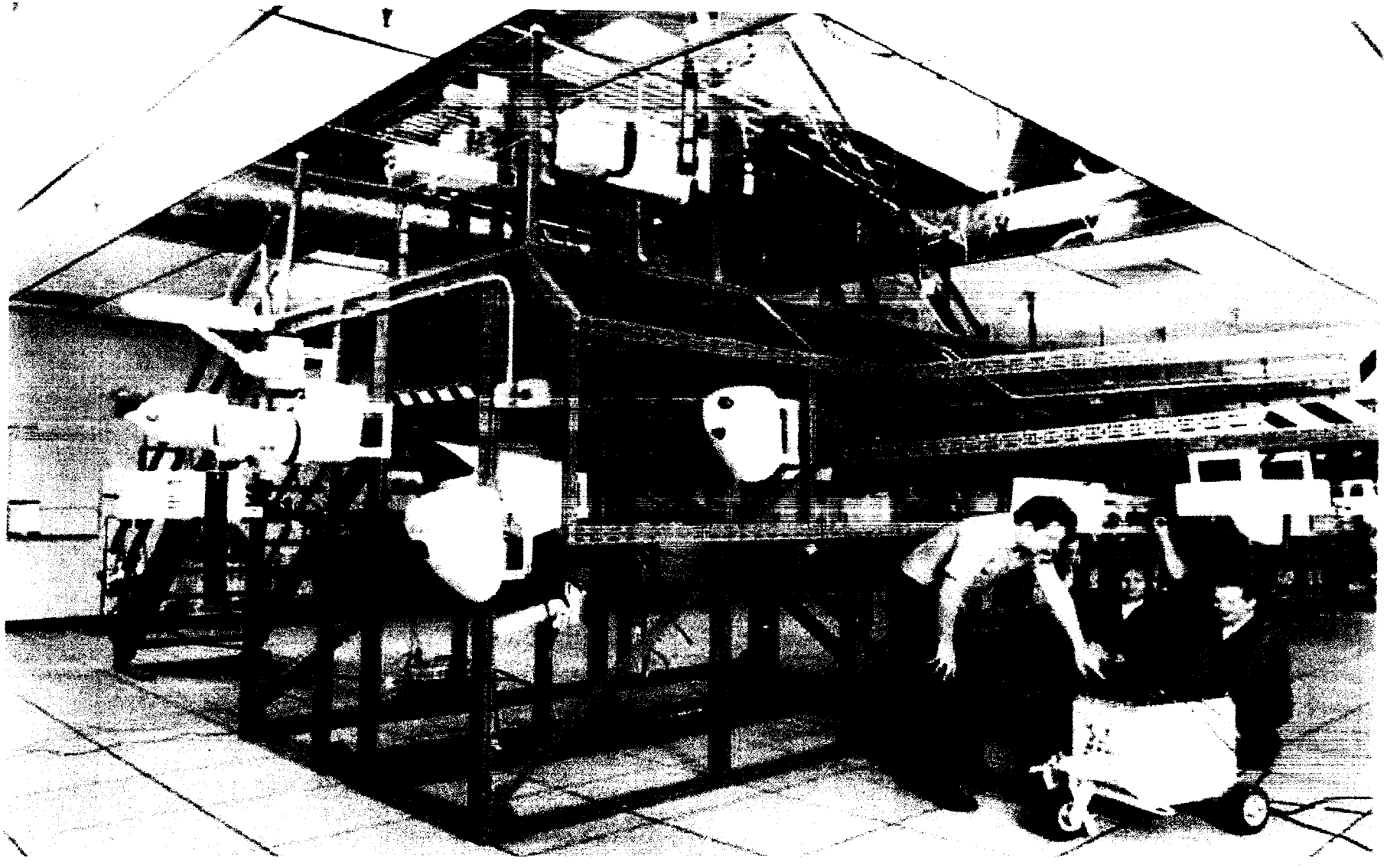
EW Support Equipment
Integrated Support Station (ISS)
("Iron Crow")

- **FUNCTION**
  - The Iron Crow Hardware-in-the-Loop (HIL) lab and the Software Development Lab (SDL) are used in the development of O-level EW Systems Test Program Sets (OEWTPS) and Common Support Equipment (CSE).

- **CAPABILITY**
  - F/A-18A/B/C/D/RECCE, AV8B and MH-47 EW systems and A-kit hardware provide OEWTPS in service resource and TACAIR EW UDF block cycle update evaluation
  - SDL used for Joint Service Electronic Combat System Tester (JSECST) AN/USM-670 OEWTPS development for the F/A-18-all models, AV-8B, MH-47, MH-60, CV-22, ALQ-167 pod, Swiss F/A-18C/D, RAAF F/A-18A/B, Kuwaiti F/A-18C/D, and Canadian F/A-18A/B platforms
  - ISS is planned to support emerging requirements for the EA-18G, JSF, MV-22, E-2C, and EA-6B platforms

- **IMPLEMENTATION CHALLENGES**
  - Continued support needed for common support equipment acquisition programs such as Hand Held Threat Generator (HHTG) and Swept Frequency Tester (SWFT)
  - Timing of move needs to include over-lap of laboratory operations to minimize delays for In-service, block cycle updates and developmental efforts

EW Support Equipment
Integrated Support Station (ISS)

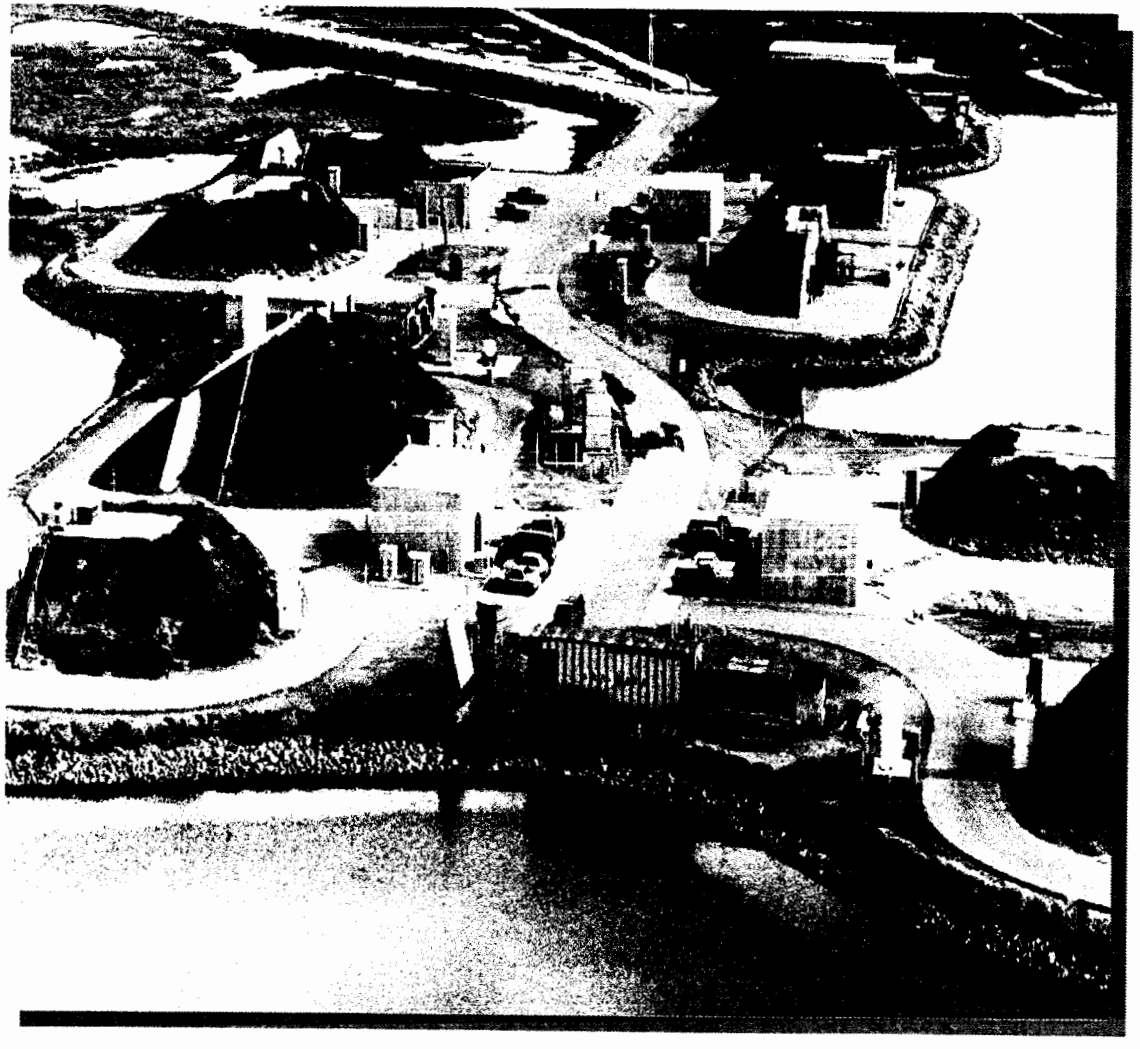


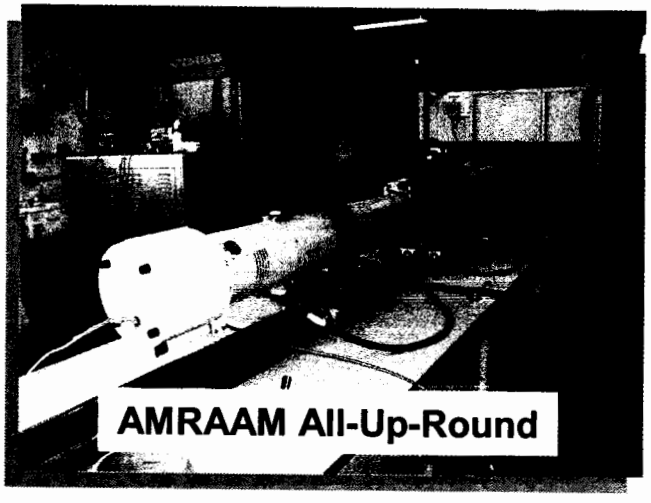
Ready Missile Test Facility (RMTF)

- **FUNCTION**
  - Provide the capability to conduct functional testing, acoustic/dynamic testing, thermal conditioning, and assembly/disassembly of all-up-round weapons containing explosive loaded warheads and live rocket motors.

- **CAPABILITY**
  - Four (4) vibro-acoustic test cells rated at +650 lbs. of class/division 1.1 explosive
  - Capable of combining shaped acoustics to 156+ dB and mechanical shakers to cover a frequency range of 5 to 2000 Hz
  - Thermal capacity in each cell for a temperature range of –70F to +170F with LN2 boost for high cooling ramps
  - Four (4) functional test cells on site to provide the complete functional check-out of each missile in a live all-up-round configuration
  - This facility also provides an assembly/disassembly building allowing for missile inspection and build-up to support the overall command mission
  - This facility supports DoD-wide missile evaluation and Automatic Test Equipment upgrades and development
  - Only existing facility that can test simultaneously functionally and environmentally a missile in a tactical configuration
- **IMPLEMENTATION CHALLENGES**
  - Sea Range operations requires an ability to support missile build-up and check-out in a timely manner

Ready Missile Test Facility (RMTF)



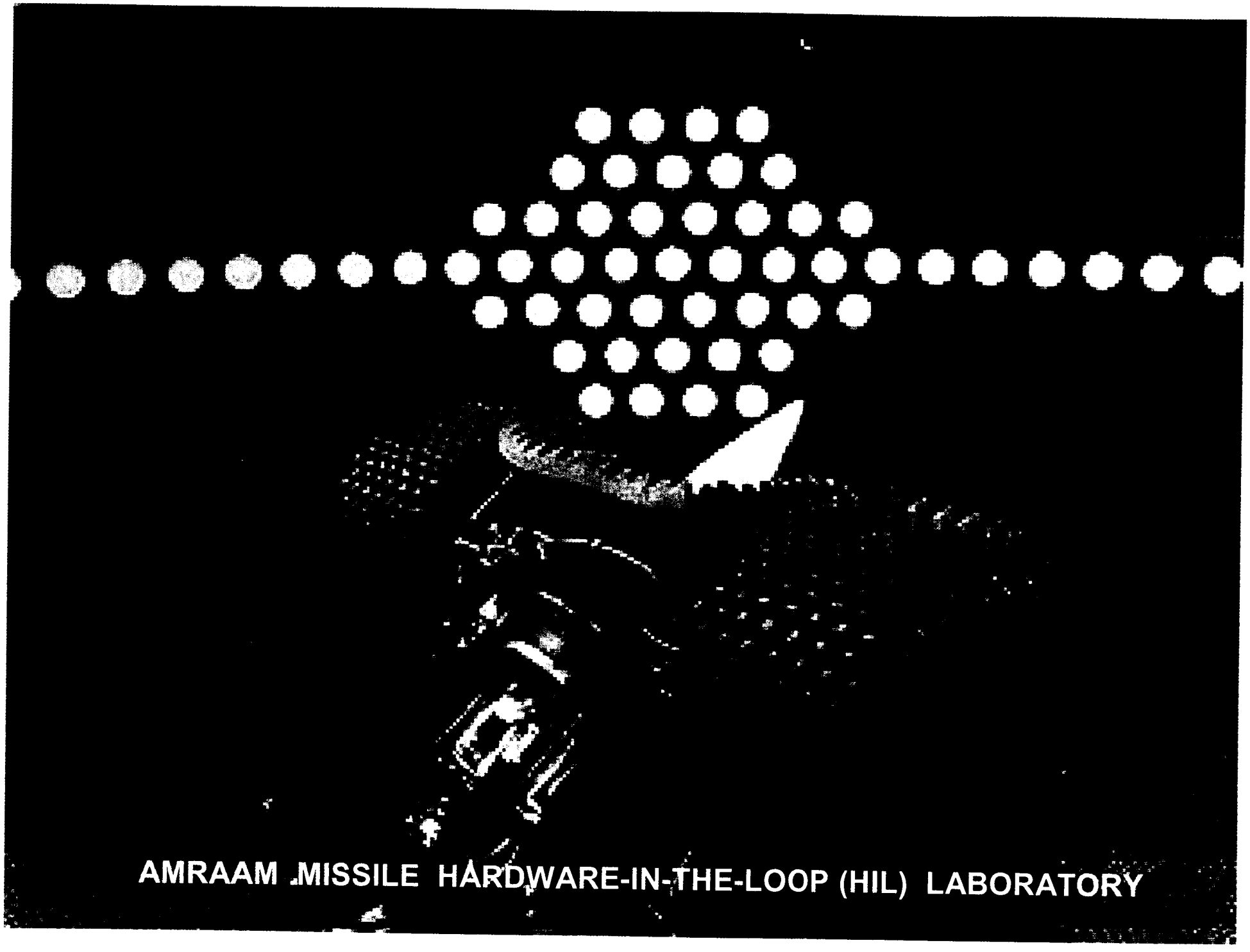


Missile Test & Evaluation Hardware-in-the-Loop (HIL) Laboratories

- **FUNCTION**
  - Full spectrum T&E support to current and advanced NAVAIR and NAVSEA air intercept, cruise and strike weapons systems through a balanced mix of laboratory, simulation, captive, and free flight testing.

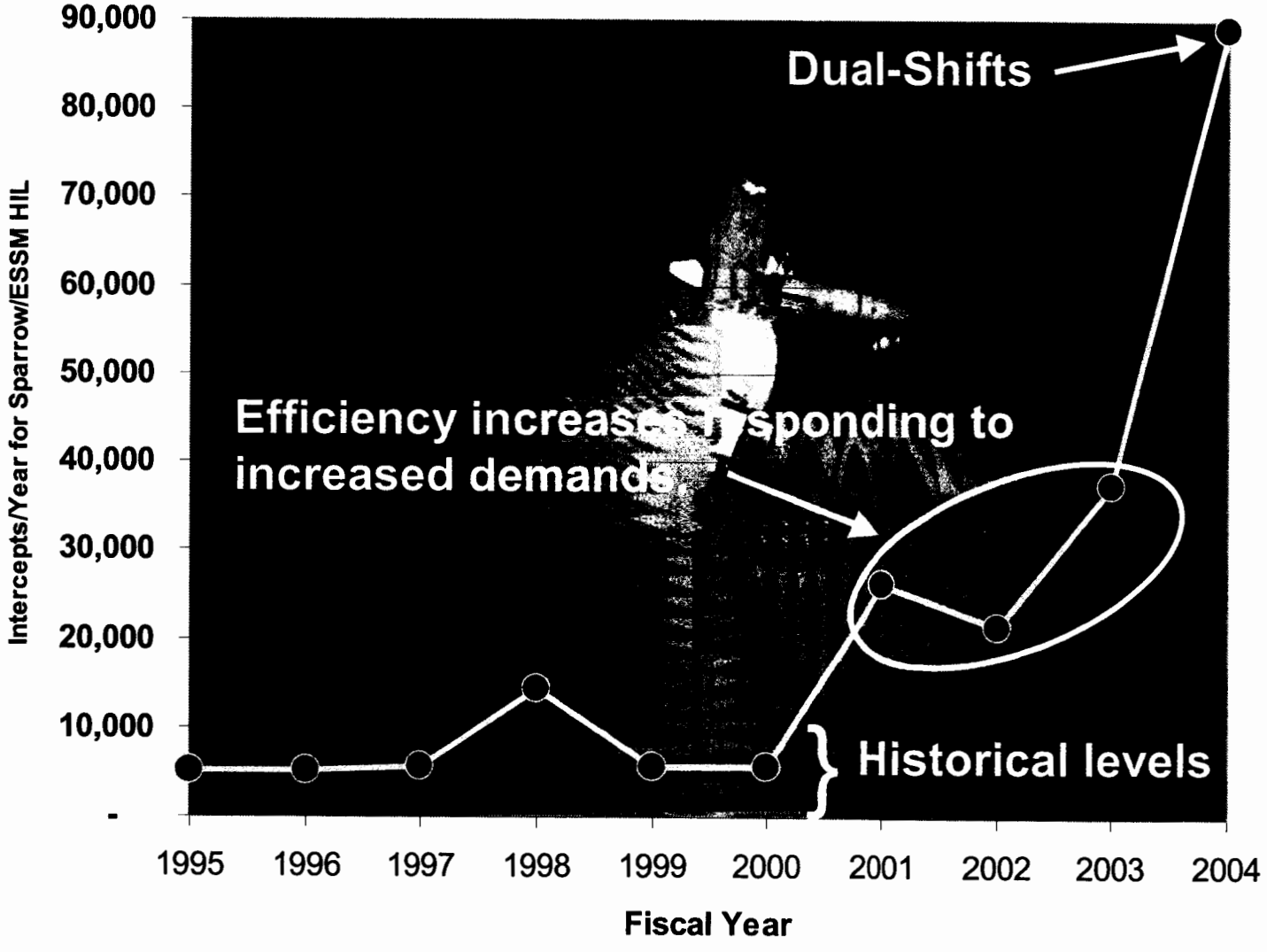
- **CAPABILITY**
  - Laboratories and simulation capability to evaluate weapon performance from pre-launch to impact performance of missiles and associated mission systems. Repeatability of testing is very cost effective compared to live-fire testing
  - Over 78,000 sq. ft. of highly secure laboratory and support spaces including: Four (4) large missile HIL labs and 14 Support laboratories providing missile simulation, modeling and simulation, flight test data analysis and weapons lethality predictions
  - Two are dedicated to specific weapon systems
    - Advanced Medium Range Air-to-Air (AMRAAM) 2 shifts per day. One shift dedicated is to Raytheon support
    - Evolved Sea Sparrow (ESSM) HIL is a one-of-kind facility that supports NATO partners

- **IMPLEMENTATION CHALLENGES**
  - Need to continue to support the AMRAAM program which conducts 90% of air launches and 75% of captive flights over the Sea Test Range
  - All NAVSEA operations are conducted on the Sea Test Range and the Pacific Missile Range Facility (PMRF)
  - Additional personnel travel costs to coordinate targets for NAVSEA operations



AMRAAM MISSILE HARDWARE-IN-THE-LOOP (HIL) LABORATORY

Evolved Sea Sparrow Missile (ESSM) Hardware-in-the-Loop Laboratory



Weapons Sustainment

- **FUNCTION**
  - Maintain readiness by providing Logistics services for Weapons, Targets and associated Support Equipment after they are deployed to the Fleet.
    - Knowledge of the condition of systems in operation
    - Provide problem resolution
    - Modify logistics elements to assure safety, reliability and readiness is achieved at an affordable cost

- **CAPABILITY**
  - In-service logistics and weapons maintenance management
  - Liaison with Fleet TYCOM and functional wing commanders for weapons problem resolution
  - Weapons reliability assessment
  - Shipboard weapons installation assurance testing
  - Airborne weapons and targets information systems
  - Maintain, update and revise technical documentation
  - Configuration control
  - Missile Depot maintenance and workload coordination at ARMY and NAVSEA facilities
  - Fleet Weapons on-site, on-call engineering technical services

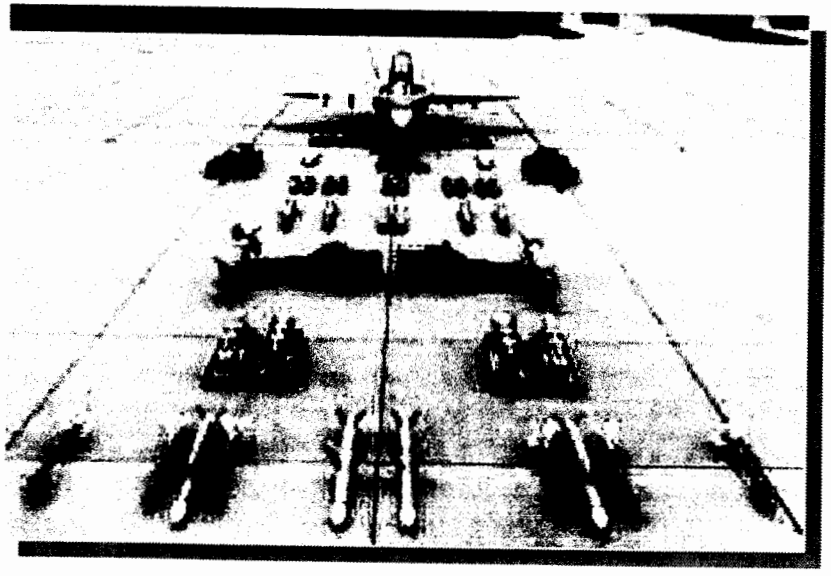
Weapons Target Support Equipment

- **FUNCTION**
  - Provide Support Equipment (SE) Engineering resource/capability to perform Weapons/Targets SE logistics functions – including software and hardware maintenance, troubleshoot, repair, upgrade, redesign, parts obsolescence study, reverse engineering of Automatic Test Equipment and SE due to lack of documentation.

- **CAPABILITY**
  - AMRAAM
  - SLAM/HARPOON Missile
  - Sidewinder Missile 9M & 9X, JDAM, JSOW, HARM, AARGM, Sparrow Missile
  - BQM-34 & 74, subsonic targets, GUNS, AMMO Loader, AQM-37, MA-31 Supersonic Target
  - TAAS

- **IMPLEMENTATION CHALLENGES**
  - Continued support to AMRAAM and SLAMER/HARPOON and Target Programs that are tested on the Sea Range

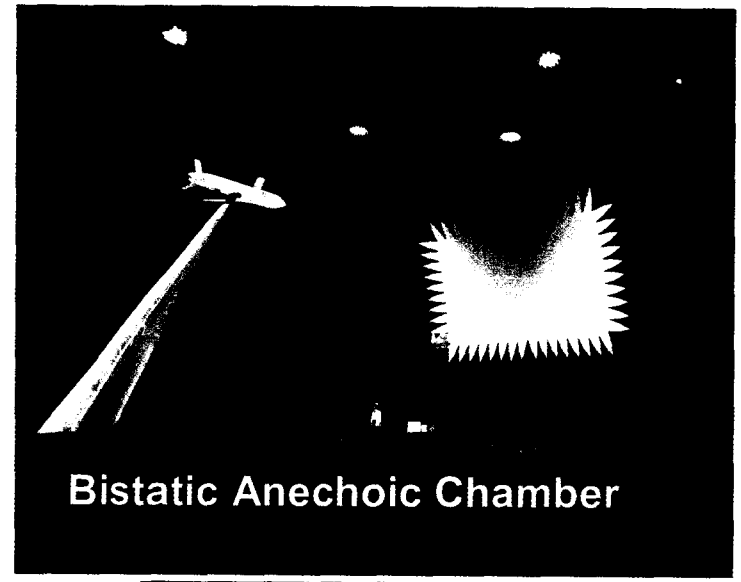
Weapons & Target Sustainment

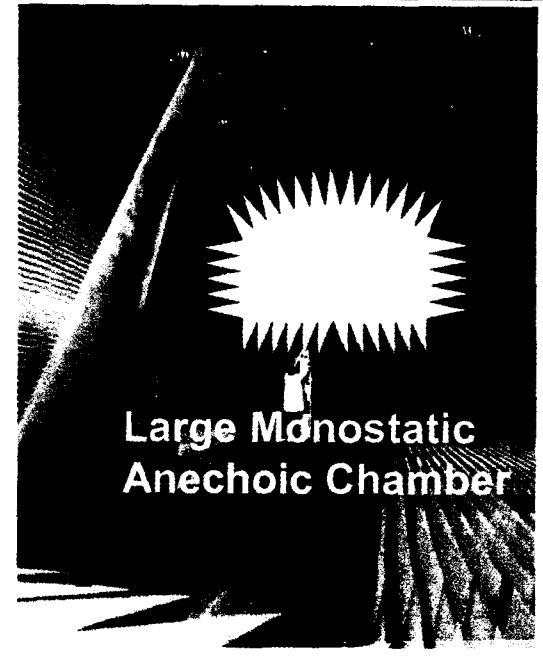


Radar Cross Section Chambers

- **FUNCTION**
  - Characterize Monostatic and Bistatic Radar Cross Sections (**RCS**) of U.S. and Foreign weapon systems and surrogate Threat Targets.

- **CAPABILITY**
  - Highly secure indoor TS/SAR Facilities - Over 76,000 square feet of facility space
  - Bistatic Anechoic Chamber
  - Size: 150' (W) x 150' (L) x 60' (H)
    - Frequency ranges: 100 MHz to 100 GHz
    - Full Bistatic Angular Coverage: 0 – 180 degrees (Horizontal), 0 – 90 degrees (Vertical)
    - No other facility like this in DOD or private industry
  - Large Monostatic Anechoic Chamber
  - – Size: 40' (W) x 100' (L) x 40' (H)
    - Frequency Range: 800 MHz to 100GHz
  - Monostatic Anechoic Chamber
  - – Size: 27' (W) x 57' (L) x 17' (H)
    - Frequency Range: 1 – 100 GHz


Bistatic Anechoic Chamber


Large Monostatic Anechoic Chamber

Radar Cross Section Chambers

- **CAPABILITIES cont.**
  - Unique DOD national assets and highly specialized expertise in RCS RDAT&E
  - Broad Customer base: Tri-services, Private Industry, Foreign Countries
  - Weapon Development programs cannot cope with significant downtime in RCS testing
    - RCS testing and analysis for customer requirements is constant all year round with about 110+ DoD Programs supported annually

- **IMPLEMENTATION CHALLENGES**
  - Maintain the synergy for operational efficiency by co-location with Target Systems Department and Sea Test Range at Point Mugu in support of DT and OT missions

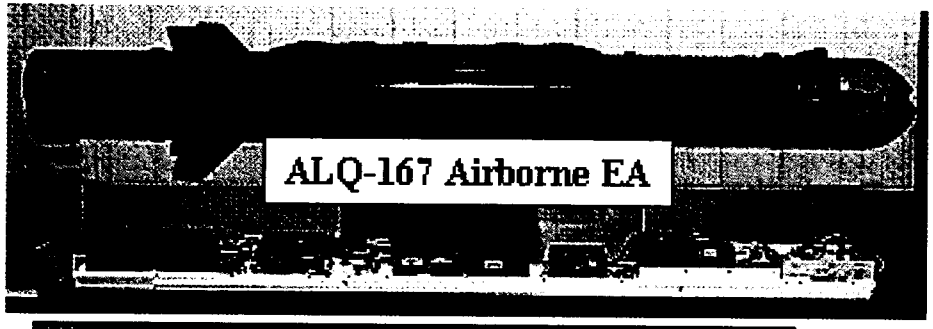
Threat Simulators

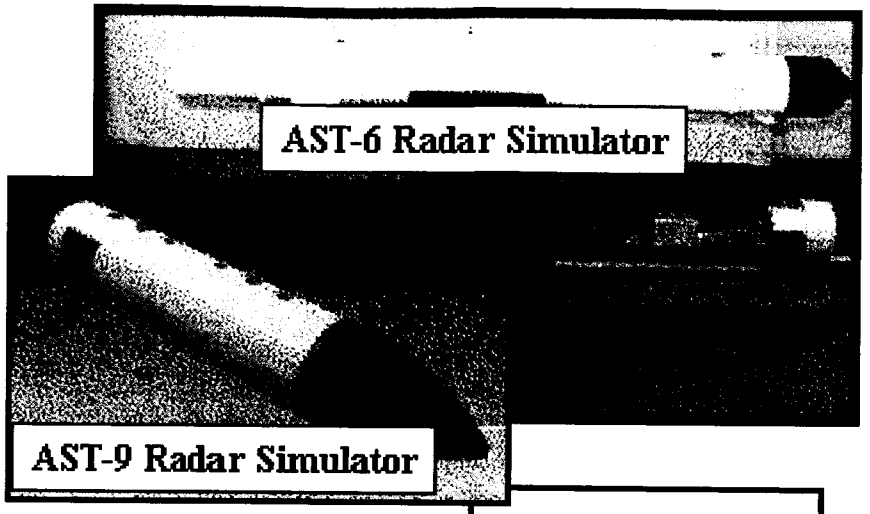
- **FUNCTION**
  - DoD Lead for Life-Cycle support (RDAT&E) for technical development and operational use of Radio Frequency Threat Simulators (Radar Signal Simulators and Electronic Attack (EA)Simulators) used world wide by all services.
  - Provide the NAVAIR Enterprise and tri-services with an integrated representation of air-land and seaborne threats (I.e. Radar cross-section, RF emitters, EA) to include target vehicles and their associated electronic payloads.

- **CAPABILITY**
  - (Project Reliance) Tri-service Life Cycle responsibility for all facets of threat simulators. This includes development, procurement, operation, in-service support and depot for all services
  - Simulators have multiple applications including use in/on manned aircraft, unmanned targets, shipboard, laboratories and land based

- **IMPLEMENTATION CHALLENGES**
  - Maintaining the synergistic relationship with existing EW threat analysis, Sea Range, Test Wing and Fleet Rapid Response expertise/knowledge base located at NAVAIR Point Mugu, CA

Threat Simulators

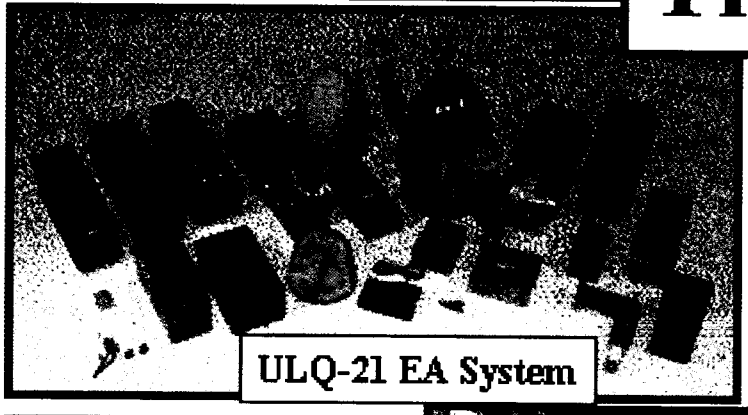

ALQ-167 Airborne EA

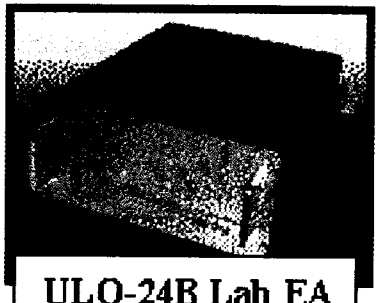

AST-6 Radar Simulator

AST-9 Radar Simulator

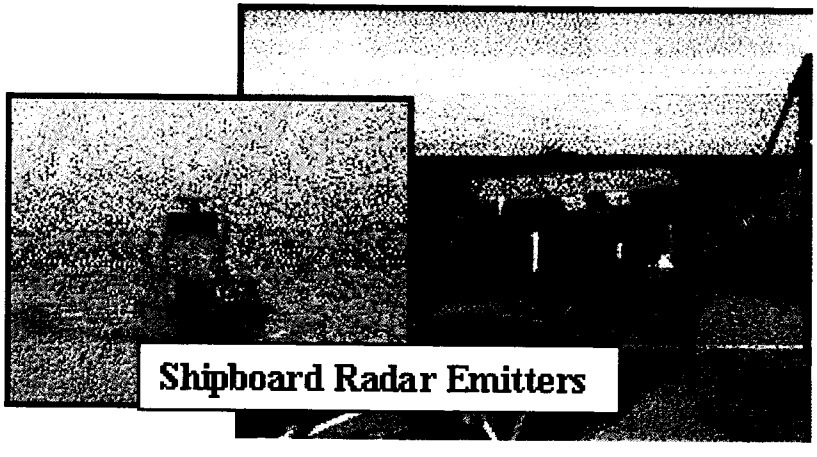

Electronic Target Simulator


Ground Based Radar Simulators


ULQ-21 EA System


ULQ-24B Lab EA


ULQ-21 Installed in BQM-34S Drone


Shipboard Radar Emitters

Aerial Targets

- **FUNCTION**
  - World wide Life-Cycle support (RDAT&E) for development and operational use of Aerial Target Systems.

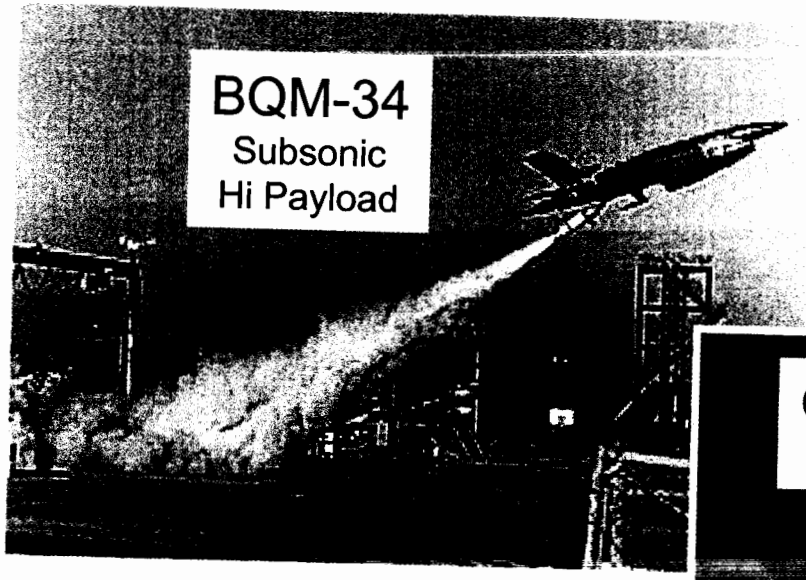
- **CAPABILITY**
  - Navy's principal site for aerial targets
  - Singular site operating all Navy's aerial targets
  - Singular site for T&E of aerial targets
  - Provides for tri-service needs in development, acquisition, production and operation of missile and sub-scale targets including associated target control, augmentation, and scoring systems
  - Unique aerial target modeling and simulation in support of training, test and evaluation
  - Provides for warfighter target/drone force multiplier (e.g. Desert Storm and OIF)

- **IMPLEMENTATION CHALLENGES**
  - Aerial Target capability on Sea Range is integral to weapons systems testing and Fleet training
  - Operations Engineering for modification of threat fidelity requires co-location with O&M functions
  - Operation of aerial target family at Sea Range requires resident surface launch capability
  - Target pre-op checkout requires use of range infrastructure
  - Increased recurring costs of logistics & operational requirements to support Sea Range missions from a remote site

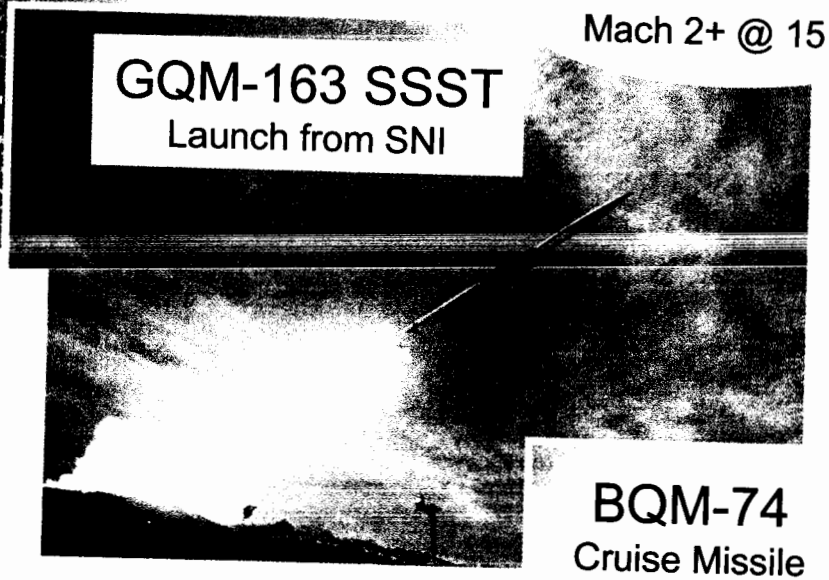
Aerial Targets

MA-31 SSST
Air Launch

SSST
Mach 2+ @ 15 FT



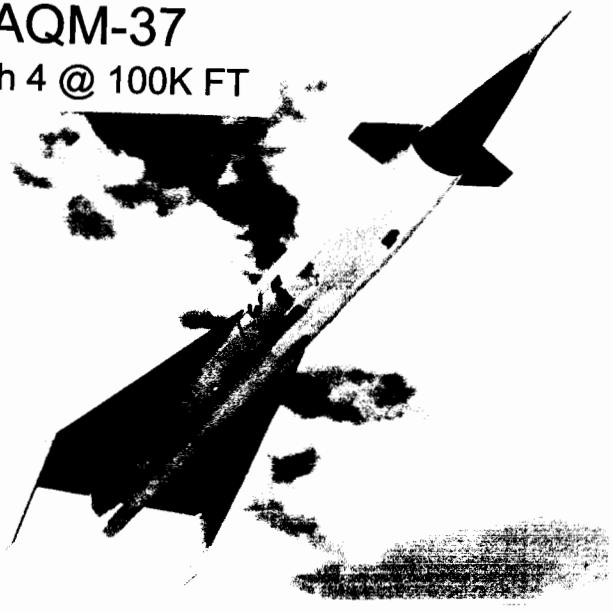
BQM-34
Subsonic
Hi Payload



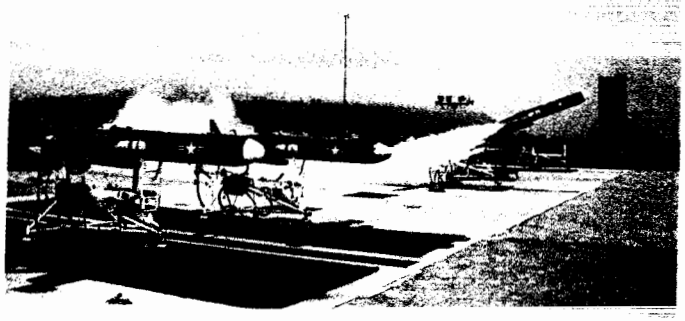
GQM-163 SSST
Launch from SNI

BQM-74
Cruise Missile

AQM-37
Mach 4 @ 100K FT



All Systems Shown Completed T&E @ Mugu



Seaborne Targets

- **FUNCTION**
  - DoD Lead for Life-Cycle support (RDAT&E) for technical development and operational use of Seaborne Target Systems used world wide.

- **CAPABILITY**
  - DoD (Project Reliance) singular site for development, acquisition, and life-cycle support of Seaborne Targets
  - Seaborne Powered Targets (10 to 260 feet)
  - Singular site operating all Navy's Seaborne targets
  - Navy's only site for
    - **Mobile Ship Target**
    - **Aerial Target Launch Ship**
    - **Fast Attack Craft Target**
  - Provides Range surface surveillance

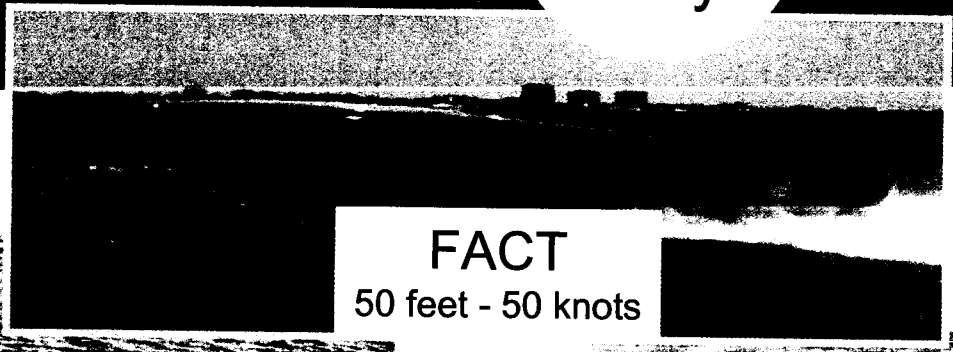
- **IMPLEMENTATION CHALLENGES**
  - Seaborne Targets capability is integral to weapons systems testing and training on the Sea Range
  - Requires deep-water port with direct access to Sea Range to support Navy and Tri-Service test events
  - Operational efficiency requires use of cross-trained aerial target personnel

Seaborne Targets

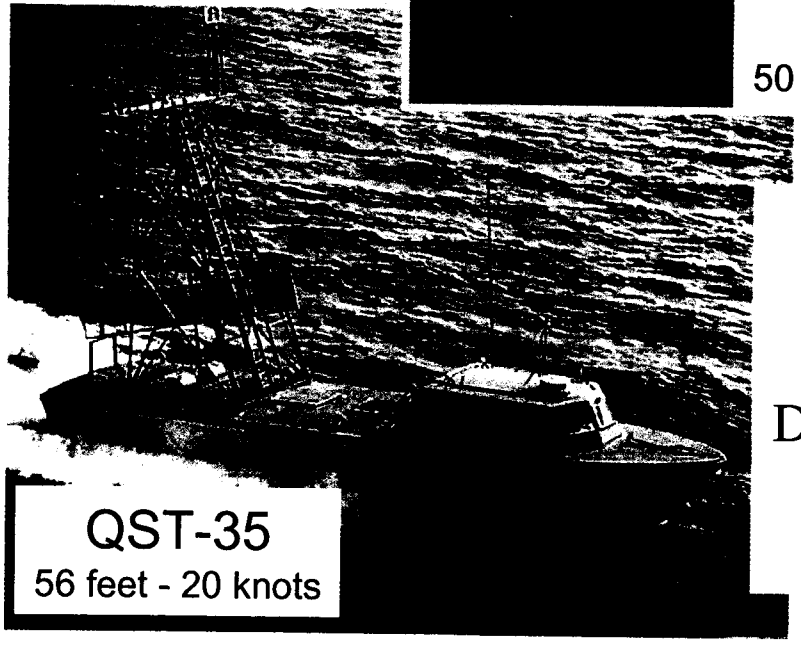
Mobile Ship Target
80 Meter-15 Knot

Mugu Only

ATLS
SSST Launch

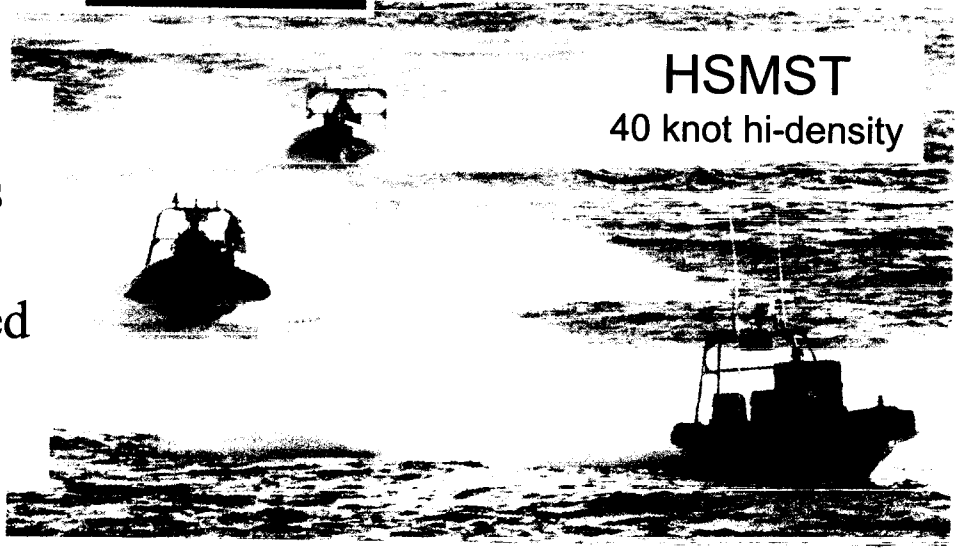


FACT
50 feet - 50 knots



QST-35
56 feet - 20 knots

All Systems Shown Developed At Mugu

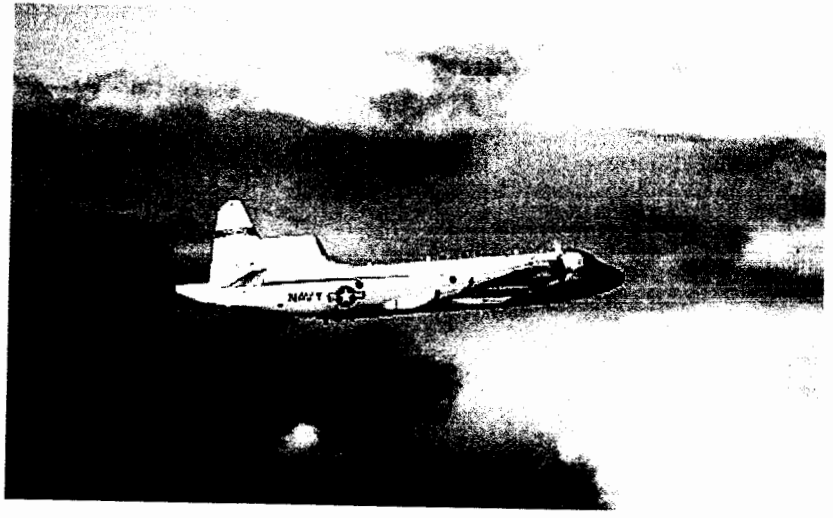


HSMST
40 knot hi-density

VX-30 Test Squadron, Point Mugu

- **FUNCTION**
  - **VX-30 Aircraft** facilitate operations on the Sea Test Range
    - Range Aircraft provide airborne instrumentation (telemetry data and photometric data) and Safety (range clearance & destruct)
    - Tactical Aircraft provide safety chase/command override for fast movers, and simulate aerial targets/threats
    - Range Aircraft provide logistical support to San Nicholas Island, and to programs requiring transport of project equipment
  - **VX-30 Aircraft** provide direct support to weapon systems and articles under test
    - Range Aircraft provide airborne launch of subscale drones (as targets for systems under test)
    - Tactical Aircraft provide high speed carriage of project equipment and project threats (non-airframe specific pods)
- **CAPABILITY**
  - 5 highly modified NP-3D and DC-130F range support aircraft
  - 6 multipurpose, non-Fleet representative, F/A-18 tactical support aircraft
  - Organizational Level Maintenance for all assigned aircraft, and for hosting project detachments at PM site
  - Flight crews trained and experienced in high risk RDT&E range flight operations
  - Mission statistics: 86% on Sea Test Range @ Pt Mugu, 13% Worldwide, 1% Land Range @ China Lake
- **IMPLEMENTATION CHALLENGES**
  - Major Construction (Hangar and Ramp) required for range support aircraft at the China Lake site
  - Significantly increased RDT&E cost to operate from China Lake site (additional daily transit costs)
  - Significantly reduced utility/availability of aircraft for customers on the Sea Test Range (time to transit)

VX-30 Test Squadron, Point Mugu



NAVAL TEST WING PACIFIC

VX - 30

NAVAIR

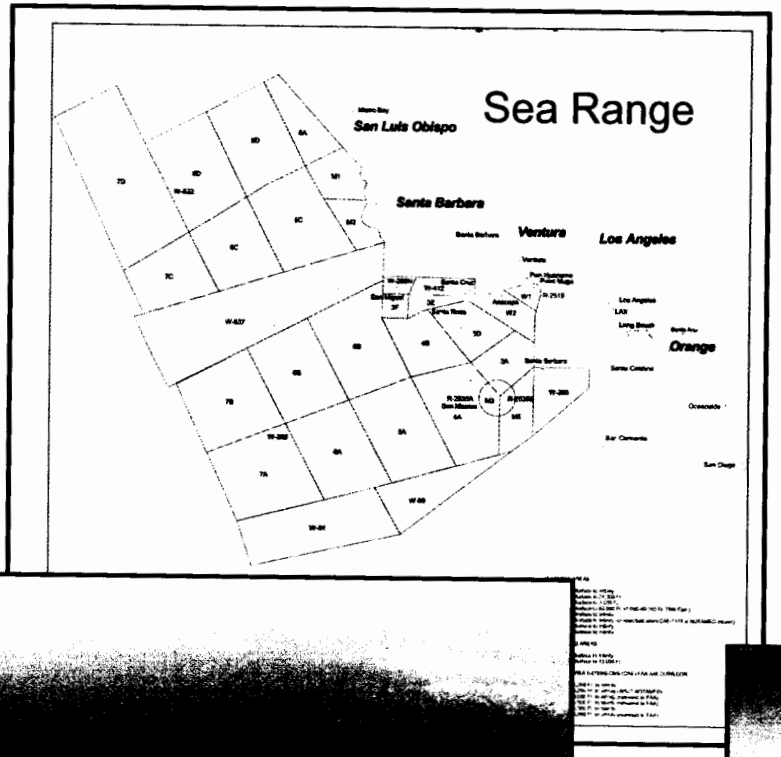
Sea Range Complex

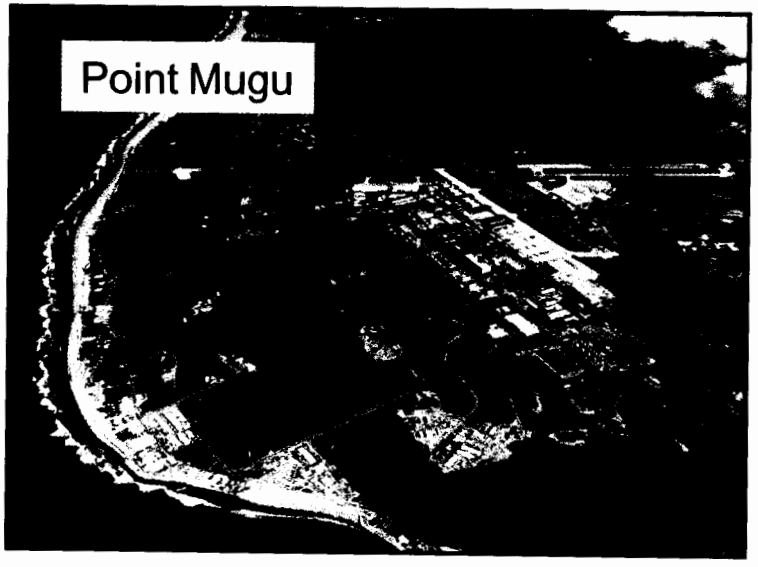
- **FUNCTION**
  - Premier Navy / DoD Range for testing and training in sea, space, and coastal environments.
  - Serves a broad spectrum of military, Homeland Defense, NATO, NASA, and private sector programs within a large, 36,000 square mile, fully-instrumented and controlled open-ocean area.

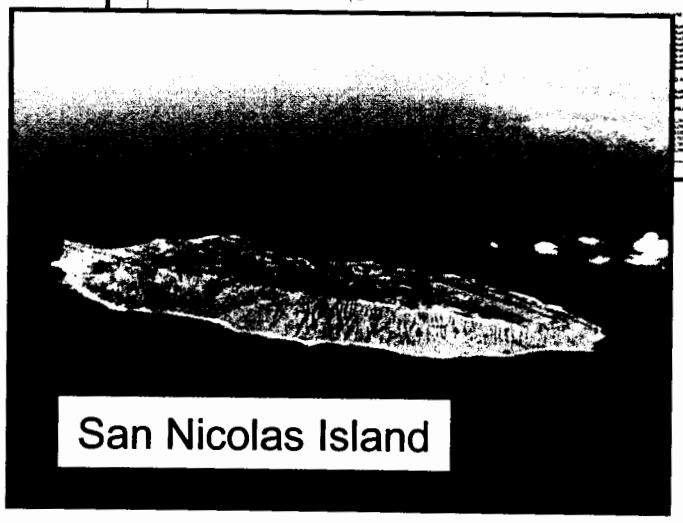
- **CAPABILITY**
  - Full spectrum of Range services ideal for the safe and secure collection of test and training data
  - Resident expertise in planning and conducting highly complex, joint-service test and training operations, including realistic Battle Group exercises, complex multi-threat scenarios, and large-scale, long-range test events

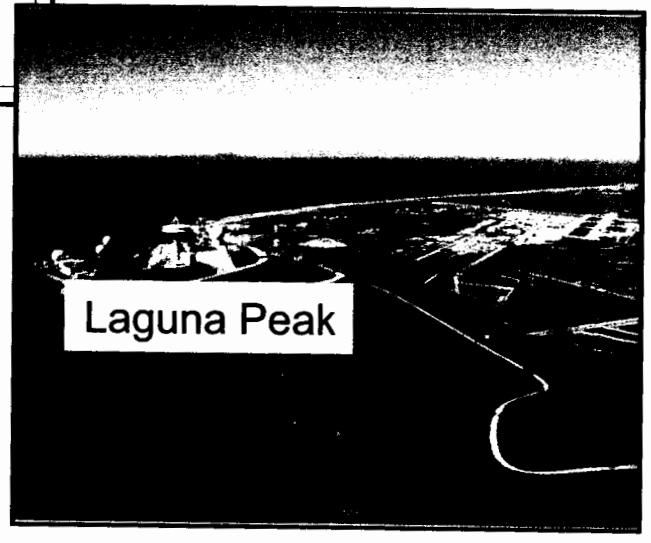
- **UNIQUE FEATURES**
  - Complete integration of all facilities and personnel required for an open-ocean test and training range, including a military airfield, target and missile launch facilities, operations control centers, and technical support personnel
  - Extensively instrumented offshore islands (San Nicolas Island and Santa Cruz Island) and adjacent high coastal mountain (Laguna Peak) synergistically merged into a range complex
  - Geographically dispersed instrumentation enabling data collection over a large area
  - A nearby deep water harbor at Port Hueneme perfect for staging targets boats, surface combatants, and providing logistics support to test programs
  - Sea and land areas un-encroached by private or commercial aircraft, boats, or community development
  - Close proximity to and interconnected with other Western DoD Ranges (Vandenberg AFB, China Lake, Edwards AFB, Third Fleet SOCAL training range), weapons laboratories, and simulation facilities that take advantage of Sea Range capabilities to satisfy their test and training objectives
  - Comprehensive, approved Environmental Impact Statement for current and future Range events

Sea Range Complex









Range Facilities at Point Mugu

- **FUNCTION**
  - Control point for the safe and effective conduct of complex Range operations.
  - Hosts and deploys aircraft for Range events.
  - Target and missile launches directly into controlled airspace.
  - Electronic data distribution, processing, display, and recording for real-time and post-mission data products.
  - Management and technical personnel providing rapid response to Range customer requirements.
- **CAPABILITY**
  - Military airfield for tactical aircraft, Unmanned Air Vehicles, airborne range instrumentation, and logistics support
  - Surface launch facilities for targets and missiles, and central point for remote control of air and sea targets
  - Range operations control center performing test execution, Range safety, and data collection, processing, distribution, and display
  - Metric tracking and sea surveillance radar
  - Telemetry systems for collecting, processing, and recording test item data
  - Comprehensive photographic and engineering video coverage of test events
  - Complete voice, Range data, and tactical data link communications systems, including microwave connectivity with voice radios and sea surveillance radar systems at Santa Cruz Island
  - Explosive ordnance handling personnel and facilities
- **UNIQUE FEATURES**
  - The synergistic integration of a military airfield, target and missile launch facilities, operations control center, test planning and management personnel
  - All facilities adjacent to an open-ocean test area, minimizing costs and extending the on-station time of aircraft and targets
  - Close proximity to and integrated with instrumented coastal mountains, offshore islands, the deep water harbor, the Self Defense Test Ship, and Surface Warfare Engineering Facility at Port Hueneme

Range Facilities at Laguna Peak

- **FUNCTION**
  - Serves as an invaluable elevated data collection point, real-time inter-range communications relay, target control and flight termination systems base.

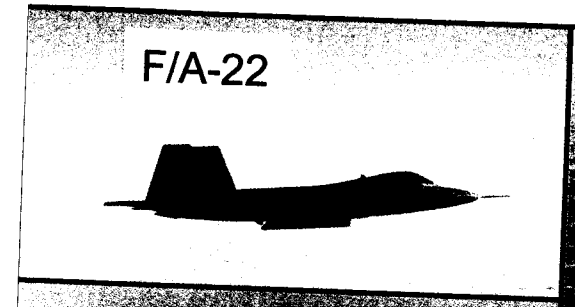
- **CAPABILITY**
  - Telemetry systems overlooking large ocean areas for collecting, processing, and recording test item data
  - Remote control systems for surface-launched air and sea targets
  - Sea surveillance radars offering a direct line-of-site view to inner Sea Range areas
  - Extensive voice, Range data, and tactical data link communications systems
  - Flight termination safety system transmitters

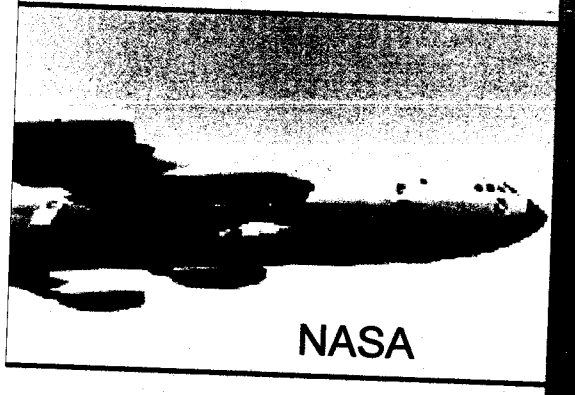
- **UNIQUE FEATURES**
  - 1,500 foot peak next to the shoreline, allowing far-reaching instrumentation coverage into controlled sea, land, and air space
  - Provides a high-elevation location for telemetry and flight termination safety systems critical to Sea Range events and space launch operations from Vandenberg Air Force Base
  - Secure fiber optics connectivity to control facilities at Point Mugu
  - High-speed microwave voice, video and data connectivity to Edwards AFB, Vandenberg AFB, and China Lake

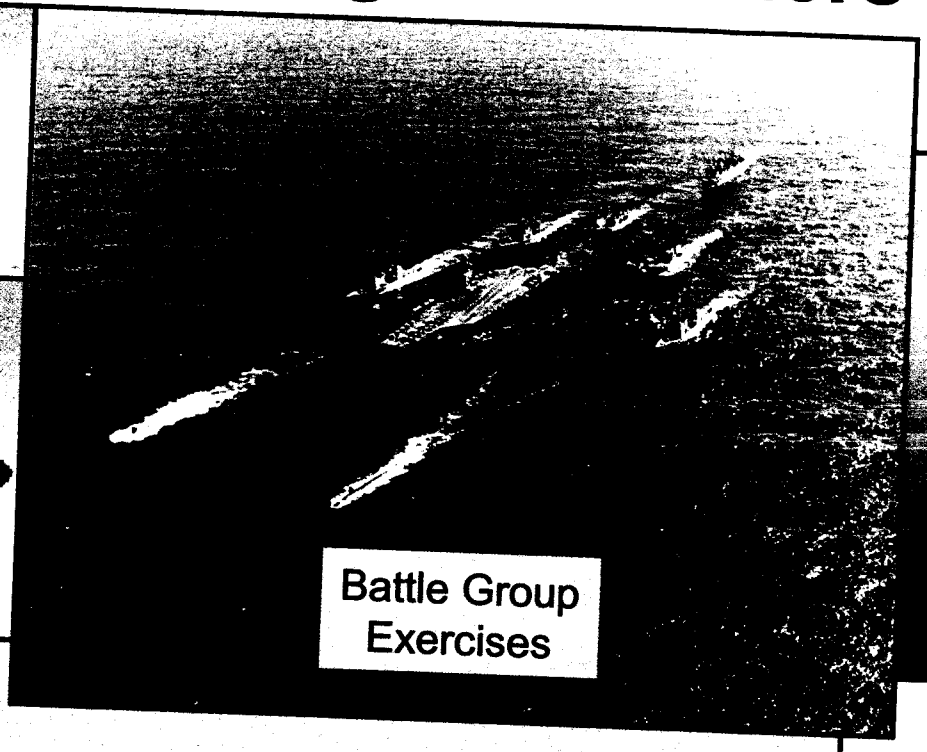
Range Facilities at San Nicolas Island

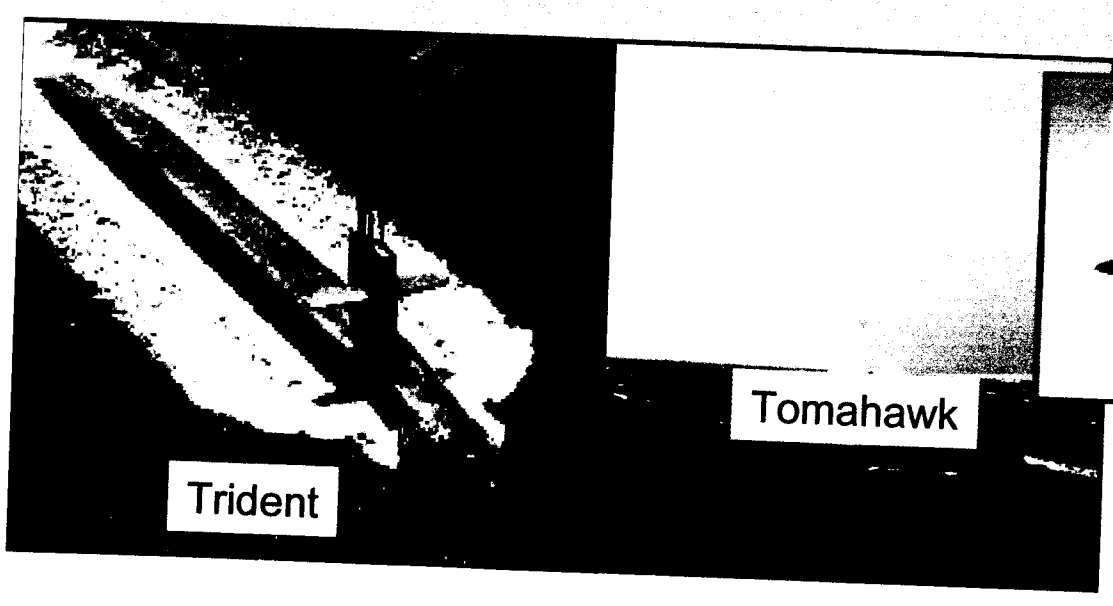
- **FUNCTION**
  - Cornerstone of Sea Range capabilities, enabling long-range instrumentation coverage for the T&E of weapons, ship systems, aircraft, large-scale Fleet training exercises, ballistic missile defense tests, and hypersonic research experiments.
  - Extends telemetry and radar data collection and target presentation over-the-horizon enabling the conduct of hazardous operations safely away from populated areas.
- **CAPABILITY**
  - Fully integrated with and complimentary to Range facilities at Point Mugu, Laguna Peak, and Santa Cruz Island
  - Airfield facilities including a 10,000 ft. runway capable of hosting C-5 sized aircraft
  - Provides telemetry data coverage to the far reaches of the Sea Range
  - Hosts multiple metric tracking radar, long-range air surveillance radar, and sea surveillance radar for tracking aircraft and ships
  - High-speed, anti-ship cruise missile target launch facilities
  - Land attack weapons impact area
  - Complete photographic and engineering video coverage of test events
  - Comprehensive voice, Range data, and tactical data link communications
  - Control systems for presentation of multiple air and sea targets
  - Flight termination systems to ensure the safe conduct of hazardous operations
  - Ordnance handling personnel and facilities
  - Littoral environment for Fleet training, Special Forces operations, and testing of emerging weapons technologies
  - Connected by a redundant, secure fiber optics cable to Point Mugu
- **UNIQUE FEATURES**
  - Realistic, isolated, marine environment located 60 miles into the Sea Range complex
  - Navy owned and controlled island where highly classified testing may be conducted

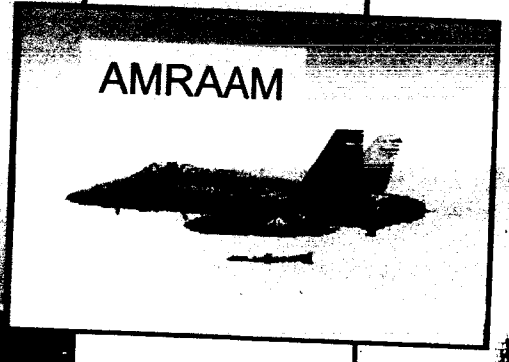
Sea Range Customers

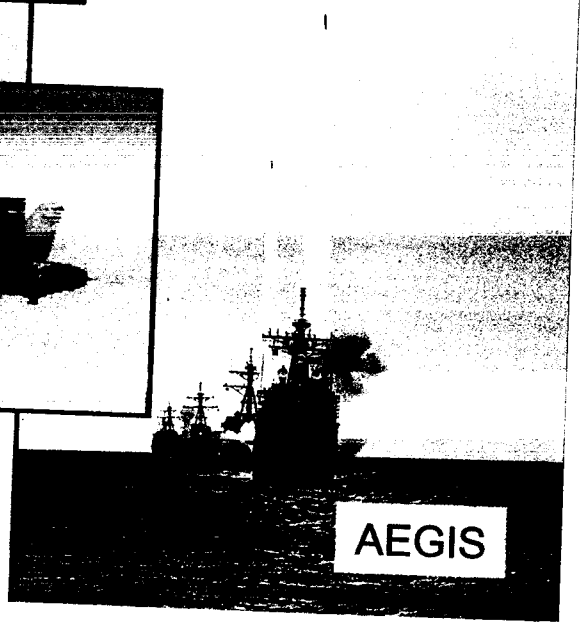













NAVAL AIR WARFARE CENTER
Weapons Division
Point Mugu, CA