Crane Division
Naval Surface Warfare Center

We Support the Warfighter!

deter

defend

...defeat

Harnessing the Power of Technology for the Warfighter
Facts

- 3rd Largest Navy Installation in the World
  - 98 Sq Miles (approximately 64,000 Acres)
  - 3,000 Buildings
  - Facilities: $3B
    - Sq Feet built FY96-06 – 636,385
    - 650,000 Tons Ordnance Storage Capacity
- No Encroachment
- Unencumbered
  - 1,751 Total Buildable Acres (Crane Site)
  - 690 Buildable Acres (Ordnance Area (Crane Site))
  - 98 Buildable Acres (Glendora Site (Sullivan Co.))
  - Environmental Compliance
- 3rd Largest Employer in SW IN
- 2663 NSWC Crane Navy Employees
  - 70% S&E/Tech
  - Average Age 46.0
- 650 Army Employees
- 71% of Receipts to Commercial Sources
- > 900 Work Years of Contract Services
Our Mission . . .

Provide engineering and technical services with a product focus in SENSORS, ELECTRONICS, ELECTRONIC WARFARE and SPECIAL MISSION WEAPONS. Applies component and system level product engineering expertise principally to the warfighting areas of STRATEGIC MISSIONS, SPECIAL MISSIONS and ELECTRONIC WARFARE/INFORMATION OPERATIONS.
• COMPREHENSIVE SUPPORT for complex military systems spanning development, deployment and sustainment

• Partnering with private industry to capitalize on COLLABORATIVE EFFORTS to streamline the introduction of new products for the Warfighter

• Real time development and RAPID IMPLEMENTATION of practical solutions for the military’s toughest problems

• Advanced application of CONTINUOUS IMPROVEMENT processes for best in class customer satisfaction and value
2637 NSWC Crane Navy Employees
“Strong Seaport Engineering Support”
70% S&E/Tech
13 Military Personnel
$1.71B Business Base

283 NAVFAC Employees
5 Military Personnel
$84M Business Base

650 Army Employees
2 Military Personnel
$119M Business Base

72 FISC Employees
1 Military Personnel
$6.9M Business Base

147 NSA Employees
11 Military Personnel
$22M Business Base

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NSWC Crane: Teaming With Industry and Academia

TOGETHER WE SUPPORT THE WARFIGHTER

– Technology Transfer
  • Partner funds Crane for services: Engineering, Repair, Testing, etc.
  • Approximately $13M/yr is funded to Crane in support of Technology Transfer projects

– Collaborative Research & Development Agreement (CRADA)
  • Partner and Crane agree to collaborate with their own resources
  • 8 Active Agreements

– Service Support Contracts
  • $364M in FY 07

– Acquisition of Supplies and Hardware
  • $1.24BM in FY 07

– Technology Development
  • Crane contracts and pays for Technology Development
  • $99M Leveraged for Technology Development in FY 07
NSWC Crane’s PhD Fellowship Program provides PhDs for future research efforts.

NSWC Crane’s Masters Program provides Advanced Degrees in a Range of Technical Engineering Disciplines.

Scientists, Engineers and Technicians 75%

Clerical/Blue Collar 3%

Administrative 22%

20 US Patents were issued to NSWC Crane employees in the last 2 years.

Crane is committed to diversity of our workforce.

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Crane has embarked on an aggressive campaign to concentrate its resources and technical capabilities in the three mission areas which best support the Warfighter, these are our FOCUS AREAS.

Crane Resource Allocation

- Other: 24%
- Special: 27%
- EW/IO: 34%
- Strategic: 15%

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Crane’s Product Focus is the foundation for our Mission Focus Areas
Crane provides cradle to grave power system engineering services for ship, air, land, and space based systems.

Unique and comprehensive Printed Circuit Board development, manufacturing, test, and evaluation capabilities.

Power Systems

Crane is DoD’s largest and most capable battery evaluation facility with a unique abusive test facility and extensive environmental capabilities.

Electronic Interconnect Technology

Last Navy Printed Circuit Board manufacturing facility and one of only two DoD Printed Circuit Board manufacturing facilities.

High Energy Test Facility

Electrochemistry Eng Facility

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Crane is the acquisition engineering & technical support agent for the Navy’s Strategic Programs Office for fielding of the Integrated Nuclear Weapons Security System.

Crane provides a broad range of systems engineering expertise for the sustainment and modernization of the Air Forces Ballistic Missile Early Warning Systems.

Crane supports systems engineering design, analysis, test and evaluation of flight systems for Strategic platforms.

Crane provides high reliability product and subsystem engineering and logistics to the Navy’s Strategic Systems Programs Strategic Weapons System and Attack Weapon Control System.

Technology & Infrastructure Protection

Platform & Launch Systems

Radar Systems

Flight Systems

Power & Circuit Board Technologies

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Control the **SPECTRUM**

... Control the **FIGHT!**
NSWC Crane is the Center of Excellence for EW & has worked the ALQ-99 TJS since it’s conception.

Crane develops & manufactures all infrared countermeasures for US Navy aircraft.

Crane is utilizing critical EW, DMS-MS, Engineering & T&E Knowledge, skills, & abilities to revolutionize support of Submarine EW Systems.

Crane developed and operates the only COMOPTEVFOR certified test facilities to support EW T&E events.

Crane is
- Helping the Army stand up their Capabilities for Ground EW
  - Leveraging Air, Surface, & Sub-Surface EW expertise for Ground

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From Mission Needs to Fielded Solutions, NO ONE is FASTER or BETTER!
Crane designed, built and fielded the first Counter-Sniper Enclosure for USAF Force Protection HMMWVs in 6 weeks.

Crane is USSOCOM’s PM for the development, acquisition, fielding and sustainment of the SOF Combat Assault Rifle (SCAR).

Sensors & Communications:
SOPMOD has surged more than $60M in ground combat end items to Special Operations in the field during OIF/OEF.

Training:
Crane provided Small Arms operations & maintenance training to over 500 personnel in FY06.
Ordnance Test Capabilities

- Ordnance/Energetic Materials Assessment Services
  - R&D Testing
  - First Article Testing
  - Lot Acceptance Testing
  - Quality Evaluation/Surveillance Testing
  - Failure Investigation/Analysis
  -Insensitive Munitions Testing
  - Hazard Classification Testing
  - Demilitarization Technology “Proof Out”

- Test Equipment Design/Build
- Engineering Analysis/Assessments
- Systems Safety/WSES RB Support Services
- Maintenance/Repair Services

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Ordnance Products Tested

- Bombs and Components
- Countermeasures
- Aircraft Gun Ammunition
- Pyrotechnics
- Rocket Warheads
- Rocket Fuzes
- Demolition Devices
- Grenades
- Ship Gun Ammunition Fuzes

- Air & Surface Missile Components
  - Fuzes
  - S&A Devices
  - Target Detection Devices
  - Warheads
  - Boosters
  - Gyroscopes
  - Separation Charges
  - Thrusters
  - Detonators
Ordnance Test Facilities on Center
~ 135,000 sq ft

- Engineering Project Offices
- Heat Flow Calorimetry Laboratory
- Gun Fuze T&E Facility
- Strategic Missile Component T&E Facility
- Explosive Sciences Laboratory
- Environmental Test Facility
- Radiographic / NDT Facility
- Missile Fuze T&E Facility
- Ordnance Test Area (OTA) - 88 acres
Environmental Test Capabilities

• Test Services
  • Research & Development Testing
  • Comparative Testing
  • First Article Testing (FAT)
  • Lot Acceptance Testing (LAT)
  • Quality Evaluation / Surveillance Testing
  • Failure Investigation / Analysis

• Engineering Services
  • Test & Data Analysis / Reporting
  • Test Fixture Design
  • Fabrication & Assessment
Environmental Test Capability Specifics

Climatic Testing
- Temperature / Shock
- Temperature / Humidity
- Temperature Cycle & Storage
- Altitude
- Salt Fog
- Icing

Dynamic Testing
- Vibration
  - Sinusoidal
  - Random
  - Mixed Mode
- Shock
  - MIL-S -901 Shipboard
  - Shock Response Spectrum
  - High Impact
  - Classical
  - Jolt & Jumble

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Materials Analysis Laboratory

- ISO-9001 certified analytical laboratory
- 10,000 ft² chemical, thermal, and microscopic laboratory
  - 1 lb explosive limit
- 2500 ft² heat flow calorimetry laboratory
  - 50-pound explosive limit
- 1000 ft² metallurgical laboratory
  - 10 lb explosive limit
- 1000 ft² mechanical properties laboratory
  - 500 lb explosive limit
- Six explosive storage magazines (SRC-I and SRC-II)
  - ranging from 10 lb to 165,000 lb capacity.

- Failure Analysis
- Material Identification
- Material selection/source identification
- Material compatibility
- Hazard classification
- Environmental compliance testing
- Shelf life determination/extension
- Qualification testing
- Product improvement initiatives
- Quality evaluation/surveillance
- First Article/Lot Acceptance Testing
Nondestructive Test Laboratory

- ISO-9001 certified NDT laboratory
- Three conventional radiographic test bays (160 KeV to 450 KeV)
  - Rated for NEQ of 75 lb 1.1
- One 2000 ft² high energy radiographic test bay
  - Rated for NEW of 2000 lb 1.1 (10 MeV Linear Accelerator)
  - Penetrates over 15 inches of steel
  - Designed to accommodate tractor trailer inspection
- 2000 ft² NDT laboratory space to accommodate UT, ET, PT, and MT testing methods
  - NEW of 1000 lb 1.1

- Conventional and High Energy Radiography
- Laminographic Test System
- Computerized Axial Tomography
- Digital Radiography Imaging systems
- Reconfigurable cabinet x-ray systems
- Ultrasonic inspection
- Eddy current testing
- Penetrant testing
- Magnetic Particle Testing
Demil Test Facility

- Development and evaluation of new demilitarization technologies
- Adaptable to accommodate prototype systems
- 7.5 acres
- 500 lb remote operated test cell
- 50 lb remote operated test cell
- 1 lb remote operated test cell
- 500 lb ordnance handling area
- Remote located control room
- 2 Magazines: 150,000 lb 1.1 storage capacity
- Self-contained fire suppression

- Abrasive Waterjet
- Induction Heating
- Fuze Aging
- Propellant Sampling
- Sensitivity Testing
- Process water waste identification
- Chemical analysis/characterization
Lake Glendora Test Facility

- Facility Footprint 450 acres
- Lake Footprint 100 acres
- Max depth 110 feet
- 1 mile length from North to South
- ¾ mile width from East to West
- 3 independent water ranges
- Underwater and surface detonation and burn approval
- Water to air launch and drop approval
- East Range NEW 100 lbs 1.1 & 1.2
Lake Glendora Test Facility

- Ordnance Support Building
- Fabrication/Repair Shop on-site
- Boat House
- Acoustic Monitoring Barges
- Multiple Watercraft
- Floating Test Platforms
- Marine Rail Launch System
- 6 ton Lift Capabilities

- Weather Monitor System
- HDTV Screens for Playback
- Climate controlled observation room
- U/W and Surface Video Monitoring and DVD Recording for all ranges
Ammunition Testing Facility

- Direct Fire Range with back blast berm for Recoilless Rifle firing
- No established NEW (Provided in Standard Operating Procedure for weapon undergoing test)
- Impact area has targets positioned at 500 to 1600 meters. 5000 meter range capability.
- 1 operating building for 20mm, 25mm, 30mm ammunition testing
- Memorandum of Understanding (MOU) signed 5 July 2000
- Long Term Strategic Partnership signed 19 March 2004
- Allowed access to 33,132 acres containing 37 direct fire ranges and 19 mortar firing points
Ordnance Test Area (OTA)

- Encompasses 88 acres
- 5 pound NEW (Class 1.1) (Self-Imposed, 20 pound NEW with restrictions)
- 4 operating and 2 support buildings
- Army Surveillance Function Test Range
- Baseline Environmental Assessment
- Air Quality Modeling Assessment

**Ordnance Tested**
- Hand Held
- Hand Tossed
- Pistol/Projector Fired
- Countermeasures
- Target Illuminating
- Target Screening
- Demolition Materials
Special Areas / Capabilities

- Aerial Signal/Flare Test Ranges
- 300’ Tower Illumination Range
- Demolition Material Ranges
- Grenade Launch Area
- Warhead Arena
- Forty Foot Drop Tower
- IM & Hazard Classification Test Areas
- Remote Ammunition Breakdown Facility Munitions
- Evaluation Facility
- Ready Service Magazines (15 total)

**Special Equipment**

- Defuzing
- Milling
- Bandsaw
- Lathe

**Final Hazard Classification/Insensitive Munitions Testing**

- Slow Cook-Off
- External Fire
- Stack Test
- Bullet Impact
- Fast Cook-Off

**Other Lab Capabilities**

- Leak Testing
- Hydrotank
- Temperature Chambers

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Muscatatuck Urban Training Center

~ 1,000 Acres
~ 318 Acre Main Campus
~ 180 Acre Reservoir
Muscatatuck Urban Training Center

68 Buildings With 851,031 Square Feet Under Roof
37 Buildings 2 to 5 Stories Tall
Operational Utilities
Over 9 Miles of Roads
Over 1 Mile of Tunnels
System Safety Office

• Experience
  – 4 person team with 64 years of combined experience in the Safety Field

• Services
  – Serve as single POC between WSES RB and NSWC Crane
  – Provide Project Managers and Project Engineers with assistance in the planning and execution of a Weapon System Safety Program
  – Act as the “Principal for Safety” for NSWC Crane executed projects

• Products
  – System Safety Program Plan (comply w/NAVSEAINST 8020.6 & MIL-STD-882)
  – Safety Analyses
  – Safety Assessment Report
  – Test Plans
    • Insensitive Munitions
    • Hazard Classification
    • Safety
    • Final (Type) Qualification
    • Shipboard Shock
  – Test Reports (for all of the above)
  – WSES RB Technical Data Packages
    • Supporting Initial Operational Capability (IOC)
    • Limited Release
    • User Evaluation
  – WSES RB Presentation Packages
• Providing assessment and analysis so customers can make "proactive" decisions!

• Assuring Ordnance Products are Safe & Effective for the Warfighter through Innovative Ordnance Assessment
Summary

• We provide FULL LIFE-CYCLE SERVICES and support for our three areas of expertise: Strategic Missions, Electronic Warfare/Information Operations and Special Missions

• Our military solutions are highly practical - developed by the BRIGHTEST SCIENTIFIC MINDS employing the latest technology and equipment

• We are HIGHLY EFFICIENT and COST EFFECTIVE, and we practice continuous improvement every day