



# NUWC DIVISION, KEYPORT

CODE 20 TEST AND EVALUATION DEPARTMENT

Industry Day Brief, Rod Bazar, Department Head  
14 March 2023

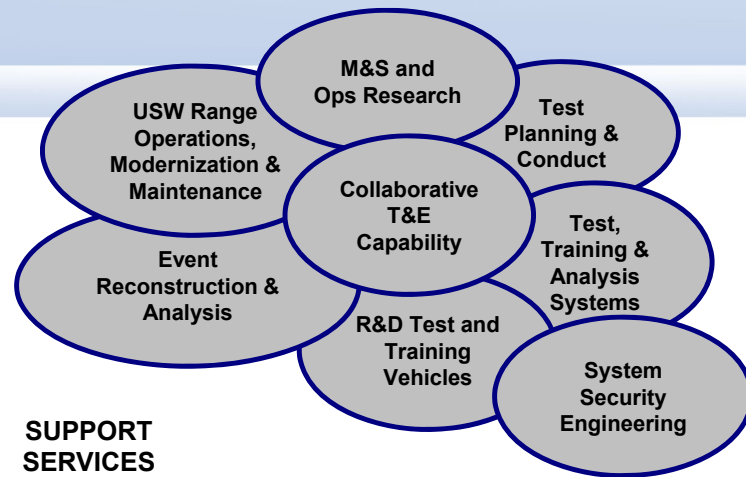
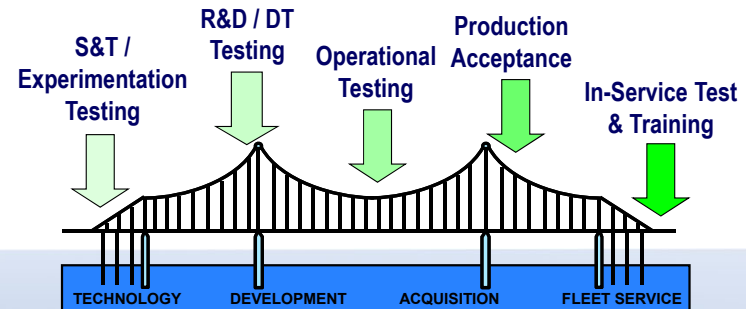


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# FULL-SPECTRUM TEST AND EVALUATION



**CORE  
SERVICES**



**Full-Spectrum T&E Capabilities for Technology Evaluation, Systems Acquisition & In-Service Performance Assessment**

# Core Mission Area – Undersea Test, Performance Assessment and Assurance

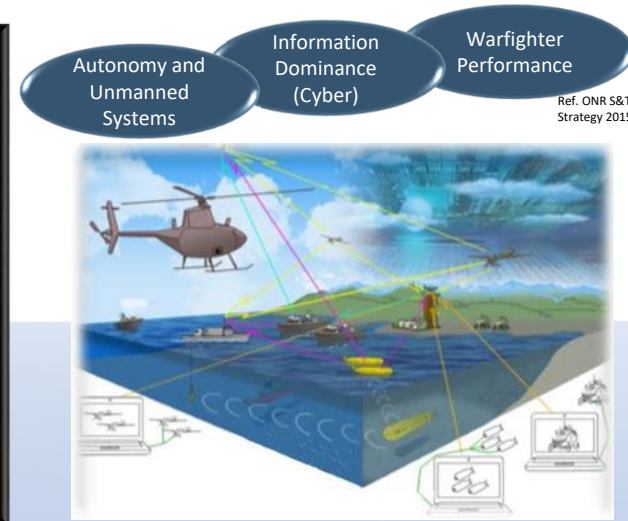
## Today's Navy

- Scripted tests
- Short duration events
- Acoustic sensors
- Post-event analysis
- Localized stimulation
- Limited threat emulation



## Potential Game Changers/ Disruptive Technologies

- Networked adaptive autonomous vehicles
- Supercavitating and stealth vehicle T&E
- Clandestine system testing
- Wideband acoustic system use
- Large area and long duration missions
- T&E Systems
- ISR stimulation (threat representative)
- Persistent sensor networks
- Stealth communications
- Improved mission planning
- Live virtual constructive events
- High-performance cloud computing
- Big data analytics
- Machine learning and autonomy



## Next Navy (+5-10 years)

### Current Focus

Anytime/Anywhere T&E. Leverage existing in-water and land-based T&E capabilities, enhance capabilities by repurposing current systems while introducing more agile stimulation and monitoring systems to expedite transformation of T&E from scripted and defined objectives to a measurement of system performance and mission relevance.

- Incorporation of network and cyber testing capabilities to enable live, virtual and constructive events
- Integrating underwater communications technology to enable frequency agile monitoring and measurement capabilities
- Improved planning and assessment capability for near real-time feedback to fleet and developers
- Improved emulator systems (agile threat representative)
- Long-term test scenarios including periodic communication, evaluation, and re-tasking

## Navy After Next (+20 years)

### Vision of the Future

Self-deploying autonomous networked underwater equipment, remotely controllable, forward deployed, with near real-time analysis feedback and archival capability for in-depth post-analysis to provide assessment of system performance

- Undersea network of distributed autonomous self-deploying and intelligent sensors
- Advanced integrated planning and assessment capability
- Advanced incorporation of simulation/stimulation capabilities for live, virtual and constructive testing
- Agile stimulation systems for threat representation
- Capability to provide assessment and confidence in complicated future systems

# Test and Evaluation Department

## Seaport Service Contracts

### **N00178-19D-7814 / N0025322F3003 Hawaii Support Services**

Ford Island, Pearl Harbor Waterfront, MK30/Kauai/Guam, MK48 IMA and Japan

Awarded: 29 June 2022/ Concludes: 28 June 2027

INDUS Technology, Inc

Base Year Plus 4 option years, CPFF

### **N00178-19-D-7331 Acoustic Trials and Range Sustainment**

Surface Ship Radiated Noise Measurement (SSRNM), Fleet Sonar Self Noise (FSSN), Prairie-Masker Operability (PMO), range systems development, range data reduction and subject matter expert support

Awarded: 01 April 2020/ Concludes: 31 Mar 2025

Celeris Systems, Inc.

Base Year Plus 4 option years, CPIF

### **N00178-19-D-8586 Technical and Industrial Support Services**

Range operations and systems, CM and drafting, environmental testing, UTRE, MK30 Depot and aircraft component depot (actuator motors) (all technical/no engineering)

Award: 27 Sep 2021 / Scheduled Conclusion: 12 Sep 2026

Strategic Technologies Inc.

Base Year Plus 4 option years, CPFF

There will be a re-compete

# Test and Evaluation Department

## Seaport Service Contracts

### **N00253-17-R-3011 San Diego Support Services**

Magnetic, acoustic and electromagnetic range operations and systems maintenance, configuration management (CM) and drafting, environmental testing, Undersea Tracking Range Equipment (UTRE)

Awarded: 30 Apr 2018/ Concludes: 29 April 2023

INDUS Technology, Inc.

Base Year Plus 5 option years, CPIF

There will be a recompet

## Examples of Contracting Entities Leveraged

**Army AMRDEC Prototype Integration Facility (PIF)**

**Defense MicroElectronics Activity (DMEA) Advanced Technology Support Program (ATSP)**

**Puget Sound Naval Shipyard: Range Vessels**

**DLA Troop Logistics Support**

**NUWC Newport Undersea Technology Innovation Consortium**

# Test and Evaluation Department

## Range Craft Major Maintenance Future Need

**Approximately 5 contracts from 2025 to 2028.  
Either Keyport or PSNS will contract.**

**Keyport Range Craft contracts anticipated:**

Yard Torpedo Test Class (YTT): Quantity 2

Torpedo Weapons Retriever (TWR): Quantity 2

Barge (IX-536): Quantity 1

**Scope of work will involve.**

Dry-docking

Hull preservation

Repair

Installation of new parts

Ship Alterations

Various preventive maintenance actions

YTT

- 187' Open Ocean Capable Vessel
- 1200 tons



TWR

- 85' Ocean Capable Vessel
- 95 tons



IX 536

- 175' Multipurpose Barge
- 1680 tons



# Test and Evaluation Department



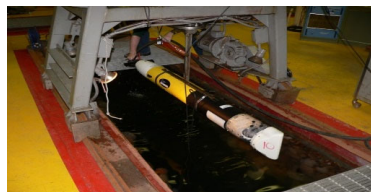
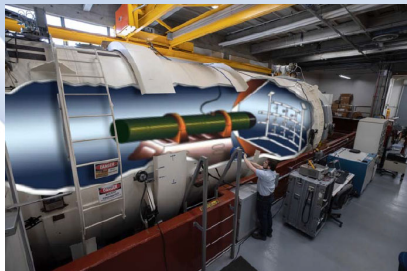
## Acoustic Test Labs



**Mission:** To provide acoustic test and evaluation for weapons, vehicles and sensors while maintaining a culture of affordability.

### Future Needs:

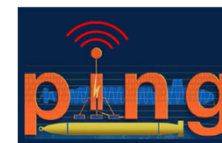
- Underwater cabling and connectors
- Anechoic materials
- Advanced transducer technology
  - Textured ceramic, single crystal
  - Vector sensor, fiber optic
- Pressure vessel expertise
  - Welding and repairs
  - Fittings
  - Locking ring alignment
- Industrial Instrumentation
  - Motor controllers
  - Pumps and valves
  - Filtering
- Advanced Acoustic Signal processing
  - Reverberant environments, near-field, measurements, AI/ML, HPC



# Test and Evaluation Department



## Underwater Tracking Range Equipment (UTRE)

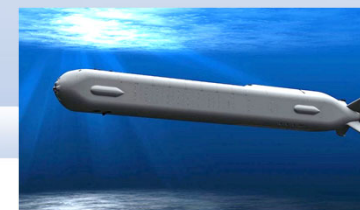


**Mission:** Provide and maintain accurate and reliable underwater tracking hardware for undersea weapons, vehicles, and submarines.

### **Future Submarine & UUV Acoustic Transducer:**

Looking for assistance with Industry best practices and development on:

- Custom acoustic transducers with increased frequency ranges for more universal applications.
- Small compact custom packaging solutions for broadband multi-frequency acoustic transducers.
- Depth sensors design, development, & production of pinger applications and transducer integration.



Conceptual LDUUV



Current EORL

### **Future End-of-Run Locator (EORL) Acoustic Beacon for Weapon Recovery:**

Looking for assistance with Industry best practices and production and manufacturing on:

- Small build to print of the electrical and mechanical components and assemblies for underwater pinger/beacons.

# Test and Evaluation Department

## Recurring Supply Purchases

Office equipment/furniture

Network hardware

Laboratory/Shop Tools and Consumables

General Range Craft Vessel Support

Safety equipment / inspections (rafts, buoys, fire prevention, beacons, etc.)

Crane and winches maintenance and repair

Consumables

# Test and Evaluation Department

## System Security & Cybersecurity Engineering

- IT Services
- System Administration
- IT Install and Maintenance
- Open Source Technical Assessments
- Cyber Tabletop Events
- Reverse Engineering
- Embedded Systems Analysis & Design
- Software, firmware analysis
- Hardware Decomposition and Development
- DEVSECOPS Secure Software Development
- Anti-tamper
- ATO Package Development Support