

National Aeronautics and
Space Administration



Neutral Buoyancy Laboratory Capabilities



Neutral Buoyancy Laboratory (NBL)



Available
to Meet
Your
Unique
Needs

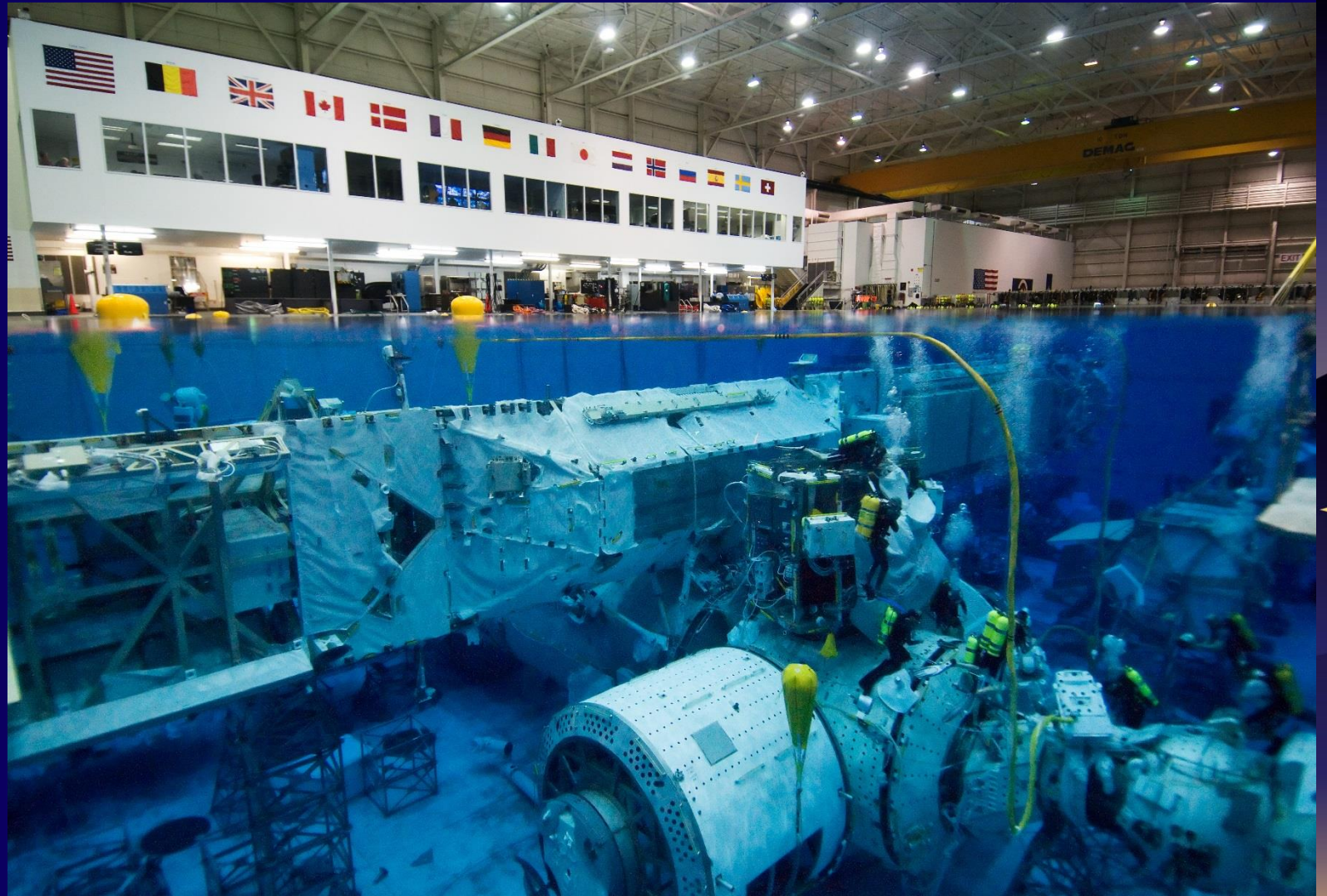


Neutral Buoyancy Laboratory (NBL)



The Pool

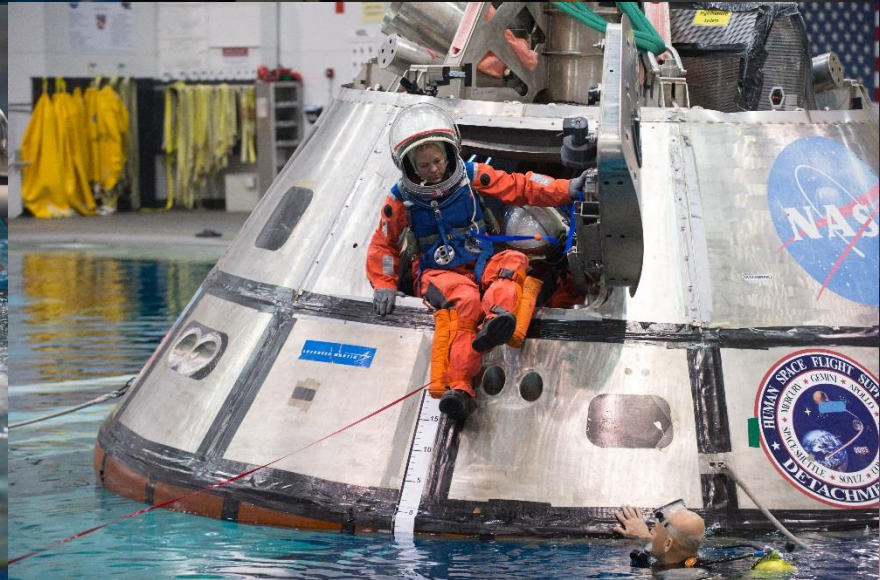
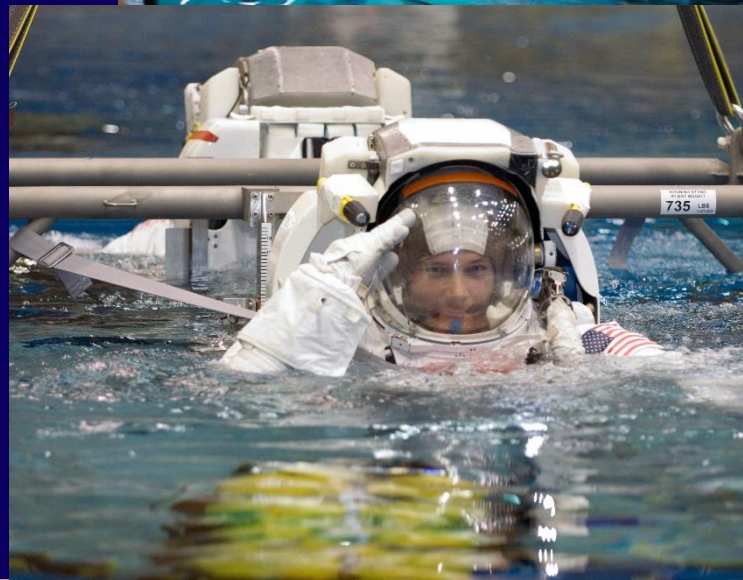
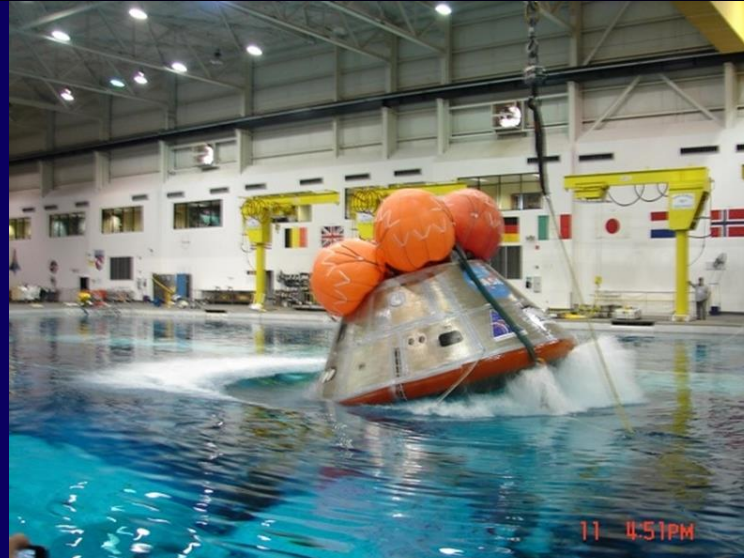
- Length: 202 ft (61.5 m)
- Width: 102 ft (31.1 m)
- Depth: 40 ft (12.2 m)
- Volume: 6.2 million gallons
- Chlorinated fresh water
- Water temperature: 84°-86° F (28.9°-30° C)
- 2 Overhead Bridge Cranes (20.6 tons each)



Neutral Buoyancy Laboratory (NBL)



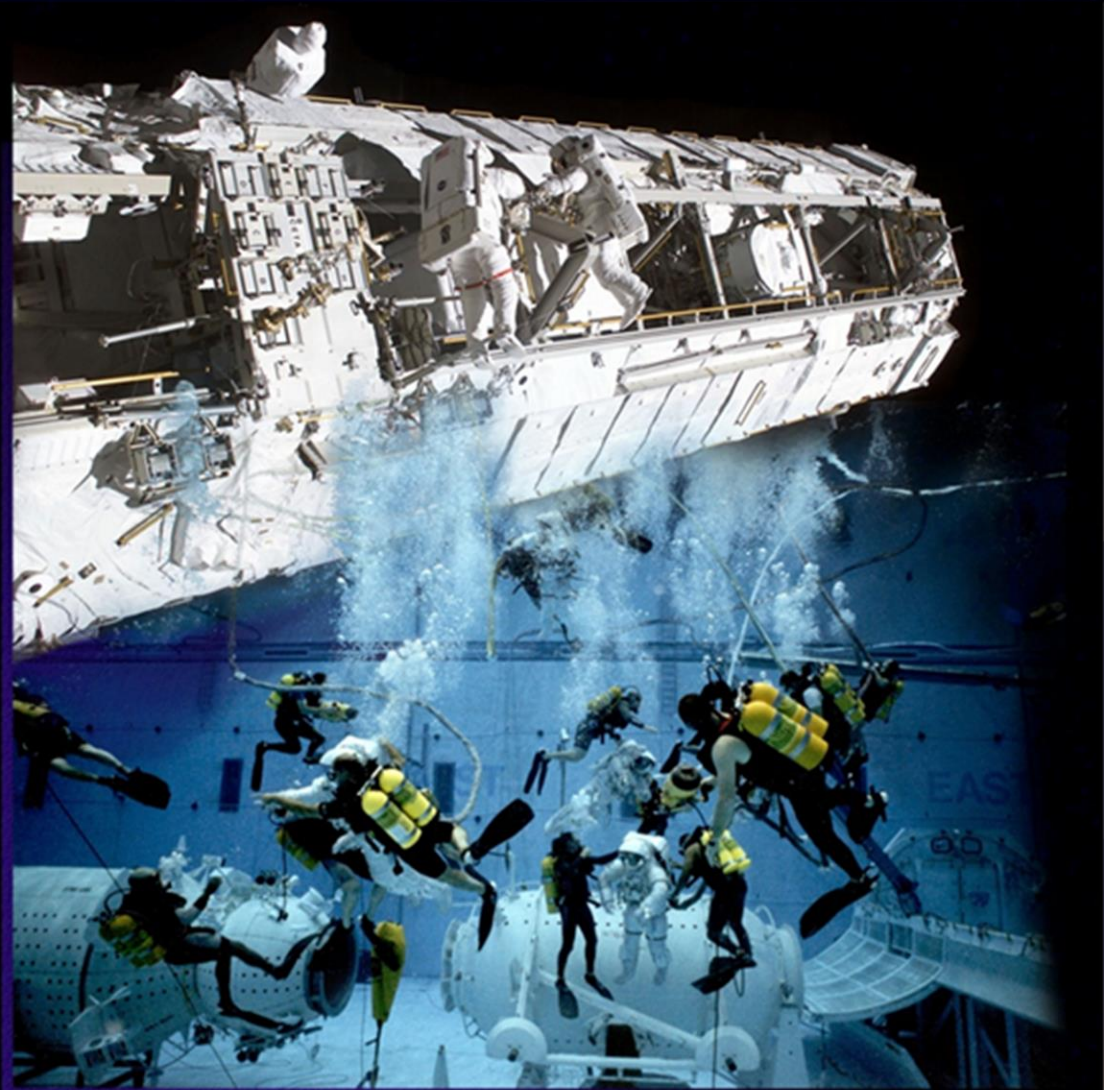
- Astronaut training
- Mission Planning
- Procedure Development
- Hardware verification
- Time-critical operations
- Mission success



Neutral Buoyancy Laboratory (NBL)



- Over 150 EVAs Trained
 - 146 ISS
 - 13 Hubble
- Over 326,000 Dive Hours
- Over 20,600 Space Suit Training Hours
- Over 3,400 Space Suit Training Events



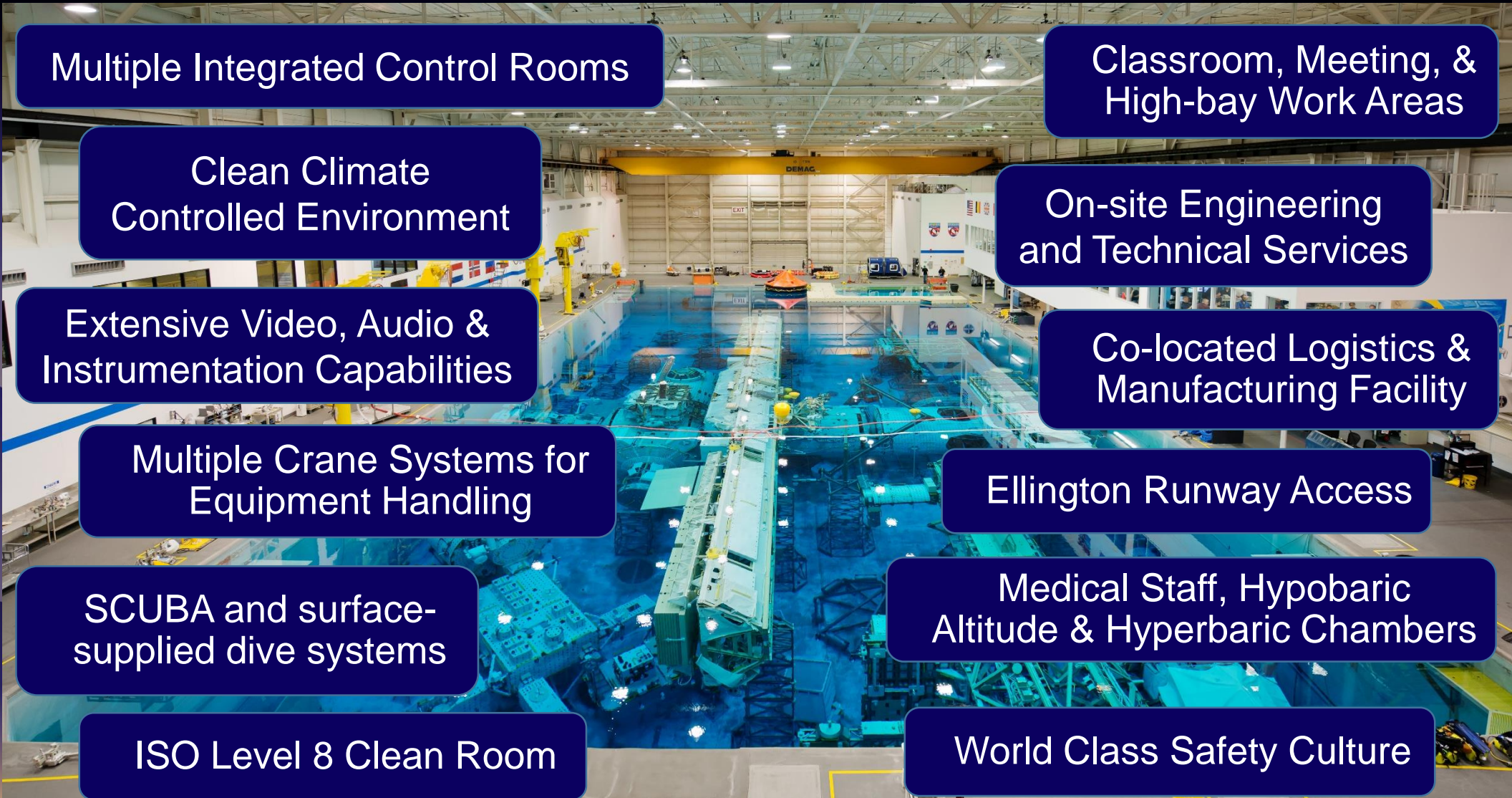
Neutral Buoyancy Laboratory (NBL)



- After Shuttle Retirement and Station Assembly-Complete:
 - NBL Evolves to ISS Operations and Maintenance Role
 - Excess Capacity Created
- NBL Capabilities available to External Customers
 - Access via NASA or NBL Contractors



Neutral Buoyancy Laboratory (NBL)



Multiple Integrated Control Rooms

Classroom, Meeting, & High-bay Work Areas

Clean Climate Controlled Environment

On-site Engineering and Technical Services

Extensive Video, Audio & Instrumentation Capabilities

Co-located Logistics & Manufacturing Facility

Multiple Crane Systems for Equipment Handling

Ellington Runway Access

SCUBA and surface-supplied dive systems

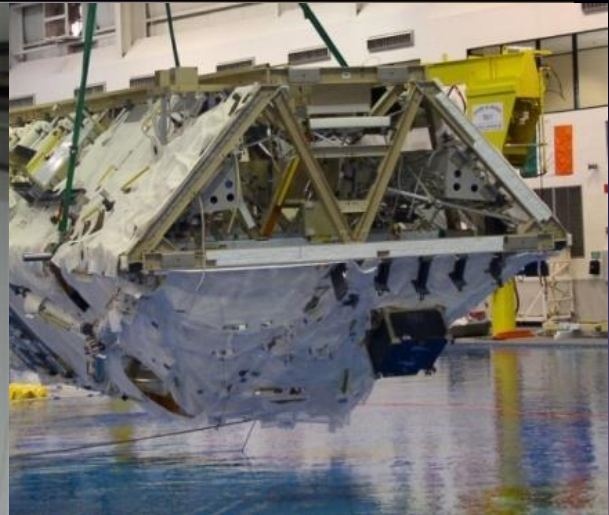
Medical Staff, Hypobaric Altitude & Hyperbaric Chambers

ISO Level 8 Clean Room

World Class Safety Culture



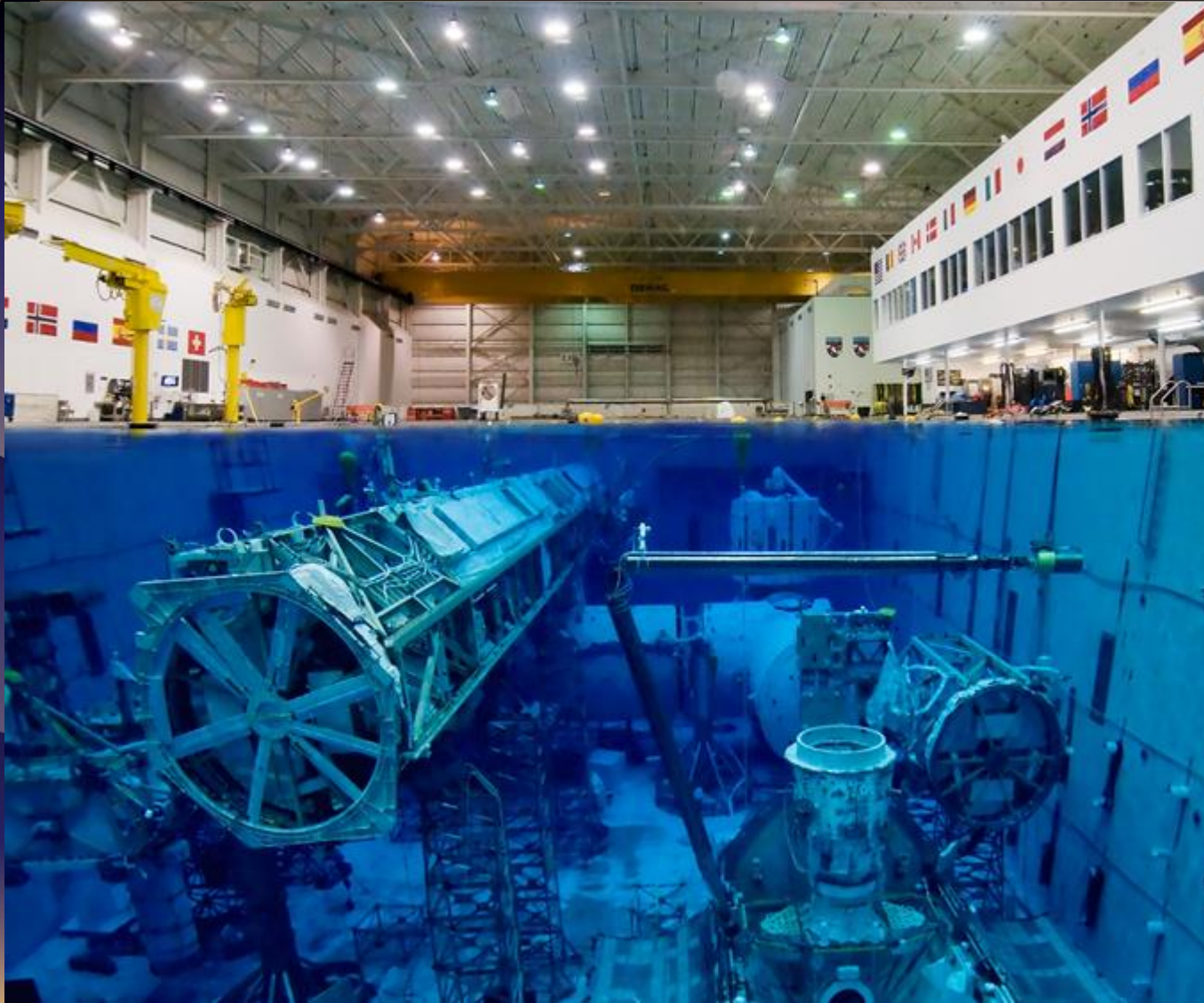
Logistics and Mockup Facility (LMF)



Vertically Integrated Design and Manufacturing

- Mockup Fabrication and Repair
- Machine shop
- Sheet Metal Shop
- Welding
- Sewing

NBL Capability Application



- Increase Simulation & Testing Fidelity
- Evaluate Technology & Procedures
- Perform Efficiency Trade Studies
- Improve Preparation
- Enhance Confidence
- Maximize Ability to React to Unexpected Events
- Reduce Operational Risk



Hardware Testing and Demonstrating



Crew Transfer Systems Test & Demonstrations



Timeline & Solution Trade Studies



Subsea Technology & Research



Autonomous Underwater Vehicle Testing & Development

Development of Non-intrusive Inspection Hardware

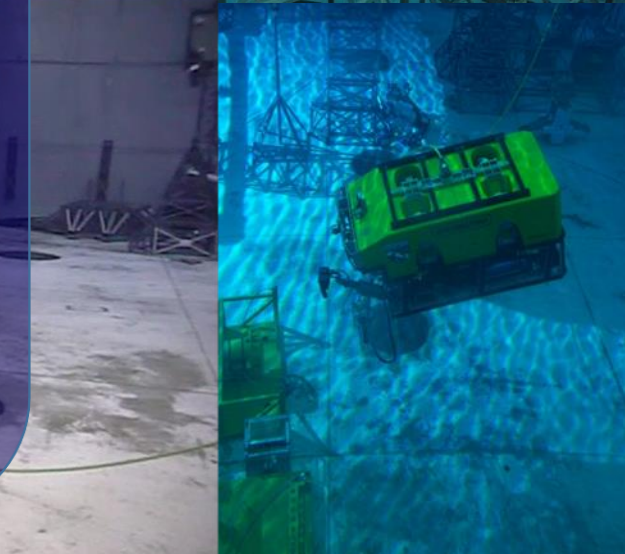
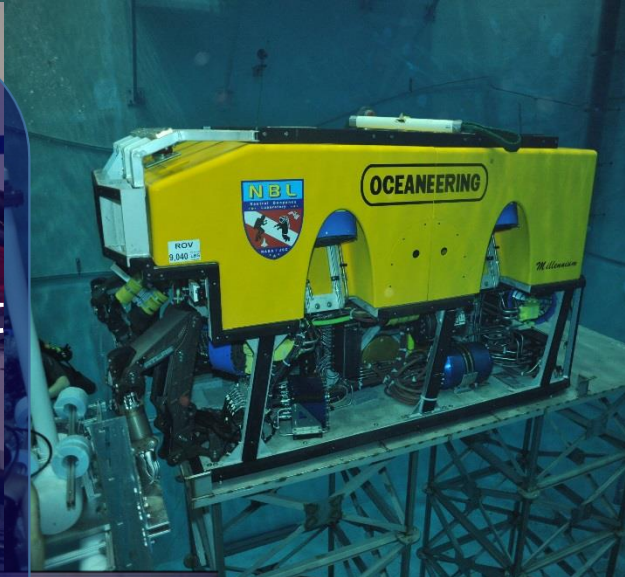


Prototyping and Hardware Production

Remotely Operated Vehicle (ROV) Operations



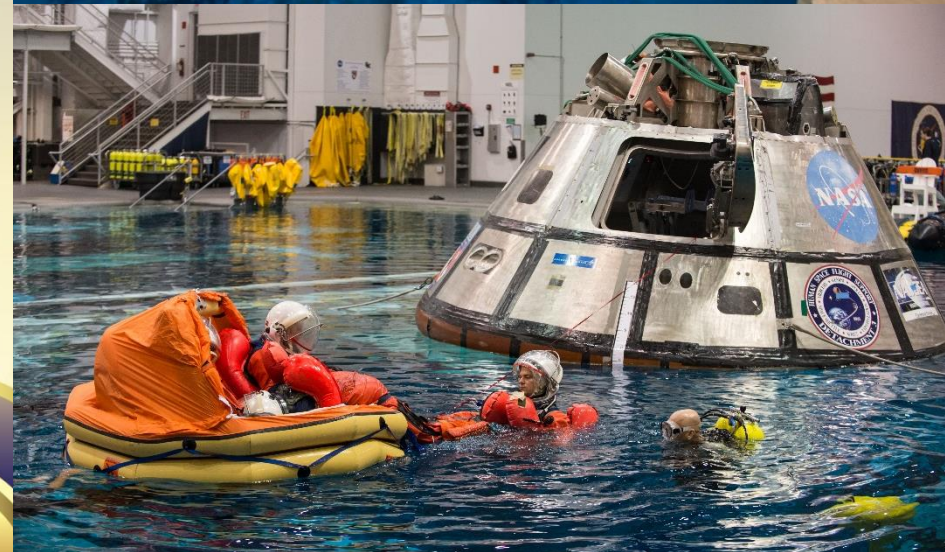
- Resident Working Class ROV
- Complex Structures in Controlled environment
- Proof of Concept Testing
- Design & Development Operations Testing
- Hardware Development Testing
- Hardware Acceptance Testing
- Systems Integration Test (SIT)



Vehicle and Crew Recovery



- Orion Search and Rescue Force Training
- Orion Mockup Development
- Hardware Development & Design
- Buoyancy & Up-righting Systems Verification
- Sea State Model Correlation
- Recovery Procedure Development
- Crew Egress Training



Diving Center of Excellence



- Over 326,000 Safe Dive Hours
- Dive both Nitrox (46% O₂) and Air
- SCUBA & Surface-Supplied Diving
- On-site Hyperbaric Chamber
- Basic to Advanced Operating Environment
- Manufacture and Development of Unique Mockups
 - Ship Hull, Bridge Structure
- External Customer & Agency Personnel can Dive in the Facility



Safety and Survival Training



OPITO Certified Training
Basic Offshore Induction Escape Training (BOSIET)
Tropical Helicopter Underwater Egress Training (THUET)
Further Offshore Emergency Training (FOET)

Questions?



- External Customer Points of Contact

- NASA/Angie Prince angela.r.prince@nasa.gov
- Rothe/Trey Hall trey@rothe.com
- Raytheon/Larry Chase larry.chase-1@nasa.gov

