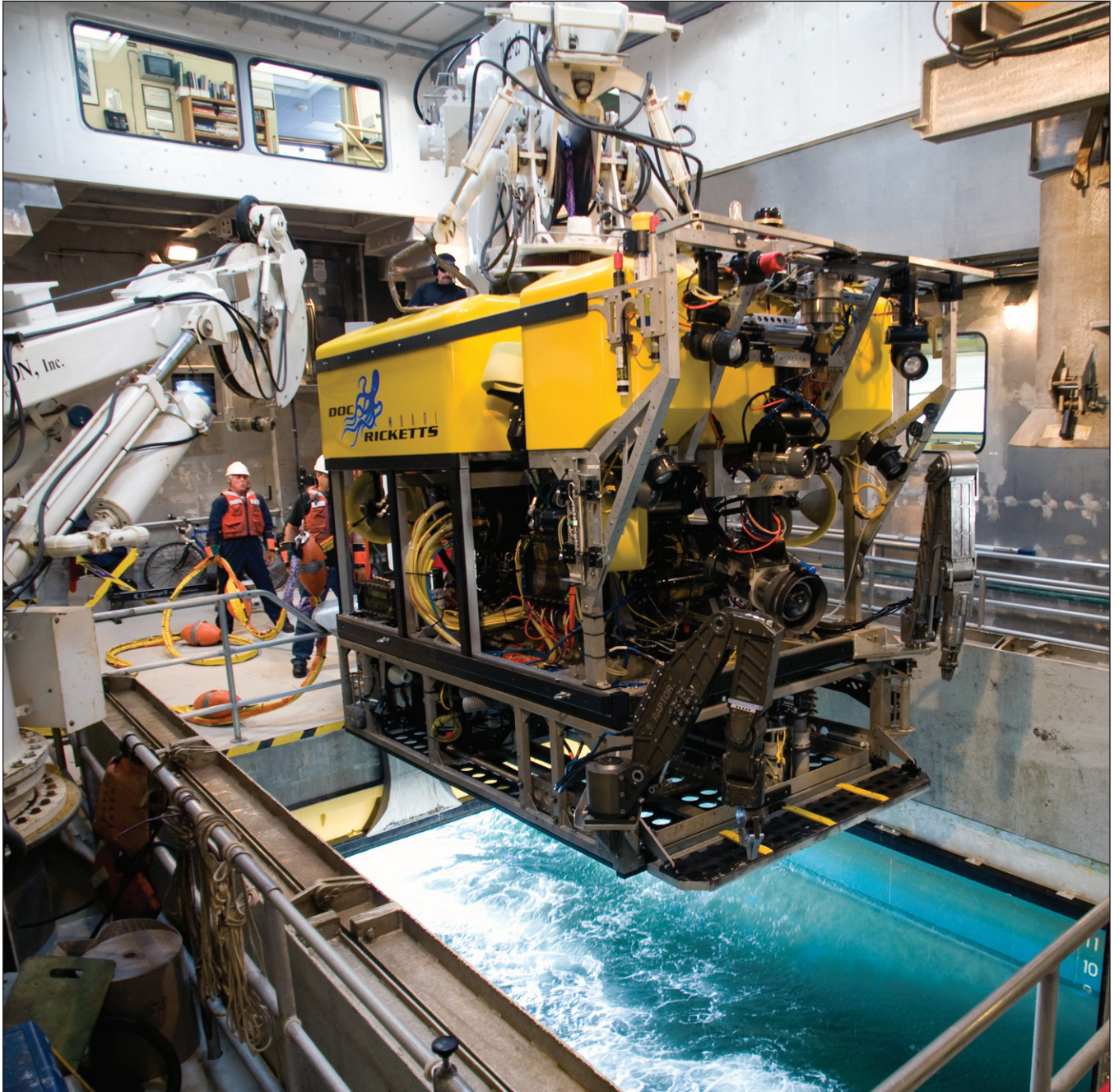


# Chapter 1



# Underwater Vehicles

# Chapter 1: Underwater Vehicles

## Stories From Real Life: Cousteau and the Underwater World

### Chapter Outline

1. Introduction
2. Types of Underwater Vehicles
  - 2.1. Submarines
  - 2.2. Submersibles
  - 2.3. Atmospheric Diving Suits
  - 2.4. Remotely Operated Vehicles (ROVs)
  - 2.5. Autonomous Underwater Vehicles (AUVs)
  - 2.6. Hybrid Underwater Vehicles
3. A Brief History of Undersea Technology
  - 3.1. Diving Bells
  - 3.2. Diving Gear
  - 3.3. Submarines and Related Technologies
  - 3.4. Submersibles for Deep Sea Research
  - 3.5. Robotic Undersea Vehicles
4. Modern-Day Uses of Underwater Vehicles and Technology
  - 4.1. National Defense
  - 4.2. Resource Extraction
  - 4.3. Science
  - 4.4. Telecommunications
  - 4.5. Construction, Inspection, and Maintenance
  - 4.6. Search and Recovery
  - 4.7. Archaeology
  - 4.8. Recreation and Entertainment
  - 4.9. Education
5. A Detailed Look at a Work Class ROV
  - 5.1. Power Source
  - 5.2. Control Room
  - 5.3. Operations Crew
  - 5.4. Deck Cable, Umbilical, and Tether
  - 5.5. Launch and Recovery System (LARS)
  - 5.6. The ROV

### 6. Chapter Summary

### Chapter Learning Outcomes

- Describe the common types and uses of modern underwater vehicles.
- Identify motivating factors and key historic events in the evolution of underwater vehicles.
- Describe some of the major challenges confronted by developers of early underwater vehicles and describe how they were overcome.
- Name and describe the major subsystems of a modern work class ROV.

#### Figure 1.1.cover: MBARI's New Doc Ricketts ROV

*The ROV Doc Ricketts is the newest underwater research vehicle for the Monterey Bay Aquarium Research Institute (MBARI). It is shown here on a 2009 test dive, with launch through the moonpool of the research vessel Western Flyer.*

*The Doc Ricketts replaced the ROV Tiburon, which was built by MBARI staff in 1996. The new ROV features more sophisticated control systems and can handle much heavier loads. The Doc Ricketts was named after local marine biologist Ed Ricketts, who was made famous by John Steinbeck's book, Cannery Row.*

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