

**TRIDENT SUBMARINE DAMAGE CONTROL TRAINER, DEVICE 21C11****TRAINING CATEGORY:**

UNDERSEA OPERATIONS  
(Submarine Damage Control)

**ORIGINATING AGENCY:**

CNET

**SECURITY CLASSIFICATION:**

Device 21C11 is unclassified.

**PURPOSE OF DEVICE:**

To provide a simulated submarine engine room environment in which ship damage in the form of sea water, oil, and high pressure pipeline failures are simulated.

**INTENDED USE:**

To train submarine crew personnel and trainees to respond to submarine damage in the form of water, air and oil pipeline leaks through recognition, communications, decision making, immediate corrective action, and temporary repairs in a controlled classroom environment.

**FUNCTIONAL DESCRIPTION:**

The trainer features mockups of 640 class submarine equipment to provide a realistic engine room environment for training submarine crew personnel in the emergency procedures required to effect ship damage control. The environmental simulation includes typical submarine sounds as well as the sounds of pump operation through the startup, running and shutdown phases. Ship damage will result in flooding the simulated engine room compartment. Submarine type communication and alarm systems, emergency air breathing equipment, portable submersible pumps, and battle lanterns are used by the trainees to effectively react to the damage situation. An upper level above the engine room provides a transition environment and storage for submersible pump connections, emergency breathing equipment, and damage control equipment. A classroom is provided where trainees are given preliminary instructions in damage control and is later used to review and critique the trainees' damage control performance. The damage situation is monitored and controlled from the instructor's console. A closed circuit television system provides a video

## DIRECTORY OF NAVAL TRAINING DEVICES

tape recording of each exercise so that a trainee may reinforce his own learning experience by examining his performance on tape as well as through the actual training exercise. Primary consideration has been given to the safety of all personnel. A water treatment system continuously filters, chlorinates, heats and circulates the water in which the trainees are immersed. An emergency drain system, which can be controlled by either the instructor or a trainee, is provided to rapidly empty the flooded compartment in the event of any emergency. All potentially hazardous electric circuits are kept above the maximum water level of the flooded compartment.

### PHYSICAL INFORMATION:

The trainer is permanently installed at Bangor, WA. The Government provided Get-Wet Compartment is a watertight concrete structure configured to represent a submarine hull. Catwalks, ladders, pump and equipment mock-ups, EAB equipment, battle lanterns, communication equipment, loudspeakers and other equipment complete the illusion of an operating submarine. The Upper Level provides a transition environment and contains hull valve controls, submersible pump connections, EAB equipment, communication equipment, loudspeaker, and damage control lockers. The trainer support equipment generates and supplies treated, heated water under pressure and air under pressure for pipe failures and demonstrations in the Get-Wet Compartment and Upper Level. A control panel in the trainer support area and an instructor console in the control room enable control and surveillance by instructors. Televised presentation and recording permit classroom trainees to view the training exercise and provide records of trainees' damage control performance for critique.

### OPERATION EQUIPMENT:

**Operational submarine communication system components:**

Intercom Set Control C-7174A/WIC-2A(V)  
 Amplifier Loudspeaker (High Power)  
 AM-4762A/WIC-2A(V)  
 Amplifier Loudspeaker (Low Power)  
 AM-4761A/WIC-2A(V), etc. unmodified

### POWER REQUIREMENTS:

277/480 VAC, 3-Phase, 60 Hz., 4-Wire  
 120/208 VAC, 3-Phase, 60 Hz., 4-Wire

### INSTALLATION REQUIREMENTS:

Get-Wet Compartment approx	23' x 10'
Upper Level approx	23' x 14'
Trainer Support approx	40' x 21'
Classroom approx	10' x 13'
Control Room approx	19' x 8'
Water Storage Tank	22,000 gal.

### PUBLICATIONS FURNISHED:

1. Submarine Damage Control Trainers Devices 21C6 and 21C11
2. Maintenance Handbook with Parts Catalog NAVTRADEV P-4434 (U)

### PERSONNEL:

**Instructor:** Chief Petty Officer

**Operator:** Instructor-Operated

**Trainees:** Class of up to Ten (10)

**Trainee Observers:** Determined by size of Classroom

**Maintenance:** A failure mode and effect analysis (FMEA) will be performed as quantitative reliability requirements have not been previously established. The quantitative maintainability requirements are:

MTTR (Mean Time to Repair)	45 minutes
MTTR (Max 90 percentile)	90 minutes

### CONTRACT IDENTIFICATION:

Manufactured by Technology, Inc., Instruments and Controls Div., 3821 Colonel Glenn Highway, Dayton, OH under NAVTRASYS-CEN Contract No. N61339-77-C-0057.

### LOCAL STOCK NUMBER:

6930-LL-C00-4490