

1. Component NAVY	FY 2005 MILITARY CONSTRUCTION PROGRAM	2. Date 13 JAN 2004
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3. Installation and Location/UIC: N00129 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT	4. Project Title MK-10 SUBMARINE ESCAPE TRAINER
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5. Program Element 0805976N	6. Category Code 17135	7. Project Number P462	8. Project Cost (\$000) 17,100
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9. COST ESTIMATES

Item	UM	Quantity	Unit Cost	Cost(\$000)
MK-10 SUBMARINE ESCAPE TRAINER (22,604 SF)	m2	2,100		12120
ESCAPE POOL	LS			(710)
ESCAPE TRAINER TOWER (10,602 SF)	m2	985	3,650.00	(3600)
SUPPORT BUILDING (12,002 SF)	m2	1,115	1,853.00	(2070)
BUILT-IN EQUIPMENT	LS			(5500)
TECHNICAL OPERATING MANUALS	LS			(240)
SUPPORTING FACILITIES				2710
SPECIAL CONSTRUCTION FEATURES	LS			(140)
SPECIAL FOUNDATION FEATURES	LS			(520)
ELECTRICAL UTILITIES	LS			(210)
MECHANICAL UTILITIES	LS			(740)
PAVING AND SITE IMPROVEMENTS	LS			(400)
DEMOLITION	LS			(700)
SUBTOTAL				14830
CONTINGENCY (5%)				740
TOTAL CONTRACT COST				15570
SIOH (6%)				930
SUBTOTAL				16500
DESIGN/BUILD - DESIGN COST				590
TOTAL REQUEST ROUNDED				17090
TOTAL REQUEST				17100

10. Description of Proposed Construction

Insulated masonry brick faced, reinforced concrete structure with a 6.1-meter diameter and 9.1 meter high column of water structure built of reinforced concrete (and built over a Los Angeles Class submarine Logistics Escape Trunk (LET) and a Virginia Class submarine Lock-in/Lock-out Trunk (LOT). Column of water structure includes a 15-person pressure lock at the 4.6-meter level. Includes space for stairs, elevator, toilet, maintenance and repair, recompression chamber, air flasks, air compressors, water filtration/circulation/heating systems, overflow tank, Heating/Ventilation/Air Conditioning (HVAC), humidity control, mechanical, and electrical rooms. Built-in equipment includes the 2-person LET and the 9 to 20 person LOT. Other features include instructors consoles, communications, video cameras and monitors; high level ambient area and underwater lighting; sound attenuation throughout; epoxy protection/coating systems; redundant high and low pressure air systems; 3 person diving bell for observation/rescue; work platform to any depth; lightning protection and emergency generator; automatic detection and re-fill of header tanks; controlled rate of pressurization to equalization; interior utilities such as potable water, fire protection system, sanitary, mechanical (including steam/condensate), communications, fire alarms and detectors, electrical, and mechanical/electrical digital control system. Support building for classrooms, offices

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for instructors, staff, medical personnel, showers, lockers, and relocation of an existing recompression chamber. Support building shall be masonry and steel frame construction. Standard interior finishes for training facilities. Connection to existing training facility for access to other classrooms, offices, storage is required. Demolition of Building #517 is included. Special construction features include retaining walls. Special Foundation features include rock removal. Site work includes rock excavation, retaining walls, piers, engineering fill, pavement, sidewalks, area lighting, and landscaping, water, storm, sanitary, and electrical/communications exterior distribution systems. Sustainable principles will be integrated into the design, development, and construction of the project in accordance with Executive Order 13123 and other laws and Executive Orders.

11. Requirement: 2100m2 **Adequate:** 0m2 **Substandard:** 0m2

PROJECT:

Construct a pressurized escape trainer, for life saving training, utilizing the new MK-10 submarine escape immersion equipment (SEIE) currently entering the fleet.
(Current Mission)

REQUIREMENT:

This project provides an essential facility required to train the entire submarine fleet on employing and maintaining the MK-10 SEIE, instill the knowledge and skills required to escape from a disabled submarine, and survive the environmental elements utilizing the MK-10 SEIE. The Navy's Flag Level Submarine Escape and Rescue Review Group (SERRG) has determined that pressurized escape training is the only viable concept of training for the new MK-10 SEIE introduced to the fleet in FY2000 and scheduled to be on all submarines by FY2005. Commander Submarine Development Squadron 5 has proposed annual training requirements at 4200 students per year (Basic Enlisted Submarine School, Submarine Officers Basic Course, Nuclear Trained Enlisted). The MK-10 SEIE is one component of the entire escape system built into U.S. submarines, which includes escape trunks and hatches, air system components, flood and drain system components, and the individual escape apparatus (previously the Steinke Hood and now the MK-10 SEIE). The MK-10 SEIE is a vast improvement over the Steinke Hood. The MK-10 SEIE provides for escapes at depths to 183 meters, thermal protection, buoyancy during an escape, and survival support while awaiting rescue on the surface. The Steinke Hood does not. The purpose of the MK-10 SEIE is to maximize survival time for the crew of a distressed submarine.

Training for the MK-10 SEIE will require complete revision of existing training to support pressurization-training requirements. Depth of water must be at least 9.1 meters

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<p>for students to experience the significant effects of pressurized conditions, without restricting instructor's time at pressurized depths. Escape trunks must allow vertical escape due to pressurizing the suit for the buoyant ascent. State-of-the-art LET for two persons and a nine to twenty person (Virginia class submarine) LOT are required to train crew members in current escape procedures. Crew members must be capable of donning the MK-10 SEIE, in a dark, cold, and noisy environment; pressurize the MK-10 SEIE; develop proper standing posture while resisting buoyancy forces to avoid damage to the MK-10 SEIE or blocking the escape hatch and preventing others from escaping; leave the escape trunk; breath properly to the surface; all while experiencing the psychological and physiological effects of the escape cycle on the mind and body.</p> <p>The Naval Submarine School Groton (SUBSCOL GROTON) provides basic enlisted submarine school and submarine officer basic training in the "State of the Art" technology and operational requirements for all classes of submarines. High-risk training includes water damage control, fire fighting, as well as submarine escape training.</p> <p>CURRENT SITUATION: Pressurized escape training is not provided. Because the Steinke Hood (a combination hood and life jacket that covers the occupant from the top of his head to the lower portion of the rib cage) has been the only escape apparatus in use until now, escape training at water depths to simulate pressurized conditions has lost favor. The Steinke Hood also leaves a large part of the body exposed to the elements, which contributes to hypothermia and a quick death in cold-water situations.</p> <p>Current training takes place in an out-of-date SSN 637 (Sturgeon) class submarine escape hatch, which requires escape through a horizontal tube into a 2.4-meter deep pool. The SSN 637 escape trunk is not the same design as those that students will encounter in the fleet. The SSN 637 class submarines have been phased out of the Navy. The current SSN 688 (Los Angeles) class submarines, the newer SSN 21 (Seawolf) class, the SSN 774 (Virginia) class submarines currently under construction, as well as the SSBN 726 (Ohio) class Trident submarines use vertical escape hatches.</p> <p>With the current Navy mission to conduct more operations in littoral waters, the opportunities for accidents occurring in these more heavily populated shallow water areas greatly increase. Recent loss of the Russian submarine Kursk attests to the potential for mishap and the need for this level of training. Current wet training for the MK-10 SEIE consist of donning the suit, slipping over the edge of the pool into the water, releasing the life raft and climbing into it. This is completely inconsistent with the philosophy to provide realistic training that promotes confidence in existing submarine</p>				

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escape systems and foster the determination to use this escape system should the need to do so arise. Current training in Water Damage Control and Fire Fighting reflect this philosophy; existing submarine escape training does not.

IMPACT IF NOT PROVIDED:

Officers and enlisted crew members of submarines outfitted with the MK-10 SEIE will not have the knowledge or skills required to escape from a disabled submarine. Crew members will not have the experience of accomplishing mandatory tasks in a highly stressful, disorienting environment throughout the escape cycle, or experience the effect on the human body. Without this training, and developing this critical confidence, crew members will not have the determination to use this escape system to save their lives.

12. Supplemental Data:

A. Estimated Design Data:

1. Status:

(A) Date Design Start	082002
(B) Date Design 35% Complete	092004
(C) Date Design Completed	042005
(D) Percent Completed as of SEPTEMBER 2003	3%
(E) Percent Completed as of JANUARY 2004	3%
(F) Type of Design Contract	Design Build
(G) Parametric Estimate used to develop cost	Yes
(H) Energy study/Life cycle analysis performed	Yes

2. Basis:

(A) Standard or Definitive Design:
(B) Where Design Was Most Recently Used:

3. Total Cost (C) = (A) + (B) = (D) + (E) :	\$580
(A) Production of Plans and Specifications	\$500
(B) All other Design Costs	\$80
(C) Total	\$580
(D) Contract	\$80
(E) In-House	\$500
4. Contract Award	012005
5. Construction Start	042005
6. Construction Complete	022007

B. Equipment associated with this project which will be provided from other appropriations:
NONE

JOINT USE CERTIFICATION:

