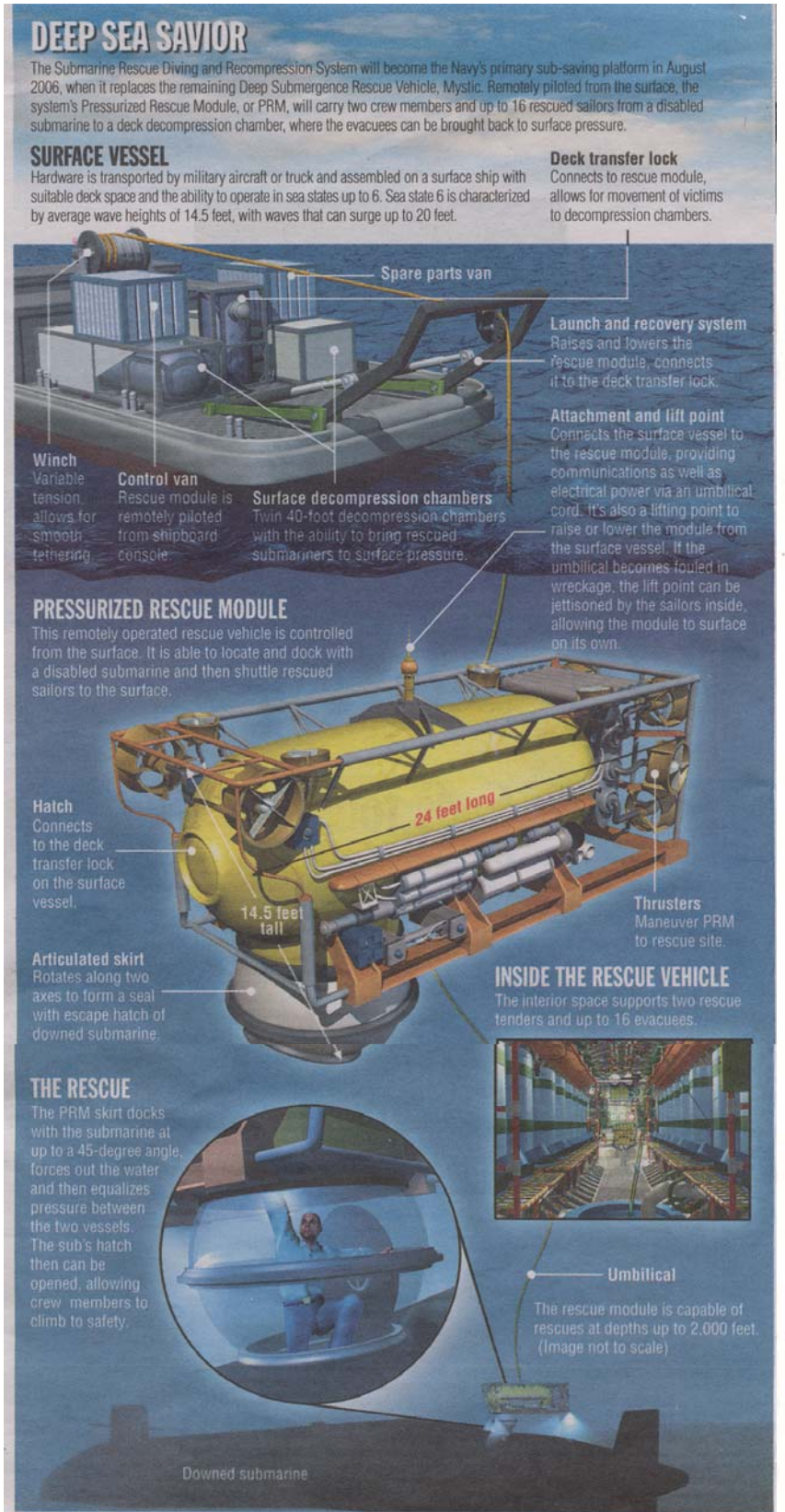

Source: Navy SRDRS Program Management Office HUMAN FIGURE BY JOHN BRETSCHNEIDER CHRIS BROZ, TIMES STAFF

Lifting lives from DOWN UNDER

New sub rescue system will reach new depths to bring sailors back

By Mark D. Faram
TIMES STAFF WRITER

Just after dark on Aug. 26, 1988, the Peruvian submarine Pacocha was steaming on the surface just three miles from home — the port of Callao.

The 312-foot-long diesel submarine, which had served 30 years in the U.S. Navy before being sold to Peru, had just finished a torpedo shoot as part of a readiness exercise. It was heading home, due to dock at 7 p.m.

The evening calm soon was shattered. Lookouts on the sub's bridge sighted the 412-ton Japanese fishing trawler Kiowa-Maru bearing down on them. The vessel was "lit up like a Christmas tree," Pacocha crew members would later recount.

The collision was fast and deadly.

The Kiowa-Maru sliced into the submarine's port-quarter with a steel-reinforced bow normally used for icebreaking. Unaware of their blunder, the trawler's crew kept going and disappeared into the night.

On the Pacocha, the aft compartments quickly flooded and 51 crew members raced forward for their lives.

In less than five minutes, the submarine was on the bottom, 140 feet deep at the keel.

As it sank, 23 sailors miraculously managed to quickly abandon ship and swim to the surface; they would cling to each other for four hours in the frigid 57-degree waters before being rescued. Three eventually would die from exposure. Six other sailors, including the skipper, died almost immediately after the collision.

The fate of the remaining 22 sailors was more horrific. They remained trapped in the sub's forward torpedo compartment, hoping against hope that help would arrive. After 22 hours, they gave up that notion. And when they eventually pressurized their compartment to help their breathing and keep the crushing ocean pressure out, they made a bad situation critically worse.

After a vote was taken and all except one agreed, Lt. Roger Cotrina ordered the submarine's escape hatch opened and four officers, four chiefs and 14 enlisted sailors shot for the surface.

When the pressurized sailors reached the decompressed surface, their bodies were racked and riddled with deadly cramps called "the bends."

One died on the surface and many others suffered permanent disabilities. Most had to leave military service.

The tragedy would become a lesson for navies that maintain submarine rescue equipment. It would change forever the notion of how submarine rescue systems are designed and how rescues themselves are conducted.

And for the U.S. Navy, those notions have finally become reality. In 2006, a revolutionary new Submarine Rescue Diving and Recompression System, or SRDRS, will hit the fleet.

Sub rescue: the next generation

"Those [Pacocha] sailors needed decompression and there wasn't the capability to treat many of them on scene," said Navy Capt. Tom Eccles, the program manager for the SRDRS.

"It was after this accident that ... people really starting to talk about decompression and submarine rescue together" in one system, he said.

"We call it transfer under pressure, or TUP, as the industry calls the ability to rescue sailors from a downed submarine that's been pressurized and transfer them to a decompression chamber on the surface," Eccles said.

That combination of technology is the key difference between the Deep Submergence Rescue Vehicle the Navy uses today, and the new system that's in development.

Eccles said the Navy's ability to decompress sailors from a downed submarine won't be totally ready until sometime in 2008, when the surface decompression chambers are expected to be operational. The new rescue module that's currently being built and tested, however, is expected to be operational by 2006.

"Our first priority is to get the Pressurized Rescue Module in operation and be able to allow the DSRV to leave service," he said.

Saving 16 at a time

The rescue module, 24 feet long and 8 feet wide, will be able to pluck up to 16 sailors at a time from depths up to 2,000 feet.

Unlike the DSRV, the PRM won't have a human pilot on board. It will be operated from the surface by remote control via an umbilical cable that also will provide electrical power.

The actual "driving" will be done by a civilian contractor at a control station on whatever "mother ship" the system is deployed.

The vehicle is a watertight cylinder attached to a rectangular metal cage outfitted with propellers called "thrusters." The thrusters swivel to drive the vehicle forward or to hold its position over a submarine's escape hatch.

Inside, there are seats for 16 rescued submariners and two sailors who will ride the submersible during the rescue and tend to the evacuees.

To help counteract the buoyancy of the air-filled vehicle, water-filled bags will sit in each empty seat to give it weight on the way to the bottom.

"It'll be guided to the submarine by a combination of rescue beacons on the submarine and a [global positioning] navigational system," said Jim Halwachs, a former Navy diving officer who works for OceanSystems, the contractor building the system. "It had to fit on a T-ATF at a minimum, but we're not limited to those ships either."

Like its predecessor, the rescue craft can dock with the escape hatch on any submarine that's sitting at an angle 45 degrees or less, said Eccles' colleague, Cmdr. Bill Brougham.

"That can be side to side or front to back," he said. "Or any combination of the two."

But unlike the DSRV, which uses a fixed skirt under the craft to cover the sub's exit hatch, the new craft will have an "articulated skirt" that Brougham said can swivel to the angle of the hatch, allowing the vehicle to stay level during the rescue.

"It will help the rescuees get into the module," he said. "It will also help keep the craft positioned properly."

Once hooked up to the submarine, the skirt is blown dry with compressed air allowing the sailor "tenders" inside to then equalize the pressure between the rescue module and the inside of the submarine before opening the hatch.

If, like the Pacocha, the inside of the submarine is pressurized, the module will remain at the submarine's inside pressure during the trip back to the surface.

Once back on board the mother ship, the module then can be mated to a transfer lock that will allow the rescued submariners to transfer into one of two parallel decompression chambers that will bring them gradually back to surface conditions in dry comfort.

Here, they also will be under the watchful eyes of specially trained doctors and corpsmen who will monitor for signs of the bends or other decompression sicknesses.

Quick response

In any rescue, time is critical. Rapid-deployment capability will be part of the new system's mission.

Once notified of a downed submarine, the SRDRS will deploy in stages.

All the pieces are modular and can be loaded into heavy transport aircraft, such as the C-5A Galaxy, C-17 Globemaster or C-141 Starlifter, and flown to the port nearest to the downed sub.

At a minimum, the system was designed to fit on the fantail of oceangoing tugs operated by Military Sealift Command ships throughout the world.

"Plans are to be able to begin deployment within 24 hours," Eccles said. "We're looking at 72 hours to be on scene and opening the hatch for the first rescue." □