

EXOSUIT WILL SAVE LIVES

Nuytco develops escape for trapped submariners

Micheal Becker

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Technology that would allow submarine crew members to safely leave downed vessels is under development in North Vancouver.

However, the commercial availability of Phil Nuytten's Exosuit will come too late for the 116 crew members trapped at the bottom of the Barents Sea aboard the *Kursk*, an Oscar-class nuclear-powered cruise missile attack submarine.

On Tuesday, Nuytten, president of Nuytco Research Ltd., was not optimistic about the chances of the Russians surviving their ordeal.

The *Kursk* sank on Sunday. The 500-foot long (152m), 13,900-ton submarine has a double-layer hull. It was designed to withstand torpedo attack. The 3.5-metre separation between the inner and outer hulls on the Oscar provides a reserve buoyancy and improved survivability against conventional torpedoes.

The Oscar was designed primarily to attack aircraft carrier battle groups. The submarine is equipped with two dozen SS-N-19 missiles with a range of 550-kilometres.

The sub had at least two possible escape mechanisms for the crew. Said Nuytten of one of them, "In that class of sub, the conning tower is detachable with the crew in it. If it was not detached then there is some reason for it."

Earlier this week, a Russian admiral said the chances of saving the crew members of the *Kursk* were not high. Said Nuytten, "There's no way that anybody in this part of the world at least would say, 'We don't think they're going to be saved,' if there was any hope. I would guess that if there is any action from the inside the sub that there is only a portion of the crew yet alive.

Nuytten is the originator of a single-atmosphere diving suit called the Newtsuit. The Newtsuit and its patented rotary joints originated with Can-Dive Services Ltd. some 15 years ago. The atmospheric suit tolerates external pressure only. Nuytten has also conceived and patented an articulated mating skirt for use in submarine rescue systems.

Nuytten has come to the conclusion that the Exosuit, a personal pressure suit, is the way to go for submarine crew rescue. His company has a proposal before the Canadian Department of National Defence that would see the navy use Exosuits to support its submarine rescue needs.

Said Nuytten, "We did a feasibility study for them and it indicated that this new form of submarine self-rescue is quite feasible and would solve most of the existing problems, such as the problems facing the Russian sub on the bottom."

In Nuytten's scenario, the suits could be carried on board or delivered in a mini-sub. "We're looking at a suit that will tolerate internal pressure as well as external pressure. The Exosuit, like the exoskeleton of a crab, is designed to protect the wearer from pressure and hold internal pressure.

When a submarine hits bottom and loses power, it takes on the pressure surrounding it. So do the people inside. "If you attempt to take them directly from the sea floor to the surface, the result would be instantaneous death by massive bends."

"A submarine escape suit would have to be able to withstand the full outside pressure but also hold the pressure that you are at inside, and bring it to the surface with you where you can then slowly decant the pressure and decompress," Nuytten said.

The Exosuit is in its pre-production stage. It offers life support of 48-man hours minimum. It will be made of composite fibre and metal. For submarines, it is designed for escape depths of up to 1,200 feet (365 m).

Despite the end of the Cold War, submarines are still used by over 40 nations. Canada has three Oberon-class diesel-electric submarines based in Halifax. The Oberons were built in the United Kingdom by the Royal Navy, and commissioned into the Canadian navy in the mid 1960s. The Oberons will continue to operate until the year 2000.

In 1998, Art Engleton announced that Canada was buying four slightly used, but "state-of-the-art" diesel-electric submarines from the United Kingdom's Ministry of Defence at a cost of about \$750 million. The Upholder submarines replace the Oberon-class submarines and are expected to last for 30 years.

Nuytten said Canada has no submarine rescue capability other than what's called the industry "blow and go."

"It's not a very desirable way to go. You pop through an escape hatch wearing buoyant escape equipment and come to the surface letting the gas out of your lungs as you do to avoid massive embolism. If you are pressured at all, you will die of massive bends on the way up," he said.