

New space suit from the depths of the sea



Can-Dive Services Ltd. president Phil Nuytten adjusts helmet of diving suit.

Suits worn by US astronauts working outside the protective environment of space vehicles will in future be based upon commercial diving technology developed in Canada. And so far it does not look as if the knowledge will cost the US National Aeronautics and Space Administration (NASA) a cent, according to the *Globe and Mail*.

Phil Nuytten, president of the Can-Dive Services Ltd. of Vancouver, British Columbia and holder of the patent of a new type of lightweight, armoured diving suit, says he will allow NASA to adapt the technology incorporated in the system for use in space. The Canadian technology is being offered free of all strings, "simply because I admire what they are doing".

Existing space suits worn by NASA astronauts are unsuited for construction work on space stations or satellites, or for hurried departures from spacecraft, because the joints blow apart at internal pressures of more than four pounds a square inch, Mr. Nuytten said.

An astronaut leaving the 14 psi atmospheric pressure of a space shuttle must breathe pure oxygen for several hours before leaving the ship, to cleanse his bloodstream of nitrogen. Failure to do so could result in the bends, a crippling and sometimes fatal disease.

Faced with a requirement for a new

suit, with joints capable of resisting the higher pressure, NASA turned to the deep diving industry, where the working conditions are, if anything, more hostile than space.

Armoured suit

The Newtsuit, a highly mobile armoured suit now being tested by Can-Dive for use at depths of between 150 and 225 metres, was discovered by NASA researchers to embody joints capable of resisting external pressures of 350 psi. To turn the underwater suit into a spacesuit requires reversal of the joints to withstand internal pressure, according to Mr. Nuytten.

Built from a charcoal-fibre composite, the Newtsuit weighs only 90 kilograms on land (in space or in the sea it "weighs" nothing). Its close relative — the deeper diving and more cumbersome Jim suit, deployed by diving contractors — weighs 550 kilograms.

The Newtsuit and Jim are the latest in a series of single atmosphere systems that are revolutionizing the offshore diving business. Protected from the enormous pressures, divers can now move freely between the surface and depths of more than 300 metres, where, with conventional ambient-pressure systems, compression would take up to 24 hours and decompression would take up to ten days. The

saving in downtime for an oil rig could be between \$200 000 and \$1 million a day.

Deepest submersible

Another new Can-Dive system, scheduled to enter service early next year, is the Deep Rover. The world's deepest diving commercial submersible, it will be capable of descents to 6 000 metres. Sometimes referred to as the underwater helicopter, the tethered machine incorporates a 10-centimetres-thick acrylic or glass bubble, from which an operator controls two advanced tactile feedback, or feeling manipulator, systems.

Although fragile in appearance, compared with the familiar metal diving bell and other armoured systems, Deep Rover will be one of the safest underwater machines and will cost about \$500 000.

IBM boosts computer research

A co-operative agreement between IBM Canada Ltd. and the University of Victoria (UVic) will boost research and development in computer software, one of the most important economic growth areas for the future.

The agreement, providing UVic with state-of-the-art computer hardware and software in the form of an IBM 4300 computer, plus 25 personal computers worth \$1 million, with access to some of IBM's world-class computer experts, is a first between IBM and a Canadian university outside the Toronto area.

The major thrust of the agreement is a research project to develop highly versatile educational software for kindergarten to grade 12 students using "software engineering".

The British Columbia Ministry of Education will provide guidance in developing applications of the research results to the school curriculum. The project also supports a number of other developments under way in Victoria and at UVic.

"Our attempts to develop a computer software industry in Victoria will be strengthened by this agreement," says University of Victoria president Dr. Howard Petch. "We need a critical mass to get the industry off the ground, and our joint efforts will create a strong centre in this field."

Access to IBM personnel may be the most valuable part of the agreement in the long term. IBM's spending on its own research programs topped \$3 billion in 1982, and UVic will gain access through the terms of the agreement.