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## **Submarine Accidents in Asia: Preparing for the Worst**

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*The proliferation of submarines in Asia's relatively confined waters increases the risks of submarine accidents at sea. Many regional navies recognise this issue and are laying the necessary groundwork in case of disaster.*

THE ASIAN undersea environment is likely to witness a surge in underwater traffic within the next decade. There have been significant investments by regional nations to acquire new submarine capabilities or to improve upon their existing fleets. It is expected that at around 80 to 100 new submarines will be procured for the navies of India, Pakistan, China, Taiwan, Japan, South Korea, Vietnam, Malaysia, Singapore, and Indonesia by 2018. Thailand has also expressed a desire to procure submarines.

With the creation of new submarine fleets as well as the planned expansion of current operators in Asia, increasing the numbers of such vessels, the risk of peacetime submarine accidents is likely to grow. Navies acquiring a new submarine capability as well as relatively inexperienced operators will be especially vulnerable to such accidents until their crews acquire familiarity with their submarines and their complex undersea environments. The relatively confined waters of Asia, with its busy shipping routes and difficult underwater terrain, also heighten the probability of a mishap. Submarine rescue services in Asia are likely to be needed more than ever as regional navies attempt to exploit the depths.

### **Recent submarine accidents**

Advances in submarine construction methods, safety systems and other high technology developments have made contemporary submarine operations considerably less hazardous. At the same time, the rigour in the crew selection and training processes, as well as operational doctrine, have also contributed greatly to the survivability of submarine crews today. A recent safety study which examined peacetime submarine disasters from the end of World War II up to 2005 indicated an annual loss ratio of 0.31 per 500 available submarines from 1975 to 2005. This compares favourably to the 0.92 vessels sunk per 500 available submarines in the preceding period of 1946 to 1974.

But while peacetime submarine losses are low, submarine accidents are not uncommon. Recent accidents illustrate the perils of submarine operations. In March 2009, the US Navy USS *Hartford* nuclear submarine was transiting the Strait of Hormuz submerged when it collided with the amphibious transport USS *New Orleans*, injuring 15 of the *Hartford*'s crew and spilling over 25,000 gallons of the fuel stores onboard the *New Orleans*. The incident was reminiscent of a similar development in January 2008, when the USS *Newport News* collided with the Japanese tanker *Mogamigawa* in the very same strait.

Navigation in the depths is also tricky even for experienced submarine operators. Just weeks before the *Hartford-New Orleans* incident, the British nuclear submarine HMS *Vanguard* was on a routine patrol under the Atlantic Ocean when it collided with another submarine, the French navy's *Le Triomphant*.

But perhaps the greatest danger to submarines is equipment failure. A malfunction of one of the many components which make up a submarine could spell disaster for its crew. In 2003, all 70 crewmembers aboard the Chinese *Ming-361* perished after a critical air intake valve failed to open, suffocating them to death. A catastrophic internal explosion sank the Russian *Kursk* along with its 118 crewmembers in August 2000.

### **Rescue systems in Asia**

In the event of a serious underwater mishap the commander of a submarine will attempt to surface the vessel with all haste. What happens when a submarine does sink? Crews are trained to escape a disabled vessel if the water is shallow enough, but such a method is highly dangerous due to the risk of decompression illness and oxygen poisoning. While modern personal escape gear improves survivability during a free ascent to the surface, it remains an absolute last resort for stranded submarine crews.

The remaining option is external assistance through a submersible or a rescue chamber. This docks a disabled submarine and transfers a number of trapped crewmembers to a waiting support ship with medical and evacuation facilities. This method seems to be particularly favoured by the global submarine community, judging by recent heavy investments in high-tech rescue systems and enthusiastic participation in international submarine rescue exercises and fora.

In Asia, at least five regional submarine operators – Singapore, South Korea, India, China, and Japan – possess their own intervention systems of varying readiness. Singapore became the most recent nation to join after successfully taking delivery of a complete rescue system based around the locally manufactured M/V *Swift Rescue* support ship and DSAR-6 rescue submersible. Operators without current rescue capabilities, such as Malaysia and Taiwan, have contracted rescue services from private or military sources.

Regional operators also recognise that international cooperation is vital for submarine rescue. A successful rescue would likely require the prompt assistance of the closest available rescue assets, regardless of the nations which owns those systems. As such, institutions such as the International Submarine Escape and Rescue Liaison Office (ISMERLO) have been set up to coordinate rescue efforts during disasters. Furthermore, regular exercises and fora such as biannual "Pacific Reach" exercises and the Asia-Pacific Submarine Conferences (ASPC) have provided regional submarine operators valuable practice in multinational rescue efforts. These events provide a platform for participants to strive for best practices and common standards in submarine rescue. As a result, responses to future submarine accidents will likely be swifter and more effective than before.

While there has been no actual rescue attempt required in Asia to date, it is still encouraging to witness

the commitment shown by regional submarine operators in ensuring the best chance of survival for their personnel in case of disaster. Hopefully the effectiveness of these rescue systems will never have to be tested in real life.

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