



A flotilla of inshore patrol craft conducts formation exercises outside Colombo Harbour. Reaching speeds in excess of 40 kt, the craft were used to intercept and destroy the LTTE's Sea Tiger cadres and gain control of sea lines of communication.

Jane's, Tim Fish: 1294984

# Sri Lanka learns to counter Sea Tigers' swarm tactics

**Over the course of the protracted conflict with the Liberation Tigers of Tamil Eelam, the Sri Lanka Navy has been transformed from a constabulary service into a potent counter-insurgency force. *Tim Fish* reports**

**A**s Sri Lanka celebrated its Independence Day on 4 February, the Sri Lanka Army was closing in on the last pockets of resistance occupied by fighters from the separatist group Liberation Tigers of Tamil Eelam (LTTE) in their jungle hideaways. After almost three decades of violent conflict, the government appeared confident that victory in the struggle for control of the island was finally within sight.

The LTTE's last major stronghold at Mullaitivu on the northeast coast of Sri

Lanka fell on 25 January, forcing 2,000 rebels to flee into the hinterland. The loss of the town followed the seizure by government forces of the LTTE's self-proclaimed capital, Kilinochchi: the culmination of the steady collapse of the rebels' power base. The LTTE had been gradually losing its influence over Sri Lankan territory following the collapse of a UN-brokered ceasefire agreement in 2006.

By mid-February 2009, four army divisions consisting of 50,000 troops were moving in on the last rebel positions, leaving the

remnants of the LTTE with little hope of survival. Bringing the conflict to a conclusion after 30 years of war would not have been possible without the Sri Lanka Navy (SLN). Throughout this period, the SLN had to evolve from its post-independence ceremonial role into a warfighting force capable of confronting a well-armed opponent possessing expert asymmetric-warfare skills in the maritime domain.

The LTTE's naval wing — known as the Sea Tigers — had just 30 km of coastline left under its control as *JNI* went to press,



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and this was rapidly being closed off by government forces. The area is constantly patrolled by what the SLN terms "defence barriers" of vessels four layers deep, consisting of fast attack craft (FAC), offshore patrol vessels (OPVs), gun boats, and the SLN's Rapid Action Boat Squadron (RABS) and Special Boat Squadron (SBS), eliminating the LTTE's seaward escape route and preventing supplies from reaching the rebels.

This level of proficiency is a significant advance from the SLN's capabilities of the 1950s-70s. The service was created in 1950 to assist fishermen, provide search-and-rescue services, prevent illegal immigration and smuggling, and aid the civil power in a national emergency. However, when the LTTE's Sea Tigers wing was created in 1984, the fledgling insurgent force used small boats to ferry guerilla fighters and equipment across the 16 km-wide strait that separates the Indian state of Tamil Nadu from the Jaffna Peninsula at Sri Lanka's northern tip.

The SLN made attempts to put a halt to these operations and achieved some degree of success using patrol boats. However, the LTTE began using faster craft with more powerful engines, allowing the Sea Tiger cadres to outrun the slower SLN patrols. The Sea Tigers were able to transport large shipments of weapons across the Palk Strait from India to Sri Lanka, forcing the navy to look overseas for a solution.

Vice-Admiral Wasantha Karannagoda, Commander of the SLN, says: "We found that the SLN did not have a suitable boat to meet this threat. We looked around the world and saw the Israeli navy was facing a similar threat and were using Dvora fast attack craft as a response."

Sri Lanka bought its first pair of 47 ton Dvora-class FAC from Israel in early 1984 and another four were purchased in 1986. An upgraded version — the 54 ton Super Dvora Mk I — was ordered from Israeli Aircraft Industries (IAI) in October 1986 and delivered from 1987-88, with a further four Super Dvora Mk II-class FAC delivered in 1995-96.

"We bought [the Dvoras] and first put them into action in the late 1980s, and the Sea Tigers found it very difficult to meet these Israeli-built craft," says Vice-Adm Karannagoda. "But then to counter this, the LTTE developed very high horsepower suicide boats and used swarming tactics to overwhelm the Dvoras, which in our view could not tackle them effectively."

During the 1990s, the LTTE scored some significant hits against the Israeli-built craft, sinking a Dvora-class FAC on 29 August 1995 and a second vessel on 30 March 1996. The Sea Tigers also sank two Super Dvora Mk I-class vessels on 29 August 1993 and again on the same day in 1995. Two Super Dvora Mk II boats were sunk in 2000.

The LTTE also enjoyed success against the SLN's other classes of FAC, sinking a 68 ton United States-built Trinity Marine-class craft, two Shanghai II-class craft (acquired from China in 1991) and three domestically built Colombo-class craft.

However, Sri Lankan security forces were able to recapture the Jaffna Peninsula from the LTTE in 2002 during Operation 'Riviresa', in which the SLN played a major role by providing transport for troops and supplies, and by patrolling the Palk Strait. At the time, the area was cut off from the rest of the government-held territory to the south, which meant that providing naval transport services to the region became a long-term tasking.

### Asymmetric conflict

A ceasefire was negotiated in 2002, lasting for four years, but the Sea Tigers had increased their strength by the time hostilities resumed in 2006.

In the area known as Adam's Bridge, from Pamban to Mannar, the waters are extremely shallow. Shifting sands can reduce depth to less than 1 m and rapid changes can cause problems for large-displacement ships with a deep draft. Some of the SLN's larger patrol craft were unable to access this area of sea safely to intercept the Sea Tigers. Dvora FAC typically need 1.8-2 m water depth.

"During this period, the LTTE improved the suicide concept, developing bigger boats with faster speed, and the Dvoras could not match this," says Vice-Adm Karannagoda.

"When the ceasefire ended, we found the LTTE Sea Tigers were very strong and were coming at us with faster and stronger boats. The Dvoras were finding it very difficult in battles at sea with normal fighting craft against about 15 Sea Tiger craft and another eight to 10 suicide craft, which would sometimes mingle with fishermen."

Identifying the suicide boats in a swarm of Sea Tiger craft was difficult as the former appeared identical to the insurgents' regular

attack boats. SLN crews would have to watch for subtle differences in the behaviour of the craft, monitoring their movements and noting if they were heavier in the water in order to identify them; this was not a skill that could be taught in the classroom.

Suicide boats had to be identified and destroyed swiftly, as given time they would attack in a pack of five or six in an attempt to overwhelm the SLN crews. With a low profile and moving at 35-40 kt, the suicide craft were very difficult to engage with gunfire and some were armoured at the front, meaning small-calibre rounds would ricochet off.

Battles involved numerous small craft and intense close-quarters action between boat crews within a 2 km range. The Sea Tigers' larger craft had four 250 hp petrol outboard motors, while the small boats were equipped with two: if one motor was damaged the other could be used to effect an escape.

Vice-Adm Karannagoda says: "We had to counter this situation so our engineers did some extensive research-and-development [R&D] work and developed three categories of new boats. With this we developed our Small Boats Concept, which was a major turning point in the progress of the war."

The Small Boats Concept effectively copied the Sea Tigers' asymmetric tactics, but on a much larger scale. The SLN started to use large numbers of small high-speed heavily armed inshore patrol craft (IPC) to outnumber the LTTE suicide boats and overwhelm them during battle.

Hundreds of indigenously produced fibreglass IPC have been built in three variants for operations in different sea states. The smallest is the 23 ft-long Arrow; a second class is 14 m long, with both types able



Super Dvora FAC squadrons are the backbone of the SLN fleet. Capable of high speeds and possessing heavier armaments than the IPC flotillas, the Dvoras can conduct surveillance, sea control and warfighting missions.

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**The SLN's IPCs employed infantry-style tactics to confront the Sea Tigers. An IPC flotilla would conceal its numbers by moving in single file and maximise its firepower by attacking in an arrow-head formation.**

to operate in conditions up to Sea State 3. A third variant — a 17 m command-cum-fighting boat — can cope with conditions up to Sea State 4.

"We manufactured these boats day and night, because we needed them quickly, and this is how we were able to tame the Tigers at sea," says Vice-Adm Karannagoda.

## Service transformation

"From a ceremonial navy we transformed ourselves into a fighting navy. Now, whilst performing the earlier constabulary duties, we are also fighting the LTTE and ensuring the safety of sea lines of communication, security of harbours, escorting merchant vessels to the Jaffna Peninsula, transporting troops from Trincomalee, and surveillance of the EEZ [exclusive economic zone] and territorial waters to prevent the LTTE from bringing in arms and ammunition."

The 14 m and 17 m boats are fitted with four 250 hp engines, giving a top speed of 37 kt. Armaments include a double-barrelled 23 mm gun, CIS 40 mm Automatic Grenade Launcher (AGL) acquired from Singapore Technologies Kinetics and two 12.7 mm (.50 calibre) machine guns. The smaller Arrow boats have two 250 hp engines for a top speed of 35 kt and are equipped with a single-barrel 23 mm gun or a .50 calibre gun and an AGL.

The Dvora FAC have been upgraded with 30 mm guns and the SLN has used its own engineers to integrate the Bushmaster M242 25 mm gun on to the deck during sea acceptance and harbour acceptance trials. Bushmaster is built by US-based Alliant Techsystems, which transferred the guns to Sri Lanka under US State Department guidelines.

"In 2007 we put [the Dvoras] into action after integrating [Bushmaster] ourselves in Sri Lanka. It cost us just the price of the guns; we did not have to pay the price of integration," says Vice-Adm Karannagoda.

The advantage that the Dvora FAC has over the smaller IPC is that it is able to remain at sea for longer periods to conduct surveillance missions, as well as engage in fighting to control the sea lines of communication. Because the LTTE boats were hidden and could only operate in short-duration missions, they were able to select the time and place of their attacks, and therefore the SLN had to maintain round-the-clock surveillance so as to be ready for them.

Following the purchase of the FAC from Israel, the SLN began to build its own versions of the craft in Colombo Dockyard. The

majority of new FAC in SLN service have been built at the dockyard and are based on the Israeli Shaldag-class design. Known locally as the Colombo class, it has been produced in four main variants: the Mk I began to be constructed in 1996, the Mk II followed a year later, deliveries of the Mk III started in 2000 and the Mk IV entered service in 2005.

The SLN's remaining classes of FAC originated in China. Five Shanghai II-class craft were built by Quixin Shipyard and commissioned on 11 June 2000, three Hai-zhui-class (Type 062/1G) vessels built by Guijiang Shipyard were transferred in 1995, and two larger versions of the Hai-zhui class were built at Lushun Dockyard and commissioned on 2 March 1998.

A larger version of the Dvora FAC is on order with IAI and the SLN expects to take delivery of six new vessels by the end of 2009. The first two boats are expected to be received by September.

Lieutenant Commander Sanjeeva Kathirarachchi, a former Dvora FAC commander, says it was the Dvora craft that bore the brunt of the Sea Tiger attacks: "The FAC squadrons had a huge role suppressing enemy activities, extensively patrolling the sea. Possessing speeds in excess of 40 kt, the FAC are also used as interceptors.

"We patrolled close to the shore to monitor enemy launching pads and acted as a deterrent to enemy sea movements. The Small Boats Concept for RABS operations was actually developed using extensive experience gained from Dvora operations since the 1980s, when the FAC squadrons took the LTTE suicide boats head on."

Vice-Adm Karannagoda, however, has a slightly different perspective. The Dvoras



**Singapore Technologies Kinetics' Automatic Grenade Launcher has provided the inshore patrol craft with increased firepower to engage Sea Tiger attack craft, particularly suicide boats.**



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“are boats that can take to the sea and are comfortable at sea, whereas the small boats we have built are mission-orientated”, he says. “When we see a confrontation looming, the IPCs are launched and take the Sea Tigers on: that is how we neutralise the enemy totally at sea.”

The new IPCs are built using GRP materials and a boat mould to provide a frame for the fibreglass hull. It takes just 45 days to complete and fully equip a single craft.

At sea, the IPCs operate in groups of four craft. Several groups — totalling 25–30 craft — combine to form IPC squadrons, which are based at strategically important locations around Sri Lanka. The IPC squadrons are organised for rapid-reaction interception operations, because the Sea Tiger cadres have been able to remain hidden until they decide to confront the SLN. The Sea Tigers’ ability — at least until recently — to dictate when a naval action will occur means the SLN has to maintain 24-hour surveillance and remain prepared to intercept any movement.

To maximise the amount of firepower each squadron can bring to a battle, an IPC squadron would speed towards the enemy using strategies that echo infantry tactics: an arrowhead formation is used to expand each boat’s arc of fire in an attack manoeuvre, or boats are arranged in three adjacent columns in single file so as to mask their numbers and increase the SLN’s element of surprise.

### Sea Tiger assets

The enemy consisted of hundreds of Sea Tiger fibreglass boats in four main types: the 45 kt Thrikka, with four crew and a machine gun, has been used to deploy frogmen; the 10 kt Sudai, also armed with a single machine gun, has been used to attack naval craft; the 45 kt Muraj, with a crew of 10 and three machine guns, has also been used for attacks against naval craft, as well as for inserting land-attack teams; and the two-man Idayan was a 45 kt suicide craft fitted with explosives and designed to detonate on impact.

Without harbours or secure launching areas, the LTTE used trailers to launch and recover their craft. Following a mission, the boats would be taken into the trailers and either a tractor or bulldozer would pull them 2–3 km inland from the beach to avoid detection by the Sri Lanka Air Force (SLAF).

Because the separatists would remain hidden for long periods, bringing them to action required a high degree of flexibility and training from the IPC squadrons because they would have to wait for and respond to the sudden deployment of the Sea Tigers. The SLN’s ability to concentrate a force at short notice that was able to confront the Sea Tigers was an important factor in gaining the upper hand in sea battles.

“In a very short period of time, we can shift one whole squadron to another place, so at some locations we have combined [squadron] numbers and have had up to 60

A construction shed at Thakshila naval base, 20 km from Colombo, is able to produce four IPCs simultaneously. The requirement for large numbers of the craft in a short space of time necessitates a turnaround of a little over six weeks.



The five Shanghai II-class (Type 062) were the first Chinese-built craft to enter service with the SLN. *Weeraya* (P 311) is the only FAC remaining from an initial batch of five transferred in 1971 and *Jagatha* (P 315) was transferred from China in 1980. They were followed by five Haizhui-class FAC, which transferred in the 1990s.

boats available in some battle situations,” says Vice-Adm Karannagoda.

Using small, fast and well-armed IPCs to best effect requires highly trained sailors. Two new units were created for this purpose: the SBS and the RABS. The SBS was established on 22 October 2005 with 36 personnel and now numbers 600. It is the SLN’s elite force, possessing high levels of physical fitness and advanced training in both land and sea warfare tactics.

The SBS operates in four- to eight-man teams using the Arrow boats for rapid insertion or black rubber inflatable boats for covert approach from the sea. The teams have expertise in long-range communications and engage primarily in surveillance operations, providing a much-needed source of information on LTTE activities. The teams also undertake reconnaissance and land-strike missions. To date, most SBS operations have been in the eastern provinces, with most land operations in Sampoor.

According to one SBS operative, the completion of basic training takes a year, during which time about 60 per cent of applicants fail to make the grade or drop out. The remainder proceed to advanced training, including paratrooper certification, diving skills and small-boat handling. The SBS is trained by the Indian Marine Commandos (MARCOS), US Green Berets and US Navy SEALs.

RABS personnel are also trained to a high standard and comprise about 400 personnel, mostly those unable to make it through the selection phase for the SBS but still with sufficient levels of physical fitness and the capacity to develop their skills. The SLN uses these volunteers to man the small boats, and develops their expertise in the handling of the IPCs and fighting at sea.

“Creating the two new units made a huge dent in LTTE operations as they were much better trained than previous crews,” says Vice-Adm Karannagoda.



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The 23 ft Arrow boats are the smallest IPCs used by elite SBS teams for covert operations. The arrangement of coloured lights on the mast is used for identification during night operations, at the risk of attracting enemy fire.

All naval officers attend basic training at the Naval and Maritime Academy in Trincomalee, which also provides advanced training for sailors. After basic training, all officers go abroad to Australia, Bangladesh, India, Pakistan, the UK or the US for specialisation in communications, gunnery, hydrography and navigation.

### Floating warehouses

Although the Small Boats Concept proved essential in beating the Sea Tiger battle units along the coast of Sri Lanka and maintaining the sea lines of communication, a significant quantity of military supplies reached the LTTE from overseas, allowing the continuation of the land war against the government.

In order to facilitate this logistics effort, the LTTE possessed an ocean-going fleet of eight ships that were used as floating warehouses on the high seas. These ships were used to stow all types of illegally acquired items such as aircraft, artillery pieces and ammunition, diving equipment, electro-optical devices, night-vision equipment, radar, torpedoes and underwater vehicles, according to Vice-Adm Karannagoda.

The warehouse ships, which had no name, national flag or port of registry, would loiter about 1,500–2,000 km from Sri Lanka and then advance to within 300–400 km of the coast to transfer armaments to LTTE-operated fishing trawlers, which were escorted by the Sea Tiger fighting cadres and suicide boats. The logistic trawlers would ferry the equipment to Sri Lanka.

"This line of support kept them alive for a long time," says Vice-Adm Karannagoda. When the ceasefire ended in 2006, the SLN

began to attack the logistic trawler fleet and destroyed 11 within the year. All of the trawlers that were sunk were located to the northwest of the country in the Gulf of Mannar. However, searching for them among hundreds of civilian vessels proved difficult and a change of tactics was required.

"We developed our intelligence to a high level and we were able to get information as to the location of the LTTE's floating warehouse vessels," says Vice-Adm Karannagoda.

Using human and tactical intelligence, the SLN discovered the locations of eight warehouse ships. The navy deployed its OPVs and destroyed the first warehouse ship on 17 September 2006, 120 n miles east of Sri Lanka. A further three warehouse ships were sunk in early 2007. Operations against the warehouse fleet culminated in a mission that saw an SLN force steam 1,620 n miles southeast, close to the Cocos Islands off the coasts of Australia and Indonesia, to destroy

three ships on 10–11 September 2007 and a fourth ship, which had escaped the initial action, three weeks later on 7 October.

"We went near to Australian waters and whacked the last four vessels," says Vice-Adm Karannagoda. "Yet we are not a big navy; we had to improvise and use innovation and ingenuity to get our job done. The SLN does not possess any frigate-sized ships, so we used offshore patrol vessels and old tankers, merchant vessels and fishing trawlers as support vessels."

The SLN has three OPVs: *Sayura*, a 1,890 ton Sukanya-class vessel that was transferred from India and recommissioned on 9 December 2000; *Samudura* (ex-USS *Courageous*), a 1,129 ton helicopter-capable Reliance-class OPV that was transferred from the US Coast Guard on 24 June 2004; and the ageing *Jayasagara*, a 330 ton OPV built at Colombo Dockyard and commissioned on 9 December 1983. Additional weapons carried included 81 mm mortars, 107 rockets and 105 mm guns.

### Turning point

After the destruction of the warehouse ships, small boats would be lowered into the water for close engagement and for the collection of debris as evidence of the ships' illicit cargos. Because the LTTE vessels were rogue ships lacking identification, the SLN forces could claim entitlement to self-defence at sea to protect themselves when they approached and came under attack.

"[The LTTE] totally lost their supplies and that turned the war," says Vice-Adm Karannagoda. "It was one of the major turning points of the war that has been going on for the last 30 years."

With the Small Boats Concept finding success in sea battles against the Sea Tigers, use of Dvora FAC squadrons to gain control over the sea lines of communication, and deployment of OPVs to attack warehouse ships, the LTTE was unable to maintain dominance at sea. The number of recorded SLN contacts with the Sea Tigers in the post-ceasefire period from 2006–08 declined dramatically. In 2006, the SLN had 21 encounters with the Sea Tigers, with up to 30 craft on each side engaged in battles lasting up to 14 hours. A year later, the



Eight LTTE warehouse ships were destroyed in 2007 by an improvised force of ocean-going SLN vessels with requisitioned civilian ships for support. Equipped with land weapons and sandbags, the task group steamed more than 3,000 km into the Indian Ocean to sink the floating warehouses.