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Terror boat incident brings India's post-Mumbai Coastal Security Network into focus

Wednesday, January 07, 2015 at 20 : 09


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The 'terror boat' incident off the coast of Gujarat shows that the seaborne option continues to find favour with Pakistan based terrorist networks post 26/11. Shaken out of its stupor by Mumbai 2008, the Government of India (GOI) has since been setting up a coastal surveillance network (CSN) consisting of both static radar and electro-optical sensors at various remote sites under the auspices of the Indian Coast Guard (ICG). While the first phase of this project is now complete with all 46 sites operational, work on Phase-II is currently underway. Progress has also been made in integrating existing CSN sites with other tracking and sensor networks already operational along the Indian coastline. Beyond that however attention needs to be given to developing and deploying systems that can detect threats such as fiberglass semi- submersibles and go fast boats that have very low detectability signatures. Given worldwide trends and India's strengthening coastal defences, non-state actors might just opt to up the ante by using asymmetric innovations in a bid to penetrate India's defences.

The so called Chain of Static Sensors project as CSN is also known, actually traces its origin to the recommendations made by the Group of Ministers constituted after the Kargil conflict for overhauling India's national security system. After much deliberation (read almost a decade) it was decided that the ICG would implement this project by defining project requirements and undertaking a detailed vulnerability 'Gap analysis' in consonance with other stake holders, such as the Director General Lighthouses & Lightships (DGLL), Indian Navy, concerned State Governments etc.

The feasibility study led by the ICG came up with a plan to implement CSN in two phases. Under Phase-I of the network, static sensors would be put up at 46 different locations along the Indian coast, with 36 on the mainland, 6 in the Lakshadweep & Minicoy Islands and 4 in the Andaman & Nicobar Islands. Phase-I, which is now complete, has been tailored to provide surveillance around areas of high sensitivity and traffic density along India's coast line. Near gap free realtime surveillance covering up to 25 nautical miles from the Indian coastline would however be achieved only with Phase-II, when 38 additional remote radar sites would be established as part of the CSN and these would be further complemented by some 8 mobile surveillance units.

As such, the project involves the setting up of frequency diversity radar, electro-optical sensors including CCD day cameras, low light television (LLTV) and thermal imagers, VHF sets and meteorological equipment on lighthouses and masts erected on DGLL land at up to 84 locations under both phases. The data generated by various static sensors would flow over a robust hierarchical network architecture, connecting ICG District Headquarters and Regional Headquarters to Coast Guard Headquarters in New Delhi.

The sensor data generated from this network would be further supplemented with data from the National Automatic Identification System (NAIS). Each site has automatic Identification system (AIS) equipment that enables it to positively identify transponders installed in various Indian vessels under the NAIS scheme. CSN will also be interfaced with the Vessel Traffic Management Systems (VTMS) of major ports, a fishing vessel monitoring system, Long Range Identification and Tracking (LRIT) and the National Command Communication Control and intelligence Network (NC3I) of Indian Navy.

According to the Ministry of Defence (MOD), the NC3I network links 51 Naval and Coast Guard stations, located along the coast and on island territories. The network provides these stations coastal surveillance information obtained from various sensors such as the coastal radar chain of the Indian Coast Guard and automatic tracking systems as well as electro-optical

More about Saurav Jha

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cameras. The network rides on dedicated terrestrial data circuits, as well as, satellite communication, which helps the stations in remote locations to be networked. The recently inaugurated Information Management and Analysis Centre (IMAC), at Gurgaon is the centre where data from various sensors and databases is aggregated, correlated and then disseminated to various stations for enhanced awareness. The software on which the coastal surveillance will be carried out incorporates hi-tech features like data fusion, correlation and decision support features thus facilitating better decision making. The entire NC3I Network has been integrated by Bharat Electronics Limited, Bangalore.

The NC3I network and IMAC are actually part of the National Maritime Domain Awareness (NMDA) project. The NC3I network will function as the communication backbone of NMDA and IMAC will ultimately be rechristened as the NMDA Centre. Indeed, the end goal is essentially to "achieve complete Maritime Domain Awareness (MDA) so that all our (India's) security agencies, state governments and central government have real-time pictures and data of Indian waters'.

Now the sensor suite at each CSN site consists of:

- A 25-nautical-mile-range Terma Scanter 2100 HCP Frequency Diversity radar with a dual antenna for superior performance in monsoon weather,
- An ARGC-2400 active-range gated electro-optic (EO) sensor sourced from Obzerv Technologies with a range of up to 10 nautical miles in "fair weather."
- A R40 Base Station from Saab Transponder Tech which is the main component of a physical AIS shore station as defined by the International Association of Lighthouse Authorities (IALA). Its main purpose is to receive data from and transmit data to AIS transponder equipped vessels, travelling within the coverage area of the Base Station. So basically the R40 is installed either stand-alone or integrated into a network enables a CSN site to interrogate vessels sporting registered transponders.
- A Marine Small Target Tracker that can positively identify vessels carrying class 'A' and 'B' AIS transponders.

NAIS itself is based on a network of 74 lighthouses fitted with the Saab supplied AIS which according to the company "provides real time merchant traffic information and the web server allows access to live data over internet." The NAIS network also has suitable interfaces that facilitate the incorporation of radar, cameras and other sensors which is exactly what is being pursued by integrating it with the emerging CSN. And it has already been integrated with the Gulf of Kachchh (GOK) VTMS network. Ultimately CSN, NAIS and VTMS taken together will give what SAAB is calling a complete operating picture. Incidentally, Elcome Marine Services is SAAB's India partner for this project and has delivered the whole network, very small aperture terminals, leased lines, installation, project management, design, and installation. It will also be maintaining the entire system in association with SAAB. It is further understood that some 21 VTMS sites in the Gulf of Kutch and Khambhat will also be augmented with similar electro-optical equipment as the CSN sites under Phase-II of the project.

Now despite CSN plugging into NAIS and various VTMS sites at ports along the Indian coastline there is concern that it would be able to identify only boats above a certain size. After all more than 2,00,000 small fishing boats operate from our coasts and several of these do not carry any kind of transponder whatsoever that would have otherwise plugged them in with the NAIS, CSN or VTMS. Indeed, it was just such a boat (typically less than 20-25 metres in length) that was used in the suspected terror attempt off the coast of Porbandar. The Mumbai 2008 attackers too came in such a boat.

So even if detected, final identification of friend from foe becomes a major issue for coastal security agencies when tracking very small vessels devoid of transponders. This is one of the reasons why the ICGS Rajratan was sent to physically tag the suspected Pakistani terror boat and investigate it.

It seems that at the moment the ICG and DGLL are also testing at least three different technologies for tagging and monitoring these kinds of small fishing boats. One of the technologies being trialled could involve the widespread use of radio frequency identification devices.

Now even as the question of small boats is being sorted out it is perhaps time that the Indian security set up started thinking beyond simply 'trackable but difficult to identify' targets to ones that are extremely difficult to detect itself.

As the US experience with semi-submersibles, narco-submarines and fiberglass go fast boats being used by drug cartels in the Americas reveals, there are several platforms out there which can be cobbled together by non-state actors for covert operations that are rather difficult to detect by existing sensors such as radar, sonar or infra-red. The erstwhile Liberation of Tamil Tigers Elam (LTTE) actually was pretty proficient in the construction of such vessels and it is believed that some of its "boat builders" may have been hired by South American drug cartels to help design and build such vessels. It would therefore not be a stretch to suggest that this expertise could even flow to various perfidious actors in Pakistan, given that it is known that terrorist organizations in South Asia do collaborate in unexpected ways.

These vessels therefore represent a very complex asymmetric challenge for the defenders. They are made using easily available materials in workshops often in remote and forested locations. Yet they increase the costs of defending disproportionately. It is perhaps time that all concerned stakeholders start brainstorming on ways to defeat such threats before they manifest themselves. Besides refashioning deployment procedures perhaps using new modelling methods, attention will have to be given to garnering enough intelligence about networks that might be involved in the construction of such vessels, in order to neutralize the supply chain and expertise as it were.

Indeed regardless of the technology augmentation that the ICG's CSN represents, at the end of the day, given the sheer numbers of vessels that need to be tracked and the length of our coastline the role of intelligence cannot be highlighted enough. An extension of this would suggest that cultivating fishermen via outreach programs and making them an integral part

work on sustainability issues due for release in late 2015 and tentatively titled The Nexus (Hachette India) explains how the nexus between energy, food and water pushes urbanizing economies towards stagflation. He has also co-authored The Heat and Dust Project (HarperCollins India) with wife Devapriya Roy, chronicling a 16000 km long backpacking trip through India on an extremely tight budget.

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of the CSN is imperative as is the need for multiple agencies to bury petty differences and share information in an actionable manner. Ultimately the real 'soft upgrades' in the security domain lie in getting the social network right as it were. The foiled terror boat attack shows that things may indeed be moving in the right direction for India on this front.

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Raahul Kumar · 3 months ago

I still think technology such as satellites and UAVs are the way to go. We also need to subsidize the installation of transponders in all desi fishing boats. That would mean we would know if it was a Pakistani boat or not and can proceed with confidence.

Helicopters also make more sense to patrol a large area than boats. As for small submarines, it's not obvious how to stop them by any means. We would need underwater drones, which Bharat doesn't have right now. The DRDO will have to produce them.

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