Submarine Acquisitions in South East Asia:

Vietnam Case Study

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Background

In the mid-1980s the Soviet Union agreed to assist Vietnam in the development of an underwater warfare capability. A Vietnamese crew was trained for service on a Project 641 diesel submarine in the Soviet Pacific Fleet and formed part of Submarine Force 196. Mikhail Gorbachev later suspended this program.

In 1997, Vietnam acquired two Yugo-class mini submarines from North Korea. They were berthed in Cam Ranh Bay. After repair and overhaul they were used for diver related training and operations. That same year, after the visit of a Russian Project 636 Kilo-class submarine to Cam Ranh Bay, Vietnam was reported to have raised the possibility of purchasing submarines. It was only in June 2000, however, that Vietnam and Russia reportedly signed a Memorandum of Understanding that included the possible sale of Kilo-class submarines to Vietnam.

In 2000, Vietnam and India signed a Defence Cooperation Agreement that included Indian assistance in training Vietnam People's Army (VPA) Navy personnel including submariners. In October 2002, Vietnam officially asked India to provide training for submariners. Four years later, in May 2006, India announced that it would commence training for VPA naval cadets and officers 'in the very near future.'

During the first quarter of 2008, Vietnam made determined steps to acquire submarines. Vietnam was reported interested in acquiring submarines from Serbia but the deal fell through. In September, during the course of a visit by Vietnam's Minister of National Defence to Moscow, his counterpart announced that Russia was ready to provide the VPA with 'arms and military hardware.' Reports then circulated that Vietnam and Russia signed a letter of intent to purchase six Project 636 MV enhanced Kilo-class or *Varshavyanka*-class submarines to be delivered by 2016. The following month Vietnam's president, Nguyen Minh Triet, visited Moscow and expressed an interest in expanding 'military technical cooperation.' Shortly after it was reported that Russia and Vietnam agreed in principle on the sale of Kilo-class submarines.

A major turning point was reached in 2009. On April 24, Vladimir Aleksandrov, General Director of Admiralteiskie Verfi in St. Petersburg, a subsidiary of the United Shipbuilding Corporation, announced that his company had been identified as executor for a contract for six Improved Kilo-class Project 636 submarines.[1]

[1] It was initially reported the submarines were to be purchased by Venezuela but Rosoboronexport broke contract on April 18.

On April 27, RIA Novosti reported that Rosoboronexport, the sole state agency responsible for the sale of weapons, confirmed negotiations with Vietnam were taking place on the sale of conventional Kilo-class submarines to Vietnam and that an export contract with the VPA Navy would be signed 'in the next few months.'

On December 3, *Vedomosti* confirmed that negotiations on completing the sales contract were proceeding successfully. According to a manager at Rossiyskiye Tekhnologii the contract would include the delivery of the Kilo-subs, crew training and the construction of on-shore basing infrastructure.

Finally, on December 15, during visit by Prime Minister Nguyen Tan Dung to Moscow, the contract for the sale of six *Varshavyanka*-class submarines and related equipment was signed between Rosoboronexport General Director Anatoliy Isaykin and VPA Navy Vice Admiral Nguyen Van Hien. Under the terms of the contract Russia agreed to supply one submarine a year over the next six years. The cost of the submarines was valued at US $2 billion.[2] Russian specialists will be involved in training, outfitting and maintenance programs.

Bob Nugent, a retired U.S. Navy intelligence analyst with twenty-two years of experience, evaluated Vietnam's acquisition of a submarine fleet in late 2009 as follows:

> What does it take for an 'emerging' Navy to make the successful transition from two-dimensional (surface/air) to 3 dimensional force that includes subs? We have observed that it has been a struggle for some SE Asian navies with missions, force structures and funding not unlike those of Vietnam to absorb submarines and produce an effective capacity in doing so. Others seem to have handled the transition quite well…
>
> What I draw from above is that Vietnam has the resources – national and naval – to field a submarine force. It also has the manpower. And the mini-sub experience provides a basic foundation for understanding submarine operations and maintenance.
>
> What the data doesn't really help forecast is how well and how quickly Vietnam will make the transition. My "gut instinct" is that their experience will be closer to Indonesia's than Singapore's – but a major unknown is how much Russia will provide them in the way of sustained concrete support over the coming years to help them effectively absorb a force of KILOS.[3]

Russians Return to Cam Ranh Bay Military Port

On March 25, 2010 the Russian Defence Minister announced that Russia would help Vietnam build a submarine base at Cam Ranh Bay. Two years later Russia confirmed it was planning to build a submarine base at Cam Ranh Bay. At the same time, Vietnam announced it would turn to India for full-scale underwater warfare training.[4]

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[2] According to analysts, the cost indicates that the *Varshavyanka*-class submarines will not have the air independent propulsion (AIP) system.

[3] "RE: Vietnam's Navy and force modernization," email to the author, December 18, 2009.

[4] *Southeast Asia Times*, March 29, 2012.

In 2010 it was revealed that the cost of Vietnam's new submarine fleet had risen from US $1.8 billion to US $3.2 billion.[5] The unit cost of construction increased from US $300 million to US $350 million.[6] In addition Vietnam will also pay an additional US $1 billion for armaments, local support infrastructure and other equipment.

Vietnam's Kilo-Class Submarines

Vietnam has purchased six diesel electric advanced Kilo-class submarines or Project 636.3-MV *Varshavyanka*-class Fast Attack Submarines (SSK) designed by the Rubin Central Design Bureau for Marine Engineering. They have improved range, firepower, reliability, speed and sea endurance.

Table 1 Characteristics of the *Varshavyanka*-class Submarine

Characteristics	
Crew	52-57 persons
Length	73.8 metres
Width	9.9 metres
Surface displacement	2,300-2,350 tons
Draft	6.2 metres
Diving Depth	300-350 metres
Surface speed/range	20 knots/9,650 km
Under water speed/range	5 km per hour/700 km
Endurance	45 days
Range	9,650 km
Armament	Torpedoes, mines, missiles

The *Varshavyanka*-class submarines have been dubbed the 'black hole' by the U.S. Navy because they are one of the quietest diesel-electric submarine classes in the world. Their acoustic characteristics include: improved stealth through removal of flooding ports and treating the hull with multilayer anechoic rubber tiles; fitting on casings and fins absorb sonar sound waves of active sonar thus results in reduction and distortion of return signal, and sounds from within submarine reducing the range of detection by passive sonar.

The *Varshavyanka*-class submarines are designed for anti-submarine warfare, anti-shipping and anti-surface ship warfare, patrol and general reconnaissance, and for the defence of naval bases and coastlines. They are capable of operating in relatively shallow water.

[5] Centre for Strategic and Technological Analysis quoted by RIA Novosti, June 3, 2010. Earlier, it was reported that the total cost for the submarines, armaments, equipment, and services was US $4 billion; RIA Novosti, March 23, 2010.

[6] Tim Fish, *Jane's Navy International*, June 9, 2012

The *Varshavyanka*-class submarine is equipped with six 533mm forward tubes capable of firing torpedoes or missiles and/or laying mines. The *Varshavyanka*-class submarine can carry eighteen torpedoes (six torpedoes stored in tubes and twelve on racks) or twenty-four mines (two in each tube and twelve on racks) Two torpedo tubes are designed for firing remote-controlled torpedoes with very high accuracy. Vietnam's subs reportedly will be fitted with new heavyweight torpedoes such as the 53-65 or TEST 76 weapons.

Table 2 Vietnam's Submarine Brigade 189

Number	Name	Status
HQ 182	*Ha Noi*	Construction commenced August 24, 2010. Launched on August 28, 2012. Delivered to Vietnam on December 31, 2013. Commissioned April 2014.
HQ 183	*Ho Chi Minh*	Launched on December 28, 2012. Commenced sea trials on April 28, 2013. Delivered to Vietnam on March 19, 2014. Commissioned April 2014.
HQ 184	*Hai Phong*	Construction began March 14, 2012. Launched August 2013.. Delivered to Vietnam on January 28, 2015. Commissioned August 1, 2015.
HQ 185	*Da Nang*	Launched on December 28, 2014. Sea trials in January 2015. Delivered to Vietnam on June 30, 2015. Commissioned August 1, 2015.
HQ 186	*Khanh Hoa*	Launched December 28, 2014. Completed sea trials on May 28, 2015.
HQ 187	*Ba Ria-Vung Tau*	Construction began May 28, 2014. Scheduled for delivery early 2016.

The *Varshavyanka*-class submarine can carry four or more missiles. According to Oleg Azizov, representative of Rosoboronexport, speaking in July 2011, Vietnam's *Varshavyanka*-class submarines will be equipped with the Novator Klub-S (SS-N 27) cruise missiles.[7] These missiles can be launched underwater from torpedo tubes and have a range of 300 km. Media reports confirmed that all of Vietnam's four *Varshavyanka*-class submarines are armed with Klub-S missiles. It is not clear whether these submarines are equipped with the 3M-54E Klub-S (220 km range) or the 3M-54E1 (range 300 km) anti-ship missiles. In May 2015, it was reported that Vietnam had taken delivery of twenty-eight of fifty anti-ship and land-attack missiles on order from Russia including the 3M-14E Klub (range 300 km) land attack precision strike missile.

In 2015 defence analysts speculated that the final two submarines on order from Russia might be configured to embark Special Forces.

[7] The Klub-S (also Club-S) missile has a range of 300 km with a 400 kg warhead. The missile initially flies at subsonic speed but the warhead separates when it approaches its target flying at 5-10 m above the surface and accelerates to three times the speed of sound.

The *Varshavyanka*-class submarine is also armed with MANPADS Strela-3 (man portable air defence missile system).

Ever since Vietnam took delivery of its first Russian-built enhanced *Kilo* or *Varshavyanka*-class conventional submarines analysts have differed over how quickly Vietnam could absorb these weapons into its navy and create a credible deterrent force to China. For example, Admiral James Goldrick (Royal Australian Navy retired) noted, '(t)he Vietnamese are trying to do something very quickly that no navy in recent times has managed successfully on such a scale from such a limited base… The new boats may have significant numbers of Russians on board for years to come.'[8]

The assessment of whether or not Vietnam can absorb submarines and create a credible deterrent is now becoming clearer with reports by diplomatic observers that Vietnam's submarines are undertaking patrols along Vietnam's coast. More recent press accounts indicate that the Vietnamese submarines have commenced patrols without their Russian advisers. In addition, Vietnamese crews are currently undergoing training at India's *INS Satavahana* submarine center in undersea warfare doctrine and tactics.

The views of defense analysts range from skeptical to cautiously optimistic about Vietnam's ability to develop an effective counter-intervention or area denial naval force to deter China in Vietnam's maritime domain. Lyle Goldstein, a professor at the U.S. Naval War College, for example, has written an analysis of Chinese assessments of Vietnamese military capabilities. Goldstein notes that Chinese defense planners monitor Vietnam's modernization programs 'extremely closely' and have 'ample respect… for Vietnam overall,' including the Vietnamese Air Force.[9]

With regard to Vietnam's *Varshavyanka*-class submarines, Goldstein notes that they can 'deliver lethal blows with either torpedoes or anti-ship cruise missiles.' Nonetheless, Goldstein reports that Chinese analysts have identified two major weaknesses in Vietnam's military strategy: lack of major experience in operating complex weapons systems and 'surveillance, targeting and battle management.' These weaknesses have led Chinese defense officials to conclude, 'that China could prevail in any armed clash' with Vietnam. Goldstein concludes that, 'Vietnam's most promising strategy versus China is the hope that it might have sufficient forces for deterrence, while simultaneously pursuing diplomacy to resolve disputes.'

Zhang Baohui, a security specialist at Lingnan University in Hong Kong, reports that China's military planners are concerned about Vietnam's submarines. 'On a theoretical level,' he notes, 'the Vietnamese are at the point where they could put them to combat

[8] James Goldrick, "Vietnam's Submarine Fleet," *United States Naval Institute Proceedings,* 139(9), September 2013.

[9] Jane Perlez, "Q. and A.: Lyle Goldstein on China and the Vietnamese Military," *The New York Times*, July 5, 2014.

use.'[10]

Brian Benedictus offers cautiously optimistic evaluations of Vietnam's counter-intervention strategy. Benedictus reviews in detail the capabilities of Vietnam's *Varshavyanka*-class submarines. He concludes that these acquisitions, 'potentially allows it more options in its power projection towards claims in the South China Sea.' In his view, Vietnam's *Varshavyanka*-class submarines 'have the potential to disrupt enemy ships in a military conflict in a variety of ways,' particularly as the People's Liberation Army Navy is weak in anti-submarine warfare.

Finally, Benedictus concludes by stressing the importance of the geographic factor. He argues:

> Vietnam is in close proximity to China's Hainan Province, the island which is harbor to the PLAN Southern Pacific Fleet. It is worrisome enough for Beijing to consider that harbored vessels could be easy prey to submarines off the island's shores, if conflict took place; the prospect of Vietnam someday having land-attack capabilities integrated into its submarine fleet would be a serious cause of concern.[11]

Collin Koh, from the S. Rajaratnam School of International Studies in Singapore, argues that Vietnam will use its submarines in area denial operations off its coast and in the Spratly islands once they become fully operational. According to Koh:

> Sea denial means creating a psychological deterrent by making sure a stronger naval rival never really knows where your subs might be. It is classic asymmetric warfare utilized by the weak against the strong and something I think the Vietnamese understand very well. The question is whether they can perfect it in the underwater dimension.[12]

Siemon Wezeman, from the Stockholm International Peace Research Institute, goes further to argue that from the Chinese point of view Vietnam's deterrence is already a reality. According to Wezeman,

> The Vietnamese have changed the whole scenario – they already have two submarines, they have the crews and they appear to have the weapons and their capabilities and experience will be growing from this point. From the point of view of Chinese assumptions, the Vietnamese deterrent is already at a point where it must be very real.[13]

One Vietnamese strategic analyst interviewed by the author argued for a strategy of 'mutually assured destruction.'[14] This strategy would only apply to a situation where relations between China and Vietnam deteriorated to the point of armed conflict. Under this strategy, if armed conflict broke out, Vietnam would give priority to targeting

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[10] Greg Torode, 'Vietnam building deterrent against China in disputed seas with submarines,' Reuters, September 7, 2014.

[11] Brian Benedictus, 'The Wildcard: Vietnam's Naval Modernization and Its Role in the South China Sea,' *Warm Oolong Tea*, February 11, 2013.

[12] Torode, 'Vietnam building deterrent against China in disputed seas with submarines.'

[13] Quoted in Torode, 'Vietnam building deterrent against China in disputed seas with submarines.'

[14] Carl Thayer, 'Vietnam Mulling New Strategies to Deter China,' *The Diplomat*, May 28, 2014. http://thediplomat.com/2014/05/vietnam-mulling-new-strategies-to-deter-china/.

Chinese flagged merchant shipping and oil containers ships operating in the southern extremity of the South China Sea. The Vietnamese strategists argues that the aim of this strategy is not to defeat China but to inflict sufficient damage and psychological uncertainty to cause Lloyd's insurance rates to skyrocket and for foreign investors to panic and take flight.

Conclusion

The commissioning of the first four of six *Varshavyanka*-class submarines into the VPA Navy marks a major milestone in the development of Vietnam's national defence capabilities. Vietnam is now a member of an elite group of Southeast Asian nations that deploy submarines, including Indonesia, Malaysia and Singapore. In order to turn the *Varshavyanka*-class submarines into an effective naval force, Vietnam will have to make great efforts to develop an effective doctrine for their use, recruit sailors to crew them, and absorb new military technology for operating and maintaining the submarines and their weapons systems.

Vietnam's military can now operate in three dimensions - on land, in the air and under the sea. The *Varshavyanka*-class submarine is known for its ability to elude detection. In 2017, when all six submarines are operational they will add a major capability in Vietnam's ability to develop anti-access/area denial capabilities against any country seeking to enter Vietnamese waters with hostile intent. In addition, the *Varshavyanka*-class submarines will add a potent strike capability with their anti-ship and land attack cruise missiles.

Vietnam's emerging submarine fleet will be based at Cam Ranh Bay. The ability of these submarines to deploy stealthily will be put at risk if China permanently stations anti-submarine warfare aircraft on Fiery Cross Reef where a three-kilometer long run-way has been constructed.

When all of Vietnam's current and future arms acquisitions are taken into account it is evident that Vietnam has taken major steps to develop a robust capacity to resist maritime intervention by a hostile power. This has taken the form of developing a counter-intervention strategy that integrates shore-based artillery and missile systems; Su-30 multirole jet fighters; fast attack craft, corvettes and frigates armed with ship-to-ship missiles; and *Varshavyanka*-class submarines. These weapon systems should enable Vietnam to make it extremely costly for China to conduct maritime operations within a 200-300 nautical miles band of water along Vietnam's coast from the Vietnam-China border in the northeast to around Da Nang in central Vietnam if not further south.[15] Additionally, Vietnam also has the capacity to strike China's major naval base near Sanya on Hainan Island and military facilities on Woody Island.

[15]Thayer, 'Vietnam Mulling New Strategies to Deter China.'

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Presentation to Submarine Acquisitions in Southeast Asia: Problems and Prospects

Maritime Security Programme Workshop

Rajaratnam School of International Studies

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November 13, 2015

Long Standing Interest in Acquiring Submarines

- Mid-1980s Submarine Force 196
  - Project 641 submarine
- 1997 acquisition of two Yugo-class mini submarines (coastal patrol)
- June 2000 Russia-Vietnam MOU on possible sale of Kilo-class submarines

M96 Submarine Force (2010)

Truong Sa Mini-Submarine (2014)

Long Standing Interest in Acquiring Submarines

- 2008 Vietnam tries to acquire coastal submarines from Serbia
- September 2008 Vietnam signs Letter of Intent to purchase submarines from Russia
- December 15, 2009 Vietnam Navy and Rosoboronexport sign contract for sale of 6 Project 636.1 *Varshavyanka*-class submarines and related equipment and training

Russian Assistance

- One submarine per year until 2016
- Cost US $300-350 million per unit
- Crew training
- Outfitting
- Armaments
- Maintenance
- On-shore infrastructure

Vietnam's Improved Kilo-class Project 636.3 MK Submarines

- HQ 182 *Ha Noi*
- HQ 183 *Ho Chi Minh*
- HQ 184 *Hai Phong*
- HQ 185 *Da Nang*
- HQ 186 *Khanh Hoa*
- HQ 187 *Ba Ria-Vung Tau*

Characteristics

Table 1 Characteristics of the *Varshavyanka*-class Submarine

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Crew	52-57 persons
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Width	9.9 metres
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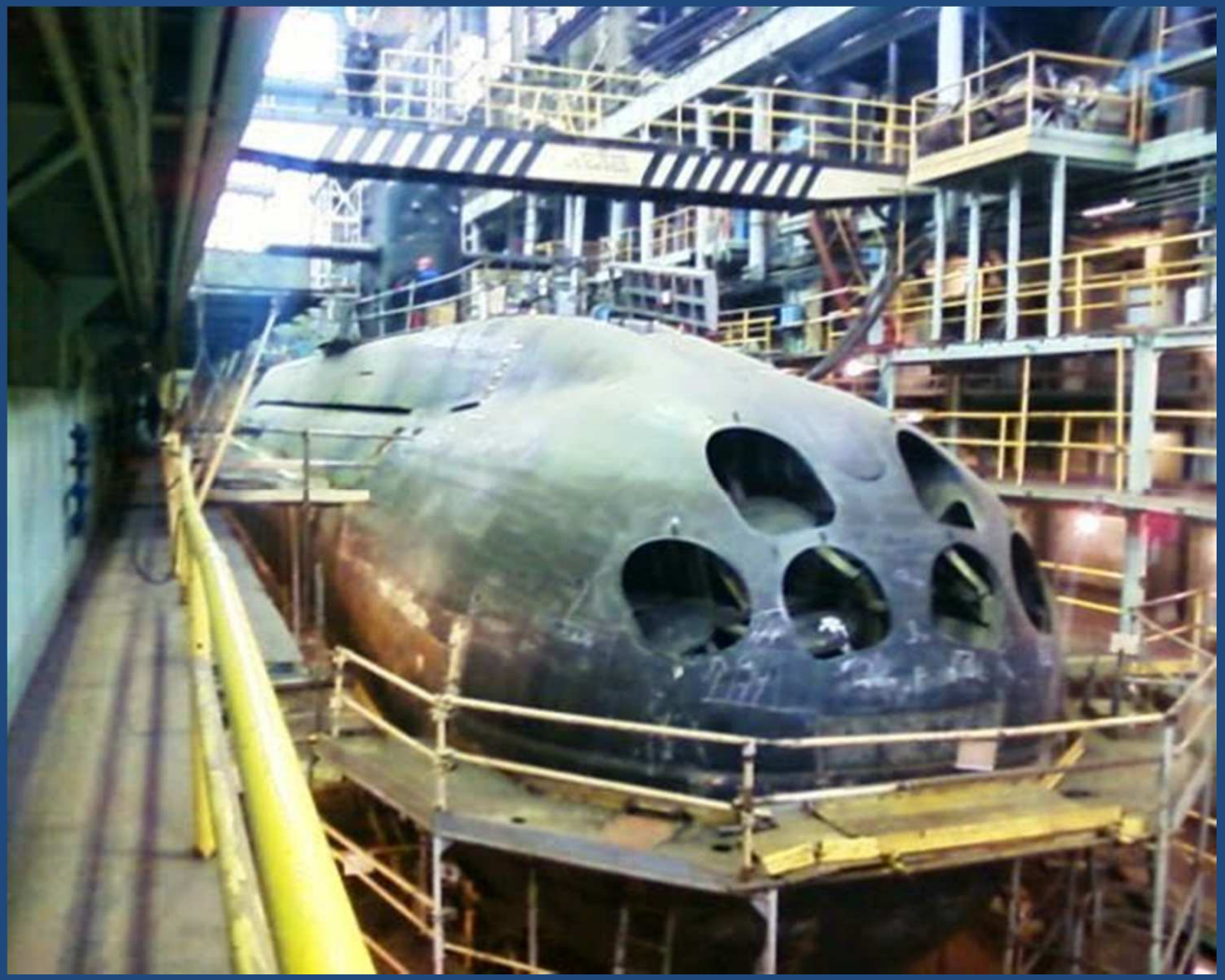
Draft	6.2 metres
Diving Depth	300-350 metres
Surface speed/range	20 knots/9,650 km
Under water speed/range	5 km per hour/700 km
Endurance	45 days
Range	9,650 km
Armament	Torpedoes, mines, missiles

Armaments

- Six 533mm forward tubes
  - 2 tubes fire remotely controlled torpedoes
- 18 Heavy Torpedoes
  - 6 in tubes, 12 in racks
  - Heavy torpedoes 53-65 or TEST 71
- 24 Mines
  - 12 in tubes, 12 in racks
- 4+ Cruise Missiles
  - Klub S/land attack

HQ 186 Khanh Hoa (2014)



Type 53-65 Torpedo

TEST-71M-NK Torpedo

3M-54E Klub Cruise Missile

HQ 182 Hanoi
transported to December 2013

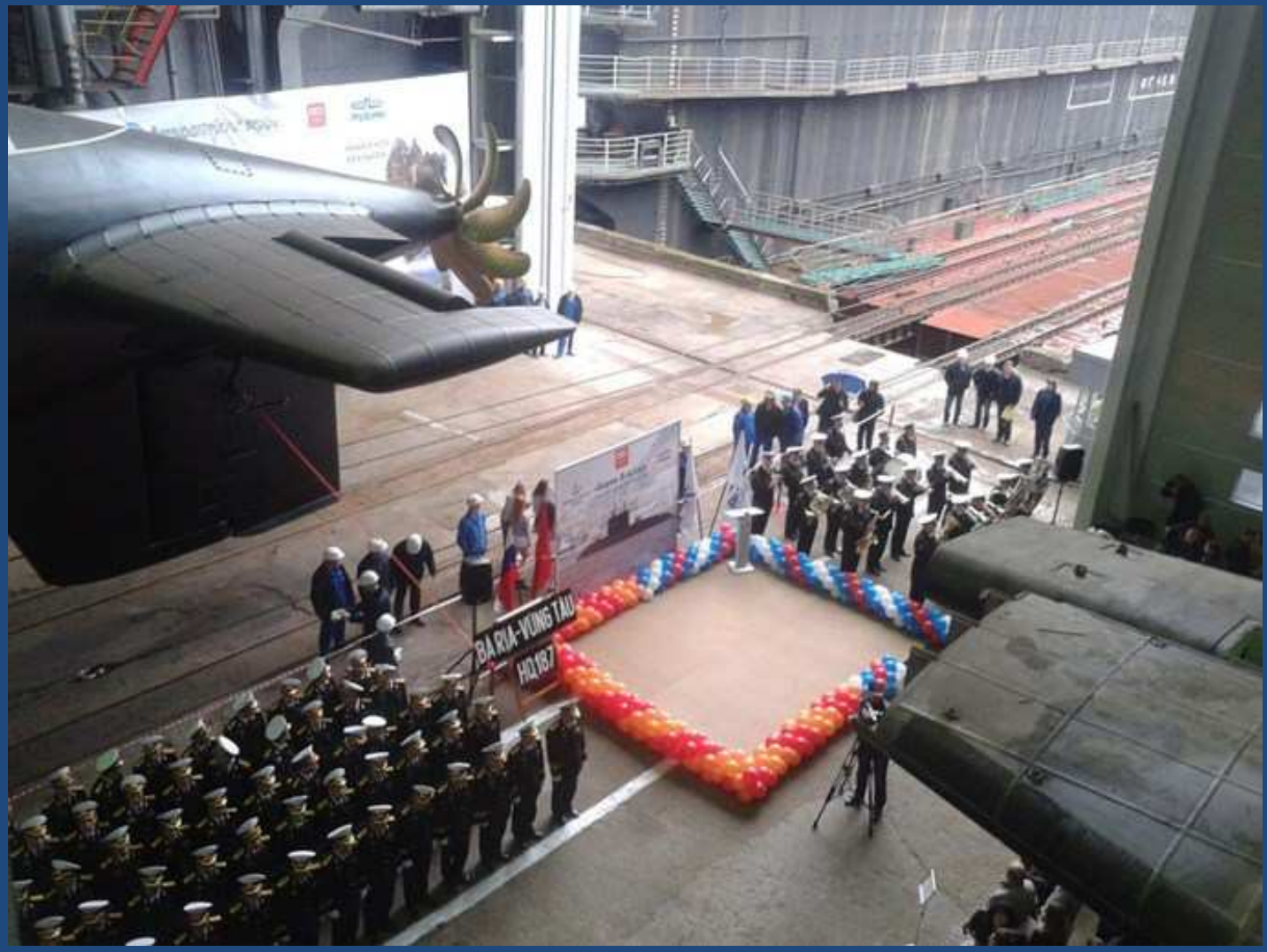
Gradual Force Modernisation

Vietnam took delivery of its first two Kilo-class submarines, HQ 182 *Hanoi* and HQ 183 *Ho Chi Minh City,* in December 2013 and March 2014.

HQ 184 *Hai Phong*

HQ 185 *Da Nang*

HQ 187 *Ba Ria-Vung Tau*



Submarine Brigade 189 Status

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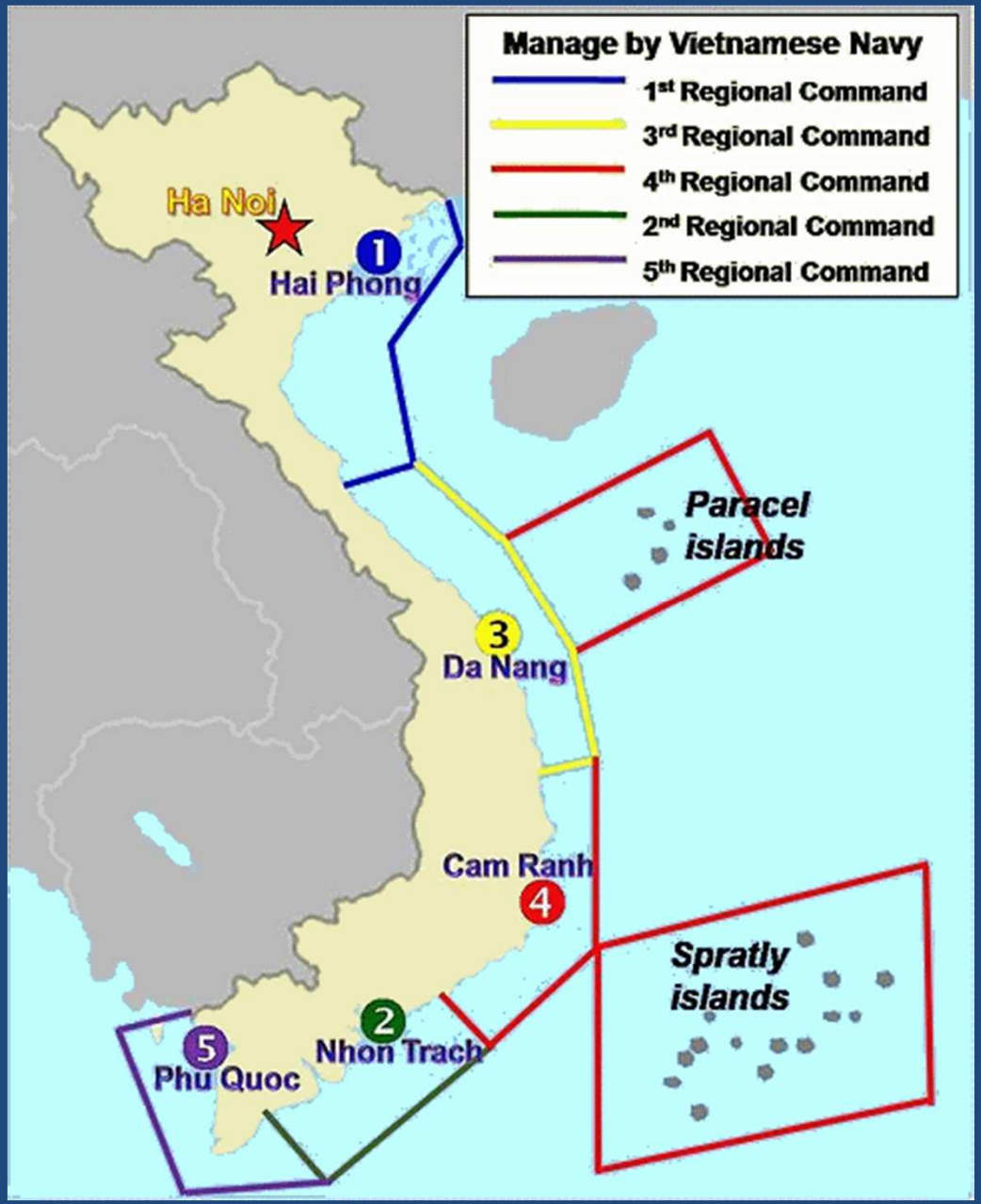
HQ 187	*Ba Ria-Vung Tau*	Construction began May 28, 2014. Scheduled for delivery

Assistance from India

- 2000 India-Vietnam DCA training for Navy
- October 2002 Vietnam asks for Indian assistance in training submariners
- May 2006 India announces it will commence training ‘ in the near future’
- 500 Vietnamese will be trained at India’s *INS Satavahana#* submarine center in undersea warfare doctrine and tactics


Manage by Vietnamese Navy
1st Regional Command
3rd Regional Command
4th Regional Command
2nd Regional Command
5th Regional Command
Ha Noi
1
Hai Phong
Paracel islands
3
Da Nang
Cam Ranh
4
Spratly islands
2
Nhon Trach
5
Phu Quoc

Submarine Crew Training

Assessment of Capability

- Vietnam's subs can 'deliver lethal blows with either torpedoes or anti-ship cruise missiles.'
- Two major weaknesses: lack of major experience in operating complex weapons systems and 'surveillance, targeting and battle management.'
- most promising strategy versus China - have sufficient forces for deterrence, while simultaneously pursuing diplomacy to resolve disputes.
  - Lyle Goldstein , U.S. Navy War College

Assessment of Capability

- ‘It is worrisome enough for Beijing to consider that harbored vessels could be easy prey to submarines off [Hainan’s]shores, if conflict took place; the prospect of Vietnam someday having land-attack capabilities integrated into its submarine fleet would be a serious cause of concern.’
  - Brian Benedictus (2013)

Assessment of Capability

- ‘The Vietnamese have changed the whole scenario… From the point of view of Chinese assumptions, the Vietnamese deterrent is already at a point where it must be very real.’
  - Siemon Wezeman, SIPRI (2014)

‘Mutually Assurred Destruction’

- If armed conflict broke out with China, Vietnam would give priority to targeting Chinese flagged merchant shipping and oil container ships operating in the southern extremity of the South China Sea. The aim of this strategy is not to defeat China but to inflict sufficient damage and psychological uncertainty to cause Lloyd’s insurance rates to skyrocket and for foreign investors to panic and take flight.
  - – Vietnamese civilian strategist

Conclusion

- Acquisition of six *Varshavyanka*-class submarines into the VPA Navy marks a major milestone in the development of Vietnam's national defence capabilities.
- Vietnam's armed forces can operate in three dimensions.

Conclusion

- Vietnam will develop anti-access/area-denial capabilities.
- Six *Varshavyanka*-class submarines add a potent strike capability with anti-ship and land attack cruise missiles.
  - Sanya Naval Base and Woody Island are potential targets

Submarine Capabilities

- Sea patrol
- Reconnaissance
- Intelligence
- Maritime Domain Awareness
- Deterrence
- Anti-surface warfare
- Anti-shipping
- Anti-submarine warfare
- Special Forces
- Support expeditionary operations
- Sea control
- Anti-blockade