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CHINA ANALYSIS

CHINA'S SEA POWER, REACHING OUT TO THE BLUE WATERS

ABOUT

Strategic culture, power balances and the analysis of geopolitical shifts are a long-standing Chinese obsession. Academic institutions, think tanks, journals and web-based debate are growing in number and quality. They work to give China's foreign policies breadth and depth.

China Analysis introduces European audiences to the debates inside China's expert and think-tank world, and helps the European policy community understand how China's leadership thinks about domestic and foreign policy issues. While freedom of expression and information remain restricted in China's media, these published sources and debates are the only available access we have to understand emerging trends within China.

China Analysis mainly draws on Chinese mainland sources, but also monitors content in Chinese-language publications from Hong Kong and Taiwan. Reports from Hong Kong and Taiwan reflect the diversity of Chinese thinking, with occasional news and analysis unpublished in the mainland.

Each issue of China Analysis in English is focused on a specific theme, and presents policy debates which are relevant to Europeans. It is available at www.ecfr.eu. A French version of China Analysis exists since 2005 and can be accessed at www.centreasia.org.

Introduction by François Godement

China has just sent one of its most advanced navy ships, the Xuzhou missile frigate, to the coast of Libya to supervise the evacuation of up to 38,000 Chinese citizens stranded in the unfolding drama. The ship has already served as the centrepiece of an anti-piracy exercise in the Indian Ocean, and Chinese navy ships have made courtesy visits to Mediterranean ports, from Athens to Toulon. But this is the first time that a PLA Navy ship has been deployed on an active mission in the region. Although some Chinese experts cast the Xuzhou's assignment in Libya as China's contribution to an international rescue operation, it is, in fact, very much China's own mission.

China is facing a serious security dilemma in Libya: its economic stakes there may not yet be as valuable as Europe's, but there are three times more Chinese than Europeans working in Libya, building a railroad, working on Sinopec's oil site, and acting as small traders. Absentee landlords do not fare well in Africa or in civil conflicts generally— so Chinese workers seem to have been preyed upon more than Europeans or Americans in the first days of the uprising. Libya is turning into a clear demonstration that any large economic or human presence needs some kind of security policy. Navy ships, and perhaps one day soldiers, must follow migrant workers and mining or infrastructure contracts. The present situation, where former colonial powers and the United States have a monopoly on armed intervention, is nearing its end.

China is not alone. India and Korea are also sending navy ships off the Libyan coast. This new state of affairs creates a dilemma for Europe. Catherine Ashton, the EU's vice-president in charge of foreign affairs and security policy, has just come out with a redefinition of Europe's power and influence: "the EU (...) cannot deploy gunboats or bombers (...). The strength of the EU lies, paradoxically, in its inability to throw its weight around. Its influence flows from the fact that it is disinterested (...) It can be an honest broker - but backed up by diplomacy, aid and great expertise"¹.

Judging from the content of this issue of China Analysis, Europe and China are moving in opposite directions. Even though Chinese experts may recognise that naval power is no longer the source of global dominance that it was in the days of Alfred Mahan, they still see a need for hard power. In this issue, Mathieu Duchâtel presents CASS researcher Xue Li's contention that the USA could never impose a successful naval blockade against China, given the number of commercial ships plying the Pacific and South China Sea – but even so, China must co-operate in hard security to ensure the security of the maritime straits. Duchâtel explains the view of various Chinese authors that the Malacca dilemma is exaggerated. He shows that as long as its navy remains focused on extending its continental defence, China must co-operate with other powers in the Indian Ocean – but when the navy's capabilities increase, Chinese intentions could change. In what must be the most detailed account of China's aircraft carrier programme drawn from public sources, Alexandre Sheldon-Duplaix shows how China has pursued its aim of constructing a carrier in the last decade.

European naval capacity is declining and Europe's leaders are overseeing the continent's reinvention as a soft power relying for protection on commercial interdependence and goodwill. Meanwhile, China is becoming the last "great nation" to expand its blue-water navy in the grand geopolitical tradition started in the eighteenth and nineteenth century. Only one of these approaches can be correct. As disagreements intensify between China and its Asian neighbours on the issues of maritime borders and freedom of navigation, some voices in China's expert community may be questioning the wisdom of taking the high road on naval development. Will Ashton's daring assertion of Europe's "post-imperial partnerships for a post-imperial age" create in the European Union the opposite debate?

¹ Speech in Budapest, February 25, 2011, at <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/11/126&format=HTML&aged=0&language=EN&guiLanguage=en>

1. The PLA Navy in the Indian Ocean

by Mathieu Duchâtel

Sources:

Shi Chunlin, "Securing the shipping lanes in the Indian Ocean and China's strategic options", *Nanya yanjiu jikan*, No. 142, March 2010, pp.1-7.²

Chen Guangwen, "The call of the open sea: towards a deep-water navy", *Jianzai Wuqi – Shipborne Weapons*, June 2010, pp.10-15.³

Tang Fuquan and Han Yi, "The people's navy is progressing along the path laid out by the party", *Zongguo Junshi Kexue – China Military Science*, No. 4, 2009, pp.12-21.⁴

The PLA Navy has rapidly accelerated its modernisation in the past decade. In December 2010, ending years of speculation, the State Oceanic Administration officially acknowledged that China has set up a national aircraft carrier building programme, and the navy is set to acquire one or two aircraft carriers by 2020.⁵ A new base has been constructed at Sanya, in the south of Hainan Island, where the Chinese navy is commissioning two new classes of ballistic missile submarines (SSBN) and attack submarines (SSN). And some analysts suspect that China is seeking to build a "string of pearls" in the Indian Ocean by investing in harbour installations that could later be used as naval bases.⁶ The country is ramping up expenditure on improving equipment, while keeping its long-term strategic intentions under wraps. Along with the evidence of some very nationalistic analyses coming from Chinese policy circles, all this activity has led some experts to conclude that China is building an American-style navy along the lines proposed by Admiral Mahan.⁷ Centred on the aircraft carrier, the Chinese navy of the future would be able to project its power on a global scale, and would conduct missions to safeguard the sea lanes of communication (SLOCs) of its

2 Shi Chunlin is a professor at the Dalian Maritime University (大连海事大学).

3 Chen Guangwen is a military expert who analyses the current strategic situation in many specialist publications.

4 Ranking officers in the PLA navy, Tang Fuquan and Han Li lecture at the Dalian Naval Fleet Institute (大连舰艇学院).

5 "First confirmation of Chinese plan to build an aircraft carrier", *South China Morning Post*, 19 December 2010.

6 See for example Christopher J. Pherson, "String of Pearls: Meeting the challenge of China's rising power across the Asian Littoral", Strategic Studies Institute, June 2006.

7 Alfred Mahan, *The Influence of Sea Power upon History 1660-1783*, (rpt Dover Publications, 1987). In this key work Alfred Mahan develops his thesis on the role of a powerful armed navy and the building of overseas bases in helping to develop a nation's international trade. Chinese analysts often quote Mahan. See for example Ni Lexiong, "Zhongguo Haiquan Zhanlue Xuanze de kunjing", *Tongzhou gongjin*, November 2009, analysed by Yann Dompierre in *China Analysis* no. 27. The thesis of the Chinese navy adopting Mahan's precepts as a development principle has been argued in particular by James Holmes and Toshi Yoshihara in *China's Naval Strategy in the 21st Century: The Turn to Mahan*, (Routledge 2009). See also Holmes and Yoshihara, "A Chinese Turn to Mahan?", *China Brief*, vol. 9, issue 13, 24 June 24 2009.

commercial fleet in the Indian Ocean. It might even take up gunboat diplomacy to protect Chinese interests in countries threatened by instability.

But according to Shi Chunlin, Chen Guangwen, Tang Fuquan, and Han Yi, this conception of the navy's future is unrealistic. The Chinese navy does not have the capability to safeguard Chinese SLOCs in the Indian Ocean, and, for the moment at least, it has more important concerns. China's strategic thinking on the SLOCs is focused mainly on "strategic maritime corridors" (海上战略通道, *haishang zhanlue tongdao*) – the navy is more interested in ensuring military security in the straits passages than in protecting maritime convoys. All avenues, military modernisation included, must be explored. But as long as China's naval capabilities remain inferior to those of the United States and India, international co-operation is the most practical way to safeguard China's interests in the Indian Ocean.

Geopolitical rivalries and China's vulnerabilities

To protect China's foreign trade, and its oil supplies in particular, China has to ensure security in the Indian Ocean. Shi Chunlin says China is contending with both traditional and non-traditional threats in the area, including the "hegemonic intentions" of the US and India, and other destabilising factors like pirate activity.

China believes that India is pursuing a strategy of controlling the Indian Ocean (印度洋控制战略, *yinduoyang kongzhi zhanlue*). India, according to Shi, is trying to achieve military superiority at the entry and exit points of "its" ocean: the Straits of Malacca, Ormuz, and Bal-el-Mandeb, the Suez Canal, the Cape of Good Hope, and the Agalega Archipelago. In 2001, India based a new Far Eastern command centre at Port Blair on the Andaman and Nicobar Islands, which could give it a platform to blockade the Malacca Strait. Shi says this command centre tightly monitors the comings and goings of Chinese merchant shipping and PLA vessels en route to the Gulf of Aden. India has spent \$8 billion since 2005 on constructing a new naval base, INS Kadamba, in Karnataka. In 2006, India rented facilities in northern Madagascar, which since 2008 has been used for signal intelligence, and the Indian navy is renting the two Agelaga islands in the Mauritius to monitor maritime traffic through the Cape of Good Hope. If bilateral relations between India and China should deteriorate, India could put China in a vulnerable position by choosing to play out disagreements in the Indian Ocean. Such a conflict has the potential to become extremely dangerous, because India's new strategy does not include any measures for crisis management or confidence building.

Like India, the US has a strategy for controlling the vital access points (咽喉, *yanhou*) to the Indian Ocean. The US has reinforced its base on Diego Garcia and is reaffirming its status as a naval power in the Indian Ocean. Shi says the American strategic community believes that in the

event of war in the Taiwan Strait, China's vulnerability in the Indian Ocean could be a useful asset – the US navy would be able to harass Chinese ships without endangering its fleet in the waters between the two island chains. Shi points to the 1993 interception in the Indian Ocean of the container ship *Yinhe*, which the US suspected of carrying material for chemical weapons to Iran. Although a US navy inspection concluded that the accusations were unfounded, the US has never apologised to China. Shi says this episode represented a “grave violation of China's sovereignty and international reputation”. He thinks that the Proliferation Security Initiative, launched by the Bush administration in 2003, could give the US a pretext to intercept any ship it likes. China has refused to co-operate with the initiative.

China must also confront non-traditional threats in the Indian Ocean. In March 2003, one of its ships was sunk off Sri Lanka by the Tamil Tigers, killing 17 people; in October 2009, the *Xindehai* was held for ransom in the Gulf of Aden. Local wars could inflict collateral damage on Chinese trade, as happened in the Iran-Iraq war and the first Gulf War. And a sovereign power could potentially block access to the Indian Ocean, just as Egypt blocked the Suez Canal, and the US disrupted Iraqi trade through the Gulf of Ormuz during the first Gulf War. As a result of the rise in non-traditional threats, insurance costs for Chinese ships passing through the Gulf of Aden have seen a fifteen-fold increase, and security costs have also gone up. Changing the route to avoid the Gulf of Aden poses problems: the only alternative route stretches an extra 3,000 nautical miles around the Cape of Good Hope.

Blue-water capabilities and military options

Chinese experts have written extensively on the question of “sea power” (海权, *haiquan*). They tend to agree that protecting China's growing global interests requires both naval modernisation and economic development, and that the country needs an ocean-going “blue-water” fleet (藍水, *lanshui*). In an article published on the 60th anniversary of the founding of the navy, Tang Fuquan and Han Yi argue for a gradual geographical expansion of naval missions. The PLA navy, they say, has over time been making a progressive transition from coastal defence to blue-water activity beyond East Asia.

Chen Guangwen says that if the Chinese navy developed blue-water capabilities, it could carry out both combat and non-combat operations at a considerable distance from its shores and over long periods of time. He cites the order of priorities for China's naval operations: “Independently or jointly with the army and air force, to deter or repel seaborne military intruders, to protect national sovereignty and territorial integrity, to safeguard the country's maritime interests, and to ensure that the State can exercise its power at sea” (行使海上权力, *xingshi haishang quanli*). Chen argues that the idea of protecting the SLOCs has had no significant influence on China's national security strategy

(支配性作用, *zhipaixing zuoyong*). Although the PLA navy has the capabilities necessary to confront crises in the Taiwan Strait, in the South China Sea, or around the Diaoyu/Senkaku Islands, its combat strength is still limited. In the East China Sea and along the sea lanes across the Indian Ocean towards the Middle East, it is inferior to the US, Japanese, and Indian navies.

“Protecting maritime interests” (保护海洋权益, *baohu haiyang quan yi*) is an increasingly important area of operation for the Chinese navy. But blue-water operations are not a priority for the navy – it is instead concerned with asserting Chinese sovereignty and safeguarding the security of its sovereign maritime territories. It does not have the means to effectively maintain international maritime security and protect China's trading interests on the high seas, and instead it sticks to the traditional approach of “circling round the house” (家门口转悠, *jia menkou zhuanyou*). The Chinese navy does possess some capabilities for carrying

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out blue-water operations, as shown by its participation in the anti-piracy operations in the Gulf of Aden. But creating true blue-water capacity is

not just a matter of building enough modern surface ships; Chen says what is needed is a real revolution in China's strategic thinking (战略思维的政变, *zhanlüe siwei de zhengbian*), which is still focused on coastal defence in the near seas.

Chen thinks that if the Chinese navy is to become a blue-water force, it has to train regularly in blue-water conditions. But since the beginning of the cold war, the US has blocked Chinese access to the open sea with a double defensive curtain, the first and the second island chains, so that Chinese submarines are unable to conduct deepwater exercises. Locked in by the first island chain, Chinese submarines have only conducted open sea exercises about three or four times a year since 2000, although Chen notes there has been greater activity in recent years, with six exercises undertaken in 2007 and 12 in 2009. Each exit from domestic waters has provoked alarm in the US and Japan.

Shi Chunlin says the Chinese navy would be hampered in any intervention in the Indian Ocean by the problems of distance and unfamiliarity with the theatres of operation, and that as it stands, the Chinese navy would find it very difficult to mount a swift response to a crisis in the Indian Ocean. Shi recommends building familiarity by significantly increasing the number of peacetime movements into the area through port calls, courtesy visits, training, joint exercises, and setting up bases (部署, *bushu*). China must also champion multilateral security arrangements in the area. Operations

to protect merchant shipping (海军护航, *haijun huhang*) must be carried out and standard operating procedures for these actions must be drawn up. In terms of hardware, on-board helicopters must be a priority in the fight against non-traditional threats – at present the Chinese flotillas in the Gulf of Aden have only two on-board helicopters. China must develop a system of full-time aerial surveillance for its flotillas at sea. Operations against threats like piracy must be based on integrating ship-borne and aerial capabilities and on standardised operating procedures from search to interception (搜索拦截, *sousuo lanjie*).

Shi believes that China must think about building logistical bases (补给基地, *bugei jidi*). Chinese fleets operating in the Gulf of Aden currently have to rotate every three months because of their lack of logistical support: although the ships sometimes make stopovers in foreign ports, in general they have to rely on their own resources. Using foreign ports can be risky, as evidenced by the terrorist attack on the USS Cole in the Yemeni port of Aden, which killed 17 American sailors.

Diplomacy and co-operation

To improve the security of China's SLOCs in the Indian Ocean, Shi recommends a mixture of diplomacy, security co-operation, and strengthening ties with friendly countries to balance the power of the US and India. Shi thinks China needs to be clear about its aims to base maritime security on forging co-operation in the Indian Ocean. At the moment, other countries in the region are nervous about China's strategic aims, and clarifying Chinese priorities should clear up any misunderstandings about the extent of China's ambitions. China should accept as a natural partner any state that has a stake in ensuring the safety of trade routes in the Indian Ocean. Co-operation should be built through regional forums and conferences to enable second track discussions, and through drawing up concrete measures and defining protocols for collaboration. China should advocate for a collective security strategy to safeguard the ports and the points of entry into the Indian Ocean. A centre for sharing information should be built along the lines of the one established to combat piracy in the Malacca Strait, and multilateral crisis management apparatus should be established. An international police force against piracy and terrorism in the Indian Ocean must be instituted. The UN Security Council and the International Maritime Organisation should be asked to play a leading role in multilateral arrangements for the security of the Indian Ocean.

Shi recommends bolstering bilateral relations between China and the Indian Ocean littoral States, in particular Burma, Pakistan, and Sri Lanka. China should also strengthen its partnerships with African countries on the Indian Ocean seaboard, perhaps through building, buying, or renting port facilities in Sudan, Madagascar, the Seychelles, and friendly countries in the Gulf of Aden.

China needs to take up “an advantageous strategic position” (有力的战略态势, *youli de zhanlue taishi*) so as to have many options available in the event of a threat to China's trade routes in the Indian Ocean.

China needs to improve its strategic relations with India and the US. With India, China should foster information sharing, search and rescue operations, and joint planning of shipping lanes in the Indian Ocean. Beijing would not be starting from scratch – in 1996, India and China signed an accord on fighting piracy and smuggling, and in 2003 and 2005 they carried out joint military search and rescue exercises at sea. At the same time, China can use its difficulties with India to improve co-operation with the USA: India does not accept that the USA and China have a stake in the security of the Indian Ocean, so it refuses to include the USA and China in multilateral maritime security arrangements. Shi believes that India's stance explains American support for increased Chinese participation in security operations in the Indian Ocean, and he recommends closer Sino-American discussions on Indian Ocean security, which should highlight US-China “interdependence” (彼此依存, *bici yicun*). China must exploit this situation to reach an understanding with the USA on Indian Ocean security – or else risk that one day, the US may decide to attack Chinese ships at sea.

2. The PLA Navy by 2020

by Alexandre Sheldon-Duplaix

Source:

Jiang Yu, “China’s naval equipment by 2020”, *Jianzai Wuqi – Shipborne Weapons*, July 2010, pp.23-34.⁸

The Chinese navy is replacing its obsolete vessels and extending its capacity to engage in combat on the high seas. By 2020, the navy will have expanded the area covered by its air arm, commissioned the first of two aircraft carriers, and developed the fleet’s anti-submarine and anti-aircraft capabilities. Its nuclear-powered submarines will be able to attack an adversary’s lines of communication, but the fleet will remain focused on defending its national sovereignty in the East and South China Seas, while building capacity to engage the enemy as far away from the mainland as possible.

In the past, Chinese commentators did not comment on PLA equipment programmes, referring to new PLA weaponry only by quoting the specialist Japanese press, in particular *Ships of the World*. But now Chinese publications like *Shipborne Weapons* openly discuss future programmes, and some websites frequently publish photographs of ships under construction, providing apparently credible details on the deployment of the navy’s main surface vessels. The Chinese press has a long way to go before it is as open as, for example, the Japanese media in reporting on national naval capacity. But the press now seems willing to meet public demand for information on the PLA’s capabilities and capacity, so long as it can give credit for the navy’s successes to Chinese industries – and by extension, to the Communist Party.

Jiang Yu writes in *Shipborne Weapons* that China’s naval strategy needs a ten-year development plan: “Unlike the army and air force, whose equipment can be replaced rapidly, the navy needs long-term development planning ... The army and air force requirements can be met within five-year plans ... but the navy has always followed ten-year plans”. The navy made progress in improving its capabilities by importing Western equipment in the 1980s. And since the 1990s, the navy has stopped thinking like a large land-based army (大陆军主义, *dalu jun zhuyi*), an outlook that in the past inhibited both equipment acquisition and tactical planning. It has replaced its traditional defensive operations within “yellow” coastal waters (黄水近海, *huangshui jinhai*) with operations in neighbouring “green water” seas (绿水, *lushui*), prioritising “rapid movement, submarines, and aircraft”. For the last ten years, the navy has taken “a new approach”, helping it to play a decisive role in the Taiwan Strait and the South China Sea. Surface and submarine fleets have been renewed, co-ordination with the fleet air arm is improving, and combat capabilities

have been strengthened. Jiang says that “the period from 2010 to 2020 will be crucial in getting the navy equipped with integrated combat systems (系统配套的作战装备体系, *xitong peitao de zuozhan zhuangbei tixi*) and able to fight on the high seas”.

Even given the progress that has been made, Jiang believes that the navy needs “a real development plan” because “China’s maritime environment is occupied by hostile forces, and the island chains so close to the mainland put great pressure on the country’s naval security”. The destroyers and frigates built in the 1970s did not have the anti-aircraft and anti-submarine capabilities to confront powers like the Soviet Union, Japan, Taiwan, or even Vietnam. Now, the main threat the navy faces is from a “hostile power”, the United States, which could launch an attack on Chinese forces from the inner chain of islands while relying on the outer chain for logistical support. The Chinese navy as it is now could do little in the face of this kind of attack. At the moment, apart from its ports of call and its participation in international operations, the navy’s reach is only as far as the Spratly Islands and the inner island chain. Since the Chinese navy cannot reach beyond the island chains in the short term, it must either surround the sea lanes leading through the chains or occupy some of the islands. This means building integrated offensive and defensive capabilities on the far side of the inner island chain. Ideally, Jiang would like to see the navy able to project its power over a range of 1,000 nautical miles, but even 500 would allow it to extend “the reach of naval defence” (海防的防御从深, *haifang de fangyu congshen*). To achieve this goal, Jiang Yu says China needs to prioritise anti-aircraft and anti-submarine capabilities for surface vessels, whose size must be increased to facilitate operations on the high seas. Alongside this development, China must enhance its training programmes and improve its communications systems.

China has already acquired one aircraft carrier, and Jiang believes that over the next five years, China should prioritise commissioning the former Soviet *Varyag* and establishing standard procedures for its use. After that, China can start the process of constructing its own aircraft carrier. The Chinese carrier air arm will not be able to conduct high intensity combat missions on the high seas, but it will be useful for limited conflicts and deterrence. Jiang thinks that two aircraft carriers by 2020 should be sufficient for China’s needs.

The naval air arm will need to make changes so that its aircraft are few in number, of high quality (精, *jing*), have special capabilities (特, *te*), and are extremely accurate (细, *xi*). It should focus on aircraft suitable for maritime patrols, anti-submarine action, and aerial surveillance, and on shipborne aircraft. Improved co-ordination should eliminate areas of overlap with the regular air force. By 2020, Jiang estimates the naval air arm will have 200 long-range attack craft. The aeronautical industry

⁸ Jiang Yu is probably a pseudonym for a writer specialising in military equipment

will supply the navy with 20 aircraft per year without reducing its supplies to the air force. Priority will be given to concentrating naval resources in the East and South China Seas. In 2020, the Eastern fleet will possess 120 modern aircraft of JH7A, SU30Mk2, J10, and J11 classes. The JH7As and the SU30Mk2s will accompany the H6s on attack missions within a radius of 900 kilometres. The Southern fleet will have about 100 aircraft capable of in-flight refuelling as well as the carrier battle group that can handle intervention in the Spratly Islands. The Northern fleet will leave some combat tasks to the air force, and will focus on logistical support and on setting up a training centre for shipborne air crew.

Destroyers will be essential in protecting China's future aircraft carriers. Jiang Yu says that China has produced two classes of destroyer with five variants: 051B and 051C, and 052A, 052B, and 052C. The website *Feiyang Junshi* (www.fyjs.cn) has announced that the 052C (LUYANG II) has been chosen as the preferred class for new destroyers. The third of the 052C class vessels was launched on 28 November 2010, and according to photographs published on Chinese websites, a fourth is under construction at the new Jiangnan shipyard on Changxi Island.⁹ But the 052C is not the only option China is exploring. Images taken from the CCTV television channel show a new 130mm turret, suggesting that a new class of destroyers could deploy weapons of that calibre, perhaps along the lines of the modified 051C version announced by Jiang Yu for 2020. By then, China will have over 20 modern destroyers in place, compared with only 13 at present. It will then decommission the remaining nine LUDA (051) vessels.

China does not have enough destroyers to meet its needs, so it must continue producing frigates, which can more cheaply carry out the same missions in less exposed areas. Because of the inner island chain, the Chinese navy cannot adopt the European model of relying on deepwater patrols to protect coastal waters. When the JIANGHU (053) class vessels are retired, the navy can use the JIANGWEI class for quick response missions in inshore waters and to protect the fleet. Jiang projects that a further 15 frigates of 054A JIANKAI II class, or modified versions of this type, will be built by 2020 to supplement the ten vessels already in service. According to *Feiyang Junshi*, four additional units could be in service between now and 2015, followed by two units modelled on the 054B. Jiang does not mention the plan for a large corvette (056), which would be less sophisticated and less costly than the JIANGKAI II and could replace the 25 JIANGHUs due for decommissioning.

The navy needs to co-ordinate the activities of the surface fleet and the fleet's air arm within the inshore waters that will be the main theatre of naval operations.

⁹ Fang Zhen, "A personal estimate of the Chinese fleet of destroyers by 2015", 15 November 2010, <http://www.fyjs.cn>. The *Feiyang Junshi* website is an authorised discussion forum dedicated to military matters, and it also publishes articles from specialist journals.

Up to now, Chinese naval vessels have not been able to defend themselves beyond the 200 nautical miles covered by the naval air arm, and coastal defence has been based on the three principles of "fly, dive, move quickly" (飞潜快, *fei, qian, kuai*). But these rules no longer apply: from now on, naval air cover and stealth missile-carrying catamarans will take on most combat operations in inshore areas, replacing units without integrated combat systems. In peacetime, though, these fighting units cannot be used for fishery protection and surveillance missions. So these civilian missions should be transferred to the armed police, which is being provided with vessels decommissioned by the navy, and to civil authorities whose unarmed vessels are better suited to reducing tensions with neighbouring powers.

Between 1995 and 2005, Jiang says, the amphibious fleet expanded rapidly in response to the perceived threat from supporters of Taiwanese independence. But nearly all China's amphibious vessels land their troops directly onto beachheads, a tactic that is now out of date. New amphibious vessels are larger and can land soldiers from the open sea

using helicopters and hovercraft. Jiang says China launched two large vessels for carrying invasion barges (071) in 2005 and 2010. He thinks that by 2020 the navy will have the capacity to transport two divisions to Taiwan, but China would still have to requisition civilian vessels for any large-scale movement.

China's navy by 2020 is likely to remain a powerful regional force with a primary mission of engaging potential enemies on both sides of the inner island chain.

Jiang says that submarines are key to the navy's ability to defend its national territory, since submarines from the US, Japan, South Korea, Australia, and India, are a threat to China's sea lanes. Economic and technical constraints restrict production of nuclear submarines to one unit every two years, so five or six should enter service over the next ten years, of which half would be strategic submarines for nuclear counter-attack, and half would be attack vessels for use on the high seas. These new vessels will supplement China's current complement of two JINs (094), two modern SHANGs (093), an XIA (092), and three obsolete HANs (091). The strategic submarine fleet, like that of France in the past, should be limited to five or six vessels. Nuclear-powered attack submarines could carry out blockade operations beyond the island chains, while in Jiang's opinion, anti-submarine missions should be left to the conventional submarine fleet. Although the conventional fleet is the largest in Asia, it includes obsolete submarines that must be replaced. Jiang believes that by 2020 China will have between 35 and 40 modern conventional submarines in service, which he thinks is enough. By 2015, China will have a submarine with an air independent propulsion unit armed with anti-ship and anti-land cruise missiles

that could neutralise the Japanese, Taiwanese, and South Korean fleets. Jiang does not mention the launch in 2010 of a prototype of a new class of diesel-electric submarines, which is the third class to be built by China in fifteen years, following the thirteen SONGs (039) and the five YUANS (041), and not counting the twelve KILO class which China imported from Russia.

Jiang says China has made progress in developing control, communication, command, and intelligence (C3I) systems. China uses a very low frequency (VLF) radio system for communicating with its submarines. Along with the Loran navigation system, China has its own system, Changhe 1-2/long wave, which can be used for operations up to 1,000 nautical miles into the Pacific and the Indian Ocean. From 2020 onwards, the Chinese C3I will have the use of five geostatic and 30 high orbiting satellites. Chinese C3I is of about the standard of Western C3I in the 1990s, and it enables China to communicate with the fleet on a global scale. China may have a fully integrated global information system by 2020.

Building the navy will be expensive and time consuming. It will require the successful integration of information resources and human input, both in defining maritime strategy and overhauling command structures. And the navy needs industry to develop infrastructure for docking aircraft carriers in both the north and the south of the country. Jiang notes that China's naval industries are currently working on assimilating foreign technology – but he is concerned about the unreliability of the combat systems they produce, their slow rates of production, and the lack of Chinese-made gas turbines. If it can overcome the challenges ahead, China's navy by 2020 is likely to remain a powerful regional force with a primary mission of engaging potential enemies on both sides of the inner island chain.

3. The illusion of a Malacca dilemma

by Mathieu Duchâtel

Source:

Xue Li¹⁰, “An analysis of the Malacca Strait dilemma and China's response”, *Zhongguo Jingyi yu Zhengzhi*, no. 10, October 2010, pp. 117-160.

The Malacca dilemma says that if China's trade route through the Malacca Strait were to be cut off, the country would face a severe energy crisis. Eighty percent of the country's oil supplies come through the Strait, and China shows no signs of reducing its dependence on this route for its imports – even when the Burma/Yunnan oil pipeline starts operations by 2030, its capacity will amount to only 22 million tons per year, so the majority of China's oil would still be transported through the Strait. But even so, researcher Xue Li contends that the Malacca Strait dilemma (马六甲困境, *Maliujia kunjing*) is an illusion.¹¹ Xue says that the argument for the Malacca Strait dilemma is based on three premises: the idea that transport capacity is approaching saturation (运输饱和状态, *yunshu baohe zhuangtai*); the threat of pirate or terrorist attacks in peacetime; and the danger of blockade by the United States in wartime. Xue argues that congestion in the Strait is very unlikely, that non-traditional threats against Chinese merchant vessels are manageable, and that the Strait could potentially be bypassed entirely at no great cost. And trying to solve the dilemma by sending oil over land would in fact make Chinese energy supplies even more vulnerable.

No risk of congestion

Estimating the risk of congestion in the strait is complicated by the fact that reliable figures on the annual tonnage of sea freight through the straits are difficult to come by, says Xue. Unlike the Suez and Panama canals, the straits are international waters and so ships have free passage through them, as laid down in the 1982 UN Convention on the Law of the Sea. The countries bordering these two straits do not levy transit taxes, and ships have no need to report their presence to the littoral states. Statistics on traffic in the straits have improved since 1998, when Singapore, Malaysia, and Indonesia divided the waters of the Strait into nine zones and started requiring ships over 300 tons and more than 30 metres long to register their presence.

¹⁰ Xue Li is a researcher in the department of politics and world economics at the Chinese Academy of Social Sciences.

¹¹ For a Western viewpoint see Ian Storey, “China's Malacca Dilemma”, *China Brief*, vol. 6, issue 8, 12 April 2006. He concludes, “The solution to China's Malacca dilemma consists of three parts: reducing the import dependence through energy efficiencies and harnessing alternative sources of power, investment in the construction of pipelines that bypass the Malacca Strait, and building credible naval forces capable of securing China's SLOCs. Each of these components is expensive, time consuming and problematic. In the meantime, China will have to contend with the dilemmas and insecurities posed by its dependence upon the public goods provided by the U.S. navy”.

A report commissioned by the Singapore port authority said that 149,000 ships passed through the Singapore Strait in 2007, and 91,000 ships passed through the Malacca Strait. That report said that a 75 percent increase in traffic would increase total transit time through the Singapore Strait by only 13 percent, which would have very little effect on transport costs. If traffic in the Malacca strait were to triple, transit time would still be under 20 hours. Chinese academics put the figures for the Malacca Strait and the straits off Singapore at about 200 ships a day, and between 70,000 and 80,000 ships a year. So, Xue says, the two straits are in no danger of congestion – unlike the world's ports, which are at serious risk for congestion based on projections that global seaborne freight will double between 2008 and 2031.

If the Malacca Strait did become congested, its communication channels could be deepened and widened (加深加宽航道, *jiashen jiakuan hangdao*), as was done in the Suez Canal in 1976. There are no technical or political obstacles to this project, and the bordering states would be able to co-fund it – the only argument against it at the moment is the lack of need. Another option would involve bypassing the Straits of Malacca and Singapore via the Sunda Straits between Java and Sumatra, or via the Straits of Lombok between the islands of Bali and Lombok. Ships weighing 200,000 tons can go through the Sunda Strait, and ships up to 500,000 tons can pass through Lombok. The Lombok passage would involve travelling an extra 400 km, three days' travel time at an average speed of 15 knots, which would represent only a marginal cost increase for a super-tanker. Xue cites a Chinese study that shows the price of carrying 60,000 tons of oil by sea from Africa to China is more or less the same as carrying the same amount from South Korea to China. He quotes an interview with an employee of the China Shipping Development Corporation, CSC (中海发展股份有限公司, *Zhonghai fazhan gufen youxian gongsi*), who said that the main cost in shipping transport is fuel, and that at oil's present cost, three extra days' travel would cost around \$300,000 more than going through the Malacca Strait. Going through the Sunda Strait would incur an even smaller extra cost, and a 300,000-ton fuel-carrier from the CSC has already taken that route.

The maximum tonnage for ships in the Malacca Strait is estimated at 200,000 tons, although a Japanese 300,000 ton tanker has passed through the Strait. Xue says the maximum draught for surface vessels is generally reckoned to be 21.5 metres. In July 2010, the three main Chinese tanker companies, the CSC, the China Merchants Energy Shipping Company or CMESC (招商局能源运输股份有限公司, *Zhaoshangju nengyuanyunshu gufen youxian gongsi*), and the China Ocean Shipping Group Company or COSCO (中国远洋运输集团, *Zhongguo yuanyang yunshu jituan*) owned nine, thirteen, and ten oil tankers respectively. Out of these 32 tankers only one, belonging to the CSC, was over 300,000 tons. The majority of these tankers pass through the Malacca Strait. France, Japan, South Korea,

and Taiwan all own super-tankers of more than 400,000 tons, and Japan operates the largest ever super-tanker, the Seawise Giant, which weighs in at 564,800 tons. But China is unlikely to invest in the future in building tankers over 320,000 tons, since it has no ports equipped to deal with these larger vessels.

Non-traditional threats are manageable

Xue Li argues that the risk of piracy, terrorism, and accidents in the Malacca Strait is low. Collisions in the Malacca Strait are proven to have very little effect on the traffic flow. The majority of accidents in the Malacca Strait in recent years took place in the territorial waters of the littoral states, and so are not incidents of piracy as defined in the UN convention. Piracy has declined since 2004, and Xue believes that the Malacca Strait is now a fairly secure

Trying to solve the Malacca dilemma by sending oil over land would in fact make Chinese energy supplies even more vulnerable.

route. The tsunami in December 2004 delivered a hard blow to the pirates, and joint security efforts carried out since 2006 have begun to bear fruit.

Between 1999 and 2004 there were more than 40 acts of piracy every year, reaching a peak of 112 in 2000. But in late 2004, the countries of Asia began to take steps to protect their maritime trade. China, Japan, South Korea, India, and 11 countries in Southeast Asia signed the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia, which set up a real-time Information Sharing Centre (ISC/ReCAAP) in Singapore, where each country maintains a permanent representative. In 2005, Malaysia, Singapore, Indonesia, and Thailand established an aerial patrol system to co-ordinate their surveillance of international waters, allowing them to pursue hostile craft across their areas of jurisdiction.

Xue rules out the possibility of terrorists and pirates working together to blow up a methane or oil tanker where it would block maritime traffic in the Strait. He says that "pirates are rational people who would have no reason for such an action, whereas terrorists, who have definite political objectives, could not achieve them through counter-productive activities that could only lead to reinforcing the coalition against them". Even if terrorists could block passage through the Strait, it would not take long to mount a clearance operation, and in the meantime, Malacca could be bypassed through the Sunda or Lombok.

Malacca and the US threat

If conflict broke out in the Taiwan Strait, the United States could try to deny Chinese foreign trade access to the Malacca Strait. But even if American forces could impose a total blockade, which Xue doubts, the Chinese economy would not be as badly affected as the proponents of the "Malacca

dilemma” maintain, because China’s energy supplies would not be completely cut off. In any case, US policy on Taiwan has changed, and Washington no longer actively supports Taiwanese independence. And, Xue says, Washington’s military options with regard to China are held in check by nuclear deterrence.

The US could in wartime impose a “selective blockade” (选择性封锁, *xuanzhexing fengsuo*) on China without impeding supplies to America’s allies and the neutral countries. But that would mean carrying out surveillance on all shipping not flying an allied flag, and Xue Li says America would have no legal foundation for this kind of action. Besides, China could diversify its navigation paths, which would make it hard for the American navy to track all its ships. Xue thinks an operation like this would be prohibitively costly, when the US could instead simply blockade China’s ports. The ports would present a smaller number of targets for a hostile force. Ports cannot be moved, and oil reserves would have to accumulate there, so they are the real weak points in China’s energy security.

China has a range of options to minimise the risk to its supplies in transit, and it is already implementing some of them. It can build a network of overland pipelines from Central Asia and Russia and a pipeline from Chittagong to Kunming in Yunnan province. It can construct an energy corridor from Karachi in Pakistan, to Xinjiang – curiously, but probably realistically, he does not mention Gwadar as the starting point for this corridor despite its inclusion in China’s feasibility study for the project. China can build either a canal or a pipeline across the Kra Isthmus, the narrow strip of land connecting the Malayan Peninsula to Thailand and Burma. The Burma-Yunnan pipeline is already under construction. China can also explore reinforcing the PLA navy’s blue-water capacity to safeguard China’s sea lanes of communication.

A canal in the Kra Isthmus, Xue says, could shorten the crossing from the Indian Ocean to the Pacific by nearly 1,200 km, or two to five days’ journey at sea. But the construction costs have been estimated at \$25 to \$28 billion over 10 to 15 years, too much for Thailand to afford alone. China, Japan, and South Korea, who would be the main users of such a canal, have the technology and capital for the project, but none of them wants to bear the costs alone, and the three governments do not trust each other enough to share the costs and the risks. There are other obstacles: in southern Thailand, building a canal might strengthen separatist tendencies and increase the risk of violence. Malaysia and Indonesia are opposed to the canal as a threat to their regional importance. Thailand’s efforts to convince Beijing, Tokyo, and Seoul of the need to curtail regional opposition seem to be failing, and Thailand itself is divided on whether the canal should be built. The US also poses a problem: America has troops stationed in Thailand, and Washington has little enthusiasm for the canal. Xue thinks the project is unlikely to get off the ground in the near future. In any

case, given US influence in Thailand, Xue says the canal would not realistically help China circumvent an American blockade of the Malacca Strait.

The Strategic Energy Land Bridge project, approved by Bangkok in February 2004, provides for the construction of a 260 km pipeline capable of carrying 1.5 million barrels a day across the Kra Isthmus in southern Thailand. The Thai government estimates that the pipeline could reduce the cost of carrying Middle Eastern and African oil to China, Japan, and South Korea by \$2 a barrel. The Chinese petrochemical giant Sinochem has already expressed interest in the pipeline to the Thai government. Although construction work was planned to begin in 2008, it has not yet got under way.

Xue contends the pipeline is no more a solution to the Malacca dilemma than the canal project. Oil passing through the pipeline would have to be refined twice, on entering and leaving the pipeline, which would eliminate any potential for cost reduction. Political instability in Thailand would make the pipeline a target for opposition groups or terrorists, and the pipeline could create a new political problem in the Muslim south of the country, where pro-independence groups already complain about the unfair distribution of economic dividends. If war broke out, the stationary pipeline would be an easier target for the US military than would moving ships, and it would be easier for Washington to demand a halt in supplies to China through the pipeline than it would be to organise a blockade on the Malacca Strait. Even in peacetime, the pipeline could carry only a sixth of the oil that passes through the Malacca Strait, and out of that sixth only part would be destined for China. Xue concludes that neither of the Kra Isthmus projects would be much use in solving China’s energy security crisis. The rival pipeline project in northern Malaysia, on which Petrochina is attempting to cooperate with Kuala Lumpur, has similar drawbacks.

The Burma-Yunnan pipeline’s construction was officially inaugurated in June 2010 by Wen Jiabao. Extending 1,100 km, the pipeline enters China through the town of Ruili and links the port of Kyaukpyu to Kunming. Construction of port facilities at Kyaukpyu began in October 2009; new facilities there include berths for ships of 300,000 tons and oil storage tanks capable of holding 600,000 cubic metres. A gas pipeline with capacity of 12 billion cubic metres a year is also being built. Xue says many Chinese analysts think these installations would be important in the event of a Sino-American war over Taiwan, sometimes even arguing that this strategic advantage is the main benefit from China’s investment in the project. But Xue thinks that purported strategic advantage is a fantasy. Since the pipeline will be above ground for most of its length, and will be less than two metres underground for the rest, it would be an easy target for US high precision cruise missiles. And it takes between ten and fifteen days to repair a broken pipeline at each break. So, Chinese pipelines in time of war

would be even more vulnerable than shipping in the Strait.

China could try to secure its imports by building a powerful navy capable of confronting the American fleets. But Xue says China would be foolish to enter into an arms race with an uncertain outcome. The spending required would not be balanced by the gains achieved, because creating security dilemmas for America in the region could undermine China's security by making confrontation more likely.

Co-operate and invest

Xue Li says that even if the Malacca dilemma were real, none of the current proposals for ending it offer viable solutions. But there are steps Beijing could take to improve China's energy security. Xue recommends building new tankers with capacity of 200,000 to 320,000 tons, as well as some tankers of over 320,000 tons to be used for carrying oil at times of high demand, and for storage when demand falls or prices are low. China's dependence on foreign shipping companies must be broken – although China is the second largest consumer of oil in the world, neither PetroChina nor Sinopec have their own tanker fleet. Chinese companies possess only 32 vessels, so 80 percent of China's oil imports are carried by foreign ships. China must also take a more active part in providing security in the Malacca Strait by working together with its neighbours. Xue thinks Japan's soft approach to security provides a useful model: Tokyo finances security equipment and emphasises surveillance and information over interception, which makes Southeast Asian States more willing to work with it. China must combat the idea that it is getting a 'free ride' in the Malacca Strait – and just as the Strait plays a crucial role in ensuring China's energy security, China must take responsibility for maintaining the security of the Strait.

4. Deploying the Varyag and developing aircraft carriers

by Alexandre Sheldon-Duplaix

Sources:

various press publications and blogs cited in the footnotes

China has one aircraft carrier, the Soviet-era *Varyag*, which it bought from Ukraine in 1997 and docked in Dalian in 2002. The refitting the former *Varyag* and the possibility of China building its own aircraft carrier have been major topics of debate in the Chinese press and blogosphere.

On the website MilChina¹², one contributor wonders why China has been so open about refurbishing the former Soviet aircraft carrier *Varyag*, when other projects like the J-10 fighter and the 094 missile-launching submarine have been shrouded in secrecy.¹³ The writer comes up with some potential explanations for the free circulation of photographs of the *Varyag* and of its future J-15 fighter: the announcement of the refitting of the aircraft carrier to serve as a training ship¹⁴ could be aimed at "deceiving the international community" so as to "calm the panic in the surrounding countries and avoid a pointless arms race", while at the same forcing China's neighbours to accept the inevitability of China acquiring aircraft carriers. He thinks the *Varyag's* modernisation will be followed by the construction of an indigenous Chinese aircraft carrier.

Other writers question the official contention that the *Varyag* will function as a training ship. The Russian precedent shows an aircraft carrier can be used for both training and combat. Therefore, it seems unlikely that China would assign its only aircraft carrier to training. Also, China has already built a concrete replica of the *Varyag* in Wuhan. This land-based vessel could be used to train pilots far more cheaply than the *Varyag* could. And the air group on board the *Varyag* should be similar to that of the Russian carrier *Kuznetsov*, with about 20 fighters, 15 helicopters, and 4 training aircraft.

On the potential home base for the *Varyag*, the writer rejects the idea that the carrier should be made part of the northern fleet to protect Beijing and Tianjin, because the land-based aircraft and the anti-ship missiles from the coastal batteries would provide sufficient defence in a conflict with the United States and Japan, or with Japan alone, in the East China Sea. And there would be no advantage in basing the aircraft carrier with the Eastern fleet,

12 The website MilChina.com compiles and analyses articles from specialised military publications, including *Naval and Merchant Ships*. It is also a discussion forum.

13 "Why such a lack of discretion around the refurbishing of the aircraft carrier *Varyag*?" (中国为何高调曝光“瓦良格”航母及其相关工程), 26 May 2010, <http://www.milchina.com/2010/0526/2133.htm>.

14 Alexandre Sheldon-Duplaix, "Chinese aircraft carriers: they're already on the way", China Analysis no. 3, January-February 2006.

because the Taiwanese shoreline is too close – submarines, mines, and missiles would be enough for preventive action. The South China Sea, on the other hand, is too large for land-based aircraft to be able to intervene in time to protect China's sovereignty. Since the only Chinese airbase is to the north, on the Paracel Islands, the *Varyag* should be assigned to the Southern fleet to patrol the South China Sea. The strategic importance of this area is indicated by the fact that the best Chinese destroyers (052B/C) as well as the most modern frigates (054A) are attached to the Southern fleet, and a nuclear submarine base has been built on the island of Hainan. The six KIL0-class submarines under construction in Vietnam would be a threat here, but it could be countered by increasing the number of anti-submarine helicopters in the group.¹⁵

Another writer guesses that the *Varyag* will be deployed "to deter Vietnam" from threatening Chinese sovereignty, since most of China's modern ships, including its anti-aircraft destroyers, are based with the Southern fleet. But the author notes some indications that could justify assigning the *Varyag* to the Northern fleet as originally suggested¹⁶. A Chinese naval force of about ten ships reached the Pacific at the beginning of 2010 by following the shores of Okinawa and Miyako, which caused consternation in Japan. The *Yomiuri Shimbun* of 10 April 2010 wrote that this move was part of a strategy to deny American aircraft carriers access to the area between the first and the second island chains. Some Japanese commentators thought that it was also a warning to Japan, which hosts the US Futenma airbase on Okinawa. The writer says that the Chinese navy conducts shows of strength in the South China Sea, just as in the East China Sea, to demonstrate its ability to break out of the inner island chain and defend its maritime borders.

On the *Varyag's* aircraft complement and weaponry, the Chinese blogs point out the presence of the prototype of the shipborne J-15 fighter on the airfield belonging to the PLA's Shenyang Aircraft Corporation in May 2010.¹⁷ Photographs of the J-15 show a reinforced undercarriage and landing hook. The first generation of shipborne fighter aircraft has been developed for the Chinese navy by Institute 601 of the Chinese Air Ministry. One article notes that initial leaks indicated the fighter would be a stealth aircraft based on research carried out by Institute 601 and the SAC for the J-20 fighter. But to save expense on research and development, China seems to have decided just to copy the Russian Su-33 by studying a prototype (T-10K-3) bought from the

15 "China Kuznetsov-class aircraft carrier should reinforce the Southern Fleet to fight the clowns", (中国瓦良格号战斗航母要加盟南海舰队打小丑), 18 May 2010, <http://www.warchina.com/news/ent/2010-05-18/121550.html>.

16 "Aircraft-career Varyag will become flagship of the North Sea Fleet and deter Vietnam" (北海舰队以航母配置震慑越南 旗舰将内定为瓦良格), MilChina, 25 April 2010, <http://www.milchina.com/2010/0425/430.htm>.

17 "Test-flight for an aircraft of the Shenyang Aircraft Corporation, this must be the J-15" (沈飞不明型号战机首飞(猜想J15)), MilChina, 31 May 2010. <http://www.milchina.com/2010/0531/2293.htm>

Ukraine in 2001. Like the Su-33, the J-15 has duck-wing flaps and a short tail to avoid contact with the flight deck on landing. The jet air intakes are altered from the original. The J-15 appears to have the same radar, the same cockpit layout, and the same WS-10 jet engine as the J-11B. Like the J-11B, the J-15 can fire the PL-8 and PL-12 air-to-air missiles and the YJ-83K anti-ship missile. The article suggests that the J-15 should have the same performance capabilities as the American F/A-18C jet fighter. The prototype of the J-15 had its first test flight with a Chinese WS-10 engine on 31 August 2009. The first take-off from the SAC launch pad reportedly took place on 6 May 2010.¹⁸

Another commentator writes that only two kinds of advanced aircraft for aerial surveillance exist at the moment: the American E2C and the Russian Ka-31, which China has just acquired.¹⁹ The E2C is part of the air fleet on American and French aircraft carriers, and the Ka-31 is deployed on

The *Varyag's* modernisation will be followed by the construction of an indigenous Chinese aircraft carrier.

Russian and Indian carriers. Advanced surveillance aircraft can give a naval force a "view from the mountaintop".

But the American and the Russian versions are not equivalent. The Russian Ka-31 flies at 220 km per hour over a range of 3,500 km and can go for two and a half hours without refuelling. Its radar rotates every ten seconds and covers 150 km for moving aircraft and 520 km for ships. But the American E2 can detect hostile aircraft or ships at 600 km. The writer believes that China's aircraft carriers will be blind unless China develops a machine comparable to the American E2. Since the Chinese aeronautical industry might find it hard to produce such an aircraft, the writer suggests getting Russia to resume development of the Yak-44, intended for the aborted Soviet aircraft carrier *Ulyanovsk*, or else trying to buy the production lines that would have produced it.

Other articles consider China's attempts to create its own homegrown aircraft carrier. In *Xuexi Shibao*, which is published by the central party school, one writer notes that at the moment, only the US and Russia have the technological skills necessary to develop an aircraft carrier.²⁰ Building light carriers is easier, but they can only be used with the British Harrier jump jet or with helicopters. So, a medium-sized aircraft carrier of 40-60,000 tons might be a good compromise for China, even if it would not be able to reach

18 "Aircraft carrier prototype enters semi-public status" (中国航空母舰舰载机原型机进入半公开状态), 21 May 2010, <http://bbs.wforum.com/wmf/bbsviewer.php?trd id=67769>.

19 "The surveillance aircraft intended for the Chinese aircraft carrier", (中国航母项目的短板: 舰载预警机), 21 May 2010, http://military.china.com/zh_cn/critical3/27/20100521/15945706.html.

20 Ba Ding, "The five technologies which China must master for its future aircraft carriers" (建造航母必须具备五大科技能力) *Xuexi Shibao*, 31 May 2010, <http://www.cntheory.com/news/XXSBRDGZ/2010/531/1053114223082505JFOKH7J33GA451D.html>

the performance levels of the giant carriers – its construction, while difficult, should be within China’s capabilities. While China’s naval industries have made progress, constructing a carrier calls for complex capacities for research, development, and production, which the writer is not convinced that China can develop in the immediate future. In March 2007, Central Committee member Zhang Yunchuan said that China was thinking of building an aircraft carrier, but emphasised that “building an aircraft carrier is a slow process which demands the resolution of many difficulties”.

give up building them, you will lose your supremacy at sea.”

Building a carrier and developing on-board fighters require wind tunnels, computer-aided design, special materials, electronic equipment, and specifically adapted technologies. China possesses the most advanced wind tunnel equipment in Asia, which was used to test the J-10 fighter and the aerial surveillance aircraft, and this equipment will be indispensable in developing carrier-borne aircraft. Computer-aided design too will be crucial – because it carries out all its design functions by computer, the US only took a year and a half to produce the 10,000 pages of blueprints needed for the Nimitz, while the Soviet Union took twice as long to produce manually the blueprints for its aborted carriers. China should take its model from the Americans and make use of computer-aided design. In April 2010, the Xinhua News Agency announced the development of a high performance super-computer comparable to the American Galaxy, which would give China the computer-assisted design capability to carry out complex operations like the construction of an aircraft carrier.

Some of the materials needed to build an aircraft carrier are difficult to obtain. The US has developed a special steel, the HY-100, which is considered a strategic material and requires an export licence. India had to import the special steel for its future aircraft carrier into Russia. Carrier-borne fighter aircraft also require more resistant materials than their land-based counterparts, and some will be problematic to acquire. The question of the steam catapult is particularly delicate. For 60 years since the Soviet Union suspended its programme, the US has held the monopoly over steam catapult technology. The technology is relatively simple, but manufacturing its components, including the pad, the rail, and the piston, requires very high precision machine tools.

Building an aircraft carrier, says the writer, is a huge strategic decision for China. It can only be successful if the state commits fully, through robust policy decisions and support for industrial engineering, to sustaining the technological effort over decades, and to organising the network of subcontractors who will supply the spare parts throughout the working life of the carriers. The process will be costly, but it should lead to the creation of enterprises and jobs in the aeronautical sector. The writer ends by quoting an American argument: “The aircraft carrier will perhaps be vulnerable in the future, and you will lose one. But if you

About the authors:

Mathieu Duchâtel is the chief editor of China Analysis and a research fellow at Asia Centre, he can be reached at m.duchatel@centreasia.eu.

François Godement is the director of the strategy of Asia Centre and a senior research fellow at the European Council on Foreign Relations, he can be reached at francois.godement@ecfr.eu.

Alexandre Sheldon-Duplaix is a research fellow at the Defense Historical Service and a lecturer at the Joint Defense College, Paris. He can be reached at asheldonduplaix@hotmail.com.

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Contact: london@ecfr.eu , contact@centreasia.eu



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