

Sustained support: the PLAN evolves its expeditionary logistics strategy

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As China's People's Liberation Army Navy seeks to support sustained operations at distance, *Andrew Erickson* and *Christopher Carlson* discuss its strategy and tools for supporting this new international presence

China's People's Liberation Army Navy (PLAN) has stepped out onto the international scene in recent years with sustained deployments of counter-piracy escort task groups to the Indian Ocean and the Gulf of Aden. These deployments, numbering 22 and counting since 26 December 2008, have enabled the PLAN to sustain presence around the Horn of Africa and even deploy onwards into the Mediterranean Sea and beyond. China is now looking to bolster this strategic presence in both scope and scale by investing in supply ships, using Chinese commercial shipping lines, and exploiting its emerging access to commercial ports around the world as it seeks to provide logistics support to deployed naval vessels.



The PLAN's Fuchi-class auxiliary Weishan Hu (right), the Type 052C Luyang II-class destroyer Haikou (top left), and the Type 052B Luyang I-class destroyer Wuhan (bottom left) prepare to sail from Hainan province, southern China on 26 December 2008 to carry out the PLAN's first Gulf of Aden counter-piracy naval escort flotilla deployment. (Press Association Images)

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China has never had a sustained overseas presence or foreign basing footprint. Yet it is building a fleet that will enable the PLAN to deploy not only at high intensity in China's immediate periphery ('Near Seas', including the Yellow, East, and South China seas), but also with gradually increasing

tempo and regularity throughout the Asia-Pacific region and the Indian Ocean ('Far Seas' operations). This ongoing effort, if Beijing seeks for it to become more continuous in nature, will require greater power projection capabilities, as well as enhanced logistics support, and maybe even a long-term presence on foreign soil.

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Projecting force



The Type 903 Fuchi-class replenishment ship Qiandao Hu, the Type 052C Luyang II-class destroyer Jinan, and the Type 054A Jiangkai II-class frigate Yiyang moored at Helsinki's West Harbour cruise liner terminal in late September 2015. Following a deployment on counter-piracy operations in the Indian Ocean, the ships completed a round-the-world tour via the Mediterranean and Baltic seas and the Atlantic and Pacific oceans. (John Pagni)

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One major challenge in projecting power into the Far Seas is the 'tyranny of distance'. Steaming from China to the Middle East takes two weeks. If it seeks to cover greater geographic areas, while also continuing to meet existing higher priority missions in the Near Seas, China will have to judiciously increase the number of surface combatants capable of being deployed. China's naval hardware has already improved considerably in qualitative terms, but it still lacks sufficient quantity to expand operations greatly.

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Sustaining forces

As supporting these extended deployments is a major factor in the power projection mission, at-sea replenishment, or underway replenishment (UNREP), is essential for sustaining Far Seas naval operations. However, this is a complex naval task that demands high levels of co-ordination

and ship-handling skills, and is especially challenging when the ships are far from home. The further afield a navy operates, the more critical accurate navigation and weather prediction, as well as estimates of fuel and stores requirements, become. When coupled with demanding ship-handling and cargo-transfer skills, this makes UNREP operations a more difficult task to undertake. Mistakes are costlier and may be witnessed by foreign navies - or worse, the media.

Forced by necessity to innovate rapidly to meet the unprecedented requirements of its Gulf of Aden counter-piracy mission, the PLAN has worked to develop a logistics capability almost from scratch. With each deployment, lessons are learned that help the PLAN polish its techniques and procedures, which will collectively provide enhanced qualitative capabilities. To date, roughly half of all reported port calls made by China's counter-piracy escort flotilla have officially been described as supporting ship and personnel replenishment, with the remainder described as friendly visits (although most port visits likely involve both activities).

Driven in part by its Gulf of Aden presence, China is already pursuing several enablers of long-duration operations. Supplies and replenishment underway have progressed rapidly since the first counter-piracy task force deployed in 2008.



A COSCO container ship, pictured here in Qingdao, China in 2010. COSCO's role in delivering logistics supplies has been a critical enabler in supporting PLAN operations in the Indian Ocean region. (Dietmar Hasenpusch)

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Special delivery

The PLAN has laboured for decades with inadequate UNREP capabilities. The two Type 905 Fuqing-class supply ships have a moderate fuel capacity, but both ships are ageing. The single Type 908 Fusu/Nanyun-class replenishment ship, a repurposed Ukrainian cargo tanker, is

currently the PLAN's largest resupply ship, but all indications are that it has the least amount of cargo fuel capacity - reportedly, many of the cargo tanks were converted to dry storage and a large number of staterooms. Both classes have made counter-piracy deployments. In the early 2000s, the PLAN built two Type 903 Fuchi-class supply ships that also have a moderate cargo fuel capacity. However, after this, production ceased for nearly a decade.



The PLAN's fifth Type 903A Mod Fuchi-class replenishment ship Dongpinghu. The ship was commissioned on 27 December 2015. The Type 903A appears to have been developed to meet requirements to support counter-piracy missions, as well as wider maritime strategy goals. (Chinese internet via www.haohanfw.com)

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Driven by both the counter-piracy mission requirement and a shift in maritime strategy goals, the PLAN began building a modified replenishment tanker, designated the Type 903A Mod Fuchi class. Two ships were commissioned in 2013 and 2015 respectively, and construction is continuing. Photographs of launched ships suggest there are at least three more Type 903As fitting out, for a possible total of seven. Compared to US auxiliaries in particular (rather than those of other navies) all of the PLAN supply ships are smaller and slower, and have considerably lower replenishment capacity. The USN's Supply-class fast combat support ship has a 24,420-tonne cargo capacity, with approximately 22,000 tonnes being fuel; the Henry J. Kaiser-class oilers carry 22,000-25,000 tonnes of fuel. China's new construction programme up to 2015 represented a modest effort, producing supply ships with cargo capacities sufficient to fuel two or three surface combatants on a Far Seas deployment, or a slightly larger formation in the Near Seas.



An internet image of what is understood to be the PLAN's first Type 901 replenishment ship, designed to support aircraft carrier operations. The tanker was launched in December 2015, less than a year after imagery emerged of the ship in a graving dock in southern China. (Chinese internet via cjdbby.net)

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However, again as in so many other areas of naval operations, China has not stopped there. On 28 September 2015 Google Earth imagery revealed the first Type 901 integrated supply ship in the

graving dock at Guangzhou Shipyard International's Longxue Island facility in southern China. Chinese websites suggest this ship was launched on 16 December 2015. The ship was built incredibly quickly, as Google Earth imagery revealed a tanker in the graving dock position on 19 January 2015. A review of Google Earth imagery and handheld photography indicate that the Type 901 is much larger than the Type 903A. Measurements suggest the ship has an overall length of approximately 229 m and a beam of about 32.5 m. Chinese blog sites consistently give the full load displacement as being between 45,000-50,000 tonnes, which is consistent with a ship of these dimensions. The propulsion is also unique for Chinese supply ships, with photographs indicating gas turbines as the prime movers. Again, this is consistent with a claimed maximum speed of 25 kt. However, by far the most interesting aspect of this new supply ship is the refuelling station arrangements; it has three stations to port and two to starboard.



China's first aircraft carrier Liaoning, pictured here sailing off Qingdao in 2012. Supporting Liaoning and future carrier operations at distance is a central component of the PLAN's evolving logistics strategy. (Chinatopix/Press Association Images)

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This feature alone suggests that the Type 901 is designed to replenish an aircraft carrier. Ship handling is essential in UNREP evolutions, and US carriers have their islands to starboard, as do *Liaoning* and China's second carrier currently under construction (based on what is known publicly). This is why all US Military Sealift Command replenishment ships have three refuelling stations to port: carriers and their air wings are hydrocarbon-thirsty machines, especially when the carrier is not nuclear-powered; this issue is arguably more acute for the PLAN, with its carrier (unlike its US counterparts) requiring fuel for both aircraft and the ship itself. It is clear that US oiler designs greatly influenced this PLAN tanker class. In fact, aside from largely cosmetic changes in the superstructure configuration and the use of large kingposts for the replenishment gear, the Type 901 is, arguably, identical to the USN Supply class.

PLAN tanker characteristics					
Designation	Type 901	Type 903	Type 903A	Type 905	Type 908
NATO class name	?	Fuchi	Mod Fuchi	Fuqing	Fusu/ Nanyun
Number in class	1+	2	4+	2	1
Full load displacement (tons)	45-50,000	20,500	23,400	21,750	37,000
Fueling stations	3P/2S	1P/1S	1P/1S	2P/2S	2P/2S
Cargo stations	1P/1S	1P/1S	1P/1S	1P/1S	1P/1S
Fuel cargo capacity (tons)	≈20,000	10,500	10,500	12,000	9,630
Total cargo capacity (tons)	≈25,000	11,400	11,400	12,500	23,000

Source: IHS

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PLAN tanker characteristics. (IHS)

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Remote maintenance

Development of the ability to conduct sophisticated ship/aircraft repairs remotely, using either ship tenders or overseas repair facilities, is likewise essential to sustaining Far Seas operations. Here, China remains a fair distance from matching US standards, although it is still making substantial qualitative improvements. Captain Dale Rielage, US Pacific Fleet director of intelligence and information operations, assesses that the PLAN has made "significant steps towards establishing the maintenance culture that marks professional navies". However, while China has some supply ships, it currently has very little capacity for repairs far afield.

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Supporting facilities



A PLAN Jiangkai II-class frigate (bottom left) moored close to two Japan Maritime Self-Defense Force Takanami-class destroyers, in Djibouti on 13 November 2014. China is understood to have secured a 10-year lease to establish its first ever naval supply facility in Djibouti. (Google Earth/DigitalGlobe)

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Distant operations escalate demands on replenishment ships and exacerbate materiel problems. Facilities are therefore important for supporting robust overseas operations, particularly to ensure effectiveness and affordability. For China, the absence of military bases limits operations overseas. Most fundamentally, neutral countries cannot support combatant platforms during hostilities. Increasing visits and low-level supply cannot support combat operations. Foreign port access is being pursued to supply the PLAN, for example in the Indian Ocean and the Gulf of Aden. However, this does not yet apply for airfields. Establishing overseas military bases is an option for equipping, servicing, and other support beyond replenishment, albeit with very high political costs and risk of operational vulnerability. Overseas facilities access has recently assumed a central position in Beijing's policy debate, and is already being realised to a modest extent in practice. The PLAN utilises a network of access points, with Djibouti and Salalah foremost among them; each Gulf of Aden naval task force, except the first, has called in to the latter. Multiple offers of more formal access are now forthcoming.

According to US AFRICOM commander General David Rodriguez, China has secured a 10-year lease to establish its first-ever naval supply facility in Djibouti. China's Foreign Ministry spokesperson Hong Lei, in his regular press conference on 21 January 2016, explained: "In fulfilling escort missions, we encountered real difficulties in replenishing soldiers and resupplying fuel and food, and found it really necessary to have nearby and efficient logistical support. China

and Djibouti consulted with each other and reached consensus on building logistical facilities in Djibouti, which will enable the Chinese troops to better fulfil escort missions and make new contributions to regional peace and stability. The nature of relevant facilities is clear, which is to provide logistical support to Chinese fleets performing escort duties in the Gulf of Aden and the waters off the Somali coast." Beijing has also reportedly received offers to establish military facilities in the Seychelles and Pakistan.

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UNDERWAY REPLENISHMENT

China's initial Gulf of Aden operations underscored what were then notable limitations in its UNREP capability. These included: the relatively small capacity of its existing replenishment ships (specifically the Type 903/903A), the lack of a shuttle system to keep the replenishment tanker topped off and able to remain on station with the task force, and the lack of adequate water supply on the task force surface ships. Moreover, the PLAN was forced to contend with developing a new approach to logistics, addressing questions such as how much and what types of food and medicine should be stored to support nearly 1,000 sailors at sea for an extended duration. Vessels initially deployed to the Gulf of Aden had been designed for Near Seas operations and therefore lacked the water purification equipment needed for longer voyages. In September 2009, managers and technicians at Qinghuang Dao Mountain Heavy Industries Machinery Company began researching the problem. By May 2010, high-production saltwater purification equipment had been installed on all medium- and large-scale ships. This solved much of the problem; thereafter, sailors on the escort ships enjoyed a constant supply of fresh water for cleaning, laundry, showers, and other needs. Beyond these basic improvements, introducing the Type 901 replenishment ship will help considerably from a hardware perspective, but the flotillas will still be very much tied to a foreign port unless China can accrue the necessary management and scheduling skills for generating at-sea resupply.

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