



The *Liaoning*. Source: <http://images.en.yibada.com/data/thumbs/full/129872/685/o/o/o/liaoning-launches-a-j-15.jpg>

China's Aircraft Carrier Program Its Development in Perspective

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Master's degree

17th August 2017

In the last few years, China has been making considerable efforts to modernize its navy, the PLAN. Among others, this includes an ambitious aircraft carrier program. In April 2017, the PRC launched the *Shandong*, its second carrier and the first to be entirely built domestically; which will likely be commissioned in 2019-2020. The ship is a Type 001A unit, an improved version of the existing Type 001, the *Liaoning*; but the two carriers have a quite similar design and share many features, as both derive from the Russian *Kuznetsov* class. The launch of the *Shandong* is a non-negligible step in the PRC's naval buildup, since it means the country will soon possess two operational carriers. However, the two units present significant technical limitations. Consequently, their operational, tactical and strategic impact should not be overestimated.

Theoretically, possessing two working aircraft carriers is a huge step forward in the PLAN's efforts to become a modern blue-water navy, and a relevant transformation in the naval equilibrium of the Asia-Pacific. On the tactical level, this would allow to provide air support during naval battles and amphibious operations; as in the case of a hypothetical invasion of Taiwan. Operationally, the carriers enable China to carry out more advanced aero-naval warfare, especially far from the mainland. This would translate in greater military options at the theatre strategy level, notably in a contingency over Taiwan; since it would increase the ability of the PLAN to support China's A2/AD strategy, to conduct blockades and amphibious assaults, to achieve air superiority, to protect the coasts of the mainland as well as the SLOC vital to the Chinese economy. Finally, in terms of grand strategy, the two units will sustain the PRC's quest to become a global power by increasing its presence abroad and by enabling it to project its power overseas. But the two ships suffer restrictions at the technical level that limit their value as means to achieve similar objectives; especially if one considers their capabilities in relation to the naval might of the U.S. or other regional powers like Japan.



A J-15 fighter. Source: <http://www.military-today.com/aircraft/j15.jpg>

The first of such limitations comes from the size of the two units: they are smaller than an American *Nimitz*-class supercarrier and, most importantly, they have an inferior displacement (59,400 tons against around 100,000 tons at full load). This translates into a reduced airwing, and consequently in

inferior firepower and power-projection capabilities. In fact, the Chinese carriers can carry a total of 40 aircraft between fighters and helicopters, which is roughly a half of those embarked on a *Nimitz*. Moreover, the quality of the airwing is definitely inferior. The Chinese units transport 24 Shenyang J-15 Flying Shark fighters, which are based on the Russian-made Su-33 Flanker D. The actual combat capabilities of the J-15 are debated, especially in

relation to the “original” Su-33 or the F/A-18 E/F Super Hornet, the jet that now represents the backbone of the U.S. Navy’s airwings; however, it is likely inferior to the most advanced American fighters. But apart from their own features, the combat effectiveness of the J-15s is restricted by a series of related factors. The first is linked to the absence of catapult-assisted take-off (CATOBAR) system onboard the Chinese carriers, contrarily to what happens in the *Nimitz*-class units. Instead, the PLAN ships rely on a sky-jump system (STOVAR); but this solution forces to launch aircraft with limited payload, resulting in lesser firepower. Besides, the combat capability of the Chinese embarked airwings is constrained by the absence of adequate support aircraft, which is also a result of the STOVAR’s limitations. As a matter of fact, the *Liaoning* and the *Shandong* do not carry any air-refueling plane, thus reducing the combat radius and the flying time of their fighters. Furthermore, the two ships lack proper AEW&C aircraft. Instead, they rely on the Russian-built Ka-31 helicopters to perform that role, but this is clearly a less performant solution. Being a helicopter, the Ka-31 is definitely inferior to the American E-2 Hawkeye plane in terms of speed, service ceiling, flying endurance, radius, and radar performance (for example, the E-2 can detect a low-flying fighter at about 400 kilometers of distance, while the Ka-31 can spot a jet at only 150 kilometers). As such, the lack of adequate AEW&C planes significantly hampers the combat capabilities of the Chinese carriers. Moreover, there are other technical limitations affecting them, as their propulsion system. The two units are equipped with diesel-fueled steam turbines, and not with nuclear reactors like the *Nimitz*-class ships. While this allows the PLAN’s carriers to reach a speed of about 30 knots, which is the same or slightly less than the American ones, the conventional propulsion presents a major inconvenient: it severely limits the carriers’ range. As a result, while their American counterparts can sail for a virtually unlimited distance, the range of the *Liaoning* and the *Shandong* is limited to just 3,850 nautical miles. At the strategic level, this problem is further aggravated by the fact that the PLAN (contrarily to the U.S. Navy) do not possess any base abroad, with the only exception of the one in Djibouti that will soon be operative. Therefore, the lack of logistical facilities limits the capabilities of the Chinese Navy to ensure, on the grand strategy plan, a global and continuous presence at sea. Finally, but not less importantly, the PRC currently possesses only these two carriers, which is an insufficient number to meet its strategic goals; especially if one considers that the U.S. deploys ten *Nimitz*-class supercarriers, plus one unit of the new *Gerald R. Ford* class (however, it should be reminded that not all of them are based in the Asia-Pacific, contrarily to the Chinese units). Additionally, the PLAN still lacks the



A Ka-31 helicopter. Source: https://cdn-images-1.medium.com/max/1600/1*buNV4nsTVK8myDcQdRPv1Q.jpeg

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experience in aircraft carrier operations, while the U.S. Navy has decades of expertise in this domain.

On this basis, it is clear that the Chinese carriers and the PLAN in general are, by the moment, unable to fully perform the activities described above and challenge America's naval supremacy. Still, their importance should not be downplayed. While the aforementioned technical constraints do not allow the PLAN to use its new carriers to fulfill the tactical, operational and strategic missions it should accomplish, the two ships represent an important step in acquiring the necessary expertise to build and operate more capable aircraft carriers. As a matter of fact, the Chinese are building a new Type 002 unit, which is meant to be bigger than the Type 001 and possibly equipped with a CATOBAR system, thus enabling it to launch fighters with greater payload as well as AEW&C and air-refueling planes. If it were actually the case, much of the technical limitations of the *Liaoning* and the *Shandong* would be overcome. Moreover, the PRC also plans to build a Type 003 unit, which is intended to have the same size of American supercarriers and be nuclear-propelled.



Chinese naval formation. Source:
<http://www.chinadaily.com.cn/slides/images/attachement/jpg/site1/20130704/eca86bd9e3d2133f032029.jpg>

In conclusion, the two Type 001 units are not particularly important by themselves; what actually matters is their significance in perspective, as they are the base upon which the PLAN will acquire experience in carrier operations and expand its capabilities in the upcoming decades, provided that China's economic situation remains good enough to

sustain such an ambitious military modernization program. It should also be reminded that the Chinese are

commissioning other advanced naval units like the Type 055 destroyers or the Type 054A frigates. This is happening in a context where other powers are reinforcing their navies: the first supercarrier of the *Gerald R. Ford* class (meant to gradually substitute the *Nimitz* units) entered in service with the U.S. Navy on 22nd July 2017, while countries like Japan, Vietnam or Australia are also building up their naval power. It is therefore clear that the naval power equilibrium in the Asia-Pacific is evolving, and the developments of China's carrier program will have a sensible impact on it in the coming years.