MANOHAR PARRIKAR INSTITUTE FOR DEFENCE STUDIES AND ANALYSES
मनोहर पर्रिकर रक्षा अध्ययन एवं विश्लेषण संस्थान

MP-IDSA
Issue Brief

China's Pursuit of Aircraft Carriers

Abhishek Kumar Darbey

May 26, 2025

Summary

China has commissioned two aircraft carriers into the PLA Navy, and the third one is expected to be commissioned in 2026. By the mid-2030s, at least six aircraft carriers are to be commissioned into the PLA Navy.

Introduction

China's dream of aircraft carriers is a century old. As early as 1928, Chen Shaokuan (陈绍宽, 1989–1969), the Chief of Navy of the Republic of China Navy, proposed the idea of building an aircraft carrier with the expectation of a strong navy.[1] However, this forward-looking proposal did not receive enough attention at the time and was rejected at the National Party Conference of the Kuomintang (KMT).[2] In those times, China was facing internal and external troubles and its economic strength was weak. Until the outbreak of the Anti-Japanese War, aircraft carriers remained an unattainable dream.[3]

During the Second Sino-Japanese War (1937–1945), Japanese aircraft carriers frequently appeared along the coast of China, and the bombing from their carrier-based aircraft brought heavy damage to the Chinese military and civilians.[4] This painful experience made China deeply aware of the importance of aircraft carriers and further strengthened China's determination to develop aircraft carriers.

After the founding of New China in 1949, given the constraints of the international situation and its own economic and technological backwardness, China's marine strategy was based on "near shore defence", and the aircraft carrier development was temporarily shelved.[5] Despite this, successive leaders of the PLA Navy paid close attention to the development of aircraft carriers. The first Commander of the PLA Navy, General Xiao Jinguang (肖劲光, 1903–1989), wrote to the government that Chinese Navy needs aircraft carrier that can operate in distant seas. He noted that without aircraft carriers, there is no air superiority, and without air superiority, there is no guarantee of victory in distant sea operations.[6]

By the 1970s, China realised that as the core equipment of the modern Navy, aircraft carriers are not only a symbol of the country's comprehensive strength, but also an important manifestation of maritime combat capabilities.[7] In 1970, General Liu Huaqing (刘华清, 1916–2011), former Commander of the PLA Navy (1950–1980)proposed "Preliminary Opinions on the Construction of Aircraft Carrier" to the PLA Navy and it was adopted. Following the proposal, in July 1970, the PLA Navy

[1] **"China's Aircraft Carrier (中国航空母舰)"**, *Baidu*, 2025.

[2] **"A Full Analysis of China's Aircraft Carriers: From Scratch, Heading for the Deep Blue (中国航母全解析：从无到有，驶向深蓝)"**, *Baidu*, 9 March 2025.

[3] Ibid.

[4] **"In 1937, the Chinese Air Force Severely Damaged Japanese Aircraft Carriers (1937 年中国空军曾重创日本航母)"**, Anti-Japanese War Memorial Network, 18 January 2019.

[5] **"Li Anfeng: The Road to Sea Power: The Formation and Historical Reflection of New China's Maritime Defence Thought (李安峰： 海权之路：新中国海防思想的形成与历史反思)"**, Academy of Ocean of China, 30 November 2023.

[6] Ibid.

[7] **"The Development Process and Technological Breakthroughs of My Country's Aircraft Carriers (我国航空母舰的发展历程与技术突破)"**, Frontier Social Sciences, 10 March 2025.

planned 'Project 707' to build 'Escort Aircraft Carrier'. However, the project failed under unfavourable circumstances due to lack of funding.[8]

In 1980, Liu Huaqing boarded the 'Kitty Hawk' aircraft carrier of the US and discussed with the US the possibility of purchasing a second-hand aircraft carrier. The US government however denied the request.[9] In 1985, China purchased a decommissioned light aircraft carrier 'Melbourne' from the Australian Navy at a cost of US$ 1.5 million for research and dismantling. An inspection team of the PLA Navy Equipment Department conducted sampling surveys of the 'Melbourne' aircraft carrier.[10] In January 1989, the PLA Navy raised more than 40 million yuan to support 'Project 891' to build an aircraft carrier. Unfortunately, this time as well, the project was suspended due to the unfavourable international scenario created by the 1989 Tiananmen incident.[11]

China's aircraft carrier dream finally began with the modification of the unfinished 'Varyag' aircraft carrier of the Soviet Union. The construction of the Varyag, a Kuznetsov-class aircraft carrier, started in 1985, and almost 70 per cent of the ship was completed by the early 1990s. The 'Varyag' aircraft carrier was given to the Republic of Ukraine after the disintegration of the Soviet Union. However, due to economic constraints, Ukraine was unable to continue the construction. Finally, the project was stopped in January 1992, and was abandoned.

In 1993, another round of negotiations was held between the governments of Russia and Ukraine to resume the construction of the aircraft carrier, but they ended in failure. In December 1995, then Ukrainian President Leonid Kuchma visited Beijing, and later on, in January 1996, Interfax, Russian News Agency, reported that China and Ukraine were negotiating the case of transporting Ukraine's unfinished aircraft carrier Varyag to a Chinese shipyard.[12]

Interestingly, the government of the PRC was not directly involved in purchasing the Varyag aircraft carrier. Rather, it was a Hong Kong-based businessman Xu Zengping (徐增平), who sealed the deal with Ukraine for the Varyag, for China, at a price of US$ 20 million.[13] In July 1999, a tugboat was hired to tow the Varyag to China, but due to the objection by the Turkish government while passing Bosporus Strait, the

[8] **"China's Aircraft Carrier (中国航空母舰)"**, no. 1.

[9] **"Fujian Ship: Technological Peak and New Chapter of the Navy (福建舰：技术巅峰与海军新篇章)"**, *Baijiahao*, 6 March 2025.

[10] Sun Jiaxun (孙佳荀), **"Love Our National Defence 丨 Sea and Sky Eagle——Record the Development History of Our Aircraft Carriers (爱我国防丨海天雄鹰——记我们的航空母舰发展历程)"**, Weixin.

[11] Ibid.

[12] Ibid.

[13] **"Hong Kong Businessman Reveals the Inside Story of Buying the 'Varyag' Aircraft Carrier: The Engine was Broken When It Was Purchased (港商揭秘买"瓦良格"航母内幕：买时发动机已坏)"**, *Global Times*, 20 January 2015.

ship had to return back to the port in Black Sea.[14] After several rounds of diplomatic negotiations between China and Turkey for nearly two years, on 25 August 2001, the ship was permitted to pass the Strait, and it reached China on 3 March 2002.[15]

On 26 April 2005, China's Dalian Shipyard resumed the construction of the Varyag. The modification of the Varyag faced many technical difficulties, especially the redesign and installation of the power system, electronic system and carrier-based aircraft take-off and landing equipment.[16] Though Chinese engineers repaired the propulsion system of the ship, China faced severe challenges in manufacturing the special steel which is the core material for building an aircraft carrier, before Anshan Iron & Steel Company developed it. In parallel, China developed the carrier-based aircraft J-15, based on Russia's carrier-based aircraft technology.[17] After a decade-long modification, finally, on 10 August 2011, the aircraft carrier was sent for its first sea trials.[18] After the completion of tests and trials, on 25 September 2012, the Type 001 aircraft carrier was officially commissioned, and was named as 'Liaoning' with Hull No 16.[19]

One major reason for China's past hesitation to acquire an aircraft carrier was due to the lack of funding. In the late 1950s, China's annual defence budget was 5 billion RMB, out of which, for total weapon acquisition in the PLA 1.5 billion RMB was allocated and the share of the PLA Navy was less than 200 million RMB. In the 1970s, the annual defence budget was 17 billion RMB, out of which less than 6 billion RMB was allocated for weapon acquisition each year, and the share of the PLA Navy was only several hundred million. These amounts were insufficient to buy or develop an aircraft carrier.[20]

However, even though the defence budget was increasing since the early 1990s, it still failed to catch up with the rising costs of the aircraft carrier, as the modern design included more advanced carrier-based fighters, air defence system and electronics. In those times, funding priority was instead given to developing submarines.[21] From 2006 onwards, the annual defence budget of the PLA began increasing significantly, and it was also the time when China began the construction of Varyag in late 2005. The annual defence budget was US$ 62.14 billion in 2007

[14] **"Varyag Aircraft Carrier Experience: Initial Design Plan to Accommodate about 60 Fighters (瓦良格航母经历：设计初期计划容纳约 60 架战机)"**, Enter the Renaissance Forum, 27 June 2011.

[15] Ibid.

[16] Ibid.

[17] **"How Difficult is it to Manufacture Special Steel for China's Aircraft Carriers? Is the Steel Plate Really 5 meters Thick? (中国的航母特种钢制造难度几何？钢板真的有 5 米厚？)"**, Baijiahao, 16 December 2024.

[18] **"China's First Aircraft Carrier 'Starts Sea Trials'"**, *BBC*, 10 August 2011.

[19] Xu Tianran, **"China Unveils First Carrier"**, *Global Times*, 26 September 2012.

[20] Nan Li and Christopher Weuve, **"China's Aircraft Carrier Ambitions Financial Affordability"**, *123 AIR POWER Journal*, Vol. 6, No. 1, Spring 2011 (January–March), Centre for Air Power Studies, India.

[21] Ibid.

out of which US$ 15.3 billion was for weapon acquisition. In 2006, China's annual defence budget was US$ 51.45 billion and in 2012, it increased almost three times to US$ 145.13 billion.[22]

The sustained increase in the annual defence budget created favourable conditions for China to develop indigenously two more aircraft carriers: Type 002 'Shandong' and Type 003 'Fujian'. The fourth one 'Type 004 aircraft carrier' is also under construction. The Type 002 'Shandong' joined the PLA Navy in 2019, and Type 003 'Fujian' is expected to join the PLA Navy in 2026.

China's Aircraft Carriers: Key Aspects

Type 001 Liaoning Aircraft Carrier

The Liaoning can hold up to 18 aircraft. There are two starboard side lifts, a ski-jump of 14 degree and an angled deck of 7 degree.[23] The Liaoning is equipped with an advanced radar, missiles, artillery and other weapon systems, and has strong self-defence capabilities and command and control capabilities.[24] It is equipped with HHQ-10 launchers and Type 1130 close-in weapon system.

After the Liaoning was commissioned, various training and tests were continuously carried out.[25] The Liaoning was formally commissioned on 25 September 2012 and by May 2018, it was announced that the Liaoning carrier group reached its initial operational capabilities.[26]

Type 002 Shandong Aircraft Carrier

Shandong is China's second aircraft carrier, which is indigenous. The construction of the aircraft carrier began in 2013, and it was officially commissioned on 17 December 2019.[27] In May 2020, the Shandong conducted long-distance training for the first time after its commissioning.[28] Since 2021, the Shandong aircraft carrier

[22] **"Military Expenditure-China"**, World Bank Group, 2025.

[23] **"Fighting Ships"**, SIPRI Yearbook 2021–2022.

[24] **"China's Aircraft Carrier Dream: From Liaoning to Fujian, How Many Hardships Have We Gone Through? (中国航母梦：从辽宁舰到福建舰，我们走过了多少艰辛？)"**, Baijiahao, 30 October 2023.

[25] Ibid.

[26] PK Chakravorty , **"Aircraft Carriers and Submarines of The PLA Navy (PLAN) and The Indian Navy"**, *Bharat Sakti*, 13 June 2017; **"Recent Developments in Chinese Aircraft Carriers and Aircraft"**, *Indian Military Review*, 15 December 2022.

[27] **"Why is My Country's First Aircraft Carrier, the Shandong, Controversial? Will it Work? (我国第一艘航母—山东舰为何争议不断？究竟行不行？)"**, *Baidu*, 4 December 2023.

[28] **"China's Aircraft Carrier Dream: From Liaoning to Fujian, How Many Hardships Have We Gone Through? (中国航母梦：从辽宁舰到福建舰，我们走过了多少艰辛？)"**, no. 24.

fleet has conducted several exercises including the 'Joint Sword' large-scale joint exercise in Taiwan Strait.[29]

The Shandong is propelled by steam turbines and the aircraft carrier can carry 36 fighters due to increased hangar capacity.[30] The dimensions of the Shandong are very similar to the Liaoning, with a full load displacement of about 70,000 tons. The ship can reach a maximum speed of 31 knots. This aircraft carrier can carry more than 40 fixed-wing fighters and helicopters of various types, including the J-15 aircraft, Z-9, Z-18 helicopters, among others.[31]

Since the Shandong does not have catapult take-off capability, it has limitations relating to dispatch rate and take-off weight of carrier-based aircraft. The ski-jump deck on Shandong ship does not support the take-off and landing of large fixed-wing early warning aircraft, transport aircraft and can only use corresponding helicopters to perform related tasks, which has certain limitations on its combat capabilities.[32] The ship has made significant progress in the informationised combat capability and automation levels that has enhanced its comprehensive combat capabilities.

Type 003 Fujian Aircraft Carrier

The Fujian ship's construction started at the Shanghai Jiangnan Shipyard in 2015, was launched in June 2022, and is expected to be officially commissioned in 2026.[33] Since its launch, it has conducted several sea trials to test key components such as the propulsion system, navigation system and electromagnetic catapult system. The Fujian ship uses conventional power instead of nuclear power, which may limit its combat durability in ocean missions.[34] The ship is equipped with catapult system (EMALS), and compared with the traditional steam catapult, EMALS has higher catapult efficiency, lower maintenance cost and stronger adaptability.[35] The ship is equipped with three electromagnetic catapults and an electromagnetic arresting device. It is capable of launching heavier and more complex carrier-based aircraft, such as the KJ-600 early warning aircraft, the J-35 stealth fighter and even drones such as the GJ-11 "Sharp Sword".[36]

---

[29] Simone McCarthy, Nectar Gan and Eric Cheung, **"China Launches Military Drills from 'Multiple Directions' around Taiwan, Testing US Resolve"**, *CNN*, 1 April 2025.

[30] "Fighting War Ships", SIPRI 2021–2022.

[31] Ibid.

[32] Ibid.

[33] Jun Maiin, Yuanyue Dangin, and Hayley Wongin, **"China's Third Aircraft Carrier Fujian Tests Power, Navigation in Maiden Sea Ttrial"**, *South China Morning Post*, Beijing, 1 May 2024.

[34] **"China Says Its Fujian Carrier is World's Largest"**, *South China Morning Post*, 23 June 2024.

[35] **"Fujian Ship: Technological Peak and New Chapter of the Navy (福建舰：技术巅峰与海军新篇章)"**, *Baijiahao*, 6 March 2025.

[36] Ibid.

Type 004 Aircraft Carrier

A 22 February 2025 report by China's CCTV had the image of a Type 004 aircraft carrier at Dalian Shipyard.[37] The Type 004 is scheduled to be in service around 2030, with upgraded power and design.[38] According to Chinese media reports, the displacement of this ship is said to be between 110,000–120,000 tons with nuclear propulsion and an electromagnetic catapult system.[39] The increased flight deck area of the Type 004 can carry more carrier-based aircraft and support the take-off and landing of KJ-600 early warning aircraft, electronic warfare aircraft and GJ-11 UAV formation.[40]

Table 1. Key Specifications of Chinese Aircraft Carriers

	Liaoning (16)- Type 001	**Shandong (17)- Type 002**	**Fujian (18)- Type 003**
Builder	Nikolayev South/Dalian Shipyard	Dalian Shipyard	Jiangnan Shipyard
Displacement Dimension Speed	58,500 tones (Full Load) L=304.5m; W=75m; H=60m[41] 30 knots	70,000 tones (Full Load) L=315m; W=75m; H=?[42] 30 knots	80,000 tones L=315 m; W= 75 m; H=? 30 knots
Machineries	8 Boilers; 4 Turbines; 147 MW; 4 Shafts	8 Boilers; 4 Turbines; 147 MW; 4 Shafts	8 Boilers; 4 Turbines; 4 Shafts
Missiles	SAM: 3 HHQ-10 (18 cell launchers)	SAM: 3 HHQ-10 (18 cell launchers)	SAM: HHQ

[37] **"China's Type 004 Aircraft Carrier: A Combination of Nuclear Power and Advanced Weapons (中国 004 型航母：核动力与先进武器的结合)"**, *Baijiahao*, 22 February 2025.

[38] Feng Qingyang, **"The Fujian Ship is About to be Commissioned, But There are Still Deficiencies to be Improved. The Advent of the 004 Aircraft Carrier May Make Up for the Shortcomings (福建舰即将入列，仍有不足待完善，004 型航母问世或可弥补缺陷)"**, *Baijiahao*, Jiangsu, 4 May 2025.

[39] Chen Guangwen, **"The Width of the 004 Aircraft Carrier is 83 meters, Exceeding the Ford Class! Nuclear Power + 120,000 tons + 6th Generation Aircraft on Board, the First Choice is the J-50 (004 航母宽度 83 米超过福特级！核动力+12 万吨+6 代机上舰 首选歼-50)"**, *Baijiahao*, 26 January 2025.

[40] **"China's Nuclear Aircraft Carrier Appears, Claiming that the Type 004 will Become the Largest Warship in History (中国核航母露面，声称 004 型将成有史以来最大战舰)"**, *Baijiahao*, Guangdong, 27 February 2025.

[41] **"How Amazing is the Size of the Liaoning? This Article Will Show You the Huge Size of China's First Aircraft Carrier (辽宁舰的尺寸有多惊人？一文带你了解中国首艘航母的庞大规模)"**, Xiaoquanshu Fujian, 21 October 2023.

[42] **"How Big is the Shandong Aircraft Carrier, the First Dmestically-made Aircraft Carrier? (国产第一艘航空母舰-山东舰航母尺寸有多大？)**, *Global Touch*, Guangdong, 8 September 2023.

Guns	3 H/P J-11 (Type 1130) 30 mm; 11 barrels per mounting A/S Mortars: 2RBO-6000 type (12 barrel launchers)	3 H/P J-11 (Type 1130) 30 mm; 11 barrels per mounting A/S Mortars: 2RBO-6000 type (12 barrel launchers)	H/P J-11 (Type 1130) 30 mm; 11 barrels per mounting; 10,000 rounds/min
Radars	Air Search: Type 382 radar Surface Search: Type 346 (Dragon Eye) Air search / Fire control: 1 Type 366 Radar; G/H Band Surface Search: 1 Type 366; I-Band	Air Search: Type 382 radar Surface Search: Type 346 A (Dragon Eye) Air search / Fire control: 1 Type 366 Radar; G/H Band Surface Search: 1 Type 366; I-Band	Air Search: To be announced Surface Search: Type 346B (Dragon Eye)
Aircrafts	Fixed-wing aircrafts: up to 24 J-15 carrier-based jets Helicopters: up to 15 helicopters	Fixed-wing aircrafts: up to 24 J-15 carrier-based jets Helicopters: up to 15 helicopters	Fixed-wing aircrafts: 40 J-15 carrier-based jets and KJ600 Early Warning aircraft
Take-off System	Short Take-Off Barrier Arrested (STOBAR)	Short Take-Off Barrier Arrested (STOBAR)	Catapult assisted take-off (CATOBAR) (Expected)
Propulsion	Conventional Propulsion System	Conventional Propulsion System	Conventional Propulsion System

Source: Media Reports

Conclusion

The Chinese navy is currently equipped with two aircraft carriers, namely, the Liaoning and Shandong, and the third Fujian is expected to be commissioned by 2026. China has built two facilities for the construction of aircraft carriers at Dalian shipyard in Liaoning and Jiangnan shipyard in Shanghai. For a traditional aircraft carrier with a ski-jump system and conventional power system, China has mastered the technologies and materials required for it. The PLA Navy is expected to have about six aircraft carriers by mid-2030s. There is a possibility of later ships having nuclear propulsion, given that in recent years, China has made significant progress in nuclear power technology, including in small nuclear reactor technology.

About the Author

Dr. Abhishek Kumar Darbey is Research Fellow at the Manohar Parrikar Institute for Defence Studies and Analyses, New Delhi.

Manohar Parrikar Institute for Defence Studies and Analyses is a non-partisan, autonomous body dedicated to objective research and policy relevant studies on all aspects of defence and security. Its mission is to promote national and international security through the generation and dissemination of knowledge on defence and security-related issues.

Manohar Parrikar Institute for Defence Studies and Analyses
1, Development Enclave, Rao Tula Ram Marg
New Delhi 110 010 India
T +91-11-2671 7983 F +91-11-2615 4191
www.idsa.in
Twitter @IDSAIndia
www.facebook.com/ManoharParrikarInstituteforDefenceStudiesAnalyses