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MP-IDSA
Commentary

Shenzhou-22: China's First Crewed Spaceflight Emergency Response

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Summary

China has demonstrated the ability to ensure continuous human-occupied space station operations, even during emergencies.

At present, two operational space stations host humans in orbit – the International Space Station (ISS) and China's Tiangong station. Both maintain a continuous human presence, with each group of astronauts usually staying for about six months. The spacecraft that transports them to the space station remains docked throughout their mission and later brings them back to Earth. Meanwhile, the incoming crew arrives (known as crew rotation) in a separate spacecraft, which then docks with the station, enabling a smooth crew handover.

For more than four years, the Tiangong space station has been operational and continuously occupied by humans. China has designed and developed a spacecraft, Shenzhou, to carry astronauts (taikonauts) to the space station. The first uncrewed flight of Shenzhou occurred in November 1999, while the first crewed mission (Shenzhou-5) launched on 15 October 2003.

During the 15th crewed Chinese spaceflight (Shenzhou-20) on 24 April 2025, three taikonauts were carried to the space station. About six months after Launch, on 31 October 2025, Shenzhou-21 delivered a replacement crew to the Tiangong space station. Shenzhou-20 was expected to return to Earth in early November 2025 in the Shenzhou-20 spacecraft. However, due to suspected damage to the Shenzhou-20 craft from space debris, the spacecraft's return was delayed. Finally, a decision was taken that Shenzhou-20 would not be used for the taikonauts' return journey. The recently launched Shenzhou-21 spacecraft carried the Shenzhou-20 crew back to Earth. They returned safely to the Earth on 14 November 2025. As a result, the Tiangong space station was left with three taikonauts on board and a damaged Shenzhou-20 spacecraft, with no rescue option available in the event of an emergency.[1]

Usually, a spacecraft remains docked to a space station for two reasons: first, to return astronauts to Earth at the end of their mission (typically after 6 months); and second, to serve as a lifeboat in an emergency. Conditions such as fire, depressurisation, a potential collision with space debris or another satellite, or a critical system failure may require the crew to quickly board the docked spacecraft and undock to ensure a safe return to Earth. In some situations, astronauts may temporarily take shelter inside the spacecraft while the hazard is assessed. They may even conduct a spacewalk to repair damage and re-enter the station once it is deemed safe. A fully serviceable spacecraft docked to the space station, therefore, is a critical safety requirement for long-duration human spaceflight.

Since 14 November 2025, the crew aboard the Tiangong space station has been without a reliable safety net, as the docked Shenzhou-20 spacecraft has been damaged. This uncertainty lasted for about 12 to 14 days, until China launched the Shenzhou-22 spacecraft on an emergency mission. Shenzhou-22 successfully docked with Tiangong on 25 November 2025, and is expected to remain attached to

[1] **"China launches Shenzhou 22 spacecraft to assist in return of 3 astronauts stranded on space station"**, *The Hindu*, 25 November 2025.

the station until around April 2026 to bring the Shenzhou-21 crew safely back to Earth. Although launched without taikonauts, Shenzhou-22 carried medical supplies, spare parts, and equipment needed to repair the damaged Shenzhou-20 spacecraft.

Three years ago, a similar situation occurred with a Russian craft at the ISS. Russia had launched Soyuz MS-22 on 21 September 2022 to ISS with two Russian cosmonauts and one NASA astronaut. A micrometeoroid strike to this craft was detected on 14 December 2022, which is known to have damaged the spacecraft's external radiator and cooling system. Finally, after more than two months, Russia had launched Soyuz MS-23 as an uncrewed replacement on 24 February 2023. This was a more extended mission, and the crew, which had reached the ISS on board MS-22, landed back on Earth on 27 September 2023. Incidentally, Soyuz MS-22 returned to Earth uncrewed on 28 March 2023 after some repairs.[2]

NASA launched astronauts Sunita Williams and Butch Wilmore aboard Boeing's Starliner capsule to the ISS on 5 June 2024. The mission was initially planned to last for eight to nine days. However, after docking, the spacecraft experienced serious technical failures, including thruster malfunctions and helium leaks, and was eventually deemed unsafe to bring the crew back to Earth. As a result, the two astronauts remained on the ISS for around nine months. They finally returned to Earth on 18 March 2025, when NASA sent SpaceX's Crew Dragon spacecraft to bring them home.[3]

These three events indicate how well China is prepared to handle space emergencies. This could be considered the first emergency mission in China's manned space programme. Yet mission managers were very clear about how to respond to a situation they were facing for the first time. After the problem with the Shenzhou-20 spacecraft was identified, Chinese authorities mainly remained silent, but they knew the procedures to follow, and ultimately they delivered.

Shenzhou-22 was initially planned for launch around April 2026, as the next crew rotation mission after Shenzhou-21. It is remarkable how quickly China was able to deploy a new spacecraft. Since 2021, China's Shenzhou missions have been sending trios of taikonauts to Tiangong for approximately six-month stays. Chinese safety protocols have always required a backup carrier rocket and Shenzhou spacecraft to remain on standby at all times. With the Shenzhou-22 spacecraft and its carrier rocket already positioned at the Jiuquan Launch Centre, also known as the Shuangchengzi Missile Test Centre, Chinese authorities carried out the emergency

[2] **"Russia sends Soyuz rescue ship to International Space Station"**, Al Jazeera, 24 February 2023.

[3] Sweta Gupta, **"How Sunita Williams Ended Up Stranded in Space: The Unexpected Ordeal,"** *The Hindu*, 15 September 2024.

launch procedure in 15 to 16 days. Under normal circumstances, the standard launch preparation timeline for a Shenzhou mission is about 45 days.[4]

Undertaking an emergency launch in such a short time speaks volumes about China's mission planning discipline, decision-making structures, and industrial capacity. It demonstrates very reliable supply chains. China is known to maintain a continuous production line of Shenzhou spacecraft and Long March-2F rockets. This rapid reaction suggests that China has well-established processes and contingency plans that allow it to keep essential units, subassemblies, and rockets assembled, tested, and on standby for rapid deployment. China has also developed a dedicated human-spaceflight launch complex at Jiuquan. In addition, the country operates four orbital launch sites and one commercial launch site, and can also conduct sea-based launches.[5]

In 2025, China will have already carried out around 72–75 orbital missions by November. In comparison, the Indian space agency ISRO has conducted four rocket launches in the same period. This highlights the scale of investment China is making in its space programme. The emergency launch of Shenzhou-22 would not have been possible without trained personnel and the necessary logistical systems ready to respond in time. This indicates that China can quickly safeguard taikonauts and ensure continuous human-occupied space station operations, even during emergencies.

There has been considerable discussion about a possible space race between the United States (US) and China, particularly regarding which nation will first return humans to the Moon in the 21st century. Both countries are currently aiming for a 2030 deadline for this achievement. At present, both their space stations operate in Low Earth Orbit (LEO) at an altitude of 350–400 km, whereas the Moon is approximately 400,000 km away. Therefore, the successful rapid launch of the Shenzhou-22 mission cannot, by itself, be used as a measure of China's readiness to conduct a crewed lunar mission.

However, when this emergency response capability is considered together with rapidly progressing China's Lunar Exploration Programme, known as the Chang'e Project and their other investments in the domain of space, it suggests that China may indeed give the US 'a run for its money' in the competition to become the first country to land humans on the Moon in the 21st century.

India is currently developing programmes such as Gaganyaan, its human spaceflight mission to LEO, and it has ambitions to establish its own space station and send humans to the Moon by 2040. Clearly, India has much to learn from China's approach to conducting large-scale space missions.

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[4] Eduardo Baptista, **"China Completes First Emergency Mission to Tiangong Space Station"**, *Reuters*, 25 November 2025.

[5] **"China's Launch Sites and Rockets"**, 11 May 2025.

About the Author

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