China rocket failure likely to set back next space missions

July 4 2017, by Christopher Bodeen

In this image taken from video footage run by China's CCTV via AP Video, a Long March 5 rocket lifts off from the Wenchang Space Launch Center in southern China's Hainan province on Sunday, July 2, 2017. Authorities say the Long March-5 Y2 launched Sunday had an abnormality during the flight after what appeared to be a successful liftoff. The failure of the Long March 5 rocket deals a rare setback to China's highly successful space program, one that will almost certainly delay plans to send a spacecraft to bring back samples from the moon later this year, along with other upcoming missions. Chinese characters at both reads "Long March-5 Y2 rocket life off." (CCTV via AP Video)

The failure of China's Long March 5 rocket deals a rare setback to China's highly successful space program that could delay plans to bring back moon samples and offer rival India a chance to move ahead in the space rankings.

Experts say the still unexplained mishap shows that for all its triumphs, China's space program is not immune to the tremendous difficulties and risks involved in working with such cutting-edge technology.

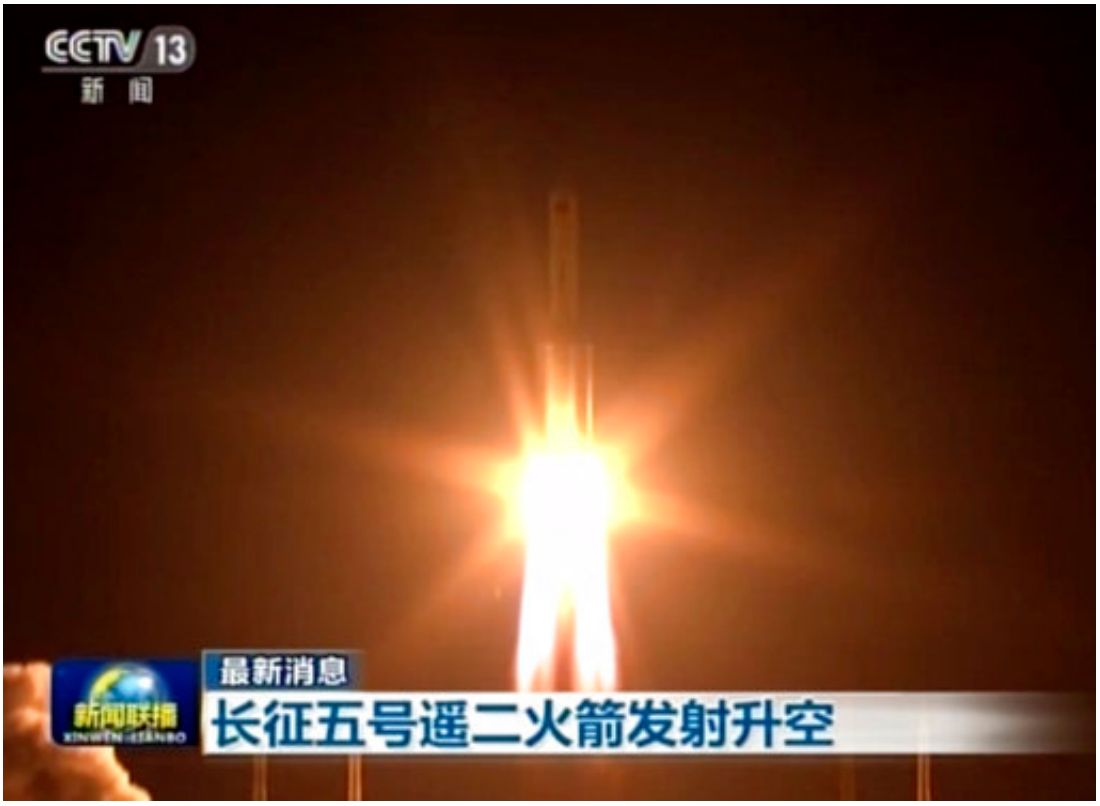
"China's approach has been slow and prudent, trying to avoid this kind of 'failure,' even though they knew it was going to occur sooner or later," Joan Johnson-Freese, an expert on China's space program at the US Naval War College, wrote in an email.

Authorities say the Long March 5 Y2 that took off Sunday in the second launch of a Long March 5 rocket, suffered an abnormality during the flight after what appeared to be a successful liftoff from the Wenchang Space Launch Center in the southern island province of Hainan. The incident is under investigation and the authorities have yet to comment on possible causes, or any knock-on effects on the program as a whole.

In a testimony to the high respect China's program now commands, the failure drew widespread commentary in the space community, including from SpaceX founder and chief executive Elon Musk, who tweeted Sunday: "Sorry to hear about China launch failure today. I know how painful that is to the people who designed & built it."

Nicknamed "Chubby 5" for its massive, 5-meter (16-foot) girth, the Long March-5 is China's largest and most brawny launch vehicle, capable of carrying 25 tons of payload into low-earth orbit and 14 tons to the more distant geostationary transfer orbit in which a satellite orbits constantly above a fixed position on the earth's surface

That's more than double that of the Long March 7, the backbone of the Chinese launching fleet, making it the linchpin for launch duties requiring such massive heft such as interplanetary travel.



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First among those is the mission slated for November by the Chang'e 5

probe to land a rover on the moon before returning to Earth with samples—the first time that has been done since 1976. China's most technically demanding mission to date, it had been put off before because of funding and then technology, Johnson-Freese said.

While the Long March 5 has suffered other setbacks, the lunar mission is "certainly the most visible one," she said.

Other upcoming Chinese missions include the launch next year of the 20-ton core module for China's orbiting Tiangong 2 space station, along with specialized components for the 60-ton station that is due to come on-line in 2022 and other massive payloads in future. The Long March 5 was also due to be the launch vehicle for a Mars rover planned for the mid 2020s.

Problems with the Long March 5 may stem from its use of liquefied gases that are less stable than the sort of propellants used in other rockets, said Morris Jones, an Australian space analyst and regular contributor to SpaceDaily.com. Unlike earlier rockets that used highly toxic fuels, the Long March 5 burns a more environmentally friendly and less expensive kerosene-liquid oxygen-liquid hydrogen mix—which is more complex and harder to regulate.

Jones called such setbacks typical of the development phase of a new rocket and said additional launches may be required to work out the kinks. Sunday's launch failure will delay the Chang'e 5 mission at least until next year, while there may also be a small delay in launching the space station components, Jones said.

Finding a fix "takes a lot of time and effort but there is no other way to produce a reliable rocket," Jones said.

Test launched for the first time last year in what had been a towering

success, the 57-meter (187-foot) two-stage rocket is just slightly less powerful than the most powerful rocket in service, the U.S.' United Launch Alliance's Delta IV, although SpaceX's Falcon Heavy is designed to carry a payload into low-earth orbit of more than 50 tons.

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Since the first launch in 1970, China's Long March series of rockets have been a remarkably solid bet, achieving a success rate of around 95 percent. That's helped facilitate a program that conducted its first crewed space mission in 2003, making China only the third country after Russia and the U.S. to do so, put a pair of space stations into orbit, and landed its Yutu, or "Jade Rabbit" rover on the moon. Administrators suggest a manned landing on the moon may also be in the program's future.

Not all has been smooth sailing, however.

A Long March 3B rocket launched June 18 launch placed its communications satellite in a lower-than planned for orbit. Though the satellite is climbing into its proper altitude on its own, the effort will reduce its useful lifespan in space. A least two similar incidents reportedly occurred last year.

With two mishaps coming so close together, Chinese space officials may decide to take a pause to re-evaluate manufacturing quality or other aspects of the program, said Stephen Clark of Spaceflight Now. That may include launching another Long March 5 test flight before attempting the Chang'e 5 mission, Clark said.

Both Clark and Johnson-Freese said they hope the failure doesn't deter Chinese officials in their pursuit of greater transparency and international participation in the country's space program.

Yet, rivals, primarily India, may see the setback as an opportunity to steal a march on China, whose geostrategic influence has benefited significantly from its role as a technology leader in space, said Johnson-Freese.

India's Mars Orbiter Mission, called Mangalyaan, is already orbiting the

red planet, years before China is ready to launch such a mission, and it won acclaim and a place in the record books earlier this year by placing 104 nano satellites in orbit from a single rocket.

"The failure of the Long March 5 may provide a window of opportunity for India," said Johnson-Freese.