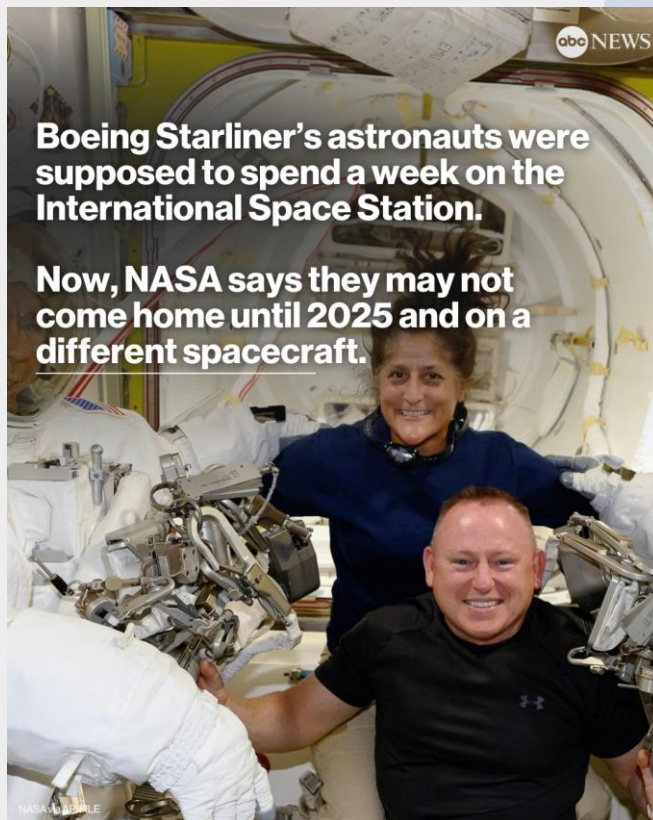


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1. NASA's Sunita Williams and Barry Wilmore could be stuck in Space till 2025: What happens now?**Why in News?**

A technical snag in the spacecraft that took them to the International Space Station (ISS) has forced astronauts Sunita Williams and Butch Wilmore to spend an extended period in space. Last week, NASA said they might have to wait till February 2025 to return to Earth.



Though in an unprecedented situation, Williams and Wilmore are not in danger. The ISS can comfortably house them for the next six months. Currently, there are seven other astronauts at the space station. The ISS, a permanent space laboratory orbiting Earth at a distance of about 400 km, is continuously manned and has never been without an astronaut since November 2000.

This is not the first time that astronauts have had to extend their stay at the ISS due to technical glitches. Williams and Wilmore, however, would have the longest unscheduled stay if they return in February.

Why are Williams and Wilmore stuck in space?

Williams and Wilmore travelled to the ISS on a Boeing spacecraft called Starliner in

June. This spacecraft has made two trips to the ISS earlier but this was the first time it was carrying astronauts. Before the launch, a helium leak in Starliner's propulsion system was detected but was not considered serious enough to abandon the journey. Although Starliner developed two more similar leaks on its way, it reached its destination without any trouble.

However, after it docked with the ISS and the two astronauts transferred inside, more problems emerged in Starlink, raising questions over the safety of the astronauts on their return journey — originally scheduled after just a week. So far, ground engineers have not been able to

resolve all issues to everyone's satisfaction, leaving Williams and Wilmore stranded as they do not have a vehicle to return home.

Possible impacts on Astronauts

According to reports, due to the longer exposure to microgravity on the ISS, astronauts might experience several health-related issues such as bone density reduction, vision-related issues, and are also at a higher risk of cancer due to DNA damage. This is why space exploration missions are kept short, not lasting more than a few weeks.

How will Astronauts return?

Both NASA and Boeing have said they hope to get Starlink in order soon. If that does not happen, the earliest that the astronauts can return to Earth would be in February 2025 on another vehicle that is set to travel to the ISS in September. This spacecraft, operated by SpaceX, is supposed to carry four astronauts to the ISS and bring them back in February. However, if Williams and Wilmore also have to be brought back, then the SpaceX spacecraft will carry only two astronauts in September.

Can the ISS accommodate them?

In recent years, the ISS, which has been operational for 25 years, has usually been hosting seven astronauts at any given time. These astronauts mostly belong to the five countries/regions whose space agencies manage this facility — the United States, Russia, Japan, Canada, and Europe. The astronauts carry out a variety of space-based experiments and are themselves subjects of some experiments, particularly those regarding the study of impacts of the outer space environment on human bodies.

Nonetheless, the ISS is large enough to accommodate more astronauts. The number increases when a new team comes to take over or when astronauts arrive for short visits like Williams and Wilmore did. The facility is bigger than a typical six-bedroom apartment in the US, according to NASA. It has six sleeping quarters, two bathrooms, and even a gym. When visiting spacecraft attach themselves, additional space is created.

Cargo spaceships routinely make trips to the ISS, carrying essential supplies and attending to maintenance requirements. On their return, these spacecraft take back waste generated at the ISS and dispose of it into space at the time of re-entering Earth's atmosphere where it gets burnt due to friction. In fact, one such cargo spacecraft, called Cygnus, operated by a private aerospace and defence firm Northrop Grumman, docked with the ISS last week. It carried more than 3,700 kg of cargo, which is currently being unpacked by the astronauts on board. It will remain docked with the space station till January after which it will return to Earth. As many as eight spacecraft can simultaneously dock themselves with the ISS.

The cargo spacecraft, however, cannot be used to bring back Williams and Wilmore as they are not equipped with the special capsules that can house humans in space.

Have astronauts stayed in space for a long duration?

Spending nine to 10 months in space is quite a long time but not unusual. Several astronauts have remained in space far longer than that.

The current record is held by Russian cosmonaut Valeri Polyakov, who spent 438 days at the Mir space station between January 1994 and March 1995. Russia's Mir predated the ISS and was operational between 1986 and 2001 before being brought down.

More recently, US astronaut Frank Rubio completed 371 days at the ISS between September 2022 and September 2023.

Several other astronauts, including women, have spent more than 300 days in space.

Williams and Wilmore are likely to spend more than 250 days by the time they return. Both these astronauts are on their third visit to the ISS. Williams spent 196 days on her first visit in 2006-2007 and then another 127 days in 2012. Wilmore, during his two previous visits in 2014 and 2015, has spent a total of 178 days at the ISS.

What happens to the human body in space?

NASA has increasingly been deploying its astronauts for extended stay missions to study the impacts on human bodies. US astronauts flying to the ISS can now volunteer to be part of such experiments. NASA is running a programme to study the impacts of short (up to 3.5 months), routine (up to eight months), and extended stays (more than eight months) of astronauts in space.

Past studies have shown that bone density and muscle quality deteriorate faster in space than on Earth. Low gravity impacts brain fluids and extended stays can potentially alter brain structure. Extended stays can also increase the risk of heart disease.

Several other impacts have also been noticed. The ongoing programme would help in better understanding of these changes.

Relevance: GS Prelims; Science & Technology

Source: Indian Express

2. All you need to know about the Hindenburg-Adani-Buch rigmarole

Why in News?

A year and a half after its January 2023 report on the Adani Group, US-based short seller Hindenburg Research has levelled allegations against the chairperson of India's capital markets regulator Securities and Exchange Board of India (Sebi).

Hindenburg alleged that Sebi chief Madhabi Puri Buch and her husband, Dhaval Buch, had stakes in offshore funds used in the alleged Adani money siphoning scandal.

The Buchs have denied the allegation and Sebi has said that it has adequate internal mechanisms for addressing issues relating to conflict of interest, including a disclosure framework and provisions for recusal.

How and when did this saga begin?

In a 106-page report released on January 25, 2023, Hindenburg accused Gautam Adani's Adani Group of "brazen stock manipulation and accounting fraud scheme over the course of decades".

The report was published ahead of the Rs 20,000-crore follow-on public offer (FPO) of Adani Enterprises Ltd. Shares of Adani companies tanked, and the group subsequently called off the FPO, which was fully subscribed.

Adani denied the allegations. Most Adani shares have now recovered.

What happened after that?

On March 2, 2023, the Supreme Court set up a six-member expert committee to investigate whether there was regulatory failure in dealing with the alleged contravention of laws by the Adani Group or other companies.

Separately, the court asked Sebi, which was already looking at allegations against Adani companies, to specifically investigate if there was a violation of the minimum public shareholding norms in public limited companies, a failure to disclose transactions with related parties, or any manipulation of stock prices.

In May 2023, the expert committee said that the markets regulator "had drawn a blank" in its investigation into alleged violations in money flows from offshore entities into Adani companies.

In November 2023, the court said it had no reason to discredit Sebi, and that it did not have to treat the contents of the Hindenburg report as the "true state of affairs".

On January 3, 2024, the court endorsed Sebi's investigation, and refused to transfer the case to a Special Investigation Team (SIT) or the CBI. It said Sebi had completed the probe in 20 out of 22 matters, and asked it to finish the job within three months. Sebi completed its probe into one more case in March, and has said the final investigation is close to completion.

What has Sebi been doing in this period?

On July 1, 2024, Hindenburg announced that it had received a show cause notice from Sebi for short selling of Adani Enterprises Ltd stock immediately before and after the release of its January 2023 report. The notice named Hindenburg Research, its founder Nathan Anderson, partner-investor Mark Kingdon, and three entities owned or controlled by Kingdon: Kingdon Capital Management LLC, M Kingdon Offshore Master Fund LP, and K India Opportunities Fund (KIOF) – Class F.

Hindenburg also said Sebi's notice had "conspicuously failed to name...Kotak Bank, one of India's largest banks and brokerage firms..., which created and oversaw the offshore fund structure used by our investor partner (Kingdon) to bet against Adani".

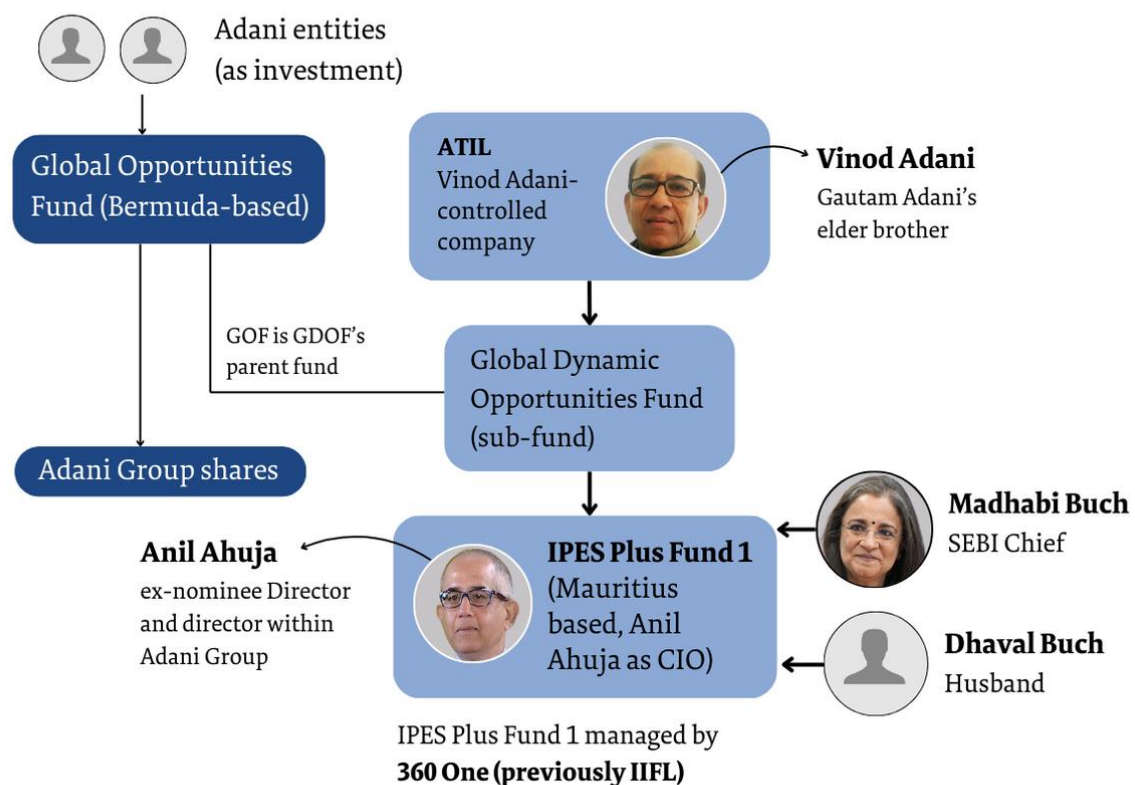
A day later, Kotak Mahindra International Limited (KMIL) and KIOF stated that Hindenburg was never their client, nor had it ever been an investor in the Fund. The Fund was not aware that Hindenburg was a partner of any of its investors, it said.

What is Hindenburg's new allegation?

Hindenburg has now alleged that "it suspects Sebi's unwillingness to take meaningful action against suspect offshore shareholders in the Adani Group may stem from Sebi Chairperson Madhabi Puri Buch's complicity in using the exact same funds used by Vinod Adani, brother of Gautam Adani".

Hindenburg's new findings linked SEBI chief Madhabi Puri Buch and her spouse to an offshore fund involved in the Adani "money siphoning scandal" in connection to Adani's elder brother - Vinod Adani. It said this was a "massive conflict of interest."

Here's how it says the money flowed.



THE HINDU

Quoting "whistleblower documents", Hindenburg alleged, "Sebi's Chairperson had stake in obscure offshore entities used in the Adani money siphoning scandal." It said Sebi was yet to take any action against other suspect Adani shareholders operated by wealth management firm India Infoline — EM Resurgent Fund and Emerging India Focus Funds.

Hindenburg alleged that Buch had ensured that accounts with ties to Adani "be registered solely in the name of Dhaval Buch", her husband, two weeks before her appointment as Sebi Whole Time Member, and had subsequently redeemed the funds "through her husband's name".

"Despite disclaiming control, a private email she sent a year into her Sebi term (in 2018) shows she redeemed stakes in the funds through her husband's name...", Hindenburg has alleged.

How has the Sebi chairperson responded to the allegations?

Madhabi Puri Buch and Dhaval Buch have said their investment in the offshore funds mentioned by Hindenburg were made in 2015 when they were "private citizens" living in Singapore. The investment was made "almost 2 years before Madhabi joined Sebi...as a Whole Time Member", they have said.

"The decision to invest in this fund was because the Chief Investment Officer, Anil Ahuja, is Dhaval's childhood friend from school and IIT Delhi and, being an ex-employee of Citibank, JP Morgan and 3i Group plc, had many decades of a strong investing career. The fact that these were the drivers of the investment decision is borne out by the fact that when, in 2018, Ahuja left his position as CIO of the fund, we redeemed the investment in that fund," the Buchs have said.

From 2011 to March 2017, Madhabi lived and worked from Singapore, initially as an employee of a private equity firm and subsequently as a consultant. The two consulting companies she set up, one each in India and Singapore, became dormant on her appointment at Sebi. These companies (and her shareholding in them) were explicitly part of her disclosures to Sebi, they have said.

What position has Sebi taken?

The regulator defended Buch. She has from time to time made relevant disclosures required in terms of holdings of securities and their transfers, Sebi said. "Chairperson has also recused herself in matters involving potential conflicts of interest," it said.

Relevance: GS Prelims; Economics

Source: Indian Express and The Hindu





3. How China increased its medal haul at the Olympics and why the Games matter to it

Why in News?



#	COUNTRY				
1	UNITED STATES	40	44	42	126
2	CHINA	40	27	24	91
3	JAPAN	20	12	13	45
4	AUSTRALIA	18	19	16	53
5	FRANCE	16	26	22	64
6	NETHERLANDS	15	7	12	34
7	GREAT BRITAIN	14	22	29	65
8	SOUTH KOREA	13	9	10	32
9	ITALY	12	13	15	40
10	GERMANY	12	13	8	33

The Closing Ceremony of the 2024 Paris Olympics took place on 12th August. The United States led the table with 125 medals while China equaled the US in gold medals, with each country winning 40.

olympics medal tally					X				
53		Dominica	1	0	0	1			
53		Pakistan	1	0	0	1			
53		Slovenia	1	0	0	1			
59		North Korea	0	2	4	6			
60		Türkiye	0	2	3	5			
61		Mexico	0	2	2	4			
62		Armenia	0	2	1	3			
63		Ethiopia	0	2	0	2			
64		India	0	1	4	5			

For a long time, the People's Republic of China (PRC) did not compete in the Olympics as it opposed the International Olympic Committee's (IOC) recognition of the Republic of China (Taiwan). Most Western, non-communist countries recognised Taiwan as the official representative of China in international arenas then, including the United Nations.

China's entry to Olympics

In 1979, the same year China established diplomatic ties with the US and ended its recognition of Taiwan, a pact was signed so that both China and Taiwan could compete at the Games. The PRC's first Summer Olympics was the 1984 Los Angeles Olympics, where it won 32 medals and 15 of them were gold.

Since then, China has been among the top-performing countries at the Olympics. Its success has been the result of deliberate policies. For the ruling Communist Party too, the event has been seen as key to its global perceptions.

Systemic focus on sports, with pitfalls

China began competing in the Olympics at a time when its economy was undergoing a monumental shift. In 1978, under President Deng Xiaoping, its economy was opened to the world. Before this, large sections of the population struggled with poverty, particularly in non-coastal and rural areas.

At an early age, children were encouraged to enroll in sports like gymnastics and table tennis at specialised training institutions. For parents from poorer and rural backgrounds, these centres were attractive options as they provided food and other necessities.

While the rigorous training produced results and medals, the pressure on athletes to win "for the country" took its toll on many. There were also cases of state-sanctioned doping. The small

odds of success as a professional athlete meant that children, who spent their youth engaged in sports rather than school, often struggled to find alternative career opportunities later in life.

In 2010, a new policy was introduced to relax some rigid systems, such as the requirement to stay on campus for training.

Why Olympics matters for “national rejuvenation”

President Hu Jintao, who assumed office in 2003, also believed that an impressive medal haul in the 2004 Athens Olympics could “serve as a useful means to encourage the public, under government orders, to work toward rapid economic growth, transform their motherland into a prosperous society, and pursue national rejuvenation.”

“National rejuvenation” is a key concept in China, framed against its colonial subjugation at the hands of Japan and Western powers in the 19th and 20th centuries. It speaks of rising as an economic superpower, being prominent on the world stage, and invoking the “five-thousand-year” history of the ancient civilization to emerge from the “humiliation” of colonization.

From the perspective of President Xi Jinping too, making Beijing the first city in the world to host both the Summer and Winter Olympics was part of this idea, prompting the successful bid for the 2022 Winter Olympic Games.

Relevance: GS Prelims

Source: Indian Express