

## Mars500 crew 'gone into orbit'

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The Mars500 simulation project crew has "gone into orbit" and is preparing to "descend" to the Red Planet and walk on the "surface" of Mars.

Three Russians, two EU citizens and a Chinese national have been sealed since June inside steel containers representing a spacecraft as part of a project aiming to investigate the psychological and physiological effects of a long-duration spaceflight on humans.

Three crewmembers will wear real spacesuits and walk on the planet surface which is actually the sandy floor of another module at the Moscow-based experiment.

Run by Russia's Institute of Biomedical Problems with the participation of the European Space Agency (Esa), the Mars500 project also introduces a time delay in communications between the crew and their ground controllers outside the modules.

"So far, I must say we've had no major problems," said Martin Zell, who is in charge of the Esa scientific program on the International Space Station (ISS).

"There is permanent monitoring, so we understand their health very well," he told the state-funded BBC. "We have a lot of data now on their mental state and on how their bodies are reacting. That's important because there is a link between the two."

Alexander Smoleevskiy, Sukhrob Kamolov, Alexey Sitev, Diego Urbina, Romain Charles and Wang Yue have been working together inside a closed facility with no windows and a total interior volume of about 550 cubic meters.

The group passed through a rigorous selection procedure and are due "back on Earth" in November 2011.

Smoleevskiy, Urbina, and Wang will enter a "descent module," from where they will enter another container that has been set up to look like the dusty Mars surface.

The trio will simulate geological investigations that future astronauts might conduct on the planet, in three stages with the first outing due on February 14, 2011.

A robot rover will help them and their work will be overseen by Mission Control Moscow which normally deals with events on the ISS.

"They will go on to the surface two at a time, with one man staying behind in the landing module," explained Dr. Zell.

"Working in their suits, they will have a drill to get below the surface; and they will do a virtual analysis of the samples the drill delivers to them. They will also take samples back to the module for further analysis."

Controllers create various types of unexpected problems and circumstances to test the crew's reaction in time of crisis.

Last month for instance they created a power failure without warning the crew.

They even blew a small amount of smoke into the containers to give the impression that there was actually a serious electrical failure.

"They spent almost a day without energy," Dr. Zell said. "They had to work through their emergency procedures and analyze the situation. They didn't panic and they remembered their training."

Mars500 simulates the duration of a possible human Mars mission in the future using conventional propulsion: 250 days for the trip to the Red Planet, 30 days on the Martian surface and 240 days for the return journey, 520 days in total.

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