

Europe sat-nav launch glitch linked to frozen pipe

October 1 2014

A frozen fuel pipe in the upper stage of a Soyuz launcher likely caused the failure last month to place two European navigation satellites in orbit, a source close to the inquiry said Wednesday.

Confirming a report in French daily Le Monde, the source said investigators suspect a pipe containing hydrazine fuel, used by the [Fregat upper stage](#) to drive the satellites to their orbital slots, had frozen during launch.

The hydrazine pipes are located near a pipe that circulates ultra-cold liquid helium, the source said.

The two satellites, launched from Europe's base in Kourou, French Guiana, were intended to be the first two fully operational satellites in the new-generation navigation system Galileo.

Two more satellites had been expected to be hoisted by the end of 2014, opening the way for a first phase of Galileo services in 2015, including applications for smartphones and in-car [navigation](#) and search-and-rescue location.

By 2017, according to the Galileo schedule, all 24 operational satellites would be in place.

Six backups would join the fleet by 2020, at which point the system would be fully operational.

Launched by a Russian-made Soyuz, the misplaced satellites should have been slotted into a circular orbit at an altitude of 23,500 kilometres (14,600 miles), inclined at 56 degrees to the equator.

Instead, they were placed in an useless elliptical orbit at a height of 17,000 kilometres (11,000 miles).

The failure adds to a catalogue of problems encountered by the 5.4-billion-euro (\$7.2-billion) programme, designed to give the EU independence in [satellite navigation](#) from the US Global Positioning System (GPS).

Galileo, according to the project's defenders, will be more accurate and have a stronger signal, particularly in built-up areas, than its competitors.

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Citation: Europe sat-nav launch glitch linked to frozen pipe (2014, October 1) retrieved 21 September 2024 from <https://phys.org/news/2014-10-europe-sat-nav-glitch-linked-frozen.html>

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