'Failed' clocks fresh blow for Europe's Galileo satnav (Update)

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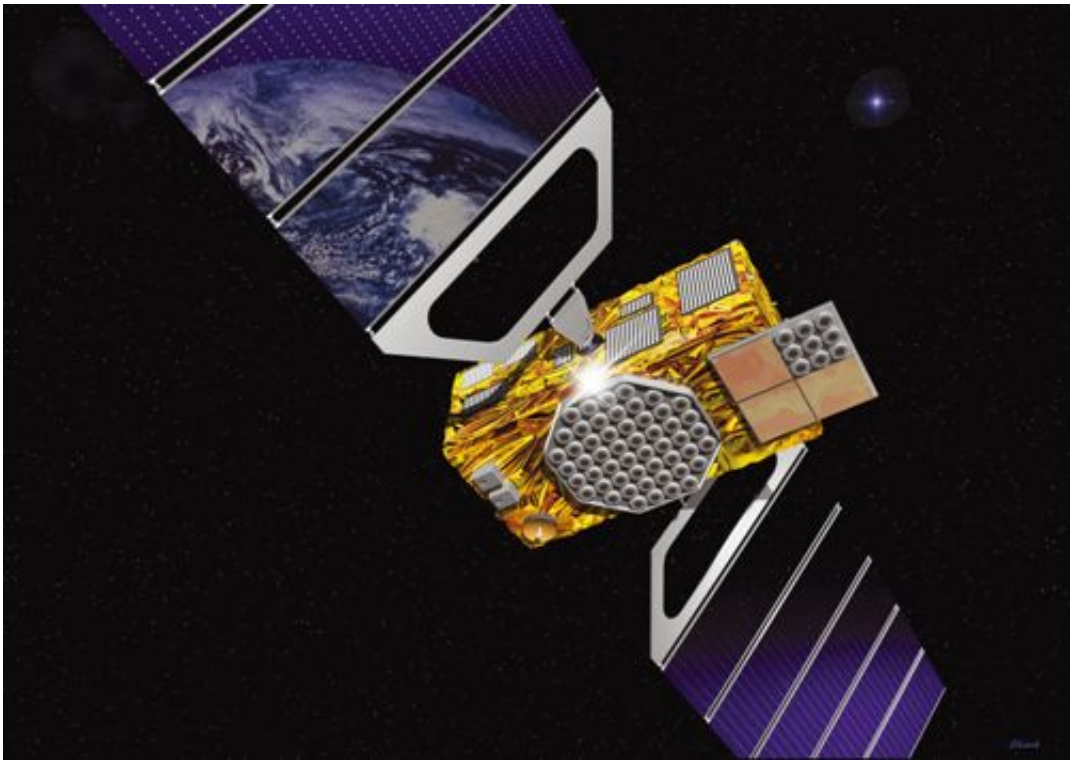

Artist's impression of a Galileo satellite. Credit: ESA.

Europe's beleaguered Galileo satnav has suffered another setback, with clocks failing onboard a number of satellites in space, the European Space Agency said Wednesday.

Designed to render Europe independent from America's GPS, the 10

billion-euro ($11 billion) project may experience further delays as the cause of the failure is investigated, ESA director general Jan Woerner told journalists in Paris.

Eighteen orbiters have been launched for the Galileo constellation to date, a number that will ultimately be boosted to 30 operational satellites and two spares.

Early, initial services were launched in December, and the failure of nine clocks out of 72 launched to date has not affected operation, Woerner said.

No satellite has been declared "out" as a result of the glitch.

"However, we are not blind... If this failure has some systematic reason we have to be careful" not to place more flawed clocks in space, he said.

Each Galileo satellite has four ultra-accurate atomic timekeepers—two that use rubidium and two hydrogen maser.

Three rubidium and six hydrogen maser clocks are not working, with one satellite sporting two failed timekeepers.

Each orbiter needs just one working clock for the satnav to work—the rest are spares.

The question now, Woerner said, is "should we postpone the next launch until we find the root cause?"

The next four satellites were to have been hoisted into space in the second half of 2017.

"You can say we wait until we find the solution, but that means if more

clocks are failing then we are reducing the capability of Galileo," the director general said.

"If we launch we will at least sustain if not increase the possibility of Galileo, but we may take the risk (of) a systematic problem."

It was also not known whether the broken clocks can be fixed.

Taking risks

ESA boasts that Galileo has the most accurate atomic clocks ever flown for geolocalisation.

Similar to traditional clocks relying on the tick of a pendulum, atomic timekeepers also count regular oscillations, in this case switches between energy states of atoms stimulated by heat or light.

The project has already experienced many setbacks, taking 17 years and more than triple the original budget before going live last month.

In August 2014, after a more than year-long delay over "technical difficulties", satellites number five and six were placed into a lopsided, elliptical orbit—delaying subsequent launches.

The civilian-controlled service is seen as strategically important for Europe, which relies on two military-run rivals—GPS and Russia's GLONASS.

Neither provides a guarantee of uninterrupted service.

Woerner defended the decision to create an autonomous European satnav system based on European technology.

"If you want to be competitive in the global market you should not rely in too many aspects on the technology of others," he said.

"If you only use proven technology, you have no further development... We ought to take risks in order to learn, in order to be competitive in the future."

Last October, ESA's Mars lander Schiaparelli, designed to test technology for a future rover, crashed into the Red Planet.

It had been Europe's second failed attempt to reach the Martian surface.