

Capacity Booster

In anticipation of higher demands for connectivity, Inmarsat has put its spare satellite into action.

BY HOWARD SLUTSKEN

Commercial airliners are filled with backups to the backups, all designed to get us to our destinations safely and efficiently. There are multiple autopilots and flight control systems, secondary hydraulic and electrical systems and two engines. The pilot and the co-pilot are even served different meals, so should one of them come down with food poisoning, there is always a backup.

Operators of communications satellites face similar demands in maintaining service, which are compounded by the orbital location of their satellites: more than 22,000 miles above the equator. A million things have to go right to get the birds (industry jargon for satellites) into orbit and working for an expected 15-year life span. Boosters, upper stages, solar panels, batteries, transmitters, thrusters and myriad high- and low-tech components are expected to work perfectly every time.

Satellites are designed to withstand the extreme temperatures and radiation of space, but components do fail, and when that happens, ground-based technicians may be able to reroute onboard systems or move traffic to other satellites.

An advanced communications satellite can cost hundreds of millions of dollars and take years to build, so it can be difficult to recover from a major in-orbit failure. However, just as airlines have extra airplanes, operators sometimes build an additional satellite as a ground-based

spare, or even launch a backup bird that can quickly be pressed into service. But in some cases, the backup is intended to boost capacity rather than to replace a broken part.

At the launch and deployment of Inmarsat's I-5 F4 satellite in May, CEO Rupert Pearce spoke to the company's decision to launch F4, which was originally intended to be a ground spare for the three-satellite Global Xpress (GX) Ka-band constellation. "We actually think that having in-orbit redundancy is very important competitively. A lot of customers really depend on us, and they want to know that if there's a problem, there's an alternative that isn't three or four years away," Pearce said. "So when you're looking to burnish your brand for in-flight connectivity, or you're a government or you're in maritime, you want to know the service is going to be there because you depend on it utterly. This fourth satellite is very useful – even if never entered into service in the next 15 years, it would still be valuable."

Since the launch, Inmarsat has announced that F4 will be used to provide additional capacity in high-demand regions, in addition to the launch of a fifth GX satellite, which will be built by Thales Alenia Space.

While geosynchronous birds might be out of reach for now, there are concepts in development for robotic servicing technologies that could replace components and refuel in-orbit satellites. Roadside service 22,236 miles up! ■



I-5 F4 was launched on May 15 from NASA's Kennedy Space Center in Florida.