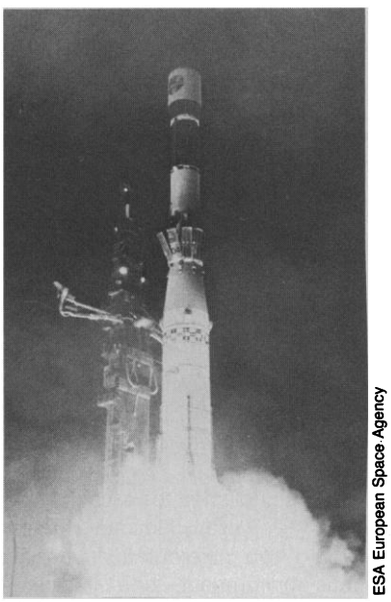
Ariane Loses One to NASA

Paris. Europe's astronomers have persuaded the European Space Agency (ESA) to swallow its pride and accept an offer from the U.S. National Aeronautics and Space Administration (NASA) to provide a Thor-Delta rocket to launch the x-ray satellite EXOSAT. The satellite was to have been the first scientific payload carried by ESA's own launcher, Ariane. The switch is a result of delays in the Ariane launch schedule caused by last September's failure of the rocket on its first "promotional" launch.

Meeting in Paris last week, the council of the agency reviewed progress in modifying the lubrication system of the turbopump, which has been identified as the most likely cause of the accident, and agreed that the next flight of Ariane from its launch site in French Guyana—originally planned to take place last November—will now be on 3 June.

The one after that will be on 26 August. This second launch was to have been dedicated to EXOSAT, a 500-kilogram German-built satellite which will enter a highly elliptic orbit with a perigee and apogee of 300 and 20,000 kilometers respectively. EXOSAT is designed to provide a precise location of x-ray sources emitting in the 0.1 to 50 kiloelectron volt energy band. It has already proved extremely popular with astronomers, and ESA has received more than 500 proposals for observations and experiments.

The August 1983 launch window, however, is relatively tight. Any further delays would have caused EXOSAT to be put back to next year; and this in turn could have created significant degradation problems with some of the satellite's experimental equipment, in particular, a beryllium window used to make mid-range energy measurements.



ESA European Space Agency

Ariane

Suffering delays.

Unofficial discussions have been taking place with NASA about the possibility of a Thor-Delta launch since Ariane's failure last fall. There has also been talk of switching EXOSAT with two communications satellites due to be carried on the June launch. Keen to encourage investigation of both alternatives, the agency's Science Program Committee passed a resolution at its November meeting urging the council to take "all actions necessary" to secure a launch before the closure of the summer window.

However, the astronomers faced two hurdles. Several member states on the ESA council—in particular, France—were reluctant to give up a prestigious launch which they had long hoped to place on Ariane. At the same time, however, ESA is also keen to reestablish the credibility of Ariane as a commercial competitor to NASA's space shuttle as quickly as possible.

Seeing the guarantee of a summer launch slipping through their fingers, European astronomers organized an all-out lobbying campaign aimed at council members. In addition, the agency's Space Science Advisory Committee, an independent group of scientists, endorsed a resolution in December urging that the Thor-Delta option be formally investigated; NASA had already indicated that it had a suitable date available.

Faced with the February deadline set by NASA to give enough time to make preparations for the launch, the ESA council has now agreed to sit on its reservations and accept the American offer. "The risk of leaving EXOSAT on Ariane was just too great," explained ESA director-general Erik Quistgaard. The launch of EXOSAT will now take place from Vandenburg Air Force Base in California on 23 May.

Putting a brave face on their disappointments, ESA officials are pointing out that the arrangement has several advantages for the agency. One is that it will not cost member states any more money, since the $26 million price tag on the Delta launch is very close to what Ariane would have cost; furthermore the Ariane I rocket which has been prepared for the launch will be kept in cold storage for the next major scientific mission, the spacecraft Giotto, due to make an encounter with Halley's comet early in 1986.

A second advantage is that it will provide Ariane an uninterrupted run of commercial satellite launches. The agency points out that the payload for the June launch—a European Communications Satellite (ECS-1) and a Radio Amateur Telecommunications Satellite (AmSAT)—is similar to the payload that ended up on the bed of the Atlantic last September.

The three following launches, currently scheduled for 26 August, 4 November, and a date next January, will each be used for INTELSAT V satellites for one of Ariane's biggest customers, the International Telecommunications Satellite Organization—an arrangement that will suit INTELSAT, since it will be able to maintain a single launch team intact for the three launches.

ESA officials are hoping that modifications to the turbopump now being tested will avoid a recurrence of last September's embarrassment. A board of inquiry set up by ESA and the French Centre Nacional d'Études Spatiales (which has responsibility subcontracted from ESA for the Ariane project) concluded last October that the failure of the rocket's turbopump was probably caused by two factors. One was insufficient lubrication during the preflight testing of the third-stage engines; this coincided with what was described as "an unduly narrow operating margin for the gearing due to unfavorable combination of the various tolerances which, taken individually, were all within the specified manufacturing limits."

Following this report, a complete review of Ariane's design has been carried out to eliminate any other circumstances in which the margin of error might be narrower than previously anticipated.—**David Dickson**