Italy in space

Minister Granelli looks ahead

THE Italian national space programme — a gigantic effort by Italian standards, designed to give Italy a place in the world satellite systems market — is endangered by swingeing cuts in the government budget, science minister Luigi Granelli said in London last week. Granelli was in passage between the launch of Spacelab at Cape Canaveral in Florida and the Italian space base of Malindi in equatorial Kenya.

Although a lawyer, Granelli has clearly been bitten hard by the space bug. "I am determined to intervene heavily to allow investment in this sector to go on", he said. "Our space plan has been so positive, we feel that a national space agency ought to be established."

But the minister of the treasury clearly feels otherwise: of a 119,000 million lira (£50 million) space budget this year (1983), 69,000 million lira have been withheld. Granelli hopes to win this back in the 1984 budget, but it may be two or three months before he knows whether he has succeeded.

Meanwhile, then, the programme must be delayed, putting a brake on ITALSAT (the biggest project), a communications satellite due for launch in 1987; IRIS, an upper stage for the US space shuttle, capable of taking a 900-kg satellite into geostationary orbit; TSS, a "tethered satellite", for aeronomy, which would physically hang on a wire 100 km below the shuttle, dragging through the upper levels of the atmosphere; and SAX, a scientific X-ray satellite. "There are programmes under way that cannot be interrupted", said Granelli. "Cuts make the existing programmes useless."

Italian industry is "very interested" in space, and even in the use of Spacelab, Granelli claimed. Italy had put up 18 per cent of the original cost of Spacelab (about 14 per cent of its final, $800 million price tag), and this was the largest sum outside West Germany, the prime constructors. The work had involved Italian industry in some "very advanced technologies" and generated important collaborations with US companies. "It's impressive", Granelli says. And he claims that although the Spacelab construction was supported by the government, Italian companies are now prepared to take advantage, on their own behalf, of opportunities for experimenting in microgravity.

Granelli admitted, however, that industrial interest in this "unique" research had not been as strong as hoped, but argued that it will increase. "The same thing happened with Ariane and the shuttle. Now there's a waiting list. Costs will fall. And we can send up unmanned experiments."

Italy is also interested in working on a space station, and on expanding its Kenyan base, according to Granelli. Kenya could be an important launch pad because its equatorial position yields a greater payload for the same launcher, when compared with Cape Canaveral and even the European Space Agency's base at Kourou in French Guiana. Negotiations are under way "to improve links" with Kenya.

On other Italian matters, Granelli gave little hope of a reform of the National Research Council (CNR), whose inflexible, bureaucratic proportions system — based on the civil service statutes — strangles proper research management in Italy; but he announced that he was preparing a white paper on scientific research, to be published in 1984, identifying areas of waste. The Italian research and development budget might be little more than 1 per cent of gross national product but it could be more efficiently spent, Granelli argues.

Robert Walgate

Acid rain

What cost, what benefit?

AS pressure everywhere increases for action to reduce atmospheric emissions of sulphur dioxide and nitrogen oxides, the British Government has reaffirmed its view that more research is still the most responsible course of action. In a briefing document, the Department of the Environment acknowledges that it is "generally accepted" that acid deposition has contributed to the acidification of lakes and streams in sensitive areas, but says there is "still little evidence" that long-range transport of acid pollutants has caused damage to forests such as that reported from West Germany. Meanwhile, the British Government has spent £1 million on research on the subject this year and hopes to spend more in 1984.

Some of the problems were aired at a meeting earlier this month in London of the Watt Committee on Energy. Sir John Mason, who is directing a study for the Royal Society in collaboration with the Royal Swedish Academy and the Norwegian Academy of Sciences and Letters, said that "representivity of measurement" would be a major problem. His study will concentrate on the chemistry of rainwater as it percolates through soil.

Just how acid rain kills trees is still in doubt. The Ulrich hypothesis that the toxicity of aluminium mobilized from the soil is followed by pathogenic action on roots seems to be falling out of favour. Attention now seems to centre on ozone peaks as a possible cause of forest damage, probably in association with other factors. Uncertainties about the mechanisms of chemical conversion and damage are such that the benefits of a substantial reduction of sulphur dioxide emissions in Europe cannot be predicted. Cost–benefit studies are therefore impossible.

Sir Walter Marshall, chairman of the Central Electricity Generating Board, agreed. If it could be shown that to halve the board's sulphur dioxide emissions would actually cure the problem in the most cost-effective way, he said, then "we should get on with it". The board is responsible for more than half the British output of sulphur dioxide and, together with the National Coal Board, has provided £5 million to support the Royal Society study. As things are, Sir Walter said, there seems a good chance that a large investment to reduce emissions might produce negligible benefit. While nothing is settled, it seems agreed that a 30 per cent reduction of British emission would cost about £1,000 million.

The governments of West Germany, Norway and Sweden take a more positive line: West Germany has introduced strong measures to reduce sulphur dioxide and nitrogen oxide emissions and in Norway and Sweden pamphlets are distributed to tourists saying "our lakes are as clean as your industry".

The European Economic Community is, by its own standards, moving rapidly towards the control of acid emissions, although agreement on an enforcible directive fixing emission limits for industrial plants is a long way off, given industrial arguments that enforcement by emission standards may be needlessly expensive. More recent proposals that all member states should reduce sulphur dioxide emissions by the same proportion (one target is 50–60 per cent by 1995) seem likely to be more acceptable.

Tim Beardsley

UK private research

AT the height of the recession in 1981, industrial research and development in British industry seemed to be modestly more vigorous. But the total numbers employed in private industry, 175,000, had decreased by 18,000 since 1969, with savings on administrative and clerical staff and an increase in the numbers of scientists and engineers in research and development laboratories from 59,000 to 67,000.

These are among the results of a survey carried out by the Department of Trade and Industry and published last week in the department's house journal British Business.

The cost of intramural research has been remarkably constant for nearly two decades. In real terms (constant-value money) intramural industrial research cost £1,400 million in 1964 and £1,661 million in 1981, according to the results of the survey. But spending in 1981 (34 per cent of which appears to have been financed by the British Government) was higher than in any previous year. □

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