

Czech chartists claim two died in nuclear accident

CHARTER-77, the Czechoslovak human rights movement, last week entered the nuclear debate, with an exposé of conditions at the Jaslovské Bohunice power station. According to Document 22 of the Charter movement (distributed abroad by the Palach press), employees at the power station have been compelled (under threat of loss of premium payments) to expose themselves to radiation levels considerably above the safety standards, while, in the course of the last three years, two serious accidents, one of them causing the death of two workers, have taken place at the station. Indeed, claim the Chartists, since the second accident in February, 1977, the station is still "temporarily" closed.

The Jaslovské Bohunice power station has a long and chequered history. It was constructed under the terms of the Soviet-Czechoslovak general agreement for nuclear energy cooperation of April 1955. In 1956, it was predicted that the station would be commissioned in "about 1962"—in fact, it went critical in 1972 and became fully operational the following year.

According to Dr Frantisek Janouch, who at that time was working at the Czechoslovak Institute of Nuclear Research, and who took part in the many professional and organisational discussions relating to the construction of the reactor, the project was essentially a Soviet proposal and was carried out under Soviet supervision. The station uses a 110 MW gas-cooled

heavy-water reactor. According to Dr Janouch, the Russians wanted to see if it was possible to construct an effective reactor of this type—leaving the details to be worked out by the Czechs and done at Czech cost.

In 1969, before the Jaslovské Bohunice station, known as the A-1, was completed, the Czechoslovak nuclear energy industry was switched, following a Soviet "recommendation", to light-water pressure reactors of the VVER type, for which the Soviet Union would supply "a substantial part of the main equipment". Whether this change of plan affected the final stages of work on the A-1 is not clear; it appears, however, from the Chartists' report that the projected automatic system for mounting new fuel elements was never brought into operation, and the mounting was done manually. Workers on the reactor were, says the report, "under psychological stress", often working a 16-hour shift instead of the six hours or less customary in "developed" countries. On 5 January, 1976, an error occurred in the mounting process. The element shot out of the reactor, under a pressure of 60 atmospheres together with a large quantity of radioactive CO₂. Since the emergency gas-traps and filters were insufficient for an accident of this magnitude, radioactive gas escaped into the atmosphere. In the area of the accident, emergency evacuation plans went into operation; unfortunately, one escape door had been locked, apparently to reduce petty thefts, and

two workers were suffocated.

Some six weeks later, however, disaster struck again (according to the Chartists). During the mounting of new fuel cells, the primary circuit overheated, the air-tight seal of the steam generator ruptured, and, as a result, the primary circuit, part of the secondary circuit and the working area all became contaminated. Radioactive material entered the drainage system of the plant and a stream in the vicinity has since had to be "fenced off" as contaminated.

During the repair work to the reactor, says the Chartists' document, safety levels of radiation were increasingly ignored, in an attempt to expedite the work.

The anonymous authors of the document urge nothing less than an open discussion and local referenda as to whether nuclear power stations should be constructed at all. This is all the more remarkable since uranium is Czechoslovakia's sole native energy source of any magnitude, and current plans envisage a nuclear expansion of 10,280 MW over the next 15 years, so that by 1990 over 30% of the installed generating capacity will be nuclear.

With such a major commitment to nuclear energy, the reaction of the Czechoslovak authorities to the report is predictably to deny everything. No such accidents occurred, they say, and even if they had occurred, they were under no obligation to make any public announcement.

Vera Rich

Canadian scientists confused by government moves on R & D funding

LAST week the Canadian Government appointed a new Minister of State for Science and Technology. Mr Alastair Gillespie. A brief occupant of the post when it was first established in 1971, Mr Gillespie will take over from Mr Judd Buchanan, who was promoted in a Cabinet shuffle to president of the Treasury Board.

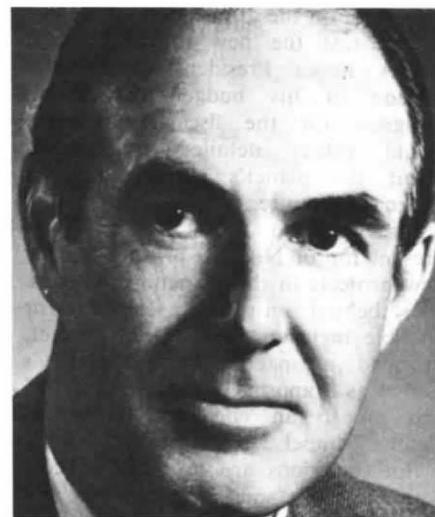
One of the new Minister's first tasks will be to sort out the confusion created in the minds of many Canadian scientists by recent moves over the funding of research. In particular, a strategy announced earlier this year by Mr Buchanan pledging greater support for research and development has been followed by budget cuts severely reducing various areas of federally-funded research, particularly in government laboratories.

R&D policy has recently become a hot political issue in Canada, figuring prominently in the pre-election cam-

paigns of all the main political parties. This prominence is based largely on the feeling that many of the country's economic problems have been due to its relatively low expenditure on research compared to other industrialised nations.

In June of this year, Mr Buchanan announced a number of funding increases and other measures designed ultimately, he claimed, to raise the proportion of the gross national product spent on R&D from 0.9% to 1.5% by 1983 (the comparable figure for countries such as West Germany and the US is about 2.5%).

In line with this strategy, a pre-election budget presented to the Canadian Parliament last month by Prime Minister Pierre Trudeau included a number of tax incentives to encourage private companies to invest in R&D. In particular, firms taxable at the small business rate will receive



Alastair W. Gillespie

a new investment tax credit of 25% on all R&D expenditure; for other firms, the basic rate of the R&D investment tax credit will be doubled from 5 to 10%.

The Government's declared commitment to increase R&D support have

been welcomed by Canada's Science Council, which has recently been arguing that such moves are necessary to promote the country's technological autonomy. "We are delighted with the new tax incentives, particularly those for small businesses, which tend to be an important source of industrial innovation, and where Canadian ownership is concentrated", the council's executive director, Mr John Shepherd, said last week.

Members of the scientific community, however, while welcoming the Government's commitment, are concerned that too much emphasis may be placed on relatively short-term research objectives, with a corresponding neglect of more long-range, basic research. And widespread concern was expressed in September when it was announced that a number of areas of federally-sponsored research would be cut back as part of a package of austerity measures.

The effect of the cuts, which included closing down a number of internationally recognised government research stations, has been to reduce the 1979/1980 research budgets of the

Department of Agriculture by \$3.5 million, of Energy by \$11.7 million, and of Fisheries by \$11.1 million.

Budget increase of \$5 million for the Natural Sciences and Engineering Research Council and \$3 million for the Medical Research Council, announced by Mr Buchanan in June will remain relatively intact, with only \$500,000 being taken away from each. However a \$2 million reduction in the budget of the National Health Research and Development programme will mean the termination of several health care research programmes.

The Canadian Association of University Teachers and other university-based organisations have sent a telegram to Mr Trudeau warning him of the "disastrous" implications of the cuts for higher education, research and health care.

Public expressions of concern have not been without their effect. Last month the Government reversed its decision to close one of the oldest research stations in Canada, that attached to an experimental forest at Petawawa, Ontario; following considerable outcry, it has been agreed to

keep the research station open, and to amalgamate into it two research groups currently based in Ottawa, namely the Forest Fire Research Institute and the Forestry Management Research Institute.

Nor has a number of universities been slow to realise that the future survival of their research efforts may depend on the extent to which they can build up a working relationship with both government and industry. This week, a two-day conference bringing together leading representatives of the three constituencies to work out mechanisms for co-operation is being held in Saskatoon, an event which some observers feel would have gained little support 10 years ago.

The scientific community must do more than simply complain about reductions in budget expenditures, says Dr John Kucharczyk of the CFBS, which has organised the conference. "Instead we must continue to stress the importance of a vigorous scientific effort to reach Canada's overall economic objectives."

David Dickson

NASA plans a new Venus mission

As us scientists prepare to analyse the data from the four probes that began their descent through the atmosphere of Venus this week, the National Aeronautics and Space Administration is already working on plans for a follow-up mission to the planet.

The current Pioneer Venus mission is primarily concerned with sending back data on the atmosphere of Venus. In contrast the new mission, which NASA hopes President Carter will include in his budget request to Congress for the fiscal year 1980, would gather detailed information about the planet's surface and its internal structure.

The proposed Venus mission is at present top of NASA's priority list for new projects in the planetary sciences. Close behind is a project, scheduled for possible inclusion in the 1981 budget, to send a spacecraft past Halley's Comet as it approaches the sun in 1985 and on to an encounter with the Comet Tempel 2.

Both missions are expected to cost between \$300 and \$500 million, and are within the framework of the US Administration's policy for space science announced two months ago. In a "normal" year, NASA officials feel the new Venus mission would stand a high chance of being financed; but with the country in a cost-cutting mood, it remains to be seen whether NASA's request survives the budget

process.

The new mission is known as the Venus Orbiting Imaging Radar (VOIR), and would involve a spacecraft circling the planet for at least seven months, providing the first detailed global view of its surface.

In the current mission, Pioneer Venus 1 will orbit the planet, and send back radar pictures. Their resolution, however, will not be much better than that which can already be obtained from Earth. The Soviet Venera missions have already sent back pictures transmitted from the surface of the planet, but only from three fixed locations.

The new spacecraft would, if it receives approval, be launched in December 1984 to arrive at the planet in May 1985. Radar mapping of the surface will be carried out using the synthetic aperture radar (SAR) successfully tested on the ill-fated Seasat mission; this will provide near-global coverage of the planet in moderate resolution, and coverage of a pre-selected small percentage of the planet's surface in high resolution (down to about 50 metres).

In addition to the SAR, the VOIR orbiter will also carry an altimeter and a magnetometer. It is hoped that the spacecraft will disclose the presence or absence of continents, ocean basins, volcanoes and other geophysical phenomena, as well as the nature and

time sequence of any plate tectonic activity.

The proposed mission to the Comet Tempel 2, which circles the sun once every five years, follows the abandonment last year of more ambitious plans for a close-range study of Halley's Comet, a mission for which NASA reluctantly decided it would have been too expensive to develop an appropriate propulsion system.

Part of the problem is that Halley's Comet circles the sun in an opposite direction from the earth, and a close encounter would have involved elaborate manoeuvring. The new plan is for a spacecraft propelled by the ionisation of mercury vapour to be launched on a course that passes close to the comet, dropping a probe into its tail, and then continues to a position that would allow it to travel alongside Comet Tempel 2 three years later.

Other projects submitted by NASA to the White House for possible inclusion in the 1980 budget include a gamma-ray observatory designed to study, for example, the high energy nuclear and gravitational processes which occur in the vicinity of neutron stars and black holes; an advanced X-ray astrophysics facility which will provide high resolution data on the position and structure of celestial objects such as pulsars, binary-star systems, and quasars.

David Dickson