

are being studied, each involving a combination of three different forms of protection. For temperatures less than 540°C, insulation would be provided by panels of titanium facing covering an insulating honeycomb. In the 540°C to 980°C range, the same arrangement would be used, this time using a superalloy known as Inconel 617.

The most significant change would be in the high temperature panels, where heat shielding would be achieved by panels of reinforced carbon/carbon, up to three feet square. Various insulating materials would be placed between the shielding and the aluminium surface. The panels would be mechanically attached to the shuttle, avoiding the bonding problem associated with the ceramic tiles. Carbon/carbon is already used in limited quantities for the nose-cap and the leading edges of the shuttle's wings.

But however the new systems perform, there is still the problem of cost to be resolved. Moving to a new system would be expensive, and NASA may not be able to afford a switch.

David Dickson

## Nuclear reactor safety

### Go for Super-Sara

Brussels

The months of deliberation in Brussels on the future of the Super-Sara project have ended with a decision to press ahead on the lines of the Commission's original proposal. The EEC's joint research centre at Ispra in Italy will now be able to start the second phase with funds totalling 50 million European Units of Account (£0.54 = 1 EUA).

The Super-Sara project will use the experimental ESSOR reactor to study loss of coolant and other accidents in water reactors. More than 200 staff have been left in limbo since last November when the member states first began to hesitate about releasing the bulk of the project's money. In March 1980, 3.31 million EUA was granted for feasibility studies after the project was agreed in principle. But when it came to making available the 40 million EUA for the major part of the project, Germany and others began to have cold feet. The negotiations over the past six months left Germany as the only member state withholding agreement. Germany has now given way to pressure from its partners but has insisted that the project be kept below its budgetary ceiling.

However, the European Commission's initial cost projections have had to be raised since they were first made last year. Automatic salary increases and rising equipment costs mean that 64 million EUA needs to be set aside to take the project up to 1983, when it is due to be reviewed.

It seems increasingly likely that it will overshoot its schedule by as much as two years.

Jasper Becker

## Election in Israel

### New deal for science?

Rehovot

If, as expected, Labour Party leader Shimon Peres becomes Israel's next Prime Minister after the election in June, he will be the first man with a good grasp of science and technology to hold that office. Although not a scientist or engineer himself, Peres was responsible for initiating many large-scale research and development projects undertaken by the Ministry of Defence, where he served from 1952 to 1977, becoming minister in 1974.

These projects contributed substantially to Israel's military capabilities and also laid the groundwork for its sophisticated aircraft industry (with a turnover in 1980 of \$500 million) and for its rapidly developing electronics industry. Indeed, a very large percentage of Israeli exports based on local research (an estimated \$1,000 million last year) were spin-offs from defence research set in motion by Peres.



Peres, Prime Minister in June?

Peres has placed heavy emphasis on science-related projects in outlining the goals of a Labour-led government. There are plans for a huge "science city" in the Galilee, heavy government subsidies for energy research, a continuation of the recently inaugurated Mediterranean-Dead Sea Canal project for hydrological power and, significantly, the establishment of two nuclear power stations in the Negev.

Israel already has two research reactors, a 5-MW facility supplied by the United States and set up just south of Tel Aviv, and a more controversial 24-MW reactor from France, located near the Negev town of Dimona. But, despite an absolute dependence on imported fossil fuel for the generation of electricity and the existence of the necessary nuclear technology, Israel still has no nuclear power stations.

This anomalous situation arises primarily because the United States, the most obvious supplier of such power stations, is prevented by the Anti-Proliferation Act from selling them until

## Kamikaze to Halley

The European Space Agency (ESA) is hoping to enlist the help of the Soviet and Japanese space agencies in sending its Giotto spacecraft on a kamikaze mission to Halley's comet in 1986. ESA would like to send Giotto to within 200 km of the comet's nucleus to observe molecules evaporating from it before they recombine or are interfered with by the solar wind. Initial plans had assumed a closest approach of 1,000 km because of the difficulties of pinpointing the precise position of the comet in advance and because of the risk to the spacecraft of cometary dust. If Giotto gets within 200 km of the comet it may manage a couple of hours of observation before being destroyed.

Such a close approach can only be made, however, with help from the Russian space agency which is also sending a spacecraft to the comet. The hope is that data from the Russian craft, due to arrive at the comet four days before Giotto, could provide precise details of the comet's whereabouts and allow last-minute corrections to Giotto's course. The Russian spacecraft itself will not be able to approach nearer than a few thousand kilometres to the comet nucleus because, unlike Giotto, it lacks a dust shield.

The Japanese space agency will also be sending a spacecraft — at 135 kg the smallest of the three — to photograph the comet in the hydrogen Lyman alpha line. The three space agencies are discussing how they might exchange data gleaned from their separate missions, and next summer the three, together with the US National Aeronautics and Space Administration (NASA), will be meeting to discuss a collaborative project between all four agencies. Although NASA has no mission of its own to Halley's comet, it is organizing a "Halleywatch" which will make use of ground as well as space based observations.

Judy Redfearn

Israel signs the nuclear non-proliferation agreement and opens its nuclear facilities to inspection by the International Atomic Energy Agency.

It was only after Egypt signed this agreement in February that the United States agreed to provide that country with two nuclear power stations with a combined capacity of 2,000 MW. But Peres refuses to say whether a Labour-led government will do what all previous governments have refused to do, namely sign on the dotted line, or, if not, how he expects to get the reactors he proposes to place in the Negev.

Peres sees a close link between the country's economic development on the one hand and its scientific and technological development on the other. He accuses the present Begin government



of allowing the economy to stagnate and, as a result, setting in motion a brain drain that has deprived Israel of thousands of scientists and engineers.

But many specific questions remain unanswered. Will, for instance, Labour create a Science Authority or even a Ministry of Science to take over from the virtually moribund National Council for Research and Development?

Also unclear is the amount of government support that can be expected for basic research, hitherto dependent on overseas grants, and whether there will be more funds for universities, which have suffered a drop of more than 30 per cent in real income over the past few years.

Peres will say no more than that he plans to "upgrade science, technology and education". How this will be reflected in Labour government budgets remains to be seen.

**Nechemia Meyers**

## Caribbean anti-pollution plan Jamaican entente

### Montego Bay, Jamaica

Temporarily forgetting their many political and cultural differences, government officials from 23 Caribbean nations met in Jamaica recently and agreed on guidelines for coordinating efforts to minimize the pollution of their seas and coastlines. The meeting was the latest in a series organized under the Regional Seas Programme of the United Nations Environment Programme (UNEP), most widely publicized of which have been those aimed at cleaning up the Mediterranean.



The plan of action agreed in Jamaica will probably have less immediate impact than the Mediterranean agreement, in part because the Caribbean is not a completely closed sea, and the level of pollution is therefore considerably lower.

Nevertheless, delegates to the Jamaican meeting stressed that the prime goal of the Caribbean plan should be preventative. According to Dr Stepan Keckes, director of the UNEP programme, "the governments have decided to tackle marine pollution not as a problem in itself but as the consequence of the problems which lie on the land".

The principal goal is to integrate concerns for the state of the marine environment into development plans for

the Caribbean region. The four projects already selected as being of top priority under the action programme include a regional oil-spill contingency plan, guidelines for managing watersheds, efforts to improve national environmental health services and broad measures to improve environmental education.

Relatively little money has been promised so far. A trust fund which is being set up as part of the action plan failed to reach its target of \$1.5 million, as a result of which UNEP secretary general Mostafa Tolba said that his organization would contribute an extra \$1.38 million. The principal donors to the fund have been Mexico, Venezuela and France, the first two being the main economic forces in the Caribbean region. Britain is prepared to make a contribution that reflects the specific interests of its dependent territories in the region (which include Antigua and the Caymans) but is unlikely to match the \$375,000 promised by France.

UNEP officials, however, as well as those from other aid bodies, hope that the plan will act as a stimulus for action at a national level. Jamaica in particular is hoping to take a leading role in coordinating development policies in the region. Addressing the closing session of the meeting, Jamaica's recently elected prime minister, Mr Edward Seaga, said that the agreement on marine pollution was "the greatest collaborative effort in the Caribbean to date, and may be a vanguard of future efforts to bond Caribbean nations in a common cause".

Jamaica is to become the base for a regional coordinating unit that will be established to facilitate the technical implementation of the action plan. The island has also put in a bid to become the home of the international sea-bed authority which would result from a successful outcome of the Law of the Sea negotiations now taking place at the United Nations in New York.

In the long term, the success of the Caribbean action plan is likely to depend primarily on procedures that individual states can be persuaded to adopt to minimize the sources of marine pollution. A top priority is to draw up a draft regional convention, and UNEP officials hope that a treaty committing countries to reducing sources of potentially damaging pollution can be agreed within two years.

The fate of the plan is also likely to be important to UNEP itself. Moves in Washington to reduce, or even eliminate, the US contribution to UNEP could cripple many of its programmes. US officials, however, are keen to cement political ties in the Caribbean — particularly with the new Jamaican government — and have indicated that the United States might in future be prepared to contribute to the trust fund. If UNEP can prove its value to the United States in the region, its medium-term prospects could be significantly improved.

**David Dickson**

## Philosophy wrangle

Doubts persist about academic freedom in post-Tito Yugoslavia. Last month, the Yugoslav Secretariat for Information announced the reinstatement of the seven Belgrade professors of philosophy dismissed last January for their association during the early 1970s with the independent Marxist journal *Praxis*. Apparently the seven are to receive new appointments in an "Institute for Social Studies" specially created for them. Members of the group, however, say that no definite settlement has been reached.

Since *Praxis* was closed down in 1975, and the members of the group were suspended on 60 per cent salary, forbidden to teach or to publish within Yugoslavia, the authorities have repeatedly tried to persuade them to find new posts.

In June last year, the Serbian republic's law on universities was amended to permit dismissal after six months' suspension on the grounds of "damaging social interests". During the next six months, the authorities tried to persuade the suspended professors to find jobs. Two were even offered non-teaching posts within the philosophical faculty of Belgrade University, but they replied that they could not accept the post unless the other five were also reinstated.

Dismissal became effective in January, but the authorities later suggested that posts might be found in the Belgrade "Institute of Social Studies" — not part of the university but the authorities suggested that it could be rapidly converted into one.

Official plans, it turned out, envisaged that three of the group would retire, and the other four would be scattered among the existing centres of the Institute of Social Studies, covering areas such as "public opinion" and law. When these plans became known to the seven, they refused emphatically: they were, they said philosophers, and wished to work as such.

The vice-premier of Serbia, Milan Dragovic, who was acting as official negotiator, had already said that the transfer of the Institute for Social Studies to the university was nothing to do with the seven's demands, but was something that had long been necessary. He also conceded that a Centre of Philosophy within the institute would be a good idea.

On 3 April, the acting director of the institute, Dr Svetozar Culibrk, called in the whole group for talks, the first time that the authorities have been willing to negotiate with the professors *en bloc*. Dr Culibrk said that he "liked the idea" of a centre and would lay it before the institute's council. The seven are understood to be cautiously optimistic.

**Vera Rich**