East European nuclear power

Bloc countries think again

THE Soviet Union's Comecon partners have responded to the Chernobyl disaster, predictably, by endorsing the Soviet line that Western commentators have overdramatized the danger of nuclear power for political motives. While, as a result of the accident, Finland has cancelled its fifth and Yugoslavia its second nuclear power plant, the Comecon allies have spoken up firmly in favour of nuclear power. Czechoslovakia, Cuba and East Germany have been particularly vocal.

Within the bloc, the only indirect official criticism of Soviet and Comecon nuclear policy came from Hungary's chief spokesman on Foreign Affairs, Mr Matyas Szueres, who publicly urged the "inalienable right" of all people to knowledge in all matters which concern them, and the duty of all concerned with science and technology to respect public fears and concern, whether or not those fears were justified, a statement widely interpreted as a hit at Soviet reticence on the consequences of Chernobyl.

Poland, which caught the first phase of fallout from Chernobyl and which is at present building its first nuclear power station at Zarnowiec, is a special case. Clearly, after implementing a mass distribution of iodine pills to under-16s, ordering cows to be kept indoors and destroying contaminated vegetables, the authorities could hardly proclaim that nuclear power was without any hazard. Official statements have therefore urged that the Chernobyl accident will make the Polish authorities "additionally aware of improvements to all safety measures", and that in any case, the Zarnowiec reactor will be of the pressurized water type, quite different from that at Chernobyl, and will have, unlike reactors in the Soviet Union, a containment building. These assurances have clearly not been sufficient. Three thousand citizens of Bialystok, close to the eastern frontier of Poland, the area most affected by the initial fallout, have signed a petition to the Sejm (parliament) asking for the Zarnowiec plant to be cancelled, and five scientists working in nuclear physics and related fields have sent an open letter to

the Minister of Energy, General Czeslaw Piotrowski, calling for more stringent safety tests at Chernobyl. At his regular press conference last week, government press spokesman Jerzy Urban said that he knew nothing of these documents.

Dissident opinion in Eastern Europe has been somewhat divided on the issue of Chernobyl. In Poland, some small anti-nuclear protests took place on 1 May and 3 May (Constitution Day), and underground Solidarity newsletters have attacked the reluctance of the Soviet and Polish governments to publish sufficient details. (The Polish government, in fact, has been fairly open with contamination statistics, at least at the international level.) In Czechoslovakia, the Charter-77 movement likewise put out a statement urging the public's right to be fully

informed. But in Hungary, the "green" dissidents of the Danube Circle declined to comment, noting only that the hazard of accidents at nuclear power stations was in their opinion less of a threat to the environment than the Gabčíkovo-Nagymaros hydroelectric project which would disrupt the ecological balance even when it was working properly. And in the Soviet Union itself, although there was some attempt to organize an anti-nuclear protest last week in Moscow, no less a person than Academician Andrei Sakharov has backed up the official Soviet line. Sakharov, whose place of enforced residence, Gor'kii, will be the site of the first joint power/district heating nuclear plant in the Soviet Union, said last week, in a message to his relatives in America, that he still viewed nuclear power as inherently the best option. Western reporting in Chernobyl, he said, echoing the official Soviet statements, has been considerably exaggerated. **Vera Rich**

Chernobyl**Improvising against radiation**

THE Chernobyl clean-up has demanded "non-standard" and "unexpected" solutions, Academician Evgenii Velikhov, Vice-President of the Soviet Academy of Sciences, told the Moscow journal *Ogonék* last week. But what are these solutions? The accounts in the Soviet press, which concentrate more on the heroism involved than the technical details, give the impression of a series of improvisations worked out after the accident.

According to Ivan Silaev, one of the deputy prime ministers of the Soviet Union, the cost of a Swedish decontamination fluid at \$18.5 a kilogram was so high that a rush effort by Soviet scientists was necessary. By 14 May, production had reached 30 tonnes a day, allowing 300,000 m² of contaminated area a day to be coated with the material. Silaev also said, in an interview in *Izvestia*, that exposed surfaces of buildings were being coated with sodium silicate solution to prevent rainwater carrying contamination into the groundwater and to the river Pripyat.

Operations around the damaged reactor itself have been organized in typical Soviet style, with planned targets and campaigns to beat them. The miners drilling under the reactor have a target of five reinforcement rings installed per shift (giving a nominal rate of progress of 14 to 15 m a day, twice that of normal mining operations). Engineers from the Ministry of Transport are installing a liquid-nitrogen cooling system.

The damaged reactor seems to be cooling very slowly; on 6 May, the Ukrainian Prime Minister Aleksandr Lyashko said that the temperature had fallen to around 300°C, but ten days later,

Academician Velikhov cited the same figure. Also, the "sarcophagus" being built around the damaged reactor is not a simple casing, but, according to Silaev, is a "complex engineering structure", which will "fully control the internal heat and release any excess".

Not only the damaged reactor, No.4, will be entombed in this way. According to Prime Minister Lyashko, the unfinished reactor No.5, where shoddy building operations had caused concern before the accident, is also to be buried.

Away from the reactor site, but still within the 30-km evacuation zone, some measures have been implemented to safeguard agriculture. By 13 May, barrages had been built to stop effluent or rainwater reaching the river Pripyat. The main problem is the contaminated soil, which is being dealt with mechanically, by digging it out, and by planting with crops that "neutralize harmful elements in the soil".

To deal with long-term contamination further afield, an aerological monitoring station has been established, some 50 km from Chernobyl, which will make round-the-clock measurements of the radioactive contents of the air, and relay aggregate figures to the International Atomic Energy Agency in Vienna daily.

Little has emerged about radiation levels near the plant. By mid-May, according to transport construction minister Vladimir Brezhnev, radiation was still too high to work more than a four- or at most five-hour shift near the reactor, while the youth Party daily *Komsomolskaya Pravda* spoke of the emergency workers receiving a year's maximum permissible dose in two weeks. **Vera Rich**

Correction

In last week's News item about Dr Robert Gale's treatment of patients from the Chernobyl nuclear accident (*Nature* 321, 369; 1986), the number of patients who received bone marrow or fetal liver transplants was incorrectly given as 35; the figure should have been 19. The estimated average radiation dose of the 35 patients Dr Gale examined is 2 Gy or more; the estimated average dose of the 19 who received transplants was 5 Gy or more. □