Dioxin source is 'safe'

IN its eighth pronouncement since 1970 on the herbicide 2,4,5-trichlorophenoxy acetic acid the UK Ministry of Agriculture, Fisheries and Food (MAFF) has recently stated that it finds 2,4,5-T to be safe if used in the "recommended way for the recommended purposes". In Australia the National Health and Medical Research Council is of the same opinion after considering recent allegations that the herbicide poses a public health problem.

Concern centres around contamination of 2,4,5-T with the toxic by-product 2,3,7,8-tetrachlorodibenzo-p-dioxin (dioxin). Recent reports suggest that traces of dioxin are produced when plants sprayed with 2,4,5-T are subsequently burned. In the opinion of the British and Australian committees, however, this does not create enough of an additional health risk to proscribe use of the herbicide. The MAFF committee is to prepare and publish a reference document on the subject.

The Swedish Natural Science Research Council, in collaboration with the Swedish Academy of Sciences, has just published such a document, which has considerable value as a reference source on the chemistry and biological properties of the compounds it discusses.

In supporting continued use of 2,4,5-T, the Swedish report makes several provisos. It considers that the stability and bioaccumulation of dioxin should be studied under normal field conditions; that manufacturing processes for production of the herbicide could be improved, thus reducing the potential dioxin contamination of the environment in the event of an accident; and that other synthetic processes that eliminate dioxin formation should be investigated. It also recommends studies of the mutagenic properties of the herbicides, and epidemiological investigations of human groups exposed to 2,4,5-T, 2,4,5-trichlorophenoxy propionic acid, and their dioxin contaminants.

A large-scale epidemiological study of 2,4,5-T and its relation to infant malformation rate is currently in progress in New Zealand. The results of this study may provide evidence to assist the United States Veterans Administration which is currently considering claims from veterans of the Vietnam war that exposure to 2,4,5-T during herbicide spraying operations in Indo-China has affected their health and, in some cases, that their children were born malformed.

Alastair Hay

India prepares to launch Earth resources satellite

INDIA will launch its second satellite at the end of this year—the Satellite for Earth Observation (SEO). This satellite should fulfil one of India's main objectives in space: the "management of natural resources through remote sensing technology"; and it should also satisfy national pride, in that it uses 85% indigenous technology.

SEO is designed to operate for a year, and should produce data on agriculture, forestry, hydrology, and oceanography. It will observe the earth with two TV cameras with a ground resolution of 1 km, and two microwave radiometers. It will be launched by a Soviet Intercosmos rocket into an orbit of altitude 525 km and inclination 51° from the Sriharikota range (SHAR), Andhra Pradesh.

Aryabhata, India's first satellite launched in 1975.

India began its space effort when the Thumba Equatorial Rocket Launching Station, near Trivandrum, an international facility for launching rockets with scientific payloads, became operational in 1963. The station is now a part of Vikram Sarabhai Space Center (VSSC), whose primary aim is to build and launch indigenous rockets complete with payloads. Facilities for monitoring India's first satellite Aryabhata were completed in 1975 at the Sriharikota range. At the range rocket launching facilities are currently nearing completion. A new satellite tracking and ranging station, equipped with a stellar camera and a ranging laser, was also established last year at Kavulur, Tamil Nadu.

India first entered space in April, 1975, when an Intercosmos rocket launched 'Aryabhata'—a 360 kg satellite carrying a payload to study aeronomy, solar neutron flux and X-ray astronomy. But only five days after launch, the payload was switched off

due to a malfunction. The satellite itself, however, went on to exceed its expected six months' life time. Soon after that launch, another agreement was signed between the Indian Space Research Organisation (ISRO) and the USSR Academy of Sciences to launch SEO in 1978.

In the 1980s India plans to have its own INSAT (Indian National Satellites) system for domestic purposes. The biggest effort in this area so far has been the Satellite Instructional Television Experiment (SITE) programme. From August 1975 to July 1976, clusters of 2,400 villages in six states were shown TV broadcasts via NASA's butterfly ATS-6 satellite. The rural populace was provided with programmes on new food production techniques, health and sanitation as well as with educational and entertainment programmes.

The current two year Satellite Telecommunications Experiment Project which began in June 1977 has a similar aim. The Franco-German "Symphonie" satellite is linked with three static earth stations at Delhi, Ahmedabad and Madras, and two mobile ones. The latter may be used to establish communications in remote areas or during an emergency.

India is also building at VSSC a four stage solid propellant rocket, Satellite Launcher Vehicle-3 (SLV-3), which should be ready by the end of the year. It is due to place a 40kg indigenous Rohini satellite into a near earth elliptical orbit during 1979. The satellite will monitor the fourth stage of the SLV-3. The aim is to develop a launcher suitable for heavier remote sensing satellites.

The ISRO has also booked a berth abroad the European Space Agency's launcher Ariane to launch APPLE—India's indigenous 616 kg experimental comsat—in May 1980. Skills acquired in building and operating this geosynchronous satellite will be of use in the multi-purpose INSAT system. However, because of "parking problems" in space over the Indian Ocean, India is eager to have its own comsat as early as possible. Already a longitude of 79° East has been reserved for it. The US Ford Aerospace Corporation, has recently been given the contract to build INSAT, which will be placed in orbit by either a Titan rocket or the US Space Shuttle. 4.5 billion Rupees has been allotted to India's Space Programme over the next five years—more than the total investment made in the last fifteen years.

Dilip M. Salwi