

## USSR

● The gap between R&D and the implementation of results is a common complaint against the whole spectrum of Soviet industry. In most cases the problem is simply one of logistics, the reorganisation of production plans and the re-equipping of plants without interrupting quarterly production schedules. For high-vacuum technology, however, the problem is more complex, as there is no single body responsible for R&D in this field. According to a recent *Pravda* article, the Ministry of Chemical and Petroleum Equipment, is prepared to tolerate a "considerable" gap between production and requirements during the current five-year plan; the Ministry of the Communications Industry, which needs the results of research in this field, will not itself undertake it "considering it to be the business of other branches."

No single body or ministry, it would seem, has high-vacuum technology high on its list of priorities. It is the Cinderella of research subjects, and it is not surprising, therefore, that a report on a pilot cryogenic 1,000 kW electric generator at present under test in Leningrad speaks gloomily of the technical problems involved, although it suggests that plans for a similar generator of up to 2 GW are already in operation.

Last December, an article by G. Saksaganskii, Head of the All-Union Section of Vacuum Apparatus, suggested a way out of this problem: the establishment of a 'Scientific-Technological Union' which would be responsible for satisfying all requirements in this field, over-riding ministerial and departmental barriers. He put particular emphasis on the need for custom-built apparatus for highly specialised branches of research and industry, and praised the high levels attained in this field by foreign firms.

A recent edition of *Pravda* says that Saksaganskii's article provoked a wide response from readers in industries which have some concern with vacuum technology. All the letter-writers "unanimously" supported his proposal for a single organisation to deal with "specialised" production. But, it is claimed, the letter-writers went even further: not only does industry require a special body to ensure production, there should also be a unified authority in charge of R&D. A number of writers proposed that a special scientific council should be established in the Academy of Sciences of the USSR "to coordinate theoretical research in the field of vacuum technology and the practical implementation of their results". In

addition, steps should be taken to ensure that there are sufficient number of highly-qualified personnel in the field of vacuum technology. So far, it is said, the ministries whose sphere of competence touches upon high-vacuum technology have made no comment on these suggestions.

A press campaign of this type is a traditional precursor of a major change in Soviet policy, and the response to Saksaganskii's article seems



to reflect a genuine discontent. The Soviet press frequently carries eulogies of the benefits of centralised planning. The current state of the high-vacuum industry, is, however, a salutary warning of what may occur when a particular branch or field of development is somehow omitted or overlooked, if not in the plan itself then in the practical details of implementation.

● The Byelorussian SSR is traditionally one of the poorest areas in natural resources of the whole of the Soviet Union. When, some 20 years ago, a large oil-refinery was built at Nova-Polatsk, the site was presumably chosen for geographical reasons, being close (in Soviet terms) to the Comecon countries which would be provided by pipeline with Soviet oil. Since then, however, oil has been located in the Byelorussian Republic itself, giving a yield in 1976 of some millions of tonnes. Some seventeen oil deposits have been located to date, and new techniques have been developed permitting the exploitation even of those around Mazyr, where the geological structure is not amenable to standard drilling techniques.

The search for oil has also yielded serendipitous results: potassium and rock salts, lignite, mineral resources, building stone and also non-ferrous metals have been discovered, as well

as new sources of drinking and spa waters. This mineral wealth has come to light in an area of Irish-type rural economy where even collectivisation could not break the traditional dependence on potatoes, peat, and cattle-rearing. The development and exploitation of the new resources should provide a fascinating study in years to come.

● In May 1976, *Pravda* proclaimed that the ninth five-year plan (1971-76) had been a period of intense implementation of laser technology in the national economy, stating that every rouble invested in laser R&D has yielded some 4-5 roubles of income. A number of practical applications of lasers were noted, such as the hardening of dies and metal-working instruments and the drilling of jewels for watches; more significant however, was the fact that an actual investment to expenditure ratio was mentioned, a comparative rarity in Soviet reportage which presumably indicates a particularly favourable return.

Since the current five-year plan began, the media have described a number of more exotic uses of lasers. These range from acupuncture (a recognised medical technique in the USSR) to the use of a laser-beam guidance system for the blind landing of aircraft at night or in adverse weather conditions. At the Latvian State University's astronomical observatory, a senior scientific worker, Maris Abele, and a senior engineer, Augusts Rubans, recently received the Silver and Bronze medals respectively of the Exhibition of All-Union National Economic Achievements for developing a laser range-finder for tracking satellites and space-probes.

Laser irradiation has been used to encourage the germination of seeds, and the Central Aerological Industry of the Hydrometeorological Service has produced a special laser reflector which is now being used for tsunami research in the Kuriles. Laser direction finders for determining the direction of mine-galleries are in use and are being exported to other members of the Comecon bloc. Naturally, nothing is said in these enthusiastic reports about possible military applications of the laser, and the outsider is left free to judge whether this emphasis of the peaceful and diverse use of lasers covers a classified programme, or whether, as in the now-notorious case of titanium alloys, the prolific references in the open press are evidence that no breakthrough of military significance has yet occurred.

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