

to (d) Sir, a number of projects relating to geology, geophysics, remote sensing, paleoseismology and geodetic observations in the earthquake affected region have been approved. However, the science of earthquake prediction has not reached an operational stage anywhere in the world. The total cost of the approved projects is close to Rs. 3 crores. The projects have been given to both experienced and young scientists depending upon their expertise and the merits of the proposals, as determined by the Expert Advisory Committee.

#### **Expansion Plans for the Department of Space**

5018. DR. SHRIKANT RAM-CHANDRA JICHKAR : Will the PRIME MINISTER be pleased to state :

(a) whether it is a fact that in view of India's increasing and ambitious space programme, the Department of Space will be expanded;

(b) if so, what are the plans in this regard;

(c) whether any expert advice or consultancy is being sought for such expansion programme; and

(d) whether the study by NASA of the USA has been made with reference to augmentation of India's Space Department ?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE AND THE MINISTER OF STATE IN THE DEPARTMENTS OF ATOMIC ENERGY AND SPACE AND THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE & TECHNOLOGY (SHRI BHUVNESH CHATURVEDI): (a) Yes, Sir.

(b) Indian Space Programme, a self-reliant programme, envisages development and operationalisation of space services in vital areas of national development such as communication, broadcasting, meteorology, education, disaster management, drought management and management of natural resources such as agricultural crops, forest, water, soils, minerals, fisheries etc., on a continued and enhanced

basis. Expansion in these services is planned in the 1990—2000 Decade Profile of the Department of Space. Forthcoming launches of IRS 1C and INSAT 2C will augment the presently available services through the two national satellite systems, Indian National Satellite (INSAT) System and Indian Remote Sensing Satellite (IRS) System. It is also planned to develop GRAMSAT, a satellite totally dedicated to rural development and eradication of illiteracy. Operationalisation of the launch vehicle, Polar Satellite Launch Vehicle (PSLV), capable of launching IRS class satellite, is also planned. Realisation of the launch vehicle, Geo-synchronous Satellite Launch Vehicle (GSLV) for launch of INSAT class of satellites is also planned. Details in this regard are available in the Annual Report of the Department of Space.

(c) No, Sir.

(d) No, Sir.

#### **Reducing Foreign Dependence in Space Programme**

5019. SHRI RAM NATH KOVIND : Will the PRIME MINISTER be pleased to state :

(a) whether Government have embarked on an ambitious space programme for attaining self-sufficiency, both in space packages and high profile launching stations;

(b) if so, what is the ratio of indigenous-foreign import in our various systems at present;

(c) whether Government have any plan and schedule to reduce foreign import ratio in our system;

(d) if so, what are the core contents of these plans and schedules; and

(e) by when Government expect that there will be zero dependency on foreign imports in the system ?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE AND THE MINISTER OF STATE IN THE DEPARTMENTS OF ATOMIC ENERGY AND SPACE AND THE MINISTER OF

STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI BHUVNESH CHATURVEDI) : (a) Yes, Sir. India has embarked on a self-reliant space programme by developing its own capability both in satellites for applications in remote sensing, communication, meteorology, disaster warning etc., as well as in launch vehicles for launching these satellites.

(b) All systems in satellites and launch vehicles are realised indigenously including design, fabrication, testing and integration. Due to the low quantity requirement of certain space-qualified electronic components, special materials and rare chemicals? it is uneconomical to produce these indigenously in our country. Hence, as of now the percentage of foreign components is about 30% for satellites and 25% for launch vehicles, though in terms of the total cost of the projects, such percentage would be much less.

(c) and (d) Yes, Sir. Plans have been formulated to reduce further foreign input, mainly through indigenous production by involving Indian industry. Schedule depends entirely upon availability of appropriate industrial infrastructure in the country. Already over 200 technologies/processes developed by Indian Space Research Organisation (ISRO) have been transferred to Indian industry for production. Over 500 industries are participating in Indian space programme. Major space, hardwares for Indian Remote Sensing Satellite (IRS), Indian National Satellite (INSAT), Polar Satellite Launch Vehicle (PSLV) and Geosynchronous Satellite Launch Vehicle (GSLV) have been contracted out to Indian industry including private sector. The expertise and infrastructure thus built up in Indian industries are now even commercially exploited abroad through Antrix Corporation.

(e) Space technology requires special materials, rare chemicals and space qualified electronic components etc., which are of specific use either in space programme alone or in few other hi-tech areas. Investment on infrastructure to produce these in small quantity is prohibitively costly and the lead time required for productionisation, testing and qualification will be very long. Thus, it will not be economical,

cost effective and schedule televent to produce each and every item within the country itself. Launch support and tracking facilities of ground stations, located abroad, are also required while launching satellite launch vehicles as well as for orbit determination of satellites. In view of these, it is not possible to aim at zero dependency for foreign input\* at present in the space programme. This applies not only to India but even to advanced nations such as USA, France, etc.

### अंतरिक्ष अनुसंधान कार्यक्रम

5020. श्री संकर बयाल सिंह : क्या प्रधान मंत्री यह बताने की कृपा करेंगे कि :

(क) भारत ने अब तक कितने अंतरिक्ष संबंधी अनुसंधान कार्यक्रम पूरे किये हैं और विगत तीन वर्षों के दौरान ऐसे कितने कार्यक्रमों को अन्तिम रूप दिया गया है;

(ख) इनमें से कितने कार्यक्रम सफल हुए और कितने कार्यक्रम असफल हुए; और

(ग) पिछले तीन वर्षों के दौरान इन कार्यक्रमों पर कितनी धनराशि खर्च की गयी ?

प्रधान मंत्री कार्यालय में राज्य मंत्री विज्ञान और प्रौद्योगिकी मंत्रालय में राज्य मंत्री का अतिरिक्त प्रभार तथा परमाणु ऊर्जा विभाग और अंतरिक्ष विभागों में राज्य मंत्री (श्री भुवनेश चतुर्वेदी) : (क) और (ख) भारत ने अभी तक निम्नानुसार 30 प्रमुख अंतरिक्ष परियोजनाएँ/कार्यक्रम पूरे किए हैं :—

— 20 उपग्रह परियोजनाएँ, जिनमें से 14 सफल रही; 2 वार्षिक सफल तथा 4 को प्रमोचक राकेट की असफलता के कारण कक्षा में स्थापित नहीं किया जा सका ।

— 8 प्रमोचक राकेटों का प्रमोचन, जिनमें 4 सफल रहे ।

— 2 प्रमुख प्रायोगिक कार्यक्रम  
— अर्थात् उपग्रह वैश्विक दूरदर्शन परीक्षण (साइट) और उपग्रह दूरसंचार परीक्षण परियोजनाएँ (स्टैपे), ये दोनों सफल रहे ।