

public sector employees should not resort to political pressures regarding their transfers and postings needed reiteration.

**हिमाचल प्रदेश में उधोगों की स्थापना के लिए जारी किए गए लाइसेंस**

\*343. श्री कृष्ण वत्त सुस्तानपुरी: क्या उधोग मंत्री निम्नलिखित जानकारी दर्शाने वाला विवरण सभा पटल पर रखने की कृपा करेंगे कि:

(क) गत दो वर्षों के दौरान हिमाचल प्रदेश में कितने औद्योगिक लाइसेंस प्रदान किए गए हैं;

(ख) उनमें से लाइसेंसों के आधार पर कितने उधोगों की स्थापना वास्तव में की गई है; और

(ग) राज्य सरकारों से उन व्यक्तियों के विरोध क्या कार्यवाही करने को कहा जा रहा है, जिन्होंने उधोगों की स्थापना नहीं की है।

उधोग मंत्रालय में राज्य मंत्री (श्री चरणजीत चानना): (क) वर्ष 1978 तथा 1979 में हिमाचल प्रदेश के लिए 5 औद्योगिक लाइसेंस स्वीकृत किए गए थे।

(ख) इन पांच में से दो एककों में उत्पादन प्रारम्भ हो गया है।

(ग) यदि आवेदक पाटी बिना उचित कारण बताए निरिच्छित समय अथवा बढ़ाई गई अवधि के अन्दर उपक्रम स्थापित करने में असफल रहती है या उपक्रम स्थापित करने के लिए भावी कदम नहीं उठाती तो ऐसे मामलों में केन्द्रीय सरकार जारी किए गए औद्योगिक लाइसेंस का प्रति संहरण कर सकती है।

#### **Alternatives to expensive Solar Power Satellites**

\*344. SHRI K. LAKKAPPA:

SHRI H. N. NANJE GOWDA:

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether the Indian Scientists have found cheaper alternatives to ex-

pensive Solar Power Satellites to meet its energy;

(b) if so, the details thereof; and

(c) the advantages which are likely to be derived out of solar energy in different fields?

THE PRIME MINISTER (SHRI-MATI INDIRA GANDHI): (a) to (c). Solar power satellites represent one of the many concepts developed for the utilisation of solar energy. While no satellite has yet been launched exclusively to tap solar energy, intensive studies have been carried out on the technical and economic feasibility of this concept. The basic idea is to establish a satellite in a geosynchronous orbit with a large photovoltaic array consisting of solar cells to convert solar energy to electricity. The electrical energy is then transmitted to earth in the form of microwaves or laser beams.

Among the major advantages of solar energy conversion in space are the higher amount of intensity available compared to locations on earth, uniform and uninterrupted availability of energy, absence of terrestrial environmental effects etc. A study carried out by NASA of USA for a 5,000 MW solar power satellite indicates that the satellite would require an array of solar cells of size 10.4 km 5.2 km. The antenna to receive the microwave power on earth would be about 10 km in diameter. The capital costs of solar power satellites are estimated to be at least 3-4 times higher compared to terrestrial solar power systems.

India has currently no plans relating to energy based on satellites. The programme relates to terrestrial systems for utilisation of solar energy. The basic technology for direct conversion of solar energy into electricity by photovoltaic cells has already been developed in India. The main problem now is to bring down the cost per peak watt of electricity by this method to a reasonable level; and this is the primary objective of the current programme of the Department of

Science and Technology in this area. This could be achieved: (a) by developing low cost solar grade silicon material and low-cost techniques of fabrication; and (b) by improving the efficiency of solar cells and panels. The programme in this area has resulted in the fabrication of single crystal silicon cells by the Central Electronics Limited (a Public Sector Undertaking under DST) with participation of research groups in IITs, National Physical Laboratory, Central Electronics Engg. Research Institute, Pilani and other Institutions.

A proposal to establish pilot plant facilities at CEL at a cost of Rs. 12 crores to achieve a production capacity of at least 1 MW/yr of panels at the end of the five year plan has been prepared, and is being processed for final approval. Advance action on this is already underway. This proposal, along with a demonstration programme initiated by the Department of Science and Technology envisages the utilisation of photovoltaic systems to provide power for pumpsets for the purposes of drinking water supply and minor irrigation as well as for community lighting and other applications. Meanwhile, a short-term programme to be completed by 1981, for fabrication and field demonstration of pumpsets powered by solar photovoltaic panels of about 25 KW aggregate capacity and other solar photovoltaic applications of 5 KW capacity is underway.

Solar energy can be utilised for a wide variety of applications. Utilising the sun as a source of heat, the energy can be used for drying, heating and cooling, for running engines etc. Solar energy can also be converted directly into electricity which in turn can be used for numerous purposes. The main advantages of solar energy are that it is renewable, non-polluting and freely available without any constraints of supply.

Under the demonstration programme of the Department of Science & Technology, Solar Photovoltaic panels developed at the Central Electronics

Ltd. are being used in the light house beacon at Dwarka Port. for pumping water at Avania Village in Gujarat, for lighting a village in Ladakh and for drinking water supply at Tijara Village in Rajasthan. The panels can also be used for community radio and TV sets, micro-irrigation, cathodic protection of oil pipe lines, signaling and communication equipment etc. The use of photovoltaic systems for some of these applications can contribute directly towards supplying some of the energy needs presently met by petroleum products. One could also generate electricity through solar thermal power plants and use this for lighting and other applications.

#### Issue of Licences in 90 days

\*345. SHRI K. RAMAMURTHY: Will the Minister of INDUSTRY be pleased to state the steps being taken to ensure that the licences are granted within 90 days, as has been assured to the West German Delegation that visited India in the first week of November, 1980?

THE MINISTER OF STATE IN THE MINISTRY OF INDUSTRY (SHRI CHARANJIT CHANANA): On 1-12-1980, out of a total of 509 pending applications from non-MRTP undertakings, only 11 per cent were pending beyond the specified time limits. Inclusive of MRTP applications, the pendency beyond time-limits was 23 per cent.

#### Applicability of Bonus Act to non-competitive public undertakings

\*346. SHRI K. A. RAJAN:  
SHRI K. M. MADHUKAR:

Will the Minister of LABOUR be pleased to state:

(a) whether Government have decided to take non-competitive public undertakings out of the purview of the Bonus Act; and

(b) if so, the details and reasons therefor?