

कर्मचारी राज्य बीमा निगम ने सूचित किया है कि प्रतिष्ठान ने जनवरी, 1979 से सितम्बर, 1980 की अवधि के दौरान 4,49,679.50 रुपये की धनराशि भ्रदा की है। प्रतिष्ठान की ओर कोई धनराशि बकाया नहीं है।

Development of Solar Power Lighting System

2367. SHRI RAJESH KUMAR SINGH:

SHRI JITENDRA PRASAD:

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

(a) whether solar-power lighting system has been developed in any part of India by the Central Electronics Ltd. or other public and private agency;

(b) if so, the details thereof; and

(c) what steps are proposed to be taken to develop solar power and make it feasible for larger use?

THE MINISTER OF STATE IN THE DEPARTMENTS OF SCIENCE AND TECHNOLOGY AND ELECTRONICS (SHRI C. P. N. SINGH): (a) Yes, Sir. India's first solar photovoltaic power based lighting system has been installed in Choglamsar, a village in Ladakh, by the Central Electronics Ltd., under a demonstration programme initiated by the Department of Science & Technology.

(b) India's first solar photovoltaic power based lighting system has been installed in Choglamsar, a remote village in Ladakh, also popularly known as the Tibetan SoS children's village. Situated at a height of nearly 11,000 feet, the system has been installed at a cost of about Rs. 1.5 lakhs, under a demonstration programme initiated by the Department of Science & Technology. A 348 peak watt solar photovoltaic array is providing electricity for lighting 17 fluorescent lamps in a 20-bed hospi-

tal. Another 192 peak watt solar photovoltaic array is providing electricity for lighting 6 fluorescent lamps in a central kitchen, and 9 fluorescent lamps in a community hall. The equipment has been fabricated at the Central Electronics Ltd., a public sector undertaking under the Department of Science & Technology. The power system is performing well and is providing electricity for lighting round the clock.

(c) The basic technology for direct conversion of solar energy into electricity by photovoltaic cells has already been developed. 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 DST Programme 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 so far successfully resulted in the fabrication of single crystal silicon cells at the laboratory scale 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. Solar Photovoltaic Modules developed at Central Electronics Ltd., are currently being used in the lighthouse Beacon at Dwaraka Port for ship navigation, for pumping water in the solar distillation plant at Awania village in Gujarat, lighting for a village in Ladakh, for drinking water supply at Tijara village in Rajasthan and in a few demonstration water pumping systems for micro-irrigation, community TV in Sahibabad and Radio at Bal Bhavan, Delhi, etc. The programme envisages scaling up the fabrication techniques for silicon solar cells and panels, developing modules for applications such a pumping of drinking water, minor irrigation, community lighting,

for educational radio and TV sets, cathodic protection of oil pipelines and for use in communication equipment in remote areas. A major pre-commercial pilot plant project costing about Rs. 12.0 crores over 5 years including large-scale application of photovoltaic systems in rural areas for a variety of purposes (with emphasis on water pumping for drinking and minor irrigation), has been drawn up. In the meantime, a short-term programme to be completed by 1981 for fabrication and field demonstration of Solar Photovoltaic pump sets of about 25 Kw aggregate capacity has been initiated. In addition, it is also planned to provide about 5 Kw capacity photovoltaic modules by 1981 for domestic and other related applications.

Progress has also been made in thin films cadmium sulphide solar cells, MOS, and on polycrystalline silicon solar cells. R&D projects on materials (extraction and purification of solar grade silicon from rice husk, amorphous silicon, etc.), concentrator solar cells and tracking systems etc. have also been funded. A Scanning Auger Spectrophotometer facility with basic ESCA accessories has been set up at IIT, Delhi for research on thin film solar cells and selective coatings with funds provided by DST. The know-how that has been generated on the fabrication of fresnel condensers is being commercialised.

It is proposed to expand the use of photovoltaic systems for various applications, as this can contribute directly towards supplying some of the needs presently met by petroleum products, e.g., pumps for drinking water and micro-irrigation, rural lighting, etc. The cost of unit of power installed by this source is presently high as compared with conventional sources, being of the order of Rs. 80—120 per peak watt. The running costs are, however, much lower than for non-hydel conventional sources such as coal, diesel, kerosene, nuclear, etc. This offsets the higher capital costs, such that for

certain applications as defence communication sets, light and radio beacons for ship navigation, Cathodic protection of pipelines, community TV and lighting, where low quantities of power are needed in remote areas, photovoltaic power appears to be nearing economic competitiveness already. Present efforts are directed towards improvements in technology, scale of development and fabrication, and field demonstration towards reduction of costs. The market availability and costs will depend on the economic competitiveness achieved through this effort. One could also generate electricity through solar thermal power plants and biogas and use this for lighting and other applications. Research and development concerning these aspects is also being supported.

Deputation of I.A.S. Officers

2368. SHRI BHEEKU RAM JAIN: Will the Minister of HOME AFFAIRS be pleased to lay a statement showing:

- (a) the number of IAS officers who are on deputation;
- (b) the period for which these officers were initially sent to work on deputation and how many of these have been given extension;
- (c) whether the IAS Officers would be asked to give their option to come back to their parent departments or remain on deputation;
- (d) the expenditure incurred on allowances and perks given to all IAS officers on deputation during the last three years, year-wise;
- (e) the names of IAS officers who are working on deputation and reasons therefor; and
- (f) whether Government propose to review the position in the matter of sending IAS officers on deputation, if so, details thereof?