POWER DEVELOPMENT IN LADAKH
An Over-view

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SUMMARY

The primary source of power supply to Leh town and its immediate suburbs is the 4MW Stakna Hydel Power House, which utilises water from the Indus river and was commissioned in the year 1987. However icing problems prevent it functioning in mid-winter.

The other principal urban power sources at present are three Diesel Generators of about 1MW at Leh, Choglamsar and Kargil. Some villages in both Leh and Kargil districts have small Diesel Generating sets for evening hours only.

Some Micro and Mini Hydel Projects are under construction in both the districts of Leh and Kargil. Also electricity through Solar Photo Voltaic (SPV) arrays for lighting purposes is being provided to remote and inaccessible villages where other sources of energy are not possible.

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The Ladakh region comprises two districts namely Leh and Kargil (which are also the two principal towns) and forms the northern frontiers of the state. The entire region is mountainous with a temperature ranging from +30 C to -30 C. In the year 1964, for the first time, electricity was made available to the people of Leh town by the commissioning of a 20 kw diesel generating set.

The primary source of power supply to Leh town and its immediate suburbs is the 4 MW Stakna Hydel Power House, which utilises the water of the Indus River and was commissioned in the year 1987. There is also a 1MW Diesel Generating Power House at Leh and a 1MW (derated capacity of 600 kw) at Choglamsar to supplement the power supply to the town in winter months.

The power supply to Kargil town is made available, during the evening hours only, from the 1MW Diesel Generating Power House at Kargil.

The power supply to a number of villages in both the Leh and Kargil districts is made available, during evening hours only, from isolated diesel Generating Sets. The installed capacity at present is as under:-

Name of Power House	Capacity
A. DISTRICT LEH	
1. Stakna Hydro-Electric Project	4000 kw
2. D.G. Station, Leh	1000 kw
3. D.G. Station, Choglamsar, Leh, 1000kw but derated	600 kw
4. Isolated Diesel Stations in various villages (see appendix)	943 kw
Total	6543 kw

B. DISTRICT KARGIL

1.	D.G. Station, Kargil	1600 kw
2.	Isolated D.G. Stations in various villages (see appendix)	1541 kw
Total		3141 kw

ON-GOING SCHEMES

Three Micro Hydel schemes, namely Sumur and Hundar in Nubra Valley and Basgo in Leh Block of District Leh, are under construction and are in an advanced stage of commissioning. The work on construction of 3MW Igo-Martselang Mini Hydel Scheme and 4.5MW Domkhar Micro Hydel Scheme has been started and is likely to take three years for completion. The projects under construction are as under:-

	Name of Project	Est. cost(Rs)	Capacity	Area to benefit
1.	Sumur Hydel Project	141,00 lakh[1]	100 kw	Nubra Block
2.	Hunder Hydel Project	261,00 lakh	400kw	,,
3.	Basgo Hydel Project	205,00 lakh	300 kw	Leh Block
4.	Igo-Martselang H. P.	1402,00 lakh	3000kw	Leh District
5.	Domkhar	1485,00 lakh	4500kw	,,
6.	Iqbal M.H. Project	2249,00 lakh	375 kw	Kargil
7.	Haftal	760 ,00 lakh	1000 kw	Zanskar
8.	Shakar-Chikten	370,00 lakh	1260 kw	Kargil District.
9.	Marpuchhu	225,00 lakh	300kw	Dras, Kargil Dist.

The following Hydro-Electric Projects are included for construction in the approved 8th Five Year Plan:-

1.	Tangtse	389,00 lakh	390 kw	Leh District
2.	Bogdang	228,00 lakh	200 kw	,,
3.	Kundog	169,00 lakh	100 kw	,,
4.	Dha Hanu	1200,00 lakh	3000 kw	,,
5.	Chutak	(in prep.)	12000 kw	Kargil
6.	Parkachik	,,	60000 kw	,,

NEW DIESEL STATION AT LEH.

The generation from Stakna Hydro Electric Project goes down during winter months due to low discharge and freezing problems in the canal. During the severe winter period when the freezing is acute, the Power House has to be shut-down due both to the non-availability of water and for the safety of the hydraulic structures and the machinery. As already stated above 1.6MW of Diesel Generating capacity is available in Leh to meet the power requirements of the people during winter months (for lighting purposes only) which is inadequate. Therefore, a new Diesel Generating Station which will have a generating capacity of 4MW has been planned at Choglamsar,

[1] 1 crore = 10,000,000; 1 lakh = 100,000

Leh, and construction has started. The equipment has been placed on order and has started coming up. The construction of the building has also commenced. Subject to availability of timely funds and cash, four units aggregating 2MW are proposed to be commissioned during the current working season. For this purpose an amount of Rs. 300.00 lakh is required.

STAKNA HYDEL PROJECT

The project was commissioned in the year 1987-88 with a generation capacity of 4MW at a cost of Rs.27.00 crore[1]. The generation from this power house has been increasing steadily and the generation figures during the last three years are as under:

1990-91	77.8 lakh units
1991-92	105.2 lakh units
1992-93	135.7 lakh units

The total generation so far from the date of commissioning is 537 lakh units and if we take the cost of generation to be the same as diesel generation at the rate of Rs.7 per unit, the total value of electricity generated till now comes to Rs. 37.6 crore with a present yearly generation worth Rs. 9.5 crore. This clearly indicates the performance of Stakna Hydel Project by any standard.

The project had its initial teething problems which is inherent in any such projects. Initially we had the problem of silting in the water conductor rendering the power house inoperative. We have procured a 0.75 cubic yard clamshell excavator for removal of silt from the desilting basin while water is flowing through the power canal. This has helped in reducing the silting of the canal and its consequent choking and we have been able to run the power house continuously without any shutdowns on account of silting during the last two years.

STAKNA HYDRO-ELECTRIC PROJECT

In the second phase of the Stakna Project provision has been kept for the installation of the third unit of 2MW. Provision for the installation of this unit has already been kept in the power house building, but power house machinery for this third unit is yet to be arranged. The works involves the construction of a balancing reservoir, balance penstocks and the erection of the generating unit. The provision has been kept in the 8th Five Year Plan.

RURAL ELECTRIFICATION

Out of total number of 112 villages in Leh District 52, 4

villages and 13 hamlets have been electrified ending 3/93. Similarly out of 129 villages in Kargil District, 82 villages and 29 Hamlets have been electrified ending 3/93.

ELECTRIFICATION BY SOLAR PHOTO VOLTAIC (SPV) SYSTEM

Provision of light by using a SPV Lighting System is meant to provide electricity to remote and inaccessible villages where conventional sources of energy are not availale. The scheme was started during the year 1990-91 and so far the progress achieved in various blocks of Leh District is as under:-

1990-91	30 units
1991-92	120 units
1992-93	293 units
Total	443 units

Orders for 700 units (500 units for Leh and 200 units for Kargil) have already been placed and are expected to be received during the current working season. These will be installed in both the Districts of Leh and Kargil.

SOLAR POWER HOUSES

In both the Districts of Leh and Kargil the population is widely distributed. There are large distances between habitations and topography of the area is such that hydel potential is not available in all the areas of the Districts. In view of the large distances and difficult terrain, extension of transmission lines is also not practicable. However both Districts are fortunate enough to have bright sun-shine all the year round with the sun at a high elevation angle. These conditions are suitable for power generation by a Solar Photo Voltaic System. Recently a 100 kw capacity Power House has been commissioned in Kalayanpur in Uttar Pradesh. Funds for a similar purpose are available in 8th Five Year Plan. It has been proposed to obtain an expert consultancy service for preparation of the feasibility report for installation of a Power House based on Solar Energy. This will provide expert advice and the latest technology. The proposal is already under consideration by the Government.

MEETING THE FUTURE DEMAND OF ELECTRICITY OF LEH TOWN AND THE NEARBY VILLAGES

The present demand of electricity of Leh town and the nearby villagers is of the order of 8 MW whereas the generation available both from Hydel and Diesel is hardly 5 MW. The town is under a heavy pressure of population increase due to the migration of people

from the villages as well as an increase in the floating population of tourists.

The demand of electricity is thus increasing manifold. The demand could be met from a hydel site which is identified near Leh on the Zanskar river about 7 km upstream of Nimo. The discharge from the Zanskar river would be diverted through a tunnel and fall into the Indus river at Basgo village. The generation of 25 to 30 MW can be made available for 8 months of summer and 5 to 10 MW during the winter. Ladakhis and all their well wishers should propagate this idea and take it up with the government for early execution of the project.

APPENDIX

DIESEL ENGINED GENERATORS IN LEH & KARGIL DISTRICTS

DISTRICT LEH		**Capacity**
1.	Hemis	18 kw
2.	Nimo	50 kw
3.	Saspol	50 kw
4	Khaltse	50 kw
5	Skurbuchan	50 kw
6	Chumathang	50 kw
7	Nyoma	50 kw
8	Lamayuru	50 kw
9	Diskit	125 kw
10	Turtuk	125 kw
11	Tingmosgang	125 kw
12	Tangtse	200 kw
	(to be commissioned)	
DISTRICT KARGIL		
1.	Saliskot	100 kw
2.	Sanku	200 kw
3.	Sangra	40 kw
4.	Panikar	100 kw
5	Silmo	40 kw
6.	Chiktan	96 kw
7.	Khangral	100 kw
8.	Shargol	100 kw
9.	Drass	200 kw
10.	Thasgam	40 kw
11	Pan-Dras	40 kw
12	Padum	100 kw
13	Sani	40 kw
14	Karsha	100 kw
15	Baletik	125 kw
16	Garkhon	60 kw
17	Hemiskot	60 kw