CHAPTER - 1

Introduction

1.1 Background

Inter-state and intra-state transmission systems are interconnected and together constitute the electricity grid. In 1963, India was divided into five regions[1] with a view to integrating State power systems in each region and promoting the concept of regional power development through integrated power systems transcending State boundaries. In 1984, a working group constituted by Government of India (GOI) for development of a national grid, recommended formation of a separate Central Sector corporation for manning, constructing, operating and maintaining transmission facilities. A major objective of this decision was to reduce operational and commercial problems which had resulted from ownership of transmission facilities by various central generating organisations and joint ventures. Another major objective was to achieve improved integrated operation of regional transmission systems.

1.2 Profile of Power Grid Corporation of India Limited

In the above background, Power Grid Corporation of India Limited (PGCIL) was established in 1989[2] to implement the decision (August 1989) of GOI to form a 'National Grid' with the following main responsibilities:

- to plan, promote and build an integrated and efficient power transmission network in all aspects including investigation, planning, engineering and design;
- to prepare preliminary feasibility and detailed project reports;
- to construct, own, operate and maintain transmission lines, sub-stations, load despatching and communication facilities and appurtenant work;
- wheeling of power generated at various power stations in accordance with the policies and objectives laid down by GOI from time to time; and
- keeping abreast of technology development in transmission, load despatching and communication system.

Accordingly, PGCIL took over (April 1991 to August 1993) transmission assets from seven Central Generating Companies[3] and also took control of existing five[4] Regional Load Despatch Centres (RLDC) in the country between 1994 and 1996. PGCIL was notified (December 1998) as the Central Transmission Utility (CTU) by GOI and is mandated under the Electricity Act, 2003 to, *inter-alia*. ensure development of an efficient, co-ordinated and economical system of inter-state transmission lines for smooth flow of electricity from generating stations to load centers.

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[1] ***Northern Region (NR), Western Region (WR), Eastern Region (ER), Southern Region (SR) and North Eastern Region (NER)***

[2] ***PGCIL was incorporated as a Government Company on 23 October 1989.***

[3] ***NTPC Ltd., NHPC Ltd., North Eastern Power Corporation Ltd., SJVN Ltd. (earlier known as Nathpa-Jhakri Power Corporation Limited), Neyveli Lignite Corporation Limited, Nuclear Power Corporation Limited and THDC India Ltd.***

[4] ***Northern Regional Load Despatch Centre, Southern Regional Load Despatch Centre, Western Regional Load Despatch Centre, Eastern Regional Load Despatch Centre and North Eastern Regional Load Despatch Centre.***

PGCIL was conferred Miniratna[5] (Category-I) status by GOI in October 1998 and thereafter Navratna[6] status in May 2008. As on 31 March 2013, PGCIL had paid up capital of ₹4629.73 crore, of which 69.42 *per cent* was held by GOI and balance equity was held by others[7]. After a 'Follow on Public Offer' in December 2013, the paid up capital of PGCIL increased to ₹5231.59 crore, of which 57.90 *per cent* was held by GOI and balance equity was held by others. Equity shares of PGCIL were listed on National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) on 05 October 2007.

1.3 Profile of Power System Operation Corporation Limited

As envisaged in the Electricity Act, 2003, National Load Despatch Centre (NLDC) was established (February 2009) as an apex body to ensure integrated operation of 'National Grid'. Till 30 September 2010, RLDCs and NLDC were being operated by PGCIL and from 01 October 2010, a separate company named Power System Operation Corporation Limited (POSOCO), incorporated on 20 March 2009 as a wholly owned subsidiary of PGCIL, took over the operations of RLDCs and NLDC.

POSOCO was to act as the apex organization to ensure integrated operation of power system including to own, operate and maintain NLDC and RLDCs and ensure optimum scheduling and despatch of electricity in accordance with the Electricity Act 2003, regulations laid down by Central Electricity Regulatory Commission (CERC) and Indian Electricity Grid Code. POSOCO is primarily a knowledge based organization. The assets of RLDCs and NLDC comprise of Supervisory Control and Data Acquisition (SCADA) and IT systems for operation of Regional Grids and the National Grid.

1.4 Physical performance of PGCIL

The physical performance of PGCIL during the period of last six years ended 31 March 2013 are given in Table 1.1.

Table 1.1

Physical performance of PGCIL

Particulars/Years	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Length of transmission lines (in ckm) at year end	67,000	71,500	75,290	82,355	92,981	1,00,200
Number of sub-stations at year end	111	120	124	135	150	167
Transformation capacity (in MVA) at year end	73,000	79,500	83,100	93,050	1,24,525	1,64,763
Transmission Network Availability (*per cent*)	99.65	99.55	99.77	99.80	99.94	99.90
Power transmitted on PGCIL Network (MUs)	3,28,709	3,34,013	3,63,723	4,00,596	4,30,992	4,50,027

ckm: circuit kilometre, MVA: Mega Volt Ampere, MUs: Million Units

[5] ***Which provided powers to the Board of the Company to undertake new projects, modernisation, purchase of equipment, etc up to ₹300 crore or equal to their net worth which ever is lower without approval of GOI.***

[6] ***Which provided powers to the Board of the Company to undertake new transmission projects of any amount without approval of GOI***

[7] ***Foreign Institutional Investors: 14.09 per cent, Indian Public: 4.13 per cent, Body Corporates: 4.14 per cent, Mutual Funds: 2.38 per cent, Bank & Financial Institutions: 5.40 per cent and Others: 0.44 per cent.***

1.5 Roles of PGCIL and POSOCO

Transmission system projects are conceived based on requirements assessed by PGCIL in consultation with Central Electricity Authority (CEA), power generators, beneficiaries, regulators and other utilities. PGCIL carries out the work of planning, execution, operation and maintenance of the inter-state transmission system projects for evacuation of Central Sector power generation, within and across regions. POSOCO manages the grid including supervision and control of inter-state transmission systems for grid control and despatch of electricity within regions and country through secure and economic operation of regional grids. It also monitors and regulates operation of grids carrying out all such functions required as an interface with power exchanges as may be related to the business of POSOCO.

1.6 Performance Audit

Transmission facilitates better utilisation of available power generation resources. Inadequacies in transmission network and delay in commissioning of the transmission system may not only result in loss of revenue to PGCIL but may lead to congestion in evacuation of power. Creating lines of higher capacity than required or abnormal redundancies in transmission assets may result in extra financial burden on beneficiaries[8] and public at large.

Keeping in view the above, a performance audit was taken up with defined audit objectives (detailed in Chapter 2) to assess the effectiveness of planning and implementation of transmission projects executed by PGCIL during 2007-2012. Besides, an attempt has been made to assess the efficiency and effectiveness of Grid Management (Chapter 7) by POSOCO/ PGCIL in ensuring uninterrupted power supply, including Grid Security and Grid Monitoring.

[8] ***State Discoms***