

UNIT 4

TRANSMISSION OF ELECTRICITY

The transmission strategy of the Government gives a thrust on development of National Grid including interstate connection, technology up gradation , and optimization of transmission cost .

4.1 National Load Dispatch Centre (NLDC)

4.1.1 Constitution of NLDC

The Central Government is empowered to establish NLDC. The Constitution and the functions of the NLDP shall also be prescribed by the Central Government. The NLDC shall be operated by a Governement Company or corporation which shall be notified by the Central Government. As of September 2003 no NLDC exists. It is believed that shortly NLDC shall be established.

4.1.2 Functions of the NLDC

The functions of the NLDC includes optimum scheduling and dispatch of Electricity amongst the Regional Load Dispatch Center. NLDC shall be the apex body for coordination between the five regional load dispatch Centers. The Central Government is empowered to make detailed rules regarding the functioning of the NLDC.

4.1.3 Other business of the NLDC

The NLDC has been specifically been barred from engaging in the business of Trading in Electricity. The Act is silent on the issue whether NLDC can enter into other business like distribution transmission and generation of electricity.

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4.2 Regional Load Dispatch Center (RLDC)

4.2.1 Constitution of RLDC

For better and integrated management of the grid in such a large and diverse nation the grids have been divided into five regions. Which are as follows-

1. Western Region
2. Northern Region
3. Southern Region
4. Eastern Region
5. North Eastern Region

The Central Government has been empowered with the authority to make region wise demarcation of the country. The Central Government can also modify the region wise demarcation for the efficient, economical, and integrated transmission and supply of Electricity and in particular to facilitate voluntary interconnection and coordination between various entities.

The RLDC shall be a Government Company or any other authority or corporation established or constituted by or Central Act .The Central Government shall notify the entities which shall be RLDC.

It is also provided in the Act that till the RLDC is notified by the Central Government the Central Transmission Utility (Power Grid Corporation of India Ltd) shall operate as RLDC for all regions till the Central Government notifies the RLDC's.

4.2.2 Other business of the RLDC

The RLDC's has been specifically been barred from engaging in the business of Trading or generation of Electricity. The Act is silent on the issue whether NLDP can enter into other business like distribution and transmission of electricity.

4.2.3 Functions of RLDC

The Regional Load Dispatch Centre is the apex body to ensure integrated operation of the power system in the concerned region. The regional Load Dispatch Centre is empowered to comply with the Indian Electricity Grid Code (As specified by the CERC) and the Grid Standards (As specified by the CEA) . For the purpose of fulfilling the functions assigned to the RLDC it may levy and collect such fee and charges from the generating companies or licensees engaged in inter-State transmission of electricity as may be specified by the Central Commission.

Section 28 (3) specifies the core functions of the RLDC which shall -

- be responsible for optimum scheduling and dispatch of electricity within the region, in accordance with the contracts entered into with the licensee of the generating companies operating in the region.
- Monitor grid operations;
- Keep accounts of quantity of electricity transmitted through the regional grid;
- Exercise supervision and control over the inter-State transmission system; and
- Be responsible for carrying out real time operations for grid control and dispatch of electricity within the region through secure and economic operation of the regional grid in accordance with the Grid Standards and the IEGC.

4.2.4 Powers of RLDC

The Regional Load Dispatch Centre has to ensure stability of grid operation. It is also responsible to maximize efficiency and economy in the operations of the power system in the area of its operations. For the above purposes RLDC may give such directions, exercise such supervision, and control as may be required.

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Every person connected with the operation of the power system shall comply with the directions issued by the Regional Load Dispatch Centers. In case the orders issued by the RLDC is primarily concerned with the intra state matters i.e. transmission licensee of state transmission lines or any other licensee of the State or generating company (other than those connected to inter-State transmission system) or sub-station in the State shall be issued through the State Load Dispatch Centre and the State Load Dispatch Centers shall ensure that such directions are duly complied with by the licensee or generating company or sub-station.

All disputes relating to the quality of electricity or safe, secure and integrated operation of the regional grid the matter shall be adjudicated by the CERC. The directions of the RLDC shall be complied by until the final order of the CERC is delivered.

Any entity not complying with the directions of the RLDC can be made to pay penalty not exceeding rupees fifteen lacs.

4.3 State Load Dispatch Centre (SLDC)

4.3.1 Constitution of SLDC

The State Government shall by notification or under state Act establish a centre to be known as the State Load Dispatch Centre. The SLDP shall be a government entity. However until the SLDP is established the State transmission Utility shall operate as SLDP

4.3.2 Other business of the SLDC

The State Load Dispatch Centre is barred to engage in the business of trading in electricity. That SLDP other wise can generate, Transmit and distribute electricity or take up some other business.

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4.3.3 Functions of SLDC

Section 32 of the Act provides for the functions of the State Load Dispatch Centre. SLDC shall be the apex body to ensure integrated operation of the power system in a State.

The major functions of State Load Dispatch Centre will include:-

- a) It shall Be responsible for optimum scheduling and dispatch of electricity within a State, in accordance with the contracts entered into with the licensees or the generating companies operating in that State :
- b) It shall Monitor grid operation;
- c) It shall Keep accounts of the quantity of electricity transmitted through the State grid.
- d) It shall Exercise supper vision and control over the intra-State transmission system;
- e) It shall be responsible for carrying out real time operations for grid control and dispatch of electricity within the State through secure and economic operation of the State grid in accordance with the Grid Standards and the State Grid Code;

4.3.4 Finances of SLDC

The State Load Dispatch Centre may levy and collect such fee and charges from the generating companies and licensees engaged in intra-State transmission of electricity as may be specified by the State Commission.

4.3.5 Powers of SLDC

Section 33 specifies that *“The State Load Dispatch Centre in a State may give such directions and exercise such supervision and control as may be required for ensuring the integrated grid operations and for achieving the maximum economy and efficiency in the operation of power system in the State”*.

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However this is not an absolute power .It is co-extensive with the powers of the National and Regional load Dispatch Centre. The orders of NLDC and RLDC shall be umbrella orders within which the SLDC can issue orders.

Every entity connected with the operation of the power system shall comply with the directions issued by the State Load Dispatch Centre and the State Load Dispatch Centre shall comply with the directions of the Regional Load Dispatch Centre.

All disputes with reference to the quality of electricity or safe, secure and integrated operation of the State grid or in relation to any direction shall be adjudicated by SERC. The directions of the State Load Dispatch Centre shall be complied with pending the decision of SLDC. Failure of any entity to comply with the direction of SLDC may lead to a penalty of 5 Lacs.

4.4 Central Transmission Utility (CTU)

4.4.1 Appointment of CTU

A Government Company shall be notified by the Central Government as a Central transmission licensee. PGCIL Will probably be the CTU. The CTU shall be a deemed to be a transmission licensee.

4.4.2 Other Business of CTU

The CTU has been barred from taking up the following-

- A) generation of electricity or
- B) trading in electricity.

There are many associated business which a transmission licensee can take up including –

- Creation of Optical Fiber Network
- Distribution of Electricity
- Telecom operations
- Cable Television Distribution

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For example, Power Grid Corporation is Laying down Optical Fiber Network¹ of 14000 km which can be called an associated Business of the same.

4.4.3 Functions of CTU

Section 38(2) states the functions of the Central Transmission Utility as-

- a) *To undertake transmission of electricity through inter-state transmission system;*
- b) *To discharge all functions of planning and co-ordination relating to inter state transmission system with :-*
 - (i) *State Transmission Utilities;*
 - (ii) *Central Government;*
 - (iii) *State Government;*
 - (iv) *Generating companies;*
 - (v) *Regional power Committees;*
 - (vi) *Authority;*
 - (vii) *Licensees;*
 - (viii) *Any other person notified by the Central government in this behalf*
- c) *To ensure development of an efficient, co-ordinated and economical system of inter-State transmission lines for smooth flow of electricity from generating stations to the load centers;*
- d) *To provide non-discriminatory open access to its transmission system for use by :-*
 - (i) *any licensee or generating company on payment of the transmission charges; or*
 - (ii) *any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission*

¹ Cabinet Committee on Economic Affairs has approved the OFC Project involving Rs 14000 Crore and is expected to be completed before March 2006.

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charges and a surcharge thereon, as may be specified by the Central Commission:

4.4.4 Surcharge

Such surcharge shall be utilized for the purpose of meeting the requirement of current level cross subsidy. The Past arrears of the cross-subsidy can not be subsidized by the surcharge. The surcharge and cross subsidies shall be progressively reduced and eliminated. The central Commission shall specify the manner in which the cross-subsidy shall be eliminated. The duration of surcharge will not extent beyond the elimination of cross subsidy. The details regarding the manner of payment and how the amount of surcharge is to be utilized shall be specified by the Central Commission.

4.4.5 Exemption from payment of Surcharge

Captive power plants have been given exemption from surcharge if they satisfy following conditions-

- 1) open access is provided to a person who has established a captive generating plant
- 2) The electricity must be carried to the destination of his own use.

Therefore this exemption shall not be valid if the electricity generated by the Captive power plant is being used by any entity other then the owner of the Captive power station.

Interestingly The transmission tariffs being currently levied by various States for captive power do not appear to have a rational basis and was resulting in non-utilization of this significant surplus capacity. He said that this matter would also be suitably dealt with in the Tariff policy.

4.5 State Transmission Utility and Functions

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4.5.1 Constitution of STU

The state Government may notify the Board or a Government company as the State Transmission Utility². Such company or companies shall be deemed to be transmission licensees under this Act. The word Company or companies imply that there can be more than one State transmission Utility.

4.5.2 Other Business of STU

State Transmission Utility has been barred from engaging in the business of trading in electricity. STU can take up other business such as –

- Generation of Electricity
- Distribution of Electricity
- Creation of Optical fiber Network

Interestingly Andhra Pradesh State Transmission Utility named AP Transco has laid down 1500km broad band optical fiber cable network on transmission lines as an associated business. The joint venture partner “Online Media Solutions Limited” will lay another 1800 KM optic fiber network on the transmission towers to reach all the district headquarters. The step in line is 6322KM of cable network on Distributing network connecting all the mandals.

4.5.3 Functions of STU

Section 39(2) specifies The functions of the State Transmission Utility to be :-

- (a) *To undertake transmission of electricity through intra-State transmission system;*
- (b) *To discharge all functions of planning and co-ordination relating to intra-State transmission system with :-*
 - (i) *Central Transmission Utility;*
 - (ii) *State Governments;*

² Appendix 8 provides a list of State Transmission Utility.

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- (iii) *Generating companies;*
 - (iv) *Regional Power Committees;*
 - (v) *Authority;*
 - (vi) *Licensees;*
 - (vii) *Any other person notified by the State Government in this behalf;*
- (c) *To ensure development of an efficient, co ordinated and economical system of intra-State transmission lines for smooth flow of electricity from a generating station to the load centers;*
- (d) *To provide non-discriminatory open access to its transmission system for use by :-*
- (i) *any licensee or generating company on payment of the transmission charges;*
or
 - (ii) *any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission:*

4.5.4 Surcharge

Surcharge can be levied on only consumer and no other entity. Surcharge has to be specified by the Commission state Commission in this case. Secondly the surcharge shall be utilized only for meeting the current level cross-subsidy and can not extent to subsidy arrears.

Cross- subsidy and surcharge are interrelated and as the cross-subsidy is eliminated the surcharge must also be removed. It is also mandated that the cross subsidy and surcharge shall be progressively be eliminated.

4.5.5 Exemption from payment of Surcharge

Captive power plants have been given exemption from surcharge if they satisfy following conditions-

- 1) open access is provided to a person who has established a captive generating plant
- 2) The electricity must be carried to the destination of his own use.

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Therefore this exemption shall not be valid if the electricity generated by the Captive power plant is being used by any entity other than the owner of the Captive power station.

4.6 Transmission

4.6.1 Concept of Open Access in Transmission

The Electricity Act 2003 provides Open Access in the transmission lines with immediate effect leading to competition in the bulk Electricity Market. The Objective being Separation of Carriage (Fixed network like wires) from Content (Moving Element like Energy).

To understand the concept Imagine a toll road where the operator has a right to choose as to who can use the road this will be anti competitive and monopolistic venture. The Electricity Transmission lines are also being opened up on the same lines.

Open Access in telecom is called "Interconnections". International Experience of Open Access has been good. When Open Access was introduced in United Kingdom the prices of Electricity fell down by 30%.The policy makers in India also it seems are aiming for the same , but due to over neglected system the experts are of opinion that in short run (3 to 5 years)the prices will rise but afterward the real prices it is proposed will decline.

4.6.2 Duties of Transmission licensees

Section 40 of the Act provides for the duties of the all Transmission licensees including the State Transmission licensee and the Central Transmission licensee.

It shall be the duty of a transmission licensee :-

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- (a) To build, maintain and operate an efficient, co-ordinated and economical inter-State transmission system or intra-State transmission system, as the case may be;*
- (b) To comply with the directions of the Regional Load Dispatch Centre and the State Load Dispatch Centre as the case may be;*
- (c) To provide non-discriminatory open access to its transmission system for use by :-*
 - (i) any licensee or generating company on payment of the transmission charges; or*
 - (ii) any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission:*

All rules regarding the surcharge and cross-subsidy and exemption to the captive power plant are similar to the provisions of STU and CTU.

4.6.3 Other Business of transmission licensee³

A transmission licensee may, with prior intimation to the Appropriate Commission, engage in any business for optimum utilization of its assets. It is also mandated that a proportion of revenue from any other business of the Transmission licensee shall be used for reducing the Charges for Wheeling of Electricity. The appropriate commission is empowered to provide for the details of the matter.

The transmission licensee shall also maintain separate accounts for each such business undertaking to ensure that transmission business neither subsidizes in any way such business undertaking nor encumbers its transmission assets in any way to support such business. To make the system of Open Access really meaningful it has been specifically barred from entering into contract or engaging in the business of trading of Electricity.

³ Section 41 of the Electricity Act 2003

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4.6.4 First Transmission license

Central Electricity Regulatory Commission has granted 25 years Transmission license to Powerlinks Transmission Limited. This transmission licensee is a joint venture company between PGCIL and Tata Power Company. It was formerly known as Tala- Delhi Transmission limited.

This Company was formed consequent to invitation of PGCIL through bid for a joint venture partner for construction of Tala Transmission system for transmission of power generated from 1020MW Tala Hydroelectric Project in Bhutan to be wheeled to the constituents of Eastern and Northern regions. Tata Power holds 51% of the equity.

4.7 Conclusion

The transmission business tends to be a natural monopoly. The fixed cost of the same is very high. Once the infrastructure is created the marginal cost of wheeling power is very low. To sustain the transmission system it is important that large volume of regular power flows through the system. The Electricity Act 2003 by providing non discriminatory open access has created an environment for the development of the transmission system.