UNIVERSITY OF PETROLEUM & ENERGY STUDIES

End-Semester Examination - May 2019 Name of Program –MBA (Power Mgt) – Second Semester

Course title –Energy Power Trading & Network Adm. Duration – 3 Hours

Course code –**PIPM 7004** Max. Marks – 100 Roll No ----------

Section A (10 Marks)

Attempt all questions. Each question carries two marks. (CO1 & CO2)

1. Secondary fuel price is now charges as the capacity charge. (True/False)
2. Who is current minister for power in India and Uttarakhand?
3. Name all RLDCs in India with their headquarters.
4. As per Indian Electricity Rules 1956 above 650 Volts Electricity supplied is classified under high Voltage. **(True or False)**
5. Explain MCP & MCV.

Section B (30 Marks) Attempt any three questions (3X10 marks)

1. Differentiate between bilateral and pooled power trading and between Short-term and Long-term power trading with relative advantages and disadvantages. (CO3 & CO5)
2. What do you mean by open access in T & D? Explain challenges in its implementation with suggestions for improvement. (CO2 & CO4)
3. Differentiate between DAM and DAC. Also explain various types of term-ahead power market in India. (CO2 & CO3)
4. Explain scheduling in Day-Ahead Market (DAM) in power trading through power exchanges. (CO3)
5. Explain various ancillary services in power business with critically evaluation of their implementation in India in near future with their benefits. (CO4 & CO5)

Section C (2X15marks = 30 marks) (Attempt any two questions)

1. Elaborate the key issues and challenges in Indian electricity market. Compare and contrast it with anyone market from other country. (CO3 to CO5)
2. Discuss the regulatory framework of Indian Power Trading business. Critically evaluate with your suggestion for improvement in short term business. (CO2 & CO3)
3. "Indian power sector is moving from monopoly to competitive market but a lot of more required to be done" – Explain this statement in context of post EA-2003 scenario. (CO5)

Section D (30 marks) **Case Study**

In the lead up to privatization the Conservative government acknowledged that key parts of the power industry in UK – the national transmission and regional distribution networks – were natural monopolies and that there was no point in trying to create competing networks. It was also not possible to open up the retail end of the industry immediately to full competition as the technical and administrative processes could not be put in place in time. Therefore, in line with the regulatory bodies established to control prices set by the privatized telecom and gas utilities (British Telecom in 1984 and British Gas in 1986), a new regulator was established by the UK Electricity Act of 1989 – the Director General of Electricity Supplies (DGES) who had the support of the Office of Electricity Regulation (Offer).

The main responsibility of the DGES, who was appointed for a five-year term by the government, was to promote competition within the industry. Offer took on around 220 staff around half of whom worked on consumer representation. Again in line with practice in the telecom and gas industries, Offer adopted an "RPI-X" formula to control transmission and distribution prices. This meant that the National Grid Company and the regional electricity companies could only increase their prices in line with inflation (RPI– the retail price index) less an amount, X, set by the regulator. For example, the X factor for transmission prices was initially set at 0% for 1991 and 1992 and then increased to 3% for the period 1993 to 1996. This meant that for each year during that four-year period transmission prices could raise no more than 3% below the rate of inflation. In fact, inflation was below 3% for three of those four years and so transmission prices had to be cut.

The idea of this formula was to encourage companies to improve efficiency and cut costs and it was initially felt that this form of price regulation would be enough to produce the right balance of productivity gains from a combination of restructuring and reorganization and new investment. However, the regulators in both the gas and electricity industries came to the conclusion that price regulation was inadequate for the highly capital-intensive energy sector and that the formula had to be revised to take account of the level of investments being made by the companies. From 1995 the X factor in the electricity industry was set on the basis of the rate of return on investments and this had a significant and immediate impact on prices.

Takeovers and mergers in the energy sector meant that by the end of the 1990s many companies were supplying both gas and electricity to consumers. This was one reason for the provision in the Utilities Act of 2000 to merge the gas and electricity regulators to form **Ofgem – the Office of Gas and Electricity Markets** along with its governing body, the Gas and Electricity Markets Authority (GEMA). GEMA members are appointed by the government and they determine strategy, take all major decisions and set policy priorities.

Ofgem's main priority is to protect consumers by promoting competition and regulating the monopoly companies – the national transmission and regional distribution grids. It is funded by the energy companies who are licensed to run the gas and electricity infrastructure. In regulating the two sectors, Ofgem has to take account of the need to ensure adequate investment in the networks. It is also required to help gas and electricity markets and industry achieve environmental improvements as efficiently as possible and take account of the needs of

vulnerable customers, particularly older people, those with disabilities and on low incomes.

The licenses issued by Ofgem for the different levels of Electricity Company set out a range of requirements for each company to meet with a common element being a duty to supply the regulator with the information necessary for it to carry out its responsibilities. For the generating companies, for example, this includes a duty to provide information so that Ofgem is in a position to decide whether or not the company has attempted to distort market prices by withdrawing generating plant from operation. Other elements common to some of the licences are requirements not to discriminate among customers. So generators must not discriminate among the customers they supply to and National Grid/Transco must not discriminate in giving companies access to the national grid.

Ofgem conducts investigations of companies that it believes may be breaking the terms of their licence conditions, acting anti-competitively or breaching consumer protection law (Competition Act 1998 and Enterprise Act 2002). Ofgem can also investigate and apply sanctions where a company if found to be in breach of other requirements and standards of performance as laid down by the Electricity Act 1989 and Utilities Act 2000. Should the Authority find that a licence breach or Competition Act infringement has occurred, it has the power to impose large financial penalties, of up to 10% per cent of turnover. In the case of licence breach the 10% applies to the turnover of the company holding the licence whereas with an infringement of the Competition Act the UK group turnover is taken into account. Ofgem has undertaken a number of official investigations of companies over the last four years most of which end with the companies making an undertaking to review and change the practices in question. For example, in 2005 SP Manweb (part of Scottish Power) a distribution network operator was found to be discriminating in the provision of connection services against companies that weren't part of the Scottish Power group. Ofgem accepted a commitment from the company to end this practice. The most recent financial penalty was £700,000 imposed on Powergen in August 2004 for the way it had objected to its customers switching to another supplier. Earlier that year Npower and Scottish Power had both been fined £200,000 each for the same behavior.

However, if consumers or industry groups believe that electricity companies are acting in an anti-competitive way then they can go to the Office of Fair Trading (OFT) rather than Ofgem. One reason for doing this is that the OFT has far great powers than Ofgem. If OFT is satisfied that a company is harming consumer interests it can take immediate action to order the company to change its behaviour and can instigate a criminal investigation with the ultimate sanction of prison sentences for individuals held responsible for a company's actions (Bowyer 2003).

Electricity distribution companies have a number of performance standards to meet in relation to maintaining supplies, repairing faults and responding to customer complaints. These standards are laid down in parliamentary regulations (latest revisions in 2005) and monitored by Ofgem which can also propose amendments to the regulations. The standards set specific times by which companies must deal with or respond to customer enquiries, complaints or problems of supply and consumers receive compensation if targets are missed. For example, if a company fails to restore supplies after a fault within 18 hours then a domestic customer is entitled to £50 in compensation while a non-domestic consumer is entitled to £100.

Companies are also assessed against performance targets, such as their ability to maintain uninterrupted supplies. Ofgem reports on company performance in an annual quality of service report.

Another major change implemented by the Utilities Act 2000 was the setting up of a separate watchdog Energywatch, to represent consumers independently of Ofgem and to make representations to Ofgem on the behalf of consumers. The body is government funded and the chair reports to the Department of Trade and Industry.

Energywatch provides a price comparison service so that consumers can try to work out if they are getting the cheapest electricity and/or gas. It also deals with a range of specific consumer issues such as incorrect bills and other complaints about quality of service. It seeks to do this primarily by taking up issues with the companies themselves.

If it has evidence that there are more fundamental problems for consumers that might be related to the structure of the electricity market then it can take these up with the regulator, Ofgem or with the Office of Fair Trading. Energywatch's most recent major case which Ofgem investigated was a general claim, although based on detailed and specific evidence, that domestic customers were being provided with an inadequate billing service by retail electricity companies, with large numbers of customers reporting incorrect bills and problems in resolving disputes with their electricity company. Although Ofgem did not find that this was a fundamental issue relating to market structure or organization it did make a number of recommendations about how companies should deal with the issue including the writing off of bills that are more than a year old, the setting up of an ombudsman to deal with billing complaints and a call for companies to review their contracts to make sure they are fair. Ofgem said these recommendations would be imposed on companies if they did not voluntarily reform their billing practices (Energywatch).

Answer following questions – (3X10 marks) (CO3 to CO5)

1. **What are problems as per given text in power sector in UK.**
2. **Analyze these problems as per given text.**
3. **Give your suggestions for solving these problems.**

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Section A (20 Marks) Attempt all questions

Section A – Explain following topics/questions (2 marks each) – Total 20 marks

(CO1 & CO2)

1. Bilateral trading and Pooled trading of power.
2. What are ACP and ACV?
3. Compare Short-term Power Trading with Long-term Power Trading.
4. Differentiate active power from reactive power.
5. What do you mean by Deviation Settlement Mechanism? Explain.
6. Trading-margins for Power-Traders and Power-Exchange.
7. What are the roles of LDCs in Power Trading?
8. Differentiate between DAM and DAC.
9. Names of two Power-exchanges in India.
10. Name various types of term-ahead market.

Section B (20 Marks)

Explain any four of the following: (4X5marks=20 marks) (CO2 & CO3)

1. Contract for Differences.
2. Transmission Rights.
3. Scheduling of power for power trading by power exchange.
4. Open access in T&D.
5. Deregulation plan.

Section C (30 marks)

(Attempt any two) (2X15marks)

1.Elaborate the key issues and challenges in electricity market with suggestions for betterment of short-term power market. (CO4 & CO5)
2.Discuss the regulatory framework of Indian power market. Critical evaluate role of power exchanges in growth of Indian power sector. (CO3, CO4 & CO5)
3."Indian power sector is moving from monopoly to competitive market but miles to go for making them global level" – Explain this statement in context of post EA-2003 scenario. (CO5)

4. Explain various bilateral power-trading mechanisms with suitable examples. Compare it with pooled mechanism. (CO2, CO3 & CO4)

Section D (30 marks)

Case Study

Power Trading in India

In India, while there is a huge section of consumers, who are power deprived, there are a lot of Captive Power Plants (CPPs) that are under-utilized and a lot of merchant capacity also expected to be added in the near future, there is a need to encourage the peaking power plants and bring the surplus captive generation in the grid.

The Electricity Act, 2003, mandated development of power markets by appropriate commissions through enabling regulations. This paved the way for the new trends to emerge like Open Access and the one in February, 2007, when the Central Electricity Regulatory Commission (CERC) issued guidelines for grant of permission for setting up operation of power exchanges within an overall regulatory framework. The emerging trends will help in proper flow of power from surplus regions to deficit regions and thus try to bring about a balance in the power sector.

The National Electricity Policy, pronounced in February 2005, stipulated that enabling regulations for inter-and-intra-state trading, and also regulations on power exchange, shall be notified by the appropriate Commissions within six months.

On 6th February 2007, the Central Electricity Regulatory Commission (CERC) issued guidelines for grant of permission for setting up and operation of power exchanges within an overall regulatory framework. Private entrepreneurship is allowed to play its role. Promoters are required to develop their model power exchange and seek permission from CERC before start of operation.

Inter State Trading of Electricity

The Central Electricity Regulatory Commission (CERC) has issued final Regulations for Inter-State Trading of Electricity after taking into account the suggestions and comments received from the stakeholders. The Electricity Act, 2003, recognizes trading as an independent activity and

accordingly prescribes issue of trading licenses by the CERC for inter-state trading. The Commission earlier received applications from various companies for issue of trading licenses immediately after the enactment of the Electricity Act, 2003 and the Commission had permitted all of them to continue trading till 31.3.2004 or till the issue of Regulations by the Commission whichever was earlier. After Notification of Trading Regulations, the interested parties could file fresh applications before CERC, seeking inter-state trading licenses, in accordance with these Regulations.

The Commission is also initiating actions for preparation of Regulations for establishment of a market mechanism for electricity. The Regulations for market mechanism will be done after following a transparent process as is the normal practice of the Commission.

The highlights of the final Regulations for inter-state trading are as follows:

1. The Regulations provide for trading carried out bilaterally between the generating company including captive generating plant, distribution licensee and electricity trader on the one hand and the electricity trader and the distribution licensee on the other.

2. The Inter-State Trading License shall be granted for 25 years.

3. The Regulation prescribes the application form for trading license. The application fee is Rs.1.00 lakh which is subject to adjustment after the same is prescribed by the Central Government. A model license document is also appended to the Regulations.

4. The Regulations also specify the methodology for publication of the license application. The application shall be published in at least two national English daily newspapers including one economic newspaper and two local newspapers falling within the areas of trading, one of which shall be in vernacular. The entire application shall also be posted on the website.

5. The applicant for the license shall file his comments on the objections or suggestions received in response to the public notice.

6. The technical requirements for being an electricity trader stipulates having at least one full time professional each with experience in

i) Power System Operations and commercial aspects of Power Transfers and

ii) Finance, Commerce and Accounts.

7. Capital adequacy requirement for various categories has been stipulated.

REGULATORY ROLE

Central and State regulatory Commissions have been formed with a view to placing greater emphasis on meeting future electric needs at least cost. The Commissions would become involved

in conservation also if International experience was any guide. They might reflect preference for renewable energy and emphasize 'integrated' or non-traditional supply options like conservation and other Demand side management (DSM), the development of technology like 'waste to watt' electricity generation.

Under the Electricity Act-03 Regulators have been mandated to develop energy markets. Energy efficiency initiative is the proactive approach to Market Transformation Program (MTP). The MTP focuses on longer-term strategies for delivering more resource-efficient goods and services, primarily through policy measures that drive innovation and competition. For example, policies such as energy labeling, product standards development and voluntary agreements with industry are especially powerful in influencing manufacture, design, market and produce in volume the more efficient products where needed. Indeed, with increasing globalization, our ability to deliver more and more efficient products to the global market will depend on the ability to meet global expectations. It is necessary to initiate energy conservation measure subject to regulatory oversight.

Regulatory policies determine the level of investment in energy efficiency. The policies are pushed through regulation, incentives and specific programs. Such policies are pursued for societal benefits, minimization of power shortage, reduce environment degradation and overall economic efficiency. Governments set the standards for building codes, appliances.

Under Integrated Resource Planning (IRP) the utility will have many options for meeting future needs. The latest idea of conservation is an additional option. The idea is that instead of meeting future demands through building more generation –transmission-distribution, facilities can be dampened making new facilities unnecessary. One of the primary means of dampening the future demand is through energy conservation that would include better energy information dissemination on consuming equipment like energy labeling.

The strategies emerging are combination of financing energy efficient technologies and financing market development policy initiatives and detailed disclosures about energy. The regulatory strategies can be designed to increase the participation of various stakeholders, notably credit providers, equipment vendors, utilities and technological service providers etc.

ANSWER FOLLOWING QUESTIONS – (3X10 marks)
(CO3 to CO5)

1. State problems in power trading in India as per this text.
2. Analyze regulatory framework for power trading.
3. Suggest remedial actions for betterment of power trading in India.