GRID CODE - PREFACE

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Date	22.11.2010	09.12.2010	10.09.2010

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CHAPTER 0: PREFACE

1 Introduction

1.1.1.1 This chapter is a preface to the **grid code** of the **Kosovan power system**. It describes the role, objective and contents of the **grid code** and gives some background information on the Kosovan power industry and market structure. It does form part of the **grid code**.

1.1.1.2 The **grid code** covers the operating procedures and principles governing the interactions between the **TSMO** and the **users** of the Kosovan **transmission system**. It covers the processes of planning, connection, operation and system balancing in both normal and exceptional circumstances. The processes cover different timeframes from 10 years ahead to real time and post event. It is a mandatory document for both the **TSMO** and the **users**.

1.1.1.3 This **grid code** is a single complete document but for ease of use and updating it has been has arranged in a number of chapters. Each chapter is a self contained document. The chapters are as follows:

- **Chapter 0 – Preface**
- Chapter 1 – **General Conditions Code** that is intended to ensure that all the sections work together and include procedures for dealing with unforeseen circumstances, disputes, **derogations** and amendments to the **grid code**;
- Chapter **2** – **Glossary** – a list of defined terms – words and acronyms – and their meaning when used as such within this **grid code**;
- Chapter **3** – **Planning Code** – this sets out the requirements for the supply of certain information by **users** so that the **TSMO** can carry out the planning and development of the Kosovan **transmission system**;
- Chapter **4** – **Connections Code** – this specifies the requirements that must be met both by the **TSMO** and by **users** either directly connected to or seeking a direct connection to the Kosovan **transmission system**;
- Chapter **5** – **Operational planning code** – this covers the period from one year ahead up to the real time balancing stage. It consists of three sub-codes viz the **outage planning code** covering the scheduling and co-ordination of **system outages**, the

system assessment code covering system security assessment and demand forecasting and the **scheduling code** covering the day ahead scheduling process;

- Chapter **6** – **Balancing code** – this covers the procedures associated with balancing the system generation and demand in real time. There are three sub-codes viz the **dispatch code** that covers the procedures and processes for dispatch for balancing, **ancillary services** and in an emergency the **frequency control code** covering the processes for the control of system **frequency** and the **voltage control code** dealing with the arrangements for control of voltage and reactive;

- Chapter **7** – **Operations Code** – this is split into a number of sub-codes and includes the following – **testing and monitoring code** that specifies the procedures to enable the monitoring and testing of network **user**s' compliance with the requirements of this **grid code**, **operational liaison and event information supply code** that covers the exchange of information under normal and abnormal conditions, **safety co-ordination code** dealing with the procedures to allow work and/or testing to be carried out across a **connection point**, **contingency planning code** that covers the provision of contingency and restoration plans following total or partial shutdown of the system, **demand control code** covering the procedures necessary to permit the reduction of **demand**, **plant and apparatus identification code** that sets out the responsibilities and procedures for the plant numbering and nomenclature to be used at all sites and **system tests code** covering the arrangements for carrying out tests that may have an effect on other **parties**;

2 Objective

2.1.1.1 The overall objective of this preface is to create a better understanding of the role of the **grid code** in the Kosovan power industry.

3 Scope

3.1.1.1 This preface contains neither rules nor requirements on any **party**. It is provided to **users** and any other **party** for information only.

4 Kosovan Power Industry

4.1 Kosovan Power Industry Structure

4.1.1.1 The **TSMO** is the independent transmission, system and market operator for Kosovo and operates in Kosovo with KEK, a vertically integrated utility incorporating four core businesses viz – lignite mines, power generation, distribution network and supply. The nominal installed generation capacity of Kosovo is 1513 MW (in 2006) – five units of Kosovo A thermal power plant (TPP) and two units of Kosovo B TPP. In addition to these lignite TPPs, KEK purchases power from a hydroelectric plant (Ujmani) with a total net capacity of 35 MW. Currently 97% of the total generation capacity comes from the two coal-fired power plants, while hydropower accounts for 3%.

4.1.1.2 The **transmission system** of Kosovo comprises the voltage levels of 400, 220 and 110 kV with the demarcation point between transmission and distribution being the 110kV bushing of the 110kV/LV transformers. The 400 kV and 220 kV **transmission system** of Kosovo is an integral part of the regional interconnected **transmission system**. The Kosovo system is also part of UCTE system and is interconnected with the neighbouring systems of Serbia, Montenegro and FYROM by single circuit 400kV lines and with Serbia and Albania by single circuit 220kV lines. There were two single circuit 220kV interconnections with FYROM but these have suffered major damage and are unlikely to be restored to service in their present form. There are also three 110kV interconnections, two with Serbia and one with FYROM. A 400 kV interconnection line to Albania is at present being planned. This line is considered to be of vital importance for substantial electricity exchanges between the predominantly thermal based Kosovo system and the predominantly hydropower based Albanian system.

4.1.1.3 With a Maximum Demand estimated at 1100MW in 2006 and an apparent large import capability there would seem at the macro level to be no problems in meeting the demand, however in actuality this is anything but the situation. Supply reliability is well below the European average with load shedding endemic and customer minutes lost figures very high. Some of the reasons for this are given in the following.

4.1.1.4 The presently available generation (2006) consists of two thermal power plants with 580MW at Kosovo B (2 x 290MW), and 130MW at Kosovo A (1 x 100MW and 1 x 30MW) and the 32MW Ujmani hydro plant. The World Bank is leading a plan to

develop a large lignite fired IPP of somewhere around 1000MW and accompanied coal mine which would supply Kosovo and sell into the regional energy market.

4.1.1.5 The 400kV network is connected to the 220kV by three 400MVA autotransformers with the **generators** at Kosovo B connected to the 400kV busbars.

4.1.1.6 The 220kV and 110kV networks are interconnected via seven transformers with a total capacity of 1000MVA. Most of the Kosovo demand has to be supplied via these transformers although around 40MW is supplied directly from the 220kV system at Podujeva – where there are 2x40MVA 220kV/LV transformers – and G1 at Kosovo A and the Hydro station at Ujmani are directly connected to the 110kV network. Also around 30MW is supplied via the 2x160MVA transformers at the customer substation at Feronikeli. The total transformer capacity at 220kV plus the direct supply by **generators** connected at 110kV is around 1200MVA to meet an estimated demand of 1200MW but the lack of transformer capacity at 220kV is made worse as the load is not spread equally across the system.

4.1.1.7 There are a number of constraints and weak points on the 220kV network. The 220kV system is supplied mainly from the 400kV busbar although there are single circuit connections with Serbia and Albania. Each of the three main 220/110kV substations are supplied by two 220kV circuits. For example:

- Prizreni is supplied by line 293/2 and the 220kV interconnector with Albania;
- Kosovo A is supplied by two 220kV circuits with the two interconnectors to the FYROM out of commission.

4.1.1.8 On the 110kV network there are also a number of weak points. For example:

- The four substations at Burimi, Peja, Decani and Gjavova 1 are supplied by lines 126/4 and 164/1. However it is planned to connect these substations to the 400kV Podgorica circuit via initially a single 400/110kV transformer;
- Line 118/5 between Pristina 4 and Ferizaji is a key circuit and is in poor condition;
- The interchange capacity on the 110kV interconnections with Serbia and FYROM are not normally in use. They are only used for planned **outages** or during some failures. During these cases they are loaded to 30MW.

4.1.1.9 Over and above all these issues is the state of the network, which is badly in need of investment and refurbishment.

4.1.1.10 Real-time **SCADA** capability is virtually non-existent and there is only a mini **SCADA** system from Kosovo B substation and power station which provides the transfer information on the 400kV lines and the power station output. There is no **SCADA** information from any substations and all of the key ones are permanently manned. There are plans to correct this by installing a modern **SCADA**/EMS system in the control centre in Pristina supported by modern communications links and substation RTUs etc. For Kosovo to play a major role in the ECSEE market and to fulfil its UCTE obligations this equipment is absolutely essential.

4.1.1.11 Also to allow Kosovo to play a full part in the ECSEE market a load frequency control (LFC) system has been installed and commissioned in Kosovo B but is not yet operational. The LFC system will match generation output with scheduled delivery commitments and will also control frequency and interchanges

5 Responsibilities of the Parties

5.1 TSMO

5.1.1.1 The **TSMO** acts as **system operator**, **transmission network** owner and **market operator**. Its responsibilities for these three functions are as follows: bidding for (spot) and balancing and reserve power and capacity;

5.1.2 System Operator

5.1.2.1 As **system operator** the **TSMO** carries out the following functions:

- Maintaining supply quality and reliability;
- Facilitating the electricity market – both the Kosovan market and the regional market;
- Provision of daily information to the **market operator** and other parties;
- Management of the **transmission network** and interstate power and capacity flows;

- Coordination of import and export of electric energy in accordance with existing agreements;
- Provision of ancillary services;
- Balancing **demand** and **generation** in the Kosovo system;
- Outage planning for the **transmission network** and for **users** directly connected to the **transmission network**;
- Installation, maintenance and operation of metering equipment.

5.1.3 Transmission Network Owner

5.1.3.1 As **transmission network** owner the **TSMO** carries out the following:

- Planning, operation and maintenance of the **transmission network**;
- Maintaining the telecoms infrastructure;
- Management of the **transmission network** assets;
- Carrying out safety management procedures;
- Long term system planning;
- Managing network expansion projects;
- Arranging for new connections and inspecting existing connections.

5.1.4 Market Operator

5.1.4.1 As **market operator** the **TSMO** carries out the following:

- Regulation of financial relations among power **market participants**;
- Collection and processing of metering data;
- Settling invoices and payments for out of balance and **ancillary services**:

5.2 Generators

5.2.1.1 The responsibilities of **generators** are as follows:

- Provision of power and energy to meet their agreed contracts;
- Responding to instructions from the **system operator** for frequency and voltage control;
- Providing timely information of planned and unplanned events to the **system operator**;
- Allowing access for testing, inspection or data collection:

5.3 Distribution System Operators

5.3.1.1 The responsibilities of **distribution system operators** are as follows:

- Responding to instructions from the **system operator** for voltage control;
- Providing timely information of planned and unplanned **events** to the **system operator**;

5.4 Suppliers

5.4.1.1 The responsibilities of **suppliers** are as follows:

- Providing information to the **market operator** of their energy requirements:

6 Transitional Arrangements

7 Resources and Documents

7.1 Resources

Nr.	Name of Document
1.	Law on Electricity
2.	Transmission System Operator Licence
3.	
4.	

7.2 Documents and forms

7.3 Revision Information

Version	Date	Description	Preservation time
1.1	27.01.2007	Edition 1, Revision 1	1 year
2.0	14.01.2008	Edition 2	2 years
2.1	10.09.2010	Edition 2, Revision 1	