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Data Exchange Code

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1 SCOPE OF APPLICATION

J.1 The scope of application provides elements for a proper understanding of the provisions set in this Code.

In the building of an efficient integrated Pan-Arab Electricity Market (PAEM), information exchange and data management shall become more connected. Increased information access and exchange lead to substantial efficiency gains not only does in grid operation and planning, but it also lowers market access barriers, ensures transparency in consumers’ usage and creates new market.

In PAEM, data from TSOs and Non-TSOs are required for various operational tasks and case studies. This document addresses the general rules for the data handling and the rules that the Parties shall follow for the provision and usage of these data between TSOs and/or Non-TSOs. This Code is a complementary document to rules described in the “League of Arab States Pan Arab Electricity Market General Agreement (2019/06/20)”, especially concerning issues regarding the protection of information as detailed in Chapter 10 of the above-mentioned document.

2 ROLES, RESPONSIBILITIES AND QUALITY OF DATA EXCHANGE

J. Each Person is responsible for the availability, reliability and validity of the data he provides, according to the specified requirements.

Each TSO shall be responsible for providing and using high quality data and Information. The availability, reliability, validity and accuracy of the exchanged data shall be ensured by TSOs to fulfill the requirements provided for in the Arab Grid Code. If nothing is specified, Best Effort shall be applied for the specific Data Exchange.

All TSOs shall jointly agree on key organizational requirements, roles and responsibilities in relation to Data Exchange. They shall apply to all Data Exchange and shall include organizational requirements, roles and responsibilities for the following elements:

a) obligations for TSOs to communicate, without delay, to all neighboring TSOs any changes in the protection settings, thermal limits and technical capacities at the International Interconnections between their Control Areas;

b) obligations for the adjacent TSOs to inform each other within agreed timescales of any changes in the data and information pursuant to the Arab Grid Code;

c) detailed contents of the data and information established pursuant to the Arab Grid Code, including main principles, type of data, communication means, format and standards to be applied, timing and responsibilities;

d) The frequency of information exchanges for Real-Time Data Exchange, scheduled data and update of structural data shall be defined.

The organizational requirements, roles and responsibilities shall be published by PAEM.

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1 J.: Justification
The Market Secretariat shall be appointed as the coordinator for each data collection related to a specific Operational TSO Business. The coordinator observes and checks the implementation of the Data Exchange and detects potential trouble and bottlenecks. At time intervals agreed by the contributors, he examines data set contents and procedures concerning the Data Exchange, and corrects them, if necessary.

3 DATA EXCHANGE AMONG TSOs

More information, regarding the Data Exchange, in the several parts of the Arab Grid Codes are reported. In Operation Code, Planning Code, Connection Code, Scheduling & Dispatching Codes, several Articles are dedicated to the Data Exchange among Parties to improve efficiently the security operation of the interconnection system. This Chapter highlights the structural and forecast Data Exchange to perform static load flow computation and dynamic assessment of the system. Further, in real time, each TSO shall exchange data on the Operating Conditions of its Grid with the other TSOs of the same Synchronous Area, using the IT tool for real-time Data Exchange at Pan Arab level as provided by PAEM.

3.1 Structural and Forecast Data Exchange

Neighboring TSOs shall at least exchange the following structural information related to the Observability Area:

a) the regular topology of substations and other relevant data, by voltage level;
b) technical data on transmission lines;
c) technical data on transformers connecting MV/LV network, demand facilities and generators' block-transformers;
d) the maximum and minimum active and reactive power of Power-Generating Modules;
e) technical data on phase-shifting transformers;
f) technical data on HVDC Systems;
g) technical data on reactors, capacitors and static volt-ampere reactive (VAR) compensators;
h) operational security limits defined by each TSO for each network element.

To coordinate the protection of their Transmission Systems, neighboring TSOs shall exchange the protection setpoints of the lines for which the contingencies are included as external contingencies in their contingency lists.

To coordinate their operational security analysis and to establish the common grid model, each TSO shall exchange, with at least all other TSOs from the same Synchronous Area, at least the following data:

a) the topology of VHV (Very High Voltage) and HV (High Voltage) Transmission Systems within its Control Area;
b) a model or an equivalent of the Transmission System with voltage below HV with significant impact on its own Transmission System;
c) the thermal limits of the Transmission System elements;
d) a realistic and accurate forecasted aggregate amount of injection and withdrawal, per primary energy source, at each node of the Transmission System, for different time-frames.

To coordinate the dynamic stability assessments, each TSO shall exchange with the other TSOs of the same Synchronous Area or of its relevant part the following data:

a) data concerning Power-Generating Modules relating to, but not limited to:
i. electrical parameters of the alternator suitable for the dynamic stability assessment, including total inertia;
ii. protection models;
iii. step-up transformer description;
iv. minimum and maximum reactive power;
v. prime movers’ models and excitation system models suitable for large disturbances;

b) the data on type of regulation and voltage regulation range concerning tap changers and network transformers;
c) the data concerning HVDC Systems and FACTS devices on the dynamic models of the system or the device and its associated regulation suitable for large disturbances.

3.2 Real Time Data Exchange

J. Requirements to data collection describing current situation in order to support the TSOs in monitoring, coordinating and operating the Transmission System.

Real-Time Data Exchange is the focus of Pan Arab Communication Network (PACN). The measurements and grid topology from neighboring TSOs are important for the secure operation of the Transmission System. The type and the amount of data to be exchanged in Real-Time Data Exchange shall be mutually agreed upon between participating TSOs within the framework of the ENTSO-E RG CE policies. The PACN is meant for Data Exchange which helps the TSOs in monitoring and coordinating operation of the PAEM Electricity System. It is recommended not to use the exchanged data through PACN for real-time control applications.

The Data Exchange between communication partners is coordinated on a bilateral basis. The Data Exchange shall be agreed among the participating TSOs.

AS a minimum, each shall gather the following information, at least, about its Observability Area and shall exchange this data with all other TSOs to the extent that it is necessary for carrying out the operational security analysis:

a) frequency;
b) area control error;
c) measured active power interchanges between Load Frequency Control areas;
d) setpoint of the load-frequency controller;
e) aggregated generation infeed;
f) consumption;
g) planned outages and substation topologies; and,
h) Operating Condition (normal, alert, emergency).

Each TSO shall exchange, with the other TSOs in its Observability Area, the following data about its Transmission System using real-time Data Exchanges between the TSOs’ supervisory control and data acquisition (SCADA) systems and EMS:

a) actual substation topology;
b) active and reactive power in each line bay, including transmission and lines connecting Power-Generating Modules;
c) regulating positions of transformers, including phase-shifting transformers;
d) measured or estimated busbar voltage;
e) reactive power in reactor and capacitor bay or from a static VAR compensator;
f) restrictions on active and reactive power supply capabilities with respect to the Observability Area. Each TSO shall have the right to request all TSOs from its Observability Area to provide real-time Snapshots of state estimated data from that TSO's Control Area if that is relevant for the operational security of the Transmission System of the requesting TSO.

4 RULES TO HANDLE THE DATA

J. Requirement to organize handling of Operational TSO Business data in such a way that it minimizes the risks of abusing the code of conduct and works in a sense of good faith and cooperation for joint benefit.

The TSOs' data needed, used for or resulting from operation of the interconnected PAEM Electricity System have to be handled under general rules concerning data confidentiality, acquisition, coordination and usage, back-up procedures and intellectual property. All Parties involved have the same rights and must comply with the same obligations at supporting PAEM's internal tasks and its external communication policy in the limits set off herein.

4.1 Basic requirements

4.1.1 Data Handling

The TSOs shall exchange different kinds of data for Operational TSO Business, as described in the relevant parts of Arab Grid Code or stipulated by bilateral or multilateral agreements among TSOs. They are required to organize handling of their Operational TSOs' Business data to fulfil this part of Code.

4.1.2 Data Format

Each TSO shall use the standardized format for Data Exchange as agreed within PAEM. In case of no standardized format, the format shall be agreed among the TSOs concerned.

4.1.3 Data Access

A TSO participating in the creation of Common Information related to a specific Operational TSO Business based on the data provided by other TSOs must share this Common Information or the data derived from it with other contributing TSOs. The contributing TSO has the right to extend or restrict this use into more precise agreements. Such a restriction or extension shall be duly recorded in writing.

4.1.4 Data Confidentiality

Any individual and/or common information falling into one of the following categories shall be considered Confidential Information:

a) Any Information pertaining to the interests of any Party developed or acquired by any Party and that is proprietarily or competitively sensitive.

b) Any critical energy infrastructure Information about proposed or existing asset, which is related to the generation, transmission or distribution of electricity and which could be used for planning an attack or for any other similar type of misuse. Critical infrastructure comprises existing and proposed systems and assets (whether
physical or virtual) of which the incapacity or destruction would negatively affect security, economic security, public health or safety or any combination of those factors.

c) Any investigation report and any records produced for or during an investigation of disturbance in the system.

d) Cybersecurity information that could damage cybersecurity.

e) All other information recognized as confidential however not falling into any of the categories above.

Confidentiality does not apply to the following data:

a) Data in the public domain other than by reason of breach of the Article 4.1.4; or any other relevant bi- and/or multilateral agreement on confidentiality protection;

b) Data already lawfully in the possession of the Receiving Party prior to its receipt from the Disclosing Party;

The Disclosing Party shall mark as confidential any information submitted to the Receiving Party that it reasonably believes to be confidential. Any Common Information which involves Confidential Information shall be treated as confidential.

Only the TSOs may use the Confidential Information, strictly for their Operational TSO Business needs, or otherwise agreed or in the case of request from authorized authorities under national or international law. This Confidential Information may only be disclosed to the managers, employees, advisers and representatives of the TSOs if those persons are bound by an obligation of confidentiality.

4.1.4.1 Non-Disclosure of Confidential Information

No disclosure of Confidential Information is allowed in any way, matter or form, in whole or in part, to any Party as a rule. By derogation to this, disclosure is allowed in case of:

a) the explicit consent of the Disclosing Party and to the conclusion of a non-disclosure agreement which provides for, at least, equivalent obligations of confidentiality as provided for in this Article 4.1.4.

b) A TSO becomes legally compelled, or expects that it will be legally compelled, to disclose the Confidential Information to any authority. In such a case it will, unless it is not authorized to do so because of national or international law, provide prompt notification of it to the TSO that has provided that Confidential Information. The Parties agree on the content and extent of the Confidential Information to be divulged, in accordance with the relevant law, the authority orders and the general rules applied within PAEM. The disclosure of the Confidential Information is made in a proper and discreet manner. The TSO who discloses Confidential Information under this Article shall inform the Receiving Party of the confidential nature of the Confidential Information and shall ask the Receiving Party to treat the information, if possible, under the same terms and obligations as this Article.

4.1.4.2 Confidential Information handling

The TSO shall organize its data handling in such a way as to minimize the risks of misuse or unauthorized access or disclosure of Confidential Information.

Any Disclosing Party and Receiving Party dealing with Confidential Information, has the right to rule its use, and protection in more precise bilateral agreements. In case of
contradiction or inconsistency between such agreement and this Article, this Article supersedes the bilateral agreement.

4.1.4.3 Use of Individual Information
Each Party may make free use of its own Individual Information and/or Common Information for any purpose without constraints.

4.1.5 Duty to mitigate
If a TSO is temporarily unable to provide its required information in due time, it shall inform the other TSOs involved immediately and shall use all reasonable efforts to mitigate the effects of the event which has caused the failure.

4.1.6 Non-TSO data
Chapter 4 also applies to data required from Non-TSOs for Operational TSO Business. These data may be provided by a TSO to the Common Information of the PAEM under the condition that there is an agreement between the TSO and the Non-TSO allowing such diffusion.

4.1.7 Responsibility
Each provider is responsible for the availability, reliability and validity of the data he provides, according to the specified requirements.

4.1.8 Miscellaneous
4.1.8.1 Property
Common Information derived from the Individual Information of all TSOs is owned by the PAEM while the Individual Information itself is and remains the exclusive property of the TSO. If a TSO uses data on behalf of another Party, the data is treated in the same way as Individual Information of the TSO, but it remains the property of the disclosing Party. Each TSO may process the Common Information for individual use. No change in the information limits the restrictions on the use of the data.

4.1.8.2 Intellectual property
The Data Exchange Code is not to be construed as granting the Receiving Party any license or intellectual property rights related to the data and its future use, unless explicitly agreed otherwise in writing.

4.2 Communication Infrastructure

J. Technical infrastructure needed to exchange the requisite data shall be available.

The PACN between TSOs shall be implemented to provide the necessary infrastructure that facilitates and supports Data Exchanges among TSOs.
The availability of technical infrastructure needed to Data Exchange shall be ensured by the TSOs.
The implementation, operation, extension and maintenance of the PACN among the TSOs is necessary.
The PACN shall be a private network dedicated to Data Exchange between TSOs and operates under the responsibility of the TSOs and the management of the relevant Coordination Center.

The purpose of PACN is to exchange:
   a) Telecontrol real time information.
   b) Non-real time services such as file transfer for exchange of transmission schedules, network model, planning data or statistics (File Transfer Protocol-FTP).

The primary scope of the PACN is the Real-Time Data Exchange, in support of TSO operational processes, aimed at enhancing the security of electricity supply in the Member States.

As a result of this, real-time data traffic has the highest priority amongst all the other data communicated.

Every TSO shall be connected to the PACN.

All other Non-TSOs and Non-PAEM TSOs can be connected to the PACN.

There must not be any direct physical or logical connection between PACN and Internet. All Data Exchange between PACN and the outside world should be done under full security procedures. The separation of PACN from insecure networks must be guaranteed by use of intermediate gateways or a Demilitarized Zone.

4.2.1 Other communication way
As fallback communication for TSOs, usually the public communication infrastructure (public mobile communication or public landline) is used. In daily operation all partners and market participants can be contacted via public communication. In case of blackout or disturbances situations may occur where these Parties, only having public communication access, temporary cannot be contacted anymore.

In case of complete shortfall of regular and fallback communication, the most important partners are provided with satellite communication as contingency communication. Therefore, this form of communication is also a fallback solution for all other forms of communication.

5 PUBLICATION

J. Requirements to define the information (incl. scope, level of aggregation of data and derived information) dedicated to internal and external publication.

PAEM defines the Information (including scope, level of aggregation of data and derived information) dedicated to internal and external publication.

PAEM publications are written in English/Arabic language.

The Market Secretariat of PAEM is responsible for the supervision of the publication and circulation of documents. The list of documents for external publication is kept by the Market Secretariat.

Regular publications with mainly recurrent statistical content are validated by the providers. All other publications are approved by the Arab TSOs Committee.
Data sent by the Member States for periodical publication can be found in monthly, quarterly, half-yearly or yearly publications that can be accessed from the PAEM website.