



GREATER MEKONG SYSTEM REGIONAL GRID CODE


Operational Planning & Scheduling Code (draft)

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Note: A section titled "ANNEX: Code – History of Comments" is attached to each Code. It provides a log of every comment and subsequent consideration taken on the Code.

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1. General Provision

1.1 Subject Matter and Scope

- (1) This Network Code defines the minimum Operational Planning and Scheduling requirements for ensuring coherent and coordinated operational planning processes of the Synchronous Areas applicable to all Significant Grid Users, all Transmission System Operators and all Distribution System Operators.
- (2) This Network Code aims at:
 - a) Determining common time horizons, methodologies and principles allowing to carry out coordinated Operational Security Analysis and Adequacy analysis to maintain Operational Security and support the efficient functioning of the GMS electricity market; and
 - b) Determining conditions to coordinate Availability Plans, allowing works required by Relevant Assets.
- (3) The provisions of this Network Code shall not apply to the Transmission System or parts of the Transmission System of a Member State which is not operating synchronously with or which is temporarily disconnected from the rest of the Synchronous Area.
- (4) For the purpose of this Network Code, Existing Power Generating Modules shall be classified as type A, B, C and D according to the criteria defined in Section 2 [Requirements for Generators] of Connection Code, for New Power Generating Modules. For the purpose of this Network Code, existing Demand Facilities shall be classified according to the criteria defined in Connection Code [Section 4 – DC]. The Significant Grid Users within the scope of this Network Code are:
 - a) Existing and New Power Generating Modules of type B, C and D according to the criteria defined in Connection Code [Section 2 “Requirements for Generators” – RfG];
 - b) Existing and new Transmission Connected Demand Facilities according to the criteria defined in Section 4 [Demand Connection] of Connection Code and all Existing and New Transmission Connected Closed Distribution Networks;
 - c) Significant Demand Facilities, Closed Distribution Networks and Aggregators according to Connection Code [Section 4 “Demand Connection” – DC], in the case where they provide Demand Side Response (DSR) directly to the TSO;
 - d) Redispatching Aggregators and Providers of Active Power Reserve according to the Network Code on Load-Frequency Control and Reserves [LFCR].
- (5) In the implementation of the technical and other requirements set in this Network Code, each TSO shall comply with good industry practice.

1.2 Definitions

- (1) For the purposes of this Regulation, the definitions of the GMS Glossary of Terms shall apply.

- (2) In particular, the following definitions shall apply for the purpose of this Network Code on Operational Planning & Scheduling [OPS]:

Adequacy – means the ability of in-feeds into an area to meet the demand in this area;

Aggregated Netted External Schedule – means a Schedule representing the netted aggregation of all External TSO Schedules and External Commercial Trade Schedules between two Scheduling Areas or between a Scheduling Area and a group of other Scheduling Areas;

Availability Plan – means the combination of all planned Availability Statuses for a Relevant Asset for a given time period;

Availability Status – means the capability for a given time period of a Power Generating Module, grid element, Demand Facility, or another facility to provide service, whether or not it is in operation;

Close to Real-Time – means the time delay between last intraday gate closure and real time, no later than 30 min before real time;

Connecting DSO – means the DSO to whose Distribution Network a Power Generating Module, Demand Facility, or grid element is connected;

Connecting CDSO – means the CDSO to whose Closed Distribution Network a Power Generating Module, Demand Facility, or grid element is connected;

Constraint – means a situation in which there is a need to implement Remedial Action in order to respect Operational Security Limits;

Consumption Schedule – means a Schedule representing the consumption of a Demand Facility or a group of Demand Facilities;

Demand Facility Operator – means the natural or legal person who is the operator of a Demand Facility;

RPCC Operational Planning Data Environment – means the set of application programs and equipment developed in order to allow the storage, the exchange and the management of the data used within operational planning processes between TSOs, orchestrated by the RPCC of GMS;

External Commercial Trade Schedule – means a Schedule representing the commercial exchange of electricity between Market Participants in different Scheduling Areas;

External TSO Schedule – means a Schedule representing the exchange of electricity of TSOs between different Scheduling Areas;

Forced Outage – means the unplanned removal from service of a Relevant Asset for any urgency reason that is not under the operational control of the respective operator;

Generation Schedule – means a Schedule representing the Generation of electricity of a Power Generating Module or a group of Power Generating Modules;

Internal Commercial Trade Schedule – means a Schedule representing the commercial exchange of electricity within a Scheduling Area between different Market Participants or between Nominated Electricity Market Operators and Market Coupling Operators;

Netted Area AC Position – means the netted aggregation of all AC-external Schedules of an area;

Outage Coordination Process – means the process of coordinating the Availability Plans of all Relevant Assets;

Outage Coordination Region – means a combination of Responsibility Areas in which procedures are defined to monitor and where necessary coordinate the Availability Status of Relevant Assets on all planning timescales;

Outage Coordinating TSO – means the TSO to which a Relevant Asset is directly connected to its Transmission System or connected via a Transmission Connected Distribution Network or a Transmission Connected Closed Distribution Network;

Outage Incompatibility – means the state in which a combination of the Availability Status of one or more Relevant Grid Elements, Relevant Power Generating Modules, and/or Relevant Demand Facilities and the best estimate of the forecasted electricity grid situation leads to violation of Operational Security Limits taking into account Non Costly Remedial Actions at the TSO's disposal;

Outage Planning Agent – means the role of planning the Availability Status of a Relevant Power Generating Module, a Relevant Demand Facility or a Relevant Grid Element;

Power Generating Facility Operator – means the natural or legal person who is the operator of a Power Generating Facility;

Relevant Asset – means any Relevant Demand Facility, Relevant Power Generating Module, or Relevant Grid Element partaking in the Outage Coordination Process;

Relevant Demand Facility – means a Demand Facility which participates in the Outage Coordination Process as its Availability Status influences cross-border Operational Security;

Relevant Grid Element – means a grid element located in a Transmission System, in a Distribution Network, or in a Closed Distribution Network which participates in the Outage Coordination Process as its Availability Status influences cross-border Operational Security;

Relevant Power Generating Module – means a Power Generating Module which participates in the Outage Coordination Process as its Availability Status influences cross-border Operational Security;

Schedule – means a reference set of values representing the Generation, consumption or exchange of electricity between actors for a given time period;

Scheduling Agent – means the role of providing Schedules;

Scheduling Area – means the Bidding Zone except if there is more than one Responsibility Area within this Bidding Zone. In the latter case, the Scheduling Area equals Responsibility Area or a group of Responsibility Areas;

Week-Ahead – means the week before the calendar week of operation;

Year-Ahead – means the year before the calendar year of operation.

1.3 Regulatory Aspects

- (1) The requirements established in this Network Code and their applications are based on the principle of proportionality, non-discrimination and transparency as

well as the principle of optimization between the highest overall efficiency and lowest total cost for all involved parties.

- (2) Notwithstanding the above, the application of non-discrimination principle and the principle of optimization between the highest overall efficiency and lowest total costs while maintaining Operational Security as the highest priority for all involved parties, shall be balanced with the aim of achieving the maximum transparency in issues of interest for the market and the assignment to the real originator of the costs.
- (3) The terms and conditions or actions necessary to ensure Operational Security or their methodologies shall be established by TSOs in accordance with the principles of transparency, proportionality and non-discrimination.

1.4 Regulatory Approvals

- (1) National Regulatory Authorities or, when explicitly foreseen in national law, other relevant national authorities shall be responsible for approving the methodologies and conditions establishing the framework for the adoption by TSOs of terms and conditions or actions necessary for Operational Security as referred to in Section 1.4 paragraph (2) and (3) hereunder.
- (2) For the purpose of this Network Code [OPS], each TSO shall submit the following methodologies and conditions to the National Regulatory Authority or, when explicitly provided for in national law, other relevant national authority for approval:
 - a) Principles of the coordination process to ensure the Availability Status of Relevant Assets in case of Forced Outages pursuant to Section 4.23 paragraph (1) of this Network Code [OPS].
- (3) For the purpose of this Network Code [OPS], each TSO shall submit the following methodologies and conditions established in cooperation with the other TSOs bound by this Regulation to the relevant National Regulatory Authority or, when explicitly provided for in national law, other relevant national authority for approval:
 - a) The methodology for establishing Seasonal Peak Generation Adequacy outlooks pursuant to Section 5.3 of this Network Code [OPS].
- (4) For the purpose of this Network Code [OPS], each TSO shall submit the following methodologies and conditions established in cooperation with the other TSOs of the same Synchronous Area to the relevant National Regulatory Authority or, when explicitly provided for in national law, other relevant national authority for approval:
 - a) The methodology set up pursuant to Section 3.4 of this Network Code [OPS] for coordinating Operational Security Analysis; and
 - b) The methodology established pursuant to Section 4.3 of this Network Code [OPS] for determining Relevant Assets for the Outage Coordination Process.
- (5) National Regulatory Authorities shall, no later than six months after having received the methodologies or conditions establishing the framework for the adoption by TSOs of terms and conditions or actions necessary to ensure Operational Security, provide TSOs with an approval or request to amend the proposed methodology or condition.

- (6) Where the concerned National Regulatory Authorities have not been able to reach an agreement within a period of six months from when the case was referred to the last of those National Regulatory Authorities, or upon a joint request from the competent National Regulatory Authorities, the Board of RPCC shall decide upon these regulatory issues that fall within the competence of National Regulatory Authorities and submit the decision to the RPTCC Meeting for its application.

1.5 Recovery of costs

- (1) The costs related to the obligations referred to in this Network Code, which have to be borne by regulated Network Operators, shall be assessed by National Regulatory Authorities.
- (2) Costs assessed as efficient, reasonable and proportionate shall be recovered as determined by National Regulatory Authorities.
- (3) If requested by National Regulatory Authorities, regulated Network Operators shall, within three months of such a request, use best endeavours to provide such additional information as reasonably requested by National Regulatory Authorities to facilitate the assessment of the costs incurred.

1.6 Confidentiality obligations

- (1) Each TSO, DSO, Power Generating Facility Operator, Demand Facility Operator and Owners of these Facilities shall preserve the confidentiality of the information and data submitted to them pursuant to this Network Code and shall use them exclusively for the purpose they have been submitted in compliance with the Network Code.
- (2) Without prejudice to the obligation to preserve the confidentiality of commercially sensitive information obtained in the course of carrying out its activities, each TSO shall provide to the operator of any other Transmission System with which its system is interconnected, sufficient information to ensure the secure and efficient operation, coordinated development and interoperability of the interconnected system.
- (3) The RPCC Administration shall preserve the confidentiality of the information and data submitted to them in connection with this Network Code and shall use them exclusively for the purpose they have been submitted, in compliance with this Network Code.

1.7 Agreement with TSOs not bound by this Network Code

- (1) No later than 12 months after entering into force of this Network Code, all TSOs shall implement a Synchronous Area Agreement to ensure that TSOs with no legal obligation to respect this Network Code, belonging to the Synchronous Area, also cooperate to fulfil the requirements.
- (2) If an agreement according to paragraph (1) or (2) of this Section cannot be implemented, the respective TSOs shall implement, no later than by [date – 14 months after entry into force], processes to ensure compliance with the requirements of this Network Code within its Responsibility Area.

1.8 Roles in operational planning and scheduling, and delegation

- (1) When delegation is done in accordance with Sections 3.4, 4.8 and 7.1 of this Network Code [OPS], the delegating entity shall remain responsible for ensuring compliance with the obligations under this Network Code [OPS].
- (2) In all cases a third party shall have clearly demonstrated its ability to fulfil each of the obligations of the Network Code, to the satisfaction of the delegating party, prior to delegation.
- (3) In the event that the whole or a part of any role specified in this Network Code is delegated to a third party, the delegating party shall ensure that suitable confidentiality agreements have been put in place prior to delegation.

2. Data for Operational Security Analysis in Operational Planning

2.1 Individual and Common Grid Model General Provisions

- (1) All TSOs shall establish Individual Grid Models for merging into Common Grid Models consistent with the objectives of this Network Code for each of the following timeframes:
 - a) Year-Ahead, in accordance with Section 2.3 and Section 2.5 of this Network Code [OPS];
 - b) Month-Ahead, in accordance with Section 2.6 of this Network Code [OPS];
 - c) where relevant, Week-Ahead, in accordance with Section 2.7 of this Network Code [OPS];
 - d) D-1, in accordance with Section 2.8 of this Network Code [OPS]; and
 - e) Intraday, where applicable in line with Section 3.5 paragraph (2)(c) of this Network Code [OPS].
- (2) Whenever a TSO establishes an Individual Grid Model for a timeframe consistent with both this Network Code and the Market Code (operational aspects) [Section 2 – Capacity Allocation and Congestion Management (CACM)], the TSO shall ensure that the Individual Grid Model is in line with the requirements established in both Network Codes.
- (3) Individual Grid Models, described in paragraph (1) of this Section, shall include the data described in Section 3.2 paragraph (3) of the Network Code [OS], as well as thermal limits of elements of the Transmission System.
- (4) The RPCC shall establish Common Grid Models consistent with the objectives of this Network Code based on:
 - a) Scenarios or forecasts provided in accordance with Sections 2.2, 2.8 and when relevant Section 2.7;
 - b) Individual Grid Models developed in accordance with Sections 2.3, 2.5 and 2.8, and when relevant to Section 2.7; and
 - c) The provisions agreed upon in accordance with Section 2.4 paragraph (1) and Section 2.8 paragraph (1) of this Network Code [OPS].

2.2 Year-ahead scenarios

- (1) Allowing the RPCC Administration sufficient time for publication according to Section 2.2 paragraph (3), each year all TSOs shall establish a common list of scenarios against which the operation of the interconnected system shall be assessed by TSOs. These scenarios shall allow the identification and the assessment of the influence on the Operational Security of the interconnected Transmission System. These scenarios shall include the following variables:
 - a) Demand;
 - b) Conditions related to the contribution of Renewable Energy Sources;
 - c) Defined import/export positions, including agreed reference values allowing the merging task; and
 - d) Generation pattern given a fully available production park.
- (2) These scenarios shall be defined taking into account:

- a) Typical cross-border exchange patterns for different levels of consumption and of Renewable Energy Sources and conventional Generation;
 - b) The probability of occurrence of the scenarios;
 - c) The potential for possible deviations from Operational Security Limits associated with each scenario; and
 - d) The amount of power generated and consumed by the Power Generating Facilities and Demand Facilities connected to Distribution Networks.
- (3) The RPCC shall publish the latest version of the common list of scenarios together with their full description on the RPCC website by 15 July of each year.

2.3 Year-ahead Individual Grid Models

- (1) In accordance with the provisions defined pursuant to Section 2.4 paragraph (1), each TSO shall establish a Year-Ahead Individual Grid Model for each of the scenarios defined in accordance with Section 2.2 above, using its best estimates for the variables defined in Section 2.2 paragraph (1), and make it available through the RPCC. At least 4 different scenarios shall be established: maximum and minimum load in rain season, maximum and minimum load in dry season.
- (2) When developing Individual Grid Models in accordance with Section 2.3 paragraph (1) above, each TSO shall:
 - a) Agree upon the estimated power flow on DC interconnections with the directly connected TSOs; and
 - b) Balance the sum of the following for each scenario:
 - i. Net exchanges on AC Interconnections;
 - ii. Estimated power flows on DC Interconnections;
 - iii. Demand, including an estimation of losses; and
 - iv. Generation.
- (3) When developing Individual Grid Models referred to in Section 2.3 paragraph (1), each TSO shall ensure that the aggregated power outputs for Power Generating Facilities connected to Distribution Networks are:
 - a) Consistent with the structural data provided pursuant to the requirements of Sections 3.4, 3.6, 3.9 and 3.12 of the Network Code [OS];
 - b) Consistent with the scenarios defined in Section 2.2 of this Network Code [OPS]; and
 - c) Differentiated according to the type of primary energy source.

2.4 Year-ahead Common Grid Models

- (1) By [*date – 6 months after entry into force*], all TSOs shall define the provisions dealing with the gathering of the Year-Ahead Individual Grid Models referred to in Section 2.3 paragraph (1), merging them into Common Grid Models and saving them. These provisions shall cover the following elements:
 - a) Data format;
 - b) A procedure to handle modifications to the Network Topology or operational arrangements;

- c) Deadlines for the gathering, merging and saving of the year-ahead Individual Grid Models into Common Grid Models;
 - d) Quality control of datasets;
 - e) A procedure for model improvement;
 - f) Tasks to be performed at the Synchronous Area and GMS level; and
 - g) Requirements for the RPCC.
- (2) Each TSO shall deliver to requesting TSOs, in line with Section 3.4, additional information on modifications to the Network Topology or on operational arrangements in such a way that an accurate representation of the system is provided for performing complete Operational Security analysis.

2.5 Updates of Year-ahead Common Grid Models

- (1) When a TSO considers a change in its best estimations of variables used for the establishment of Individual Grid Models referred to in Section 2.3 paragraph (1), significant in relation to Operational Security, each TSO shall update its Year-Ahead Individual Grid Models and deliver them to the RPCC.
- (2) Whenever changes are made to an Individual Grid Model in accordance with Section 2.5 paragraph (1), the RPCC shall establish an updated Year-Ahead Common Grid Model.

2.6 Month-Ahead Individual and Common Grid Models

- (1) When two or more TSOs consider it necessary for coordinating Operational Security Analysis, they shall define the most representative scenarios for analysing the Operational Security of the Transmission System for the Month-Ahead time horizons.
- (2) When applicable, each TSO shall create or update their Individual Grid Models for the Month-Ahead in line with the scenarios according to Section 2.6 paragraph (1), and make them available to the RPCC.
- (3) The RPCC shall build Month-Ahead Common Grid Models from the Individual Grid Models established pursuant to Section 2.6 paragraph (2) of this Network Code [OPS].

2.7 Week-Ahead Individual and Common Grid Models

- (1) When two or more TSOs consider it necessary for coordinating Operational Security Analysis, they shall define the most representative scenarios for analysing the Operational Security of the Transmission System for the Week-Ahead time horizons.
- (2) When applicable, each TSO shall create or update their Individual Grid Models for the Week-Ahead in line with the scenarios according to Section 2.7 paragraph (1), and make them available to the RPCC.
- (3) The RPCC shall build Week-Ahead Common Grid Models from the Individual Grid Models established pursuant to Section 2.7 paragraph (2) of this Network Code [OPS].

2.8 D-1 and Intraday Grid Models

- (1) All TSOs shall agree on the provisions dealing with the gathering and merging of the D-1 and intraday Individual Grid Models into Common Grid Models. These provisions shall be consistent with the methodology set up pursuant to Market Code, Section 2 “Capacity Allocation and Congestion Management” [CACM] and shall cover the following elements:
 - a) Data format;
 - b) Time granularity;
 - c) A procedure to handle Network Topology modification or operational arrangements in order to manage Operational Security;
 - d) Deadlines compatible with setting up Remedial Actions and the Capacity Calculation Process;
 - e) Plausibility and quality control of datasets including the Individual Grid Models as well as Common Grid Models in line with Section 2.8 paragraphs (4), (5) and (6);
 - f) A procedure for model improvement;
 - g) Tasks to be performed at the Synchronous Area and GMS level including time schedules for the different tasks in all time horizons; and
 - h) Specifications of the RPCC.
- (2) Each TSO shall create and deliver, via the RPCC its D-1 and intraday Individual Grid Models in accordance with the provisions defined pursuant to Section 2.8 paragraph (1) of this Network Code [OPS] and with the Market Code [Section 2 - CACM].
- (3) Individual Grid Models referred to in Section 2.8 paragraphs (1) and (2) shall contain at least the following variables:
 - a) Up to date demand and Generation forecasts;
 - b) For Power Generating Facilities connected to Distribution Networks, aggregated Active Power output differentiated according to the type of primary energy source in line with data provided in accordance to Sections 3.1, 3.4 and 3.5 of the Network Code [OS];
 - c) Topology of the Transmission System; and
 - d) Remedial Actions proposed for Constraints management.
- (4) Each TSO shall assess the accuracy of the variables referred to in Section 2.8 paragraph (3) above, used to build its Individual Grid Models, comparing it with the actual values and implementing the principles defined pursuant to Section 3.4 paragraph (1)(f).
- (5) If a TSO considers the accuracy of the variables referred to in Section 2.8 paragraph (3) to be insufficient in relation to the Operational Security as a result of the assessment pursuant to Section 2.8 paragraph (4), that TSO shall perform an analysis to determine the causes of the inaccuracy. If the causes depend on the TSO processes for creating the Individual Grid Models, that TSO shall adapt the related processes to create more accurate results. If the causes depend on variables referred to in Section 2.8 paragraph (3) provided by other stakeholders, that TSO and those providers shall use all available economically efficient and feasible means under their control to improve these forecasts.

- (6) For D-1 and intraday Common Grid Models, TSOs shall check at least the following:
- a) The coherency of the connection status of interconnections;
 - b) Voltage deviation above the criteria defined in accordance with Section 2.8 paragraph (1) for elements of the Transmission System located in the Observability Area of other TSOs;
 - c) The coherency of Transitory Admissible Overloads of interconnections; and
 - d) Implausible Active Power and Reactive Power injections or withdrawals.

3. Operational Security Analysis in Operational Planning

3.1 *Operational Security Analysis in operational planning*

- (1) Each TSO shall perform coordinated Operational Security Analyses at least at the following time horizons:
 - a) Year-Ahead;
 - b) Month-Ahead, when applicable according to Section 2.6 of this Network code [OPS];
 - c) Week-Ahead, when applicable according to Section 2.7 of this Network Code [OPS];
 - d) D-1; and
 - e) Intraday.
- (2) Each TSO shall perform Operational Security Analyses for each of the time horizons specified in Section 3.1 paragraph (1) above, in N-Situation by simulating each Contingency from the TSO's Contingency List in accordance with Section 2.6 of the Network Code [OS] and verifying that the Operational Security Limits defined in accordance with Section 2.1 paragraphs (5), (6) and (8) of the Network Code [OS] in the (N-1) Situation are not exceeded.
- (3) When simulating each Contingency in accordance with Section 3.1 paragraph (2) of this Network Code [OPS], each TSO shall take into account the capabilities of the Significant Grid Users as mentioned in Section 2 of the Network Code [OS].
- (4) TSOs shall coordinate between them their Operational Security Analyses in accordance with the Section 2.5 paragraph (3) and Section 2.6 paragraph (3) of the Network Code [OS] and in accordance with Section 3.4 of this Network Code [OPS], in order to verify that Operational Security Limits affecting their own Responsibility Areas are not exceeded.
- (5) Each TSO shall use as a minimum Common Grid Models described in Sections 2.4, 2.5, 2.8 and where relevant in Section 2.6 and 2.7 of this Network Code [OPS] to perform the Operational Security Analyses referred to in Section 3.2 and 3.3 of this Network Code.

3.2 *Year-Ahead up to and including Month-Ahead and Week-Ahead Operational Security Analysis*

- (1) Each TSO shall perform Operational Security Analyses for assessing that the Operational Security Limits of its Responsibility Area are not exceeded, taking into account all the Contingencies from its Contingency List and using the applicable Common Grid Models described in Section 2 of this Network Code [OPS] and relevant information as described in Section 3.5 of the same Network Code.
- (2) Each TSO shall perform Operational Security Analyses referred to in Section 3.2 paragraph (1), in accordance with the coordination methodology and processes described in Section 3.4 paragraph (1)(g) in order to detect at least the following Network Constraints:
 - a) Power flows and voltages over Operational Security Limits;

- b) Breaches of Stability Limits of the Transmission System if applicable according to Section 2.8 paragraphs (4) and (5) of the Network Code [OS]; and
 - c) Violation of short-circuit thresholds of the Transmission System if applicable according to Section 2.4 paragraph (3) of the Network Code [OS].
- (3) When, as a result of Operational Security Analysis referred to in Section 3.2 paragraphs (1) and (2) of this Network Code [OPS], a TSO detects possible Constraints, affected TSOs shall prepare, if applicable with affected DSOs or Significant Grid Users, and if available, Non Costly Remedial Actions to solve the Constraint. If these are not available, this shall be considered an Outage Incompatibility and a coordination process according to Section 4.15 and Section 4.21 shall be initiated.

3.3 D-1, Intraday and Close to Real-Time Operational Security Analysis

- (1) On a D-1 basis and within the intraday periods, each TSO shall perform Operational Security Analyses for assessing that the Operational Security Limits of its Responsibility Area are not exceeded. It shall take into account all the Contingencies from its Contingency List as established in Section 2.6 of the Network Code [OS] in order to detect possible Constraints and define with the affected TSOs and, if applicable, with affected DSOs or Significant Grid Users the appropriate Remedial Actions.
- (2) Each TSO shall monitor demand and Generation forecasts and shall proceed to updated Operational Security Analysis when these forecasts lead to significant deviation in demand or Generation.
- (3) In undertaking the analysis pursuant to Section 3.3 paragraph (1), each TSO shall take into account:
 - a) The available updates of Generation and consumption data;
 - b) Possible significant deviation in demand or Generation due to uncertain weather forecasts;
 - c) The results of the D-1 and intraday market processes; and
 - d) The results of the scheduling tasks described in Section 7 of this Network Code [OPS].
- (4) On a D-1 and intraday basis, if Constraints are detected by a TSO, this TSO shall evaluate, in line with coordination principles defined in Section 3.4 and 3.5 of this Network Code [OPS], the effectiveness of the joint Remedial Actions in accordance with Section 2.1 paragraph (11) of the Network Code [OS] and the technical-economic efficiency of the joint Remedial Action, in line with the Section on Redispatching and Countertrading of the Market Code [CACM], respecting the principles for defining remedial actions in capacity calculation, provided in the Market Code [CACM].
- (5) Close to Real-Time, when performing Operational Security Analysis in its Observability Area, each TSO shall use State Estimation.

3.4 Methodologies for Coordinating Operational Security Analysis

- (1) By [date – 12 months after entry into force], TSOs shall establish a methodology standardized at least per Synchronous Area, for Operational Security Analysis. This methodology shall at least cover:
 - a) Methods for assessing the influence of external elements;
 - b) Methods for definition of the Observability Area;
 - c) Contingency Influence Thresholds above which Contingencies of external grid elements are deemed as External Contingencies, within each TSO Contingency List;
 - d) Common risk assessment principles, covering at least, for the Contingencies described in Section 2.6 of the Network Code [OS]:
 - i. Associated probability;
 - ii. Transitory Admissible Overloads; and
 - iii. Impact of Contingencies;
 - e) Principles for the selection of the appropriate joint Remedial Actions;
 - f) Principles for assessing and dealing with uncertainties of Generation and demand, taking into account at least Reliability Margin in line with Section 2.5 of the Market Code [Section 2 - CACM]; and
 - g) Methodologies and processes for performing coordinated Dynamic Stability Assessment in line with the Network Code [OS].
- (2) All TSOs shall make the methodologies established in accordance with Section 3.4 paragraph (1) of this Network Code [OPS] available to the RPCC. The RPCC shall publish these methodologies on its website.
- (3) Each TSO within a Synchronous Area shall apply the methodology established for its own Synchronous Area in accordance with Section 3.4 paragraph (1) of this Network Code [OPS].

3.5 Agreements for Coordinating Operational Security

- (1) By [date – 15 months after entry into force], TSOs shall establish a multi-party agreement within which there is multilateral operational impact resulting from:
 - a) Electrical interdependencies between Responsibility Areas including but not limited to loop flows, voltage profiles, phase-shifting transformers, and HVDC influencing each other;
 - b) Power flow effects from changes in Generation patterns; or
 - c) The integration of grid elements of a TSO within the Observability Area and the Contingency List of another TSO.
- (2) TSOs shall ensure the consistency and the efficiency of the coordination of Operational Security Analyses within the multi-party agreements referred to in Section 3.5 paragraph (1). These multi-party agreements shall cover at least:
 - a) Governance and decision making procedures to be adopted by the concerned TSOs;
 - b) Common processes for:

- i. Sharing the information on external Contingencies in Contingency list affecting each TSO's Responsibility Area;
 - ii. The evaluation of deviations from Operational Security Limits and their consequences, in accordance with the methodology referred to in Section 3.4 paragraph (1) of this Network Code [OPS];
 - iii. Taking into account the information concerning the range of uncertainties regarding Generation and/or demand and its associated probability;
 - iv. Exchanging the information of the available joint pre-Fault and post-Fault Remedial Actions; and
 - v. Preparing and activating the most suitable joint Remedial Actions.
- c) Identification of the number and update frequency of intraday grid models, additional to those established as mandatory in accordance with the Market Code [Section 2 – CACM], necessary to reassess the Operational Security;
 - d) Compatible or common tools for performing common processes defined in Section 3.5 paragraph (2)(b) of this Network Code [OPS];
 - e) The identification of any tasks within the common processes referred to in Section 3.5 paragraph (2)(b) of this Network Code [OPS], which are delegated;
 - f) Processes for reviewing the contents or the perimeter of the multi-party agreements if so resulted from influence analysis in line with the common approach referred to in Section 3.4 paragraph (1) of this Network Code [OPS];
 - g) Additional datasets, as needed, to the ones described in Section 2 [OPS], including:
 - i. Protection Set Points or System Protection Schemes;
 - ii. Single line diagram and substations configuration;
 - iii. Additional grid models to represent specific situations;
 - h) Necessary information concerning the range of uncertainties regarding Generation and/or demand and its associated probability for each Individual Grid Model.
- (3) If a TSO involved in multiple multi-party agreements in accordance with Section 3.5 paragraph (1) detects conflicts and/or contradictions between these multi-party agreements, all TSOs involved in these multi-party agreements shall ensure a common solution.
 - (4) TSOs shall officially inform all other TSOs and the RPCC about any delegation.
 - (5) TSOs shall inform the RPCC about the scope of the regions of multi-party agreements established in accordance with Section 3.5 paragraph (1). The RPCC shall publish this information.

4. Outage Coordination

4.1 Definition of Outage Coordination Regions

- (1) Each Outage Coordinating TSO shall coordinate the outage planning process within its Responsibility Area.
- (2) By [*date – 15 months after entry into force*], all Outage Coordinating TSOs shall adopt a multi-party agreement defining Outage Coordination Regions within which the Availability Status of Relevant Assets shall be monitored and coordinated.
- (3) When defining the Outage Coordination Regions, all Outage Coordinating TSOs shall ensure that:
 - a) Each Responsibility Area is included within at least one Outage Coordination Region;
 - b) The definition is based on an assessment against the cross-border impact on Operational Security of the Availability Status of a Relevant Asset in a Responsibility Area;
 - c) When the Availability Status of a Relevant Asset located in one Responsibility Area has a major cross-border impact on Operational Security in another Responsibility Area, these Responsibility Areas are included within the same Outage Coordination Region;
 - d) The size of the Outage Coordination Regions allows an efficient Outage Coordination Process;
 - e) A regional coordination procedure in accordance with Section 4.2 of this Network Code [OPS] is defined for each Outage Coordination Region; and
 - f) A procedure to amend the definition of the Outage Coordination Regions is established including principles establishing when such a procedure will be undertaken.
- (4) All Outage Coordinating TSOs shall provide the RPCC with the definition of the Outage Coordination Regions, together with all other information required by Section 4.1 paragraph (3). The RPCC shall publish all information on its website at the earliest opportunity.

4.2 Regional Coordination Procedure

- (1) When developing regional coordination procedures as required by Section 4.1 paragraph (3)(e) of this Network Code [OPS], all Outage Coordinating TSOs of an Outage Coordination Region shall define:
 - a) The frequency, scope and type of coordination which shall take place at least for the Year-Ahead, Month-Ahead and Week-Ahead time horizons;
 - b) Arrangements to ensure the participation of the RPCC in the Outage Coordination Process; and
 - c) Procedures for the validation of the Year-Ahead Relevant Grid Element Availability Plans by all Outage Coordinating TSOs of the Outage Coordination Region.

- (2) Each Outage Coordinating TSO shall participate in the Outage Coordination Process of its Outage Coordination Regions in accordance with Section 4.2 paragraph (1) above.
- (3) If Outage Incompatibilities arise between different Outage Coordination Regions, each Outage Coordinating TSO of those Outage Coordination Regions shall contribute to relieve these Outage Incompatibilities.
- (4) Each Outage Coordinating TSO shall provide all Outage Coordinating TSOs of its Outage Coordination Region(s) with all relevant information at its disposal on those infrastructure projects relating to the Transmission System, Distribution Network, Closed Distribution Network, Power Generating Modules, or Demand Facilities that impact on the operation of the Responsibility Area of another TSO.
- (5) Each Outage Coordinating TSO shall provide all DSOs of Transmission Connected Distribution Networks located in its Responsibility Area with all relevant information at its disposal on the Transmission System related infrastructure projects that impact on the operation of the Distribution Network of these DSOs.
- (6) Each Outage Coordinating TSO shall provide all CDSOs of Transmission Connected Closed Distribution Networks located in its Responsibility Area with all relevant information at its disposal on the Transmission System related infrastructure projects that impact on the operation of the Closed Distribution Network of these CDSOs.

4.3 Methodology for assessing relevance of assets for the Outage Coordination Process

- (1) By [*date – 12 months after entry into force*], all Outage Coordinating TSOs shall establish a coordinated methodology, standardised at least per Synchronous Area, for assessing the relevance of Power Generating Modules, Demand Facilities, and grid elements located in a Transmission System, in a Distribution Network, or in a Closed Distribution Network for the Outage Coordination Process.
- (2) The methodology referred to in Section 4.3 paragraph (1) of this Network Code [OPS] shall include a procedure to quantify the impact of the Availability Status of Power Generating Modules, Demand Facilities, and grid elements located in a Transmission System, in a Distribution Network, or in a Closed Distribution Network on Responsibility Areas of TSOs other than the Outage Coordinating TSO. This procedure shall be based on:
 - a) Operational Security Analyses using established Common Grid Models;
 - b) Sensitivity analyses of power flows through the interconnected Network; and
 - c) A threshold on the sensitivity of power flows, standardized at least per Synchronous Area.
- (3) The methodology referred to in Section 4.3 paragraph (1) shall be consistent with the methods for assessing the influence of external elements referred to in Section 3.4 paragraph (1)(a) of this Network Code [OPS].
- (4) All Outage Coordinating TSOs shall make the methodology referred to in Section 4.3 paragraph (1) available to the RPCC. The RPCC shall publish the methodology on its website within one week after receiving it.

4.4 Methodology for assessing relevance of assets for the Outage Coordination Process

- (1) By [date – 15 months after entry into force], all Outage Coordinating TSOs of each Outage Coordination Region shall apply the methodology established pursuant to Section 4.3 of this Network Code [OPS] to assess the relevance of Power Generating Modules and Demand Facilities for the Outage Coordination Process.
- (2) All Outage Coordinating TSOs of each Outage Coordination Region shall establish a single list of Relevant Power Generating Modules and Relevant Demand Facilities for the Outage Coordination Process.
- (3) The list of Relevant Power Generating Modules and Relevant Demand Facilities shall only contain Significant Grid Users.
- (4) The list of Relevant Power Generating Modules and Relevant Demand Facilities shall contain all Power Generating Modules and Demand Facilities for which the Availability Status impacts on another Responsibility Area to a level beyond the thresholds defined in the methodology established pursuant to Section 4.3 of this Network Code [OPS] and for which Section 4.3 paragraph (3) applies.
- (5) All Outage Coordinating TSOs shall make the list of Relevant Power Generating Modules and Relevant Demand Facilities available to the RPCC.
- (6) Each Outage Coordinating TSO shall inform its National Regulatory Authority of the list of Relevant Power Generating Modules and Relevant Demand Facilities.
- (7) For every Relevant Power Generating Module and every Relevant Demand Facility, the Outage Coordinating TSO shall:
 - a) Inform the owners of the Relevant Power Generating Modules and the Relevant Demand Facilities about their inclusion in the list;
 - b) Inform DSOs on the Relevant Power Generating Modules and the Relevant Demand Facilities for which they are the Connecting DSO; and
 - c) Inform CDSOs on the Relevant Power Generating Modules and the Relevant Demand Facilities for which they are the Connecting CDSO.

4.5 Re-assessment of the list of Relevant Power Generating Modules and Relevant Demand Facilities

- (1) Before 1 July of each calendar year, all Outage Coordinating TSOs of each Outage Coordination Region shall re-apply the methodology established pursuant to Section 4.3 of this Network Code [OPS] for assessing the relevance of Power Generating Modules and Demand Facilities for the Outage Coordination Process.
- (2) When, pursuant to the assessment in Section 4.5 paragraph (1) of this Network Code [OPS], all Outage Coordinating TSOs of an Outage Coordination Region identify a need to update the list of Relevant Power Generating Modules and Relevant Demand Facilities established in accordance with Section 4.4, the concerned Outage Coordinating TSOs shall update this list as soon as reasonably practicable. All Outage Coordinating TSOs shall make the updated list available in accordance with Section 4.4 paragraphs (5), (6) and (7).

4.6 List of Relevant Grid Elements

- (1) By [date – 15 months after entry into force], all Outage Coordinating TSOs of each Outage Coordination Region shall apply the methodology established pursuant to Section 4.3 of this Network Code [OPS] for assessing the relevance of grid elements located in a Transmission System, in a Distribution Network, or in a Closed Distribution Network for the Outage Coordination Process.
- (2) All Outage Coordinating TSOs of each Outage Coordination Region shall establish a single list of Relevant Grid Elements for the Outage Coordination Process.
- (3) The list of Relevant Grid Elements shall contain:
 - a) All grid elements located in a Transmission System or in a Distribution Network connecting Responsibility Areas;
 - b) All grid elements located in a Transmission System, in a Distribution Network, or in a Closed Distribution Network for which the Availability Status impacts on another Responsibility Area to a level beyond the thresholds defined in the methodology established pursuant to Section 4.3 of this Network Code [OPS]; and
 - c) All Critical Network Elements.
- (4) The list of Relevant Grid Elements shall contain the types of information which shall be provided by each Outage Coordinating TSO to the RPCC, including at least:
 - a) The reason for every unavailable status of a Relevant Grid Element;
 - b) Specific conditions that need to be fulfilled before executing an unavailable status of a Relevant Grid Element; and
 - c) The time required to restore a Relevant Grid Element to service if necessary to maintain Operational Security.
- (5) All Outage Coordinating TSOs shall make the list of Relevant Grid Elements available on the GMS Operational Planning Data Environment.
- (6) Each Outage Coordinating TSO shall inform its National Regulatory Authority of the list of Relevant Grid Elements.
- (7) For every Relevant Grid Element, the Outage Coordinating TSO shall:
 - a) Inform the owners and the operators of the Relevant Grid Elements about their inclusion in the list;
 - b) Inform DSOs of the Relevant Grid Elements for which they are the Connecting DSO; and
 - c) Inform CDSOs of the Relevant Grid Elements for which they are the Connecting CDSO.

4.7 Re-assessment of the list of Relevant Grid Elements

- (1) Before 1 July of each calendar year, all Outage Coordinating TSOs of each Outage Coordination Region shall re-apply the methodology established pursuant to Section 4.3 of this network Code [OPS] for assessing the relevance of grid elements located in a Transmission System, in a Distribution Network, or in a Closed Distribution Network for the Outage Coordination Process.

- (2) When, pursuant to Section 4.7 paragraph (1) of this network Code [OPS], all Outage Coordinating TSOs of an Outage Coordination Region identify a need to update the list of Relevant Grid Elements established in accordance with Section 4.6 of this Network Code [OPS], the concerned Outage Coordinating TSOs shall update this list as soon as reasonably practicable. All Outage Coordinating TSOs shall make the updated list available in accordance with Section 4.6 paragraphs (5), (6) and (7) of this Network Code.

4.8 Appointing Outage Planning Agents

- (1) For each Relevant Asset, the owner shall ensure that an Outage Planning Agent is appointed.
- (2) Each Outage Coordinating TSO shall be appointed as the Outage Planning Agent for every Relevant Grid Element that is operated by this Outage Coordinating TSO.

4.9 Treatment of Relevant Assets located in a Distribution Network or in a Closed Distribution Network

- (1) For the Relevant Assets that are located in a Distribution Network, the Outage Coordinating TSO shall coordinate the outage planning with the Connecting DSO.
- (2) For the Relevant Assets that are located in a Closed Distribution Network, the Outage Coordinating TSO shall coordinate the outage planning with the Connecting CDSO.
- (3) DSO shall be responsible for submitting their outage plans to TSO. If such plans affect TSO's operation modes, the TSO has the right to refuse such plans and must make a written notice to the DSO.

4.10 Variations to deadlines for the Year-Ahead coordination process

- (1) The adoption of a timeframe for the Year-Ahead coordination process that deviates from the timeframe defined in this Network Code shall only be possible for an entire Synchronous Area and if all Outage Coordinating TSOs in this Synchronous Area agree on the newly defined timeframe. Such timeframes can only be implemented if:
 - a) All Outage Coordinating TSOs have agreed that the timeframes of the Outage Coordination Process within other Synchronous Areas are not impacted; and
 - b) The approval of all National Regulatory Authorities within the concerned Synchronous Area has been gained.

4.11 Link with data to be provided according to requirements outside this Network Code

- (1) In case any party is required to provide or publish information on the Availability Status for Relevant Assets, this party shall ensure that the provided or published data is consistent with the coordinated Availability Plan established in this Network Code, if such a coordinated Availability Plan exists at the concerned point in time and for the covered time period.

4.12 General provisions on Availability Plans

- (1) The Availability Plans shall contain a separate Availability Status for each Relevant Asset with at least an hourly granularity.
- (2) For exchanging Availability Plans between parties, Availability Statuses may be aggregated to a lower time granularity level if agreed by the exchanging parties.
- (3) On the timeframes when Generation Schedules and Consumption Schedules are submitted to the TSO according to Section 7.2 of this Network Code [OPS], Availability Plans shall have a time granularity consistent with Generation Schedules and Consumption Schedules.
- (4) The Availability Status shall be one of the following three states:
 - a) Available: the Relevant Asset is capable of and ready for providing service, whether or not it is actually in operation;
 - b) Unavailable: the Relevant Asset is not capable of or ready for providing service;
 - c) Testing: the capability of the Relevant Asset for providing service is being tested.
- (5) The Availability Status “testing” shall only be used when there is a potential impact on the Transmission System, and shall be limited to the time periods:
 - a) Between first connection and final commissioning of the Relevant Asset; and
 - b) Directly following maintenance of the Relevant Asset.

4.13 Long-term indicative Availability Plans

- (1) Two years prior to the start of the Year-Ahead coordination process, each Outage Coordinating TSO shall assess the indicative Availability Plans for Relevant Assets, provided by the Outage Planning Agents pursuant to Transparency Regulation.
- (2) Following this assessment, each Outage Coordinating TSO shall provide its preliminary comments, including detected Outage Incompatibilities, to all impacted Outage Planning Agents.
- (3) The assessment of the Outage Coordinating TSOs shall be repeated every 12 months until the start of the Year-Ahead coordination process.

4.14 Long-term indicative Availability Plans

- (1) Before 1 August of each calendar year, for every Relevant Asset for which the Outage Planning Agent is not an Outage Coordinating TSO, DSO or CDSO, this Outage Planning Agent shall propose an Availability Plan for its Relevant Assets for the following calendar year to the Outage Coordinating TSO, and if the Relevant Asset is connected to a Distribution Network or to a Closed Distribution Network also to the Connecting DSO or Connecting CDSO respectively.
- (2) Between 1 August and 1 December, all Outage Planning Agents referred to in Section 4.14 paragraph (1) of this Network Code [OPS] shall have the right to initiate changes to their proposed Availability Plan by sending a change request to the Outage Coordinating TSO(s).

- (3) Each Outage Coordinating TSO shall handle the change requests received in accordance with Section 4.14 paragraph (2) of this Network Code [OPS] after the Year-Ahead coordination process has been finalized, hereby:
 - a) Respecting the order in which the change requests were received; and
 - b) Following the procedure set forth in Section 4.21 paragraph (2) of this Network Code.

4.15 Year-Ahead Coordination of the Availability Status of Relevant Assets for which the Outage Planning Agent is not an Outage Coordinating TSO, DSO or CDSO

- (1) Each Outage Coordinating TSO shall assess on a Year-Ahead horizon whether Outage Incompatibilities arise from the proposed Availability Plans provided in accordance with Section 4.14 of this Network Code [OPS].
- (2) In the event that Outage Incompatibilities are detected, the Outage Coordinating TSO(s) and all affected Outage Planning Agents shall coordinate their Availability Plans. Each Outage Coordinating TSO shall:
 - a) Inform each affected Outage Planning Agent of the conditions to be fulfilled to relieve the detected Outage Incompatibilities;
 - b) Be entitled to request that one or more Outage Planning Agents submit an alternative Availability Plan fulfilling these conditions; and
 - c) Repeat the assessment pursuant to Section 4.15 paragraph (1) to establish whether any Outage Incompatibilities remains.
- (3) In the event that no alternative Availability Plan relieving all Outage Incompatibilities is submitted following a request from the Outage Coordinating TSO(s) pursuant to Section 4.15 paragraph (2) of this Network Code, this Outage Coordinating TSO shall establish such an alternative Availability Plan. In that case, this Outage Coordinating TSO shall:
 - a) Take into account the impact reported by the affected Outage Planning Agents;
 - b) Ensure the changes in the alternative Availability Plan are limited to what is strictly necessary to relieve the Outage Incompatibilities; and
 - c) Inform its National Regulatory Authority, the affected DSOs and CDSOs if any, and the affected Outage Planning Agents about the established Availability Plan, the impact reported to the Outage Coordinating TSO by the affected Outage Planning Agents, and the reasons which motivated its adoption.

4.16 Year-Ahead Coordination of the Availability Status of Relevant Assets for which the Outage Planning Agent is an Outage Coordinating TSO, DSO or CDSO

- (1) Each Outage Coordinating TSO shall coordinate the Availability Status of Relevant Grid Elements interconnecting different Responsibility Areas and for which it is an Outage Planning Agent with the other Outage Coordinating TSOs of its Outage Coordination Region(s) in accordance with the following principles:
 - a) Minimizing the impact on the market while preserving Operational Security; and

- b) Using as a basis the proposed Availability Plans for Relevant Assets established in accordance with Sections 4.14 and 4.15 of this Network Code [OPS].
- (2) Each Outage Coordinating TSO, DSO and CDSO shall plan the Availability Status of the Relevant Grid Elements for which they are the Outage Planning Agent and that are not interconnecting different Responsibility Areas in accordance with the following principles:
- a) Minimizing the impact on the market while preserving Operational Security; and
 - b) Using as a basis the proposed Availability Plans for Relevant Assets established in accordance with Sections 4.14 and 4.15 of this Network Code [OPS], and the Availability Status of Relevant Grid Elements interconnecting different Responsibility Areas established in accordance with Section 4.16 paragraph (1).
- (3) In case of Outage Incompatibilities, the Outage Coordinating TSO shall be entitled to propose a change to the proposed Availability Plans of the Relevant Assets for which the Outage Planning Agent is not an Outage Coordinating TSO, DSO or CDSO and shall in this event initiate coordination with the concerned Outage Planning Agents.
- (4) In the event that a DSO or CDSO has been unable to plan the unavailable Availability Status of a Relevant Grid Element, this DSO or CDSO shall report to the Outage Coordinating TSO. In this case or if the Outage Coordinating TSO has been unable to plan the unavailable Availability Status of a Relevant Grid Element, this Outage Coordinating TSO and all affected Outage Planning Agents shall use all available economically efficient and feasible means under their control in accordance with the national legal framework to plan the unavailable Availability Status of the Relevant Grid Element.
- (5) In the event that, having implemented the provisions of Section 4.16 paragraph (4) of this Network Code [OPS], the unavailable Availability Status of the Relevant Grid Element has not been planned, and if in the reasoned opinion of the Outage Coordinating TSO, not planning this unavailable Availability Status would threaten Operational Security, the Outage Coordinating TSO shall:
- a) Take such actions as it deems necessary to plan this unavailable Availability Status while ensuring Operational Security, taking into account the impact reported to the Outage Coordinating TSO by affected Outage Planning Agents;
 - b) Provide a notification of these actions to all affected parties; and
 - c) Inform the relevant National Regulatory Authorities and the affected DSO or CDSO if any, and the affected Outage Planning Agents of the actions taken, the impact reported to the Outage Coordinating TSO by affected Outage Planning Agents, the threats which required such actions to be taken and the rationale for using the chosen actions.
- (6) Each Outage Coordinating TSO shall include all information at its disposal about grid-related conditions that need to be fulfilled and Remedial Actions that need to be taken before executing an unavailable Availability Status of a specific Relevant Grid Element in the RPCC Operational Planning Data Environment alongside information on the Availability Plan.

4.17 Provision of Preliminary Year-Ahead Availability Plans

- (1) Before 1 November of each calendar year, each Outage Coordinating TSO shall provide the preliminary Year-Ahead Availability Plans for all Relevant Assets for the following calendar year to all other Outage Coordinating TSOs via the RPCC Operational Planning Data Environment.
- (2) Before 1 November of each calendar year, for every Relevant Asset that is located in a Distribution Network, the Outage Coordinating TSO shall provide the preliminary Year-Ahead Availability Plan for this Relevant Asset to the Connecting DSO.
- (3) Before 1 November of each calendar year, for every Relevant Asset that is located in a Closed Distribution Network, the Outage Coordinating TSO shall provide the preliminary Year-Ahead Availability Plan for this Relevant Asset to the Connecting CDSO.
- (4) The Availability Plans referred to in Section 4.17 paragraphs (1), (2) and (3) of this Network Code [OPS] shall contain at least the information listed in Section 4.6 paragraph (4) of this Network Code.

4.18 Validation of Year-Ahead Availability Plans within Outage Coordination Regions

- (1) Each Outage Coordinating TSO shall analyse whether Outage Incompatibilities arise when combining all preliminary Availability Plans impacting its Responsibility Area.
- (2) In the event that Outage Incompatibilities impacting the Year-Ahead Availability Plans for Relevant Assets are identified, each Outage Coordinating TSO shall coordinate with the concerned Outage Planning Agents, DSOs, CDSOs and/or Outage Coordinating TSOs to find a solution.
- (3) Once a solution is found for each Outage Incompatibility, all Outage Coordinating TSOs of the concerned Outage Coordination Region shall validate the Year-Ahead Availability Plans for all Relevant Grid Elements for which the Outage Planning Agent is an Outage Coordinating TSO, DSO or CDSO in accordance with the procedure established pursuant to Section 4.2 paragraph (1)(c) of this Network Code [OPS].

4.19 Final Year-Ahead Availability Plans

- (1) Before 1 December of each calendar year, each Outage Coordinating TSO shall:
 - a) Finalise the Year-Ahead coordination process of Relevant Assets; and
 - b) Update the preliminary Year-Ahead Availability Plans for Relevant Assets on the RPCC Operational Planning Data Environment.
- (2) Before 1 December of each calendar year, for every Relevant Asset, the Outage Coordinating TSO shall confirm the final Year-Ahead Availability Plan for this Relevant Asset to the appointed Outage Planning Agent.
- (3) Before 1 December of each calendar year, for every Relevant Asset that is located in a Distribution Network, the Outage Coordinating TSO shall provide the updated Year-Ahead Availability Plan for this Relevant Asset to the Connecting DSO.

- (4) Before 1 December of each calendar year, for every Relevant Asset that is located in a Closed Distribution Network, the Outage Coordinating TSO shall provide the updated Year-Ahead Availability Plan for this Relevant Asset to the Connecting CDSO.
- (5) The Availability Plans referred to in Section 4.19 paragraph (2), (3) and (4) of this network Code [OPS] shall contain at least the information listed in Section 4.6 paragraph (4) of this Network Code.

4.20 Coordination Processes in case of detected Outage Incompatibilities

- (1) For all Outage Planning Agents involved in the coordination process, each Outage Coordinating TSO shall conduct this process for the Relevant Assets of the Outage Planning Agents located in its Responsibility Area in line with the applicable national legal framework.
- (2) Each Outage Coordinating TSO shall use the means at its disposal according to the applicable national legal framework to find a solution for the detected Outage Incompatibilities.
- (3) This Article shall apply to each coordination process that is initiated pursuant to the detection of Outage Incompatibilities according to Section 4.18 and 4.21 of this Network Code [OPS].

4.21 Updates to the Year-Ahead Availability Plans

- (1) After the finalisation of the Year-Ahead coordination process in accordance with Section 4.19 of this Network Code [OPS] and before real-time execution, all Outage Planning Agents shall have the right to initiate an adaptation of the coordinated Availability Plan.
- (2) Each Outage Planning Agent that is not an Outage Coordinating TSO that initiates an adaptation of the coordinated Availability Plan of the Relevant Assets under its responsibility shall send a change request to the Outage Coordinating TSO(s). The Outage Coordinating TSO(s) shall follow the following procedure:
 - a) Receive the change request;
 - b) Assess as soon as reasonably practicable whether Outage Incompatibilities arise as a result of this change to the coordinated Availability Plan of Relevant Assets;
 - c) In the event that Outage Incompatibilities are detected, initiate a coordination process involving Outage Planning Agents, affected Outage Coordinating TSOs, Connecting DSOs, and Connecting CDSOs for the Relevant Assets of which the Availability Status is impacted;
 - d) Issue a reasoned decision on the change request at the end of the coordination process, validating the change request when no Outage Incompatibility is detected or no Outage Incompatibility remains after coordination, and rejecting the change request when not all of the detected Outage Incompatibilities can be solved after coordination;
 - e) Incorporate the validated change request in the coordinated Availability Plan and notify all impacted parties; and
 - f) Update the RPCC Operational Planning Data Environment, if the change request is validated.

- (3) Each Outage Coordinating TSO which initiates an adaptation of the coordinated Availability Plan of Relevant Grid Elements for which it is the Outage Planning Agent shall follow the following procedure:
 - a) Assess as soon as reasonably practicable whether Outage Incompatibilities arise as a result of this change to the coordinated Availability Plan of Relevant Assets;
 - b) Send a change request and report detected Outage Incompatibilities to all other Outage Coordinating TSOs of its Outage Coordination Region(s);
 - c) Consider additional Outage Incompatibilities related to the change request detected by other Outage Coordinating TSOs of its Outage Coordination Region(s);
 - d) In the event that Outage Incompatibilities are detected, initiate a coordination process involving Outage Planning Agents, affected Outage Coordinating TSOs, Connecting DSOs, and Connecting CDSOs for the Relevant Assets of which the Availability Status is impacted;
 - e) Receive a reasoned decision on the change request from all parties that are impacted by the adaptation of the coordinated Availability Plan at the end of the coordination process, validating the change request when no Outage Incompatibility is detected or no Outage Incompatibility remains after coordination and rejecting the change request when not all of the detected Outage Incompatibilities can be relieved after coordination;
 - f) Incorporate the validated change request in the coordinated Availability Plan and notify all impacted parties; and
 - g) Update the RPCC operational planning data environment if the change request is validated.
- (4) In the event that an Outage Coordinating TSO detects that Outage Incompatibilities arise according to Section 3.2 paragraph (3) of this network Code [OPS], this Outage Coordinating TSO shall initiate a coordination process involving all Outage Planning Agents, affected Outage Coordinating TSOs, Connecting DSOs, and Connecting CDSOs for the Relevant Assets of which the Availability Status is impacted.

4.22 Detailing the Testing Status of Relevant Assets

- (1) The Outage Planning Agent of a Relevant Asset for which the testing Availability Status is declared, shall provide the Outage Coordinating TSO, and if connected to a Distribution Network or to a Closed Distribution Network also the Connecting DSO or the Connecting CDSO respectively, as early as reasonably practicable, and no later than one month before the start of the testing Availability Status with:
 - a) A detailed test plan;
 - b) An indicative Generation or Consumption Schedule if the concerned Relevant Asset is a Power Generating Module or a Demand Facility; and
 - c) Changes to the Transmission System or Distribution Network Topology if the concerned Relevant Asset is a Relevant Grid Element.
- (2) The Outage Planning Agent of a Relevant Asset for which the testing Availability Status is declared, shall provide the Outage Coordinating TSO, and if connected to a Distribution Network or to a Closed Distribution Network also the Connecting DSO or the Connecting CDSO respectively with an update of the information

required in Section 4.22 paragraph (1) of this Network Code [OPS] as early as reasonably practicable.

- (3) The Outage Coordinating TSO of a Relevant Asset for which the testing Availability Status is declared shall provide the information it received pursuant to Section 4.22 paragraphs (1) and (2) of this Network Code [OPS] to all other Outage Coordinating TSOs of its Outage Coordination Region(s) on request of these Outage Coordinating TSOs.
- (4) In case the Relevant Asset referred to in Section 4.22 paragraphs (1) or (2) of this Network Code is a Relevant Grid Element which interconnects two Responsibility Areas, the Outage Coordinating TSOs operating the two concerned Responsibility Areas shall coordinate in order to agree on the information to be provided pursuant to Section 4.22 paragraphs (1) or (2) of this network Code.

4.23 Processes for Handling Forced Outages

- (1) Each Outage Coordinating TSO shall establish and manage a coordination process to ensure the available or unavailable Availability Status of Relevant Assets in its Responsibility Area in case of Forced Outages and when Operational Security is endangered. The process shall:
 - a) Be used only in cases where all attempts to agree to a negotiated solution have been exhausted; and
 - b) Ensure, to the extent possible, that the technical limits of the Relevant Assets are respected.
- (2) In the event of a Forced Outage of a Relevant Asset, the Outage Planning Agent shall inform the Outage Coordinating TSO and, if connected to a Distribution Network or to a Closed Distribution Network, also the Connecting DSO or the Connecting CDSO respectively of this Forced Outage as soon as reasonably practicable and provide it with information on:
 - a) The reason for the Forced Outage;
 - b) The expected duration of the Forced Outage; and
 - c) If applicable, the impact of the Forced Outage on the Availability Status of other Relevant Assets under its responsibility.
- (3) Whenever the Outage Coordinating TSO detects that one or several Forced Outages referred to in Section 4.23 paragraph (2) of this Network Code [OPS] has the potential of leading the Transmission System out of a Normal State, this Outage Coordinating TSO shall inform the concerned Outage Planning Agent(s) of the latest time at which Operational Security can be maintained without the Relevant Asset(s) in Forced Outage being available. Outage Planning Agents of the Relevant Asset(s) shall inform the Outage Coordinating TSO of their possibility to respect this time or shall justify their deviation from this time to the Outage Coordinating TSO.
- (4) Following all updates to the Availability Plan due to Forced Outages and in accordance with the timeframe established in [Regulation on Transparency and provision of information in electricity market], the concerned Outage Coordinating TSO shall update the RPCC Operational Planning Data Environment with the most recent information.

4.24 Real-time Execution of the Availability Plans

- (1) Each Power Generating Module Owner shall ensure that all Relevant Power Generating Modules under its responsibility, which are declared available, are ready to produce electricity pursuant to their declared technical capabilities when necessary to maintain Operational Security, except in case of Forced Outages.
- (2) Each Power Generating Module Owner shall ensure that all Relevant Power Generating Modules under its responsibility that were declared unavailable do not produce electricity.
- (3) Each Demand Facility Owner shall ensure that all Relevant Demand Facilities under its responsibility that were declared unavailable do not consume electricity.
- (4) Each Relevant Grid Element owner shall ensure that all Relevant Grid Elements under its responsibility that were declared available, are ready to transport electricity pursuant to their declared technical capabilities when necessary to maintain Operational Security, except in case of Forced Outages.
- (5) Each Relevant Grid Element owner shall ensure that all Relevant Grid Elements under its responsibility that were declared unavailable do not transport electricity.
- (6) If specific grid-related conditions apply for the execution of an unavailable status of a Relevant Grid Element in accordance with Section 4.16 paragraph (6) of this network Code [OPS], the concerned Outage Coordinating TSO, DSO or CDSO shall assess if these conditions are fulfilled before the real-time execution of the unavailable Availability Status. If not, the unavailable Availability Status, or a part thereof, shall not be executed.
- (7) Upon the request of an Outage Coordinating TSO before executing an unavailable Availability Status of a Relevant Asset which puts the Transmission System out of Normal State, each concerned party shall delay the corresponding unavailable Availability Status according to the instructions of the Outage Coordinating TSO to the extent possible while respecting the technical and safety limits.
- (8) Upon the request from an Outage Coordinating TSO before executing a planned test of Relevant Assets which puts the Transmission System out of Normal State, each concerned party shall delay the corresponding test according to the instructions of the Outage Coordinating TSO to the extent possible while respecting the technical and safety limits.

5. Adequacy

5.1 Forecasts for Assessing Adequacy

Each TSO shall make any forecasts used for Responsibility Area Adequacy analyses in accordance with Section 5.2 or Section 5.5 of this Network Code [OPS], available to all other TSOs through the RPCC Operational Planning Data Environment.

5.2 Responsibility Area Adequacy Analyses

- (1) When performing Responsibility Area Adequacy analyses, each TSO shall assess the possibility for the sum of Generation within its Responsibility Area and cross border import capabilities to meet the total demand within its Responsibility Area under various operational scenarios, taking into account the required level of Active Power Reserves in line with the Network Code on Load Frequency Control and Reserves [LFCR].
- (2) When performing an Adequacy analysis in accordance with Section 5.2 paragraph (1) of this Network Code [OPS], each TSO shall:
 - a) Use the latest Availability Plans and the latest available data for:
 - i. Capabilities of Power Generating Modules in accordance with Section 3.4 paragraph (5), Sections 3.6 and 3.12 of the Network Code [OS] and their Availability Statuses; and
 - ii. Cross border capacities;
 - b) Take into account:
 - i. Contributions of Generation from Renewable Energy Sources; and
 - ii. Demand;
 - c) Assess the probability and expected duration of an absence of Adequacy and the expected energy not served as a result of such a deviation.
- (3) As soon as reasonably practicable, each TSO shall inform:
 - a) Its National Regulatory Authority or when explicitly foreseen in national law, other relevant national authority, and when applicable any affected party, when an absence of Adequacy is detected within its Responsibility Area; and
 - b) All TSOs through the RPCC Operational Planning Data Environment when Generation within its Responsibility Area alone is insufficient to meet the demand.

5.3 Seasonal Peak Generation Adequacy Outlooks and Methodology

- (1) By [date – 12 months after entry into force], all TSOs shall define a common methodology to establish GMS annual Seasonal Peak Generation Adequacy outlooks including:
 - a) The criteria used to define the set of operational scenarios by Responsibility Area, taking into account their probability of occurrence;
 - b) The criteria used to combine these operational scenarios by Responsibility Area to build a set of GMS scenarios, taking into account their probability of occurrence;

- c) The methods to assess the Adequacy of each Responsibility Area in accordance with Section 5.2 of this Network Code [OPS] taking into account GMS scenarios;
 - d) The cross border capacities for exchanges of electricity;
 - e) The data to be exchanged between TSOs; and
 - f) Conditions for reviewing the methodology established.
- (2) All TSOs shall perform GMS annual Seasonal Peak Generation Adequacy outlooks before [DD-MM-YY] and [DD-MM-YY] (to be defined) of each calendar year respectively.
 - (3) All TSOs shall monitor the quality of the Seasonal Peak Generation Adequacy outlooks.
 - (4) Whenever all TSOs agree on the basis of the conditions defined in accordance with Section 5.3 paragraph (1)(f) of this Network Code that the quality of the Seasonal Peak Generation Adequacy outlooks is insufficient or an update is necessary for other reasons, all TSOs shall update the common methodology referred to in Section 5.3 paragraph (1).
 - (5) Before submitting of the methodology for National Regulatory Authority's approval, all TSOs shall:
 - a) Collect comments from stakeholders; and
 - b) Deliver answers to stakeholders' comments.
 - (6) All TSOs shall make the approved methodology available to the RPCC. The RPCC shall publish the methodology on its website within one week after receiving it.
 - (7) All TSOs shall apply the approved methodology for all subsequent outlooks after publication by the RPCC.

5.4 Responsibility Area Adequacy up to and including Month-Ahead and Week-Ahead

- (1) From the establishment of the Seasonal Peak Generation Adequacy outlooks in accordance with Section 5.3, up to and including the Month-Ahead and Week-Ahead timeframes, each TSO shall monitor changes on the Availability Status of Power Generating Modules, on demand estimations, on Renewable Energy Sources estimations and on cross border capacities.
- (2) Each TSO shall perform an updated Responsibility Area Adequacy assessment in accordance with Section 5.2 of this Network Code [OPS] when the TSO considers the changes observed in accordance with Section 5.4 paragraph (1) of this Network Code to be significant in light of maintaining Adequacy.

5.5 Responsibility Area Adequacy D-1 and Intraday

- (1) Each TSO shall perform a Responsibility Area Adequacy analysis on a D-1 and intraday basis by using:
 - a) Market Participant Schedules in accordance with the applicable national legal framework;
 - b) Forecasted demand;
 - c) Forecasted Generation from Renewable Energy Sources;

- d) Active Power Reserves in accordance with the data provided pursuant to Section 3.7 of the Network Code [OS];
 - e) Cross border capacities consistent with Cross Zonal Capacities as calculated to fulfil the requirements of the Market Code [Section 2 - CACM] where applicable;
 - f) Capabilities of Power Generating Modules in accordance with the data provided pursuant to Section 3.4 paragraph (5), Sections 3.6 and 3.12 of the Network Code [OS] and their Availability Statuses; and
 - g) Capabilities of Demand Units with Demand Side Response in accordance with the data provided pursuant to Sections 3.13 and 3.14 of the Network Code [OS] and their Availability Statuses.
- (2) Each TSO shall evaluate:
- a) The maximum level of import and export capacity compatible with its Responsibility Area Adequacy;
 - b) The expected duration of a potential absence of Adequacy; and
 - c) The expected energy not served in the absence of Adequacy.
- (3) If Adequacy is not fulfilled according to the analysis referred to in Section 5.5 paragraph (1) of this Network Code [OPS], each TSO shall inform its National Regulatory Authority or when explicitly foreseen in national law, other relevant national authority. The TSO shall provide its relevant national authority with an analysis of the causes of the absence of Adequacy as soon as reasonably practicable.

6. Ancillary Services

6.1 Ancillary Services

- (1) Each TSO shall monitor the availability of Ancillary Services.
- (2) At least for Active Power and Reactive Power, either on an autonomous basis or in coordination with other TSOs, each TSO shall:
 - a) Design and set up procedures for the procurement of Ancillary Services;
 - b) Monitor on the basis of data provided in accordance with Section 3 of the Network Code [OS] whether the level and location of available capacity of Ancillary Services allows the fulfilment of operational security;
 - c) Manage the procedures designed in accordance with Section 6.1 paragraph (2)(a) of this Network Code [OPS]; and
 - d) Use all available economically efficient and feasible means under its control to procure the level of Ancillary Services required.
- (3) Each TSO shall publish the required levels of Active Power Reserves.
- (4) If TSOs decide to exchange Active Power Reserves between LFC Areas, they shall establish one or more procedures in accordance with the Network Code on Load Frequency Control and Reserves [LFCR].
- (5) Each TSO shall communicate the available level of Active Power Ancillary Services to other TSOs upon their request.

6.2 Reactive Power Ancillary Services

- (1) Each TSO shall assess in all operational planning timeframes whether its available Reactive Power sources are sufficient to ensure the Operational Security of the Transmission System, in line with Section 2.1 of the Network Code [OS].
- (2) In order to increase the efficiency in operation of the elements of its Transmission System, each TSO shall monitor:
 - a) The available Reactive Power capacities of Power Generating Facilities;
 - b) The available Reactive Power capacities of Transmission Connected Demand Facilities;
 - c) The available Reactive Power capacities of DSOs;
 - d) The transmission connected available equipment dedicated to providing Reactive Power; and
 - e) The ratios of Active Power and Reactive Power at the interface between Transmission Systems and Distribution Networks.
- (3) Whenever the level of Reactive Power Ancillary Services is not sufficient for maintaining Operational Security, each TSO shall:
 - a) Inform neighbouring TSOs; and
 - b) Prepare Remedial Actions for activation in line with Section 2.1 paragraph (9) of the Network Code [OS].

7. Scheduling

7.1 *Establishment of Scheduling Processes*

- (1) For each Power Generating Facility and Demand Facility to which requirements for scheduling in accordance with the applicable national legal framework apply, the concerned owner shall ensure that a Scheduling Agent is appointed. Each Market Participant and Market Coupling Operator to which requirements for scheduling in accordance with the applicable national legal framework apply, shall appoint a Scheduling Agent.
- (2) For regions with central dispatching of generation, the Operator responsible for of the central dispatching of generation shall appoint or act as a Scheduling Agent and establish the provisions necessary to produce Schedules in accordance with the applicable national legal framework.
- (3) Each TSO operating a Scheduling Area shall establish the provisions necessary to process Schedules, provided from Scheduling Agents, in accordance with the applicable national legal framework.
- (4) When a Scheduling Area covers more than one Responsibility Area, the TSOs responsible for these Responsibility Areas shall agree on which one operates the Scheduling Area.

7.2 *Notification of Schedules within Scheduling Areas*

- (1) Each Scheduling Agent within a Scheduling Area, except Scheduling Agents of Market Coupling Operator shall submit to the TSO operating this Scheduling Area in accordance with the national legal framework the following Schedules:
 - a) Generation Schedules;
 - b) Consumption Schedules;
 - c) Internal Commercial Trade Schedules; and
 - d) External Commercial Trade Schedules.
- (2) Each Scheduling Agent of a Market Coupling Operator shall submit Schedules to the TSOs operating a Scheduling Area involved in the market coupling in accordance with the applicable national legal framework. These Schedules include:
 - a) Net Position related to the Scheduling Area;
 - b) External Commercial Trade Schedules as:
 - i. Multilateral exchange between the Scheduling Area and a group of other Scheduling Areas; or
 - ii. Bilateral exchange between the Scheduling Area and another Scheduling Area.

as requested by concerned TSOs;
 - c) Internal Commercial Trade Schedules between Scheduling Agents of Market Coupling Operators and Scheduling Agents of Nominated Electricity Market Operators, if requested by concerned TSOs.
- (3) Before adopting an External TSO Schedule, all involved TSOs shall agree on the content of such an External TSO Schedule.

7.3 Coherence of schedules

- (1) By [*date – 12 months after entry into force*], each TSO operating a Scheduling Area shall develop and implement a process to ensure its area internal balance for Generation Schedules, Consumption Schedules, External Commercial Trade Schedules and External TSO Schedules.
- (2) By [*date – 12 months after entry into force*], all TSOs operating Scheduling Areas within Synchronous Area shall implement a process to ensure that all Schedules between all Scheduling Areas within the Synchronous Area are balanced. This process includes at least:
 - a) The bilateral agreement of External Commercial Trade Schedules and External TSO Schedules between Scheduling Areas; and
 - b) The verification that all Aggregated Netted External Schedules within a Synchronous Area sum up to zero.

If TSOs within a Synchronous Area without having legal obligation to respect this Network Code do not cooperate to fulfil the Network Code, the other TSOs have to take this in account, when implementing this process.

- (3) Each Scheduling Agent of a Market Coupling Operator shall follow the process described in Section 7.3 paragraph (2)(b) of this Network Code [OPS] and provide requesting TSOs with the values of External Commercial Trade Schedules of each Scheduling Area involved in market coupling in the form of Aggregated Netted External Schedules.

7.4 Provision of Information to other TSOs

- (1) Each TSO shall calculate and provide any requesting TSO with:
 - a) Aggregated Netted External Schedules; and
 - b) Netted Area AC Position when the Scheduling Area is interconnected to other Scheduling Areas via AC transmission links.
- (2) When required for the creation of Common Grid Models, in accordance with Section 2.8 paragraph (2) of this Network Code [OPS], each TSO operating a Scheduling Area shall provide any requesting TSO with:
 - a) Generation Schedules; and
 - b) Consumption Schedules.

8. RPCC Operational Planning Data Environment

8.1 General provisions for RPCC Operational Planning Data Environment

- (1) By [*date – 24 months after entry into force*], the RPCC shall implement and shall administer a RPCC Operational Planning Data Environment for the storage of all relevant information for operational planning.
- (2) By [*date – 12 months after entry into force*], all TSOs shall have defined a standardised data format for the data exchanges taking place. The description of this data format shall be an integral part of the RPCC Operational Planning Data Environment.
- (3) Each TSO shall be responsible for providing and updating the relevant information to this environment.
- (4) All TSOs and the RPCC shall have access to all information contained on the RPCC Operational Planning Data Environment.
- (5) As long as the RPCC Operational Planning Data Environment has not yet been implemented, all TSOs shall ensure applicability of this Network Code and exchange data as referred in this Network Code in a transitory form.

8.2 Individual Grid Models, Common Grid Models and Operational Security Analysis

- (1) The RPCC Operational Planning Data Environment shall store all Individual Grid Models and related relevant information for all relevant time horizons defined in this Network Code and in the Market Code [Section 2 – CACM].
- (2) The RPCC Administration shall have full access to all information contained on the RPCC Operational Planning Data Environment in relation to Individual and Common Grid Models and scenarios, as detailed in Section and Section 8.2 of this Network Code [OPS].
- (3) The information on Individual Grid Model contained on the RPCC Operational Planning Data Environment shall allow for the merging into Common Grid Models by the RPCC Administration.
- (4) All Common Grid Models shall be made available on the RPCC Operational Planning Data Environment.
- (5) For the Year-Ahead time horizon, the following information shall be made available on the RPCC Operational Planning Data Environment:
 - a) Description of the scenarios referred to in Section 2.2 of this Network Code;
 - b) Year-Ahead Individual Grid Model per TSO and per scenario defined in accordance with Section 2.3 of this Network Code; and
 - c) Year-Ahead Common Grid Model per scenario defined in accordance with Section 2.4 of this Network Code.
- (6) For the D-1 and intraday time horizons, the following information shall be made available on the RPCC Operational Planning Data Environment:
 - a) D-1 and intraday Individual Grid Models per TSO and according to the time granularity defined pursuant to Section 2.8 of this Network Code;

- b) Scheduled Exchanges at the relevant time instances per Scheduling Area or per Scheduling Area Border, whichever is deemed relevant by the TSOs, and per DC interconnection;
- c) D-1 and intraday Common Grid Models according to the time granularity defined pursuant to Section 2.8 of this Network Code; and
- d) A list of the prepared and agreed upon pre-Fault and post-Fault Remedial Actions identified to cope with cross Responsibility Area Constraints.

8.3 Outage Coordination Process

- (1) The RPCC Operational Planning Data Environment shall contain a module for the storage and sharing of all relevant information for the Outage Coordination Process.
- (2) This information shall include at least:
 - a) Availability Status of Relevant Grid Elements including at least all information described in accordance with Section 4.6 paragraph (4) of this Network Code [OPS];
 - b) Availability Status of Relevant Power Generating Modules including; and
 - c) Availability Status of Relevant Demand Facilities including, but not limited to, outage period, specific conditions for execution of the outage and time required to restore service if necessary to maintain Operational Security.

8.4 System Adequacy

- (1) The RPCC Operational Planning Data Environment shall store all relevant information for coordinated Adequacy analysis.
- (2) This information shall include at least:
 - a) The season-ahead system Adequacy data provided by the individual TSOs;
 - b) The season-ahead GMS system Adequacy analysis report;
 - c) Forecasts used for Adequacy in line with Section 5.1 of this network Code [OPS]; and
 - d) Information about a lack of Adequacy in line with Section 5.2 paragraph (3)(b) of this Network Code [OPS].

9. Performance Indicators

9.1 Performance Indicators

- (1) Each TSO shall contribute to the annual reporting developed pursuant to the common incidents classification scale in accordance with Section 4.2 paragraph (2) of the Network Code [OS].
- (2) This report shall include the results of quality monitoring of the following Performance Indicators relevant for operational planning:
 - a) Indicator OPS 1A – an indicator about the number of events in which an incident contained in the Contingency list led to a degradation of system operation conditions;
 - b) Indicator OPS 1B – an indicator about the number of events counted by indicator OPS 1A in which a degradation of system operation conditions occurred as a result of unexpected discrepancies of demand or Generation forecasts;
 - c) Indicator OPS 2A – an indicator about the number of events in which there was a degradation in system operation conditions due to an Out-of-Range Contingency;
 - d) Indicator OPS 2B – an indicator about the number of events counted by indicator OPS 2A in which a degradation of system operation conditions occurred as a result of unexpected discrepancies of demand or Generation forecasts; and
 - e) Indicator OPS 3 – an indicator about the number of events leading to a degradation in system operation conditions due to lack of Active Power Reserves.
- (3) For OPS 1A, OPS 1B, OPS 2A, OPS 2B and OPS 3, the indicator shall only record the events leading to a degradation in system operation conditions, ranked at Scale 1, Scale 2 or Scale 3, according to the Operational Security Ranking defined in Section 4.2 paragraph (3) of the Network Code [OS].

10. Final Provisions

10.1 Amendments of contracts and general terms and conditions

By [date – the same as the date in Section 5.2], each relevant TSO, DSO and each relevant Significant Grid User shall amend all relevant clauses in contracts and relevant clauses in general terms and conditions, regardless of whether the relevant contracts or general terms and conditions contain an amendment process, in order to achieve compliance with the requirements of this Network Code.

10.2 Entry into force

This Network Code shall enter into force on xxxxx.

With the exception of the Sections 1.4, 1.7, 2.4, 3.4, 3.5, 4.1, 4.3, 4.4, 4.6, 5.3, 7.3, 8.1, 10.1, which shall apply as from the entry into force, this Network Code shall apply as from [date – at minimum 18 months after entry into force].

This Network Code shall be binding in its entirety and directly applicable in all Member States.

ANNEX: Operational Planning & Scheduling Code – History of Comments

#	Country	Reference section in the document	Country Comment	Consultants Review and Recommendation	Country Acceptance
1.	PR of China	2.3 (2) Year-ahead Individual Grid Models	We suggest at least 4 different scenarios should be established: maximum and minimum load in rain season, maximum and minimum load in dry season.	Agreed. Other specific scenarios could be defined in the agreement signed between TSOs and RPCC.	
2.	PR of China	2.4 Year-ahead Common Grid Models	We suggest the more detailed description of provisions dealing with the Common Grid Models could be added.	The process is enough detailed. Details shall be more detailed in the agreement signed between TSOs and RPCC.	
3.	PR of China	3.4 Methodologies for Coordinating Operational Security Analysis	We suggest the more detailed description about how to carry out coordinating Operational Security Analysis could be added. For example, how to determine the observation area, contingency influence thresholds and external grid elements.	The process shall be more detailed in the agreement signed between TSOs and RPCC. TSOs shall establish a methodology standardized at least per Synchronous Area, for Operational Security Analysis.	
4.	PR of China	3.5 (2) and 4.3 (2) Agreements for Coordinating Operational Security	Could you give us some example guidance or template of the agreement in section 3.5 (2) and the procedure in section 4.3 (2)? We suggest this guidance or template can be included in Appendix.	Example cannot be included in the Network Code. A separate document will be established with example and attached to the multi-party agreement that needs to be signed.	
5.	PR of China	4.4 (2) Methodology for assessing relevance of assets for the Outage Coordination Process	How to establish this list of Relevant Power Generation Modules and Relevant Demand Facilities?	This shall be done in agreement and coordination with the other concerned TSOs. The list shall include the facilities having the biggest impacts.	

#	Country	Reference section in the document	Country Comment	Consultants Review and Recommendation	Country Acceptance
6.	PR of China	General	When there are elements outages, especially forced outages, the generation scheduling and the power supply plan may be affected. How to carry out this scheduling and plan updating coordination process? Is there any terms in the OPS code concerning about this process?	This shall be covered by the Balancing and Interchanging Code – Market Code.	
7.	PR of China	General	The structure and real time data of power grid which is deemed as exchanging and sharing data in this OPS code and the Operational Security Code may belong to confidentiality in much national legislation. If some governments will not issue this information for exchanging and sharing, what will we do then?	Sharing data is one of the major bases of regional power market. If not, it cannot be functional.	
8.	Thailand	1./1.4/(5) Regulatory Approvals	National Regulator Authorities (NRAs) are mentioned in the Grid Code. Are they obligated by Grid Code?	NRAs have to review, approve and facilitate the implementation of the GMS Network Codes requirements at the national level. They have also to approve revision and update of nation Grid Codes in compliance with the GMS Network Codes. This is part of the NRAs responsibilities.	
9.	Thailand	2. Data for Operational Security Analysis in Operational Planning	Monthly Grid model should be added.	Done.	
10.	Thailand	2./2.1/(2) Individual and Common Grid Model General Provisions	CACM should be defined at the first time.	Done.	

#	Country	Reference section in the document	Country Comment	Consultants Review and Recommendation	Country Acceptance
11.	Thailand	3./3.1/(1)/d D-1, Intraday and Close to Real-Time Operational Security Analysis	How often of Operational Security Analysis in the intraday period should be mentioned?	In the Operational Security Code [OS], Section 2./2.1 (2), it is mentioned that, to determine the System State, each TSO shall at least every 30 minutes perform Contingency Analysis in real-time. Every 30 minutes.	
12.	Thailand	3./3.3/(5) D-1, Intraday and Close to Real-Time Operational Security Analysis	Difference between intraday and close to real-time should be defined.	Intraday market provides market participants with the opportunity to trade in energy in time intervals at least as short as the imbalance settlement period. Intraday is aligned on the periodicity of market gate opening and closure for re-declarations. Time interval varies between 1 hour and 15 minutes (under study in Europe). Close to real-time is between two gates.	
13.	Thailand	4./4.1 Definition of Outage Coordination Regions	Outage coordinating regions should be defined. Is it the same as Control Block?	Yes, it is. In Europe, Regional Security Coordinators are companies owned by their clients, the TSOs. They perform services for the TSOs, such as providing a regional model of the grid or perform advanced calculations to tell TSOs which remedial actions are the most cost-efficient, without being constrained to national borders. Currently, there are three existing RSCs in continental Europe. Their offices are based respectively in Munich (TSC), Belgrade (SCC) and Brussels (Coreso).	

#	Country	Reference section in the document	Country Comment	Consultants Review and Recommendation	Country Acceptance
14.	Thailand	4./4.3 (1) Methodology for assessing relevance of assets for the Outage Coordination Process	Gas Supply Maintenance Plan should be added in Outage Coordination. Special Devices such as HVDC and SVC that have an impact to transmission system should be emphasized.	This Section defines the methodology which shall be established. The methodology shall consider these elements, which will be incorporated.	
15.	Vietnam	3.1 Operational Security Analysis in operational planning	Each TSO shall perform coordinated Operational Security Analyses at least at the following time horizons: a) Year-Ahead; b) Week-Ahead, when applicable according to Section 2.6 of this Network Code [OPS]; c) D-1; and d) Intraday. To be added: monthly horizon.	Done.	
16.	Vietnam	4.9 Treatment of Relevant Assets located in a Distribution Network or in a Closed Distribution Network	<ul style="list-style-type: none"> ▪ For the Relevant Assets that are located in a Distribution Network, the Outage Coordinating TSO shall coordinate the outage planning with the Connecting DSO. ▪ For the Relevant Assets that are located in a Closed Distribution Network, the Outage Coordinating TSO shall coordinate the outage planning with the Connecting CDSO. <p>To be added: DSO shall be responsible for submitting their outage plans to TSO. If such plans affect TSO's operation modes, the TSO has the right to refuse such plans and must make a written notice to the DSO.</p>	Done.	