



**Greater Mekong Subregion  
WGPG ON PERFORMANCE STANDARDS  
& REGIONAL GRID CODE**

**GMS GRID CODE / GAP ASSESSMENT / NEXT STEPS**

**RPTCC-25 Meeting**

**Bangkok – Thailand, 21-22 March 2019**

**By Michel CAUBET**

1. GMS Grid Code
2. Development Process of the Grid Code
3. Compliance Gap Assessment
4. Next Steps

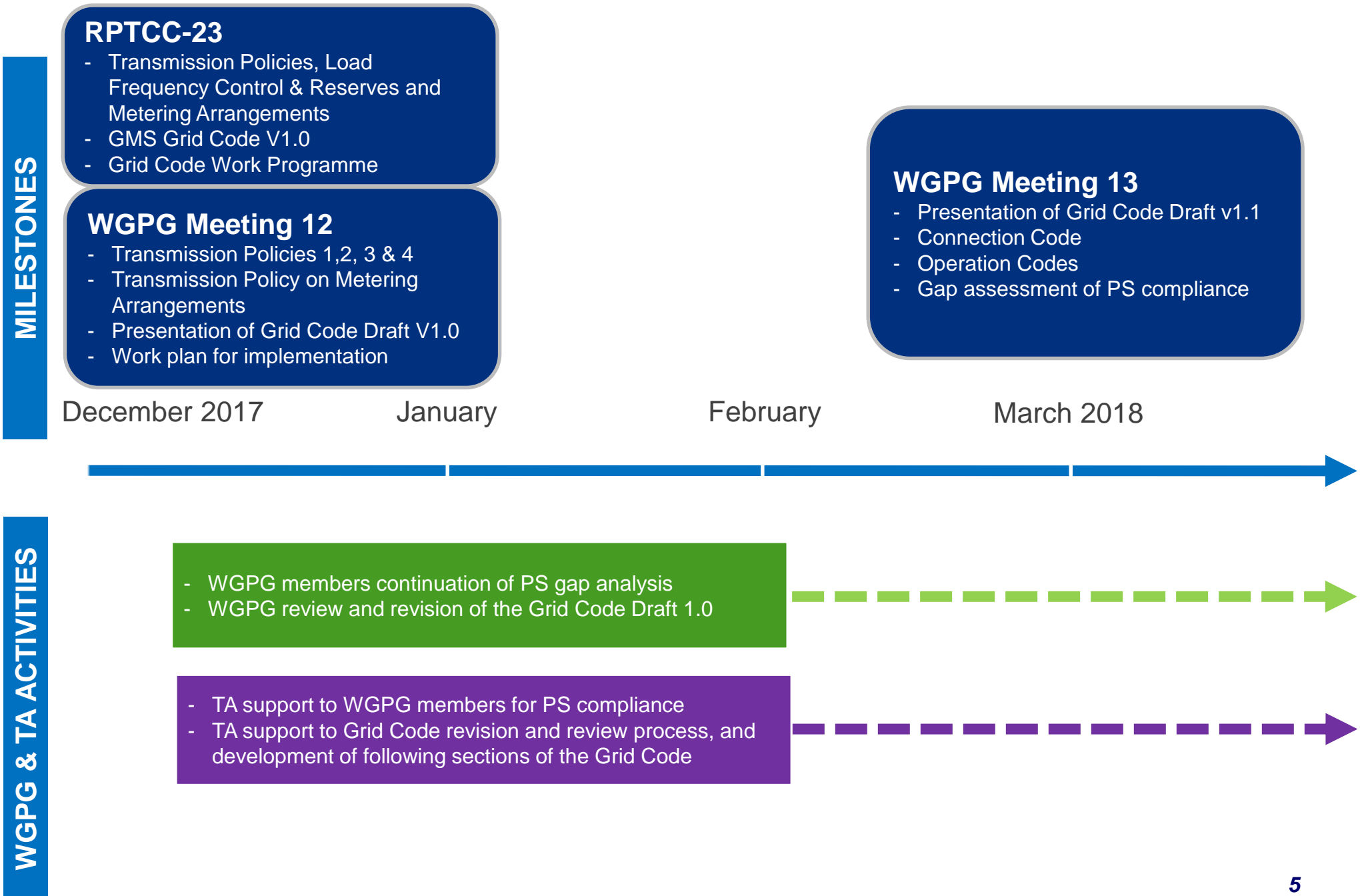
## Adopted structure of the GMS Grid Code:

1. Preamble
2. Governance
3. Connection Codes
  - Demand Connection Code
  - Requirements for Generators
  - High Voltage Direct Current Connections
4. Operational Security Code
5. Operational Planning and Scheduling Code
6. Load Frequency Control and Reserves Code
7. Emergency & Restoration Code
8. Market Codes (Operational Aspects)
  - Capacity Allocation and Congestion Management
  - Electricity Balancing
  - Forward Capacity Allocation
9. Metering Code
10. Training Code

## **Plus two (2) Additional Documents:**

- 1. Glossary of Terms**
  - 2. Strategic Planning Document**
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- An Annex “Code Title – History of Comments” has been attached to each Code to keep record of all comments received with the stated reason for rejection when it is the case.**

## 2. DEVELOPMENT PROCESS OF THE GRID CODE



**MILESTONES**

**WGPG Meeting 13**

- Presentation of Grid Code Draft v1.1
- Connection Code
- Operation Codes
- PS compliance assessment

March 2018

April

May

June 2018



**RPTCC-24**

- GMS Grid Code Draft 2.0
- Agreement of continued Work Programme for the GMS Grid Code

**WGPG Meeting 14**

- GMS Grid Code Draft V2.0
- Connection Code
- Operation Codes
- PS compliance assessment

**WGPG & TA ACTIVITIES**

- WGPG members continuation of PS gap analysis
- WGPG review and revision of the Grid Code Draft 1.1



- TA support to WGPG members for PS compliance
- TA support to Grid Code revision and review process, and development of following sections of the Grid Code



**MILESTONES**

**RPTCC-24**

- GMS Grid Code Draft 2.0
- Agreement of continued Work Programme for the GMS Grid Code

**WGPG Meeting 14**

- Grid Code Draft V2.0
- Connection Code
- Operation Codes
- PS compliance assessment

**WGPG Meeting 15**

- Grid Code Draft V3.0
- Connection Code
- Operation Codes
- Market Code (operation)
- Metering Code
- Training Code

June 2018

July

August

September 2018



**WGPG & TA ACTIVITIES**

- WGPG members continuation of PS gap analysis
- WGPG review and revision of the Grid Code Draft 2.0



- TA support to WGPG members for PS compliance
- TA support to Grid Code revision and review process, and development of following sections of the Grid Code



**MILESTONES**

**WGPG Meeting 15**

- GMS Grid Code Draft v3.0
- Connection Code
- Operation Codes
- Market Code (operation)
- Metering Code
- Training Code

September 2018

December 2018

March 2019

**RPTCC-25**

- GMS Grid Code V4.0 (Full Version)
- Compliance assessment for implementation

**WGPG Meeting 16**

- GMS Grid Code V4.0 (full version)
- Compliance assessment for implementation

**WGPG & TA ACTIVITIES**

- WGPG members continuation of gap analysis
- WGPG review and revision of the Grid Code Draft 3.0

- TA support to WGPG members for compliance
- TA support to Grid Code revision and review process



- **A Draft Final Version of the GMS Grid Code has been delivered to the WGPG Members on 10 January 2019.**
- **No further comments have been received.**
- **The last GMS Grid Code version (January 2019) is submitted to the RPTCC at its 25<sup>th</sup> Meeting for consideration.**

- ✓ The Sub-Codes composing the GMS Grid Code have been subject to an analysis of their requirements in order to identify the prerequisites or preconditions to be met at national level prior to their implementation.
- ✓ A report called: “Regional Grid Code – Gap Assessment Analysis” has been issued presenting the requirements of each Sub-code and the identified preconditions classified by domain of impact (Institutional – Legal, Regulatory, Technical and Contractual).
- ✓ This report is the first step of the Gap Assessment Process.
- ✓ On that basis, a first GMS Country Gap Assessment Analysis will be carried out on the basis of the identified preconditions, responses to the Questionnaire on Operational Practices (received end of 2017) and complementary contributions of the GMS Countries, in the coming 3 months.

**The results of the analysis of the identified preconditions has highlighted the need to fulfilled some important requirements:**

- The importance of the creation and operationalization of the RPCC for the implementation of the GMS Grid Code.
- Indeed, the RPCC is the “Master Piece” of the GMS Grid Code as a major actor of its management and approval, governance and compliance, dispute mediation and arbitration.
- The RPCC Board shall appoint a Grid Code Secretariat as a function of the RPCC Administration.
- The RPCC Board shall establish and maintain, as a standing body, the Regional Grid Code Review Panel.
- The RPCC is also involved in the coordination and successful implementation of regional power trade.

- The importance of establishing a legal enforcement mechanism of the GMS Grid Code at regional level, thus facilitating the compliance process of the national grid codes by the national Regulatory Authorities.
- The application of the Third Party Access in the GMS region is also of paramount importance for the development of regional power trade, thus necessitating the unbundling or as minimum accounting separation of the generation – transmission – distribution & sale of electricity segments.
- Clear definition of key roles and missions, limits of responsibility of the market players at national level is also required.
- The review and update of the mandate and functions of NRAs is required to allow them playing a role in the compliance process, adopting criteria for granting derogations, etc.

- Synchronous Area Operational Agreements / Multi-party agreement and Confidentiality Agreements shall be established by the TSOs, approved by NRAs and signed by the concerned Parties.
- Methodologies for the definition of actions for Over-Frequency, for the definition of minimum inertia required to maintain Operational Security and to prevent violation of Stability Limits, for the definition of the Low Frequency Demand Disconnection Scheme, for example, shall be established and approved by NRAs.
- Compliance monitoring mechanism, rules and procedures shall be developed and applied in the GMS Member States.
- The LFC Structure for the Synchronous Areas and the Process Responsibility Structure shall be defined by the TSOs and adopted by the NRAs.
- National Dispatch Centres shall be equipped with up-to-date SCADA/EMS tools and facilities including AGC.
- Etc.

### **Establishment of a Roadmap for implementation of the regional GMS Grid Code comprising:**

- a) Establishment of a regional mechanism for the enforcement of the GMS Grid Code: legal authority for adoption, instrument to be defined and adopted, etc.
- b) The first GMS Country Gap Assessment Analysis will be carried out on the basis of the identified preconditions, responses to the Questionnaire on Operational Practices and complementary contributions of the GMS Countries, in the coming 3 months.
- c) Mitigation measures and milestones for compliance will be proposed for each GMS Country accordingly.
- d) Country road maps for compliance of the national grid codes will be proposed accordingly.
- e) A mechanism for monitoring compliance will be established at regional level and applied.

## **2. Establishment of a Load Frequency Control Organization for the GMS Synchronous Areas**

To ensure good quality of service and security of supply in the GMS Synchronous Areas:

- LFC organization and structure
- Synchronous Area Operational Agreements
- Multi-Parties Agreements including:
  - LFC Block Operational Agreements
  - LFC Area Operational Agreements
  - Monitoring Area Operational Agreements
  - etc.

The following methodologies shall be established by the TSOs and adopted by the national Regulatory Authorities:

- A standardized methodology for coordinating Operational Security Analysis in each Synchronous Areas
- A common methodology for establishing seasonal peak generation adequacy outlooks
- A coordinated methodology for assessing the relevance of power generating units, demand facilities, and grid elements for the Outage Coordination Process

With the following procedures:

- Common Operational Security Analysis procedure
- Regional Outage Coordination procedure
- Coordinated procedures for recovery and restoration
- Etc.



### **3. Establishment of the technical specifications of the Electronic Highway**

- This regional communication network shall provide the necessary infrastructure to support a safe and secure exchange of data and information among TSOs and the RPCC (Policy #3 on Communication Infrastructure)

### **4. Establishment of the GMS Metering Organization and Architecture**

The Metering organization and architecture will allow an appropriate settlement of power exchange in the GMS including:

- Meter equipment on tie-lines; and
- A centralized data processing systems.

**These are some of the Steps proposed for the implementation of the GMS Grid Code and the Synchronous Operation of the Interconnected GMS Power Systems.**

**THANK YOU VERY MUCH FOR  
YOUR ATTENTION**