

**Summary of Discussions**  
**The 3<sup>rd</sup> meeting of the Working Group on**  
**Performance Standards and Grid Code (WGPG)**  
**Hanoi, Vietnam, 3-4 June 2013**

**Objectives**

1. The 3<sup>rd</sup> Meeting of the Working Groups on Performance Standards and Grid Code (WGPG) was focused to: (i) the gap analysis reports submitted by each GMS country as well as the gap analysis report prepared by the consultant for Lao PDR, Cambodia, and Myanmar; (ii) Progress of Harmonization of Technical Standard Codes and Guidelines in the Area of Planning and Design, System Operation and Maintenance for the ASEAN Power Grid; (iii) Review of Proposed Guidelines for Technical Performance; (iv) TOR for Transmission Regulation and TOR for Metering; and (v) Discuss the next steps for the WGPG. The agenda for the meeting is attached for your kind reference (Annex 1).

2. The 3<sup>rd</sup> Meeting of WGPG was held in Hanoi, Vietnam on 3-4 June 2013 and co-organized by Electricity Regulatory Authority of Vietnam (ERAV) and the Asian Development Bank (ADB). It was attended by the members of the WGPG other participants of the six GMS member countries, as well as by representatives of ADB. The list of participants is attached file (Annex 2).

**Opening Session**

3. The Meeting of the working Group on Performance Standards and Grid Code was chaired by Mr. Samerjai Suksumek, Deputy Director General, Energy Policy and Planning Office (EPPO) of Thailand and by the host of the meeting acting as cochairman, Mr. Trinh Quoc Vu, Director of Power Market Development Research and Training Center, Electricity Regulatory Authority of Vietnam (ERAV), and Mr. Jong-Inn Kim, Lead Energy Specialist, Energy Division, Southeast Asia Department (SEEN), ADB.

4. Mr. Samerjai Suksumek, DDG, EPPO, Thailand, a Chair of WGPG, warmly welcomed the participants to the meeting and noted the work of WGPG was progressing quickly which was a good sign. He added that the WGPG were a step closer to the completion of the objectives owing to the effort and the cooperation of all members. He also said there are tasks that may require more effort from GMS members to be achieved, and finally he was sure that there were no tasks that the members could not accomplish.

5. Mr. Trinh Quoc Vu, Director of Power Market Development Research and Training Center, Electricity Regulatory Authority of Vietnam (ERAV), warmly welcomed the members of WGPG on behalf of the host country and thanked Asian Development Bank (ADB) for supporting GMS countries in developing the regional grid code and a common performance standard for power system of GMS countries, which was necessary for the development of power trading programs among countries and GMS regional power market development in the future. He noted that the mission of these 02 working groups was to review and analyze gaps among GMS countries on performance standards of the power system, grid code and relating technical issues as well as legal framework for power trading activities and for the operation of the regional power market in the future. He also said many interesting but challenging topics were waiting for all members to work together with the knowledge, experience and enthusiasm. He really hoped and did believe that after the meeting we would achieve remarkable progress.

6. Mr. Jong-Inn Kim, Lead Energy Specialist, Energy Division, Southeast Asia Department (SEEN), ADB, welcomed all members of WGPG and thanked to Electricity Regulatory Authority of Vietnam (ERAV) and Vietnam Electricity (EVN) for the meeting arrangements. He also thanked to all GMS members in cooperation for the important works to move forward to GMS Power Trade Arrangements. He stressed the tasks of WGPG and WGRI were the big steps to prepare the necessary works for Regional Power Trade besides establishment of the Regional Power Coordination Center (RPCC). Finally, he mentioned that cooperation among GMS members in this meeting would lead to the success of Power Trade in the region. He also introduced two (2) ADB staff, Ms. Aruna K Wanniachchi who is Senior Energy Specialist in SEEN who will be the ADB team leader for WGPG from now, and Miss Katrina Jayme for assisting the Thailand EGAT secretariat.

#### **Presentation of Gap Analysis by PRC (Annex 3)**

7. Mr. Li Peng, from China Southern Power Grid (CSG), presented the Gap Analysis and Remedial Measure on Performance standards that was compared between the RETA 6440 report of ADB consultant and report of CSG. He mentioned that the details of CSG performance standards were defined according to China Laws of Regulations Central Government and Chinese Regulator. The content of presentation consists of i) Frequency Control : Primary Control, Secondary Control, Coordination of Primary Control and Secondary Control, Tertiary Control, Measures for Emergency Conditions, ii) Operational Security : N-1 Security Principle, Three types of contingency, iii) Emergency Procedure : TSO alarm, Remedial actions, SAP duration demand etc. He noted that some topics in RETA 6440 are not clear. It is suggested to add more details such as Remedial Action Demand, Risk definition and Risk Management etc.

8. **Discussions.** Members asked about investment to improve the system in PRC. The representative from PRC said that the investment would focus on SCADA and SI system. It was no need for Frequency Control and others. Any investments would not have an effect on the gap. Mr. Kim was concerned about Interconnection between China and Vietnam due to national technical grid code and stressed that the 2 parties had to discuss together. The representative from Vietnam informed that the working group was set by PRC and Vietnam to carry out these activities during the process of power system connection and exchange. Nevertheless, the representative from Laos informed some technical problems about this issue with PRC due to difference voltage level. Laos concluded that the different of voltage level among GMS countries would be one of the technical problems which have to be solved in the future. ADB consultant responded, for the purpose of interconnection, we should pay most of our attention to 500 kV.

#### **Presentation of Gap Analysis by Thailand (Annex 4)**

9. Mr. Arthit Sode-Yome, from Electricity Generating Authority of Thailand, briefed Gap Analysis for GMS performance standard. The presentation provides gap analysis of Thailand by considering SWOT analysis, gaps of infrastructure assessment and roadmap for the next 5-10 years of Thailand. The total of 7 subcategories, namely, Transmission Infrastructure, ICT, Control Centers, Control Devices, Generation Scheduling, Operation Standard, and Protection standard are analyzed.

10. **Discussions:** Consultants, ADB representative and representative from Vietnam had the following comments:

**ADB Consultant** had a question about commercial mechanism for transmission investment. Commercial mechanism should be replaced by another word. Thailand clarified that wheeling charge was the major concern for transmission investment. The consultant also asked about statement of primary response and secondary response of IPP in Thailand Grid Code. Thailand stated that the primary and secondary responses were mentioned in Thailand Grid Code and it was similar to the GMS performance standard.

**ADB representative** asked about programs used for Transmission System Planning and the planning period. Thailand responded that PSS/E and DlgSILENT are the software used for load flow, transient and small signal stability. Reactive power reserves for generators were used for voltage stability.

**Vietnam representative** asked about the opinion on how to do the study in order to define the amount and location of load shedding. Thailand mentioned that there were two kinds of study for load shedding: one was for under frequency relay and the other one was for stability. The under frequency relay load shedding was in normal procedure in all the GMS countries. The load shedding due to stability problem, on the other hand, might need system study in transient and steady state periods. The study should be necessary after the interconnection was existed. Additionally, the representative from Vietnam asked about the need for upgrading existing "RCC with SCADA" to "RCC with EMS". Thailand responded that the objectives were to serve the GMS interconnection and Smart Grid policy in Thailand. The Chairman added that Thailand would complete the Thailand Smart Grid roadmap in June 2013. He stated that EGAT would be responsible for Smart Grid in Transmission system and PEA/MEA would be responsible for distribution. ADB representative commented that Smart Grid had to be started at distribution level. Thailand responded this case that the roadmap depended upon the definition of the Smart Grid defined for each country. It was agreed by ADB representative.

#### **Presentation of Gap Analysis by Vietnam (Annex 5)**

11. Mr. The Huu Nguyen, from ERAV, gave a presentation of Gap Analysis and Assessment on GMS Performance Standards which consisted of 5 main items: i) Load Frequency Control, ii) Voltage Control, iii) Short Circuit Current and Fault Clearance, iv) Voltage Balance, v) Security Principle. Due to the incompatibility in 5 items above of such information and codes, Vietnam would need to consider for Vietnam's performance standard to ensure stable and reliable operation of power system. He also recommended GMS's countries should add more information such as: Low Frequency Automatic Load Shedding, Voltage Control; Voltage Balance; and Short Circuit Current at interconnection point in order to avoid wide-range blackout. He concluded that Vietnam power system had been facing challenge that electric demand increases significantly than development of generation and network. The country had been promoting development of generation and network according to national master plan to meet continuing rapid electricity demand growth also. Subsequently, even N-1 security principle had already applied in planning and development; this principle had not been ineffectively satisfied in Vietnam power system.

12. **Discussion:** ADB consultant asked about the parameters at Primary Control which were presented at code of N/A even they were applied at the same parameters of GMS's performance standard. Vietnam representative informed that Vietnam Grid Code which related to several technical codes for operation had been implemented this year and should be finished by soon. Consequently, Vietnam could not identify exactly such information without official approval. They would be informed after the declaration of Grid Code. Then, Viet Nam representative replied PRC about N-1 security principle concerning risk of power outage that the

country would have encountered the problem of transmission condition; for example Blackout in South Viet Nam at the end of May 2013. This matter would be considered and solved by related utilities in Vietnam. For the suggestion of ADB consultant about the time setting of Primary control and Secondary control, Vietnam would be considered and identified clearly in Vietnam Performance Standard.

#### **Presentation of Gap Analysis for Laos, Cambodia and Myanmar by ADB Consultant** (Annex 6)

13. Mr. Michel Caubet, ADB Consultant, presented the existing Performance Standard of the three countries and focus on Gap Analysis with GMS and UTCE including proposed measures and time for implementation. Starting with Laos, Cambodia and then Myanmar, the contents were composed of: Frequency Range, Primary Frequency Control, Secondary Frequency Control, Tertiary Frequency Control, Voltage Control, Fault Clearance Times, Short Circuit Current Level, Harmonic Distortion, Power System Studies. He mentioned that although, Grid Code in Laos had already finished and specified all required system parameters, some of the parameters were not being employed. These parameters would be used after some modifications are made. Therefore, Laos still needed to review and revise the existing Grid Code so that the national Grid Code would harmonize with the GMS Grid Code. In case of 500 kV transmission lines in Cambodia, he had to consider and make correction again.

14. **Suggestions:** The comments were informed by; Chairman, Cochairman and ADB representative;

**Chairman** suggested that in Europe, their multinational interconnections were initiated from bilateral contract. Hence, in order to continue our work with convenience, it was advisable for GMS countries to follow such procedures.

**Cochairman** said about the parameters in any Performance Standards and Grid Codes, such as primary and secondary control that should be nationally standardized according to each individual system. After that, these parameters can be modified according to the regional network. Nevertheless, technical economic should be taken into consideration for such modification. He also added that the Vietnam main problem for interconnecting was frequency deviation. Vietnam should be able to remedy this problem before further interconnection.

**ADB representative** commented that gap filling measures require significant amount of investment, hence each country should prepare the investment plans based on their power development plans. She requested ADB TA consultant to identify expected timing of implementation of the proposed interconnections based on the system studies conducted so far.

#### **Progress of Harmonization of Technical Standard Codes and Guidelines in the Area of Planning and Design, System Operation and Maintenance for ASEAN Power Grid** (Annex 7)

15. Mr. Kang Seng Seow, ADB Consultant, gave a presentation on Progress of Harmonization of Technical Standard Codes and Guidelines in the Area of Planning and Design, System Operation and Maintenance for ASEAN Power Grid. The scope of work was to provide technical and advisory services to the HAPUA Working Group No.2 (HWG2) HAPUA Secretariat, and ASEAN Centre for Energy (ACE). The objectives of study were to : analyze technical standards of power transmission systems of 10 ASEAN Member States; recommend common technical standards or guidelines for harmonization in areas of planning, system operation and

maintenance for ASEAN Member States; and prepare an implementation plan for harmonization for each Member State, including the least developed Member States of ASEAN, to realize the benefits of ASEAN Power Grid (APG). The Final Technical Harmonization Study Report would have to be deliverable at the mid of September 2013.

Mr. Kim also added that as some of the GMS country members are also HAPUA members, it is required to harmonize GMS and HAPUA Performance Standards. Mr.Kang Seng Seow had been invited to this meeting for presenting his findings on this requirement.

#### **Review of Proposed Guidelines for Technical Performance (Annex 8)**

16. Mr. Michel Caubet, ADB Consultant, provided his conclusion of the Proposed Guides for Technical Performance which consisted of; i) the activities; ii) Reference Performance Standards namely, Load Frequency Control, Voltage Control, Fault Clearance Times, Short Circuit Current Levels, Additional Performance Standards, for GMS members to understand clearly.

Ms Aruna Wannichchi indicated that a comparison table of the Gap Analysis of the six (6) countries needs to be prepared clearly presenting the gaps, priority level (whether the implementation is critical or can be delayed), difficulty level of achieving the targets, realistic implementation schedule and estimated investments for each gap filling measure.

#### **Review of Future Work – Transmission Regulation (Annex 9)**

17. Mr. Michel Caubet emphasized on the scope of activities to be performed by this WG. Based on the scope of work, there are four tasks to be fulfilled; GMS Performance Standards, Transmission Regulation, Metering and GMS Grid Code as indicated in MOU-2. He presented that we would be at the second task concerning the works for Transmission Regulation. On the proposed Transmission Regulation, which would be implemented during 2013-2014, would include implementation of the four GMS Policies namely: Scheduling and Accounting, Coordinated Operational Planning, Data Exchange and Communication Infrastructure. As usual, this task would be considered for adoption by the RPTCC. He noted that the priority of tasks including the topic of the next meeting would be set for this WG then. However, as Consultant presentation, Cochairman summarized to put the first 2 topics of Policy on Communication Infrastructure and Policy on Data Exchange in the next WGPG meeting.

#### **18. Comments and suggestions:**

- a. PRC raised a question about the different between RPCC and real-time control center. The consultant clarified that the real-time control center is responsible for actual operation once the trading schedules are officially declared. On the other hand, RPCC is more or less operated like a market operator. Also, the RPCC will deal with contracts, settlements, regulations, policies, and so on. The representative from PRC also informed that PRC didn't have experience in Coordinated Operational Planning in term of Interconnection and understand that we should take long time to implement these issues.
- b. Lao PDR noted that Laos had already set Communication Infrastructure by the Laos' Committee but, it still was focused between the neighboring countries such as Thailand; South of China. As well as Coordinated Operational Planning for the six GMS countries, they would have to be adopted and upgraded from the study of Consultant. He talked

about Protocols which had been used for Data Exchange. Specially, Laos had got information and lesson learned from IPPs and EGAT, Thailand.

- c. Thailand noted that the priority of activities is rather important. It should be done clearly because the persons who involved would prepare to study and implement with the consultant.
- d. Cambodia asked ADB Consultant about a draft of the next step for the WG doing together.
- e. Myanmar informed that they were pleased to cooperate with GMS\_members and ADB Consultant. Presently, Myanmar didn't have enough experience to share information in this meeting.
- f. Viet Nam (By Cochairman) asked to have TOR for Transmission Regulation as identified in Agenda. This was because the WG should know the scope of work and run the process correctly.

### **Review of Future Work (Continued) – TOR for Metering (Annex 10)**

19. Mr. Michel Caubet presented the Standard Regional Metering Arrangements for the WGPG based on Final Report of RETA No.6440.

#### **20. Discussions:**

- a. Vietnam noted that the TOR was quite comprehensive so he also needed more time to make clearly understanding in all details. The Cochairman added that Vietnam employed the international consultant to do the national Grid Code. However, the TOR of Metering was related to economic issues, the discussion and clarification would be done to compare with the national Grid Code. Anyway, Vietnam said that they could implement the tasks of 2 policies by themselves.
- b. PRC informed that PRC could implement both policies by themselves. Whenever, the implementation was approached to step of interconnection among 6 countries, the international consultant would be needed.
- c. Thailand suggested that power loss on transmission line was also an essential issue which needed to be taken care of simultaneously with other issues. The consultant agreed with the suggestion and further emphasized that there had to be discussions about tie line power loss in all aspects, for example; which parties should be responsible for the loss, both financially and technically. In case of consultant, Thailand gave the commend as well as PRC.
- d. Myanmar noted that the implementation of internal standardize of transmission grid code including Metering Arrangement had to be considered before and then also continued to the standard of GMS. Cochairman added that we might take much time to set internal regulations not only in Myanmar but in Vietnam also. Anyway, Myanmar also needed ADB Consultant to assist them to implement the tasks of such technical policies.
- e. Cambodia agreed as Thailand' comment about power loss on transmission line. Additional, they also needed ADB Consultant to fulfill everything in the future.
- f. Laos suggested that GMS should have a platform for metering system. This could be initiated by gathering examples from member counties. The representative from Laos wanted to start studying in the topics of Scheduling and Accounting, Coordinated Operational Planning before, and then Communication Infrastructure and Data Exchange due to risk of investment. However, he informed that Laos still needed the technical consultant from ADB to assist in each tasks of Performance Standards and Grid Code.

24. Conclusion. Cochairman suggested the consultant to consider the idea from Laos about what topics of policy to be first priority to study together. This was because it was difficult for Laos to implement Communication Infrastructure and Data Exchange without clearing address for Scheduling and Accounting, Coordinated Operational Planning.

Ms. Aruna Wanniachchi, ADB representative, added that the four (4) policies could be undertaken in parallel and mentioned ADB can assist in this. She will seek Mr. Kim's recommendations on engagement of consultants and the group will be informed of the appropriate arrangement

Cochairman together with WGPG members wanted the consultant to do the report of GMS Performance Standards in conclusion and also identify what parameters that GMS members would have to upgrade or modify.

The proposed indicative work plan for WGPG, as follows:

- a. GMS Performance Standards (2013): including updating information, proposed RPS, gap and remedy measures identified;
- b. Transmission Regulation (2013-2014): including implementation of the proposed GMS policies (scheduling and accounting, coordinated operational planning, communication infrastructure and data exchange) and technical coordination for transmission regulation;
- c. Standard Regional Metering Arrangements (2013-2014);
- d. GMS Grid Code (Operational Procedures) (2014-2015).

### **Closing Session**

25. **Next Meeting and Venue.** It was announced that the next meeting of the WGPG would be in Cambodia. The next meeting venue and date would be discussed among ADB, the Chair, and the hosting country and each member would be informed later.

26. **Closing Remarks** . Mr. Trinh Quoc Vu thanked all the GMS member countries, ADB and development partners, for the consistent support in developing power trade arrangements in the GMS. Ms. Aruna Wanniachchi thanked Viet Nam for hosting the event and the excellent meeting arrangements.

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