



**MEKONG
INSTITUTE**



中国南方电网
CHINA SOUTHERN POWER GRID

Professional Training on GMS Power Equipment Operation & Maintenance and Safety Management



Curriculum Design Statement

September 11-22, 2017

Kunming, Yunnan Province, China

A. BACKGROUND

With the continuous progress of regional economic integration, regional power grid interconnection has become an inevitable trend in the development of power system, which can facilitate the optimal allocation of regional energy resources and improve efficiency of energy utilization. It serves as an effective way to explore the establishment of regional power market, and a strong guarantee to accelerate the regional economic and social development. Moreover, in the implementation of the China-proposed Belt and Road Initiative, it has become a realistic choice to achieve energy infrastructure connectivity in the Greater Mekong Subregion (GMS).

However, power grid interconnection in the GMS countries is a complex systematic project. It is extremely urgent to set up a systematic, complete and open technical standard system for power grid. The technical standard system can effectively regulate the practices in different fields and links such as regional power grid planning, construction, operation and equipment compatibility, thus ensuring and promoting orderly and healthy development of the power grid and relevant industries in the region.

To realize the above expectation, the skilled and experienced human resource is the most important prerequisite. Based on the previous cooperation foundation, on November 5, 2014, Mekong Institute (MI) signed a Framework Cooperation Agreement with China Southern Power Grid Co., Ltd. (CSG) to join efforts to co-design and implement training programs, workshops, special topics research and projects on the GMS power cooperation in 2015-2020, with a pragmatic view to promote GMS collaborative projects in energy sector, so as to significantly boost the social economic development for all GMS countries and bring direct benefits to the people in the sub-region.

Based on the successful experience of the cooperative projects of Capacity Building on GMS Energy Policy Formulation and Power Grid Planning in 2015 and Power Grid Interconnection in 2016, CSG and MI are conducting the cooperative project of Capacity Building on GMS Power Equipment Operation & Maintenance and Safety Management in 2017. In this regard, with the authorization from CSG, a two-week professional training on GMS Power Equipment Operation & Maintenance and Safety Management will be co-organized by Yunnan Power Grid Co., Ltd. (YNPG) and MI at Baiyun Training Center in Kunming, Yunnan Province, China in September 2017. It targets the participants from national electricity regulatory authorities and power utilities in the GMS.

This training course will focus on power equipment operation & maintenance, power safety management and key technologies and experiences sharing among GMS countries. The structured learning visits (SLVs) to relevant sites in Yunnan Province will be organized as well to learn about the best practices.

B. OBJECTIVES

The training aims to expand the participants' professional knowledge and improve their skills and capabilities on power grid equipment operation & maintenance, safety management, key and advanced technologies and proven experience. Furthermore, the training also sets it as a goal to build up mutual understanding on power grid equipment operation & maintenance and safety management criteria of GMS countries, lay a sound foundation for drafting standards and codes of power grid interconnection and launch actual regional interconnection projects in GMS.

C. TARGET PARTICIPANTS AND QUALIFICATION

The target participants will be senior technicians or middle management involved in power grid equipment operation & maintenance or safety management with at least five years' working experience in any of the fields: power equipment operation & maintenance or research and development, power-substation, power transmission, power safety management or supervision in GMS countries. A total 30 participants are expected from the following power authorities /utilities of GMS countries:

- Electricity Du Cambodia (EDC)
- China Southern Power Grid Co., Ltd. (CSG)
- Yunnan Power Grid Co., Ltd. (YNPG)
- Myanmar Electric Power Enterprise (MEPE)
- Metropolitan Electricity Authority (MEA)
- Provincial Electricity Authority (PEA)
- Electricite du Laos (EDL)
- Electricity Generation Authority of Thailand (EGAT)
- Electricity of Vietnam (EVN)

The qualified participants should be:

- Have a basic diploma/ degree or an equivalent educational background with minimum of 3 to 5 years of working experience in power grid equipment operation & maintenance, (for both substation and transmission) or in power safety management.
- Be capable to communicate in English;
- Have sufficient professional capacity to actively participate cross-culturally at international level;
- Less than 45 years old;
- Be able to attend the entire training program and the structured learning visits.

D. CURRICULUM DESIGN AND TRAINING METHODOLOGIES

As required, all training modules, case studies, simulation exercises, field visits, and best practices are to be drawn from and tailored to the GMS context and will focus on practical knowledge, respect adult learning principles, use real case studies, adopt participative approaches and be linked to the daily realities of the participants from the GMS.

Each training module will be designed and delivered using “Integrated Curriculum” approach. The salient features of this integrated curriculum are that, competencies are carefully selected, support theory is integrated with skill practice and essential knowledge is learned to support the performance of skills, and above all, various functional competencies (e.g. facilitation, presentation, communication, and leadership skills) are integrated across the curriculum.

A modular training methodology – “learn to do”, “do to learn” and “share to learn” will be applied throughout the class and the SLVs.

Learn to Do: Each training module will start with the participatory training sessions where concerned trainees are trained on the concepts, techniques and tools to be employed to accomplish the real tasks as expected by their superiors. At this cognitive stage, learner-centered instruction will be applied to inspire the active participation.

Do to Learn: This competency-based module has been classified as a form of work-based learning. Immediately after the new skills/knowledge has been acquired, the trainees will then carry out their corresponding assignments. During this practicum stage, the working group members are required to consult with the assigned trainer/mentor regularly to ensure that the work is carried out as planned and in accordance with the agreed process. This application or “doing” (psychomotor) enables the learner to apply the ideas and concepts expressed in cognitive objectives. This stage will be carried out using case studies, actual field works, and simulation exercises.

Share to Learn: Before progressing to another learning module, there will be a share-to-learn session where each individual/group will have a chance to present their outputs and share the learning/working experience with others. Lessons learned and practical experiences from the actual applications will be shared and innovative knowledge and skill will emerge and be institutionalized. The achievement of this objective is critical to the development of appropriate knowledge and skills in power dispatching, operation and controlling for GMS power grid.

Part 1: Training Modules (September 11-15, 2017, excluding September 16 and 17)

For Equipment Operation & Maintenance

1. The research on the condition assessment and differential operation and maintenance of the equipment
2. The research and application of the X-ray detection for the GIS equipment
3. Application Research and Management for “Patrolman + Patrol Aircraft” Mode of Transmission Line Inspection and Live Working
4. Research on innovation of substation operation mode and application of new technology
5. Research on the assessment of manufactures and power equipment maintenance based on data analysis
6. Smart Interlock Technology and the Trends of Power Safety Control
7. Lightning disaster and protection of transmission line
8. The research and application of infrared temperature measurement technology

9. Basic concept and Application of Travelling Wave Fault Location
10. Discussion on transmission lines live work
11. The research and application of live-working technology in distribution network
12. The technology and application of simple distribution automation

For Safety Management

1. Power enterprise safety culture and education
2. Power enterprise emergency management system
3. CSG risk management system for safety production
4. Power enterprise safety supervision

Part 2: SLV and other Arrangements (September 18-22, 2017)

- **September 18, 2017:**

1. Lab of the of X-ray digital imaging detection for GIS equipment, Electric Power Research Institute.
2. Key Lab of electric energy measuring of CSG, Electric Power Research Institute.
3. Engineering lab of superconducting equipment of Yunnan province.
4. The power operation and maintenance safety body-feeling training base, YNPG Education, Training and Evaluation Center (ETEC)
5. Drone and aircraft operation training base, YNPG ETEC

- **September 19, 2017:**

6. 3C and smart 110kV Huacheng Substation (of Green Substation Criteria)
7. 500kV Baofeng Substation (Demonstrative Substation)

- **September 20, 2017:**

8. ± 500 kV Yongren convertor station

- **September 21, 2017:** City Tour in Kunming

- **September 22, 2017:** Closing Ceremony

Note:

- All participants will arrive and check in hotel on September 10, 2017. Registration will be on September 10, 2017 and the training program will begin at 09:00 am on September 11, 2017.
- The entire program will be September 11-22, 2017.
- The training and communication program will be arranged 2.5 hours of lecture in the morning and 30 minutes for the discussion, and 2.5 hours of lecture in the afternoon and 1 hour for case study and discussion.

E. CONTACT

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