Competency Category 1 – Technical Competence		Overall Level: 3
Competencies		
1.1	Demonstrate knowledge of regulations, codes, standards, and safety - this includes local engineering procedures and practices as applicable	*1. Identify and comply with legal and regulatory requirements for project activities.* *2. Incorporate knowledge of codes and regulations in design materials.* *3. Prepare reports on standards and project compliance.* *4. Recognize the need to design for code compliance while achieving constructability*
1.2	Demonstrate knowledge of materials, or operations as appropriate, project and design constraints, design to best fit the purpose or service intended and address inter-disciplinary impacts.	*1. Have knowledge of plant layout and operations* *2. Preparation of technical specifications* *3. Coordination with equipment vendors and other discipline engineers.* *4. Demonstrate involvement with feasibility*

		studies
1.3	Analyze technical risks and offer solutions to mitigate the risks	*1. Demonstrate familiarity with system protection objectives, philosophies, and functions.* *2. Identify risk areas.* *3. Develop risk minimization plans.*
1.4	Apply engineering knowledge to design solutions.	*Note: Each example should demonstrate a different design solution or facet of your application of knowledge.* *1. Demonstrate an understanding of the engineering principles used in the application of computer design programs.* *2. Demonstrate use of theory and calculations to arrive at solutions.* *3. Demonstrate why a unique design solution could not be accomplished with a standard design solution* *4. Ability to calculate fault levels and select equipment to withstand the available fault current.* *5. Understanding ground currents and potential rise and designing grounding system that would protect life and property.* *6. Perform load calculations for sizing service*

		and distribution equipment including future provisions. *7. Design circuits and systems with consideration for efficiency and power quality.* *8. Using engineering principles, determine voltage level, transformation and distribution methods that provide the most economic and sustainable system.* *9. Understand source and cause of harmonics and methods used to minimize the effects of harmonics on the system.* *10. Design electrical control and protection schemes for transmission and distribution systems*
1.5	Be able to understand solution techniques and independently verify the results.	*1. Demonstrate an understanding of the engineering principles used in the application of computer design programs* *2. Perform Field Checks*
1.6	Safety awareness: be aware of safety risks inherent in the design; and Demonstrate Safety Awareness – on-site and possible safety authorization/certificate as appropriate	*1. Identify and use relevant safety procedures, processes, and equipment.* *2. Develop maintenance programs.* *3. Design test plans and equipment.*

		4. Implement inspection results. *5. Review and alter safety or system operating procedures when necessary.* *6. Demonstrate specific knowledge safety regulations.*
1.7	Demonstrate understanding of systems as well as of components of systems	*1. Demonstrate a working knowledge of the basic components of power generation -- Including: generators, switchgears, transformers, electronic drives, capacitors/reactors, voltage regulators, high and low voltage switches, cables/trays and conduits, overhead lines, protection and control equipment, fault protection/isolation devices and their coordination, specification of power grid interfaces, grounding systems.* *2. Manage processes within the overall system (monitor and, where needed, modify processes to achieve optimum outcomes)*
1.8	Exposure to all stages of the process/project life cycle from concept and feasibility analysis through implementation	*1. Demonstrate participation or exposure to all stages of the project life cycle:* *I **Identification**: generation of the initial project idea and preliminary design* *II **Preparation**: detailed design of the project addressing technical and operational aspects* *III **Appraisal**: analysis of the project from technical, financial, economic, social, institutional and environmental perspectives*

		*IV **Preparation of specifications and tender documents:** preparation of tender document, inviting and opening of tenders, pre-qualification, evaluation of bids and award of work* *V **Implementation and monitoring**: implementation of project activities, with on-going checks on progress and feedback* *VI **Evaluation**: periodic review of project with feedback for next project cycle.*
1.9	Understand the concept of quality control during design and construction including independent design check and independent reviews of design, field checks and reviews.	*1. Demonstrate peer review.* *2. Demonstrate completed project, systems or sub-systems meet project objectives.* *3. Participate in regular meetings and discussions with project members, both electrical and other disciplines, to ensure quality, scheduling, deadlines and budgeting are not compromised during both design and construction stages.* *4. Review designs, procedures and manuals to ensure design guide lines are adhered to.* *5. Consult with and seek input, including design and field review, from other project members throughout the project design and construction.* *6. Perform testing and commissioning upon completion of the product/project to ensure all design criteria, terms and conditions and applicable safety standards and regulations*

		have been met. 7. *Demonstrate understanding of ISO 9000.*
1.10	Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents**.**	*1. Demonstrate communication of ideas and concepts to project team members.* *2. Demonstrate produced design documents required minimum additional interaction with other designers, contractors and commissioning personnel.* *3. Demonstrate the value of project completion reports and lessons learned reports to application in future projects by self or others.* *4. Understand established and acceptable symbols and terminology used in preparation of design drawings.* *5. Create sketches, notes and documentation to prepare proposals, preliminary, and final design drawings for acceptance by the client and approval by regulatory authorities.*