

The background of the entire page is a photograph of high-voltage electrical transmission towers and power lines, overlaid with a dark red gradient. On the right side, there are several large, overlapping geometric shapes in white and dark red, creating a modern, abstract design.

GCC Lab
المفتبر الفليجي

GCC LAB Certified Power System Operator Program

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Glossary & Abbreviation

CD	:	Certification Division
CP	:	Certified Person
CS	:	Certification Surveillance
AGC	:	Automatic Generation Control
CEH	:	Continuing Education Hours
CPSO	:	Certified Power System Operator
GWA	:	General Weighted Average
ESO	:	Electrical System Operator
MENA	:	Middle East & North Africa
PSO	:	Power System Operator
SME	:	Subject Matter Expert
SOL	:	System Operating Limits
MTL	:	Maximum Transferrable Limits

Section 1: Introduction

Certified Power System Operator Scheme aims to improve the reliability of the Middle East & North Africa (MENA) electric Power grid/system operators' competencies in delivering critical duties and to manage system's challenges and abnormalities through a continued competency development program which is governed by GCC Lab Certification Division.

This certification scheme is designed for system operators, operations support staff, market operators and new engineers who are assigned to power control center and need to understand the basics of high voltage electric system operations. As to ascertain their competency of the fundamental knowledge in operating a power system during normal and emergency situations.

Section 2: Certification Objectives

Power System Operator Certification program will provide:

- Sound knowledge and capabilities of power system operations.
- An improved system reliability and recovery thru highly talented and knowledgeable system operators.

Section 3: Scope of Certification

The certification covers the core and fundamental knowledge areas and operation requirements that are applicable for power control center to monitor, operate and control the power network.

The Certification Scheme includes the following:

- Criteria for initial certification and re-certification.
- Assessment methods for initial and re-certification.
- Surveillance methods and criteria.
- Criteria for suspending and withdrawing certification.

The certification scheme cycle is a dynamic process and shall evolve based upon continual improvement and industry demands. Feedback for the Certification Scheme shall be collected thru communication with System Operators and inputs from the Advisory Committee (Steering Committee). This is to ensure that ongoing development reflects the needs and expectations of GCC region utilities market sectors.

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Section 4: Job and Task Description

The Certification Scheme is owned, governed, and managed by GCCLAB Certification Division (CD) where GCCLAB is committed to oversee the program by the following personnel:

Certification Scheme Manager

- Decides on certification application and related issues
- Spearheads the Certification Advisory Committee (Steering Committee).

Examination Committee

- Manages and administrates the exam working group.
- Hosts and provide the written and oral examinations.
- Shall comprise of competent examiner and/or Subject Matter Expert

Certification Surveillance Committee

- Suspends or withdraws system operator's certification.
- Reviews and audits system operator's profile, development, & CEH.
- Conducts surveillance for Certified Power System Operators.
- Shall comprise of at least Administrator & a member of Examination Committee

Administration

- Manages the certification process for application, fees, and awarding.
- Issues competence certificate to certified power system operators.

Subject Matter Expert

- Conducts technical interview to candidates.
- Shall have at least ten (10) years working experience in the power system operations.

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Section 5: Required Competence

Candidate shall possess a bachelor's degree in engineering and/or related field with a minimum of one (1) year work experience in electrical power systems (field operations or maintenance activities) and plans to develop his/her career in electrical power systems operations.

-or-

Field Electric System Operator (ESO) with a related diploma and with a minimum of six (6) years (including educational years) in electrical power system operations, dispatcher/system operator who operates from a control room for generation, transmission, and distribution.

Section 6: Certification Scheme Process and Description

For a candidate to be certified, he/she must undergo the certification phases as follow:

Phase#	Description
1	Submit Application Form and complete the Preparatory course
2	Document Review
3	Attend and pass the Written/Online Examination
4	Attend the Technical Interview
5	Evaluation
6	Awarding the certification
7	Maintenance, Renewal, Suspension & Withdrawal of Certification

Table 1: Certification Phase

Initial Certification (Phases 1 & 2)

If the applicant is applying for the first time, he/she shall accomplish the required application form (IMS-FO-42). Then he/she must attend and complete the preparatory course: (Refer to Appendix A for the complete preparatory course outline)

The preparatory course should be aligned and covers all the knowledge areas as follows:

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SN#	Knowledge Areas
1	Resource and Demand Balancing
2	Transmission Lines
3	Emergency Preparedness
4	Emergency Preparedness & Response
5	Contingency Analysis and Reliability
6	Communications and Data
7	Renewable Energy Sources Integration and Operations
8	Switching & Tagging

Table 2: Knowledge Areas

GCC Lab Certification Committee shall evaluate the effectiveness of the course attended by the applicant. Meeting this minimum requirement allows the applicant to be an eligible candidate to take the Power System Operator examination; otherwise, applicant cannot progress to competency assessment phase yet.

The applicant may re-apply and re-submit the application if he/she has met the minimum requirement within the span of one year after completing the preparatory course.

The Administration may request the applicant to submit pertinent records and documents as proof of eligibility, as needed.

Certification Test, Criteria and Awarding

The candidate must obtain a General Weighted Average (GWA) of 75% to be a Certified Power System Operator (CPSO).

Each Phase will be scored as follows:

Phase	Task	Grade Weight Distribution	Passing Grade
3	Technical Interview	110	83
4	Overall Score	20	10

Table 3: Assessment Score Criteria

In case the candidate failed Phase# 3, he/she can retake the test one month after the initial examination date. Two consecutive failures shall require the candidate to retake the preparatory course and resubmit his/her application.

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Phase# 3: Written Online Examination

The examination is comprised of 110 questions taken from the group of Knowledge Areas as mentioned above. The weight distribution of questions contained on the test are mentioned in Appendix A. Each question is categorized accordingly from Level I (Easy) to Level III (Hard). In this fundamental exam, 70% of the questions will come from Level I, 20% Level II and 10% from Level III. The questions are comprehensive in nature. The test will be a closed book examination.

Note: The result must be verified by Examination Committee after test completion.

Phase# 4: Technical Interview

After the candidate pass the written online exam, a Technical Interview is scheduled for two (2) hours session.

The interview can be done by:

- Face to Face either in GCC Lab premises or Candidate's working site
- Online through conferencing software

The Interview Panel should consist of:

- One member from Certification Surveillance Committee (Administrative)
- Subject-Matter-Expert (SME) from GCC Lab
- Subject-Matter-Expert (SME) from the field (when required)
- The Administration schedules the interview during working hours and/or as per agreed time of all concern personnel

The candidate will be assessed based on his/her rational responses on example scenarios for each attribute.

Attributes	Number of Questions
Resource & Demand Balancing	3
Transmission Lines	3
Emergency Preparedness & Response	4
Emergency Response	3
Contingency Analysis and Reliability	3
Communications and Data	2
Renewable Energy Sources	2
Switching and Tagging	3
TOTAL	20

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The questions during the interview could come either or both sources:

- Spontaneous questions from Subject-Matter-Expert (SME)
- From the group of knowledge areas as mentioned in Table 2-Knowledge Areas, Section 6

Phase# 5: Evaluation

After the candidate's interview, the results will be verified and further evaluated by Examination Committee.

The Examination Committee will prepare and forward the diagnostic report and recommendation to Administration for preparation and issuance of the Certificate.

The grade obtained by the candidate will be kept confidential, therefore, the diagnostic report and examination result will show only Pass or Fail for exam overall score.

The results for each topic on the online/written test and technical interview will show only the grade mark in the diagnostic report. Where:

Mark	Percentile
A+	95 - 100
A -	90 - 94
B+	85 - 89
B -	80 - 84
C	75 - 79
D	74 Below

Refer to Appendix D for sample of Diagnostic Report and Test Result

Phase# 6: Awarding the Certification

The validity starts on issue date of the certificate and shall be based on the last examination date with the conditions on meeting all requirements of the program scheme.

CPSO Certificate and ID will be issued and sent as soft copy to the official registered email of the certified candidate.

Certified Person may request the Administration for a hard copy of the Certificate and ID sent to the preferred mailing address.

Certified Person is required to sign and practice the Code of Ethics (IMS-FO-46) & Behavioral Policy (IMS-PO-06) prescribed by GCC Lab all throughout the certification cycle. Initial certificate is for free of charge, while recertification certificate is for a fee.

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Maintaining the Certification

After awarding the certificate, the Certified Person (CP) shall accumulate and achieve the required Continued Education Hours (CEH) and complete a Cycle Surveillance.

Continued Education Hours (CEH)

Certified Person shall maintain at least 15 Credit Score of Continued Education Hours annually. Below table shows different type of credits with corresponding credit score to allow CP to develop his/her competence and earn the required credit score in on certification cycle basis (3 years).

Continued Education Hours (CEH)	Number of Hours Training	Credit Score
Training Courses	8*	2
Simulation (Practical Course)	1	2
Write & share a lesson learn report (For everyone report)	NA	0.5

Note: 8 hours duration equivalent to 1-day training

The credited topics for training and simulation courses are listed in Appendix B.

Certification Surveillance (CS)

The Certification Surveillance (CS) date will be set according to the expiry date of the certificate and in coordination with the Certified Person (CP). The surveillance will be conducted once in the Certification Cycle (three years).

The Certification Surveillance Committee will send notification to CP at least three months before the end of certificate validity date.

Certified Person (CP) must submit the copy of all requirements to Certification Surveillance Committee one month before the date of Surveillance.

Certification Surveillance Committee will:

- Conduct review and assessment to CP's competence development in accordance with the continued education hours credits criteria.
- Verify achieved credits and documents submitted by CP.
- Issue validity notification based on maintaining the certification criteria.
- Issue non-conformity notification based on maintaining the certification criteria.

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Recertification

The validity of the certification is three (3) years. It is advisable that all existing Certified Person (CP) for recertification to ensure and maintain or exceed their competency level of knowledge demonstrated during the initial certification.

Certified Person is required to meet the following criteria:

- Complete the verification of Surveillance.
- Submit required Continued Education Hours (45 Credits in three years)
- Pay for the corresponding recertification fee.

Suspension of Certification

The following condition shall be a cause for suspension of the certification:

- Non-conformity with CEH credits.
- Non-completion of Certification Surveillance.
- Exceeding the given period to complete the required CEH credits and completing the Certification Surveillance.

In this case, the CP will be given a period of two months from the Certification Surveillance date to complete and submit the missing requirements.

Withdrawal of Certification

The following conditions will revoke the certification:

- Exceeding the given period to complete the required CEH credits and completing the Certification Surveillance.
- Any proven unethical behavior of this certification scheme program.
- Any proven misuse of the certification scheme program and/or branding.

Those whose certifications withdrawn due to first condition can be admitted again in the program, but he/she must re-apply as an initial certification.

And, for those whose certification withdrawn due to second and third conditions can apply again in the program after one (1) year from the date of removal. He/she must submit a "Letter of Reconsideration" address to Director of Certification for approval. If approved, he/she needs to apply the program again from initial certification.

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Appendix A: GCC Lab Certified Power System Operator (PSO) Exam Preparation Training Content Requirement

Certification Test, Criteria and Awarding

The following describe the topics for examination with weight distribution that a candidate shall go through as a preparation for certification test:

Knowledge Areas		%Weight
1	Resource and Demand Balancing	20
1.a	Reserves (spinning and non-spinning)	
1.b	Automatic Generation Control (AGC)	
1.c	Frequency	
1.d	Load Forecasting	
1.e	Generation Equipment	
2	Transmission	20
2.a	Protection and Control	
2.b	Voltage and Reactive	
2.c	Electrical Current	
2.d	Reconfiguration and Switching	
2.e	Operating Limits	
2.e	Transmission Equipment	
3	Emergency Preparedness	5
3.a	Current and Next-Day Planning	
3.b	Severe Weather, Natural Disasters, and Geomagnetic Disturbances	
3.c	Anticipated Capacity Deficiency	
4	Emergency Response	20
4.a	System Restoration	
4.b	Response to System Disturbances	
4.c	Response to Capacity Emergencies	
4.d	Response to Loss of Control Center	
4.e	Response to Loss of Analysis and Monitoring Tools	
5	Contingency Analysis and Reliability	15
5.a	Contingency Analysis	
5.b	Network Analysis Tools (e.g., State Estimators)	
5.c	Response to Results of Contingency Analysis	
5.d	System Operating Limits (SOL)	
5.e	Maximum Transferable Limits (MTL)	
6	Communications and Data	10
6.a	Reporting Requirements	
6.b	Communication Methods (e.g., Three-Part Communication)	
6.c	Data Validity and Verification	
6.d	Telemetry and Communications Equipment	
7	Renewable Energy Sources Integration and Operations	10
7.a	Integration of renewable energy sources to the grid	
7.b	Operating renewable energy sources	
7.c	Forecasting renewable energy sources generation	
8	Switching and Tagging	10
8.a	Switching on the electric power system	
8.b	Requirements of a hazardous energy control program	
8.c	Electric power system equipment configuration	
8.d	Electric power system substation control building functions	
8.e	Hazardous energy control (switching) on the electric power system	
Total		110

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Appendix B: GCCLAB Certified Power System Operator (PSO) Continued Education Hours Training Content Topics

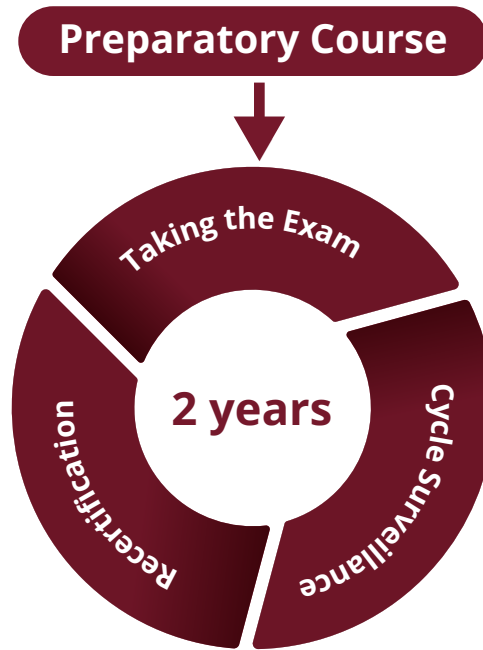
The training development program for CP would be different from one operator to another based on his strength and weakness. The program recommends CP to attend the suggested topics he/she got the lowest score in the diagnostic report.

- Below are the topics for CEH accreditation:
- Resource and Demand Balancing
- Transmission Line
- Emergency Preparedness
- Emergency Response
- Contingency Analysis and Reliability
- Communications and Data
- Grid Code
- Renewable Energy Sources Integration and Operations
- Switching and Tagging
- Cybersecurity in control room operations
- Market operations
- Renewable energy integration, operations, and forecasting
- Economic dispatch and unit commitment
- Load forecasting & generation planning
- Blackstart and system restoration
- Systems simulator training
- System and equipment Failures and operations matters
- Generation connection
- Psychological training for network operation crisis

Also, the program highly recommends the employer to use the result of the diagnostic report to prepare and plan the competency development map/plan of Certified Person (CP).

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Appendix C: GCC Certified Power System Operator (PSO) Certification Process Diagram



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Appendix D: GCC Lab Certified Power System Operator (PSO) Sample of Diagnostic Report & Test Result

GCCLAB Certification Division

Power System Operator (PSO)

Diagnostic Report and Test Result

Date :

Attention : Candidate Name
Email Address

Dear Candidate,

We are pleased /regret to inform you that you PASS / FAIL the Power System Operator (PSO) Certification.

The following shows the result of your examination in each category:

Examination	Topics	Score
Written/Online Test	Resource & Demand Balancing	A+
	Transmission Lines	A-
	Emergency Preparedness	B+
	Emergency Response	B-
	Contingency Analysis and Reliability	C
	Communications and Data	A+
	Renewable Energy Sources	C
	Switching and Tagging	D
Technical Interview	Not Applicable	B-

With the result above, we recommend attending to the topics you have obtained the lowest score.

Again, congratulations in passing the certification and being one of the Certified Power System Operators in GCC Region.

/ or /

Although you did not make it, we hope you continue pursuing your desire to become a Certified Power System Operator. You are very welcome to re-apply with the program.

Prepared by:

Reviewed by:

Approved by:

Regards,

GCCLAB Certification Committee