

# ERCOT Certification Prep

This online training series is designed for real-time system operating personnel who are required or desire to prepare for taking the ERCOT Certification Exam. The training course content includes:

- A review of the ERCOT Nodal Operating Guides
  - Sections – 2, 3, 4, 6, 7, & 11
- A review of the ERCOT Nodal Protocols
  - Section - 2
- A review of the ERCOT Fundamentals Manual
  - Sections – 2, 13, 15

Upon completion of this course, attendees receive a free subscription to the ERCOT TEST TRAK® program. Completion of ERCOT TESTTRAK® will reinforce material covered in the course and better prepare individuals for the testing experience!

This online course is intended for real-time system operators and support personnel who operate on the ERCOT system, are in direct communication with any ERCOT System Operator, or perform daily operations-related functions at the direction of the ERCOT System Operator during normal, emergency and/or system restoration situations.

The ERCOT Certification Prep Program includes the following online modules:

- ERCOT Fundamentals: Interconnected Operations
- ERCOT Fundamentals: Transmission Operations
- ERCOT Fundamentals: Mathematics
- ERCOT Fundamentals: Economic Operation
- ERCOT Nodal Op Guides: Section 2
- ERCOT Nodal Op Guides: Section 3
- ERCOT Nodal Op Guides: Section 4
- ERCOT Nodal Op Guides: Section 6
- ERCOT Nodal Op Guides: Section 7
- ERCOT Nodal Op Guides: Section 11
- ERCOT Nodal Protocols: Section 2

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The ERCOT Certification Prep Program includes the following modules:

## **Mod 1 - ERCOT Fundamentals: Interconnected Operations**

The module provides an overview to the ERCOT Fundamentals: Interconnected Operations. The module explains how the North American power system is configured and describes the role of NERC and ERCOT in promoting reliable system operations. The module explains how the many different electric systems in North America, and particularly those in ERCOT, work together to achieve that goal. The module describes how the North American power system is configured and also describes the role of the NERC and ERCOT in promoting reliable operation.

## **Mod 2 - ERCOT Fundamentals: Transmission Operations**

The module reviews the elements of the ERCOT Fundamentals: Transmission Operations. The introduces the ERCOT transmission system operation. Topics addressed include the ERCOT security (reliability) criteria, the switching process, and responding to transmission system outages. The module explores transmission system reliability criteria, explanation of the design and operating requirements, it outlines procedures and methods of the switching process, identifies the types of outages, and specifies Operator responses to various types of outages.

## **Mod 3 - ERCOT Fundamentals: Mathematics**

The module reviews elements of the ERCOT Fundamentals: Mathematics, in addition to other mathematics used in the Bulk Power System. It is intended to provide students with the basics of mathematics and the various situations that it may have to be utilized by System Operating Personnel. Topics covered in this module includes: basics of mathematics, use of mathematics in Balancing, uses of mathematics related to voltage control, mathematics and its use in operating the transmission system, and how mathematics could be used during restoration.

## **Mod 4 - ERCOT Fundamentals: Economic Operation**

The module reviews elements of the ERCOT Fundamentals: Economic Operation. This module briefly describes how to schedule and dispatch generating units for optimum system economy. The module starts by defining the different costs involved in producing power. Particular attention is paid to the concept of incremental cost. The module then describes how these costs are used to determine which units should be scheduled on-line and the generation levels at which on-line units should be dispatched.

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## **Mod 5 - ERCOT Nodal Op Guides: Section 2**

The module reviews elements of the ERCOT Nodal Op Guides: Section 2. The review focuses on the System Operations and Control Requirements for the ERCOT system. The module then describes Ancillary Services, Outage Coordination, and Reliability Unit Commitment. The Operating Guides then explore Under-Frequency and Over-Frequency conditions, System Voltages, DC Tie Operation, and the ERCOT Voltage Ride-Through requirements.

## **Mod 6 - ERCOT Nodal Op Guides: Section 3**

The module reviews elements of the ERCOT Nodal Op Guides: Section 3. The review focuses on ERCOT and Market Participant Responsibilities operating in the ERCOT system. The review identifies the responsibilities of the Qualified Scheduling Entities, Resource Entities, Transmission Service Providers, and Transmission Operators. In addition, the module covers elements related to compliance with dispatch instructions, changes in resource status, ancillary service qualifications, unit capability requirements, and load resource testing requirements. The module concludes with the requirements for reporting sabotage.

## **Mod 7 - ERCOT Nodal Op Guides: Section 4**

The module reviews elements of the ERCOT Nodal Op Guides: Section 4. The review focuses on ERCOT Emergency Operation. The review includes the following topics: Communications under Emergency Conditions, Maintaining Transmission System Security, Energy Emergency Alerts, and Load Shed Obligation. The module then explores Black Start Service, which includes, Principles, Strategies, Priorities, Responsibilities, and Back-up Communications. The module concludes with Geomagnetic Disturbances, and Responsive Reserve Service.

## **Mod 8 - ERCOT Nodal Op Guides: Section 6**

The module reviews elements of the ERCOT Nodal Op Guides: Section 6. The review focuses on Disturbance Monitoring and System Protection. The module first explores the Disturbance Monitoring Requirements that includes: Fault Recording and Sequence of Events, Phasor Measurement Recordings, Maintenance and Testing Requirements, and Equipment Reporting Requirements. The module then explores System Protective Relaying. It defines Design and Operating Requirements, Performance Analysis, Relay System Failure, and finally, Maintenance and Testing Requirements.

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## **Mod 9 - ERCOT Nodal Op Guides: Section 7**

The module reviews elements of the ERCOT Nodal Op Guides: Section 7. The review focuses on Telemetry and Communication. The module explores the ERCOT Wide Area Network and associated responsibilities of ERCOT and WAN Participants. It then defines the elements of ICCP and Telemetry. The modules identifies data flow between ERCOT and Market Participants and concludes with identification of calibration and Testing Responsibilities.

## **Mod 10 - ERCOT Nodal Op Guides: Section 11**

The module reviews elements of the ERCOT Nodal Op Guides: Section 11. The review focuses on Constraint Management Plans and Remedial Action Schemes. The module then proceeds with the identification of Remedial Action Schemes, Automatic Mitigation Plans, Remedial Action Plans, Mitigation Plans, Pre-Contingency Action Plans, and concludes with Temporary Outage Action Plan.

## **Mod 11 - ERCOT Nodal Protocols: Section 2**

The module reviews the elements of the ERCOT Nodal Protocols: Section 2. The review focuses of the Definitions and Acronyms associated with the ERCOT Protocols. The review begins with the definitions and concludes with Acronyms used.

## **ERCOT TEST TRAK™**

The ERCOT Certification Program concludes with the ERCOT TEST TRAK™. ERCOT TEST TRAK™ is an innovative tool from OES-NA designed for utilization in preparing for the ERCOT Certification Exam. TEST TRAK™ provides web-based activities that help system operators strengthen test taking skills and also provides them with the opportunity to gain knowledge and experience with answering questions based on the resources identified for development of the certification exam. ERCOT TEST TRAK™ offers the individual five opportunities to complete quizzes and tests in preparation for taking the ERCOT Certification exam.

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**ERCOT Certification Prep Cost:** \$1,400.00 (24.0 NERC Total CEHs)

**TOTAL:** 24.0 CEHs

**Standards:** 0.0 CEHs

**Ops Topics:** 24.0 CEHs

**Sim:** 0.0 CEHs

NOTE: Completion of ERCOT TEST TRAK™ is NOT a valid activity for NERC CEHs. All applicable CEHs are awarded for the successful completion of the ERCOT Certification Prep Course material.

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