



ITP Fall 2010 Schedule

Week 1

9/27 GT	9/28 GT	9/29 GT	9/30 GT	10/1 GT
FS (Intro to PJM)	<u>FS Quiz</u>	<u>FC Quiz</u>	<u>GU Quiz</u>	<u>GC Quiz</u>
FC (Comm)	FC GU (Gen Plant)	GU	GC (Gen Control)	LS
FC	GU	GU	GC LS (Load Schedule)	LS

Week 2

	10/4 GT	10/5 GT/T	10/6 T	10/7 T	10/8 T
0800	<u>LS Quiz</u>	GT - AM	<u>T EM Quiz</u>	<u>TF Quiz</u>	TO
1145	EM (Markets)	EM	TF	TO (Trans Operations)	
1245	EM	<u>G EM Quiz</u> G out 2:30pm	TF	TO	TO
1600		T Only - TF (Substation Equipment)			

Week 3

	10/18 T	10/19 T	10/20 T	10/21 T	10/22 T
0800	NO CLASS	<u>TO Quiz 1</u>	<u>TO Quiz 2</u>	<u>TO Quiz 3</u>	
1145		TO	TO	RA (Relay Application)	RA
1245	NO CLASS	TO	TO	RA	RA
1600					

Week 4

	10/25 T/GT	10/26 GT	10/27 GT	10/28 GT	10/29
0800	<u>T only AM</u>		<u>RE Quiz</u>		
1145	<u>RA Quiz</u>	RE	SR	SR	
1245	TO (Sims)				
1600	<u>G/T 1 PM</u>	SR	SR	<u>SR Quiz</u>	
	RE (Emer Ops)	SR (System Restoration)		Wrap-up Eval	

DAILY HOURS: MORNING: 0800 TO 1145 AFTERNOON 1245 TO 1600

G = Generation Track: 11 days of classroom instruction, mods FS, FC, GU, GC, LS, EM, RE, SR

Generation Track NERC CEH credits: Operating topics and EOP: 97.0 CEH, Simulations: 4.0 CEH

T = Transmission and Interchange – Standard Track: 18 days of classroom instruction all modules

Trans/Standard Track NERC CEH credits: Operating topics and EOP: 154.0 CEH, Simulations: 9.0 CEH



Interconnection Training Program Overview, Modules

This comprehensive and intensive 4-week instructor-led training program is designed for those new to system operations. Attendees must complete a self-study module on basic electricity fundamentals prior to classroom work. The ITP is offered as a standard track (18 days) and a generation track (11 days limited to the core topics required by generation operators). The ITP is typically offered twice a year by the PJM Member Training staff. It is typically delivered at PJM's offices.

Organized in modules, the training is based on North American Electric Reliability Corporation (NERC) and PJM operating standards and policies. Topics covered include AC electrical principles, electric production, transmission, interconnected operations, emergency procedures and PJM markets. The ITP must be completed within two years of assignment to participate in real time operations in the PJM RTO.

ITP modules are approved for NERC continuing education credits known as Continuing Education Hours (CEH). All ITP modules are approved for the CEH category of Operating Topics, and select modules are also approved for the subcategory of Simulation. Identified ITP modules can also contribute to satisfying the NERC annual 5 day (32 hour) Emergency Operations Preparedness (EOP) requirement.

Following the ITP module descriptions is a generic version of the ITP session schedule of classroom modules. The schedule for actual sessions may vary due to PJM designated holidays. The topics addressed each day are denoted by the module's acronym. The days of attendance required by the standard and generation tracks are designated respectively by a **T** and/or **G** and are summarized at the bottom of the page.

Module Descriptions

Module FE:	Fundamentals of Electricity Principles Refresh
Overview:	A self-study review and refresh of basic electrical principles as they apply to bulk power systems. The trainee completes five lessons and passes five quizzes and a final exam. This module or equivalent needs to be completed within 18 months before attending the ITP Classroom Modules. The FE requirement is waived if the ITP candidate has earned a bachelor's degree in Electrical Engineering (BSEE).
Hour:	28 CEH
Mode:	Self Study



Module FS:	Introduction to the PJM System
Overview:	First, an introduction to the program including its purpose and requirements. Second an orientation to the PJM Organization, governance and operation; and the PJM RTO including major features and neighboring systems. Also, there is a brief orientation to the PJM System Operator Certification Program.
Hours:	2 CEH
Module FC:	Communications and Crew Resource Management
Overview:	Orientation to communication protocols required by NERC and PJM stressing the importance of three part Communications. Also, discussed are the principles and application of Crew Resource Management.
Hours:	6.5 CEH, 6.5 EOP
Module GU:	Generating Units
Overview:	Orientation to the generator, its electrical characteristics, and an overview of the major types of generating units: fossil steam, nuclear, hydro, combustion turbines and combined cycle.
Hours:	9 CEH, 9 EOP
Module GC:	Generation Control
Overview:	An orientation to power system control to balance generation and load, Area Control Error (ACE), and methods of system control.
Hours:	6.5 CEH, 6.5 EOP
Module LS:	Load Scheduling
Overview:	An orientation to the tools and techniques used to economically schedule generation to meet load and reserve requirements, report equipment outages and reductions, and determine the production and scheduling rates for a generation unit.
Hours:	10 CEH, 10 EOP
Module EM:	PJM Markets
Overview:	This module includes an orientation to the markets and ancillary services, Locational Marginal Pricing (LMP) and the rules related to bidding and scheduling of generation resources in the Day Ahead and Real Time markets. Also covered are OASIS and transmission service.
Hours:	13 CEH, 13 EOP



- Module TF: Transmission Substation Facilities
Overview: Orientation and examination of the major pieces of equipment which comprise the transmission system. Discussed are the function, construction, application and limitations of lines and cables, transformers, phase angle regulators, switchgear, capacitors and reactors.
Hours: 10 CEH, 10 EOP
- Module TO: Transmission Operations
Overview: Key topics in this module include principles of transmission operations, distribution factors, and limits used to insure reliable operation of the transmission system. Also addressed are methods available to a system operator for control of real and reactive power, and voltage control. Additional topics include scheduling of transmission outage procedures.
Hours: 37 CEH, 5 Simulation, 37 EOP
- Module RA: Relay Applications
Overview: This module provides and orientation to the principles of operation and types of relay devices and their application in relay schemes for line, substation, and generator protection.
Hours: 13.5 CEH, 13.5 EOP
- Module RE: Responding to Generation and Transmission Emergencies
Overview: This module focuses on responding to generation and transmission emergency procedures. Generation aspects include procedures employed within PJM during periods of reserve shortages, heavy loads, and light load. Transmission aspects include load relief procedures, and conditions of under and over voltages. Also discussed are conservative operation and mutual assistance with neighboring systems.
Hours: 7.5 CEH, 7.5 EOP
- Module SR: System Restoration Primer
Overview: An orientation to the principles of system restoration and their application in total and partial system shutdowns. Topics include causes and processes of blackouts, transmission restoration and reserves during restoration. During this module trainees will have the opportunity to participate in small group PC based restoration simulation exercises.
Hours: 16 CEH, 4 Simulation, 16 EOP