



**Transmission Owner Operator
Certification Examination Content Outline**

Content Area	# of Questions
I. Real-Time Operations	39
Electrical theory	
Frequency and Area Control Error (ACE)	
Transmission and generation equipment	
Voltage limits	
Thermal limits	
Stability limits	
Interconnected reliability operating limits (IROL)	
Unit reactive capability (e.g. D-curve)	
Actual and post-contingency flows	
Equipment failure	
Relaying protection and control	
Voltage control and voltage schedules	
Transmission switching	
Protocols for switching	
Coordination with neighboring utilities	
Effects of weather on system operations	
Operations reporting	
Reactive Reserve Check (RRC) and Supplemental Status Report (SSR) data	
Reporting changes in equipment ratings	
Reporting system events to PJM and government agencies	
Verbal communication of directives and operating instructions	
II. Emergency Operations	26
Capacity shortages and light-load conditions	
Low-voltage and high-voltage conditions	
Conservative operations (e.g. severe weather, GMDS, terrorism, sabotage)	
Post-contingency local load relief warnings (PCLLRW)	
Load Shedding	
System disturbances (e.g. synchronous reserves, loss of facility, d-fax)	
Loss of control center functionality	

Content Area	# of Questions
III. System Restoration	14
Selection of system restoration method	
System assessment for generation and transmission	
Identification of black-start units (e.g. cross-zonal coordination)	
Identification of critical loads and priority loads	
Types of restoration methods	
Implementation of system restoration method	
Syncing with islands and neighbors	
Synchronous and dynamic reserves (e.g. UFLS)	
Frequency and tie-line control	
Reporting progress of restoration	
Cranking paths	
EHV minimum source requirements	
Transferring of control to PJM	
IV. Operations Planning and Scheduling	5
Scheduled Outage Notifications	
eDART	
Coordination with other affected companies	
Timelines	
Reporting criteria	
V. Computer and Telecommunication Systems	6
Computer equipment	
Integrity and quality of data and data links	
Security analysis	
Data requirements	
Scheduling work on data systems	
Telecommunications equipment	
PJM All-call	
Satellite phones	

Note. The PJM Transmission Operator certification examination consists of 110 exam question. 90 of those questions contribute to an examination candidate’s score and are selected according to the above content sampling. The remaining 20 questions do not contribute to a candidate’s score and may not reflect the same distribution as the scored questions.