EAST KENTUCKY POWER COOPERATIVE, INC.

EKPC Emergency Electric Procedures

EKPC's Emergency Electric Procedures are based on the following NERC Emergency Operations Standards:

- EOP-001 Emergency Operations Planning
- EOP-002 Capacity and Energy Emergencies
- EOP-003 Load Shedding Plans
- EOP-005 System Restoration Plans

Definitions

Transmission Operator (and Balancing Authority) - EKPC
Reliability Coordinator - TVA
Regional Reliability Organization – SERC

Overview

The Balancing Authority and the Reliability Coordinator have the responsibility and clear decision-making authority to take whatever actions are needed to ensure the reliability of its respective area and to exercise specific authority to alleviate capacity and energy emergencies. The Balancing Authority will implement its capacity and energy emergency plan, when required and as appropriate, to reduce risks to the interconnected system. The Balancing Authority experiencing an operating capacity or energy emergency will communicate its current and future system conditions to the Reliability Coordinator and neighboring Balancing Authorities.

When the Balancing Authority anticipates an operating capacity or energy emergency it will perform all actions necessary including bringing on all available generation, postponing equipment maintenance, scheduling interchange purchases in advance, and being prepared to reduce firm load. If the Balancing Authority is deficient it will only use the assistance provided by the Interconnection's frequency bias for the time needed to implement corrective actions.

The Balancing Authority will not unilaterally adjust generation in an attempt to return Interconnection frequency to normal beyond that supplied through frequency bias action and Interchange Schedule changes. Such unilateral adjustment may overload transmission facilities. If the Balancing Authority cannot comply with the Control Performance and Disturbance Control Standards, then it will immediately implement remedies to do so.

A Reliability Coordinator that has any Balancing Authority within its Reliability Coordinator Area experiencing a potential or actual Energy Emergency will initiate an Energy Emergency Alert as detailed in EOP-002-0 "Energy Emergency Alert Levels." The Reliability Coordinator will act to mitigate the emergency condition, including a request for emergency assistance if required.

Measures

The Transmission Operator (and Balancing Authority) has emergency plans and self-assessments available for review by the Regional Reliability Organization. The Regional Reliability Organization reviews and evaluates emergency plans every three years to ensure that the plans are complete and may elect to request self-certification of the Transmission Operator and Balancing Authority in years that the full review is not done.

Each Reliability Coordinator and Balancing Authority has and provides upon request evidence that includes job descriptions, signed agreements, authority letter signed by an appropriate officer of the company, or other equivalent evidence that confirms that it meets NERC requirements.

If the Reliability Coordinator or Balancing Authority implements its Capacity and Energy Emergency plan, that entity has and provides upon request evidence that includes operator logs, voice recordings or transcripts of voice recordings, electronic communications, computer printouts or other equivalent evidence that will be used to determine if the actions it took to relieve emergency conditions were in conformance with its Capacity and Energy Emergency Plan.

Insufficient Generating Capacity

The steps for mitigation of operating emergencies for insufficient generating capacity are:

1. Load all available generating capacity
2. Deploy all available operating reserve
3. Interrupt interruptible load and exports
4. Request emergency assistance from other Balancing Authorities
5. Declare an Energy Emergency through the Reliability Coordinator
6. Reduce load through procedures such as public appeals, voltage reductions, or curtailment of interruptible loads and firm loads

EAST KENTUCKY POWER COOPERATIVE, INC.

Once the Balancing Authority has exhausted these steps or if these steps cannot be completed in sufficient time to resolve the emergency condition, the Balancing Authority shall:

1. Manually shed firm load without delay to return its ACE to zero
2. Request the Reliability Coordinator to declare an Energy Emergency Alert

All Emergency Electric Procedures consider:

1. Communication protocol
2. Controlling actions
3. Coordination with adjacent Transmission Operators and Balancing Authorities
4. Staffing levels

Elements addressed in Insufficient Generating Capacity Emergency Electric Procedures are:

1. Fuel supply and inventory - recognition of reasonable delays or problems in the delivery or production of fuel
2. Fuel switching - for units for which fuel supply shortages may occur
3. Environmental constraints - seek removal of environmental constraints for generating units
4. System energy use - reduction of the system's own energy use
5. Public appeals - through all media for voluntary load reductions and energy conservation
6. Load management - implementation of load management and voltage reductions
7. Optimize fuel supply - operation of generating sources to optimize the availability
8. Appeals to customers to use alternate fuels - appeals to large industrial and commercial customers to reduce non-essential energy use and maximize the use of customer-owned generation that rely on fuels other than the one in short supply
9. Interruptible loads - interrupt customer load to reduce capacity requirements or to conserve the fuel in short supply
10. Maximizing generator output and availability - operation of all generating sources to maximize output and availability
11. Notification of IPPs - cogeneration and other power producers, to maximize output and availability
12. Requests of government - to implement programs to achieve energy reductions
13. Load curtailment - mandatory load curtailment plan to use as a last resort
14. Notification of government agencies - as the various steps of the emergency plan are implemented

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15. Notifications to operating entities - as steps in emergency plan are implemented

Transmission System Operating Emergencies

The Transmission Operator (and Balancing Authority) develops, maintains, and implements a set of plans to mitigate operating emergencies. These plans are coordinated with other Transmission Operators, Balancing Authorities, and the Reliability Coordinator. Balancing Authorities have operating agreements with adjacent and remote Balancing Authorities that contain provisions for emergency assistance.

The Transmission Operator has an emergency load reduction plan for all identified Interconnection Reliability Operating Limits (IROLs). The plan includes the details on how the Transmission Operator will implement load reduction in sufficient amount and time to mitigate the IROL violation before system separation or collapse occurs. The Transmission Operator and Balancing Authority emergency plans include:

1. Communications protocols to be used during emergencies
2. A list of controlling actions to resolve the emergency
3. Load reduction, in sufficient quantity and within established timelines
4. Tasks to be coordinated with and among adjacent Transmission Operators and Balancing Authorities
5. Staffing levels for the emergency

The Transmission Operator (and Balancing Authority) annually reviews and updates each emergency plan and provides a copy of its updated emergency plans to the Reliability Coordinator and to neighboring Transmission Operators and Balancing Authorities.

The Transmission Operator (and Balancing Authority) coordinates its emergency plans with other Transmission Operators and Balancing Authorities as appropriate. This coordination includes the following steps:

1. Establish and maintain reliable communications between interconnected systems
2. Arrange new interchange agreements to provide for emergency capacity or energy transfers if existing agreements cannot be used
3. Coordinate transmission and generator maintenance schedules to maximize capacity or conserve the fuel in short supply
4. Arrange deliveries of electrical energy or fuel from ~~remote systems through~~ normal operating channels

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Load shedding

After taking all other remedial steps, the Transmission Operator and Balancing Authority, operating with insufficient generation or transmission capacity, will shed customer load rather than risk an uncontrolled failure of components or cascading outages of the Interconnection. Coordination of load shedding would take place between the Transmission Operator (and Balancing Authority) and other interconnected Transmission Operators and Balancing Authorities. Implementation of manual load shedding takes into consideration frequency, rate of frequency decay, voltage level, rate of voltage decay, and power flow levels. The Transmission Operator (and Balancing Authority) would implement load shedding in steps established to minimize the risk of further uncontrolled separation, loss of generation, or system shutdown.

After the Transmission Operator (and Balancing Authority) separates from the Interconnection, if there is insufficient generating capacity to restore system frequency following automatic underfrequency load shedding, the Transmission Operator (and Balancing Authority) would shed additional load. The Transmission Operator (and Balancing Authority) coordinates automatic load shedding throughout its area with underfrequency isolation of generating units, tripping of shunt capacitors, and other automatic actions that occur under abnormal frequency, voltage, or power flow conditions. Each Transmission Operator and/or Balancing Authority has plans for operator-controlled manual load shedding to respond to real-time emergencies.

System restoration

The Transmission Operator has a restoration plan to reestablish its electric system in a stable and orderly manner in the event of a partial or total shutdown of its system including necessary operating instructions and procedures to cover emergency conditions and the loss of vital telecommunications channels.

The Transmission Operator reviews and updates its restoration plan annually and whenever it makes changes in the power system network, and corrects deficiencies found during the simulated restoration exercises. The Transmission Operator coordinates its restoration plans with the Generator Owners and Balancing Authorities within its area, its Reliability Coordinator, and neighboring Transmission Operators and Balancing Authorities.

The Transmission Operator (and Balancing Authority) periodically tests its telecommunication facilities needed to implement the restoration plan and trains its

operating personnel in the implementation of the restoration plan. This training includes simulated exercises and verification of the restoration procedure by actual testing and simulation.

During system restoration, affected Transmission Operators and Balancing Authorities work in conjunction with their Reliability Coordinator(s) to determine the extent and condition of the isolated area(s). The affected Transmission Operators and Balancing Authorities take the necessary actions to restore Bulk Electric System frequency to normal, including adjusting generation, placing additional generators on line, or load shedding.

The affected Balancing Authorities, working with their Reliability Coordinator(s), immediately review the Interchange Schedules between those Balancing Authority Areas or fragments of those Balancing Authority Areas within the separated area and make adjustments as needed to facilitate the restoration. The affected Balancing Authorities make all attempts to maintain the adjusted Interchange Schedules, whether generation control is manual or automatic. The affected Transmission Operators may resynchronize the isolated area(s) with the surrounding area(s) when the following conditions are met:

1. Voltage, frequency, and phase angle permit
2. The size of the area being reconnected and the capacity of the transmission lines effecting the reconnection and the number of synchronizing points across the system are considered adequate
3. Reliability Coordinator(s) and adjacent areas are notified and Reliability Coordinator approval is given
4. If required, load is shed in neighboring areas to permit successful interconnected system restoration

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