Emergency Grid Service Proposal

3 Feb 2023
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# Background Information

The following material provides context for emergency conditions and requests for emergency response from system participants.

## NERC Definitions

NERC definition of Emergency: Any abnormal system condition that requires automatic or immediate manual action to prevent or limit the failure of transmission facilities or generation supply that could adversely affect the reliability of the Bulk Electric System.

NERC definition of Energy Emergency: A condition when a Load-Serving Entity or Balancing Authority has exhausted all other resource options and can no longer meet its expected Load obligations.

## SPP Energy Emergency Alerts

<https://spp.org/documents/66184/spp%20emergency%20communications%20and%20operations%20procedures%20-%20dec.%2010%202021%20public%20session.pdf>

Energy Emergency Alert Level 1: Declared when all available resources have been committed to meet obligations, and SPP is at risk of not meeting required operating reserves. Entities operating behind-the-meter generation should contact the SPP BA regarding capabilities and availability.

EEA Level 2: Declared when SPP can no longer provide expected energy requirements and is an Energy Deficient Entity, or when SPP foresees or has implemented procedures up to, but excluding, interruption of firm load commitments. Entities operating behind-the-meter generation are expected to be on-line, if available. Entities with non-firm load shed capabilities can expect curtailments to be implemented by their Transmission Operator.

EEA Level 3: SPP is utilizing operating reserves such that it is carrying reserves below the required minimum and has initiated assistance through the Reserve Sharing Group. Declared when SPP foresees or has implemented firm load obligation interruption. Before requesting an EEA 3, SPP will have already provided the appropriate internal notifications to its Market Participants. Entities operating behind-the-meter generation are expected to be on-line, if available. Entities with non-firm load shed capabilities can expect curtailments to be implemented by their Transmission Operator.

EEA Level 3 Controlled Service Interruption: SPP deems it necessary to direct controlled service interruptions to balance region-wide demand with available generation and prevent uncontrolled outages.

## CASIO Notifications

<http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf>

Energy Emergency Alert 1: Real-time analysis shows all resources are in use or committed for use, and energy deficiencies are expected. Market participants are encouraged to offer supplemental energy and ancillary service bids. Consumers are encouraged to conserve energy.

Energy Emergency Alert 2: ISO requests emergency energy from all resources and has activated its emergency demand response program. Consumers are urged to conserve energy to help preserve grid reliability.

Energy Emergency Alert 3: ISO is unable to meet minimum contingency reserve requirements and has asked utilities to prepare for the possibility of rotating power outages.

Energy Emergency Alert 3 − Firm Load Interruption: ISO energy supply is not able to meet demand which directs utilities to initiate controlled rotating power outages in accordance with their emergency plan.

## PJM Emergency Operations

<https://www.pjm.com/~/media/documents/manuals/m13.ashx>

Generation Owners: • Reporting the operating status and resource limitations. • Canceling, or recall of, Generator testing and maintenance. • Canceling GMS/EMS Database or communication link testing and maintenance. • Reducing non-critical plant load. • Reducing non-essential office load. • Directing personnel to unattended generation sites. • Increase/Decrease generation output in alignment with PJM redispatch. • Starting, including black-start, and loading such generation, as directed. • Increasing output to Maximum Emergency generation. • Reducing output to Emergency Minimum Generation. • Shutting down such generation. • Interrupting sales for delivery to loads outside the PJM RTO. • Selling energy to other control areas. • Maintaining records of emergency actions taken and the results achieved.

Transmission and Distribution Providers: • Canceling, or recall of, Transmission testing and maintenance. • Transmission system reconfiguration. • Canceling EMS Database or communication link testing and maintenance. • Maintaining under frequency load shedding relays. • Providing capability for manual shedding of specified amounts of load. • Reducing energy purchases (DP only). • Reducing non-essential office load. • Implementing voltage reductions. • Requesting voluntary customer energy conservation or load curtailment. • Implementing manual load shed, looking to minimize overlap with automatic Under Frequency Load Shedding (UFLS), and capable of being implemented in a timeframe adequate for mitigating the Emergency. • Managing, curtailing, or interrupting load, including PJM programs such as Load Management (LM) or other Load Reduction Programs. • Maintaining records of Emergency actions taken and the results achieved.

# Observations

* Emergencies are abnormal system operating conditions where normal service agreements in place are inadequate to maintain reliable system operating conditions.
* The services requested are under extraordinary circumstances. While some can be up in place ahead of time, they are non-elective except for early-alert-level voluntary load reduction calls to the public.
* The NERC definition of emergency (energy or otherwise) is high level, while the ISOs need to carefully define levels and operating procedures so that participants understand the criteria for calling a level and their responsibilities.
* The services themselves appear to be covered by the common grid service types: Energy Grid Service (schedules emergency energy from providers), Reserve Grid Service (calls on resources to use emergency capacity levels beyond normal reserve agreement), Blackstart Grid Service to see that blackstart resources are available and energized in the event of restoration. Even load-shed can be considered a reserve grid service where the LSE or distribution operator communicates the load electrical and timing attributes, though it is only called upon in emergency situations. The criteria for calling on the services is carefully specified, but that is not part of the grid service definitions per se.
* There are some differences in types of resources being called upon in an emergency where the existing material is not resource agnostic. For example, generators are asked to go beyond normal to emergency limits or to shut down. Loads are curtailed or shed. Wording could be done to make these read more resource agnostic.
* Servicing emergency conditions is real and cannot be ignored. However, defining an emergency grid service does not seem to offer something obviously different beyond the common grid services already defined. It seems to relate more closely to operational objectives that use one of the other six common grid services.

# Proposal

Create a section in the standard that recognizes emergency conditions. Define those conditions using the material from the NERC definitions and the ISO examples. Explain that while extraordinary circumstances, the basic requests of the service providers fall into the six common grid service types, primarily energy, reserve, and blackstart grid services. Some proposed wording follows with the intent to spur discussion and arrive at a resolution in the standard efficiently.

xxx-8 **Emergency Situations**

System operating organizations recognize that emergency situations require extraordinary actions to preserve and restore the health and integrity of the electric system. Emergency operating procedures are spelled out by each operating organization and comprise emergency alerts or notifications as well as emergency operating procedures. The responsibilities of SOs, SPs, and other participants are identified in these procedures.

This standard recognizes that the coordination of resources under emergency conditions requires agreements on operating policy. However, from a grid service perspective, the coordination falls into one or more of the common grid service definitions already described. The fact that the service is called upon in an emergency situation explains the operational objective for the service but does not change its basic definition or format of electrical and timing attributes.