

**NERC**

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# BAL-012-1 - Operating Reserve Policy Standard Background Document

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**RELIABILITY | ACCOUNTABILITY**



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## Introduction

This document provides background on the development of BAL-012-1, Operating Reserve ~~Policy~~ ~~Planning~~ (ORP) proposed standard. The intent is to explain the rationale and considerations for the requirements and their associated compliance information.

The original Standards Authorization Request (SAR) directed the drafting team to consider the following directives ~~points~~ from FERC Order 693:

- Include a continent-wide Contingency Reserve policy, which should include uniform elements (definitions and requirements).
- Include a requirement that explicitly provides that Demand Side Management (DSM) may be used as a resource for Contingency Reserves.
- Recognizes the loss of Transmission, as well as generation, thereby providing a realistic simulation of possible events that might affect the Contingency Reserves.

This standard was developed to require a Balancing Authority (BA) or, as appropriate, Reserves Sharing Group, Regulation Reserve Sharing Group, Frequency Response Sharing Group (responsible entities) to develop and document ~~policies~~ ~~plans~~ that will detail its appropriate mix of Operating Reserves. Each responsible entity's policies ~~plan~~ will detail the specific amounts of Operating Reserves based on the responsible entity's Load characteristics and magnitude, topology, and mix of resources available to the responsible entity in the region, ~~and~~ to ensure adequate Regulating Reserve (RR), Contingency Reserve (CR), and Frequency Responsive Reserve (FRR) to maintain Balancing Authority Load/resource balance in support of Interconnection frequency.

Formal reserve planning has been considered for a long time by the operating entities under NERC, going back to Policy 1. NERC Policy 1 required, "The minimum reserve requirement for the group, its allocation among members, the permissible mix of Operating Reserve – Spinning and Operating Reserve – Supplemental (non-spinning) that may be included in Contingency Reserve, and the procedure for applying Contingency Reserve in practice, and the limitations, if any, upon the amount of interruptible Load that may be included." BAL-012-1 takes the planning for Operating Reserves and divides them into the individual components to provide visibility and accountability.

Operating Reserves are an absolute requirement to maintain a reliable Interconnection. It is important that all responsible entities ~~BAs~~ have policies ~~long-range plans~~ for Operating Reserves to allow arrangements in terms of contracts, agreements, and testing to meet their long-range forecasts. Requiring responsible entities ~~BAs~~ to develop these Operating Reserve policies ~~plans~~ will identify gaps and will require the responsible entities ~~BAs~~ to resolve these gaps. For example, some of the responsible entities ~~BAs~~ may not have the necessary data on their units to

allow them to project the required amount of unit headroom needed to provide a level of Frequency Responsive Reserve (FRR). Some responsible entities~~BAs~~ may determine after testing that their system does not have the ability to provide the required FRR or the economics may force them to consider alternatives; such as purchasing FRR from other responsible entities~~BAs~~ or customers.

Each responsible entity's~~BA's~~ different system characteristics will necessitate that the policies~~plans~~ will be different and, therefore, a one-size fits all Operating Reserve standard was discussed, but dismissed by the standard drafting team as unworkable. The team decided to make a general framework that would instruct that each responsible entity~~BA~~ will develop a plan that meets the requirements of its~~their~~ particular area. The team also discussed that a new type of Reserve Sharing Group or Frequency Response Sharing Group, may become necessary when BAL-003-1 becomes an approved standard. Historically, many BAs have formed Contingency Reserve Sharing Groups to comply with BAL-002-0. Some BAs may choose to form a Frequency Response Sharing Group to achieve compliance with BAL-003-1.

Note that while Requirements R1, R3, R5, R7 and R8 each require a policy document to be developed by the responsible entity, there is no preclusion of all of the policies being placed into one document.

## Background and Rationale by Requirement

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### Requirement 1

**R1.** Each responsible entity ~~Balancing Authority~~ shall ~~have a, once each calendar year, with no more than 15 calendar months between intervals,~~ document ed its annual plan for Regulating Reserve ~~policy~~ used to manage the Balancing Authority's Area Control Error (ACE) addressing each of that includes at least the following:

- 1.1. The method for determination of the responsible entity's ~~Balancing Authority's~~ regulating needs ~~margin~~.
- 1.2. The types of resources and the portion of their capacity that can be made available for regulation ~~included in the regulating margin~~.
- ~~1.3. The control of supply and demand resources; such as generators, controllable loads, and energy storage devices.~~
- 1.3.4. Consideration of t ~~The incorporation of~~ energy exports and imports ~~by entities within the Balancing Authority Area and~~ with other responsible entities ~~Balancing Authorities~~, including an assessment of the ability of the resources within the responsible entity ~~Balancing Authority's resources~~ to meet the net-ramping requirement associated with these transactions.

- ~~1.45. A prohibition against counting toward the responsible entities The characteristics: Such as capabilities, constraints and volatilities, of the regulating resources operating inside the Balancing Authority Area.~~
- ~~1.6. The characteristics: Such as capabilities, constraints and volatilities, of the Load operating inside the Balancing Authority Area.~~
- ~~1.7. The exclusion of any shared portions of regulating needs any capacity which is resources already included in another responsible entity's Balancing Authority's Regulating, Contingency, or Frequency Responsive Reserve ~~policy~~ plans.~~
- 1.5. A review of the responsible entity's Regulating Reserve for the operating time horizon.
- 1.6. The ability of the responsible entity's System Operator(s) to determine, on at least an hourly basis, that the responsible entity has sufficient Regulating Reserve.
- 1.7. How depleted Regulating Reserves will be restored in a timely manner.

### ***Background and Rationale***

Requirement R1 is intended to ensure that each responsible entity ~~BA~~ has a documented policy ~~plan~~ to carry sufficient Regulating Reserves to be able to balance supply and demand within responsible entity's area ~~their BA Area~~, as required by BAL-001-1. In addition, each responsible entity's BA's policy ~~plan~~ for Regulating Reserves must account for their individual systems requirements due to ~~differences in~~ size, ~~as well as differences in~~ types of resources and Load characteristics that may be unique to their particular responsible entity area ~~BA Area~~.

### **Requirement 2**

- R2. Each Responsible Entity shall implement, in a manner that identifies, assesses, and corrects deficiencies, a Regulating Reserve policy identified in Requirement R1.

### ***Background and Rationale***

Requirement R2 requires responsible entities to implement a process for identifying deficiencies with adherence to their documented Regulating Reserve policy. The process must identify potential deficiencies, and assess and correct the identified deficiencies, because every process has improvement opportunities and also any deficiencies that are found external to the process (e.g. during an audit by the CEA or through an internal audit) must be evaluated to determine whether the process needs changes. If an entity determines that no changes are needed, the entity must demonstrate that no changes to the process are necessary to address the deficiencies that were found external to the process. This ensures that the entity is evaluating their Regulating Reserve policy, and eliminates the need for the entity to report each deficiency as a potential violation.

## Requirement 32

~~R32.~~ Each responsible entity~~Balancing Authority and Reserve Sharing Group~~ shall have a ~~once each calendar year, with no more than 15 calendar months between intervals,~~ document ed its annual plan for Contingency Reserve policy that includes at least~~used to recover from Balancing Contingency Events addressing each of~~ the following:

~~32.1.~~ The method for determination of the responsible entity's~~Balancing Authority's or Reserve Sharing Group's~~ Contingency Reserve needs~~margin~~.

~~32.2.~~ The types of resources and the portion of their capacity capable of reducing the Balancing Authority's Area Control Error in response to each of the following:

~~32.2.1.~~ A Balancing Contingency Event.

~~32.2.2.~~ Events associated with Energy Emergency Alert 2. And

~~32.2.3.~~ Events associated with Energy Emergency Alert 3.

~~32.3.~~ The control of supply and demand resources such as generators, controllable loads, and energy storage devices.

~~2.34.~~ Consideration of t~~The incorporation of~~ energy import and export schedules by entities within the Balancing Authority Area and with other responsible entities~~Balancing Authorities~~.

~~32.45.~~ A prohibition against counting toward the responsible entities ~~The characteristics: Such as capabilities, constraints and volatilities, of the supply resources operating inside the Balancing Authority Area.~~

~~2.6.~~ The characteristics: Such as capabilities, constraints and volatilities, of the load operating inside the Balancing Authority Area.

~~2.7.~~ The exclusion of any portion of shared C~~ontingency Reserve requirement any capacity which is resources already~~ included in another responsible entity's~~Balancing Authority's~~ Regulating, Contingency, or Frequency Responsive Reserve policy~~plans~~.

~~32.58.~~ The planned amount of the Balancing Authority's or Reserve Sharing Group's resources that can be reduced in response to a Large Loss of Load Event by the responsible entity.

~~3.6~~ A review of the responsible entity's Contingency Reserve for the operating time horizon.

~~3.7.~~ The ability of the responsible entity's System Operator(s) to determine, on at least an hourly basis, that the responsible entity has sufficient Contingency Reserve.

~~3.8~~ How depleted Contingency Reserves will be restored in a timely manner.

### ***Background and Rationale***

Requirement R~~32~~ is intended to ensure that each responsible entity~~BA~~ shall have a documented policy~~plan~~ to carry sufficient Contingency Reserves to restore the balance of supply and demand within the responsible entity's area~~air individual BA Area~~. The requirement also requires the responsible entity~~BA~~ to support Interconnection~~System~~ frequency based on maintaining ACE within acceptable limits under credible Contingency Events, as defined within BAL-002-2. In addition, each responsible entity's policy for Contingency Reserves must account for their individual systems requirements due to size, types of resources and Load characteristics that may be unique to the particular responsible entity area.

### **Requirement 4**

R4. Each responsible entity shall implement, in a manner that identifies, assesses, and corrects deficiencies, a Contingency Reserve policy identified in Requirement R3.

### ***Background and Rationale***

Requirement R4 requires responsible entities to implement a process for identifying deficiencies with adherence to their documented Contingency Reserve policy. The process must identify potential deficiencies, and assess and correct the identified deficiencies, because every process has improvement opportunities and also any deficiencies that are found external to the process (e.g. during an audit by the CEA or through an internal audit) must be evaluated to determine whether the process needs changes. If an entity determines that no changes are needed, the entity must demonstrate that no changes to the process are necessary to address the deficiencies that were found external to the process. This ensures that the entity is evaluating its Contingency Reserve policy, and eliminates the need for the entity to report each deficiency as a potential violation.

### **Requirement 53**

**R~~53~~.** Each responsible entity ~~Balancing Authority and Frequency Response Sharing Group~~ shall have a ,once each calendar year, with no more than 15 calendar months between intervals, documented its annual plan for Frequency Responsive Reserve policy that includes at least to arrest frequency change during imbalance events addressing each of the following:

**53.1.** The Frequency Response Obligation (FRO) assigned to the responsible entity~~Balancing Authority or Frequency Response Sharing Group~~.

- ~~53.2.~~ The types of resources (such as generation, load, storage devices, etc.) and their expected Frequency Response (such as MW/0.1 Hz and the range of frequency where response is expected). minimum amount and capability of resources required to meet the Balancing Authority's or Frequency Response Sharing Groups FRO.
- ~~3.3.~~ The Frequency Responsive capabilities of generation operating inside the Balancing Authority Area or Frequency Response Sharing Group.
- ~~3.4.~~ The Frequency Responsive capabilities of Load operating inside the Balancing Authority Area or Frequency Response Sharing Group.
- ~~3.5.~~ The Frequency Responsive capabilities of energy storage devices operating inside the Balancing Authority Area or Frequency Response Sharing Group.
- ~~53.36.~~ A prohibition against counting toward the responsible entities ~~The exclusion of any portion of shared~~ Frequency Responsive Reserves any capacity which is resources already included in another responsible entity's Balancing Authority's Regulating, Contingency, or Frequency Responsive Reserve ~~policy~~ plans.
- ~~53.47.~~ The amount of Frequency Responsive Reserve provided through contractual agreements.
- 5.5 A review of the responsible entity's Frequency Responsive Reserve for the operating time horizon.
- 5.6. The ability of the responsible entity's System Operator(s) to determine, on at least an hourly basis, that the responsible entity has sufficient Frequency Responsive Reserve.
- 5.7 How depleted Frequency Responsive Reserves will be restored in a timely manner.

### ***Background and Rationale***

Requirement R~~53~~ is intended to ensure that each responsible entity ~~BA~~ shall have a documented ~~policy~~ ~~plan~~ to carry sufficient Frequency Responsive Reserves to maintain system frequency within limits, as defined within BAL-003-1. In addition, each responsible entity's policy for Frequency Responsive Reserves must account for their individual systems requirements due to size, types of resources and Load characteristics that may be unique to the particular responsible entity area.

### **Requirement 6**

R6. Each responsible entity shall implement, in a manner that identifies, assesses, and corrects deficiencies, a Frequency Responsive Reserve policy identified in Requirement R5.

### **Background and Rationale**

Requirement R6 requires responsible entities to implement a process for identifying deficiencies with adherence to their documented Frequency Responsive Reserve policy. The process must identify potential deficiencies, and assess and correct the identified deficiencies, because every process has improvement opportunities and also any deficiencies that are found external to the process (e.g. during an audit by the CEA or through an internal audit) must be evaluated to determine whether the process needs changes. If an entity determines that no changes are needed, the entity must demonstrate that no changes to the process are necessary to address the deficiencies that were found external to the process. This ensures that the entity is evaluating its Frequency Responsive Reserve policy, and eliminates the need for the entity to report each deficiency as a potential violation.

### **Requirement 74**

**R74.** Each Reserve Sharing Group, Regulation Reserve Sharing Group or Frequency Response Sharing Group shall have a policy signed agreement among the participating Balancing Authorities addressing each of the following:

- 74.1.** The minimum reserve requirement for the group.
- 74.2.** The allocation of reserves among members.
- 74.3.** The procedure for activating reserves.
- 74.4.** Reporting and recordkeeping processes.

### **Background and Rationale**

Requirement R74 is intended to determine whether a Balancing Authority (~~BA~~) is part of a Reserve Sharing Group. This requirement allows for Reserve Sharing Groups to be formed to meet the requirements of BAL-001-1, BAL-002-2 and BAL-003-1. It requires an agreement in which the minimum criteria needed in the agreement areis detailed, as well as the criteria auditors will be able to use to identify the roles of the participating Balancing Authorities.

### **Requirement 5**

~~R5. Each Balancing Authority shall perform at least a weekly review of its operational plan(s) for the next seven days for Regulating Reserve, Contingency Reserve, and Frequency~~

~~Responsive Reserve to ensure sufficient reserves are available to support reliable operation of the Bulk Electric System.~~

***Background and Rationale***

~~Requirement R5 is to ensure that a BA reviews and updates its plan, as necessary, on at least a weekly basis for the next seven calendar days for Regulating, Contingency, and Frequency Responsive Reserves.~~

~~Each BA will have plans for Regulating, Contingency, and Frequency Responsive Reserves which takes into account specification given in Requirements R1, R2, and R3. Requirement R4 requires the BA to review that all three types of reserves are appropriately accounted for based on the planned mix of resources, and necessary adjustments are made to the plan in the Operation Planning time horizon.~~

**Requirement 6**

~~R6. Each Balancing Authority shall estimate and assess, on at least an hourly basis, that it has sufficient Regulating Reserve, Contingency Reserve, and Frequency Responsive Reserve to meet its reserve plan(s) to ensure reliable operation of the Bulk Electric System.~~

***Background and Rationale***

~~There have been requirements or policies on reserves for a long time, but there has never been a requirement to specifically examine reserves in the Real-time horizon. It is easy to plan for reserves in the long-term horizon. It is a little harder to plan reserves next day (operations planning) and even more complex to plan and assess reserves in the Real-time environment.~~

~~Requirement R5 requires a BA to review reserves in the Real-time environment and make the adjustments, as needed, to account for items such as: Loss of planned resources, unexpected changes in Loads, forecast errors, unexpected generating unit limitations, etc.~~

**Requirement 87**

~~R87. Each responsible entity shall have a policy that requires the total capability of resources designated to provide Regulating Reserve, Contingency Reserve and Frequency Responsive Reserve to be at least equal to the amount required to meet all reserve requirements concurrently prior to deploying any such resources. Each Balancing Authority shall evaluate that its aggregate amount of planned Regulating Reserve, Contingency Reserve, and Frequency Responsive Reserve margin(s,) above and below its forecasted demand, is within the operating limits of its resources dedicated to meet its plan to ensure reliable operation of the Bulk Electric System.~~

***Background and Rationale***

The SDT discussed at length that the quantity for each type of reserve (regulating, contingency, and frequency responsive) must be uniquely identified. For example, a MW amount from an individual resource could be allocated only for one type of reserve at any given time. Another example, FRR may be substituted for CR, but most likely the reverse would not be true. In addition, each different type of reserve may be needed during Contingencies which strongly supports that double accounting would lead to less reliability. All three types of reserves could be from a single resource, provided that they are uniquely identified to meet the individual Operating Reserve requirements.