

BAL-001-2

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BAL-001-2

- Approved by FERC Order No. 810 on April 16, 2015
- Enforcement date: 7/1/2016
- Retires BAL-001-1

The Commission directs NERC to make an informational filing 90 days after the end of the two-year period following implementation (approximately 2 years from the implementation period, 7/1/2016) that includes analysis of data on whether experience with the BA ACE Limit in the first two years after approval has seen ACE swings and unscheduled power flows or inadvertent interchange that could cause SOL/IROL exceedances

**To control
Interconnection
frequency
within defined
limits**

FERC Directives

FERC Directive	How Directive was Met
Modify BAL-002-0 to define significant deviation and a reportable event, taking into account all events that have an impact on frequency, e.g., loss of supply, loss load and signification scheduling problems, which can cause frequency disturbances and to address how balancing authorities should respond	New BAL-002-2's R2: 1. Clock-minute average of Reporting ACE does not exceed its clock-minute Balancing Authority ACE Limit (BAAL) for more than 30 consecutive clock-minutes, 2. Introduces BAAL, which is unique for each Balancing Authority and provide dynamic limits for its Area Control Error (ACE) value limit as a function of its Interconnection frequency

New Glossary Terms

Regulation Reserve Sharing Group (RRSG)

Reserve Sharing Group Reporting ACE

Reporting ACE

Interconnection

Change Summary

RRSG

- A group whose members consist of two or more Balancing Authorities that collectively maintain, allocate, and supply the Regulating Reserve required for all member Balancing Authorities to use in meeting applicable regulating standards

Reporting ACE

- Reporting ACE is calculated as follows:
 - Reporting ACE = $(NIA - NIS) - 10B (FA - FS) - IME$
- Reporting ACE is calculated in the Western Interconnection as follows:
 - Reporting ACE = $(NIA - NIS) - 10B (FA - FS) - IME + IATEC$

Reserve Sharing Reporting ACE

- At any given time of measurement for the applicable Reserve Sharing Group, the algebraic sum of the Reporting ACEs (or equivalent as calculated at such time of measurement) of the Balancing Authorities participating in the Reserve Sharing Group at the time of measurement

Detailed Comparison

**R1 is not a
new
requirement
- It is a
restatement
of the
current
BAL-001**

- R1 is intended to measure how well a Balancing Authority is able to control its generation and load management programs, as measured by its Area Control Error (ACE), to support its Interconnection's frequency over a rolling one-year period

**Requirement
R2 is a new
requirement
intended to
replace
existing
BAL-001**

- R2 is intended to enhance the reliability of each Interconnection by maintaining frequency within predefined limits under all conditions
- The Balancing Authority ACE Limits (BAAL) are unique for each Balancing Authority and provide dynamic limits for its Area Control Error (ACE) value limit as a function of its Interconnection frequency. BAAL was derived based on reliability studies and analysis
- BAAL are Balancing Authority and Interconnection specific

Impact on ERCOT Region

When actual frequency is equal to Scheduled Frequency, $BAAL_{High}$ and $BAAL_{Low}$ do not apply.

When actual frequency is less than Scheduled Frequency, $BAAL_{High}$ does not apply, and $BAAL_{Low}$ is calculated as:

$$BAAL_{Low} = (-10B_i \times (FTL_{Low} - F_s)) \times \frac{(FTL_{Low} - F_s)}{(F_A - F_s)}$$

When actual frequency is greater than Scheduled Frequency, $BAAL_{Low}$ does not apply and the $BAAL_{High}$ is calculated as:

$$BAAL_{High} = (-10B_i \times (FTL_{High} - F_s)) \times \frac{(FTL_{High} - F_s)}{(F_A - F_s)}$$

Where:

$BAAL_{Low}$ is the Low Balancing Authority ACE Limit (MW)

$BAAL_{High}$ is the High Balancing Authority ACE Limit (MW)

10 is a constant to convert the Frequency Bias Setting from MW/0.1 Hz to MW/Hz

B_i is the Frequency Bias Setting for a Balancing Authority (expressed as MW/0.1 Hz)

F_A is the measured frequency in Hz.

F_s is the scheduled frequency in Hz.

FTL_{Low} is the Low Frequency Trigger Limit (calculated as $F_s - 3\epsilon_{1i}$ Hz)

FTL_{High} is the High Frequency Trigger Limit (calculated as $F_s + 3\epsilon_{1i}$ Hz)

Where ϵ_{1i} is the constant derived from a targeted frequency bound for each Interconnection as follows:

- Eastern Interconnection $\epsilon_{1i} = 0.018$ Hz
- Western Interconnection $\epsilon_{1i} = 0.0228$ Hz
- ERCOT Interconnection $\epsilon_{1i} = 0.030$ Hz
- Quebec Interconnection $\epsilon_{1i} = 0.021$ Hz

Regional Impact

BAL-001-TRE-1 still applies after 7/1/2016

BAL-001-TRE-1 was not selected for either the 2012 or 2015 ERCOT audit

NERC's Searchable Notice of Penalty Spreadsheet: only 2 entries: BAL-001-0 (WECC), and BAL-001-0.1a (SPP)

BAL-001 does not seem to be a frequently violated standard

For Further Reading

[BAL-001-2](#)

[Implementation Plan](#)

[FERC Order No. 810](#)

QUESTIONS?

