

ACE Definition

Project 2022-01 Reporting ACE Definition and Associated Terms

Draft 3

The ~~standard~~-drafting team (SDT) is seeking comment on the following new or modified terms used in the proposed standards. The first column (*NERC Glossary Term*) provides the NERC Glossary term being modified or proposed as a new. The SDT is proposing acronyms to some currently approved and new Glossary terms as shown in redline. The second column (*Currently Approved Definition*) provides the currently approved definition and the third column (*SDT Proposed New or Revised*) reflects the proposed modifications to the current definitions in redline and also reflects newly proposed definitions in clean view. The fourth column identifies the currently effective Reliability Standards or *Glossary* terms in which the proposed terms are used.

Table 1: Retired, Modified, or Newly Proposed Definitions

NERC Glossary Term	Currently Approved Definition	SDT Proposed New or Revised REDLINE TO Currently Approved	Standards Effected / Definitions Affected	Technical Guidelines / Reference Documents	Notes
Actual Net Interchange - (NI_A)	The algebraic sum of actual megawatt transfers across all Tie Lines, including Pseudo-Ties, to and from all Adjacent Balancing Authority areas within the same Interconnection. Actual megawatt transfers on asynchronous DC tie lines that are directly connected to another Interconnection are excluded from Actual Net Interchange.	The algebraic sum of actual megawatt transfers across all Tie Lines, including Pseudo-Ties, to and from all a Adjacent Balancing Authority Areas within the same Interconnection. Actual megawatt transfers on asynchronous DC tie lines that are directly connected to another Interconnection are excluded from Actual Net Interchange.	Standards BAL-003-2 BAL-004-WECC-3 None Terms Reporting ACE (<i>current and proposed</i>)	Technical Reference Document: Balancing and Frequency Control Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards	Capitalized terms in definition.

Table 1: Retired, Modified, or Newly Proposed Definitions

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				Technical Reference Document: Area Control Error Diversity Interchange Process Reliability Guideline: Inadvertent Interchange	
<u>ACE Diversity Interchange (ADI)</u>		<u>A frequency neutral exchange program where multiple participating Balancing Authorities utilize it to achieve reductions in their generation control and Reporting ACE through offsets to either Actual Net Interchange or Scheduled Net Interchange ACE components to create an ACE value closer to zero for each participant.</u>	<u>Included in Reporting ACE definition.</u>		<u>New definition</u>

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Area Control Error - (ACE)	The instantaneous difference between a Balancing Authority's net actual and scheduled interchange, taking into account the effects of Frequency Bias, correction for meter error, and Automatic Time Error Correction (ATEC), if operating in the ATEC mode. ATEC is only applicable to Balancing Authorities in the Western Interconnection.	The instantaneous difference between an entity's Actual Net Interchange (NI _A) and Scheduled Net Interchange (NI _S), taking into account the effects of Frequency Bias, of correction for meter error, and of Inadvertent Interchange Management (I _{IM}) if operating in the I _{IM} mode. For compliance usage, refer to the term Reporting ACE.	<p>Standards</p> <ul style="list-style-type: none"> • BAL-002-3 (<i>purpose</i>) • BAL-003-2 • BAL-005-1 <p>Terms</p> <ul style="list-style-type: none"> • Control Performance Standard (<i>current; see proposed revisions</i>); • Disturbance Control Standard (<i>current; proposed for retirement</i>); • Frequency Bias Setting (<i>current; see proposed revisions</i>); 	<p>Reliability Guideline Operating Reserve Management</p> <p>Technical Reference Document: Balancing and Frequency Control</p> <p>Technical Reference Document: Area Control Error Diversity Interchange Process</p> <p>Inverter-Based Resource Performance Guideline</p>	The old definition was restricted to only Balancing Authorities and excluded entities such as Balancing Authority Areas and Reserve Sharing Groups. Also updated terms to reflect current NERC defined terms and newly proposed terms added to the Reporting ACE term. Also added a clarifying statement to refer to Reporting ACE for compliance purposes.

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			<ul style="list-style-type: none"> Reporting ACE (current and proposed) 		
Automatic Time Error Correction – (ATEC)	<p>The addition of a component to the ACE equation for the Western Interconnection that modifies the control point for the purpose of continuously paying back Primary Inadvertent Interchange to correct accumulated time error. Automatic Time Error Correction is only applicable in the Western Interconnection.</p> $I_{ATEC} = \frac{PI_{accum}^{on/off\ peak}}{(1-Y)*H}$ <p>when operating in Automatic Time Error Correction Mode.</p> <p>The absolute value of I_{ATEC} shall not exceed L_{max}.</p> <p>I_{ATEC} shall be zero when operating in any other AGC mode.</p> <ul style="list-style-type: none"> L_{max} is the maximum value allowed for I_{ATEC} set by 	<p>The addition of a component, represented by the term I_{ATEC}, to the Reporting ACE equation for the Western Interconnection that modifies the control point for the purpose of continuously paying back Primary Inadvertent Interchange and to correct Time Error. Automatic Time Error Correction is only applicable in the Western Interconnection.</p> $I_{ATEC} = \frac{PI_{accum}^{on/off\ peak}}{(1-Y)*H}$ <p>The absolute value of I_{ATEC} shall not exceed L_{max}.</p> <p>I_{ATEC} shall be zero when operating in any other AGC mode.</p> <ul style="list-style-type: none"> L_{max} is the maximum value allowed for I_{ATEC} set by 	<p>Standards BAL-004-WECC-3</p> <p>Terms Reporting ACE (current and proposed)</p>	<p>Technical Reference Document: Balancing Authority Area Footprint Change Tasks</p> <p>Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards</p> <p>Reliability Guideline: Inadvertent Interchange</p>	<p>Re-organized published glossary terms to reflect changes made during the standard drafting process.</p> <p>Published term was unreadable.</p> <p>Added an islanding term, "BA_{island}" to accurately reflect a BA that has lost synchronism with the remainder of the interconnection cannot have an impact on Time Error. Changed the method of allocating</p>

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	<p>each BA between $0.2 * B_i$ and L_{10}, $0.2 * B_i \leq L_{max} \leq L_{10}$.</p> <ul style="list-style-type: none"> $L_{10} = \frac{1.65 * \epsilon_{10}}{\sqrt{(-10B_i)(-10B_s)}}$ ϵ_{10} is a constant derived from the targeted frequency bound. It is the targeted root-mean-square (RMS) value of ten-minute average frequency error based on frequency performance over a given year. The bound, ϵ_{10}, is the same for every Balancing Authority Area within an Interconnection. $Y = B_i / B_s$. H = Number of hours used to payback primary inadvertent interchange energy. The value of H is set to 3. 	<p>each BA between $0.2 * B_i$ and L_{10}; i.e. $0.2 * B_i \leq L_{max} \leq L_{10}$.</p> <ul style="list-style-type: none"> $L_{10} = \frac{1.65 * \epsilon_{10}}{\sqrt{(-10B_i)(-10B_s)}}$ ϵ_{10} is a constant derived from the targeted frequency bound. It is the targeted root-mean-square (RMS) value of ten-minute average Frequency Error based on frequency performance over a given year. The bound, ϵ_{10}, is the same for every Balancing Authority Area within an Interconnection. $Y = B_i / B_s$. H = Number of hours used to pay back primary Inadvertent Interchange energy. The value of H is set to 3. B_i = Frequency Bias Setting for the Balancing 			<p>Primary Inadvertent to use actual Bias settings to more accurately <u>more accurately</u> reflect each Balancing Authority's share of Time Error impact more accurately.</p> <p>Capitalized NERC defined terms.</p>

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	<ul style="list-style-type: none"> • B_i = Frequency Bias Setting for the Balancing Authority Area (MW / 0.1 Hz). • B_s = Sum of the minimum Frequency Bias Settings for the Interconnection (MW / 0.1 Hz). • Primary Inadvertent Interchange (PII_{hourly}) is $(1 - Y) * (I_{actual} - B_i * \Delta TE / 6)$ • I_{actual} is the hourly Inadvertent Interchange for the last hour. • ΔTE is the hourly change in system Time Error as distributed by the Interconnection time monitor, where: $\Delta TE = TE_{end\ hour} - TE_{begin\ hour} - TD_{adj} - (t) * (TE_{offset})$ • TD_{adj} is the Reliability Coordinator adjustment for differences with Interconnection time 	<p>Authority Area (MW/0.1 Hz).</p> <ul style="list-style-type: none"> • B_s = Sum of the Frequency Bias Settings for the Interconnection (MW/0.1 Hz). For entities with a variable Frequency Bias, <u>the annual time weighted average FBS based on the one minute values used in BAL-001 when frequency is greater than 60.036Hz or less than 59.964 Hz.</u> • Primary Inadvertent Interchange (PII_{hourly}) is $(1 - Y) * (I_{actual} - B_i * \Delta TE / 6) * BA_{island}$ <p>BA_{island} = Binary term: 1 indicates the BA is interconnected; 0 indicates the BA is entirely islanded and not interconnected.</p> <ul style="list-style-type: none"> • I_{actual} is the hourly Inadvertent Interchange for the last hour. 			

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	<p>monitor control center clocks.</p> <ul style="list-style-type: none"> t is the number of minutes of manual Time Error Correction that occurred during the hour. TE_{offset} is 0.000 or +0.020 or -0.020. PII_{accum} is the Balancing Authority Area's accumulated PII_{hourly} in MWh. An On-Peak and Off-Peak accumulation accounting is required, where: $PII_{accum}^{on/offpeak} = \text{last period's } PII_{accum}^{on/offpeak} + PII_{hourly}$	<ul style="list-style-type: none"> ΔTE is the hourly change in system Time Error as distributed by the Interconnection time monitor, where: $\Delta TE = TE_{end\ hour} - TE_{begin\ hour} - TD_{adj} - t*(TE_{offset})$ TD_{adj} is the Reliability Coordinator adjustment for differences with Interconnection time monitor control center clocks. t is the number of minutes spent performing manual Time Error Correction that occurred during each hour. TE_{offset} is 0.000 or +0.020 or -0.020. PII_{accum} is the Balancing Authority Area's accumulated PII_{hourly} in MWh. An On-Peak and Off Peak accumulation 			

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		<p>accounting is required, where:</p> $PI_{accum}^{on/offpeak} = \text{last period's } PI_{accum}^{on/offpeak} + PI_{hourly}$			
Balancing Authority Area (BAA)	The collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.	Added Acronym	<p>Standards</p> <ul style="list-style-type: none"> BAL-003-2 COM-001-3 EOP-004-4 EOP-011-1 MOD-004-1 PRC-005-6 TOP-001-5 <p>Terms <i>Multiple terms</i></p>	<p>Reliability Guideline: Operating Reserve Management</p> <p>Technical Reference Document: Balancing and Frequency Control</p> <p>Technical Reference Document: Balancing Authority Area Footprint Change Tasks</p> <p>Technical Reference Document: Integrating</p>	Added Acronym

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				Reporting ACE with the NERC Reliability Standards	
Balancing Contingency Event – (BCE)	Any single event described in Subsections (A), (B), or (C) below, or any series of such otherwise single events, with each separated from the next by one minute or less. A. Sudden loss of generation: a. Due to i. unit tripping, or ii. loss of generator Facility resulting in isolation of the generator from the Bulk Electric System or from the responsible entity’s System, or iii. sudden unplanned outage of transmission Facility;	Any single event described in Subsections (A), (B), or (C) below, or any series of such otherwise single events, with each separated from the next by one minute or less. A. Sudden loss of generation: a. Due to i. unit tripping, or ii. loss of generator Facility resulting in isolation of the generator from the Bulk Electric System or from the responsible entity’s System, or iii. sudden unplanned outage of transmission Facility;	Standards BAL-002-3 Terms • Contingency Reserve; • Most Severe Single Contingency; • Reportable Balancing Contingency Event	Reliability Guideline Operating Reserve Management Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards Technical Reference Document: Area Control Error Diversity Interchange Process	Added acronym and updated to correct NERC defined term.

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	<p>b. And, that causes an unexpected change to the responsible entity's ACE;</p> <p>B. Sudden loss of an Import, due to forced outage of transmission equipment that causes an unexpected imbalance between generation and Demand on the Interconnection.</p> <p>C. Sudden restoration of a Demand that was used as a resource that causes an unexpected change to the responsible entity's ACE.</p>	<p>b. And, that causes an unexpected change to the responsible entity's Reporting ACE;</p> <p>B. Sudden loss of an import, due to forced outage of transmission equipment that causes an unexpected imbalance between generation and Demand on the Interconnection.</p> <p>C. Sudden restoration of a Demand that was used as a resource that causes an unexpected change to the responsible entity's Reporting ACE.</p>			
Control Performance Standard – (CPS)	The reliability standard that sets the limits of a Balancing Authority's Area Control Error over a specified time period.	Methodology of controlling Reporting ACE relative to Frequency Error, expressed as a moving average subject to a limit. It is used as an indicator of	<p>Standards</p> <ul style="list-style-type: none"> • BAL-001-2 • BAL-003-2 (Attachment 	Reliability Guideline: Operating Reserve Management	

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		sufficient secondary AGC control to maintain energy balance and Scheduled Frequency.	A) Terms None	Technical Reference Document: Balancing and Frequency Control Technical Reference Document: Area Control Error Diversity Interchange Process	
Disturbance	<ol style="list-style-type: none"> 1. An unplanned event that produces an abnormal system condition. 2. Any perturbation to the electric system. 3. The unexpected change in ACE that is caused by the sudden failure of generation or interruption of load. 	<ol style="list-style-type: none"> 1. An unplanned event that produces an abnormal system condition. 2. Any perturbation to the electric system. 3. The unexpected change in Reporting ACE that is caused by the sudden failure of generation or interruption of load 	Standards <ul style="list-style-type: none"> • BAL-002-3 • EOP-004-4 • EOP-005-3 • MOD-026-1 • MOD-027-1 • MOD-033-2 • PRC-026-1 Terms	Reliability Guideline: Operating Reserve Management Recommended Approaches for UFLS Program Design with Increasing Penetrations of DERs Methods for	Update to the NERC defined term "Reporting ACE" to accurately reflect current terminology.

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			<ul style="list-style-type: none"> Disturbance Control Standard <i>(proposed for retirement)</i>; Disturbance Monitoring Equipment 	Establishing IROLs Reliability Guideline: Generating Unit Operations During Complete Loss of Communications Inverter-Based Resource Performance Guideline Reliability Guideline: Bulk Power System Reliability Perspectives on the Adoption of IEEE 1547-2018 Load Composition Guideline Reliability Guideline: Model Verification of	

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				Aggregate DER Models used in Planning Studies Power Plant Model Verification and Testing for Synchronous Machines DER Modeling Power Plant Model Verification for Inverter-Based Resources Reliability Guideline: DER Data Collection for Modeling in Transmission Planning Studies DER_A Model Parameterization Improvements to	

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				Interconnection Requirements for BPS-Connected Inverter-Based Resources	
Disturbance Control Standard – (DCS)	The reliability standard that sets the time limit following a Disturbance within which a Balancing Authority must return its Area Control Error to within a specified range.	Retire	Standards BAL-002-3 Terms None	Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards	Retire
Dynamic Interchange Schedule or Dynamic Schedule	A time-varying energy transfer that is updated in Real-time and included in the Scheduled Net Interchange (NIS) term in the same manner as an Interchange Schedule in the affected Balancing Authorities’ control ACE equations (or alternate control processes).	A time-varying energy transfer that is updated in Real-time and included in the Scheduled Net Interchange (NIS) term in the same manner as an Interchange Schedule in the affected Balancing Authorities’ Reporting ACE	Standards <ul style="list-style-type: none"> BAL-002-WECC-3 INT-009-3 Terms Scheduled Net Interchange (NIS) (<i>current and proposed</i>)	Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards	Update to the NERC defined term “Reporting ACE” to accurately reflect current terminology. Eliminated the word “equation” for consistency and eliminated the parenthetical which has no

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					known application.
Frequency Bias Setting (FBS)	A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority's Area Control Error equation to account for the Balancing Authority's inverse Frequency Response contribution to the Interconnection, and discourage response withdrawal through secondary control systems.	A negative number either fixed or variable, expressed in MW/0.1 Hz, included in a Balancing Authority's Reporting ACE to account for the Balancing Authority's Frequency Response to the Interconnection Frequency Error, and discourage response withdrawal through secondary control systems.	Standards <ul style="list-style-type: none"> BAL-001-2 BAL-003-2 Terms Reporting ACE (<i>current and proposed</i>)	Reliability Guideline: Operating Reserve Management Technical Reference Document: Balancing Authority Area Footprint Change Tasks Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards	Added language to indicate this value must be a negative number and eliminated language to was not accepted in practice (usually). Update to the NERC defined term "Reporting ACE" to accurately reflect current terminology.
Frequency Error	The difference between the actual and scheduled frequency. ($F_A - F_S$)	The difference between the actual frequency and the Scheduled Frequency. ($F_A - F_S$)	Standards <ul style="list-style-type: none"> BAL-001-2 MOD-027-1 Terms	Power Plant Model Verification and Testing for Synchronous Machines	

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			<ul style="list-style-type: none"> Control Performance Standard Reporting ACE Frequency Regulation; Reporting ACE (<i>current and proposed</i>); Time Error Correction (<i>proposed</i>) 	DER_A Model Parameterization	
Inadvertent Interchange	The difference between the Balancing Authority's Net Actual Interchange and Net Scheduled Interchange. (IA – IS)	The difference between the Balancing Authority's Actual Net Interchange and Scheduled Net Interchange. (NI _A – NI _S)	<p>Standards BAL-004-WECC-3</p> <p>Terms</p> <ul style="list-style-type: none"> Automatic Time Error Correction (I_ATEC) (<i>current and proposed</i>); 	<p>Technical Reference Document: Balancing and Frequency Control</p> <p>Technical Reference Document: Integrating Reporting ACE with</p>	Updated to correct NERC defined terms and correct acronyms.

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			<ul style="list-style-type: none"> Dynamic Transfer; Primary Inadvertent Interchange (WECC) 	<p>the NERC Reliability Standards</p> <p>Reliability Guideline: Inadvertent Interchange</p>	
Inadvertent Interchange Management – (I_{IM})	New term to NERC glossary	A term used in Reporting ACE to allow for management of Inadvertent Interchange and correction of Time Error. <u>The I_{IM} value is not used for unilateral paybacks and is null unless there is a regional procedure in place to coordinate an inadvertent control methodology for an Interconnection.</u>	<p>Standards None</p> <p>Terms Reporting Ace (proposed)</p>		New term to NERC glossary
Interchange Meter Error –(I_{ME})	A term used in the Reporting ACE calculation to compensate for data or equipment errors affecting any other components of the Reporting ACE calculation.	A term used in Reporting ACE to compensate for data or equipment errors affecting any other components of Reporting ACE.	<p>Standards None</p> <p>Terms Reporting ACE (current and</p>	Technical Reference Document: Integrating Reporting ACE with the NERC Reliability	Eliminated the word “calculation” for consistency

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			<i>proposed</i>)	Standards	
Interchange Schedule	An agreed-upon Interchange Transaction size (megawatts), start and end time, beginning and ending ramp times and rate, and type required for delivery and receipt of power and energy between the Source and Sink Balancing Authorities involved in the transaction.	No changes	Standards MOD-028-2 Terms <ul style="list-style-type: none"> • Dynamic Interchange Schedule or Dynamic Schedule (<i>current and proposed</i>); • Net Interchange Schedule (<i>proposed for retirement</i>); • Net Scheduled Interchange (<i>proposed for retirement</i>); • Ramp Rate or Ramp (<i>see proposed</i>) 	Technical Reference Document: Balancing and Frequency Control Methods for Establishing IROLs	Team reviewed, and determined no changes determined

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			<i>revisions</i>); <ul style="list-style-type: none"> • Reliability Adjustment RFI; • Scheduling Entity; • Sink Balancing Authority; • Source Balancing Authority; • Tie Line Bias (<i>current and proposed</i>) 		
Implemented Interchange	The state where the Balancing Authority enters the Confirmed Interchange into its Area Control Error equation.	The state where the Balancing Authority enters the Confirmed Interchange into its Reporting ACE.	Standards None Terms <ul style="list-style-type: none"> • Reliability Adjustment; • Arranged Interchange 		Update to the NERC defined term "Reporting ACE" to accurately reflect current terminology.

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Net Actual Interchange	The algebraic sum of all metered interchange over all interconnections between two physically Adjacent Balancing Authority Areas.	Retire	Standards BAL-003-2 None BAL-004-WECC-3 Terms Inadvertent Interchange (current; see proposed revision)	Reliability Guideline: Inadvertent Interchange	Retire. Term is no longer utilized.
Net Interchange Schedule	The algebraic sum of all Interchange Schedules with each Adjacent Balancing Authority.	Retire	Standards None Terms None	Reliability Guideline: Inadvertent Interchange	Retire. Term is no longer utilized.
Net Scheduled Interchange	The algebraic sum of all Interchange Schedules across a given path or between Balancing Authorities for a given period or instant in time.	Retire	Standards None Terms None		Retire. Term is no longer utilized.
Operating Reserve – Spinning	The portion of Operating Reserve consisting of: <ul style="list-style-type: none"> • Generation synchronized to the system and fully available to serve load 	The portion of Operating Reserve consisting of: <ul style="list-style-type: none"> • Generation synchronized to the system and fully available to serve load 	Standards BAL-002-WECC-3 Terms None	Reliability Guideline: Operating Reserve Management Technical	Utilized proper capitalization on terms that are not NERC defined.

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	<p>within the Disturbance Recovery Period following the contingency event; or</p> <ul style="list-style-type: none"> • Load fully removable from the system within the Disturbance Recovery Period following the contingency event. 	<p>within the Disturbance recovery period following the contingency event; or</p> <ul style="list-style-type: none"> • Load fully removable from the system within the Disturbance recovery period following the contingency event. 		<p>Reference Document: Balancing and Frequency Control</p> <p>Power Plant Model Verification for Inverter-Based Resources</p>	
Operating Reserve – Supplemental	<p>The portion of Operating Reserve consisting of:</p> <ul style="list-style-type: none"> • Generation (synchronized or capable of being synchronized to the system) that is fully available to serve load within the Disturbance Recovery Period following the contingency event; or • Load fully removable from the system within the Disturbance Recovery Period following the contingency event. 	<p>The portion of Operating Reserve consisting of:</p> <ul style="list-style-type: none"> • Generation (synchronized or capable of being synchronized to the system) that is fully available to serve load within the Disturbance recovery period following the contingency event; or • Load fully removable from the system within the Disturbance recovery period following the contingency event. 	<p>Standards BAL-002-WECC-3</p> <p>Terms None</p>	<p>Technical Reference Document: Balancing and Frequency Control</p> <p>Power Plant Model Verification for Inverter-Based Resources</p>	Utilized proper capitalization on terms that are not NERC defined.
Overlap Regulation	A method of providing regulation service in which the Balancing	A method of providing Regulation Service in which the	Standards	Technical Reference	Update to the NERC defined

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Service	Authority providing the regulation service incorporates another Balancing Authority's actual interchange, frequency response, and schedules into providing Balancing Authority's AGC/ACE equation.	Balancing Authority providing the Regulation Service incorporates into its Reporting ACE a receiving Balancing Authority's Actual Net Interchange, Scheduled Net Interchange, and response to Interconnection Frequency Error.	<ul style="list-style-type: none"> BAL-001-2 BAL-003-2 Terms None	Document: Integrating Reporting ACE with the NERC Reliability Standards	term "Reporting ACE", "Actual Net Interchange", "Scheduled Net Interchange" and "response to Interconnection Frequency Error", to accurately reflect current terminology.
Pre-Reporting Contingency Event ACE Value	The average value of Reporting ACE, or Reserve Sharing Group Reporting ACE when applicable, in the 16-second interval immediately prior to the start of the Contingency Event Recovery Period based on EMS scan rate data.	Team reviewed, no changes and determined no changes	Standards BAL-002-3 Terms None	Reliability Guideline: Operating Reserve Management	Update to the NERC defined term "Reporting ACE" to accurately reflect current terminology and grammatical changes to improve understanding.
Pseudo-Tie	A time-varying energy transfer that is updated in Real-time and included in the Actual Net Interchange term (NIA) in the same manner as a Tie Line in the	A time-varying energy transfer that is updated in Real-time and included in the Actual Net Interchange term (NIA) in the same manner as a Tie Line in	Standards <ul style="list-style-type: none"> BAL-005-1 BAL-002-WECC-3 	Technical Reference Document: Balancing Authority Area Footprint	Eliminated the word "equation" for consistency and eliminated the parenthetical

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	affected Balancing Authorities' Reporting ACE equation (or alternate control processes).	the affected Balancing Authorities' Reporting ACE .	<ul style="list-style-type: none"> INT-009-3 Terms Actual Net Interchange (<i>current and proposed</i>)	Change Tasks	which has no known application.
Ramp Rate or Ramp	(Schedule) The rate, expressed in megawatts per minute, at which the interchange schedule is attained during the ramp period. (Generator) The rate, expressed in megawatts per minute, that a generator changes its output.	(Schedule) The rate, expressed in megawatts per minute, at which the <u>I</u> nterchange <u>S</u> chedule is attained during the ramp period. (Generator) The rate, expressed in megawatts per minute, that a generator changes its output.	Standards None Terms Response Rate	Technical Reference Document: Balancing and Frequency Control Reliability Guideline: Generating Unit Operations During Complete Loss of Communications Inverter-Based Resource Performance Guideline Performance, Modeling, and	Capitalized NERC defined terms within the definition.

Table 1: Retired, Modified, or Newly Proposed Definitions

NERC Glossary Term	Currently Approved Definition	SDT Proposed New or Revised REDLINE TO Currently Approved	Standards Affected / Definitions Affected	Technical Guidelines / Reference Documents	Notes
				<p>Simulations of BPS-Connected BESS and Hybrid Power Plants</p> <p>Reliability Guideline: Model Verification of Aggregate DER Models used in Planning Studies</p> <p>DER Modeling</p> <p>Power Plant Model Verification for Inverter-Based Resources</p> <p>Reliability Guideline: DER Data Collection for Modeling in Transmission Planning Studies</p> <p>DER_A Model Parameterization</p>	

Table 1: Retired, Modified, or Newly Proposed Definitions

NERC Glossary Term	Currently Approved Definition	SDT Proposed New or Revised REDLINE TO Currently Approved	Standards Effected / Definitions Affected	Technical Guidelines / Reference Documents	Notes
				Improvements to Interconnection Requirements for BPS-Connected Inverter-Based Resources	
Regulation Service	The process whereby one Balancing Authority contracts to provide corrective response to all or a portion of the ACE of another Balancing Authority. The Balancing Authority providing the response assumes the obligation of meeting all applicable control criteria as specified by NERC for itself and the Balancing Authority for which it is providing the Regulation Service.	The process whereby one Balancing Authority contracts to provide corrective response to all or a portion of the Reporting ACE of another Balancing Authority. The Balancing Authority providing the response assumes the obligation of meeting all applicable control criteria as specified by NERC for itself and the Balancing Authority for which it is providing the corrective response.	Standards <ul style="list-style-type: none"> • BAL-001-2 • BAL-003-2 Terms <ul style="list-style-type: none"> • Overlap Regulation Service (<i>proposed</i>); • Supplemental Regulation Service (<i>proposed</i>) 	Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards	
Reporting Area Control Error – (Reporting ACE)	The scan rate values of a Balancing Authority Area’s (BAA) Area Control Error (ACE) measured in MW includes the difference between the	The scan rate values of a Balancing Authority Area’s Area Control Error (ACE) measured in MW, which includes the error in scheduled interchange adjusted	Standards <ul style="list-style-type: none"> • BAL-001-2 • BAL-002-3 	Technical Reference Document: Balancing and Frequency Control	Modified to reflect a common term across all multiple BA interconnections.

Table 1: Retired, Modified, or Newly Proposed Definitions

NERC Glossary Term	Currently Approved Definition	SDT Proposed New or Revised REDLINE TO Currently Approved	Standards Effected / Definitions Affected	Technical Guidelines / Reference Documents	Notes
	<p>Balancing Authority Area’s Actual Net Interchange and its Scheduled Net Interchange, plus its Frequency Bias Setting obligation, plus correction for any known meter error. In the Western Interconnection, Reporting ACE includes Automatic Time Error Correction_(ATEC). Reporting ACE is calculated as follows: $Reporting\ ACE = (NI_A - NI_S) - 10B (F_A - F_S) - I_{ME}$ Reporting ACE is calculated in the Western Interconnection as follows: $Reporting\ ACE = (NI_A - NI_S) - 10B (F_A - F_S) - I_{ME} + I_{ATEC}$ Where:</p> <ul style="list-style-type: none"> • NI_A = Actual Net Interchange. • NI_S = Scheduled Net Interchange. • B = Frequency Bias Setting. • F_A = Actual Frequency. 	<p>for Frequency Bias obligation, known meter error, and inadvertent management. Reporting ACE is calculated as follows: $Reporting\ ACE = (NI_A - NI_S) - 10B (F_A - F_S) - I_{ME} + I_{IM}$ Where:</p> <ul style="list-style-type: none"> • NI_A = Actual Net Interchange. • NI_S = Scheduled Net Interchange. • B = Frequency Bias Setting. • F_A = Actual Frequency. • F_S = Scheduled Frequency. • I_{ME} = Interchange Meter Error. • I_{IM} = Inadvertent Interchange Management (Term is expressed if a regional procedure exists, otherwise is null and does is not need-to-be included in the Balancing Authority’s Reporting ACE.)- 	<ul style="list-style-type: none"> • BAL-005-1 <p>Terms</p> <ul style="list-style-type: none"> • Automatic Generation Control; • Interchange Meter Error (I_{ME}) (<i>current and proposed</i>); • Pre-Reporting Contingency Event ACE Value; • Pseudo-Tie (<i>current and proposed</i>) 	<p>Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards</p> <p>Technical Reference Document: Area Control Error Diversity Interchange Process</p>	<p>This change will allow regions to create methodologies to control Inadvertent Interchange accumulations.</p>

Table 1: Retired, Modified, or Newly Proposed Definitions

NERC Glossary Term	Currently Approved Definition	SDT Proposed New or Revised REDLINE TO Currently Approved	Standards Effected / Definitions Affected	Technical Guidelines / Reference Documents	Notes
	<ul style="list-style-type: none"> • F_S = Scheduled Frequency. • I_{ME} = Interchange Meter Error. • I_{IATEC} = Automatic Time Error Correction. <p>All NERC Interconnections operate using the principles of Tie-line Bias (TLB) Control and require the use of an ACE equation similar to the Reporting ACE defined above. Any modification(s) to this specified Reporting ACE equation that is(are) implemented for all BAAs on an Interconnection and is(are) consistent with the following four principles of Tie Line Bias control will provide a valid alternative to this Reporting ACE equation:</p> <ol style="list-style-type: none"> 1. All portions of the Interconnection are included in exactly one BAA so that the sum of all BAAs' generation, load, and loss is 	<ul style="list-style-type: none"> ○ In the Western Interconnection this term is I_{ATEC} <p>All NERC Interconnections operate using the principles of Tie-Line Bias (TLB) control and require the use of an ACE equation similar to the Reporting ACE defined above. Any modification(s) to this specified Reporting ACE that is(are) implemented for all BAAs in an Interconnection and is(are) consistent with the following four principles of Tie Line Bias control will provide a valid alternative to this Reporting ACE equation:</p> <ol style="list-style-type: none"> 1. Each individual portion of the Interconnection is included in exactly one BAA so that the sum of all BAAs' generation, Load, and losses is the same as total Interconnection 			

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NERC Glossary Term	Currently Approved Definition	SDT Proposed New or Revised REDLINE TO Currently Approved	Standards Effected / Definitions Affected	Technical Guidelines / Reference Documents	Notes
	<p>the same as total Interconnection generation, load, and loss;</p> <p>2. The algebraic sum of all BAAs' Scheduled Net Interchange is equal to zero at all times and the sum of all BAAs' Actual Net Interchange values is equal to zero at all times;</p> <p>3. The use of a common Scheduled Frequency FS for all BAAs at all times; and,</p> <p>4. Excludes metering or computational errors. (The inclusion and use of the IME term corrects for known metering or computational errors.)</p>	<p>generation, Load, and losses;</p> <p>2. The algebraic sum of all BAAs' Scheduled Net Interchange is equal to zero at all times and the sum of all BAAs' Actual Net Interchange values is equal to zero at all times This includes effects of ACE Diversity Interchange (ADI) implementations;</p> <p>3. The use of a common Scheduled Frequency for all BAAs at all times; and,</p> <p><u>4.</u> Excludes metering or computational errors. (The inclusion and use of the I_{ME} term corrects for known metering or computational errors.)</p>			

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NERC Glossary Term	Currently Approved Definition	SDT Proposed New or Revised REDLINE TO Currently Approved	Standards Effected / Definitions Affected	Technical Guidelines / Reference Documents	Notes
Reportable Balancing Contingency Event – (RBCE)	<p>Any Balancing Contingency Event occurring within a one-minute interval of an initial sudden decline in ACE based on EMS scan rate data that results in a loss of MW output less than or equal to the Most Severe Single Contingency , and greater than or equal to the lesser amount of:</p> <ul style="list-style-type: none"> (i) 80% of the Most Severe Single Contingency , or (ii) the amount listed below for the applicable Interconnection. Prior to any given calendar quarter, the 80% threshold may be reduced by the responsible entity upon written notification to the Regional Entity. <ul style="list-style-type: none"> • Eastern Interconnection – 900 MW • Western Interconnection – 500 MW 	<p>Any Balancing Contingency Event occurring within a one-minute interval of an initial sudden decline in the responsible entity’s Reporting ACE that results in a loss of MW output less than or equal to its Most Severe Single Contingency (MSSC) , and greater than or equal to the lesser amount of:</p> <ul style="list-style-type: none"> (i) 80% of its MSSC. Prior to any given calendar quarter, the 80% threshold may be reduced by the responsible entity upon written notification to its Regional Reliability Organization(s)Entity, or (ii) the amount listed below for the applicable Interconnection. <ul style="list-style-type: none"> • Eastern Interconnection: 900 MW 	<p>Standards BAL-002-3</p> <p>Terms Contingency Event Recovery Period</p>	<p>Reliability Guideline: Operating Reserve Management</p> <p>Technical Reference Document: Area Control Error Diversity Interchange Process</p>	<p>Update to the NERC defined term “Reporting ACE” to accurately reflect current terminology.</p> <p>Moved note on modification of 80% threshold for readability.</p>

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	<ul style="list-style-type: none"> ERCOT – 800 MW Quebec – 500 MW 	<ul style="list-style-type: none"> Western Interconnection: 500 MW ERCOT: 800 MW Quebec: 500 MW 			
Reportable Disturbance	Any event that causes ACE change greater than or equal to 80% of a Balancing Authority’s or reserve sharing group’s most severe contingency. The definition of a reportable disturbance is specified by each Regional Reliability Organization. This definition may not be retroactively adjusted in response to observed performance.	Retire	Standards CIP-002-5.1 (<i>outdated reference in G&TB</i>) Terms None		Retire
Reserve Sharing Group – (RSG)	A group whose members consist of two or more Balancing Authorities that collectively maintain, allocate, and supply operating reserves required for each Balancing Authority’s use in recovering from contingencies within the group. Scheduling	A group whose members consist of two or more Balancing Authorities that collectively maintain, allocate, and supply Operating Reserves required for each Balancing Authority’s use in recovering from contingencies within the group.	Standards <ul style="list-style-type: none"> PRC-005-6 BAL-001-2 BAL-002-3 BAL-002-WECC-3 	Reliability Guideline: Operating Reserve Management	Update to the NERC defined term “Operating Reserves” to accurately reflect current terminology. Replaced “disturbance

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	energy from an Adjacent Balancing Authority to aid recovery need not constitute reserve sharing provided the transaction is ramped in over a period the supplying party could reasonably be expected to load generation in (e.g., ten minutes). If the transaction is ramped in quicker (e.g., between zero and ten minutes) then, for the purposes of disturbance control performance, the areas become a Reserve Sharing Group.	Scheduling energy from an Adjacent Balancing Authority to aid recovery need not constitute reserve sharing provided the transaction is ramped in over a period the supplying party could reasonably be expected to load generation in (e.g., ten minutes). If the transaction is ramped in more quickly (e.g., between zero and ten minutes) then, for the purposes of recovery from a <u>Reportable</u> Balancing Contingency Event, the areas become a Reserve Sharing Group.	Terms Reserve Sharing Group Reporting ACE		control performance” with “Balancing Contingency Event” to accurately reflect changes to BAL-002-3 terminology.
Reserve Sharing Group Reporting ACE	At any given time of measurement for the applicable Reserve Sharing Group (RSG), the algebraic sum of the ACEs (or equivalent as calculated at such time of measurement) of the Balancing Authorities participating in the RSG at the time of measurement.	At any given time of measurement for the applicable Reserve Sharing Group (RSG), the algebraic sum of the Reporting ACEs (or equivalent as calculated at such time of measurement) of the Balancing Authorities participating in the RSG at the time of measurement.	Standards BAL-001-2 Terms None		Edited to accurately require a Reserve Sharing Group’s Reporting ACE to use the sum of the Balancing Authorities Reporting ACE.

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Scheduled Frequency	60.0 Hertz, except during a time correction	60.00 Hertz, except during a Time Error Correction	<p>Standards</p> <ul style="list-style-type: none"> BAL-001-2 MOD-027-1 <p>Terms</p> <ul style="list-style-type: none"> Frequency Regulation; Reporting ACE (<i>current and proposed</i>); Time Error Correction (<i>proposed</i>) 	<p>Reliability Guideline: Operating Reserve Management</p> <p>Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards</p>	Added resolution to the term as Time Error corrections are normally performed in +/- .02 Hz increments. Also capitalized terms that are NERC defined glossary terms.
Scheduled Net Interchange - (NI_s)	The algebraic sum of all scheduled megawatt transfers, including Dynamic Schedules, to and from all Adjacent Balancing Authority areas within the same Interconnection, including the effect of scheduled ramps. Scheduled megawatt transfers on asynchronous DC tie lines directly connected to another	Added acronym	<p>Standards</p> <p>None</p> <p>Terms</p> <p>Reporting ACE (<i>current and proposed</i>)</p>	<p>Technical Reference Document: Balancing and Frequency Control</p> <p>Technical Reference Document: Integrating Reporting ACE with</p>	Added acronym

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	Interconnection are excluded from Scheduled Net Interchange.			the NERC Reliability Standards Technical Reference Document: Area Control Error Diversity Interchange Process Reliability Guideline: Inadvertent Interchange	
Supplemental Regulation Service	A method of providing regulation service in which the Balancing Authority providing the regulation service receives a signal representing all or a portion of the other Balancing Authority's ACE.	A method of providing Regulation Service in which the Balancing Authority providing the Regulation Service receives a signal representing all or a portion of the other Balancing Authority's Reporting ACE.	Standards None Terms None		Update to the NERC defined term "Reporting ACE" to accurately reflect current terminology.
Tie Line Bias (TLB)	A mode of Automatic Generation Control that allows the Balancing Authority to :	A mode of Automatic Generation Control that allows the Balancing Authority to :	Standards BAL-004-WECC-3		Added acronym and capitalized defined terms.

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	<ol style="list-style-type: none"> maintain its Interchange Schedule and respond to Interconnection frequency error. 	<ol style="list-style-type: none"> maintain its Interchange Schedule and respond to Interconnection Frequency Error. 	Terms Reporting ACE		
Time Error (TE)	The difference between the Interconnection time measured at the Balancing Authority(ies) and the time specified by the National Institute of Standards and Technology. Time error is caused by the accumulation of Frequency Error over a given period.	The difference between the Interconnection time measured at the Balancing Authority(ies) and the time specified by the National Institute of Standards and Technology. The difference is caused by the accumulation of Frequency Error over a given period.	Standards None Terms <ul style="list-style-type: none"> Automatic Time Error Correction (<i>current and proposed</i>); Time Error Correction (<i>current and proposed</i>) 	Technical Reference Document: Balancing and Frequency Control Technical Reference Document: Integrating Reporting ACE with the NERC Reliability Standards	Added acronym commonly used and minor grammatical change to definition.
Time Error Correction (TEC)	An offset to the Interconnection’s scheduled frequency to return the Interconnection’s Time Error to a predetermined value.	A manual offset to the Interconnection’s Scheduled Frequency to return the Interconnection’s Time Error to a predetermined range.	Standards BAL-004-WECC-3 Terms <ul style="list-style-type: none"> Automatic Time Error Correction 	Technical Reference Document: Balancing and Frequency Control Technical Reference	Added the word “manual” to indicate this process is not automatically implemented.

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			<i>(current and proposed);</i> <ul style="list-style-type: none"> Scheduled Frequency <i>(proposed)</i> 	Document: Balancing Authority Area Footprint Change Tasks	