Figure 1: Block diagram of ACE calculation and manipulation.
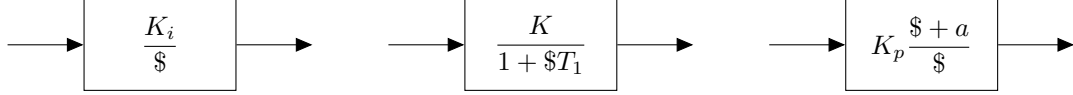

Figure 2: Block diagram available filters.

Table 1: Tie-Line Bias AGC type ACE calculations.

TLB Type	ACE Calculation
0	$ACE_{FB} + ACE_{TL}$
1	$ACE_{FB} + (sgn(\Delta\omega) == sgn(ACE_{TL})) * ACE_{TL}$
2	$(ACE_{FB} + ACE_{TL}) * (sgn(\Delta\omega) == sgn(ACE_{FB} + ACE_{TL}))$
3	$ACE_{FB} * (sgn(\Delta\omega) == sgn(ACE_{FB})) + ACE_{TL} * (sgn(\Delta\omega) == sgn(ACE_{TL}))$

If IACE is to be added using the weight option:

$$ACE = ACE * (1 - IACEweight) + IACE * IACEweight * IACEscale$$
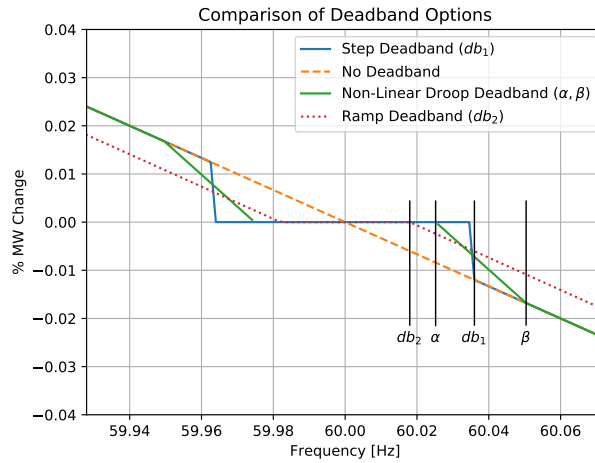
Else:

$$ACE = ACE + IACE * IACEscale$$

Figure 3: Governor deadband options.

Table 2: Balancing Authority dictionary input information.

Key	Type	Units	Example	Description
B	String	MW/0.1Hz	"1.0 : permax"	Describes the frequency bias scaling factor B used in the ACE calculation. Various Options exist.
AGCActionTime	Float	Seconds	5	Time between AGC dispatch messages.
AGCType	String	-	"TLB : 2"	Sets AGC routine to use and type specific options.
UseAreaDroop	Boolean	-	False	If True, all governed generators under BA control will use the area droop.
AreaDroop	Float	Hz/MW	0.05	Droop value to use if 'UseAreaDroop' is True.
IncludeIACE	Boolean	-	True	If True, include IACE in ACE calculation
IACEconditional	Boolean	-	False	Adds IACE to ACE if signs of $\Delta\omega$, ACE and IACE match.
IACEwindow	Integer	Seconds	60	Defines the length of moving integration window to use in IACE. If set to 0, integration takes place for all time.
IACEscale	Float	-	0.0167	Value used to scale IACE.
IACEuseWeight	Boolean	-	True	Option to use weighting of IACE during summation.
IACEweight	Float	-	0.5	Weighting of IACE to ACE used during summation.
IACEdeadband	Float	Hz	0.036	Absolute value of system frequency where IACE will not be included below.
ACEFiltering	String	-	'PI : 0.03 0.001'	String used to dictate which filter agent is created and specific parameters.
AGCDeadband	Float	MW	1.5	Value of ACE to ignore sending in AGC dispatch.
GovDeadbandType	String	-	step'	Type of deadband to be applied to area governors.
GovDeadband	Float	Hz	0.036	Absolute value of system frequency that governors will not respond below.
GovAlpha	Float	Hz	0.016	Specific to 'NLDroop' type of deadband. Specifies lower bound of non-linear droop.
GovBeta	Float	Hz	0.036	Specific to 'NLDroop' type of deadband. Specifies upper bound of non-linear droop and return to specified machine droop.
CtrlGens	List of Strings	-	-	List of generators, participation factor, and dispatch signal type.