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Table
Major WECC Remedial Action Schemes (RAS)
Used in Standard PRC-004-WECC-AB1-1
(Revised September 19, 2007)

	Path Name*	Path Number	RAS
1.	Alberta – British Columbia	Path 1	Remedial actions are required to achieve the rated transfer capability. Most involve tripping tie lines for outages in the BCTC system. East to West: For high transfers, generation tripping is required north of the SOK cutplane in Alberta.
2.	Northwest – British Columbia	Path 3	Generator and reactive tripping in the BCTC system to protect against the impact caused by various contingencies during transfers between British Columbia and the Northwest.
3.	West of Hatwai	Path 6	Generator dropping (Libby, Noxon, Lancaster, Dworshak); Reactor tripping (Garrison); Tripping of Miles City DC link.
4.	Montana to Northwest	Path 8	Tripping Colstrip by ATR (NWMT); Switching shunt reactors at Garrison 500 kV; Tripping the back-to-back DC tie at Miles City; Tripping Libby and Noxon generation by WM-RAS (BPA).
5.	Idaho to Northwest	Path 14	Generator Runback at Hells Canyon; Jim Bridger tripping for loss of Midpoint – Summer Lake 500 kV line.
6.	Midway-Los Banos	Path 15	CDWR and PG&E pump load dropping north of Path 15. PG&E service area load dropping north of Path 15. PG&E service area generation dropping south of Path 15.
7.	Idaho Sierra	Path 16	Automatic load shedding is required when the Alturas line is open for loss of the Midpoint-Humbolt 345 kV line during high Sierra system imports.

	Path Name*	Path Number	RAS
8.	Bridger West	Path 19	Jim Bridger tripping for delayed clearing and multi-line faults; Addition of shunt capacitors at Jim Bridger, Kinport and Goshen and series capacitor bypassing at Burns.
9.	IPP DC Line	Path 27	IPP Contingency Arming System trips one or two IPP generating units.
10.	TOT1A	Path 30	Bonanza and Flaming Gorge generation is tripped for loss of the Bonanza-Mona 345 kV line to achieve rating on TOT1A.
11.	TOT2A	Path 31	For the Montrose-Hesperus 345 kV line outage with Nucla generation above 60 MW, the parallel Montrose-Nucla 115 kV line is automatically transfer tripped.
12.	TOT2B	Path 34	Trip Huntington generation for loss of the Huntington-Pinto + Four Corners lines when parallel lines are heavily loaded.
13.	TOT5	Path 39	For an outage of the Hayden-Gore Pass 230 kV line, the lower voltage parallel path is tripped.
14.	SDGE RAS	Path 44	RAS used to meet reactive margin criteria for loss of both San Onofre units.
15.	SDGE – CFE	Path 45	The purpose of the RAS is to automatically cross-trip (transfer trip) the Miguel – Tijuana 230kV following the outage of Imperial Valley – Miguel 500kV line.
16.	Southern New Mexico	Path 47	For double contingencies on the 345 kV lines defined in the path, WECC Operating Procedure EPE-1 is implemented.
17.	Pacific DC Intertie	Path 65	Northwest generator tripping; Series capacitor fast insertion; mechanically switched shunt capacitors
18.	California – Oregon Intertie	Path 66	Northwest generator tripping; Chief Jo Brake insertion; Fort Rock Series Capacitor insertion; Northern California generator and pump load tripping; N. California series capacitor bypassing, shunt reactor or capacitor insertion; Initiation of NE\SE Separation Scheme at Four Corners.

	Path Name*	Path Number	RAS
19.	Meridian 500/230 kV Transformers**		Following the loss of the Meridian 500/230kV transformers, RAS are used to comply with WECC Standards under high load conditions.
20.	Northern-Southern California	Path 26	Remedial action required to achieve the rated transfer capability. Midway area generation tripped for loss of any two of three Midway-Vincent 500 kV lines.
21.	PNM Import Contingency Load Shedding Scheme (ICLSS)	Path 48	ICLSS is a centralized load shedding scheme for low probability events such as simultaneous outage of the Four Corners-West Mesa (FW) 345 kV and San Juan-B-A (WW) 345 kV lines, as well as any unplanned disturbance affecting voltage in the Northern New Mexico transmission system.
22.	Valley Direct Load Trip (DLT)		RAS is required for the loss of the Serrano-Valley 500 kV line. About 200 MW of Valley load is tripped.
23.	South of Lugo N-2 RAS		RAS is required for the simultaneous double line outage of any combination of the Lugo-Mira Loma 1 (when looped), 2, and 3 500 kV lines and the Lugo-Serrano (when de-looped) 500 kV line.
24.	Lower Snake RAS		The RAS is required to protect for the double line outage of the Lower Monumental-Little Goose 500-kV lines. Generation is dropped at Little Goose and Lower Granite Powerhouses as well as key the WM RAS. An outage of the Little Goose – Lower Granite 500 kV lines will drop generation at Lower Granite Powerhouse and key the Western Montana RAS.
25.	Palo Verde – COI Mitigation Scheme	Path 66	Required to provide for safe operation of the COI for the loss of two units at Palo Verde Nuclear Generating Station (PVNGS). The RAS protects the PVNGS and Palo Verde Transmission System (PVTS) for faults at Palo Verde and subsequent outage of the Palo Verde – Westwing 500 kV lines.
26.	Palo Verde/Hassayampa RAS		Provides protection to the PVNGS and the PVTS for faults at Palo Verde and subsequent double line outage of the Palo Verde to Westwing 500 kV lines.***

	Path Name*	Path Number	RAS
27.	Sierra Pacific – PacifiCorp RAS	Path 76	Needed for loss of the 230 kV Malin-Hilltop line when heavily loaded unless automatic reclose is successful. The scheme closes the Hilltop 345 kV line reactor if pre-outage northbound flow is greater than 150 MW. For pre-outage southbound flow greater than 235 MW the Hilltop 345 kV line trips and the Hilltop 345 kV line reactors closes.

* For an explanation of terms, path numbers, and definition for the paths refer to WECC's Path Rating Catalog.

** The Meridian 500/230 kV transformers are not included in the Path Rating Catalog. The RAS associated with the Meridian transformers is included in Table 3 because the failure of the RAS may result in cascading.

*** The Palo Verde/Hassayampa RAS is designed to prevent cascading problems throughout the WECC region. This scheme is not Path related and is not used to protect any specific WECC Path.