



California ISO  
Shaping a Renewed Future

# Operations Highlights Report

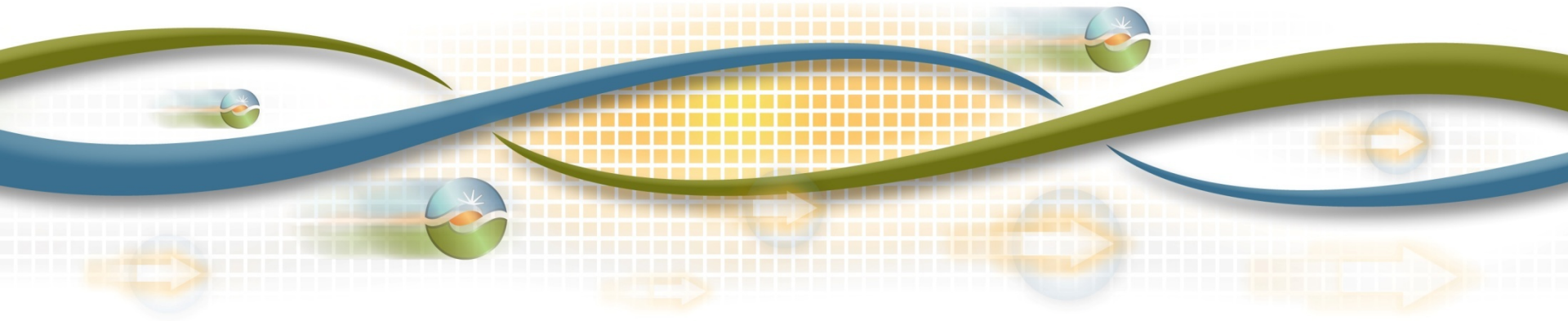
Eric Schmitt

Vice President, Operations

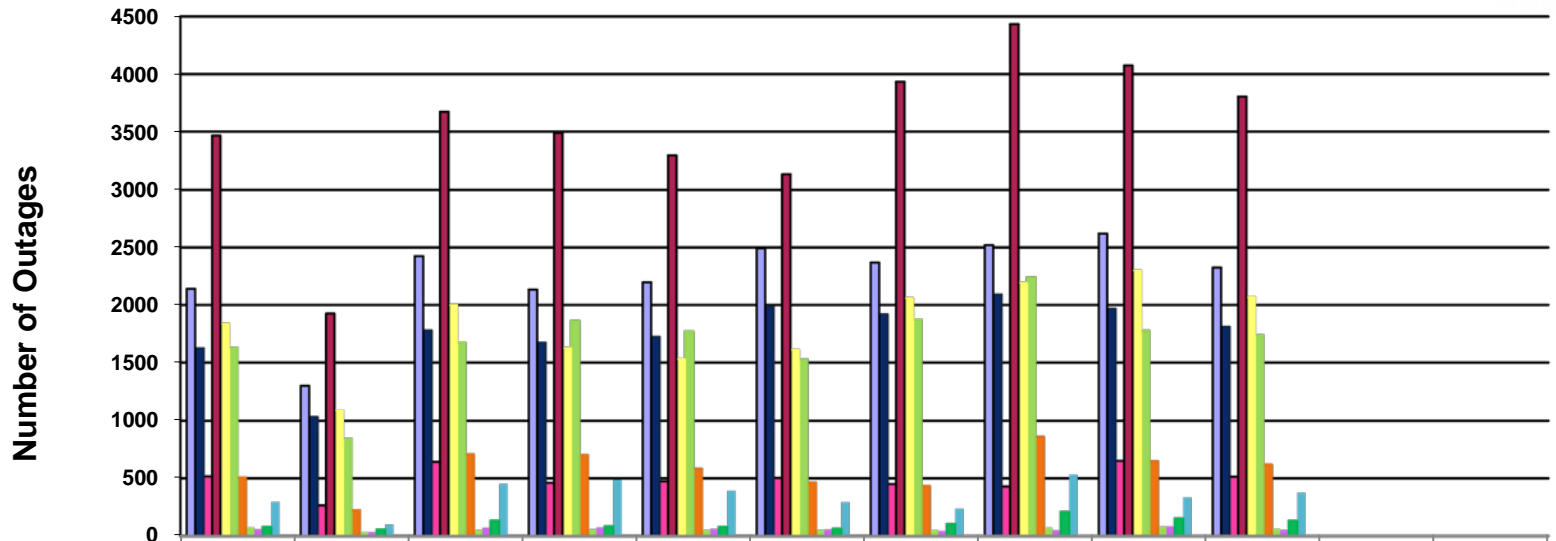
Board of Governors Meeting

General Session

December 15-16, 2011



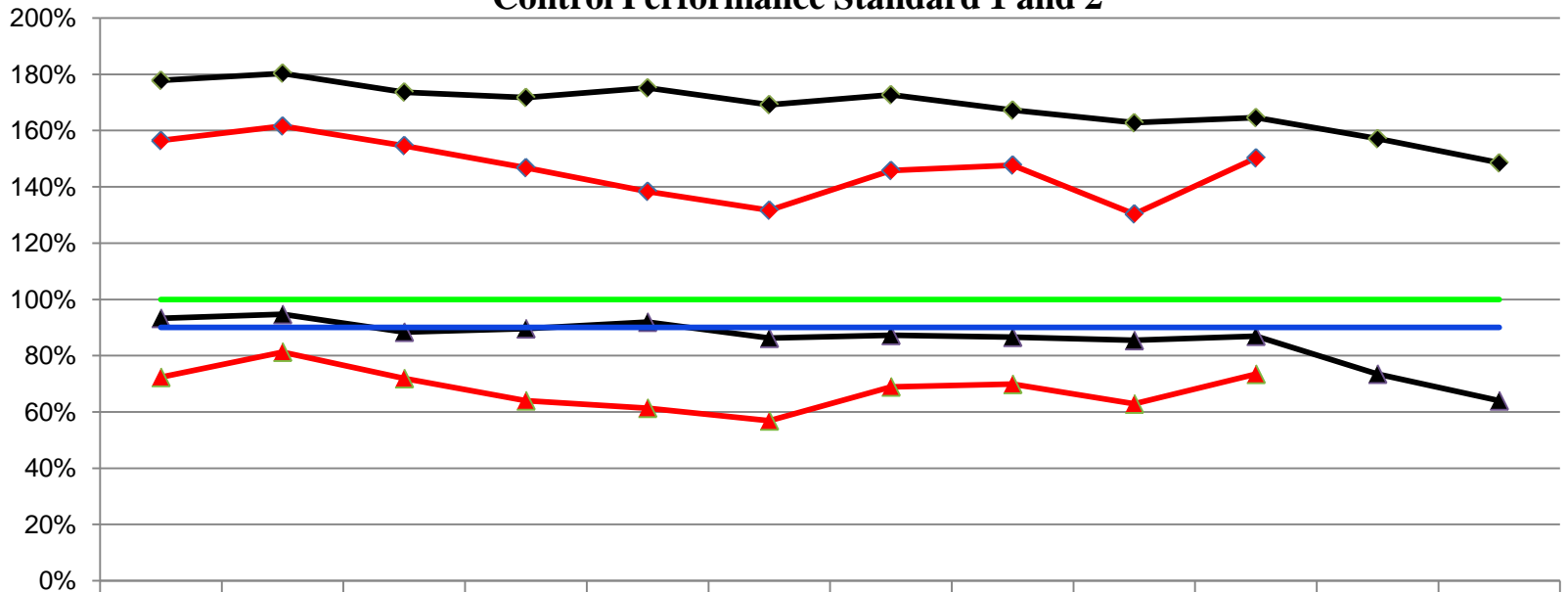
## Outage Summary 2011



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Forced	2141	1298	2424	2134	2197	2492	2369	2520	2620	2325		
Forced Generation	1624	1033	1779	1672	1723	1988	1919	2091	1968	1810		
Forced Transmission	517	265	643	462	474	504	450	429	652	515		
Scheduled	3466	1926	3673	3489	3300	3136	3934	4434	4075	3805		
Scheduled Generation	1839	1084	2000	1628	1531	1610	2060	2195	2299	2068		
Scheduled Transmission	1627	842	1673	1861	1769	1526	1874	2239	1776	1737		
Cancelled	506	222	707	702	582	463	431	861	648	618		
Cancelled Forced Generation	76	34	52	59	52	51	50	72	81	62		
Cancelled Forced Transmission	57	34	70	72	61	56	43	48	82	51		
Cancelled Planned Generation	78	56	133	83	78	63	103	208	151	131		
Cancelled Planned Transmission	295	98	452	488	391	293	235	533	334	374		
RMO	0	0	0	0	0	0	1	0	4	5		

The outage summary graph shows the number of forced, scheduled and cancelled generation and transmission outages processed per month by the Outage Coordination office. Included in the graph is the number of restricted maintenance operations. Restricted maintenance operations accommodates additional transmission or other maintenance on the grid.

## Control Performance Standard 1 and 2



	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
◆ '11 CPS 1	156%	162%	155%	147%	138%	132%	146%	148%	130%	150%		
▲ '11 CPS 2	72.32%	81.29%	71.90%	64.02%	61.38%	56.89%	68.94%	69.85%	62.87%	73.43%		
◆ '10 CPS 1	178%	180%	174%	172%	175%	169%	173%	167%	163%	165%	157%	149%
▲ '10 CPS 2	93.32%	94.67%	88.39%	89.60%	91.95%	86.24%	87.26%	86.59%	85.43%	86.97%	73.48%	64.00%
— CPS1 Min Req	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
— CPS2 Min Req	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%

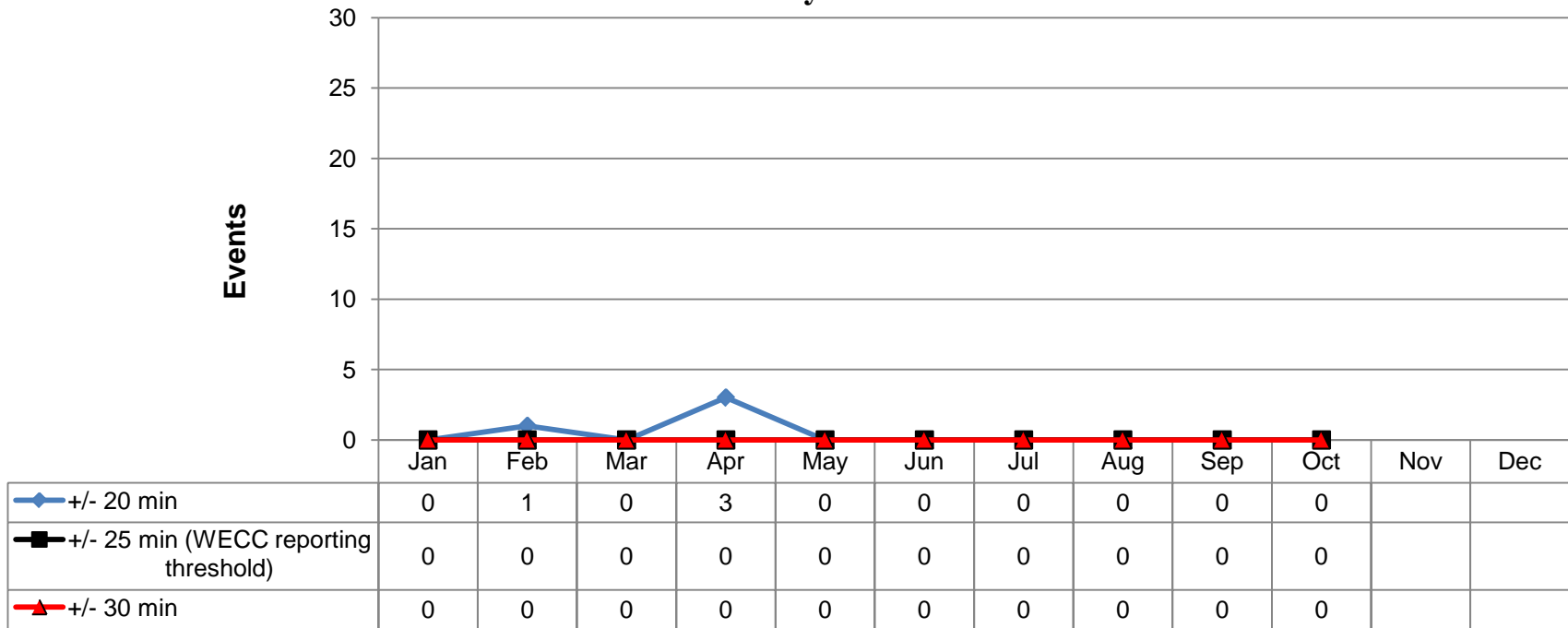
**CPS1** is a statistical measure of area control error (ACE) variability. It measures ACE in combination with the interconnection frequency.

The CPS1 formula was developed on a conformance scale, therefore values over 100% are not only desired, but also expected.

**CPS2** is a statistical measure of ACE magnitude. It is designed to limit a control area's unscheduled (or inadvertent) overflows that could result from large ACE values.

**Note:** Effective March 1, 2010: WECC launched the reliability based control proof-of-concept field trial. The CPS2 measure is impacted by the reliability based control field trial currently underway. The ISO has received a signed release waiving the CPS2 requirement from WECC during the participation in the trial.

## Reliability Based Control

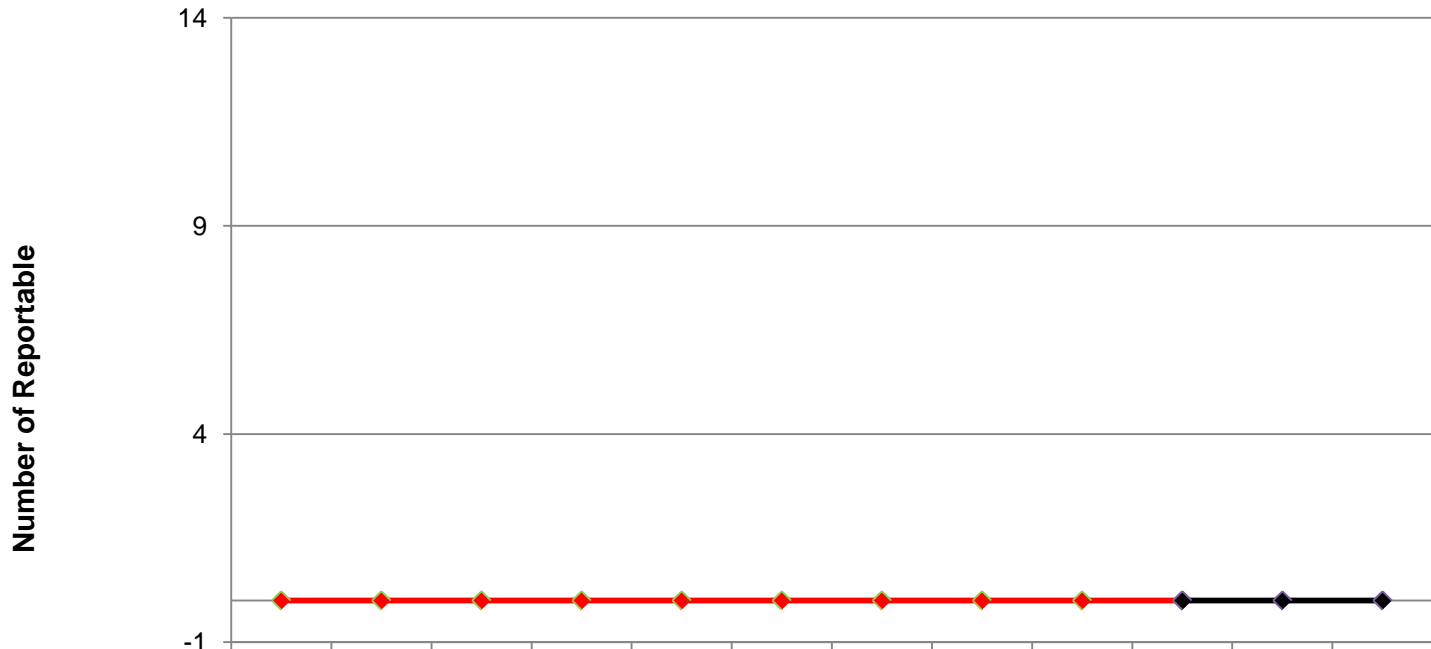


Reliability based control is an Eastern and Western Field Trial that supports the interconnection frequency by requiring balancing areas to take action to limit the duration of operating outside a variable area control error bound that gets “tighter” as actual frequency deviates further from 60 Hz., during field trial reporting, which is required, but not considered a violation. The following actions are taken when exceeding balancing area ace limit (BAAL) - *high* or *low* for:

- **10 Consecutive Minutes**—Identify any period that exceeded BAAL high or BAAL low for 10 consecutive clock minutes.
- **20 Consecutive Minutes**—Provide a brief explanation of the circumstances related to any period that exceeded BAAL high or BAAL low for 20 consecutive clock minutes.
- **30 Consecutive Minutes**—Provide a detailed account of the event related to any period that s exceeded BAAL high or BAAL low for 30 consecutive clock minutes.

The field trial started in March of 2010 and the chart indicates the number of times the BAAL exceeds a high or low limit each month. The reliability based control standard took effect on 3/1/2010 – the January and February control was monitored under CPS2.

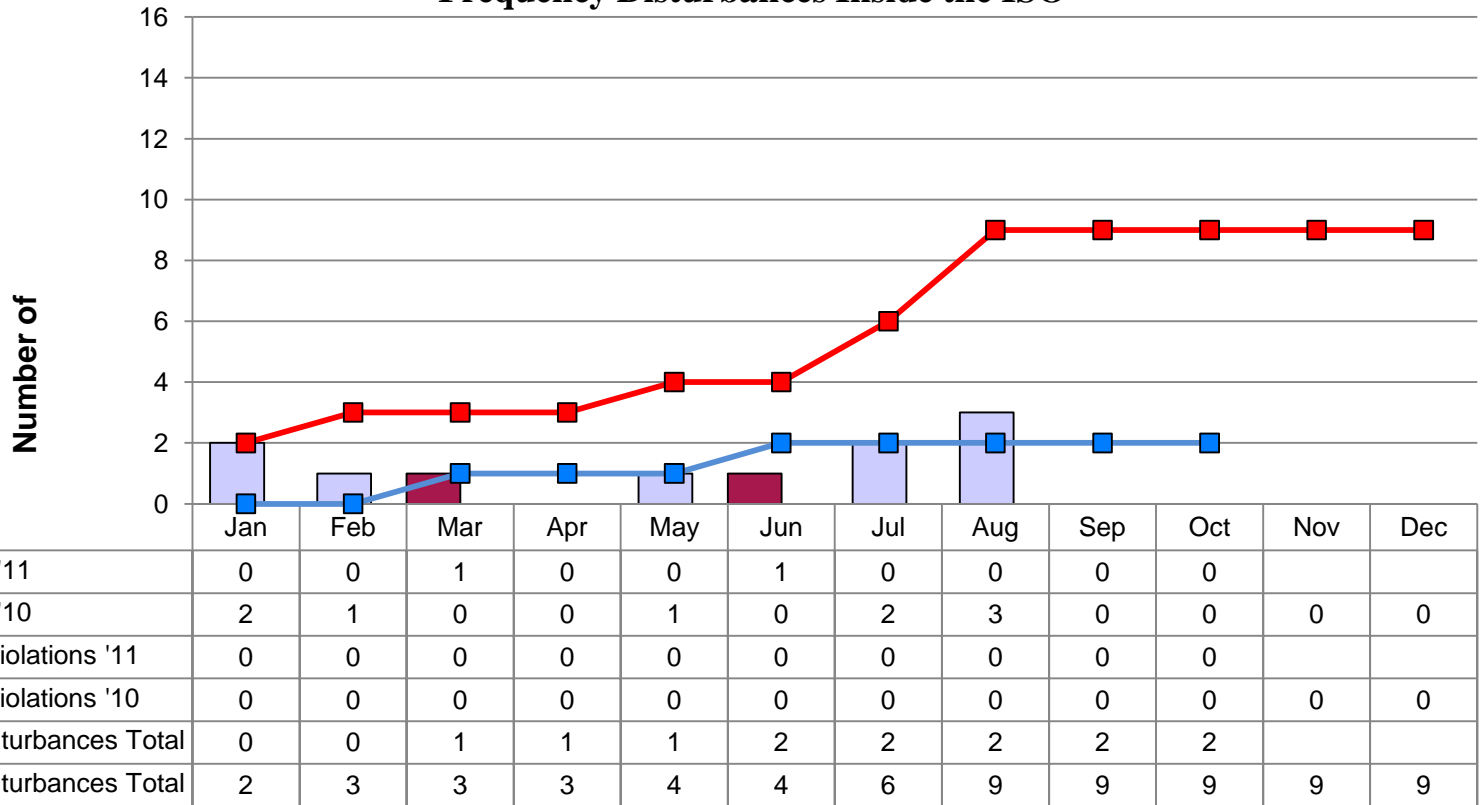
## Operational Transfer Capability Reportable Events



	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
<span style="color: red;">■</span> '11 Reportable Events	0	0	0	0	0	0	0	0	0	0		
<span style="color: black;">■</span> '10 Reportable Events	0	0	0	0	0	0	0	0	0	0	0	0
<span style="color: red;">◆</span> '11 YTD Reportable Events	0	0	0	0	0	0	0	0	0	0		
<span style="color: black;">◆</span> '10 YTD Reportable Events	0	0	0	0	0	0	0	0	0	0	0	0

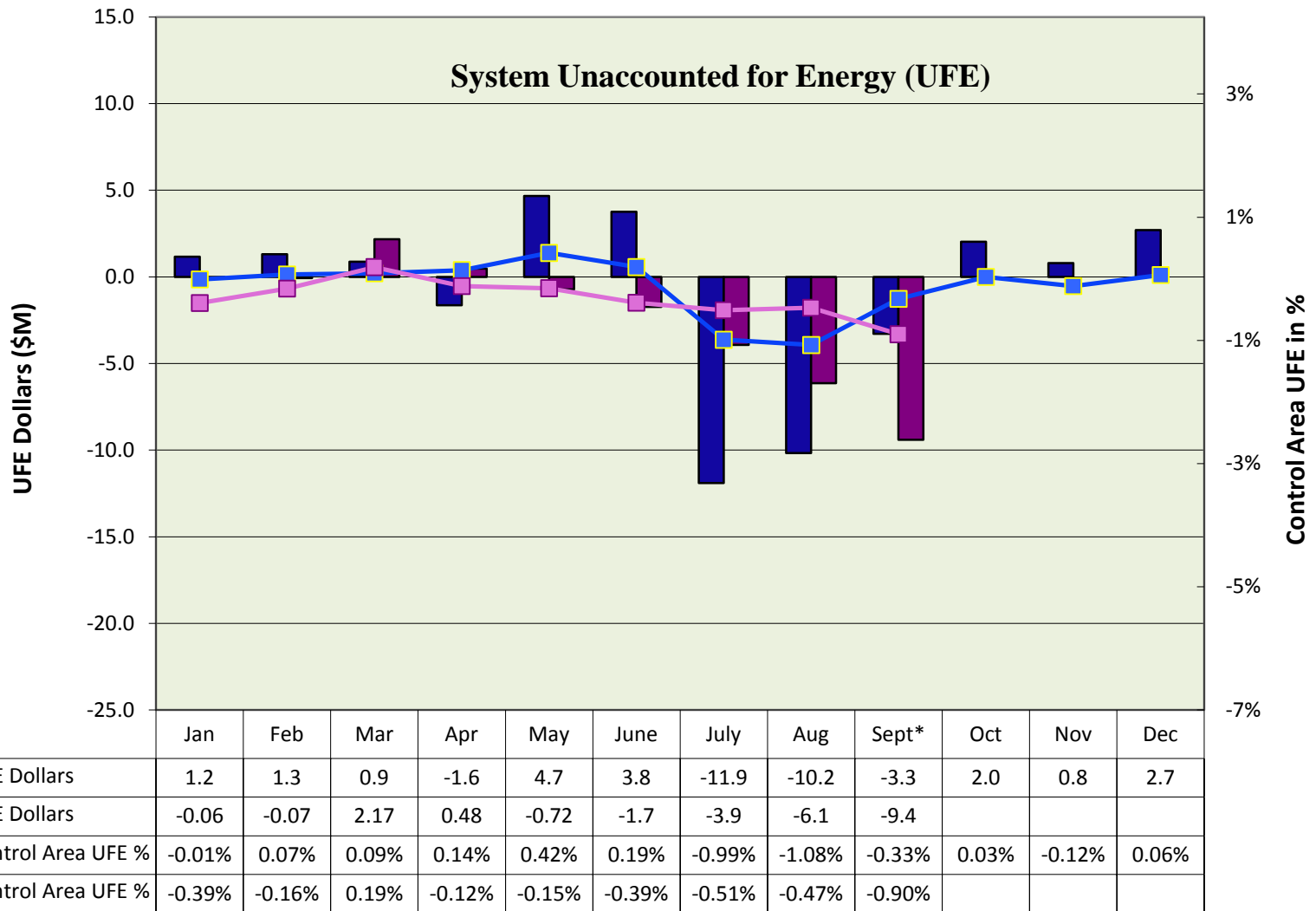
Operational transfer capability reportable events are defined as path overloads that exceed WECC allowable time limits for both stability-related and thermally-related paths.

## Frequency Disturbances Inside the ISO



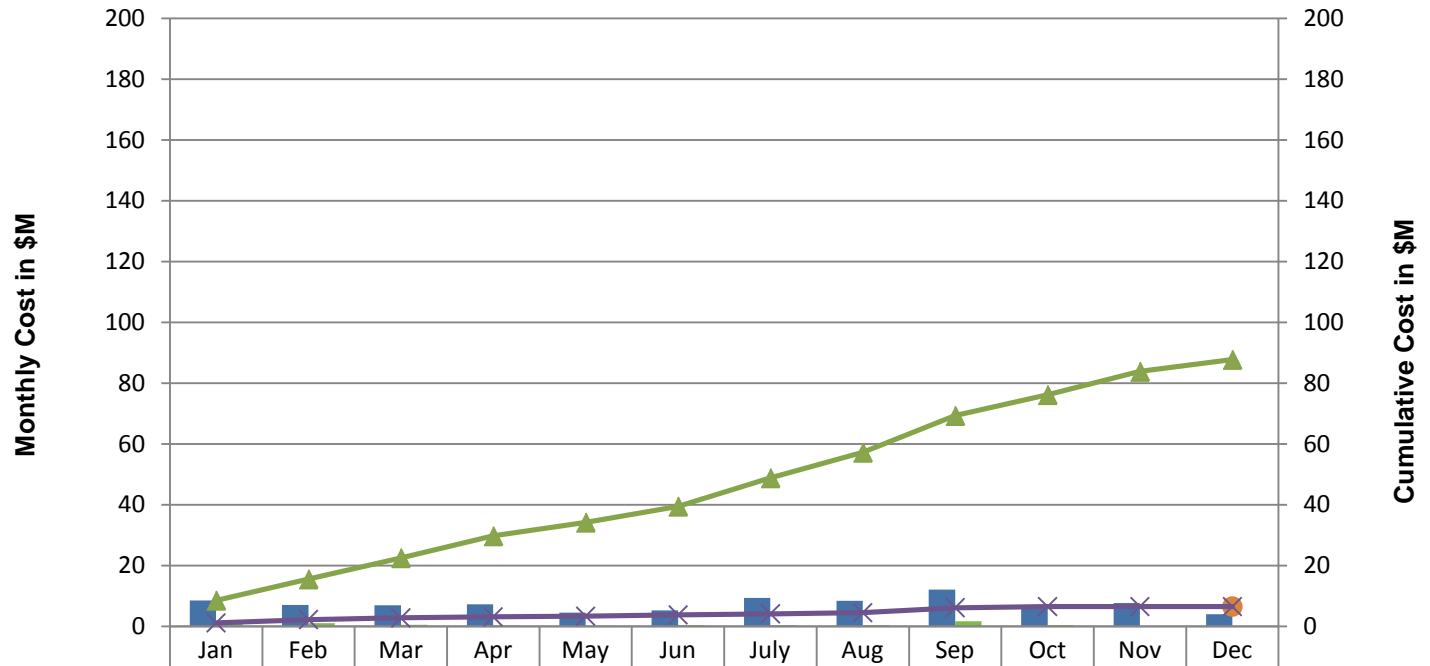
**Frequency Disturbances** are results of a sudden loss of load or generation.

**ISO DCS Violations** are those internal losses of generation greater than 80% of our most severe single contingency (currently 920 MW), where the ACE is not recovered within the 15 minutes. Prior to June 22, 2011, the ISO DCS Violations were those internal losses of generation greater than 35% of our most severe single contingency (currently 402.5 MW), where the ACE is not recovered within 15 minutes. Data provided is current through 10/31/11.



\*Initial amounts are estimated - there is a 31 business day time lag before actual unaccounted for energy data becomes available. Actual settlement quality meter data is required for the T+38B settlement statement.

## Reliability Must Run (RMR)

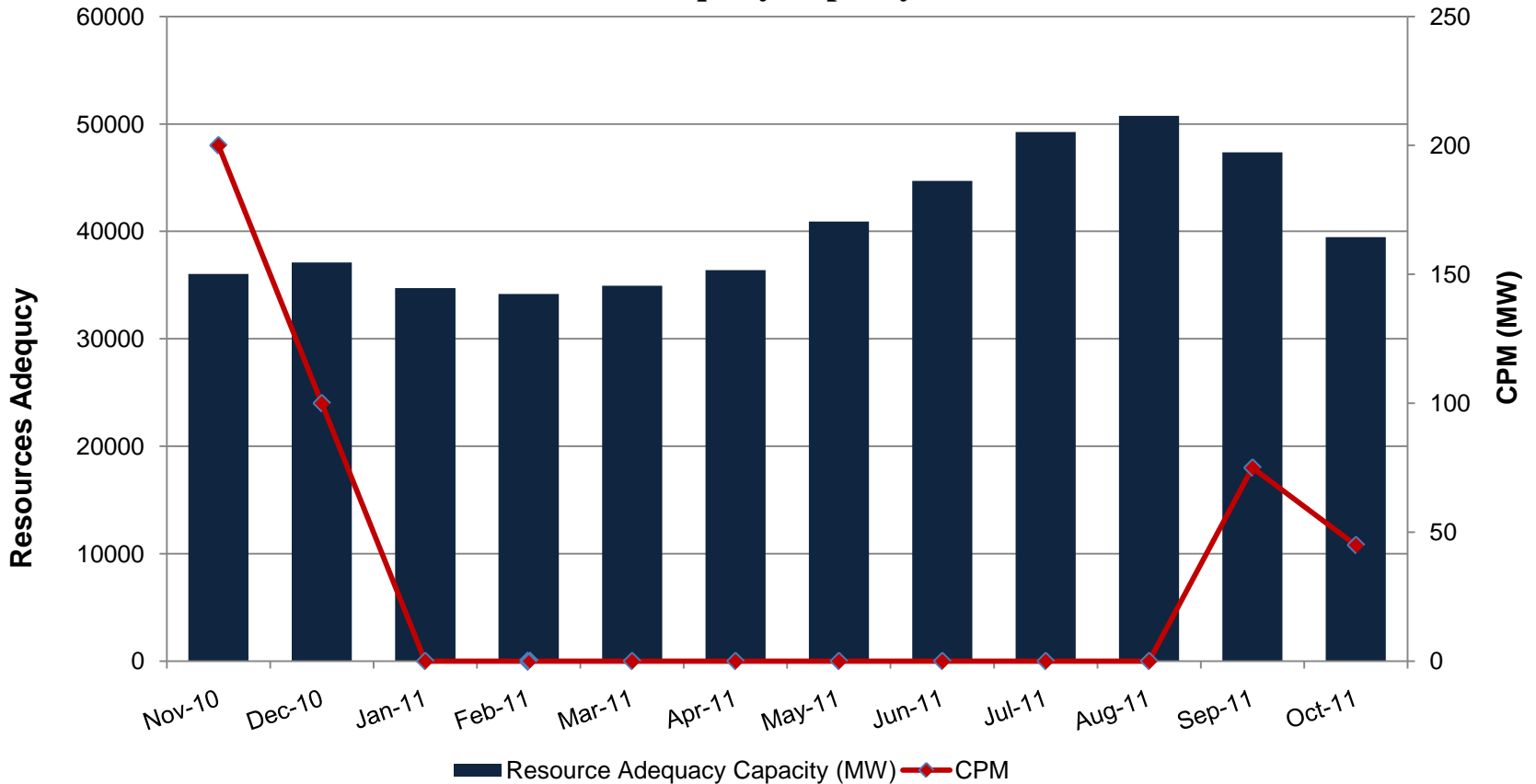


2010 Monthly Cost Gross	\$8.56	\$7.00	\$6.98	\$7.21	\$4.48	\$5.26	\$9.33	\$8.41	\$12.09	\$6.86	\$7.65	\$3.95
2011 Monthly Cost Gross	\$1.17	\$1.07	\$0.55	\$0.32	\$0.23	\$0.40	\$0.38	\$0.37	\$1.62	\$0.38		
2011 Estimated Annual Cost												6.50
2010 Cumulative Cost Gross	\$8.56	\$15.56	\$22.54	\$29.75	\$34.23	\$39.50	\$48.82	\$57.23	\$69.32	\$76.18	\$83.83	\$87.78
2011 Cumulative Cost Gross	\$1.17	\$2.24	\$2.79	\$3.11	\$3.35	\$3.75	\$4.13	\$4.51	\$6.13	\$6.50	\$6.50	\$6.50

Reliability must-run facilities decreased in January 2011 to two facilities and in March 2011 to one facility; down from four facilities in 2010. Note: There is a 120 day lag time before final reliability must-run data becomes available.



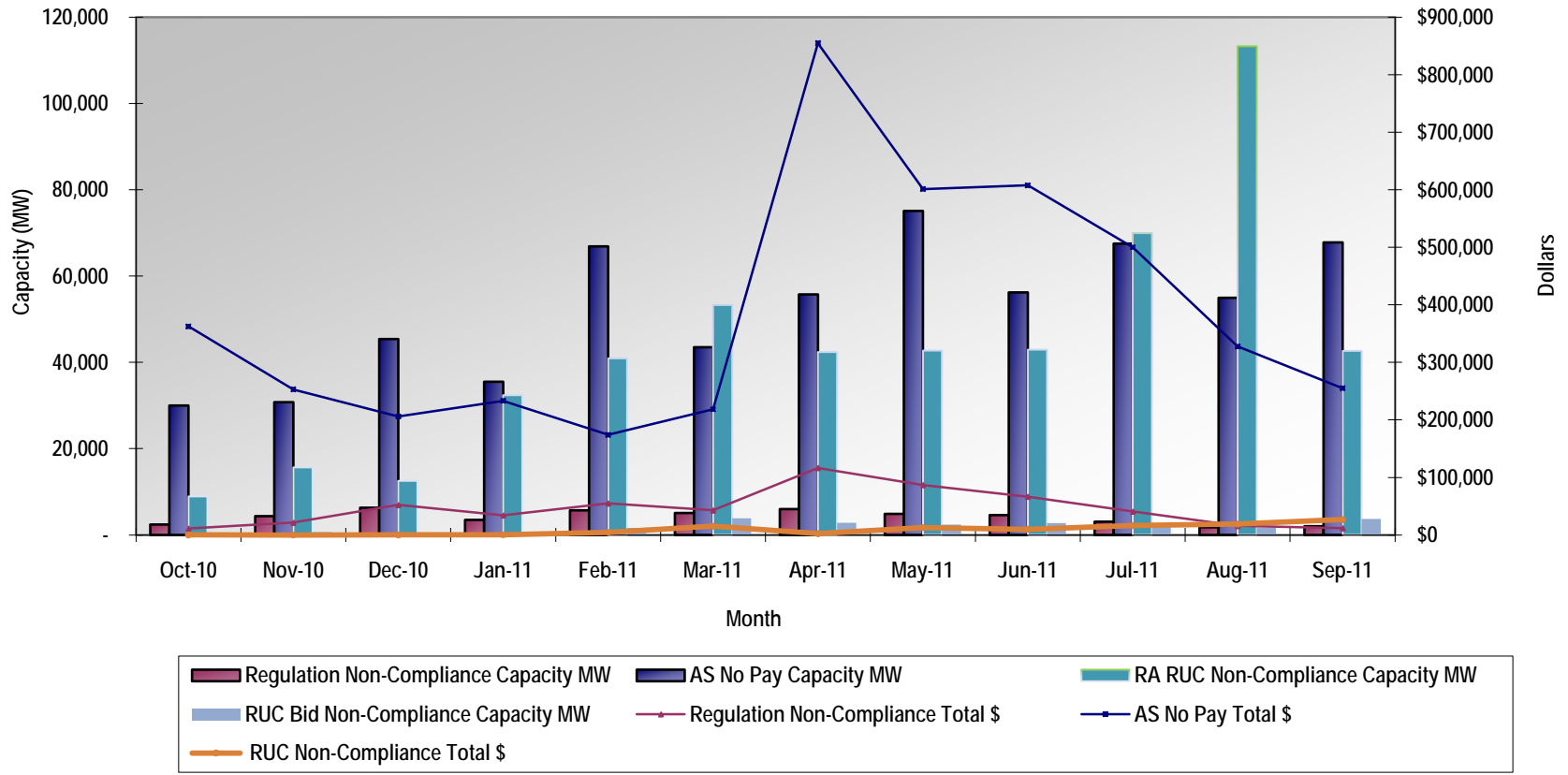
## Resource Adequacy Capacity and ICPM



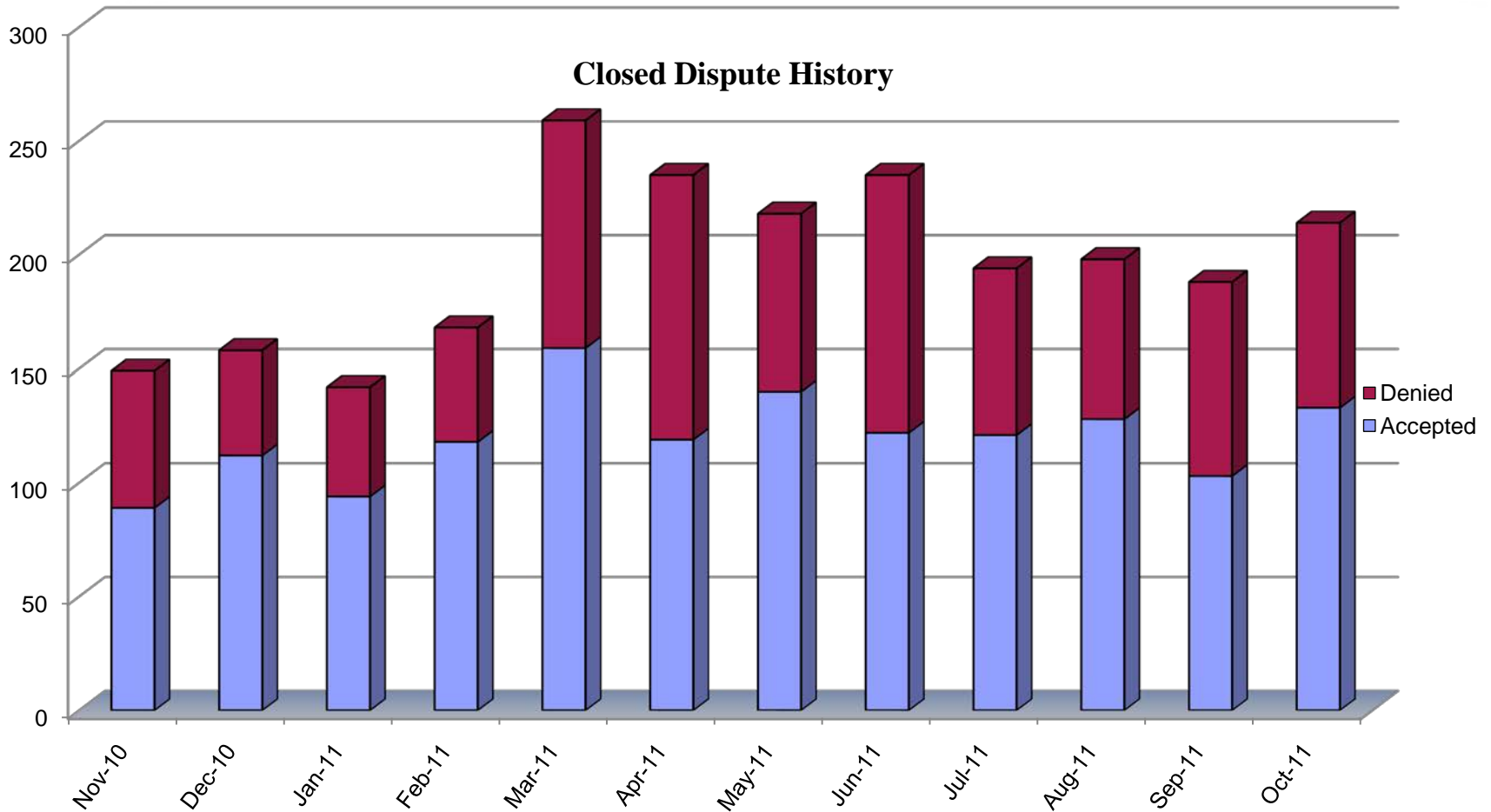
### Resource Adequacy Volume and ICPM Procurement

The total amount of resource adequacy capacity from generators and system resources, provided to meet local and system requirements as demonstrated in submitted supply plans, was 39462.66 MW in October and 47346.52 MW in September. The ISO procured capacity procurement mechanism (CPM) capacity for 45 MW in October 2011. The CPM market notices and monthly reports are located at: <http://www.caiso.com/237a/237ac93c2a6c0.html>

## Ancillary Service and RUC Compliance Programs



**Ancillary Services and Residual Unit Commitment (RUC) Compliance Program**: shows the monthly totals of non-compliant ancillary service capacity (MW) and non-compliant RUC capacity (MW). Market Services monitors suppliers of ancillary services and RUC to ensure that ancillary service and RUC capacity awarded in the ISO market is available in real-time.



The overall trend of approved disputes since March 2011 continues in a downward direction as variance fixes continue to be applied to the market and post-market systems, and improvements in data accuracy controls are implemented. The overall volume of disputes remains high as market participants traverse the learning curve connected with the complexities of recent market functionality implementations and their associated settlements results.

## **Definitions:**

The following are definitions of the items or systems covered in this report.

### ***Control Performance Standards 1 & 2 (CPS1 & CPS2) –***

- CPS1 is intended to provide a control area with a frequency sensitive evaluation of how well it is meeting its demand requirements. CPS1 is a statistical measure of area control error (ACE) variability.
- CPS2 is a statistical measure of ACE magnitude. It is designed to limit a control area's unscheduled (or inadvertent) power flows that could result from large ACE values. CPS2 is no longer a compliance measure: the ISO received a written release from WECC.

### ***Reliability Based Control (RBC) Field Trial –***

RBC is an Eastern and Western Field Trial that supports the interconnection frequency by requiring balancing areas to take action to limit the duration of operating outside a variable area control error bound that gets “tighter” as actual frequency deviates further from 60 Hz. The following actions are taken when exceeding balancing area ace limit (BAAL) - high or low for:

- 10 Consecutive Minutes – Identify any period that exceeded BAAL high or BAAL low for 10 consecutive clock minutes.
- 20 Consecutive Minutes – Provide a brief explanation of the circumstances related to any period that exceeded BAAL high or BAAL low for 20 consecutive clock minutes.
- 30 Consecutive Minutes – provide a detailed account of the event related to any period that exceeded BAAL high or BAAL low for 30 consecutive minutes.

## **Definitions, continued:**

***Operating Transfer Capability Reportable Events*** – OTC reportable events are defined as those transmission path overloads that exceed WECC allowable time limits for stability rated (20 minutes) and thermally rated (30 minutes) paths.

### ***ISO Control Area Frequency*** –

The ISO control area frequency figures report internal and external system disturbances and include reportable events of the *Disturbance Control Standard* (DCS) resulting from ISO control area internal disturbances, such as loss of a large generating unit or transmission line. WECC allowable time limit for disturbance recovery is 15 minutes. Per WECC criteria, qualifying disturbances are defined as those greater than 35% of our maximum generation loss from our most severe single contingency. The ISO's most severe single generation contingency is a nuclear unit with maximum generation output 1,120 MW, 35% of which is the 392 MW thresholds used herein.

### ***Residual Unit Commitment (RUC) Rescission Payments*** –

The rescission charge for a RUC award rescinds the RUC capacity payments to the extent that the resource with a RUC award does not fulfill the requirements associated with the award. The rescission charge rescinds RUC capacity payment for generating units, dynamic system resources, and non-dynamic system resources when one of the following occurs:

- Generating unit and dynamic system resource – RUC capacity is availability-limited undispatchable due to an outage or rerate is undelivered outside of a tolerance band, or ineligible for a RUC award because it is a resource adequacy resource.
- Non-dynamic system resource – RUC award is adjusted due to differences between RUC award amount and E-tag amount.

Additional information and examples can be found in the business practice manual for compliance monitoring.