



California ISO  
Shaping a Renewed Future

# Allocating CRR Revenue Inadequacy by Constraint to CRR Holders

Department of Market Monitoring

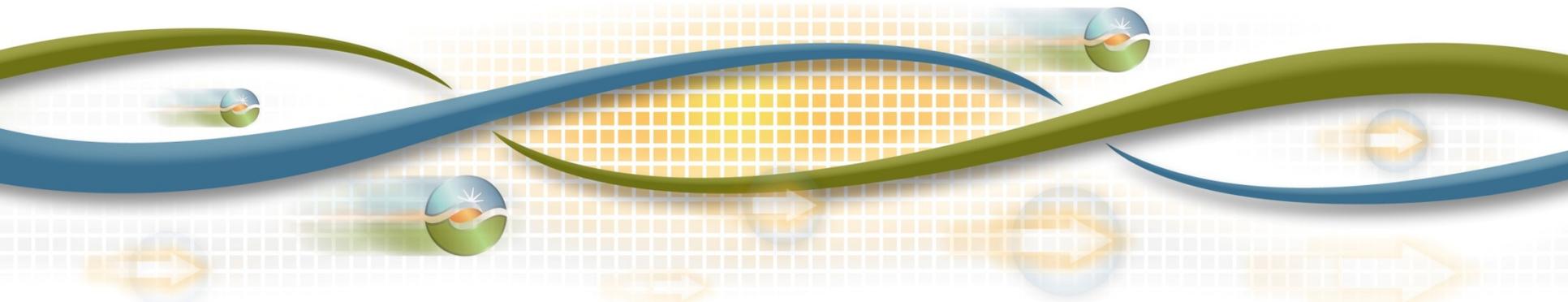
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Market Surveillance Committee Meeting

General Session

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# Example: ISO de-rate from outage of non-ISO line

## CRR Model



| Company | CRR flows over constraint 1 |
|---------|-----------------------------|
| Phys A  | 600 MW                      |
| Phys B  | 600 MW                      |
| Fin C   | 900 MW                      |

Total CRR flow = 2,100 MW

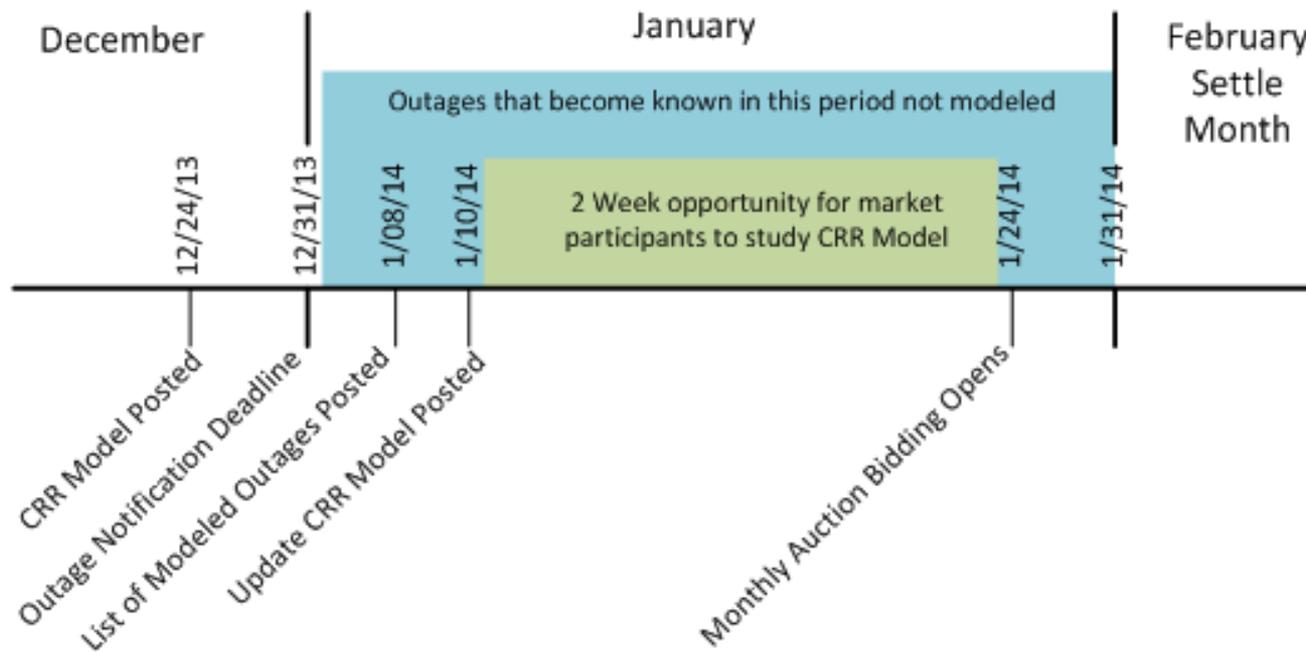
## IFM Model



| Company | IFM bid MW | IFM bid price |
|---------|------------|---------------|
| Phys A  | 550 MW     | -\$150        |
| Phys B  | 500 MW     | -\$149        |

Total IFM scheduled flow = 600 MW

# Outage timing



| Company | CRR flows over constraint 1 |
|---------|-----------------------------|
| Phys A  | 600 MW                      |
| Phys B  | 600 MW                      |
| Fin C   | 900 MW                      |

# Example CRR revenue inadequacy

CRR Model



IFM Model



CRR revenue inadequacy on constraint 1:

$$=(\text{CRR flow} - \text{IFM scheduled flow}) * (\text{IFM shadow price})$$

$$=(2,100 \text{ MW} - 600 \text{ MW}) * (\$200)$$

$$= \$300,000 \text{ per hour}$$

$$> \$7 \text{ million per day}$$

$$> \$200 \text{ million for month}$$

# Example allocation of hourly CRR revenue inadequacy

CRR Model



IFM Model



| Company      | CRR auction flow | CRR flow after de-rate | CRR revenue before de-rate | Inadequacy allocation | CRR revenue after de-rate |
|--------------|------------------|------------------------|----------------------------|-----------------------|---------------------------|
| Phys A       | 600 MW           | 171.5 MW               | \$120,000                  | \$85,700              | \$34,300                  |
| Phys B       | 600 MW           | 171.5 MW               | \$120,000                  | \$85,700              | \$34,300                  |
| Fin C        | 900 MW           | 257 MW                 | \$180,000                  | \$128,600             | \$51,400                  |
| <b>Total</b> | <b>2,100 MW</b>  | <b>600 MW</b>          | <b>\$420,000</b>           | <b>\$300,000</b>      | <b>\$120,000</b>          |

# Select causes of inherent modeling discrepancies between CRR and IFM models

- Outage timing
- Time granularity
  - ◆ CRR: Monthly
  - ◆ IFM: Hourly
- Loop flows
  - ◆ Time between estimation and realization
  - ◆ Time granularity
    - CRR: Monthly
    - IFM: Hourly

# CRR auction revenues and IFM congestion rents for CRRs bought by non-LSEs

