Soak Time Analysis

Modeling Generation Senior Task Force

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Analysis Methodology

- Select a subset of units, representing various sizes, ages and technology types from around the RTO (18 Steam, 18 CC).
- Use five years of history to get an adequate sample size of starts/soaks.
- Pull data from breaker close to Eco Min and determine the total MWh produced for each soak period.
- Remove “Bad” starts
  - Records that appear to be unit trips
  - Records where insufficient data existed to determine the end of the soak period

Methodology cont.

- Categorize starts as Hot, Warm, or Cold based on the time since the previous shut-down.
- Only consider units that have more than 20 starts for a particular temperature state.
- By unit and temperature state, average the total MWh produced for all soaks.
- Determine the % variation of each soak to the average.
- On a unit-by-unit basis determine how frequently a soak produces MWh +-10%, 25%, 50%, 75%, 90%, 100% of the average.

Simplified Example

Unit A - Cold Starts		
Start	**Total MWh**	**Diff from Average**
Start #1	20	72%
Start #2	30	58%
Start #3	40	44%
Start #4	50	31%
Start #5	60	17%
Start #6	70	3%
Start #7	80	11%
Start #8	100	39%
Start #9	120	67%
Start #10	150	108%
Avg	**72**	**0%**
Std Dev	**39**	

Cold Starts	Unit A	Unit B	Unit C	Average
Percent within 10%	10%	20%	0%	**10%**
Percent within 25%	30%	30%	0%	**20%**
Percent within 50%	60%	50%	30%	**47%**
Percent within 75%	90%	60%	40%	**63%**
Percent within 90%	90%	80%	80%	**83%**
Percent within 100%	90%	100%	90%	**93%**
Percent not within 100%	10%	0%	10%	**7%**

Analysis Results

Percent of Starts with Total MWh within X% of the Average Total MWh produced for all Starts									
Unit Type	**Temperature State**	10%	25%	50%	75%	90%	100%	>100%	Std. Dev/Average
CC	**Cold**	**23%**	**50%**	**78%**	**96%**	**97%**	**98%**	**2%**	**66%**
	Warm	**17%**	**40%**	**79%**	**94%**	**98%**	**99%**	**1%**	**63%**
	Hot	**12%**	**33%**	**64%**	**84%**	**91%**	**92%**	**8%**	**63%**
Steam	**Cold**	**13%**	**39%**	**71%**	**85%**	**89%**	**93%**	**7%**	**83%**
	Warm								
	Hot	**13%**	**30%**	**60%**	**83%**	**89%**	**91%**	**9%**	**77%**