



# Alternative Validation Logic & Compliance Tool for SOD

Thursday, October 06<sup>th</sup>, 2022



# Alternative Validation Logic & Compliance Tool for SOD

# Agenda

- Expected challenges for LSEs w/t current validation logic
- Alternative logic: aggregate testing for single-cycle energy storage
- Alternative compliance tool w/t aggregate testing
- Proposed modification to excess energy sufficiency test
- Takeaways & questions



# Proposed Logic & Expected Challenges

Example Showing - BESS Capacity				
HE	Houlyr NQC w/o Storage (Gas + Solar)	RAR	Hourly Position w/o Storage	BESS Resource
1	600	479	121	
2	600	457	143	
3	600	444	156	
4	600	438	162	
5	600	441	159	
6	600	464	136	
7	600	504	96	
8	610	531	78	
9	653	539	114	
10	706	541	165	
11	740	529	211	
12	754	527	227	
13	750	543	207	
14	733	554	179	
15	695	573	122	
16	646	585	61	
17	608	609	-1	<b>1</b>
18	600	642	-42	<b>42</b>
19	600	644	-44	<b>44</b>
20	600	611	-11	<b>11</b>
21	600	584	16	
22	600	564	36	
23	600	535	65	
24	600	499	101	

Requiring LSEs to show hourly capacity of storage to balance hourly positions will present unnecessary burden for position management & complicate transactability

- Underlying energy generation and hourly load profiles dictate when storage capacity is needed, which change month over month
- Every transaction will require LSEs to reevaluate hourly storage profiles to know impact of transaction across delivery period\*
- Automation simplifies showing process, but LSEs need to know monthly positions well in advance of submitting a filing
- For position management, LSEs will either manually modify hourly storage capacity or replicate complicated automation logic in-house, which would be very slow if applied to 36+ months of data

\*288 data points for each standalone storage resource for a calendar strip transaction (24\*12)

# Expected Challenges - Example

Hourly Position (MW)				
Month	HE	Total NQC w/o Storage (Gas + Solar)	RAR	Hourly Position w/o Storage
1	1	525	479	46
1	2	525	457	68
1	3	525	444	81
1	4	525	438	87
1	5	525	441	84
1	6	525	464	61
1	7	525	504	21
1	8	535	531	3
1	9	578	539	39
1	10	631	541	90
1	11	665	529	136
1	12	679	527	152
1	13	675	543	132
1	14	658	554	104
1	15	620	573	47
1	16	571	585	-14
1	17	533	609	-76
1	18	525	642	-117
1	19	525	644	-119
1	20	525	611	-86
1	21	525	584	-59
1	22	525	564	-39
1	23	525	535	-10
1	24	525	499	26

# Alternative Single-Cycle ES Validation

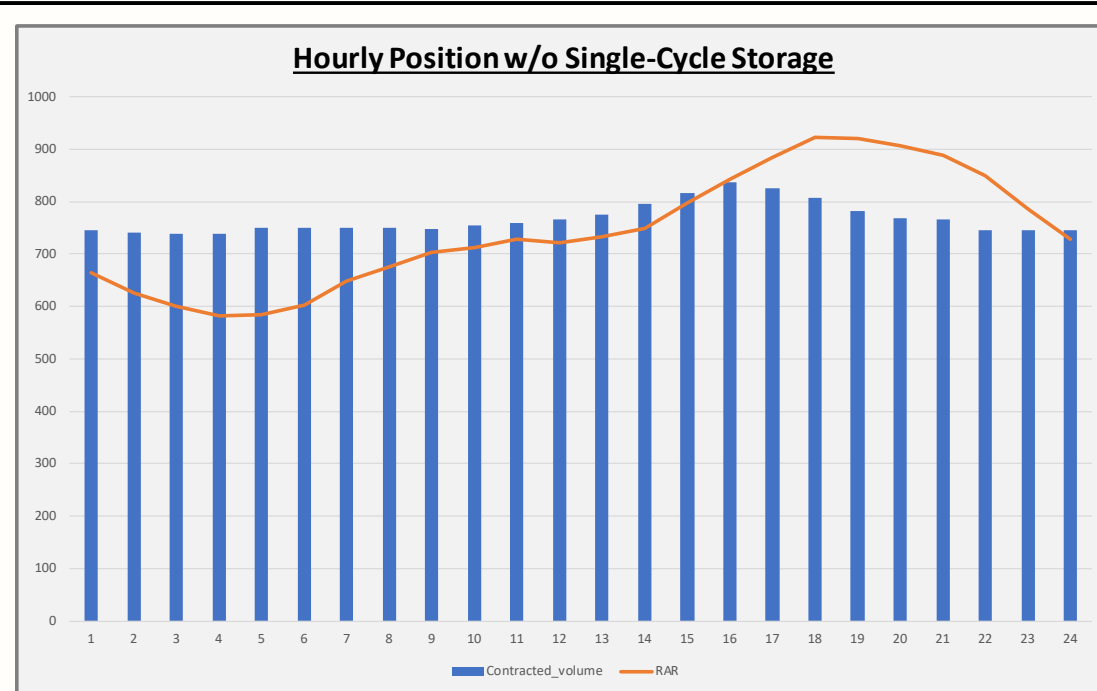
Rather than showing **how** energy can be shifted with hourly storage capacity values for each resource, test shown storage in aggregate to determine **if** energy can be shifted to fill shorts

1. Excess Energy – Is there is enough excess energy in showing to charge all shown storage resources?
  - If total excess energy available to charge  $>$  total energy needed to charge all shown storage resources, pass
  - Limit hourly charging to maximum aggregate charge value\*
  - If yes, we know all shown storage can be used at full capacity to shift energy into hourly shorts
2. Energy Shift – Can full capacity of shown storage shift enough energy to cover all hourly shorts?
  - If the sum of max continuous energy for all shown storage resources  $>$  sum of all hourly shorts, pass
  - Requires a Pmax test to make sure sufficient capacity available to fill largest short
  - If yes, we know we have enough excess capacity & shown storage to fill hourly shorts



# Alternative Compliance Validation Tool

Hourly Position without Storage (MW)			9/1/2025
Hour Ending	Final RAR	Hourly Volume w/o SCES	Hourly Position w/o SCES
HE-1	664	745	80.31
HE-2	626	740	114.02
HE-3	599	740	140.41
HE-4	581	740	158.52
HE-5	584	750	166.65
HE-6	603	750	146.87
HE-7	647	750	102.36
HE-8	675	750	74.66
HE-9	703	748	44.89
HE-10	713	756	42.08
HE-11	729	759	30.24
HE-12	723	767	44.20
HE-13	732	777	44.06
HE-14	749	797	47.16
HE-15	797	816	19.09
HE-16	844	838	-6.36
HE-17	883	826	-57.29
HE-18	922	808	-114.06
HE-19	921	782	-139.23
HE-20	907	768	-139.72
HE-21	888	767	-121.62
HE-22	850	747	-103.68
HE-23	786	746	-39.95
HE-24	729	746	17.59



Compliance Validation Tests	
Test Name	Test Status
Hourly Position with Storage	Pass
NQC and Shape	Pass
Daily Hour Check	Pass
Paired Resources	Pass
Multi-Cycle Storage	Pass

# Alternative Compliance Validation Tool

Validation Check Comparison	
SCE Validation Tests	Equivalent CPA Validation Tests
Storage Excess Capacity	Hourly Position with Storage
RA Capacity Showing	
NQC & Shape	NQC & Shape
Available Hours	
Hybrid Check	Hybrid Check
Storage Showing Validation	Multi-Cycle Storage

*\*Local & flex checks can easily be built in*

*\*\*Contract month & resource name check can be included on separate tab for CPUC*

- Retains robustness of proposed logic while reducing complexity of showing tool & position management
- Reduces transactability concerns by creating easy(er)-to-measure metrics for monthly compliance
- Can only be applied to single cycle storage resources; separate testing needed to validate energy sufficiency for paired resources & multi-cycle storage (as-is the case in SCE's proposed tool too)



# Modification to Energy Sufficiency Test

## Current Logic

Does not limit hourly energy storage charging to max hourly charge



## Issue

Assumes a storage resource can charge its full MWh at a given efficiency rate in one hour



## Solution

Limit hourly charging to a max value

Hourly Charging Logic			
HE	Shown Volume	RAR	Hourly Position
1	100	8	92
2	100	100	0
3	100	100	0
4	100	100	0
5	100	100	0
6	100	100	0
7	100	100	0
8	100	100	0
9	100	100	0
10	100	100	0

A 20 MW / 80 MWh at 87.5% efficiency needs 91.5 MWh to charge

- Would pass excess capacity to charge storage test
- Resource really needs 4 hours at ~ 23 MW to fully charge

# Key Takeaways

- Current logic requires LSEs show energy storage capacity in specific hours to determine compliance; this will impose unnecessary burden on position management & complicate transactability
- Validation logic in compliance tool should be easily replicable for LSE position management and CPUC validation
- Testing single-cycle storage resources in aggregate can reduce complexity of position management & transacting under SOD framework
- Single-cycle storage resources should be limited to a max hourly charge value when testing whether there is sufficient energy available to charge



# Questions?

# Validation Logic Mapping

