LCR Working Group Discussion per D.20-06-031

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August 13, 2020

Topics

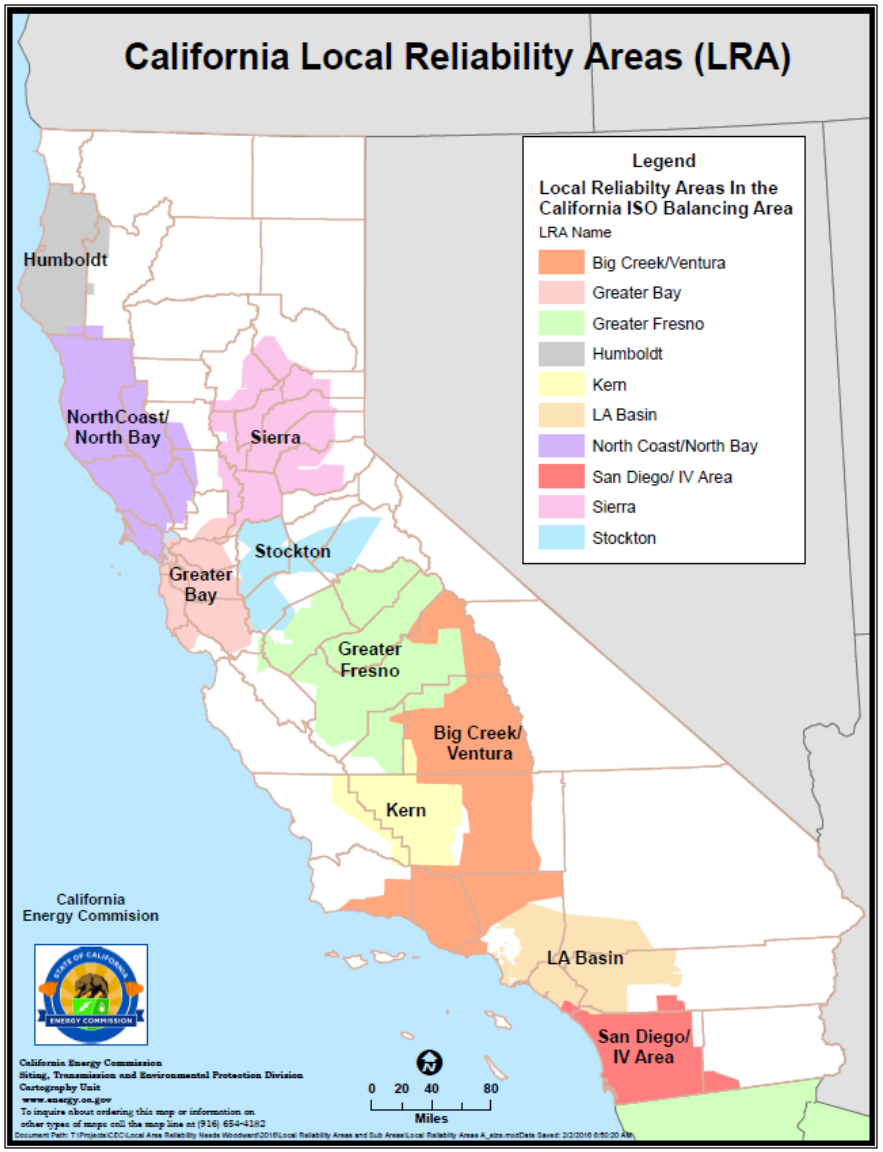
- Background
- Procedural History
- Issues
- Schedule

Background

Background

- CAISO conducts LCR studies annually
- 2021 schedule
  - October 2019 -- Published draft study manual
  - December 2019 – Published final study manual
  - March 2020 – Published draft study results
  - April 2020 – Published final study results
  - May 2020 – CAISO filed LCR study with the CPUC
- Purpose – Determine minimum local resource requirement to maintain reliability standards
- Load – 1-in-10, very hot day in the summer (winter for Humboldt)
- Criteria – Previously N-1-1, but changed in late 2019

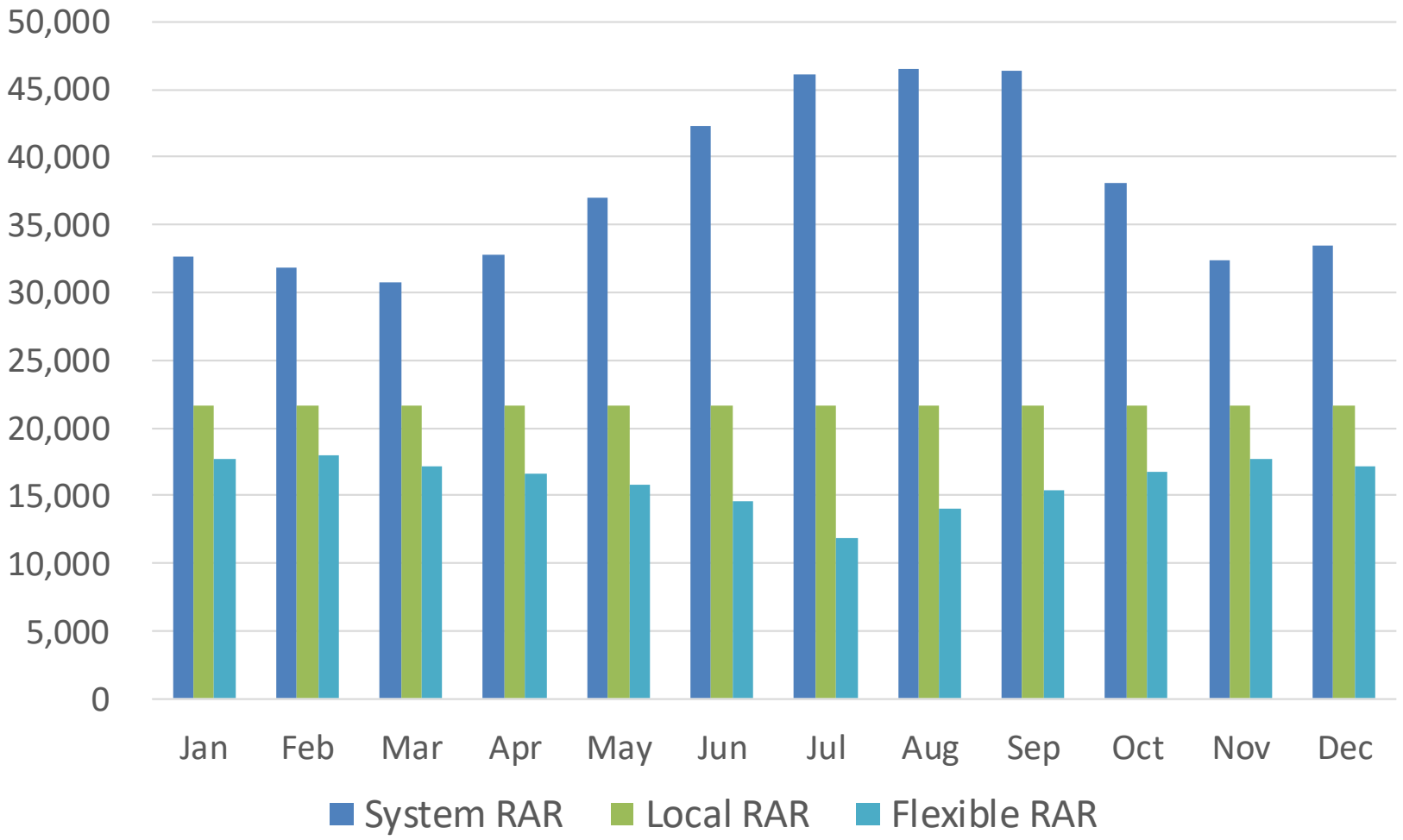
Local Reliability Areas



LCR Requirements for 2021

	August Qualifying Capacity				Capacity Available at Peak	2021 LCR Need
Local Area Name	**QF/ Muni (MW)**	**Non-Solar (MW)**	**Solar (MW)**	**Total (MW)**	**Total (MW)**	**Capacity Needed**
Humboldt	0	191	0	**191**	**191**	**130**
North Coast/ North Bay	119	723	0	**842**	**842**	**842***
Sierra	1183	920	5	**2108**	**2103**	**1821***
Stockton	139	445	12	**596**	**584**	**596***
Greater Bay	604	6806	8	**7418**	**7418**	**6353**
Greater Fresno	216	2815	361	**3392**	**3191**	**1694***
Kern	5	330	78	**413**	**335**	**413***
Big Creek/ Ventura	424	4454	250	**5128**	**5128**	**2296**
LA Basin	1197	8456	11	**9664**	**9664**	**6127**
San Diego/ Imperial Valley	2	4003	356	**4361**	**4005**	**3888**
Total	**3889**	**29143**	**1081**	**34113**	**33461**	**24160**

LCR Requirements Compared to System and Flexible Requirements for 2020



Procedural History

Procedural History

- CAISO revised its LCR study criteria in late 2019, filing with FERC thereafter
  - Presented to CAISO's Board in the following manner:

Management recommends the Board approve the update to the Local Capacity Technical study criteria.

- Proposed updates will:
  - Align category definitions with current standards
  - Adopt new definition for bulk electric system (BES) voltage level, and
  - Align the LCT study criteria with NERC, WECC and ISO mandatory standards
- Proposed updates are broadly supported by stakeholders

Procedural History cont.

- Unexpectedly, CAISO's revisions resulted in substantial increases in the local requirements in the Bay Area:

	Qualifying Capacity				Capacity Available at Peak	2020 LCR Need Category B	2020 LCR Need Category C
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Procedural History cont.

- In comments at the CPUC, TURN and PG&E, among others, noted the large increase in local requirements, approximately 1,800 MW in the Bay Area from 2020 to 2021 (from 4,500 MW to 6,353 MW)– thus requiring nearly all of the resources in the local area.
- PG&E and other parties raised other issues associated with CAISO's local capacity technical studies and implementation of local requirements and requested working groups, with CAISO as a co-lead, to address these issues.

Procedural History cont.

- D.20-06-031 -- The working group should focus its immediate efforts on evaluating and providing recommendations on the following issues:
  1. Evaluation of the newly adopted CAISO reliability criteria in relation to NERC and WECC mandatory reliability standards;
  2. Interpretation and implementation of CAISO's reliability standards, mandatory NERC and WECC reliability standards, and the associated reliability benefits and costs;
  3. Benefits and costs of the change from the old reliability criteria "Option 2/Category C" to CAISO's newly adopted reliability criteria;
  4. Potential modifications to the current LCR timeline or processes to allow more meaningful vetting of the LCR study results;
  5. Inclusion of energy storage limits in the LCR report and its implications on future resource procurement; and
  6. How best to address harmonize the Commission's and CAISO's local resource accounting rules.

Evaluation of the Newly Adopted CAISO Reliability Criteria

Adoption of New LCR Criteria

- Bay Area issue
  - 2020 contingency- aggregation of sub-area requirements

Year	Limit	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2020	First limit	B	Reactive margin	Tesla-Metcalf 500 kV line & DEC unit	3970
2020	First Limit	C	Aggregate of Sub-area requirements.		4550

  - 2021 contingency - two transformer outages

Year	Limit	Category	Limiting Facility	Contingency	LCR (MW)
2021	First limit	P6	Metcalf 500/230 kV #13 transformer	Metcalf 500/230 kV #11 & #12 transformers	6353

Changes compared to 2020 requirements

Compared to 2020 load forecast went up by 292 MW and total LCR need went up by 1803 MW mainly due to LCR criteria change.

Comments in CPUC Proceeding

- PG&E indicated that they have backup transformer equipment on site to address outage in 24 hours
- CAISO indicates that 30 minutes is required
- PG&E and CAISO explored alternatives, but that did not work

Old Criteria

Contingency Component(s)	ISO Grid Planning Criteria	Old RMR Criteria	Local Capacity Criteria
A – No Contingencies	X	X	X
B – Loss of a single element			
1. Generator (G-1)	X	X[1]	X[1]
2. Transmission Circuit (L-1)	X	X	X[1]
3. Transformer (T-1)	X	X[2]	X[1,2]
4. Single Pole (dc) Line	X	X	X[1]
5. G-1 system readjusted L-1	X	X	X
C – Loss of two or more elements			
1. Bus Section	X		
2. Breaker (failure or internal fault)	X		
3. L-1 system readjusted G-1	X		X
3. G-1 system readjusted T-1 or T-1 system readjusted G-1	X		X
3. L-1 system readjusted T-1 or T-1 system readjusted L-1	X		X
3. G-1 system readjusted G-1	X		X
3. L-1 system readjusted L-1	X		X
3. T-1 system readjusted T-1	X		
4. Bipolar (dc) Line	X		X
5. Two circuits (Common Mode) L-2	X		X
6. SLG fault (stuck breaker or protection failure) for G-1	X		
7. SLG fault (stuck breaker or protection failure) for L-1	X		
8. SLG fault (stuck breaker or protection failure) for T-1	X		
9. SLG fault (stuck breaker or protection failure) for Bus section	X		
WECC-S3. Two generators (Common Mode) G-2	X[3]		X
D – Extreme event – loss of two or more elements			
Any B1-4 system readjusted (Common Mode) L-2	X[4]		X[3]
All other extreme combinations D1-14.	X[4]		

New Criteria

Contingency Component(s)	Mandatory Reliability Standards	Old Local Capacity Criteria	New Local Capacity Criteria
P0 – No Contingencies	X	X	X
P1 – Single Contingency			
1. Generator (G-1)	X	X[1]	X[1]
2. Transmission Circuit (L-1)	X	X[1]	X[1]
3. Transformer (T-1)	X	X[1,2]	X[1]
4. Shunt Device	X		X[1]
5. Single Pole (dc) Line	X	X[1]	X[1]
P6 – Multiple Contingency – P1.2-P1.5 system adjustment and:	X	x	X
1. Transmission Circuit (L-1)	X	x	X
2. Transformer (T-1)	X		X
3. Shunt Device	X		X
4. Bus section			

Issues

- What is the difference between planning criteria and local capacity requirements (LCR) criteria?
- Does this mean CAISO was not previously implementing mandatory NERC and WECC reliability standards or is this a CAISO standard and has it changed over time? Or it is just now being adopted as an LCR criteria?
- Where does the 30 minute requirement derive from?
- Is this unique to CAISO or is it included in other BAAs?
- Are there other implementable work arounds? What might they cost? If so, what would be the next contingency under these newly adopted reliability criteria?

CAISO's Reliability Standards, Mandatory NERC and WECC Reliability Standards, and the Associated Reliability Benefits and Costs

D.06-06-064

- LCR study would form the basis for local RA program
- CAISO presented 3 options, N-1 (Option 1, or Category B), N-1-1, with operational solutions (Option 2, or Category C), N-1-1 with only generation (Option 3)
- D.06-06-064 stated:
  - The most persuasive information before us is the CAISO's conclusion that a decision to adopt Category B criteria for purposes of local procurement obligations would likely result in substantial load interruptions when N-1 conditions occur. No party has presented information that would lead us to conclude that the risk of such interruptions is acceptable if that risk can be avoided or mitigated. The CAISO has determined that for 2007, the totals of the LCRs for the nine identified local areas are 22,649 MW and 23,857 MW under Options 1 and 2, respectively, a difference of about 5%. Given the reduced risk of interruptions expected under Option 2, we consider the required procurement of an additional 5% of needed capacity to be reasonable. We make this reliability determination for 2007 only. While we expect to apply Option 2 in future years in the absence of compelling information demonstrating that the risks of a lesser reliability level can reasonably be assumed, we nevertheless leave for further consideration in this proceeding the appropriate reliability level for Local RAR for 2008 and beyond.

D.06-06-064

- "However, in deference to the Commission's role in determining the appropriate service reliability level for retail customers, the CAISO makes clear that it does not intend to pursue backstop procurement to achieve Category C reliability if the Commission establishes LSE procurement obligations based on Category B."
- "For purposes of establishing Local RAR for 2007 only, we accept the CAISO's judgment to use 1-in-10 load forecasts to calculate LCRs. At this time, we are not persuaded that the potential cost reduction of using a less stringent load forecast justifies the reduced reliability that may result from doing so. However, we are not satisfied that this issue has been fully vetted. Accordingly, parties may revisit this issue in Phase 2 for 2008 and beyond."

LCR at the Time of Adoption

Local Requirements Comparison

	Qualifying Capacity			2007 LCR Requirement Based on Category B Option 1			2007 LCR Requirement Based on Category C with operating procedure Option 2			2006 Total LCR Req.
Local Area Name	QF/ Muni (MW)	Market (MW)	Total (MW)	Existing Capacity Needed	Deficiency	Total (MW)	Existing Capacity Needed	Deficiency	Total (MW)	(MW)
Humboldt	73	133	206	202	0	**202**	202	0	**202**	162
North Coast / North Bay	158	861	1019	582**	0	**582****	582**	0	**582****	658
Sierra	1072	776	1848	1833	205	**2038**	1833	328	**2161**	1770*
Stockton	314	257	571	348	0	**348**	506	53	**559**	440*
Greater Bay	1314	5231	6545	4771	0	**4771**	5341	0	**5341**	6009
Greater Fresno	575	2337	2912	2530	0	**2530**	2534	68	**2602**	2837 *
Kern	978	31	1009	554	0	**554**	769	17	**786**	797*
LA Basin	3510	7012	10522	8843	0	**8843**	8843	0	**8843**	8127
San Diego	191	2741	2932	2781	0	**2781**	2781	0	**2781**	2620
Total	**8185**	**19379**	**27564**	**22444**	**205**	**22649**	**23391**	**466**	**23857**	**23420**

LCR in 2020, Category B v. Category C

2020 Local Capacity Needs

	Qualifying Capacity				Capacity Available at Peak	2020 LCR Need Category B	2020 LCR Need Category C
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Greater Fresno	203	2583	372	**3158**	**2751**	1694	**1694***
Kern	8	354	103	**465**	**362**	169*	**465***
Big Creek/ Ventura	402	4343	305	**5050**	**5050**	2154	**2410***
LA Basin	1344	9078	17	**10439**	**10104**	7364	**7364**
San Diego/ Imperial Valley	4	3891	439	**4334**	**3895**	3895	**3895**
Total	**4018**	**29082**	**1256**	**34356**	**33064**	**21765**	**23643**

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Issues

- Does the CPUC need to adopt the new LCR criteria?
- Does the CPUC need to consider the costs v. the benefits as it did in the previous Commission decision?
- If CPUC does not adopt this LCR criteria, will CAISO refrain from backstop procurement, as indicated it would do in 2006?

Benefits and Costs of the Change from the Old Reliability criteria “Option 2/Category C” to CAISO’s Newly Adopted Reliability Criteria

Benefits v. Costs

- Subsumed in the discussion in the previous section.

Potential Modifications to the Current LCR timeline or Processes to Allow More Meaningful Vetting of the LCR Study Results

Timeline

- Final draft submitted to CPUC on May 1, 2020
- No time to consider solutions to address increases by end of June RA decision
- Initial RA allocations issued in July
- Final RA allocations issued in September
- What processes can we establish to provide further vetting of the results prior to adoption?
- Other issues?
- Solutions?

Energy Storage Limits in the LCR Report and Implications

CAISO's Study

- In its final report, CAISO included information on battery penetration that could meet local needs in each local area and sub-area
- Some parties argued that providing this information in the final study did not allow for sufficient time to vet the additional information
- Some parties argued that the purpose of additional information is unclear
  - Is it meant to guide new procurement or to guide backstop decisions?

PG&E Issues

- Energy storage discussion section in Final 2021 LCR Report, was not included in the Draft 2021 Local Capacity Technical Study.
- This section lacks sufficient explanation to provide necessary procurement feedback/guidance.
- PG&E's understands this section of the report to suggest that the CAISO believes limits should be placed on the amount of energy storage that displaces other local area resources.
- Believes this is a logical step to ensuring the "right mix" of resources, this limitation could have implications for integrated resource planning procurement and broader state efforts to decarbonize the grid.
- Unclear how the CAISO plans to enforce these limitations and whether the CAISO will exercise its authority for backstop procurement resulting from potential

Issues and Potential Solution

- Issues-
  - Not adopted in the CPUC decision, thus, there are no upfront requirements
    - Should energy storage limits be addressed in CPUC's Local RA requirements, including consideration of MCC buckets, energy requirements, etc.
  - Does it make sense to include this information in the LCR study without upfront requirements and if so, how can it be made more useful to LSEs?
- Solutions –
  - Do not include in LCR report but in separate report? Conduct on different timeframe to allow for vetting of results?

Harmonizing the CPUC's and CAISO's Local Resource Counting Rules

Annual v. Monthly NQC for Local RA

- CPUC uses August NQC, CAISO uses monthly NQC values
  - CPUC rationale – 1-in-10 load occur in August, so the CPUC uses the August NQC, 1-in-10 loads do not occur in January (with the exception of Humboldt local area)
- Implications
  - LSEs can use higher NQC values for use-limited resources to meet local needs in CPUC's paradigm, but not in CAISO's
  - Makes it difficult to use seasonal DR (or other use-limited resources) for local
    - LSE has a 100 MW local requirement
    - LSE uses DR resource that has August NQC of 100 MW, January NQC of 10 MW
    - LSE could show this resource for local, but if it is on a supply plan, but
      - CAISO will expect a bid for 100 MW and will issue RAAIM penalties if the LSE fails to bid in 100 MW.
      - If the LSE bids in the 100 MW as required under CAISO's rules, CAISO could potentially refer the LSE to FERC.

Potential Solutions

- CAISO uses the August NQC value for local, rather than monthly NQC values
- CAISO and CPUC could establish seasonal local values, which could reduce the local requirements during low load months
- CPUC could adopt CAISO's methodology, but this would likely preclude use-limited resources for local
  - Not consistent with statute and previous CPUC decisions

Major Difference and Implications

- CPUC v. CAISO treatment of DR for local
  - CPUC credits DR based on location
  - CAISO requires DR on supply plan so that it can pre-dispatch slow-response DR
  - CAISO will only count BIP 15, not BIP 30, nor any portion of BIP 30 that responds in 20 minutes
- Implications
  - Putting it on the supply plan raises the seasonal DR issues (RAAIM penalties if not all shown in all months) and potential referral if it does not bid all that is "shown" for local (e.g., if it only shows 10 MW, it will be short, but if it shows 100 MW, it can be referred – catch 22).

Issues, Potential Solutions

- Issues – makes it difficult to count DR resources for local, could result in only gas resources counting to meet local needs
- Solutions
  - Unwind bifurcation – move DR back to load modifying
  - Other?

Other Issues?

Other Issues

- Updates to QC and NQC
  - One set of NQC values used in local studies
  - Updates to QCs
  - Examples
    - ELCC, one set used to set LCR, different set used in compliance
    - Hydro, one set used to set LCR, different set used in compliance (nearly guarantees LSEs will not be able to comply with LCR requirements)
- Other issues?

Schedule

Schedule, Input and Working Group Report

- September 1, 2020 Working Group Report
  - Will likely only identify issues
  - Will not have solutions or proposal on 9/1/2020 for consideration in CAISO's 2022 LCR process, which begins in October 2020
  - Proposed schedule
    - Comments on draft working group issue paper – mid or late September
    - Further working group meetings, October – December 2020
    - Working group draft report and/or proposals – January 2021
    - Working group final report and/or proposals, February 2021
    - Any proposals to be considered in Track IV (June 2021 for 2022 compliance year or 2023 LCR study process)
- Requesting informal comments by next week, August 21, 2020
  - Additional issues?
  - Comments on the issues identified and explained here?
  - Additional proposals re: schedule?

Questions