

Resolution E-5230 Workshop #4

April 7, 2023

08:00 am – 2:00 pm

Topic B.1: Quarterly Reporting

Background on Topic B.1

"As presented during the November 29, 2022 workshop, the Large IOUs shall utilize Advanced Metering Infrastructure (AMI) data for projects with a nameplate of less than 1 MW and telemetry for LGP projects with a nameplate over 1 MW as telemetry is already a requirement per the current Rule 21 for projects sized above 1 MW. The Large IOUs are therefore directed to finalize details and tariff language during the workshops ordered in this Resolution and include it in the subsequent ALs."

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Resolving Topic B.1

J.5. Telemetry

Proposed Addition to Section J.5.:

For Generating Facilities with a Limited Generation Profile attached to their Generator Interconnection Agreement, if AMI is not available, or Customer opts out, telemetry at the point of common coupling will be required **at the Producer's expense.**

Topic B.2: Use of Gross Nameplate Rating

Background on Topic B.2

"We direct the Large IOUs to discuss tariff language modifications during the workshops and to provide more information on which aspects of Screen P will be studied using the LGP value and which will not, if this is the case. In the November 10, 2022 SIWG meeting, the Large IOUs also state that Screens F, G, and H will be evaluated on nameplate rating. The Large IOUs note that 'Screens A-E are also not included in ICA calculation. The evaluation is not based on nameplate rating but will depend on aspects of each screen.' As it is still unclear how screens D, I, J, and K will be studied, discussions regarding these screens should continue within the workshop discussions. We find a mere statement 'Given that ICASG values do not account for screens D, J, and K, then it is appropriate to evaluate screen D using gross nameplate rating' without proper justification and details unconvincing. Accordingly, the Large IOUs are directed to fully justify their arguments. The discussions should refer to how the Decision adopts Proposal A-B 3 and how the Working Group Three Report states the screens should be applied, which we discuss below. Below we also address SDG&E's response regarding upward revisions in allowable generation."

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Proposed Tariff Language for Topic B.2

The IOUs recommend the addition of a 12th option for Screen I to provide better clarity and minimize the number of required revisions.

Existing Options:

- Option 1 ("Reverse Power Protection")
- Option 2 ("Minimum Power Protection")
- Option 3 (Certified Non-Islanding Protection)
- Option 4 (Relative Generating Facility Rating)
- Option 5: Inadvertent Export as described in Section M.
- Option 6: Inadvertent Export utilizing UL-1741 or UL-1741 SA/SB-listed grid support (non-islanding) inverters as described in Section Mm.
- Option 7: Non-Export utilizing Non-Export AC/DC Converter as described in Section O.
- Option 8: Non-Export utilizing Certified Power Control Systems with an open loop response time no more than two seconds as described in Section Mm1.
- Option 9: Limited Export utilizing Certified Power Control Systems with an open loop response time no more than two seconds as described in Section Mm2.
- Option 10: Non-Export with Inadvertent Export utilizing Certified Power Control Systems with an open loop response time greater than two seconds and no more than ten seconds as described in Section Mm3.
- Option 11: Limited Export with Inadvertent Export utilizing Certified Power Control Systems with an open loop response time greater than two seconds and no more than ten seconds as described in Section Mm4.

Summary of Assumptions for Fast Track Initial Review Screens for LGP Projects

Screen	Description	Nameplate/Maximum LGP
A	Networked Secondary Determines if project is located on a "Networked Secondary." ICA values not calculated for secondary systems (networked or not).	N/A
B	Certified Equipment Screen is related to certification of equipment (inverters) which is not related to ICA calculations.	N/A
C	Voltage Drop While ICA has PQ/Voltage fluctuations, that is mainly for primary systems. Screen C includes voltage drop and flicker on the service transformer and secondary service; service transformers and secondary service are not included in ICA.	N/A
D	Transformer Rating This screen is related to service transformer/secondary overloads which are not accounted for in ICA given that ICA only calculates the values at the primary system.	Maximum LGP Value (see slide 11)
E	Single Phase Generator This screen is related to circuit phase balancing for single-phase generators. Single phase circuit balancing is not calculated in ICA.	N/A
F	Short Circuit Current Contribution ICA does not calculate Short Circuit Contribution Ratio (SCCR) to determine if SCCR is $\leq 10\%$.	Nameplate
F.1	Protection ICA ICA uses facility gross nameplate to determine whether short circuit contribution is within allowable limits.	Nameplate
G	Short Circuit Interrupting Capability ICA does not calculate impact of increased short circuit on protection and devices and equipment.	Nameplate
H	Line Configuration ICA does not account for line configuration loading per table G-1 of Rule 21.	Nameplate
I	Screen I asks whether the project will export power across the PCC. Currently there are 11 screen I options. Pending further discussion, a 12th may be need to be added to address LGP projects.	N/A
J	Rule 21 already uses Gross Nameplate Rating. The working group only recommended that "11 kVA" be changed to "30 kVA." No changes were recommended or discussed regarding changing Gross Nameplate Rating.	Maximum LGP Value (see slide 11)
K	Same argument as for Screen J.	Maximum LGP Value (see slide 11)
L	Transmission Dependency/Stability/Overvoltage/Islanding Test	Nameplate
M	Does the Generating Facility pass the ICA as required in G.1.m or is aggregate generation less than 15% of line section peak load for all line sections bounded by automatic sectionalizing devices?	Individual (all) LGP Values

Summary of Assumptions for Fast Track Supplemental Review Screens for LGP Projects

Screen	Description	Nameplate/Maximum LGP
N	Penetration Test	<p style="text-align: center; color: red;">Nameplate</p> See proposed tariff language slide 11
O	Power Quality & Voltage Fluctuation	See proposed tariff language slide 11
P	Safety and Reliability Test Analysis of Screen P under supplemental review will be triggered by failure of Screens [A-H] . As indicated on slide 10, Screens F, F.1, G, and H use nameplate, therefore, Screen P would be evaluated using nameplate.	See proposed tariff language slide 11

Proposed Tariff Language for Topic B.2

Mm5 - OPTION 12: Limited Export with Limited Generation Profile Utilizing Certified Power Control Systems That are Approved for Scheduling

Applicability:

The following are minimum requirements for limited export with limited generation profile (LGP) systems that use certified power control systems (PCS) with an open loop response time (OLRT) of no more than two seconds to maintain a level of export that is lower than the nameplate rating. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Use a PCS that is certified to the UL 1741 Supplement SE. The NRTL evaluation must have determined that the PCS conforms to the export limiting functionality using a schedule in accordance with the published UL Standard.
2. Use a PCS that is certified to accept and execute a schedule.
3. Use a PCS that is certified with an OLRT of two seconds or less as provided in the PCS's specification data sheets.
4. In the event of an inadvertent export that exceeds the approved export limit, the PCS must reduce export to the approved export limit, or less, within two seconds of exceeding the approved export limit. A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of ten seconds or less, meets this requirement.
5. Set the PCS to not exceed the proposed level of export.
6. Use only UL 1741 listed grid-support Non-Islanding inverters as approved by this tariff.
7. Maintain voltage fluctuations at the limits specified in Electric Rule 2.

Proposed Tariff Language for Topic B.2

Mm5 - OPTION 12: Limited Export with Limited Generation Profile Utilizing Certified Power Control Systems That are Approved for Scheduling

The evaluation of a limited generation profile (LGP) project requesting interconnection under this section shall:

1. Utilize the Generating Facility's Gross Nameplate Rating for screens F, F1, G, and H.
2. Is the maximum steady state value greater than 1% of the PCS controlled nameplate (as provided in the NRTL testing reports)? If so:
 - a. Screens D, J, K: Use the maximum LGP value plus the maximum steady state value of the PCS multiplied by the PCS controlled nameplate
 - b. Screen M: Use the requested LGP values plus the maximum steady state value of the PCS multiplied by the PCS controlled nameplate
 - c. Screen N: For LGP projects, Screen N (section G.2.a.i.) is considered a PASS if Screen M PASSED.
 - d. Screen O: Use the maximum LGP value plus the maximum steady state value of the PCS multiplied by the PCS controlled nameplate
 - e. Screen P: Use the Generating Facility's Gross Nameplate Rating for evaluations that use fault current calculations. For other evaluations under Screen P, use the maximum LGP value plus the maximum steady state value of the PCS multiplied by the PCS controlled nameplate
3. Is the maximum steady state value less than or equal to 1% of the PCS controlled nameplate (as provided in the NRTL testing reports)? If so:
 - a. Screens D, J, K: Use the maximum LGP value
 - b. Screen M: Use the requested LGP values
 - c. Screen N: For LGP projects, Screen N (section G.2.a.i.) is considered a PASS if Screen M PASSED.
 - d. Screen O: Use the requested LGP values
 - e. Screen P: Use the Generating Facility's Gross Nameplate Rating for evaluations that use fault current calculations. For other evaluations under Screen P, use the maximum LGP value

Proposed Tariff Language for Topic B.2

Proposed addition to Section G.1.m

For Interconnection Requests based on Limited Generation Profile Utilizing Power Control Systems that are approved for Scheduling:

Is the Generating Facility Limited Generation Profile, as defined under section Mm5, less than or equal to 90% of the ICA-SG 576 Profile?

If the response is "yes", the Interconnection Request passes Screen M.

If the response is "no, the Interconnection Request fails Screen M and must be evaluated under the Supplemental Review to determine mitigation requirements.

Note:

- If any hour of the customer LGP profile is above 90% of ICA-SG profile, the project will fail screen M / Initial Review.
- If Initial Review fails, then customer will be notified of Initial Review failure and offered an optional results meeting.
- If modifications that can mitigate the initial review failure are identified during the optional results meeting as per section F.2.b. of Rule 21, Applicant must provide updated LGP within 5 BD:
 - Reduction at each hour of the updated LGP must comply with Table F.1. Each hour may not be reduced by more than 20% of the original request unless the update is due to outdated ICA results as determined by the IOU.
 - Where reduction of LGP impacts other failed screens (such screen D), the cost and time for the restudy will be based on Table F.1.
 - Increases in project size i.e., increases in project nameplate or LGP values are not allowed under Fast Track.
 - If modifications to the LGP are not received within 5 BD , the project will be deemed withdrawn and the applicant will have the option of re-applying based on LGP or nameplate.

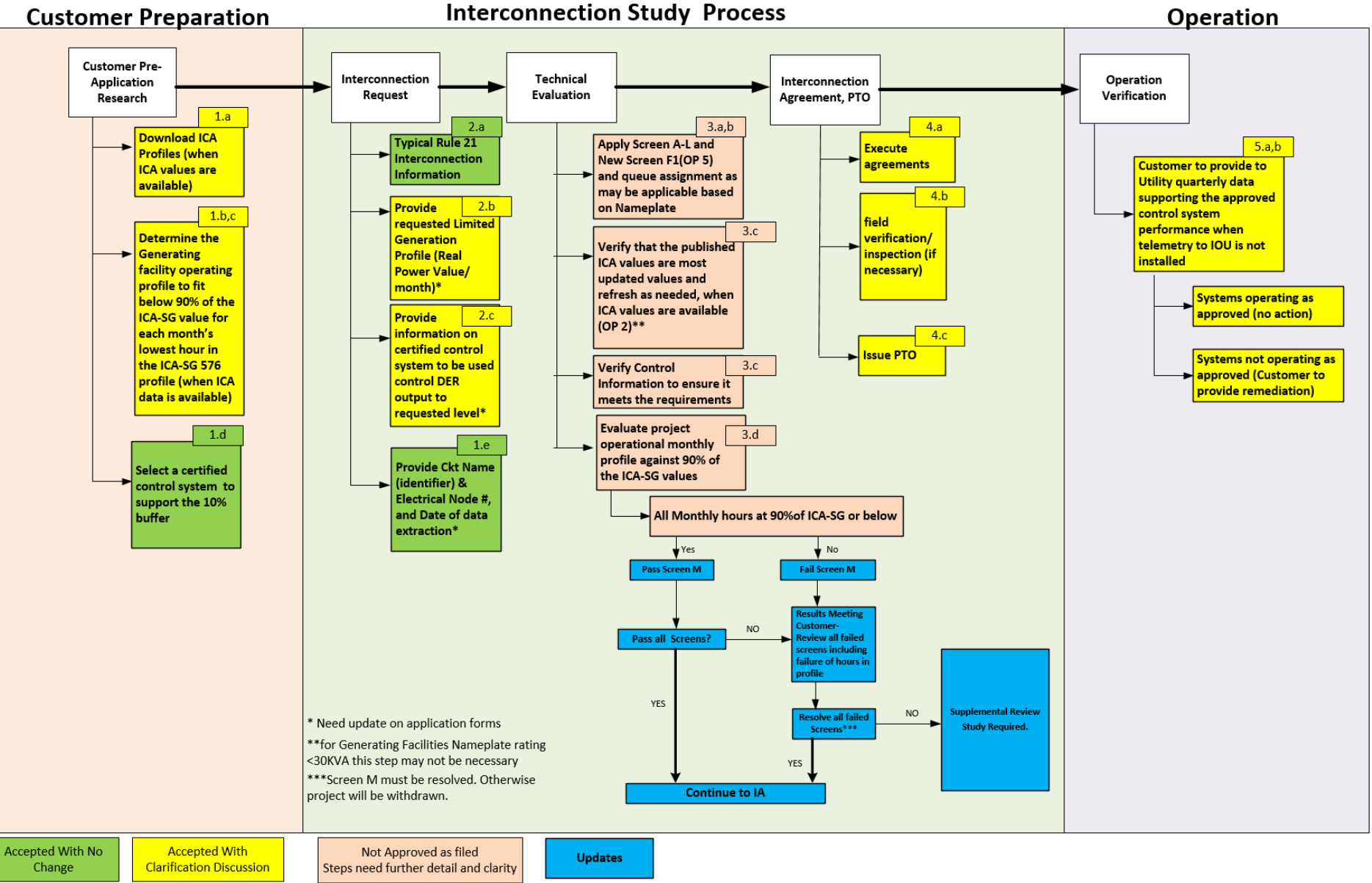
Proposed Tariff Language for Topic B.2

Mm6 - OPTION 13: TBD

Additional discussion on potential solutions is ongoing. Further information is needed to develop proposed tariff language for a new, 13th Option.

Topic C: Overview of Proposals: Including technical requirements, "Monthly" scheduling (See Topic 5), Nameplate capacity (Topic 2); Should include alignment of language (Section D of Res) and incorporate all topics in Resolution

Updated Framework / Proposed Changes to Implement LGP

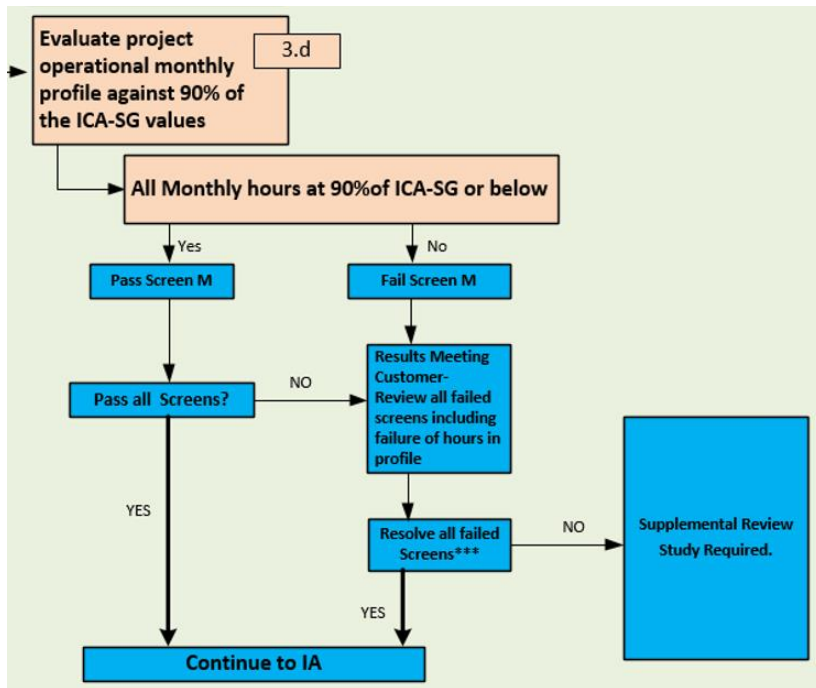


- Decision D.20-09-035 OP 15 required that IOUs to discuss with SIWG the implementation of LGP per IOUs counter outlined Rulemaking 17-07-007 Working Group Two Final Report
- During 5230 workshop 1 through workshop 3 and SWIGs, IOUs and stakeholders had robust conversation on the process, with the remaining item to be addressed in the next slide, Figure 1 reflect the outcome of the current discussions

Figure 1 – Updated LGP implementation framework to reflect workshop discussions

Resolving Topic C

Discussion below provides clarification on how customer will be given an opportunity to update the LGP values if one or more does not comply with 90%, the process, and timing of the communication with customer.



***Screen M must be resolved. Otherwise, project will be withdrawn. (Subject to revision based on further discussion)

As discussed at Workshop 3, IOU's identified that section F(2)(b) of the tariff allows modifications that obviate the need for Supplemental Review. To be fair to all other Rule 21 projects (including those currently using ICA), IOU's propose failing Screen M in initial review whenever the LGP does not comply with 90% ICA-SG profile. Based on Workshop 3 feedback, IOUs added a special condition for projects failing Screen M when ICA values are outdated.

IOU's will allow LGP customers to provide an updated LGP as allowed under R21 section F(2)(b).

- Updated LGP must be provided 5 BD after Optional Initial Review Results Meeting
- Reduction at each hour of the updated LGP must comply with Table F.1. Each hour may not be reduced by more than 20%¹ of the original request.
- If IOU determines that the ICA results are outdated and the project would fail Screen M based on the updated ICA results, the Customer will be allowed to update their proposed LGP values with no restrictions on the amount of reduction.
- Where reduction of LGP impacts other failed screens (such screen D), the cost and time for the restudy will be based on Table F.1
- Increases in project nameplate or LGP values are not allowed under Fast Track

1. The 20% was adopted in the decision D. 19-03-013 section 3.3.2 based on Working Group 1 Final Report.

Topic E: Implementation of Limited Generation Profiles Using Current Smart Inverter Functions

Background on Topic E

"To expedite the use of available hosting capacity it is prudent, therefore, for the Large IOUs to discuss any challenges to implement Issue 9 and Proposal A-B 3 using current smart inverter settings.

The Large IOUs shall elaborate on challenges and concerns as stated in the Working Group Reports and discuss and propose solutions.

The Large IOUs shall determine which functional elements are already present in commercially available inverters, and which are not, to establish LGP functionality prior to the approval of standards.

Should implementation of Issue 9 and Proposal A-B 3 be feasible before approval of standards, the Large IOUs shall outline a clear process and the requirements, including technical, to be considered in the implementation of the LGP option.

The Large IOUs shall also establish a mechanism for validating proposed profiles. If the implementation of this mechanism is not feasible, the Large IOUs shall clearly articulate the reasons.

We remind the Large IOUs that the subsequent ALs shall specify which items have reached consensus within the workshop participants and which items have not reached consensus. If an item has not reached consensus, the Large IOUs shall provide details as to the bases for lack of consensus and the alternative proposals, if any."

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Resolving Topic E

IOUs recommend the addition of **Mm6 – Option 13** once additional information is obtained from stakeholders.

Proposed Tariff Language:

For sites using a PCS that has not been certified to **UL 1741 Supplement SE**, a Real-time Automation Controller (~~RTAC~~) may be used in combination with a ~~an approved~~ relay with directional overcurrent, power elements, and automation logic functions, **as approved by the Utility**. For LGP projects, the applicant shall demonstrate the capability of the Real-time Automation Controller and relay to follow the agreed upon LGP schedule.

Continued Discussion on Real-time Automation Controller plus Relay Solution:

- Architecture Diagram of Real-time Automation Controller + relay solution.
- Additional Information from relay manufacturers.

Topic F: Implementing More Than 12 LGP Values Per Year

Background on Topic F

"In adopting a modified version of the Large IOUs' counter proposal, the Decision modified the proposal such that the 'frequency of changes is expanded to monthly limits to align with the Integration Capacity Analysis.' The Decision, however, did not specify that the monthly profile was limited to only one value.

The Decision addressed the frequency of change and did not restrict the number of values within a month to be only one. **The adopted 288-hour format includes 24 values per each of the 12 months of the year. Essentially this amounts to customers submitting the same value 24 times a month, on a monthly basis for a year when one value would suffice.**

The Large IOUs are therefore directed to discuss the 288-hour format and how it may allow for more than one value per month. Given that the Working Group Two Report was filed October 31, 2018, four years from the current date, we expect there is now more information and experience available to the Large IOUs to allow this.

The Large IOUs shall discuss their learnings and best practices in the workshops and propose how implementation of more than one value per month may be accomplished to better take advantage of the available capacity on a circuit to accomplish the goals of Issue 9."

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Resolving Topic F

"The Large IOUs are therefore directed to discuss the 288-hour format and how it may allow for more than one value per month. Given that the Working Group Two Report was filed October 31, 2018, four years from the current date, we expect there is now more information and experience available to the Large IOUs to allow this."

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- The IOUs presented a proposed LGP format in LGP Workshop 1.

"The Large IOUs shall discuss their learnings and best practices in the workshops and propose how implementation of more than one value per month may be accomplished to better take advantage of the available capacity on a circuit to accomplish the goals of Issue 9."

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- The IOUs presented a phased approach to implementing 288 LGP values in LGP Workshop 1.

Proposal for Additional LGP Analysis Presented at LGP Workshop 3

- **Scope:** Compare ICA-SG for two time periods, for at least 1 node on at least 5 different circuits.
 - Frequency (% and count of hours)
 - Severity/Magnitude range (kW)
 - Breakdown of limiting criteria, e.g., voltage, thermal, protection (as recommended by IREC during March 2 SIWG)
- **Interpretation of Results:** if the number of LGP values increases, and the frequency **or** maximum magnitude of violation increase, the IOUs maintain their position to utilize 12 unique LGP values.