MUSSEY GRADE OFFICE DATA REQUEST:
MGRA-SDGE-2023WMP-04
SDG&E RESPONSE

Date Received: May 08, 2023
Date Submitted: May 12, 2023

GENERAL OBJECTIONS

1. SDG&E objects generally to each request to the extent that it seeks information protected by the attorney-client privilege, the attorney work product doctrine, or any other applicable privilege or evidentiary doctrine. No information protected by such privileges will be knowingly disclosed.

2. SDG&E objects generally to each request that is overly broad and unduly burdensome. As part of this objection, SDG&E objects to discovery requests that seek "all documents" or "each and every document" and similarly worded requests on the grounds that such requests are unreasonably cumulative and duplicative, fail to identify with specificity the information or material sought, and create an unreasonable burden compared to the likelihood of such requests leading to the discovery of admissible evidence. Notwithstanding this objection, SDG&E will produce all relevant, non-privileged information not otherwise objected to that it is able to locate after reasonable inquiry.

3. SDG&E objects generally to each request to the extent that the request is vague, unintelligible, or fails to identify with sufficient particularity the information or documents requested and, thus, is not susceptible to response at this time.

4. SDG&E objects generally to each request that: (1) asks for a legal conclusion to be drawn or legal research to be conducted on the grounds that such requests are not designed to elicit facts and, thus, violate the principles underlying discovery; (2) requires SDG&E to do legal research or perform additional analyses to respond to the request; or (3) seeks access to counsel's legal research, analyses or theories.

5. SDG&E objects generally to each request to the extent it seeks information or documents that are not reasonably calculated to lead to the discovery of admissible evidence.

6. SDG&E objects generally to each request to the extent that it is unreasonably duplicative or cumulative of other requests.

7. SDG&E objects generally to each request to the extent that it would require SDG&E to search its files for matters of public record such as filings, testimony, transcripts, decisions, orders, reports or other information, whether available in the public domain or through FERC or CPUC sources.

8. SDG&E objects generally to each request to the extent that it seeks information or documents that are not in the possession, custody or control of SDG&E.

9. SDG&E objects generally to each request to the extent that the request would impose an

undue burden on SDG&E by requiring it to perform studies, analyses or calculations or to create documents that do not currently exist.

10. SDG&E objects generally to each request that calls for information that contains trade secrets, is privileged or otherwise entitled to confidential protection by reference to statutory protection. SDG&E objects to providing such information absent an appropriate protective order.

II. EXPRESS RESERVATIONS

1. No response, objection, limitation or lack thereof, set forth in these responses and objections shall be deemed an admission or representation by SDG&E as to the existence or nonexistence of the requested information or that any such information is relevant or admissible.

2. SDG&E reserves the right to modify or supplement its responses and objections to each request, and the provision of any information pursuant to any request is not a waiver of that right.

3. SDG&E reserves the right to rely, at any time, upon subsequently discovered information.

4. These responses are made solely for the purpose of this proceeding and for no other purpose.

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Ignition Model

Please provide technical description of the following elements of the Ignition Rate Normalization process:

QUESTION 1

For the Wind Adjustment Rate:

a. What is the algorithm and formula used to apply the wind adjustment rate?

b. What data was used to determine the wind adjustment rate?

c. Show the analysis that determined the algorithm and formula from the available data.
d. Show how the wind adjustment rate was validated to prove that it accurately represents the ignition rate.

RESPONSE 1
SDG&E objects to the request on the grounds set forth in General Objections Nos. 2 and 3. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

a. The generalized factor adjustment process implementation is depicted below:

$$Adj.Ignition\ Rate = Initial\ Ignition\ Rate \times Ignition\ Adj.Factor_i \times Normalization\ Factor_i$$

Where, Initial Ignition Rate is the initial ignition rate prior to implementation of adjustment factor *i*, Ignition Adj. Factor$_i$ is the adjustment factor metric tied to the adjustment factor *i,* Normalization Factor$_i$ is the normalization factor tied to adjustment factor *i,* Adj. Ignition Rate is the adjusted ignition rate after implementation of adjustment factor *i and i* is the specific adjustment factor (e.g., wind speed, tree strikes, etc.).

For the wind speed ignition adj. factor, the historical max wind speeds are categorized into four severity ranges and each given an assigned adjustment factor rate:

1. < 40 mph = 0.025
2. 40 – 50 mph = 0.075
3. 50 – 60 mph = 0.225
4. > 60 mph = 0.675

b. Historical max wind speeds from associated weather stations tied to each circuit-segment.

c. The generalized factor adjustment formula is devised using principles of weighted-sum modeling and factor-adjustment parametrization. The severity range bucketing and associated adjustment factor variables tied to each were informed by subject matter expert guidance.

Note: The overall methodology for the WiNGS Planning ignition rate is currently undergoing evaluation for improvement. The current WiNGS Planning ignition rate methodology is based on the original methodology that was chosen by the development team during conception of the model. This methodology was retained during the WiNGS platform cut-over from Excel to Python/AWS to make sure output was as consistent as possible between architectural changes.

d. Unit test verification steps are performed within the model to ensure that the normalization for each ignition rate adjustment step is performed correctly. Ad-hoc analysis by modeling team has shown positive correlation between ignition rates and wind speeds, as intended. Furthermore, a thorough third-party review has been performed on the WiNGS-Planning model and completed in 2023, which reviewed and evaluated the validity of the modeling steps within the model, including the Ignition Rate Normalization Factor Sub-Model and found that the model is a robust model which meets user needs and performs the function for which it was designed. The third party review found no high-severity issues that could change the output of the model. The WiNGS model output is furthermore scrutinized for validity by scoping engineers via the Desktop Feasibility Study, which is implemented during the project scoping process.

Note: Section 6.7 of SDG&E's WMP details the roadmap for formalizing the WiNGS Planning model's validation process.

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QUESTION 2

For the Vegetation Adjustment Rate:

a. What is the algorithm and formula used to apply the vegetation adjustment rate?

b. What data was used to determine the vegetation adjustment rate?

c. Show the analysis that determined the algorithm and formula from the available data.

d. Show how the vegetation adjustment rate was validated to prove that it accurately represents the ignition rate.

RESPONSE 2

SDG&E objects to the request on the grounds set forth in General Objections Nos. 2 and 3. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

a. The generalized factor adjustment process implementation is depicted below:

$$Adj.Ignition\ Rate = Initial\ Ignition\ Rate \times Ignition\ Adj.Factor_i \times Normalization\ Factor_i$$

Where, Initial Ignition Rate is the initial ignition rate prior to implementation of adjustment factor *i*, Ignition Adj. Factor$_i$ is the adjustment factor metric tied to the adjustment factor *i,* Normalization Factor$_i$ is the normalization factor tied to adjustment factor *i,* Adj. Ignition Rate is the adjusted ignition rate after implementation of adjustment factor *i and i* is the specific adjustment factor (e.g., wind speed, tree strikes, etc.).

The tree strike ignition adj. factor = $\frac{segment\ tree\ strike\ potential\ count}{segment\ OH\ miles}$

where a potential tree strike is a tree that is within contact-range proximity of the OH line.

b. The Veg Management tree inventory points as well as Circuit Segment line features were used to create the tree strike data.

c. The generalized factor adjustment formula is devised using principles of weighted-sum modeling and factor-adjustment parametrization. The associated adjustment factor variables tied to each were informed by subject matter expert guidance.

Note: The overall methodology for the WiNGS Planning ignition rate is currently undergoing evaluation for improvement. The current WiNGS Planning ignition rate methodology is based on the original methodology that was chosen by the development

team during conception of the model. This methodology was retained during the WiNGS platform cut-over from Excel to Python/AWS to make sure output was as consistent as possible between architectural changes.

d. Unit test verification steps are performed within the model to ensure that the normalization for each ignition rate adjustment step is performed correctly. Ad-hoc analysis by modeling team has shown positive correlation between ignition rates and potential tree strikes per OH miles, as intended. Furthermore, a thorough third-party review has been performed on the WiNGS-Planning model and completed in 2023, which reviewed and evaluated the validity of the modeling steps within the model, including the Ignition Rate Normalization Factor Sub-Model and found that the model is a robust model which meets user needs and performs the function for which it was designed. The third party found no high-severity issues that could change the output of the model. The WiNGS model output is furthermore scrutinized for validity by scoping engineers via the Desktop Feasibility Study, which is implemented during the project scoping process.

   Note: Section 6.7 of SDG&E's WMP details the roadmap for formalizing the WiNGS Planning model's validation process.

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QUESTION 3

For the Asset Health Adjustment Rate:

a. What is the algorithm and formula used to apply the asset health adjustment rate?

b. What data was used to determine the asset health adjustment rate?

c. Show the analysis that determined the algorithm and formula from the available data.

d. Show how the asset health adjustment rate was validated to prove that it accurately represents the ignition rate.

RESPONSE 3

SDG&E objects to the request on the grounds set forth in General Objections Nos. 2 and 3. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

a. The generalized factor adjustment process implementation is depicted below:

$$Adj.Ignition\ Rate = Initial\ Ignition\ Rate \times Ignition\ Adj.Factor_i \times Normalization\ Factor_i$$

Where, Initial Ignition Rate is the initial ignition rate prior to implementation of adjustment factor *i*, Ignition Adj. Factor$_i$ is the adjustment factor metric tied to the adjustment factor *i,* Normalization Factor$_i$ is the normalization factor tied to adjustment factor *i,* Adj. Ignition Rate is the adjusted ignition rate after implementation of adjustment factor *i and i* is the specific adjustment factor (e.g., wind speed, tree strikes, etc.).

The Asset Health adj. factor =

$$\left(\frac{2*(Segment\ avg\ conductor\ age)}{avg\{Segment\ avg\ conductor\ age_1,\ Segment\ avg\ conductor\ age_2,\ldots,Segment\ avg\ conductor\ age_n\}}\right) + \left(\frac{Segment\ chi}{\{Segment\ chi_1,\ Segment\ chi_2,\ldots,Segment\ chi_n\}}\right)$$

Where CHI is the Circuit Health Index and *n* is the count of segments in the model scope.

b. Primary Overhead Conductor, Overhead Structure data from GIS Electric production database

c. The generalized factor adjustment formula is devised using principles of weighted-sum modeling and factor-adjustment parametrization. The associated adjustment factor variables tied to each were informed by subject matter expert guidance.

Note: The overall methodology for the WiNGS Planning ignition rate is currently undergoing evaluation for improvement. The current WiNGS Planning ignition rate methodology is based on the original methodology that was chosen by the development team during conception of the model. This methodology was retained during the WiNGS platform cut-over from Excel to Python/AWS to make sure output was as consistent as possible between architectural changes.

d. Unit test verification steps are performed within the model to ensure that the normalization for each ignition rate adjustment step is performed correctly. Ad-hoc analysis by modeling team has shown positive correlation between ignition rates and the asset health attributes, as intended. Furthermore, a thorough third-party review has been performed on the WiNGS-Planning model and completed in 2023, which reviewed and evaluated the validity of the modeling steps within the model, including the Ignition Rate Normalization Factor Sub-Model and found that the model is a robust model which meets user needs and performs the function for which it was designed. The third party found no high-severity issues that could change the output of the model. The WiNGS model output is furthermore scrutinized for validity by scoping engineers via the Desktop Feasibility Study, which is implemented during the project scoping process.

   Note: Section 6.7 of SDG&E's WMP details the roadmap for formalizing the WiNGS Planning model's validation process.

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QUESTION 4

For the Significant Wildfire Adjustment Rate:

a. What is the algorithm and formula used to apply the significant wildfire adjustment rate?

b. What data was used to determine the significant wildfire adjustment rate?

c. Show the analysis that determined the algorithm and formula from the available data.

d. Show how the significant wildfire adjustment rate was validated to prove that it accurately represents the ignition rate.

RESPONSE 4

SDG&E objects to the request on the grounds set forth in General Objections Nos. 2 and 3. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

a. The factor adjustment process implementation is depicted below:

$$Wildfire\ Rate = Initial\ Ignition\ Rate \times SigWF\ Adj.Factor$$

Where, Initial Ignition Rate is the initial ignition rate prior to implementation of the adjustment factor, SigWF Adj. Factor is the adjustment factor metric, Wildfire Rate is the adjusted wildfire rate after implementation of the adjustment factor.

$$SigWF\ Adj.Factor = \frac{1}{(Wildfire\ Frequency \times Annual\ HFTD\ Ign\ Rate)}$$

Where wildfire frequency is represented in years, and Annual HFTD Ign Rate is the rate of ignition per year in the HFTD.

b. See RAMP 2019, section IV, B. “Sources of Input”
c. See RAMP 2019 ,section IV, B. “Sources of Input”
d. See RAMP 2019 , section IV, B. “Sources of Input”

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QUESTION 5

For the Hardening Adjustment Rate:

a. What is the algorithm and formula used to apply the hardening adjustment rate?

b. What data was used to determine the hardening adjustment rate?

c. Show the analysis that determined the algorithm and formula from the available data.

d. Show how the hardening adjustment rate was validated to prove that it accurately represents the ignition rate.

RESPONSE 5

SDG&E objects to the request on the grounds set forth in General Objections Nos. 2 and 3. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

a. The factor adjustment process implementation is depicted below:

$$Adj.Wildfire\ Rate = \ Initial\ Wildfire\ Rate \times Pct\ Hardening_i \times (1 - Ign\ Effect\ Rate_i)$$

Where, Initial Wildfire Rate is the initial wildfire rate prior to implementation of the adjustment factor, $Pct\ Hardening_i$ is the percentage of segment hardening of hardening type *i,* $Ign\ Effect\ Rate_i$ is the effectiveness rate of hardening type *i,* and *i* is the hardening state type.

b. Primary Overhead Conductor, Overhead Structure data from GIS Electric production database

c. The generalized factor adjustment formula is devised using principles of weighted-sum modeling and factor-adjustment parametrization. The associated effectiveness rates tied to each hardening type were informed by subject matter expert guidance and/or efficacy studies.

   Note: The overall methodology for the WiNGS Planning ignition rate is currently undergoing evaluation for improvement. The current WiNGS Planning ignition rate methodology is based on the original methodology that was chosen by the development team during conception of the model. This methodology was retained during the WiNGS platform cut-over from Excel to Python/AWS to make sure output was as consistent as possible between architectural changes.

d. Efficacy studies and/or subject matter expert guidance has been utilized to assess the effectiveness rates that go into adjusting the ignition rate for the hardening state.

Additionally, a thorough third-party review was performed on the WiNGS-Planning model and completed in 2023, which reviewed and evaluated the validity of the modeling steps within the model, including the Ignition Rate Normalization Factor Sub-Model and found that the model is a robust model which meets user needs and performs the function for which it was designed. The third party found no high-severity issues that could change the output of the model. The WiNGS model output is furthermore scrutinized for validity by scoping engineers via the Desktop Feasibility Study, which is implemented during the project scoping process.

Note: Section 6.7 of SDG&E's WMP details the roadmap for formalizing the WiNGS Planning model's validation process.

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END OF REQUEST