SED DATA REQUEST: SED-SDG&E-02
R.18-10-007 – SB901 WILDFIRE MITIGATION PLAN OIR
SDG&E RESPONSE

Date Received: March 7, 2019
Date Submitted: March 12, 2019

Regarding SDG&E Wildfire Mitigation Plan (WMP or Plan) Section 4.3 – System Hardening

QUESTION 1:

Has SDGE established or discovered general time frames for when specific types of line elements need to be evaluated for aged related deterioration? How does SDGE determine the range during which a line elements age should be examined?

RESPONSE 1:

SDG&E utilizes visual and intrusive inspections to identify line elements that need repair or replacement due to age related deterioration. The line elements targeted for proactive replacement on the Fire Risk Mitigation (FiRM) program were not determined by age alone, but by the number of wire downs caused by small conductor failures. These areas were then prioritized utilizing SDG&E's Wildfire Risk Reduction Model (WRRM).

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QUESTION 2:

What is the average age of a wire in the "1,100 miles of aged high-risk conductor" in the HFTD mentioned in section 4.3.9? Is there an accepted age at which conductor should be evaluated for age-related risk of failure?

RESPONSE 2:

SDG&E did not consistently start tracking conductor age until around 1978. The 1,100 miles of aged high-risk conductor were identified by wire size, not age. However, given that SDG&E does not have conductor age data on this specific conductor, it can be inferred that it is at least older than 41 years. As stated in response to Question 1 above, SDG&E utilizes visual and intrusive inspections to identify line elements that need repair or replacement due to age related deterioration.

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QUESTION 3:

What are the line elements that the SDGE FiRM program considers when determining whether replacement due to age is necessary? Are there accepted ages for different line elements at which the element should be evaluated for age-related risk of failure?

RESPONSE 3:

SDG&E's FiRM program was created to proactively replace conductor with the highest rate of failure, which includes small copper wire (predominantly #6 and #4 copper wire) within the HFTD. With that goal in mind, utilizing larger and stronger conductor leads to new connectors, insulators, and poles to support designing to known local wind conditions, including 85 mph in much of the HFTD and increased conductor spacing.

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QUESTION 4:

What evidence has SDGE used in its decision to discontinue the use of hotline clamps? Identify the purpose of hotline clamps on SDGE facilities and how construction standards will be affected by the omission of this piece of equipment.

RESPONSE 4:

SDG&E has experienced numerous events where the cause for a wire down outage was attributed to a hotline clamp. The purpose of a hotline clamp is to provide a connection from a transformer or lighting arrestor directly to the primary conductor. Through its Hotline Clamps program, SDG&E will discontinue connecting hotline clamps directly to the primary conductor, which will drastically reduce this wire down failure mode. When connections directly to the line are required, a wedge connector with stirrup would be applied to the line and the hotline clamp will be connected to the stirrup. The wedge connector will provide a larger connection surface area directly to the line versus a hotline clamp, which helps to spread-out the mechanical load and improves the electrical conductivity. The wedge connector is also fired on with a booster to ensure uniform and consistent application versus the hotline clamp which is manually torqued.

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QUESTION 5:

When SDGE indicates in section 4.3.14 that it is increasing phase spacing between conductors to reduce risk of contact, does this refer only to a change in current and future construction standards or will this also affect previous constructions?

RESPONSE 5:

As discussed in Section 4.3.14 of SDG&E's WMP, the increase in phase spacing between conductors is prospective and will only impact current and future construction.

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QUESTION 6:

How many miles of covered conductor are there in SDGE's service area? What percentage of the miles of wires in SDGE's service area are currently covered conductor? How many miles does SDGE intend to replace with covered conductors in the future?

RESPONSE 6:

SDG&E has approximately 5 miles of covered conductor and approximately 5 miles of tree wire in its service territory representing 0.15% of overhead conductor. SDG&E's future plans for covered conductor are still in development.

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QUESTION 7:

Has SDGE discovered any considerable changes to infrastructure that would be necessary in order to support the additional weight of covered conductors?

RESPONSE 7:

SDG&E has completed a study based on weight differences of covered conductor versus bare conductor and found that the covered conductor will have more sag per span length due to this weight increase. To overcome this, poles would have to be taller, or conductor must be strung at higher tension, which would increase pole strength requirements, or more poles would need to be installed to reduce span lengths and sag, or a combination of all three options. In addition, covered conductor has a larger diameter, which would have greater wind loading, requiring stronger pole structures. In sum, while installation of covered conductor is feasible, in general it will require infrastructure that is a stronger and taller than that used for bare conductor construction.

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QUESTION 8:

How accurate is the High Accuracy Fault Location technology described in section 4.3.15? What kind of location information is available? Are there minimum parameters that limit the types of incidents for which this technology can provide location information?

RESPONSE 8:

Fault locating on transmission lines has been highly accurate, where the ability to identify fault distance is as accurate as +/- 5% of the actual fault location. For distribution, fault locating technology is still under development.

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QUESTION 9:

To what extent is falling conductor protection technology currently implemented in the SDGE service area?

RESPONSE 9:

SDG&E has installed and tested falling conductor protection on four distribution circuits.

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Regarding SDG&E WMP Section 4.4 – Vegetation Management

QUESTION 10:

Describe the pre-inspection of trees in proximity to powerlines. Are inspectors required to go through specific training to perform these inspections? What documentation is used either as a guide during the inspections or as training material? Are these vegetation inspections ever performed concurrently with regular facility inspections?

RESPONSE 10:

Inspections are conducted via foot patrol looking at all trees in proximity to the overhead electrical lines. All trees meeting the tree inventory criteria are entered into an electronic database and work management system called *PowerWorkz*. An inventory tree is defined as one that may impact the lines via encroachment or failure within three (3) years of the inspection date. The inspector records information in the work management system for all inventory trees to reflect what work is necessary for the current inspection cycle. The annual vegetation inspections are usually not performed concurrently with regular facility inspections. SDG&E, however, does perform internal compliance inspections related to equipment and other General Order compliance requirements. A component of these inspections includes vegetation, but these internal inspections do not serve as the annual inspection performed by SDG&E's Vegetation Management.

The pre-inspection activity is performed by a workforce of contractors. The hiring preference for inspectors includes an education and/or experience background in forestry, horticulture or related field. Contractors receive specific utility-related vegetation management training via their internal company. This documented training includes electrical hardware identification, hazard tree assessment, customer service, and work management processes. Contractually, contractors are also expected to achieve the status of Certified Arborist through the International Society of Arboriculture. Contractors also receive annual hazard tree refresher training from their company. SDG&E provides the contractor a 'Pre-inspection Procedure' manual which outlines specific policies and procedures related to the tree inspection activity.

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QUESTION 11:

Is there a guide or training material on how to perform 360-degree tree-hazard evaluations? Are these performed concurrently with the regular tree inspections?

RESPONSE 11:

Hazard tree inspection guidelines are outlined to some degree within the aforementioned 'Pre-Inspection Procedures' manual. Detailed hazard tree inspection guidelines are provided internally by the contractor and via training using their 'Tree Risk Assessment Guide' which includes language on 360-degree hazard tree evaluation and matrix. This information is also provided by the contractor to employees during their annual refresher training. The 360-degree hazard tree evaluations are performed within the HFTD during the regular tree inspections.

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QUESTION 12:

How did SDGE determine the need for a 25 foot post-trim clearance within the HFTD? When will this increase be adopted?

RESPONSE 12:

SDG&E had previously established a post-trim clearance factoring tree growth rate, required minimum clearance, and past pruning practices to achieve compliance for an annual cycle. The decision to establish a 25-foot post-trim clearance where applicable is an effort to further reduce the chance of tree/powerline contacts from branch or tree trunk failure. SDG&E utilized its tree outage database findings to help determine this expanded clearance scope.

SDG&E adopted a greater post-trim clearance guideline for palm species several years ago and will now expand this to other trees species that are adjacent to and above conductors and within a clearance to strike the overhead line, pole or equipment on the pole.

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QUESTION 13:

How did SDGE determine what constitutes a "problematic species" in context of its tree removal program?

RESPONSE 13:

SDG&E considers "problematic species" as those that are incompatible with power lines based on their growth rate and/or propensity to shed limbs and trunk failure.