

DATA REQUEST RESPONSE
Bear Valley Electric Service, Inc.
Wildfire Mitigation Plan

Response provided by: Paul Marconi
Title: President, Treasurer & Secretary
Data Request Number: Circuit Risk Prioritization GIS Data WSD-022
Date Received: May 20, 2021
Date Due: June 4, 2021
Date Provided: June 4, 2021

From Ivan Garcia (Wildfire Safety Division) email to BVES dated May 20, 2021. The following questions regarding Circuit Risk Prioritization GIS Data. Due date extended to June 4, 2021.

1. Does BVES have a listing of circuits ranked in order of risk? If so, provide the following:
 - a. Whether circuit risk is ranked as an overall aggregate, specific to particular risk drivers (e.g., vegetation contact, equipment failure, etc.), or both.
 - b. A listing and detailed explanation of how such risk ranking is calculated for each risk type identified in response to 1a.
 - c. For each risk type identified in response to 1a, a GIS dataset that includes the following fields:

Field Name	Field Description
Circuit_ID	A unique ID corresponding to Circuit_ID fields in the PrimaryDistributionLine and TransmissionLine datasets, as outlined in the WSD GIS Data Reporting Standard.
Risk_Type	The type of risk as identified in response to 1a above (e.g., overall, equipment failure, vegetation contact, etc.).
Risk_Ranking	The risk ranking relative to the Risk_Type identified listed from 1 to n. Where 1 is the highest risk circuit and n denotes the number of total circuits risk ranked. A unique Risk_Ranking is required for each Risk Type identified.

Response:

BVES does have listing of circuit segments ranked in order of risk

- a. Risk ranking is based on wildfire risk, which is an overall aggregate to several risk drivers (vegetation contact, equipment failure, etc.).

- b. The Fire Safety Circuit Matrix aims to characterize all BVES distribution circuits in groups of High, Moderate, and Low wildfire risks and the prioritization of the circuits within each wildfire risk group. To meet this objective, BVES developed a balanced scorecard approach with the use of a Fire Safety Circuit Matrix. The purpose of the model is to assist in determining a circuit-level risk that accounts for the current and planned mitigation activities, which are intended to reduce ignition potential. The model provides the planning period of the WMP considering changes to the risk profile as mitigations are executed over time.

<i>Fire Safety Circuit Matrix – Data Terms</i>	
Circuit	List of circuits located in High Fire-Threat Districts, which determines the scope of data collection and presentation within the matrix
Voltage	Kilovolt (kV) listing for each identified circuit
Fire Threat Tier	Acknowledgment of the fire threat Zone/Tier in which the circuit resides
# of Poles	The number of poles within the identified circuit segments
# of Tree Attachments	The number of tree attachments cataloged with the identified circuit segments
Bare Wire OH Circuit Miles	The length of bare wire overhead in circuit miles respective to the listed circuit
Covered Conductor OH Circuit Miles	The length of covered conductor overhead in circuit miles respective to the listed circuit
UG Circuit Miles	The length of undergrounded circuit in miles respective to the listed circuit
Substation	Associated substation, if any, by circuit
De-Energize in Unfavorable Condition	This column provides the allowance of which lines are permitted to be de-energized if fire potential threat exists

Exacter Survey (EMI & Infrared)	Determined if exacter survey process has started, is in progress, or is completed, by circuit
Pole Loading Program	Based on parameters of pole loading, GO 95, and age of the pole (70yrs. ⁺), this column tracks the status of pole loading, intrusive testing, or pole replacement needs by circuit
Tree Attachment Removal Program	Determines the status of tree attachment removal activities by circuit
Tree Wire	The status of investigation determining the need for tree wire by circuit
Covered Wire	The status, by circuit, of covered conductor implementation and evaluation
Replace Expulsion Fuses	The status of evaluation of where fuse replacements from convention to current-limiting fuses are warranted, by circuit
IntelliRupters Pulsing Auto Reclosers	The status of determining whether fault interrupters are warranted on the identified circuit
System Instrumentation	The status, by circuit, of investigations of where further instrumentation is warranted
Switch Automation Opportunities	The status, by circuit, of evaluated opportunities for switch automation that enhance fire safety
Branch Line Fusing Options	The status of investigation, by circuit, of additional related fusing opportunities that enhance fire safety
Evaluate Protective Settings	The status of evaluation, by circuit, for protective setting determinations for breakers, switches, reclosers, fuse trip savers, fuses, and other trip devices
Consider Partial Undergrounding	The status of investigation, by circuit, of additional related fusing options

Data Elements:

The Wildfire Risk Group (WRG) Score is calculated using the following equation:

WRG =

*Bare Wire OH Circuit Miles on an identified circuit within a specified Tier area
as a worst performing circuit rating +*

of fuses +

of tree attachments +

of level 2 deficiencies to be corrected +

rank of work performing circuit rating –

*the pole loading program percent complete multiplied by the number of wood
poles –*

the fault indicator percentage –

*(whether the circuit is subject to enhanced vegetation management , whether a
GO 165 ground patrol is performed, subject to GO 165 five year inspections, GO
195 intrusive inspections, whether the circuit is subject to a bi-annual LiDAR
survey, third party annual ground control, or GO 174 Substation inspections).*

<i>Risk Scoring Amount (Adds to Risk Score)</i>
34.4 kV = 500 & 4 kV = 50
HFTD Tier 3 = 10000 x Bare Wire Circuit Miles and HFTD Tier 2 = 50 x Bare Wire Circuit Miles
Bare Wire Circuit Mile x 200
High Density = 100 x Bare Wire Circuit Miles; Med Density = 25 x Bare Wire Circuit Miles; and Low Density = 5 x Bare Wire Circuit Miles
High Wind Area = 100 x Bare Wire Circuit Miles; Med Wind Area = 25 x Bare Wire Circuit Miles; and Low Wind Area = 5 x Bare Wire Circuit Miles
of Conventional Fuses x 2
of Tree Attachments x 4
of Level 1 Deficiencies x 1000
of Level 2 Deficiencies x 100
Circuit Ranking: #1 = 1000, #2 = 900, #3 = 800, #4 = 700, #5 = 600, #6 = 500, #7 = 400, #8 = 300, #9 = 200, #10 = 100, & Not Ranked = 0

<i>Risk Mitigation Factors</i>	<i>Risk Scoring Amount (Subtracts from Risk Score)</i>
Pole Loading Program (Percent Complete)	(Number of Wood Poles x Percent Complete) x 5; NA = 0
FI Program (Percent Complete)	(Percent Complete * 100) x 2; NA = 0
Enhanced Vegetation Management	On Schedule (Green) = Bare Wire Circuit Miles x 2; Behind Schedule (Red) = 0
GO 165 Ground Patrol	In Periodicity (Green) = Bare Wire Circuit Miles x 2; Out Periodicity (Red) = 0
GO 165 5-Year Inspections	In Periodicity (Green) = Bare Wire Circuit Miles x 2; Out Periodicity (Red) = 0
GO 165 Intrusive Inspections	In Periodicity (Green) = Number of x 2; Out Periodicity (Red) = 0
Bi-Annual LiDAR Survey	In Periodicity (Green) = Number of Wood Poles x 2; Out Periodicity (Red) = 0
3rd Party Annual Ground Patrol	In Periodicity (Green) = Bare Wire Circuit Miles x 2; Out Periodicity (Red) = 0
GO 174 Substation Inspections	In Periodicity (Green) = Bare Wire Circuit Miles x 2; Out Periodicity (Red) = 0

Methodology:

The following risk factors have an impact on making a circuit “high risk” with respect to wildfire: Length of overhead bare wire (longer length is higher risk);

- Available energy (higher voltage is higher risk);
- Availability of fuel (higher vegetation density is higher risk);
- Susceptibility to high winds (higher wind area is higher risk);
- Susceptibility to pole failure (higher number of wood poles is higher risk);
- Number of conventional (expulsion) fuses (higher is higher risk);

- Number of Tree attachments (higher number is higher risk);
- Number of Uncorrected Level 1 deficiencies (higher number of uncorrected Level 1 wind area is higher risk);
- Number of Uncorrected Level 2 deficiencies (higher number of uncorrected Level 1 wind area is higher risk); and
- Rank in Top Ten worst performing circuits (#1 is highest risk, then #2, etc.).

Application and results: The following programs directly mitigate the above risk factors that make a circuit “high risk” with respect to wildfire by removing or significantly reducing the frequency (or likelihood) of certain risk factors occurring (while the programs are in progress, they partially reduce the risk):

- Covered wire program (removes bare wire)
- Undergrounding facilities (removes bare wire)
- Replace conventional fuses (removes expulsion fuses)
- Tree Attachment Removal Program (removes tree attachments from system)

The following programs mitigate the above risk factors that make a circuit “high risk” with respect to wildfire by reducing the frequency (or likelihood) of the certain risk factors occurring:

- Pole Strengthening (Pole Loading and Assessment Program) (reduces susceptibility of wood poles to failure)
- Installing Fault Indicators (reduces time to locate faults)
- Replace AR with Pulse Conditioned Interruption (reduces energy on a line being tested after a fault)
- Install Remotely Monitored Circuit Meters on All Phases (immediately provides indication of outage or abnormal circuit parameters reducing detection time of faults)
- Install Fault Localization Isolation Service Restoration (FLISR) (automatically isolates and de-energizes faults)
- Enhanced Vegetation Management (reduces fuel in immediate vicinity of lines from making contact with bare wire)

- GO-165 Ground Patrol (detects Level 1 and 2 vegetation and facilities discrepancies and other discrepancies that may lead to safety issues; also detects if previously noted discrepancies are being properly cleared)
- GO-165 5-Year Inspections (detects Level 1 and 2 vegetation and facilities discrepancies and other discrepancies that may lead to safety issues; also detects if previously noted discrepancies are being properly cleared)
- GO-165 Intrusive Inspections (detects pole strength integrity issues)
- Bi-Annual LiDAR Survey (detects Level 1 and 2 vegetation and facilities discrepancies and other discrepancies that may lead to safety issues; also detects if previously noted discrepancies are being properly cleared)
- 3rd Party Annual Ground Patrol (detects Level 1 and 2 vegetation and facilities discrepancies and other discrepancies that may lead to safety issues; also detects if previously noted discrepancies are being properly cleared)
- UAV Fly-over Inspections (detects Level 1 and 2 vegetation and facilities discrepancies and other discrepancies that may lead to safety issues; also detects if previously noted discrepancies are being properly cleared)
- GO-174 Substation Inspections (detects substation equipment issues that may fault or failure to open on a fault down circuit)
- Substation Electrical Equipment Preventative Maintenance (detects substation equipment issues that may fault or failure to open on a fault down circuit)

The following programs reduce the severity of wildfire or Public Safety Power Shuts

- Evacuation Route Hardening (reduce likelihood of overhead facilities failing into an evacuation route or causing other damage)
- Circuit Sectionalized to Reduce PSPS Impact (reduce number of customers impacted by PSPS events)
 - BVES currently does not does not have GIS data set for each risk type in question 1.a. BVES will consider developing such a dataset.

2. Does BVES have a listing of circuit segments ranked in order of risk? If so, provide the following:

a. An explanation of how circuit segments are defined.

- b. Whether circuit segment risk is ranked as an overall aggregate, specific to particular risk drivers (e.g., vegetation contact, equipment failure, etc.), or both.
- c. A detailed explanation of how such risk ranking is calculated for each risk type identified in response to 2b.
- d. For each risk type identified in response to 2b, a GIS dataset that includes the following fields:

Field Name	Field Description
Circuit_ID	A unique ID corresponding to Circuit_ID fields in the PrimaryDistributionLine and TransmissionLine datasets, as outlined in the WSD GIS Data Reporting Standard.
Circuit_Segment_ID	A unique ID for the circuit segment.
Risk_Type	The type of risk as identified in response to 2b above (e.g., overall, equipment failure, vegetation contact, etc.).
Risk_Ranking	The risk ranking relative to the Risk_Type identified listed from 1 to <i>n</i> . Where 1 is the highest risk circuit segment and <i>n</i> denotes the number of total circuit segments risk ranked. A unique Risk_Ranking is required for each Risk_Type identified.

Response:

BVES does not have a listing of circuit segments ranked in order of risk.