COMPLIANCE PLAN

INSPECTION PROCEDURES

FOR GENERAL ORDER 165

Submitted by:

Bear Valley
Electric Service, Inc.
A Subsidiary of American States Water Company

July 1, 2020

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1. BACKGROUND

Pursuant to Section IV of California Public Utilities Commission's (CPUC) General Order (G.O.) 165, Bear Valley Electric Service, Inc. (BVES) submits its compliance plan for distribution facilities inspection procedures and activities.

BVES serves and maintains facilities in a "rural" area, as defined by the United States Bureau of Census, requiring a *Circuit Patrol* every two years under G.O. 165. The G.O. 165 further requires that all below ground facilities and equipment have a *Detailed Inspection* at a minimum of every three (3) years and above ground structures and equipment receive a *Detailed Inspection* at a minimum of every five (5) years, regardless of population density designation. Additionally, the G.O. requires an *Intrusive Inspection* of all wood pole structures which have been in service over 15 years. Poles which are over 15 years in service and have not received an Intrusive Inspection are required to have an Intrusive Inspection performed within a 10-year cycle. Poles which pass an Intrusive Inspection are required to have a follow up Intrusive Inspection within a 20-year cycle.

The G.O. 165 specifies that all facility inspections shall be recorded and reported in a manner which can be used to monitor and audit conformance to the requirement of G.O. 165. BVES has established a plan to meet the requirements of G.O. 165 by establishing an inspection methodology and inspection cycles for performing Circuit Patrols, Detailed Inspections, and Intrusive Inspections for wood poles to cover facilities and structures within its territory. The inspection and maintenance of certain portions of the BVES service territory may also be governed by public resource codes where overhead facilities traverse such areas. California Public Resource Code 4292 requires annual patrols of structures within power line facilities traversing State or Local Responsibility Areas which support non-exempt electrical equipment to mitigate fire hazard potentials. BVES, at its discretion, may perform patrols and facility inspections at intervals more frequent than required under G.O. 165. Internal BVES documents, such as the "Emergency Plan" intended to minimize outage duration to its customers, may require more frequent patrols at key facilities than required under G.O. 165. Reporting will, at a minimum, conform to G.O. 165 requirements.

In order for the CPUC to identify and monitor conformance to G.O. 165, BVES has developed inspection procedures based on patrol type and facility type as follows:

- Circuit Patrol and Detail Inspection for Overhead Structures and Equipment
- Detailed Inspection for Underground Facilities/Equipment, and Padmount Transformers
- Intrusive Inspection for Wood Poles

2. FACILITY INSPECTION

A *Circuit Patrol* includes a visual inspection and reporting of the condition of overhead and underground facilities. The Circuit Patrol will consist of a "drive-by" inspection performed on a routine annual (one-year) basis. It is intended to identify obvious safety and circuit reliability problems or hazards. In addition to routine Circuit Patrols, BVES line crews are to perform on-going patrols in the course of routine activities.

The *Detail Inspection* consists of more critical visual inspections and data reporting of the condition of conductors/cables, transformers, capacitors, regulators, street lighting, and other equipment/devices. Detail Inspections will be performed from ground level or from the air. BVES owns limited underground equipment and inspects such facilities on a relatively frequent basis while performing meter reading and equipment monitoring activities. Underground facilities such as vaults, manholes, etc. will have detailed equipment inspection every three (3) years or more frequently as BVES determines to be necessary. Facilities located above ground such as pad mounts or walk-in enclosures will receive a Detailed Inspection every five (5) years.

Intrusive Inspections will be performed on wood pole structures on at least a 10-year cycle for poles over 15 years of age which have not been subject to an intrusive inspection and at each 20-year period, thereafter, on poles which have passed an intrusive inspection. Intrusive testing will be completed on a target of 2.5 circuits per year. BVES has decided to contract its intrusive inspections. The BVES Intrusive Inspection Parameters document should be referenced for more information.

Appendix A provides forms and coding for reporting facility inspection results and Appendix B provides the format for the summary reports to be submitted to the CPUC detailing inspection schedules, discrepancies found, and schedules for corrective actions. *Corrective actions* are defined by G.O. 165 as actions such as maintenance, repair, or replacement of equipment and structures to ensure the safety and reliability of the system. Identifying the response time which these corrective actions are to be performed is necessary to meet the G.O. 165 objective and to the overall system integrity plan at BVES. The following table identities the condition rating, description, and response time of the corrective action. The *condition rating* will remain a constant for each patrol type and interval unless otherwise specified. The condition rating system has been expanded from the requirements of G.O. 165 to coincide with the BVES approach to facilities management and maintenance.

3. INSPECTION METHODOLOGY AND REQUIREMENTS

The BVES Inspection Plan is intended to promote safety, circuit reliability, minimal service interruption, and reduced risk of fire through routine visual inspection of facility conditions. The inspection focus is ensuring compliance to G.O. 95 and G.O. 128 requirements. Inspection intervals and reports comply with the requirement specified in G.O. 165. The reporting procedures set forth and defined herein can be used to evaluate compliance with the BVES plan. Inspection intervals will conform to G.O. 165 unless required more frequently by other Federal, State, or local agencies or BVES.

Presented herein are brief descriptions of the inspection methodologies, assumptions, requirements, and key items to identify for each type of inspection. These items are provided for Circuit Patrol, the Detailed Inspections of overhead and underground facilities and Intrusive Inspections for wood poles.

3.1 Circuit Patrol and Detailed Inspection for Overhead Structures and Equipment

As similarities exist for Circuit Patrol and Detailed Inspections related to inspection assumptions, patrol requirements, and patrolman requirements, these areas are provided jointly.

Circuit Patrol and Detailed Inspection Assumptions

The requirements for Circuit Patrol and Detailed Inspection are provided below:

- Circuit Patrols and Detailed Inspections will be performed by qualified staff.
- Circuit Patrol is predominantly a “drive-by” inspection for all overhead facilities, attachments and equipment; however, Circuit Patrol and Detailed Inspections may be performed by air at the discretion of BVES.
- Inspection results will be recorded in a BVES-specified recording format.

Circuit Patrol and Detailed Inspection Requirements

The following requirements serve as a guideline to identify the focus of the patrol:

- Visual inspection of distribution circuits from the substation source to end of circuit will be performed and will include support structures, hardware, conductors, transformers (overhead), capacitors, switches, fuses, etc. to identify obvious problems or hazards for public or worker safety, circuit reliability and fire hazards.
- Vegetation encroachments in violation of BVES tree-trimming requirements or G.O. 95 clearance requirements will be identified.
- Circuit map discrepancies, as directed by supervision, will be reported.

- Minor maintenance activities to place guy guards, visibility strips, etc. as directed by supervision, will be performed. Items not performed at the time of inspection will be scheduled for correction according to the priority rating.

Responsibilities for Circuit Patrol and Detailed Inspections

Patrolman Requirements

- Inspectors are to be qualified to perform each type of patrol by meeting minimum experience requirements or successfully completing training requirements established by BVES.

Reporting

- Inspection results will be recorded on BVES-specified forms or reporting formats (Appendix A). A condition rating for observations requiring corrective action or re-evaluation will be provided.
- Reports will be submitted to the Operations Superintendent and District Engineer as required by BVES.
- Facilities patrolled (identified by circuit and patrol type) will be reported.

Circuit Patrol Methodology

Circuit Patrol will be performed on a circuit-by-circuit basis at least once per year directed by G.O. 165. BVES has an emergency response plan in effect that prioritizes circuits serving key public agencies such as hospitals, emergency response services, etc. Circuits will be patrolled in order of priority to ensure public safety and reliability. The patrol is intended to identify obvious problems or hazards while performing a "drive-by" patrol. The problems sought are those which are readily observable when performing a driving-, foot-, or aerial-patrol and do not require the patrolman to enter properties unless facilities cannot be observed from public access locations.

Circuit Patrol Checklist

To aid the patrolman in identifying obvious problems or notable conditions during the Circuit Patrol, the following checklist is provided:

A. Condition of Poles and Structures

Identify/examine:

- Damaged/deteriorated pole (mechanical damage by vehicle, storm, fire, etc.)
- Broken or damaged components
- Damaged down guys
- Erosion or excavation around pole or anchor
- Movement and cabinet security in padmount transformer
- Damage to vault lids or vent pipes
- Vegetation clearance around poles or structures.

B. Condition of Hardware and Apparatus

Identify/examine:

- Broken or damaged insulators
- Pole switch indicating need for repair
- Indication of equipment/transformers leaking oil
- Bulged or discolored capacitor units
- Blown fuses and broken fuse holders
- Blown lightning arresters
- Foreign objects interfering with operation
- Obvious evidence of tracking or burning of pole or arms

C. Conductors

Identify/examine:

- Inadequate ground clearances
- Clearance from building, telecommunications, cable television or radio antenna, billboard signs, scaffolding or other line hazards
- Crane or other excessive height equipment operating in close proximity
- Obvious vegetation clearance infractions
- Hazardous tree conditions, vegetation encroachment, dead trees, foreign objects in line, etc.

D. General Conditions

Identify/examine:

- Unlocked equipment
- Verify circuit map accuracy

Detailed Inspection Methodology

Detailed Inspections of overhead lines, and aerial or padmounted equipment will be performed at least every five (5) years as directed by G.O. 165. The Detailed Inspection will be used in place of the Circuit Patrol in the calendar year in which it is performed. The detail inspection has much the same emphasis as the Circuit Patrol except that it involves a more detailed examination of facilities in order to identify facilities and circuit problems or hazards which may compromise safety or circuit reliability. Detailed Inspections will be visual-based from ground or air and do not require climbing unless directed by supervision and performed by qualified staff.

Overhead Detailed Inspection Checklist

To assist the patrolman in identification of problems or hazards during a Detailed Inspection, the following checklist is provided:

Line Element	Potential Hazards
Conductor	Inadequate clearances
	Idle
	Insulated conductor contacting communication cable / drop
	Burned jumper or connector
	Burned high voltage conductor
	Unattached
	Bare conductor contacting communication cable / drop
Guys	Insulator compromised
	Missing marker
	Broken / damaged
	Slack / missing
	Anchor – decayed / loose
	Broken / damaged guy in proximity to high voltage conductor
Insulator / Cutout	Broken / damaged / missing
	Minor Damage
Pole	Structure Number
	Leaning
	Climbing space obstructed
	Broken / damaged
	High Voltage Signs
	Excessive lean
Crossarm	Broken / damaged
	High Voltage Signs
	Burned / decayed
Equipment	Equipment weeping / seeping
	Broken / damaged
	Equipment leaking oil
Hardware	Missing
	Damaged / loose
Other / Vegetation	Vegetation causing strain or abrasion on low voltage conductor
	Vegetation contacting or nearly contacting high voltage conductor
	Vegetation contacting low voltage conductor and compromising structure
Ground Wire / Rod / Moulding	Ground wire exposed above public and below communication level
	Exposed / broken / missing at public or communication level

3.2 Detailed Inspection for Underground Facilities/Equipment and Padmount Transformers

Detailed Inspection Methodology for Underground Facility

Detailed Inspections are required for subsurface transformer and other devices/equipment on a three (3)-year cycle while above-ground padmounted transformers and devices/equipment require a five (5)-year inspection cycle. While the inspection intervals vary for subsurface relative to padmounted equipment, the basic inspection criteria are nonetheless similar and are reported identically for each inspection cycle, respectively. The inspections will be conducted in accordance with BVES and G.O. 128 requirements and will comply with G.O. 165 inspection intervals.

Detailed Inspections of underground facilities and equipment requires that the inspector enter vaults, manholes, walk-in enclosures and open padmounted transformers.

Underground Equipment and Padmounted Transformer Inspection Assumptions

- Qualified electrical workers are allowed to open or to be exposed to energized equipment.
- Air quality (oxygen and gas) test will be performed in accordance with standard OSHA policies before entering vaults and underground facilities.
- Observations will be detailed on BVES-specified inspection forms or formats.
- Supervision will define the number of crewmen required to perform inspection activities.

Underground Equipment and Padmount Requirements

- Ensure all locks, bolts, covers, etc. are intact and functional.
- All equipment and facility access shall be locked upon departure.
- Verify clearance requirements of underground equipment.
- Vegetation control around equipment will be performed.
- Presence and condition of appropriate signage to be verified.

Line Element	Potential Hazards
External	Prior to and after entering a structure, perform a general thermal scan for hot spots in structure and all equipment, cable, terminations, and splices.
	Check for missing or damaged manhole lid gasket/seal rope.
	Check air vents for damage and presence of shields around vent standpipe in landscaped areas.
	Check vault lid (equipment cover) seal (felt) and lifting hole plugs.
	Check manhole and vault lid for any openings where small objects can be inserted.
	Check for evidence of water ponding on top of the structure.
	Check for missing/damaged bolts or penta bolts.
	Check for debris in or around structures.
	Check for visual hazards.
	Check for structure movement.
	Verify that HIGH VOLTAGE signs and the structure number are legible.
	Check for exterior damage to structure.
	Check for sufficient work space around structure.
	Check for deterioration of concrete.
	Check for signs of corrosion (specifically inspect weld seams, corners, door hinges, and enclosure roof.).
	Check that the structure is sound and secure.
	Check for openings in structure which may allow the passage of wire, or other conducting material into the structure from the outside.
	Check for exterior damage to adjacent service handholes or splice boxes.

Line Element	Potential Hazards
Internal	Check for water inside the structure.
	Check for sand, dirt, mud, signs of vermin, debris, and so forth
	Verify cable tags are as complete as possible and consistent with the circuit map.
	Verify that cable clearances are adequate, not rubbing on sharp edges.
	Check that duct plugs are installed and in good working order in all necessary ducts.
	Check if the vent is leaking, or shows signs of previous leaking.
	Check for corrosion of ground rods and cables and all ground connections are proper.
	Check for concrete spalling and rebar rusting.
	Remove debris and loose materials from inside structure.

Line Element	Potential Hazards
Equipment	Prior to and after entering a structure, perform a detailed thermal scan for hot spots on structure and all equipment, cable, terminations, and splices.
	Check for signs of termination overheating or distortion.
	Check for signs of corrosion, oil leakage, and low oil levels.
	Check operation of sump pumps and perform maintenance.
	Check for scratches or abrasion to bare metal on equipment.
	Inspect weld seams.
	Inspect external operating mechanism.
	Inspect operating shaft seals.
	Inspect gaskets (cover, cableheads, and so forth).
	Inspect oil fill plug and sight gauge seals.
	Inspect tightness of hold-down bails.
	Inspect condition of marine-coating.
	Inspect fuse carriers for proper locking and sealing.
	Check for sufficient work space around equipment.
	Check for signs of contamination, tracking, or deterioration of insulating barriers and arc interrupting chutes
	Verify electrical clearances are maintained between barriers, like parts, and other insulated components.
	Verify that phase barriers are securely attached.
	Verify that the ground conductor is the correct size and is attached to the ground pad on the tank.
	Check safety barrier installation and condition on live front equipment (for example, pothead skirt in the PMH switch in contact with the protective barrier).
	In live-front equipment, verify that the fuse clips are in good condition (no signs of heating, arcing, or corrosion)
	Verify that locking devices are in place.
	Inspect mounting bolts for the correct size and number, tightness and corrosion.

Line Element	Potential Hazards
Apparatus	Check for bulging, ruptured, or discolored capacitor units.
	Inspect fuseholders, cutouts, or fused disconnects.
	Check for blown fuses.
	Check cable and cable terminations for signs of deterioration or damage (underground).
	Heat scan the cable, terminations, and equipment (underground).
	Check for corrosion or other damage.
	Check for oil or compound leaks.
	Check clearances, barriers, and grounding.
	Check weld seams.
	Inspect operating shaft seals.
	Check oil fill and sight gauge seals (underground)
	Check condition of marine coating (underground).
	Check to see if relay tripped (if applicable).
	Check for loose connections (arcing or burning).
	Check for damaged or blown control transformer.
	Check for approved locking devices in place and locked.
	Check for exterior/interior damage to enclosure (underground).
	Check for washout or excavation around enclosure (underground).
	Check that High Signs, and so forth, are legible.
	Check that enclosure mountings are securely bolted to structure (underground).
	Check for signs of rodents or other animals (underground).
	Check for any signs of water or oil within the apparatus housing (underground).
	Enter the status of equipment, counter and load reads, any abnormal conditions, and the names of all inspection personnel in the log provided at equipment.

3.3 Intrusive Inspections on Wood Pole Structures

Intrusive Inspection Methodology

Intrusive Inspections will be performed on wood pole structures on at least a 10-year cycle for poles over 15 years of age which have not been subject to an intrusive inspection and at each 20-year period, thereafter, on poles which have passed an intrusive inspection. BVES has decided to contract out intrusive inspections.

Intrusive Inspection Assumptions

- Inspections are to be done by qualified personnel trained in recognizing both biological and non-biological degradation and be able to accurately assess damaged caused by same.
- Poles in concrete or asphalt will be intrusively inspected at and above the ground line area.
- A minimum of two borings will be taken per structure to assess internal condition of each structure.
- Serviceability of decayed/damaged structures will be defined as per BVES specifications.
- Record keeping will be done on a per structure basis on BVES-specified forms (Appendix A)

Intrusive Inspection Equipment

- Hammer and/or small hatchet to sound the poles as well as investigate depth of external decay and/or mechanical damage
- Means to excavate one quadrant of the pole a minimum of 12 in. below the groundline.
- Appropriate boring device. Some examples are:
    - — Resistograph Drill System of the PD type
    - — Gas powered or electric 1/2 drive drill with a 3/8 in. x 18 in. auger bit
    - — Increment bore with a minimum bit length of 12 in.
- Means to measure remaining shell thickness
- Bore hole sterilization substance
- Treated 7/16 in. hardwood plugs

Intrusive Inspection, Sound & Bore Procedures

All wood structures 15 years and older will be minimally intrusively inspected by the following criteria:

- Hammer to sound the poles six foot above ground line to the bottom of any excavation, as well as investigate the depth of external decay and/or mechanical damage.
- If not in concrete or asphalt, excavate to a minimum depth of 12in. below ground line.
- A minimum of two borings will be taken with appropriate boring device, to be approved by BVES.
- If not in concrete or asphalt one of the borings will be at the bottom of the excavation, the other will be 90 degrees from the first boring and at ground line.

- If in concrete or asphalt one boring will be at ground line, the other will be 90 degrees from the first boring and 12in above ground line.
- Each pole shall be probed with an instrument to determine the presence of internal decay and/or insect damage.
- Inspection holes shall be sterilized by utilizing a BVES approved material.
- Inspection holes will be plugged with a BVES approved material.
- Information will be entered into D-Calc or other approved program to determine the remaining section modulus of force for every structure.
- Report the following information in BVES-approved formats:

    — Facility number
    — Manufacturer
    — Manufacture date
    — Original treatment
    — Pole length
    — Pole class
    — Wood species

Resistograph Procedures

All wood structures 15 years and older will be minimally intrusively inspected by the following criteria:

- Hammer to sound the poles six foot above ground line to the bottom of any excavation, as well as investigate the depth of external decay and/or mechanical damage.
- The first drill will be at a horizontal 0 degree angle, at a height of roughly 3'. This will be used to calculate the diameter of the pole. During this drill you will see the needle exit the pole at about two inches on the other side. The purpose of this drill is to establish a baseline diameter of the pole which will be used to determine the automatic drilling depth for the steps below, to avoid penetrating the shell of the pole below grade.
- The second drill will be conducted at the base of the pole at a 30 degrees angle. If void or decay is detected by the tool during this drilling, you will be asked to confirm and will then be prompted to perform an additional drilling 180 degrees from the one just completed.
- The third drill will be at the base with a 30 degrees angle perpendicular to the second drilling. If void or decay is detected by the tool during this drilling, you will be asked to confirm and will then be prompted to perform an additional drilling 180 degrees from the one just completed.

Based on this method of inspection, there will be a minimum of three drillings per pole, and up to five, depending on what the drill detects during the inspection. This NESC based analysis provides a percentage of remaining strength result.

Raw testing results will be provided to BVES in a spreadsheet created by Resistograph program.

4. GO 165 Inspection Cycles

BVES Distribution Inspection Cycles	Patrol	Detailed	Intrusive
Transformers			
Overhead	1	5	---
Underground	2	3	---
Padmounted	2	5	---
Switching/Protective Devices			
Overhead	1	5	---
Underground	2	3	---
Padmounted	2	5	---
Regulators/Capacitors			
Overhead	1	5	---
Underground	2	3	---
Padmounted	2	5	---
Others			
Overhead Conductor or Cables	1	5	---
Streetlighting	2	---	---
Wood Poles under 15 years	2	---	---
Wood Poles over 15 years which have not been subject to intrusive inspection	2	---	10
Wood Pole which passed intrusive inspection	---	---	20

5. PATROL & DET. CONDITION RATINGS

Condition Ratings		
Condition Rating	**Rating Description**	**Response Time**
1	Requires immediate corrective action	Immediate
2*	Requires timely corrective action. Potential risk of fire or worker safety	Within 12 Months
3	Requires corrective action but does not pose an immediate risk of fire or worker safety	Within 59 Months

*Condition Rating 1 issues shall be immediately resolved to correct the issue or place the issue in condition where it is rated as Condition Rating 2 or 3 and then treated accordingly for final resolution.

6. APPROVALS

This GO 165 Compliance Plan has been reviewed and approved, and is effective on the date indicated on page 1 of this document.

APPROVED:

By: Paul Marconi Digitally signed by Paul Marconi Date: 2020.09.30 20:22:46 -07'00' Date: 9/30/2020

Paul Marconi
President & Treasurer
Bear Valley Electric Service, Inc.