IID 2021 IID Service Territory Field Survey

Introduction and Summary

California Senate Bill 901 - Wild Fire Mitigation, requires IID to hire an independent evaluator to perform an annual service territory survey. The SB 901 survey inspects for potential fire ignition sources on the IID power system, and identifies areas that should be classified as CAL FIRE Moderate, High, or Extreme fire threat areas.

The 2019 survey focused on the IID transmission system. Inspections were performed in several areas with possible vegetation issues near power lines such as S line at New River, Imperial Dam area, KNKS line near Midway, Mecca and Indio. Inspections were also performed in areas identified by CAL FIRE as Moderate threat areas that contain or are near IID infrastructure: Ocotillo, Ocotillo Wells, and adjacent to the Imperial County line, west of Desert Shores.

The 2020 survey used the latest power outage information available on the IID GIS system (2019) to identify clusters of reported outages that involved vegetation, and infrastructure issues. Field inspections were performed of these areas in late January 2021. The inspection team inspected a sample of poles, inspecting for vegetation encroachments, possible fire ignition sources, and G.O. 95 issues.

Goals

The 2021 IID Service Territory Field Survey has several primary goals

- Identify potential trends of overhead infrastructure issues that may create safety risks, including fire ignition.
- Identify new areas or changes to existing CAL FIRE fire threat areas.
- Recommend solutions for overhead infrastructure construction, maintenance, and upgrades as appropriate.

Approach

The survey team, comprised of IID resources and Fuentes Consulting LLC consultants, prepared for and completed the survey in late 2020 / early 2021. The overall strategy was to identify areas in the territory with a recent history of outage clusters, then perform ground-up inspections on a sample of poles in those areas.

The team identified 15 areas, and performed visual inspections, documentation, and photography on approximately 150 poles in 14 areas, identifying various infrastructure issues and opportunities for maintenance and improvements.

IID also performed an SAP equipment database review of 31 poles out of approximately 50 poles found with issues during the survey.

Findings Summary

CAL FIRE, Fire Threat Areas

- No additional CAL FIRE Extreme or High fire threat areas identified.
- Some mountainous areas located near Imperial County line west of Mecca, and west of City of La Quinta classified by CAL FIRE as Extreme or High fire threat areas, do not warrant the classification due to the lack of fuel.

Possible Fire Ignition Sources

- Some vacant properties with excessive vegetation near IID infrastructure found in the Desert Shores and Mecca areas.
- Some alleys with excessive rubbish and obstructions found in El Centro.
- Some evidence of pole fires found in Brawley.
- Found a few pole bases and guy wire anchor points with excessive vegetation.
- Use of open expulsion type fuses.
- Evidence of high voltage tracking on distribution pole cross-arms found in several areas.

Safety

- Missing, damaged, and degraded High Voltage safety signs found in several areas.
- Missing bolt covers for pole top transformer installations found in several areas.
- Obstructions, shrubbery, and burial of IID pad mount transformers, vaults, and sector boxes in the Coachella Division reported by IID Trouble Shooter Supervisors.

System Condition

- Some distribution system areas found with considerable aging and degradation.
- IID Trouble Shooters reporting annual inspections have previously reported these issues. Issues previously reported are not resolved due to resource availability.

SAP

- IID SAP pole equipment records do not include city location, urban/rural designation, pole class, pole condition information, poles reinforcements. Staff is actively working to automate transfer of inspection records from GIS system to SAP.

Recommendations Summary

Aside from some equipment-specific and general suggestions, the team developed critical recommendations:

1. Review and update the existing GO 165 inspection and maintenance plan, to ensure that the plan is up to date and meets CPUC practices.
2. Dedicate full-time resources to resolve critical inspection and maintenance issues.
3. Dedicate full-time crew(s) to implement a “find it and fix it” strategy, starting with the Coachella / Indio area.
4. Include a cyclical, time-based asset management strategy that includes location specific “state of the infrastructure” assessments based on a scale rating, i.e. 1-5. The scale would identify hazardous conditions and severity, such that IID can develop a fixed and cyclical time frame for maintenance, repairs or replacements, including the resolution of dangerous vegetation issues.
5. Update engineering construction standards to resolve cross-arm tracking, lightning arrestor operation, and avian contamination issues.
6. Address underground and surface mount encroachments, with active reporting and processing of incidents, and by conducting customer education campaigns to help prevent incidents.

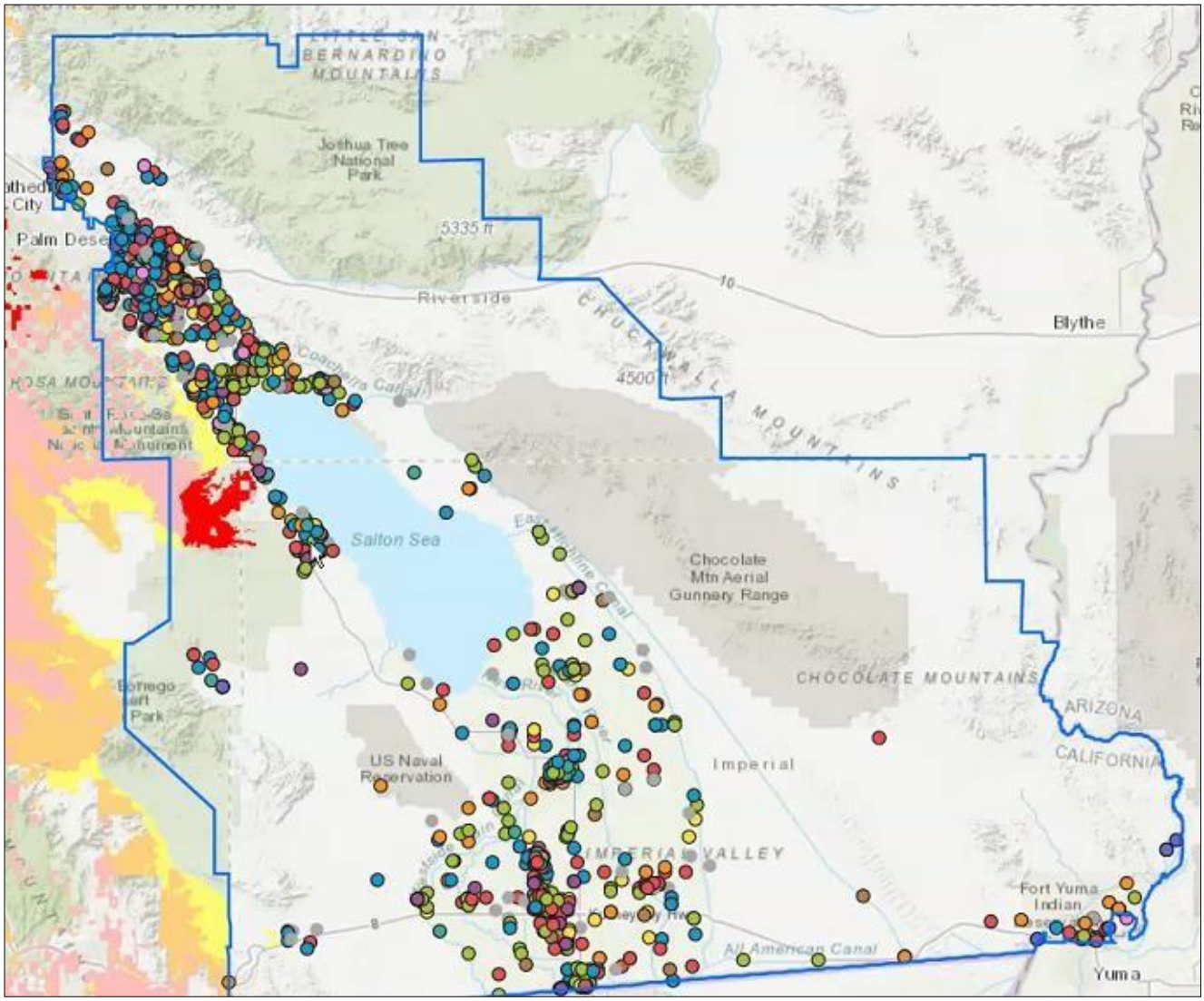
Detail Information

Strategy

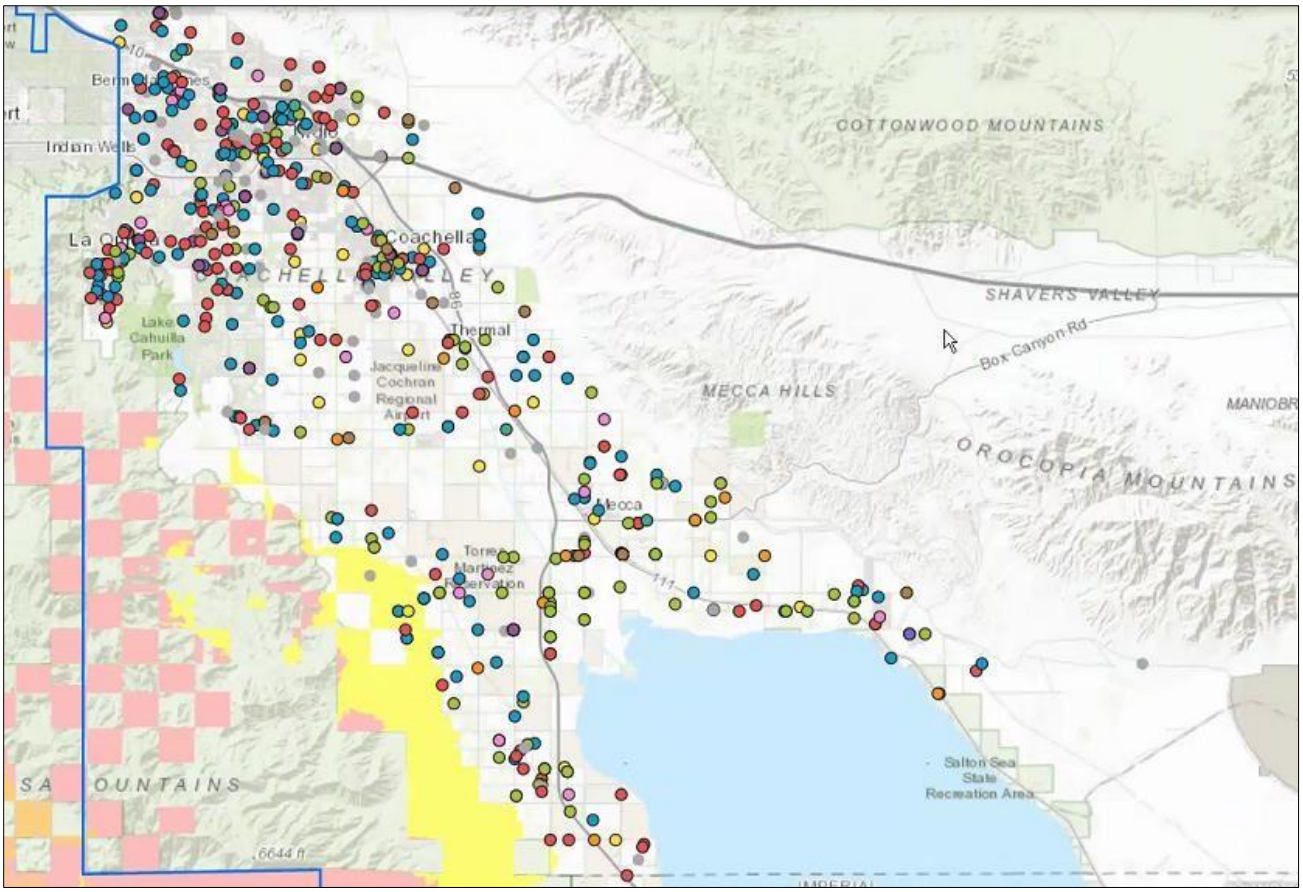
1. To identify potential territory sites for overhead infrastructure observation, the team filtered and prioritized high-volume outage clusters on the GIS territory map, assessing outage trending data from 2017-2019 (number of outages, customers impacted, number of sustained outages), as well as outage causes and descriptions that referred to equipment failure, e.g. transformer, connector, guy wire, and so forth.

   Graphics 1-3 below represent the entire territory, then northern and southern IID sections with colored dots indicating outages of specific types, e.g. equipment issues, animal-caused, and so forth. Note the red and yellow CAL FIRE designated risk areas within and near IID territory (Red = High, Yellow = Moderate)

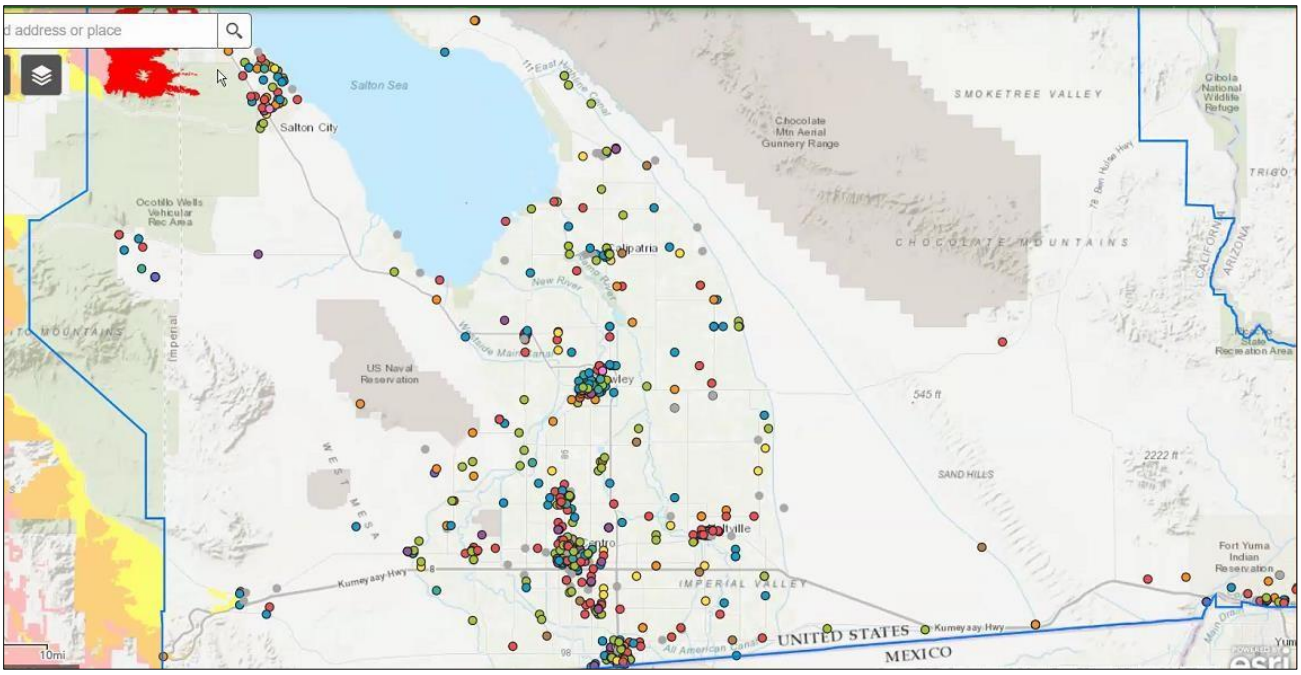
Graphic 1 – Entire Territory, 2019 outage data



Graphic 2 – Northern Section, 2019 outage data



Graphic 3 – Southern Section, 2019 outage data



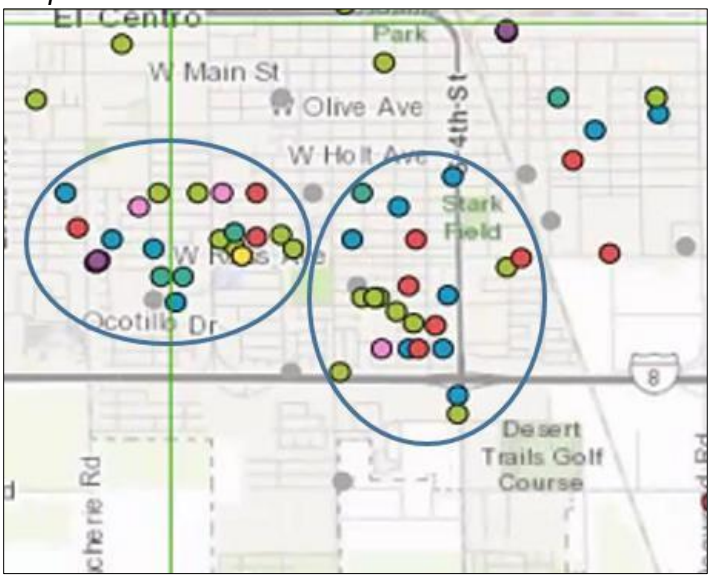
Note that 2020 outage information was not available at the time the survey was conducted.

2. The survey team ultimately chose 15 township squares (25x25mile sections) for overhead infrastructure sample observations, selected primarily for locations within the townships that had experienced frequent, clustered outages between 2017-2019 that were not necessarily trending down over time. The survey team decided to pay special attention while observing areas close to CAL FIRE risk designations, as well as note any vegetation issues encountered. The locations were:

Township(s)	**Outage Cluster Location(s)**
T16SR9E	Ocotillo
T16SR14E	El Centro
T17SR14E & T17SR15E	Calexico
T15SR15E	Holtville
T16SR22E	Winterhaven
T13SR14E	Brawley
T10SR10E	Salton City
T8SR9E	County Line East & County Line West
T8SR8E	Torrez
T7SR9E	Mecca
T6SR7E-NW & T6SR6E-NE	La Quinta
T6SR8E and T5SR7E	Coachella & Indio

3. The team further identified specific areas to inspect within the chosen locations. Graphic 4 below is a sample of two targeted areas in El Centro.

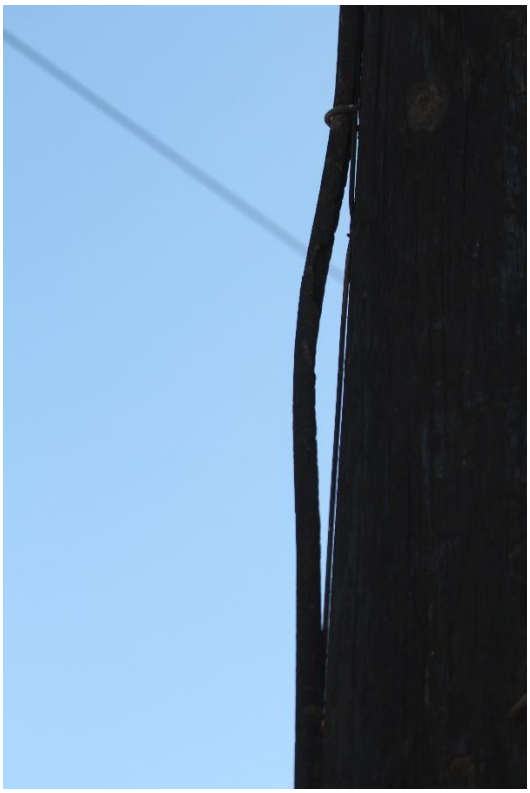
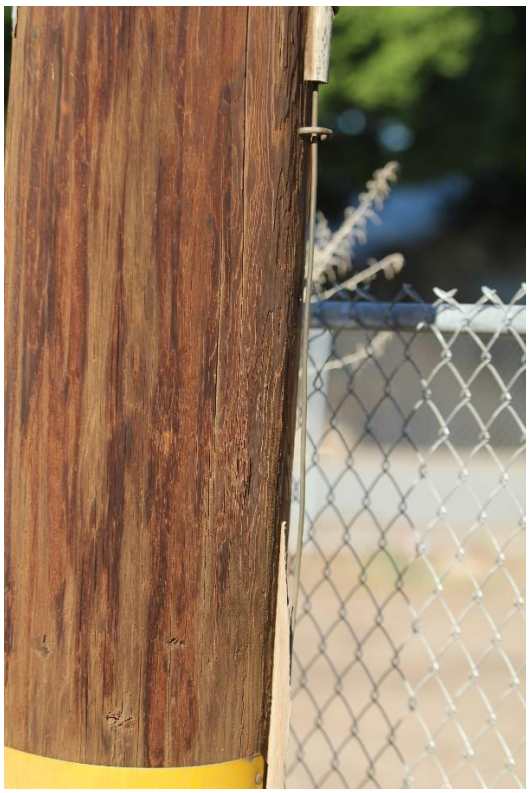
Graphic 4



4. During the survey, the team scrutinized approximately 150 poles and noted obvious and potential issues listed by pole numbers (field notes and photos can be found in Appendix A). The more common issues are listed with sample pictures in Table 1 below.

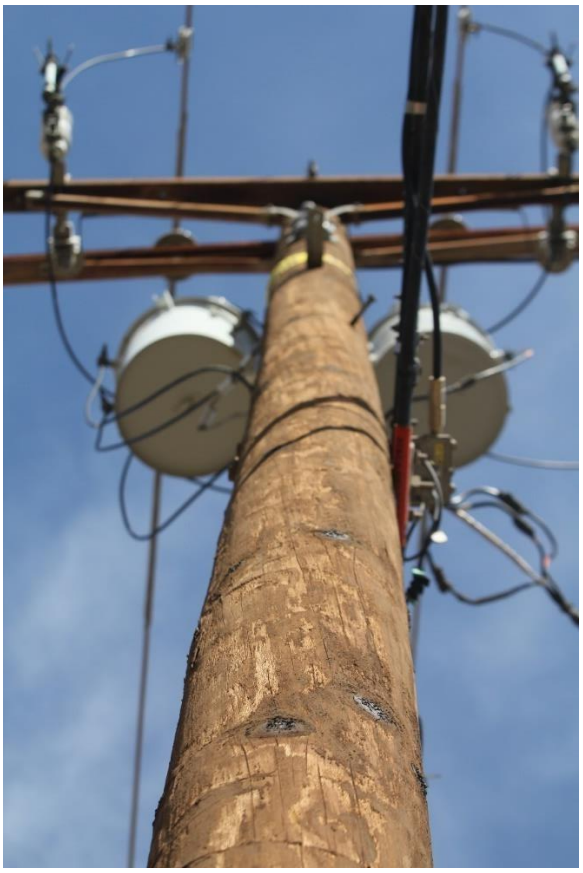
Table 1

Observation / Issue	**Sample Photo(s)**
1. Tracking on crossarms & poles	 

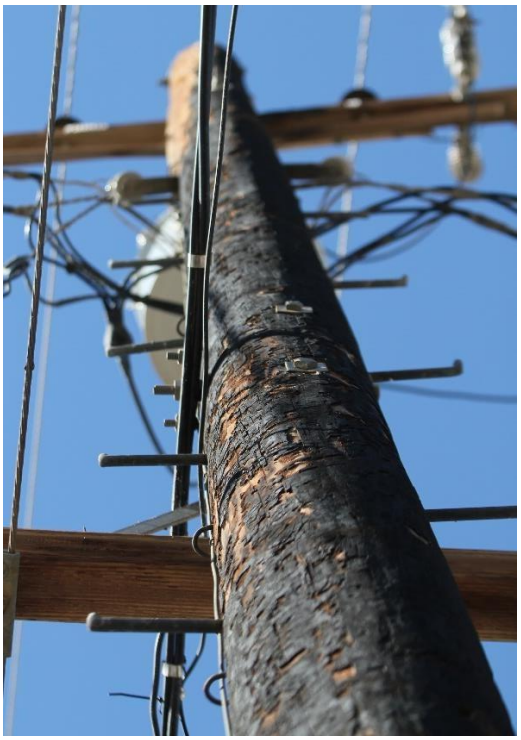
Observation / Issue	Sample Photo(s)
2. Missing load break cutouts	
3. Missing / damaged ground molding	 

Observation / Issue	Sample Photo(s)
4. Vegetation encroachment	 
5. Missing / damaged high voltage signs	

Observation / Issue	Sample Photo(s)
6. Bird contamination	
7. Missing bolt covers	

Observation / Issue	Sample Photo(s)
8. Missing pole steps	

9. Split poles	

Observation / Issue	Sample Photo(s)
10. Burned poles	 
11. Missing nuts and bolts	

Observation / Issue	Sample Photo(s)
12. Standards inconsistencies, e.g. wire clamping, use of surge arrestors	 

5. The team then made an initial list of location-specific observation trends and possible improvement recommendations, then discussed them with IID Troubleshooters and Inspectors for clarification and validation (again, field notes and pole-specific photos for each location can be found in Appendix A). After those discussions the team documented their location-specific recommendations into Table 2:

Table 2

Location	Observations and Possible Improvement Recommendations
Ocotillo	▪ For tracking, isolate neutral from the crossarm ▪ Add load break cutouts on poles with transformers ▪ Add pole steps as needed for frequently climbed poles ▪ Repair ground molding as needed ▪ Install split bolts as needed ▪ Install pole grounds as needed ▪ Clear veg as needed
El Centro	▪ Add load break cutouts on poles with transformers ▪ Add pole steps as needed for frequently climbed poles ▪ Install split bolts as needed ▪ Square up washers as needed ▪ Adjust crossarms to be parallel as needed
Calexico	▪ Clear veg as needed ▪ Add load break cutouts on poles with transformers ▪ Remove exposed meter base as needed (pole not owned by IID) ▪ Request phone company to take out old poles
Holtville	▪ (none observed)
Winterhaven	▪ For tracking, isolate neutral from the crossarm ▪ Add load break cutouts on poles with transformers ▪ Repair ground molding as needed ▪ Install pole grounds as needed ▪ Clear veg as needed ▪ Install / repair high voltage signs as needed ▪ Install braided wire on arresters as needed ▪ Install avian protection as needed ▪ Install bolt covers as needed ▪ Install pole steps as needed ▪ Install visibility strips as needed ▪ Use bolts instead of lags as needed
Brawley	▪ For tracking, isolate neutral from the crossarm ▪ Repair ground molding as needed ▪ Repair/replace high voltage signs as needed ▪ Install bolt covers as needed ▪ Replace burned poles as needed

Location	Observations and Possible Improvement Recommendations
Salton City	▪ Install bolt covers as needed ▪ Install load break cutouts as needed ▪ Install pole steps as needed ▪ Clear veg as needed
County Line East	▪ For tracking, isolate neutral from the crossarm ▪ Install nuts/bolts as needed ▪ Install grounds as needed ▪ Resolve bent pole issue ▪ Fix rotated pole ▪ Should always add stirrups or line guards to hot side of disconnect; in this case they used an extra wire to protect the conductor ▪ Add pole steps as needed ▪ Resolve arrester ground
County Line West	▪ For tracking, isolate neutral from the crossarm ▪ Resolve system neutral ground issues ▪ Add pole steps as needed ▪ Note no ground potential on primary arm – provide solution ▪ Add avian protection as needed ▪ Install/repair voltage signs as needed ▪ Clear veg as needed ▪ Install split bolts as needed
Torrez	▪ Install load break cutouts as needed ▪ Install pole steps as needed ▪ Repair/replace voltage signs as needed ▪ Straighten crossarm ▪ Remove dead meter socket (pole not owned by IID) ▪ For tracking, isolate neutral from the crossarm ▪ Clear veg as needed ▪ Research smaller wire connection sizes
Mecca	▪ For tracking, isolate neutral from the crossarm ▪ Install hard caps as needed
La Quinta	▪ Clear veg as needed ▪ Note general absence of lightning arrestors in area ▪ Good to use conduit for ground molding and insulated wire for neutral grounding ▪ Note variances in construction standards ▪ Install hard caps as needed ▪ For tracking, isolate neutral from the crossarm ▪ Repair molding as needed ▪ Repair/replace voltage signs as needed ▪ Add pole steps as needed ▪ Repair loose connectors as needed

Location	Observations and Possible Improvement Recommendations
Coachella	▪ Add avian protection ▪ Repair broken insulators – general recommendation: replace all insulators in the area, total upgrade ▪ Repair/replace high voltage signs as needed ▪ Resolve lightning arrestor installation inconsistencies
Indio	▪ Add avian protection ▪ Upgrade old infrastructure ▪ Install bolt covers as needed ▪ Possible option: upgrade copper wire to aluminum (can sell copper) ▪ For tracking, isolate neutral from the crossarm ▪ Resolve standards inconsistencies, e.g. surge arrestors

6. The team then developed an overall summary of observations and a critical strategy recommendation for IID to consider:

Summary of Observations

- IID's overhead distribution system shows considerable aging and degradation in many areas, likely contributing to the outage clusters that were surveyed. According to Inspectors and Troubleshooters, these issues have been previously reported for these areas but not resolved due to resource constraints. Key findings include:
  - Old 4-kV (box) cutouts and insulators in areas where the voltage has been increased.
  - Observations of tracking on poles where a bare common neutral was stapled to the underside of the cross-arm and attached to surge arresters.
  - Poles split in various locations, typically due to a series of bolts drilled in the same direction.
  - Lack of line guard where electrical connections are being made, e.g. high side jumpers from the cutouts to the line.
  - Extensive bird contamination.
  - Gang-Operated-Air-Brake switches, with the operating handle located at ground level - doesn't appear to have the switch handle grounded.
  - Inconsistent use of surge arresters.
  - Lack of hard caps on transformer hanger bolts, missing pole steps, high voltage signs damaged or missing, ground molding damage and other easily fixed issues.

- Of the approximately 50 poles that were found with issues during the survey, IID staff reviewed 31 SAP pole equipment records:
  - 6 poles had no sap equipment record - these are possible illegible pole tags or records are not in the SAP database.
  - 24 pole equipment records had no notification or order records for the period 2/12/2000-2/11/2021.
  - 21 pole functional location records had no notification or order records for the period 2/12/20002/11/2021.
  - 3 pole functional location records contained notification and order records for repairs for the period 2/12/2000-2/11/2021.
  - 8 pole tags do not match the SAP equipment technical identification number - found added hyphens, letters in the sap records.

Based on the SAP database inquiry, the IID staff has the following related recommendations:

- The SAP technical identification number and the pole tag number should be identical – found differences which made it difficult to find some equipment records.
- Add the geolocation of the equipment location to the equipment record.
- Fully maintain equipment record information fields - much of the information is missing, e.g. installation date, city location, circuit, pole class.
- Add fields in SAP to track reinforced poles; date of reinforcement, type of reinforcement used, reinforcement manufacturer, pole class achieved with reinforcement.
- Replace illegible pole tags in the field.
- Note IID staff are working to resolve technical issues with the transfer of inspection information from GIS to SAP.

Critical Strategy Recommendation

- IID needs to review and update its existing GO 165 inspection and maintenance plan, and ensure that the plan is up to date and meets with the CPUC standard.
- Once the plan has been reviewed and revised, IID line construction leadership should dedicate full-time resources to resolve critical inspection and maintenance issues, including inspectors and crew(s) to implement a "find it and fix it" strategy.
- The strategy should also include and execute a cyclical, time-based inspection and maintenance plan that includes location-specific "state of the infrastructure" assessments based on a scale rating for, i.e. 1-5. The scale will identify hazardous conditions and severity, such that IID can develop a fixed time frame for repairs or replacements, including the resolution of dangerous vegetation issues

The following general and equipment-specific actions are also recommended:

1) IID needs to communicate with CAL FIRE to adjust certain designation areas. Some areas denoted by CAL FIRE as moderate or high fire risk need to be downgraded to little or no fire risk – There's very little fuel in these mountain areas west of County Line and La Quinta.
2) The use of drones would be a valuable improvement to the inspection process. A drone can provide greater details of the conditions at an elevated level, such as contamination due to birds, tracking, cross-arms and poles split out, tracking on high voltage equipment and devices, overall condition of the conductors, and so forth. Drone-mounted thermal cameras can identify "hot spots," detecting problems before they get more serious. IID needs to have a mechanism to report issues and non-conformance infractions to pole owners (GO95 requirement).
3) Telephone and cable companies need to remove all abandoned meters and electrical equipment from their poles. The two abandoned meter sockets found were on either telephone or cable company poles.
4) IID should continually upgrade their system with the latest AMI and Distribution Smart Grid infrastructure to obtain better information about their grid, understand outage details, remotely access more controls and dispatch resources with better information.
5) Poles that have expulsion fuses (cut-outs) and surge arresters should have the area around the base of the pole cleared of vegetation and sterilized so that that it will not catch fire when the pole equipment operates as designed. A diameter of approximately 10' is recommended.
6) Regarding the need to designate the common neutral throughout the service territory – GO 95 states:
   - "Designation of Common Neutral In common neutral systems, where the common neutral line conductor is installed in a primary pin position - it shall be designated at each pin position with the letters "CN". A weather and corrosion–resisting material shall be used and the letters shall be clearly legible."
7) Regarding grounding of the neutral - it appeared that there were areas where there was no grounding of the neutral.
   - Per GO 95 B. - Neutral Conductors: "(1) Locations: The common neutral grid system shall be grounded at intervals not greater than 1,000 feet. On branch circuits extending from a grid, where return loop

paths are not available, the common neutral conductor shall be grounded at intervals not greater than 500 feet.
    - For each transformer installed on a branch circuit without a loop return, the transformer shall be so located that there will be one or more grounds, of a combined resistance not greater than 3.5 ohms."
8) Regarding surge arresters: They should have a copper braided ground in order to allow the expulsion to blow out the bottom side of the arrester. Currently, the arrester is attached with a #4 or #6 solid ground that won't allow the arrester to operate properly.
9) Regarding Gang-Operated-Air-Brake switches, with the operating handle located at ground level (doesn't appear to have the switch handle grounded): Best practice would be to have the handle grounded to a tread plate that the operator stands on to operate the switch. This would place the worker in an equipotential zone and protect them from a high voltage flashover that would migrate down the handle to ground.
10) Regarding pole steps: These should be added where required. The position of the steps should be in line with the conductors. This is especially true in alleys where trucks can make contact with them while driving.
11) Regarding bird contamination and the IID Avian Protection program: Install appropriate devices to deter birds from landing on poles. There were numerous areas of avian contamination and bird nests in high voltage equipment.
12) Record the third party infraction notice on the IID system of record.
13) Remove all power equipment from abandoned poles.
14) Remove all IID ownership labels, pole number labels from abandoned poles.
15) Record when a pole is abandoned on the IID system of record.
16) The City of El Centro needs to keep alleys with power lines clear of trash and debris.
17) Regarding vacant property vegetation near power lines in the Mecca area: IID needs to report these issues to CAL FIRE. IID Vegetation Management will address vegetation located in the power line corridor.
18) Regarding the Imperial County Salton City area: IID needs to report vacant lot vegetation near power lines to Imperial County Fire Department. IID Vegetation Management will address vegetation located in the power line corridor.
19) Notices to Imperial County Fire, CAL Fire, or other agencies should be recorded on the IID system of record.

To see all rough field notes and photographs taken during the survey, see the following "2021 IID Service Territory Field Survey – Appendix A."

Appendix A

Rough field notes and pictures – numbers represent pole numbers when they were visible

<u>Ocotillo</u>

General: Recommend load break cutouts on poles with capacitors and tap lines.

- (No pole number - by Palo Verde St. across from 21649) needs ground molding fix, need pole steps

Note: frequently climbed poles require pole steps

- 21131 possible tracking on cutout arm? Or just stains? Install load break cutouts, unless IID utilizes a loadbreak tool for this type of operation.

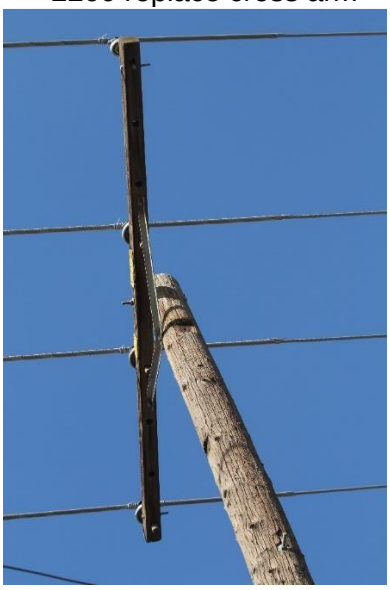
- (No pole number - across from 21130D) needs split bolt. Bolts in poles drilled in close proximity on one side have a tendency to split the pole, - recommend drilling a hole at 90^0 and inserting a bolt with curved washers on both side to prevent further splitting.

- 21129 need pole ground? missing nuts washers on top arm, also clear veg below cutout

El Centro

- 1202311 needs pole steps (common need on all poles in area with transformers and cutouts)

- 2260 replace cross arm

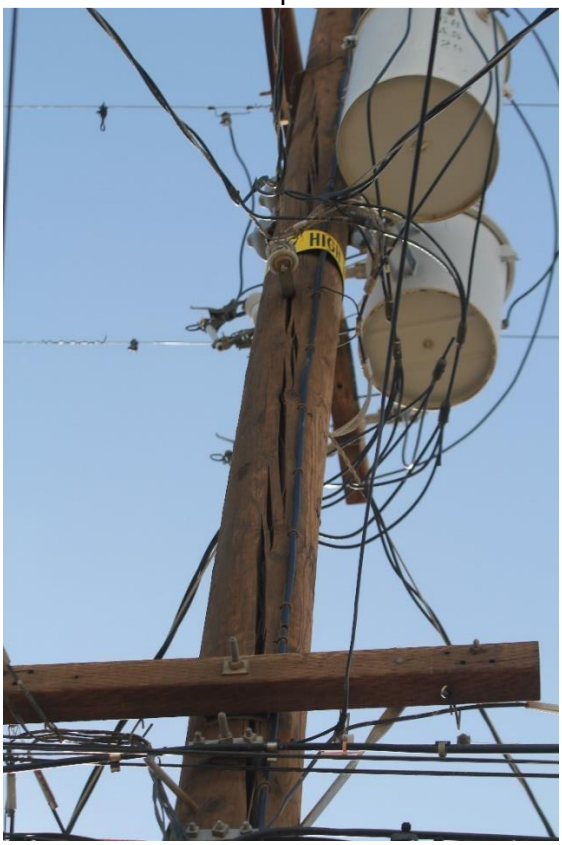


- 1217942 (and in general) - keep washers square to the arm, keep arms parallel -recommend hot line clamps for making jumpers from the primary bushings to the Common Neutral to enable clearing the transformers with a live-line tool/shotgun.

- 2276d - need split bolt at top; lot of strain on dead end pole, 6 guys, some bowing, inspect soon

General: add common neutral tags

- 1219098 - need split bolt



Next, went west of imperial, near desert gardens / cottonwood intersection, poles good in newer neighborhood. Then, went back east of imperial, area of West Wind and 6th.

- 22416d need load break cutouts -recommend documenting corner configuration in GIS in the event that the pole has to be changed out.

Calexico

- 1240003 Add load break cutouts: phone co. should take out old pole

Note: other poles in the area look good

- (No pole number, across from 41284d) - needs ground cover low on the pole

- Heffernan and 5th - wire in trees, may want to consider installing tree wire in these types of conditions.

- 1167208 add load break cutouts

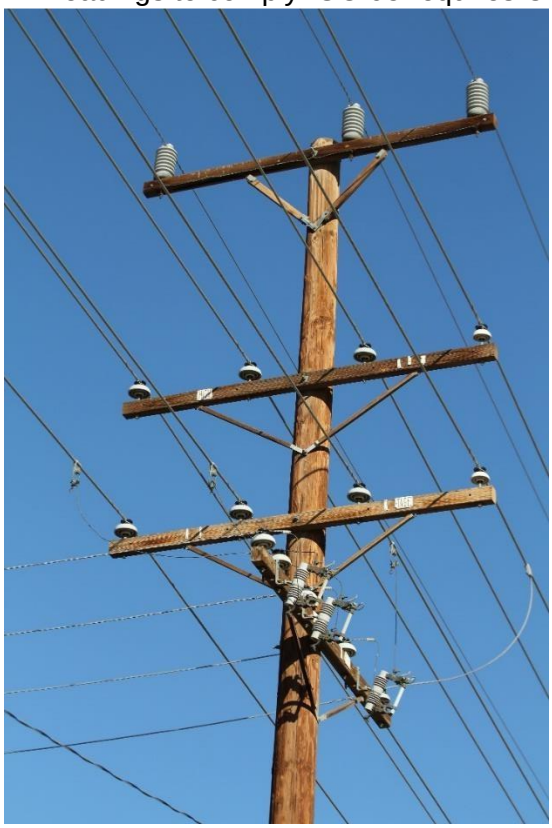
- 41300d old pole, exposed meter base, next to new pole of same number (pole not owned by IID)

Holtville

- No issues seen

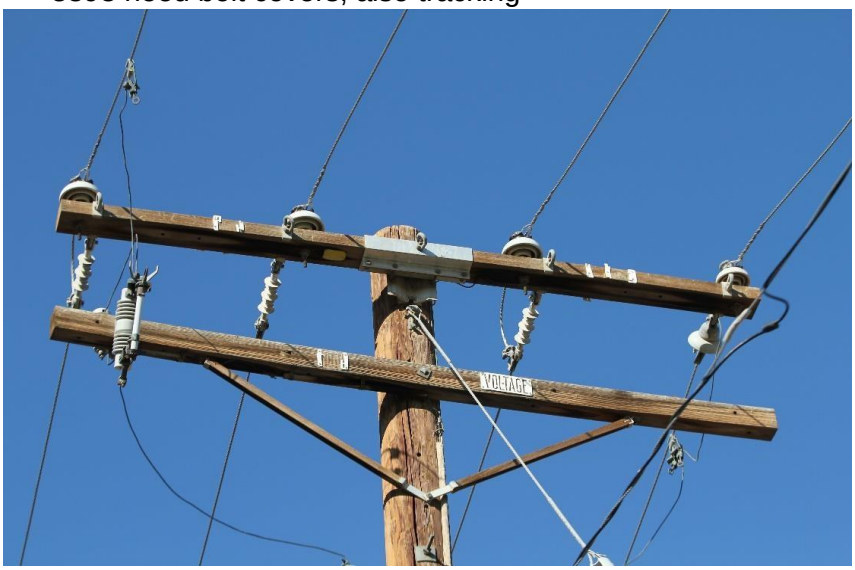
Winterhaven

- T1540d add loadbreak cutouts, also tracking on top arm; need high voltage signs; need to ensure that common neutrals are meeting GO 95 regulations for grounding on main lines and tap lines along with ohm readings to comply. GO 95 requires CN signage on the arms where the common neutral is positioned.

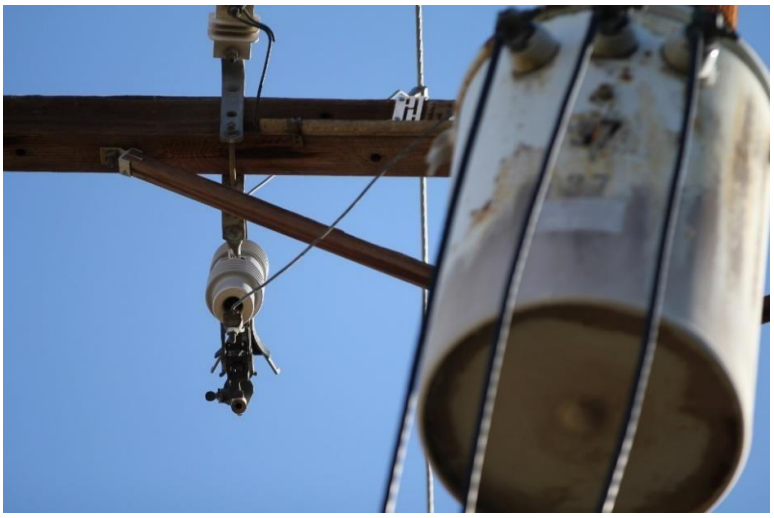


Question: Is all of system neutral effectively grounded for GO 95?

- 8393 need bolt covers; also tracking



- 8394 tracking, high voltage signs, ground molding; other pics show need for surge arrester wire improvement (use braided wire); can use bracket instead of extra cross arm. Recommend using brackets that are fabricated to hold cutouts and arresters.



General: Need avian protection

General: Frequent absence of bolt covers

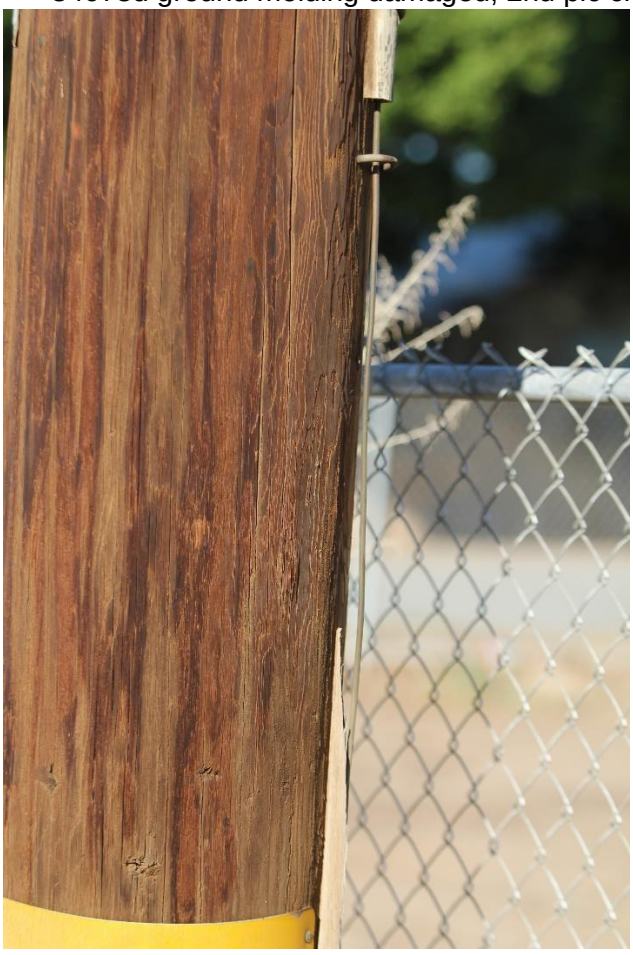
General: Add yellow high voltage signs where needed

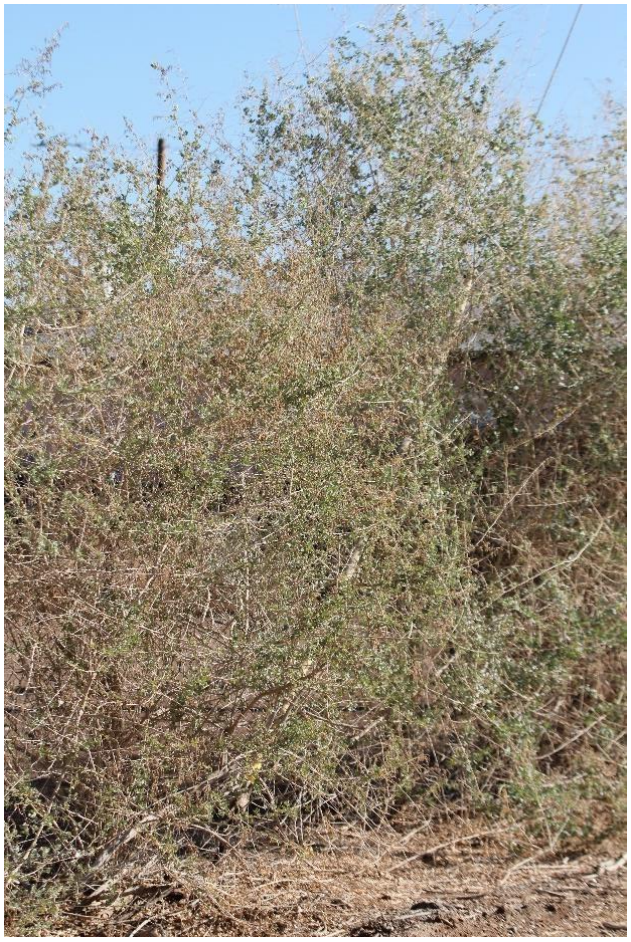
Question: When was last time ground resistance levels were measured on system neutrals?

General: Tracking on most poles

Eliminate or reduce tracking in future by using covered ground wire in pvc conduit under the arm

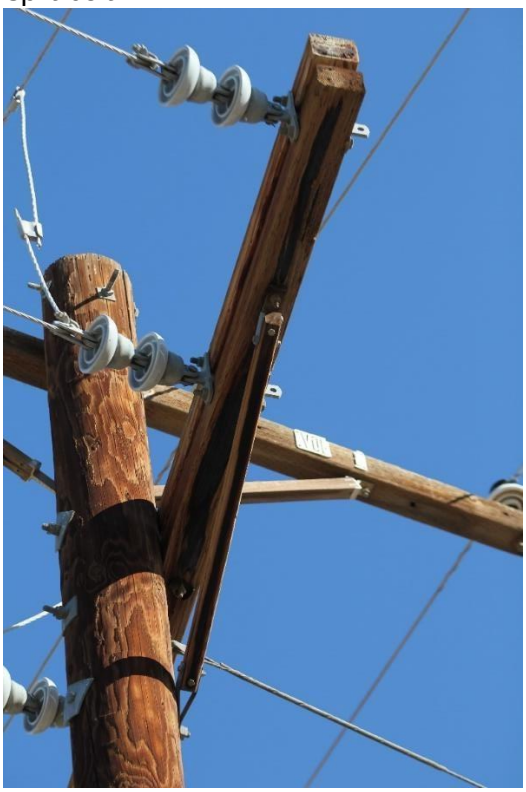
- 84673d ground molding damaged; 2nd pic clear brush from guy wire



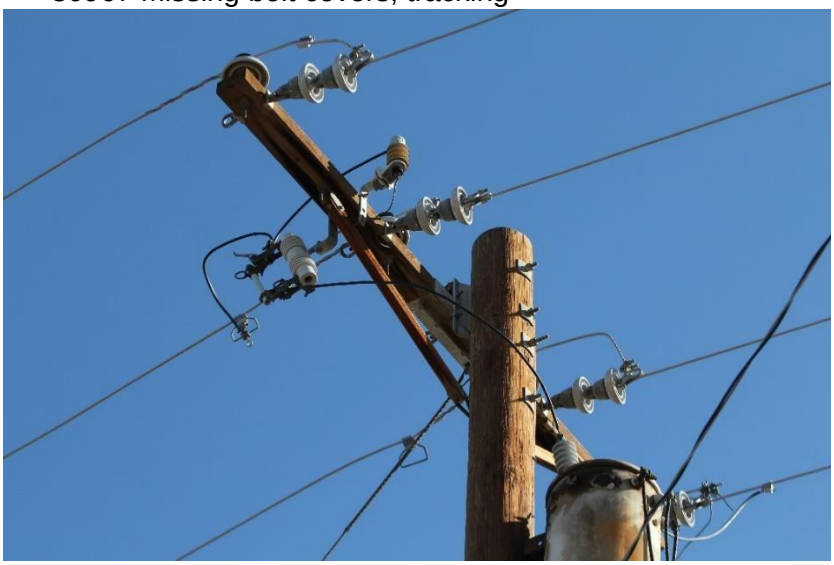


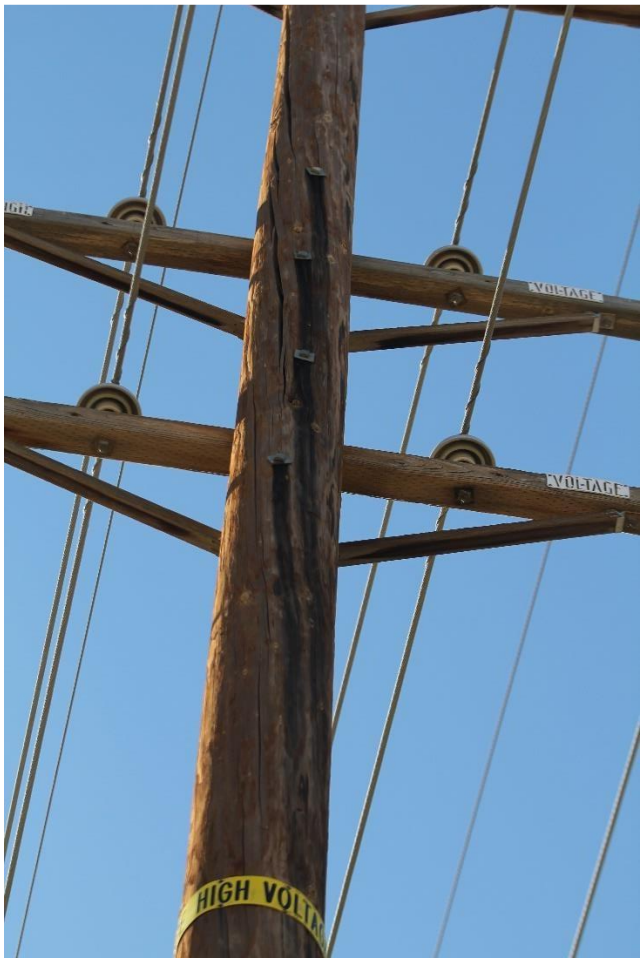
- 60963 tracking

- 8815 bird contamination contributes to tracking; 2nd pic: tracking, no pole steps; multiple bolts in a linear direction at top of pole could lead to splitting in the future, install split bolt.



- 80967 Missing bolt covers, tracking





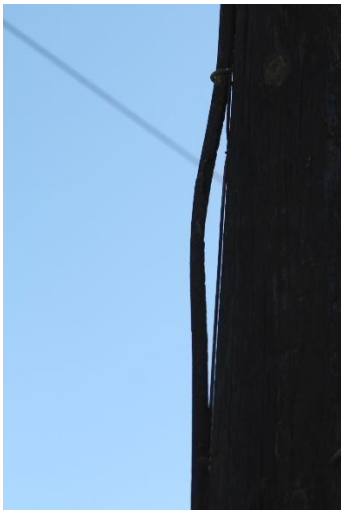
Note: Missing visibility strips on sub transmission in this area; also should have been bolts instead of lags

Brawley

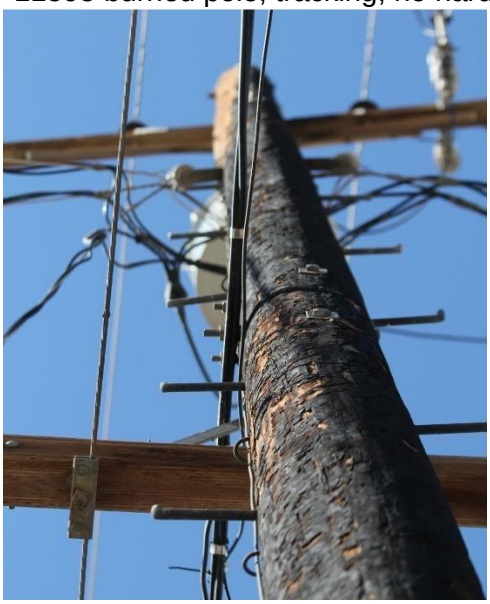
- B724 tracking, voltage signs

- 11503 tracking voltage signs

- 10477 tracking, damaged signs, molding issue



- 11595 burned pole, tracking, no hard caps on transformer, damaged signs, ground molding



- 1?359- (# plate melted), burned pole, signs, molding

Moved to area 2 by library / park

- 11333d tracking by molding, signs

Note: Went and looked at area in Brawley NE with no outages... all UG

Salton City

- 906878d no bolt covers

- 98391d no pole steps; second pic is of pole to north - can't access pole number due to vacant lot vegetation at base

General:

Note: less tracking here than other areas

County line east

- 912061 tracking, missing nut/bolt, no ground, no CN signage.

- 98792 leaning pole in line with conductors but also leaning sideways, uneven strain and sagging,

Note when there's no common neutral, we see more tracking...Possibly, if we isolate the neutral from the arm, there will be less or no tracking

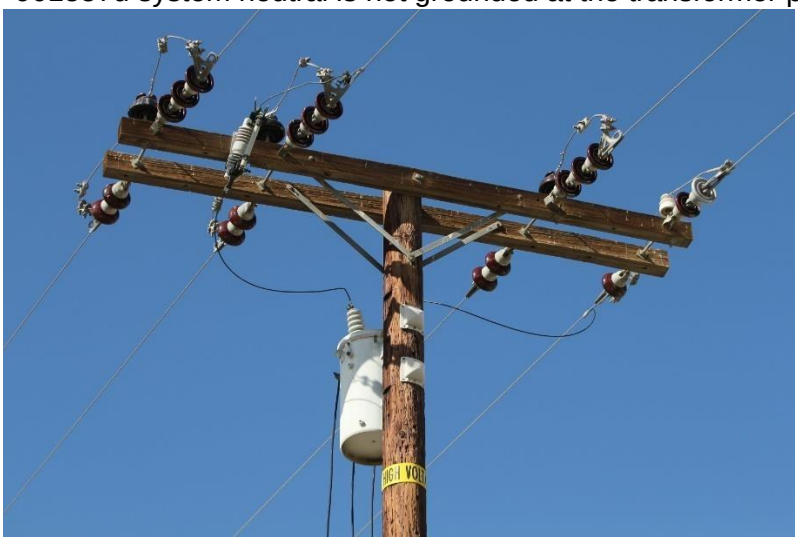
- 912062d pole top rotating, probable cause is the wood has dried out over the years and pole top has moved; also 2nd pic: Should always add stirrups or line guards to hot side of disconnect; in this case they used an extra wire to protect the conductor—- again, very little tracking in this region

- 9895 no pole steps, arrestor ground, tracking with common neutral

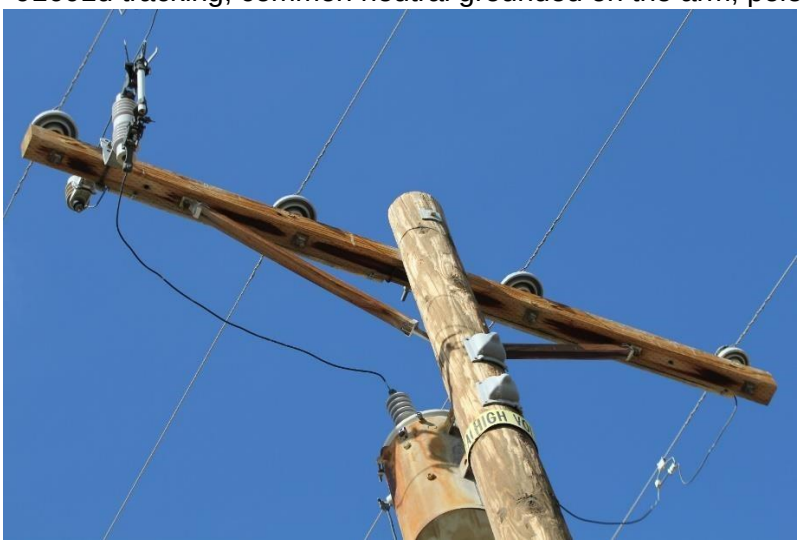
General - date nail corresponds to the pole brand, second date nail corresponds to length of pole (assumption)

County line west

- 901557d system neutral is not grounded at the transformer pole; neutral, no pole steps



- 91601d tracking, common neutral grounded on the arm, pole steps



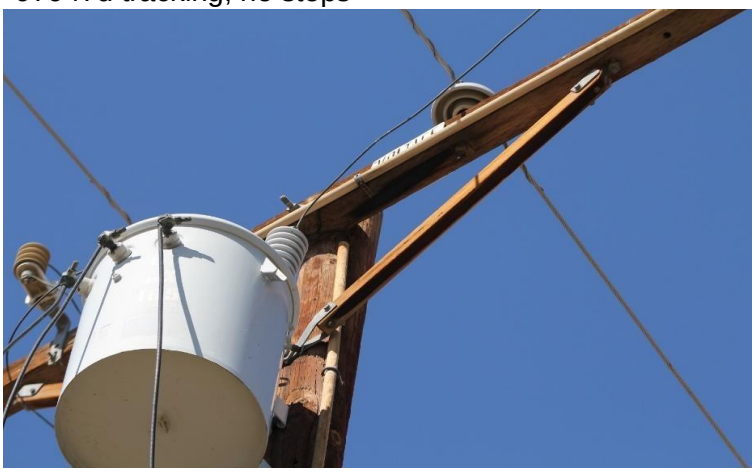
- 916232 private ranch - tracking; next pole 10 feet away

- 901796 No ground on primary arm, no tracking, bird contamination, no signs, no steps, need to clear veg

- 901795d clear veg

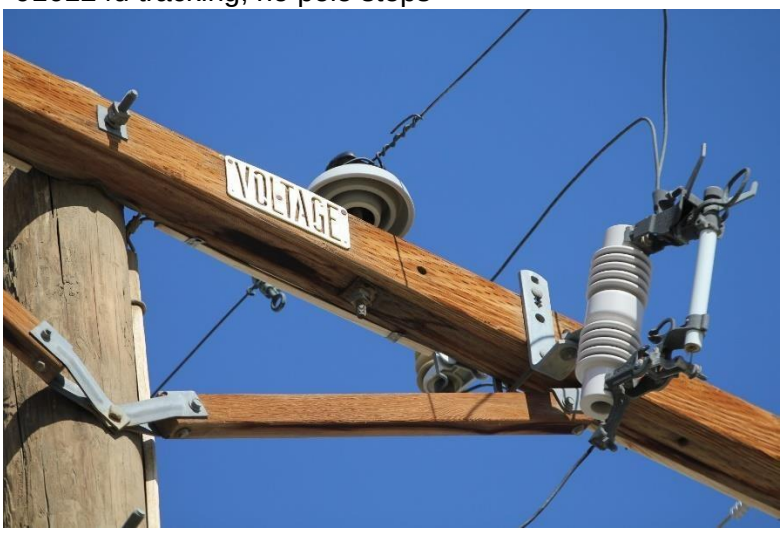
Moved NW, several pics of rocky mountains – CAL FIRE says hi fire danger but no fuel on them

- 97947d tracking, no steps



- 915803d Feeds ag. pump; Tracking, needs split bolt up top. Pole 10 ft away has no number, needs signs; steps for both poles

- 916124d tracking, no pole steps



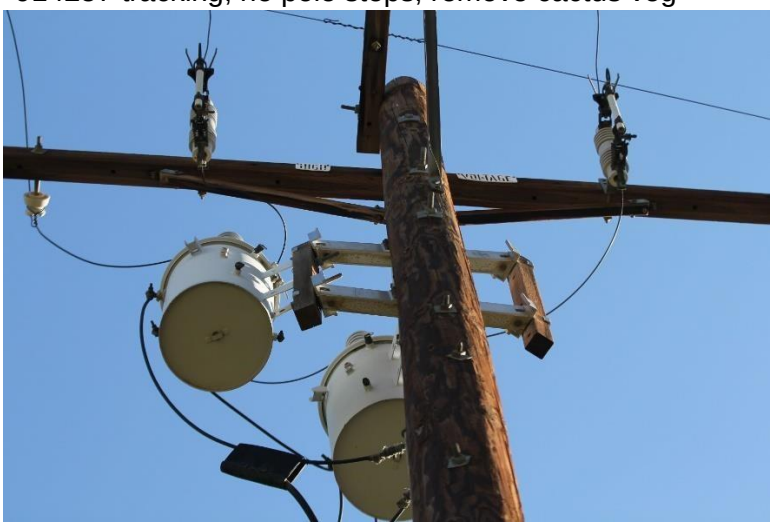
Torrez

- 1093401d add load break cutouts, steps, relocate signs (High voltage signs should be placed on the outside of the arms),

- 907173 need pole steps, high volt signs

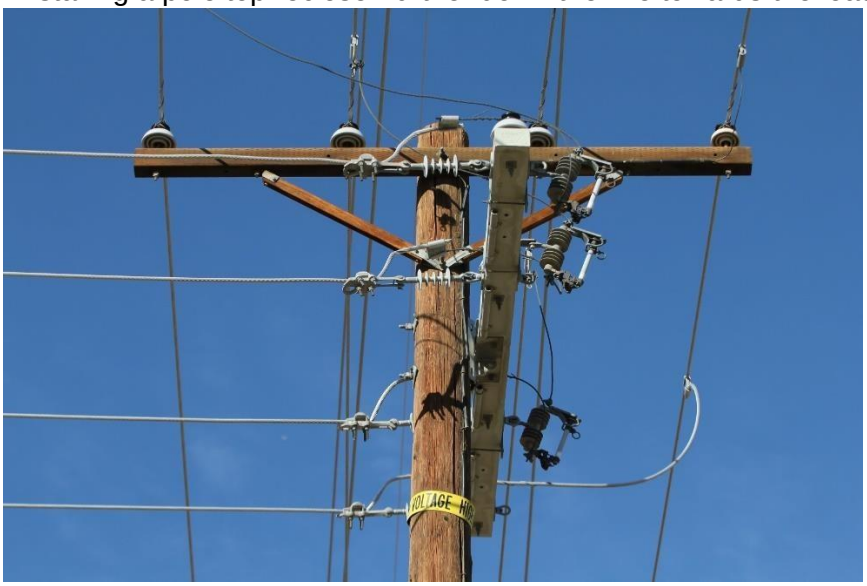
- (No number) – exposed meter base (pole not owned by IID)

- 914257 tracking, no pole steps, remove cactus veg

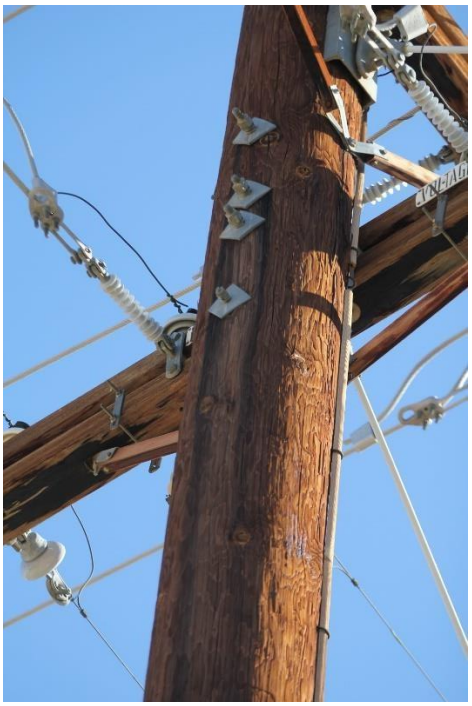


- T17899 veg intrusion – trees planted under lines


- 1219901 Doesn't make sense to install fused C/O's (Cutouts) in what appears to be a feeder circuit with a change of direction. We did not follow the entire circuit out. However, consider making the corner solid and installing a pole top recloser further down the line towards the load.



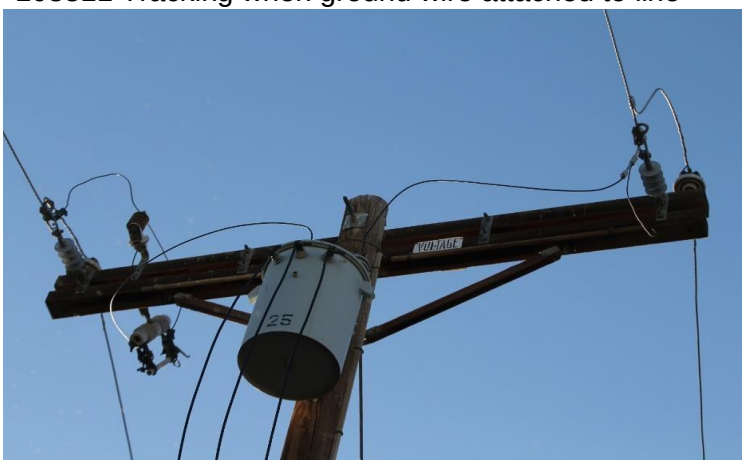
- T17914 tracking, need load break cutouts, tracking



- 1094115 veg intrusion

Mecca

- 108311 Tracking when ground wire attached to line



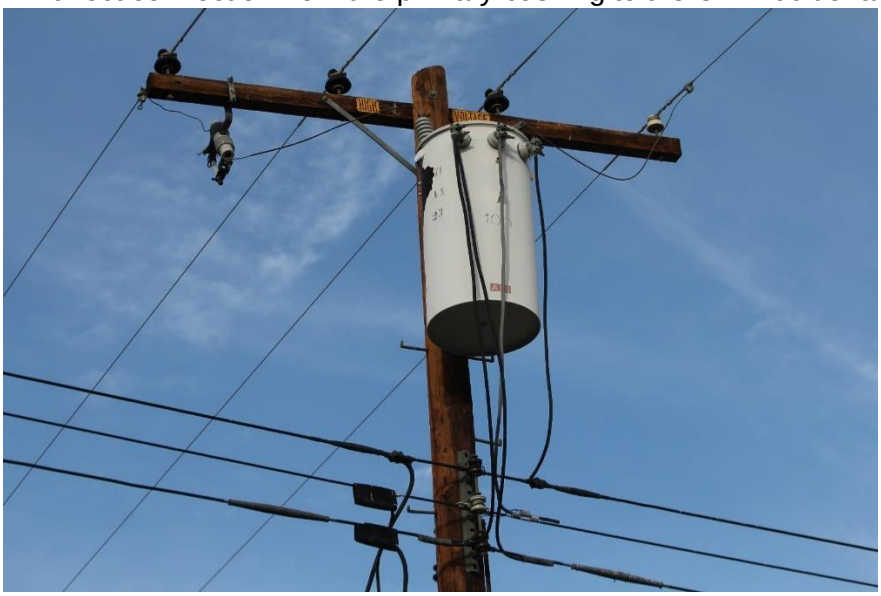
- Pole next to 96774 (can't get to number) ground on cross arm tracking

- 98718 no hard caps

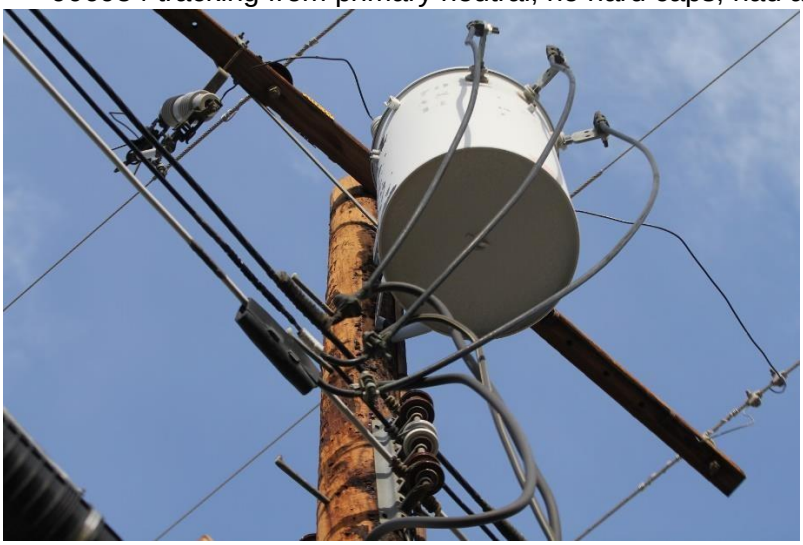
La Quinta

- 906952 veg intrusion, no lightning arrestor, no hard caps, no tracking on arm – the neutral wire is covered/insulated and is run through a PVC conduit

- 906953 Inconsistent construction standards – sometimes the neutral runs under the arm, other times it is a direct connection from the primary bushing to the CN. Additionally needs CN tag on the crossarm.

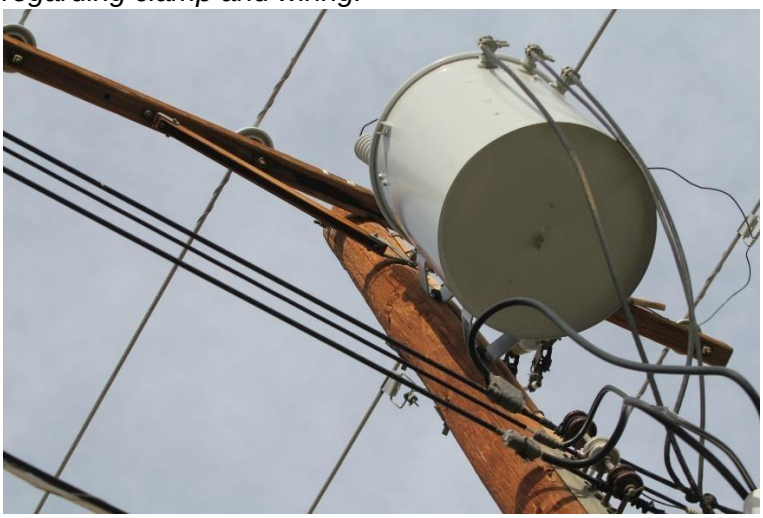


- 906954 tracking from primary neutral, no hard caps, had a wire down previously; no arrestors in area



- 1064243 tracking, sign damaged, molding on cross arm damaged, needs pole steps, has arrestor.

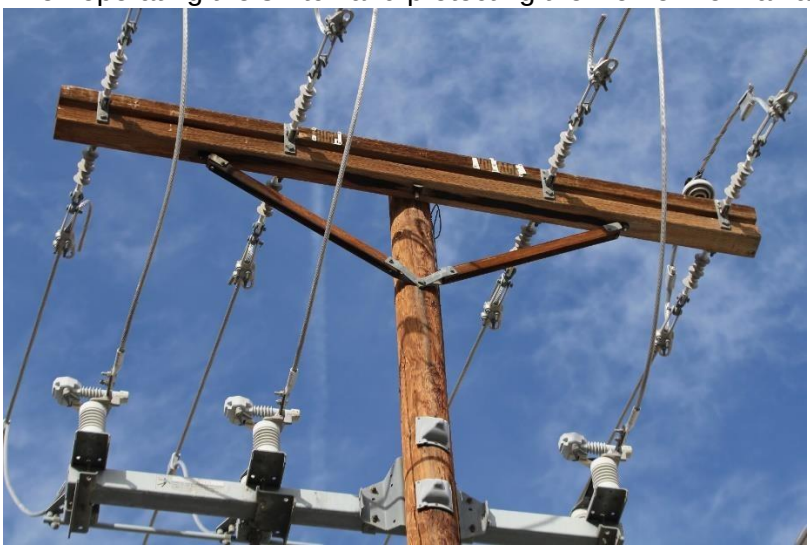
Additional note: La Quinta-subdivision has a primary feed, each easement has 75-100 Kva transformer feeding main line supply secondary and all services are fed underground with risers. Also see pic after this shot regarding clamp and wiring.



- 1064244 tracking, has arrestor, no pole steps

- 1062300 tracking, loose connector

This is a Gang Operated Air Brake Switch – the switch handle is located at the ground level. Recommend installing a grounded tread plate bonded to the handle. This will place the operator in an equipotential zone when operating the switch and protecting the worker from a flash energizing the handle.



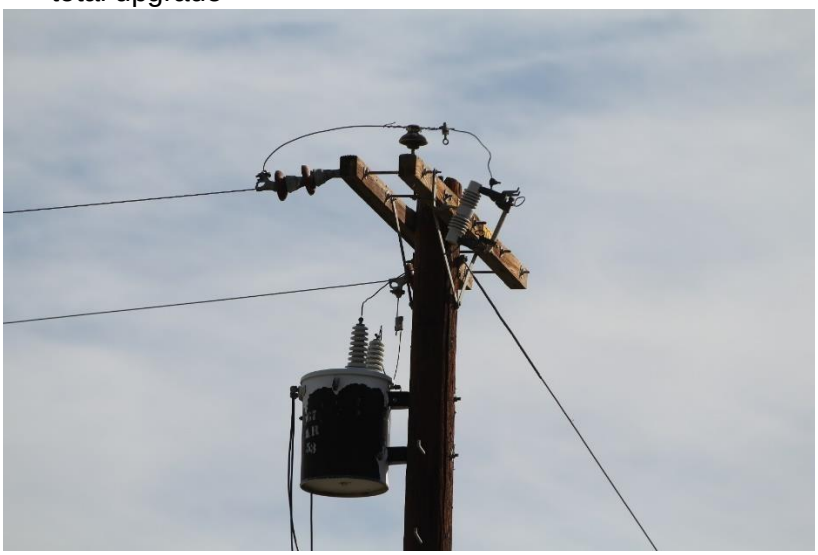
Coachella / Indio

Intersection Ave 52 and cypress, backyard poles (sample pictures below)

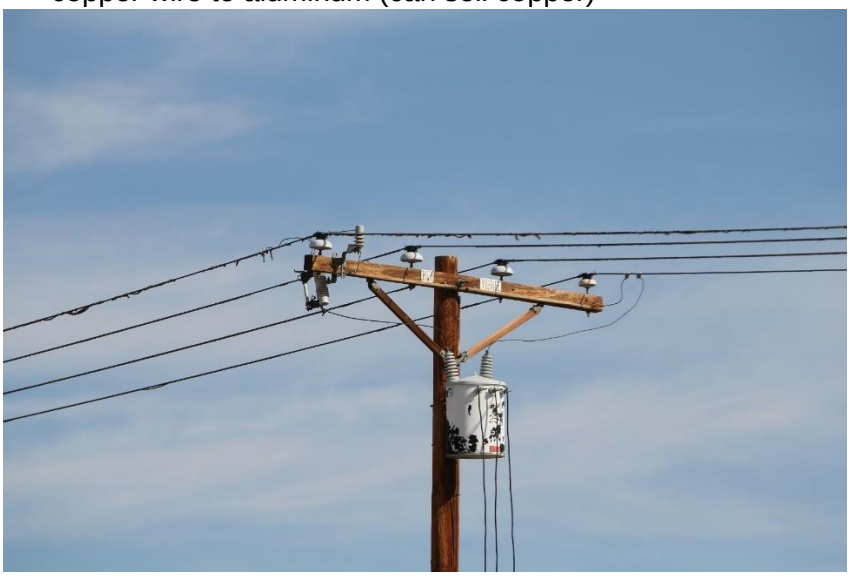
- Extensive bird contamination (likely tracking), broken glass insulators (recommend replace all insulators in the area)
- Transformer bank in pic 1 – should upgrade transformer bank, hardware, insulators and cutouts - wrong type of cutouts (these are old box type C/O's from when this was a 2400/4160 system); old construction not upgraded to higher voltage
- Fix High voltage signs
- No arrestors, inconsistency
- Last pic, broken insulator far side

A couple blocks away, neighborhood including 52462 Las Palmas address

- Bird contamination, upgrade insulators, signs, cutouts not rated for voltage, no hard caps... recommend total upgrade

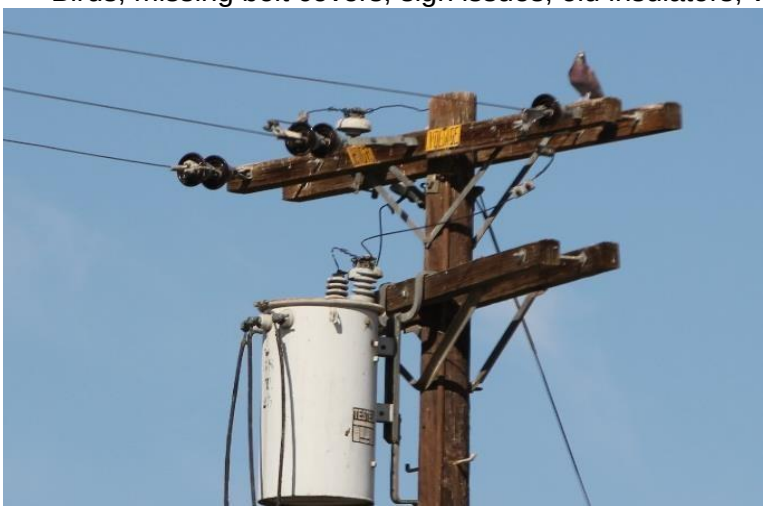


- Excessive bird contamination, some old infrastructure, insulation shot, missing bolt covers; maybe upgrade copper wire to aluminum (can sell copper)



Moved 2 blocks away

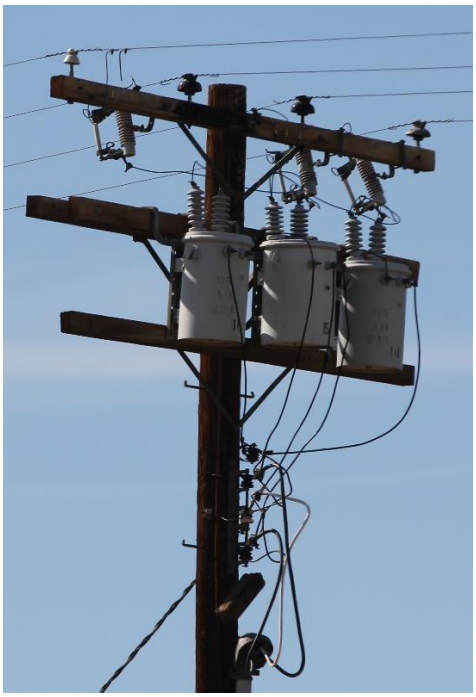
- Birds, missing bolt covers, sign issues, old insulators, very little tracking, but likely bird related outages...

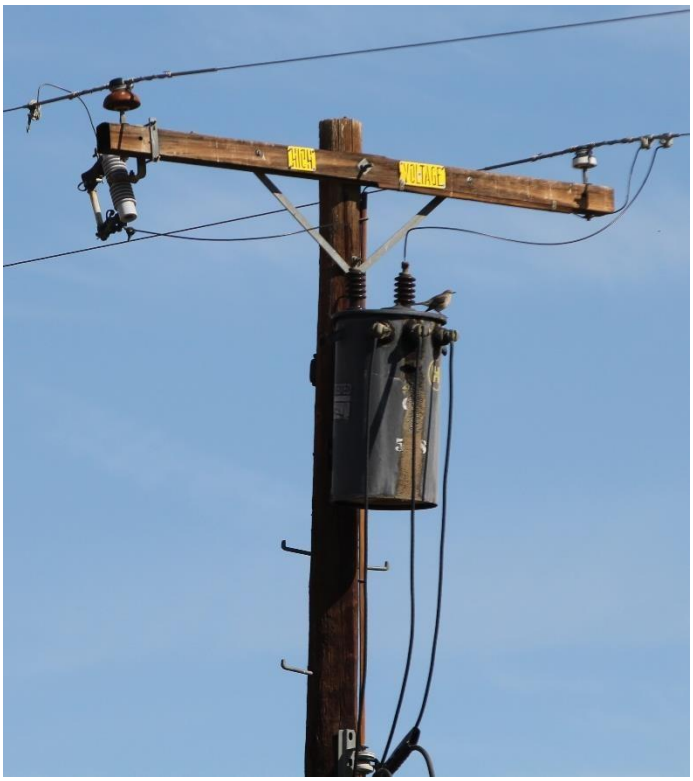


Note: No veg issues observed in area

Final location: Bermuda dunes (backyard poles)

- Infrastructure looks good but more tracking than previous area, some bird issues; some inconsistencies with standards, e.g. surge arrestors




HIGH
VOLTAGE


HIGH
OLTAGE

- UG primary risers should be fed with load break Cutouts.

(End of Appendix A)