



OVERVIEW

The client discovered that insulator failure was a large portion of its transmission outages, and likely a large percentage of risk. But they had no data on individual insulators, and couldn't identify or manage the associated risk of failure. Client analysis demonstrated that insulators are a common source of failure leading to ignition events on the system. Fully understanding as much as we can about insulators, as an asset class, is therefore imperative.

They asked us to demonstrate what we could do in a pilot analysis. We:

- Created a data collection template and process to record insulator and structure information from inspection photos.
- Manually reviewed photos and populated the data collection template with key insulator and structure characteristics with high levels of accuracy and efficiency.



METHODOLOGY

- The client chose two transmission lines for our pilot (~600 structures). The lines selected were diverse from the perspective of the equipment on them and therefore the varying degree of information we would be recording.
- Multiple photos, from various sources, of each structure were gathered by the client, and sent to a UMS server via SFTP.
- Working with the client, we developed a template to record the information requested: # of insulators on each structure, type of insulator, insulator material, structure type, framing type.
- Each UMS analyst located the correct set of photos for the structure being reviewed, and recorded the requested information.
- A QA / QC review process was conducted by a different analyst.

Case Study: Insulator Count and Features



DATA UTILIZED

Structure database, structure photos, structure/insulator/framing examples document (from client).



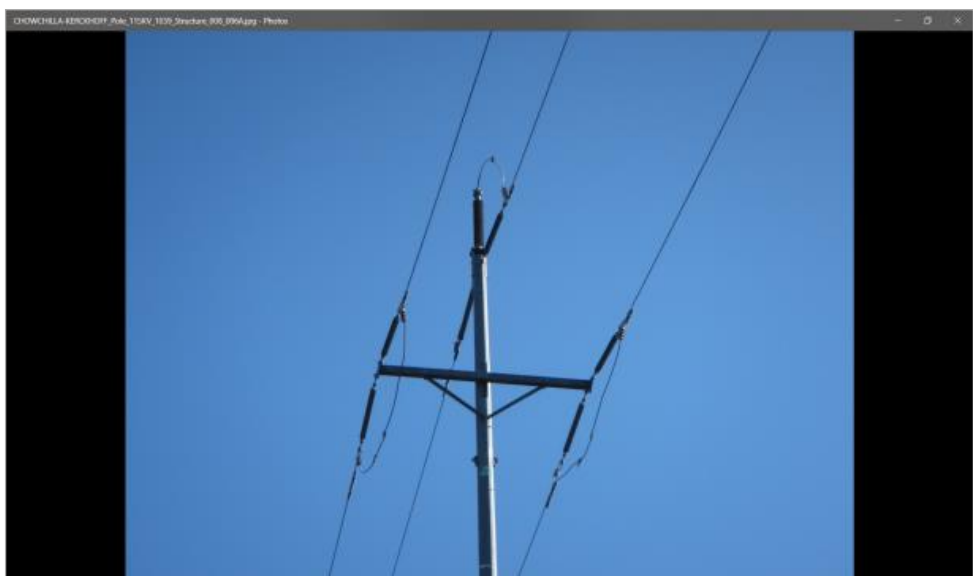
CHALLENGES

Photos were incorrectly cataloged by the client, or were out of date.



SUCCESS

- Delivered a very accurate work product to the client, with good quality control processes in place
- Structure and insulator information was recorded very efficiently compared to another contractor also piloting this work (UMS: 76 vs. Contractor: 48 structures/analyst day).



Example photo used to determine the structure / framing / insulator information, as well as the data recording template.

FLOC_ST_NO	STRUCT_SAP_EQUIP_ID	SAP_STRUCTURE_NO (modified)	Picture_Date	STRUCTURE_TYPE_DESC	FRAMING_CODE_DESC	POST_Count	SUSPENSION_Count	POLYMER_Count	GLASS_Count	CERAMIC_Count	TOTAL_INSL_Count	Corona_Rings_Y_N
	44191827	008_006A	12/28/2016	LIGHT DUTY STEEL POLE (LDSP)	TPD - Tri Post Dead End Construction	1	6	7			7	N
	40806785	008_007	12/28/2016	LIGHT DUTY STEEL POLE (LDSP)	T-1 - Tri Post	3		3			3	N
	44191636	008_007A	12/28/2016	LIGHT DUTY STEEL POLE (LDSP)	T-1 - Tri Post	3		3			3	N
	40866845	008_008	12/28/2016	LIGHT DUTY STEEL POLE (LDSP)	T-1 - Tri Post	3		3			3	N
	40859555	008_009	12/28/2016	LIGHT DUTY STEEL POLE (LDSP)	TPD - Tri Post Dead End Construction	1	6	7			7	N
	40604443	008_010	11/10/2016	LIGHT DUTY STEEL POLE (LDSP)	T-1 - Tri Post	3		3			3	N
	40590412	009_001	11/10/2016	SINGLE WOOD POLE	T-1 - Tri Post	3				3	3	N