

# BC Hydro Creates Consistency in Pole Design and Analysis While Ensuring Government Compliance

SPIDAcac™ Helped Perform Realistic and Consistent Pole Checks across British Columbia

## PROVIDING ESSENTIAL ELECTRICITY TO MILLIONS OF PEOPLE

BC Hydro is a provincial corporation owned by the government and people of British Columbia, Canada. They generate and deliver electricity to 95% of British Columbia and serve over five million people. Each year, BC Hydro designs thousands of structures.

Historically, engineering standards were based on linear analysis of pole and guying/anchoring strength. For more than a century, many companies adhered to practices and standards that were born out of necessity and innovation at the time. BC Hydro's process for creating a pole design started with selecting pole framing from engineered standards. Then, they would perform linear calculations for pole strength, guying/anchoring, and clearance by hand, using lookup tables, or using MS Excel-based calculators.

## SEARCHING FOR A MODERN APPROACH TO DEPLOYING NEW STANDARDS

While this process helped BC Hydro achieve their mission of safely providing customers with reliable, affordable, and clean electricity for a more sustainable British Columbia, the 2015 edition of CSA C22.3 brought focused attention to compliance with the CSA's geometric nonlinear analysis requirement and the need to seek new technologies. The CSA sets safety and performance standards across various industries, including utilities. Specifically, in pole loading, CSA standards establish requirements for ensuring the structural integrity of utility poles to maintain public safety. Therefore, their goal was to ensure that every pole design complied with CSA 22.3. Their client file went through typical set-ups to ensure all bases were thoroughly covered and included all framing

standards, applicable wires and equipment, weather cases, and load cases.

The team searched for software that could help them get trusted results and analysis of their standards for pole design. They needed to ensure compliance with the regulatory requirements of the CSA for geometric nonlinear analysis for pole loading using the standards implemented by their client file.

## USING SPIDACALC ACROSS OPERATIONS

After considering their options, BC Hydro chose SPIDAcac and implemented the application with a two-phase approach—starting with a pilot and then rolling it out across the organization. Their client file makes it easy for all their users to adhere to standards, making consistent designs across the organization. All the overhead assemblies are pre-built to include BC Hydro construction while accommodating the local telecom company, which has joint pole ownership.

SPIDAcac gave engineers an easy-to-use graphical interface and client-defined configurations that make it easy to deploy a new approach to standards reviews. Deployment was efficient, with the comprehensive online self-guided and instructor-led training from SPIDAcac helping with widespread adoption within the entire organization. The software's intuitive interface empowered new users to maintain design consistency, from wire repositioning to communication pole specifications. Consequently, this integration resulted in a more robust pole design that met code requirements, streamlined internal and external processes with contractors, and optimized the overall operational efficiency.

## PROJECT SUMMARY ORGANIZATION

BC Hydro

## SOLUTION

Utility and Communication Networks

## LOCATION

British Columbia, Canada

## PROJECT OBJECTIVES

- ◆ To modernize workflows for pole loading.
- ◆ To ensure compliance with CSA requirements.

## PROJECT PLAYBOOK

SPIDAcac

## FAST FACTS

- ◆ BC Hydro, owned by the government and people of British Columbia, Canada, generates and delivers electricity to 95% of the population and serves over five million people.
- ◆ Configuration of a well-developed SPIDAcac engineering library, or client file, has provided consistency in design and analysis among a large user base.
- ◆ By adopting SPIDAcac, BC Hydro was able to update and validate standards that meet requirements for geometric nonlinear analysis for pole loading throughout their organization and externally with contractors.



After considering their options, BC Hydro chose SPIDAcalc and implemented the application with a two-phase approach—starting with a pilot and then rolling it out across the organization.

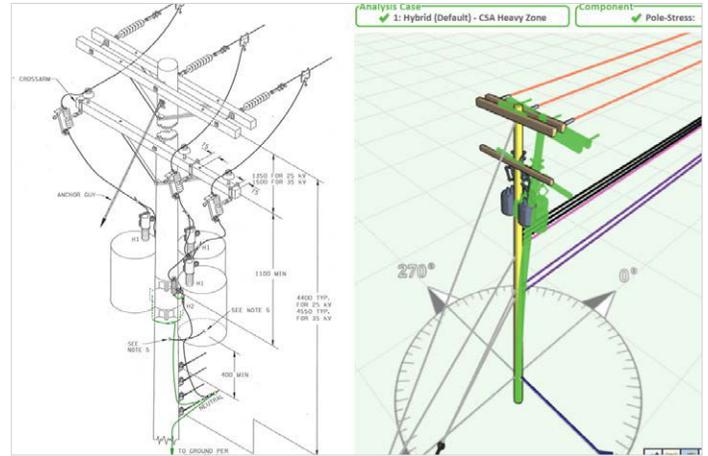
BC Hydro sent hundreds of thousands of pole models through SPIDAcalc's cloud analysis engine. Through this massive volume of data, they developed design standards for pole line design that included look-up tables for pole class and guying/anchoring for typical scenarios. This resource was developed to assist with the rollout of SPIDAcalc. All pole designs now go through SPIDAcalc. BC Hydro also received a large amount of information about their standards, such as span length limitations by conductor size, optimum anchor leads, and the effect of third-party telecom attachments across their system.

### REDUCING RISK WHILE INCREASING PUBLIC SAFETY

Currently, BC Hydro uses over 400 licenses of SPIDAcalc, and the organization has seen several benefits. One such advantage was a well-configured SPIDAcalc engineering library, which can be leveraged to facilitate design and analysis consistency among a vast user base to ensure uniformity in their approaches. By using SPIDAcalc's sophisticated geometric, nonlinear analysis capabilities, engineers can seamlessly meet regulatory requisites, mitigating non-compliance risk. Through SPIDAcalc's configuration for client files, engineers can review multiple scenarios simultaneously, bolstering their ability to modernize pole designs while minimizing the potential for underbuilding or overbuilding structures.

BC Hydro is now able to meet CSA requirements, including public safety requirements, using SPIDAcalc. The application plays a crucial role by providing advanced engineering software that complies with CSA

requirements. It helps engineers analyze pole loading scenarios to ensure utility poles can withstand the stresses imposed by various conditions, such as weather, equipment attachments, and environmental factors. It enables utilities like BC Hydro to assess and manage the safety and reliability of their pole infrastructure in accordance with CSA standards, ultimately contributing to public safety.



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