



GETting MORE from the EXISTING Grid

Quick and reliable solutions that seamlessly integrate
with existing transmission corridors and existing towers.

- GETs MORE from the EXISTING Grid / Right-of-Ways
- Advanced Reconductoring & Other GETs
- Advanced Reconductoring on Transmission
- Two Advanced Reconductoring Examples
- Energy Institute at Haas / Grid Labs Advanced Reconductoring Study Summary



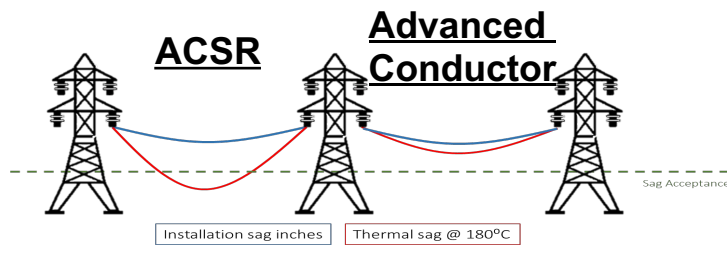
- When is an Advanced Conductor a Grid-Enhancing Technology (GET)?
- GETs are software (Grid Optimization, DLR) and hardware (Advanced Flow Controllers, Storage-as-Transmission, and Advanced Reconductoring) solutions that can be used with the existing grid.
- GETs are important for their ability to:
 - Rapidly (months) increase capacity on the existing grid
 - Increase energy efficiency of the grid
 1. Decrease in GHG
 2. Decrease generation capacity required to serve loads
 - Increase Reliability and Resilience
 - Rapidly provide these benefits at a lower cost than “conventional rebuild solutions”
- **Reconductoring with Advanced Conductor on the Existing Structures IS a GETs application**

- Unique Applications Enabled by Advanced Conductors that save time and money (faster at lower cost!)



Reconductoring on existing structures

- Same “diameter & weight” for Tower Design
- Greater Capacity & Efficiency
- Low-sag Wildfire & Overload Risk Mitigation



GETs



Uprate voltage within the existing ROW

- Low-sag technology for Greater Clearances (Including Blow-out)
- Increased opportunity when used with new tower designs (BOLD)

US and international examples

- Boundless/TERNA Project: 345 kV to 500 kV with BOLD & ACCC conductor
- Ireland
- South Asia & SE Asia

Not universal solution but works for some

NOT GETs

Advanced Reconductoring on Transmission CTC GLOBAL



Reconductoring at congestion points to interconnect more offshore wind
(Netherlands & Germany)

What to expect when reconductoring with Advanced Conductors using the existing transmission structures?

- 50%-100% more operating capacity in same ROW
- 25%-40% lower line losses
- About HALF the cost of conventional structural rebuild to uprate line
- Fast Process: ~18 - 24 months from decision to an energized line
 - Eliminate Construction permit process
 - Use maintenance practices for installation
- LOW SAG => Wildfire Risk Mitigation (and other safety benefits)

South Texas Electric Cooperative (STEC) 138 kV

STEC selected ACCC® Advanced Conductor to re-conductor the wooden H-Frame structures

<- Existing Guyed Structure

- Used the existing wooden H-frame structures with minimal repairs and maintenance; Guy wire capacity upgrade
- **Increased rated power capacity by 70% and kept 138kV (from 237 MVA to 411 MVA)**
- Completed the installation in 6 months from project field start
- **Completed the project for about \$3.5M (versus rebuild for expected \$7M)**



Deadend Fitting

First-year benefit:

~\$340,000 energy savings and CO² value

- 5,186 MWh reduced energy loss
- 3,227 metric tons reduction in CO₂ emissions (@ EIA 2019 Texas emission rate)
- ~0.6 MW less continuous generating capacity needed to serve load
- ~5 ft less sag at peak operating amps

~ \$600,000 one-time savings from lower generating capacity required

Description: 240 circuit miles, 345 kV line, double bundle

Project: replace 1,440 miles of ACSR conductor with Advanced Conductor (ACCC®)

Objectives

- Improve reliability (less sag and corrosion)
- Increased capacity to serve growth
- Retain existing structures – to reduce costs
- Eliminate downtime and replacement power costs with Live Reconductoring

Additional benefits received by AEP

- Reduced line losses by 30%
 - *Saving \$15 million/yr. (300,000 MWh at \$50)*
 - *Reducing CO₂ emissions by ~200,000 metric tons per year (= 43,000 cars off the road)*
 - *Freeing up ~34 MW of generation*
 - *Saving 3.5 billion gallons of water/yr. (12k/MWh)*



This project won EEI Transmission Project of the Year - 2016

Energy Institute at Hass Report

Accelerating Transmission Expansion by Using Advanced Conductors in Existing Right-of-Way

February 2023

Emilia Chojkiewicz, Umed Paliwal, Nikit Abhyankar, Casey Baker, Ric O'Connell, Duncan Callaway, and Amol Phadke

“Our modeling shows that reconductoring enables nearly four times more transmission capacity at only slightly higher cost than a business-as-usual case” by 2035

- Advanced reconductoring unlocks “a high availability of cost-effective renewable resources in close proximity to the existing US transmission network and load”
- “With \$180 billion in system cost savings by 2050, reconductoring presents a cost-effective and time efficient, yet underutilized, opportunity to accelerate global transmission expansion”
- Advanced reconductoring “should constitute a key pillar in strategies to achieve grid decarbonization goals”





**To GETs More From the EXISTING GRID,
AGGRESSIVELY DEPLOY Advanced Reconductoring!**

For more information

Please visit: www.ctcglobal.com or email: pbrehm@ctcglobal.com