AEP Advanced Conductor Case Study

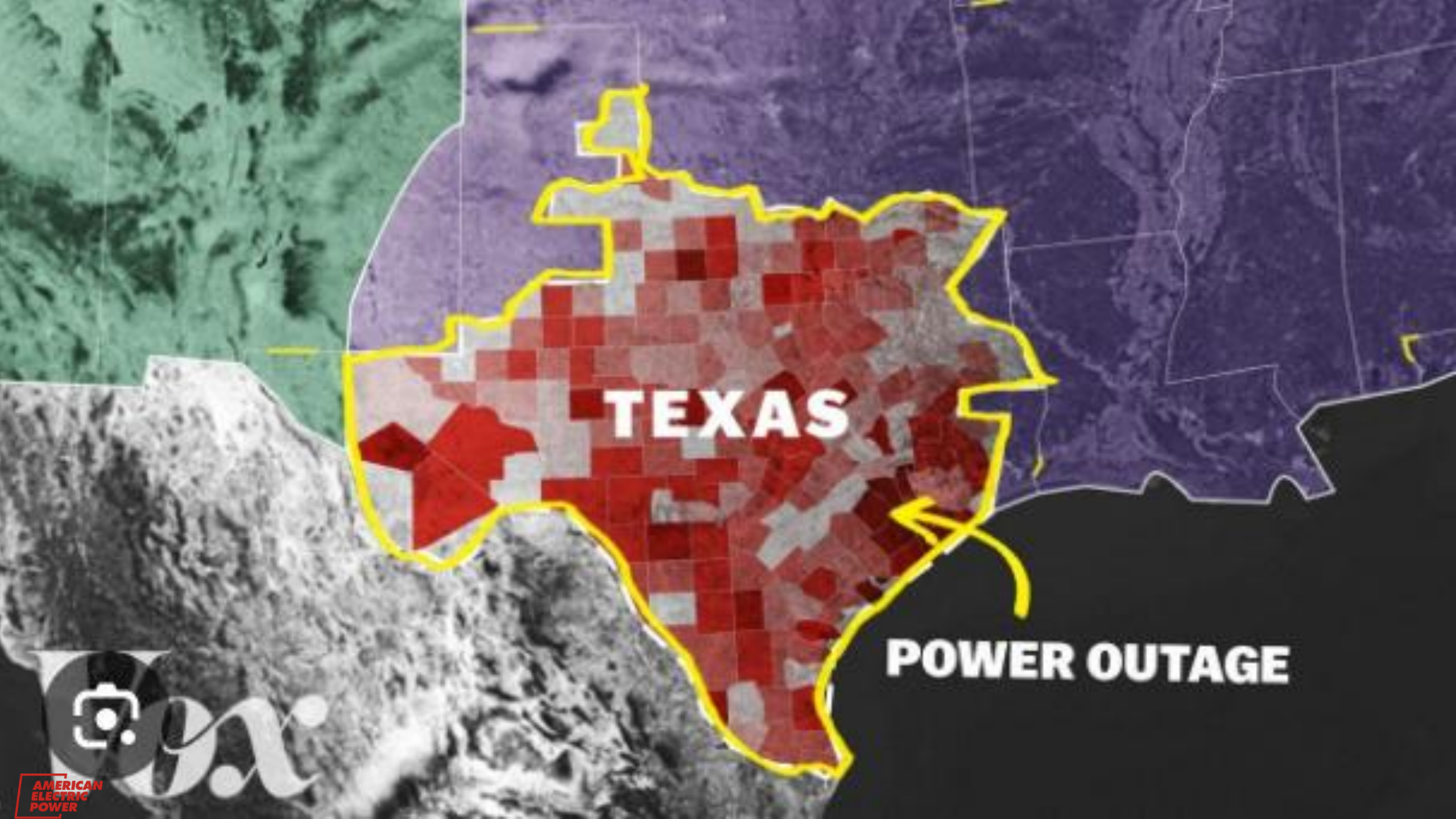
WORLD BANK GROUP

AEP TRANSMISSION

An AEP Company

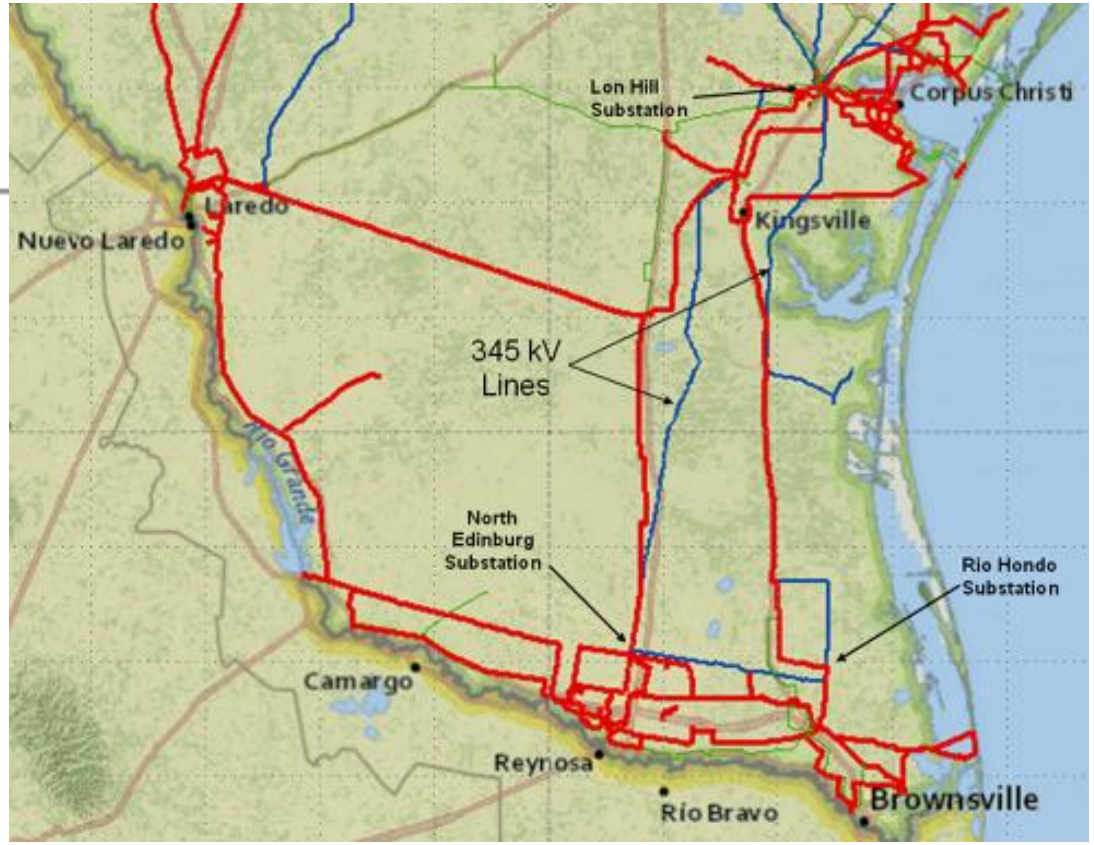
BOUNDLESS ENERGY™

Rev. 9/1/25


TEXAS
POWER OUTAGE

Lower Rio Grande 345kV Reconductor

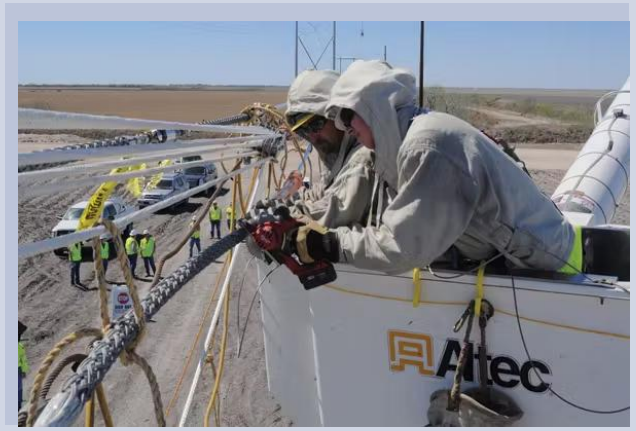
- In 2011, the LRGV was served by two 120-mile long 345kV lines originating in Corpus Christi, Texas
- Since 1996 Peak Load had increased by 80%
- Record in 2010 of 2378 MW
- Winter Storm in 2011 created a peak demand of 2730MW resulting in load shedding and rolling blackouts due to energy import constraints

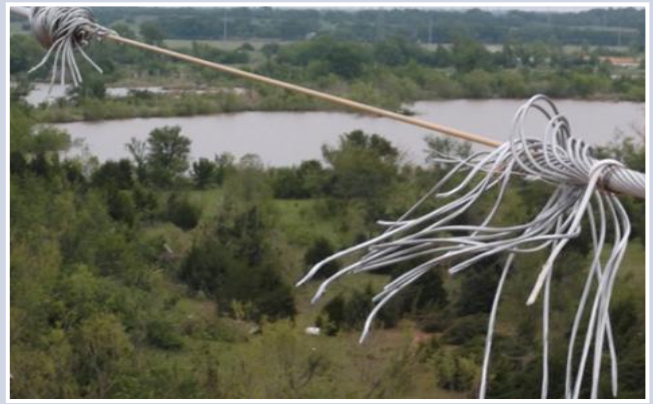


Conductor Comparison Table

Attribute	ACCC® (2003)	XTACIR (1970)	AAAC (1968)	ACSR (1906)
Type	Advanced composite core	HTLS with Invar core	Traditional aluminum alloy	Traditional steel-core
Core Material	Carbon-glass composite	Invar alloy (nickel–iron)	None (homogeneous aluminum alloy)	Galvanized steel
Strand Material	Fully annealed aluminum	Thermal-resistant aluminum alloy	Aluminum alloy	EC-grade aluminum
Operating Temp	Up to 210°C	Up to 210°C	~75–90°C	~100°C
Ampacity	High (up to 2-3× ACSR)	High (1.5–2× ACSR)	Moderate	Standard
Thermal Sag	Very low	Low	High	High
Weight	Low	Similar to ACSR	Lighter than ACSR	Moderate
Tensile Strength	High	High	Moderate	Moderate–High
Corrosion Resistance	Excellent	Very good (Al-clad Invar)	Good	Fair (steel prone to corrosion)
Installation Complexity	Easy but different	Easy	Easy	Easy
Losses saving	Up to 40% of ACSR	Up to 25% of ACSR	Up to 16% of ACSR	General purpose, legacy lines
Cost	High upfront, low lifecycle	Moderate-high	Low	Low

Why Advance Conductors





Capacity

2X the capacity of traditional ACSR with lower sag

Time

50% less construction time

Resiliency

Proven to withstand EF5 tornado winds

Resists cyclic load fatigue

Up to 200 Celcius

Core 50% stronger and 70% lighter

AMERICAN ELECTRIC POWER

Why ACCC?

North America

Europe

Rest of World

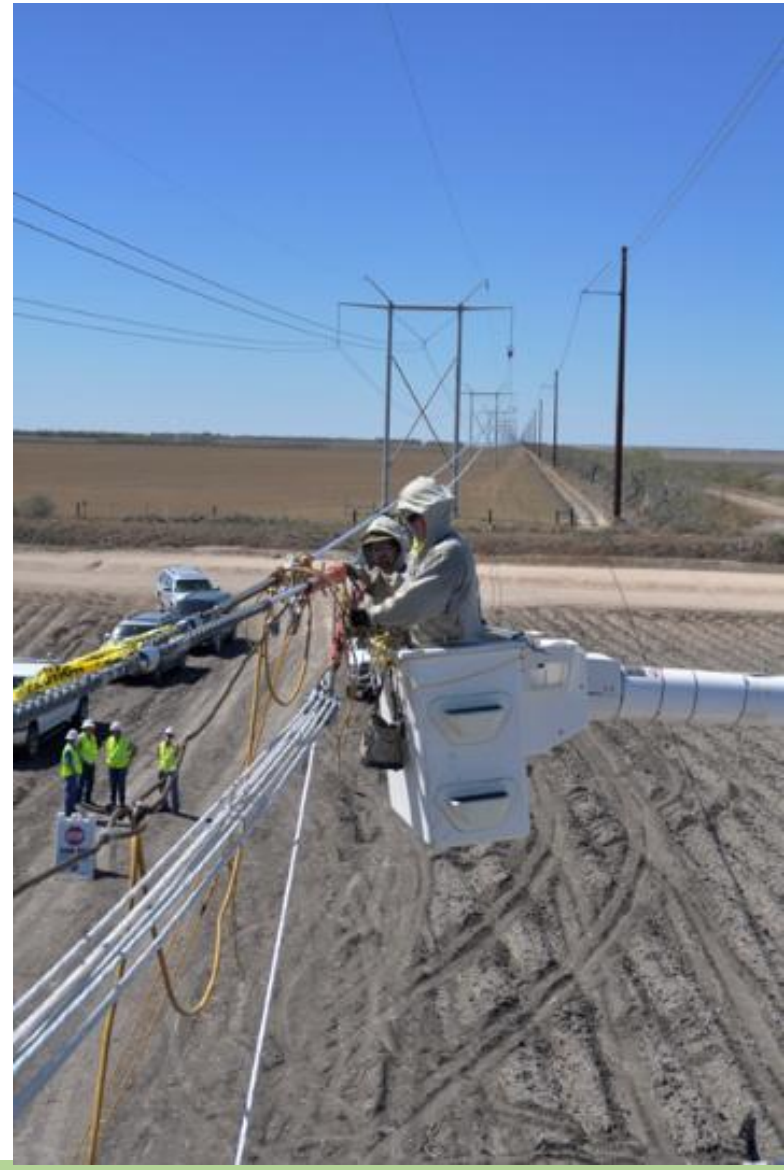
More Capacity - Less CAPEX and Less Time

Today, the transmission line has performed flawlessly for a decade, delivering outstanding results:

- Commissioned 9 months ahead of schedule.
- Losses cut by up to 40%, saving over $30 million in the first year.
- CO2 reductions in year one matched the removal of 34,000 cars.
- Continuous operation avoided Texas N-1 challenges.
- Due to energized work, cost savings for 2014–2015 reached $43.4 million.
- No permitting, environmental and social related work, and no corrosion

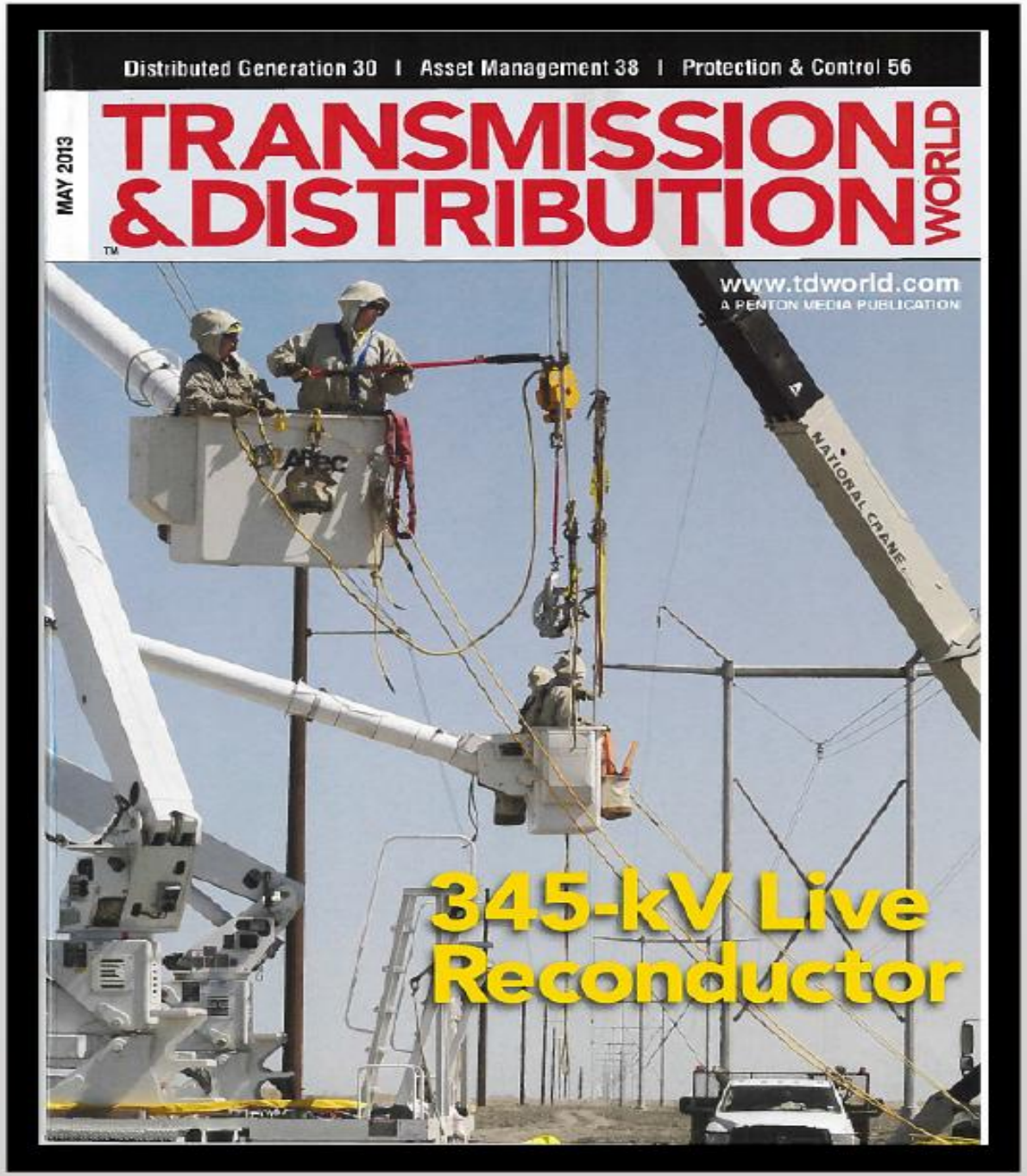
When assessing total cost of ownership, advanced conductors consistently outperform for new or reconducting projects, especially in select applications.

Data Point	ACCC®	ACSR
Amps	3,099	1,751
Speed	33 months	66 months
Cost	$375M	$418M



QUESTIONS?

James Berger
jbergerenterprises@gmail.com
(614)580-7444
PO Box 856
Port O'Connor, TX 77982



Timing is Everything