

3M™ Aluminum Conductor Composite Reinforced (ACCR)

More Amps,
More Confidence

for your most
challenging applications



Qualification Testing
of 1033TW ACCR for 400kV
Network

Hervé Deve, CIGRE, Stockholm, 2010

Introduction



ACCR Application

- *Thermal upgrade solution to replace aluminum alloy conductors on 400 kV lines*
- *Use in challenging areas where extensive tower upgrades are not possible*
- *Use in challenging where ACSS upgrades are not possible*

ACCR Conductor Specification

- *Diameter: 31 mm*
- *Weight: 1.95 kg/m*
- *Strength: 250 kN*
- *Resistance: 0.05 ohm/km*

ACCR

Qualification Tests of Conductor and Accessories followed IEC Std.



600 mm Spacer



Joint –



Connector

Clevis

Deadend



TW conductor



Suspension





1033TW-T13 ACCR
Test conductor

Thermo-Mechanical Test

- Conductor + deadend
- Tension to 20% RBS at 20°C
- Heat to 240°C, hold 5 mins
- Cool to 20°C
- Repeat for 100 cycles
- Tension to 70% RBS for 24 hours
- Tension to 20% RBS
- Repeat for 4 x 100 cycles more = 500 cycles
- Tension test to failure
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RESULT = 106% RBS

3M

Conductor and Accessory Tests

Conductor	Suspension	Dead End/Joints	Spacer
Conductor strength	vertical load, clevis	DE strength RT	Slip test
Core strength	Vertical load	Joint strength RT	Tension-compress strength
Stress-strain	Slip test	Term. strength RT	Corona/RIV
Resistance	Magnetic loss	Lug strength RT	Electrical Resistivity
Thermo-mechanical	Short circuit	High temp strength	High temp profile
Crush test	Corona/RIV	Current cycle	Repair Sleeve
Turning Angle	High temp profile	Corona/RIV	Strength
Dampers		Clevis connector strength	Vibration
			Current Cycle

Summary



- ACCR qualified for 400kV with a EU utility
- ACCR offers a thermal upgrade solution for demanding 400kV line sections. ACSS would require extensive tower modifications
- A 400 kV, double circuit, twin bundled ACCR pilot line will be installed in June 2010