

## Chapter 9 – Maintenance and Repair – Table of Contents

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### 1. PURPOSE

- 1.1. This is Chapter 9 of the ACCC® Conductor Installation Guidelines, covering ACCC® maintenance and repair. The Guidelines consist of nine chapters, each written to stand alone to address specific installation subjects. Taken together, nine ten chapters comprise the entire Installation Guidelines:
  - 1.1.1. Chapter 1 — General Installation Guidelines
  - 1.1.2. Chapter 2 — Safety
  - 1.1.3. Chapter 3 — Training
  - 1.1.4. Chapter 4 — Reel Handling and Storage
  - 1.1.5. Chapter 5 — Site Considerations and Set-ups
  - 1.1.6. Chapter 6 — Required Equipment
  - 1.1.7. Chapter 7 — Stringing / Pulling
  - 1.1.8. Chapter 8 — Sagging, Terminations, and Suspensions
  - 1.1.9. Chapter 9 — Maintenance & Repair
- 1.2. The purpose of the Guidelines is to provide experienced transmission engineers, project managers and planners, field inspectors, utility personnel and linemen with guidelines, recommendations and requirements necessary to safely and successfully install and repair ACCC® composite-core bare overhead conductor and accessories. This document is an overview and guideline covering what to do but not necessarily how to do it. It is not intended to serve as a more intensive training manual or act as a substitute for proper training, required personnel skill sets, or industry experience.

**2. SCOPE**

- 2.1. These guidelines apply to equipment and techniques required to successfully maintain and repair all sizes of ACCC® conductor.
- 2.2. These guidelines include additional equipment and techniques that are required for Ultra-Low Sag (ULS) ACCC® conductor sizes.

**3. DEFINITIONS**

- 3.1. ACCC® is a registered trademark of CTC Global, and is defined as Aluminum Conductor Composite Core, stranded with Aluminum 1350-O (where O stands for fully annealed) or Aluminum 1350-O Z-wire trapezoidal wire.

**4. ASSOCIATED DOCUMENTS**

- 4.1. IEEE Standard 524™ Guide to the Installation of Overhead Transmission Line Conductors.
- 4.2. OSHA Electric Power Generation, Transmission, and Distribution Standards 1910.269 and 1926.950 or ISO 29.240.20 or local country equivalents.
- 4.3. The remaining Chapters of the Installation Guidelines

**5. MAINTENANCE**

- 5.1. Once installed, maintenance of ACCC® conductor consists simply of periodic inspection for environmental damage, structure degradation, broken insulators, vegetation encroachment, or other issues, and then repair of such damage, exactly as any other bare overhead conductor.

**5.2. Conductor Trolleys**

- 5.2.1. There are no special requirements for the use of conductor trolleys on undamaged conductor. If aluminum strand damage is observed and the condition of the core is suspected to have been compromised, then a conductor trolley must not be used for access and an alternative source of access should be used to allow further detailed investigation.

**6. REPAIR METHODS**

- 6.1. All conductor damage should be inspected carefully and an accurate count of the number of damaged strands to correctly identify the most appropriate repair.
- 6.2. If aluminum strand damage is observed and the condition of the core is suspected to have been compromised, then a conductor trolley must not be used for access. Alternative method of access should be used to allow further detailed investigation.

6.3. There are three methods of repair techniques for repairing damage to ACCC® conductor that are available:

6.3.1. Pre-formed Helical Repair Sleeve (96” armor rod)

6.3.2. Compression Repair Sleeve

6.3.3. Mid-span Splice (ACCC® Splice)

6.4. Conventional methods are used to repair ACCC® conductor strands. Aluminum Repair Methods:

Number of Damaged Aluminum Strands	Helical Preform Repair (96”)	Compression Repair	Mid Span Joint
1 Outer Layer Strands	X	X	--
2 Outer Layer Strands	--	X	--
3+ Outer Layer Strands	--	--	X
Any Inner Layer Strands	--	--	X

6.5. Example One: Aluminum strand damage only. Use appropriate repair method from table above.

6.6. Example Two: Conductor is damaged and core is damaged in a single area. Remove damaged core area and install a mid-span splice.

6.7. Example Three: Conductor is damaged and core is damaged over a larger area than can be replaced by a single splice. Using splices, replace 50’ to 100’ (15 to 30 m) of conductor per each phase that is damaged. Keep splices at least 50’ (15 m) away from any structure.

6.8. Example Four: Conductor is damaged mid-span and also at one structure at the armor rod suspension. Using splices, replace all damaged conductor, keeping splices at least 50’ (15 m) from any structure.

6.9. Example Five: Conductor is damaged and core is damaged in a dead-end span. Add a section of conductor with a splice and add a new dead-end.



**7. REPAIR GUIDELINES**

- 7.1. Never install a splice any closer than 50' (15 m) from a structure.
- 7.2. Repairs must always be made with materials and components which are rated for ACCC® operating temperatures (180° C).
- 7.3. The minimum distance from a repair sleeve to another fitting on the conductor shall be 1.2m, this includes other repair sleeves. (If the repair sleeve is moved closer to the deadend, the conductor strands may loosen and open and remain open).
- 7.4. A spacer damper of the appropriate size should be fitted 2 - 8 m from the repair sleeve to prevent sub-conductor clashing near the repair.
- 7.5. ACCC® splices or dead-ends cannot be installed via live line maintenance because of the mechanical way that the splice or dead-end fasten the core.

**REVISION HISTORY**

<b>REV.</b>	<b>CHANGE REQUEST #</b>	<b>DATE</b>
A		8 May 2012
B		10 May 2012
C		31 July 2013
D	121515-1	15 Dec 2015
E	3.1 Corrected "1350-0" to "1350-O" Changed copyright footer to 2017	July 2017