

Rejuvenation Instructions

#542 – 200A Live-Front Terminations – iUPR



This NRI covers the following:

- How to select live-front components and accessories.
- How to prepare a cable for iUPR injection without using a template.
- How to install new termination kits with a terminator fluid injection cap (TFIC) that requires adjusting the cutbacks in the manufacturer's instructions.



WARNING: It is dangerous working around energized high-voltage systems, pressurized systems, and chemicals. Always work in accordance to the Novinium Field Operations Safety Handbook (FOSH) or other local governing safety standards.

Table of Contents

Introduction	2
Selecting the Component and Accessory.....	2
1. Select the TFIC.....	2
Keeping or Replacing Existing Connector	2
1. Prepare the existing connector.....	2
2. Replacing the existing connector.....	3
3. Checking the connector	4
Preparing the Cable.....	4
1. Insulation-connector gap.....	5
2. Mark the TFIC position.....	5
3. Marking tape position.....	5
4. Jacket cutback.....	6
5. Semi-con cutback.....	6
6. Verify.....	7
7. Compare the cable with the template.....	7
Installing Termination Body and TFIC	8
1. Install the termination.....	8
2. Install the TFIC.....	8
Injection	9
1. Install the LFAI and inject.....	9
The iUPR Process is now complete	9

Introduction

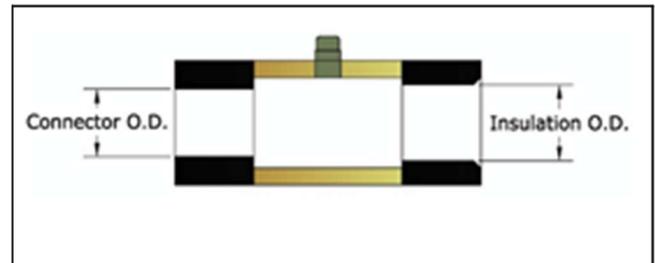
This NRI describes how to install new 200A live-front termination kits used for the Improved Unsustained Pressure Rejuvenation (iUPR) process.

This NRI walks through the process of selecting components and preparing the connector and cable. The cable preparation applies to most stress-control terminations. In the case that a termination requires different installation steps, contact Engineering for assistance.

Selecting the Component and Accessory

1. Select the TFIC.

- a. Measure the connector and insulation OD and select the TFIC using Table 1
- b. Use the insulation OD to select the component for installation.
- c. Request a template through Engineering@novinium.com
- d. TFICs are compatible with most stress-control terminations. If you are unsure, Engineering can verify compatibility.



Part Number	Connector OD (in)	Insulation OD (in)
300TFIC-FA	0.470-0.510	0.600-0.730
300TFIC-FB	0.620-0.650	0.675-0.785
300TFIC-FG	0.620-0.650	0.775-0.885
300TFIC-GB	0.620-0.650	0.875-0.985
300TFIC-3/0-4/0	0.820-0.940	0.875-0.985

Table 1: TFIC selection table.

Keeping or Replacing Existing Connector

If the existing connector and cable preparation quality are satisfactory and meet IEEE® 1816™ requirements, the existing connector may be kept with the cutbacks modified per the non-extension, or standard templates.

1. Prepare the existing connector.

- a. The conductor strands rotate around at a 15° angle. It is possible to create a suitable flow path into the cable by opening the conductor strands. There are two methods to accomplish this goal:
 - 1) Open the strands by rotating the connector the opposite direction of the strand lay by 15°. Remember, 15° is the strand lay angle.

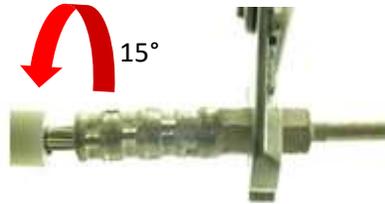


Figure 1: Method 1 is twisting the connector to open the strands.

Firmly tap the top of the connector to open the strands. This process is called “bird caging”. This helps improve flow by opening channels between the conductor strands.



Figure 2: Method 2 is tapping the top of the connector to open the strands.

OR

- 2) Tighten the strands by rotating the connector 15° in the strand lay’s direction. Then, rotate the connector back 15° to its original position.

- b. Examine and remove any debris from the strands.
- c. Examine for any strands that broke during the rotation steps. Re-terminate if necessary.

2. Replacing the existing connector.

- a. Use the manufacturer’s specified crimping die, or refer to [NRI 442 – Swage and Crimp Die Table](#) for crimp dies based on the connector’s OD.
- b. If the die does not appear to crimp the connector correctly, contact Engineering for assistance.
- c. Crimp the connector barrel as many times as possible in the connector’s crimping region.
- d. Follow IEEE® 1816™ guidelines on how to install the connector.
- e. Begin crimping the connector at the “no crimp” line.
- f. Rotate the crimping tool for each crimp to avoid curving the connector.
- g. Crimp the connector as many times as possible, moving towards the cable each time.



Figure 4: Place the maximum amount of crimps possible.

3. Checking the connector

Occasionally, crimped connectors will have sharp edges or “ears.”

- Smooth these sharp edges with a file, a 3M® Scotch-brite™ pad, or a 120 grit sandpaper.
- Flatten any “ears” and smooth any resulting sharp edges.
- Smoothing these edges helps prevent interior damage to component bodies.
- Rotate the crimping tool 180° each time to reduce bending from crimps.

Check for overly bent connectors. Redo as needed.

Preparing the Cable

Figure 5 shows how a typical live-front termination is installed for iUPR injection. Note that the end of the term is where the TFIC begins. **In other words, the installed length of the termination will go from the marking tape to the beginning of the TFIC.** See the circled dimension in Figure 5.

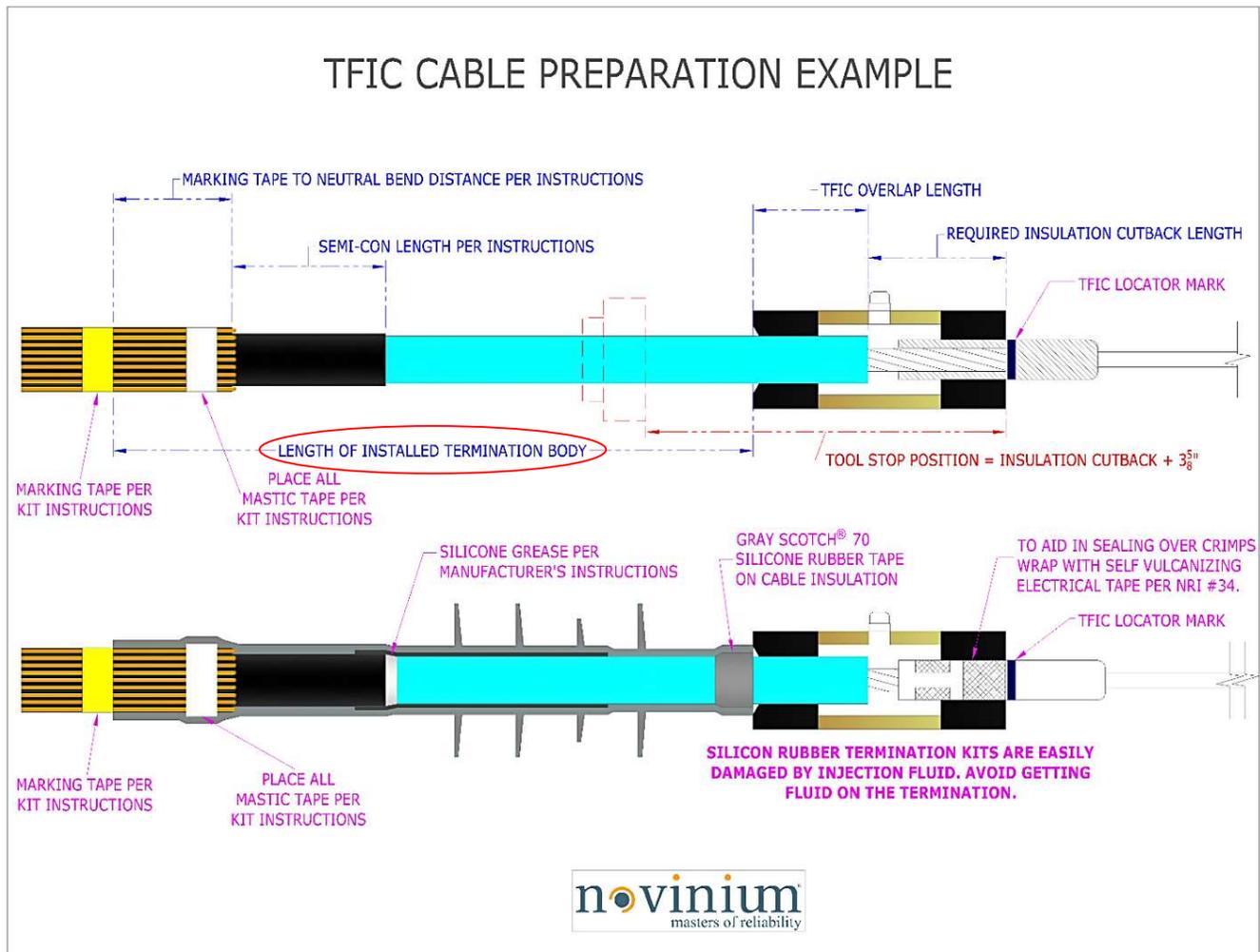


Figure 5: Example of an iUPR live-front termination.

1. Insulation-connector gap.

- Leave a 1/4" to 3/8" insulation-connector gap to make a good flow path.

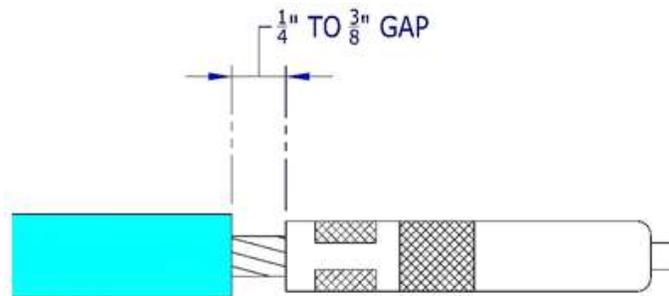


Figure 6: Leave sufficient gap to allow fluid to flow.

- Trim back insulation if necessary.

2. Mark the TFIC position.

- Center the TFIC's injection port over the insulation-connector gap.
- Mark the connector and insulation where the top and bottom of the TFIC line up.

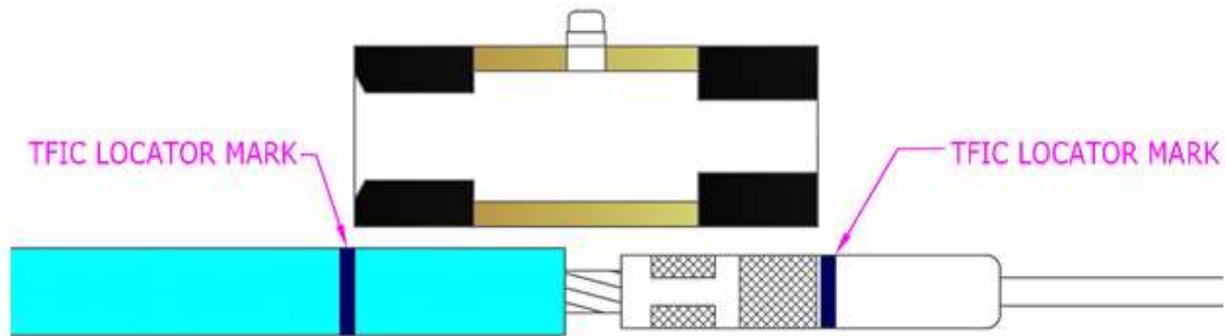


Figure 7: Use marks on the insulation and connector to show placement of the TFIC.

- Use these marks as an alignment guide for the TFIC.
- If it is difficult to seal around the connector's crimps, wrap the connector with semi-conducting self-vulcanizing rubber electrical tape (Scotch 13 or similar).
- Do not cover the mark on the connector.
- Do not use silicone rubber tape where it may contact injection fluid.

3. Marking tape position.

- Starting from the insulation's TFIC mark, measure the termination's typical installed length (see Table A at the end of this NRI).
- Mark the jacket at this location. This is the marking tape position.

c.



Figure 8: Use Table A to find the marking tape position.

4. Jacket cutback.

Jacketed Concentric Neutral Cables:

- Use the kit instructions to find and mark the jacket cutback location.
- Remove the jacket to that point.
- Bend back the concentric neutral wires.
- Place marking tape over them at the location found in step 3b (page 5).

Unjacketed Concentric Neutral Cables:

- Use the kit instructions to find where to bend back the neutral wires.
- Secure the neutral wires at this point and bend them back.
- Place marking tape over them at the location found in step 3b (page 5).



Figure 9: Place marking tape over the newly bent neutral wires.

Jacketed Tape Shielded Cables:

- Use the kit instructions to find and mark the jacket cutback location.
- Remove the jacket to that point.
- Find the exposed tape shield length required in the kit instructions.
- Remove the tape shield to that length and ground to the kit instructions using the kit components.

5. Semi-con cutback.

- Find the bare semi-con length required in the kit instructions.

- b. Remove the semi-con to that point.



Figure 10: Use the kit instructions to find the length of the necessary semi-con.

6. Verify.

- a. Verify that the distance between the marking tape and insulation's TFIC line is the typical installed termination length (from **Table A**).
- b. Verify that all neutral/shield and semi-con lengths and distances from the marking tape are correct according to the kit instructions.
- c. Verify that the internal components of the termination line up in the correct spots.
- d. Do any required cleaning and place kit required tapes, mastics, greases, etc. on the cable.

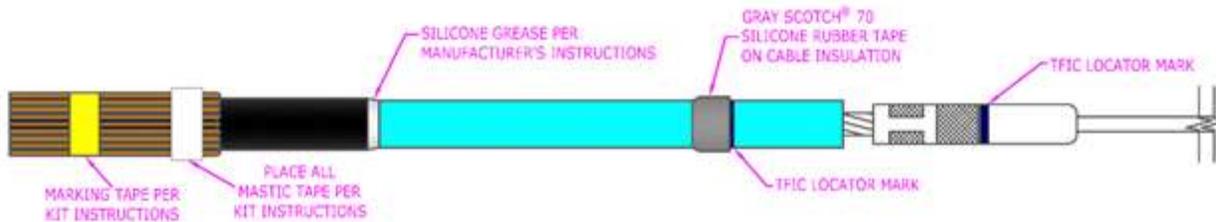


Figure 11: Place required items on cable before installing the termination.

7. Compare the cable with the template.

- a. Lay the crimped cable length next to the post-crimp portion of the template.

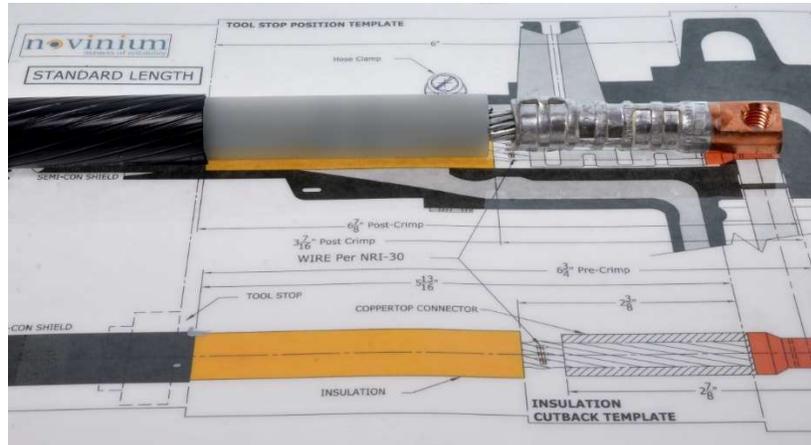


Figure 12: Check the cable against the template.

- b. Confirm that all cutbacks and post-crimp lengths are within the required ranges. Adjust or redo any, if necessary.
- c. Check the insulation and semi-con for cracks, gouges, ripples, scratches, dirt, or other defects.

Installing Termination Body and TFIC

1. Install the termination.

- a. Slide the termination body down the cable.
- b. Align the bottom of the termination with the marking tape or per kit instructions.
- c. Install according to the manufacturer's instructions.

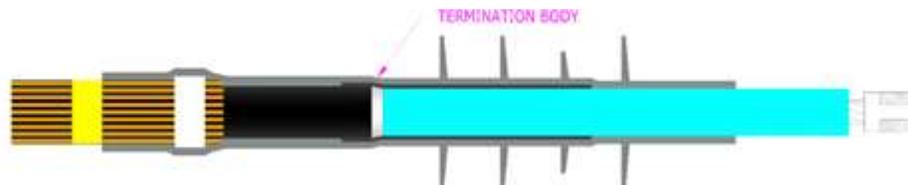


Figure 13: Hold the termination at the marking tape and deploy.

2. Install the TFIC.

- a. Align the top of the TFIC with the mark on the connector. It should butt against the body of the termination.
- b. Install the TFIC according to its instructions.



Figure 14: Line the TFIC with the line on the connector.

- c. Cover all sharp edges on the hose clamps with self-vulcanizing electrical tape.

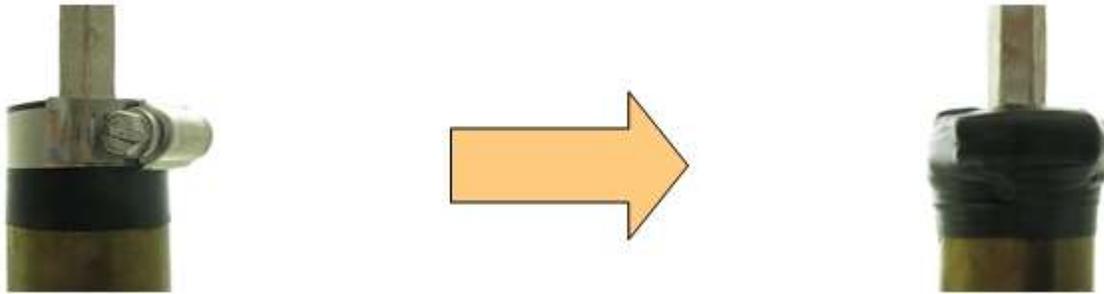


Figure 15: Use self-vulcanizing tape to smooth sharp edges.

Injection

1. Install the LFAI and inject.

- a. Follow the instructions on how to install the live-front access interface (LFAI) per [NRI 452 Injection Tools – iUPR & SPR](#).
- b. Begin iUPR injection according to [NRI 602 Small Diameter Cables \(URD\) – iUPR](#).
- c. Position the injection equipment so that it is secure and will not catch when moving away.
- d. The cable can now be returned to service.
- e. Return periodically to check the feed tank and the vacuum tank for fluid.
- f. After injection is finished, use a hot stick to remove the LFAI from the TFIC.
- g. Treat all equipment in contact with the energized cable as potentially energized.

The iUPR Process is now complete