



**Magnesium
Sacrificial
Anode**

novinium
cable life extension

**Rejuvenation
Instructions
Power Cables
Neutral
Corrosion
Repair**

The contents of this document are the property of Novinium, Inc. and may not be duplicated or distributed without the express written consent of Novinium. Novinium[®], Ultrinium[™], Tailored Injection[™], Tailored Formulation[™], Perficio[™], N-Rex[™], N-Ter[™] and Single visit – single switch[™] are trademarks of Novinium. Novinium has patents granted or pending on many of the technologies described by these instructions including but not limited to:

- Ultrinium[™] sustained pressure injection method (patent pending: US2005 0189130)
- Ultrinium[™] formulation optimization injection method
- Injection Adaptor (U.S. Patent 7,195,504 and pending US 2007 0169954)
- Perfectium[™] single switch injection
- Formulation of Ultrinium[™] & Perficio[™] components (patents pending)
- Formulation optimization (pending US 2007 0046668)
- N-Rex[™] radial exclusion process for treating long cables

Version 20080429

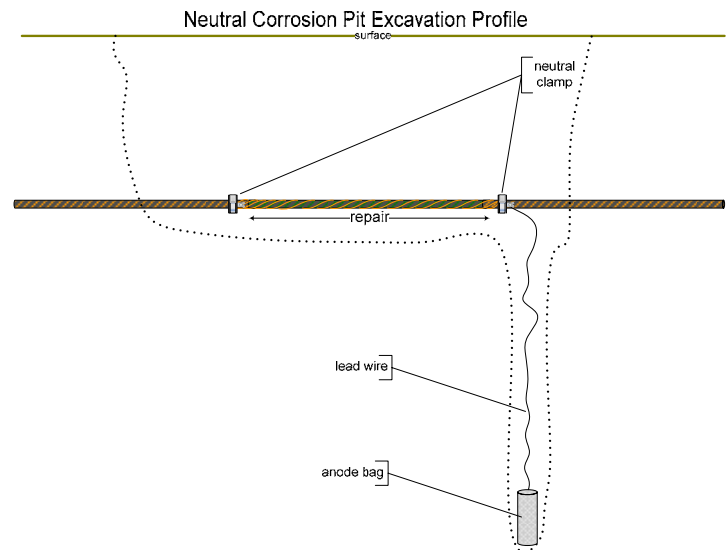
Neutral Corrosion Repair

All cables must be deenergized, tested dead, and grounded before any of these instructions may be executed. All switching operations must cease. 100% of the personnel on the site must verbally concur that it is safe to handle the cable. The ground must be connected to the termination to be handled, or in the case of a spiking operation at a cable midpoint (e.g. a splice or fault), the ground must be immediately adjacent (i.e. the connection can be confirmed by an unobstructed view of the cable between the spike and the work area) to the portion of the cable to be worked. The individual who executes these neutral corrosion repair instructions must be present when the ground is put in place and must witness and concur with the temporary removal of any ground connections. The ground connections should be left in place until their removal is required and put back in place as soon as possible. Any individual who touches an un-spiked cable at mid-span must be within an equipotential zone established with a non-corroded portion of the cable concentric neutral.



Caution: Working around energized high-voltage systems may cause serious injury or death. The procedures in these instructions should be performed by personnel familiar with good safety practice in handling high-voltage electrical equipment. De-energize, test and ground all electrical systems before proceeding.

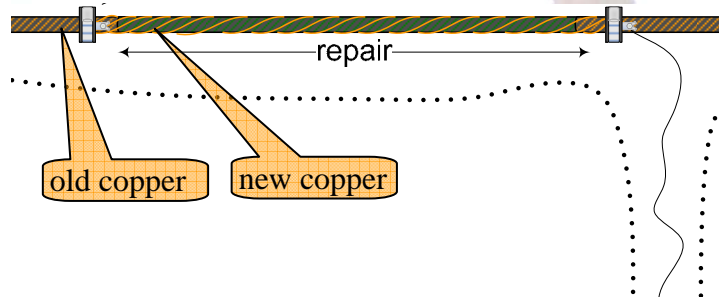
1. Excavate the neutral corrosion site pinpointed by NRI 10, “Inspect & Pinpoint” until solid neutrals are exposed on both ends of the corrosion site.
2. Excavate a 9” diameter hole perpendicular to the cable axis to receive a sacrificial magnesium anode. The end of the hole should terminate no less than 6 feet (2 meters) from the cable. The hole may be vertical, horizontal, or anywhere in between.
3. Attach a equipotential grounding mat such as the Basic EQUI-MAT™ Personal Protective Ground Grid (C600-2850) available from Chance (Hubbell Power Systems) to a good system neutral. Place the mat in a location so that anyone executing the following instructions can remain on the mat at all times when in contact with the cable.



- Clean embedded soil from the neutrals and gently wire brush the clean copper on either side of the damaged neutral wires.



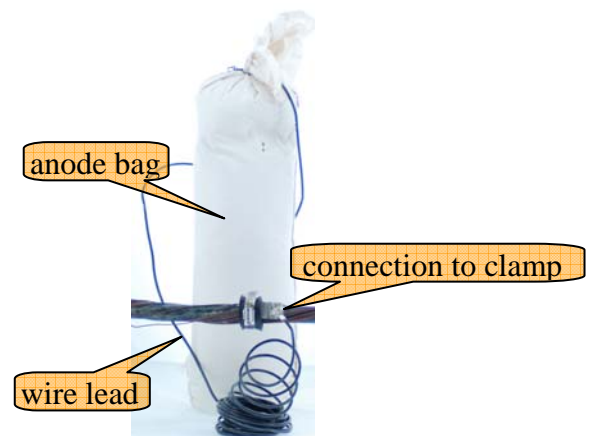
- Apply a helical wrap of new copper wires with a total cross section greater than that of the original cable over the corroded length. Use tie wraps every 6 inches (15 cm) to hold the neutrals in place and hold the neutrals in intimate contact with the insulation shield of the cable.



- Attach a neutral clamp (NPN: 1-NC-NCLAMP) at both ends of the new copper such that both the old and new copper are in direct electrical contact with the tinned-copper inner sleeve. Tighten the hose clamp snug, but do not over tighten.



- Place a sacrificial anode (NPN: 1-NC-ANODE09) into the bottom end of the hole excavated in step 2. Connect the wire lead from the anode to one or both of the neutral clamps. Crimp or solder the connection to make it permanent.



- Replace and pack soil into the 9" diameter hole which holds the magnesium anode. Replace the soil in the excavated pit.