

# Safe Work Practices



<b>Title:</b>  <b>Line Voltage Regulator Installation</b>	<b>Reference:</b> SWP-5.06	<b>Revision:</b>
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	<b>Revised:</b>	

## 1.0 GENERAL

- 1.1 Voltage regulators are installed on distribution lines to provide regulation between light and heavy load conditions.
- 1.2 Regulator installation should be reviewed with the Planning & Engineering Department.
- 1.3 An approved switching procedure is required to install or remove the regulator.
- 1.4 Risk assessment shall be completed prior to work.

## 2.0 HANDLING AND TRANSPORTING

Note: Because of the hazards associated with aerial devices coming in contact with overhead and underground energized conductors, the operator of any aerial device must always stand on the designated operator platform while performing any operation which could potentially bring the aerial device within the limits of approach of energized conductors, and all other personnel must remain clear of the vehicle, the boom, boom accessories, and winch line while the aerial device is being operated unless proper protective equipment is utilized.

- 2.1 Before handling a regulator, check the weight on the nameplate.
- 2.2 The truck capacity chart should be referred to, to make the operators aware of the limitations when lifting equipment as heavy as a regulator.
- 2.3 Determine if available slings will meet the weight requirements. Use two slings attached to the load line and to the regulator lifting lugs. Figure 1.
- 2.4 Ensure the slings are tucked firmly into the lifting lugs.
- 2.5 Lift the regulator with lifting lugs located on the top side of the tank only. Do not use the lifting eye situated on the tank cover. It shall be used for internal inspection only.

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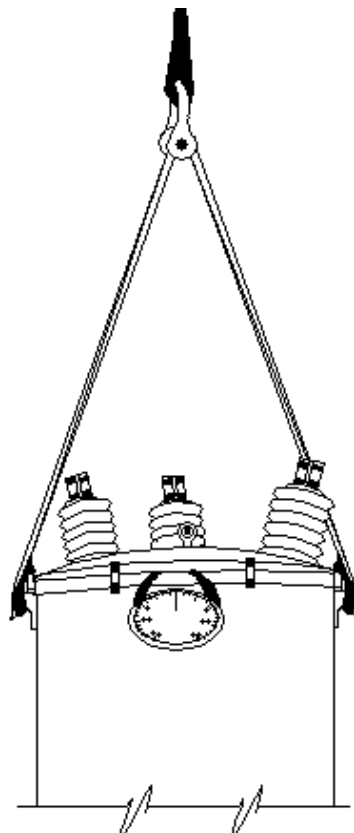


FIGURE 1

## 3.0 POLE MOUNTING

- 3.1 Minimum 45 ft. class '3' pole shall be used for installing regulators. Refer to EM Distribution Standards drawing 1401 and 1403 for pole mounting.
- 3.2 Install a floating dead-end by using live line techniques. Leave jumper installed. Install stirrups on the load and line side of the dead-end.
- 3.3 Install the by-pass switch, leaving all blades open.
- 3.4 Regulator taps shall be #2 copper (min.). Regulators larger than 150 amps shall have 1/0 copper taps. By-Pass wire size shall match main line conductor ampacity.
- 3.5 Double dead-end construction is preferred. However, in line dead-end is acceptable.

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## 4.0 PLATFORM STRUCTURE

- 4.1 Refer to EM Distribution Standards drawing 1402 and 1404 for regulators platform mounted and 1405 for aluminum platform details.
- 4.2 Install floating dead-ends using live line techniques. Leave jumpers installed. Install stirrups on the load and line side of the floating dead-ends.
- 4.3 Do not install by-pass switches or the timber supporting them until after the regulators have been placed on the structure. Leave all blades on the by-pass switches open.
- 4.4 Install support guys, as required, on each pole.

## 5.0 GROUNDING

- 5.1 Grounding to be in accordance with Standard 102 of the EM Standards Manual.
- 5.2 Bond the control panel, and regulator case lug, to the down ground.
- 5.3 Install #2 AWG copper conductor to the "SL" bushing and connect directly to the system neutral.

## 6.0 PLACING REGULATOR IN SERVICE

- 6.1 Confirm settings for voltage level, bandwidth, time delay and line drop compensation.
- 6.2 Put the regulator mechanism in the "neutral" and off position. Check the position indicator and neutral light.  
  
Note: When by-passing regulator, if neutral light and neutral indicator on dial are not both stating neutral position, then DO NOT BY-PASS!
- 6.3 Turn the control circuit breaker or voltage source switch off
- 6.4 With a shotgun stick, attach the primary leads to the stirrups on source and load side of the floating dead-end.
- 6.5 Close the by-pass blade of the by-pass switch.
- 6.6 Remove the jumper from the floating dead-end.
- 6.7 Close the blade energizing the source side of the regulator or the "S" bushing. Open the by-pass.
- 6.8 Switch control on.
- 6.9 Switch control on and turn the transfer switch to the "Auto" position. Allow time for preset delay between operations.
- 6.10 Check the voltage down line to ensure the regulator is working correctly.

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**7.0 REMOVING REGULATOR FROM SERVICE**

7.1 Operate the regulator switch mechanism to neutral position (position 0) as shown on the position indicator. The neutral light should come on.

Note: Allow time for preset delay between operations.

7.2 Open the control circuit breaker or turn the voltage source switch off.

7.3 Turn transfer switch to the "manual" or "off" position.

7.4 Close the by-pass blade to shunt the regulator.

7.5 Open the source side blade to the "S" bushing.

7.6 Remove the load side tap to the "L" bushing.

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