One Percent (1%) Worst Performing Circuit Reliability Toolbox

PURPOSE: This "toolbox" is intended to help aid the reliability engineers on potential design improvements:

Sectionalizing/Fusing

- Additional fusing - limits the number of customers impacted by an outage. Identify areas where there are unfused taps and apply engineering judgment on protection.
  - Check fuse coordination.
  - Resettable Electronic Sectionalizer (RES) – to allow additional layers of sectionalizing and to coordinate with single-phase reclosers and existing downstream fuses.
  - Drop out reclosers installed in cutouts (e.g. TripSaver™)
  - Oil reclosers – install single-phase or three-phase reclosers on lateral taps.
- Distribution Automation - For 12kV circuits with a high incidence of breaker lockouts with multiple causes, consider application of recloser schemes tailored to the circuit outage characteristics:
  - Automatic line recloser - for circuits with majority of outages located on the second half or tail end of the circuit.
  - Automatic line recloser with a tie recloser at end of circuit - for circuits with unrelated outages spread across the entire circuit.
- Station auto-reclosing – for circuits with an aggregate of more than 0.5 miles of man-stem overhead exposure up to the first DA device(s). (See TB-09-076)

Lightning arrester protection

- Look for data correlation between circuit lockouts attributed to lightning and strike location data. Perform targeted application of lightning protection.

Conductors (overhead and underground)

- Excessive splices - identify areas where there are conductors with excessive splices and apply engineering judgment on targeted replacement. If wire replacement is required, determine if same size or other sized replacements are appropriate.
- Slack spans - either remove the slack or install phase separators.
- Cable failures - identify areas with repeated mainline cable failures and determine if diagnostic testing is warranted. (See OP-CE-210004)
- Review existing WO task backlog of leaking cable/joint(s) on the 1% circuit
- Hendrix spacer cable - identify areas with repeated tree outages and apply engineering judgment on targeted installation of tree resistant Hendrix spacer cable.
- Aerial Cable- identify areas with repeated tree outages and apply engineering judgment on targeted installations.

Other pole or equipment adequacy

- Pole hits - identify areas with repeated pole hits and apply engineering judgment on pole relocation or barriers.
- Wildlife - identify areas with repeated wildlife outages an install: split tube tap wire covering, electrostatic guard, or "clam-shell" transformer bushing covers.