Technical Procedure

Steel Pole Inspection and Maintenance Guideline

Background

In general, a hot dip galvanised steel pole will not require maintenance over its service life. The rate of corrosion of a galvanised steel pole internally is generally an order of magnitude smaller than the external corrosion rate (i.e. approximately one tenth of the external rate). The external rate of corrosion or the rate of loss of the hot dip galvanised coating is dependent on the exposure classification and local topography. For an in-ground mounted pole, the oxygen rich ground line area is generally the area of the highest rate of corrosion.

Scope of work

This guideline aims to recommend a suitable asset management maintenance plan by evaluating the general condition of nominated steel pole in-situ at a set period of time from installation. A simpler or a more detailed assessment may be made.

Methodology

1. Create a site plan
2. Prepare the pole for inspection
3. Simple Assessment method
    a. Inspect pole externally only
4. Detailed Assessment method. In addition to above;
    a. Measure the pole coating thickness
    b. Measure the pole steel thickness at the base only if significant rust is visible
    c. Photographic documentation

Site plan

Create or use an existing site plan to clearly identify and mark the location of the individual poles inspected, using an appropriate numbering sequence. Any existing pole identification numbers are to be noted on the site plan as a cross reference.

Inspection Preparation

Each pole that is to be inspected needs to have the soil and vegetation around the base removed for the full perimeter of the pole to reveal the ground line interface. This is where corrosion is most likely to occur.

Simple Assessment Method

External inspection only

Examine the area immediately above and below the natural ground line for signs of corrosion. Inspect steel poles to a depth of 100mm below ground line in natural ground conditions only. Where there is concrete or cement-stabilised soil inspect only to the ground line (unless prior arrangements have been made with the customer to expose the base of the poles).

If rust is detected and it continues beyond 100mm dig down further to ascertain the extent of the rust. Dig no deeper than 350mm.

Where an additional corrosion protection enhancement has been applied, check to see that the additional protection remains intact and if any sign of corrosion exists.

Simple Asset Management Plan

For a typical A2 exposure classification (to AS4676) at 15 years from installation, inspect the pole externally only as per above.

If there is no sign of corrosion, reinspect in another 15 years. For a B2 exposure classification, initially inspect at 10 years.

If the beginning of corrosion is evident, reinspect sooner or establish a coating thickness measurement program (see Detailed Assessment Method below).

Detailed Assessment Method

Carry out the simple assessment method followed by;

Coating Thickness

Each pole is to be tested externally to determine the condition of the galvanising and/or the applied coating, using a Positector 6000 electronic thickness gauge or similarly accurate device. A series of six readings around the base of the pole are to be taken at the exposed pole ground line area. Another series of say five readings at 300mm intervals up the pole from the ground line on three different faces should be made to determine the coating profile of the above ground pole portion.

For galvanised poles, AS/NZS 4680:2006 Table 1 provides average coating thicknesses minimums for different steel thicknesses.

Steel Thickness Testing (only if significant rust is visible)

Each pole is to be tested ultrasonically using a Sonagage II ultrasonic thickness gauge or equivalent to determine the original steel thickness and to detect any reduction in steel thickness in areas affected by corrosion.

Photographic documentation

Digital photographs are to be taken to illustrate any pertinent details presented during the inspection.

Detailed Asset Management Plan

For a typical A2 exposure classification, inspect the pole at 15 years from installation externally as per above.

In determining the approximate loss of galvanising over the 15 year period, as a guide base the initial average coating thickness on the average coating thickness minimum requirement in Table 1 of AS/NZS 4680:2006. Based on the approximate loss of galvanising over the 15 years, calculate the average loss of galvanising (corrosion rate) per year.

As there is a linear progression of loss of galvanising, an estimated service life and subsequent inspection program can be easily established based on the data.

For a B2 exposure classification initially inspect at 10 years.

Should significant rust be visible, contact International Utility Poles (IUP) for further advice or assessment.

Acid Sulphate & High Salt Content Soils

Poles in these areas should be initially inspected at 10 year intervals.

If the beginning of corrosion is evident, reinspect sooner (five year intervals or less) or establish a coating thickness measurement program (see Detailed Assessment Method above).

Maintenance of Galvanised Steel Poles

If there is no visible rusting or damage to the galvanised coating, no maintenance is required.

If there is damage to the galvanising or light rusting, see the IUP galvanising repair procedure for further action.