This standard is designed to verify that a dc control relay with time delay is in a safe and reliable operating condition. In the event that the relay is not in this condition then this standard will establish the reconditioning requirements. The term "reconditioning" is defined as "the process of returning electrical equipment to safe and reliable operating condition based upon the design of the original manufacturer at the time of manufacturing."

REFERENCES

The following references are use in this standard. Each of these references can be found in their respective listed locations.

Table References: Section 6000

Table 2: Insulation resistance and test values for electrical apparatus.
Table 11: Insulation resistance and test temperature conversion to 20°C values.

I TEST EQUIPMENT

The following test equipment is required to perform the testing requirements of this reconditioning standard:

1. Insulation Resistance Test Set (Megohmeter) 500 Vdc minimum
2. DC Voltage Supply
3. Multimeter
4. Timer with a DC voltage applied START Circuit

II RECONDITION EVALUATION

These steps are used to determine what will be required to recondition this product under this standard.

1 INSPECTION

1.1 General

1.1.1 Ensure that the nameplate data is legible.
1.1.2 Ensure that the third party listing service label is legible.
1.1.3 Inspect for missing screws
1.1.4 Check for stripped screws
1.1.5 Inspect case for cracks
1.1.6 Inspect exterior surface for signs of;
1.1.6.1 Contamination
1.1.6.2 Overheating
1.1.6.3 Corrosion
1.1.6.4 Rust
1.1.7 Record results on an approved PEARL Evaluation Form.

2 TESTING

2.1 Operation

2.1.1 Contact Transfer
2.1.1.1 Using a multimeter verify each contact state (NO or NC)
2.1.1.2 Set Time Delay to Minimum setting
2.1.1.3 Apply rated voltage to operating coil
2.1.1.4 Using a multimeter verify the transfer of each contact after time delay has timed out.
2.1.1.5 Remove rated voltage
2.1.1.6 Record results on an approved PEARL Evaluation Form.
2.1.2 Minimum Operating Voltage
2.1.2.1 Increase voltage to operating coil until relay operates
2.1.2.2 Record as minimum operating voltage.
2.1.2.3 Remove voltage
2.1.2.4 Compare manufacturer's minimum operating voltage to test voltage found in 2.1.2.2 above.
2.1.2.5 Record results on an approved PEARL Evaluation Form.
2.1.3 Minimum Time Delay
2.1.3.1 Connect timer test circuit to relay
2.1.3.2 Apply manufacturers rated voltage to operating coil
2.1.3.3 Record minimum time of operation
2.1.3.4 Remove voltage
2.1.3.5 Compare minimum time of operation with manufacturer's specification.
2.1.3.6 Record results on an approved PEARL Evaluation Form.

2.1.4 Maximum Time Delay
- **2.1.4.1** Connect timer test circuit to relay
- **2.1.4.2** Apply manufacturers rated voltage to operating coil
- **2.1.4.3** Record maximum time of operation
- **2.1.4.4** Remove voltage
- **2.1.4.5** Compare maximum time of operation with manufacturer's specification.
- **2.1.4.6** Record results on an approved PEARL Evaluation Form.

2.2 Insulation Resistance

2.2.1 Perform an insulation resistance test at test voltage specified by manufacturer or using a 500 volt dc megohmeter.
- **2.2.1.1** Relay De-energized
  - **2.2.1.1.1** Test across each contact
  - **2.2.1.1.2** Test between contacts on the line side
  - **2.2.1.1.3** Test between contacts on the load side
- **2.2.1.2** Relay Energized
  - **2.2.1.2.1** Test between contacts
- **2.2.1.3** Record results on an approved PEARL Evaluation Form.

2.2.2 Compare test results to manufacturer's recommendations or a minimum of 1 megohm.

III RECONDITIONING PROCEDURES

The following procedures are in a recommended order and are required to recondition this product. PEARL recognizes that, based on actual product design and as found condition, some of these procedures may not be applicable. The testing requirement must be completed before the product can be labeled as a PEARL reconditioned product.

1 RECONDITIONING

1.1 Exterior

1.1.1 Clean all exterior surface to remove any:

1.1.1.1 Contamination

1.1.1.2 Corrosion.

1.1.2 Record results on an approved PEARL Reconditioning Test Form.

1.2. Missing or Defective Components, Parts and Hardware

1.2.1 Replace or repair any missing or defective components, parts and hardware found during the inspection phase of this standard.

1.2.2 Replace any defective contact or contact assembly, if necessary

1.2.3 Replace time delay unit, if necessary

1.2.4 Record results on an approved PEARL Reconditioning Test Form

2 TESTING

2.1 Operation

2.1.1 Contact Transfer

2.1.1.1 Using a multimeter verify each contact state (NO or NC)

2.1.1.2 Set Time Delay to Minimum setting

2.1.1.3 Apply rated voltage to operating coil

2.1.1.4 Using a multimeter verify the transfer of each contact after time delay has timed out.

2.1.1.5 Remove rated voltage

2.1.1.6 Record results on an approved PEARL Reconditioning Test Form

2.1.2 Minimum Operating Voltage

2.1.2.1 Increase voltage to operating coil until relay operates

2.1.2.2 Record as minimum operating voltage.

2.1.2.3 Remove voltage

2.1.2.4 Compare manufacturer's minimum operating voltage to test voltage found in 2.1.2.2 above.

2.1.2.5 Record results on an approved PEARL Reconditioning Test Form

2.1.3 Minimum Time Delay
- **2.1.3.1** Connect timer test circuit to relay
- **2.1.3.2** Apply manufacturers rated voltage to operating coil
- **2.1.3.3** Record minimum time of operation
- **2.1.3.4** Remove voltage
- **2.1.3.5** Compare minimum time of operation with manufacturer's specification.
- **2.1.3.6** Record results on an approved PEARL Reconditioning Test Form.

2.1.4 Maximum Time Delay
- **2.1.4.1** Connect timer test circuit to relay
- **2.1.4.2** Apply manufacturers rated voltage to operating coil
- **2.1.4.3** Record maximum time of operation
- **2.1.4.4** Remove voltage
- **2.1.4.5** Compare maximum time of operation with manufacturer's specification
- **2.1.4.6** Record results on an approved PEARL Reconditioning Test Form.

2.2 Insulation Resistance

2.2.1 Perform an insulation resistance test at test voltage specified by manufacturer or using a 500 volt dc megohmeter.
- **2.2.1.1** Relay De-energized
  - **2.2.1.1.1** Test across each contact
  - **2.2.1.1.2** Test between contacts on the line side
  - **2.2.1.1.3** Test between contacts on the load side
- **2.2.1.2** Relay Energized
  - **2.2.1.2.1** Test between contacts
- **2.2.1.3** Record results on an approved PEARL Reconditioning Test Form.
- **2.2.1.4** Compare test results to manufacturer's recommendations or a minimum of 1 megohm.

2.2.2 The test results must be within the guidelines recommended in order for the product to become a PEARL labeled product.

IV PEARL CERTIFICATION

This product has now been reconditioned under the PEARL Reconditioning Standard. The blue PEARL Reconditioning Quality Seal may now be placed on the device.