The purpose of the **TR-HIREL-1** is to provide the user with an established, pre-formatted specification meeting the requirements of the **NASA/GSFC S311-P-754**, **European Space Agency (ESA) Specification SCC/3601 & 3601** and the latest **NASA Document EEE-INST-002, Instructions for EEE Parts Selection, Screening, Qualification and Derating**. The default requirements of the TR-HIREL meet all three referenced specifications with the following ‘Final Production Tests” and “Screening and Electrical Measurements”:

**100% Pre-cap inspection (Criteria establishing the standard methods for inspection prior to hermetic sealing)**

(Teledyne Relays’ Procedure of Internal Inspection, Document 0-40-115)

**Small Particle Inspection/Millipore Clean (in-process inspection to further evaluate relay cleanliness**

**Through an automated small particle inspection process prior to sealing)**

(Teledyne Relays’ Pre-cap Small Particle Inspection, Document 0-40-265)

**Sinusoidal Vibration (Standard Vibration test, sinusoidal and random, as specified by MIL-PRF-39016 & MIL-PRF-28776)**

(MIL-STD-202, Method 204; Test Method: Vibration, High Frequency)

**Particle Impact Noise Detection (P.IN.D.) (This test is designed to detect the presence of loose particles in sealed relays. This test method meets the criteria of MIL-R-39016E, Appendix B\*)**

(Teledyne Relays’ Particle Impact Noise Detection, Document 0-40-824)

**Temperature Conditioning & High and Low Temperature Miss Test (Internal Moisture and High and Low Temperature Run-In tests per the requirement of MIL-PRF-39016 & MIL-PRF-28776)**

(MIL-STD-202, Method 107 Test Method: Thermal Shock)

**Room Temperature Miss Test (Relays shall be subjected to a 2,500 cycle run-in test at**

**applicable ambient temperatures).**

(MIL-PRF-39016)

**Electrical Measurements (used to prove that the component part can operate safely at its rated voltage)**

(MIL-PRF-39016 & MIL-STD-202)

**Leak/Seal Test The purpose of this test method is to determine the effectiveness of the seal of a component part**

**which has an internal cavity which is either evacuated or contains air or gas (there shall be no leakage in excess of1 × 10–8 atm-cm3/s of air)**

(MIL-STD-202, Method 112 Test Method: Seal)

**Radiographic Inspection (X-ray) (Each relay shall be examined to determine proper internal construction and workmanship)**

(Teledyne Relays’ Radiographic Inspection of Relays, Document No. 0-40-193

**External Visual and Mechanical Inspection (Relays shall be examined to verify that the marking, header glass, external design and construction, physical dimensions and workmanship are in accordance with Teledyne Relays’ acceptance criteria)**

(Teledyne Relays’ Inspection Criteria, External Visual and Mechanical, Document 0-40-913)

The TR-HIREL-1 specification is a guideline to aid in the procurement of electromechanical relays furnished

to meet the requirements of all applicable electro-mechanical specifications:

* MIL-PRF-39016
* MIL-PRF-28776
* NASA/GSFC S-311-P-754
* NASA EEE-INST-002
* ESA/SCC 3601
* ESA/SCC 3602

The TR-HIREL-1 provides an efficient cost effective alternative to the requirements for Source Control Drawings (SCD) and the cycle of specification reviews associated with them. The TR-HIREL-1 has the heritage and credibility of worldwide recognition and use in every facet of the space community. Relays screened in accordance with the TR-HIREL-1 are currently in use on communications satellites, deep space probes and launch vehicles. The specification has been embraced on an international level because of its ability to satisfy NASA and ESA requirements with its default requirements. In addition to being used as a stand-alone procurement specification the TR-HIREL-1 has been used as the baseline for customer SCD’s.

