Assets Planning and Delivery Group
Engineering

HA-ST-06

Electrical Equipment in Hazardous Areas (EEHA) Testing Standard

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REVISION 5

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FOREWORD

Electrical Equipment in Hazardous Area (EEHA) Standards are prepared to ensure that the Water Corporation's staff, consultants and contractors are informed as to the Water Corporation's EEHA standards and recommended practices. EEHA standards are intended to promote uniformity so as to simplify selection, installation and maintenance practices; their ultimate objective is to provide safe and functional plant, at minimum whole of life cost.

The Water Corporation EEHA standards and recommended practices described in this EEHA standard have evolved over a number of years as a result of capital project delivery, plant operation and maintenance experience gained through the selection, installation and maintenance of electrical equipment in our hazardous area facilities.

Deviation, on a particular project, from the EEHA standards and recommended practices maybe permitted in special circumstances but only after consultation with and endorsement by the Senior Principal Electrical Engineer, Mechanical & Electrical Assets, Engineering.

Users are invited to forward submissions for continuous improvement to the Senior Principal Electrical Engineer, Mechanical & Electrical Assets who will consider these for incorporation into future revisions.

Head of Engineering

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Users should use and reference the current version of this document.

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REVISION STATUS

The revision status of this standard is shown section by section below:

REVISION STATUS						
SECT.	**VER./ REV.**	**DATE**	**PAGES REVISED**	**REVISION DESCRIPTION (Section, Clause, Sub-Clause)**	**RVWD.**	**APRV.**
All	1/0	24/08/12	All	Original (First) Version	-	-
All	1/1	04/04/12	All	Updated Formatting	FL	RC
All	1/2	30/11/13	All	Updated Formatting	AW	JO
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1 INTRODUCTION

1.1 Scope

This Standard specifies the testing requirements for explosion-protected electrical installations on Water Corporation facilities to ensure the safety of the installation and personnel and plant safety during testing. The intention of this Standard is to expand upon the requirements of AS/NZS 60079.17 and to specify additional Water Corporation requirements.

This Standard covers the testing of new installations, planned periodic testing of existing installations, and testing during breakdowns.

The requirements of this Standard are in addition to the general requirements for testing of electrical installations.

1.2 Exclusions

This Standard does not apply to electrical installations in non-hazardous areas, provided that there are no cables associated with the testing which traverse a hazardous area.

1.3 Abbreviations

EMF Electromotive Force

IS Intrinsically Safe

TIC Technical Integrity Custodian

WWTP Waste Water Treatment Plant

1.4 Technical Integrity Custodian

The Technical Integrity Custodian (TIC) for this Standard is the Senior Principal Electrical Engineer, Mechanical & Electrical Assets.

1.5 Referenced Documents

The following documents are referenced in this Standard. If a referenced standard has been superseded, the user shall notify the TIC and utilize the latest edition of the standard unless advised otherwise in writing by the TIC.

AS/NZS 60079.17:2017	Explosive atmospheres Part 17: Electrical installations inspection and maintenance
AS/NZS 3000:2018	Electrical installations (known as Australian/ New Zealand Wiring Rules)
HA-ST-04	Electrical Equipment in Hazardous Areas (EEHA) – Competency Standard
HA-WI-02	Hazardous Area Cable Testing Work Instruction
HA-WI-03	IS Earth Testing Work Instruction

2 GENERAL

Electrical installations in a hazardous area on the Water Corporation's facilities shall be tested in accordance with the requirements of AS/NZS 3000, AS/NZS 60079.17, and this Standard.

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Explosion-protected electrical equipment in a non-hazardous area does not have to be tested in accordance with this Standard because lack of testing will not prevent the equipment from being suitable to be relocated - if necessary to a hazardous area.

New explosion-protected electrical installations must be fully tested prior to energisation, to ensure that they operate correctly and that their safety features are fully functional. In addition, periodic testing of explosion-protection electrical installations is required to ensure that their safety features are not compromised due to potential deterioration. Periodic testing work instructions are contained in maintenance work instructions stored in the Hazardous Area Verification Dossier.

3 TESTING

3.1 Safety

3.1.1 General

To prevent safety being compromised during testing, the testing of circuits in, or traversing hazardous areas, shall be performed in accordance with this Standard and Flammable Gas Area (FGA) Procedure.

NOTE: Caution is needed to ensure that isolated equipment is not live after the isolation of the supply. This can occur if: capacitors have not discharged, there is back EMF from rotating equipment, emergency batteries are not isolated, etc.

3.1.2 Job Hazard Analysis

A Job Hazard Analysis shall be performed prior to commencing any test. The analysis shall include the identification of any ignition sources and explosive atmospheres associated with proposed testing, and shall identify ways to mitigate the risk of ignition. For common tests such as cable testing, and IS earth testing, Water Corporation's work instructions exist to ensure a standard approach (Refer HA-WI-02 and HA-WI-03 respectively).

3.2 Testing New Installations

3.2.1 General

New installations shall be tested in accordance with AS/NZS 3000. These tests are specified in the relevant Installation Specifications, and include:

- Cable insulation resistance
- Earth continuity and resistance
- Setting of Protection devices
- Polarity

Exemption from testing shall require TIC written approval.

3.2.2 Intrinsic Safety

The testing of intrinsically safe installations shall comply with section 3.2.1, and the additional requirements of this section.

All new intrinsically safe circuits shall be tested to prove that there are no unintentional earths prior to connecting the circuits to the barriers.

All new intrinsically safe earth installations shall be tested prior to commissioning to ensure that their resistance is acceptable, and that they are only connected to earth at the specified locations. The resistance of the intrinsically safe earth shall be checked at least every two years.

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3.3 Periodic Testing Of Existing Installations

Periodic testing of the electrical installation shall be undertaken in accordance with the relevant maintenance strategy for the electrical equipment to ensure its continuing compliance with the relevant standards. These tests include:

- Earth continuity and resistance
- Setting of protection devices
- Intrinsically Safe earth continuity and resistance
- Intrinsically Safe earth free test
- Equipment tests (such as purge timer settings and actions on pressurization failure
- on Ex p enclosures, seal quality tests on Ex nR (restricted breathing) enclosures

3.4 Hazardous Area Verification Dossier

The results of all tests shall be recorded in the Water Corporation hazardous area verification dossier.

3.5 Competency

All persons testing electrical installations in hazardous areas shall comply with the relevant requirements of the Water Corporation's Electrical Equipment in Hazardous Areas (EEHA) Competency Standard: HA-ST-04.

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END OF DOCUMENT

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