EWIS Interoperability Forum
Test Round 04E

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Release 1.0

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Document History

Release	Date	Change
1.0	2021-12-09	Initial Release

1   Introduction

This document describes the suite of test cases to be used for the first round of testing in the Electrical Wire Harness Interconnect System (EWIS) Implementer Forum (IF). The EWIS-IF is a joint testing forum, organized and facilitated by AFNeT and PDES, Inc.. The test rounds of the EWIS-IF concentrate primarily on testing the interoperability and compliance of STEP processors based on AP242 Ed. 2, amendment (upcoming)

The test rounds in general combine testing of synthetic and production models. Production models will in most cases be provided by the member companies of the organizations AFNeT and PDES, Inc.. When production models are not available from the member companies, "production-like" models will be solicited from the various EWIS-IF participants.

This test round focuses on the AP242ed2 Domain Model XML format.

1.1   Functionality tested in this round

Functionality tested in this round relates to:

- **EWH_Assembly1** with the specific needs for
    - part categories:
        - discrete_part, raw_material_by_length
        - wire, cable, connector, lug
    - WiringHarnessAssemblyDesign, subtype of AssemblyDefinition
    - QuantifiedOccurrence, WireOccurrence, CableOccurrence

- **EWH_Topology1**
    - WiringHarnessAssemblyDesign with topology
    - EdgeBasedTopologicalRepresentationWithLengthConstraint, with EdgeBoundedCurveWithLength & BoundedCurveWithLength, Vertex-Point & Point, ConnectedEdgeSet

- **EWH_Topology2**
    - extension of EWH-Topology1 with simplified EWH-Assembly1
    - enhanced topology model with Path, SubEdge, PointOnCurve
    - GeometryToTopologyModelAssociation

- **EWH_Topology3**
    - extension of EWH-Topology2
    - external reference to complete p21 files for part geometry
    - external element reference into p21 files to select curves and axis_placements
    - TopologyToGeometryModelAssociation

- **EWH_Connectivity1**
    - basic connectivity between a simple connector, a terminal lug, a wire and a cable
    - PartTerminal, OccurrenceTerminal
    - WireIdentification & WireOccurrenceTerminal

- o   CableOccurrenceTerminal & CableOccurrenceTerminalLocationGroup

- o   electrical AssemblyShapeJoint & AssemblyShapeJointItemRelationship

- **EWH_Connectivity2**

  - o   extension of Connectivity1

  - o   ContactFeatureDefinition for cavity_profile and contact_profile with corresponding ContactFeatureDefinitionFitRelationship

  - o   PartContactFeature & OccurrenceContactFeature

  - o   mechanical AssemblyShapeJoint & AssemblyShapeJointItemRelationship

- **EWH_Connectivity3**

  - o   EWH design with coaxial connector assembly and cable cable

- **EWH_Connectivity4**

  - o   EWH design with a 2 core shielded cable, with connector with backshell, one of which is electrified while for the other a shield sleeve is used

- **EWH_Connectivity5**

  - o   EWH design with modular EPX B2 connector and quadrax contact & cable

1.2   *General testing instructions for this round*

The general procedures for communication of models and statistics are outlined in a separate document, named 'General Testing Instructions' (to be provided at a later time).

All documents and public results of the EWIS-IF will be published on the web: https://www.cax-if.org/

1.3   *Testing Schedule*

The following schedule has been agreed on for Round 04E:

2021-09-22   Joint EWIS-IF: Introduction of schema enhancements for round 04E
2021-12-01   Joint EWIS-IF: Update of EWH_Connectivity3
2021-12-08   IG conference call: introduction to EWH_Connectivity5 test case
2021-12-09   Final release of Test Suite 04E
2022-01-11   IG conference call: review of implementation status
2022-02-01   Optional: IG conference call: review of implementation status
2022-03-01   Optional: IG conference call: review of implementation status
2022-03-16/17 Joint EWIS-IF meetings, presentation of results
2022-03-18   CAx/MBx/EWIS-IF Round table

2   Document references

This test round is based on the following documents:

- STEP: ISO 10303 "Industrial automation systems and integration -- Product data representation and exchange"

  - AP242 ed2: ISO/IS 10303-242 (2020): Application protocol: Managed model-based 3D engineering" and the changes in the upcoming amendment

  - XSD of AP242 ed2 amendment (and further) for the Domain Model documented in SysML:

    - DomainModel.xsd; updated from 2021-09-17

    - DomainModel.exp; update from 2021-09-20

- Recommended Practices for AP242 Business Object Model XML Assembly Structure, Release 2.99.03; 2021-03-24
  https://www.cax-if.org/joint_testing_info.html#recpracs

- STEP AP 242 Electrical Harness XML Tutorial, Version: pre 1.2, Date: 2019-02-22 with the following example files:

  - HarnessExample_Hierarchical.xml; update 2021-12-02

  - HarnessExample_HierarchicalReflect.xml; update 2021-12-02

  - HarnessExample_Flat.xml; update 2021-12-02

  - HarnessExample_DesignSplitting.xml; update 2021-12-02

- AP242 ed2 Electrical Wire Harness (EWS) Tutorial
  – Slides part 1 v2.0, 2020-09-09
  – Slides part 2 v2.4, 2021-12-02

- EWIS Interoperability Forum, Test Suite v4.0, 2021-12-09

3   Synthetic Test Case Specifications

The details for testing are documented in the EWIS-IF Test-Suite v3.0.

This round contains the following formal test cases (all):

- EWH-Assembly1

- EWH-Topology1

- EWH-Topology2

- EWH-Topology3

- EWH-Connectivity1

- EWH-Connectivity2

- EWH-Connectivity3

- EWH-Connectivity4

- EWH-Connectivity5

At of today these test cases are only suitable for preprocessor testing, as no example EWIS corresponding XML files are available yet. The responsible team is trying to make such files available as soon as possible.

In addition implementers are encouraged to try to import the provided XML files from the EWIS tutorial and to report about the results.