



European Network of  
Transmission System Operators  
for Electricity

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# INTEROPERABILITY TEST “CIM FOR SYSTEM DEVELOPMENT AND OPERATIONS” 2011

## **APPENDIX B: TEST PROCEDURES**

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5 JULY 2011

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FINAL VERSION

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## 7 APPENDIX B: TEST PROCEDURES

### 7.1 TEST RULES

#### 7.1.1 ON-SITE RULES

On-site test starts on 11 July 2011 and finishes on 15 July 2011. Test participants should be present in the ENTSO-E premises between 8:00h and 18:00h.

The following ground rules to be followed during the ENTSO-E Interoperability test:

- Test witnesses and test witness substitutes, if any, need to familiarize themselves with the test models and be able to witness the correct implementation of the ENTSO-E profiles. The test witnesses move between test participants in order to cover all vendors and ensure that each test witness witnesses each vendor. The test participants (vendors) execute all tests and complete the internal validation as well as execute the validation tools for the external file validation. The test witness ensures that all steps are executed and all issues are noted. The test witness scores each test following the rules defined in Section 7.1.2.
- The test participant (vendor) downloads the model files to be imported from the file storage location and the model files produced by the test participant are then uploaded to the agreed file server for use by other participants. The test participants (vendors) are responsible for the CIM/XML file validation and for ensuring that the files produced during the test are loaded onto the file server. However, the test witness should assist the test participant with these tasks as much as possible. At a minimum, the test witness should ensure the files are included on the file server. The test director ensures the contents of the file server are backed-up to a memory stick each day and makes the contents available to all test attendees upon request prior to the end of the IOP.
- Vendors must submit the product release (version ID) for the software under test. If the software is not production grade, indicate when the production release will contain this software.
- Unstructured tests may be performed if there is time and the test participant wishes to complete these tests. Any unstructured test must be documented on the test record form by the test witness for inclusion into the IOP report. Each step of the procedure followed must be fully documented.
- The test files used in the ENTSO-E IOP must contain all required classes and attributes defined in the ENTSO-E profile.
- The test participants may select what test cases and test procedure they wish to execute depending on the functionalities of their tools. The IOP report presents the results for all files used and all procedures executed.

## 7.1.2 TEST SCORING RULES

The following section provides test witnesses with guidelines how to score the tests performed by vendors. In general more attention in terms of quality and correctness is paid to the exchanges done with the 1st edition of the ENTSO-E CIM profile. The tests in which 2nd edition of the profile is involved should be witnessed taking into account that the main objective is to confirm the correctness of the profile. Specific vendor's implementation should not be judged. The goal of the scores is to provide information on the ENTSO-E CIM profile support status and identify implementation gaps to be covered in order to ensure smooth data exchanges among ENTSO-E TSOs and to support IEC CIM standards development.

The scores applied in the test do not have any ranking intention and must not be used to support any commercial interest by any of the involved in the ENTSO-E IOP participants.

The following scores are defined:

- **Score 0** The vendor (tool) does not support the given test (or do not support a key feature of the test) of the ENTSO-E CIM profiles. There is no plan to support this test/feature in upcoming sub releases (e.g. the tool is only for load flow and it is not used for dynamics simulations).
- **Score 1:** The vendor (tool) does not support the given test (or do not support a key feature of the test) of the ENTSO-E CIM profiles, but intends to support the test/feature in the upcoming releases, i.e. the tool is not ready to test this feature in this IOP.
- **Score 2:** The vendor (tool) completes the given test partly. The tool is intentionally developed to support only part of a given test (e.g. the tool is developed for data exchange and cannot run load flow calculation).
- **Score 3:** The vendor (tool) completed the given test partly, e.g. minor validation errors are present. The key feature of the test case for the given ENTSO-E CIM profile is supported.
- **Score 4:** The vendor (tool) completes the given test and it is fully compliant with the test case for the given ENTSO-E CIM profile.

### 7.1.2.1 GENERAL RULES APPLIED TO TESTS FOR THE 1ST EDITION OF THE ENTSO-E CIM PROFILE

**Score 4** is given only if the following conditions are fulfilled:

- ENTSO-E naming convention is fully supported;
- Model assembling process is successfully completed (e.g. merging/splitting of multi TSO models into EQ, TP, SV files as required by the profile);
- Solution process is successful and the results are within engineering tolerance.

**Score 3** is given if the following errors occur:

- Presence of validation errors reported by validation tools. Validation errors caused by wrong interpretation of validation tools are ignored in case they are agreed by IOP participants.
- Any other errors that are not considered critical for the data exchange.

**Score 2** is given if the following conditions occur:

- A minimum of one key feature for the test is met in full;
- Validation of the feature can be performed and documented
- RDFids are kept persistent in the file exchange process;
- No instance data is are modified or lost during the import or export;

**Score 1** is given if one of the following conditions occur:

- Any of Score 4 criteria are not met;
- There are more than 3 validation errors (errors caused by the validation tool are excluded) reported by the validation tools;
- RDFids are not kept persistent in the file exchange process;
- Imported instance data is modified and not exported in the same way as in the original instance files.

#### **7.1.2.2 GENERAL RULES APPLIED TO TESTS FOR THE 2ND EDITION OF THE ENTSO-E CIM PROFILE**

**Score 4** is given only if the following conditions are fulfilled:

- ENTSO-E naming convention is fully supported;
- Model assembling process is successfully completed (e.g. merging/splitting of multi TSO models into MAS files as required by the profile);
- Solution process is successful and the results are within engineering tolerance;
- The tool support import and export of zipped (\*.zip) file that contains one or multiple XML files (\*.xml) grouped together;
- File header is supported;
- Short circuit calculations using IEC 60909 are correct (only in case the tool is capable to perform short circuit calculations);
- Dynamics simulations results are correct (only in case the tool is capable to perform dynamics simulations);

- Diagram layout is supported (only in case the tool is capable to support diagrams);
- Geographical profile is supported (only in case the tool is capable to support GIS coordinates).

**Score 3** is given if the following errors occur:

- Presence of validation errors reported by validation tools. Validation errors caused by wrong interpretation of validation tools are ignored in case they are agreed by IOP participants.
- Any other errors that are not considered critical for the data exchange.

**Score 2** is given if the following conditions occur:

- A minimum of one key feature for the test is met in full;
- Validation of the feature can be performed and documented
- RDFids are kept persistent in the file exchange process;
- No instance data is are modified or lost during the import or export;

**Score 1** is given if one of the following conditions occur:

- Any of Score 3 criteria are not met if the vendor claim that the tool has necessary functionalities and further development is not needed;
- There are more than 5 validation errors (errors caused by the validation tool are excluded) reported by the validation tools;
- RDFids are not kept persistent in the file exchange process;
- Imported instance data is modified and not exported in the same way as in the original instance files.

### 7.1.3 IOP AGENDA

- Monday, 11 July 2011
  - 8:00h - Welcome, Introductions and Practical information – Chavdar Ivanov
  - 8:10h
    - Vendors meet in test room and complete set up
    - Test witnesses meet with Chavdar Ivanov to review the procedures and forms (20 min.)
  - 8:30h - Vendors perform dry run testing



- 9:30h-17:30h - Interoperability testing
- 17:30h-18:00h - Summary of Day 1 (test progress, discuss test status, discuss issues, schedule for the next day)
- Tuesday, 12 July 2011
  - 8:00h-17:30h - Interoperability testing
- Wednesday, 13 July 2011
  - 8:00h-8:30h - Summary of Day 2 (test progress, discuss test status, discuss issues)
  - 8:30h-17:30h - Interoperability testing
  - 17:30h-18:00h - Summary Day 3 (test progress, discuss test status, discuss issues, schedule for the next day)
- Thursday, 14 July 2011
  - 8:00h-17:30h - Interoperability testing
  - 17:30h-18:00h - Summary of Day 3 (test progress, discuss test status, discuss issues, schedule for the next day)
  - 19:30h - ENTSO-E invites you for a dinner
- Friday, 15 July 2011
  - 8:30h-12:00h - Interoperability testing
  - 12:00h-14:00h - Review the results with each vendor/test witness individually to ensure all reports and results are clear – Chavdar Ivanov
  - 14:00h-16:00h – Discussion on identified issues agreements on profile changes, if necessary
  - 16:00h – 17:30h – Agreements on Final IOP report: CIM issues to be listed, recommendations to IEC, issues to be further discussed within ENTSO-E, etc. Discussion on action plan after the IOP – to do list for the next IOP.

#### 7.1.4 VALIDATION TOOLS

During the IOP the ENTSO-E profile is supported by CIMSpy validation tool. CIMdesk is used by test witnesses from ENTSO-E TSOs to validate against ENTSO-E naming convention. These tools can also be used by test participant to validate exported \*.xml files.

Test witnesses from ENTSO-E TSOs should have CIMdesk installed and ready to use by them during the IOP.

## 7.1.5 FILE NAMING DURING THE IOP

Due to the usage of file headers, vendors should not count on file names to identify information about file types (equipment, topology, state variables, dynamics, diagram and geographical). This information has to be obtained using file header.

In order to facilitate file organization during the test and in case of tests using 1st edition of the ENTSO-E CIM Profile the following abbreviations are included in the file name to track import/export actions:

- **"\_EQ"**: Equipment file (always at the end of the file name). Boundary equipment file follows the same logic, e.g. **"\_EU\_EQ"** can be used for better identification;
- **"\_TP"**: Topology file (always at the end of the file name). Boundary topology file follows the same logic, e.g. **"\_EU\_TP"** can be used for better identification;
- **"\_SV"**: State variables file (always at the end of the file name);
- **NE**: BCP Busarello + Cott + Partner AG (NEPLAN);
- **OD** for PSS@ODMS, **SE** for PSS@E: Siemens Power Technologies International (PSS@ODMS; PSS@E);
- **SP** for SPIRA, **CR** for CRESO, **SI** for SICRE: CESI (SPIRA, CRESO, SICRE);
- **ES**: Tractebel and RTE (EUROSTAG);
- **CP**: Open Grid Systems (Cimphony);
- **IN**: FGH (INTEGRAL7);
- **PI**: SISCO (UIB Adapter for PI-AF);
- **IS**: Intercompro AG (ISPEN);
- **TS** for e-terrasource, **TP** for e-terraplatform: Alstom Grid (e-terrasource; e-terraplatform);
- **GE** for GEDEON Database, **CS** for CIMclipse, **CC** for CIM-ENTSO-E Converters: EDF R&D (GEDEON Database; CIMclipse; CIM-ENTSO-E Converters);
- **PF**: DlgSILENT GmbH (PowerFactory);
- **TN**: DMSGGroup & EKC (Transmission Network Analyzer);
- **AM**: TIBCO (TIBCO ActiveMatrix platform);
- **EG**: GE Energy (Enterprise Gateway);
- **CO**: RTE (Convergence);

- **SC:** Nexant (Scope);
- **PS:** GE (PSLF).

An example of a file name for equipment file exported by DIgSILENT GmbH (PowerFactory) is: ENTSO-E\_16\_Pf\_11J14h\_EQ.xml. 11J14h indicates that the file has been exported on 11 July 2011 at 14:00h.

### 7.1.6 FILE TRANSFER

ENTSO-E IOP will use local file server to support file exchange among vendors. The test director will create the folder structure in the server. All vendors will have a folder where they must save all files that are exchanged in the IOP. All files (import, export and supporting documents) are stored in this directory according to the Single Test Record Form. Subfolders are created by the vendor to indicate the test and the profile to which the files belong to, e.g. T01e1 (means Test 1, profile edition 1).

60 GB HDD is accessible on the following address is \\172.16.12.4\Public. Login: Guest; Password: nas

Access to the HDD and the Internet is provided via a Wi-Fi and a LAN (3 switches, 24 ports each in rooms Volt, Ampere and Watt) connection. In the room Hertz the connection is only via Wi-Fi. Wi-Fi user name is: ENTSO-E\_GUESTS, password: 3nts03\_guest

Memory sticks can be used to backup data. All files produced during the ENTSO-E IOP must be uploaded by vendors in the CIMug site ([www.cimug.org](http://www.cimug.org)) at the end of each test day.

### 7.1.7 TEST LOGISTICS

The test is held in Brussels, ENTSO-E premises (Avenue de Cortenbergh 100, 1000 Brussels, Belgium). Vendors are tables are arranged according to the following table.

| Vendor                            | ENTSO-E room | Vendor            | ENTSO-E room |
|-----------------------------------|--------------|-------------------|--------------|
| Alstom Grid                       | WATT         | GE Energy         | WATT         |
| BCP Busarello + Cott + Partner AG | WATT         | Intercompro AG    | VOLT-AMPERE  |
| CESI                              | VOLT-AMPERE  | Nexant            | VOLT-AMPERE  |
| DIgSILENT                         | VOLT-AMPERE  | Open Grid Systems | VOLT-AMPERE  |
| DMS Group&EKC                     | VOLT-AMPERE  | RTE               | HERTZ        |
| EDF R&D                           | WATT         | Siemens PTI       | VOLT-AMPERE  |
| FGH                               | VOLT-AMPERE  | SISCO             | WATT         |
| GE                                | HERTZ        | TIBCO             | VOLT-AMPERE  |
| Tractebel/RTE                     | HERTZ        |                   |              |

### 7.1.8 TEST RECORD FORMS

ENTSO-E IOP uses two types of test record forms:

- Tool summary form – one record form per tool (one file). In case the tool participates in many tests additional form can be filled in.
- Single test record form – this is the record form that should be used to record results from single tests. All single test record forms are collected in one file.

#### **7.1.8.1 TOOL SUMMARY FORM**

- The form is completed by vendors
- The form is completed electronically in a single Word document and printed in two copies (one original for the vendor, one original for ENTSO-E). The form is signed by the vendor, the test witnesses and the ENTSO-E. A scanned version of the form is included in the final IOP report (Appendix)
- The form provides information on the vendor and on which tool is tested
- The form lists all test witnesses that witnessed that particular tool.
- „Test No“ is a reference number which refer to the „Single test record form“, e.g. 3\_4 means test No3 (the number of the test is indicated in the title of the test), 4th time of execution of this test (it indicates that the test has been executed with different set of data – e.g. different test cases or different changes done to the data).
- Summarizes the results from all tests that are performed
- Comments are included in „Comments“section. Comments can be: CIM issues, references to documents that provide additional information on particular issues, etc. Comments section must include a list of other tools with which this tool demonstrates interoperability. Comments section must include a list of tests that have not been performed. All tests that are not performed should be grouped according to the reason why they have not been performed and short information on the reason must be provided (e.g. time constrain, limitation in tool's functionalities/this is not supported by the tool, require additional development time). The comments must also include short information on the vendor's intention to cover this functionality in next releases.
- The form can be extended (additional lines created) in case of need to add additional comments or lines for tests that were performed
- The vendor updates this table on daily basis and submits it to the test director from ENTSO-E (at the end of the IOP) for inclusion in the final IOP report.

#### **7.1.8.2 SINGLE TEST RECORD FORM**

- The form is completed by vendors
- The form is completed electronically in a single Word document and printed in two copies (one original for the vendor, one original for ENTSO-E) and signed by vendor,

test witnesses. Scanned version of the form is included in the final IOP report (Appendix)

- The form provides information on the vendor and on which tool is tested in that particular test.
- „Test No“ is a reference number, e.g. 3\_4 means test No3 (the number of the test is indicated in the title of the test), 4th time of execution of this test (it indicates that the test has been executed with different set of data – e.g. different test cases or different changes done to the data).
- „Comments/Results/Issues“ section can include: CIM issues, any information required by the test procedure, other information by test witness, etc. In case test witness gives scores different than Score 3 the reasons for the score should be briefly explained.
- „Supplementary files“ section includes: references to documents that provides additional information on particular issues, file name of screenshots, etc. Please specify the purpose of each file. The file can be added to the test record file as file component.
- The form can be extended (additional lines created) in case of need to add additional comments, etc
- The form (signed by vendor and test witness) is submitted to the test director (ENTSO-E) together with tool summary form for inclusion in the final IOP report.

## 7.2 TEST PROCEDURES DESCRIPTION

The following table indicates which tests are performed using 1st edition of the profile (marked with 1st) and which - the 2nd edition of the profile (marked with 2nd).

| Test No | Performed using profile No | Test No | Performed using profile No | Test No | Performed using profile No |
|---------|----------------------------|---------|----------------------------|---------|----------------------------|
| 1       | 1st, 2nd                   | 12      | 2nd                        | 23      | 2nd                        |
| 2       | 1st, 2nd                   | 13      | 2nd                        | 24      | 2nd                        |
| 3       | 1st, 2nd                   | 14      | 2nd                        | 25      | 2nd                        |
| 4       | 1st, 2nd                   | 15      | 2nd                        | 26      | 2nd                        |
| 5       | 1st, 2nd                   | 16      | 2nd                        | 27      | 1st, 2nd                   |
| 6       | 1st, 2nd                   | 17      | 2nd                        | 28      | 1st, 2nd                   |
| 7       | 1st, 2nd                   | 18      | 2nd                        | 29      | 2nd                        |
| 8       | 1st (partly), 2nd          | 19      | 2nd                        | 30      | 2nd                        |
| 9       | 1st, 2nd                   | 20      | 2nd                        | 31      | 2nd                        |
| 10      | 1st, 2nd                   | 21      | 2nd                        | 32      | 2nd                        |
| 11      | 2nd                        | 22      | 2nd                        | 33      | 2nd                        |

## 7.2.1 **TEST No 1**: IMPORT OF A COMPLETE LOAD FLOW MODEL

### 7.2.1.1 OBJECTIVE

The aim of this test is to prove that a complete load flow model is properly imported in the tool.

### 7.2.1.2 DESCRIPTION

A complete set of test model is used: equipment, topology and state variables files. A single MAS (a TSO model) model is imported together with boundary MAS or boundary MAS is imported before the "TSO model". The following procedure is applied:

- Vendor A imports all three files (equipment, topology and state variables). The import considers the rule for importing boundary MAS. Imported files can be official test files or exported files from other tests. For the tests with 2nd profile - Vendor A imports single \*.zip file with equipment, topology and state variables and \*.zip file of boundary set
- Vendor A executes a load flow to demonstrate that the models can be solved.
- Test witnesses check instance data, naming convention rules and load flow results;

### 7.2.1.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or \*.zip file(s);
- Which instance data (types of instance data) was checked;
- At least one screenshot that show imported instance data has to be referenced as a supplementary document.

## 7.2.2 **TEST No 2**: EXPORT OF A COMPLETE LOAD FLOW MODEL

### 7.2.2.1 OBJECTIVE

The aim of this test is to prove that a complete load flow model is properly exported from the tool. Exported files are used to demonstrate interoperability among vendors.

### 7.2.2.2 DESCRIPTION

A complete set of test model is used: equipment, topology and state variables files. A single MAS (a TSO model) model is used. The following procedure is applied:

- Vendor A uses imported files from the Test No 1 (7.2.1);

- Vendor A exports all three files (equipment, topology and state variables) as a single model authority set (a TSO model). Export of boundary MAS is not required. For the tests with the 2nd profile – single \*.zip file is exported.
- Vendor A validates exported set of files using validation tools
- Test witnesses check instance data/validation report using validation tools. Test witness also verifies that RDFids are the same in comparison with the original files;

### 7.2.2.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or \*.zip file;
- File names of the exported \*.xml files or \*.zip file;
- Which instance data (types of instance data) was checked;
- At least one screenshot that shows imported instance data has to be referenced as a supplementary document;
- One screenshot that shows validation report has to be referenced as a supplementary document.

## 7.2.3 TEST No 3: COMPARISON OF THE LOAD FLOW RESULTS BETWEEN TOOLS

### 7.2.3.1 OBJECTIVE

The aim of this test is to demonstrate interoperability among vendors. Load flow results should match in an engineering tolerance (max 5%).

### 7.2.3.2 DESCRIPTION

A complete set of test models are used: equipment, topology and state variables files. The models that will be compared have a single model authority set (TSO models). This test can be performed using both official test files and exported files from Test No 2 (7.2.2). The following procedure is applied:

- Vendor A (Tool A) and vendor B (Tool B) can use already imported files from the test 7.2.1 or import new \*.xml files;
- Vendor A (Tool A) and vendor B (Tool B) execute a load flow.
- Test witnesses compare load flow results between Tools;

### 7.2.3.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or \*.zip files;
- Which solution parameters were checked;
- At least one screenshot (from Tool A) that shows solution results has to be referenced as a supplementary document;
- At least one screenshot (from Tool B) that shows solution results has to be referenced as a supplementary document;

## 7.2.4 **TEST No 4**: APPLY TOPOLOGY CHANGES AND EXPORT TOPOLOGY AND STATE VARIABLES FILES ONLY

### 7.2.4.1 OBJECTIVE

The aim of this test is to demonstrate the ability of the tool to export topology and state variables files only.

### 7.2.4.2 DESCRIPTION

A complete set of test model (a single MAS - TSO model) model is used: equipment, topology and state variables files or a \*.zip file (2nd profile). This test is performed using both official test files and exported files from Test No 2 (7.2.2). The following procedure is applied:

- Vendor A can use imported files from the Test No 1 (7.2.1) or import already exported files from Test No 2 (7.2.2);
- Vendor A applies topology changes suggested by test witness.
- Vendor A executes a load flow
- Vendor A exports topology and state variable files and validates those using CIM validation tools. In case of 2nd profile - topology and state variables files are \*.zipped together.

### 7.2.4.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or \*.zip file;
- File names of the exported \*.xml files (topology and state variables) or \*.zip file;
- Which topology changes were applied;



- At least one screenshot that shows new solution results has to be referenced as a supplementary document;
- At least one screenshot that shows validation results has to be referenced as a supplementary document;

## 7.2.5 **TEST No 5**: APPLY SOLUTION CHANGES (GENERATION, LOAD, VOLTAGE REFERENCES) AND EXPORT STATE VARIABLES FILE ONLY

### 7.2.5.1 OBJECTIVE

The aim of this test is to demonstrate the ability of the tool to export state variables file only.

### 7.2.5.2 DESCRIPTION

A complete set of test model (a single MAS – TSO model) is used: equipment, topology and state variables files (one \*.zip file in case of 2nd profile). This test is performed using both official test files and exported files from Test No 2 (7.2.2). The following procedure is applied:

- Vendor A can use imported files from the Test No 1 (7.2.1) or import already exported files from Test No 2 (7.2.2);
- Vendor A applies changes (generation, load, voltage references, etc.) suggested by test witness.
- Vendor A executes a load flow
- Vendor A exports a state variable file (state variable files is \*.zipped in case of 2nd profile) and validates it using CIM validation tools;

### 7.2.5.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or \*.zip file;
- File names of the exported \*.xml file (state variables) or \*.zip file;
- Which state variables changes were applied;
- At least one screenshot that shows new solution results has to be referenced as a supplementary document;
- At least one screenshot that shows validation results has to be referenced as a supplementary document;

## 7.2.6 **TEST No 6**: IMPORT OF TOPOLOGY AND STATE VARIABLES FILES ONLY AND COMPARISON OF THE LOAD FLOW RESULTS BETWEEN TOOLS

### 7.2.6.1 OBJECTIVE

The aim of this test is to demonstrate the ability of the tool to import topology and state variables files only (update of an imported project). The test also demonstrates interoperability between vendors. Load flow results should match in an engineering tolerance (max 5%).

### 7.2.6.2 DESCRIPTION

The model that have a single model authority set - TSO model is used. This test is performed using both official test files and exported files from Test No 2 (7.2.2). The following procedure is applied:

- Vendor A and vendor B import an equipment file from the official test files or from exported files (Test No 2 (7.2.2)). A \*.zipped version of the EQ file is imported in case of 2nd profile. Boundary MAS is imported in order to complete the TSO model.
- Vendor A and vendor B import topology and state variables files (or \*.zip in case of 2nd profile) exported in Test No 4 (7.2.4).
- Vendor A and vendor B executes a load flow;
- Test witnesses compare load flow results.

### 7.2.6.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml file (equipment) or \*.zip file;
- File names of the imported \*.xml files (boundary MAS) or \*.zip file;
- File names of the imported \*.xml files (topology and state variables) of \*.zip file;
- At least one screenshot that shows solution results (Tool A) has to be referenced as a supplementary document;
- At least one screenshot that shows solution results (Tool B) has to be referenced as a supplementary document;

## 7.2.7 **TEST No 7**: IMPORT OF A STATE VARIABLES FILE ONLY AND COMPARISON OF THE LOAD FLOW RESULTS BETWEEN TOOLS

### 7.2.7.1 OBJECTIVE

The aim of this test is to demonstrate the ability of the tool to import state variables file only. The test also demonstrates interoperability between vendors. Load flow results should match in an engineering tolerance (max 5%).

### 7.2.7.2 DESCRIPTION

The model that have a single model authority set - TSO model is used. This test is performed using both official test files and exported files from Test No 2 (7.2.2). The following procedure is applied:

- Vendor A and vendor B import equipment and topology files from the official test files or from exported files (Test No 2 (7.2.2)). \*.zipped file is imported in case of 2nd profile. Boundary MAS is imported in order to complete the TSO model.
- Vendor A and vendor B import a state variables file exported in Test No 5 (7.2.5).
- Vendor A and vendor B executes a load flow;
- Test witnesses compare load flow results.

### 7.2.7.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files (equipment and topology) or \*.zip file;
- File names of the imported \*.xml files (Boundary MAS) or \*.zip file;
- File names of the imported \*.xml file (state variables) or \*.zip file;
- At least one screenshot that shows solution results (Tool A) has to be referenced as a supplementary document;
- At least one screenshot that shows solution results (Tool B) has to be referenced as a supplementary document;

## 7.2.8 **TEST No 8**: COMPARISON OF THE SHORT-CIRCUIT RESULTS BETWEEN TOOLS

### 7.2.8.1 OBJECTIVE

The aim of this test is to demonstrate the ability of the tool to import short circuit data. The test also demonstrates interoperability between vendors. Short-circuit results should match in an engineering tolerance.

The test can be fully performed using 2nd edition of the profile. In case of testing with 1st edition of the profile only limited amount of short circuit calculations could be performed.

### 7.2.8.2 DESCRIPTION

This test is performed using both official test files and exported files from Test No 2 (7.2.2). The following procedure is applied:

- Vendor A and vendor B import all three files (equipment, topology and state variables) from the official test files or from exported files (Test No 2 (7.2.2)). Boundary MAS is imported in order to complete the TSO model. In case of testing with 2nd profile - \*.zip files are imported.
- Vendor A and vendor B perform a short-circuit calculation (a three phase short-circuit and an unbalanced fault) according to IEC 60909.
- Test witnesses compare short-circuit results.

### 7.2.8.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files (equipment, topology, state variables and boundary MAS) or \*.zip files ;
- At least one screenshot that shows short-circuit results (Tool A) has to be referenced as a supplementary document;
- At least one screenshot that shows short-circuit results (Tool B) has to be referenced as a supplementary document;

## 7.2.9 **TEST No 9**: IMPORT OF COMPLETE LOAD FLOW MODELS FROM DIFFERENT MODEL AUTHORITY SETS, ASSEMBLE THESE MODELS AND EXPORT OF AN ASSEMBLED MODEL (EQUIPMENT FILES, TOPOLOGY FILES, A STATE VARIABLES FILE AND BOUNDARY FILES)

### 7.2.9.1 OBJECTIVE

The aim of this test is to prove that tools can import complete load flow models from different model authority sets (MAS). This test simulates merging process and demonstrated the ability of the tool to update one of the MAS in the assembled model.

### 7.2.9.2 DESCRIPTION

Models from different model authority sets are imported. This test is performed using both official test files (ENTSO-E 16 nodes – 2 areas) and exported files In case Area 1 and Area 2 are exported by one vendor this test should be repeated using exports from two different vendors. The following procedure is applied:

- Vendor A imports boundary files (equipment and topology) or one \*.zip file. Boundary MAS is imported first or together with other MAS (next two steps). Nevertheless the Vendor A should demonstrate that can import boundary MAS separately.
- Vendor A imports all required files (equipment, topology and state variables) - or one \*.zip file in case of 2nd profile- for MAS A (Area 1);
- Vendor A imports all required files (equipment, topology and state variables) - or one \*.zip file in case of 2nd profile- for MAS B (Area 2).
- Vendor A assembles Area 1 and Area 2 and performs load flow solution (Solution 1)
- Vendor A exports assembled model - 2 equipment files (one per each MAS), 2 topology files (one per each MAS), 2 boundary files (equipment and topology) and **1 state variables file**. This is exported in one \*.zip file in case of testing the 2nd profile.
- Vendor A validates exported set of files using validation tools
- Vendor A imports files resulted from Test No 4 (7.2.4) (topology and state variable files are combined with the right equipment file). Therefore the vendor updates one of the MAS (Area 1 or Area 2)
- Vendor A performs load flow solution (Solution 2)

### 7.2.9.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files - 2 equipment, 2 topology, 2 state variables and 2 boundary files (equipment and topology) or \*.zip files;
- File names of the imported \*.xml files (1 equipment, 1 topology and 1 state variables) – updated MAS or \*.zip files;
- File names of the exported \*.xml files - 2 equipment, 2 topology, 1 state variables and 1 boundary files (equipment and topology) or \*.zip file;
- At least one screenshot that shows load flow results (Solution 1) of the assembled model has to be referenced as a supplementary document;
- At least one screenshot that shows load flow results (Solution 2) of the assembled model has to be referenced as a supplementary document;

## 7.2.10 **TEST No 10**: IMPORT OF AN ASSEMBLED MODEL (EQUIPMENT FILES, TOPOLOGY FILES, A STATE VARIABLES FILE AND BOUNDARY FILES). COMPARISON OF THE LOAD FLOW RESULTS OF AN ASSEMBLED MODEL BETWEEN TOOLS

### 7.2.10.1 OBJECTIVE

The aim of this test is to prove that tools can import assembled model which contains different MAS. This test can also be used to compare Solution 2 from Test No 9 (7.2.9).

### 7.2.10.2 DESCRIPTION

This test is performed using exported models from the Test No 9 (7.2.9). The following procedure is applied:

- Vendor A imports all files exported in Test No 9 - 2 equipment, 2 topology, 1 state variables and 2 boundary files (equipment and topology) or one \*.zip file in case of 2nd profile;
- Vendor A performs load flow solution
- Vendor A and Vendor B compare load flow results

### 7.2.10.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files - 2 equipment, 2 topology, 1 state variables and 2 boundary files (equipment and topology) or a \*.zip file;
- At least one screenshot that shows load flow results from Tool A of the assembled model has to be referenced as a supplementary document;

- At least one screenshot that shows load flow results from Tool B of the assembled model has to be referenced as a supplementary document;

## 7.2.11 **TEST No 11**: APPLY EQUIPMENT CHANGES AND EXPORT EQUIPMENT DIFFERENCE FILE AND COMPLETE TOPOLOGY AND STATE VARIABLES FILES

### 7.2.11.1 OBJECTIVE

The aim of this test is to demonstrate exchange of difference files. The test is performed for testing of 2nd edition of the profile.

### 7.2.11.2 DESCRIPTION

This test is performed using exported models from previous tests. The following procedure is applied:

- Vendor A applies changes suggested by the test witness. These changes should be in the equipment part of the model;
- Vendor A performs load flow solution and records the results
- Vendor A exports difference models for equipment and complete topology and state variables files (all in a \*.zip file). In case the test model contains more than one MAS the complete topology and state variables are exported per MAS.
- Vendor A validates exported files

### 7.2.11.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip file (equipment, topology, state variables);
- List all changes that have been applied
- At least one screenshot that shows load flow results has to be referenced as a supplementary document;
- At least one screenshot that shows validation results has to be referenced as a supplementary document;

## 7.2.12 **TEST No 12**: IMPORT OF DIFFERENCE FILES (EQUIPMENT) AND COMPLETE TOPOLOGY AND STATE VARIABLES FILES. COMPARISON OF THE LOAD FLOW RESULTS BETWEEN TOOLS

### 7.2.12.1 OBJECTIVE

The aim of this test is to demonstrate interoperability when importing difference files. The test is performed for testing of 2nd edition of the profile.

### 7.2.12.2 DESCRIPTION

This test is performed using exported models from previous tests (e.g. Test No 11). The following procedure is applied:

- Vendor A and Vendor B apply importing procedure that takes into account that difference models of equipment needs to be imported as well as complete topology and state variable files which are imported. One \*.zip file is imported.
- Vendor A and Vendor B perform load flow solution and records the results
- Test witnesses compare load flow results.

### 7.2.12.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip file (equipment, topology, state variables including difference models);
- At least one screenshot that shows load flow results (from Tool A) has to be referenced as a supplementary document;
- At least one screenshot that shows load flow results (from Tool B) has to be referenced as a supplementary document;

## 7.2.13 **TEST No 13**: APPLY EQUIPMENT CHANGES ON AN ASSEMBLED MODEL AND EXPORT DIFFERENCE FILE (EQUIPMENT) AND COMPLETE TOPOLOGY AND STATE VARIABLES FILES

This test is the same as Test No 11 with the only difference that changes are applied in equipment file from different MAS. The same procedure as Test No 11 (7.2.11) is followed. The test is performed for testing of 2nd edition of the profile.

## 7.2.14 **TEST No 14**: IMPORT OF DIFFERENCE FILE (EQUIPMENT) AND COMPLETE TOPOLOGY AND STATE VARIABLES FILES FOR AN



## ASSEMBLED MODEL AND COMPARISON OF THE LOAD FLOW RESULTS BETWEEN TOOLS

This test is the same as Test No 12 (7.2.12). Difference file (equipment) coming from different MAS is imported. The same procedure as Test No 12 is followed. The test is performed for testing of 2nd edition of the profile.

### 7.2.15 **TEST No 15**: IMPORT OF COMPLETE DYNAMIC MODEL THAT CONTAINS STANDARD MODELS ONLY

#### 7.2.15.1 OBJECTIVE

The aim of this test is to prove that vendors can import data for dynamics studies. The test is performed for testing of 2nd edition of the profile only.

#### 7.2.15.2 DESCRIPTION

Five types of files are used in this test: equipment, topology, state variables, boundary and dynamics. Equipment, topology, state variables and boundary files can be official files or files exported during previous tests. All these files are imported as one \*.zip file. The following procedure is applied:

- Vendor A applies importing procedure that takes into account different model authority sets.
- Test witness checks instance data
- Vendor A runs load flow and initializes the model.

#### 7.2.15.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip file (the \*.zip includes: equipment, topology, state variables, boundary, dynamics);
- At least one screenshot that shows imported instance data has to be referenced as a supplementary document;
- At least one screenshot that shows load flow result and initialization conditions has to be referenced as a supplementary document;

## 7.2.16 **TEST No 16**: EXPORT OF COMPLETE DYNAMIC MODEL THAT CONTAINS STANDARD MODELS ONLY

### 7.2.16.1 OBJECTIVE

The aim of this test is to prove that vendors can export data for dynamics studies. The test is performed for testing of 2nd edition of the profile only.

### 7.2.16.2 DESCRIPTION

The files imported in the test procedure Test No 15 (7.2.15) are used for this test. Equipment, topology, state variables and boundary files can be official files or files created during previous tests. The following procedure is applied:

- Vendor A exports all files taking into account different model authority sets.
- Vendor A validates exported files.
- Test witness checks instance data.

### 7.2.16.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip file;
- File names of the exported \*.zip file;
- At least one screenshot that shows imported instance data has to be referenced as a supplementary document;
- At least one screenshot that shows exported instance data has to be referenced as a supplementary document;
- At least one screenshot that shows validation report has to be referenced as a supplementary document;

## 7.2.17 **TEST No 17**: COMPARISON OF THE DYNAMIC SIMULATION RESULTS BETWEEN TOOLS (FOR MODEL USING STANDARD MODELS)

### 7.2.17.1 OBJECTIVE

The aim of this test is to demonstrate the interoperability between vendors. Simulation results should match in an engineering tolerance. The test is performed for testing of 2nd edition of the profile only.

### 7.2.17.2 DESCRIPTION

This test is performed using imported files in Test No 15 (7.2.15). The following procedure is applied:

- Vendor A and vendor B import all files required for dynamics simulation as a \*.zip file;
- Vendor A and vendor B perform apply a fault (a three phase short-circuit and an unbalanced fault) or step response ( $V_{ref}=\pm 5\% V_{ref}$ ). The simulation is run for at least 10 sec. The following signals are recorded during the simulations:  $V_{ref}$ ,  $P_{gen}$  (P flow),  $Q_{gen}$  (Q flow),  $V$ .
- Test witnesses compare simulation results.

### 7.2.17.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip file;
- At least one screenshot that shows simulation results (Tool A) has to be referenced as a supplementary document;
- At least one screenshot that shows simulation results (Tool B) has to be referenced as a supplementary document;

## 7.2.18 **TEST No 18**: IMPORT OF A DYNAMIC FILE THAT CONTAINS USER-DEFINED MODEL WITH STANDARD CONNECTIONS

The test is identical with Test No 15 (7.2.15). The focus is on importing a User-defined model (a model that is created by an user and consists of elementary control blocks) that will replace one or more standard models components. The same procedure as Test No 15 is followed. The test is performed for testing of 2nd edition of the profile only.

## 7.2.19 **TEST No 19**: EXPORT OF A DYNAMIC FILE THAT CONTAINS USER-DEFINED MODEL WITH STANDARD CONNECTIONS

The test is identical with Test No 16 (7.2.16). The focus is on exporting a User-defined model that will replace one or more standard models components. The same procedure as Test No 16 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.20 **TEST No 20**: COMPARISON OF THE DYNAMIC SIMULATION RESULTS BETWEEN TOOLS (FOR MODEL USING USER-DEFINED MODEL WITH STANDARD CONNECTIONS)

The test is identical with Test No 17 (7.2.17). The same procedure as Test No 17 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.21 **TEST No 21**: IMPORT OF A DYNAMIC FILE THAT CONTAINS USER-DEFINED MODEL WITHOUT STANDARD CONNECTIONS

The test is identical with Test No 15 (7.2.15). The focus is on importing a User-defined model that will replace one or more standard models components and applying changes in standard connections. The same procedure as Test No 15 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.22 **TEST No 22**: EXPORT OF A DYNAMIC FILE THAT CONTAINS USER-DEFINED MODEL WITHOUT STANDARD CONNECTIONS

The test is identical with Test No 16 (7.2.16). The focus is on exporting a User-defined model that will replace one or more standard models components and applying changes in standard connections. The same procedure as Test No 16 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.23 **TEST No 23**: COMPARISON OF THE DYNAMIC SIMULATION RESULTS BETWEEN TOOLS (FOR MODEL USING USER-DEFINED MODEL WITHOUT STANDARD CONNECTIONS)

The test is identical with Test No 17 (7.2.17). The same procedure as Test No 17 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.24 **TEST No 24**: IMPORT OF A DYNAMIC FILE THAT CONTAINS PROPRIETARY MODEL

The test is identical with Test No 15 (7.2.15). The focus is on importing a proprietary model (a dynamic model, representing of a network component, modelled implicitly - a "black box") that will replace one or more standard models. The same procedure as Test No 15 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.25 **TEST No 25**: EXPORT OF A DYNAMIC FILE THAT CONTAINS PROPRIETARY MODEL

The test is identical with Test No 16 (7.2.16). The focus is on exporting a proprietary model that will replace one or more standard models. The same procedure as Test No 16 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.26 **TEST No 26**: COMPARISON OF THE DYNAMIC SIMULATION RESULTS BETWEEN TOOLS (FOR MODEL USING A PROPRIETARY MODEL)

The test is identical with Test No 17 (7.2.17). The same procedure as Test No 17 is followed. The test is performed for testing of 2nd edition of the profile only.

### 7.2.27 **TEST No 27**: EXPORT OF A "PLANNING" MODEL USING AN "OPERATIONAL" MODEL

#### 7.2.27.1 OBJECTIVE

The aim of this test is to prove the ability of SCADA/EMS vendors or a tool that could maintain "operational" model to export a "planning" model using an "operational" model.

#### 7.2.27.2 DESCRIPTION

This test is performed using \*.xml files (operational – detailed model). In case of 2nd profile - \*.zip file is imported. The following procedure is applied:

- Vendor A imports all files which have all required classes and attributes marked with stereotype operational in the ENTSO-E profile;
- Vendor A exports the same model but compliant with the ENTSO-E Profile, but bus-branch "planning" model (classes and attributes marked operational are not required).
- Vendor A validates exported files
- Test witness checks instance data and validation report.

#### 7.2.27.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or a \*.zip file;
- File names of the exported \*.xml files or a \*.zip file;

- At least one screenshot that shows instance data of the imported model has to be referenced as a supplementary document;
- At least one screenshot that shows validation results has to be referenced as a supplementary document;

## 7.2.28 **TEST No 28**: IMPORT OF A "PLANNING" MODEL RESULTED FROM AN "OPERATIONAL" MODEL AND COMPARISON OF THE LOAD FLOW RESULTS BETWEEN TOOLS

### 7.2.28.1 OBJECTIVE

The aim of this test is to prove the ability of "Planning" vendors to import a "planning" model that results from an "operational" model and compare load flow results between planning and SCADA/EMS tools and well as among planning tools.

### 7.2.28.2 DESCRIPTION

This test is performed using exported \*.xml files in Test No 27 (7.2.27). The following procedure is applied:

- Vendor A (Tool A) imports all files (or a \*.zip file in case of 2nd profile) exported in Test No 27;
- Vendor A (Tool A) runs load flow solution;
- Vendor B (Tool B) imports all files (or a \*.zip file in case of 2nd profile) exported in Test No 27;
- Vendor B (Tool B) runs load flow solution;
- Test witnesses check instance data and load flow results.

### 7.2.28.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or a \*.zip file;
- At least one screenshot (from Tool A) that shows solution results has to be referenced as a supplementary document;
- At least one screenshot (from Tool B) that shows solution results has to be referenced as a supplementary document;

## 7.2.29 **TEST No 29**: IMPORT OF AN "OPERATIONAL" MODEL BY "PLANNING" VENDORS AND COMPARISON OF THE LOAD FLOW RESULTS BETWEEN TOOLS

### 7.2.29.1 OBJECTIVE

The aim of this test is to prove the ability of "Planning" vendors to import an "operational" model and compare load flow results between planning and SCADA/EMS tools.

### 7.2.29.2 DESCRIPTION

This test is performed using \*.xml files "operational" models. The following procedure is applied:

- Vendor A (Tool A) imports all files necessary to produce planning case (bus-branch model);
- Vendor A (Tool A) runs load flow solution;
- Test witness checks instance data and load flow results.

### 7.2.29.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.xml files or a \*.zip file;
- At least one screenshot (from Tool A – planning tool) that shows solution results has to be referenced as a supplementary document;
- At least one screenshot (from Tool B – SCADA/EMS tool or "operational" tool) that shows solution results has to be referenced as a supplementary document;

## 7.2.30 **TEST No 30**: MODEL AUTHORITY SETS EXCHANGE TEST

### 7.2.30.1 OBJECTIVE

The MAS exchange test demonstrates that a boundary and regional set (TSO set) may be imported into a base model (any TSO MAS model or assembled model from previous tests), creating a single model that contains the original base and the new boundary and regional model segments. In case of assembled model some of the MAS files are replaced/updated based of the information provided in the header. This test is partly included in the Test No 9 (7.2.9). Here a special attention on MAS is paid.

### 7.2.30.2 DESCRIPTION

The following procedure is applied:

- Vendor A imports the base model.
- Vendor A imports the boundary and regional sets and links them into the base model. Using internal validation, verify that the new model is complete and accurate. The MAS model is identified from the CIM/XML document file header (in case of 2nd profile). In this step the imported MAS updates the existing MAS in the base model.
- Export the new model and validate it using one or more of the CIM validation tools.
- Vendor B imports the file exported by Vendor A.
- Test witness validates that the new data from the boundary and regional sets are contained in the model.

### 7.2.30.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip files;
- At least one screenshot (from Vendor A) that shows validation results has to be referenced as a supplementary document;
- At least one screenshot (from Vendor B) that shows validation results has to be referenced as a supplementary document;

## 7.2.31 TEST No 31: FILE HEADER TEST

### 7.2.31.1 OBJECTIVE

The file header test demonstrates the ability of vendors to use the information included in the file header. The test is performed for testing of 2nd edition of the profile only.

### 7.2.31.2 DESCRIPTION

The following procedure is applied:

- Test witness requests Vendor A to introduce a change in the file header information of the one or more of the \*.xml files of the base model. The change needs to be done outside the tool of Vendor A.
- Vendor A imports the \*.zip files to form base model. File header information of one or more \*.xml files is changed.
- Test witness checks the import procedure applied by Vendor A. The tool needs to produce error message and advise the user on the appropriate action to be performed to correct the error.



### 7.2.31.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip files;
- Description of introduced change in the file header;
- At least one screenshot that shows error message produced by Vendor A has to be referenced as a supplementary document;

## 7.2.32 TEST No 32: EXCHANGE OF DIAGRAM DATA TEST

### 7.2.32.1 OBJECTIVE

This test demonstrates the ability of vendors to use the information included in the diagram data file. The test is performed for testing of 2nd edition of the profile only.

### 7.2.32.2 DESCRIPTION

Complete set of test models are used. The \*.zip file contains: equipment, topology, state variables and diagram files. This test can be performed using both official test files and exported files from a test participant. The following procedure is applied:

- Vendor A (Tool A) imports all necessary \*.zip files to form the model;
- Test witnesses compare the diagram shown by Tool A or compare x,y coordinates present in the diagram data file;
- Vendor A changes the coordinates of one element (or more) and exports only the diagram data file (as a \*.zip file)
- Vendor B (Tool B) imports the exported from Tool A diagram \*.zip file.
- Test witnesses the diagram shown by Tool B (compare screenshots) or compare x,y coordinates present in the diagram data file

### 7.2.32.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip files;
- File name of the exported \*.zip diagram data file;
- Description of introduced change in the diagram data;
- At least one screenshot that shows data imported by Vendor A has to be referenced as a supplementary document;

- At least one screenshot that shows data imported by Vendor B has to be referenced as a supplementary document;

### 7.2.33 **TEST No 33**: EXCHANGE OF GEOGRAPHICAL DATA TEST

#### 7.2.33.1 OBJECTIVE

This test demonstrates the ability of vendors to use the information included in the geographical data (GIS) file. The test is performed for testing of 2nd edition of the profile only.

#### 7.2.33.2 DESCRIPTION

Complete set of test models are used. The \*.zip file contains: equipment, topology, state variables and geographical files. This test can be performed using both official test files and exported files from a test participant. The following procedure is applied:

- Vendor A (Tool A) imports all necessary \*.zip files to form the model;
- Test witnesses compare the GIS data shown by Tool A with the geographical data file;
- Vendor A changes the coordinates of one element (or more) and exports only the geographical data file (as a \*.zip file);
- Vendor B (Tool B) imports the exported from Tool A geographical \*.zip file.
- Test witnesses the geographical data shown by Tool B or compare GIS coordinates present in the geographical data file

#### 7.2.33.3 TEST RECORD

The following information should be recorded in the test form:

- File names of the imported \*.zip file;
- File name of the exported \*.zip geographical data file;
- Description of introduced change in the geographical data;
- At least one screenshot that shows data imported by Vendor A has to be referenced as a supplementary document;
- At least one screenshot that shows data imported by Vendor B has to be referenced as a supplementary document;



### 7.3.2 SINGLE TEST RECORD FORM

|                                 |                            |                  |                     |
|---------------------------------|----------------------------|------------------|---------------------|
| <b>Test No:</b>                 | <b>Profile edition No:</b> | <b>Tool:</b>     | <b>Score:</b>       |
| <b>Test files:</b>              |                            |                  |                     |
| <b>Import</b>                   |                            | <b>Export</b>    |                     |
|                                 |                            |                  |                     |
| <b>Comments/Results/Issues:</b> |                            |                  |                     |
|                                 |                            |                  |                     |
| <b>Supplementary files:</b>     |                            |                  |                     |
|                                 |                            |                  |                     |
| <b>Date</b>                     | <b>Vendor</b>              | <b>Signature</b> | <b>Test witness</b> |
|                                 | <b>Name</b>                | <b>Name</b>      | <b>Signature</b>    |
|                                 |                            |                  |                     |