COMPLIANCE AUDIT REPORT
Transelectrica S.A.

11 – 12 JUNE 2014

COMPLIANCE AUDIT CONDUCTED IN THE NATIONAL CONTROL CENTRE IN BUCHAREST BY ENTSO-E RGCE SG CME
DISCLAIMER

The present Compliance Audit Report is based on the information as provided by the audited company. This report is in no way a guarantee that security and reliability on the system of the audited company and/or on the whole synchronously interconnected system of the Regional Group Continental Europe (RGCE) is ensured. This report cannot be considered as a certification of whatever form. Finally, this report does not as such have any impact on the compliance, by the audited company and/or by any other member of ENTSO-E, with the RGCE Operation Handbook and/or any other relevant applicable standard.
## Contents

### TRANSELECTRICA S.A. COMPLIANCE AUDIT REPORT

**1 EXECUTIVE SUMMARY** ................................................................................................................................. 1

**1.1 COMPLIANCE MONITORING IN ENTSO-E REGCE** .......................................................................................... 4

**1.2 AUDITED TSO** ............................................................................................................................................... 4

**1.3 AUDITED OH STANDARDS** .......................................................................................................................... 4

**1.4 RESULTS** ..................................................................................................................................................... 4

**2 AUDIT REPRESENTATIVES** ............................................................................................................................... 6

**3 AUDIT PLAN** ................................................................................................................................................... 7

**3.1 GENERAL PROCEDURES** ............................................................................................................................ 7

**3.2 SCOPE** ....................................................................................................................................................... 9

**3.3 METHODOLOGY** ......................................................................................................................................... 9

**3.4 EVALUATION PRINCIPLES** ........................................................................................................................ 10

**3.5 CONFIDENTIALITY** ...................................................................................................................................... 10

**4 AUDIT WORKSHEET FOR 2014 ONSITE AUDIT** ............................................................................................. 11

**4.1 OH STANDARD P3-A1-S3.3. CALCULATIONS IN REAL TIME OPERATION** ..................................................... 11

**4.2 OH STANDARD P3-A1-S3.3.1 FREQUENCY CALCULATION** .......................................................................... 14

**4.3 OH STANDARD P3-A1-S3.3.2 ADDITIONAL N-1 CALCULATIONS** ................................................................. 16

**4.4 OH STANDARD P3-A2-S1. DETERMINATION OF THE EXTERNAL CONTINGENCY LIST AND OBSERVABILITY AREA** .................................................................................................................................................................................. 18

**4.5 OH STANDARD P3-A2-S2 IMPLEMENTATION OF OBSERVABILITY AREA** ....................................................... 21

**4.6 OH STANDARD P3-A2-S6 DATA PROVISION** .................................................................................................. 23

**4.7 OH STANDARD P3-A3-S2. OVERLOADS IN N-1 SITUATION (SIMULATION)** .................................................... 26

**4.8 OH STANDARD P3-A3-S2.2 INSTANTANEOUS TRIPPING IN N-1 SIMULATIONS** ........................................... 28

**4.9 OH STANDARD P3-A3-S4.1 TIE-LINES OPERATION CONDITIONS** ............................................................... 31

**4.10 OH STANDARD P3-A3-S4.2.2 SYNCHRONISING EQUIPMENT SETTINGS** ......................................................... 34

**4.11 OH STANDARD P3-A3-S4.2.3 PROTECTION SYSTEM SETTING** ..................................................................... 37

**4.12 OH STANDARD P3-A4-S5 PREPARATION OF REMEDIAL ACTIONS IN THE OPERATIONAL PLANNING STAGE** ................................................................................................................................................................................................................. 40

**4.13 OH STANDARD P3-A4-S5.1** ............................................................................................................................. 42

**4.14 OH STANDARD P3-A4-S5.2** ............................................................................................................................. 44

**4.15 OH STANDARD P3-A4-S5.3** ............................................................................................................................. 45

**4.16 OH STANDARD P3-A4-S5.4** ............................................................................................................................. 47

**5 CONCLUSIONS** .................................................................................................................................................. 49

**6 SIGNATURE PAGE** ........................................................................................................................................... 50
1 EXECUTIVE SUMMARY

1.1 COMPLIANCE MONITORING IN ENTSO-E RGCE

The mission of the ENTSO-E System Operation Committee Regional Group Continental Europe (RGCE) is to improve the reliability and security of the interconnected power system in the Continental Europe through developing and enforcing RGCE Operation Handbook (OH) standards, monitoring the interconnected power system and assessing its future adequacy. The RGCE member TSOs are subject to compliance with all approved OH standards. The Compliance Monitoring Program (CMP) is the RGCE program that monitors and assesses compliance with these standards via:

- the annual process of self-assessment, which is applied to all TSOs, as well as
- the annual process of mandatory on-site compliance audits, which is applied to a certain number of TSOs chosen on a rotating base either directly (in case of doubts that a certain TSO complies with OH Standards) or randomly.

Sub-Group Compliance Monitoring & Enforcement (SG CME) is in charge of performing above mentioned two processes. The 2014 is the fifth year of conducting mandatory compliance audits. SG CME performed 4 voluntary compliance audits in 2008-2009 and 24 mandatory audits in 2010-2013.

1.2 AUDITED TSO

The RGCE member TSO Transelectrica was chosen for a Compliance Audit in 2014. CME conducted the audit on 11 & 12 June 2014 in Bucharest (Transelectrica premises), Romania.

1.3 AUDITED OH STANDARDS

The Compliance Audit encompassed 16 standards/sub-standards of Operation Handbook Policy 3 (Operational Security). In 2013, TRANSELECTRICA made compliance declarations in the self-assessment process for all standards of OH Policy 3, a subset of which has been checked against their evidence during the audit.

1.4 RESULTS

At the beginning the Audit Team had an hour and a half long visit in the National Control Centre, which helped the Audit Team to understand better the organisation and processes in the system of TRANSELECTRICA.

The Audit Team audited 16 standards/sub-standards. The Audit Team concluded that TRANSELECTRICA is fully compliant with 14 of the standards and for 2 standards Audit Team declared Non Applicable.

TRANSELECTRICA was very well prepared for the audit, the evidences were already provided in the worksheet beforehand. All the documents considered as evidence were available during the audit as well and were a good basis for proving the compliance level of TRANSELECTRICA with the audited standards. Requests for additional material were promptly met.

In the case of this Compliance Audit, all preconditions for a successful audit were fulfilled and the Audit Team wishes to express its gratitude to the TRANSELECTRICA staff involved in the Audit and the company management.

Table 1 describes TRANSELECTRICA compliance declaration in self-assessment questionnaire 2013 and compliance audit questionnaire 2014 with compliance level suggestion by the Audit Team after reviewing the evidence for the audited standards.
### Table 1: Compliance Level Changes for the Audited OH Standards

<table>
<thead>
<tr>
<th>OH Standard</th>
<th>Self-assessment questionnaire 2013</th>
<th>Compliance audit questionnaire 2014</th>
<th>On site compliance audit 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>P3-A1-S3.3. CALCULATIONS IN REAL TIME OPERATION</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A1-S3.3.1 FREQUENCY CALCULATION</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A1-S3.3.2 ADDITIONAL N-1 CALCULATIONS</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A2-S1. DETERMINATION OF THE EXTERNAL CONTINGENCY LIST AND OBSERVABILITY AREA</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A2-S2 IMPLEMENTATION OF OBSERVABILITY AREA</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A2-S6 DATA PROVISION</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A3-S2. OVERLOADS IN N-1 SITUATION (SIMULATION)</td>
<td>FCo</td>
<td>FCo</td>
<td>N/A</td>
</tr>
<tr>
<td>P3-A3-S2.2 INSTANTANEOUS TRIPPING IN N-1 SIMULATIONS</td>
<td>FCo</td>
<td>FCo</td>
<td>N/A</td>
</tr>
<tr>
<td>P3-A3-S4.1 TIE-LINES OPERATION CONDITIONS</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A3-S4.2.2 SYNCHRONISING EQUIPMENT SETTINGS</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A3-S4.2.3 PROTECTION SYSTEM SETTING</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>P3-A4-S5 PREPARATION OF REMEDIAL ACTIONS IN THE OPERATIONAL PLANNING STAGE</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.1</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.2</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.3</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.4</td>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
</tbody>
</table>
2 Audit Representatives

The Audit Team has the task to prepare and perform the Compliance Audit as well as to develop the corresponding audit report. The Audit Team composition is given in Table 2. The TSO subject to a compliance audit may object any member of the Audit Team on the basis of a conflict of interests or the existence of other circumstances that could interfere with the impartial performance of his or her duties. The audited TSO is obligated to express its concerns with the proposed team member four weeks prior to the team’s arrival on-site. No objection was expressed by TRANSELECTRICA. TRANSELECTRICA personnel involved in the audit are given in Table 3.

<table>
<thead>
<tr>
<th>Audit Team role</th>
<th>Company or association</th>
<th>Name</th>
<th>Email address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit Team leader</td>
<td>50Hertz</td>
<td>Ana Cigarán Romero</td>
<td><a href="mailto:Ana.CigaranRomero@50hertz.com">Ana.CigaranRomero@50hertz.com</a></td>
</tr>
<tr>
<td>Audit Team member</td>
<td>Terna</td>
<td>Silvia Moroni</td>
<td><a href="mailto:silvia.moroni@terna.it">silvia.moroni@terna.it</a></td>
</tr>
<tr>
<td>Audit Team member</td>
<td>REE</td>
<td>Jaime Sanchiz</td>
<td><a href="mailto:jsanchiz@ree.es">jsanchiz@ree.es</a></td>
</tr>
<tr>
<td>Compliance Monitoring Advisor</td>
<td>ENTSO-E Secretariat</td>
<td>Jaka Žvab</td>
<td><a href="mailto:jaka.zvab@entsoe.eu">jaka.zvab@entsoe.eu</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function in the company</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director for Operational Planning</td>
<td>Florin Bălașiu</td>
</tr>
<tr>
<td>Control Area Manager</td>
<td>Virgiliu Ivan</td>
</tr>
<tr>
<td>Manager of System Operational Planning Department</td>
<td>Cristian Radoi</td>
</tr>
<tr>
<td>Director for System Operation</td>
<td>Mihai Cremenescu</td>
</tr>
<tr>
<td>Manager of Market Monitoring Department</td>
<td>Octavia Unguroiu</td>
</tr>
</tbody>
</table>
3 Audit Plan

3.1 General Procedures

The audit covered a chosen set of Operation Handbook (OH) standards which had already been monitored within the Compliance Monitoring Program 2013 self-assessment process.

The completed Audit Worksheet was sent by email to the ENTSO-E Secretariat and carbon copies to all Audit Team members four weeks before the first audit day. The complete schedule of the audit process for TRANSELECTRICA is given in Table 4.

In preparation for the audit, TRANSELECTRICA organised its supporting compliance documentation which is the evidence of the compliance with audited standards. The ENTSO-E RGCE SG CME acknowledges a good preparation for the audit.

All documentation (evidence) required for the onsite audit of each standard was available in electronic format during the audit. The Control Area Manager and/or other responsible expert personnel were available during the audit to provide guidance to the Audit Team on where to look in the documentation for compliance to the OH standard and, if requested, to give further explanation on criteria and procedures implemented.

All documentation will be considered as confidential audit records and treated as such. The Audit Team will prepare a public report of its audit findings.
<table>
<thead>
<tr>
<th>Event</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submittal of the audit material on behalf of the Audit Team</td>
<td>8 weeks prior to audit 16.4.2014</td>
</tr>
<tr>
<td>Objection or concern about audit team personnel</td>
<td>5 weeks prior to audit 7.5.2014</td>
</tr>
<tr>
<td>Submittal of the completed Audit Worksheet to the Audit Team by</td>
<td>4 weeks prior to audit 14.5.2014</td>
</tr>
<tr>
<td>TRANSELECTRICA</td>
<td></td>
</tr>
<tr>
<td>Initial feedback based on the submitted Audit Worksheet sent to</td>
<td>2 working days prior to audit 9.6.2014</td>
</tr>
<tr>
<td>TRANSELECTRICA by the Audit Team</td>
<td></td>
</tr>
<tr>
<td>Opening meeting of the Audit Team and CAM of TRANSELECTRICA</td>
<td>First audit day, 11.6.2014 09:00 – 09:30</td>
</tr>
<tr>
<td>(1) Introduction of the Audit Team members,</td>
<td></td>
</tr>
<tr>
<td>(2) Description of how the on-site audit will be conducted,</td>
<td></td>
</tr>
<tr>
<td>(3) Discussion on how confidential information will be handled,</td>
<td></td>
</tr>
<tr>
<td>(4) Discussion on data access required by the Audit Team,</td>
<td></td>
</tr>
<tr>
<td>(5) Announcement that TRANSELECTRICA will be asked to provide</td>
<td></td>
</tr>
<tr>
<td>feedback on the audit process and results,</td>
<td></td>
</tr>
<tr>
<td>(6) Presentation of the TSO and TSO’s organization.</td>
<td></td>
</tr>
<tr>
<td>Start of the OH standards’ review*</td>
<td>First audit day, 11.6.2014 09:30 – 17:30</td>
</tr>
<tr>
<td>Continuation of the OH standards’ review</td>
<td>Second audit day, 12.6.2014 09:00 – 12:30</td>
</tr>
<tr>
<td>Internal Audit Team meeting</td>
<td>Second audit day, 12.6.2014 12:30 – 14:00</td>
</tr>
<tr>
<td>Closing meeting with CAM of TRANSELECTRICA</td>
<td>Second audit day, 12.6.2014 14:00 – 15:30</td>
</tr>
<tr>
<td>(1) Presentation of preliminary audit findings and</td>
<td></td>
</tr>
<tr>
<td>recommendations to be included on the draft audit report, with</td>
<td></td>
</tr>
<tr>
<td>a strong emphasis on the evidence for each compliance level or</td>
<td></td>
</tr>
<tr>
<td>non-compliance identified by the Audit Team,</td>
<td></td>
</tr>
<tr>
<td>(2) Discussion and feedback by TRANSELECTRICA with a possibility</td>
<td></td>
</tr>
<tr>
<td>to object the findings,</td>
<td></td>
</tr>
<tr>
<td>(3) In case of any non-compliance or lack of evidence of</td>
<td></td>
</tr>
<tr>
<td>compliance, first draft proposal of the TSO on an adequate</td>
<td></td>
</tr>
<tr>
<td>mitigation plan, including deadline. Should such an immediate</td>
<td></td>
</tr>
<tr>
<td>proposal not be possible, the TSO must submit it afterwards in</td>
<td></td>
</tr>
<tr>
<td>written copy within seven days.</td>
<td></td>
</tr>
<tr>
<td>Delivery of the draft audit report to TRANSELECTRICA for review</td>
<td>2 weeks after the audit 26.6.2014</td>
</tr>
<tr>
<td>Remarks by TRANSELECTRICA</td>
<td>4 weeks after the audit 10.7.2014</td>
</tr>
<tr>
<td>Delivery of the final audit report to TRANSELECTRICA</td>
<td>6 weeks after the audit 24.7.2014</td>
</tr>
<tr>
<td>Acknowledgement of the final Audit Report by ENTSO-E RGCE Plenary</td>
<td>RGCE Plenary in 2015</td>
</tr>
<tr>
<td>and decision on its possible internal or external publishing.</td>
<td></td>
</tr>
</tbody>
</table>
3.2 Scope

The objective of Compliance Audits in 2014 is to check chosen set of standards from OH Policy 3. These standards were also monitored in the 2013 regular compliance process via the self-assessment questionnaire.

The scope of a compliance audit encompasses issues which are directly related to the compliance of the audited TSO with the investigated RGCE OH standards and issues which make a general background for the implementation of the OH at the audited TSO.

Directly related issues

Issues directly related to the audited RGCE OH standards:

- Existence of TSO’s addenda and/or non-compliance declarations/non-compliance self-reports
- Follow-up of the TSO’s mitigation plans to remove the declared non-compliances
- Self-assessment questionnaires of 2013 stored at the ENTSO-E Secretariat related to audited TSO concerning the audited OH standards
- Audit Worksheet (AW) 2014
- Information and explanations which the Audit Team receives on site

General background

The compliance audit also encompasses issues of general nature listed below:

- General policies of the audited TSO rules and procedures for the control centre(s) related to the audited standards
- Procedures to control the application of the audited OH standards and their follow-up
- Procedures to improve the compliance with the audited OH standards
- TSO’s internal report related to the implementation of the audited OH standards
- TSO’s internal audits and/or documentation concerning implementation of OH standards
- TSO’s internal bodies (forums, panels) for the implementation of the OH standards

3.3 Methodology

The CME group prepared an audit schedule defining the chronological order of the compliance audit, which the audited TSO accepted without comment. The Audit Team reviewed the existing material on the audited TSO and its neighbouring TSOs already collected through the self-assessment process in the 2013 self-assessment questionnaires. It also processed (assessed) the answers in the 2014 Audit Worksheet filled in by the audited TSO.

The applied methodology includes audit criteria and expectations based on best practices. The adopted criteria are objective, measurable (if possible), complete and relevant to the objectives. At defining the audit methodology, the auditors identified the potential sources of audit evidence and estimated the amount and type of evidence needed.

The Audit Team used an Audit Worksheet (see chapter 4) for reviewing the audited OH standards. The purpose of the AW is to ensure consistency and fairness. By using the AW the Audit Team documented the material reviewed and the observations made. One of the main reasons for an on-site visit is to review the existing documentation and to interview the staff. Thus, the auditors obtain “objective evidence” which support the self-assessed declarations of the audited TSO. The Audit Team determined whether the evidence presented by the TSO is sufficient. They did this by assessing the relevance, validity and reliability of the information and documentation presented.

It was the responsibility of the audited TSO to provide evidence of compliance with all audited OH standards. In most cases the evidence was in written form like documents, plans, programs or
records. In some cases the evidence consisted of a review of computerized records or additional supporting material provided at interviews by the staff of the audited TSO.

### 3.4 Evaluation Principles

**Preparatory phase – activities in charge of Audited TSO**

- Inspection of the exact wording of each audited OH standard and of additional questions formulated by the CME
- Fill in the audit questionnaire and submit to the Audit Team before the audit
- Identification of documents and other material to present to the auditors in order to demonstrate its compliance level with each OH standard

**Preparatory phase – activities in charge of CME Audit team**

- Identification of compliance level declaration inconsistency with neighbouring TSOs (Self-assessment questionnaire 2013 cross-border check regarding compliance level declarations)
- Analysis of the explanations and comments which the audited TSO made in the self-assessment 2013 and audit questionnaires 2014 in written form in order to evaluate the quality of explanations and comments
- Identification of the missing explanations in the self-assessment 2013 and audit questionnaire 2014
- Analysis of the improvements achieved during the implementation of mitigation and improvement plans declared in the MLA Addendum/Addenda, in the self-assessment questionnaire 2013 and in the Audit Worksheet 2014 in case of non-compliance and sufficient compliance

**Audit phase**

- Request to the audited TSO to give additional explanations, especially related to standards which were not or not fully addressed by documents and other material mentioned in the self-assessment questionnaire 2013 and audit questionnaire 2014.
  - The goal was to improve the quality of the explanations.
- Request to the audited TSO to present that evidence and, if necessary, additional evidence, in printed or electronic form
  - The goal was to improve the quality of the presented evidence.
  - The goal was to present material relevant to the audited OH standard at all.
- Request to the audited TSO to remark the titles of all presented documents, their relevant chapters and even relevant passages.
- Request to the audited TSO to provide further written explanations related to the presented material.

### 3.5 Confidentiality

By signing this report the Audit Team members assure that they will maintain the confidentiality of information obtained during the compliance audit and drafting of the audit report. Moreover, they express their readiness to sign a supplementary confidentiality agreement, if the audited TSO assert such a claim.
4 Audit Worksheet for 2014 Onsite Audit

4.1 OH Standard P3-A1-S3.3. Calculations in Real Time Operation

<table>
<thead>
<tr>
<th>Self-Assessment Questionnaire 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P3-A1-S3.3</strong></td>
</tr>
<tr>
<td><strong>Calculations in real time operation.</strong> The N situation has to be determined by state estimation on the basis of measurements and topology. Each TSO must perform an automatic N-1 simulation for all the contingencies of the contingency list in real time.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td><strong>Additional Questions</strong></td>
</tr>
<tr>
<td>Do you determine the N situation by state estimation on the basis of measurements and topology?</td>
</tr>
<tr>
<td>Do you have a list of contingencies for the automatic N-1 simulations in real time?</td>
</tr>
<tr>
<td>Do you perform an automatic N-1 simulation for all the contingencies of the contingency list in real time?</td>
</tr>
</tbody>
</table>
P3-A1-S3.3

Calculations in real time operation. The N situation has to be determined by state estimation on the basis of measurements and topology. Each TSO must perform an automatic N-1 simulation for all the contingencies of the contingency list in real time.

Compliance Level: FCo

Concise explanation and list of evidence for declared compliance level:

State estimator on EMS-SCADA is in operation and automatic N-1 simulations are performed in real time by RTCA application in RT Network Analysis. All the contingencies of the contingency list are used for simulations.

List of evidences:
- presentation of state estimator and example of N-1 simulation;
- contingency list implemented in EMS – SCADA;
- Bilateral Operational Agreements.

Do you have a mitigation plan to the standard? Yes ☒ No ☐

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

Additional Questions

Do you determine the N situation by state estimation on the basis of measurements and topology? Yes ☒ No ☐

Do you have a list of contingencies for the automatic N-1 simulations in real time? Yes ☒ No ☐

Do you perform an automatic N-1 simulation for all the contingencies of the contingency list in real time? Yes ☒ No ☐

List of evidence, comments:

List of evidences:
- presentation of state estimator and example of N-1 simulation;
- contingency list implemented in EMS – SCADA;
- Bilateral Operational Agreements.
AUDIT PHASE

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:

State estimator on EMS-SCADA is in operation and automatic N-1 simulations are performed in real time by RTCA application in RT Network Analysis. All the contingencies of the contingency list are used for simulations.

List of evidences:
- Real-time running of state estimator and N-1 simulation in control room.
- Contingency list implemented in EMS – SCADA.

Bilateral operational agreements are not considered as a relevant evidence for assessing the compliance level of this standard.
### 4.2 OH STANDARD P3-A1-S3.3.1 FREQUENCY CALCULATION

#### SELF-ASSESSMENT QUESTIONNAIRE 2013

<table>
<thead>
<tr>
<th>P3-A1-S3.3.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency of calculation.</strong> The automatic N-1 simulation must run periodically, at least every 15 minutes in real time.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td><strong>Additional Questions</strong></td>
</tr>
<tr>
<td>How often do you perform an automatic N-1 simulation in real time?</td>
</tr>
<tr>
<td><strong>2 min.</strong></td>
</tr>
</tbody>
</table>

#### AUDIT QUESTIONNAIRE 2014

<table>
<thead>
<tr>
<th>P3-A1-S3.3.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency of calculation.</strong> The automatic N-1 simulation must run periodically, at least every 15 minutes in real time.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td><strong>Concise explanation and list of evidence for declared compliance level:</strong></td>
</tr>
<tr>
<td>The automatic N-1 simulation runs periodically, every 2 minutes. The running period is configurable in our EMS SCADA application (RTCA application).</td>
</tr>
<tr>
<td>List of evidences:</td>
</tr>
<tr>
<td>- presentation of RTCA application (configuration window)</td>
</tr>
<tr>
<td><strong>Do you have a mitigation plan to the standard?</strong> Yes ☐ No ☑</td>
</tr>
<tr>
<td>In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:</td>
</tr>
<tr>
<td><strong>Additional Questions</strong></td>
</tr>
<tr>
<td>How often do you perform an automatic N-1 simulation in real time?</td>
</tr>
<tr>
<td><strong>Every 2 minutes</strong></td>
</tr>
</tbody>
</table>
List of evidence, comments:

List of evidences:
- presentation of RTCA application (configuration window)

AUDIT PHASE

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:

The automatic N-1 simulation runs periodically, every 2 minutes. The running period is configurable in EMS SCADA application (RTCA application).

List of evidences:
- presentation of RTCA application (configuration window)
- check of triggering time in control room
- parameterisation window
4.3 OH STANDARD P3-A1-S3.3.2 ADDITIONAL N-1 CALCULATIONS

### SELF-ASSESSMENT QUESTIONNAIRE 2013

**P3-A1-S3.3.2**

**Additional N-1 calculations.** The TSOs must perform additional N-1 simulations prior to the application of important topology changes by manoeuvres (opening line, opening bus-bar) or after a relevant unexpected change of topology or a significant shift of the generation pattern (e.g. units tripped or out of operation).

**Compliance Level:** FCo

**Additional Questions**

In which cases or in which situations do you perform additional N-1 simulations?

*Every time when the network topology changes or generation pattern modification are considered important, having possible significant influences, according with: operational planning results; operational programming computations and results (short term analysys); operational best practice; informations coming from outside/neighbors about topology changes according with contingency lists; some emergencies (slow evolving) if possible.*

### AUDIT QUESTIONNAIRE 2014

**P3-A1-S3.3.2**

**Additional N-1 calculations.** The TSOs must perform additional N-1 simulations prior to the application of important topology changes by manoeuvres (opening line, opening bus-bar) or after a relevant unexpected change of topology or a significant shift of the generation pattern (e.g. units tripped or out of operation).

**Compliance Level:** FCo

Concise explanation and list of evidence for declared compliance level:

Additional N-1 simulations are performed every time when the network topology changes or generation pattern modification are considered important.

List of evidences:

- simulation example

**Do you have a mitigation plan to the standard?**  
Yes ☐  No ☒

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

- - -

**Additional Questions**
In which cases or in which situations do you perform additional N-1 simulations?

Every time when the network topology changes or generation pattern modification are considered important, having possible significant influences, according with: results and operational measures coming from operational planning, operational programming computations (short term analysis). There are also considered information coming from neighbouring TSOs about topology changes according with contingency lists.

List of evidence, comments:

List of evidences:
- operational planning studies;
  - short term analysis results and operational measures.

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:

Additional N-1 simulations are performed by dispatchers if they consider them necessary having the following criteria as background:
- operational experience
- results from last available security analysis

List of evidence:
- simulation example on SCADA by dispatcher in Study mode, on a real time snapshot
4.4 OH STANDARD P3-A2-S1. DETERMINATION OF THE EXTERNAL CONTINGENCY LIST AND OBSERVABILITY AREA

SELF-ASSESSMENT QUESTIONNAIRE 2013

P3-A2-S1

Determination of the external contingency list and observability area. Each TSO is required to determine the external contingency list and the external observability list related to its responsibility area. External contingency list items must be treated as normal type of contingencies in all N-1 security calculations in all time frames. Additionally exceptional contingencies (double lines, busbars) as announced by a neighbouring TSO have to be included by the TSO if it considers them very relevant for risks.

Compliance Level: FCo

Additional Questions

Do you determine the external contingency list related to your responsibility area?  
yes

Do you determine the external observability list related to your responsibility area?  
yes

Which criteria do you implement in determination of the external contingency list and the external observability list related to your responsibility area?

Influence factor calculation results, NTC optimization.

Do you include the elements of your external observability list in the model of your security analysis?  
yes
### P3-A2-S1

**Determination of the external contingency list and observability area.** Each TSO is required to determine the external contingency list and the external observability list related to its responsibility area. External contingency list items must be treated as normal type of contingencies in all N-1 security calculations in all time frames. Additionally exceptional contingencies (double lines, busbars) as announced by a neighbouring TSO have to be included by the TSO if it considers them very relevant for risks.

**Compliance Level:** FCo

Concise explanation and list of evidence for declared compliance level:

External contingency list and external observability list are determined. All these elements are implemented in the EMS/SCADA system and there are taken into consideration in the regular security analysis assessment in all timeframes.

List of evidences:
- Bilateral Operational Agreements;
- external contingency list and the external observability list in the model of the security analysis.

**Do you have a mitigation plan to the standard?** Yes ☐ No ☒

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

**Additional Questions**

Do you determine the external contingency list related to your responsibility area?

Yes ☒ No ☐

Do you determine the external observability list related to your responsibility area?

Yes ☒ No ☐

Which criteria do you implement in determination of the external contingency list and the external observability list related to your responsibility area?

Influence factor calculation results

Do you include the elements of your external observability list in the
model of your security analysis?

Yes ☒ No □

List of evidence, comments:

List of evidences:
- Bilateral Operational Agreements;
- external contingency list and the external observability list implemented in the model of the security analysis.

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:

External contingency list and external observability list are determined on the basis of ENTSO-E RGCE Operation Handbook Policy 3, applying the first methodology of influence factor which is described in annex of Policy 3.
All these elements are implemented in the EMS/SCADA system and they are taken into consideration in the security analysis assessment regularly performed in all timeframes.

List of evidences:
- Operational Planning Study for summer 2014, Annex 3.15 (influence factor analysis), March 2014
- External contingency list and the external observability list in the application of the security analysis.
- Agreement on Network and System Operation Management between Transelectrica and Mavir, 2009 Annexe 5 and 15 (contingency list) – updated June 2014
- Operational agreement between ESO EAD and Transelectrica, 2013, appendix 28 and 29 (contingency list)
- Operational agreement between EMS and Transelectrica, 06.2011, appendix 33 and 34 (contingency list)
4.5 **OH STANDARD P3-A2-S2 IMPLEMENTATION OF OBSERVABILITY AREA**

**SELF-ASSESSMENT QUESTIONNAIRE 2013**

<table>
<thead>
<tr>
<th>P3-A2-S2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Implementation of observability area.</strong> The external network model corresponding to the observability area must be implemented in the SCADA system and its real-time observability by state estimator must be ensured by a proper amount of exchanged online data.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td><strong>Additional Questions</strong></td>
</tr>
<tr>
<td>Are there external elements of your observability area that are not included in your SCADA/EMS model?</td>
</tr>
</tbody>
</table>

**AUDIT QUESTIONNAIRE 2014**

<table>
<thead>
<tr>
<th>P3-A2-S2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Implementation of observability area.</strong> The external network model corresponding to the observability area must be implemented in the SCADA system and its real-time observability by state estimator must be ensured by a proper amount of exchanged online data.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td>Concise explanation and list of evidence for declared compliance level:</td>
</tr>
<tr>
<td>The elements from the observability area are implemented and visible in the EMS/SCADA system</td>
</tr>
<tr>
<td>List of evidences:</td>
</tr>
<tr>
<td>- list of elements of the observability area implemented and visible in SCADA system</td>
</tr>
<tr>
<td><strong>Do you have a mitigation plan to the standard?</strong></td>
</tr>
</tbody>
</table>

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments: 

<table>
<thead>
<tr>
<th>Additional Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there external elements of your observability area that are not included in your SCADA/EMS model?</td>
</tr>
</tbody>
</table>
List of evidence, comments:

List of evidences:
- list of elements of the observability area implemented and visible in SCADA system

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:

The elements from the observability area are implemented and visible in the EMS/SCADA system.

List of evidences:
- List of elements of the observability area included in the internal operational planning study.
- Model of the observability area which is implemented in SCADA system in the control room.
4.6 **OH STANDARD P3-A2-S6 DATA PROVISION**

<table>
<thead>
<tr>
<th>SELF-ASSESSMENT QUESTIONNAIRE 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P3-A2-S6</strong></td>
</tr>
</tbody>
</table>

**Data provision.** The TSO has to provide its neighbours in due time with all needed information for adequate simulations. Each TSO must provide the real-time telemetry and the network characteristics to its neighbours that is necessary for the neighbouring TSOs to have a sufficient external network model of the observability area for the state estimator and for the N-1 security calculations. This implies among others all data related to switching status, active and reactive power flows, voltage, injections and loads, tap changer position of transformers.

**Compliance Level:** FCo

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC</td>
<td>FC</td>
<td>FC</td>
</tr>
</tbody>
</table>

**Additional Questions**

Do you provide the data requested by the neighbouring TSO in due time?

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

Do you receive the data requested from the neighbouring TSO in due time?

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>
**AUDIT QUESTIONNAIRE 2014**

### P3-A2-S6

**Data provision.** The TSO has to provide its neighbours in due time with all needed information for adequate simulations. Each TSO must provide the real-time telemetry and the network characteristics to its neighbours that is necessary for the neighbouring TSOs to have a sufficient external network model of the observability area for the state estimator and for the N-1 security calculations. This implies among others all data related to switching status, active and reactive power flows, voltage, injections and loads, tap changer position of transformers.

**Compliance Level:** FCo

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
</tbody>
</table>

Concise explanation and list of evidence for declared compliance level:

Details about information exchange for the elements of the external observability area are defined in bilateral operational agreements, signed with all neighbouring TSOs.

List of evidences:
- Bilateral Operational Agreements (set of information exchanged)

Do you have a mitigation plan to the standard?  

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☐</td>
<td>Yes ☐</td>
<td>Yes ☐</td>
</tr>
</tbody>
</table>

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

Additional Questions

Do you provide the data requested by the neighbouring TSO in due time?

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☒</td>
<td>Yes ☒</td>
<td>Yes ☒</td>
</tr>
</tbody>
</table>

Do you receive the data requested from the neighbouring TSO in due time?

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☒</td>
<td>Yes ☒</td>
<td>Yes ☒</td>
</tr>
</tbody>
</table>
List of evidences:
- e-mails exchanged with neighbours

### COMPLIANCE AUDIT 2014

**Compliance Level suggestion by the Audit Team:** FCo

**Explanation for the suggested compliance level:**

Details about information exchange for the elements of the external observability area are defined in bilateral operational agreements, signed with all neighbouring TSOs.

List of evidences:
- Operational agreement between ESO EAD and Transelectrica, Appendix 27 (on-line data exchange), 2013
- Operational agreement between EMS and Transelectrica, 06.2011, Appendix 32 (on-line data exchange), 2011
- Agreement on Network and System Operation Management between Transelectrica and Mavir, 2009 Annex 15 (on-line data exchange, including Observability area)
4.7 **OH STANDARD P3-A3-S2. OVERLOADS IN N-1 SITUATION (SIMULATION)**

### SELF-ASSESSMENT QUESTIONNAIRE 2013

**P3-A3-S2**

**Overloads in N-1 situation (simulation).** Considering the loss of a network element (N-1 situation) overloads on impacted network elements are admitted only if remedial actions are available as to get back any overloaded network element below its respective Permanent Admissible Transmission Loading (PATL).

**Compliance Level:** FCo

**Additional Questions**

What type of remedial action do you use to get back an overloaded network element below its respective PATL?

*Redispatching/network topology, Congestion Management, Q/V control.*

### AUDIT QUESTIONNAIRE 2014

**P3-A3-S2**

**Overloads in N-1 situation (simulation).** Considering the loss of a network element (N-1 situation) overloads on impacted network elements are admitted only if remedial actions are available as to get back any overloaded network element below its respective Permanent Admissible Transmission Loading (PATL).

**Compliance Level:** FCo

**Concise explanation and list of evidence for declared compliance level:**

In N-1 simulation we don't accept overloads. Regular preparation of remedial actions takes place in the planning phase, at different time horizon. There are N-1 simulations performed twice per year, as part of seasonal operational studies and in D-1 for day D.

List of evidences:

- reports of N-1 simulations performed at different time horizon (operational studies, operational measures, outages planning);
- Romanian Transmission Grid Code statements.

**Do you have a mitigation plan to the standard?**  

Yes ☐  No ☑

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

- - -

**Additional Questions**
What type of remedial action do you use to get back an overloaded network element below its respective PATL?

List of evidence, comments:

In order to avoid overloads we use congestion management as: change of network topology, Q/V control, generation redispatching.

List of evidences:
- Romanian Transmission Grid Code, Wholesale Energy Market Commercial Code (congestion management part) and internal operational procedures;
- Operational planning studies and operational measures.

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: N/A

Explanation for the suggested compliance level:
According to the Romanian Grid Code overloads are not accepted in N-1 situations. Since there is no admission of overloads on the network elements in N-1 situations, Transelectrica does not make use of running the system admitting overloads and no remedial actions are developed accordingly. Therefore, the Audit Team considers that the appropriate compliance level for this standard is N/A.

List of evidences:
- Romanian Transmission Grid Code, August 2004, Chapter 3.5 “N-1 applied in the dispatcher control of the transmission grid”, Article 115
4.8 OH STANDARD P3-A3-S2.2 INSTANTANEOUS TRIPPING IN N-1 SIMULATIONS

SELF-ASSESSMENT QUESTIONNAIRE 2013

<table>
<thead>
<tr>
<th>P3-A3-S2.2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Instantaneous tripping in N-1 simulation. It is admitted to overpass the TC of a network element after a N-1 simulation exclusively if there is no uncontrolled evolution for the overall system (no cascading tripping, no voltage collapse, no loss of synchronism). If the N-1 simulation indicates an uncontrolled evolution or cascading effects with impact outside the boundaries, preventive remedial actions are mandatory to come back to an N-1 secure situation. TSO informs its neighbours as soon as the danger of over-passing is detected and no remedial actions are available to avoid it.</td>
<td></td>
</tr>
</tbody>
</table>

Compliance Level: FCo

Additional Questions

Do you apply preventive remedial actions in case that probable instantaneous tripping in N-1 simulation leads to a cascading effect?  

yes
P3-A3-S2.2

**Instantaneous tripping in N-1 simulation.** It is admitted to overpass the TC of a network element after a N-1 simulation exclusively if there is no uncontrolled evolution for the overall system (no cascading tripping, no voltage collapse, no loss of synchronism). If the N-1 simulation indicates an uncontrolled evolution or cascading effects with impact outside the boundaries, preventive remedial actions are mandatory to come back to an N-1 secure situation. TSO informs its neighbours as soon as the danger of over-passing is detected and no remedial actions are available to avoid it.

**Compliance Level:** FCo

Concise explanation and list of evidence for declared compliance level:

According with the Romanian Transmission Grid Code and operational procedures it is not allowed to overpass the TC of any network element after N-1 simulation/calculation. As soon as the danger of over-passing is detected and no remedial actions are available, the neighbouring TSOs are informed.

List of evidences:
- Bilateral Operational Agreements;
- Romanian Transmission Grid Code, internal procedures.

**Do you have a mitigation plan to the standard?**  
Yes ☐  No ☒

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

**Additional Questions**

Do you apply preventive remedial actions in case that probable instantaneous tripping in N-1 simulation leads to a cascading effect?  
Yes ☒  No ☐

List of evidence, comments:
- Bilateral Operational Agreements;
- internal procedures.

**COMPLIANCE AUDIT 2014**

**Compliance Level suggestion by the Audit Team:** N/A

**Explanation for the suggested compliance level:**
According to the Romanian Grid Code overloads are not accepted in N-1 situations. Since there is no admission of overloads on the network elements in N-1 situations, Transelectrica does not make use of running the system admitting overloads, no remedial actions are developed
accordingly and there’s no need of informing neighboring TSOs. Therefore, the Audit Team considers that the appropriate compliance level for this standard is N/A.

List of evidences:
- Romanian Transmission Grid Code, August 2004, Chapter 3.5 “N-1 applied in the dispatcher control of the transmission grid”, Article 115
4.9 OH STANDARD P3-A3-S4.1 TIE-LINES OPERATION CONDITIONS

<table>
<thead>
<tr>
<th>SELF-ASSESSMENT QUESTIONNAIRE 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P3-A3-S4.1</strong></td>
</tr>
<tr>
<td><strong>Tie-lines operating conditions.</strong> The information on values of PATL, TATL or couples (TATL; Duration), overload conditions (acceptable duration of overload), and TC of tie-lines must be shared with adjacent TSOs. Mutual information must be agreed and implemented. In case of settings changes TSO has to inform the adjacent TSO on the new values.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td><strong>Additional Questions</strong></td>
</tr>
<tr>
<td>Do you have a reference document with the values of PATL, TATL and TC for both sides of tie-lines agreed by both TSOs?</td>
</tr>
<tr>
<td><strong>ESO EAD</strong></td>
</tr>
<tr>
<td>yes</td>
</tr>
<tr>
<td><strong>Please, describe the procedure of changing settings of PATL, TATL and TC on tie-lines?</strong></td>
</tr>
<tr>
<td><strong>According with OAs in case of settings changes a process of mutual information and correlation is triggered by the concerned TSO and each neighbour performs his own calculations. The results are mutually agreed.</strong></td>
</tr>
</tbody>
</table>
## P3-A3-S4.1

### Tie-lines operating conditions

The information on values of PATL, TATL or couples (TATL; Duration), overload conditions (acceptable duration of overload), and TC of tie-lines must be shared with adjacent TSOs. Mutual information must be agreed and implemented. In case of settings changes TSO has to inform the adjacent TSO on the new values.

#### Compliance Level: FCo

Concise explanation and list of evidence for declared compliance level:

Information is exchanged according with bilateral Operational Agreements, signed with all neighbouring TSOs.

List of evidences:
- Bilateral Operational Agreements;
- Examples of information exchange with neighbouring TSOs in case of settings changes.

Do you have a mitigation plan to the standard?  

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☑</td>
<td>Yes ☑</td>
<td>Yes ☑</td>
</tr>
<tr>
<td>No ☐</td>
<td>No ☐</td>
<td>No ☐</td>
</tr>
</tbody>
</table>

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

### Additional Questions

Do you have a reference document with the values of PATL, TATL and TC for both sides of tie-lines agreed by both TSOs?

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☑</td>
<td>Yes ☑</td>
<td>Yes ☑</td>
</tr>
<tr>
<td>No ☐</td>
<td>No ☐</td>
<td>No ☐</td>
</tr>
</tbody>
</table>

Please, describe the procedure of changing settings of PATL, TATL and TC on tie-lines?

According with OAs in case of settings changes a process of mutual information and correlation is triggered by the concerned TSO and each neighbour performs his own calculations. The results are mutually agreed.

List of evidence, comments:

List of evidences:
- Bilateral Operational Agreements;
- Examples of information exchange with neighbouring TSOs in case of settings changes.
Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:
Information is exchanged according to bilateral Operational Agreements, signed with all neighbouring TSOs.

List of evidence:
- Example of information exchange with neighbouring TSOs for tie-line operation settings changes, between Transelectrica and ESO EAD –“Information about new substation Stupina,” November 2012
- Excel table with tie-lines operational condition settings, “ENTSO-E tie-lines 2011”
- Operational agreement between ESO EAD and Transelectrica, 2013, Appendix 1-3
- Operational agreement between EMS and Transelectrica, 06.2011, Appendix 1-4
- Agreement on Network and System Operation Management between Transelectrica and Mavir, 2009, Annex 3A
## 4.10 OH STANDARD P3-A3-S4.2.2 SYNCHRONISING EQUIPMENT SETTINGS

### SELF-ASSESSMENT QUESTIONNAIRE 2013

<table>
<thead>
<tr>
<th><strong>P3-A3-S4.2.2</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synchronising equipment settings.</strong> TSO is obliged to inform the neighbouring TSO about the settings of the synchronising equipment for switching supervision installed on tie-lines (voltage phase angle difference, voltage module difference, frequency difference).</td>
<td></td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Questions

Do you inform your neighbours about the settings of the synchronising equipment for switching supervision installed on your side of tie-lines?

<table>
<thead>
<tr>
<th><strong>ESO EAD</strong></th>
<th><strong>JP EMS</strong></th>
<th><strong>MAVIR ZRt</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

Do you have information about the settings of the synchronising equipment for switching supervision installed on the neighbouring side of tie-lines?

<table>
<thead>
<tr>
<th><strong>ESO EAD</strong></th>
<th><strong>JP EMS</strong></th>
<th><strong>MAVIR ZRt</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>
## Synchronising equipment settings

TSO is obliged to inform the neighbouring TSO about the settings of the synchronising equipment for switching supervision installed on tie-lines (voltage phase angle difference, voltage module difference, frequency difference).

### Compliance Level: FCo

**Concise explanation and list of evidence for declared compliance level:**

- Information is exchanged according with bilateral Operational Agreements, signed with all neighbouring TSOs.
- List of evidences:
  - Bilateral Operational Agreements

**Do you have a mitigation plan to the standard?**

- Yes [ ]
- No [x]

**In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:**

### Additional Questions

**Do you inform your neighbours about the settings of the synchronising equipment for switching supervision installed on your side of tie-lines?**

<table>
<thead>
<tr>
<th>TSO</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESO EAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JP EMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAVIR ZRt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Do you have information about the settings of the synchronising equipment for switching supervision installed on the neighbouring side of tie-lines?**

<table>
<thead>
<tr>
<th>TSO</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESO EAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JP EMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAVIR ZRt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**List of evidence, comments:**

- List of evidences:
  - Bilateral Operational Agreements;
  - Example of information exchange with neighbouring TSOs.
COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:
Information is exchanged according to bilateral Operational Agreements, signed with all neighbouring TSOs.

List of evidences:
- Operational agreement between ESO EAD and Transelectrica, Appendix 16-18, 2013
- Operational agreement between EMS and Transelectrica, 06.2011, Appendix 21
- Agreement on Network and System Operation Management between Transelectrica and Mavir, 2009 Appendix 9
- Correspondence between Transelectrica and ESO EAD, Information letter about Rahman windfarm integration and notifications of the system developments, 27 September 2011
- Correspondence between Mavir and Transelectrica, Commissioning of the new 400 kV lines Albertirsa – Szolnok and Szolnok – Békéscsaba in November at Mavir, 29.9.2012
- Excel table with tie-lies per border with the operational condition settings, “ENTSO-E tie-lines 2011”
## 4.11 OH STANDARD P3-A3-S4.2.3 PROTECTION SYSTEM SETTING

### SELF-ASSESSMENT QUESTIONNAIRE 2013

<table>
<thead>
<tr>
<th>P3-A3-S4.2.3</th>
<th><strong>Protection system settings.</strong> The settings of protection systems for tie-lines have to be co-ordinated between TSOs. Therefore TSO is obliged to inform in advance neighbouring TSOs of the settings of protection systems and of changes in operating conditions of tie lines.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compliance Level:</strong></td>
<td>FCo</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC</td>
<td>FC</td>
<td>FC</td>
</tr>
</tbody>
</table>

**Additional Questions**

How do you coordinate the settings of protection systems for tie-lines with neighbouring TSOs?

*According with OAs in case of changing the protection settings a process of mutual information and correlation is triggered by the concerned TSO and each neighbour performs his own calculations. The results are mutually agreed.*
## AUDIT QUESTIONNAIRE 2014

### P3-A3-S4.2.3

**Protection system settings.** The settings of protection systems for tie-lines have to be co-ordinated between TSOs. Therefore TSO is obliged to inform in advance neighbouring TSOs of the settings of protection systems and of changes in operating conditions of tie lines.

**Compliance Level:** FCo

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
</tbody>
</table>

**Compliance Level:**

Concise explanation and list of evidence for declared compliance level:

The settings of protection systems for tie-lines are co-ordinated with neighbouring TSOs and information is exchanged according to bilateral Operational Agreements.

List of evidences:
- Bilateral Operational Agreements;
- Example of information exchange with neighbouring TSOs.

**Do you have a mitigation plan to the standard?**

- [ ] Yes
- [x] No

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

**Additional Questions**

How do you coordinate the settings of protection systems for tie-lines with neighbouring TSOs?

According to Bilateral Operational Agreements, in case of changing the protection settings a process of mutual information and correlation is triggered by the concerned TSO and each neighbour performs his own calculations. The results are mutually agreed.

List of evidence, comments:

List of evidences:
- Bilateral Operational Agreements;
- Examples of information exchange with neighbouring TSOs.
COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:

The settings of protection systems for tie-lines are co-ordinated with neighbouring TSOs and information is exchanged according to bilateral Operational Agreements.

List of evidences:
- Operational agreement between ESO EAD and Transelectrica, Appendix 10-15, 2013
- Operational agreement between EMS and Transelectrica, 06.2011, Appendix 13-20
- Agreement on Network and System Operation Management between Transelectrica and Mavir, 2009, Annex 8A
- Minutes of the meeting between Transelectrica and EMS about design of protection settings, 20 October 2005
- Email correspondence between Transelectrica and ESO EAD on the protection settings for OHL Rahman – Dobrudja and proposal for teleprotection equipment commissioning (before energizing the substation), 20 March 2012
### 4.12 OH STANDARD P3-A4-S5 PREPARATION OF REMEDIAL ACTIONS IN THE OPERATIONAL PLANNING STAGE

**SELF-ASSESSMENT QUESTIONNAIRE 2013**

<table>
<thead>
<tr>
<th>P3-A4-S5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation of remedial actions in the operational planning stage.</strong> Preventive and curative remedial actions are due to be prepared in the operational planning stage.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td><strong>No Additional Questions</strong></td>
</tr>
</tbody>
</table>

**AUDIT QUESTIONNAIRE 2014**

<table>
<thead>
<tr>
<th>P3-A4-S5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation of remedial actions in the operational planning stage.</strong> Preventive and curative remedial actions are due to be prepared in the operational planning stage.</td>
</tr>
<tr>
<td><strong>Compliance Level:</strong> FCo</td>
</tr>
<tr>
<td><strong>Concise explanation and list of evidence for declared compliance level:</strong></td>
</tr>
<tr>
<td>Remedial actions are prepared in the operational planning stage from year ahead till day ahead.</td>
</tr>
<tr>
<td><strong>List of evidences:</strong></td>
</tr>
<tr>
<td>- Bilateral Operational Agreements;</td>
</tr>
<tr>
<td>- Annual Maintenance Outages Program (AMOP) for SEE region;</td>
</tr>
<tr>
<td>- Weekly teleconference-WOPT;</td>
</tr>
<tr>
<td>- DACF forecast files.</td>
</tr>
</tbody>
</table>

**Do you have a mitigation plan to the standard?**  Yes [ ]  No [x]  |

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

- - -
**COMPLIANCE AUDIT 2014**

**Compliance Level suggestion by the Audit Team:** FCo

**Explanation for the suggested compliance level:**

Transelectrica is part of two regional coordination groups: SEE region and a group which focuses on the north eastern part of Romania, attended by Mavir, SEPS, Transelectrica, WPS.

The coordination of remedial actions takes place during the operational planning phase within TSOs of both regions. Transelectrica provided evidence on coordination of remedial actions in SEE region. Year ahead planning is coordinated within maintenance group of SEE region. As soon as one TSO of SEE region changes the plans of outages it informs neighbouring TSOs. Transelectrica performs security analysis in order to analyse the impact in their responsibility area and check whether preventive remedial actions are needed and reports the conclusion to the concerned TSO. A teleconference for coordination within concerned TSOs is weekly performed in order to coordinate and agree on operational activities within region for the next week. Transelectrica re-launches required security analysis on daily basis.

List of evidences:
- Email correspondence with neighbouring TSOs in the SEE region (ESO EAD, EMS, Transelectrica) for the disconnection of the following lines due to unplanned intervention on protection devices: OHL 400 kV Djerdap – Drmno on 28.3.2014 and OHL 400 kV Djerdap – Bor on 28.3.2014, emails from 18.3.2014 to 22.3.2014 include security analysis performed by Transelectrica on 18.3.2014 and confirmation on the envisaged remedial actions.
- Security analysis performed by Transelectrica on day ahead taking into account the forecasted situation.
- Information for operational teleconference on 27.3.2014 provided by EMS, ESO EAD and Transelectrica
- Minutes of 10th Annual Meeting of the Maintainance Group, 19 November 2013
### 4.13 OH STANDARD P3-A4-S5.1

**SELF-ASSESSMENT QUESTIONNAIRE 2013**

<table>
<thead>
<tr>
<th>P3-A4-S5.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remedies are prepared pursuant to the time horizons they are detected: from year ahead, to week ahead and till day ahead.</td>
</tr>
<tr>
<td>Compliance Level: FCo</td>
</tr>
<tr>
<td>No Additional Questions</td>
</tr>
</tbody>
</table>

**AUDIT QUESTIONNAIRE 2014**

<table>
<thead>
<tr>
<th>P3-A4-S5.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remedies are prepared pursuant to the time horizons they are detected: from year ahead, to week ahead and till day ahead.</td>
</tr>
<tr>
<td>Compliance Level: FCo</td>
</tr>
</tbody>
</table>

Concise explanation and list of evidence for declared compliance level:

There are operational long – term planning and operational short – term planning departments, sharing the operational tasks according with operational time horizon. There are performed yearly, weekly and daily mutual information exchange and correlations with the neighbours based on maintenance outages program.

List of evidences:
- Bilateral Operational Agreements;
- AMOP for SEE region;
- Weekly teleconference-WOPT;
- DACF forecast files.

Do you have a mitigation plan to the standard?  
Yes ☐ No ☒

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

- - -
COMPLIANCE AUDIT 2014

Compliance Level suggestion by the Audit Team: FCo

Explanation for the suggested compliance level:
See the explanation in Standard P3-A4-S5.
4.14 OH STANDARD P3-A4-S5.2

**SELF-ASSESSMENT QUESTIONNAIRE 2013**

<table>
<thead>
<tr>
<th>P3-A4-S5.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>These remedial actions (preventive/curative) have to be previously assessed by numerical simulations in order to evaluate the efficiency of those measures on the constraints.</td>
</tr>
<tr>
<td><strong>Compliance Level</strong>: FCo</td>
</tr>
<tr>
<td><strong>No Additional Questions</strong></td>
</tr>
</tbody>
</table>

**AUDIT QUESTIONNAIRE 2014**

<table>
<thead>
<tr>
<th>P3-A4-S5.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>These remedial actions (preventive/curative) have to be previously assessed by numerical simulations in order to evaluate the efficiency of those measures on the constraints.</td>
</tr>
<tr>
<td><strong>Compliance Level</strong>: FCo</td>
</tr>
</tbody>
</table>

**Concise explanation and list of evidence for declared compliance level:**

There are operational long – term planning and operational short – term planning departments, sharing the operational tasks according with operational time horizon. There are performed numerical simulations at different time frames. In case of detected problems, there is an exchange of information with neighbouring TSOs and remedial actions are mutually agreed.

List of evidences:
- Bilateral Operational Agreements;
- AMOP for SEE region;
- Internal Monthly Maintenance program;
- Weekly teleconference-WOPT;
- DACF forecast files.

**Do you have a mitigation plan to the standard?**

Yes [ ] No [X]

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:
4.15 OH STANDARD P3-A4-S5.3

SELF-ASSESSMENT QUESTIONNAIRE 2013

P3-A4-S5.3

The remedial actions applied by a TSO with possible influence abroad must be checked between all TSOs of the same region in order to prevent counter-effects to neighbouring networks. Additional simulations have to be executed.

Compliance Level: FCo

Additional Questions

How are remedial actions with possible influence abroad checked between all TSOs of your region(s) before applied by the TSO(s), in the different time frames?

In all cases when a remedial action is needed because of a contingency which may affect neighbouring TSOs, after common information exchange the involved TSOs check together the efficiency of these remedial actions and their consequences by additional N-1 computation (based on the external model implementation within off-line power applications). This principle is mutually agreed in OAs.

AUDIT QUESTIONNAIRE 2014

P3-A4-S5.3

The remedial actions applied by a TSO with possible influence abroad must be checked between all TSOs of the same region in order to prevent counter-effects to neighbouring networks. Additional simulations have to be executed.

Compliance Level: FCo

Concise explanation and list of evidence for declared compliance level:

Coordination of remedial actions is performed according with bilateral Operational Agreements signed with the neighbouring TSOs based on Harmonization Procedure on regional yearly outages planning.
List of evidences:
- Bilateral Operational Agreements;
- AMOP for SEE region;
- Internal Monthly Maintenance program;
- Weekly teleconference-WOPT;
- DACF forecast files.

Do you have a mitigation plan to the standard?       Yes ☐       No ☒

In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

Additional Questions

How are remedial actions with possible influence abroad checked between all TSOs of your region(s) before applied by the TSO(s), in the different time frames?

In all cases when a remedial action is needed because of a contingency which may affect neighboring TSOs, after common information exchange the involved TSOs check together the efficiency of these remedial actions and their consequences by additional N-1 computation (based on the external model implementation within off-line power applications). This principle is mutually agreed in OAs.

List of evidence, comments:

List of evidences:
- Bilateral Operational Agreements;
- AMOP for SEE region;
- Internal Monthly Maintenance program;
- Weekly teleconference-WOPT;
- DACF forecast files and simulations examples.
4.16 OH STANDARD P3-A4-S5.4

SELF-ASSESSMENT QUESTIONNAIRE 2013

**P3-A4-S5.4**

The remedial actions with possible influence abroad have to be agreed by the neighbouring TSOs in advance. Therefore information between TSOs is due to be exchanged without any delay as soon as a problem is detected for the real time operation.

**Compliance Level:** FCo

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC</td>
<td>FC</td>
<td>FC</td>
</tr>
</tbody>
</table>

**No Additional Questions**

AUDIT QUESTIONNAIRE 2014

**P3-A4-S5.4**

The remedial actions with possible influence abroad have to be agreed by the neighbouring TSOs in advance. Therefore information between TSOs is due to be exchanged without any delay as soon as a problem is detected for the real time operation.

**Compliance Level:** FCo

<table>
<thead>
<tr>
<th>ESO EAD</th>
<th>JP EMS</th>
<th>MAVIR ZRt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCo</td>
<td>FCo</td>
<td>FCo</td>
</tr>
</tbody>
</table>

Concise explanation and list of evidence for declared compliance level:

Bilateral Operational Agreements contain predefined operational measures and remedial actions. As soon as a problem is detected, necessary actions are discussed and agreed with neighbouring TSOs.

List of evidences:
- Bilateral Operational Agreements;
- AMOP for SEE region;
- Weekly teleconference-WOPT;
- DACF forecast files and simulations examples.

**Do you have a mitigation plan to the standard?**
- Yes ☐
- No ☒
In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:

---

**COMPLIANCE AUDIT 2014**

**Compliance Level suggestion by the Audit Team:** FCo

**Explanation for the suggested compliance level:**

See the explanation in Standard P3-A4-S5.
5 CONCLUSIONS

At the beginning of the first audit day, the Audit Team had an hour and a half long visit in the National Control Centre, which helped the Audit Team to better understand the organisation and processes in the system of TRANSELECTRICA. Presentation of installed SCADA/EMS with demonstration of calculations was the significant part of this visit.

The Audit Team audited 16 standards and sub-standards. The Audit Team found that TRANSELECTRICA is FC with all the audited standards but two which are assessed as N/A (P3-A3-S2 and P3-A3-S2.2), because Romanian electric regulation does not admit overloads on the network elements in N-1 situations in any case, thus TRANSELECTRICA does not make use of running the system admitting overloads and no remedial actions are developed accordingly.

TRANSELECTRICA estimates that their staff needed about 256 man hours for the preparation of the compliance audit.

TRANSELECTRICA was well prepared for the audit. The documents considered as evidence were available during the audit. All these documents were a good basis for proving the compliance level of TRANSELECTRICA with the audited standards. TRANSELECTRICA has updated operation agreements, what is evidence of sufficient cooperation with all neighbours. Requests for additional material were promptly met by TRANSELECTRICA.

In the case of this Compliance Audit, all preconditions for a successful audit were fulfilled and the Audit Team wishes to express its gratitude to the TRANSELECTRICA staff involved in the Audit and the company management.

Recommendations by Audit Team:

- Efforts are needed by Transelectrica in order to improve a documentation control management which ensures that the latest, complete and approved versions of documents are available at point of use, i.e. to put the date in every Annex of the internal operation planning study and operational agreements, to retire cancelled hardcopies of the document within the control rooms.

- To make consistent the external contingency lists provided by bilateral agreements and by the operational planning studies (i.e. standard P3-A2-S1 and operational planning study for summer 2014), regularly updating the bilateral agreements on the basis of the outcomes of these studies.
6 SIGNATURE PAGE

ENTSO-E Audit Team Members:

Ana Cigarán Romero (Audit Team Leader)

Silvia Moroni (Audit Team Member)

Jaime Sanchiz (Audit Team Member)

Jaka Žvab (Compliance monitoring Advisor)

Date and Place: 08.07.2014, Brussels, Belgium