COMPLIANCE AUDIT REPORT

VUEN – Vorarlberger Übertragungsnetz GmbH

20 – 21 MAY 2014

COMPLIANCE AUDIT CONDUCTED IN THE NATIONAL CONTROL CENTRE IN VIENNA 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.
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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 VUEN was chosen for a Compliance Audit in 2014. CME conducted the audit on 20 & 21 April 2014 in Vienna (APG premises), Austria.

Short description on APG/VUEN cooperation

In order to ensure a secure and cost efficient operation of the very small transmission system and control area of VUEN, APG and VUEN have agreed to cooperate on control area operation and transmission system operation. Both control areas were merged and the merged control area is now operated by APG. APG is solely responsible for control area operation. APG operates the transmission system of VUEN just “on behalf” of VUEN which means that VUEN remains the ultimately responsible for transmission system operation as a contractor of the MLA. The cooperation between the two TSOs is based on a bilateral contract only. In order to ease the collaboration with other TSOs, APG represents and coordinates the transmission system of APG and VUEN concerning operational tasks. Asset related tasks (maintenance, development planning, protection settings etc.) still remain solely with VUEN.

1.3 AUDITED OH STANDARDS

The Compliance Audit encompassed 16 standards/sub-standards of Operation Handbook Policy 3 (Operational Security). In 2013, VUEN 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 APG, where APG operates the merged control area.

The Audit Team audited 16 standards/sub-standards. The Audit Team concluded that VUEN is fully compliant with all of the 16 standards. VUEN was very well prepared for the audit, all the documents and evidence were already provided as embedded objects in the worksheet in advance. All of the documents considered as evidence were available during the audit as well. All these documents were
a good basis for proving the compliance level of VUEN 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 VUEN staff involved in the Audit and the company management.

Table 1 describes VUEN compliance declaration in self-assessment questionnaire 2013 and compliance audit questionnaire 2014 with compliance level suggestion by the CME 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>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A1-S3.3.1 FREQUENCY CALCULATION</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A1-S3.3.2 ADDITIONAL N-1 CALCULATIONS</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A2-S1. DETERMINATION OF THE EXTERNAL CONTINGENCY LIST AND OBSERVABILITY AREA</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A2-S2 IMPLEMENTATION OF OBSERVABILITY AREA</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A2-S6 DATA PROVISION</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A3-S2 OVERLOADS IN N-1 SITUATION (SIMULATION)</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A3-S2.2 INSTANTANEOUS TRIPPING IN N-1 SIMULATIONS</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A3-S4.1 TIE-LINES OPERATION CONDITIONS</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A3-S4.2.2 SYNCHRONISING EQUIPMENT SETTINGS</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A3-S4.2.3 PROTECTION SYSTEM SETTINGS</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>P3-A4-S5 PREPARATION OF REMEDIAL ACTIONS IN THE OPERATIONAL PLANNING STAGE</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.1</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.2</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.3</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</td>
</tr>
<tr>
<td>OH STANDARD P3-A4-S5.4</td>
<td>FC0</td>
<td>FC0</td>
<td>FC0</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 VUEN. VUEN 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>PSE</td>
<td>Rafał Kuczyński</td>
<td><a href="mailto:rafal.kuczynski@pse.pl">rafal.kuczynski@pse.pl</a></td>
</tr>
<tr>
<td>Audit team member</td>
<td>RTE</td>
<td>Alexandre Dutoit</td>
<td><a href="mailto:alexandre.dutoit@rte-france.com">alexandre.dutoit@rte-france.com</a></td>
</tr>
<tr>
<td>Audit team member</td>
<td>EMS</td>
<td>Aleksandar Petkovic</td>
<td><a href="mailto:aleksandar.petkovic@ems.rs">aleksandar.petkovic@ems.rs</a></td>
</tr>
<tr>
<td>Audit team member</td>
<td>ESO EAD</td>
<td>Ivo Nishanov</td>
<td><a href="mailto:inishanov@ndc.bg">inishanov@ndc.bg</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 2. SG CME Audit team

<table>
<thead>
<tr>
<th>Function in the company</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing Director</td>
<td>Huber Peter</td>
</tr>
<tr>
<td>Operations Manager</td>
<td>Daniel Fenigbauer</td>
</tr>
</tbody>
</table>

Table 3. VUEN Audit staff
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 VUEN is given in Table 4.

In preparation for the audit, VUEN 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 4. Schedule for the Compliance Audit

<table>
<thead>
<tr>
<th>Event</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submittal of the audit material on behalf of the Audit Team</td>
<td>7 weeks prior to audit 1.4.2014</td>
</tr>
<tr>
<td>Objection or concern about audit team personnel</td>
<td>5 weeks prior to audit 15.4.2014</td>
</tr>
<tr>
<td>Submittal of the completed Audit Worksheet to the Audit Team by VUEN</td>
<td>3 weeks prior to audit 29.4.2014</td>
</tr>
<tr>
<td>Initial feedback based on the submitted Audit Worksheet sent to VUEN by the Audit Team</td>
<td>2 working days prior to audit 16.5.2014</td>
</tr>
<tr>
<td>Opening meeting of the Audit Team and CAM of VUEN</td>
<td>First audit day, 20.5.2014 09:00 – 10:00</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 VUEN will be asked to provide 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>Second audit day, 21.5.2014 09:00 – 13:00</td>
</tr>
<tr>
<td>Continuation of the OH standards’ review</td>
<td></td>
</tr>
<tr>
<td>Internal Audit Team meeting</td>
<td>Second audit day, 21.5.2014 13:00 – 17:00</td>
</tr>
<tr>
<td>Closing meeting with CAM of VUEN</td>
<td>Third audit day, 22.5.2014 09:00 – 12:00</td>
</tr>
<tr>
<td>(1) Presentation of preliminary audit findings and recommendations to be included on the draft audit report, with a strong emphasis on the evidence for each compliance level or non-compliance identified by the Audit Team,</td>
<td></td>
</tr>
<tr>
<td>(2) Discussion and feedback by VUEN with a possibility to object the findings,</td>
<td></td>
</tr>
<tr>
<td>(3) In case of any non-compliance or lack of evidence of compliance, first draft proposal of the TSO on an adequate mitigation plan, including deadline. Should such an immediate proposal not be possible, the TSO must submit it afterwards in written copy within seven days.</td>
<td></td>
</tr>
<tr>
<td>Delivery of the draft audit report to VUEN for review</td>
<td>2 weeks after the audit 3.6.2014</td>
</tr>
<tr>
<td>Remarks by VUEN</td>
<td>4 weeks after the audit 17.6.2014</td>
</tr>
<tr>
<td>Delivery of the final audit report to VUEN</td>
<td>6 weeks after the audit 1.7.2014</td>
</tr>
<tr>
<td>Acknowledgement of the final Audit Report by ENTSO-E RGCE Plenary and decision on its possible internal or external publishing.</td>
<td>RGCE Plenary in 2015</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

#### Self-Assessment Questionnaire 2013

**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

**Additional Questions**

- Do you determine the N situation by state estimation on the basis of measurements and topology?  
  - yes

- Do you have a list of contingencies for the automatic N-1 simulations in real time?  
  - yes

- Do you perform an automatic N-1 simulation for all the contingencies of the contingency list in real time?  
  - yes
### AUDIT QUESTIONNAIRE 2014

**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

<table>
<thead>
<tr>
<th>Concise explanation and list of evidence for declared compliance level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executed by APG (same answer as APG):</td>
</tr>
<tr>
<td>All necessary telemetry data is available in the SCADA system and can be shown during the visit of the control room. N-1 security calculations are performed and displayed in the control room every 6 minutes. Proofs (contingency list and example screenshot, screenshots of N-1 and N-2 results) are enclosed with this audit worksheet.</td>
</tr>
</tbody>
</table>

**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**

1. Do you determine the N situation by state estimation on the basis of measurements and topology?

   - **Yes** ☑
   - **No** ☒

2. Do you have a list of contingencies for the automatic N-1 simulations in real time?

   - **Yes** ☑
   - **No** ☒

3. 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:

Same evidences as listed above (see “concise explanation” for the declared compliance level for this standard).

### AUDIT PHASE

**COMPLIANCE AUDIT 2014**

**Compliance Level suggestion by the audit team:** FCo

**Explanation for the suggested compliance level:**
APG covers all the analysis for VUEN. APG has shown the tool implemented in SCADA, where N-1 and as well N-2 calculations are performed automatically on whole observability area for high voltage levels including 110 kV assets owned and operated by APG (for VUEN as well). For contingency calculations all the elements from observability area are included. APG has operational planner in 24/7 shift (working as CTDS dispatcher) who is executing detailed analyses for the dispatcher on shift. During the on-site audit dispatcher has shown the ability to perform analyses in study mode and as an example performed tripping of 220 kV circuit 231A Salzburg-Tauern.
### 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>
</tbody>
</table>

**Compliance Level:** FCo

**Additional Questions**

How often do you perform an automatic N-1 simulation in real time?

*Every 6 minutes in real time.*

---

#### 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>
</tbody>
</table>

**Compliance Level:** FCo

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

Executed by APG (same answer as APG):

N-1 security calculations are performed and displayed in the control room every 6 minutes (can be shown during the visit of the control room). Proofs (screenshots of N-1 and N-2 results) are enclosed with this audit worksheet.

**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 often do you perform an automatic N-1 simulation in real time?

*Every 6 minutes in real time; results e.g. shown on the “overview screen” (“barco-wall” in the
control room).

List of evidence, comments:

Same evidences as listed above (see "concise explanation" for the declared compliance level for this standard).

AUDIT PHASE

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:
The automatic N-1 simulation is running periodically every 6 minutes in real time. Results were shown in the control room during the audit.
## 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?


### 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:

- Executed by APG (same answer as APG):
  - Ad-hoc-analyses are performed by SCADA system, TSC-CTDS (TSO Security Cooperation-Common Tool for Data acquisition and Security analysis) and can be performed with a separate tool “ISPEN” as a backup solution (if SCADA and CTDS failed).
  - “TSC” is a security cooperation between APG, all German TSOs, ELES, Mavir, CEPS, Tennet-NL, Energinet.dk, Swissgrid, PSE and HOPS. We use a common electronic tool “CTDS” (see explanation above) to collect data, to perform security analyses and to coordinate (remedial) measures with this tool or via video/telephone conferences.
  - Proofs are enclosed:
    - Switching results (power flows) of state estimator (SE) in “study mode” of SCADA
    - N-1 results of state estimator (SE) in “study mode” of SCADA
    - Substation topology and status after switching (“study mode” of SCADA)
    - N-1 results for the current day (current hour until midnight) on an hourly basis produced by CTDS (“rolling intraday forecast”)
    - Example of “ISPEN” tool (input form)
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?

In case of critical results of the automatic N-1 simulation, critical load-flow situations (identification of possible cascades). Additional automatic N-2 calculation and manual trigger at any time. Furthermore, additional N-1 security “forecast analyses” are calculated at least every hour for the current day (current hour until midnight) by CTDS (“rolling intraday forecast”).

List of evidence, comments:

Example for CTDS rolling intraday forecast

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:

APG covers all the analyses for VUEN. All the elements from observability area are included in the tools for contingency calculations. APG has operational planner in 24/7 shift (working as CTDS dispatcher) who is executing detailed analyses for the grid dispatcher on shift. During the on-site audit dispatcher has shown the ability to perform analyses in study mode and as an example performed tripping of 220 kV circuit 231A Salzburg-Tauern.

Exceptional contingencies can be performed if needed on SCADA system. APG exchanges exceptional contingencies and updates on regular basis with all the TSOs in observability area of APG.

Ad-hoc-analyses are also performed with TSC-CTDS tool (TSO Security Cooperation-Common Tool for Data acquisition and Security analysis) and can be performed with a separate tool “ISPEN” as a backup solution (if SCADA and CTDS failed).
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?

*Individual sensitivity thresholds, used in a sensitivity analysis by a common software tool "CTDS" within TSC (TSO Security Cooperation).*

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:

**Executed by APG (same answer as APG):**

- The Observability area of APG is determined on load flow analyses and sensitivity analyses (depending on the influence of load flows outside APG’s grid). Proofs are enclosed: Determination of APG’s observability area
- The external contingency list is stored in the SCADA system (exported list and screenshot example of SCADA list is enclosed below):

  N-1 security calculations include also the external contingencies (marked with “FREMDLTG” in the screenshot example enclosed):

  - The external contingency list includes also “pre-announced” exceptional contingencies, which are included in all N-1 security calculations but considered as relevant (in their consequences) only if declared by the corresponding TSO (if they consider them as very relevant for risks at that time). The necessity to assess the effect of exceptional contingencies can be declared every time, preferably in TSC-DACF process in DOPT; if done so, the exceptional contingencies are considered in TSC-CTDS and taken into N-1 security calculation as relevant.

**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?

Individual sensitivity thresholds, used in a sensitivity analysis by a common software tool "CTDS" within TSC (TSO Security Cooperation).

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

Yes ☒ No ☐

List of evidence, comments:

Same evidences as listed above (see “concise explanation” for the declared compliance level for this standard).

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:
During the audit APG has presented external and exceptional contingency lists on SCADA system. The external contingency list includes “pre-announced” exceptional contingencies, which are included in all N-1 security calculations but considered as relevant (in their consequences) only if declared by the corresponding TSO (if they consider them as very relevant for risks at that time). The necessity to assess the effect of exceptional contingencies can be declared every time, preferably in TSC-DACF process in DOPT and via email; if done so, the exceptional contingencies are considered in TSC-CTDS and taken into N-1 security calculation as relevant. The Observability area of APG (including VUEN) is determined on load flow analyses and sensitivity analyses (depending on the influence of load flows outside APG’s grid).

List of evidences:
-Annex 5 of the APG inter TSO agreements (see annex 1 of this report)
4.5 OH STANDARD P3-A2-S2 IMPLEMENTATION OF OBSERVABILITY AREA

SELF-ASSESSMENT QUESTIONNAIRE 2013

P3-A2-S2

Implementation of observability area. 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.

Compliance Level: FCo

Additional Questions

Are there external elements of your observability area that are not included in your SCADA/EMS model? no

AUDIT QUESTIONNAIRE 2014

P3-A2-S2

Implementation of observability area. 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.

Compliance Level: FCo

Concise explanation and list of evidence for declared compliance level:

Executed by APG (same answer as APG):

Observability area is implemented in SCADA system and is shown in real time on the “barco-wall” (different levels of extent):

Additionally the “Regional Alarm and Awareness System” within the TSC region shows the real time grid status (including some detailed information) of the member TSOs:

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

Are there external elements of your observability area that are not included in your SCADA/EMS model?

Yes ☐  No ☒

List of evidence, comments:

APG includes all relevant external elements in its SCADA model (see provided attachments).

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:
APG covers this standard for VUEN. Observability area is implemented in APG SCADA system and was presented in control room to the audit team. Additionally the “Regional Alarm and Awareness System” shows the real time grid status (including some detailed information) of TSC members.
### 4.6 OH STANDARD P3-A2-S6 DATA PROVISION

#### SELF-ASSESSMENT QUESTIONNAIRE 2013

<table>
<thead>
<tr>
<th>P3-A2-S6</th>
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<tbody>
<tr>
<td><strong>Data provision.</strong> 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.</td>
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#### Compliance Level: FCo

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#### Additional Questions

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

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<tr>
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**Do you receive the data requested from the neighbouring TSO in due time?**

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**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**

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Concise explanation and list of evidence for declared compliance level:

**Executed by APG**

Data provision between APG and neighbouring TSOs is ensured by bilateral ITAs / Inter TSO Agreements, which define the cooperation and includes all necessary details on real-time telemetry and network characteristics. Proofs (extract of ITAs with all partners, i.e. coversheet, list of contents, signature page and list of supplements) are enclosed:

This data is implemented in SCADA system and shown in real time on the “barco-wall”.

**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 provide the data requested by the neighbouring TSO in due time?

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<td>Yes ☒ No ☐</td>
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Do you receive the data requested from the neighbouring TSO in due time?

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<td>Yes ☒ No ☐</td>
<td>Yes ☒ No ☐</td>
<td>Yes ☒ No ☐</td>
</tr>
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</table>
List of evidence, comments:

Same evidences as listed above (see "concise explanation" for the declared compliance level for this standard).

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:
Data provision between VUEN and neighbouring TSOs is ensured by bilateral ITAs (Inter TSO Agreements), which define the cooperation and include all necessary details on real-time telemetry and network characteristics.
These data are implemented in SCADA system of APG and were shown during the audit in the control room.

List of evidences:
- extract of ITAs with neighbouring TSOs, i.e. coversheet, list of contents, signature page and list of supplements
- Annex 15 of the VUEN inter TSO agreements (see annex 1 in this report)
### 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?

*Phase shifter and angle regulating transformers, special switchings, national congestions management (via contracts with power plant providers), cross border redispatch (especially MRAs - Multi-lateral Remedial Actions via TSC) - all actions are usually prepared and coordinated together with all TSC-partners.*

### 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:**

Executed by APG (same answer as APG):

In case of severe N-1 violations, remedial actions are (usually) prepared and coordinated in advance together with all TSC-partners (and with Terna via exchange of information with Coreso [Coreso is a TSO security network similar to TSC between Terna, RTE, Elia, 50HzT and National Grid]) within the TSC-DACF process and applied in real-time. Examples are following remedial actions: phase shifter and angle regulating transformers, special switchings, national congestion management (via contracts with power plant providers), cross border redispatch (especially MRAs - Multi-lateral Remedial Actions via TSG). Proofs are enclosed:

Example of DOPT-report, example of "internal daily reports" called “Tagesbericht” and “CTDS_Übergabe”:

Two examples/presentations of applied remedial actions (Powerpoint-presentations with details about the redispatch are generated whenever a redispatch was performed):
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?

Phase shifter and angle regulating transformers, special switchings, national congestion management (via contracts with power plant providers), cross border redispatch (especially MRAs - Multi-lateral Remedial Actions via TSC) - all actions are usually prepared and coordinated together with all TSC-partners.

List of evidence, comments:

The list of prepared remedial actions (agreed in advance with all TSC partners) is enclosed (the german word "Maßnahmenkatalog" means "catalogue of measures")

As a proof for practical implementation of mentioned remedial actions see the evidences listed above (see "concise explanation" for the declared compliance level for this standard).

---

COMPLIANCE AUDIT 2014

Compliance Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:
APG covers this standard for VUEN. In case of severe N-1 violations, remedial actions are (usually) prepared and coordinated in advance together with all TSC-partners (and with Terna via exchange of information with Coreso [Coreso is a Regional Security Cooperation Initiative (RSCI) similar to TSC between Terna, RTE, Elia, 50HzT and National Grid]) within the TSC-DACF process and applied in real-time.

In addition APG showed merged DOPT daily report of 19 May for the day of 20 May 2014 to audit team. In case of congestions in the system the report shows in which hour the overload on elements appears and the value in % of the overloaded element. This report also includes proposal for remedial actions to solve the situation. APG showed also the report from CTDS contingency analysis for the same day, based on IDCF process.

APG uses phase shifter and angle regulating transformers, special switchings, national congestion management (via contracts with power plant providers), cross border redispatch (especially MRAs - Multi-lateral Remedial Actions via TSC) in order to get back an overloaded network element below its respective PATL. List of prepared remedial actions for both APG and VUEN are stated in "Maßnahmenkatalog" (which means "catalogue of measures").

List of evidence:
- Maßnahmenkatalog (N-1) Tagesberichtsdatenbank (UBH/UBM) / The list of prepared remedial actions (possible measures agreed in advance with all TSC partners)
- emergency information email from APG sent on 19.4.2014 and emergency information note from Transnet BW from date 17.4.2014
4.8 OH STANDARD P3-A3-S2.2 INSTANTANEOUS TRIPPING IN N-1 SIMULATIONS

SELF-ASSESSMENT QUESTIONNAIRE 2013

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

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:

**Executed by APG (same answer as APG):**

If the N-1 security calculation results show possibly impacts or cascading effects outside of the APG boundaries, preventive remedial actions are defined and coordinated within the TSC-DACF process and applied in real-time. The process can be simulated and shown during the visit of the control room. Proofs (example of DOPT-report and illustrations of related preventive remedial actions (special switching state) taken already within DACF-process) are enclosed:

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:

Same evidences as listed above (see “concise explanation” for the declared compliance level for this standard).

**COMPLIANCE AUDIT 2014**

**Compliance Level suggestion by the audit team: FCo**

**Explanation for the suggested compliance level:**

APG covers this standard for VUEN. In addition APG showed merged DOPT daily report of 19 May for the day of 20 May 2014 to audit team. In case of congestions in the system the report shows in which hour the overload on elements appears and the value in % of the overloaded element. This report also includes proposal for remedial actions to solve the situation. APG showed also the report from CTDS contingency analysis for the same day, based on IDCF process.
APG uses phase shifter and angle regulating transformers, special switchings, national congestion management (via contracts with power plant providers), cross border redispatch (especially MRAs - Multi-lateral Remedial Actions via TSC) in order to get back an overloaded network element below its respective PATL. List of prepared remedial actions for both APG and VUEN are stated in “Maßnahmenkatalog” (which means “catalogue of measures”).

APG informs its neighbours as soon as the danger of over-passing is detected via email or by phone in addition to CTDS process of sharing information.

List of evidence:
- Maßnahmenkatalog (N-1) Tagesberichtsdatenbank (UBH/UBM) / The list of prepared remedial actions (possible measures agreed in advance with all TSC partners)
- emergency information email from APG sent on 19.4.2014 and emergency information note from Transnet BW from date 17.4.2014
4.9 OH STANDARD P3-A3-S4.1 TIE-LINES OPERATION CONDITIONS

SELF-ASSESSMENT QUESTIONNAIRE 2013

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

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?

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<thead>
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<tr>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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</table>

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

VUEN defines PATL. VUEN has no TATL/TC in operation. If it is necessary to change the value of PATL, the effected TSO will be informed in advance. Reference document: Inter TSO Agreement appendix 8.
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:

VUEN defines PATL. VUEN has no TATL/TC in operation.
If it is necessary to change the value of PATL, the effected TSO will be informed in advance and the value will be updated in the ITA (Inter TSO Agreements).
Extracts of ITA with all VUEN partners (i.e. coversheet, list of contents, signature page and list of supplements).

Extracts of Inter TSO Agreements with all APG partners (i.e. coversheet, list of contents, signature page and list of supplements):

Example of update procedure of Inter TSO Agreement (e-mail communication, signed annex with new values, signed list incl. new adaptation).
Reference document: Example of annex 8, ITA – APG and VUEN

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

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<td>Yes ☒ No ☐</td>
<td>Yes ☒ No ☐</td>
<td>Yes ☒ No ☐</td>
</tr>
</tbody>
</table>

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

VUEN defines PATL. VUEN has no TATL/TC in operation.
If it is necessary to change the value of PATL, the effected TSO will be informed in advance and
the value will be updated in the ITA (Inter TSO Agreements).

List of evidence, comments:

Same evidences as listed above (see “concise explanation” for the declared compliance level for this standard).

---

**COMPLIANCE AUDIT 2014**

**Compliance Level suggestion by the audit team:** FCo

**Explanation for the suggested compliance level:**
Evidence is in annex 8, where only PATL is defined. The agreed values are implemented in APG SCADA system (and TSC-CTDS) and were presented to the audit team (e.g. substation 220 kV Meiningen). When changes are performed they are implemented in the DACF data sets and SCADA system by APG and updated in the annex 8 of the ITA by VUEN.

List of evidence:
- Annex 8 of inter TSO agreements (see Annex 1 of this report)
## 4.10 OH STANDARD P3-A3-S4.2.2 SYNCHRONISING EQUIPMENT SETTINGS

### SELF-ASSESSMENT QUESTIONNAIRE 2013

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<th><strong>P3-A3-S4.2.2</strong></th>
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<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>
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<tr>
<td><strong>Compliance Level:</strong> FCo</td>
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### Additional Questions

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

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<td>yes</td>
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</table>

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

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<tr>
<td>yes</td>
<td>yes</td>
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</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:

- All values of synchronising equipment settings are agreed with all partner TSOs in contracts (ITAs/Inter TSO Agreements, Annex 9).
- Extracts of Inter TSO Agreements with all VUEN partners (i.e. coversheet, list of contents, signature page and list of supplements).
- Example of annex 9 “Settings of parallel switching devices” of Inter TSO Agreement.

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

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<tr>
<td>swissgrid</td>
<td>Yes</td>
<td>No</td>
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</tbody>
</table>

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

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**Additional Questions**

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

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<td>No</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
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Do you have information about the settings of the synchronising equipment for switching supervision installed on the neighbouring side of tie-lines?

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<td>No</td>
<td></td>
<td>Yes</td>
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<td>No</td>
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</table>

List of evidence, comments:

Same evidences as listed above (see “concise explanation” for the declared compliance level for this standard).
Compliance Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:

VUEN has presented as an example annex 9 “Settings of parallel switching devices” of ITA with all the neighbouring TSOs.

List of evidence:
- annex 9 of inter TSO agreements (see Annex 1 of this report)
4.11 OH STANDARD P3-A3-S4.2.3 PROTECTION SYSTEM SETTING

SELF-ASSESSMENT QUESTIONNAIRE 2013

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

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Additional Questions

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

The neighbouring TSO will be informed in advance if the setting of protection devices or the protection concept will be changed. All values of tie line protection devices are agreed with all adjacent TSOs in the ITA.

Reference document: Inter TSO Agreement appendix 8
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

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</table>

Compliance Level: FCo

Concise explanation and list of evidence for declared compliance level:

- All values of tie line protection devices are agreed with all adjacent TSOs in the ITA (Inter TSO Agreements, Annex 8).
- Extracts of Inter TSO Agreements with all VUEN partners (i.e. coversheet, list of contents, signature page and list of supplements).
- Example of update procedure of Inter TSO Agreement, annex 8a “Protection Settings” (signed mutual letters, signed annex with new values).

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

The neighbouring TSO will be informed in advance if the setting of protection devices or the protection concept will be changed. All values of tie line protection devices are agreed with all adjacent TSOs in the ITA (Inter TSO Agreements).

List of evidence, comments:

- Same evidences as listed above (see “concise explanation” for the declared compliance level for this standard).
**Compliance Level suggestion by the audit team:** FCo

**Explanation for the suggested compliance level:**

VUEN presented the list of protection settings of the tie-lines to all the neighbouring TSOs. The neighbouring TSO will be informed in advance if the setting of protection devices or the protection concept will be changed. All values of tie line protection devices are agreed with all adjacent TSOs in the ITA (Inter TSO Agreements). The protection setting values are available on intranet for APG dispatchers.

**List of evidence:**
- Annex 8 of inter TSO agreements (see Annex 1 in this report)
4.12 OH STANDARD P3-A4-S5 PREPARATION OF REMEDIAL ACTIONS IN THE OPERATIONAL PLANNING STAGE

SELF-ASSESSMENT QUESTIONNAIRE 2013

P3-A4-S5

Preparation of remedial actions in the operational planning stage. Preventive and curative remedial actions are due to be prepared in the operational planning stage.

Compliance Level: FCo

No Additional Questions

AUDIT QUESTIONNAIRE 2014

P3-A4-S5

Preparation of remedial actions in the operational planning stage. Preventive and curative remedial actions are due to be prepared in the operational planning stage.

Compliance Level: FCo

Concise explanation and list of evidence for declared compliance level:

Executed by APG (same answer as APG):

In case of detected congestions, remedial actions are defined and coordinated in the operational planning process, depending on specific horizon – from year ahead procedure to week ahead and day ahead process. All actions are coordinated together with all TSOs in defined regions: CEE (APG, CEPS, SEPS, MAVIR, PSE), CSE (APG, RTE, TERNA, ELES, Swissgrid), DACH (APG, all German TSOs, Swissgrid), SEE (APG, MAVIR, ELES, HOPS, TERNA) and within TSC. Proofs are enclosed:

Year ahead coordination (example of agreed list of planned outages for CEE and DACH).
Example of long term planning e-mail coordination (double-disconnection of tie-lines between APG and CEPS).

Week ahead coordination (example of WOPT/weekly operational teleconference report and of an internal WOPT-summary).

Day ahead coordination (example of DOPT/daily operational teleconference report, list of negligible N-1 violations in TSC so called “TSC Black-List”):

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 Level suggestion by the audit team: FCo

Explanation for the suggested compliance level:
In case of detected congestions, remedial actions are defined and coordinated in the operational planning process, depending on specific horizon – from year ahead procedure to week ahead and day ahead process. All actions are coordinated together with all TSOs in defined regions: CEE (APG, CEPS, SEPS, MAVIR, PSE), CSE (APG, RTE, TERNA, ELES, Swissgrid), DACH (APG, all German TSOs, Swissgrid), SEE (APG, MAVIR, ELES, HOPS, TERNA) and within TSC.

APG presented as examples the year ahead list of planned outages for CEE, week ahead coordination (WOPT) for week 20 of 2014 and Day ahead coordination (DOPT) for the day 14 April 2014.

List of evidence:
- Year ahead list of planned outages for CEE
- Week ahead coordination (example of WOPT/weekly operational teleconference report and of an internal WOPT-summary), week 20 of 2014.
- Day ahead coordination (example of DOPT/daily operational teleconference report, list of negligible N-1 violations in TSC so called “TSC Black-List”), day 14 April 2014.
4.13 OH STANDARD P3-A4-S5.1

**SELF-ASSESSMENT QUESTIONNAIRE 2013**

<table>
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<tr>
<th>P3-A4-S5.1</th>
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<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>
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<tr>
<td><strong>Compliance Level:</strong> FCo</td>
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<tr>
<td><strong>No Additional Questions</strong></td>
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**AUDIT QUESTIONNAIRE 2014**

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<td>Remedies are prepared pursuant to the time horizons they are detected: from year ahead, to week ahead and till day ahead.</td>
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</tr>
<tr>
<td>Concise explanation and list of evidence for declared compliance level:</td>
</tr>
<tr>
<td>Executed by APG (same answer as APG):</td>
</tr>
<tr>
<td>Exactly the same evidences as listed above in Standard P3-A4-S5 (see &quot;concise explanation&quot; for the declared compliance level for this standard).</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>
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**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

P3-A4-S5.2

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.

Compliance Level: FCo

No Additional Questions

AUDIT QUESTIONNAIRE 2014

P3-A4-S5.2

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.

Compliance Level: FCo

Concise explanation and list of evidence for declared compliance level:

Executed by APG (same answer as APG):

In case of detected congestions, remedial actions are defined and simulated with a common tool TSC-CTDS to be able to evaluate the efficiency of taken measures. The process of numerical simulation can be shown during the visit of the control room. Proofs are enclosed:

Example of results of DACF security monitor (an example of exceptional contingency)

Example of remedial actions in CTDS/IDCF data sets ("change manager")

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:

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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.
4.15 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?

With a common tool CTDS (Common Tool for Data acquisition and Security assessment) together with all TSC-partners (especially with Terna by telephone, by CORESO and by "pentalateral instruction" together with Inter TSO Agreement).

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:

Executed by APG (same answer as APG):

In case of detected congestions, remedial actions are defined, coordinated and agreed (incl. additionally simulations and calculations with a common tool CTDS) in the operational planning process together with all TSOs in defined regions. Usually, this coordination is done within the TSC procedure within WOPT/DOPT (weekly or daily operational teleconference) depending on specific horizon. Proofs (example of WOPT and DOPT report) are enclosed:

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
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?

With a common tool CTDS (Common Tool for Data acquisition and Security assessment) together with all TSC-partners (especially with Terna by telephone, by CORESO and by "pentalateral instruction" together with Inter TSO Agreement).

List of evidence, comments:

Same evidences as listed above (see “concise explanation” for the declared compliance level for this standard).

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.
**4.16 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

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**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.

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

Executed by APG (same answer as APG):

Exactly the same explanation and evidences as listed above in Standard P3-A4-S5.3 (see “concise explanation” for the declared compliance level for this standard).

**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 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 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 APG. Presentation of installed SCADA/EMS with demonstration of calculations was the significant part of this visit.

The Audit Team audited 16 standards/sub-standards. The Audit Team found that VUEN is fully compliant with all the 16 standards.

VUEN estimates that their staff needed about 8 man hours for the preparation of the compliance audit.

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

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 VUEN staff involved in the Audit and the company management.
6 SIGNATURE PAGE

ENTSO-E Audit Team Members:

Rafał Kuczyński (Audit Team Leader)

Alexandre Dutoit (Audit Team Member)

Aleksandar Petkovic (Audit Team Member)

Ivo Nishanov (Audit Team Member)

Jaka Žvab (Compliance monitoring Advisor)

Date and Place: 17.06.2014, Brussels, Belgium
7 ANNEX 1 - LIST OF INTER TSO AGREEMENTS (ITA)

- **VÜN & APG**
  - Netz- und Systemführungsvertrag zwischen „Austrian Power Grid AG“ (APG) und „Vorarlberger Übertragungsnetz GmbH“ (VÜN) über den Systembetrieb zwischen der APG und VÜN
  - Agreement signed on 13.08.2012, last updated on 30.04.2014

- **VÜN & TransnetBW**
  - Netz- und Systemführungsvertrag zwischen „TransnetBw GmbH“ (TransnetBw) und „Vorarlberger Übertragungsnetz GmbH“ (VÜN) über den Betrieb zwischen TransnetBW und VÜN
  - Agreement signed on 19.12.2012, (= last update)

- **VÜN & Swissgrid**
  - Netz- und Systemführungsvertrag zwischen „Swissgrid AG“ (Swissgrid) und „Vorarlberger Übertragungsnetz GmbH“ (VÜN) über den Betrieb zwischen Swissgrid und VÜN
  - Agreement signed on 04.02.2013 (= last update)

- **VÜN & Amprion**
  - Agreement signed on 14.12.2012 (= last update)