



European Network of
Transmission System Operators
for Electricity

COMPLIANCE AUDIT REPORT

APG – Austrian Power Grid

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 APG was chosen for a Compliance Audit in 2014. CME conducted the audit on 20 & 21 April 2014 in Vienna, Austria.

1.3 AUDITED OH STANDARDS

The Compliance Audit encompassed 16 standards/sub-standards of Operation Handbook Policy 3 (Operational Security). In 2013, APG 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.

The Audit Team audited 16 standards/sub-standards. The Audit Team concluded that APG is fully compliant with all of the 16 standards. APG 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 APG 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 APG staff involved in the Audit and the company management.

Table 1 describes APG 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

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

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 APG. APG personnel involved in the audit are given in Table 3.

TABLE 2. SG CME AUDIT TEAM

Audit Team role	Company or association	Name	Email address
Audit team leader	PSE	Rafał Kuczyński	rafal.kuczynski@pse.pl
Audit team member	RTE	Alexandre Dutoit	alexandre.dutoit@rte-france.com
Audit team member	EMS	Aleksandar Petkovic	aleksandar.petkovic@ems.rs
Audit team member	ESO EAD	Ivo Nishanov	inishanov@ndc.bg
Compliance Monitoring Advisor	ENTSO-E Secretariat	Jaka Žvab	jaka.zvab@entsoe.eu

TABLE 3. APG AUDIT STAFF

Function in the company	Name
Head of National Control Centre	Tahir Kapetanovic
Head of Department "Grid Security", Responsible for Compliance Monitoring regarding Operation Handbook, Member of CMEG	Kurt Misak
Member of Department "Grid Security", Expert for Monitoring of Grid Operation	Michaela Leonhardt
Coordinator of Team "Operational Control" (Control Centre)	Milos Vilic
Coordinator of Team "Operational Planning" (Control Centre)	Markus Ostovits
Member of Team "System data- & Application Management" (Control Centre)	Thomas Kotrba
Member of Department "Grid Security", Fault analysis and disturbance statistics	Matthias Broneder

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 APG is given in Table 4.

In preparation for the audit, APG 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

Submittal of the audit material on behalf of the Audit Team	7 weeks prior to audit 1.4.2014
Objection or concern about audit team personnel	5 weeks prior to audit 15.4.2014
Submittal of the completed Audit Worksheet to the Audit Team by APG	3 weeks prior to audit 29.4.2014
Initial feedback based on the submitted Audit Worksheet sent to APG by the Audit Team	2 working days prior to audit 16.5.2014
Opening meeting of the Audit Team and CAM of APG (1) Introduction of the Audit Team members, (2) Description of how the on-site audit will be conducted, (3) Discussion on how confidential information will be handled, (4) Discussion on data access required by the Audit Team, (5) Announcement that APG will be asked to provide feedback on the audit process and results, (6) Presentation of the TSO and TSO's organization.	First audit day, 20.5.2014 09:00 – 10:00
Start of the OH standards' review*	First audit day, 20.5.2014 10:00 – 17:00
Continuation of the OH standards' review	Second audit day, 21.5.2014 09:00 – 13:00
Internal Audit Team meeting	Second audit day, 21.5.2014 13:00 – 17:00
Closing meeting with CAM of APG (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, (2) Discussion and feedback by APG with a possibility to object the findings, (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.	Third audit day, 22.5.2014 09:00 – 12:00
Delivery of the draft audit report to APG for review	2 weeks after the audit 3.6.2014
Remarks by APG	4 weeks after the audit 17.6.2014
Delivery of the final audit report to APG	6 weeks after the audit 1.7.2014
Acknowledgement of the final Audit Report by ENTSO-E RGCE Plenary and decision on its possible internal or external publishing.	RGCE Plenary in 2015

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

Concise explanation and list of evidence for declared compliance level:

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.

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:

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 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 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	
P3-A1-S3.3.1	
Frequency of calculation. The automatic N-1 simulation must run periodically, at least every 15 minutes in real time.	
Compliance Level: FCo	
Additional Questions	
How often do you perform an automatic N-1 simulation in real time?	
<i>Every 6 minutes in real time.</i>	

AUDIT QUESTIONNAIRE 2014	
P3-A1-S3.3.1	
Frequency of calculation. The automatic N-1 simulation must run periodically, at least every 15 minutes in real time.	
Compliance Level: FCo	
Concise explanation and list of evidence for declared compliance level:	
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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	
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).	

Additional

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?

In case of critical results of the automatic N-1 simulation, critical load-flow situations (identification of possible cascades). Automatic N-2 calculation and manual trigger at any time.

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:

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:

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

AUDIT QUESTIONNAIRE 2014

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:

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:	
<p>Observability area is implemented in SCADA system and is shown in real time on the “barco-wall” (different levels of extent):</p> <p>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:</p>	
<p>Do you have a mitigation plan to the standard? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>In case of an existing Addendum or a Non Compliance Declaration; list of evidence for a mitigation plan, comments:</p> <p style="background-color: #e0e0e0; padding: 5px;">- - -</p>	
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:

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				
P3-A2-S6				
<p>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.</p>				
Compliance Level: FCo				
TenneT TSO GmbH FCo	Amprion FCo	Transnet BW FCo	swissgrid FCo	Terna S.p.A. FCo
ELES FCo	MAVIR ZRt FCo	CEPS FCo		
Additional Questions				
Do you provide the data requested by the neighbouring TSO in due time?				
TenneT TSO GmbH yes	Amprion yes	Transnet BW yes	swissgrid yes	Terna S.p.A. yes
ELES yes	MAVIR ZRt yes	CEPS yes		
Do you receive the data requested from the neighbouring TSO in due time?				
TenneT TSO GmbH yes	Amprion yes	Transnet BW yes	swissgrid yes	Terna S.p.A. yes
ELES yes	MAVIR ZRt yes	CEPS yes		

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

TenneT TSO GmbH FCo	Amprion FCo	Transnet BW FCo	swissgrid FCo	Terna S.p.A. FCo
ELES FCo	MAVIR ZRt FCo	CEPS FCo		

Concise explanation and list of evidence for declared compliance level:

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?

TenneT TSO GmbH Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Amprion Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Transnet BW Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	swissgrid Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Terna S.p.A. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
ELES Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	MAVIR ZRt Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	CEPS Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

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

TenneT TSO GmbH
Yes No

Amprion
Yes No

Transnet BW
Yes No

swissgrid
Yes No

Terna S.p.A.
Yes No

ELES
Yes No

MAVIR ZRt
Yes No

CEPS
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:

Data provision between APG 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 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 APG 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:

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 TSC). 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:

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

AUDIT QUESTIONNAIRE 2014

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:

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:

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?

TenneT TSO GmbH
FCo

Amprion
FCo

Transnet BW
FCo

swissgrid
FCo

Terna S.p.A.
FCo

ELES
FCo

MAVIR ZRt
FCo

CEPS
FCo

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

Currently APG defines no TATLs; all values of PATL and TC are agreed with all adjacent TSOs in contracts (ITA - Inter TSO Agreements). When changes are necessary the affected partner is informed via DOPT/WOPT (daily or weekly operational teleconference) or via update to the ITA.

AUDIT QUESTIONNAIRE 2014

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:

Currently APG defines no TATLs; all values of PATL and TC are agreed with all adjacent TSOs in contracts (ITAs/Inter TSO Agreements). The agreed values are implemented in SCADA system (and TSC-CTDS) and displayed in real-time on "barco wall". When changes are performed, they are implemented in the DACF data sets (e.g. seasonal values) or via update to the ITA. Proofs are enclosed:

Example of change of seasonal values in DACF data set and screenshot of grid map incl. seasonal values:

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):

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?

TenneT TSO GmbH
FCo

Amprion
FCo

Transnet BW
FCo

swissgrid
FCo

Terna S.p.A.
FCo

ELES
FCo

MAVIR ZRt
FCo

CEPS
FCo

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

Currently APG defines no TATLs; all values of PATL and TC are agreed with all adjacent TSOs in contracts (ITAs/Inter TSO Agreements). When changes are performed, they are implemented in the DACF data sets (e.g. seasonal values) or via update to the ITA.

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:

Currently APG defines no TATLs. All values of PATL and TC are agreed with all adjacent TSOs in contracts (ITAs/Inter TSO Agreements). The agreed values are implemented in SCADA system (and TSC-CTDS) and were presented to the audit team (e.g. tie-line 400 kV Slavetice-Duernrohr and 400 kV substation Duernrohr). When changes are performed, they are implemented in the DACF data sets, **SCADA system** (e.g. seasonal values) and via update to the ITA.

APG presented the list of parameters of the tie-lines and the track of changes for the updates in annex 8.c in ITA with CEPS as an example. All the contracts are available on their intranet for the employees and especially dispatchers.

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

P3-A3-S4.2.2

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

Additional Questions

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

TenneT TSO GmbH yes	Amprion yes	Transnet BW yes	swissgrid yes	Terna S.p.A. yes
ELES yes	MAVIR ZRt yes	CEPS yes		

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

TenneT TSO GmbH yes	Amprion yes	Transnet BW yes	swissgrid yes	Terna S.p.A. yes
ELES yes	MAVIR ZRt yes	CEPS yes		

AUDIT QUESTIONNAIRE 2014

P3-A3-S4.2.2

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). Proofs are enclosed:

Extracts of Inter TSO Agreements with all APG 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? 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 inform your neighbours about the settings of the synchronising equipment for switching supervision installed on your side of tie-lines?

TenneT TSO GmbH

Yes No

Amprion

Yes No

Transnet BW

Yes No

swissgrid

Yes No

Terna S.p.A.

Yes No

ELES

Yes No

MAVIR ZRt

Yes No

CEPS

Yes No

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

TenneT TSO GmbH

Yes No

Amprion

Yes No

Transnet BW

Yes No

swissgrid

Yes No

Terna S.p.A.

Yes No

ELES

MAVIR ZRt

CEPS

Yes No

Yes No

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 has presented as an example annex 9 “Settings of parallel switching devices” of ITA with CEPS.

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

TenneT TSO GmbH FCo	Amprion FCo	Transnet BW FCo	swissgrid FCo	Terna S.p.A. FCo
ELES FCo	MAVIR ZRt FCo	CEPS FCo		

Additional Questions

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

All values of tie line protection devices are agreed with all adjacent TSOs in contracts (ITA - Inter TSO Agreements). When changes are necessary the respective annex (annex 8a/8b) of the ITA is updated and agreed with the partner-TSO.

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

TenneT TSO GmbH FCo	Amprion FCo	Transnet BW FCo	swissgrid FCo	Terna S.p.A. FCo
ELES FCo	MAVIR ZRt FCo	CEPS FCo		

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 contracts (ITAs/Inter TSO Agreements). When changes are necessary the respective annex (annex 8a/8b) of the ITA is updated and agreed with the partner-TSO. Proofs are enclosed:

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, 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?

All values of tie line protection devices are agreed with all adjacent TSOs in contracts (ITAs/Inter TSO Agreements). When changes are necessary the respective annex (annex 8a/8b) of the ITA is updated and agreed with the partner-TSO.

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 presented the list of parameters of the tie-lines and the track of changes for the updates in annex 8.c in ITA with CEPS as an example. All the contracts are available on their intranet for the employees and especially dispatchers.

List of evidence:

- Annex 8 of inter TSO agreements (see Annex 1 in this report)
- Track of changes for the updates in annex 8.c in ITA with CEPS

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:

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 AUDIT 2014

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.

APG presented “Long term planning pilot 2” document, which includes preparations of special model for calculation, results of calculation and agreed remedial actions with all affected TSOs.

List of evidence:

- Year ahead list of planned outages for CEE
- “Long term planning pilot 2” document, where CEPS and APG agree to improve the interconnecting lines (380kV tie-lines Slavetice - Dürnröhr 437 and 438) to cope with the increasing challenges in this region.
- 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
P3-A4-S5.1
Remedies are prepared pursuant to the time horizons they are detected: from year ahead, to week ahead and till day ahead.
Compliance Level: FCo
No Additional Questions

AUDIT QUESTIONNAIRE 2014
P3-A4-S5.1
Remedies are prepared pursuant to the time horizons they are detected: from year ahead, to week ahead and till day ahead.
Compliance Level: FCo
Concise explanation and list of evidence for declared compliance level: Exactly the same evidences as listed above in Standard P3-A4-S5 (see "concise explanation" for the declared compliance level for this standard).
Do you have a mitigation plan to the standard? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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
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: 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>
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.

4.15 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 "pentilateral 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:

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 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?

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 "pentilateral 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				
TenneT TSO GmbH FCo	Amprion FCo	Transnet BW FCo	swissgrid FCo	Terna S.p.A. FCo
ELES FCo	MAVIR ZRt FCo	CEPS FCo		
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				
TenneT TSO GmbH FCo	Amprion FCo	Transnet BW FCo	swissgrid FCo	Terna S.p.A. FCo
ELES FCo	MAVIR ZRt FCo	CEPS FCo		
Concise explanation and list of evidence for declared compliance level:				
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 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 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 APG is fully compliant with all the 16 standards.

APG estimates that their staff needed about **90 man hours** for the preparation of the compliance audit.

APG 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 APG with the audited standards. APG has quite well updated operation agreements, what is evidence of sufficient cooperation with all neighbours. Requests for additional material were promptly met by APG.

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 APG 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)

- **APG & VÜN**
 - 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
- **APG & TNG**
 - Netz- und Systemführungsvertrag zwischen „EnBW Transportnetze AG“ (EnBW TNG) und „VERBUND-Austrian Power Grid AG“ (APG) über den Systembetrieb zwischen der EnBW TNG und APG
 - Agreement signed on 19.11.2009, last updated on 18.02.2014
- **APG & Terna**
 - Agreement on Network and System Operation Management between “Verbund - Austrian Power Grid AG” (APG) and “Terna - Rete Elettrica Nazionale S.p.a.” (TERNA) concerning System operation between APG and TERNA
 - Agreement signed on 30.01.2009
- **APG & TenneT-D**
 - Netz- und Systemführungsvertrag zwischen „VERBUND- Austrian Power Grid AG“ (APG) und „E.ON Netz GmbH“ (E.ON Netz) über den Systembetrieb zwischen der APG und E.ON Netz
 - Agreement signed on 11.02.2009, last updated on 07.11.2013
- **APG & Swissgrid**
 - Netz- und Systemführungsvertrag zwischen „Swissgrid AG“ (Swissgrid) und „VERBUND- Austrian Power Grid AG“ (APG) über den Systembetrieb zwischen Swissgrid und APG
 - Agreement signed on 12.10.2010, last updated on 29.04.2013
- **APG & Mavir**
 - Agreement on Network and System Operation Management between “Verbund - Austrian Power Grid AG” (APG) and “MAVIR Hungarian Transmission System Operator Company Ltd.” (MAVIR) concerning System operation between APG and MAVIR
 - Agreement signed on 03.07.2009, last updated on 04.04.2014
- **APG & ELES**
 - Agreement on Network and System Operation Management between “Verbund - Austrian Power Grid AG” (APG) and “Elektro-Slovenija, d.o.o.” (ELES) concerning System operation between APG and ELES
 - Agreement signed on 10.02.2009, last updated on 29.08.2012
- **APG & CEPS**
 - Agreement on Network and System Operation Management between “CEPS, a.s.” (CEPS) and “Verbund - Austrian Power Grid AG” (APG) concerning System operation between CEPS and APG
 - Agreement signed on 21.01.2009, last updated on 28.01.2014
- **APG & Amprion**
 - Netz- und Systemführungsvertrag zwischen „VERBUND - Austrian Power Grid AG“ (APG) und „Amprion GmbH“ (Amprion) über den Systembetrieb zwischen der APG und Amprion
 - Agreement signed on 26.11.2009, last updated on 26.07.2013

- **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**
 - Netz- und Systemführungsvertrag zwischen „Amprion GmbH“ (Amprion) und „Vorarlberger Übertragungsnetz GmbH“ (VÜN) über den Betrieb zwischen Amprion und VÜN
 - Agreement signed on 14.12.2012 (= last update)