



European Network of
Transmission System Operators
for Electricity

COMPLIANCE AUDIT REPORT

MAVIR MAGYAR VILLAMOSENERGIA-IPARI ÁTVITELI RENDSZERIRÁNYÍTÓ ZÁRTKÖRŰEN MŰKÖDŐ RÉSZVÉNYTÁRSASÁG

8. - 9.11.2011

COMPLIANCE AUDIT CONDUCTED IN BUDAPEST BY THE
ENTSO-E RG CE SG COMPLIANCE MONITORING &
ENFORCEMENT
AT THE CONTROL CENTRE OF THE ENTSO-E MEMBER
MAVIR

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 by random.

SG Compliance Monitoring & Enforcement (CME) is in charge of performing above mentioned two processes. The 2011 is the second year of conducting mandatory compliance audits. In 2008 and 2009 CME performed four voluntary compliance audits and in 2010 six mandatory audits.

1.2 AUDITED TSO

The RGCE member TSO MAVIR was chosen for a Compliance Audit in 2011. CME conducted the audit on 8. - 9.11.2011 at the control centre of MAVIR in Budapest, Hungary.

1.3 AUDITED OH STANDARDS

The Compliance Audit encompassed 21 standards of Operation Handbook Policies 1-3 which are related to Load-Frequency Control and Performance, Scheduling and Accounting, and Operational Security. In 2010 MAVIR made compliance declarations in the self-assessment process for standards which will be checked against their evidence during the audit:

1	P1-A-S1.1 PRIMARY CONTROL Organisation
2	P1-B-S4 SECONDARY CONTROL RESERVE
3	P2-A-S4 General Agreements between UCTE System Operators who are affected by cross border scheduling
4	P2-A-S5 General Agreements between neighbouring CONTROL AREAS
5	P2-A-S5.1 Identification Code used-either EIC or GS1 (former EAN)
6	P2-A-S5.2 Agreement on the contents and granularity of the exchanged CAS (e.g. MTFs, resolution) in order to allow a sufficient matching
7	P2-A-S5.3 Agreed timing for processes (e.g. exchange of programs, matching, day ahead and intraday process, Gate Closure, Cut-Off Time)
8	P2-A-S5.4 Rules to solve mismatches at Cut-Off Time
9	P2-A-S5.5 Responsibilities (e.g. matching, CAPACITY check)
10	P3-A1-S2 Coordination for exceptional type of contingency
11	P3-A2-S1 Determination of the external contingency list and observability area
12	P3-A2-S2 Implementation of observability area
13	P3-A2-S5.2 Abroad consequences of TSOs decisions in operational planning and in real time
14	P3-A2-S6 Data provision
15	P3-A3-S2 Overloads in N-1 situation (simulation)
16	P3-A3-S4.1 Tie-lines operating conditions
17	P3-A4-S3 Principle of "No cascading with impact outside my border"
18	P3-A4-S4.1 Regional agreement for the set of remedial actions
19	P3-B-S1.2.2 Other REACTIVE POWER generation/absorption resources
20	P3-B-S2.1.2 Coordination for voltage and reactive power management
21	P3-D-S2 Transient angle Stability calculation

1.4 RESULTS

The Audit Team visited the MAVIR control room at the beginning of the audit. All questions of the Audit Team were answered in a very precise manner. The evidence presented in the control room helped the auditors to better understand the organisation of the work and the processes in MAVIR..

MAVIR was excellently prepared for the audit. All necessary documentation was easily available. The MAVIR's representatives answered all questions in a competent way and gave detailed but comprehensible explanations.

In 7 cases the Audit Team upgraded the declared level from the level of sufficient compliance (SC) to the level of full compliance (FC) - see table below. This led to the conclusion that MAVIR is fully compliant with all audited standards.

The table 1 describes MAVIR's compliance declaration in self assessment questionnaire 2010 and compliance audit questionnaire 2011 with compliance level suggestion by CME audit team after review of the evidence for the audited standards. The upgrades are highlighted with green and downgrades with red colour in every phase. Standards which kept their declaration level are not highlighted.

TABLE 1. COMPLIANCE LEVEL CHANGES FOR THE AUDITED OH STANDARDS

OH Standard	Self assessment questionnaire 2010	Compliance audit questionnaire 2011	On site compliance audit 2011
P1-A-S1.1	FC	FC	FC
P1-B-S4	FC	FC	FC
P2-A-S4	FC	SC	FC
P2-A-S5	FC	SC	FC
P2-A-S5.1	FC	FC	FC
P2-A-S5.2	FC	SC	FC
P2-A-S5.3	FC	SC	FC
P2-A-S5.4	FC	SC	FC
P2-A-S5.5	FC	FC	FC
P3-A1-S2	FC	FC	FC
P3-A2-S1	FC	FC	FC
P3-A2-S2	FC	FC	FC
P3-A2-S5.2	FC	FC	FC
FC P3-A2-S6	SC	FC	FC
P3-A3-S2	FC	FC	FC
P3-A3-S4.1	FC	FC	FC
P3-A4-S3	SC	SC	FC
P3-A4-S4.1	SC	SC	FC
P3-B-S1.2.2	FC	FC	FC
P3-B-S2.1.2	FC	FC	FC
P3-D-S2	FC	FC	FC

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 on 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. The MAVIR didn't make any such objection. The MAVIR staff present during the compliance audit is given on table 3.

TABLE 2. CME AUDIT TEAM FOR MAVIR

Audit team role	Company or association	Name
Audit team leader	CEPS	Martin Rehacek
Audit team member	HTSO	Yiannis Toliás
Audit team member	50 Hertz	Matthias Kuring
Audit team member	PSE-O	Rafal Kuczynski
Compliance Monitoring Advisor	ENTSO-E Secretariat	Lasse Konttinen

TABLE 3. MAVIR AUDIT STAFF

Function in the company	Title	Name
CAM	Deputy CEO	Lajos Oroszki
Network Operation Planning Service	Senior Advisor	Zoltan Feleki
Market Organisation Department	Head of Market Organisation Department	Erika Szaniszlone Markus
Market Organisation Department (Balance Management)	Senior Advisor	Milan Majer
National Dispatch Service	Head of Realtime System Operation	Gabor Decsi
Process Control IT Department	Head of Process Control IT Department	Gyula Sztrada
Intersystem Co-operation Department	Head of Intersystem Co-operation Department	Laszlo Galambos
System Operation Division	Director of System Operation	Zoltan Tihanyi
Planning and Analysis Department	Senior Advisor	Peter Gölöncser

3 AUDIT PLAN

3.1 GENERAL PROCEDURES

The purpose of this chapter is to help and provide guidance to your organization regarding the oncoming Compliance Audit. The audit will cover a chosen set of Operation Handbook (OH) standards equivalent to those monitored within the Compliance Monitoring Program 2010 self-assessment process.

Please submit the completed Audit Worksheet by email to the ENTSO-E Secretariat and send carbon copies to all Audit Team members three weeks before the first audit day. On table 4. you may find the complete schedule of the audit process for your company.

All documentation (evidence) required for the onsite audit of each standard must be available as a hard copy or in electronic format at the audit location. The Control Area Manager and/or other responsible expert personnel must be 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.

In preparation for the audit, please organise your supporting compliance documentation which is the evidence for your compliance for audited standards. If possible, please try to provide English versions of the documents. Otherwise please translate the main title, index and last update of the document for the Audit Team. Previously mentioned preparations must be completed prior to the start of the audit. The ENTSO-E RGCE SG CME would like to emphasize the importance of preparation for the audit. 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
Submittal of the completed Audit Worksheet to the Secretariat by MAVIR	3 weeks prior to audit
Initial draft of the audit report based on the Audit Worksheet sent to MAVIR by the Audit Team	2 working days prior to audit
Opening meeting of the Audit Team and CAM of MAVIR (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 the MAVIR will be asked to provide feedback on the audit process and results, (6) Presentation of the TSO and TSO's organization (7) Visit at the control room	First audit day, 8.11.2011 8:30 – 10:30
Start of the OH standards' review	First audit day, 8.11.2011 10:30 – 17:00
Continuation of the OH standards' review	Second audit day, 9.11.2011 8:30 – 11:00

Internal Audit Team meeting	Second audit day, 9.11.2011 11:00 – 12:30
Closing meeting with CAM of MAVIR (1) Presentation of preliminary audit findings and recommendations to be included on the draft audit report, with a strong emphasis on the evidences for each compliance level or non compliance identified by the Audit Team, (2) Discussion and feedback by the MAVIR 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.	Second audit day, 9.11.2011 12:30 – 14:00
Delivery of the draft audit report to MAVIR for review	2 working days
Remarks by MAVIR	2 weeks after the audit
Delivery of the final audit report to MAVIR	3 weeks after the audit
Acknowledgement of the final Audit Report by ENTSO-E RGCE Plenary and decision on its possible internal or external publishing.	RGCE Plenary in February 2012

3.2 OBJECTIVES

In 2011 the objective of Compliance Audits is to check chosen set of standards from OH Policies 1-3. These standards were also monitored in the 2010 regular compliance process via the self-assessment questionnaire. Furthermore, before performing the Compliance Audit, the Audit Team makes recommendations to the audited TSO to prepare the evidence or documentation on compliance with the audited OH standards.

3.3 SCOPE

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 2010 stored at the ENTSO-E Secretariat related to audited TSO concerning the audited OH standards
- Audit Worksheet 2011
- 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

3.4 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 2010 self-assessment questionnaires. It also processed (assessed) the answers in the 2011 Audit Worksheet filled in by the audited TSO.

The 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 identify the potential sources of audit evidence and estimate the amount and type of evidence needed.

The audit team uses an Audit Worksheet (AW) (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 determine whether the evidence presented by the TSO is sufficient. They do this by assessing the relevance, validity and reliability of the information and documentation presented.

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

3.5 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
- The TSO must fill in the audit questionnaire and submit to the audit team before the audit
- Identification of documents and other material the TSO has 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 2010 cross-border check regarding compliance level declarations)
- Analysis of the explanations and comments which the audited TSO made in the self-assessment 2010 and audit questionnaires 2011 in written form in order to evaluate the quality of explanations and comments.
- Identification of the missing explanations in the self-assessment 2010 and audit questionnaires 2011
- Analysis of the improvements achieved during the implementation of mitigation and improvement plans declared in the MLA Addendum/Addenda, in the self-assessment questionnaire 2010 and in the Audit Worksheet 2011 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 2010 and audit questionnaire 2011.
 - The goal is 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 is to improve the quality of the presented evidence
 - The presented material must be 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

3.6 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 WORK SHEET

4.1 P1-A-S1.1 PRIMARY CONTROL ORGANISATION

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010	
P1-A-S1.1	
PRIMARY CONTROL Organisation. An organisational procedure to cover requirements and obligations for PRIMARY CONTROL actions and reserves performed by third parties in the CONTROL AREA including a monitoring procedure must be in place (e.g. GridCode, regulation, association agreement or contract).	
Compliance Level: FC	
Explanation for the full compliance declaration:	
Additional Questions	
Do you have a formal procedure in place to ensure compliance with this standard?	yes
What level of legal support does the procedure entitle? (i.e. law, grid code, agreement, other)	
Grid code	
How do you monitor the primary control response of your Control area? (i.e. as a whole, for each single generation unit, etc. Timeframe: realtime/retrospective)	
Real-time measurement through EMS/SCADA system for each generation unit taking part in primary control. Data are archived.	

AUDIT QUESTIONNAIRE 2011	
P1-A-S1.1 PRIMARY CONTROL Organisation. An organisational procedure to cover requirements and obligations for PRIMARY CONTROL actions and reserves performed by third parties in the CONTROL AREA including a monitoring procedure must be in place (e.g. Grid Code, regulation, association agreement or contract).	
Compliance level	FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level:	
<p>The Hungarian Grid Code covers the obligation of the primary control for all units where the installed capacity is higher than 50 MW. The Code rule contains characteristics and amount of the primary reserve, as well as requirement for accreditation of power plant units. The Resource Planning Department of MAVIR selects, in the frame of yearly tender process, the power plants providing primary reserve power. Allocation of primary reserve power is done by a day-ahead process.</p>	
Do you have an addendum to the standard?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

In case of an existing addendum; list of evidences for a mitigation plan, comments:

[Redacted]

Do you have a formal procedure in place to ensure compliance with this standard?

Yes No

List of evidences, comments:

Grid Code/Commercial Code/Accreditation Certificates (Gönyü, DUME G3)

MAVIR contracts on yearly basis with system service providers for primary control capacity. Allocation is done on day-ahead basis. As part of the accreditation process the capability of the primary control is tested (test forms are archived). In real-time operation circumstances the EMS/SCADA system displays the actual kxdf value for each enabled units (as measured value).

What level of legal support does the procedure entitle? (i.e. law, grid code, agreement, other)

Grid code (point 5.1.9); MAVIR internal regulation "Procurement of System Services"

List of evidences, comments:

[Redacted]

How do you monitor the primary control response of your Control area? (i.e. as a whole, for each single generation unit, etc. timeframe: realtime/retrospective)

Realtime measurement through EMS/SCADA system for each generation unit taking part in the primary control. Data are archived.

List of evidences, comments:

Real-time monitoring and measured data are archived (cycle time 2 sec).

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR representative showed the audit team translated excerpt 5.1.9. (B,a) of Hungarian national Grid Code. It states that a power plant which fulfils given criteria must provide primary reserve control. Also archived measured values of provided primary control and power plant primary control certifications were shown to the audit team. MAVIR has also real time measurements in their SCADA system for primary control which were presented to audit team.

4.2 P1-B-S4 SECONDARY CONTROL RESERVE

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010	
P1-B-S4.	
SECONDARY CONTROL RESERVE. An adequate SECONDARY CONTROL RESERVE must be available to cover expected DEMAND and generation fluctuations. If the loss of the largest generating unit of the CONTROL AREA is not already covered by the requisite SECONDARY CONTROL RESERVE, additional TERTIARY CONTROL RESERVE (see -> P1-C) has to be activated to offset the shortfall within the required time (see P1-B-S2.1).	
Compliance Level: FC	
Explanation for the full compliance declaration:	
Additional Questions	
Does the sum of allocated Secondary and Tertiary Reserve cover normally and within the required time the loss of the largest generation unit connected in your control area?	yes
How does your TSO monitor and report about the technical availability of TERTIARY RESERVE?	
Real-time measurement through EMS/SCADA system (tech. min/max for each generation unit) and offered actual availability for non-spinning generation units.	

AUDIT QUESTIONNAIRE 2011	
P1-B-S4 SECONDARY CONTROL RESERVE. An adequate SECONDARY CONTROL RESERVE must be available to cover expected DEMAND and generation fluctuations. If the loss of the largest generating unit of the CONTROL AREA is not already covered by the requisite SECONDARY CONTROL RESERVE, additional TERTIARY CONTROL RESERVE (see P1-C) has to be activated to offset the shortfall within the required time (see P1-B-S2.1).	
Compliance level	FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level:	
<p>The Resource Planning Department of MAVIR selects, in the frame of yearly tender process, the suppliers providing secondary and tertiary reserve power. Allocation of reserve power is done by a day-ahead process. The Hungarian Electricity Act requires that all operating units have to offer and for the request of the TSO, provide (secondary, tertiary) control capability.</p> <p>On the actual day the dispatcher has a tool (namely RTDWE: Real-time Dataware House Explorer) to trace the actual reserves which can be activated in less than 15 minutes, and the total amount of the spinning reserve. Tertiary reserve capacities are displayed and handled in the Control Reserves Information System (SZTIR). Activation of the tertiary reserve is supported by SZTIR System.</p>	
Do you have an addendum to the standard?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

In case of an existing addendum; list of evidences for a mitigation plan, comments:

[Redacted]

Does the sum of allocated Secondary and Tertiary Reserve cover normally and within the required time (Secondary: 15 min and Tertiary: 30 min) the loss of the largest generation unit connected in your control area?

Yes No

List of evidences, comments:

Day Ahead Capacity Plan

The largest units in the Hungarian power system are in the Paks Nuclear Power Plant (one nuclear reactor with two units) 500 MW each. The reserved secondary capacity (downward: at least 145 MW, upward: at least 145+120 MW) and the reserved fast start-up capable gas turbines (2 x 120 and 1 x 170 MW units, start-up time and max. load in 13 minutes after start-up command) and other tertiary reserve suppliers (generators, consumers) can cover the requirements.

How does your TSO monitor and report about the technical availability of TERTIARY RESERVE?

On day-ahead period the service providers give information about reserve capability to the Control Reserves Information System (SZTIR) and their schedule to the Scheduling System (MEK). These data are transferred to the Real-time Dataware House (RTDW), where numerical and graphical monitoring is possible.

Intra-day period the service provider has to inform the dispatcher service about every change of reserved capacity. Dispatcher updates the changes in RTDW.

List of evidences, comments:

The non-spinning units capability (tertiary reserve fast start-up gas turbines) are tested periodically (typically on monthly basis) with test start-up process.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

The dispatchers were able to view past, real-time actual and future amount of secondary and tertiary control reserve with load measurement and forecast (Real-time Data Ware House Explorer) which was verified by an audit team visit to the control centre.

The methodologies of quantifying needed amount secondary and tertiary reserves were written to Hungarian Grid Code chapter 7, annex 7.2 which had adapted the procedure from Annex 1 of RGCE Operation Handbook Policy 1.

4.3 P2-A-S4 General Agreements between UCTE System Operators who are affected by cross border scheduling

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010	
P2-A-S4.	
General Agreements between UCTE System Operators who are affected by cross border scheduling . For performing a proper matching process and especially for cases of troubleshooting the UCTE bodies (Control Areas, Control Blocks and CO-ORDINATION CENTRES) have to document common agreed rules e.g.	
Compliance Level: FC	
Explanation for the full compliance declaration:	
 Additional Questions	
Do you have common agreed documents with corresponding ENTSOe bodies for Scheduling of Power Exchange?	yes
Do you have an agreement which specifies MTFS (Multi Time Frame System) and number of digits?	yes
What procedure do you apply for solving mismatches ?	
According to the Code of Commerce, the lower schedule is accepted. Schedules in opposite direction are cancelled.	

AUDIT QUESTIONNAIRE 2011	
P2-A-S4 General Agreements between UCTE System Operators who are affected by cross border scheduling. For performing a proper matching process and especially for cases of troubleshooting the UCTE bodies (Control Areas, Control Blocks and CO-ORDINATION CENTRES) have to document common agreed rules e.g.	
A-S-4.1 Agreed MTFS and number of digits	
A-S-4.2 Solution for mismatches (see Guidelines)	
A-S-4.3 Troubleshooting in case of problems with data exchange and matching process. (see P2-A-G2 & P2-A-G3 & P2-A-G4)	
Compliance level FOR P2-A-S4 FC <input type="checkbox"/> SC <input checked="" type="checkbox"/> NC <input type="checkbox"/>	
Concise explanation for declared compliance level:	
<p>MAVIR has document concerning the matching process for the CEE Regional borders (SK, AT). The agreed matching process is written in the “<i>Implementation Guide CEE Scheduling</i>”. This is used for long-term, day-ahead and intraday processes.</p> <p>Concerning the other borders (HR, RS, RO), MAVIR informed the neighbouring TSOs about the proposed matching process, which is already used with our partners during the matching.</p> <p>Bilateral document for matching with neighbouring TSOs (HR, RS, RO) is under preparation that meets the requirements of the relevant UCTE OH regulations. (Before the introduction of the common allocation, the Memorandum contained the matching process description.)</p>	

The relevant chapter of the effective Code of Commerce describes the solution of the troubleshooting for mismatches – handled by the scheduling software – which is fully in line with the UCTE SO-SO and ESS guide.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you have common agreed documents with corresponding ENTSO-E bodies for Scheduling of Power Exchange?

Yes No

List of evidences, comments:

Bilateral document for matching with neighbouring TSOs is under preparation (with HR, RS, RO).

Do you have an agreement which specifies MTFs (Multi Time Frame System) and number of digits?

Yes No

List of evidences, comments:

Bilateral document for matching with neighbouring TSOs is under preparation (with HR, RS, RO).

What procedure do you apply for solving mismatches?

According to the UCTE SO-SO Guide, the lower schedule is accepted and schedules in opposite direction are cancelled. There are some differences between the borders because in the CEE Regional borders, the pro rata reduction is used in case of mismatches.

List of evidences, comments:

Implementation Guide CEE Scheduling, draft Agreements for scheduling and matching processes

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR has signed or is in signature process for contracts for common rules “Agreement for scheduling and matching” with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For APG and SEPS had common agreement “Implementation Guide CEE Scheduling”. Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs.

Contracts fulfilled all requirements for P2-A-S4 and its sub standards.

4.4 P2-A-S5 GENERAL AGREEMENTS BETWEEN NEIGHBOURING CONTROL AREAS

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010	
P2-A-S5.	
General Agreements between neighbouring CONTROL AREAS. For automatic matching neighbouring CONTROL AREAS have to document their agreement for common rules for their border. Rules relevant for Market Parties must be published or communicated towards the parties in question. This document has to contain:	
Compliance Level: FC	
Additional Questions	
Do you perform automatic matching with your neighbouring CONTROL AREAS?	yes
Do you have documented agreements on automatic matching with your neighbours?	yes
Do you have agreements which define the contents and granularity of the exchanged CAS in order to allow sufficient matching?	yes
Do the agreements include timing for processes (e.g. exchange of programs, matching, day ahead and intra day process, Gate Closure, Cut-Off Time)?	yes
How are the relevant rules communicated to the Market Parties?	
Code of Commerce available on MAVIR's web site, forums to clarify possible questions	
Do you have rules which are agreed in advance to solve mismatches at Cut-Off Time?	yes
Do the agreed responsibilities assignation follow the "Implementation Guide for the ESS (ETSO Scheduling System) in the UCTE processes"?	yes

AUDIT QUESTIONNAIRE 2011
P2-A-S5 General Agreements between neighbouring CONTROL AREAS. For automatic matching neighbouring CONTROL AREAS have to document their agreement for common rules for their border. Rules relevant for Market Parties must be published or communicated towards the parties in question. This document has to contain:
A-S-5.1 Identification Code used-either EIC or GS1 (former EAN)
A-S-5.2 Agreement on the contents and granularity of the exchanged CAS (e.g. MTFs, resolution) in order to allow a sufficient matching
A-S-5.3 Agreed timing for processes (e.g. exchange of programs, matching, day ahead and intra day process, Gate Closure, Cut-Off Time)
A-S-5.4 Rules to solve mismatches at Cut-Off Time
A-S-5.5 Responsibilities (e.g. matching, CAPACITY check)
Neighbouring CONTROL AREAS shall implement and run their matching process according to the "Implementation Guide for the EES (ETSO Scheduling System) in the UCTE

processes”

Compliance level FC SC NC

Concise explanation for declared compliance level:

Bilateral documents for matching with neighbouring TSOs are under preparation (HR, RS, RO).

MAVIR has written document concerning the matching process for the CEE Regional borders (SK, AT).

MAVIR scheduling system and matching process is fully in line with the ENTSO-E requirements and run according to the UCTE SO-SO Process.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you perform matching with your neighbouring CONTROL AREAS?

Yes No

List of evidences, comments:

MAVIR performs matching process with the neighbouring Control Areas.

How are the relevant rules communicated to the Market Parties?

The effective Code of Commerce is available on MAVIR's web site, forums, training and test period are organised before the introduction of the new rules to clarify possible questions.

List of evidences, comments:

Presentations for market participants are available on MAVIR's website.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR has signed or is in signature process for contracts for common rules “Agreement for scheduling and matching” with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For APG and SEPS had common agreement “Implementation Guide CEE Scheduling”. Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs.

Contracts fulfilled all requirements for P2-A-S5 and its sub standards.

4.5 P2-A-S-5.1 IDENTIFICATION CODE USED-EITHER EIC OR GS1 (FORMER EAN)

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
P2-A-S5.1.
Identification Code used - either EIC or GS1 (former EAN)
Compliance Level: FC

AUDIT QUESTIONNAIRE 2011
P2-A-S-5.1 Identification Code used-either EIC or GS1 (former EAN)
Compliance level FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level:
Schedule messages and also CAS files used in matching processes contain EIC codes.
Do you have an addendum to the standard? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
In case of an existing addendum; list of evidences for a mitigation plan, comments:

AUDIT PHASE

COMPLIANCE AUDIT 2011
Compliance Level suggestion by the audit team: FC
Explanation for the suggested compliance level: MAVIR has signed or is in signature process for contracts for common rules "Agreement for scheduling and matching" with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For APG and SEPS had common agreement "Implementation Guide CEE Scheduling". Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs.
Contracts fulfilled all requirements for P2-A-S5.1. The contracts "Agreement for scheduling and matching" Appendix 2 "CAS example" which utilised EIC code.

4.6 P2-A-S-5.2 AGREEMENT ON THE CONTENTS AND GRANULARITY OF THE EXCHANGED CAS (E.G. MTFS, RESOLUTION) IN ORDER TO ALLOW A SUFFICIENT MATCHING

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
P2-A-S5.2.
Agreement on the contents and granularity of the exchanged CAS(e.g. MTFS, resolution) in order to allow a sufficient matching
Compliance Level: FC

AUDIT QUESTIONNAIRE 2011

P2-A-S-5.2 Agreement on the contents and granularity of the exchanged CAS (e.g. MTFS, resolution) in order to allow a sufficient matching

Compliance level FC SC NC

Concise explanation for declared compliance level:

MAVIR has “Implementation Guide CEE Scheduling” document concerning the content and granularity of the exchanged CAS.

The processes are operating based on the UCTE practice. Agreements which are under preparation contain the information about the content and granularity.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you have documented agreements on matching with your neighbours?

Yes No

List of evidences, comments:

MAVIR has “Implementation Guide CEE Scheduling” document with CEE Regional borders (AT, SK) concerning the matching process. With other TSO’s (HR, RS, RO), Agreements which are under preparation also contain the matching process description.

Do you have agreements which define the contents and granularity of the exchanged CAS in order to allow sufficient matching?

Yes No

List of evidences, comments:

MAVIR has “*Implementation Guide CEE Scheduling*” document with CEE Regional borders (AT, SK) concerning the matching process. With other TSO’s (HR, RS, RO), Agreements which are under preparation also contain the matching process description.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR has signed or is in signature process for contracts for common rules “Agreement for scheduling and matching” with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For APG and SEPS had common agreement “Implementation Guide CEE Scheduling”. Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs.

Contracts fulfilled all requirements for P2-A-S5.2.

4.7 P2-A-S-5.3 Agreed timing for processes (e.g. exchange of programs, matching, day ahead and intra day process, Gate Closure, Cut-Off Time)

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
P2-A-S5.3.
Agreed timing for processes (e.g. exchange of programs, matching, day ahead and intra day process, Gate Closure, Cut-Off Time)
Compliance Level: FC

AUDIT QUESTIONNAIRE 2011
<p>P2-A-S-5.3 Agreed timing for processes (e.g. exchange of programs, matching, day ahead and intra day process, Gate Closure, Cut-Off Time)</p> <p>Compliance level FC <input type="checkbox"/> SC <input checked="" type="checkbox"/> NC <input type="checkbox"/></p> <p>Concise explanation for declared compliance level:</p> <div style="background-color: #e0f0e0; padding: 5px; margin: 5px 0;"> <p>MAVIR has agreed timing on the CEE Regional borders (AT, SK). The Annexes of the effective Code of Commerce describe the timing of the matching process. Agreements which are under preparation (with HR, RS, RO) contain the timing for processes.</p> </div> <p>Do you have an addendum to the standard? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>In case of an existing addendum; list of evidences for a mitigation plan, comments:</p> <div style="background-color: #e0e0e0; height: 20px; margin: 5px 0;"></div> <hr/> <p><i>Do the agreements include timing for processes (e.g. exchange of programs, matching, day ahead and intraday process, Gate Closure, Cut-Off Time)?</i></p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>List of evidences, comments:</p> <div style="background-color: #e0f0e0; padding: 5px; margin: 5px 0;"> <p>MAVIR has agreed timing on the CEE Regional borders (AT, SK). The Annexes of the effective Code of Commerce describe the timing of the matching process. Agreements which are under preparation (with HR, RS, RO) contain the timing for processes.</p> </div>

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR has signed or is in signature process for contracts for common rules “Agreement for scheduling and matching” with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For APG and SEPS had common agreement “Implementation Guide CEE Scheduling”. Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs.

Contracts fulfilled all requirements for P2-A-S5.3.

4.8 P2-A-S-5.4 RULES TO SOLVE MISMATCHES AT CUT-OFF TIME

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
P2-A-S5.4.
Rules to solve mismatches at Cut-Off Time
Compliance Level: FC

AUDIT QUESTIONNAIRE 2011
P2-A-S-5.4 Rules to solve mismatches at Cut-Off Time
Compliance level FC <input type="checkbox"/> SC <input checked="" type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level:
<p>MAVIR has document concerning the matching process for the CEE Regional borders (SK, AT). The agreed matching process is written in the “<i>Implementation Guide CEE Scheduling</i>”. This is used for day-ahead and intraday processes.</p> <p>Agreements which are under preparation (with HR, RS, RO) also contain the matching process and also the description of solving mismatches.</p> <p>The matching process – handled by the scheduling system of MAVIR – is fully in line with the ENTSO-E requirements and run according to the UCTE SO-SO Process as well as at Cut-Off Time.</p>
Do you have an addendum to the standard? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
In case of an existing addendum; list of evidences for a mitigation plan, comments:
<div style="background-color: #cccccc; height: 20px; width: 100%;"></div>
<hr/>
<i>Do you perform matching with your neighbouring CONTROL AREAS? Do you have rules which are agreed in advance to solve mismatches at Cut-Off Time?</i>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
List of evidences, comments:
<p>Rules described in the “<i>Implementation Guide CEE Scheduling</i>” which is valid for the CEE Regional borders (SK, AT); and bilateral documents for matching – containing this procedure – with other neighbouring TSOs (HR, RS, RO) are under preparation.</p>

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR has signed or is in signature process for contracts for common rules "Agreement for scheduling and matching" with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For APG and SEPS had common agreement "Implementation Guide CEE Scheduling". Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs.

Contracts fulfilled all requirements for P2-A-S5.4.

4.9 P2-A-S-5.5 RESPONSIBILITIES (E.G. MATCHING, CAPACITY CHECK)**PREPARATORY PHASE****SELF-ASSESSMENT QUESTIONNAIRE 2010****P2-A-S5.5.**

Responsibilities (e.g. matching, CAPACITY check) Neighbouring CONTROL AREAS shall implement and run their matching process according to the "Implementation Guide for the ESS (ETSO Scheduling System) in the UCTE processes".

Compliance Level: FC

AUDIT QUESTIONNAIRE 2011**P2-A-S-5.5 Responsibilities (e.g. matching, CAPACITY check)**Compliance level FC SC NC

Concise explanation for declared compliance level:

The matching process is based on UCTE SO-SO Guide and "Implementation Guide CEE Scheduling". The checking of the capacities is done immediately after the schedule submission.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Does the agreed responsibilities assignation follow the "Implementation Guide for the ESS (ETSO Scheduling System) in the UCTE processes"?

Yes No

List of evidences, comments:

There are agreed roles for the CEE borders (AT, SK). For the other borders (HR, RS, RO) the initiating and receiving TSO role is described in the draft Agreements. Currently the matching is performed in parallel.

AUDIT PHASE**COMPLIANCE AUDIT 2011****Compliance Level suggestion by the audit team:**

FC

Explanation for the suggested compliance level:

MAVIR has signed or is in signature process for contracts for common rules “Agreement for scheduling and matching” with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For APG and SEPS had common agreement “Implementation Guide CEE Scheduling”. Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs.

Contracts fulfilled all requirements for P2-A-S5.5.

4.10 P3-A1-S2 Coordination for exceptional type of contingency

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
P3-A1-S2.				
Coordination for exceptional type of contingency. It is the responsibility of the operator of the concerned network elements to establish the list of the exceptional type of contingency for security calculation based on the likelihood of occurrence of the event and to communicate this list to the neighboring TSOs. Each TSO selects these exceptional contingencies based on the respective risk assessment by itself (see P3-A2-S1). Some exceptional events are considered only in case of temporary specific operational conditions, which have to be communicated to neighbors with a view of security calculation. If a TSO A considers a resulting risk for an exceptional type of contingency for elements located in the area of TSO B not considered in the contingency list of TSO B, both TSOs reconsider together their contingency lists.				
Compliance Level: FC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS FC
Explanation for the full compliance declaration:				
Additional Questions				
Do you establish and communicate to other TSOs a formal list of exceptional contingencies?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
Do you consider the exceptional list from the neighbouring TSOs and reconsider your own contingency list with your neighbour TSO if needed?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
How do you coordinate with your neighbouring TSOs the exceptional contingency list as of what to take into account and how to manage the list?				
VERBUND APG The list is included in the bilateral operational agreements. It is updated when considered as necessary by any of the parties.				
HEP-OPS The list is included in the bilateral operational agreements. It is updated when considered as necessary by any of the parties.				
JP EMS The list is included in the bilateral operational agreements. It is updated when considered as necessary by any of the parties.				
Transelectrica The list is included in the bilateral operational agreements. It is updated when considered as necessary by any of the parties.				
SEPS The list is included in the bilateral operational agreements. It is updated when considered as necessary by any of the parties.				

AUDIT QUESTIONNAIRE 2011

P3-A1-S2 COORDINATION FOR EXCEPTIONAL TYPE OF CONTINGENCY. It is the responsibility of

the operator of the concerned network elements to establish the list of the exceptional type of contingency for security calculation based on the likelihood of occurrence of the event and to communicate this list to the neighbouring TSOs. Each TSO selects these exceptional contingencies based on the respective risk assessment by itself (see P3-A2-S1). Some exceptional events are considered only in case of temporary specific operational conditions, which have to be communicated to neighbours with a view of security calculation.

If a TSO A considers a resulting risk for an exceptional type of contingency for elements located in the area of TSO B not considered in the contingency list of TSO B, both TSOs reconsider together their contingency lists.

Overall Compliance level **FC** **SC** **NC**

Neighbour	Compliance level
APG	FC
HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	FC

Concise explanation for declared compliance level:

There are lists of network elements bilaterally exchanged. Switching of these elements has to be coordinated. Exceptional cases are included in these lists, if there are any (e.g. SEPS: OA point 9.2.1, TEL: OA Annex 5).

Do you have an addendum to the standard? **Yes** **No**

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you establish and communicate to other TSOs a formal list of exceptional contingencies?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

Operational Agreements

Do you consider the exceptional list from the neighbouring TSOs and reconsider your own contingency list with your neighbour TSO if needed?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

Operational Agreements, regular data exchange during yearly disconnection planning

How do you coordinate with your neighbouring TSOs the exceptional contingency list as of what to take into account and how to manage the list?

Neighbour	Explanation
APG	The list is included in the bilateral operational agreement. It is updated when it is considered as necessary by any of the parties.
HEP-OPS	The list is included in the bilateral operational agreement. It is updated when it is considered as necessary by any of the parties.
Transelectrica	The list is included in the bilateral operational agreement. It is updated when it is considered as necessary by any of the parties.
JP EMS	The list is included in the bilateral operational agreement. It is updated when it is considered as necessary by any of the parties.
SEPS	The list is included in the bilateral operational agreement. Until the operational agreement is concluded in the renewed structure, the list is exchanged and agreed between the relevant departments of the two TSOs, when it is considered as necessary by any of the parties.

List of evidences, comments:

Operational agreements

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR presented the summary and bi-lateral lists of all exchanged coordinated contingency elements with neighbouring TSOs. MAVIR takes into consideration exceptional contingencies only with SEPS and Transelectrica as there are no exceptional contingencies with other neighbouring TSOs.

Summary contingency list was dated on September 2011: "Co-ordination of disconnections of network elements". The bi-lateral updated lists are exchanged on need basis with MAVIR neighbours. Audit team also reviewed bi-lateral contracts "Agreement on Network and System Operation Management" and "Agreement on joint operation" which MAVIR has concluded with neighbouring TSOs. These agreements contain official list of contingency elements. MAVIR and its neighbours have annual meetings to coordinate "disconnection plans".

The contingency list is implemented to N-1 security analysis of EMS which was verified by a visit to the control room.

4.11 P3-A2-S1 DETERMINATION OF THE EXTERNAL CONTINGENCY LIST AND OBSERVABILITY AREA.

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
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 timeframes. Additionally exceptional contingencies (double lines, busbars) as announced by a neighboring TSO have to be included by the TSO if it considers them very relevant for risks.				
Compliance Level: FC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS FC

AUDIT QUESTIONNAIRE 2011																									
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 timeframes. Additionally exceptional contingencies (double lines, bus bars) as announced by a neighboring TSO have to be included by the TSO if it considers them very relevant for risks.																									
Overall Compliance level FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; padding: 5px;">Neighbour</th> <th style="width: 50%; padding: 5px;">Compliance level</th> </tr> </thead> <tbody> <tr><td style="padding: 5px;">APG</td><td style="padding: 5px; color: green;">FC</td></tr> <tr><td style="padding: 5px;">HEP-OPS</td><td style="padding: 5px; color: green;">FC</td></tr> <tr><td style="padding: 5px;">Transelectrica</td><td style="padding: 5px; color: green;">FC</td></tr> <tr><td style="padding: 5px;">JP EMS</td><td style="padding: 5px; color: green;">FC</td></tr> <tr><td style="padding: 5px;">SEPS</td><td style="padding: 5px; color: green;">FC</td></tr> <tr><td style="padding: 5px;"> </td><td style="padding: 5px;"> </td></tr> </tbody> </table>	Neighbour	Compliance level	APG	FC	HEP-OPS	FC	Transelectrica	FC	JP EMS	FC	SEPS	FC													<p>Concise explanation for declared compliance level:</p> <div style="background-color: #e0e0e0; padding: 10px; margin-top: 10px;"> <p style="color: green;">There are lists of network elements bilaterally exchanged. Switching of these elements has to be coordinated. Previous lists based on long term experiences have been mostly approved by a study.</p> <p style="color: green;">Observability area is implemented in the EMS/SCADA system.</p> </div>
Neighbour	Compliance level																								
APG	FC																								
HEP-OPS	FC																								
Transelectrica	FC																								
JP EMS	FC																								
SEPS	FC																								

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

[Redacted]

Do you determine the external contingency list? If yes how often do update it?

There is an external contingency list. We check it each time if external network configuration considerably changes.

List of evidences, comments:

Operational Agreements (Annex 5)

Is your external contingency list integrated in all your N-1 security calculations?

Yes No

List of evidences, comments:

Contingency list of load-flow calculation module of EMS/SCADA system

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR showed the list of contingency elements in their EMS contingency analysis which covered all neighbouring TSOs even selected parts of neighbours of neighbouring TSOs.

4.12 P3-A2-S2 IMPLEMENTATION OF OBSERVABILITY AREA

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
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: FC

AUDIT QUESTIONNAIRE 2011

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.

Overall Compliance level FC SC NC

Neighbour	Compliance level
APG	FC
HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	FC

Concise explanation for declared compliance level:

The observability area of MAVIR is implemented in the Spectrum SCADA.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Is the observability area implemented in the SCADA? If yes how often do update it?

Observability area is implemented in the SCADA and it is updated when MAVIR got a notification of topology changes from neighbouring TSOs and there is a verification of the

external network yearly.

List of evidences, comments:

Screenshot of the external SCADA network of MAVIR

E-mails from neighbouring TSOs containing topology changes and ICCC object identifier changes. Contract for the verification of the external network.

Do you have a proper amount of exchanged online data to ensure the real time observability by the state estimator

Yes No

List of evidences, comments:

The result of the observability analysis of the state estimator can be checked on one-line displays for the measurements concerning the elements defined in the external observability list.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR showed the list of contingency elements in their EMS contingency analysis which covered all neighbouring TSOs even selected parts of neighbours of neighbouring TSOs.

4.13 P3-A2-S5.2 Abroad consequences of TSOs decisions in operational planning and in real time

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
P3-A2-S5.2.				
Abroad consequences of TSOs decisions in operational planning and in real time. In case of changing the network configuration for network branches included in the external observability list of neighbors (e.g. outage of elements, double busbar operation) or major changes of generation pattern, the TSO must inform in due time and firstly in the operational planning phase its affected neighbors. If needed corresponding measures have to be coordinated to prevent counter-effects in neighboring networks.				
Compliance Level: FC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS FC
Explanation for the full compliance declaration:				
Additional Questions				
Have you implemented a procedure ensuring exchange of information related to changes of network configuration or major changes of generation pattern in operational planning and real time operation?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
Do you have any agreed procedures in which counter measures to prevent counter-effect in neighbouring networks are determined?				
VERBUND APG no	HEP-OPS no	JP EMS no	Transelectrica no	SEPS no

AUDIT QUESTIONNAIRE 2011	
P3-A2-S5.2 ABROAD CONSEQUENCES OF TSOs DECISIONS IN OPERATIONAL PLANNING AND IN REAL TIME. In case of changing the network configuration for network branches included in the external observability list of neighbours (e.g. outage of elements, double busbar operation) or major changes of generation pattern, the TSO must inform in due time and firstly in the operational planning phase its affected neighbours. If needed corresponding measures have to be coordinated to prevent counter-effects in neighbouring networks.	
Overall Compliance level FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>	
Neighbour	Compliance level
APG	FC

HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	FC

Concise explanation for declared compliance level:

Regular and close cooperation with adjacent TSOs' network operation planning teams. Regular yearly, monthly, weekly and if necessary, more frequent information exchange on relevant changes, as required in OH P4.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

[Redacted area]

Have you implemented a procedure ensuring exchange of information related to changes of network configuration or major changes of generation pattern in operational planning and real time operation?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

There is regular information exchange between the parties about power system improvements. It is regulated by the operational agreements (point 4.2.1) and OH P4.
 E.g. yearly disconnection planning meetings, weekly operational teleconferences.

Do you have any agreed procedures in which counter measures to prevent counter-effect in neighbouring networks are determined?

Neighbour	Yes	No
APG		No
HEP-OPS		No
Transelectrica		No
JP EMS		No
SEPS		No

List of evidences, comments:

No definite procedure is considered to be necessary in advance. If needed, the parties contact each other in order to agree about measures for the single cases.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:
FC

Explanation for the suggested compliance level:

“Agreement on Network and System Operation Management” and “Agreement on joint operation” contain provisions to inform neighbouring TSOs in real time regarding changes in network topology.

4.14 P3-A2-S6 DATA PROVISION

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
P3-A2-S6.				
Data provision. The TSO has to provide its neighbors in due time with all needed information for adequate simulations. Each TSO must provide the real-time telemetry and the network characteristics to its neighbors that is necessary for the neighboring 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: SC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS SC
Actions taken to reach compliance:				
Data provision from the first loop of SEPS grid is not complete. Completion is initiated, realization depends on SEPS.				
Deadline: 12/2010				
Additional Questions				
Do you have an agreement with your neighbouring TSOs which precises in details what data have to be exchanged concerning the network elements identified in the observability area ?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
What kind of communication methods do you use for data provision? (e.g. email, data server,...)				
VERBUND APG Electronic Highway				
HEP-OPS Electronic Highway				
JP EMS Electronic Highway				
Transelectrica Electronic Highway				
SEPS Electronic Highway				

AUDIT QUESTIONNAIRE 2011

P3-A2-S6 DATA PROVISION. The TSO has to provide its neighbors in due time with all needed information for adequate simulations. Each TSO must provide the real-time telemetry and the network characteristics to its neighbors that is necessary for the neighboring 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.

Overall Compliance level FC SC NC

Neighbour	Compliance level
APG	FC
HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	FC

Concise explanation for declared compliance level:

Data provision is defined in bilateral operational agreements between MAVIR and other TSOs except SEPS. Between MAVIR and SEPS there were negotiations where the scope of the necessary data provision was defined in the minutes of the meetings.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you have an agreement with your neighbouring TSOs which describe in detail what data have to be exchanged concerning the network elements identified in the observability area?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

MAVIR has agreements (defined in minutes or bilateral Operational Agreements) with the neighbouring TSOs. The minutes of meetings and the Operational Agreements define the necessary data to be exchanged.

Do you provide the realtime telemetry necessary for the state estimator and for the N-1 calculations to the neighbouring TSOs? (to be asked border by border),...

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

MAVIR provides all the necessary real-time telemetry that is specified in the agreements. Configured objects can be checked in the ICCP Database Management of MAVIR's EMS/SCADA system.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

“Agreement on Network and System Operation Management” and “Agreement on joint operation” with neighbouring TSOs contain list of exchanged elements and their network characteristics which are also part of DACF files. Email confirmations of DACF model sent to Swissgrid DACF server were presented to audit team. MAVIR also showed logs and emails which they exchange with their neighbours after each change in the network.

They also presented a procedure how they update Annex 15 “Online data exchange” of “Agreement on Network and System Operation Management” if needed. Between 2010 and 2011 SEPS and MAVIR improved their data exchange procedures which resulted full compliance with the standard.

4.15 P3-A3-S2 Overloads in N-1 situation (simulation).

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
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 remedialactions are available as to get back any overloaded network element below itsrespective Permanent Admissible Transmission Loading PATL.
Compliance Level: FC
Explanation for the full compliance declaration:
<p>Additional Questions</p> <p>Which measures do you take if there is no possible remedial action in terms of topological modifications and generation redispatching available in such a case? (That means remedial actions allowed by laws, regulators, which can be applied in such a situation, but which are not prepared in advance for regular application, e.g. no contracts,...)</p> <p>Countertrading, voltage reduction and finally load shedding if needed</p> <p>If a remedial action is considered as "available", which time lag is taken into account for this action to become effective?</p> <p>Seconds-minutes, depending on the manner of action</p>

AUDIT QUESTIONNAIRE 2011
<p>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."</p>
<p>Compliance level FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/></p>
<p>Concise explanation for declared compliance level:</p>
<p>The contingency analysis discovers the bottleneck of the network. The dispatcher modifies in advance the topology (reconfiguration of the network). Practically it means that the dispatcher reconfigures the busbar topology without opening the busbar coupling. In some cases it is enough to modify tap position of the transformers. If necessary the dispatcher prepares for redispatch. It is characteristic of the Hungarian network that the meshed distribution 120 kV network branches are parallel connected with the meshed transmission network. Usually, if the (N-1) criterion is not fulfilled, it effects the 120 kV meshed distribution network, or the 400/120 kV, 220/120 kV transformers. According to transformers' specifications they may permanently be overloaded by 120% of their nominal power (current). Considering oil/winding temperature the transformers may be overloaded by 150%. Overloading of conductors of tie-lines is not allowed, but on the transmission lines the limitation elements are the current transformers (that may permanently be overloaded 120%) and the disconnectors.</p>
<p>Do you have an addendum to the standard? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>

In case of an existing addendum; list of evidences for a mitigation plan, comments:

[Redacted]

Which measures do you take if there is no possible remedial action in terms of topological modifications and generation redispatching available in such a case? (That means remedial actions allowed by laws, regulators, which can be applied in such a situation, but which are not prepared in advance for regular application, e.g. no contracts,...)

Countertrading, voltage reduction and finally load shedding if needed.

List of evidences, comments:

Every network maintenance program has a pre-defined maximum cancellation time period. If needed, the dispatcher gives command to cancel the maintenance program and the network element shall be put into operation within cancellation time period.

The last tool is the manual load shedding (directly from the TSO's control room or from the DSO's control room).

If a remedial action is considered as "available", which time lag is taken into account for this action to become effective?

Seconds-minutes, depending on the manner of action.

List of evidences, comments:

Execution of the available remedial actions takes place within seconds-minutes (all elements of the Hungarian transmission network and almost all elements of the distribution network are remote controlled). Maximum delay time of the redispatch execution command is 15 minutes (according to Hungarian Commercial Code III./4.3.3(g)). The typical maintenance cancellation time period is 30-60 minutes.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR presented Code of Commerce I./2.36 "Emergency modification of exchange programs", their SCADA system functions and dispatcher procedures which cover the remedial actions in case of N-1 overload situation. Hungarian Grid Code describes load shedding possibilities in chapter 16.2. "Restriction of consumption". MAVIR does not expect initiation of counter trading as remedial action, but they have jurisdiction to use counter trading to help neighbouring TSOs.

4.16 P3-A3-S4.1 Tie-lines operating conditions

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
P3-A3-S4.1.				
Tie-lines operating conditions. The information on values of PATL, TATL or couples (TATL)				
Compliance Level: FC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS FC
Explanation for the full compliance declaration:				
Additional Questions				
Do you share values of PATL, TATL and TC for all tie-line with adjacent TSOs?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
Do you inform neighbours in case of settings changes at the time of the change?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes

AUDIT QUESTIONNAIRE 2011	
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.	
Overall Compliance level FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>	
Neighbour	Compliance level
APG	FC
HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	FC

Concise explanation for declared compliance level:

Information is exchanged as regulated by operational agreements.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you share values of PATL, TATL and TC for all tie-line with adjacent TSOs?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes <input type="checkbox"/>	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

Operational Agreements (Annex 8; SEPS: point 9.2.1, amendments)

Do you inform neighbours in case of settings changes at the time of the change?

Yes No

List of evidences, comments:

Operational Agreements (point 3.4.11), e-mails (SEPS)

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

“Agreement on Network and System Operation Management” Annex 3A “Basic parameters of tie-lines” and Annex 8 “Congestion values and settings” with neighbouring TSOs cover the requirements of the standard. MAVIR does not allow overloading of tie-lines (PATL = TATL) and has not installed over current protection in their system, tie-lines included. MAVIR provided evidence examples regarding communication of tie-line parameters change with their neighbouring TSO.

4.17 P3-A4-S3 PRINCIPLE OF “NO CASCADING WITH IMPACT OUTSIDE MY BORDER”

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
P3-A4-S3.				
Principle of "No cascading with impact outside my border". TSOs commonly identify, prepare and implement in a coordinated way all possible operational measures and remedial actions (doing their best efforts in accordance with their legal framework) so that the simulated situations ⁴ based on the contingency lists cannot lead to the propagation of cascading effects outside their borders.				
Compliance Level: SC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS SC
Actions taken to reach compliance:				
Reconcluded operational agreements are intended to include agreed remedial actions. Process initiated.				
Deadline: 6/2011				
Additional Questions				
Do you share datasets and additional information to identify risks of cascading effects on the interconnection by the means of calculations?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
Do you define in advance a set of contingencies and relative coordinated remedial actions with neighbouring TSOs?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS no
How do you check the effectiveness of prepared measures for situations based on the contingency list?				
VERBUND APG Load-flow calculation				
HEP-OPS Load-flow calculation				
JP EMS Load-flow calculation				
Transelectrica Load-flow calculation				
SEPS Load-flow calculation				

Do you have a procedure to coordinate remedial actions with your neighbouring TSOs in case of detected violations on the interconnection?

VERBUND APG	HEP-OPS	JP EMS	Transelectrica	SEPS
yes	yes	yes	yes	yes

Do you have agreed methods of cost sharing?

VERBUND APG	HEP-OPS	JP EMS	Transelectrica	SEPS
yes	yes	yes	yes	yes

AUDIT QUESTIONNAIRE 2011

P3-A4-S3 PRINCIPLE OF “NO CASCADING WITH IMPACT OUTSIDE MY BORDER”. TSOs commonly identify, prepare and implement in a coordinated way all possible operational measures and remedial actions (doing their best efforts in accordance with their legal framework) so that the simulated situations based on the contingency lists cannot lead to the propagation of cascading effects outside their borders.

Overall Compliance level FC SC NC

Neighbour	Compliance level
APG	FC
HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	SC

Concise explanation for declared compliance level:

There are agreements with each neighbours about informing on switching of definite network elements. Operational agreements (Annex 13) contain predefined operational measures and remedial actions. There is no declaration with SEPS about any predefined remedial action.

Definite necessary actions (both in planning phase or in real-time operation) are discussed and agreed among the affected partners based on the investigation of the actual circumstances.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you share datasets and additional information to identify risks of cascading effects on the interconnection by the means of calculations?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

Operational Agreements (point 3.5.4; SEPS: points 8, 9); disconnection planning process; DACF procedure. Information is exchanged if it is considered as necessary.

Do you define in advance a set of contingencies and relative coordinated remedial actions with neighbouring TSOs?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS		No

List of evidences, comments:

Annex 13 of the renewed operational agreements.

How do you check the effectiveness of prepared measures for situations based on the contingency list?

Neighbour	Explanation
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4.18 P3-A4-S4.1 REGIONAL AGREEMENT FOR THE SET OF REMEDIAL ACTIONS

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
P3-A4-S4.1.				
Regional agreement for the set of remedial actions. For probable constraints impacting neighboring control areas TSOs have to agree in advance with their neighbors in the same region on a set of remedial actions and on related procedures of activation.				
Compliance Level: SC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS SC
Actions taken to reach compliance: Reconcluded operational agreements are intended to include agreed remedial actions. Process initiated.				
Deadline: 6/2011				
Additional Questions				
Do you have any written agreements on procedures to provide maximal assistance to adjacent TSOs no longer capable to face a critical situation, taking into account cross-border remedial actions. (i.e. changes of network topology, cross-border re-dispatching, counter-trading, NTC curtailment, etc.)?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS no

AUDIT QUESTIONNAIRE 2011	
P3-A4-S4.1 REGIONAL AGREEMENT FOR THE SET OF REMEDIAL ACTIONS. For probable constraints impacting neighboring control areas TSOs have to agree in advance with their neighbors in the same region on a set of remedial actions and on related procedures of activation.	
Overall Compliance level FC <input type="checkbox"/> SC <input checked="" type="checkbox"/> NC <input type="checkbox"/>	
Neighbour	Compliance level
APG	FC
HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	SC

Concise explanation for declared compliance level:

There are agreements with each neighbours about informing on disconnection of definite network elements. Operational agreements (Annex 13) contain predefined operational measures and remedial actions. There is no declaration with SEPS about any predefined remedial action.

Definite necessary actions (both in planning phase or in real-time operation) are discussed and agreed among the affected partners based on the investigation of the actual circumstances.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Have you agreed with your neighbouring TSOs in the same region on a set of remedial actions and on activation of related procedures for probable constraints impacting neighbouring control areas?

Yes No

List of evidences, comments:

Operational Agreements (Annex 13)

In operational agreements there are remedial actions affecting more TSOs, e.g. EMS+TEL, APG+HEP-OPS

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR has signed the contract "Measures in critical network situation" with SEPS on 4.11.2011 which covers the remedial actions. For other neighbours the "Agreement on Network and System Operation Management" Annex 13 "Measures in critical network situation" covers the requirements of the standard.

4.19 P3-B-S1.2.2 OTHER REACTIVE POWER GENERATION/ABSORPTION RESOURCES

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010	
P3-B-S1.2.2.	
Other REACTIVE POWER generation/absorption resources. TSOs have to keep available a sufficient number of other reactive power sources like generators, capacitors and reactors connected to the grid, which contribute to REACTIVE POWER generation or absorption, in order to maintain or get back the voltage in normal ranges after any contingency.	
Compliance Level: FC	
Explanation for the full compliance declaration:	
Additional Questions	
Do you check regularly whether you have a sufficient additional reserve of reactive power in order to recover the normal range in N-1 situation	yes
Do you have information about the availability/restriction of reactive power reserves?	yes
Do you have any contracts with adjacent TSOs for the exchange of reactive power reserve in case of necessity (e.g. voltage margins violations)?	yes

AUDIT QUESTIONNAIRE 2011	
P3-B-S1.2.2 OTHER REACTIVE POWER GENERATION/ABSORPTION RESOURCES. TSOs have to keep available a sufficient number of other reactive power sources like generators, capacitors and reactors connected to the grid, which contribute to REACTIVE POWER generation or absorption, in order to maintain or get back the voltage in normal ranges after any contingency.	
Compliance level	FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level:	
Shunt reactors are connected to all 400/120 kV transformers' tertiary windings. Switch off one circuit of double circuit lines takes place, if needed. All generating units are capable of generating reactive power according to demand of the dispatcher. All 50 MW and bigger units are capable of centralized reactive power control (Hungarian Grid Code 5.1.9. (B) 3). The reactive power reserve is monitored by the EMS/SCADA system.	
Do you have an addendum to the standard?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
In case of an existing addendum; list of evidences for a mitigation plan, comments:	

Do you check regularly whether you have a sufficient additional reserve of reactive power in order to recover the normal range in N-1 situation?

Yes No

List of evidences, comments:

The "Real-time network analysis" process of the EMS/SCADA system has a "Voltage Scheduler" module. That module observes the state of the power system and in case of over/under voltage or overload, it gives advice to eliminate, solve the problem. The calculation cycle time is 5-10 minutes. The real-time reactive power reserve is monitored by the EMS/SCADA system.

Do you have information about the availability/restriction of reactive power reserves?

Yes No

List of evidences, comments:

The real-time reactive reserve is monitored by the EMS/SCADA system.

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR showed the audit team translated excerpt 5.1.9. (B,d) "Provision of voltage control" of Hungarian national Grid Code. It states that a power plant which fulfils given criteria must provide voltage control reserve. MAVIR has either shunt reactor on tertiary windings of 400/120 kV transformers or generation unit(s) connected to substation to ensure sufficient amount reactive power reserve. MAVIR uses two primary shunt reactors in 750 kV substation Albertirsa.

4.20 P3-B-S2.1.2 COORDINATION FOR VOLTAGE AND REACTIVE POWER MANAGEMENT

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010				
P3-B-S2.1.2.				
Coordination for voltage and reactive power management. A coordination between adjacent TSOs is needed in order to manage voltage control (primary and other means) and reactive power resources near boundary preventing that individual actions have a contrary effect to the security of neighbors (including border nodes for voltage) in normal operation and in case of disturbances.				
Compliance Level: FC				
VERBUND APG FC	HEP-OPS FC	JP EMS FC	Transelectrica FC	SEPS FC
Explanation for the full compliance declaration:				
Additional Questions				
Do you have any reactive power resources which are placed near to the boundaries of your system?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
Do you inform your neighbours in advance if you intend to perform an action that will cause significant increase or decrease of voltage at your boundary substations?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
Do you inform your neighbours if a disturbance which occurred in your system causes a significant change of voltage at boundary substations and additional reactive flows on tie-lines?				
VERBUND APG yes	HEP-OPS yes	JP EMS yes	Transelectrica yes	SEPS yes
How do you control voltages and reactive power flows on tie-lines (i.e. using of reactors or capacitors, generator based reactive power dispatch, etc.)?				
VERBUND APG Generators and reactors				
HEP-OPS Generators and reactors				
JP EMS Generators and reactors				
Transelectrica Generators and reactors				

SEPS Generators and reactors

AUDIT QUESTIONNAIRE 2011

P3-B-S2.1.2 COORDINATION FOR VOLTAGE AND REACTIVE POWER MANAGEMENT. A coordination between adjacent TSOs is needed in order to manage voltage control (primary and other means) and reactive power resources near boundary preventing that individual actions have a contrary effect to the security of neighbors (including border nodes for voltage) in normal operation and in case of disturbances.

Overall Compliance level FC SC NC

Neighbour	Compliance level
APG	FC
HEP-OPS	FC
Transelectrica	FC
JP EMS	FC
SEPS	FC

Concise explanation for declared compliance level:

According to the operational agreements, the reactive power flow should be minimized. MAVIR's dispatchers strive to balance cross border reactive power flow (less than ±50 Mvar on the border). In case of voltage/reactive power flow problem the dispatchers in coordinated ways switch on/off shunt reactors or tie-lines, over/under excites the generators.

Do you have an addendum to the standard? Yes No

In case of an existing addendum; list of evidences for a mitigation plan, comments:

Do you inform your neighbours in advance if you intend to perform an action that will cause significant increase or decrease of voltage at your boundary substations?

Neighbour	Yes	No
APG	Yes	

HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

Operational Agreements (point 3.4.10, Annex 7; SEPS: points 8.7, 8.8)

Do you inform your neighbours if a disturbance which occurred in your system causes a significant change of voltage at boundary substations and additional reactive flows on tie-lines?

Neighbour	Yes	No
APG	Yes	
HEP-OPS	Yes	
Transelectrica	Yes	
JP EMS	Yes	
SEPS	Yes	

List of evidences, comments:

Operational Agreements (point 3.4.10, Annex 7; SEPS: points 8.7, 8.8)

How do you control voltages and reactive power flows on tie-lines (i.e. using of reactors or capacitors, generator based reactive power dispatch, etc.)?

Neighbour	Explanation
All	Using of reactors, generators, transformers' tap changers, switching off one system of double circuit tie-lines or internal lines connected to border stations

List of evidences, comments:

Using of reactors, generators, switching off one system of double circuit tie-lines or internal lines connected to border stations. Voltage Scheduler (part of "Real-time network analysis" process of the EMS/SCADA system, running in advice mode).

Do you have any reactive power resources which are placed near to the boundaries of your system?

Neighbour	Explanation
APG Sarasdorf	Power station GÖNYŰ connected via Győr 400 kV substation
APG Wien SO	-
HEP-OPS Ernestinovo	Nuclear Power Station Paks connected via Pécs 400 kV substation
HEP-OPS Zerjavinec	-
Transelectrica Arad	Nuclear Power Station Paks connected via Sándorfalva 400 kV substation
Transelectrica Nadab	-
JP EMS Subotica	Nuclear Power Station Paks connected via Sándorfalva 400 kV substation
SEPS Gabcikovo	Power station GÖNYŰ connected via Győr 400 kV substation
SEPS Levice	-

List of evidences, comments:

EMS/SCADA display copy

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

“Agreement on Network and System Operation Management” annex 7 states the permissible maximum and minimum voltage in the neighbouring TSO substation. The reactive power flow must be minimised on tie-lines and neighbouring TSO must be informed in case of voltage drop according to above mentioned agreement on 3.4.10. Internal MAVIR practice recommends keeping the reactive power flow on a tie-line within ± 50 MVar.

MAVIR has either shunt reactor on tertiary windings of 400/120 kV transformers or generation unit connected to substation to ensure sufficient amount of reactive power reserve.

4.21 P3-D-S2 TRANSIENT ANGLE STABILITY CALCULATION

PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010	
P3-D-S2.	
Transient angle Stability calculation. Each TSO has at its own disposal relevant dynamic models and dedicated software in order to carry out dynamic simulations ensuring transient angle stability in its responsibility area.	
Compliance Level: FC	
Explanation for the full compliance declaration:	
Additional Questions	
Do you have relevant dynamic models in order to carry out dynamic simulations ensuring transient angle stability in your responsibility area.	yes

AUDIT QUESTIONNAIRE 2011	
P3-D-S2 TRANSIENT ANGLE STABILITY CALCULATION. Each TSO has at its own disposal relevant dynamic models and dedicated software in order to carry out dynamic simulations ensuring transient angle stability in its responsibility area	
Compliance level FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>	
Concise explanation for declared compliance level:	
<p>Network Planning and Analysis Department makes a transient stability calculation on ad hoc basis, and annually (until 2011 biannually) as part of the Transmission Development Plan, by PSS/E software package.</p> <p>Reference document: "Irányelv a 120 kV és nagyobb feszültségű hálózatok fejlesztésének tervezésére" („Planning Standards for the network 120 kV and above”), Paragraph 6.4.1.: "Transient stability"</p>	
Do you have an addendum to the standard? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
In case of an existing addendum; list of evidences for a mitigation plan, comments:	

<i>Do you have relevant dynamic models in order to carry out dynamic simulations ensuring transient angle stability in your responsibility area?</i>	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
List of evidences, comments:	
<p>We update our dynamic model with data received from power plant operators. Point</p>	

11.5.4 of the Grid Code requests, that
„Power plant operators are obliged to give the necessary data for network calculations and dynamic analyses. Scope and method of data supply is regulated by Appendix 2.5. Data supply shall be initiated by the power plant operator in case of significant change of conditions (commissioning or reconstruction of power plant, change of control parameters, etc.).”

Grid Code Appendix 2.5: “Data for Network Calculations”

“Provision of Dynamic Data”

AUDIT PHASE

COMPLIANCE AUDIT 2011

Compliance Level suggestion by the audit team:

FC

Explanation for the suggested compliance level:

MAVIR makes annual angle stability simulations with PSS/E as MAVIR's transmission development plan requires. They also make additional study before new/reconstructed/upgraded generation unit is connected to the grid. Audit team reviewed “Network Stability Analysis”, 15.10.2010 study which was additional to normal annual activities. Hungarian Grid Code Appendix 2.5 “Data for Network Calculations” and document “Planning Standards for the network 120 kV and above” cover the requirements of the standard.

5 CONCLUSIONS

The Audit Team found that MAVIR is fully compliant with all audited standards.

The Audit Team visited the MAVIR control room at the beginning of the audit. All questions of the Audit Team were answered in a very precise manner. The evidence presented in the control room helped the auditors to better understand the organisation of the work and the processes in MAVIR.

MAVIR was excellently prepared for the audit. All necessary documentation was easily available. The MAVIR's representatives answered all questions in a competent way and gave detailed but comprehensive explanations. The Audit Team wants to stress its satisfaction with the approach of MAVIR to the compliance audit.

In 7 cases the Audit Team upgraded the declared level from the level of sufficient compliance to the level of full compliance in case of 7 standards: P2-A-S4, P2-A-S5, P2-A-S5.2, P2-A-S5.3, P2-A-S5.4, P3-A4-S3, P3-A4-S4.1. The explanations for these decisions are given in the following:

P2-A-S4, P2-A-S5 and P2-A-S5.2:

MAVIR declared sufficient compliance but finally has signed or is in signature process of contracts for common rules "Agreement for scheduling and matching" with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For other TSOs APG and SEPS had common agreement "Implementation Guide CEE Scheduling" before the audit questionnaire submission. Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs. Contracts fulfilled all requirements of the respective standard. Therefore, the Audit Team upgraded MAVIR to the level of full compliance.

P2-A-S5.3 and P2-A-S5.4:

MAVIR declared sufficient compliance but finally has signed or is in signature process for contracts for common rules "Agreement for scheduling and matching" with Transelectrica, EMS and HEP-OPS after returning the audit questionnaire which makes MAVIR fully compliant for the standard. For other TSO's APG and SEPS had common agreement "Implementation Guide CEE Scheduling" before the audit questionnaire submission. Audit team reviewed all previously mentioned contracts and approval emails for the ones which were under signature process with the neighbouring ENTSO-E TSOs. Contracts fulfilled all requirements of the respective standard. Therefore, the Audit Team upgraded MAVIR to the level of full compliance.

P3-A4-S3 and P3-A4-S4.1:

MAVIR declared sufficient compliance because until the audit questionnaire submission there was no agreement with SEPS about any predefined remedial action but they finally signed the contract "Measures in critical network situation" with SEPS on 4.11.2011 which covers the remedial actions. For other neighbours the "Agreement on Network and System Operation Management" Annex 13 "Measures in critical network situation" covers the requirements of the standard. Therefore, the Audit Team upgraded MAVIR to the level of full compliance.

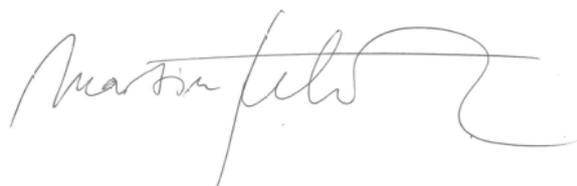
The Audit Team made the experience that MAVIR is an excellently organized TSO with a very high level of expertise.

The MAVIR representatives reported they had spent 290 working man-hours on audit preparation.

The Audit Team wishes to express its gratitude to the MAVIR company management for fulfilling all preconditions for an excellent and successful audit.

6 SIGNATURE PAGE

ENTSO-E Audit Team Members:



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Rafal Kuczynski (Audit Team Member)



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Date and Place: 19.12.2011, Brussels, Belgium