



European Network of  
Transmission System Operators  
for Electricity

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# COMPLIANCE AUDIT REPORT TENNET TSO B.V.

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21. – 22.6.2011

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**COMPLIANCE AUDIT CONDUCTED IN ARNHEM BY THE  
ENTSO-E RG CE SG COMPLIANCE MONITORING &  
ENFORCEMENT  
AT THE CONTROL CENTRE OF THE ENTSO-E MEMBER  
TENNET TSO B.V.**

### **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 year 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 TenneT TSO B.V. (further to be mentioned TenneT in this report) was chosen for a Compliance Audit in 2011. CME conducted the audit on 21 - 22.6.2011 at the National Control Centre of TenneT in Arnhem, the Netherlands.

## 1.3 AUDITED OH STANDARDS

The Compliance Audit encompassed 21 standards of Operation Handbook Policies 1-2-3 which are related to Load-Frequency Control and Performance, Scheduling and Accounting, and Operational Security. In 2010 TenneT made compliance declarations in the self-assessment process for the standards which will be checked for 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 found that the evidence presented by TenneT during the audit were adequate.

- The onsite compliance assessment (see the table 1 below) resulted in 1 NC level (P1-A-S1.1) and 3 SC level (P2-A-S5, P2-A-S5.5 and P3-A1-S2), being the remaining 17 standards FC. With regards to the compliance level declared by TenneT in the audit questionnaire 2011, the Audit Team proposed to upgrade 3 standards from SC to FC level (P2-A-S4, P2-A-S5.4 and P3-D-S2) while 1 standard proposed to downgrade from FC to SC level (P3-A1-S2);
- TSO approach: the audit team experienced a warm welcome, transparent and well organized approach and clever audited personnel. During the assessment TenneT declared and well demonstrated its aim to improve current process and procedures, taking the chance to detect potential criticalities thanks to the audit process
- The audit team performed 2 visits to the control room (concerning Policy 1-3 in the first day (just after introduction round) and Policy 2 in the second one) aimed at investigating evidences related to the audited standards. All explanations were well presented, focused to the matter and gave great contribution for the assessment process. The Audit Team had also the opportunity to discuss about the way of fulfilling investigated OH standards with TenneT control room staff.

The table 1. describes TenneT's compliance declaration in the self assessment questionnaire 2010 and compliance audit questionnaire 2011 with compliance level suggestion by CME Audit Team after reviewing the evidence for the audited standards. Upgrades are highlighted with green and downgrades with red colour. Standards which kept their declaration level are not highlighted.

TABLE 1. COMPLIANCE LEVEL CHANGES FOR THE AUDITED OH STANDARDS<sup>1</sup>

OH Standard	Self assessment questionnaire 2010 (TenneT)	Compliance audit questionnaire 2011 (TenneT)	On site compliance audit 2011 (Audit Team)
P1-A-S1.1	FC	NC	NC
P1-B-S4	FC	FC	FC
P2-A-S4	FC	SC	FC
P2-A-S5	Not asked <sup>2</sup>	SC	SC
P2-A-S5.1	FC	FC	FC
P2-A-S5.2	FC	FC	FC
P2-A-S5.3	FC	FC	FC
P2-A-S5.4	N/A	SC	FC
P2-A-S5.5	FC	SC	SC
P3-A1-S2	SC	FC	SC
P3-A2-S1	SC	FC	FC
P3-A2-S2	FC	FC	FC

<sup>1</sup> Compliance level keys: NC Non Compliant, SC Sufficient Compliant, FC Fully Compliant, N/A Non Applicable Standard

<sup>2</sup> the overall compliance level for this standard was not requested in the self assessment process 2010

P3-A2-S5.2	FC	FC	FC
P3-A2-S6	FC	FC	FC
P3-A3-S2	FC	FC	FC
P3-A3-S4.1	FC	FC	FC
P3-A4-S3	FC	FC	FC
P3-A4-S4.1	FC	FC	FC
P3-B-S1.2.2	SC	FC	FC
P3-B-S2.1.2	SC	FC	FC
P3-D-S2	NC	SC	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 TenneT didn't make any such objection. The TenneT staff present during the compliance audit is given on table 3.

TABLE 2. CME AUDIT TEAM FOR TENNET

Audit team role	Company or association	Name
Audit team leader	PSE-O	Rafal Kuczynski
Audit team member	SEPS	Martin Jedinak
Audit team member	MEPSO	Antonio Ivanovski
Audit team member	TERNA	Silvia Moroni
Audit team member	APG	Kurt Misak
Compliance Monitoring Advisor	ENTSO-E Secretariat	Lasse Konttinen

TABLE 3. TENNET AUDIT STAFF

Function in the company	Title	Name
System Operations - Control Area Manager	Senior Manager of System Operation	Siem Bruijns
System Operations	Senior Adviser System Operations	John Hoogveld
National Control Centre	Head of National Control Centre	Jaap Hagen
National Control Centre	Senior Operator	Eric Groeneweg
National Control Centre	Operator	André Soffers
Operational Planning and Settlement	Head Operational Planning and Settlement	Henrie Mathijssen
Operational Planning and Settlement	Operational Planner	Maarten van Swam
SO Concepts	System Management	Raymond Kok
SO Concepts	System Management	Fabian Heus
SO Concepts	System Management	Paul van den Heuvel
Process Development and Applications	Process Expert Transmission	Patrick Piters

### 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 the last update of the document for the Audit Team. Previously mentioned preparations must be completed prior to the start of the on-site 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	<b>7 weeks prior to audit</b>
Submittal of the completed Audit Worksheet to the Secretariat by TenneT	<b>3 weeks prior to audit</b>
Initial draft of the audit report based on the Audit Worksheet sent to TenneT by the Audit Team	<b>2 working days prior to audit</b>
Opening meeting of the Audit Team and CAM of TenneT (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 TenneT 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	<b>First audit day,</b> 21.6.2011 11:00-12:30
Start of the OH standards' review	<b>First audit day,</b> 21.6.2011 12:30-18:00
Continue of the OH standards' review	<b>Second audit day,</b> 22.6.2011 08:00-12:00



Internal Audit Team meeting	<b>Second audit day,</b> 22.6.2011 12:00-13:00
Closing meeting with CAM of TenneT (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 TenneT 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.	<b>Second audit day,</b> 22.6.2011 13:00-14:00
Delivery of the draft audit report to TenneT for review	<b>2 weeks after the audit</b>
Remarks by TenneT	<b>4 weeks after the audit</b>
Delivery of the final audit report to TenneT	<b>6 weeks after the audit</b>
Acknowledgement of the final Audit Report by ENTSO-E RGCE Plenary and decision on its possible internal or external publishing.	<b>RGCE Plenary in 2012</b>

### 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 onsite 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. Grid Code, regulation, association agreement or contract).

**Compliance Level:** FC

##### 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, establishing the availability of primary control

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

Monitoring both as a whole and for each single relevant generation unit; monitoring usually retrospective, although TenneT can perform quite close to real time monitoring.

#### 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**             **SC**             **NC**

Concise explanation for declared compliance level:

No enforcement of Availability of (Mandatory) Primary Control Reserve

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

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

Evidence:

Addendum

Proposal Joint Grid Operators to Regulator June 2<sup>nd</sup> 2010, to amend Grid (System) Code

Comment:

Pending Decision by Regulator

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

Yes             No

List of evidences, comments:

Evidence:

Yearly Inventory Non-Infrastructure Requirements System Operations (MO 10-188) Behoefteraming 2011\*

Capability Tests

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

Grid (System) Code

Tariff Code

List of evidences, comments:

Evidence:

Grid (System) Code

Tariff 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: real time/retrospective)*

Control Area; retrospective, resolution 4 sec

List of evidences, comments:

Work instruction: "Werkinstructie voor het bepalen en rapporteren van Nederlandse primaire reactie na een buitenlandse storing".

Results (report) will be shown

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

NC

**Explanation for the suggested compliance level:**

TenneT representatives explained the reason for non-compliance declaration as on previous year they declared full compliance. TenneT cannot currently enforce primary control reserve providers for the delivery of the reserve. The reserve providers are obliged by Dutch legislation (and Grid Code) to provide reserves to TenneT. The respectable parties and TenneT do not have contract between each other. TenneT has measurements from each primary reserve generator above 60 MW threshold and can perform post-incident analysis.

TenneT has a RGCE approved addendum on this particular OH standard until end of 2011. TenneT is currently engaged with Dutch regulator to have enforcement rights for primary reserve providers.

**Improvement/Mitigation plan with deadline:**

The Dutch regulator will give their response to TenneT request on mid-2011.

## 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

##### 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?

Monitoring of availability of tertiary reserve is being done via publication of its aggregation on TenneT website. Reporting is being done, if requested, via email exchange

#### 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             SC             NC

Concise explanation for declared compliance level:

Market design, Product design, Regulatory regime hitherto allow TenneT TSO BV to comply fully to the Standard.

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

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

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*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:

Yearly Inventory Non-Infrastructure Requirements System Operations (MO 10-188)  
*Behoefteraming 2011\**  
Overview Contracted resources

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

Contractual, how to monitor technical availability is written in the contracts.

List of evidences, comments:

Contracts

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**  
FC

**Explanation for the suggested compliance level:**

TenneT provided the document: Behoefteraming 2011 "Yearly Inventory Non-Infrastructure Requirements System Operations (MO 10-188)", 31.3.2010. It describes acquirement and specification of secondary control reserve. TenneT also showed their public on line reporting of the activated reserve energy.

[http://www.tennet.org/english/operational\\_management/System\\_data\\_relatng\\_processing/volume\\_s\\_ettled\\_regulating\\_reserve\\_emergency.aspx](http://www.tennet.org/english/operational_management/System_data_relatng_processing/volume_s_ettled_regulating_reserve_emergency.aspx).

The Audit Team reviewed one of the TenneT's secondary control reserve contract: Contract Regelvermogen. TenneT showed an outcome report after operation day for one of their secondary control reserve provider and explained the whole procedure to the Audit Team.



### 4.3 P2-A-S4 GENERAL AGREEMENTS BETWEEN UCTE SYSTEM OPERATORS WHO ARE AFFECTED BY CROSS BORDER SCHEDULING

#### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>	
<b>P2-A-S4.</b>	
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.	
<b>Compliance Level:</b> FC	
<b>Additional Questions</b>	
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 ?  lowest value will prevail	

<b>AUDIT QUESTIONNAIRE 2011</b>	
<b>P2-A-S4 General Agreements between UCTE System Operators who are affected by cross border scheduling.</b> 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)	
<b>Compliance level FOR P2-A-S4</b> FC <input type="checkbox"/> SC <input checked="" type="checkbox"/> NC <input type="checkbox"/>	

Concise explanation for declared compliance level:

TenneT has bilateral agreements as described in P2 A-S4 with its adjacent TSO's which describes rules, procedures and processes which are needed for matching and troubleshooting Cross border scheduling issues.

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 agreements Scheduling of Power exchange with Amprion, Elia and TenneT DE

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

Yes  No

List of evidences, comments:

Within the bilateral agreements with the adjacent TSO's, specifications are agreed on the topic of MTFS and number of digits.

What procedure do you apply for solving mismatches?

Lowest value will prevail, only applies to Year, Month nominations with Belgium  
Due to changes in the system (2010) this is changed, for different products and borders.  
The procedure is described in the bilateral agreements or process descriptions.

List of evidences, comments:

Bilateral Agreements and process descriptions are made up per border or TSO's

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

Compliance level suggestion by the Audit Team:  
FC

Explanation for the suggested compliance level:

The voluntary TenneT compliance declaration downgrade was due to more critical point of view to the standard's requirements. TenneT do not formally fulfil the whole specification of ESS. TenneT uses a scheduling format which was in use before ESS. The whole process is covered with following inter TSOs agreements: "Functional Design data exchange TSOs and Auction Office", 4.3.2002; "Intraday Cross Border" (with German TSOs), 20.8.2008; "Interim Implicit Cross Border Intraday BE-NL", 26.10.2010. The previously mentioned documents cover all the requirements for the sub standards of P2-A-S4. The ESS is not mandatory part of this standard; it is only recommendation in the guidelines P2-A-G1. The implicit market structure in the Netherlands eliminates the need for having mismatch settlement process with market parties.

Audit Team recommends to upgrade TenneT to fully compliant.

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

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>	
<b>P2-A-S5.</b>	
<p>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:</p>	
<b>Compliance Level:</b>	
<b>Additional Questions</b>	
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 intraday process, Gate Closure, Cut-Off Time )?	yes
How are the relevant rules communicated to the Market Parties?	
Market parties receive documents by registration	
Do you have rules which are agreed in advance to solve mismatches at Cut-Off Time?	yes

Do the agreed responsibilities assignment 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. MTF5, 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 intraday 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:

TenneT has an agreement with Adjacent control areas SO's for the matching procedure rules for day-ahead and intraday market. The matching process is based on the ETSO scheduling system, but is not fully in line with the "Implementation guide for the ESS in the UCTE processes".

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

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

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*Do you perform matching with your neighbouring CONTROL AREAS?*

Yes             No

List of evidences, comments:

TenneT performs a matching process with its neighbouring Control Areas. Results of the matching process are available.

*How are the relevant rules communicated to the Market Parties?*

The market rules are made available through presentations on the start-up of the market product.

List of evidences, comments:

Presentation for market participants

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

SC

**Explanation for the suggested compliance level:**

TenneT has an automatic matching process with neighbouring TSOs which is not in line with ESS. The whole process is covered with following agreements: "Functional Design data exchange TSOs and Auction Office", 4.3.2002; "Intraday Cross Border" (with German TSOs), 20.8.2008; "Interim Implicit Cross Border Intraday BE-NL", 26.10.2010.

TenneT has published the relevant market rules on its web site: "Preparation of E-programmes & T-forecast".

**Improvement/Mitigation plan with deadline:**

TenneT has an improvement plan "Improvement plan P2-A-S5.5", 9.6.2011. The ESS will be implemented by end of 2012.

## 4.5 P2-A-S5.1 IDENTIFICATION CODE USED-EITHER EIC OR GS1 (FORMER EAN)

### PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
<b>P2-A-S5.1.</b>
Identification Code used - either EIC or GS1 (former EAN)
<b>Compliance Level:</b> FC
There are no Questions defined for this company and this policy!
<b>Additional Questions</b>

AUDIT QUESTIONNAIRE 2011
<b>P2-A-S5.1 Identification Code used-either EIC or GS1 (former EAN)</b>
<b>Compliance level</b> FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level: Within the CAS files EIC codes are used
<b>Do you have an addendum to the standard?</b> 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
<b>Compliance level suggestion by the Audit Team:</b> FC
<b>Explanation for the suggested compliance level:</b>

EIC codes are used in the TenneT CAS files.

The format is described in following documents: “Functional Design data exchange TSOs and Auction Office”, 4.3.2002; “Intraday Cross Border” (with German TSOs), 20.8.2008; “Interim Implicit Cross Border Intraday BE-NL”, 26.10.2010.



#### 4.6 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

##### PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
<b>P2-A-S5.2.</b>
Agreement on the contents and granularity of the exchanged CAS(e.g. MTFS, resolution) in order to allow a sufficient matching
<b>Compliance Level:</b> FC
There are no Questions defined for this company and this policy!
<b>Additional Questions</b>

AUDIT QUESTIONNAIRE 2011
<b>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</b>
<b>Compliance level</b> FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level: Within the bilateral agreement the information which is contained within the CAS exchange file is described, this information is agreed between the TSO's for the matching process.
<b>Do you have an addendum to the standard?</b> 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>
<i>Do you have documented agreements on matching with your neighbours?</i> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
List of evidences, comments: Bilateral Agreement with Neighbouring TSO's, Amprion, Elia and TenneT D

*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:

Bilateral Agreement with Neighbouring TSO's, Amprion, Elia and TenneT D

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

The following agreements describe the contents and granularity of the CAS file: "Functional Design data exchange TSOs and Auction Office", 4.3.2002; "Intraday Cross Border" (with German TSOs), 20.8.2008; "Interim Implicit Cross Border Intraday BE-NL", 26.10.2010..

#### 4.7 P2-A-S5.3 AGREED TIMING FOR PROCESSES (E.G. EXCHANGE OF PROGRAMS, MATCHING, DAY AHEAD AND INTRADAY PROCESS, GATE CLOSURE, CUT-OFF TIME)

##### PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
<b>P2-A-S5.3.</b>
Agreed timing for processes (e.g. exchange of programs, matching, day ahead and intraday process, Gate Closure, Cut-Off Time )
<b>Compliance Level:</b> FC
There are no Questions defined for this company and this policy!
<b>Additional Questions</b>

AUDIT QUESTIONNAIRE 2011
<b>P2-A-S5.3 Agreed timing for processes (e.g. exchange of programs, matching, day ahead and intraday process, Gate Closure, Cut-Off Time)</b>
<b>Compliance level</b> FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level: Within the bilateral agreement a chapter describes the timing process for the day-ahead and intra-day process (separate documents).
<b>Do you have an addendum to the standard?</b> 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>
<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>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
List of evidences, comments: Bilateral agreements with neighbouring TSO's, Amprion, Elia and TenneT D.

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

The following agreements describe the timing process for the day-ahead and intra-day processes: "Functional Design data exchange TSOs and Auction Office", 4.3.2002; "Intraday Cross Border" (with German TSOs), 20.8.2008; "Interim Implicit Cross Border Intraday BE-NL", 26.10.2010.

TenneT has automated system and software for scheduling with respect of deadlines (i.e. Gate Closure and Cut-Off Time).

## 4.8 P2-AS5.4 RULES TO SOLVE MISMATCHES AT CUT-OFF TIME

### PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
<b>P2-A-S5.4.</b>
Rules to solve mismatches at Cut-Off Time
<b>Compliance Level:</b> N / A
There are no Questions defined for this company and this policy!
<b>Additional Questions</b>

AUDIT QUESTIONNAIRE 2011
<b>P2-A-S5.4 Rules to solve mismatches at Cut-Off Time</b>
<b>Compliance level</b> FC <input type="checkbox"/> SC <input checked="" type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level:
No specific rules are made to solve mismatches at cut-off-time, this is already solved within previous matching of programs.
<b>Do you have an addendum to the standard?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
In case of an existing addendum; list of evidences for a mitigation plan, comments:
<hr/>
<i>Do you perform matching with your neighbouring CONTROL AREAS?</i>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
List of evidences, comments:
On D-1 and D the CAS, CBS-M and CBS-B files are exchanged, the process and procedures are described in the KLS* system and logging is done within lib-system, information on the exchange is presented as an attachment.
*The KLS system is the system which contains all the instructions on processes and procedures within TenneT

### AUDIT PHASE

## COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

TenneT does not have specific rules to solve mismatches at cut-off-time as they are already solved within previous matching of programs. TenneT has memorandum “Improvement plan – Cut off time”, 22.6.2011 which covers necessary actions regarding the standard in question. TenneT will update bilateral agreements with neighbouring TSO to specify the no need for mismatching solving process after cut off time.

Audit Team recommends to upgrade TenneT to fully compliant

## 4.9 P2-A-S5.5 RESPONSIBILITIES (E.G. MATCHING, CAPACITY CHECK)

### PREPARATORY PHASE

SELF-ASSESSMENT QUESTIONNAIRE 2010
<b>P2-A-S5.5.</b>
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".
<b>Compliance Level:</b> FC
There are no Questions defined for this company and this policy!
<b>Additional Questions</b>

AUDIT QUESTIONNAIRE 2011
<b>P2-A-S5.5 Responsibilities (e.g. matching, CAPACITY check)</b>
<b>Compliance level</b> FC <input type="checkbox"/> SC <input checked="" type="checkbox"/> NC <input type="checkbox"/>
Concise explanation for declared compliance level:
TenneT has a matching process with adjacent TSO's this is done according to the IG for ESS but not fully compliant with it.
<b>Do you have an addendum to the standard?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
In case of an existing addendum; list of evidences for a mitigation plan, comments:
<i>Does the agreed responsibilities assignment follow the "Implementation Guide for the ESS (ETSO Scheduling System) in the UCTE processes"?</i>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
List of evidences, comments:
The process and procedures are described in the KLS system and within the Bilateral agreements with neighbouring TSO's, Amprion, Elia and TenneT D.

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

SC

**Explanation for the suggested compliance level:**

TenneT has following agreements with neighbouring TSOs: “Functional Design data exchange TSOs and Auction Office”, 4.3.2002; “Intraday Cross Border” (with German TSOs), 20.8.2008; “Interim Implicit Cross Border Intraday BE-NL”, 26.10.2010. TenneT does not use ESS.

**Improvement/Mitigation plan with deadline:**

TenneT has an improvement plan “Improvement plan P2-A-S5.5”, 9.6.2011. The ESS will be implemented by end of 2012.



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

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>		
<b>P3-A1-S2.</b>		
<p>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 TSOB, both TSOs reconsider together their contingency lists.</p>		
<b>Compliance Level: SC</b>		
<b>Transpower</b> FC	<b>Amprion</b> SC	<b>Elia</b> FC
<p><b>Actions taken to reach compliance:</b></p> <p>For TenneT- Amprion contacts and annexes are still in draft version. TenneT and Amprion need to sign contacts etc to be fully compliant</p> <p><b>Deadline:</b> 12\2010</p> <p><b>Additional Questions</b></p> <p>Do you establish and communicate to other TSOs a formal list of exceptional contingencies?</p>		
<b>transpower</b> yes	<b>Amprion</b> yes	<b>Elia</b> yes

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

**transpower**  
yes

**Amprion**  
yes

**Elia**  
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?

**Transpower**

In the bilateral agreements is listed under which conditions the exceptional contingencies will occur . If such conditions occur the NCC will inform the neighbouring TSO. . If the exception will last for a longer period TenneT has the possibility to take this contingency in their N-1 real-time calculations.

**Amprion**

In the bilateral agreements is listed under which conditions the exceptional contingencies will occur . If such conditions occur the NCC will inform the neighbouring TSO. . If the exception will last for a longer period TenneT has the possibility to take this contingency in their N-1 real-time calculations.

**Elia**

In the bilateral agreements is listed under which conditions the exceptional contingencies will occur . If such conditions occur the NCC will inform the neighbouring TSO. . If the exception will last for a longer period TenneT has the possibility to take this contingency in their N-1 real-time calculations

## 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
TenneT D	FC
Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

In the bilateral agreements with Amprion, TenneT-D and Elia the exceptional contingencies are listed if they are known in advance. If such conditions occur the NCC will inform the neighbouring TSO.

**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]

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

Neighbour	Yes	No
TenneT D	FC	
Amprion	FC	
Elia	FC	

List of evidences, comments:

In the annexes of the bilateral agreements exceptional contingencies are listed if known in advance.  
 Elia Annex 5  
 Amprion Annex 15a en 15b  
 TenneT D Annex 15

*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
TenneT D	FC	
Amprion	FC	
Elia	FC	

List of evidences, comments:

If such conditions occur the NCC and Security Service Centre will inform the

neighbouring  
 TSO during WOPT, DOPT or real time based for example on weather forecast.

*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
TenneT D	
Amprion	
Elia	
	In the bilateral agreements is listed under which conditions the exceptional contingencies will occur.
	If such conditions occur the NCC will inform the neighbouring TSO.
	If the expectation will last for a longer period TenneT has the possibility to take this contingency in their N-1 real-time calculations.
	Exchange of information via WOPT, DOPT or Real Time )

List of evidences, comments:

In the annexes of the bilateral agreements contingencies are listed.

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

SC

**Explanation for the suggested compliance level:**

TenneT has bi-lateral agreements with all of its neighbours regarding the coordination actions. TenneT provided hard copy and electronic version of the contract with Elia “Agreement on Grid Operation and Management”, 11.3.2011. With TenneT\_DE and Amprion, TenneT communicates exceptional contingencies on need basis. TenneT does not have any exceptional contingency list with German TSOs. Due to this Audit Team recommends SC level for TenneT.

**Improvement/Mitigation plan with deadline:**

Development of an exceptional contingency list with German TSOs or formal declaration that such a list is not needed by all partners.

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

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>		
<b>P3-A2-S1.</b>		
<p>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 neighbouring TSO have to be included by the TSO if it considers them very relevant for risks.</p>		
<b>Compliance Level: SC</b>		
<b>transpower</b> FC	<b>Amprion</b> SC	<b>Elia</b> FC
<b>Actions taken to reach compliance:</b>		
<p>For TenneT- Amprion contacts and annexes are still in draft version. TenneT and Amprion need to sign contacts etc to be fully compliant</p>		
<b>Deadline:</b>	12\2010	
There are no Questions defined for this company and this policy!		
<b>Additional Questions</b>		

<b>AUDIT QUESTIONNAIRE 2011</b>
<p><b>P3-A2-S1 Determination of the external contingency list and observability area.</b> 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 neighbouring TSO have to be included by the TSO if it considers them very relevant for risks.</p>

Overall Compliance level FC  SC  NC

Neighbour	Compliance level
TenneT D	FC
Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

We execute this process as described above

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

Yes, depending on the external information from our neighbouring TSO's

List of evidences, comments:

Yes, depending on the external information from our neighbouring TSO's

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

Yes, depending on the external information from our neighbouring TSO's

List of evidences, comments:

Yes, depending on the external information from our neighbouring TSO's

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

Yes  No

List of evidences, comments:

See our EMS

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

Compliance level suggestion by the Audit Team:  
FC

**Explanation for the suggested compliance level:**

The external contingency list is implemented to TenneT EMS which was presented to Audit Team members in TenneT control room. The list is updated on need basis with neighbouring TSOs. The observability area was presented to Audit Team members with SCADA in TenneT control room. The external observability areas are defined in the bilateral contracts between neighbouring TSOs in the online data exchange annexes which were presented to the Audit Team.

## 4.12 P3-A2-S2 IMPLEMENTATION OF OBSERVABILITY AREA

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>
<b>P3-A2-S2.</b>
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.
<b>Compliance Level:</b> FC
There are no Questions defined for this company and this policy!
<b>Additional Questions</b>

<b>AUDIT QUESTIONNAIRE 2011</b>								
<b>P3-A2-S2 Implementation of observability area.</b> 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.								
<b>Overall Compliance level</b> FC <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/>								
<table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <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;">TenneT D</td> <td style="padding: 5px;">FC</td> </tr> <tr> <td style="padding: 5px;">Amprion</td> <td style="padding: 5px;">FC</td> </tr> <tr> <td style="padding: 5px;">Elia</td> <td style="padding: 5px;">FC</td> </tr> </tbody> </table>	Neighbour	Compliance level	TenneT D	FC	Amprion	FC	Elia	FC
Neighbour	Compliance level							
TenneT D	FC							
Amprion	FC							
Elia	FC							
Concise explanation for declared compliance level:								
We have implemented the observability area in the network model of our EMS for above mentioned TSOs								
<b>Do you have an addendum to the standard?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>								
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?*

Yes

Update is done if there is information about changes or a need to expand the observed grid by our operators,

List of evidences, comments:

See our EMS

*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:

Observability area is included in State Estimator output (see our EMS)

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

#### Compliance level suggestion by the Audit Team:

FC

#### Explanation for the suggested compliance level:

The observability area was presented to Audit Team members with SCADA in TenneT control room. The external observability areas are defined in the bilateral contracts between neighbouring TSOs in the online data exchange annexes which were presented to the Audit Team.

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

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>		
<b>P3-A2-S5.2.</b>		
<p>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 bus bar operation) or major changes of generation pattern, the TSO must inform in due time and firstly in the operational planning phase its affected neighbors<sup>2</sup>. If needed corresponding measures have to be coordinated to prevent counter-effects in neighbouring networks.</p>		
<b>Compliance Level: FC</b>		
<b>Transpower</b> FC	<b>Amprion</b> FC	<b>Elia</b> FC
<b>Additional Questions</b>		
<p>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?</p>		
<b>Transpower</b> yes	<b>Amprion</b> yes	<b>Elia</b> yes
<p>Do you have any agreed procedures in which counter measures to prevent counter-effect in neighbouring networks are determined?</p>		

<b>transpower</b>	<b>Amprion</b>	<b>Elia</b>
yes	yes	yes

## 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**             **SC**             **NC**

Neighbour	Compliance level
TenneT D	FC
Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

The obligation of exchange of information is settled in the bilateral contacts, coordination of measurements ( if needed ) is described in the CSM procedure

CSM: Congestion and Security Management

**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 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
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

Changes in normal state of the grid are communicated by outage report, in DACF files and WOPT reports, or for the short time communicated by the NCC to the involved TSO

,

See WOPT report, Outage report and logbook NCC.

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

Neighbour	Yes	No
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

See congestion security management ENG BS OPP 01-082.pdf

Relevant contingencies and remedial actions are considered in the Daily operational teleconference at SSC see DOPT report

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

TenneT provided a document: TSO to TSO agreements, Annex 12, procedure for congestion and security management, 1.7.2001 which fulfils communication requirements of the standard. They also provided the Audit Team a hard copy of Daily Operation Planning Teleconference report, 24.4.2011.

## 4.14 P3-A2-S6 DATA PROVISION

### PREPARATORY PHASE

#### SELF-ASSESSMENT QUESTIONNAIRE 2010

##### P3-A2-S6.

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

**Compliance Level:** FC

**transpower**  
FC

**Amprion**  
FC

**Elia**  
FC

##### 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 ?

**transpower**  
yes

**Amprion**  
yes

**Elia**  
yes

What kind of communication methods do you use for data provision? (e.g. email, data server,...)

**transpower**  
real time by datalink (EH)

**Amprion**  
real time by datalink (EH)

**Elia**

real time by datalink (EH)

### AUDIT QUESTIONNAIRE 2011

**P3-A2-S6 DATA PROVISION.** The TSO has to provide its neighbours in due time with all needed information for adequate simulations. Each TSO must provide the real-time telemetry and the network characteristics to its neighbours that is necessary for the neighbouring TSOs to have a sufficient external network model of the observability area for the state estimator and for the N-1 security calculations. This implies among others all data related to switching status, active and reactive power flows, voltage, injections and loads, tap changer position of transformers.

**Overall Compliance level**    FC                     SC                     NC

Neighbour	Compliance level
TenneT D	FC
Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

In the annexes of the agreements the needed information is listed and exchanged by EH  
 See also our EMS

**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]

*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
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

See agreements with Amprion, TenneT D and Elia annexes:  
 Amprion: annex 15a/15b, TenneT annex G 15 and Elia annex 16.

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

<b>Neighbour</b>	<b>Yes</b>	<b>No</b>
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

See above mentioned agreements annexes

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

The Audit Team was shown the EMS which had all the required functions. TenneT also presented electronic versions of the contract with neighbouring TSOs. The Audit Team also briefly reviewed TenneT's Inter-Control Centre Communications list.

## 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 remedial actions are available as to get back any overloaded network element below its respective Permanent Admissible Transmission Loading PATL.

**Compliance Level:** FC

##### Additional Questions

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,...)

See our Defence plan , Stopping maintenance , and testing programmes and maintenance with risk on generators. Changing production of generator plants. Starting or stopping generators

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

Due to our Defence plan actions mentioned above are only allowed if our is system is in status Alert or Emergency. If and when it is allowed to call of the Alert situation depends of the amount of load with is endangered . To be realised within minutes.

#### AUDIT QUESTIONNAIRE 2011

**P3-A3-S2 "OVERLOADS IN N-1 SITUATION (SIMULATION).** Considering the loss of a network element (N-1 situation) overloads on impacted network elements are admitted only if remedial actions are available as to get back any overloaded network element below its respective Permanent Admissible Transmission Loading PATL."

**Compliance level**    FC     SC     NC



Concise explanation for declared compliance level:

Due to our operational criteria (Bedrijfsvoeringscriteria) load more than the PATL is not allowed for tie lines, only transformers are to overload up to a maximum of 150 % if remedial actions are possible to reduce to load below PATL within one hour.

Do you have an addendum to the standard?    Yes     No

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

-----  
*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,...)*

Changing production or start/stop generators

List of evidences, comments:

See our Defence plan. Due to Not Normal state no contracts needed for immediate actions.

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

To be realized within one hour, we switch the transformers to a not affected bus bar.

List of evidences, comments:

Max. applicable loading of transformers

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**  
FC

**Explanation for the suggested compliance level:**

The TenneT's Grid Code "Netcode Elektriciteit", 11.1.2011 chapter 5 contains the procedures and rights for redispatching of generation and load shedding. Details of these actions are described in TenneT's defence plan during alert and emergency system state. The Audit Team reviewed this

document. TenneT presented their operational criteria “Bedrijfsvoeringscriteria” to show their permitted overloads of the grid equipment.

## 4.16 P3-A3-S4.1 TIE-LINES OPERATING CONDITIONS

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>		
<b>P3-A3-S4.1.</b>		
Tie-lines operating conditions. The information on values of PATL, TATL or couples (TATL		
<b>Compliance Level: FC</b>		
<b>transpower</b> FC	<b>Amprion</b> FC	<b>Elia</b> FC
<b>Additional Questions</b>		
Do you share values of PATL, TATL and TC for all tie-line with adjacent TSOs?		
<b>transpower</b> yes	<b>Amprion</b> yes	<b>Elia</b> yes
Do you inform neighbours in case of settings changes at the time of the change?		
<b>transpower</b> yes	<b>Amprion</b> yes	<b>Elia</b> yes

<b>AUDIT QUESTIONNAIRE 2011</b>
<b>P3-A3-S4.1 TIE-LINES OPERATING CONDITIONS.</b> 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             SC             NC

Neighbour	Compliance level
TenneT D	FC
Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

See agreements annexes  
 TenneT G: annex 8  
 Amprion: annex 8  
 Elia: annex 8

**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
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

See agreements annexes  
 TenneT G: annex 8  
 Amprion: annex 8  
 Elia: annex 8

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

Yes             No

List of evidences, comments:

TenneT NL has no Summer values, so we do not change the values regularly.

## AUDIT PHASE

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

Audit Team reviewed the “Agreement on Grid and Operation Management” annexes 8 of Elia, TenneT\_DE and Amprion which contains all needed information.

## 4.17 P3-A4-S3 PRINCIPLE OF "NO CASCADING WITH IMPACT OUTSIDE MY BORDER"

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>		
<b>P3-A4-S3.</b>		
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 <sup>4</sup> based on the contingency lists cannot lead to the propagation of cascading effects outside their borders.		
<b>Compliance Level:</b> FC		
<b>transpower</b> FC	<b>Amprion</b> FC	<b>Elia</b> FC
<b>Additional Questions</b>		
Do you share datasets and additional information to identify risks of cascading effects on the interconnection by the means of calculations?		
<b>transpower</b> yes	<b>Amprion</b> yes	<b>Elia</b> yes
Do you define in advance a set of contingencies and relative coordinated remedial actions with neighbouring TSOs?		
<b>transpower</b> yes	<b>Amprion</b> yes	<b>Elia</b> yes

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

**transpower**

NCC TenneT will calculate the effect for the short term in a modification of a snapshot of the real-time system or in our off line load flow programme. And the NCC TenneT will requested the Adjacent TSOs to check the proposed actions in their load flow calculation

**Amprion**

NCC TenneT will calculate the effect for the short term in a modification of a snapshot of the real-time system or in our off line load flow programme. And the NCC TenneT will requested the Adjacent TSOs to check the proposed actions in their load flow calculation

**Elia**

NCC TenneT will calculate the effect for the short term in a modification of a snapshot of the real-time system or in our off line load flow programme. And the NCC TenneT will requested the Adjacent TSOs to check the proposed actions in their load flow calculation

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

**transpower**

yes

**Amprion**

yes

**Elia**

yes

Do you have agreed methods of cost sharing?

**transpower**

no

**Amprion**

no

**Elia**

no

**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
TenneT D	FC
Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

ENTSO-E DACF-procedures , Security Service Centre (SSC Amprion and TenneT NL)  
 TSC TSO Security Cooperation, DOPT, CSM

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

Neighbour	Yes	No
TenneT D	FC	
Amprion	FC	
Elia	FC	

List of evidences, comments:

ENTSO-E DACF-procedures , TSC, DOPT  
 Our Security Service Centre ( SSC ) is concerned with the DACF-proces.

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

Neighbour	Yes	No
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

TenneT D: annex 13,  
 Amprion: annex 13,  
 Elia: annex 14  
 TSC procedures DACF  
 SSC activities

*How do you check the effectiveness of prepared measures for situations based on the*



*contingency list?*

Neighbour	Explanation
TenneT D	
Amprion	
Elia	
	Remedial actions are checked in the planning phase.
	NCC will calculate the effect for the short term in a modification of a snapshot of the real-time system.
	Both measures are taken in close cooperation with the adjacent
	TSO's Especially in SSC/TSC processes

List of evidences, comments:

See DACF-procedure TSC

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

Neighbour	Yes	No
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

DACF-procedure TSC  
 Procedure for Congestion en Security management, Amprion Annex 12  
 SSC procedures

**AUDIT PHASE**

**COMPLIANCE AUDIT 2011**

**Compliance level suggestion by the Audit Team:**  
 FC

**Explanation for the suggested compliance level:**

TenneT provided the Audit Team hard copies of Daily Operation Planning Teleconference reports, 24.4.2011 and 17.6.2011. DOPT reports are created every day. Security Service Centre provides DACF and 2DAF calculations for TenneT NL and DE and Amprion. An example SSC report (proposed, coordinated and quality checked NTC values, including coordinated remedial actions), 21.1.2011, was presented to Audit Team. TenneT provided the SSC agreement 9.7.2008 to Audit Team. TenneT also takes part in TSO Security Cooperation.

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

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>		
<b>P3-A4-S4.1.</b>		
Regional agreement for the set of remedial actions. For probable constraints impacting neighbouring control areas TSOs have to agree in advance with their neighbours in the same region on a set of remedial actions and on related procedures of activation.		
<b>Compliance Level:</b> FC		
<b>transpower</b> FC	<b>Amprion</b> FC	<b>Elia</b> FC
<b>Additional Questions</b>		
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.)?		
<b>transpower</b> yes	<b>Amprion</b> yes	<b>Elia</b> yes

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

TenneT D	FC
Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

See agreements: TenneT G annex13, Amprion annex 13, Elia annex 14 and TSC remedial actions document.

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 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:

See agreements TenneT G annex13, Amprion annex 13, Elia annex 14 and TSC remedial actions document.

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

Audit Team reviewed the "Agreement on Grid and Operation Management" annexes (Elia annex 14, TenneT\_DE annex 13 and Amprion annex 13) which contains all relevant information to fulfil 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:** SC

##### **Actions taken to reach compliance:**

new coils are planned

**Deadline:** 12\2011

##### **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)?

#### 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             SC             NC

Concise explanation for declared compliance level:

Regularly studies for voltage control  
Contracts with producers  
EMS screen dumps of available shunt reactors, capacitor banks and contacted reactive power on power plants.

**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 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:

Yearly investigation of the to be contracted power.  
( Behoeft raming 2011)

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

Yes             No

List of evidences, comments:

Maintenance planning ( VNB ) description ( process )  
Real Time information by means of EMS (See EMS screen dumps mentioned above.), weekly Maintenance planning overview (VNB) and information to/from neighbouring TSOs by WOPT and DOPT reports

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**  
FC

**Explanation for the suggested compliance level:**

An agreement for reactive power “Overeenkomst inzake Blindvermogen” with one of the providers was presented to Audit Team. The Audit Team also verified the voltage control system on the EMS at the control room. TenneT also presented annual investigation for the need of future contracted reactive power “Behoeft raming 2011”.

## 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 neighbours (including border nodes for voltage) in normal operation and in case of disturbances.

**Compliance Level:** SC

**transpower**  
FC

**Amprion**  
SC

**Elia**  
FC

##### **Actions taken to reach compliance:**

For TenneT- Amprion contacts and annexes are still in draft version. TenneT and Amprion need to sign contacts etc to be fully compliant .

**Deadline:** 12\2010

##### **Additional Questions**

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

**transpower**  
no

**Amprion**  
no

**Elia**  
no

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?

**transpower**

yes

**Amprion**

yes

**Elia**

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?

**transpower**

yes

**Amprion**

yes

**Elia**

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.)?

**transpower**

The level of the voltage and the amount of total exchange of reactive power on the tie line are input for our voltage management.

**Amprion**

The level of the voltage and the amount of total exchange of reactive power on the tie line are input for our voltage management.

**Elia**

The level of the voltage and the amount of total exchange of reactive power on the tie line are input for our voltage management.

**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 neighbours (including border nodes for voltage) in normal operation and in case of disturbances.

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

Neighbour	Compliance level
TenneT D	FC



Amprion	FC
Elia	FC

Concise explanation for declared compliance level:

Document: Coordination for Voltage Regulation between TenneT and Elia  
 See Bilateral agreements about voltage control. Voltage level is exchanged in Annex 7.

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
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

See logs (logbook coordinated reducing voltage level)

*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
TenneT D	X	
Amprion	X	
Elia	X	

List of evidences, comments:

Our Contingency Analyses calculates every 2 minutes new results **including** voltage drops and voltage level. If we find effects on a grid of an adjacent TSO occurs, our NCC informs the involved TSO.

*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
TenneT D	
Amprion	
Elia	

	The level of the voltage and the amount of total exchange of reactive
	Power on the tie lines is input for our voltage management
	Voltage management is done by using reactors, capacitor banks or
	calling in reactive power on contracted power plants. Or changing PST
	tap position or switching lines to increase or decrease reactive losses
	losses

List of evidences, comments:

Procedures for voltage management NCC (werkwijze afroep blindvermogencontracten)

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

Neighbour	Explanation
TenneT D	Production units connected to Eemshaven 220 and 380 kV
TenneT D	Shunt Reactors connected at Eemshaven 380 kV
Amprion	Production units connected to Maasbracht 380 kV
Elia	Production units connected to Geertruidenberg and Borssele 380 kV
Elia	Shunt Reactors connected at Geertruidenberg 380 kV

List of evidences, comments:

List of coils ( EMS screen dump )

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**

FC

**Explanation for the suggested compliance level:**

TenneT presented a log book regarding their voltage control actions. Audit Team reviewed "Addendum Agreement on Grid and Operation Management" regarding Coordination for voltage regulation between TenneT and Elia. TenneT has regular meetings with German TSOs for reactive power management of which Audit Team saw emails and presentations from the meetings. The Audit Team also saw EMS displays regarding reactive power resources located near to the boundaries and the measurements exchanged on-line with neighbouring TSOs.

## 4.21 P3-D-S2 TRANSIENT ANGLE STABILITY CALCULATION

### PREPARATORY PHASE

<b>SELF-ASSESSMENT QUESTIONNAIRE 2010</b>	
<b>P3-D-S2.</b>	
<p>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.</p>	
<p><b>Compliance Level:</b> NC</p>	
<p><b>Actions taken to reach compliance:</b></p> <p>The Grid Strategy department of TenneT is organizing to start-up Transient angle Stability calculations.</p>	
<b>Deadline:</b>	12\2010
<p><b>Temporary measures to preserve the security of interconnected system</b></p> <p>there are extra constraints on the transport volume from a certain area within the Netherlands</p>	
<b>Existing addendum for this Policy reference</b>	no
<p><b>Additional Questions</b></p> <p>Do you have relevant dynamic models in order to carry out dynamic simulations ensuring transient angle stability in your responsibility area.</p>	

<b>AUDIT QUESTIONNAIRE 2011</b>	
<p><b>P3-D-S2 TRANSIENT ANGLE STABILITY CALCULATION.</b> 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</p>	
<p><b>Compliance level</b>    FC <input type="checkbox"/>            SC <input checked="" type="checkbox"/>            NC <input type="checkbox"/></p>	
<p>Concise explanation for declared compliance level:</p>	
<p>Our TenneT department Asset Management (AM) is ably to let carry out for us the Dynamic simulations ( tool and models included )</p> <p>Dynamic calculations are externally executed and supervised by TenneT</p>	

Do you have an addendum to the standard?    Yes     No

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

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*Do you have relevant dynamic models in order to carry out dynamic simulations ensuring transient angle stability in your responsibility area?*

Yes     No

List of evidences, comments

Investigation report Zeeland (Onderzoek stabiliteit Zeeland april 2011)

## AUDIT PHASE

### COMPLIANCE AUDIT 2011

**Compliance level suggestion by the Audit Team:**  
FC

**Explanation for the suggested compliance level:**

TenneT uses KEMA as an external contractor for transient angle stability calculations. KEMA developed for TenneT a dynamic model for the Netherlands in 2011. KEMA has also produced a report of which TenneT takes full responsibility concerning Zeeland dynamic instability which was presented to the Audit Team. TenneT already started to train their personnel to achieve self-reliance in dynamic analysis.

Audit Team recommends to upgrade TenneT to fully compliant

## 5 CONCLUSIONS

The Compliance Audit conducted at TenneT clearly demonstrated that the onsite checking of the TSO's compliance with the OH standards is one of the best methods for receiving clear and precise information of the audited TSO and to revise its list of evidences.

The Audit Team has a much better opportunity to outline its main intentions at asking questions than within the scope of the self-assessment process. If the audited TSO actively participate in the audit (as TenneT), the Audit Team always receives high quality explanations. This is also true for the list of evidences, because its quality is not measured by its completeness and the number of details it contains, but by the readiness of the audited TSO to show the evidence, to discuss its content or to simply admit that there is no evidence.

The Compliance Audit requires a very good preparation of both the Audit Team and the representatives of the audited TSO. The audit itself absorbs a lot of time, patience and full concentration of the participants. Two days audits seem acceptable from the practical point of view, but duration of the audit depends mostly of how OH standards are evaluated and discussed. In case of investigated OH standards from Policy 1,2 and 3 all standards were checked in depth in very efficient cooperation with staff of audited TSO.

The onsite compliance assessment detected 1 NC level (P1-A-S1.1) and 3 SC level (P2-A-S5, P2-A-S5.5 and P3-A1-S2), being the remaining 17 standards FC. With regards to the compliance level declared in the audit questionnaire 2011, The Audit Team proposed to upgrade 3 standards from SC to FC level (P2-A-S4, P2-A-S5.4 and P3-D-S2) while 1 standard proposed to downgrade from FC to SC level (P3-A1-S2); [summary: cf. Table 1]

As a result of the audit process it's pointed out as follow:

- **Standard P1-A-S1.1 (NC)** - no change of the compliance level declared in AQ 2011: the current Dutch regulation concerning actions and rights for dispatching and monitoring the primary reserves performed by third parties providers must be changed to cover requirements and obligations for primary control
- **Standard P2-A-S5 and P2-A-S5.5 (SC)** - no change of the compliance level declared in AQ 2011: the implementation and run of the matching process is not in line with the "Implementation Guide for the ESS (ETSO Scheduling System); the full implementation of ESS is envisaged by the end of 2012
- **Standard P2-A-S4 (FC)** - upgrade of the compliance level declared in AQ 2011: the ESS is not mandatory part of this standard (it is only recommendation in the guidelines P2-A-G1)
- **Standard P2-A-S5.4 (FC)** - upgrade of the compliance level declared in AQ 2011: the implicit market structure in the Netherlands eliminates the need for having mismatch settlement process with market parties. For this reason, TenneT does not need any specific rules to solve mismatches at cut-off-time as they are already solved within previous matching of programs
- **Standard P3-A1-S2 (SC)** – downgrade of the compliance level declared in AQ 2011: on the basis of the likelihood of occurrence and respective risk assessment, a list of the exceptional type of contingencies for security calculation shall be formally agreed with the German neighbouring TSOs
- **Standard P3-D-S2C (FC)** – upgrade of the compliance level declared in AQ 2011: TenneT uses an external contractor for transient angle stability calculations; even though self reliance in dynamic analysis is not mandatory part of this standard, the process of training internal personnel is already well in progress

Moreover the Audit Team points two further issues:

- The list of the normal type of contingencies was out of the scope of the audit. Nevertheless, it's recommend to develop such a list with all the German neighbouring TSOs
- The Audit Team well appreciated the added value provided by the Security Service Centre to improve the security of the interconnected system. The centre provides daily high level results in terms of DACF and 2DAF calculations, coordinated remedial actions and quality check of NTC values and coordination with CORESO

TenneT well demonstrated transparent and clever approach. The TSOs readiness, organization and preparation to the audit saved a lot of time during the investigations.

The Audit Team recognized a lot of efforts in the preparation and good explanation of all evidences needed.

The Audit Team also appreciated the continuous aim to learn from this experience, taking the chance to improve current process and procedures.

In case of the TenneT Compliance Audit, all preconditions for an excellent and successful audit were fulfilled, and the Audit Team wishes to express its gratitude for that to the TenneT company management.

## 6 SIGNATURE PAGE


### ENTSO-E Audit Team Members:



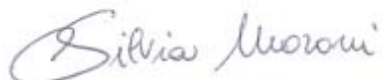
Rafal Kuczynski (Audit Team Leader)




Martin Jedinak (Audit Team Member)



Antonio Ivanovski (Audit Team Member)



Silvia Moronia (Audit Team Member)



Kurt Misak (Audit Team Member)



Lasse Kontinen (Compliance Monitoring Advisor)

Date and Place: 18.07.2011, Brussels, Belgium