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608540

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GARPUR

Project full title:

**Generally Accepted Reliability Principle with
Uncertainty modelling and through probabilistic Risk assessment**

Collaborative project

FP7-ENERGY-2013-1

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D10.3b

**Workshops proceedings and satisfaction questionnaires
(first and second year)**

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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
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EXECUTIVE SUMMARY

To reach the dissemination objectives of GARPUR, several workshops are planned during GARPUR project lifetime, each targeting a specific audience:

- Transmission System Operators (project task 10.3),
- Regulatory bodies and policy makers (task 10.4),
- Impacted stakeholders: Distribution System Operators, power generators and technology providers (task 10.10).

1. Workshops organized during the first year of the project

During the first year of GARPUR (September 2013 – August 2014), two workshops were organised:

- A workshop towards TSOs, on 7 April 2014 in Brussels (ENTSO-E premises),
- A workshop towards regulatory bodies, on 30 June 2014 in Ljubljana (ACER premises).

These workshops allowed GARPUR partners to present the project and very first deliverables. Both TSOs and regulators expressed interest in the project and asked for further exchanges, in particular when GARPUR partners are able to present more technical aspects of their activities. Proceedings of these workshops were the purpose of the deliverable D10.3a.

The presentations given at the two workshops can be found on the GARPUR website: <http://www.garpur-project.eu/publications>.

First workshop towards TSOs

The workshop was attended by 35 participants, including 13 people representing 11 TSOs non partners in GARPUR and ENTSO-E secretariat.

Six presentations were given and were followed by questions and answers sessions:

- “Opening introduction - the overarching goals of the GARPUR project” by STATNETT,
- “Overview and organization of the GARPUR project” by SINTEF,
- “Functional analysis of probabilistic reliability management” by the Scientific Advisor (ULG),
- “Current practices for reliability management in complex systems: a review of drivers and barriers for new reliability standards” by AALTO,
- “Shaping the GARPUR quantification platform” by KUL,
- “The role of reference group” by STATNETT.

A satisfaction questionnaire was distributed at the end of the workshop and provided positive feedback and interesting remarks that will be taken into account for the next workshops.

First workshop towards regulatory bodies

At GARPUR’s instigation, this workshop was co-organized with iTESLA and UMBRELLA projects. It was attended in total by 19 participants, including 3 ACER representatives and 4 NRAs representatives.

In conclusion for GARPUR, regulators demanded further exchange of views about the reliability criteria and the economic indicators. They asked the possibility to be involved in the discussions before new reliability criteria are finalized. They insisted that the next workshop (more technical) should be held as soon as possible. The next workshop towards regulators should therefore involve WP2 and WP3 partners and be held early 2015.

2. Workshops organized during the second year of the project

During the second year of GARPUR (September 2014 – August 2015), three meetings were organised between GARPUR and the above-mentioned stakeholders:

- Presentation of GARPUR at the Pentalateral Energy Forum, on 23 September 2014 in Brussels (Benelux Secretariat premises),
- A workshop with DSOs, power generators and technology providers, on 7 October 2014 in Brussels (ENTSO-E premises),
- A workshop with TSOs, on 2 June 2015 in Brussels (ENTSO-E premises).

Proceedings of these meetings are the purpose of the present revision of the same deliverable (version D10.3b).

The presentations given at these various events can be found on the GARPUR website: <http://www.garpur-project.eu/publications>.

Meeting with the Pentalateral Energy Forum (PLEF)

The Pentalateral Energy Forum (PLEF) is the framework for regional cooperation in Central Western Europe. It was created in 2005 by Energy Ministers from Benelux countries, Austria, Germany and France (with Switzerland as a permanent observer) in order to promote collaboration on cross-border exchange of electricity.

Participants in PLEF support group meetings are representatives of Energy Ministries, regulators, TSOs, power generators, and when relevant power exchanges. From GARPUR WP10 tasks point of view, participation in PLEF meetings is therefore seen as a contribution to tasks 10.3, 10.4 and 10.10.

GARPUR was presented to PLEF Support Group 2 "Security of Supply" at the occasion of a meeting held at the Benelux Secretariat in Brussels on 23 September 2014.

Following this presentation, regulators and ministries representatives expressed interest in participating in future exchanges with GARPUR, in particular regarding the design of new reliability criteria.

First workshop with DSOs, power generators and technology providers

This workshop was held in ENTSO-E premises on 7 October 2014, the day before an EDSO Technology Committee meeting. Not only GARPUR was presented, but representatives of the three categories of targeted stakeholders were invited to present their point of view about reliability management.

Discussion mainly focused on the following aspects:

- Complexity of GARPUR and the communication towards external stakeholders,
- Data and scenarios,
- Impacts of GARPUR.

Responses to the evaluation questionnaire show that stakeholders are eager to know more about GARPUR and ask for more concrete examples, pictures or use cases illustrating the impacts of GARPUR on their own activities.

Second workshop with TSOs

This workshop was held in ENTSO-E premises on 2 June 2015, the day before an ENTSO-E RDC meeting. At this workshop, the GARPUR reliability management framework was introduced, with a focus on the development of new reliability criteria and the socio-economic assessment of reliability criteria; the current practices amongst European TSOs in terms of TSOs functional workflow of long-term, mid-term and short-term decision making processes was presented; and a focus was made on recent and upcoming project milestones.

Discussions during the workshop and responses to the evaluation questionnaire show that TSOs are interested in GARPUR and request more practical examples about the potential impacts of GARPUR approach.

1 INTRODUCTION

Dissemination activities are an important part of the GARPUR project. Objectives of dissemination activities are the following:

1. To convince the TSO community to implement a new reliability criteria to make the pan-European transmission network more flexible while keeping security at a socially acceptable level.
2. To convince policy makers and regulators to make the present pan-European transmission network reliability criteria evolve to increase its flexibility.
3. To involve other electricity market players (DSOs, generators, manufacturers) in the preparation of the future deployment of the project outputs.
4. To deliver the new project-based knowledge in a manner suited to meet the collected multi-stakeholder needs.
5. To stimulate the relevant players towards further demonstration activities to support the deployment of the new criteria according to an agreed road map.

Several workshops are planned during GARPUR project lifetime, each targeting a specific audience:

- Transmission System Operators (project task 10.3),
- Regulatory bodies and policy makers (task 10.4),
- Impacted stakeholders: Distribution System Operators, power generators and technology providers (task 10.10).

During the first year of the GARPUR project (September 2013 – August 2014), two workshops were organised:

- The first workshop towards TSOs, on 7 April 2014, in Brussels (ENTSO-E premises),
- The first workshop towards regulatory bodies, on 30 June 2014 in Ljubljana (ACER premises).

Proceedings of these workshops can be found in [D10.3a “Workshops proceedings and satisfaction questionnaires \(first year\)”](#), published in September 2014.

During the second year of GARPUR (September 2014 – August 2015), three meetings were organised between GARPUR and the above-mentioned stakeholders:

- A presentation of GARPUR at the Pentalateral Energy Forum, on 23 September 2014 in Brussels (Benelux Secretariat premises),
- The first workshop with DSOs, power generators and technology providers, on 7 October 2014 in Brussels (ENTSO-E premises),
- The second workshop with TSOs, on 2 June 2015 in Brussels (ENTSO-E premises).

Proceedings of these meetings are the purpose of the present revision of the same deliverable (version D10.3b).

2 FIRST WORKSHOP TOWARDS TSOS

This workshop was held in ENTSO-E premises on 7 April 2014, the day before an ENTSO-E RDC meeting.

2.1 Attendees

The workshop was attended by 35 participants, including 13 people representing 11 TSOs non partners in GARPUR and ENTSO-E secretariat. The detailed attendance list is presented in Table 1.

Table 1 – Attendance list of the first workshop towards TSOs

Company name	Representative	email
TSOs non GARPUR partners		
AMPRION	Björn Wohlgenuth	bjoern.wohlgenuth@amprion.net
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REE	Carlos Llanos	cllanos@ree.es
SVENSKA KRAFTNÄT	GÖRAN ERICSSON	GORAN.N.ERICSSON@SVK.SE
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TENNET	Gert Aanhaanen	Gert.Aanhaanen@tennet.eu
TERNA	Antonio Iliceto	antonio.iliceto@terna.it
GARPUR partners		
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17_TECHNOFI	Sophie Dourlens-Quaranta	sdourlens@symple.eu

2.2 Agenda

The workshop was held from 13:30 to 18:20, and was followed by a diner jointly organised with ENTSO-E. The detailed agenda is presented in Table 2.

Table 2 – Agenda of the first workshop towards TSOs

Time	Title	Responsible
13:30	Welcome of attendees	STATNETT (Gerard Doorman)
14:00	Opening introduction - the overarching goals of the GARPUR project	STATNETT (Gerard Doorman)
14:15	Overview and organization of the GARPUR project	SINTEF Energy Research (Einar Jordanger, acting coordinator)
14:30	Q/A	
14:45	Functional analysis of probabilistic reliability management	UNIVERSITY OF LIEGE (Louis Wehenkel, scientific advisor)
15:00	Q/A	
15:15	Coffee break	
15:30	Current practices for reliability management in complex systems: a review of drivers and barriers for new reliability standards	AALTO UNIVERSITY (Liisa Haarla)
15:50	Group discussion – "Drivers and barriers (for new reliability standards)"	AALTO UNIVERSITY (Liisa Haarla)
16:30	Coffee break	
16:45	Shaping the GARPUR quantification platform	KU LEUVEN (Dirk Van Hertem)
17:00	Discussion – Methods and Tools to be included in the Quantification Platform	KU LEUVEN (Dirk Van Hertem)
18:00	The role of reference group	STATNETT (Gerard Doorman)
18:15	Conclusions : the way forward with ENTSO-E members <ul style="list-style-type: none"> • TSOs in GARPUR • TSOs of the reference group • TSOs of ENTSO-E 	STATNETT (Gerard Doorman)
18:20	End of meeting	
19:30	Joint dinner invited by TECHNOFI	

2.3 Proceedings

The presentations can be found on the GARPUR website: <http://www.garpur-project.eu/publications>. The detailed minutes of the workshop can be found in Annex 1.

With the first presentation “Opening introduction - the overarching goals of the GARPUR project” (by STATNETT), the purpose of GARPUR, with the detailed scientific and technical objectives of the project, were presented to the audience. The relation with the N-1 rule was clarified.

With the second presentation “Overview and organization of the GARPUR project” (by SINTEF), GARPUR key figures, partners, work packages, timeline and milestones were presented.

Following the first two presentations, several participants suggested that new reliability criteria should be presented to ENTSO-E System and Development Committee (SDC) and System Operation Committee (SOC). The role of ENTSO-E was emphasized: GARPUR recommendations, if directed towards ENTSO-E, could be taken into account in future updates of the Network Codes.

With the third presentation “Functional analysis of probabilistic reliability management” (by the Scientific Advisor), the main ingredients of the generic functional analysis of reliability management proposed by GARPUR WP2 were presented. A focus was done on the short-term horizon of System Operation (coupling of real-time decision making with operational planning). A discussion followed with the audience, regarding the meaning of different terms (criticalities, mid-term vs. long-term...), the connection between reliability evaluation and economic evaluation, the relation with other projects as iTesla, Umbrella and eHighway2050, and the relation with ENTSO-E TYNDP.

With the fourth presentation “Current practices for reliability management in complex systems: a review of drivers and barriers for new reliability standards” (by AALTO), the work of GARPUR WP1 and the content of D1.1 and D1.2 were presented and discussed. The audience was invited to express on what they consider to be drivers or barriers to new reliability standards. A discussion followed about:

- The reliability criteria applied outside Europe,
- The need to involve regulators in the possible adoption of a risk-based approach (cost recovering),
- Data needed to adopt such approach,
- The customer point of view,
- Some differences between N-1 and probabilistic approaches (risk of black-out, the need to assess consequences of contingencies, the habits of the staff in real-time operation, the possibility to verify “by hand” that power flows are correct),

The fifth presentation “Shaping the GARPUR quantification platform” (by KUL) was accompanied by a more detailed document distributed to the audience and published on the website (<http://www.garpur-project.eu/publications>). A discussion followed about:

- The possible focus of the Quantification Platform on real-time,
- The scope and granularity of the model of the European network,
- Data standards (CIM),
- The training sessions with the GQP organized at the end of the project to convince the TSOs community of the performance of the new reliability criteria,
- The possible impact of new reliability criteria of Transmission Reliability Margins,
- Test cases for the GQP which could be proposed by SOC members.

The last presentation “The role of reference group” (by STATNETT) aimed at clarifying the role of the Reference Group and recruiting TSOs. Questions were raised about the exact role of Reference Group members and associated workload.

2.4 Responses to satisfaction questionnaire

A satisfaction questionnaire was distributed at the end of the workshop, both to TSOs non partner of GARPUR and to GARPUR partners. It is copied in Annex 2 of this document. Responses were gathered as presented in Annex 3.

Seven questions called for a quantified answer, from 1 (in full disagreement) to 5 (fully agree). The average marks given by attendees are presented in Table 3.

Table 3 – Average marks to quantitative questions of the satisfaction questionnaire

#	Questions	Average marks
<i>This meeting has helped you ...</i>		
1	... understanding the overreaching goal of the GARPUR project	4.7
2	... understanding the scientific challenges of the GARPUR project	4.1
3	... getting a clear picture of the drivers and barriers for using new reliability standards	4.1
4	... understanding the functioning and the role of the GQP	4.2
5	... understanding the role of the GARPUR Reference Group	3.9
<i>You consider that...</i>		
6	... enough time was dedicated to describing the key ambitions and challenges of GARPUR	4.6
7	... the R&D activities foreseen by the consortium are appropriate to meet the presented project ambitions	4.1

The following reasons were given to explain marks between 1 and 3:

- Question 2:
 - “Understanding the scientific challenges requires probably more than one working day for people not daily involved in reliability assessment”.
 - “WP2 and WP3 need to be synchronized. There needs to be a balance between reliability criteria and social benefits”.
- Question 4: “Still a bit high-level and abstract (but promising)”.
- Question 5: “It would be a good thing to have the MoU ready for the workshop”.
- Question 7: “Not enough overview about the research capacity - therefore hard to evaluate appropriateness of the activities”.

Qualitative questions were raised and received the following answers:

9. How would you sum up in one sentence the main message of the meeting?

- “Nice challenge to hear different opinions of other TSOs”.
- “GARPUR is ready to test conceptually different options for reliability criteria and to provide recommendation for next steps to evolve N-1”.
- “The analysis of alternatives to N-1 approach is complex and controversial, because of all the impacts and consequences it would have on "Business as Usual" for the electricity sector and for all the society”.
- “N-1 must not be always the right rule”.
- “The GARPUR team is very interested in input from TSOs”.

- “TSOs have to find something that is more sophisticated than N-1 criteria in the field of network planning”.
- “GARPUR is a European R&D project which involves all TSOs”.

From GARPUR partners:

- “GARPUR will try to improve current reliability criteria, with participation of RD's and TSOs, looking at both technical and economic issues”.
- “The TSOs show interest in the project”.
- “GARPUR is going in the right direction”.
- “Overview of the project ambitions, and need for feedback from non-consortium TSOs”.
- “Very important to disseminate the findings to other TSOs (SOC, MC...) of ENTSO-E”.
- “GARPUR will investigate the potential and realism of a probabilistic reliability criterion”.
- “Can N-1 be replaced by probabilistic methods?”
- “Challenging R&D project. High risk project”.
- “Inform TSOs of GARPUR and get feedback to some work already done in GARPUR”.

10. Are there any important issues that you thought worth being discussed and were not addressed during the meeting? Or any topic you would have liked spending more time on?

- “Each country optimize its own grid, so what about the use of phase-shifter in a probabilistic planning?”
- “Not for this initial workshop, it has provided a very good and complete picture; for future workshops more time and details will be necessary”.
- “Beside providing input information, how can TSOs help the project and what are the benefits of developing and using software like GQP?”

From GARPUR partners:

- “Goal of the Reference Group (not at the end of meeting!)”.
- “What are the shortcomings of the current situation? (what we are going to ‘repair’)”.
- “Influence of environmental issues”.

11. What would you suggest to improve the agenda and organization of the next workshops with TSOs?

- “Some practical mean should be used to “force” all participants to the workshops to actively contribute”.
- “Send material before the workshop / provide presentations in printed form at the workshop”.

From GARPUR partners:

- “Another set-up of meeting room”.
- “Present more initial results”.
- “In next meetings, discussions on specific methodologies, test cases and previous experience should start”.
- “Interactivity of “drivers and barriers” was good. More of that!”
- “TSOs should also present something”.

12. Do you intend to join the GARPUR Reference Group?

- 3 “yes”
- 2 “no”
- 3 “maybe” (need to check available resources, depends on decision of management...)

3 FIRST WORKSHOP TOWARDS REGULATORY BODIES

To organize this workshop, the contact was first established with one CEER member. Despite his interest in the subject, he considered it highly difficult to gather several representatives of regulators (NRAs, ACER) into one specific workshop dedicated to GARPUR. This was due to the high workload of regulators and the difficulty, in that context, to travel for an event which is not directly linked to their short-term duties. This difficulty was increased by the fact that the GARPUR project would be able, at this stage (June 2014), not to present results but only intentions.

It was therefore decided, instead of organizing a workshop in Brussels, that a small delegation would go to Ljubljana to meet ACER representatives, with the National Regulators involved by teleconference.

At GARPUR's instigation, this workshop was co-organised with iTESLA and UMBRELLA projects. The purpose was to give regulators a more complete presentation regarding European projects at the cutting-edge of research and innovation in power system reliability and control.

The workshop was held in ACER premises on 30 June 2014.

3.1 Attendees

The workshop was attended by 19 participants. The detailed attendance list is presented in Table 4.

Table 4 – Attendance list of the first workshop towards regulators

Company name	Representative	email	
Regulators			
ACER	Ernst Tremmel	Ernst.Tremmel@acer.europa.eu	
ACER	Mirela Dutoiu	Mirela.Dutoiu@acer.europa.eu	
ACER	Riccardo Vailati	Riccardo.VAILATI@acer.europa.eu	
CER (Ireland)	Robert O'Rourke		<i>by phone</i>
E-CONTROL (Austria)	Jakub Fijalkowski		<i>by phone</i>
EI (Sweden)	Lena Lange Jaakonantti		<i>by phone</i>
NCC (Lithuania)	Paulius Blažys		<i>by phone</i>
GARPUR partners			
SINTEF	Einar Jordanger	Einar.Jordanger@sintef.no	<i>by phone</i>
SINTEF	Oddbjørn Gjerde	Oddbjorn.Gjerde@sintef.no	<i>by phone</i>
STATNETT	Gerard Doorman	gerard.doorman@statnett.no	
TECHNOFI	Sophie DOURLENS-QUARANTA	sdourlens@symple.eu	
iTESLA partner			
RTE	Gabriel Bareux	Gabriel.bareux@rte-france.com	
UMBRELLA partners			
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ELES	Jan Kostevc	jan.kostevc@eles.si	
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RWTH Aachen	Tobias van Leeuwen	tl@iaew.rwth-aachen.de	<i>by phone</i>
TENNET GmbH	Helmut Paeschke	Helmut.Paeschke@tennet.eu	<i>by phone</i>
TransnetBW	Patrick Wajant	p.wajant@transnetbw.de	<i>by phone</i>
UDE	Klaus Köck	Klaus.Koeck@student.tugraz.at	<i>by phone</i>

3.2 Agenda

The workshop was held from 14:30 to 17:00.

Table 5 - Agenda of the first workshop towards regulatory bodies

Time	Title	Responsible
14:30	Opening presentation	TECHNOFI (Sophie Dourlens-Quaranta)
14:45	Presentation of UMBRELLA project <i>+ Question and answers</i>	ELES (Jan Kostevc)
15:30	Presentation of iTESLA project <i>+ Question and answers</i>	RTE (Gabriel Bareux)
16:15	Presentation of GARPUR project <i>+ Question and answers</i>	STATNETT (Gerard Doorman)
17:00	End of meeting	

3.3 Proceedings

The presentations can be found on the GARPUR website: <http://www.garpur-project.eu/publications>.

A discussion occurred following the GARPUR presentation:

- Most questions were about WP2 and WP3 :
 - When will intermediate results be presented?
 - What is the exact meaning of “criteria”?
 - The definition of indicators would be very useful for the work of regulators and TSOs on network codes.
- Regulators also expressed interest in the GQP which may be very useful to them.
- Also regarding iTESLA and UMBRELLA, regulators are interested in concrete recommendations towards ENTSO-E for amending network codes, not in high-level, “vague” recommendations.

In conclusion for GARPUR, regulators demanded further exchange of views about the reliability criteria and the economic indicators. They asked the possibility to be involved in the discussions before new reliability criteria are finalized. They insisted that the next workshop (more technical) should be held as soon as possible. The next workshop towards regulators should therefore involve WP2 and WP3 partners and be held early 2015.

4 PRESENTATION AT THE PENTALATERAL ENERGY FORUM (PLEF)

This meeting was held at the Benelux Secretariat in Brussels on 23 September 2014, at the occasion of a meeting of the PLEF Support Group 2 “Security of supply”.

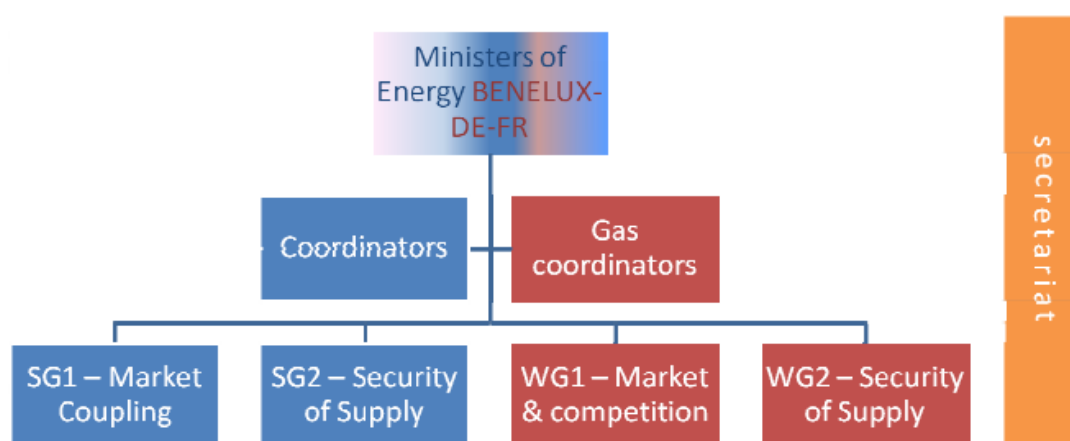
4.1 About the Pentalateral Energy Forum

The Pentalateral Energy Forum (PLEF) is the framework for regional cooperation in Central Western Europe. It was created in 2005 by Energy Ministers from Benelux countries, Austria, Germany and France (with Switzerland as a permanent observer) in order to promote collaboration on cross-border exchange of electricity. It is a temporarily, intergovernmental initiative, which goal is to enhance the cooperation

between all relevant parties in order to create a regional Northwest-European electricity market as an intermediate step towards one common European electricity market,... For electricity, two “support groups” are working on specific topics: Market Coupling (SG1) and Security of Supply (SG2), as depicted in Figure 1.

Participants in PLEF support group meetings are representatives of Energy Ministries, regulators, TSOs, power generators, and when relevant power exchanges. From GARPUR WP10 tasks point of view, participation in PLEF meetings is therefore seen as a contribution to tasks 10.3, 10.4 and 10.10.

Figure 1 - Pentilateral Energy Forum organization chart



Source: Benelux Secretariat

4.2 Participants in the SG2 meeting

The participants registered at the PLEF SG2 meeting on 23 September 2014 are listed in Table 6 below.

Table 6 – Participants registered at the PLEF SG2 meeting on 23 September 2014

Name	Organisation	email
COORDINATORS (Member States representatives)		
Jan HENSMANS	FOD Economie (BE)	jan.hensmans@economie.fgov.be
Pierre BOUTOT	Ministère de l'Écologie (FR)	pierre.boutot@developpement-durable.gouv.fr
Benedikt GÜNTER	Bundesministerium für Wirtschaft & Technologie (DE)	benedikt.guenter@bmwi.bund.de
Steffen JENNER	Bundesministerium für Wirtschaft & Technologie (DE)	steffen.jenner@bmwi.bund.de
Ludwig DUVIGNEAU	Bundesministerium für Wirtschaft & Technologie (DE)	johann.duvigneau@bmwi.bund.de
Nico HEINEMANN	Bundesministerium für Wirtschaft & Technologie (DE)	nico.heinemann@bmwi.bund.de
Gérard MEYER	Ministère de l'Économie (LU)	gerard.meyer@eco.etat.lu
Erik SIEDERS	Ministerie van Economische Zaken (NL)	h.sieders@minez.nl
Wieger WIERSEMA	Ministerie van Economische Zaken (NL)	w.j.wiersema@minez.nl

REGULATORS		
Jakub FIJALKOWSKI	E-Control	jakubatarina.bauer@e-control.at
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Bart DE WAELE	CREG	bart.dewaele@creg.be
Patricia DEBRIGODE	CREG	patricia.debrigode@creg.be
TSOs		
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Eppie PELGRUM	TenneT	eppie.pelgrum@tennet.eu
Nicolas KITTEN	RTE	nicolas.kitten@rte-france.com
Thomas MEISTER	TenneT TSO GmbH	thomas.meister@tennet.eu
Cindy BASTIAENSEN	ELIA	cindy.bastiaensen@elia.be
Vanessa BRUN	RTE	vanessa.brun@rte-france.com
OBSERVERS		
Walter SCHLEGEL	Swiss Federal Office of Energy	walter.schlegel@bfe.admin.ch
Stefan DÖRIG	Mission of Switzerland to the EU	stefan.doerig@eda.admin.ch
Cherry YUEN YEE SHAN	Swissgrid	Cherry.Yuen@swissgrid.ch
Roman HAGEN	Swissgrid	Cherry.Yuen@swissgrid.ch
EUROPEAN COMMISSION		
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MARKET PARTIES PLATFORM		
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Marcel STEINBACH	BDEW	marcel.steinbach@bdew.de
Nicolas KUEN	Electrabel	nicolas.kuen@electrabel.com
GARPUR		
Sophie DOURLENS-QUARANTA	Technofi	sdourlens@symple.eu
CORES0		
Patrick DE LEENER	CORES0	patrick.deleener@coreso.eu
SECRETARIAT		
Frederik DELOOF	BENELUX Secretariat	f.delooof@benelux.int

4.3 Presentation of and discussion about GARPUR

The presentation can be found on the GARPUR website: <http://www.garpur-project.eu/publications>.

Elia and Technofi presented the GARPUR project at the SG2 PLEF meeting on 23 September 2014, in front of about 30 people representing Ministries, Regulators, TSOs and market parties from Belgium, Luxemburg, Netherlands, France, Germany, Switzerland and Austria.

The presentation fit well in this meeting since the UMBRELLA project was also presented, and CORESO did present their views on Regional Security Coordination Initiatives.

Both regulators and ministries representatives expressed interest in participating in future exchanges with GARPUR. They are in particular keen to participate in the design of new reliability criteria.

5 FIRST WORKSHOP WITH DSOS, POWER GENERATORS AND TECHNOLOGY PROVIDERS

This workshop was held in ENTSO-E premises on 7 October 2014, the day before an EDSO Technology Committee meeting.

5.1 Agenda

The workshop was held from 13:30 to 18:00. Not only GARPUR was presented, but representatives of the three categories of targeted stakeholders were invited to present their point of view about reliability management (session 2 of the agenda).

The detailed agenda is presented in Table 6 below.

Table 7 – Agenda of the first workshop with DSOs, power generators and technology providers

Time	Title	Responsible
13:30	<i>Welcome of attendees</i>	
SESSION 1: Insights from the GARPUR project		
13:45	Introduction to GARPUR and objectives of the workshop	Technofi (Sophie Dourlens-Quaranta)
14:00	Vision from TSOs: purpose of the GARPUR project	Statnett (Gerard Doorman)
14:20	Probabilistic reliability management: comparison with the N-1 approach	University of Liège (Louis Wehenkel)
15:00	State of the art in reliability assessment and management	SINTEF Energy Research (Gerd Kjølle)
15:30	<i>Coffee break</i>	
SESSION 2: Vision from impacted electricity stakeholders		
16:00	Reliability management from the DSOs' perspective	ErDF (Jacques Merley)
16:20	Reliability management from the Power Generators' perspective	Statkraft (Paul Giesbertz)
16:40	Reliability management from the Technology Providers' perspective	Alstom Grid (Jean-Louis Coullon)
SESSION 3: Roundtable discussion		
17:00	Probabilistic reliability management: pros and cons from the electricity system players	Technofi (Sophie Dourlens-Quaranta)
18:00	<i>End of meeting</i>	

5.2 Attendees

The workshop was attended by 19 participants, including representatives of the targeted stakeholders (DSOs, Power Generators and Technology Providers) as well as university representatives. The detailed attendance list is presented in Table 8.

Table 8 – Attendance list of the first workshop with DSOs, power generators and technology providers

Company name	Representative	email
ALPHA TECHNOLOGIES	Emmanuel Orban de Xivry	eorban@alphatechnologies.be
ALPHA TECHNOLOGIES	Jean-Philippe Vanhulst	jvanhulst@alphatechnologies.be
Alstom Grid	Jean-Louis Coullon	jean-louis.coullon@alstom.com
ELIA	Arnaud Attanasi	arnaud.attanasi@elia.be
ENTSO-E	Norela Constantinescu	Norela.Constantinescu@entsoe.eu
ERDF	Jacques Merley	jacques.merley@erdf.fr
EC DG Research	Patrick Van Hove	Patrick.van-hove@ec.europa.eu
Netze BW GmbH	Bettina Helbig	b.helbig@netze-bw.de
ORES	David Vangulick	david.vangulick@ores.net
SINTEF ENERGY RESEARCH	Gerd Kjølle	gerd.kjolle@sintef.no
Statkraft	Paul Giesbertz	Paul.Giesbertz@statkraft.com
STATNETT	Gerard Doorman	gerard.doorman@statnett.no
TECHNOFI	Sophie Dourlens-Quaranta	sdourlens@symple.eu
TRACTEBEL	François Promel	francois.promel@gdfsuez.com
TU Delft (representing UMBRELLA project)	Rob Bootsman	r.j.bootsman@student.tudelft.nl
University of Technology - Eindhoven	Raoul Bernardts	R.Bernards@tue.nl
University of Technology - Eindhoven	Michiel Nijhuis	M.Nijhuis@tue.nl
ULG	Louis Wehenkel	louis.wehenkel@ulg.ac.be
ULG	Efthymios Karangelos	e.karangelos@ulg.ac.be

5.3 Proceedings

The presentations can be found on the GARPUR website: <http://www.garpur-project.eu/publications>.

Following ULg presentation

- Question: How would reliability management be modelled, through planning to operation or the other way around?
 - Response: Reliability management decisions will be modelled for the very short term horizon first, and the modelling of mid- and long-term horizons will be derived from that.
- Question: It seems you intend to solve an optimal control problem. How do you address the chain of decisions, the end of the game...?
 - Response: The multi-stage nature of the problem is currently investigated. The difficult part is how to formulate the optimization problem. Simplifications must be made, having in mind the risks of making the wrong simplifications and the risk of missing data. There is no guarantee that new reliability strategies are better than current practices, there is therefore a need for evaluating the new criteria (quantification platform).
- Question: How will you take into account the reactions from the different actors?
 - Response: WP3 works in two steps: in the absence of market response, and with market response. It is indeed difficult to study the dynamics, and TSOs will also adapt their behaviour.

Following SINTEF presentation

- **Question:** TSOs already gather data on primary components: only network or also load and generation?
 - **Response:** Mainly generation
 - **Remark:** The loss of a big consumer (factory) may also create a disturbance.
- **Question:** How to evaluate the criticality of failure of each component? Is there a methodology commonly accepted to evaluate this on a per-component basis?
 - **Response:** Not really.
- **Question:** Have you noticed if the differences between TSOs (in voltage levels, in size) have impacts on the way they address reliability?
 - **Response:** Few.
- **Question:** You received inputs to your questionnaire from 9 TSOs. Are they representative from all TSOs, aren't we missing something important?
 - **Response:** Only 9 but covering both Nordic and continental systems. The TSOs represented at the TSO workshop in April 2014 (about 10 non-GARPUR TSOs) were also questioned during the workshop and their answers were very similar to the ones gathered by the questionnaire.
 - **Remark:** You should try to characterize the TSOs who have responded to the questionnaire (% of EU load...). Experiences outside EU may not be relevant.

Roundtable discussion

About the complexity of GARPUR and the communication towards external stakeholders

- **Remark:** Formulating the problem in a simple way is very challenging.
 - **Response:** GARPUR combines a bottom-up approach (WP4-5-6) and a top-down approach (WP2-3) to deal with this complexity.
- **Question:** How to deal with events whose probabilities are not independent?
 - **Response:** Modelling correlation between variables is challenging and needs more data. For example, there is a correlation between ageing of an equipment and its value to the system.
- **Remark:** The explainability of GARPUR is important. You should find a way to explain N-1 vs. probabilistic approach (costs and benefits) in a few minutes.
 - **Response:** Efforts will be made in that direction, however complexity may be necessary. GARPUR approach can be compared with the "complex" flow-based method which will replace the "simple" ATC method to make the most of existing infrastructures. In addition, it is the role of the GARPUR Quantification Platform to demonstrate the benefits of the proposed approach and make its complexity acceptable.

About data and scenarios

- **Remark:** There are "quick wins" in the field of DSOs-TSOs cooperation, regarding in particular the grid network information from DSOs to TSOs.
 - **Response:** There is also a need for data from generators to DSOs and TSOs.
 - **Remark:** This depends on countries: some have one main DSO, some have hundreds of DSOs... We need a framework for TSOs-DSOs data exchange.
- **Remark:** TSOs are ready to share with other TSOs data on failure statistics.
- **Remark:** A probabilistic approach will require more data than today: Cost to gather data → need to find the right balance between amount and precision); Lots of estimations needed → uncertainties of the input data into complex processes → how to take decisions? Who shall take this risk: DSOs, TSOs?

- **Response:** If there is an issue for regulators (costs borne by TSOs or DSOs), this could be addressed at the next GARPUR workshop with regulators.
- **Remark:** DSOs asset data are not so important to TSOs. What is more important is where generation is located, where it is growing... You should concentrate on the main points since access to data is very expensive (which is exacerbated for very accurate data). You should know beforehand what kind of data we need to explore. For example, smart meters will provide huge amount of data, but not necessarily relevant for TSOs reliability management.
- **Question:** There are different scenarios for the development of the electricity system. Are probabilities associated to each scenario?
 - **Response:** No, but the impacts of new reliability criteria within different scenarios will be tested thanks to the GQP.
- The ErDF representative proposes to organize a meeting between GARPUR and DSOs associations (Eurelectric, EDSO, CEDEC and GEODE) to discuss a possible framework for TSOs-DSOs data exchange related to reliability management.

About the impacts of GARPUR

- **Remark:** Changing reliability criteria will require a learning process from TSOs.
- **Question:** Will GARPUR have impacts on the network codes currently under development?
 - **Response:** No, GARPUR is initiating a process which may lead to amending network codes in a few years (amendments to Network Codes are foreseen by the Regulation). Before that, pilot tests will be performed in the framework of GARPUR. Again, it can be compared with flow-based: this method has been discussed for at least 10 years before being adopted in Network Codes.
- The ALSTOM representative proposes to cooperate with GARPUR regarding the pilot tests.
- **Remark:** You should concentrate on cross-border impacts.

5.4 Responses to evaluation questionnaire

A satisfaction questionnaire was distributed at the end of the workshop to all participants. Six responses were collected.

The average marks and general comments given by respondents are presented in Table 9. Marks fall between 1 (in full disagreement) and 5 (fully agree).

Table 9 – Average marks to quantitative questions of the satisfaction questionnaire and qualitative comments expressed by respondents

#	Questions	Average marks
<i>This meeting has helped you ...</i>		
1	... understanding the overarching goal of the GARPUR project	4.4
2	... understanding the scientific challenges of the GARPUR project	4.4
3	... getting a clear picture of the drivers and barriers for using new reliability standards	4.2
4	... getting an overview on how GARPUR results may impact your own activities	2.9
<i>You consider that ...</i>		
5	... the choice of non-GARPUR speakers was appropriate	4.3
6	... enough time was dedicated to describing the key ambitions and challenges of	4.1

	GARPUR	
7	... the R&D activities foreseen by the consortium are appropriate to meet the presented project ambitions	3.8
8	... there is a need to reconvene periodically in the future to know about the project findings and interact with a representative set of stakeholders acting along the electricity value chain	4.4
<i>Your comments to explain marks between 1 and 3 (if any)</i>		
For communication, it is important to highlight the concrete impact on the challenges that TSO/DSO cope with		
Let's make the description of risks more precise and measurable		
Too early to fully see the impact on DSO scope		
In terms of understanding the scientific challenges, the workshop addressed only scientific topic in a very general way		
Q4: I am very interested in the further research into the probabilistic analysis, but could not yet fully see how it will impact my research		
Q8: Probabilistic analysis may have benefits, but also adds uncertainty and complexity and it should be focused to keep the results clear and practical		
Q4: on own activities the point of view of TSOs on reliability management were more interesting than actual results		
<i>How would you sum up in one sentence the main message of the meeting?</i>		
Huge challenge ahead!		
There is a real need for a probabilistic approach		
Whatever is developed, it will not be straightforward to move to deployment		
Probabilistic reliability management is complex but necessary.		
Will the new approach be a big qualitative and quantitative (€) positive move?		
How to gain acceptance for a more probabilistic operating and infrastructure planning approach, and what drivers could be used for that		
GARPUR: what is it?		
<i>Are there any important issues that you thought worth being discussed and were not addressed during the meeting? Or any topic you would have liked spending more time on?</i>		
The transition from indicators to decision		
What is the long term vision of system? (share of DG...)		
More examples in pictures (picture of a use case)		
Drivers for change and what is required to bridge the gap		
Effects on other stakeholders		
The external stakeholders viewpoint on how they can be affected by the GARPUR outcomes		
<i>What would you suggest to improve the agenda and organization of future workshops with electricity stakeholders?</i>		
Brainstorming mode is interesting. Can be run on more specific questions to help building your overall		

plan.
Maybe a meeting with DSOs: we can try to arrange it
At the beginning you should introduce the attendees
Maybe it could be specified a bit more clearly which part of the research is done and will be presented

6 SECOND WORKSHOP TOWARDS TSOS

This workshop was held in ENTSO-E premises on 2 June 2015, the day before an ENTSO-E RDC meeting.

6.1 Attendees

The workshop was attended by 20 participants, including 3 representatives of Reference Group members (Fingrid, Tennet, CORESO), 3 representatives of other TSOs (REN, Swissgrid, Svenska) and 2 representatives of ENTSO-E secretariat. The detailed attendance list is presented in Table 10.

Table 10 – Attendance list of the second workshop towards TSOs

Name	Company	email
Olli Mäkelä	Aalto	olli.makela@aalto.fi
Marián Belyuš	CEPS	Belyus@ceps.cz
Martin Godemann	CORESO	martin.godemann@coreso.eu
Cindy Bastiaensen	Elia	Cindy.Bastiaensen@elia.be
Thong Vu Van	ENTSO-E	thong.vu.van@entsoe.eu
Robert Schroeder	ENTSO-E	Robert.Schroeder@entsoe.eu
Jussi Matilainen	Fingrid Oyj	Jussi.Matilainen@fingrid.fi
Dirk Van Hertem	KUL	dirk.vanhertem@esat.kuleuven.be
João Moreira	REN	joao.moreira@ren.pt
Rémy Clément	RTE	remy.clement@rte-france.com
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Sonja Monica Berlijn	Statnett	Sonja.Berlijn@statnett.no
Gerard Doorman	Statnett	Gerard.Doorman@statnett.no
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Michael Paulus	Swissgrid	Michael.Paulus@swissgrid.ch
Sophie Dourlens-Quaranta	Technofi	sdourlens@symple.eu
Ana Roxana Ciupuliga	TenneT	Ana.Ciupuliga@tennet.eu
Julia Bellenbaum	UDE	Julia.Bellenbaum@uni-due.de
Louis Wehenkel	ULg	l.wehenkel@ulg.ac.be
Efthymios Karangelos	ULg	e.karangelos@ulg.ac.be

6.2 Agenda

The workshop was held from 13:00 to 17:30. The detailed agenda is presented in Table 11 below.

Table 11 – Agenda of the second workshop towards TSOs

13:00	Presentation of the agenda and of dissemination activities Sophie Dourlens-Quaranta, Technofi
13:05	Presentation of GARPUR Gerard Doorman, Statnett
SESSION 1: GENERAL INTRODUCTION TO THE GARPUR RELIABILITY MANAGEMENT FRAMEWORK	
13:15	Development of new reliability criteria Efthymios Karangelos, ULg
13:30	Socio-economic assessment of reliability criteria Julia Bellenbaum, UDE
	<i>Questions and answers</i>
SESSION 2: CURRENT PRACTICES AMONGST EUROPEAN TSOs, CHALLENGES AND OPPORTUNITIES MOVING FORWARD	
14:00	Functional workflow of the system development decision making process Cindy Bastiaensen, Elia
	<i>Questions and answers</i>
14:25	Functional workflow of mid-term decision making processes Rémy Clément, RTE
	<i>Questions and answers</i>
14:50	Functional workflow of short-term and real-time decision making processes Håkon Kile, Statnett
	<i>Questions and answers</i>
15:15	Coffee break
SESSION 3: PRESENTATION AND DISCUSSION OF RECENT AND UPCOMING PROJECT MILESTONES	
15:50	Functional description of the GARPUR Quantification Platform Dirk Van Hertem, KUL
16:30	Pilot testing ambitions Håkon Kile, Statnett
16:50	Alternative reliability criteria to be studied Louis Wehenkel, ULg
17:30	End of meeting

6.3 Proceedings

The presentations can be found on the GARPUR website: <http://www.garpur-project.eu/publications>.

Following the presentation “Development of new reliability criteria” (Efthymios Karangelos, ULg)

It was discussed how the fact that the probability of certain contingencies varies across time was taken into account in the project. Regarding the events with long duration, they are considered in WP5 (mid-term process).

It was also remarked that the same network contingency may have different criticality level depending on the generation and demand level.

The connection of the reliability model in GARPUR with weather forecasts was questioned.

It was suggested to illustrate the possible outcome of the new reliability criteria, for example regarding the impact on transmission capacity available to the market, or other practical examples.

Following the presentation “Socio-economic assessment of reliability criteria” (Julia Bellenbaum, UDE)

It was questioned whether the proposed socio-economic assessment methodology is compatible with the ENTSO-E cost-benefit analysis (CBA) methodology for the TYNDP and eHighway2050. It was suggested not to develop competitive methodologies. The RealiseGrid project was also mentioned as a reference. It was highlighted that the CBA methodology for the TYNDP was developed for cross-border projects, while in GARPUR we need a global methodology to assess socio-economic impact of reliability management criteria (RMC) not only at cross-border level and not only for the network planning timeframe.

The notion of “TSO surplus” was questioned. It actually represents the difference between revenues and expenses of the TSO; the word surplus is being used for wording harmonization with “consumer surplus” and “generator surplus”. It is remarked that over long period of time, the sum of the “TSO surplus” is expected to be zero.

The fact that TSOs (being natural monopolists) by nature do not behave socio-economic welfare (SEW) maximizing was discussed. This is related to regulatory frameworks. As an example, the N-1 rule is clearly not aimed at maximizing SEW. The optimal regulatory framework provides incentives that align TSO interests with social welfare maximization.

The absence of the congestion rent in the picture was remarked. The depiction presented referred to a single country, single TSO and single market zone, so that congestion rents do not arise. The balance presented was a general and stylized list of costs and benefits. The internal deliverable (ID3.2.1) contains more detailed balances for each time horizon. There, congestion rent is included. Similarly, for multiple market zones or multiple TSOs or multiple markets, congestion rent needs to be taken into account.

Following the presentation “Functional workflow of the system development decision making process” (Cindy Bastiaensen, Elia)

The compatibility of the functional workflow of the system development decision making process as described in D4.1 with the TYNDP CBA methodology was highlighted.

The origin of candidate projects was questioned: do the drivers for these projects include solving reliability issues? It was clarified that this was not the driver, but was taken into account in the design remedies (in case a project does not meet the applied reliability criterion).

It was remarked that the TSOs investment plans are based on the N-1 rule. This is indeed current practice, however the impact of new RMC in the functional workflow has been delimited.

The value of this work for ENTSO-E was highlighted.

Following the presentation “Functional workflow of mid-term decision making processes” (Rémy Clément, RTE)

It was questioned whether situations in which planned outages had to be cancelled due to operational circumstances were considered. They actually are, in WP6 (system operation).

The data issue was particularly highlighted here. For example, data are needed not only during maintenance periods but also out of these periods to assess the components' health for conditional maintenance purposes.

It was remarked that if the health of components was better known, then TSOs would be able to “relax” in some sense the N-1 constraint.

Following the presentation “Functional description of the GARPUR Quantification Platform” (Dirk Van Hertem, KUL)

Considering that simulations would cover one year of operations, it was questioned how this would be applicable to long-term planning. It was clarified that the pilot tests would be focused on short-term aspects only.

In fact, two main applications of the GARPUR Quantification Platform (GQP) will be addressed by the project:

- Pilot testing, probably on French and Belgian systems;
- Extensive sensibility analysis of RMC.

It was remarked that we should not necessarily aim at increasing reliability: maybe a small decrease in reliability may lead to a huge decrease in costs.

To a question about the contingency list considered in the GQP (listing all the N-1 contingencies or only a subset), it was responded that the contingency list is independent from the RMC. The contingency list has however to be limited, e.g. to N-3 events. It was advised not to discard contingencies based only on probability but rather consider also the severity of impact.

Regarding the new RMC it was remarked that many people in TSOs operating rooms are happy with N-1. GARPUR should therefore not make things too complex to be applied. Actually it is the purpose of the GQP to evaluate the benefits of moving away from N-1, which may depend on the different situations in Europe. For example, N-0 can be relevant sometimes. The consequences of moving away from N-1 really need to be explored.

Following the presentation “Pilot testing ambitions” (Håkon Kile, Statnett)

It was questioned whether the GQP could link with iTesla and Umbrella. It was clarified that iTesla and Umbrella aim at delivering toolboxes able to perform detailed calculations, while GARPUR is more at conceptual level. The GQP will be made open, and at a later stage one of its module may be replaced by one of the iTesla or Umbrella tools.

Following the presentation “Alternative reliability criteria to be studied” (Louis Wehenkel, ULg)

It was questioned whether the non-acceptable events were considered. They actually are; for example a black-out at an aluminum melter site or big internet server would not be acceptable, while it could be acceptable in a residential area. The impact of such events on economy, employment etc. should be taken into account in the consumers' utility function.

The need for practical examples about the application of new RMC was again highlighted.

6.4 Responses to evaluation questionnaire

A satisfaction questionnaire was distributed at the end of the workshop to all participants. Six responses were collected.

The average marks and general comments given by respondents are presented in Table 12. Marks fall between 1 (in full disagreement) and 5 (fully agree).

Table 12 – Average marks to quantitative questions of the satisfaction questionnaire and qualitative comments expressed by respondents

#	Questions	Average marks
SESSION 1		
1	Have you understood the main aspects of the new reliability management framework designed by GARPUR?	4.0
2	Do you support measuring the impacts of moving from deterministic to probabilistic reliability management?	4.2
3	Do you agree with the socio-economic assessment of the reliability criteria as designed within GARPUR?	3.7
SESSION 2		
4	Do you agree with how the functional workflow of the system development decision making process is described within GARPUR?	4.3
5	Do you agree with how the functional workflow of the mid-term decision making processes are described within GARPUR?	4.0
6	Do you agree with how the functional workflow of the short-term and real-time decision making processes are described within GARPUR?	3.8
SESSION 3		
7	Have you understood the purpose of the GARPUR Quantification Platform?	4.0
8	Do you consider the GARPUR Quantification Platform a useful tool to assess the performance of different reliability criteria?	3.8
9	Do you support the pilot testing ambitions of GARPUR?	4.2
10	Do you support the way the alternative reliability criteria to be studied have been defined?	4.0
ABOUT THE REFERENCE GROUP OF TSOs		
11	Have you understood the role of the GARPUR Reference Group?	4.0
12	If you are already member of the Reference Group: Would you be interested in being involved more closely in GARPUR activities?	3.0
13	If you are not a Reference Group member (nor a GARPUR partner): Would you be interested in receiving more information about the Reference Group, and possibly joining it?	3.0
GENERAL QUESTIONS		
14	Are you satisfied with the organization of the workshop?	4.2

15	Do you consider that enough time was dedicated to questions and answers?	3.8
16	Do you consider that the R&D activities foreseen by the consortium are appropriate to meet the project ambitions?	4.4
YOUR COMMENTS		
Questions 3 and 10: real implementation not yet clear Question 6: in principle yes, not completely checked for usability Question 11: seems to be a still in definition Question 12: already under discussion Question 16: focus on real implementation in next phase		
Thank you for an interesting workshop. It would be nice to start the meeting earlier next time and provide a choice for the date of the meeting (like a doodle poll).		

ANNEX 1: DETAILED MINUTES FO THE FIRST WORKSHOP TOWARDS TSOS

Following the presentation “Overview and organization of the GARPUR project” (SINTEF)

- **SVENSKA:** New reliability criteria should be presented to ENTSO-E System and Development Committee (SDC).
- **SWISSGRID/SOC:** New reliability criteria should be presented to ENTSO-E System Operation Committee (SOC) and possibly integrated into the Network Code. Risk management is a pivotal concept for GARPUR (which risk should we take, which risk are we ready to accept).
- **REE:** GARPUR is “only” an FP7 project: it does not replace ENTSO-E. GARPUR recommendations should be towards ENTSO-E rather than towards EC or ACER. ENTSO-E is the entity taking decisions regarding reliability management.

Following the presentation “Functional analysis of probabilistic reliability management” (Scientific Advisor)

- **TENNET:** Criticalities are not only service disruptions: for example, decreasing the reliability level implies occupying teams, stressing them...
- **FINGRID:** “mid-term” may be confusing. Does operational planning belongs to mid-term horizon?
 - **Response from Scientific Advisor:** long-term = possible changes in structure; short-term = no changes in structure; mid-term = possible changes like new PSTs...
- **ENERGINET:** What are the connections between reliability evaluation and economic evaluation?
- **TENNET:** N-1 takes into consideration events occurring once every 10 years as well as events occurring once every 10 minutes. GARPUR proposes a smarter way of applying N-1.
- **FINGRID:** What are the connections with other FP7 projects (iTesla, Umbrella, eHighway2050)? Will results of these projects be used by GARPUR to avoid duplication of work?
 - **Response from Scientific Advisor:** Yes, but GARPUR is the only one covering the 3 time horizons.
- **REE:** Will SEI be calculated consistently with the TYNDP?
 - **Response from RU:** yes.

Following the presentation “Current practices for reliability management in complex systems: a review of drivers and barriers for new reliability standards” (AALTO)

- **REE:** Have you reviewed reliability criteria applied outside Europe? Response from Task 2.1 leader: worldwide literature has been reviewed, but the questionnaire was sent only to European TSOs.
- **REE:** It would be interesting to assess the SoS level performed by the TSOs having answered the questionnaire.
- **AMPRION:** Is the questionnaire representative for the planning criteria applied in the whole Europe?
 - **Response from AALTO:** The new criteria will not be based on the questionnaire; the purpose of the questionnaire is to assess where we are at the moment.
- **SVENSKA** asks for the slides presented at the workshop.
- **SWISSGRID/SOC:** If we want to adopt a risk-based approach, we need regulators around the table (example with the Swiss regulator who allocate to the TSO a fixed amount for redispatching purposes).
- **LANDSNET:** Iceland can’t afford N-1. SoS and SEI need to be balanced.
- **STATNETT:** The problem is not the data itself, but the trust in data.
- **ENTSO-E:** From a customer point of view, SoS is needed whatever the reliability criteria are.

- **Response from AALTO:** The N-1 criterion does not guarantee that there are no black-outs.
- **REE:** With N-1 black-outs are limited. Large black-outs in Europe were due to a poor application of N-1.
 - **Response from KUL:** New, probabilistic reliability criteria do not necessarily imply to be less secure than N-1. Evaluating reliability is needed: some customers may be more secure, others less secure, just as today.
 - **Response from Scientific Advisor:** A possible comparison may be the speed limits on the highway: they depend on traffic and weather.
- **ENERGINET** remarks that with N-1 there is no need to quantify the consequences (since they are not accepted). With probabilistic approaches, need to assess consequences.
- **REE** mentions the habits of the staff in real-time operation.
- **STATNETT:** with N-1, it is possible to verify that power flows are correct “by hand”, while with probabilistic approaches it is not possible.

Following the presentation “Shaping the GARPUR quantification platform” (KUL)

- **SVENSKA:** Why focusing first on real-time, while it is the most complicated?
- **AMPRION:** There are many challenges in performing these tests from a system development point of view. It will be very complex to get the complete Europe overview because lots of data will be needed (reference to TYNDP).
 - **Response from KUL:** The whole EU network will not be modelled. Only a few options will be tested. Existing software will be used (iTesla, Umbrella).
- **REE** would like to implement within the GQP their reference case by their own.
 - **Response from SINTEF:** This would be out of the scope of GARPUR.
- **STATNETT:** data standards (CIM) would be useful to GARPUR.
- **AMPRION:** For the high acceptance by the TSOs community, GARPUR should contact SDC and SOC.
 - **Response from ELIA:** Training sessions with the GQP are planned at the end of the project to convince the TSOs community of the performance of the new reliability criteria.
- **AMPRION:** GARPUR will deliver concepts, not operational tools. So what is the purpose of these training sessions?
 - **Response from TECHNOFI:** GARPUR will deliver a prototype tool, with capabilities linked with budget and scope of pilot tests (which may be improved thanks to the Reference Group). After the end of the GARPUR project, the prototype may be further developed and access to non-GARPUR stakeholders may be granted, just as what has been done with the OPTIMATE prototype.
- **REE:** Regulators could ask for a more efficient way to reach reliability requirement but would never accept losing “one gram” of reliability.
 - **Response from KUL:** Thanks to new reliability criteria, Transmission Reliability Margins (TRM) could be reduced with no loss in reliability.
- **SWISSGRID/SOC will ask SOC members to propose some test cases for the GQP.**
 - **Response from STATNETT:** Please don’t limit yourself because of data: only the description of an interesting case would be of interest for the project.

Following the presentation “The role of reference group” (STATNETT)

- **AMPRION:** What is meant by “support role”?

- **Response from STATNETT:** Active participation in workshops, validation that the project goes into the right direction.
- **FINGRID:** What would be the workload of RG members?

ANNEX 2: SATISFACTION QUESTIONNAIRE DISTRIBUTED AT THE FIRST WORKSHOP TOWARDS TSOS



Generally Accepted Reliability Principle with Uncertainty modelling and through probabilistic Risk assessment

First GARPUR workshop towards ENTSO-E members

7 April 2014 - ENTSO-E premises

EVALUATION QUESTIONNAIRE

Participant name: _____ Organization: _____

For all the questions below, please rate with marks between 1 (in full disagreement) and 5 (fully agree).

This meeting has helped you ...	mark
1. ... understanding the overarching goal of the GARPUR project	1 2 3 4 5
2. ... understanding the scientific challenges of the GARPUR project	1 2 3 4 5
3. ... getting a clear picture of the drivers and barriers for using new reliability standards	1 2 3 4 5
4. ... understanding the functioning and the role of the GARPUR Quantification Platform	1 2 3 4 5
5. ... understanding the role of the GARPUR Reference Group	1 2 3 4 5
You consider that ...	
6. ... enough time was dedicated to describing the key ambitions and challenges of GARPUR	1 2 3 4 5
7. ... the R&D activities foreseen by the consortium are appropriate to meet the presented project ambitions	1 2 3 4 5

8. Your comments to explain marks between 1 and 3 (if any):

9. How would you sum up in one sentence the main message of the meeting?

10. Are there any important issues that you thought worth being discussed and were not addressed during the meeting? Or any topic you would have liked spending more time on?

11. What would you suggest to improve the agenda and organization of the next workshops with TSOs?

12. Do you intend to join the GARPUR Reference Group?

Thank you for your participation!

ANNEX 3: ANALYSIS OF RESPONSES TO THE SATISFACTION QUESTIONNAIRE DISTRIBUTED AT THE FIRST WORKSHOP TOWARDS TSOS

Outside TSOs									
	FINGRID J. Matilainen	TERNA A. Illiceto	TENNET G. Aanhaanen	REE V. Gonzalez	REE C. Llanos	HOPS M. Lasic	ELERING A. Mazikas	IMAVIR P. Kovacs	Anonymous
Please rate with marks between 1 (in full disagreement) and 5 (fully agree). This meeting has helped you ...									
1. ... understanding the overarching goal of the GARPUR project	5	5	4	5	5	4	4	5	4
2. ... understanding the scientific challenges of the GARPUR project	3	5	3	3	4	5	4	4	5
3. ... getting a clear picture of the drivers and barriers for using new	4	5	4	4	4	3	5	4	3
4. ... understanding the functioning and the role of the GQP	4	5	4	5	5	3	4	4	4
5. ... understanding the role of the GARPUR Reference Group	4	5	4	5	3	3	4	4	3
You consider that ...									
6. ... enough time was dedicated to describing the key ambitions and	5	5	5	4	5	4	4	4	5
7. ... the R&D activities foreseen by the consortium are appropriate to meet the presented project ambitions	4	4	4	4	4	3	3	4	5
8. Your comments to explain marks between 1 and 3 (if any)				Understanding the scientific challenges requires probably more than one working day for people not daily involved in reliability assessment			Not enough overview about the research capacity - therefore hard to evaluate appropriateness of the activities	TSOs have to find something that is more sophisticated than N-1 criteria in the filed of network planning	It would be a good thing to have the MoU ready for the workshop
9. How would you sum up in one sentence the main message of the meeting?		Informative, focused	Nice challenge to hear different opinions of other TSOS	GARPUR is ready to test conceptually different options for reliability criteria and to provide recommendation for next steps to evolve N-1.	The analysis fo alternatives to N-1 approach is complex and controversial, because of all the impacts and consequences it would have on "Business as Usual" for the electricity sector and for all the society	N-1 must not be always the right rule.	The GARPUR team is very interested in input from TSOS	TSOs have to find something that is more sophisticated than N-1 criteria in the filed of network planning	GARPUR is a european R&D project which involves all TSOS!
10. Are there any important issues that you thought worth being discussed and were not addressed during the meeting? Or any topic you would have liked spending more time on?		No	Each country optimize its own grid, so what about the use of phase-shifter in a probabilistic planning?		Not for this initial workshop, it has provided a very good and complete picture; for future workshops more time and details will be necessary.		Beside providing input information, how can TSOS help the project and what are the benefits of developing and using software like GQP?	Please send material before the workshops!	
11. What would you suggest to improve the agenda and organization of the next workshops with TSOS?		Some practical mean should be used to "force" all participants to the workshops to actively							
12. Do you intend to join the GARPUR Reference Group?	Yes	Yes	No, maybe my colleague Ana Cupuliga -Tennet)	We will see.	We have to check available resources.	Not for now.	Hard to tell, depends on the decision of management.	No	

GARPUR partners											
	ELIA	ESO	ESO	ESO	RTE	CEPS	ENERGINET	LANDSNET	STATNET	AALTO	
	Manuel & Cindy	K. Gerasimov	N. Gamov	R. Dément	M. Belyus	G. Bronno	G. Asmundsson	L. Vormedal	L. Haarla		
Please rate with marks between 1 (in full disagreement) and 5 (fully agree).											
This meeting has helped you ...											
1. ... understanding the overarching goal of the GARPUR project	NA	NA	5	5	5	NA	5	4	5		
2. ... understanding the scientific challenges of the GARPUR project	NA	NA	5	4	5	4	3	4	5		
3. ... getting a clear picture of the drivers and barriers for using new	4	NA	4	4	5	4	4	4	5		
4. ... understanding the functioning and the role of the GQP	4	NA	5	4	5	3	4	4	5		
5. ... understanding the role of the GARPUR Reference Group	1	NA	5	4	5	3	4	4	5		
You consider that ...											
6. ... enough time was dedicated to describing the key ambitions and	5	4	5	5	4	5			4	5	
7. ... the R&D activities foreseen by the consortium are appropriate to meet the presented project ambitions	3	4	5	5	5	NA			4	5	
8. Your comments to explain marks between 1 and 3 (if any)	3: there was a good discussion on this with participation of TSOs not participating in GARPUR										
9. How would you sum up in one sentence the main message of the meeting?	GARPUR will try to improve current reliability criteria, with participation of RD's and TSOs, looking at both technical and economical issues	The TSOs show interest in the project.	GARPUR is going in the right direction	Overview of the project ambitions, and feedback from non consortium TSOs	Very important to disseminate the findings to other TSOs (SOC, MC...) of ENTISO-E	GARPUR will investigate the potential and realism of a probabilistic reliability criterion	Can N-1 be replaced by probabilistic methods?	Challenging R&D project. High risk project.	Inform TSOs of GARPUR and get feedback to some work already done in GARPUR		
10. Are there any important issues that you thought worth being discussed and were not addressed during the meeting? Or any topic you would have liked spending more time on?	Goal of the Reference Group (not at the end of meeting!)	Not at this stage.				What are the shortcomings of the current situation? (that we are going to "repair")	Influence of environmental issues	No			
11. What would you suggest to improve the agenda and organization of the next workshops with TSOs?	Another set-up of meeting room. Present more initial results	In next meetings, discussions on specific methodologies, test cases, and previous experience should start		Different shape of the meeting room	To send the presentations in advance	Interactivity of "drivers and barriers" was good. More of that :-)	Send out presentations before the meeting	TSOs should also present something			
12. Do you intend to join the GARPUR Reference Group?	NA		NA		NA	NA		NA	NA	NA	