

ERGEG
Draft Guidelines of Good Practice for Operational Security
E08-ENM-02-04, 10. April 2008

Regarding chapter	Content	Comment of the German TSO's	Proposal of the German TSO's
General 3.	These Guidelines of Good Practice are intended to provide a basis for an EU-wide regulatory and legally binding framework		More clear.
General 3.2.	“It is therefore of the utmost importance to provide a regulatory and legally binding framework for the technical rules for interoperability and operational security and that is precisely the intention and key objective of these Guidelines of Good Practice.”	The operational security of the electricity grid is only possible, if all market participants work together. Therefore it is important that in an unbundled market the rights and obligations are clear regulated. Under this aspect we can see, that a lot of requirements out of this GPP don't have a clear receiver e.g. TSOs, DSOs, Generators...	Please consider it.
General 3.3.	a. These GGP specify at a “meta-level” which issues and in which way they must be defined and implemented within the technical rules and codes for operational security of the EU transmission grids/synchronous areas; furthermore the Guidelines also address the issues of organisation, compatibility and coherence as far as necessary, but	The problem of this structure is how the technical rules get a legally binding character?	In our opinion the ERGEG should authorise TSO associations to design technical rules and ERGEG approves formally the developed technical rules of the associations to bring them in legally binding character.

	b. These GGP do not deal with any actual and detailed technical issue – this must remain an issue for the rules and codes mentioned already above.		
Rules and Responsibilities			
4.1.1.	The regulatory authorities shall enable, enhance and enforce a secure operation of the electricity grids as well as the cooperation and coordination among the TSOs, DSOs and other stakeholders and market participants through adequate regulatory framework.	More precisely.	More precisely.
4.1.2.	The regulators have to ensure that in emergency situations the TSOs have full power to give dispatching orders to market participants to ensure system operation.	Only the regulator/legislator can guarantee that fact.	Add this point.
4.2.1. The TSOs shall:	(1) coordinate and follow up the actions of market participants and customers in order to achieve adequate operational security and efficient utilisation of the power system;	The TSO haven't the rights to coordinate the market participants.	Delete or Reformulate it.
	(2) prepare and distribute information about power system related matters that have relevance to the electricity market, as well as matters of significance to the general security of supply;	The GPP should define requirements which are necessary for a secure system operation. This requirement has nothing to do with a secure system operation. In our opinion this requirement would regulate the issues of the electricity market.	Delete this requirement.

	(4) inform the regulators about developments in the power system. and the short term balance between supply and demand;	What is the exact meaning of this requirement? To inform the regulator about the short term balance is one step to much. It is TSOs' operational task to keep the frequency at its nominal value resulting in a short term balance which will always be zero.	Delete second part of this requirement.
	(6) have the responsibility to implement appropriate defence and restoration plans and procedures load shedding systems in coordination with other TSOs and;	Load shedding is only one of the elements of the "Defence Plan". TSOs are also responsible for the restoration plans, therefore this point should be formulated more general "defence and restoration plans and procedures".	Reformulate it.
	(7) have full powers to give dispatching orders to market participants to ensure system operation in emergency situations.	Only the legislator can enforce full power to TSO, see 4.1.2	Delete the words and add this point in chapter 4.1.
4.3.	This section refers only to those DSOs which are directly physically connected to the transmission grid, but not to those which are subsequently connected (e.g. as smaller DSOs) to other DSOs and have no direct connection to transmission grid.	This requirement isn't free of discrimination. All DSOs directly connected or subsequently connected must support operational security by their means (such as under frequency load shedding). We propose to add point 4.3.4.	A solution could be to describe the cascade principle, see 4.3.4
4.3.3.	The DSOs shall participate in emergency planning, restoration procedures and exercises planned and carried out by TSOs. In particular, the DSOs shall contribute to operational	This addition is necessary for a secure grid operation.	Please add the last sentence

	security by installing and maintaining load shedding systems, designed in coordination with TSOs. The DSO's shall realize the dispatching orders given by the TSO's to ensure system operation in emergency situations		
4.3.4.	The DSOs which have a direct connection to the TSO grid must ensure that in case they have subsequently connected DSOs the instructions from the TSO are distributed to them.	All DSOs directly connected or subsequently connected must support operational security by their means.	Please add the cascade principle.
4.3.5.	(1) accept and fulfil the grid connection agreement (2) ensure the requested data supply to TSO	These requirements are necessary for a secure grid operation. Without them we have no possibilities to ensure a secure grid operation.	Please add these requirements and make sure that TSOs will legally be entitled to force all market participants to comply with them.
4.4.1	The All generators (inclusive the renewable) shall:	In principle all generator have to fulfil the requirements	More precisely.
4.4.1.	(4) accept and fulfil the grid connection agreement (5) ensure the requested data supply to TSO	These requirements are necessary for a secure grid operation. Without them we have no possibilities to ensure a secure grid operation.	Please add these requirements and make sure that TSOs will legally be entitled to force all market participants to comply with them.
4.6.	Trader / Balance-responsible-parties	A further important group of market participants is missing (the Trader/Balance-responsible-parties)	Please add this group.
4.6.1.	(1) accept and fulfil the balance-group-agreement (2) ensure the requested data supply to TSO	These requirements are necessary for a secure grid operation.	Please add these requirements.

Rules for Synchronous PSO			
5.2.2.	Within a synchronous area, associations of the TSOs (e.g. ENTSO) shall jointly define a drafting procedure, describing the steps from its initiation to rules implementation.	More precise.	Please reformulate it.
5.2.3.	The description of the rules shall leave no room for interpretation. In this respect, compliance criteria shall identify precisely what the TSOs, DSOs, generators and balance-responsible parties have to do or which requirements they should meet to comply with these rules.	TSO aren't the only market participants having the impact on reliability.	Reformulate it.
5.2.4.	Synchronous area rules shall be published in an organised manner. Even if these rules apply to TSOs, they should be understandable by all affected interested parties.	Only for the affected parties the rules must understandable.	Please reformulate it.
5.2.6.	When such an interface involves third countries, EU TSOs shall try to reach an agreement with the TSOs from these countries providing for a high level of operational security. These agreements shall be made public as far as they concern operational security.	These agreements might contain sensible information concerning the security of the grid operation. With respect to protection of critical infrastructure it is not helpful to publish such sensible information.	Delete this sentence.

5.3.2.	<p>The compliance monitoring process shall rely, at least partly, on on-site audits. The audit shall be executed by experts from the TSO and one supervising member from regulatory authorities. independent auditors e.g. representatives from the Commission and regulatory authorities. The appropriate implementation of self assessment methodology should be one of the aspects under review during these audits.</p>	<p>"Compliance monitoring audits" should not be executed entirely by representatives of the EC and regulators, but by TSO organization (the future ENTSO-E) with participation of representatives of EC and regulatory authorities. Such solution will be sufficient for providing transparency of the compliance monitoring process and simplicity and will consider the fact that e.g. some UCTE members are not members of the European Union.</p>	<p>Please reformulate it.</p>
5.3.4.	<p>A comprehensive description of any non-compliance: involved TSO, concerned rule, non-compliance level, remedial measures and mitigation plan, consequences of the non-compliance on operational security;</p>	<p>To publish these sensitive information in the report isn't useful. We could agree to give this information outside of the report to the regulatory authority.</p>	<p>Reformulate it.</p>
5.3.5.	<p>Any TSO which can no longer comply with an operational rule, shall immediately inform any possibly impacted TSOs and the compliance monitoring authority. Remedial measures shall be implemented without any delay to preserve the secure system operation. These measures shall be agreed with the other impacted TSOs. As soon as possible, the affected TSO shall establish a mitigation plan that will</p>	<p>It is important that the TSO organization which monitors the compliance is informed of the compliance problem and of the mitigation plan. This is to constantly have a good overview of the compliance situation in the synchronous system. Furthermore the compliance monitoring organization must agree on the formal correctness of the mitigation</p>	<p>Reformulate it.</p>

	allow the TSO to comply with the violated rule(s). This plan shall be agreed by other impacted TSOs and must be formally agreed upon by the compliance monitoring organisation which sets the rules for mitigation plans.	plan.	
Technical Framework for OS			
6.1.	Security criteria defined at the synchronous area level should be in keeping with the common accepted technological development. are “the lowest common denominator”. Each TSO can define stronger criteria if it is necessary for their particular situation.	While “best practice” may be an inappropriately high standard, the “lowest common denominator” approach might be not sufficient to ensure an adequate level of system reliability. If new measures must be implemented, it has to be ensured that the TSOs get back the money through grid utilisation costs.	Regulators’ role concerning the approval of these additional costs shall be defined.
6.1.1.2.	TSOs at the regional level and at the level of the whole synchronous areas shall define and implement security criteria and contingency analysis (for both the dynamic and probabilistic ones) beyond the own control area border, taking into account the following aspects: (1) all interconnection tie lines between control areas ; (2) cross-effect of contingencies of critical network elements in one control	Sense and reference of the deleted words are not clear. 1-3) more clear and precise	Reformulate it.

	area on the situation in the adjacent control area; (3) Cross-effects of relevant any external impacts (e.g. weather, social events, etc.) own one contingencies/security criteria between the control areas.		
6.1.1.4.	Beyond the static approach, each TSO shall assume the obligation to define the dynamic scenarios and possible adaptations to the contingency lists in advance.	It is not clear what is meant by “dynamic scenarios”. Today that isn’t possible for such a big grid in real time.	Delete this point or reformulate this point, if you mean something else.
6.1.1.5.	Any effects from changes in the security criteria shall be clearly explained by the concerned TSO to the concerned regulatory authorities and communicated towards the affected market participants.	In our opinion clearly means that everyone must understand our explanations. We think only the relevant groups must understand it.	Delete clearly.
6.1.1.7.	The implementation of the defined security criteria shall be completed, at the very least, through the regular steady-state security assessment, run on a periodical basis within the (n-1 or n-X) contingency analysis in each control area.	It is not clear what is meant by “steady state” in this context.	Reformulate it!
6.1.1.9.	The actual outcome of the contingency analysis within the control areas concerning cross-border effects of contingencies shall be exchanged between the affected TSOs.	To exchange every result of the n-1 security calculation isn’t necessary. Only an exchange is necessary if there is a cross-border effect on contingencies.	More clear
6.1.2.4.	At an operational planning stage, each TSO does everything in its power shall	TSOs can’t ensure enough available power plants.	Reformulate it.

	<p>ensure that sufficient levels of auxiliary services (e.g. active and reactive power reserves, balancing service) will be available in real time to meet security criteria and the requirements set at synchronous area level. Cross-border exchange of active power reserves shall be agreed between TSOs.</p>		
6.1.2.5.	<p>Reactive power flows on cross-border lines and voltage at boundary substations shall be jointly studied and agreed at the operational planning stage by the TSOs involved. In principle, reactive power exchanges shall be kept at minimum or zero.</p>	<p>Reactive power exchanges are a normal physical phenomenon that can be only hardly controlled. The right approach is to fix the voltage level at each side and to control them.</p>	<p>Reformulate it.</p>
6.2	<p>Transmission Capacity calculation determination</p>	<p>To get the amount of the transmission capacities is a often just a determination instead of an exact calculation.</p>	<p>Please use this wording in the whole chapter 6.2</p>
6.2.1.	<p>As stipulated in the CM guidelines (annex to Regulation (EC) 1228/2003), capacity calculation determination methods have to be coordinated within defined regions, including the use of a common transmission model dealing efficiently with interdependent physical loop-flows and having regard to discrepancies between physical and commercial flows.</p> <p>Interconnection capacities may not be limited in order to solve congestions</p>	<p>The development of load flow based capacity calculation and allocation methods is accompanied by the fact that all grid devices are taken into account regardless whether it is an interconnection or not.</p> <p>In this context we embrace that this rule softens the requirement from the Regulation (EC) No 1228/2003.</p>	<p>The guideline should state whether TSOs shall be obliged to create virtual cross border capacity by costly measures (e. g. Redispatch). Regulators shall be obliged to approve related costs.</p>

	inside national grids without taking into account cost-effectiveness and the minimisation of the impact on the Internal Electricity Market.		
6.2.2.	Methodology for Transmission Capacity calculation determination	See general comment 6.2	Please reformulate it.
6.2.2.1.	TSOs must carry out all necessary studies for transmission capacity calculation determination and provide the resulting information on transmission capacity available for commercial purposes to the market players that intend to import or export electricity.	See general comment 6.2	Please reformulate it.
6.2.2.2.	In transmission capacity calculation determination , the TSOs shall apply the security criteria defined in 65.1 .	It seems that the reference is incorrect.	Please clarify it.
6.2.2.4.	As stated in article 5(2) of Regulation (EC) 1228/2003, the general scheme for the calculation determination of the total interconnection capacity and necessary margins based upon the electrical and physical features of the network shall be published and subject to the approval of the regulatory authorities.		Please reformulate it. Reformulate it.
6.2.2.5.	This calculation determination method shall also be agreed among involved TSOs.		
6.2.2.6.	TSOs shall perform a calculation determination of both long-term (including the following year and the following months) and short-term		

	transmission capacities (in particular for each hour of the following day and preferably also for the following week).		
6.2.2.7.	For long term capacity calculation determination , transmission capacity shall be based on the definition of forecasted worst-case scenarios. The calculation determination methodology shall include the determination of base case(s) taking into account different generation (including different hydro and wind regimes), load and network topology scenarios and, if necessary, assumptions on loop flows generated by countries external to the region.		
6.2.2.8.	For short term capacity, the calculation determination of the technical transmission capacity shall include the determination of a base case indicating the level(s) of pre-existing flows taken as the starting point for the calculation determination process.		
6.2.2.9.	Those principles shall be approved by regulatory authorities as part of the general scheme (paragraph 5.2.2.4).	This paragraph doesn't exist!	Proof it.
6.2.2.10.	The security criteria applied for transmission capacity calculation determination shall be clearly defined and approved by regulatory authorities as part of the general scheme (paragraph 5.2.2.4). Their coordinated and coherent implementation throughout the affected	1) This reference does not exist. 2) Such a standardisation is difficult because the security levels and the frameworks are different.	1) Proof it. 2) Reformulate it.

	synchronous areas and the integrated electricity market shall be guaranteed by the TSOs through the compliance monitoring process and regularly evaluated by regulatory authorities.		
6.2.2.11.	For the different time frames; TSOs must exchange all necessary information to calculate determine transmission capacity in a co-ordinated and co-operative manner. In particular, each TSO shall use a common network model for calculation determination.		Please reformulate it.
6.2.2.12.	The principles for calculation determination in the transmission capacity available to the market shall be agreed by the affected TSOs of the interconnected systems and principles for agreement must be published.	In the near future we will not calculate the NTC values any more but we will use the flow based capacity allocation method. Thus we must agree on the principles for calculation.	Please reformulate it.
6.2.3.1.	(2) The relevant base cases and hypothesis, with assumptions made for generation, load, DC interconnections and loop flows, including the flows of electricity through each interconnection, bottleneck or critical branch pre-existing to the allocation process, for the different time frames;	With this requirement we would have to publish sensible data of our critical infrastructure which could be used by terrorists.	Delete this requirement.
6.2.3.1	(3) Maximum physical capacity and adopted reliability margin, duly justified, per all interconnections between adjacent TSOs, in specific	The proposed text is inaccurate when speaking about interconnections. It should be clearly stated that this term does not	Reformulate it

	<p>cases also per bottleneck or critical branch, for the different time frames.</p>	<p>mean single tie lines, but the totality of tie lines connecting the neighboring TSOs. This is because a misinterpretation would mean that the reliability margin should be calculated and published per single line – a method that is not only impractical, but also impossible in case of complex interconnections encompassing high number of tie lines which can be operated on different voltage levels.</p>	
6.2.4.1.	<p>The methods for capacity calculation determination covering all time frames to be applied during one considered period (by default the following year) should be submitted for approval to the regulatory authorities not later than 6 months before the beginning of this period (only if methods change).</p>	<p>This seems to be a national standard. There are no rules and timeframe for proceedings in case the regulator does not accept the methods.</p>	<p>Make regulators' obligations clear.</p>
6.3.1.	<p>Moreover, a high degree of coherence and co-ordination is necessary inside of a synchronous areas and limited coordination inbetween synchronous areas.</p>	<p>We think a high degree of coordination between synchronous areas isn't necessary.</p>	<p>Please reformulate it.</p>
6.3.2.1.	<p>Outage scheduling for the purpose of maintenance of network elements generators and significant consumption units shall be agreed among involved TSOs. In this respect, all scheduled outages that influence two or more TSOs shall be considered.</p>	<p>In an unbundled market TSOs can't determine maintenance schedules of other market participants unless the regulator authorise the TSO for it (e.g. TSO have to permit a generators maintenance application).</p>	<p>To be deleted.</p>

	TSOs shall establish a joint scheduling process providing for long-term and short-term planning of outages. This process shall be settled at the level of synchronous areas and agreed between the areas accordingly.		
6.3.2.2.	(4) Possible preventive and (in case of failures or unplanned disturbances) remedial measures based on the detected congestions of an analysis of probable/expected problem scenarios. These “scenario-based” analyses shall be based on operational experiences and especially on lessons learned from large disturbances that have occurred in the past.	Delete this requirement, because it isn't necessary. An outage of an element will be only realised, if the grid is N-1 secure after the switching operation.	Reformulate it.
6.3.2.6.	The coordinated maintenance and revision plan for the market relevant elements shall be presented to the regulators for information and published for market participants.	The maintenance plan is changed by small maintenances every day. It makes no sense to publish this and send it to the regulator, if it is not market relevant.	Reformulate it.
6.3.3.1.	TSOs must inform and coordinate any commissioning and entering into operation of any network element, generator or significant consumption unit in their grid.	There is confusion in the meaning of “inform and coordinate”. TSOs do not have the right to coordinate the commissioning of generators and significant consumption units.	Reformulate this requirement.

6.3.4.4.	TSOs shall exchange all the necessary data and information required in order to accomplish the tasks mentioned in 5.3.4.1 and 5.3.4.2. In this respect, TSOs shall in particular agree on data format, protocols, communication infrastructure and media.	These references seem not correct.	Proof it.
6.4.2.1.	TSOs shall regularly perform (within a determined and mutually agreed time period): (1) Data collection and storage State estimation, filtering out all the faulty/wrong measurements; (2) Load flow calculation; (3) Static and dynamic stability analysis; (4) Reactive power and voltage analysis in order to be able to identify conditions for undertaking measures to prevent voltage collapse.	<ol style="list-style-type: none"> 1. What is the frequency (how often? for “storage State estimation”?) 2. Dynamic stability analysis is very complex. We can’t calculate it in a regular short time frame. In networks with no obvious critical stability problems dynamic studies are only performed on special occasion. 	<ol style="list-style-type: none"> 1. Please clarify it. 2. Delete it.
6.4.2.3.	The operational/on-line information on the actual outcome of the contingency analysis within the control areas shall be exchanged between the TSOs if affected. Furthermore, TSOs shall cooperate whenever it is required to accomplish the tasks requested by 5.4.2.1.	<ol style="list-style-type: none"> 1. Only an exchange between TSOs is necessary if the other TSO is affected. 2. The requirement 5.4.2.1. doesn’t exist. 	<ol style="list-style-type: none"> 1. Reformulate it. 2. Proof it.
6.4.2.4.	1) Each TSOs shall establish a system for observing monitoring and control of	A common control system isn’t possible because each TSO controls its grid itself.	Reformulate it.

	<p>systems associated with the decision support systems for increased efficiency in disturbance prevention and system defence in cases of disturbed or critical system conditions.</p> <p>2) TSOs shall establish a common observing system a system for monitoring and control of systems associated with the decision support systems for increased efficiency in disturbance prevention and system defence in cases of disturbed or critical system conditions.</p> <p>3) Such a system should shall enable the functions of wide area monitoring and control as well as a range of preventive/remedy measures to be executed in real time.</p>	<p>It is possible that each TSO observes other systems (1) or that the TSOs have a common observing system (2).</p> <p>3) What is mean with “wide area monitoring”? It is the WAM-System which is used to observe wide area oscillations or it is a system to observe parts of neighbouring grids?</p>	
<p>6.4.2.5.</p>	<p>If a violation of a security criterion is detected, the TSO concerned shall prepare and possibly activate appropriate measures. All the other TSOs concerned shall be informed without delay. Any joint measure shall be agreed in advance.</p>	<p>Only most probable measures can be agreed in advance.</p>	<p>Delete last sentence.</p>
<p>6.4.2.6.</p>	<p>(2) Provisions for the load-frequency control shall contain the directions and main principles for the market based procurement of balancing and automatically activated reserves,</p>	<p>What is the different between “automatically activated reserves” and “balancing products” ?</p>	<p>Please reformulate it.</p>

	<p>applicable for all TSOs; (3) Provisions for load-frequency control shall also consider the procurement of reserve/balancing products in an integrated balancing market with more than one control area participating.</p>		
6.5.2.4.	<p>In the case of disturbances, the TSO shall execute the remedial actions to restore the system to the normal operating state without delay. Remedial actions are dependent on the nature of the disturbance and they shall accordingly be used to restore the state of the system to normal as efficiently as possible within a predefined time frame. Procedures for remedial actions shall be defined by TSOs.</p>	<p>To define in advance every possible remedial action isn't possible. Furthermore every disturbance has other conditions. To solve a disturbance problem in a predefined timeframe isn't possible.</p>	<p>Delete the last part.</p>
6.5.2.6.	<p>Automatic load shedding systems design shall be harmonised and coordinated across synchronous areas. In this respect, the DSOs involved shall cooperate with TSOs. Responsibilities regarding load shedding system installation and maintenance shall be clearly defined in each control area. The realization shall be in a non discrimination manner. The efficiency of load shedding systems shall be regularly evaluated.</p>	<p>Does it mean real tests? This isn't possible. It must be clear that all DSOs (directly connected or subsequently connected) have to implemented load shedding systems) see 4.3.</p>	<p>Add this point and precise it.</p>

6.5.3.3.	Restoration plans must be coordinated among TSOs to allow the organised restoration of the whole synchronous area. and shall be evaluated by regulatory authorities.	The last point isn't necessary. Today no regulator does it.	Delete the last sentence.
6.5.3.4.	TSOs shall do everything in their power to maintain sufficient black start and islanding capability within their control area to ensure the efficient and fast restoration after power system blackouts. The black start capability shall be designed to be reliable and to have real possibilities to generate voltage and power for the collapsed network or to the islanded part of the network. to reenergized the grid.	1) The TSO can't control where such generators will be build. What happens, if in an area are not enough black start units? Can the TSO build on itself? Or can it control this only over the prices for this service? 2) more clear.	Please clarify it.
6.5.3.5.	To this end, the restoration plans are to be maintained by TSOs and their personnel trained to manage these exceptional incidents. TSOs shall test these restoration plans regularly and shall make adjustments to these plans where appropriate. The process for this shall be described transparently and communicated to all involved parties by TSOs.	A real-time test is not possible. Synthetic testing may not reveal valuable results.	A precise description of the envisaged test procedure is needed.
6.5.3.6.	The restoration, after a blackout, of the affected part of the system shall be executed as soon as possible. In the aftermath of the event, TSOs shall be able to determine the status of their network, particularly the presence of	1. If all neighbouring TSOs have e.g. a blackout too, every TSO will apply the restoration itself. In this case coordination isn't necessary. Only if a TSO	1. Add the last part. 2. The passage shall be deleted.

	<p>any faulty grid element. This status shall be used as an essential input to properly implement the restoration plan. The application of restoration plan shall be coordinated among involved TSO if the help of neighbouring TSO is possible.</p>	<p>gets help from a neighbouring TSO.</p> <p>2. There are no means to determine all faulty grid elements remote controlled (e. g. damaged lines will not be visible in any control center)</p>	
6.6.2.5.	<p>TSOs having interconnections to other synchronous systems shall ensure that operation of these interconnectors is compatible with interconnectors within a synchronous system and thus the secure system operation between synchronous areas is ensured. Effects of disturbances are not allowed to spread from one synchronous system to another. Only disconnection of the interconnector joining the systems is allowed.</p>	<p>With a DC-Link it is possible to help with a coordinate power flow without a spreading of the disturbance. Only to allow the disconnection of the DC-Link is too narrow.</p>	<p>Delete the last sentence.</p>
Technical Framework for OS			
7.1.		<p>What is the meaning of IEM?</p>	<p>Clarify it.</p>
7.2.5.	<p>The renewal of the certification shall be based on the dispatcher's participation in a continuous training programme and the assessment of the dispatcher's performance in the control room.</p>	<p>This is a contradiction to 7.2.3. There is regulated, that the TSO is authorised to regulate the process of certification.</p>	<p>Delete it.</p>

Glossary			
8.	Alert (disturbed) state, critical state	Inside the definition some definitions are double. Furthermore these definitions are based on the current OH Policy 5 definitions which are being reviewed now.	Reformulate it.