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608540

Project acronym:
GARPUR

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

Collaborative project

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Public introduction to D2.1 Functional analysis of reliability management

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Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	X
CO	Confidential , only for members of the consortium (including the Commission Services)	

Abstract

The objective of this report is to present the results of GARPUR Task 2.1, where the goal was to develop a functional description of a probabilistic reliability management framework for transmission system operators. The GARPUR project aims at developing new reliability criteria for the pan-European electric power system and evaluating their practical use while maximizing social welfare.

When performing reliability management, a TSO has to define alternatives for actions for maintaining reliability. In the framework, a TSO has to select between possible actions or to decide not to take any action. Such alternatives create a set of candidate decisions. The purpose of the framework is to enable quantifying the effects of the candidate decision on the reliability and socio-economic costs, compare relevant indicators against any applicable limits, and finally select the best decision.

A *reliability criterion* imposes a basis to determine if the reliability level of the transmission system is acceptable. In the context of this framework, a set of reliability and socio-economic indicators are used to evaluate the reliability and the corresponding socio-economic costs associated with candidate decisions.

The framework consists of three basic tasks: a modelling task, a reliability and socio-economic assessment task, and a reliability control task. The modelling task provides all the data and mathematical models that are relevant to reliability management. These data and models are used by the reliability and socio-economic assessment task in a quantitative simulation to assess the reliability and socio-economic costs of the system as a result of each candidate decision. Finally, the reliability control task ranks the candidate decisions with respect to the socio-economic costs and processes the outcome of the assessment task by looking at the results for all decisions together. As a result, the framework has identified, among the considered candidate decisions, a decision that leads to socio-economic optimum and fulfils all the reliability and economic requirements.

The framework is applicable to the different time horizons the TSO uses, namely real-time operation and operation planning, mid-term planning and asset management, and long-term system development. Even though the framework is for a transmission system where a single transmission system operator is responsible for the system development and operation, it is applicable also for multi-area power systems since the adjacent systems are modelled in the framework too.

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