Institut pour la Maîtrise des Risques
Sûreté de Fonctionnement - Management - Cindyniques

L'IMdR (association Loi 1901) est une société savante visant à améliorer les connaissances dans le domaine de la gestion des risques

EDF lab

Results of the electrical system dependability benchmark launched by EDF in 2017: demonstration of tools and models

EDF lab, Paris – Saclay
June 14th, 2019
09:00 - 16:45

Online registration : www.imdr.eu

EDF lab, Paris - Saclay : 7 blvd Gaspard Monge, 91120 Palaiseau

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In 2017, EDF launched a benchmark designed to compare advanced modeling and calculation tools for the dependability analysis of dynamic systems, that is to say, impossible to represent with static models such as fault trees or Bayesian networks. This benchmark included several use cases, but only two of them were solved with a significant variety of tools. Of these, only one is representative of a real industrial system: the 6.6kV emergency power supply of a nuclear power plant. This example concentrates the great majority of the difficulties that one can encounter in a study of the reliability and availability of a repairable system: reconfigurations with cascades of probabilistic instantaneous transitions, high redundancy level, common cause failures, large differences between the lowest and highest transition rates, multidirectional interactions (due to the propagation of short circuits), looped interactions, existence of deterministic delays due to battery depletion. A precise definition of this test case including reliability data (fake, for confidentiality reasons), as well as a first BDMP modelling are given in the article available here, published at the MARS 2017 workshop (http://mars-workshop.org/mars2017).

On June 14th you will have the opportunity to judge for yourself the advantages, disadvantages and limitations of no less than eight different approaches applied to the case of the 6.6kV system. The tools and models used will be demonstrated and the results obtained can be compared. It will be an international day, with contributions from foreign universities, so it will be in English.

PROGRAM

9h00	***Welcome coffee***
9h30	**Welcome, benchmark history and definition**
10h00	**Solution by KB3-BDMP and Figseq (A*) or YAMS (M*) - *Marc Bouissou (EDF)***
10h45	***Coffee break***
11h15	**Solution 1 by Pycatshoo (M) in textual mode - *Keoni Sanny & Claudia Picoco (Ohio State Univ.), Valentin Rychkov (EDF)***
12h00	**Solution 2 by Pycatshoo (M) with GUI - *Jean-Christophe Houdebine (Aristè)***
12h30	**Partial solution (non repairable version) by STORM (A) - Shahid Khan & Pieter-Joost Katoen (Aachen Univ.)**
13h00	***Lunch***
14h00	**Solution by SimfiaNeo (M) - *Xavier de Bossoreille & Mathilde Machin (APSYS-AIRBUS)***
14h45	**SMT-based safety analysis of redundant power networks (A)" - *Marco Bozzano, Alessandro Cimatti, Mirko Sessa (Fondazione Bruno Kessler), Sergio Mover (Ecole Polytechnique)***
15h30	***Coffee break***
15h45	**Solution by KB3-K6 and Figseq or YAMS - *Anthony Legendre (EDF)***
16h15	**Solution by RiskSpectrum I&AB (A) - *Marc Bouissou (EDF), Pavel Krcal (Lloyd's Register)***

*A : analytical
*M : Monte Carlo simulation

PRICE : 110€ incl tax

The price includes the study day, the morning reception, coffee breaks, lunch and documents.

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