COUNTRY : SERBIA
REGISTRATION NUMBER : 7054

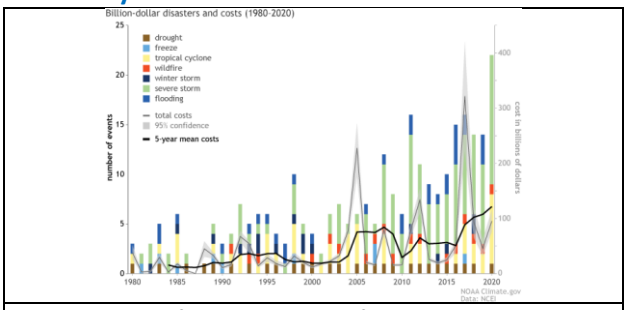
GROUP REF. : C2
PREF. SUBJECT : PS1
QUESTION N° : 1.1

Resilience Enhancement Applications in Operational Planning and Control for the TSO of Serbia

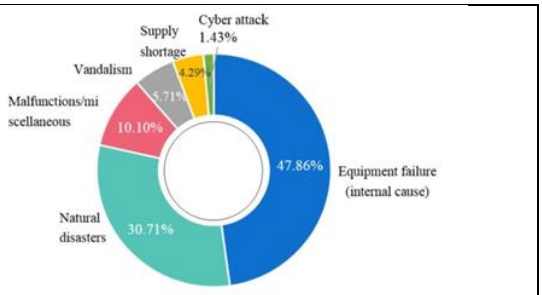
Ninel Čukalevski

All the details are given in the paper 10985_2022

Power System Threats and Hazards

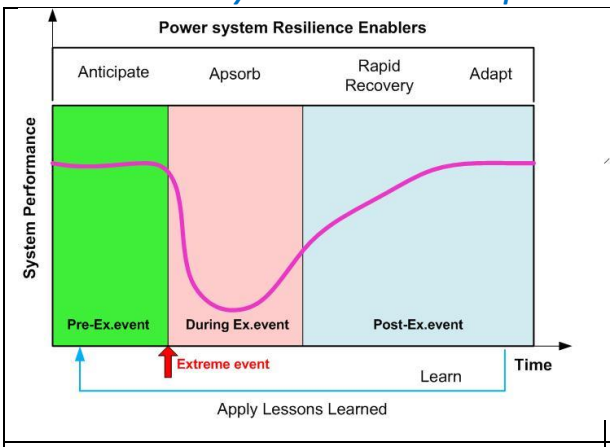


Number of BUSD disasters from 1980-2020

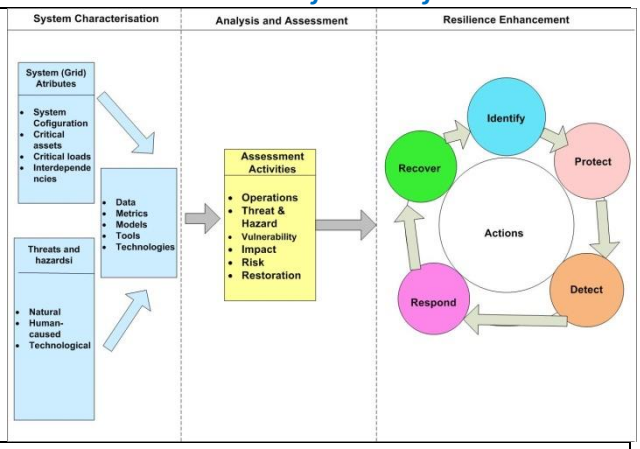


Share of different causes of supply loss

Power system resilience concepts and The Resilience Framework for TSO of SERBIA



Mapping of resilience attributes to extreme event related periods



The basic structure of the methodological framework for system resilience proposed for EMS JSC

Resilience enhancement after May 2014 flood and December 2014 Extreme weather conditions

Structural resilience enhancement: Develop. a flood protection plan; Building of a protective bank around the SS; Sec. equip. within the SS has been mounted above ground level; Mechanically stronger lines in the affected area; Purchase more mobile towers	**Operational resilience enhancement** apps: DLR, PMU/WAMS, Lightning detect.+ location system, BU_NCC, HPP black-start cap

Regarding the SC C2 Q1.1- There is a large set of tools and platforms made available to control room operators each one bringing their own benefits**. Is there a limit on tools per control room operator?** Answer:

Always, in any practical situation, there is a limit, known or not, on the number of tools. This is due to the constrained information processing capabilities of human operators (sensor limits, cognitive limits, etc.). But those human operator limits are flexible (to the point) and can be relaxed, through:

- Continuous education and training of operators, best done with an advanced, new generation OTS
- Information integration with the ''main'' control system (SCADA/EMS)
- Automatizing some of the functions
- Increased level of decentralized-coordinated control (smart field)
- Current ICT developments can support these solution paths