

1.15. SOFTWARE COMPLEX FOR AUTOMATING THE CALCULATIONS OF TRANSIENT MODES OF COMPLEX POWER SYSTEMS

The software complex is designed to perform calculations of a dynamic stability of complex power systems and formation of the reports in automatic mode.

The complex is developed on the basis of DigSILENT PowerFactory software and Python programming language. In order to perform stability calculations, a base of regulatory disturbances was created that covers the most severe emergency outages: close single-phase short-circuit to the ground with a breaker failure and an action of a circuit breaker failure protection (CBFP) and close two-phase short-circuit to the ground followed by unsuccessful high-speed automatic reclosing (HSAR).

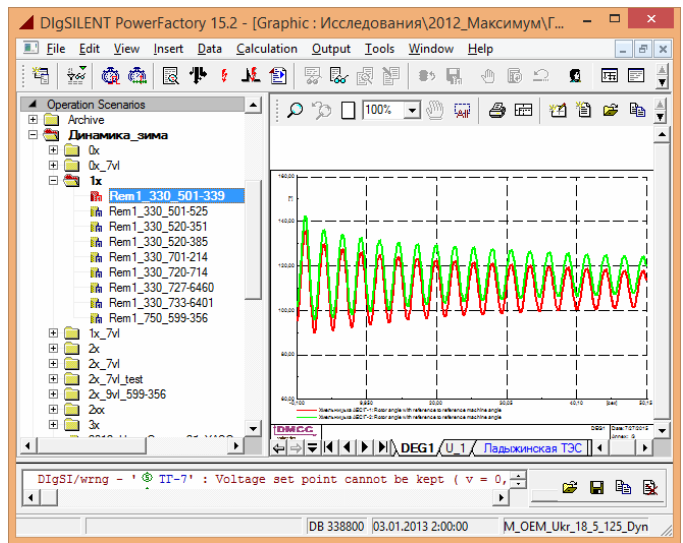
A short-circuit shunt is selected automatically from a database of shunt values in accordance with a specific repair scheme and regulatory disturbance.

Based on the calculation results, a report is generated in Microsoft Excel, which includes the following information:

- name of the repair scheme;
- busbar section, where a short-circuit occurs;
- object that is turned off as a result of short-circuit elimination;
- description of the regulatory disturbance;
- time of short-circuit elimination;
- residual voltage and calculation result.

The format of generated reports can be easily modified and changed.

The use of the developed software complex will significantly speed up a calculation process of dynamic stability and perform the calculations at the stage of a short-term mode planning.



Main dialog window of software complex

Режим	СШ	Объект	Описание	Общее время	Остат. напряж., о.е.	Переток по сечен., МВт	Динам. устойчив.
Ремонт ВЛ 330 кВ Трихаты-КрТЭС и ВЛ 330 кВ Трихаты-Николаев	330 кВ ЧАЭС	ВЛ 330 кВ ЧАЭС-Мозырь	Близкое двухфазное КЗ на землю с последующим неуспешным БАПВ	0,16	0,24	4377,36	Сохран
Ремонт ВЛ 330 кВ Трихаты-КрТЭС и ВЛ 330 кВ Трихаты-Николаев	330 кВ ЧАЭС	ВЛ 330 кВ ЧАЭС-Славутыч	Близкое двухфазное КЗ на землю с последующим неуспешным БАПВ	0,16	0,24	4377,36	Сохран
Ремонт ВЛ 330 кВ Трихаты-КрТЭС и ВЛ 330 кВ Трихаты-Николаев	330 кВ Чернигов	ВЛ 330 кВ Чернигов-Гомель	Близкое двухфазное КЗ на землю с последующим неуспешным БАПВ	0,16	0,38	4377,36	Сохран
Ремонт ВЛ 330 кВ Трихаты-КрТЭС и ВЛ 330 кВ Трихаты-Николаев	330 кВ Чернигов	ВЛ 330 кВ Чернигов-Гомель	Близкое двухфазное КЗ на землю с последующим неуспешным БАПВ	0,16	0,38	4377,36	Сохран

Report of dynamic stability calculation in Microsoft Excel created by the software complex in automatic mode