Table of contents

1 Communication limits and isolated-network operation 8

1.1 INTRODUCTION 8

1.2 Island operation 8

1.3 Communication 10

1.4 CONCLUSION 11

2 Possible steady-state voltage stability analyses of electric power systems 12

2.1 INTRODUCTION 12

2.2 Analytical solution using the theory of load flow analysis 13

2.2.1 Theoretical background to the nose (voltage-power, V-P) curve 13

2.2.2 Analyzed problem I. (3-bus power system) 15

2.3 Continuation load flow analysis 18

2.4 Initial Continuation load flow studies 19

2.5 CONCLUSIONS 22

3 New trends of nuclear waste storages 23

3.1 INTRODUCTION 23

3.2 Radioactive waste 23

3.2.1 Rise radioactive waste 23

3.2.2 Processing radioactive waste 24

3.2.3 Capacity savings of storage space 24

3.2.4 Effect of composition of the waste, while using a method with high-pressure 25

3.3 CONCLUSIONS 27

4 Short circuit capability of generator circuit breaker 28

4.1 INTRODUCTION 28

4.2 Short circuit rating of a gcb 28

4.2.1 Background of short-circuit current rating 29

4.2.2 Generator-source fault 30

4.3 CONCLUSIONS 31

5 Influence between a construction of a light fitting and a utility factor 33
5.1 INTRODUCTION 33
5.2 Definition of the utility factor 33
5.2.1 Calculation results 33
5.3 Researching and calculations 34
5.3.1 Results 35
5.4 CONCLUSIONS 36
6 Readiness of an electric network for the oncoming of the smart technology ... 37
6.1 INTRODUCTION 37
6.2 Smart technology 37
6.2.1 Smart meters 37
6.2.2 Smart lines 38
6.2.3 Security 39
6.3 CONCLUSIONS 39
7 Electromagnetic noise of hV equipment 40
7.1 INTRODUCTION 40
7.2 Sources of interference 40
7.2.1 Corona 40
7.2.2 Sparks the imperfect or interrupted connections 42
7.3 Practical ways to reduce the noise of HF 42
7.3.1 Corona on conductors 42
7.3.2 Corona on metal armatures and insulators 43
7.3.3 Capacitive discharge (spark) 43
8 Configuration of thin-film photovoltaic cells 44
8.1 INTRODUCTION 44
8.2 Solar energy and possibilities its utilization 45
8.2.1 Solar Energy as Renewable Energy Source 45
8.2.2 Photovoltaic Effect and Photovoltaic Cells 45
8.3 Thin-film photovoltaic cells 45
8.3.1 Briefly Introduction to Thin-Film Photovoltaic 45

8.3.2 Configuration of Thin-Film Photovoltaic Cells 46
8.3.3 Superstrate Configuration 47
8.3.4 Substrate Configuration 50
8.4 CONCLUSIONS 51
9 Model of Wind Power Plant With Asynchronous Generator In Simulink Platform 52
9.1 Mathematical Modelling Procedure 52
9.2 Models of Basic Parts of Wind Power Plant 53
9.2.1 Model of Wind Turbine 53
9.2.2 Model of Drive Train 54
9.2.3 Model of Asynchronous Generator 55
9.2.4 Model of Aerodynamic Control 57
9.3 Model of Wind Power Plant 58
9.4 CONCLUSIONS 60
10 Biomass as a source and as a perspective of the renewable energetics in the world, Europe and in the Czech Republic 61
10.1 INTRODUCTION 61
10.2 Sources of the biomass 61
10.3 Energy from the biomass as a renewable resource of the energy 62
10.4 Biomass in European Union (EU) 62
10.5 Biomass in Czech Republic 63
11 Power Quality and Quality of Supply 64
11.1 INTRODUCTION 64
11.2 Definition of Power Quality 66
11.3 Voltage characteristics (EN 50160) 70
11.3.1 Power quality monitoring 71
11.4 CONCLUSIONS 72
12 Entwicklung der Ausnutzung von Biomasse in Pilsen 73
12.1 EINLEITUNG 73

12.2 Die grüne Zukunft und die Entwicklung der AUSNUTZUNG von Biomasse in Pilsen 73
12.2.1 Die Parameter 73
12.3 ZUM ABSCHLUSS 75
13 Gliding Discharges in Rotary Machine Insulation – Diagnostics, Simulation and Measurement 76
13.1 INTRODUCTION 76
13.2 Experiment 77
13.3 Partial Discharges Measurement 84
13.4 CONCLUSION 84
14 LIST OF LITERATURE 86
15 LIST OF AUTHORS 92
16 REGISTER 94