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# Contents

	Page
Acknowledgement	i
Contents	ii
List of table	iv
List of figures	v
Abstract	vi
□□□□□	vii
<b>Chapter one</b>	<b>introduction</b>
1.1	Introduction . . . 1
<b>Chapter two</b>	<b>stability and power control</b>
2.1	Steady state characteristic 4
2.2	Power factor control 4
2.3	Power angle characteristic 6
2.4	Swing equation 8
2.5	Small disturbances 10
2.6	Equal area criteria 10
<b>Chapter three</b>	<b>Power system control</b>
3.1	Introduction 11
3.2	Generator voltage control 11
3.3	Mathematical description of synchronous machine 12
3.4	Active power and frequency control 15
3.5	Reactive power and voltage control 15
3.6	Generator model 16
3.6.1	Prime mover model 18
3.6.2	Load model 18
3.7	Modeling of generator control system . 20
3.7.1	Governor model 20
3.7.2	Automatic voltage regulator model 21
3.8	Types of excitation system 22
3.8.1	Brushless excitation system 22
3.8.2	Static excitation system 22
3.9	Automatic voltage regulator 23
3.10	AVR modeling 23
3.10.1	Modeling of excitation system 24

3.10.2	Amplifier model.	24
3.10.3	Exciter model	25
3.10.4	Generator model	26
3.10.5	Sensor model	27
3.11	Automatic voltage regulator and firing circuit	28
	<b>Chapter four</b>	<b>Controllers</b>
4.1	Introduction	31
4.2	Control Action	31
4.2.1	Two position or on off control action	31
4.2.2	Proportional control action.	31
4.2.3	Integral control action	32
4.2.4	Derivative control action	32
4.2.5	Proportional -plus-integral control action	33
4.2.6	Proportional -plus- derivative control action	33
4.2.7	Proportional -plus-integral-plus-derivative action	34
4.3	PID Implementation	35
4.4	Simulation of the AVR with PI	37
4.4.1	Root locus	37
4.4.2	Frequency Response	39
4.5	Simulation of AVR with PID	45
4.5.1	Root Locus	45
4.5.2	Frequency Response	48
4.6.1	Matlab Program with PI	54
4.6.2	Matlab Program with PID	55
	<b>Chapter Five</b>	<b>Results and conclusion</b>
5.1	Results	56
5.2	Conclusion	57
5.3	Recommendation	58
	References	59

## **List of Tables**

Table No.	Title	Page
4.1	Constant of Generator and AVR	38
4.2	Constant of AVR with PID	47
5.1	Root Locus Result	56
5.2	Results of Close Loop Frequency Response of AVR with and without PID	56

## List of figures

Fig. No.	Title	Page
Fig(1.1)	Khartoum Grid	3
Fig(2.1)	Per phase circuit of synchronous generator	5
Fig(2.2)	Variation of field current of constant power	6
Fig(3.1)	LFC and AVR control loops	12
Fig(3.2)	Stator and rotor circuits of synchronous machine	14
Fig(3.3)	Generator block dig ram	17
Fig(3.4)	The block dig ram for simple non reheat turbine	18
Fig(3.5)	Generator load block diagram	19
Fig(3.6)	Generator load diagram	19
Fig(3.7)	Watt governor	21
Fig(3.8)	Amplifier block diagram	24
Fig(3.9)	AVR arrangement	25
Fig(3.10)	Exciter block	25
)		
Fig(3.11)	Generator block diagram	26
)		
Fig(3.12)	Sensor block diagram	27
)		
Fig(3.13)	AVR block diagram	27
)		
Fig4.1)	Circuit diagram of PID	36
Fig(4.2)	PID block diagram	37
Fig(4.3)	Root locus of AVR with PI	39
Fig(4.4)	Peak Response After Adding PI Controller	41
Fig(4.5)	Settling Time After Adding PI Controller	42
Fig(4.6)	Rise Time After Adding PI Controller	43
Fig(4.7)	Steady State After Adding PI controller	44
Fig(4.8)	AVR with PID	45
Fig(4.9)	Simplified Block Diagram of AVR with PID	46
Fig(4.10)	Root Locus of AVR with PID	48
)		

Fig(4.11	Peak Response After Adding PID controller	50
)		
Fig(4.12	Settling Time After Adding PID controller	51
)		
Fig(4.13	Rise Time After Adding PID controller	52
)		
Fig(4.14	Steady State After Adding PID controller	53
)		

## **ABSTRACT**

DR Sharif power station at Khartoum North consists of two turbines 30MW each.

The AVR of these machines consists of amplifier, generator, exciter and sensing unit. The excitation system has been chosen to the topic due to the problems faced by the operators in the power station .These problems include, aging problems of the final control element, feedback signal problem and load increase /decrease problems. The excitation system of the mentioned generator includes PI controller, so, PID controller was added instead of PI controller to avoid the problem mentioned previously.

To add the PID controller, it was implemented experimentally, tested and its response has been found.

The excitation system circuit test was simulated by MATLAB before adding the PID controller with different inputs.

Finally the PID controller has been added to the AVR and then simulated with different inputs disturbances and the responses were compared.

And also we use root locus methods before and after adding PID and the results were also compared.



محطة كهرباء د.شريف بالخرطوم بحري تتكون من وحدتين كل وحدة تنتج ثلاثون ميغاواط. احد المشاكل التي تواجه المحطة هي التارجح في الجهد تنتج منظومة الاثارة، منظومة الاثارة في هذه المحطة تتكون من الحاكمة التناسبية التكاملية ، في هذا البحث تم استعمال حاكمة التناسب- التكامل - التفاضل ، تمت محاكاة دارة التحكم التلقائي للجهد بدون أي اضافة لها وباستخدام ثوابت المولد و التحكم التلقائي للجهد ذلك باستخدام دالة درجية ونتج منها منظومة غير مستقرة ذلك تم اضافة حاكمة التناسب- التكامل - التفاضل الي منظومة التحكم التلقائي للجهد وباستخدام نفس ثوابت التناسب- التكامل - التفاضل حصل على الاستجابة المثلى لدالة درجية