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## 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.

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محطة كهرباء د.شريف بالخرطوم بحري تتكون من وحدتين كل وحدة تنتج ثلاثة ميغاواط. احد المشاكل التي تواجه المحطة هي التارجح في الجهد تنتج منظومة الاتارة، منظومة الاتارة 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 ذك باستخدام دالة درجية ونتج منها منظومة غير مستقرة ذك تم اضافة حاكمة التناسب- التكامل - التفاضل الى منظومة التحكم التلقائي للجهد وباستخدام نفس ثوابت التناسب- التكامل - التفاضل حصل على الاستجابة المثلثي لدالة درجية