



دبلوم تطبيقات التحكم الأوتوماتيكي في نظم القوى الميكانيكية

MEP 569 Using Virtual Lab Applications for Control of a Steam Power Plant (Applications of Automatic Control Virtual Labs.)

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مك 569 تطبيقات المعامل الافتراضية في التحكم في محطات القوى البخارية:

Interactive Auto. Control System for 30 MWatt Steam-Turbine & Rankine Cycle Power Generation Plant:

دراسة حالة وتطبيق عملي لتشغيل وإدارة نظم التحكم الأوتوماتيكي لمحطة كهرباء حرارية تعمل بالبخار وتتضمن غلاية لإنتاج البخار وتوربينة بخارية متعددة المراحل وكذلك باقى أجزاء المحطة من مكثف وعدة مبادلات حرارية وظلمبات إعادة سريان المياه ومولد كهربائى 30ميغاوات. ويتضمن البرنامج كذلك قياس وتحديد كفاءة التشغيل وخريطة الإلتزان الحرارى لكال أجزاء المحطة عند ظروف تشغيل مختلفة.

What do we have in the Steam Power Plant under investigation?

This is an interactive computer-based training course that includes an investigation, a virtual computer simulation and flow visualization. The course is designed to give the participant a broad based understanding of the most important concepts of practical automatic control and real thermo-fluid processes existing in multi-stage industrial Steam-Turbine & Rankine Cycle Power Generation Plant of maximum electric output of 30 MWatt. Pressure and temperature gauges show various values at all critical points of the plant. The steam-turbine unit includes one high-pressure part and two low-pressure parts. Steam may be extracted or not-extracted from those 3 parts for 3-feed water heat exchangers and also for a deaerating unit. The plant also includes: an industrial 120 ton/hr at 120 bar water-tube boiler (of virtLab-1) and a water-cooled vacuum condenser with 6000 m³/hr condenser cooling-water pump and many flow control valves. The simulation includes all previous boiler controls of VirtLab-1. Additional control systems/boards are included for steam turbine and electric-alternator unit and for the vacuum condenser and the cooling-water pump. The simulation includes many critical control alarms, input/output signals, operation and instrumentation parameter-boards, diagnostic tools, error-report filling, help/trouble-shooting and Thermal Balance Calculations and Plotting tools.

