DOWNLOAD PDF BOOK ON POWER PLANT ENGINEERING

Chapter 1 : Power Plant Engineering EBooks Free Pdf Download

Power Plant Engineering is the culmination of experience of hundreds of engineers from Black & Veatch, a leading firm in the field for more than 80 years. The authors review all major power generating technologies, giving particular emphasis to current approaches.

Dipak Sarkar , Posted on: September 18, We took some time to catch up with Dipak Sarkar, Author of recently published Thermal Power Plants to find out why he decided to write a book. About 45 years ago when I was posted at a 60 MW non-reheat pulverized coal fired power plant as a budding engineer I was amazed by seeing the size of the boiler and height of the stack. My experience prior to the above is as an undergraduate student on vocational training at a stoker fired power plant with capacity of kW. Obviously, the latest change in size made a great dent on my visual senses. Over the next few days I found myself in a sort of in trance and used to look at the stack height and at the elevation of boiler drum just to get acquainted with the bare facts and physical dimensions. The feeling of such vastness were soon surpassed when I regularly started to visit plants of even larger sizes. Looking back, when I visualize the size of a MW supercritical power plant, the size of the old 60 MW plant appears to be a midget. Eventually plausible answers to these questions resulted in immense development of my technical skills and erudition along with satisfying comfort of knowledge enhancement. What factors decide which type of condenser cooling should be adopted? What are the advantages of adopting multi-pressure condenser over single-pressure condenser? Why are feedwater heaters of smaller size plants installed vertically, while larger size plants go for horizontally installed feedwater heaters? Whether valves should be erected in vertical pipe lines or horizontal pipe lines, in other words whether spindle of valves should be horizontal or vertical? Fifty years back smoke coming out from the stack could be visible, yet within a decade or so and onwards the stack exhaust had to be made invisible. The question why and how? Why is wet bottom ash handling from a coal fired boiler no longer preferred to meet environmental norms? From techno-economic consideration whether boiler feed pump should be electric motor driven or steam turbine driven. Why are SF6 circuit breakers preferred to minimum-oil circuit breakers? In smaller size plants generators used to be cooled with air, but a generator of larger size plants adopts hydrogen cooling. What prompted such a change in the cooling medium and what are the added advantages? What are the advantages of selecting each control system and which system should be suitable for control of a specific parameter? Up to MW unit capacity main steam flow used to be measured with the help of flow nozzles installed in main steam lines. Units larger than MW capacity never use flow nozzles to measure main steam flow. Two questions arise why flow nozzles are not required and how main steam flow is measured in units larger than MW unit capacity? These are just some of the questions I faced during my professional career both at a design office as while working out in the field. Answers to these questions were so fascinating that I still cherish the efficacy of each of the answers, and shared my experiences with my peers and associates whenever there was an opportunity. Besides the above, I also faced different types of queries from fellow students at technical institutes and from operating personnel during various training programs. I made utmost effort to clarify all queries to their full satisfaction. These ranged from; What factors influence selection of type and size of a boiler? How fuels are classified? What are the different types of air heaters? Why is thermal insulation of hot surfaces imperative? What are the differences between fans, compressors and blowers? Why is DM water required in steam power plants? Whether to go for induced draft ID cooling tower or natural draft ND? What are the functions of a stacker-reclaimer? What code is to be followed for evaluating turbine performance? How to design a restricting orifice? With these questions in mind I had a profound feeling that I must share my experience and knowledge with a wider group of engineers. Our products cover fundamental scientific and technological advances in solar, wind, power transmission, smart grids, and more, with a focus on improving energy efficiency and output among key sectors. Like Energy on Facebook.

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Chapter 2 : [PDF] Power Plant Engineering Books Collection Free Download â€“ EasyEngineering

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Special care has been taken to explain the complicated subject of power plant engineering in a language and with an approach so as to make it comprehensible and interesting to the undergraduate students. Thus, the basic concepts have been presented in brief but with full clarity. The orientation of the book has been kept towards the practical aspect of running the power plants while retaining the theoretical aspects at the same time, which is the unique feature of this book. Topics mentioned hereunder are either unique to this book or have received a focussed treatment: The book is replete with solved examples. Every chapter ends with a summary, objective type questions and review questions. Practical problems have been provided wherever required. References of related published works and website addresses have also been provided for further studies. Steam tables and Mollier diagram have been provided in the end as Annexure. Power Scenario in India, 2. Coal-Based Thermal Stations, 3. Gas Turbine Power Plant, 4. Nuclear Power Plant, 5. Diesel Power Plant, 7. Non-conventional Power Plants, 8. Combined Cycle Plants, 9. Steam Tables and Mollier Diagram Energy conservation and power tariff system availability-based tariff. Gas turbine cycle with its modification, blade cooling, jet propulsion. Nuclear power strategy of India and nuclear power generation. Mini- and micro-hydroelectric generation, governing of hydro turbines and diesel power plants. Non-conventional power generation by solar thermal and photovoltaic, wind, gasification, geothermal, tidal, thermionic, thermoelectric, tidal, and biomass. Latest techniques of combined cycle power generation. Measurement of various parameters and their controls. Environmental aspects of power plants.

Chapter 3 : Power plant engineering book

About Power Plant Engineering Books. Power engineering, also called power systems engineering, is a subfield of electrical engineering that deals with the generation, transmission, distribution and utilization of electric power, and the electrical apparatus connected to such systems.

History[edit] Pearl Street Station Power plant engineering got its start in the s when small systems were used by individual factories to provide electrical power. Originally the only source of power came from DC, or direct current , systems. During these times, the coal powered steam engine was costly to run and there was no way for the power to be transmitted over distances. Hydroelectricity was one of the most utilized forms of power generation as water mills could be used to create power to transmit to small towns. AC systems allowed power to be transmitted over larger distances than DC systems allowed and thus, large power stations were able to be created. One of the progenitors of long-distance power-transmission was the Lauffen to Frankfurt power plant which spanned miles. When power plants were up and coming, engineering tasks needed to create these facilities mainly consisted of mechanical, civil, and electrical engineers. But when nuclear power plants were created it introduced nuclear engineers to perform the calculations necessary to maintain safety standards. This is especially important in power generation because power production in nearly all types of power plants relies upon the use of a generator. The generator then creates electricity due to the interaction of a conductor within a magnetic field. In this case, the mechanical energy generated by the wind is converted, through the generator, into electric energy. Most power plants rely on these conversions to create usable electric power. As the law relates to power plants, it dictates that heat is to flow from a body at high temperature to a body at low temperature the device in which electricity is being generated. However, as technology has evolved, the sources of energy used in power plants has evolved as well. They can be categorized into three different types; impoundment, diversion and pumped storage. Mechanical engineers are in charge of calculating flow rates and other volumetric calculations necessary to turn the generators at the electrical engineers specifications. Pumped storage hydroelectric power plants operate in a similar manner but only function at peak hours of power demand. At calm hours the water is pumped uphill, then is released at peak hours to flow from a high to low elevation to turn turbines. Thermal power plants[edit] Coal being pushed into coal power plant Thermal power plants are split into two different categories; those that create electricity by burning fuel and those that create electricity via prime mover. A common example of a thermal power plant that produces electricity by the consumption of fuel is the nuclear power plant. Mechanical engineers maintain performance of the thermal power plants while keeping the plants in operation. Photovoltaic panels, or solar panels , are constructed using photovoltaic cells which are made of semiconductor materials that release electrons when they are warmed by the thermal energy of the sun. The new flow of electrons generates electricity within the cell. Wind power plants can be implemented on large, open expanses of land or on large bodies of water such as the oceans; they simply rely on being in areas that experience significant amounts of wind. Knowledge of fluid dynamics from the help of mechanical engineers is crucial in determining the viability of locations for wind turbines. The field can solicit information from mechanical, electrical, nuclear, and civil engineers. Mechanical[edit] Mechanical engineers work to maintain and control machinery that used to power the plant. The Mechanical Engineers have additional roles that are needed to be considered based on their career. In thermal power plants work in its optimal capacity. In nuclear and hydraulic power plants the engineers work to make sure that maintain heavy machinery and preventative care of machinery breaking down. Electrical[edit] Electrical engineers work with electrical appliances while making sure electronic instruments and appliances are working in company and state level satisfaction. ABET and field experience before getting an entry level position. Nuclear[edit] Nuclear engineers develops and research methods, machinery and systems concerning radiation and energy in subatomic levels. These engineers work in Nuclear Power plants and require licenses for practice while working in the power plant. These operations can range from handling of nuclear wastes, nuclear material experiments, and design of nuclear equipment. Associations[edit] While there are many disparities between the aforementioned

engineering disciplines, they all cover material related to heat or electricity transmission. Obtaining a degree from an ABET accredited school in any one of these disciplines is essential to becoming a power plant engineer. Fields[edit] Power plant operation and maintenance consists of optimizing the efficiency and power output of power plants and ensuring long term operation. Individual household electric power generators are not included.

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The book contains chapters on non conventional power generation, diesel engine, gas turbine power plants, renewable energy usage, energy storage mechanisms, steam cycle analysis, cycle power generation, fuels and combustion, steam turbines and generators, nuclear power plants, hydroelectric power plant, energy storage, environmental degradation.

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This comprehensive volume provides a complete, authoritative, up-to-date reference for all aspects of power plant engineering. Coverage ranges from engineering economics to coal and limestone handling, from design processes to plant thermal heat balances.

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TEXT BOOK: 1. P.K. Nag, Power Plant Engineering, Tata McGraw - Hill Publishing Company Ltd., Third A steam power plant must have the following equipment.

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The book is interspersed with solved problems for a sound understanding of the various aspects of power plant engineering. Plant Engineering's Fluid Power Handbook, Volume 2: System Applications and C.