



# Power Plant Instrumentation and Controls

*Philip Kiameh*

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## **A practical guide to increasing power plant operating uptime and profitability**

*Power Plant Instrumentation and Controls* provides a detailed description of power plant computer simulation and modern instrumentation and control systems that allow improvements in online power plant operating periods and thus profitability – minimizing unnecessary outages, maintenance activities, and downtime. The book reviews the many benefits of these different computer simulation programs, modern instrumentation, and control systems as they relate to plant safety, reliability, costs, efficiency, and emissions. It focuses on modern power generating plants – gas turbines, co-generation, and combined cycle plants.

The book features a simulation program to determine the effects on turbine performance; turbine creep life; environmental emissions; and turbine life-cycle cost, revenue, and profitability of the following parameters:

- Variations in ambient temperature and pressure
- Inlet and exhaust losses
- Engine deterioration
- Different faults
- Power augmentation methods, including peak mode
- Water injection
- Control system performance, including proportional offset, integral windup, and trips
- Fuel type
- Variations in maintenance techniques and frequency

Power generating plant outages are often due to unnecessary and improper maintenance activities and poor or outdated instrumentation and control systems, resulting in a significant reduction in profitability of power plant operation. This authoritative volume addresses these concerns and offers proven solutions. It is an essential next step to Kiameh's successful *Power Generation Handbook* and *Power Plant Equipment Operation and Maintenance Guide*.

## ***Power Plant Instrumentation and Controls* includes**

- Bar charts trending key turbine parameters
- Bar charts trending compressor characteristics and operating point during engine transients
- Tips for exporting simulated data to other software, such as Excel
- Exercises to illustrate use of simulation programs under different scenarios, including modern co-generation and combined-cycle plants
- In-depth coverage of smart instrumentation and advanced control systems used in modern power generating plants
- Details on selecting, commissioning, operating, diagnosing, and testing smart instrumentation, Distributed Control Systems, Supervisory Control and Data Acquisition (SCADA) systems, and all types of control valves, actuators, and positioners

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