

Power Plant Operators, Distributors, and Dispatchers

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Significant Points

- Most entry-level workers start as helpers or laborers, and several years of training and experience are required to become fully qualified.
- Applicants are expected to encounter keen competition for jobs.
- Opportunities will be best for operators with training in computers and automated equipment.

Nature of the Work

Electricity is vital for most everyday activities. From the moment you flip the first switch each morning, you are connecting to a huge network of people, electric lines, and generating equipment. Power plant operators control the machinery that generates electricity. Power plant distributors and dispatchers control the flow of electricity from the power plant, over a network of transmission lines, to industrial plants and substations, and, finally, over distribution lines to residential users.

Power plant operators control and monitor boilers, turbines, generators, and auxiliary equipment in power-generating plants. Operators distribute power demands among generators, combine the current from several generators, and monitor instruments to maintain voltage and regulate electricity flows from the plant. When power requirements change, these workers start or stop generators and connect or disconnect them from circuits. They often use computers to keep records of switching operations and loads on generators, lines, and transformers. Operators also may use computers to prepare reports of unusual incidents, malfunctioning equipment, or maintenance performed during their shift.

Operators in plants with automated control systems work mainly in a central control room and usually are called *control room operators* and *control room operator trainees* or *assistants*. In older plants, the controls for the equipment are not centralized, and *switchboard operators* control the flow of electricity from a central point, whereas *auxiliary equipment operators* work throughout the plant, operating and monitoring valves, switches, and gauges.

The Nuclear Regulatory Commission (NRC) licenses operators of nuclear power plants. *Reactor operators* are authorized to control equipment that affects the power of the reactor in a nuclear power plant. In addition, an NRC-licensed *senior reactor operator* must be on duty during each shift to act as the plant supervisor and supervise the operation of all controls in the control room.

Power distributors and dispatchers, also called *load dispatchers* or *systems operators*, control the flow of electricity through transmission lines to industrial plants and substations that supply residential electric needs. They monitor and operate current converters, voltage transformers, and circuit breakers. Dispatchers also monitor other distribution equipment and record readings at a pilot board—a map of the transmission grid system showing the status of transmission circuits and connections with substations and industrial plants.

Dispatchers also anticipate power needs, such as those caused by changes in the weather. They call control room operators to start or stop boilers and generators, to bring production into balance with needs. Dispatchers handle emergencies such as transformer or transmission line failures and route current around affected areas. In

substations, they also operate and monitor equipment that increases or decreases voltage, and they operate switchboard levers to control the flow of electricity in and out of the substations.

Working Conditions

Because electricity is provided around the clock, operators, distributors, and dispatchers usually work one of three daily 8-hour shifts or one of two 12-hour shifts on a rotating basis. Shift assignments may change periodically, so that all operators can share duty on less desirable shifts. Work on rotating shifts can be stressful and fatiguing, because of the constant change in living and sleeping patterns. Operators, distributors, and dispatchers who work in control rooms generally sit or stand at a control station. This work is not physically strenuous, but it does require constant attention. Operators who work outside the control room may be exposed to danger from electric shock, falls, and burns.

Nuclear power plant operators are subject to random drug and alcohol tests, as are most workers at such plants.

Employment

Power plant operators, distributors, and dispatchers held about 51,000 jobs in 2002. Jobs were located throughout the country. About 86 percent of jobs were in utility companies and government agencies that produced electricity. Others worked for manufacturing establishments that produced electricity for their own use.

Training, Other Qualifications, and Advancement

Employers seek high school graduates for entry-level operator, distributor, and dispatcher positions. Candidates with strong mathematics and science skills are preferred. College-level courses or prior experience in a mechanical or technical job may be helpful. With computers now used to keep records, generate reports, and track maintenance, employers are increasingly requiring computer proficiency. Most entry-level workers start as helpers or laborers. Depending on the results of aptitude tests, their own preferences, and the availability of openings, workers may be assigned to train for one of many utility positions.

Workers selected for training as a fossil-fueled power plant operator or distributor undergo extensive on-the-job and classroom instruction. Several years of training and experience are required to become a fully qualified control room operator or power plant distributor. With further training and experience, workers may advance to shift supervisor. Utilities generally promote from within; therefore, opportunities to advance by moving to another employer are limited.



A power plant dispatcher uses a computer to control the flow of electricity.

Extensive training and experience are necessary to pass the NRC examinations for reactor operators and senior reactor operators. To maintain their license, licensed reactor operators must pass an annual practical plant operation exam and a biennial written exam administered by their employers. Training may include simulator and on-the-job training, classroom instruction, and individual study. Entrants to nuclear power plant operator trainee jobs must have strong mathematics and science skills. Experience in other power plants or with Navy nuclear propulsion plants also is helpful. With further training and experience, reactor operators may advance to senior reactor operator positions.

In addition to receiving preliminary training as a power plant operator, distributor, or dispatcher, most workers are given periodic refresher training—frequently in the case of nuclear power plant operators. Refresher training usually is taken on plant simulators designed specifically to replicate procedures and situations that might be encountered at the trainee's plant.

Job Outlook

People who want to become power plant operators, distributors, and dispatchers are expected to encounter keen competition for these high-paying jobs. Declining employment and very low replacement needs in the occupation will result in few job opportunities. The slow pace of construction of new plants also will limit opportunities for power plant operators, distributors, and dispatchers. In addition, the increasing use of automatic controls and more computerized equipment should boost productivity and decrease the demand for operators. As a result, individuals with training in computers and automated equipment will have the best job prospects.

A decline in employment of power plant operators, distributors, and dispatchers is expected through the year 2012, as the utilities industry continues to restructure in response to deregulation and increasing competition. The Energy Policy Act of 1992 continues to have an impact on the organization of the industry. The Act aims at increasing competition in power-generating utilities by allowing independent producers to sell power directly to industrial and other wholesale customers. Consequently, utilities, which historically operated as regulated local monopolies, are restructuring their operations in order to reduce costs and compete effectively; as a result, the number of jobs is decreasing.

Earnings

Median annual earnings of power plant operators were \$49,920 in 2002. The middle 50 percent earned between \$40,090 and \$58,690. The lowest 10 percent earned less than \$31,290, and the highest 10 percent earned more than \$67,950. Median annual earnings of power plant operators in 2002 were \$52,410 in electric power generation, transmission, and distribution and \$44,200 in local government.

Median annual earnings of nuclear power reactor operators were \$61,060 in 2002. The middle 50 percent earned between \$53,060 and \$70,580. The lowest 10 percent earned less than \$48,060, and the highest 10 percent earned more than \$79,880.

Median annual earnings of power distributors and dispatchers were \$54,120 in 2002. The middle 50 percent earned between \$43,750 and \$65,390. The lowest 10 percent earned less than \$34,640, and the highest 10 percent earned more than \$75,420.

Related Occupations

Other workers who monitor and operate plant and system equipment include chemical plant and system operators; petroleum pump system operators, refinery operators, and gaugers; stationary engineers and boiler operators; and water and wastewater treatment plant and system operators.

Sources of Additional Information

For information about employment opportunities, contact local electric utility companies, locals of unions, and State employment service offices.

For general information about power plant operators, nuclear power reactor operators, and power plant distributors and dispatchers, contact:

► American Public Power Association, 2301 M St. NW., Washington, DC 20037-1484. Internet: <http://www.appanet.org>

► International Brotherhood of Electrical Workers, 1125 15th St. NW., Washington, DC 20005.