



## Career Pathways at SMUD

# Engineering Opportunities

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SMUD offers career paths in civil, electrical, mechanical and power systems engineering, from a STEM student assistant position to a director in engineering.

Powering forward.  
Together.



# Careers in Engineering

*Desired knowledge and experience*

## Architectural Engineer

Our architects' primary focus is designing for energy efficiency, including both new construction and energy retrofits. Our Architectural Engineers provided energy efficiency and lighting design assistance for the Golden One Center.

- Best practices in energy efficiency
- Energy analysis and computer modeling
- Structural, mechanical and electrical systems
- Construction methods, codes and standards
- Land and building codes and regulations
- Community development trends
- Preparation of construction documents
- Project management

## Civil Engineer

Civil engineers design infrastructure for the reliability of our electrical system and ensure compliance with governing laws and regulations. They also help us meet the evolving needs of our customers, working with them in the move towards renewable energy sources and the reduction of greenhouse gasses.

- Power plant systems and structures, their capabilities and ratings
- Power plant operations and maintenance procedures
- Laws and regulations governing power generation, transmission and distribution
- Civil design and structural engineering

## Distribution Design Engineer

Distribution design engineers ensure the reliability of our local grid infrastructure in keeping with safety and engineering codes, while ensuring compliance with applicable laws and regulations.

- Electrical power engineering
- Design, construction, operation and protection of electric distribution systems
- Management of design and construction standards

## Electrical Engineer

Electrical engineers develop cost-effective solutions to increase the efficiency and reliability of our grid and power plants. They apply comprehensive knowledge of electrical system design, utility infrastructure, as well as protection and control systems to ensure compliance with changing laws and regulations.

- Thermal, hydro, wind and solar power generation, as well as natural gas pipelines
- Ratings, operation and equipment limitations of generation and transmission systems
- Power system protective relaying
- The protection of generators, motors, transformers, station buses, lines and circuits

## Energy Management System (EMS) Engineer

EMS engineers work to ensure the stability of the electrical grid on a local and regional level. They leverage real-time systems software, data analytics, power system applications and database administration to maximize energy savings, operational efficiency and sustainability.

- Computer science and/or engineering
- Generation, transmission and distribution system design, operations and procedures
- Systems software and database administration
- Network and workstation technologies
- Technical issues related to energy management systems
- Software, hardware and telecommunication/ systems for real-time data collection and exchange

## Instrument and Controls (I&C) Engineer

I&C engineers design instrument and control systems for our various generation assets in keeping with federal and state regulations, SMUD policies and other standards. As part of an interdisciplinary team, they work in the initial planning and design phases of power plant component, system upgrade and plant modification projects.

- Design of control systems employing:
  - Electronic, pneumatic, hydraulic or computer technology
  - Instrumentation and measurement methods
  - Computer-aided drafting and design software
- Mathematics, statistics, economics, and cost-benefit analyses related to electrical engineering

## Mechanical Engineer

Mechanical engineers play a crucial role in monitoring, inspecting and maintaining our electrical facilities and related equipment. They develop safe, economically viable and environmentally sustainable clean energy systems utilizing solar, wind, thermal, hydropower and other non-carbon-emitting resources.

- Mechanical engineering design
- Machine design and shop practices
- Stress analysis
- Piping systems
- Air conditioning systems
- Vibration and noise control
- Hydraulics and flow measurement methods
- Safety codes and regulations governing mechanical systems
- Engineering mathematics and statistical analysis
- Computer-aided drafting and design software

## Power System Operations Engineer

Power system operations engineers work to ensure stability and reliability of our bulk transmission system. They collaborate with other utilities and regulatory entities to ensure the stability and reliability of the regional interconnected grid.

- Electrical engineering design related to power operations and transmission system planning
- Power system theory and operating procedures
- Electrical codes and standards
- Electrical testing methods and safety
- Engineering software for power system operations

## Project Development Manager, Engineering

Project development managers lead teams in the design and engineering of new power generation and transmission assets. They manage cost estimation, cash flow and resource allocation and are responsible for risk assessment.

- All aspects of design, licensing and engineering for new power generation and transmission, including work plans, budgets and schedules
- Project team leadership
- Writing bid requests, evaluating bids and managing contractors
- Conducting public outreach with project stakeholders including developers, architects, engineers, host utilities, regulatory agencies and the general public

## Protection Engineer

Protection engineers design, develop, analyze and test protective relaying and control systems to maintain the operating balance of generation, transmission and distribution systems. They are the front line against blackouts and system failures.

- Design of power system protective relaying schemes and related equipment
- Generation and transmission systems, their ratings, limitations and operation
- Proper maintenance of power system equipment
- Power system operating procedures, electrical codes and standards, electrical testing methods and safety and engineering software for system protection

## Quality Engineer

Quality engineers ensure that SMUD upholds stringent standards and codes governing electric utilities including generation, transmission, distribution, safety, hazardous materials handling and environmental protection. They participate in process improvement and develop and maintain quality control inspection plans.

- Electrical, mechanical and civil engineering for the electric utility industry
- Quality assurance standards, regulations and best practices as they relate to electric utilities
- Industry standards and codes governing generation, transmission and distribution systems
- Regulations for handling, storing, transporting and disposing of hazardous materials
- Safety and environmental regulations governing the electric utility industry

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For more information, please visit [smud.org/Careers](https://smud.org/Careers).

## Telecom Engineer

Telecom engineers work with cutting edge technology to ensure uninterrupted operation and reliability of our voice, data and video systems. They plan, budget, design, construct, operate and maintain our telecommunications systems. They recommend technical modifications to improve the performance of existing systems.

- Principles of electrical engineering, telecommunication systems and equipment, including computer-based control and data acquisition systems
- Specialized equipment such as SONET, microwave radio, two-way VHF/UHF radio and PBX
- Knowledge of power-line carrier, fiber optics, broadband coaxial cable, video and wiring systems

## Transmission Planning Engineer

Transmission planning engineers ensure the capacity and reliability of our transmission system necessary to meet customer demand. They conduct essential load-flow and fault analysis studies to assess system capabilities to ensure the reliability of our transmission infrastructure.

- Planning and operations of generation, distribution and transmission systems
- Assessing transmission, power flow and reliability
- Recordkeeping requirements
- Power system theory, AC/DC transmission systems, short circuit evaluation, electrical codes and standards, electrical testing and safety

## Potential Career Path in Engineering

**STEM Student Assistant:** Full-time (8 months/year and 12 credit hours/semester) college junior or senior who has completed lower division requirements in an approved Engineering Council for Professional Development (ECPD) engineering or physical science curriculum — \$40,656 to \$49,524/year (\$19.55 to \$23.81/hour)

**Assistant Engineer:** Must be in the last semester of an engineering program at an accredited university or college — \$63,036 to \$83,460/year

**Associate Engineer:** Bachelor's degree from an accredited college or university majoring in engineering or a related field OR equivalent experience OR a professional electrical engineering license (PE) from the State of California OR 3 years of experience with SMUD as a Designer IV and possession of the Engineer-in-Training Certificate from the California Dept. of Consumer Affairs; salary range for applicant with less than 3 years progressively responsible relevant work experience — \$82,680 to \$109,488/year; salary range for applicant with minimum 3-5 years of progressively responsible relevant work experience — \$98,220 to \$130,152/year

**Senior Engineer:** Bachelor's degree from an accredited college or university majoring in engineering or a related field OR equivalent experience OR a professional engineering license (PE) from the State of California; minimum 5-7 years of progressively responsible relevant work experience — \$116,772 to \$154,668/year

**Principal Engineer:** Bachelor's degree from an accredited college or university majoring in engineering or a related field OR equivalent experience OR a professional engineering license (PE) from the State of California; minimum 7-10 years of progressively responsible relevant work experience — \$125,712 to \$166,512/year

**Manager, Engineering:** Bachelor's degree from an accredited college or university majoring in engineering, architecture or a related field OR equivalent experience; 10 or more years of progressively responsible relevant supervisory work experience in engineering, planning design, construction and/or operation and maintenance of power systems and rotating equipment, including experience managing large projects — \$132,036 to \$174,960/year

**Director, Engineering:** Bachelor of Science degree in Electrical Engineering or a related field. Between 10-15 years of progressively responsible relevant work experience; direct supervisory experience over professional engineering and represented personnel; progressively increasing knowledge and experience in managing an O&M and Capital budget — \$162,984 to \$227,033/year

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