

GENERAL DESCRIPTION OF CLASS

The COMMUNICATIONS SYSTEMS ANALYST 3 is responsible for performing design and engineering analysis over a wide variety of nonroutine problems arising in connection with the planning, design and operation of communication equipment and systems. This includes microwave, telephone, wire line, UHF and VHF systems, and related facilities such as a.c. and d.c. power supplies, engine-generators, buildings and radio communication sites. As a specialist in the design of electronic communications systems, the incumbent performs design work on major projects and furnishes technical advice to other engineers on specific design problems. Work has an impact on a wide range of agency construction projects, many of which involve critical data or voice communications systems.

DISTINGUISHING FEATURES

This is the third level of a three-level series. It is distinguished from the lower levels by its responsibility for overall project direction, including the planning, establishment of system goals and objectives, and the technical direction of lower-level technical staff engaged in the development, installation, and maintenance of a statewide telecommunications system. The Communications Systems Analyst 3 also has the responsibility for the preparation of technical procurement documents, and the review and approval of proposed new equipment purchases.

DUTIES AND RESPONSIBILITIES

Allocation of positions to this class will depend on the total work performed which may include one or a combination of the duties or tasks listed below.

1. **Project Planning.** Typical tasks: prepares detailed cost estimates for use in obtaining project funding, bid evaluation, and project cost analyses; evaluates various alternatives for meeting an objective and provides a recommendation of the best plan based on technical and economic considerations; performs or directs the survey and investigations at project sites to determine condition of facilities and to secure necessary data prior to initiating design, evaluates the data obtained and incorporates the salient factors into design considerations and solutions; coordinates with and provides technical assistance to other specialists at various levels throughout the agency in design development, to ensure that all technical areas are covered, areas of overlapping responsibilities between technical disciplines receive proper design consideration, and that the total project objectives and schedules are met; evaluates design objectives, performs complex technical calculations, identifies most economical and efficient procedure for project design and performances considering all influences and prepares necessary drawings, specifications and supporting documents for advertised or negotiated procurements.
2. **Consulting and Project Development.** Typical tasks: prepares correspondence, technical reports, estimates, marked drawings, design sketches, status reports, and schedules as required to complete project assignments, consults with construction contractor personnel to resolve difficult and complex unforeseen problems and latent conditions developing during construction and based on the condition, prepares sketches or changes drawings and specifications solving the problem, and

incorporates these changed documents into the contract performance documents; reviews and evaluates drawings and material certifications submitted by contractor for contract and performance requirements, recommending approval, rejection or receipt; coordinates joint communications design considerations with other governmental agencies and private utilities.

3. **Miscellaneous Administrative Duties.** Typical tasks: plans, assigns and coordinates the work of lower-level Communications Systems Analysts; determines how data is to be analyzed, the format to be followed, the type of information to collect, and when the assignment is due; reviews all assignments to ensure compliance with State and Federal laws; provides input to supervisor concerning staff performance appraisals; provides on-the-job training to new analysts; counsels analysts on work-related activities.

Employees in this level are typically assigned projects of considerable difficulty (i.e., containing combinations of unusual features, requiring significant departures from previous approaches to similar projects and assignments involving new design, design modifications, requirements definition, and engineering evaluations). The assignments are diverse in nature and cover a number of essentially different electronic systems and communications equipment types. Employees in this class must exercise creativity and experienced judgment in extending traditional techniques or developing new ones in order to solve novel or obscure engineering problems. In some cases, the assignments deal with the inapplicability of established design criteria and technical precedents to project objectives, thus requiring sound design judgment to bring the project to completion without compromising design and engineering principles. The work also requires recognition of the relationship of problems and practices of related engineering fields either to solve the engineering problem or refer it to the appropriate source.

RELATIONSHIPS WITH OTHERS

Employees in this class have regular telephone and in-person contact with technical personnel, managers, and other specialists in the agency in order to plan, coordinate, or advise on work efforts; to resolve technical problems, and to determine specific requirements and design needs. There is periodic contact, in-person and by telephone, with persons from other agencies or utilities engaged in similar or related functions in order to resolve problems and present alternatives that require persuasion and compromise. There is occasional contact in person, by telephone and in writing with engineers outside of government who are the foremost experts in the field, in order to exchange information and resolve problems. There is periodic contact, in-person and by telephone, with equipment manufacturers and suppliers performing contractual requirements for the state in order to solicit and render advice in resolving design problems; to coordinate work efforts; to furnish technical advice; to receive and correct drawings, designs, or specifications and resolve problems.

SUPERVISION RECEIVED

Employees in this class receive general supervision from a unit supervisor or manager who provides direction and gives assignments in general terms and indicates priorities and overall objectives. Employees in this class work with considerable independence during the course of a project. Employees in this class are specialists in the field and are expected to exercise judgment in analyzing and developing solutions to the project objectives. Completed work is reviewed to ensure compatibility with these objectives. The employees keep appropriate supervisory levels informed of the progress, potentially controversial matters, or far-reaching implications. Guidelines include manuals, engineering regulations, established procedures, policy statements, the terms of contracts and Federal Communications (FCC) Rules and Regulations which are useful in aiding the employee to exercise judgment and initiative in developing new methods, where

significant departures from established practices and precedents are required, resulting from such factors as unusual local conditions, increased emphasis on energy conservation, and changes in the "state of the art."

GENERAL INFORMATION

Work is usually performed in an office environment, although there will be frequent exposure to buildings and other facilities under construction or other outdoor conditions. Some laboratory work in the vicinity of electronic test equipment will be required. When performing field work there is some walking, climbing, lifting, and bending required during site investigations, radio path surveys, and equipment inspection at job sites. The job will require occasional use of an automobile, including four-wheel drive.

KNOWLEDGE, SKILLS, AND ABILITIES (KSA)

Extensive knowledge of FM radio theory and practices as applied to two-way radio and microwave systems.

Extensive knowledge of electronic theory.

Extensive knowledge of AM radio theory and practices.

Extensive knowledge of solid state electronic theory and troubleshooting techniques.

Extensive knowledge of the Federal Communications Commission Rules and Regulations pertaining to Public Safety Radio Services, microwave radio services, data communications, and telephone systems.

General knowledge of digital logic theory and applications.

General knowledge of antenna, transmission line, and propagation theory.

General knowledge of mathematics as applied to electronics.

General knowledge of data communications theory and practice.

General knowledge of telephone circuits and systems.

Basic knowledge of microprocessor theory and circuits.

Skill in the analysis of communication needs of users, and in the design, development and implementation of systems to meet those needs.

Skill in the troubleshooting and repairing of solid state communications equipment, including microprocessor-based systems.

Skill in the repair of printed circuit boards and strip-line circuitry.

Skill in reading and interpreting electronic schematic diagrams.

Skill in solving radio interference and intermodulation problems.

Skill in the use of electronic hand tools and soldering techniques.

Skill in devising and implementing effective solutions for unique and unusual problems in telecommunications systems.

Skill in presentation of ideas in direct, understandable language.

Skill in preparing clear and concise written reports of technical subject matter.

Ability to think on a multi-system level.

Ability to plan, develop, prioritize and coordinate work of lower level technical staff.

Ability to train lower-level technical staff and evaluate progress.

Ability to operate communications equipment in accordance with Federal Communications Commission Rules and Regulations.

Ability to work independently of direct supervision.

Ability to present a professional image and maintain harmonious relationships with fellow employees, other agency employees, and highway officials.

Ability to climb communications towers and poles.

Ability to traverse deep snow on foot or snowshoe.

Ability to operate a snowcat when required to perform system maintenance in adverse weather conditions.

Ability to operate a four-wheel drive vehicle.

Ability to lift and carry a load of 50 pounds over uneven terrain.

SPECIAL QUALIFICATIONS

Ability to secure and maintain a valid Oregon driver's license.

Possession of a Federal Communications Commission General Class Radio Telephone License or equivalent industrial certification is required.

NOTE: The KNOWLEDGE and SKILLS are required for initial consideration. ABILITIES may be required for initial consideration, at any time during the selection process, or during a trial service period as a final stage of the selection process. Some duties performed by positions in this class may require different KSA's. No attempt is made to describe every KSA required for **all** positions in this class. Additional KSA requirements will be explained on the recruiting announcement.

Adopted 1/90

Revised

Examples of work are typical of duties assigned to this class. No attempt is made to describe every duty performed by all positions in this class.