COMMUNICATIONS SYSTEMS ANALYST 2 2168

GENERAL DESCRIPTION OF CLASS

The COMMUNICATIONS SYSTEMS ANALYST 2 employs an extensive knowledge of electronics theory and practice while performing highly scientific and engineering-related tasks which include analyzing, developing, and implementing solutions for the installation, maintenance, repair, modification, and calibration of a wide variety of communications equipment that constitute the statewide communications network. This equipment includes point-to-point microwave systems; telephone and data transmission systems; vehicular and portable radio systems; and fixed station VHF and UHF equipment. Assignments include emergency responses to independently analyze, repair, or devise a temporary solution to restore communications service.

DISTINGUISHING FEATURES

This is the second level of a three-level series. It is distinguished from the lower level by having the more difficult and complex nature of assignments requiring a higher degree of specialized knowledge and experience and less guidance and supervision, by a greater independence in applying engineering principles and designing projects, and by developing, monitoring, and implementing a maintenance and repair program for communications equipment and systems. At this level employees provide close direction and monitor the developmental progress of the lower-level Analyst 1. This level is distinguished from the higher level by absence of responsibility for overall project leadership, and designing, developing, and applying state-of-the-art methods and procedures to unusually complex projects or projects of a system-wide nature involving multiple facilities and a specialized in-depth knowledge of engineering.

DUTIES AND RESPONSIBILITIES

1. **Communications System Development.** Typical tasks: evaluates/analyzes voice and/or data communications requirements of potential users; discusses system or equipment problems, limitations, or changing requirements with clients; employs an extensive knowledge of communications systems architecture and equipment to analyze the possible options and suggest viable solutions; prepares detailed technical proposals and cost analyses for the proposed system change or addition; presents documented proposals to Communications Systems Analyst 3 level and/or supervision in an oral or written format; participates in the planning, designing, and development of systems and equipment; makes recommendations for the evaluation and/or purchase of new equipment; performs specialized studies of a technical nature as directed, such as developing a feasibility study for interfacing potential users with the existing microwave network to provide new communications links throughout Oregon; performs the highest level of equipment design modification or development required in an electronics engineering-related field; constructs, assembles, tests, and documents new, highly specialized equipment.

2. **Equipment Installation, Modification, and Maintenance.** Typical tasks: the Communications Systems Analyst 2 employs advanced knowledge of electronic technology including analog, digital, and radio frequency generation techniques to install, modify, maintain, repair, and operate complex equipment used in a communications system which includes microwave transmitters, receivers, and common equipment (e.g., combiners, multiplex equipment, baseband switching equipment,

microprocessor-based alarm and control systems) data transmission equipment, telephone station equipment, mobile repeater stations, base stations, vehicular radios, portable radios, battery charging systems, emergency power generating systems, and a wide variety of fixed and mobile antennas; reviews technical data, manuals, and schematics to become familiar with the characteristics and operation of all equipment; uses complex schematic diagrams to follow signal paths; uses test equipment (e.g., signal generators, oscilloscopes, spectrum analyzers, selective level meters, transmission impairment measurement sets, digital communications protocol analyzers, frequency counters, power meters, etc.) to troubleshoot and repair equipment and systems, and test new equipment; uses a disciplined, analytical engineering approach to problem solving while determining the defective circuit or system component; makes necessary measurements or observations and interprets the collected data to determine the appropriate course of action; develops original solutions for the effective diagnosis of system degradation and restoration of system performance specifications; consults with Communications Systems Analyst 3 and users to determine the need for and characteristics of modifications necessary to obtain or maintain operational standards (modification may require original design and construction of custom components and/or subsystems); performs independently-planned maintenance services at central and remote facilities to ensure the continual integrity of operation and compliance with equipment specifications and FCC rules and regulations; works with safety around high voltages and non-ionizing radiation levels; makes repairs to equipment and systems in emergency situations where limited time and resources require innovative problem solving techniques; determines radio frequency path conditions, assesses antenna radiation patterns and document performance by field strength measurements; performs initial tests on new equipment to determine compliance with purchase specifications; installs equipment and performs tests necessary to insure that it is in compliance with system objectives and applicable Federal Communications Commission Rules and Regulations.

3. **Miscellaneous.** Typical tasks: updates expertise and skills through continued formal education, technical seminars, and self-directed studies; establishes and maintains contact with peers in associated technical, scientific, and electronics engineering-related fields to exchange and update information and findings.

RELATIONSHIPS WITH OTHERS

Employees in this class are in daily telephone or in-person contact with various levels of agency staff and staff from other agencies to respond to inquiries, consult on services, install new equipment, and perform maintenance on existing systems and equipment. They have weekly contact with personnel of other State and Federal agencies, and other public entities to provide technical support and maintenance on shared communication systems. Employees intermittently telephone equipment vendors and manufacturers to exchange technical information on equipment specifications, performance, and operation.

SUPERVISION RECEIVED

Employees in this class receive general supervision from a unit supervisor who formally reviews work annually, and randomly confers with the communications system clients to determine quality of work and system reliability. Due to the large geographical area of Oregon, some employees are permanently stationed in specific areas of the state and others travel extensively statewide, with limited access to supervision. Employees in this class work independently or as part of a team. They are expected to be able to take direct action based on independent decisions in all situations, including the most technically demanding situations. Employees independently initiate emergency repairs or modifications of equipment to assure continuous operations until permanent solutions can be found. Guidelines used by employees in

performing the work of this class include Federal Communications Commission Rules and Regulations establishing technical standards and licensing requirements for communications systems. Oregon statutes and administrative rules establish procedures for procuring parts and equipment.

GENERAL INFORMATION

The work of this class is generally performed wherever the equipment is located. This may include base station, repeater, or microwave equipment service at remote mountaintop sites; telephone station equipment and data transmission equipment in an office environment; or vehicular equipment servicing at roadside, stockpile sites, or section management yards. Employees in this class must have the willingness to work under occasionally severe environmental conditions and temperature extremes. It is often necessary to use four-wheel drive vehicles and/or snowcats to reach remote communications sites during the winter months. Occasional snowshoe travel may be required.

KNOWLEDGE, SKILLS, AND ABILITIES (KSA)

Extensive knowledge of electronic and FM radio theory and practices as applied to two-way radio and microwave systems.
Extensive knowledge of solid state electronic theory and troubleshooting techniques.
General knowledge of microwave systems.
General knowledge of AM radio theory and practices.
General knowledge of digital logic theory and applications.
General knowledge of antenna and transmission line and propagation theory.
General knowledge of mathematics as applied to electronics.
General knowledge of the Federal Communications Commission Rules and Regulations pertaining to Public Safety Radio Services, microwave radio services, data communications, and telephone systems.
Basic knowledge of microprocessor theory and circuits.
Basic knowledge of data communications theory and practices.
Basic knowledge of telephone circuits and systems.

Skill in the troubleshooting and repair 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 operate communications equipment in accordance with Federal Communications Commission Rules and Regulations.
Ability to install and align various antenna systems including microwave dish antennas.
Ability to work independently of direct supervision.
Ability to develop and train entry-level technicians.
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 work in all weather conditions and traverse deep snow, on foot or on snowshoe.
Ability to operate a four-wheel drive vehicle and a snowcat.
Ability to lift and carry a load of 50 pounds over uneven terrain.
Ability to apply scientific and engineering principles to independently resolve problems.

SPECIAL QUALIFICATIONS

Ability to secure and maintain a valid Oregon Driver's License.

Possession of 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.