

Position Classification Standard for Irrigation System Operation Series, GS-0459

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SERIES DEFINITION

This series includes positions that involve the management or operation of irrigation systems, where the work requires primarily knowledge of the methods and procedures used in distributing, controlling, and measuring irrigation water.

This standard supersedes and is to be substituted for the standard for the Irrigation System Operation Series, GS-0459, issued in April and October 1958 and revised in October 1960,

COVERAGE OF SERIES

Irrigation system operators are concerned with all phases of the control and movement of water from the source of supply through main canals (or conduits), through regulating and holding basins, into laterals and ultimately to the point where the water user takes charge of the water supplied. The work includes determining water users' requirements; preparing water release and delivery schedules; recording and reporting data relating to the operation and maintenance of irrigation systems; controlling flow and release of water at delivery points by means of the various regulating features in the irrigation systems; measuring and recording quantities of water delivered; enforcing terms of agreements, contracts or conditions in contracts related to the delivery and payment for water; making crop censuses and water use surveys, and recording hydrologic and weather data for program planning.

The duties of some positions may also include managing and directing the work of mechanics, repairmen, equipment operators, and laborers engaged in the maintenance and repair of irrigation systems. Some irrigation system operators also perform limited operational and emergency maintenance and repairs while engaged in irrigation operation functions. During the off-irrigation season on some systems, operators perform a variety of maintenance and repair duties on the system, including electrical and hydraulic equipment such as pumps, gates, valves, and meters.

In irrigation work there also is a security aspect. Operations include responsibility for safeguarding adjacent lands, properties, and persons against damage or danger from overflow, seepage, or canal breaks, and the protection of the facility from right-of-way encroachments by unauthorized persons or by livestock; misuse of roadways along canals; and vandalism or tampering with measuring devices, water control devices, or other equipment.

EXCLUSIONS

Positions that are essentially identified with other occupations by the nature of the paramount qualifications required and the primary emphasis of the work are excluded from the Irrigation System Operation Series.

1. Positions concerned primarily with the design, construction, and operation of irrigation systems where the emphasis of the work requires primarily engineering knowledges are classified in the [Civil Engineering Series, GS-0810](#), [Engineering Technician Series, GS-0802](#), or other appropriate series.
2. Positions that involve performing, supervising, or inspecting work in trades, crafts, or equipment operation, which requires primarily knowledge and experience in a trade, craft, or manual laboring occupation are excluded from the General Schedule system. Such positions are classified and graded under the [Federal Wage System](#).

BACKGROUND INFORMATION

An irrigation system is a composite of canals, laterals, structures, and equipment involved in the transport of water from where it is available to where it is required. The larger the volume or capacity of the irrigation system, and the more sophisticated its various supporting components, the greater is the skill that is required to operate and maintain it. However, occasionally even in a small and relatively unsophisticated system in an area with such existing problems as land subsidence, flash floods, etc., considerable knowledge and skill may be required to operate and maintain it. Each irrigation system is custom built to fit the particular conditions in which it is located. A great number of factors affect their design and operation-topography, climate, water supply, the local economy, and the nature of the agriculture and industry of the area.

Irrigation systems are run by teams of irrigation system operators. The members of the team must be reliable and responsible, able to use diplomacy, and not prone to panic when they run into such problems as equipment failures, power outages, canal bank failures or irate water users. Because each system is in many respects unique, effective and efficient operation depends on each irrigation system operator knowing how to balance his portion of the system to deliver water as required. Operators must know how their operations fit in and are affected by or affect other portions of the system. Basically, operators must learn by experience the peculiarities of a particular system and it is this knowledge that makes them most effective.

Irrigation operations are a cooperative endeavor of water users and operators. The operators must know something of the problems of the water user. For example, lettuce may require water within 6 to 8 hours if the crop is not to be lost; at certain seasons of the year 18 hectares (40 acres) of lettuce may have a dollar value of approximately \$100,000. It is particularly helpful if operators know when the water user needs water and when he may have made a mistake in ordering water. In such situations, operators usually exercise tact and diplomacy and make a discreet inquiry on the water user's intention. Irrigation operators must also be able to communicate the necessary information on operating problems to the water users so that they can plan their schedule accordingly. The operators are the agencies' field representatives in the case of accidents. They are the witnesses, the eyes and ears of the agencies, and must be able to write an accurate report of what has happened.

Irrigation operation work is usually very confining. Frequently during the irrigation seas on operators must be on standby 24 hours a day so that in an emergency requiring their services they can be reached. They work in all kinds of weather and must know the terrain they cover

well enough to drive trucks along the banks of canals at night in heavy weather and fog. They also do minor maintenance, to the extent time permits, I. e., remove dogs, deer, and cattle (dead or alive) from the canal, and clear other debris from trash racks.

In the final analysis, it is the operators in the field observing existing conditions at particular locations who must evaluate them, and make the judgments and the critical adjustments necessary to a safe and effective operation of the systems. Generally, radio communications are used in irrigation systems; however, atmospheric conditions do not invariably permit radio communication with higher levels in the organization.

TITLES

The authorized title for nonsupervisory positions in this series is *Irrigation System Operator*. For those positions which involve [supervision](#) over others and require supervisory qualifications, the title is obtained by adding the prefix Supervisory. For positions at GS-9 and above with managerial responsibilities the title is *Irrigation System Manager*.

CLASSIFICATION CRITERIA

Grade levels are determined and defined under two broad factors: Nature of Assignment and Level of Responsibility. Qualification requirements are not described separately, but are reflected as appropriate in both the nature of assignment and responsibility factors.

Nature of Assignment

This factor includes the scope and difficulty of the projects and the skills and knowledges required to complete the assignments.

At lower levels irrigation operators usually regulate the flow of water in a portion of a system. The size of their "beats" is based on the amount they can adequately and efficiently cover in a day. At higher levels operators control and deliver water within a subdivision or a division of a total system. Normally, they make a weekly inspection of the portion of the system for which they are responsible. These inspections give them an understanding of changing conditions, such as the growth of moss which would retard the rate of flow of water. They must consider such factors in scheduling and controlling operations.

Level of Responsibility

This factor includes consideration of such aspects as authority to select a course of action, the nature of supervision received, scope of decisions, nature and purpose of contacts with the public and public officials, and (where significant in terms of exercising responsibilities) the knowledge and personal abilities.

The extent to which the technical judgments of operators are relied upon without detailed review, and the personal contacts they maintain with others are important considerations in determining level of responsibility.

At lower levels, the availability of specific and detailed established procedures and the relatively close supervision received are of primary significance. At higher levels, the freedom to plan and execute assignments and independently coordinate the work with other individuals and groups is more frequently to be considered. Irrigation system operators may serve as team leaders, and occasionally give directions to maintenance working parties.

In order to perform adequately, operators must be reliable and dependable, and quick to interpret and react to changes in water conditions. In addition, they must have a sufficient knowledge and understanding of local farm and industrial problems required to deal with the people served by the irrigation system.

EVALUATION NOTES

The grade-level criteria in this standard cover positions in grades GS-2 through GS-7. Although positions at GS-6 and GS-7 may involve supervision of a variable number of employees, the responsibility for a portion of an irrigation system provides the most appropriate basis for determination of grade levels. Positions above GS-7 should be evaluated by extrapolation from the criteria in this standard with the application of sound position-classification judgment. For supervisory positions, the [General Schedule Supervisory Guide](#), should also be used, as appropriate. However, most positions at the higher levels involve managerial and related functions not adequately covered by that Guide.

The distinguishing factors used to determine levels are broad indicators of the levels of job difficulty. They must be applied with the application of sound classification judgment and particular attention to the level and nature of the work performed in individual positions. Since each irrigation system has some unique features and characteristics, the user of the standard is expected to go beyond the typical examples furnished, and to take into account the total duties and responsibilities of the position, the qualifications required, and other pertinent factors. No one factor is grade determining. The factors should be weighed and considered in combination.

GRADE LEVEL DEFINITIONS

IRRIGATION SYSTEM OPERATOR, GS-0459-02

Nature of Assignment

This is an entry level. Irrigation System Operators GS-2 accompany higher grade operators and carry out a variety of simple repetitive tasks, such as:

1. Performing specified manual tasks in the assembly or installation of instruments or equipment.
2. Performing other simple manual tasks. Assignments include training to provide knowledges and skills important in irrigation system operations.

Level of Responsibility

GS-2 operators work under close supervision. New methods or tasks are demonstrated once or several times if necessary. Work is spot-checked in progress and upon completion. Contact with the public is not a significant part of assignments at the GS-2 level.

IRRIGATION SYSTEM OPERATOR, GS-0459-03

Nature of Assignment

GS-3 operators perform a variety of duties, typically without responsibility for operating a portion of an irrigation system or beat. GS-3 operators apply knowledge of detailed procedures which are established and repetitive or which are described in detail by supervisors, plus some readily-acquired skills and knowledge of irrigation systems. By comparison, GS-2 operators are not required to apply knowledge of procedures or systems.

The following tasks are illustrative:

- Examines instruments and equipment to detect apparent malfunction.
- Operates simple test instruments and controls used in standardizing metering devices.
- Reads metering devices and records data.
- Makes and records scheduled deliveries of water in accordance with specific instructions.
- Performs minor operating maintenance.
- Observes irrigation channels for such conditions as breaks, seepage, and weed growth.

GS-3 operators generally are given rotating assignments to give them a broad practical knowledge of irrigation subsystems and their operation. By comparison, GS-2 operators receive assignments that are limited in variety and less demanding.

Level of Responsibility

Irrigation System Operators GS-3 receive complete detailed instructions at the beginning of each assignment covering the limits of their assignment work methods, available equipment, relationships with the public and water users, safety practices and procedures, and the care and use of equipment employed in irrigation systems operations. These instructions are more complex and voluminous than is typical for positions at grade GS-2. The supervisor is available for instruction and guidance at any time. GS-3 operators are expected to perform recurring tasks under supervision which gradually lessens, until the more routine recurring tasks are only infrequently spot-checked or observed. The less routine tasks are occasionally checked in progress as well as upon completion.

Contacts at GS-3 usually are limited to answering questions from the public for general information related to the system, whereas at the GS-2 level, contacts are not a part of the assignment. GS-3 operators have occasional minor contacts with water users, e. g., to inform users when water will be turned off for repairs.

IRRIGATION SYSTEM OPERATOR, GS-0459-04

Nature of Assignment

Irrigation System Operators GS-4 typically have responsibility for a beat, that is, an assigned portion of an irrigation system, GS-4 operators must apply background of knowledge of local irrigation practices and techniques in carrying out a varied series of standardized or recurring tasks on a beat. By comparison, GS-3 operators typically do not have responsibility for a beat. Assignments of GS-4 operators, however, do not require skill in highly specialized operating techniques, or ability to deal with complex environmental situations.

GS-4 irrigation system operators perform a variety of operating duties which require a basic background of knowledge of the methods used to regulate and deliver water. The portion of the system for which the operator is responsible usually operates within design capacity and main laterals have waste ways for disposal of excess water thus reducing or limiting damage to adjacent areas. Few water loss problems are present in the system. Water can be delivered through the system without use of intermediate pumps.

Operators regulate and deliver water through canals and laterals to individual water users where deliveries are made on modified demand or by other methods which require operators to determine the quantity and scheduling of water to be ordered into their beats, and to adjust individual deliveries to meet water users needs.

Level of Responsibility

The routine work of the GS-4 operators is not subject to detailed review, whereas at GS-3 the routine work is reviewed by the supervisors. The work of GS-4 operators is spot-checked to determine that knowledge of methods and procedures is adequate, that they are being applied, and for progress on completion of the work. Explicit instructions for solving technical problems which are not routine are given by the supervisor. The supervisor is usually available by telephone or radio.

GS-4 operators have contact with water users to: collect water orders and water requirements data; to advise users when water will be turned on or to advise of changes in delivery schedules; and to obtain data pertaining to crop censuses. By comparison, GS-3 operators have only occasional contacts primarily to transmit specified

IRRIGATION SYSTEM OPERATOR, GS-0459-05

Nature of Assignment

Irrigation System Operators GS-5 are assigned systems that require depth of knowledge of the irrigation cycle and procedures. Environmental aspects complicate operations, such as added danger of bank washouts arising from soil conditions, or which may necessitate the operation of the system at or over design capacity for one or two months a year. The variables present in the system result in GS-5 level operations not being standardized, or predictable as at the GS-4 level.

The focus of the efforts of GS-5 operators is to operate that portion of the system for which they are responsible in such manner as to reduce the probability of a break in the canals or other failures that would disrupt the system, endanger life or property, or delay the scheduled delivery of water. To this end, GS-5 irrigation system operators must have a thorough knowledge of special problems inherent in the irrigation system and the subdivision of the system to which they are assigned. They also require a thorough knowledge of the highway and road network providing rapid access to the system.

Because of the nature of the system, GS-5 operators are confronted with frequent opportunities for trouble. They must be especially alert to detect indirect evidence and incipient signs of canal or structure failure, I. e., water in borrow pits or outside lateral banks, excessive seepage or wet areas in banks, leakage through gopher holes, plugged culverts, unusual settlement in banks or near structures, cracked concrete, and excessive erosion below checks or turnouts. By comparison, GS-4 operators are not confronted with as many hazardous conditions as a consequence of the nature of the system and environs assigned to them.

In scheduling water delivery, Operators GS-5 consider a variety of interrelated factors including the amount required, the capacity and condition of the system through which the water passes, losses in the system, weather conditions, and the need to avoid excel water which might be wasted. By comparison, GS-4 operators perform scheduling which is relatively uncomplicated.

Some GS-5 operators observe and maintain water delivery schedules through a main canal; regulate check structures in the canal to control silting and the pattern of the flow of water; make a physical check of operating facilities on the canal; inspect and check each automatic structure, siphon, and tunnel for security purposes; and maintain logs that are the basis for determining the amount of daily water deliveries.

Level of Responsibility

GS-5 operators serve under the general supervision of a higher level operator. At this level, the operators must recognize when established techniques of operation are not applicable, or the existence of conditions which require a change in scheduled operations. They may change procedures only after obtaining prior approval of a supervisor. Difficult problems are referred to supervisors for advice and assistance when the time permits. By comparison, at the GS-4 level, because of the nature of the irrigation system, such problems are rare and explicit instructions for solving technical problems which are not routine are supplied.

Usually, operators at the GS-5 level have more frequent contacts with the public or water users than at the GS-4 level. The nature of the systems to which GS-5 operators are assigned produce more such contacts. At GS-5 the size-and location of canals may attract fishermen, swimmers, or other trespassers along canal right-of-ways, and the operators are required to obtain identification from them and request them to leave for their own safety. On some projects the nature of the operations requires the operators at this level to maintain a continuous personal contact with water users on operational needs and policies.

IRRIGATION SYSTEM OPERATOR, GS-0459-06

Nature of Assignment

The work of GS-6 irrigation system operators differs from that at the GS-5 level in that GS-6 operators plan, organize, and direct the control and delivery of water to several different beats in a section or subdivision of an irrigation system. By comparison, GS-5 operators are more involved in seeing that the water gets to the user than in planning.

GS-6 irrigation system operators typically operate a portion of an irrigation system large enough to require several lower grade irrigation system operators to patrol separate beds. From time to time, GS-6 operators make on-site inspections of project facilities to determine the extent of needed repairs or alterations, and prepare job work orders for higher level approval. They schedule recurring minor operating maintenance, relating to the efficient operation of the system, such as control of weeds, rodents, silt, or wind erosion.

Some water control problems are present in the irrigation system because of variations in the rate of seepages, evaporation, mousing, and flash floods, or because of the effect of design and age on the operation of the system. Varying crops, weather conditions, or operating characteristics within the portions of the system require the operators at this level to make adjustments, and to use judgment in ordering water and in adjusting the rate of flow of the water to insure that water

users as nearly, as possible receive the quantity of water they need at the time it is needed. The work is more demanding than at grade GS- 5 in terms of breadth of required knowledge and the judgment required to evaluate and interpret situations.

Some Irrigation System Operators GS-6 are responsible for the operation of major plant systems such as diversion dams, electronically-controlled diversion gates, or other facilities that require special operating procedures, where accurate measurement and control of the quantity of water delivered is important in order to prevent major damage to property and danger to life. GS-6 operators with these assignments are responsible for monitoring the alarm systems and adjusting subsidiary systems in order to prevent damage to the total system. The operators are expected to follow prescribed procedures, or in unusual situations to be capable of using judgment in selecting alternate steps to take to correct the problems causing the alarm.

Level of Responsibility

GS- 6 operators are expected to maintain a constant review of the effectiveness of operating practices and make recommendations for the improvement of standard practices. In order to perform this and other aspects of their assignment they must keep informed of water users attitudes, crop patterns, and irrigation practices which might affect operating decisions.

GS- 6 operators have delegated authority to resolve administrative and operational public relations problems that arise. However, the operators' supervisors are readily available by telephone or radio, and can be consulted on especially difficult public relations or operating problems.

Also, when the water available is inadequate to meet all requests, they may consult their supervisors on the apportionment of the water to the various users. In the absence of the supervisors, precedent serves as a general guide to appropriate action to take in distributing the water among users.

The supervisor establishes work schedules, hours of work and tours of duty, and furnishes policy direction on the technical and administrative aspects of the work. The work of GS-6 operators is reviewed for compliance with established policies, techniques, operational procedures, related to the physical conditions of the system, and the adequacy of services furnished water users. GS-6 operators have freedom to take action and to change those operating procedures which they deem necessary as long as the changes fall within the broad procedures and patterns set by the supervisor. By comparison, GS-5 operators obtain prior approval for changes in procedures.

GS-6 operators discuss subdivision water operations with representatives of water users. The discussions cover such problems as the advanced ordering of water, the scheduling and measurement of water deliveries, and scheduled repairs planned for the system. They also deal with county or other local officials on problems related to the protection of the facilities, the administration of public recreation in reservoir areas, or other projects related to the maintenance and operation of the irrigation systems that are of interest to these.

IRRIGATION SYSTEM OPERATOR, GS-0459-07

Nature of Assignment

GS- 7 operators schedule and coordinate the operations of the more complicated subdivisions of irrigation systems. Operators GS-7 use the same methods and procedures as operators at the GS-6 level, but planning is more complex than at the GS-6 level because the scope of operations is greater and more variables are present. They are expected to schedule their time and effort on the various phases of the assignment in such a way as to realize maximum results. Routinely, they modify their day-to-day work plans to contend with weather changes, requests for additional water or the cancellation of water orders, or operating difficulties, such as equipment failures, which arise unexpectedly.

The irrigation systems which GS-7 operators are concerned with have some features which add to the complexity of the operation and normally are not assigned to operators at GS-6. The significant presence of one or more of the following complications is typical of the GS-7 level:

- The system has limited facilities for wasting or disposing of excess water when operating at peak loads, or in disposing of peak runoffs from storms.
- The system is in an area having a variety of soils with different rates of seepage, complicating the problem of compensating for water lost through seepage.
- The system presents extra of bank breaks in canals because the soils are particularly susceptible to erosion.
- The water demands in the area result in rigorous delivery schedules through systems without regulating reservoirs to provide reserve storage capacity within the system.
- The system must operate at or above design capacity for extended periods of time to meet water users' needs.
- Water rights existing prior to the development of the irrigation system require release of a fixed amount of water to meet these water rights and fish life requirements in addition to supplying water for irrigation needs.

Irrigation System Operators GS-7 are expected to have sound judgment and a thorough knowledge of management's policies for water regulation and delivery within the subdivision for which they have responsibility. They must have a general understanding of all phases of irrigation operations and a particular knowledge of the water users' needs. Where the system requires a team of three or four lower grade irrigation operators to continually patrol the system, the GS- 7 operators as team leaders keep in touch with them by radio or telephone and assist them with advice relative to difficult problems encountered on their tours.

Level of Responsibility

Supervisors of GS-7 operators furnish general information and advice concerning the organization and operations of the subdivision; establish operating policies and procedures; and interpret instructions from higher levels in the organization. The supervisors make occasional visits and inspect the system to note any major operational or public relations problems, and to offer advice if required. The supervisor also reviews reports for adequacy of results and compliance with established practices and procedures. By comparison, GS-6 operators receive assistance on difficult problems.

The contacts of GS-7 operators are similar to those of GS-6 operators but involve more complex problems, e. g., on the apportionment of inadequate water supplies.