

U.S. Office of Personnel Management  
Division for Human Capital Leadership & Merit System Accountability  
Classification Appeals Program

Atlanta Field Services Group  
75 Spring Street, SW., Suite 1018  
Atlanta, GA 30303-3109

**Job Grading Appeal Decision**  
**Under section 5346 of title 5, United States Code**

**Appellant:** [appellant]  
[appellant]

**Agency classification:** Electronics Mechanic  
WG-2604-11

**Organization:** [organization] Section  
[organization] Branch  
[organization] Division  
[organization]  
Department  
Marine Corps Base  
Department of the Navy  
[location]

**OPM decision:** Electronic Industrial Controls Mechanic  
WG-2606-11

**OPM decision number:** C-2606-11-03

/s/ Marta Brito Pérez \_\_\_\_\_

Marta Brito Pérez  
Associate Director  
Human Capital Leadership  
and Merit System Accountability

May 18, 2005 \_\_\_\_\_  
Date

As provided in section S7-8 of the *Operating Manual: Federal Wage System*, this decision constitutes a certificate that is mandatory and binding on all administrative, certifying, payroll, disbursing, and accounting officials of the government. There is no right of further appeal. This decision is subject to discretionary review only under conditions and time limits specified in section 532.705(f) of title 5, Code of Federal Regulations (address provided in the *Introduction to the Position Classification Standards*, appendix 4, section H).

Since this decision changes the grading of the appealed job, it is to be effective no later than the beginning of the first pay period that begins after the 60th day from the date the appellant filed an appeal with the agency (5 CFR 532.705(d)). The servicing human resources office must submit a compliance report containing the corrected job description and a Standard Form 50 showing the personnel action taken. The report must be submitted within 30 days from the date of this decision.

**Decision sent to:**

[appellant]  
[address]  
[location]

[appellant]  
[address]  
[location]

[name]  
Human Resources Officer  
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## **Introduction**

On August 20, 2004, the Atlanta Field Services Group of the U.S. Office of Personnel Management (OPM) accepted a job grading appeal from [appellant] and [appellant] who occupy identical jobs graded as Electronics Mechanic, WG-2604-11. The appellants request that their job be graded as Electronic Industrial Controls Mechanic, WG-2606-12. They work in the [organization] Section, [organization] Branch, [organization] Division, [organization] Department, Marine Corps Base, Department of the Navy, [location]. We accepted and decided this appeal under section 5346 of title 5, United States Code (U.S.C.). We received a complete administrative report for the appeal on September 7, 2004.

## **Background**

One of the appellants filed an appeal with OPM in 1994 for his job as an Instrument Mechanic, WG-3359-11. OPM certified the job as an Electronics Mechanic, WG-2604-11. Since that time, an advanced wastewater treatment plant was constructed at the installation and the appellant was reassigned to a new updated job description which identifies new job complexities. The appellants filed an appeal to their agency. Its decision, issued on July 9, 2004, sustained the occupational code and grade of the jobs. They subsequently appealed to OPM.

The appellants believe that the 2604 occupation is inappropriate for their job because it covers equipment (ground, airborne, and marine electronic equipment, such as radio; radar, sonar, cryptographic and similar devices) which their organization does not maintain, repair or service. They believe that that the 2606 occupation more appropriately covers the electronic control and monitoring systems for which they are responsible.

Both the appellants and their supervisor certified the accuracy of the job description (JD), number [#]. In reaching our job grading decision, we have carefully reviewed all information furnished by the appellants and the agency, including their official JD and information obtained from a telephone audit of the appellants' job. We also interviewed the appellants' first level supervisor, an Industrial Equipment Mechanic Supervisor I, their second level supervisor, a Utility Systems Operator Supervisor II, and the activity's Deputy Public Works Officer. We find that the JD of record contains the major duties and responsibilities assigned to and performed by the appellants and we incorporate it by reference into this decision.

## **Job information**

The appellants' duties involve diagnosing, installing, modifying, repairing, and replacing complex electronic control, monitoring and indicating systems and subsystems at the installation's wastewater treatment plant which is approximately seven years old. Their responsibilities include monitoring wastewater treatment operations, electronic control systems, and pumping equipment at various locations at this installation.

The electronic systems and associated subsystems that the appellants work on use radio telemetry to remotely control, centrally monitor and indicate the various operations and

processes carried out by the 130 sewage/wastewater lift stations, wastewater collection system pumping equipment, and the water and wastewater treatment equipment. The treatment plant is capable of treating up to 15 million gallons of wastewater per day that is produced by the more than 60,000 residential and industrial users located at the installation. The plant includes a series of treatment systems such as primary and secondary clarification systems, anaerobic, anoxic and aerobic systems, a post aerobic anoxic system, second stage aeration system, filtration system, reaeration system and an ultraviolet disinfection system. Each system has logic controllers with inputs and outputs that control operations, monitor activity, determine activity sequence and length of time and receive instructions from mainframe computers. These systems also have dual (primary and secondary) data paths to ensure that required operations continue until a mechanic can effect repairs if a system fault occurs. The "aquatrol" system is representative of the electronic control and monitoring systems for which the appellants are responsible. This system controls and monitors the 130 sewage lift stations involved in wastewater treatment operations. This computer controlled system monitors sewage wetwell levels, flow rates, temperature and current at each station. The system also monitors the position of equipment switches and valves (on or off, etc.), whether a station is operating on commercial power or the backup generator, and unauthorized intrusion. Information recorded by the system includes how much sewage the station processed, the length of time various processes operated and whether or not they were successfully completed, etc. This system transmits messages to a mainframe computer identifying stations that are experiencing problems.

The appellants also work on swing bridge controls, alternating current measuring devices, telemetry and network controlled systems, and a variety of other electronic systems and equipment located at the installation. They serve as technical advisors to in-house engineering staff and contractor technical personnel and provide detailed information on the workings of the plant's electronic control systems. This information covers matters related to their experiences with current and past problems, "workarounds" and solutions they developed to resolve problems, system peculiarities, methods that were expected to work but did not, etc. The appellants also participate, on an ad hoc basis, in discussions of systems issues with design engineering staff who prepare solicitations for bids on contracts to repair, replace, or upgrade equipment.

The appellants work under the supervision of the Industrial Equipment Mechanic Supervisor I who assigns work orally and through written instructions outlining the purpose of the work. The appellants are responsible for independently determining the nature of the problems involved, repairs required, and the methods, materials, and procedures required to accomplish the work.

### **Occupational code, title, and standard determination**

The 2604 job grading standard (JGS) covers nonsupervisory jobs involved in fabricating, overhauling, modifying, installing, troubleshooting, repairing, and maintaining ground, airborne, and marine electronic equipment, such as: radio; radar; sonar; cryptographic; satellite; microwave; micro computers and peripherals; laser; infrared; industrial x-ray; marine, aeronautical, and space navigation aid; TV receiver; surveillance; and similar devices. The work requires knowledge of electronic principles; the ability to recognize improper operation, locate

the cause, and determine the best method to correct the defect; and the skill to disassemble, assemble, and adjust electronic equipment.

The Introduction to the Electronic Equipment Installation and Maintenance Family 2600 provides additional information on coverage of the various occupations in the 2600 job family. It states that the broadest coverage of electronics work is found in the 2604 occupation and that other occupations provide more specific criteria. It further states that that if a job does not match the specific criteria of one of the other occupations, it should probably be placed in the 2604 occupation.

The 2606 JGS covers work involved in the installation, maintenance, troubleshooting, repair, and calibration of electronic controls, indicating, and recording systems used in industrial machinery and other equipment. The work requires knowledge of the practical application of electronics theories and circuits that are applicable to power, timing, motion control, indicating devices, and pulse and counting mechanisms. This includes special purpose digital computers (microprocessors) dedicated to control functions, as well as knowledge of industrial equipment operation and processes.

The appellants' work primarily involves work on electronic control, indicating, recording systems, sensing devices and equipment controlled from a mainframe computer. The systems and equipment worked on includes motion detectors and controllers, logic controllers and subsystems, and devices using radio telemetry to communicate with the mainframe computer. The work performed and the systems and equipment knowledge required is comparable to that covered by the 2606 JGS. The work also requires similar occupational knowledge of the industrial equipment and processes used at the installation's water/wastewater treatment plant. The appellants' jobs match the specific criteria of the 2606 occupation. Therefore, the appealed job is properly allocated as an Electronic Industrial Controls Mechanic, WG-2606. The 2606 JGS must be used for grade determination.

### **Grade determination**

The 2606 occupation uses four factors for grade determination. The four factors are: *Skill and knowledge, Responsibility, Physical effort, and Working conditions.*

#### *Skill and knowledge*

At grade 11, Electronic Industrial Controls Mechanics work on highly complex systems which require a thorough knowledge of logic circuits, electronic amplification and control circuits, and of complex electrical, mechanical, hydraulic, and/or pneumatic systems. They must be skilled in the interpretation of engineering drawings that combine electrical and electronic schematics, logic diagrams, and mechanical drawings in order to trace signal flow throughout the system while troubleshooting malfunctions of complex systems, such as a numerically controlled (NC) machining center with adaptive control. For this type of system, the signal must be traced in digital logic form from the part program in the tape reader through the central processor, in electrical and mechanical form through the machining center to the tool, in electrical and then

digital form to the adaptive control micro-processor, and then as a digital input to modify the commands from the central processor.

Grade 11 mechanics must know the characteristic voltage, current, and signal shape of the input and output of a wide variety of microprocessors, integrated and discrete solid state circuits, and high power vacuum tube or transistor applications in order to recognize indications of improper operation and differentiate them from temporary anomalies introduced by the testing itself. The mechanic must be skilled in the interpretation of installation and repair instructions which describe only general applications for the various components of the specific system, since the various components are often produced by many manufacturers with differing design philosophies. Examples of this include when new numerically controlled (NC) units are retrofitted onto older machines, or when environmental monitoring and control system (EMCS) controls are connected through customized interface devices to electrical, mechanical, pneumatic, or hydraulic controls of components which vary greatly in operating theories and operating tolerances as a result of differing age, purpose, and manufacturers' practices. To troubleshoot these, mechanics use Boolean algebra to construct truth tables and logic equations for analysis of logic circuits and the ability to program simple test instructions in the tape language or on an input console to check out particular circuits or functions.

The grade 11 level is met. Comparable to this level, the appellants' work requires knowledge of the plant's control processes and skill in interpreting engineering drawings that combine electrical and electronic schematics, logic diagrams, and mechanical drawings that identify signal flow throughout the system. In performing the work, the appellants use a thorough understanding of circuit elements, operation of individual circuits, circuit interfaces, interrelationships, and interaction, digital data transmission, signal flow, etc., of the systems they are responsible for installing and repairing. For example, they use computer based software to troubleshoot, test and modify computer program "ladder logic" to correct the actions of malfunctioning control and monitoring system components. As at the grade 11 level, the appellants' work requires a high degree of skill in the interpretation of manufacturers' instructions on the proper installation and repair of their products. These instructions are very general in nature and do not specifically address systems, such as those at the wastewater treatment plant, comprised of a variety of components produced by numerous manufacturers. In many instances, the appellants work on systems whose components have been significantly modified due to changing requirements, age, or the end of production of replacement parts. The appellants cited as an example their requirement to troubleshoot a system that was experiencing major malfunctions following the installation of new equipment by a contractor. They determined that the new equipment had been improperly wired in relation to other components and was shutting down too quickly. This resulted in two instances of a 36 inch sewer line rupturing.

Comparable to the grade 11 level, the appellants use a wide variety of test equipment (oscilloscopes, multi-meters, PH analyzers, various calibrators, frequency generators, etc.) to troubleshoot, isolate, identify and test repaired system components. They respond to "general" system alarms reported through the plant's mainframe computer by malfunctioning individual systems. These computer generated alarms only indicate that some type of malfunction requiring attention has occurred.

At grade 12, the work requires extensive theoretical and practical knowledge of operation, capabilities, and limitations of electronic control equipment and systems. The mechanics must have skill in applying this knowledge to understand new or extensively modified systems in order to improvise alignment, repair, and operating procedures that will be efficient, complete, and compatible with available resources. The work may require constructing interface devices and modifications to the equipment from sketches and verbal instructions in order to refine the new system operations. Grade 12 mechanics must use ingenuity in the application of shop and trade practices to solve operating and repair problems. For example, they may have to improvise troubleshooting procedures for an environmental control system in which a number of the major components were designed as independent systems with different engineering parameters and practices and that have been modified to accept central digital control. Mechanics at this level need practical knowledge of electronic theory and design and ability to use theoretical concepts to devise solutions for operating or repair problems on one-of-a-kind systems in which novel engineering approaches have created unforeseen problems. They exercise skill in interpreting electronic, electrical, and mechanical drawings, specifications, and schematics of complete custom systems such as a new automated warehouse materials handling system with numerous remote units and functions that must be coordinated or similar involved subunits that create and use many interlocking signals. They require skill in troubleshooting complex electronic systems characterized by unusual circuit arrangements and theories and lack of developed documentation.

The grade 12 level is not met. The appellants' work involves responsibility for troubleshooting, installing, repairing, and testing highly complex electronic control systems, but does not involve work with the new or significantly modified systems characteristic of grade 12 level work. The primary focus of the appellants' work is to maintain the operational status of the water/wastewater treatment plant. This plant is a mature facility which has been in operation for approximately seven years. As a result, the appellants are not typically required to deal with new or extensively modified systems or new or improvised alignment, repair, and operating procedures to ensure compatibility with existing equipment or systems as found at the grade 12 level. A significant amount of the appellants' time is spent repairing and modifying equipment, and developing "workarounds" because certain items are no longer in production or are no longer supported by the manufacturer. This type of repair and modification is consistent with grade 11 work. Unlike the grade 12 level, it does not require practical knowledge of electronic theory and design or ability to use theoretical concepts to devise solutions for one-of-a-kind systems having novel engineering approaches.

This factor is credited at the grade 11 level.

### *Responsibility*

At grade 11, the mechanics receive work assignments from the supervisor in the form of written work orders and inspection reports and oral instructions. They plan the work sequence and determine that equipment meets the requirements for serviceability, especially when working in remote user locations. They work in accordance with available drawings, technical orders, or specifications. Work assignments at this level require judgments and decisions regarding the methods and procedures for completing assignments. This may involve extending the use of



conventional tools and equipment, and improvising changes to techniques and procedures to reach specified parameters when aging of components or modification of circuits have changed operating conditions. The mechanics are responsible for knowing and judging the impact of repairs, i.e., the effects that changes and adjustments will have on the related integral devices of the equipment serviced. They are also responsible for making further tests and alignments to insure that the completed equipment is aligned and functioning properly. The mechanics at this level must keep abreast of technological changes in the occupation, and provide technical guidance and assistance to lower grade employees. Technical advice is available on unusually difficult problems. Completed work is spot checked for compliance with accepted trade practices and specifications.

The grade 11 level is met. The immediate supervisor assigns work orally and in the form of written work tickets. The appellants are responsible for independently performing the work in accordance with available guidance in the form of detailed electronic schematic drawings, technical orders, blue prints, specifications and procedures. Similar to the grade 11 level, guidance on unusually difficult technical issues and problems is available from manufacturers' representatives when needed. Decisions and judgments as to the sequence of methods and procedures to use for completing assignments are the responsibility of the appellants. They are also responsible for determining the impact of any changes and adjustments they have made on related equipment and systems on the overall system. The review of the work is in terms of completeness and effectiveness in meeting operational requirements.

At grade 12, the mechanics exercise significantly more judgment and independence in determining the methods and techniques required to solve unusually complex installation and repair problems. For example, they independently judge the need for modification of test devices or work sequences, and for special or nonstandard trade techniques. They develop and submit for approval changes to detailed schematics, drawings, and maintenance procedures for use by lower grade employees. The grade 12 mechanics are required to keep abreast of technological changes in the occupation to understand new electronics theories and applications and provide technical guidance and assistance to lower grade employees. They coordinate their efforts with technical and professional personnel on matters affecting installation or operating specifications and changes to equipment. The supervisor assigns work orally and through written instructions that outline the purpose of the work and possible approaches. Work is reviewed by occasional spot checks, review of documentation developed, and successful check out of the equipment.

The grade 12 level is not met. The appellants exercise a high degree of technical judgment and independence in carrying out their normal work assignments. However, they are not routinely required to independently resolve installation and repair problems of the level of complexity envisioned at this level. Their work does not involve determining the need to modify test equipment, work sequences, or for special or nonstandard trade techniques. The appellants' work does not routinely involve developing and submitting changes to schematics, drawings or maintenance procedures be used by lower grade employees. When unusually difficult problems installation or repair problems are encountered, the appellants normally seek assistance from technical representatives of equipment manufacturers.

This factor is credited at the grade 11 level.

*Physical effort and Working conditions*

*Physical effort* and *Working conditions* are the same in the standard for all grade levels. Because they do not have grade level impact, and the appellants' work meets the levels described in the JGS, we will credit both factors as being met and will not address them further.

**Decision**

The appealed job is properly graded as Electronic Industrial Controls Mechanic, WG-2606-11.