

Job Family Position Classification Standard for Professional Work in the Physical Science Group, GS-1300

Series Covered by This Standard:

General Physical Science	GS-1301
Health Physics	GS-1306
Physics	GS-1310
Geophysics	GS-1313
Hydrology	GS-1315
Chemistry	GS-1320
Metallurgy	GS-1321
Astronomy & Space Science	GS-1330
Meteorology	GS-1340
Geology	GS-1350
Oceanography	GS-1360
Cartography	GS-1370
Geodesy	GS-1372
Land Surveying	GS-1373
Forest Products Technology	GS-1380
Food Technology	GS-1382
Textile Technology	GS-1384
Photographic Technology	GS-1386

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COVERAGE

This standard provides series definitions, titling instructions, and grading criteria for nonsupervisory professional positions in the physical sciences. These are typically positions with positive education requirements.

This standard cancels and supersedes standards for the following occupational series: General Physical Science Series, GS-1301; Health Physics Series, GS-1306; Geophysics Series, GS-1313; Hydrology Series, GS-1315; Chemistry Series, GS-1320; Metallurgy Series, GS-1321; Astronomy and Space Science Series, GS-1330; Meteorology Series, GS-1340; Geology Series, GS-1350; Oceanography Series, GS-1360; Cartography Series, GS-1370; Geodesy Series, GS-1372; Land Surveying Series, GS-1373; and Photographic Technology Series, GS-1386.

In addition, this standard provides coverage for the following occupational series for which published standards do not currently exist: Physics Series, GS-1310; Forest Products Technology Series, GS-1380; Food Technology Series, GS-1382; and Textile Technology Series, GS-1384.

INTRODUCTION

The grading criteria in position classification standards are based upon the definitions of grade levels found in title 5, Chapter 51 of the United States Code, supplemented by information gained through occupational studies conducted by the U.S. Office of Personnel Management. Department and agency heads are responsible for classifying positions within the intent of these standards and may delegate that responsibility.

Positions are to be graded by comparing their duties, responsibilities, and qualification requirements to the grading criteria in one or more standards, sometimes called guides. This standard provides specific criteria for nonsupervisory positions from GS-5 through GS-15. Each position should be placed at the grade with the descriptive material that best represents it. The criteria includes appropriate language from the law, supplemented by more specific material. (The series criteria applies to all positions--research, development or operational, while the grade-level criteria applies only to nonresearch and nondevelopment positions.)

No classification action should be taken based on language in the grade level definitions in the law alone. The language in the title 5 definitions is to be interpreted within the context of all the applicable grading criteria in this standard. In grading a position, users should review criteria for a range of grades to ensure a fuller understanding of the intent of criteria at a particular level. Criteria for a single grade should not be read in isolation.

EVALUATING POSITIONS

Other standards may apply to physical science professional positions. Among these are the [Research Grade Evaluation Guide](#), the [Equipment Development Grade Evaluation Guide](#), the [Test and Evaluation Grade Evaluation Guide](#), the [Research Grants Grade Evaluation Guide](#), and the [General Schedule Supervisory Guide](#). They may be used in conjunction with this standard or independently as appropriate, depending upon the nature of the work. For interdisciplinary work, standards from other occupations may apply, such as those for professional engineering or biological sciences (see Exclusions section).

NOTE TO USERS: *The illustrations in this job family standard are intended to show the nature of assignment and level of responsibility **typical** of professional physical science positions in a variety of work situations. They are designed to aid the user in determining the grade level of specific work situations relative to illustrations at lower and higher grade levels. Users should read **all** illustrations at the various grade levels and carefully consider **all** of the grading criteria presented in each illustration before making a final determination. In addition, users are cautioned to consider the entire wording of each illustration instead of relying strictly on such terms as “expert,” “senior expert,” “site manager,” “project manager,” etc.*

EXCLUSIONS

The following job family occupational groups and series are excluded from coverage under this standard:

GS-0400	Biological Sciences Group;
GS-0600	Medical, Hospital, Dental, and Public Health Group;
GS-0800	Engineering Group;
GS-1300	Physical Sciences--Technician Series; and
GS-1500	Mathematics and Statistics Group.

In addition, *all* technician positions, regardless of job family designation, are specifically excluded from coverage under this standard, including the following: [GS-1311, Physical Science Technician Series](#); [GS-1341, Meteorological Technician Series](#); [GS-1371, Cartographic Technician Series](#); and [GS-1374, Geodetic Technician Series](#).

SERIES COVERAGE AND TITLES

This standard provides grading criteria for the 18 occupations listed below. Parenthetical titles may be added to the authorized titles shown at the option of the agency. The *Supervisory* prefix should be used in the title of positions that are classified by the appropriate [supervisory guide](#). The *Research* prefix should be used in the title of positions that are classified by the [Research Grade Evaluation Guide](#).

General Physical Sciences Series, GS-1301

This series includes positions that involve professional work in the physical sciences when there is no other more appropriate series, that is, the positions are not classifiable elsewhere. This series also includes work in a combination of physical science fields, with no one predominant.

Titling: The basic title for this occupation is *Physical Scientist*.

Health Physics Series, GS-1306

This series includes positions that require primarily application of professional knowledge and competence in health physics, which is concerned with the protection of persons and their environment from unwarranted exposure to ionizing radiation.

Titling: The basic title for this occupation is *Health Physicist*.

Physics Series, GS-1310

This series includes positions that advise, administer, supervise, or perform research or other professional and scientific work in the investigation and application of the relations between space, time, matter, and energy in the areas of mechanics, sound, optics, heat, electricity, magnetism, radiation, or atomic and nuclear phenomena.

Titling: The basic title for this occupation is *Physicist*.

Geophysics Series, GS-1313

This series includes professional scientific positions requiring application of knowledge of the principles and techniques of geophysics and related sciences in the investigation, measurement, analysis, evaluation, and interpretation of geophysical phenomena and artificially applied forces and fields related to the structure, composition, and physical properties of the earth and its atmosphere.

Titling: The basic title for this occupation is *Geophysicist*.

Hydrology Series, GS-1315

This series includes positions that involve professional work in hydrology, the science concerned with the study of water in the hydrologic cycle. The work includes basic and applied research on water and water resources; the collection, measurement, analysis, and interpretation of information on water resources; the forecast of water supply and water flows; and the development of new, improved or more economical methods, techniques, and instruments.

Titling: The basic title for this occupation is *Hydrologist*.

Chemistry Series, GS-1320

This series includes all positions involving work that requires full professional education and training in the field of chemistry. This work includes the investigation, analysis, and interpretation of the composition, molecular structure, and properties of substances, the transformations which they undergo, and the amounts of matter and energy included in these transformations.

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Titling: The basic title for this occupation is *Chemist*.

Metallurgy Series, GS-1321

This series includes positions that require primarily professional education and training in the field of metallurgy, including ability to apply the relevant principles of chemistry, physics, mathematics, and engineering to the study of metals. Metallurgy is the art and science of extracting metals from their ores, refining them, alloying them and preparing them for use, and studying their properties and behavior as affected by the composition, treatment in manufacture, and conditions of use.

Titling: The basic title for this occupation is *Metallurgist*.

Astronomy & Space Science Series, GS-1330

This series includes professional positions requiring primarily application of the principles and techniques of astronomy and physics in the investigation and interpretation of the physical properties, composition, evolution, position, distance, and motion of extraterrestrial bodies and particles in space.

Titling: The basic titles for positions for this occupation are:

Astronomer--This title includes professional positions concerned with observing and describing celestial objects; determining the positions, the motions and gravitational interactions of celestial objects; and investigating related aspects of stellar and galactic dynamics;

Astrophysicist--This title includes professional positions concerned with applying the laws of physics to a wide range of topics dealing with the state and condition of matter in space;

Radio Astronomer--This title includes professional positions using radio telescopes with various techniques to detect and investigate radiation in the radio region of the electromagnetic spectrum; or

Space Scientist--This title includes professional positions concerned with investigations of solid bodies within the solar system, with the effect of solar radiation on those bodies and the space environment, and with subjects not included in the other specializations.

Meteorology Series, GS-1340

This series includes positions that involve professional work in meteorology, the science concerned with the earth's atmospheric envelope and its processes. The work includes basic and applied research into the conditions and phenomena of the atmosphere; the collection, analysis, evaluation, and interpretation of meteorological data to predict weather and determine climatological conditions for specific geographical areas; the development of new or the improvement of existing meteorological theory; and the development or improvement of meteorological methods, techniques, and instruments.

Positions in this occupation require full professional knowledge and application of meteorological methods, techniques, and theory.

Titling: The basic title for this occupation is *Meteorologist*.

Geology Series, GS-1350

This series includes professional scientific positions applying a knowledge of the principles and theories of geology and related sciences in the collection, measurement, analysis, evaluation, and interpretation of geologic information concerning the structure, composition, and history of the earth. This includes the performance of basic research to establish fundamental principles and hypotheses to develop a fuller knowledge and understanding of geology, and the application of these principles and knowledge to a variety of scientific, engineering, and economic problems.

Titling: The basic title for this occupation is *Geologist*.

Oceanography Series, GS-1360

This series includes professional scientific positions engaged in the collection, measurement, analysis, evaluation and interpretation of natural and physical ocean phenomena, such as currents, circulations, waves, beach and near-shore processes, chemical structure and processes, physical and submarine features, depth, floor configuration, organic and inorganic sediments, sound and light transmission, color manifestations, heat exchange, and similar phenomena (e.g., biota, weather, geological structure, etc.). Oceanographers plan, organize, conduct, and administer seagoing and land-based study and research of ocean phenomena for the purpose of interpreting, predicting, utilizing and controlling ocean forces and events. This work requires a fundamental background in chemistry, physics, and mathematics and appropriate knowledge in the field of oceanography.

Titling: The basic title for this occupation is *Oceanographer*.

Cartography Series, GS-1370

This series includes positions requiring the application of professional knowledge and skills in mapping and related sciences, and relevant mathematics and statistics to plan, design, research, develop, construct, evaluate and modify mapping and charting systems, products, and technology.

Titling: The basic title for this occupation is *Cartographer*.

Geodesy Series, GS-1372

This series includes professional positions requiring primarily application of the principles and techniques of geodesy. The work includes determining the size and shape of the earth and its gravitational field, measuring the intensity and direction of the force of gravity, and determining the horizontal and vertical positions of points on the earth and in space, where consideration of the curvature of the earth is required.

Titling: The basic title for this occupation is *Geodesist*.

Land Surveying Series, GS-1373

This series includes positions that involve professional work in land surveying, which is concerned with establishing, investigating, and reestablishing land and property boundaries, and with preparing plats and legal descriptions for tracts of land. The work requires application of professional knowledge of the concepts, principles and techniques of surveying, including underlying mathematics and physical science, in combination with a practical knowledge of land ownership laws.

Titling: The basic title for this occupation is *Land Surveyor*.

Forest Products Technology Series, GS-1380

This series includes professional positions concerned with the development, improvement, and utilization of wood or wood products, including the study of preservation and treatment methods, the processing and production of wood products, the properties and structure of wood, and the production of lumber.

Titling: The basic title for this occupation is *Forest Products Technologist*.

Food Technology Series, GS-1382

This series includes positions that involve professional work concerning the application of science and technology to food product research, development, improvement, evaluation, production, processing, preservation, and packaging. The work requires knowledge of the biological, physical, and engineering sciences that make possible safe and wholesome food products; of food industry facilities, methods, processes, equipment capabilities and limitations; and of relevant laws, regulations, and agency programs.

Titling: The basic title for this occupation is *Food Technologist*.

Textile Technology Series, GS-1384

This series includes classes of professional positions involving scientific and technological work with textile or fibers, including investigation, development, production, processing, evaluation, and application.

Titling: The basic title for this occupation is *Textile Technologist*.

Photographic Technology Series, GS-1386

This series includes professional positions requiring interdisciplinary knowledge and skills in those scientific and engineering fields that comprise photographic technology. This includes planning, research, design, development, modification, instrumentation, testing, and evaluation of photographic equipment and techniques.

Titling: The basic title for this occupation is *Photographic Technologist*.

GRADING CRITERIA

GS-1300-05

The law

“Grade GS-5 includes ... positions the duties of which are --

(B) to perform, under immediate supervision, and with little opportunity for the exercise of independent judgment, simple and elementary work requiring professional, scientific, or technical training ...”

The standard

This is the grade for basic trainee positions in physical science professions. At this level, trainees receive assignments that consist of specific, well defined tasks that typically are designed to orient them to the professional work of the organization. At this grade, employees work in strict adherence to specific, detailed guidelines and refer deviations to the supervisor for authorization. For both one-of-a kind and repetitive tasks, these employees receive clear, detailed, and specific instructions.

Illustration -- GS-5:

Performs duties that are designed to orient the trainee to the mission of the organization. Receives clear, specific, and detailed instructions as to the methods, procedures, and guidelines to use. Takes measurements and collects information; learns to take proper samples; conducts routine calculating, plotting, and checking of numerical data; prepares graphs and data profiles; and accomplishes routine analyses.

Adheres strictly to guidelines, referring any deviations to the supervisor. Receives formal and on-the-job training in the functions and operations of the organization.

GS-1300-07

The law

“Grade GS-7 includes ... positions the duties of which are ---

(B) under immediate or general supervision, to perform somewhat difficult work requiring --
(i) professional, scientific, or technical training; and
(ii) to a limited extent, the exercise of independent technical judgment ...”

The standard

This is the grade for advanced trainee positions in physical science professions. At this level, trainees perform a variety of technical tasks, such as selecting samples, interpolating missing data, uncovering clear discrepancies, solving minor problems, and performing scientific analyses in support of projects assigned to higher level scientists.

Advanced trainees receive assignments in terms of general instructions regarding work to be accomplished, quality and quantity expected, limitations, and suggested approaches. They exercise judgment in locating and selecting the most appropriate guides and references to apply, make routine decisions, and refer situations requiring significant deviation to the supervisor or a higher graded specialist.

Illustration -- GS-7:

Performs work within established methods and procedures. Performs preliminary analyses, makes computations and applies correction factors, and plots preliminary prediction values; prepares computer programs for processing data based on established programs and techniques; and performs higher level tasks as training assignments. Exercises judgment in selecting the appropriate methods and procedures to carry out the analyses and tests. Independently completes recurring assignments, but refers all deviations and problems not covered by instructions to the supervisor.

GS-1300-09*The law*

“Grade GS-9 includes those ... positions the duties of which are ---

(B) with considerable latitude for the exercise of independent judgment, to perform moderately difficult and responsible work, requiring ---

- (i) professional, scientific, or technical training equivalent to that represented by graduation from a college or university of recognized standing; *and*
- (ii) considerable additional professional, scientific, or technical training or experience which has demonstrated capacity for sound independent work ...” [emphasis supplied]

The standard

This is the “first full performance” grade for professional positions in the physical sciences. That is, grades GS-5 and GS-7 are intended to cover work that is performed within strict limits and under relatively detailed supervision and, for professional positions, these grades are intended as training levels only. GS-9, on the other hand, may be the full performance target grade for some work settings. The most obvious GS-9 work assignment is independent responsibility for applying established technology in routine ways to well-defined, moderate sized physical science projects, but GS-9's might also work in support of larger projects using less established technology.

GS-9 scientists plan and carry out routine work. They select and make minor adaptations to procedures and accepted practices and handle unexpected conditions arising in the normal course of the work. For recurring assignments, GS-9 scientists are responsible for organizing the work, following prescribed methods and guidelines, and recognizing conditions and results that may affect the findings. By comparison, GS-7's are held accountable primarily for the accurate application of standard methods, techniques, and procedures.

Illustrations -- GS-9:

Assumes independent responsibility for an oceanographic study or for a phase of a combined marine and science study. Plans, conducts, and analyzes observations to determine the nature of tidal and nontidal currents in calculating the mass transport of ocean circulation within a limited ocean area. Determines applicable methods and procedures and applies them to the project or study. Examines and analyzes observations, prepares continuous data profiles, searches for anomalies, and makes preliminary conclusions as to their significance. Prepares scientific reports setting forth appropriate data and their interpretation.

Updates forecasts to reflect observed phenomena or new weather information and prepares warnings and advisories based on new conditions. Warns the general public of immediate dangerous situations such as hurricanes, tornadoes, and other severe storms by issuing local statements, warnings, and advisories in accordance with established local procedures. Commitments are restricted usually to the more routine aspects of assignments that are covered by instructions, precedent, established policy or accepted meteorological practice.

Sets up a photographic instrumentation system to record experiments when standard equipment and techniques can be used. Makes minor modifications to the equipment and constructs simple auxiliary equipment. Prepares photographic equipment to withstand special environmental conditions such as water, humidity, shock, and extreme heat or cold. Visits the field to advise on installation of the system and to instruct photographers on the system's operation. Receives assignments with instructions on objectives, applicable procedures, and time allowed for completion. Refers complex technical problems to supervisor, who approves deviations from established procedures.

Performs established, standardized chemical tests and analyses on a broad range of food, drug, and cosmetic samples in a laboratory setting. Implements new testing and analytical methods involving either automated analytical systems or manual laboratory analytical procedures. Develops and suggests minor adaptations and fills in the gaps found in the newly developed guidelines that govern the new testing methods.

Inspects and edits digital geospatial data to ensure compliance with applicable specifications, certifying it for inclusion in the corporate data base. Processes data through appropriate software routines to produce color-separate map layers for printing. Performs cartographic assignments of limited scope and complexity. Plans and carries out the successive steps and handles problems and deviations in accordance with instructions, policies, previous training, or accepted cartographic practices.

Measures and monitors the nutrient and radon levels or other constituents in well-defined ground water supplies. Studies reports from similar projects to learn more about the geographic area, hydrologic system, and chemical processes involved. Reviews water resource maps to identify aquifers within the area and selects well sites along established ground water flow paths. Follows prescribed project plans, applies conventional methods to collect and analyze water samples and determine the causes of data anomalies. Evaluates the data, identifies trends in the movement of contaminants, and provides oral and written feedback on the results obtained.

Prepares flood forecasts when the hydrologic nature of the basin is stable or homogeneous. Reviews and analyzes real-time radar, satellite, and rain gage data and identifies clear anomalies due to equipment malfunctions, interference, and misread gages. Applies standard flood forecasting procedures to compensate for missing or conflicting measurements, and determine short-term flood risk. Coordinates separate phases of assignments and applies scientific knowledge and judgment in selecting methods and techniques and in analyzing data. Recognizes when standard guides, methods, or precedents are not applicable and selects appropriate methods and techniques.

Performs a variety of duties in a hospital that include surveying all radiation areas. Takes measurements and wipe tests as appropriate. Reads and records wipe test results in accordance with the hospital plans. Responds to a wide variety of conventional questions about radiation from doctors, nurses, other hospital personnel and the general public. Uses appropriate radiation detection and measurement equipment to define ambient dose equivalent rates and contamination levels in conjunction with Performance of Radioactive Material (RAM) package surveys, user facility inspections, sealed source leak tests, management of wastes from radio nuclide therapy patients, RAM spill decontaminations, and radiological decommissionings of treatment rooms and user facilities. Assignments normally involve different and unrelated established processes and methods involved in recognizing, evaluating, and controlling radiation safety hazards.

GS-1300-11

The law

“Grade GS-11 includes those classes of positions the duties of which are --

(B) with wide latitude for the exercise of independent judgment, to perform responsible work of considerable difficulty requiring somewhat extended professional, scientific, or technical training and experience which has demonstrated important attainments and marked capacity for independent work ...”

The standard

GS-11 professional physical scientists plan and execute complex studies. These studies usually involve intensive investigations into one or more recognized phenomena. The work typically involves conventional methods and techniques, though going beyond clear precedents, and requires adapting methods to the problems at hand and interpreting findings in terms of their scientific significance. Finished products are reviewed for adequacy of conclusions and soundness of the procedures and methods used.

Assignments generally do not involve radical departures from past practices or require the development of new, novel or innovative approaches, methods or techniques. By comparison, GS-9 scientists perform assignments that have fewer variables and produce relatively obvious results and conclusions. Some GS-11 scientists provide technical guidance and instructions to lower graded professional or technical employees generally for the duration of a given assignment.

Illustrations -- GS-11:

Leads or independently performs a multi-year study to assess the occurrence of an important industrial ore as part of a comprehensive land assessment project. Studies background data, analyzes and resolves conflicts in archival information, and locates and obtains substantive unrecorded data from sources such as mine owners and state officials. Leads and performs extensive field work and map alterations around deposits. Evaluates findings to determine the grade of ore, tonnage, quantity of reserves, production and milling costs, and environmental measures. Prepares the geologic portion of the report for publication. Recommendations and conclusions are expected to be logical and the product of a trained scientist and reviewed primarily for the adequacy of conclusions presented.

Sets up advanced photographic instrumentation systems with few guidelines when great accuracy is required, the event cannot be repeated, or where conventional photography produces unsatisfactory results. Advises on when, where, and how to conduct scientific experiments to produce the best photographic results. Plans instrumentation systems and develops cost estimates. Selects, modifies, and designs equipment, including such special equipment as timing devices to synchronize cameras with unpredictable events or a series of events. Performs extensive modifications without a full range of tools and supplies in the

field. Receives assignments with the objectives outlined, an overall plan of work indicated, and a time schedule suggested. Determines the validity of test methods and results and recommends acceptance or rejection of contractor items. Consults with supervisor on unusual technical problems. Exercises independent responsibility and is held accountable for actions and findings.

Performs one or more cartographic duties such as source assessment, geopositioning, data extraction and capture, and product generation. Typical activities at this level include identifying and evaluating data sources for applicability and quality; operating stereoscopic instruments to perform automated and interactive point selection; extracting digital terrain data; editing and symbolizing content to produce a specific graphic product according to product specifications; and coordinating the day-to-day production processes for both digital and graphic geospatial output according to specifications for assigned projects. Solves a variety of cartographic problems, adapts precedents or makes significant departures from previous approaches to similar projects to accommodate specialized requirements of some projects. Exercises initiative and originality in solving problems relating to complex map finishing, revisions, automated cartography, and digital data. Tests and evaluates new or modified cartographic instruments, techniques, methods, or practices. Applies standard practices of other scientific disciplines as they relate to cartography.

Modifies and adapts standard methods and procedures that detect, identify and quantify pesticides and other organic substances found in meat and poultry products. Uses field laboratory methods and procedures to make determinations for regulatory compliance and enforcement purposes. Performs analyses that include wet laboratory and/or instrumental analyses, such as gas chromatography. Determines its usefulness as a standard regulatory method or procedure and then develops and evaluates possible improvements. Writes a report describing the method or procedure and the changes that are made.

Analyzes and prepares river volume and flood forecasts for varied river basins with unstable conditions. Disseminates the forecasts to Federal, state, or municipal water resource or emergency management organizations, hydropower and agricultural industries, and the general public. Reviews completed forecasts and adjusts, modifies, or develops complex procedures to improve forecasting accuracy. Calibrates forecasting models to account for changes in land use or the use of municipal, agricultural, or fishery water supplies. Adds new gaging stations where data are unavailable or divides basins into smaller sub-basins to increase forecasting specificity and accuracy.

Reviews timber harvesting plans to determine the potential impact on a watershed area or river basin. Applies conventional water and soil sampling techniques to assess current conditions, including water yield, sediment transport, and soil types and stability. Studies records of how the basin or watershed area has reacted to land management activities in the past. Applies the collected data and the parameters of the harvesting plan (e.g., amount and type of timber to be cut) to a standard watershed analysis model to simulate the effect harvesting will have on the river basin. Reviews precedent cases for standard harvesting or watershed protection strategies and recommends alternatives for minimizing degradation.

Plans and coordinates projects involving the analysis and evaluation of the flow and transport of sediment or pollutants in a river basin. Analyzes basin conditions, including varying channel sizes; sediment types and densities; water volumes and velocities; and municipal, agricultural, and industrial influences. Searches out, adapts, and applies various sampling procedures, schedules, equipment, and analysis methods throughout the study to assess and evaluate the diverse conditions. Correlates the data, adapts and applies computer modeling techniques to simulate the hydrologic processes of the river basin, and writes reports and findings.

Provides health physics services in a VA Medical Center for an assigned area made up of many small laboratories in a research area, in addition to a radiation treatment area involving different forms and different masses and intensities of radiation. Ensures that all personnel are properly trained and monitored. Provides advice on appropriate safeguards to use. Performs radiological surveys and related activities. Assesses new or unusual situations, variations in approach, and incomplete or conflicting data. Makes decisions concerning such things as interpreting extensive data, planning the work, or refining the methods and techniques to be used.

Selects and performs or supervises tests in a laboratory (or at a contractor's plant) to determine operating performance of equipment for conformance with specifications. Writes specifications for new but conventional equipment used in the development, improvement and evaluation of food products; their production, utilization, processing and preservation; and the utilization or disposal of byproducts. Receives assignments with the objectives outlined, an overall plan of work indicated, and a suggested timetable. Discusses general approach to work with supervisor, but details are left to the employee. Work is reviewed for overall technical adequacy, fulfillment of project objectives, and compliance with agency policy.

Plans and conducts projects of considerable scope and variety with numerous complications. Establishes, investigates, and reestablishes land and property boundaries and prepares plats and legal descriptions for tracts of land. Projects require extensive study, search, and adaptation of records, history and precedents. Serves as chief of party on land surveys involving complexities, such as problems caused by changing watercourses or erroneous original meander lines; distorted or fraudulent prior surveys; obliterated or unrecoverable monuments; extremely high value property; actual or probable litigation; conflicting land records and survey data; omitted lands (such as islands); or application of new or experimental survey equipment and techniques. Independently plans, coordinates, and directs all phases of the field surveys and records search and studies required. Work is reviewed for attainment of objectives, compliance with policies, and soundness of judgment.

Serves as a specialist in the area of spectroscopy and the analysis of metals, metal alloys, and related products in an installation's quality assurance laboratory, where the primary activities are ship maintenance, repair, and overhaul, including the manufacture of metal parts and equipment. Independently plans and completes the work. Analyzes difficult, complex, and unusual chemical samples received in the laboratory. Modifies established methods and

practices as necessary to complete the work. Work is reviewed from an overall standpoint for feasibility and effectiveness in meeting assignment's requirements.

Conducts or directs all types of metallurgical tests and develops necessary testing procedures and techniques where existing ones are inadequate by modifying existing procedures and techniques. Designs and constructs special metallurgical specimens and devices and establishes procedural instructions. Chooses the necessary tests and interprets the results. Analyzes a wide variety of types of failures of metals and pieces of equipment. Coordinates work, disseminates information on data developed in tests, and advises project engineers and designers on metals selection for prototypes and manufactured items. Revises or writes new Federal or military specifications for commercial metals. Receives assignments for which the supervisor indicates the general scope and purpose, major types of problems likely to be encountered, and time limitations. Responsible for accomplishing objectives and for the technical accuracy of the work. Reviews with the supervisor progress made on assignments and unusual developments.

Performs the full range of chemical analyses and tests of body fluids and tissue in the laboratory of a large hospital. Receives samples or analytical requests that consist primarily of difficult or unusual chemical problems presented by the professional medical staff of the hospital. Determines the approach and methods to use, taking into consideration the chemistry and biological characteristics of the substances. Modifies methods to meet the specific assignment requirements. Evaluates and interprets a wide variety of material and determines if the data is complete and valid. Writes a report detailing results and conclusions. Independently plans and carries out the work and resolves most technical problems. Work is reviewed from an overall standpoint for meeting the objectives and for solving the problems posed by the medical staff.

GS-1300-12

The law

“Grade GS-12 includes ... positions the duties of which are ---

(B) under general administrative supervision, and with wide latitude for the exercise of independent judgment, to perform professional, scientific, or technical work of marked difficulty and responsibility requiring extended professional, scientific, or technical training and experience which has demonstrated leadership and attainment of a high order in professional, scientific, or technical research, practice, or administration ...”

The standard

Work assignments at this level typically involve planning, executing, and reporting on original studies or ongoing studies requiring a fresh approach to resolve new problems. The complexity of assignments requires extensive modification and adaptation of standard procedures, methods, and techniques, and development of totally new methods and techniques to address problems for which guidelines or precedents are not substantially applicable. Assignments at this level

typically include considerable breadth, diversity, and intensity; varied, complex features; and novel or obscure problems. By comparison, GS-11 scientists have complete responsibility for conventional projects where existing guidelines, approaches, and techniques are adequate or adaptable. The work requires considerable initiative and resourcefulness. Completed work is reviewed primarily for general acceptability and feasibility in relation to the overall program. Scientific recommendations are normally accepted as sound without close review, unless matters of policy or program resources are involved. Study reports and scientific papers are considered to be authoritative scientific documents.

Illustrations -- GS-12:

Plans very significant projects, advises on improvement of instrumentation or procedural methods, and ensures that special equipment is procured, modified, and installed. Plans, coordinates, and implements tests and conducts the projects. May serve as an advisor to other scientists, such as, a specialist on polar ice surveillance studies or a specialist on improving complex instruments for measuring and studying ocean phenomena. May also serve as a team leader. Uses initiative, resourcefulness, and past personal experience to deviate from established approaches and precedents to develop methods and procedures and to apply basic principles and theories. Often develops new methods, techniques, or precedents to plan and carry out assignments. Work and conclusions are accepted as technically authoritative and are reviewed only for meeting the assignment's objectives.

Performs scientific and technical evaluation, correlation, synthesis, and presentation of important data in a complex field of science, such as wave action in the Indian Ocean. Assures that special equipment is procured, modified as necessary, and installed on research vessels or at shore installations. Plans, coordinates, and implements tests and conducts significant surveys. Makes significant technical and scientific recommendations and decisions in a broad but highly specialized field of oceanography. Generally, conclusions and publication material are accepted as final unless matters of agency policy are involved.

Develops long-range hydrologic plans, programs, and /or precedents of an authoritative and state-of-the-science nature. Develops and modifies hydrologic river forecast procedures for a wide variety of basins when existing procedures are not supplying results that are sufficiently accurate and usable. Develops procedures for specialized forecasts for which procedures do not exist (e.g., snowmelt, river ice formation and dissipation, minimum flow, and flash floods). Makes significant technical and scientific recommendations and decisions. Exercises considerable initiative and resourcefulness in carrying out these assignments to completion. Plans projects and makes changes without securing prior technical approval. Represents the agency before public bodies on complex problems that are noncontroversial in nature.

Prepares and issues complete public service weather forecasts and interpretations for an assigned forecast region, using readings from weather surveillance radar, other sources, and personal expertise. As the technical meteorology expert for a weather forecast office, furnishes guidance, assistance, and complete theoretical explanations for particular forecast situations to television and radio stations, the general public, special user interests, and

related weather service activities. Brings problems of a particularly difficult or unusual nature to the supervisor for advice and assistance. Receives assignments in broad, general terms. Work is reviewed for adequacy of results and compliance with overall program requirements.

Conducts new and complex analyses of food, drugs, biologics, or medical devices in support of regulatory activities. Develops a method or modifies an existing method, when no official analytical method is prescribed, to analyze samples and to provide appropriate validation. Creates and maintains quality control and quality assurance data for the method. Interprets and evaluates the results of analyses to determine validity and scientific significance. Writes reports documenting the nature of any regulatory violations. Testifies in court and other formal or informal reviews concerning the technical merit of the assigned analyses. Uses initiative, resourcefulness, and knowledge of the field to adapt and develop new approaches and methods, to identify areas that need development, and to relate technical developments to the work. Responsible for planning, organizing, and carrying out the assignments; resolving almost all technical problems; and coordinating the work with others. Work is reviewed in terms of general objectives and effectiveness in meeting the program objectives.

Develops and monitors the production of geospatial data to support agency geographic information systems and hardcopy map generation for a staff unit. Works on inter- and intra-agency committees to develop and/or revise Federal standards for geospatial data. Revises agency cartographic standards and specifications. Provides staff advisory, consulting, and reviewing services. Applies standard cartographic practices to new situations and solves novel or obscure problems. Exercises initiative and originality in the solution of cartographic problems. Serves as a technical authority on all aspects of cartography.

Determines the condition and restoration needs of multiple watersheds over a diverse forest-wide area. Surveys and inspects the watershed areas for adverse conditions, such as landslides or eroded gullies. Utilizes data on water temperature, instream flow and discharge, and soil stability and study records of previous watershed conditions and land and water management activities in the area. Analyzes and evaluates the collected data in relationship to desired conditions and regulatory requirements to determine the cumulative effects of previous land management practices on current watershed conditions. Develops, modifies, and recommends extensive plans, treatments, and projects for restoring conditions; and monitors and evaluates the results to ensure achievement and maintenance of healthy conditions.

Reviews and studies proposals for remediating contaminated ground water when little information on the type and nature of the contaminant and composition of the geographic area is known. Searches for and studies precedent reports for applicable data gathering and analysis techniques. Adapts and devises methods to collect information on soil and rock types and patterns, aquifer locations, ground-water flow, and contaminant types and concentrations in the area. Applies the collected data to geochemical analysis and ground-water flow models to simulate the existing conditions and processes, and to forecast the effects of each decontamination proposal on the hydrologic system. Modifies the models to

reflect the nature of the hydrologic process, geographic area (e.g., pumping rates and duration) and correlates the physical- and chemical-analysis results.

Designs and constructs specialized equipment and develops unusual techniques in order to provide photographic instrumentation going beyond present system capabilities. Photographs objects, for example, where existing photographic methods or equipment may be inadequate for instrumentation of advanced experiments, such as photographing objects in a hypervelocity range that are smaller and are traveling at speeds greater than those ever previously recorded. Receives assignments in terms of broad, general objectives, time limitations, and policy instructions. Discusses the general method of approach with the supervisor and the aspects to be emphasized. Determines when new equipment or procedures are needed. Works free from technical supervision, although informs the supervisor of general progress and any unusual findings, problems, or results. Provides technical advice to professionals in his or her agency and to contractor personnel. Completed work is reviewed for overall adequacy and conformance to the agency's procedures and policies.

Serves as an organic chemistry specialist in a physical science laboratory at a military installation that services maintenance and industrial shops, which support and overhaul aircraft, missiles and aerospace ground equipment. Analyzes, identifies, and tests various organic substances, such as oils, fluids, solvents, and sealants, which require the development of laboratory tests or analytical methods using various instruments. Solves problems and improves the methods and processes carried out in the installation, which often require the development, adaptation, and modification of precedents, methods, and procedures. Completed work is accepted as being technically correct and is reviewed for effectiveness in meeting the program's objectives.

Analyzes and reviews seismic data for input to computer programs that determine epicenters and magnitudes of earthquakes. Participates in disseminating information to the public, the news media, other government agencies and disaster relief agencies on the location, magnitude and damage resulting from earthquakes. Plans and conducts novel studies of selected seismological events alone or in conjunction with other geophysicists or other scientists. Provides training and reviews work performed by lower-graded scientists. Writes or modifies simple earthquake location programs. Plans and manages assigned projects, interprets policy in terms of established objectives, resolves problems, and coordinates work with others. Performs work under the general direction of the supervisor and informs the supervisor of progress, potentially controversial matters, and anything with far-reaching implications. Work is reviewed from an overall standpoint of meeting the assignment's objectives.

Plans and conducts investigations or studies of problems affecting the organization's geodetic program. Receives general instructions concerning the objective of the study and the time, facilities, and manpower available. Uses selectively to plan and organize the work and to apply extensive guidelines. Applies geodetic principles and techniques in developing systems, procedures, and methods to meet new or unusual needs in the agency's programs. Improvises where guidelines do not apply or recommends action for approval at a higher

level. Trains or advises scientists and engineers from other organizations regarding the employee's particular area of work. Work is accepted as technically correct and factual and is reviewed by the supervisor for achievement of objectives and conformance with agency policy.

GS-1300-13

The law

“Grade GS-13 includes those ... positions the duties of which are ---

(C) to perform, under administrative direction, with wide latitude for the exercise of independent judgment, work of unusual difficulty and responsibility requiring extended professional, scientific, or technical training and experience which has demonstrated leadership and marked attainments in professional, scientific, or technical research, practice, or administration ...”

The standard

This is a senior expert level, involving work for which technical problem definitions, methods, and/or data are highly incomplete, controversial, or uncertain. This level differs significantly from the GS-12 level in that evaluations and recommendations are accepted by others as those of a technical expert. Typically, scientists at this level represent an authoritative source of consultation for other scientists and program specialists and are called upon to perform a key role in resolving issues that significantly affect scientific programs. They make long-range and controversial proposals and defend their findings and recommendations in public or high level forums.

Characteristically, GS-13 scientists represent their organizations or programs or the Government's interests, in some cases including representing the agency before public bodies on controversial projects. Some positions include staff work with responsibility for reviewing and coordinating field work in a narrow program area or reviewing and developing legislative or regulatory proposals. Other positions may involve planning, organizing, and leading teams to prepare requirements and specifications for new, large scale systems or to evaluate overall plans and proposals for significant systems developed by contractors.

Illustrations -- GS-13:

Serves as a senior scientific representative on a Navy oceanographic survey vessel conducting a variety of oceanographic and environmental survey missions. Plans, arranges, and manages data collection and preliminary analysis work performed by the mission crew of the vessel and provides the ship's captain with the missions to be performed and the courses and tracks to be followed. Uses judgment to determine the areas that need study and uses ingenuity to devise and plan projects that thoroughly investigate those areas. Develops new information, considers data from a variety of sources, and modifies and originates

approaches, methods, and procedures to plan and carry out assignments. Work is accepted as technically authoritative and is reviewed for accomplishing the project's objectives.

Serves as a site manager for a large environmental cleanup project that includes extensive analysis during the site selection process and ongoing management responsibility for a large construction effort. Represents the Department in public hearings and in negotiations with local jurisdictions or state regulatory bodies on matters concerning the site. Serves as an expert on interpretation of regulations and technical issues associated with the site and oversees the work of contractors. Determines approaches to be used and is responsible for results. Demonstrates marked degree of professional independence and technical expertise. Keeps supervisor informed of general progress and direction of the work. Work is reviewed from an overall standpoint in terms of feasibility, compatibility with other work, or effectiveness in meeting requirements or expected results.

Leads a team of hydrologists and other scientists and engineers to plan and conduct a comprehensive hydrologic survey of a large basin or several small basins within a statewide area. Describes the hydrologic system and the related environmental framework of the basin, determines the quantity, distribution, availability, and quality of the water resources; and relates water resources to water needs. Defines and evaluates alternative water resource management projects and problems. Coordinates the work of supporting scientists and engineers concerned with related issues such as flood control, fish and wildlife, and navigation. Develops long-range hydrologic plans, programs, and/or precedents of an authoritative and state-of-the-science nature.

Leads projects covering a wide variety of geologic conditions and problems associated with geotechnical and/or geophysical issues for an extensive geographical area. Resolves major conflicts between geologic, economic, and management requirements and coordinates with land owners, tribes, the public, industry, and state agencies. Develops new methods and techniques and coordinates the findings of multidisciplinary specialists working under critical time constraints. Handles the interrelated, emerging, complex, and frequently conflicting nature of Federal, state, and local laws and regulations that govern the management of natural resources and the environment (e.g., Federal and tribal lands, minerals, mining, wilderness, and endangered species).

Develops new chemical analytical procedures to be used by the industry to determine decomposition, degradation, or contamination of food, or the substitution of other products for those shown on labels. Plans and performs investigations to develop new methods and means of validating findings. Establishes new criteria or extends existing methodology to the point of developing methods and techniques in addition to adapting and modifying the established guides, precedents, and methods. Applies new developments and theories to critical and novel problems. Extends and modifies approaches, precedents, and methods to solve a variety of chemical problems with unprecedented and obscure aspects. Study findings are incorporated into agency guidelines and regulations and affect industry practices nationwide.

Performs scientific assessments and makes recommendations concerning corrective actions for identified weaknesses or deficiencies in radiation protection and/or nuclear safety

programs involving chemical processing, mixed and hazardous waste, decommissioning, and construction. Assignments cover numerous energy technologies, waste management, and site service activities that require originality in adapting or developing precedents for complex and unusual situations. Solves problems that would be considered novel or obscure within the occupation, extends and modifies existing techniques, and develops new approaches for other experienced scientists to use in solving a variety of problems.

Independently provides expert, comprehensive radiation safety oversight to a segment of a large, complex biomedical research facility. Provides technical guidance to researchers and junior health physicists. Participates in the design or renovation of work space, and coordinates emergency response activities in support of hundreds of research laboratories in which a wide variety of radioactive materials and other radiation sources are used. May also serve as a radiation safety liaison and technical expert to unique specialty groups within the organization. Serves as an expert in either the comprehensive practice of health physics or a major specialization. Participates in developing radiation safety policies and procedures for the organization, reviews complex protocols for the use of unusual types or quantities of radioactive materials, independently develops innovative techniques for accomplishing tasks for which there is no precedent, prepares highly technical position papers representing the organization, and/or provides expert technical advice and assistance to junior health physicists. Determines approaches to be used and information needed and is responsible for results. Evaluations and recommendations made are accepted by others as those of a technical expert in his or her area.

Serves as water-quality expert for an organization that is comparable to a single or multi-state water-resources program area or a small region in terms of size and complexity. Plans and develops new water quality programs and projects by studying and analyzing the information needs of state and local government organizations and Federal agencies and the requirements and objectives of new legislation and regulations. Reviews project proposals involving extremely complex water quality problems and issues to determine the feasibility of the projects, based on agency or bureau programs or priorities, the adequacy of work plans, proposed technical approaches and methodology, and human and budgetary resources. Develops broad guidelines for applying state-of-the-science hydrologic data, analysis, and quality assurance techniques to various water-quality projects.

Plans, organizes, directs, and evaluates regional watershed-management programs. Studies new or modified legislative or regulatory requirements and agency objectives and formulates policies and approaches for managing the watershed areas in the region. Develops and advises on new criteria, practices, and techniques for inventorying and analyzing water resources conditions, monitoring and maintaining water quality, and restoring watershed areas. Works closely with representatives from Federal, state, and municipal organizations and private industries to develop long-range land and water resource management programs that have minimal effect on the watershed areas within the region.

Develops and implements a radiation safety program at a large medical facility. Reviews, advises, and provides guidance on the full range of radiation safety matters related to the organization's use and testing of radioactive material, including matters related to the

environment and to the radioactive waste that is generated. Develops and recommends regional evaluation criteria and guidelines for assessing radiation safety programs. Responsible for independently planning and carrying out the assignments, resolving most of the conflicts that arise, coordinating the work with others as necessary, and interpreting policy on own initiative in terms of established objectives. Develops, in consultation with the supervisor, work projects and deadlines. Keeps the supervisor informed of the progress, potentially controversial matters, or far-reaching implications of the work. Resolves technical problems without supervisory assistance. Work is typically reviewed for fulfillment of program objectives and influence on the overall program.

Responsible for assigned projects involving the development of optical sensor technology for advanced ballistic missile defense systems. Performs studies and investigations in assigned technology areas. Performs conceptual studies and analyses. Applies physics in formulating requirements to integrate new technology into advanced concepts. Plans and coordinates assignments with other agencies and contractor personnel to assure full integration of optical sensor technology into the ballistic missile defense system concepts. Defines technical details for budgets. Discusses work assignments, objectives, and priorities with supervisor in broad general terms. Informally reports the progress of assignments to the supervisor. Receives little or no technical guidance. Recommendations and conclusions are accepted as technically sound, and work is reviewed primarily for feasibility in relation to requirements, fiscal constraints and coordination with other activities, and attainment of objectives.

GS-1300-14

The law

“Grade GS-14 includes those classes of positions the duties of which are ---

(A) to perform, under general administrative direction, with wide latitude for the exercise of independent judgment, work of outstanding difficulty and responsibility along special technical, supervisory, or administrative lines which has demonstrated leadership and *unusual* attainments;...

(C) to plan and direct or to plan and execute major professional, scientific, technical, administrative, fiscal, or other specialized programs, requiring extended training and experience which has demonstrated leadership and unusual attainments in professional, scientific, or technical research, practice, or administration, or in administrative, fiscal, or other specialized activities; or

(D) to perform consulting or other professional, scientific, technical, administrative, fiscal, or other specialized work of equal importance, difficulty, and responsibility, and requiring comparable qualifications.” [Emphasis supplied to assist in identifying small differences in text between grades.]

The standard

Responsibilities at this level tend to involve highly unstructured and interconnected problems involving both difficult technology and complex human relations or programmatic issues. The level differs significantly from the GS-13 level in that the GS-14 scientist is one that other recognized senior technical experts turn to for advice and counsel, not only because of the position, but because of the incumbent's personal reputation in the field. At this level, the work typically has special significance for the success of the organization, e.g., it may have significant direct effects over a wide region or over multiple programs or may include responsibility for a new technology especially critical to the organization's programs. Typically, GS-14 assignments include a wide area of responsibility carried out under administrative direction in terms of broad agency policies, objectives, and mission statements. In contrast, GS-13 assignments generally involve project or program responsibility of a lesser scope that is covered by general guidance such as precedents, recent work, and developments in a specialty area.

Illustrations -- GS-14:

Serves as project manager for dismantling a category of nuclear weapons requiring newly designed dismantling techniques, regulations, and procedures. Represents the government, along with the program director, in dealings with the contractor. Represents the project in dealings with oversight committees, base commanders, various regulatory bodies, and similar parties. Plans and coordinates the orderly delivery and destruction of weapons, the storing of remaining components, and the documentation required to account for all weapons and components.

Serves as a project manager who establishes and implements top level strategy, objectives, and performance measures for assigned projects, prioritizes work, and determines funding needs and allocation. Assignments include obscure and novel problems that are handled by planning and carrying out either individual projects or major studies. Work includes complicating factors, e.g., the accepted solution of one of them may be in direct conflict to the accepted solution of another. Provides expert advice and assistance to scientists and officials on a wide range of matters. Responsible for the sustained progress of the projects in accordance with scope, cost, and scheduled baseline, as well as the human health and safety and environmental soundness.

Manages extensive projects to combine cartographic technology from several military services into a single set of electronic cartographic tools. Develops and maintains long and near-term plans, including personnel, budget, hardware, software, and schedule resources. Represents the agency on technology and functional steering groups and working groups to generate plans, guidance, agreements, and technical findings. Represents the project in dealings with senior management in various agency components, other government departments, and foreign representatives to establish goals, and/or to resolve conflicts.

Serves in an agency as the senior health physicist responsible for evaluating, providing information, or developing hypotheses regarding the pathways of radioactive chemical exposure to humans. Isolates and defines unknown conditions, resolves critical problems, or

develops and establishes new approaches and guides. Deals with obscure and novel problems by planning and carrying out either individual projects or major studies. Provides consultation to other Federal, state and local health, environmental and natural resource agencies on problems associated with exposures to radioactive environmental contaminants, and chemical toxins. Provides expert evaluation of imminent health threats associated with emergency releases of toxic and radioactive wastes and other chemical incidents. Work efforts affect the work of scientific experts, top officials, or the development of major segments of the agency's programs.

Serves as the radiation safety officer for a facility, overseeing a comprehensive radiation safety program in support of hundreds of individuals using radioactive materials and/or radiation sources under a single NRC (Nuclear Regulatory Commission) license. Advises senior health physicists on the most unusual, complex and critical problems identified during their review of experimental procedures and during emergency responses involving radioactive materials and/or other radiation sources. Plays a lead role in policy development for the organization's radiation safety program, and provides technical assistance/feedback to other groups outside of the organization. Coordinates and administers a comprehensive radiation safety training program in which thousands of researchers use radioactive materials and/or other radiation sources. Provides technical direction to a team of health physicists. Sets overall radiation safety program goals to be accomplished by the team, allocates available resources, defines objectives, priorities, and deadlines, and reviews the end products of the team's efforts.

Serves as project chief for multidisciplinary ground-water monitoring projects that are typically nationwide in scope or have transfer value in defining basic processes that will impact the science nationwide. Develops project plans, including the schedules, personnel, budgets, and reports required and the goals for each discipline area. Searches out and studies new approaches for monitoring and evaluating ground-water systems and develops specific applications to the projects. Coordinates the schedules and objectives with hydrologists, chemists, geologists, and other support scientists involved in the study. Reviews the reports from each discipline area to ensure project objectives are met, sound quality assurance practices are applied, and methodology and results are accurate and consistent. Prepares consolidated reports and journal articles of the approaches used and results obtained, and makes formal presentations to Federal agencies, universities, and professional societies, and state and local government organizations.

Plans and personally conducts studies and investigations and plans, directs, and manages efforts of contractors and other government agencies in the radio frequency area with emphasis on the development of Solid State Demonstration Arrays for Ballistic Missile Defense applications. Efforts consist of the configuration, specification, design development, and integrated simulations and analyses to define and predict problem areas in radars that are required to operate in a nuclear environment. Manages the development of advanced engagement simulation models. Responsibility is of outstanding difficulty and complexity and has national significance in terms of the national defense. Assignments require expertise in complex mathematical analysis. Supervisor provides very general administrative and policy direction. Guidance is restricted to matters of broad policy, overall program objective,

priorities, budget limitations, and broadly defined technical objectives. Decisions, commitments, and conclusions reached have considerable influence on the development of the program and establishment of standards and guides for extensive engineering activities. Incumbent determines areas for investigation and assigns projects to private laboratories, etc.; advises on new approaches to scientific problems; and determines the extent to which objectives are accomplished and if changes are necessary. Recommends changes, redirection of effort, and additions to the basic projects to maintain desired objectives.

GS-1300-15

The law

“Grade GS-15 includes ... positions the duties of which are ---

(A) to perform, under general administrative direction, with *very* wide latitude for the exercise of independent judgment, work of outstanding difficulty and responsibility along special technical, supervisory, or administrative lines which has demonstrated leadership and *exceptional* attainments;...

(C) to plan and direct or to plan and execute specialized programs *of marked difficulty, responsibility, and national significance*, along professional, scientific, technical, administrative, fiscal, or other lines, requiring extended training and experience which has demonstrated leadership and unusual attainments in professional, scientific, or technical research, practice, or administration, or in administrative, fiscal, or other specialized activities; or

(D) to perform consulting or other professional, scientific, technical, administrative, fiscal, or other specialized work of equal importance, difficulty, and responsibility, and requiring comparable qualifications.” [Emphasis supplied to assist in identifying small differences in text between grades.]

The standard

Scientists at this level conceive, plan, and conduct pioneering work of outstanding scope, difficulty, and complexity in unexplored or previously unpromising areas of investigation or manage complex and extensive scientific programs of critical importance to the agency. The work involves high levels of uncertainty and the balancing of conflicting interests of extreme intensity. The systems or programs involved may have significant effects on the economic health of an industry or geographic area. The work typically is of such major importance and scope as to affect technical policies of a major department or agency, have a significant bearing on legislation, or involve equivalent implications.

As at the GS-14 level, the grade 15 scientist has broad recognition as a top technical expert and consultant in the field of expertise. However, this level differs significantly from GS-14 in that GS-15 work is typically related to: (a) a rapidly evolving field that has extensive impact on agency programs; or (b) pioneering development efforts to achieve new capabilities with previously unattainable characteristics. Some positions at this level may have responsibility for

evaluating the effect of significant technological developments on fundamental agency policies, objectives and goals. GS-15 scientists provide advice and guidance to top agency management on matters of such difficulty and controversy that leading experts disagree as to the proper approach to or the probable outcome of significant and far-reaching efforts and generate new hypotheses, develop new concepts, and plan and evaluate long-range programs and projects that accomplish the organization's mission. Typically, the GS-15 professional physical scientist is a nationally recognized expert in a broad specialty field.

Illustrations -- GS-15:

Serves as manager of a broad program to dismantle the full range of nuclear weapons. Represents the government in all dealings with contractors and represents the program in dealings with oversight committees, base commanders, various regulatory bodies, higher levels of the Department, and similar parties. Plans and coordinates the orderly delivery and destruction of weapons, the storing of remaining components, and the documentation required to account for all weapons and components. Directs the work of a staff of project managers at various levels. Assignments concentrate on the limitation of proven concepts and practices of a broad and complex area where issues and factors to be considered are largely undefined and require extensive probing and analysis to determine the nature and scope of the problems. Recommendations and decisions have a continual and lasting effect on the agency's programs and frequently on the policies and operations of other governmental and private organizations.

Serves as director of an office responsible for planning, coordinating, and executing programs for pollution monitoring and control; environmental monitoring; groundwater protection; solid, hazardous, radioactive, and mixed waste compliance; and related matters for a nuclear weapons complex or an environmental management site. [The weapons complex or site occupies several hundred square miles and employs over 1,000 Federal employees and 40,000 contract employees.] Requires mastery and recognized skill in planning and evaluating long range programs and projects where issues and factors to be considered are largely undefined and, therefore, require extensive analysis to determine the nature and scope of the problem. Establishes the agency's official position on highly complex and technical work. Creates agency precedents or determines the action to be taken by field installations on matters of major importance. Recognized nationally as an expert in the field.

Serves as an authority in areas of spacecraft instruments and their acquisition. Serves as a consultant to high level managers and officials within the agency and to various U.S. and foreign government organizations. Leads a small group of professional and technical staff in defining spacecraft systems, environmental sensors, and associated data processing systems. Collaborates with international partners for the delivery of sensors to be flown on foreign satellites.

Formulates national policies to manage ground water of critical aquifers. Serves as a recognized authority on the prevention of ground-water storage depletion. Plans and directs broad pioneering studies to satisfy the urgent need for systematic and comprehensive

analyses of the nation's aquifer systems and to increase understanding and management of this critical resource. Provides consultation to other technical experts and executives in other bureaus and agencies regarding hydrogeology and the hydrology of regional aquifer systems.