TS-38 January 1980, TS-67 April 1967

General Schedule
Position Classification Standards

WCPS-1 August 2001

POSITION CLASSIFICATION STANDARD FOR

PHYSICAL SCIENCE TECHNICIAN SERIES, (SPECIAL SUPPLEMENT) GS-1311

Workforce Compensation and Performance Service

Theodore Roosevelt Building • 1900 E Street, NW • Washington, DC 20415- Classification Programs

NOTE

This standard has been converted from the original paper format to electronic format without substantive change in series coverage or grading criteria. The standard was reviewed to correct errors that may have been introduced during the conversion process. In some standards minor corrections were made such as updating references to other documents that may have become obsolete, or correcting minor typographical errors in the original standard. Any errors that remain due to conversion to electronic format should be minor and are not intended to change the meaning of the original standard.

If you find page references near the right hand margin of this standard they indicate the pagination of the official, printed version of this standard. For example, a notation "PAGE 2, 4/88, TS-87" would mean that (1) page two of the printed version begins here, (2) the date of issuance was 4/88, and (3) the Transmittal Sheet number was TS-87.

Physical Science Technician Series

GS-1311

CONTENTS

SERIES DEFINITION

This series includes positions which involve nonprofessional technical work in the physical sciences and which are not specifically included in other series in the Physical Sciences Group. Positions in this series require a knowledge of the principles and techniques of physical science, but do not require competence equivalent to that represented by the completion of a full four-year college curriculum leading to a bachelor's degree in physical science. Positions in this series involve work in the fields of astronomy, chemistry, geology, geophysics, health physics, hydrology, metallurgy, oceanography, physics, and other physical sciences.

This standard supersedes the standard for the Physical Science Technician Series, GS-1311, issued in October 1958, and the amendment dated August 1960.

EXCLUSIONS

The following categories of positions are excluded from this series:

1. Positions involving professional work in the physical sciences. Pertinent information regarding distinctions between professional and nonprofessional technical work may be found in the introduction to the Engineering and Architecture Group, GS-800. Although that material deals primarily with positions in engineering, it contains criteria which are useful when applied to similar situations in physical science.

2. Nonprofessional technical positions in physical science for which separate series have been established, such as the Meteorological Technician Series, GS-1341, the Cartographic Technician Series, GS-1371, and the Geodetic Technician Series, GS-1374.

3. Positions involving nonprofessional work in physical science in combination with work in other fields or sciences when the primary requirement is a knowledge of the methods and procedures characteristic of established technician series in the Biological Sciences Group, GS-400, the Medical, Hospital, Dental, and Public Health Group, GS-600, or the Engineering and Architecture Group, GS-800.

4. Positions involving nonprofessional technical work in connection with the operation of museums. Such positions are classifiable in the Museum Specialist and Technician Series, GS-1016.

5. Positions for which the paramount qualification requirements are skill and experience in trades, crafts, or manual occupations. Such positions are exempt from the General Schedule (5 U.S.C. 5103).

In distinguishing between physical science technician positions and those exempt from the General Schedule, it should be recognized that work in support of the physical sciences requires manual and craft skills in varying degrees. In many instances specialized shops which include trade and craft positions are established within laboratories. Positions in such shops are exempt from the General Schedule when the manual or craft skills constitute the primary qualifications requirement for the major duties of these positions. On the other hand, much of the incidental manual work in laboratories may be incorporated into technician positions.

NOTES ON EXCLUSIONS

There are instances in which the work characteristic of technical positions in different occupational areas is not sharply differentiated. As a result, positions involving similar duties and responsibilities can be classified within different series and occupational groups, or exempted from the General Schedule. In making classification determinations under such circumstances it should be recognized that the environment in which a position functions may affect the qualification requirements and the classification of the position.

Therefore, even though the duties and responsibilities of a position are of paramount importance in determining its classification, the following factors should also be considered in situations in which it is difficult to distinguish between positions classified to the Physical Science Technician Series and those included in professional or other nonprofessional technical series, and between General Schedule positions and those exempted.

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1. *Line of promotion*: When the work performed is not sharply differentiated from that in several related occupational areas, the normal line of promotion within the organization will frequently indicate the occupational specialization toward which the position is oriented.

2. *Organizational function*: The mission or function of an organization frequently provides an indication of the occupational specialization. Thus, for example, in an organization engaged in engineering development, much of the nonprofessional technical work will be oriented toward engineering, while in physical science research organizations much of the nonprofessional technical work will be oriented toward the physical sciences.

3. *Recruitment source*: To the extent that the recruitment source reflects the paramount requirements of a position, it provides an indication of its classification. Thus, where recruitment is necessarily from the trades and crafts, the position is likely to be exempt from the General Schedule even though it operates within a laboratory environment.

4. *Management intent*: In some situations management may train employees for nonprofessional technical work. Under these circumstances the ultimate purpose for which the employee is being trained should be considered in the classification of the position. Similarly, for training purposes, management may establish professional positions which involve work similar to that performed by

physical science technicians. The intent of management frequently indicates the occupational series toward which the position is oriented.

TITLES

The basic titles "Physical Science Aid" for grades GS-1 through GS-4 and "Physical Science Technician for GS-5 and above are authorized. The prefix "Supervisory" is to be used for those positions which include significant supervisory responsibilities.

Formerly, this series had a number of separate specializations based on scientific disciplines. The specializations have been eliminated for the following reasons:

--The overlap of the scientific disciplines is accentuated at the support level and thus the specializations have never been mutually exclusive in this series. The several specialized areas typically involve similar work.

--The nature of the support work performed by physical science technicians has been multidisciplinary in most instances. Hence, specializations based on disciplines tended to confuse rather than aid in the personnel management process.

--There is a continuing need on a Government-wide basis for broader classification and qualification standards, with fewer specializations. This must be accomplished to simplify the classification process and allow for greater career mobility.

--Placement for jobs with specific demanding qualification requirements can best be made through selective certification based on specific job requirements rather than reliance on the job title. These requirements may be based on a broad discipline, e.g., chemistry, or a narrow specialty, e.g., spectroscopy. (Where considered appropriate, agencies may use organizational or other unofficial titles for their convenience in identification of positions with distinctive qualification requirements.)

EVALUATION NOTES

1.*Supervisory positions*

Supervisory positions are included in the coverage of this series but this standard does not provide criteria for classifying positions in which supervisory responsibilities are grade controlling. The grades of such positions are determined by reference to the General Schedule Supervisory Guide.

2.*Specific grade-level coverage*

This standard includes criteria for use in classifying positions up to and including GS-10. Those positions which exceed the GS-10 level as depicted in this standard may be classified either by extrapolation of this material, by application of the appropriate professional standards, or, in some instances, by use of standards published for other technician series.

A high degree of caution must be exercised when professional standards are used in classifying technician jobs. Consideration must be given to any possible significant differences in the true scope and intensity of the theoretical and practical knowledge and insight required to accomplish the assigned project. There are some situations where the qualifications required for the work of professionals are so different from the qualifications required for the work of a technician that these distinctions have a marked impact on grade level. On the other hand, there are situations where these differences have no effect on grade level. This situation would occur at levels above GS-10 when the technician performs professional-type duties and does in fact possess and apply theoretical knowledge approaching that of the scientist. In these cases, the position may be properly evaluated by reference to the appropriate professional classification standard.

3.*Fabrication work performed by technicians*

In some instances technicians build and repair the equipment they use. This may vary from performing such tasks as bending glass, replacing defective or worn components, and drawing rough sketches of new devices on the one hand to the relatively complete fabrication of complex laboratory apparatus on the other. These special skill requirements are characteristically not grade controlling.

4.*Hydrology technician positions*

This standard does not include specific grade-level criteria for positions engaged in nonprofessional technical work in support of professional Hydrologists. Although such technician positions may be included in this series, grade levels should be determined by the criteria now provided in the Engineering Technician Series, GS-802.

CLASSIFICATION FACTORS

The factors of paramount significance in determining the proper grade level for Physical Science Technicians are:

Responsibility

This factor includes the kind and degree of supervision over work performed, the extent of the worker's authority to accomplish assignments, and the nature of available instructions and guides.

This factor is described in terms of five levels, I through V, ranging from that of a trainee under close technical supervision to that of an extremely responsible technical worker. It is the overall meaning of the description of a level, not a particular word or phrase, which should be weighed in assigning a level to the position.

Complexity

The actual complexity of the assignment is determined by the nature and variety of work as well as the knowledges, skill, and judgment required to adequately perform the duties of the position.

Care should be exercised in assigning credit to a position for any particular level of complexity that such credit is being given for the actual difficulties found in the position under consideration, and not solely for the function of the organization in which it is located. For example, it is often found that a position located in a basic research laboratory working closely with a group of professional scientists may in fact be limited to the performance of routine testing. In such a case it would equate to a much lower grade than would be the case if it operated as depicted in Degree F. Conversely, a technician located in a testing laboratory could be devising novel approaches to old but vexing problems, and thereby command a higher grade than would normally be found in such a work situation.

GRADE-LEVEL CRITERIA

Element 1. -- Responsibility

Level I. Under close supervision, serves as a trainee acquiring a familiarity with the laboratory and/or field environment. Oral instructions are given at the beginning of each task, and all completed work is subject to close review. At this level the worker has little or no practical experience in the work, but may possess theoretical knowledge gained through formal technical training.

Level II. This level differs from Level I in that the worker is expected to apply a limited amount of experience in accomplishing the work. At the beginning of each new task, he receives oral instructions concerning work methods, available equipment, and procedures to be followed. When more complex work is involved, the technician is given the location of more specific guidance such as available manuals, texts, laboratory notes, etc., to examine prior to commencing actual work. When differences occur because of possible vagueness of oral or written guidance or conflicting results of precedents, the worker discusses the case with the supervisor or higher grade employee prior to continuing the assignment. Work is subject to check for adequacy and accuracy while in progress and upon completion. The employee at this level is usually given increasingly more freedom and less specific guidance as his knowledge of the work and its methodology grows.

Level III. The technician receives general oral instructions relative to such factors as time to be alloted to certain functions, expected time of completion of assignments, possible technical problems which

may be anticipated, and possible sources of additional guidance. This level differs from Level II in that although written guides are available for most work, gaps, deviations, and differences in the procedural manuals and other guides do occur. When this situation arises the technician is expected to apply his knowledge gained through work experience of possible alternatives which will aid in gaining the desired results. Work is rarely checked in progress, but is subject to general review for adequacy of methods employed and accuracy of results obtained at the end of each assignment or "phase" of particularly long or detailed projects.

Level IV. This level differs from Level III in that the technician performs with a greater degree of independence. This usually is the result of the worker's long-term experience. In some instances it may also be due to additional education and training, and/or the absence of a supervisor well versed in the technical intricacies of the work. Although usually assigned to a specific function, the technician is often called upon to aid as a "troubleshooter" in the solution of technical problems occurring in other segments of the organization. Also found at this level is the technician who, because of his capacity to act independently on a variety of assignments, is designated as a "floater" to fill in where needed or is assigned to work where decisions must be made without benefit of supervisory or professional guidance.

Level V. This level differs from Level IV in that assignments are given in terms of long-range projects on which the technician will be working with an usual amount of autonomy. The supervisor, who is usually a professional scientist, gives initial instructions concerning the primary goal(s) and relative parameters of a project. Applicable methods and techniques contain gaps, deviations, or differences which usually must be critically examined prior to conducting the full project. To resolve such matters, the technician conducts a search of available literature and/or may perform preliminary experiments in a laboratory setting. At the completion of these initial steps, he presents his preliminary findings to the project leader who determines the feasibility of conducting the full study. During the course of a project of considerable duration the technician may report on completed phases of the work. Upon conclusion of the full assignment, he usually renders a written report to the project leader. Guides developed by the technician at this level are often used as precedents for additional studies of similar phenomena.

Element 2. -- Complexity

Degree A. Work at this degree is relatively simple. The employee performs one or a few repetitive tasks where work methods and procedures are well established. At this degree, no significant skill, knowledge, or judgment is required. The most difficult aspects of the work lie in learning proper work sequences and in operating simple-to-operate laboratory equipment such as choppers, grinders, autoclaves, etc.

Degree B. The incumbent performs one or a few routine procedural tasks where work methods and techniques are well established. The need for accuracy and attention to detail becomes more important than at the previous degree. This degree differs from Degree A in that skill, judgment, and knowledge are required in arranging work sequences, adjusting and operating equipment, and recognizing significant deviations in results obtained.

Degree C. Work methods are usually fairly well established, but often require a number of sequential steps to complete a full assignment. The technician is usually required to make procedural readjustments when problems occur, and in the laboratory situation usually must possess the ability to calibrate, adjust, and operate a variety of equipment. Considerably more judgment is required than that found at Degree B in that the technician often has to select the appropriate auxiliary equipment or an alternative method of testing because of such factors as sample size, need to vary environmental conditions, limitations of equipment, and the like.

Degree D. The nature and scope of the technical work is quite demanding in terms of knowledges and skills required to accomplish assigned tasks adequately. These attributes may be gained through additional education, training, and/or experience in the theoretical and practical aspects of the technical work. In many instances procedures followed consist of a large number of delicate and exacting steps in gathering reliable data and/or the instrumentation is very elaborate. This degree differs from Degree C in that the technician not only has to apply skill and knowledge in gathering significant data, but also must analyze, evaluate, consolidate, and report his findings.

Degree E. Typically, the technician is involved in the development of new procedures and techniques such as for the more effective utilization of complex equipment. The skills, practical and theoretical knowledges, and the need for use of sound judgment are evident in that the phenomena to be examined contain a number of unknown variables and the equipment utilized is highly complex. The chief difference between this degree and Degree D is that the technician must apply a knowledge of physical science methodology and techniques in developing new procedures and recording them for more conventional use by others.

Degree F. Technical complexity at this degree is extremely involved. Projects are typically of long duration, consist of a number of phases, and are generally in support of or directly involved in research and development functions. The continuing need for ingenuity and originality is an inherent factor in the

job requirements. Skill requirements are high and include the need for extensive knowledge of the equipment utilized and the procedures employed, as well as a need for ability to write reports relative to results obtained and analyzed. This degree differs from Degree E in that the technician must apply intensive knowledge of the specific theoretical concepts which underly the work and skill in planning complex operations.

Note:This work situation is less demanding than that depicted in Degree A of the Research Grade-Evaluation Guide in that it does not involve problem definition, interpretation of results, or other aspects that require professional knowledge and judgment.

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TYPICAL WORK ASSIGNMENTS

The following material describes work situations typically found at the various grade levels covered by this standard:

PHYSICAL SCIENCE AID GS-1

With Level I responsibility, performs work typically found at Degree A. For example, as a basic trainee in a general purpose laboratory, performs tasks such as cleaning glassware and moving equipment. As required, may operate equipment such as simple salt spray apparatus after being given oral instructions as to arrangement of specimens, duration of test, ingredients to be used in the solution, and the like.

PHYSICAL SCIENCE AID GS-2

With Level II responsibility, performs work typical of Degree A. For example, in a chemistry laboratory performs a number of tasks such as the operation of mixers, choppers, grinders, and rough balances to prepare various types of materials for examination by others. After initial instructions, operates an autoclave to sterilize laboratory glassware and equipment, deciding which cleaning procedures are to be used to assure that glass is free of waxes and other residues. Prepares stock solutions and distills water. As knowledge of work increases, may prepare culture media, purify solvents by distillation, and perform other similar tasks after a brief discussion as to results expected.

PHYSICAL SCIENCE AID GS-3

With Level II responsibility, performs work of a complexity typical of Degree B. For example, after initial oral instructions as to the required location and desired frequency of inspection, takes samples of dust, air, water, soil, grass, etc., from a variety of sites at or near radiation sources such as nuclear reactors and/or linear accelerators. After primary discussions relative to methods and procedures to be followed and direction regarding possible written sources of additional instructional material, utilizes various radiation detection devices to examine samples gathered at various locations as well as to accomplish site inspections. Ascertains whether the amount of radiation present is within established

dosimetric levels and reports unusually high readings to higher grade worker or supervisor. New assignments are checked in progress and upon completion. As incumbent displays more proficiency, is given more freedom to accomplish assigned tasks.

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PHYSICAL SCIENCE AID GS-4

Illustrative Example #1

With Level III responsibility, performs work typical of Degree B complexity. For example, under general technical supervision, tests a variety of items such as paper, textiles, polyethylene sheeting, rubber hose, burlap, and other similar materials under normal atmospheric conditions to assure they meet established specifications. Follows procedures established by the American Society for Testing and Materials, National Bureau of Standards, and other appropriate authorities. Tests for such physical properties as breaking strength, elongation, and abrasion resistance. Utilizes equipment such as a tensile testing machine, an abraser, thickness gauges, and the like. When material fails to meet established specifications, the aid reports findings to supervisor or higher grade technician who accomplishes a new series of tests prior to final rejection. Materials accepted are subject to occasional spot check for adequacy of method and accuracy of results obtained.

Illustrative Example #2

With Level I responsibility, performs duties typically found at Degree D complexity. For example, as a recent graduate of a 2-year technical institute curriculum in chemistry, works under immediate supervision performing work requiring considerable technical training in chemistry but little or no practical experience. Under close supervision prepares samples and operates equipment such as a spectrograph and a gas chromatograph to perform chemical analyses of a variety of materials. Upon completion of tests, consolidates findings, analyzes derived data, and gives a report of findings to supervisor or higher grade worker.

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PHYSICAL SCIENCE TECHNICIAN GS-5

Illustrative Example #1

With Level III responsibility, performs work typical of Degree C complexity. For example, as a technician at a sewage plant, is responsible for conducting a substantial variety of tests for qualitative and quantitative determinations of various elements found in sewage. Selects appropriate test procedures and/or techniques as required by the accuracy of results needed and makes various determinations such as nitrogen, carbon, iron, ferric chloride, magnesium, and potash content in sewage water, sludge, and filter cake. Prepares curves displaying such data as the relative content of synthetic detergent in sewage. Performs other chemical tests of similar difficulty. Maintains accurate records and

presents completed findings to supervisor for review and analysis of data. Calibrates equipment utilized in tests and makes minor repairs.

Illustrative Example #2

With Level III responsibility, performs work typical of Degree C responsibility. For example, under general technical supervision sets up, operates, gathers, and consolidates data in a test and evaluation function concerned with the various physical properties as well as the quantitative and qualitative analysis of alloys. Operates equipment such as a high voltage X-ray machine and a spectrograph, making minor adjustments to the apparatus as the need arises. Gathers and consolidates data for definitive review and analysis by the supervisor.

PHYSICAL SCIENCE TECHNICIAN GS-6

With Level IV responsibility, performs work typical of complexity found at Degree C. For example, in a metallurgical laboratory, serves as a technician responsible for the full range of metallurgical testing activities at the facility, which includes such work as tensile testing (under both normal and adverse temperature conditions), performing Rockwell hardness tests, preparing metallographic samples, and the like.

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Is called upon to perform tests in the absence of supervisor and/or professional employees, often on a "crash" basis which entails working without the benefit of supervisory guidance at night or on weekends. When new physical test equipment is received in the function, is often called upon to participate in the primary testing operations.

Upon completion of tests, prepares list of findings (usually in the form of statistical data) for supervisor or professional employee requesting the work.

PHYSICAL SCIENCE TECHNICIAN GS-7

Illustrative Example #1

With Level IV responsibility, performs duties typically associated with Degree D complexity. For example, as a seasoned technician in a test and evaluation activity, is responsible for the operation of a spectrograph to perform qualitative and quantitative chemical analysis of various samples sent to the laboratory by a variety of sources. Operates the spectrograph, making appropriate adjustments, inserting the photographic plate, and causing the ignition of the arc. Develops and examines the plate, identifying the characteristic spectra and estimating the nature and relative proportions of elements present in the sample. Selects the spectral lines most likely to yield the best densitometric readings. Takes readings and records and reports findings, analyzing data and noting, when possible, the presence of inconsistencies in the results.

Notes:(1)A situation similar to that described above but of a lower level of difficulty may involve, for example, sample preparation and operation of the spectrograph but with no responsibility for the interpretation of the data.

(2)A work situation similar to that described above but of a higher level of difficulty may involve, for example, the development of procedures for spectrographic analysis.

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Illustrative Example #2

With Level IV responsibility, performs work typical of Degree D complexity. For example, in a test and evaluation function, is technically responsible for conducting spectrophotometric, chromatographic, as well as more conventional analyses of materials containing a wide variety of constituents. Based upon the training and experience of the technician, he selects the appropriate procedure to be used under varying conditions (such as amount of material available for analysis, short deadlines, accuracy required, etc.), and independently performs the analysis.

Operates equipment and/or follows appropriate procedures, obtaining and consolidating the required data. Analyzes the data and forwards findings obtained to the various parties requesting the information.

PHYSICAL SCIENCE TECHNICIAN GS-8

With Level IV responsibility, performs work typically found at a complexity equivalent to Degree E. For example, as a technician in a laboratory devoted to metallurgical research, independently utilizes an electron microscope to study the microstructure of dissimilar thin film metal composites.

Prepares specimens and operates the microscope, identifying transmission images as representative of the specimen, measures electron diffraction patterns, takes sequential dislocation pictures while stressing the specimen, and introduces shadow process to emphasize detail. Develops new techniques for examination of various specimens as work requires. Utilizes a knowledge of the more practical aspects of metallurgical phenomena (1) to interpret micrographs taken at elevated and depressed temperatures, (2) to determine correct electrolytes to be used, (3) to provide representative micrographs by acquiring a knowledge of such phenomena as martensite formation, (4) to adapt procedures to examine and interpret defective structures in materials.

Summarizes data, prepares charts, graphs, statistical tables, prepares memorandums of findings and recommendations. Maintains a file of techniques used to meet the general needs of the laboratory.

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Note:A work situation similar to that described above but of a lower level of difficulty may involve, for example, the exclusive utilization of techniques developed by others.

PHYSICAL SCIENCE TECHNICIAN GS-9

Illustrative Example #1

With Level V responsibility, performs work of a complexity comparable to that found at Degree E. For example, serves as a member of an interdisciplinary scientific "team" assigned the task of developing procedures to enable the team to vacuum coat a 40-inch mirror to be utilized as a standard for other similar pieces of equipment. In addition to normal support duties for the overall multidisciplinary project, the technician is assigned specific tasks involving the setup and operation of special equipment and attachments to an 80-inch vacuum chamber. This equipment includes a vacuum ultraviolet spectrometer, a microphotometer with recorder, and various other monitoring devices.

The technician searches various texts and articles previously published relating to similar projects, devises unique fixtures and shutters to aid in the coating application, and participates with other members of the team in simulated coating operations.

Participates in the actual coating of the mirror and aids in the writing of the technical report concerning the successful development of the device. The total duration of the entire project is approximately 1 year.

Illustrative Example #2

With Level IV responsibility, performs work of a complexity typically found at Degree F. For example, as a close personal assistant to a physicist in a research laboratory, the technician aids the scientific effort by performing the following duties: After a general discussion with the project leader relative to the theoretical problems likely to be encountered and the general overall design required, the technician designs a cryostat for conducting experiments at extremely low temperatures. Makes significant contributions to the design work in the form of recommended changes which later prove to increase overall efficiency of the device. Incorporates such modification after approval by the supervisor and supervises the fabrication of the cryostat.

After completion of construction, makes a thorough check of all components to assure that all critical specifications are met. Operates the device, taking appropriate readings and measurements from resistance bridges, potentiometers, manometers, and other devices used in low temperature studies. In experiments utilizing the cryostat with an accelerator, uses mechanical, optical, and radiological techniques to align the target in the cryostat wit the beam of the accelerator. Participates in collecting data during operation of the device(s) by use of scales, multichannel analyzers, and various read-out

instruments. Reduces data by use of a desk calculator, plotted curves, and gives written reports of results obtained to project leader.

Participates in the writing of a technical report concerning the construction, operation, and results obtained from the project, which is later published in the open literature.

Note:A work situation similar to that described above but of a higher level of difficulty may involve, for example, the independent analysis and evaluation of data and results by the technician.

GRADE-DETERMINATION CHART

The various combinations of factors may be converted to grade levels by reference to the following chart:

ELEMENT 1 -- RESPONSIBILITY	ELEMENT 2 -- COMPLEXITY					
LEVEL	DEGREE A	DEGREE B	DEGREE C	DEGREE D	DEGREE E	DEGREE F
I	GS-1	GS-2	GS-3	GS-4	*	*
II	GS-2	GS-3	GS-4	GS-5	GS-6	*
III	GS-3	GS-4	GS-5	GS-6	GS-7	GS-8
IV	*	GS-5	GS-6	GS-7	GS-8	GS-9
V	*	*	GS-7	GS-8	GS-9	GS-10

*These extreme combinations are unlikely to occur.

SPECIAL SUPPLEMENT TO THE POSITION CLASSIFICATION STANDARD FOR THE PHYSICAL SCIENCE TECHNICIAN SERIES, GS-1311

APPLICABLE TO PHYSICAL SCIENCE TECHNICIAN POSITIONS ENGAGED IN TECHNICAL RADIOLOGICAL CONTROL WORK IN THE DEPARTMENT OF THE NAVY

December 1979

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PURPOSE

This supplement extends and particularizes the coverage and grade level criteria provided by the position classification standard for the Physical Science Technician Series, GS-1331, dated April 1967.

COVERAGE

The positions covered consist of highly specialized, technical work involved in planning and accomplishing the containment and control of radioactivity on personnel and equipment, during and in support of engineering and maintenance work processes (repair, overhaul, refueling, testing, modification, etc.) on nuclear power reactors, propulsion systems, plants, and associated areas, environment, and equipment. Under certain emergency, test, or active conditions, po sitions at full performance levels include responsibility and author ity to control all personnel and traffic activity, order work stop pages, direct evacuation, and take immediate action to contain, control, and minimize radiation exposure, prevent accidents, and han dle emergencies using available personnel.

The work is performed to eliminate or minimize exposure of personnel and equipment to radiation, to eliminate or minimize the pos sibility of its adverse physical effects, immediate and long term, and to prevent and control accidents involving radiation.

Industrial radiological control work often involves technical expertise relating to, or used to control or support: industrial hygiene, medical or science-support oriented health physics, engineering, trades and crafts, and (non-radiological) safety functions. These aspects are not emphasized in this coverage statement because they overlap with work in other existing occupations and, in some instances, are

covered by criteria in existing standards. They do not distinguish this specialization from others, but may relate to someof the work performed and qualifications for actual positions. The work and positions intended for coverage by this supplement are those which, at full performance levels, involve strong primary em phasis on the following:

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--Skill in the on-site containment and control of radiation and the prevention of radiation related incidents in an active industrial setting;

--Knowledge of (not skill in performing) various blue collar trades and crafts procedures;

--Knowledge and skill sufficient to review work procedures on-thejob as a final check to ensure that the radiological controls specified in these procedures are radiologically safe for the on-the-job conditions;

--Knowledge and skill sufficient to assess abnormal work situ ations involving radioactivity and stop work where neces sary to ensure radiological safety;
--Knowledge and skill sufficient to act independently (drawing upon intensive specialized training) to cope effectively with radiation incidents involving an intense radiation source, during those critical minutes before a more knowledgeable employee can take over, so as to forestall potentially se-ere accidents (e.g., those possibly affecting many personnel in side and outside the shipyard).

The requisite, specialized knowledge and skill may be considered, as necessary, in selective placement and other personnel actions to the extent it is essential to the position(s) to be filled.

EXCLUSIONS

1.Positions which are limited to routine duties such as the logging of the issue, receipt, and readings of individual personnel radiation detection devices, adding doses, "frisking" personnel, checking identification, collecting samples, and placing and adjusting equipment, are not covered unles they involve developmental training and work assignments leading to positions requiring the key skills and knowledge described above under "Coverage." To classify such (excluded) work, consult the main body of the Physical Science Technician Series, GA-1311; Gas and Radiation Detection Monitoring Series, WG-5205; and Guard Series, GS-085.

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2.Positions which primarily provide support and assistance to scientific experiments, research reactor operation, or engineering development using a radiation source are not covered unless they have as their main requirement, application of the key skills and knowledge previously described under "Coverage." To classify such (excluded) work, consult standards such as the Engineering Techni cian Series, GS-802, and the main body of the Physical Science Technician Series, GS-1311, which precedes this supplement.

3.Positions which primarily involve training others and teaching radiological control are not covered by this supplement. They should be classified by reference to the Training Instruction Series, GS 1712; the Education and Vocational Training Series, GS-1710; and the Grade-Evaluation Guide for Instructor and Specialist Positions Involving Education and Training Work.

4.Positions which involve professional work in fields such as health physics, industrial hygiene, and safety engineering should be classified by reference to the series for professional work in the occupation(s) involved.

TITLES

The basic title for nonsupervisory positions classified using this supplement is: Physical Science Technician.

Agencies authorized to apply this supplement are encouraged to use "organizational" or "agency" titles, such as "Radiological Control Technician," for internal administration, regulatory compliance, and similar purposes.

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Positions which meet or exceed the criteria of the Supervisory Grade-Evaluation Guide for evaluation as a supervisor are titled: Supervisory Physical Science Technician.[1]

Positions which fall within the coverage of the Work Leader Grade-Evaluation Guide are titled: Lead Physical Science Technician.[1]

GRADING OF POSITIONS

Nonsupervisory radiological control work should be evaluated factor by factor using the nine factors in the Factor Level Descriptions section which begins on the next page, and/or the OPM Benchmark Descriptions which follow the Factor Level Descriptions section. Total points for the nine factors of a position are converted to a grade using the conversion table below.

[1] The Factor Level Descriptions provided in this standard are applicable to nonsupervisory work only. Supervisory positions that meet the "minimum level of supervisory responsibility," as defined in the General Schedule Supervisory and positions which fall within the coverage of the Work Leader Grade Evaluation Guide, should be evaluated by the application of the criteria in the appropriate guide

All users of this standard need to know the basic rules, procedures, and policies for grading positions found in the *Introduction to the Position Classification Standards* and *The Classifier's Handbook*.

GRADE CONVERSION TABLE

Points for the nine factors of a position are added, and the total is converted to a GS grade using the table below:

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Grade	*Point Range*
GS-1	190- 250
GS-2	255- 450
GS-3	455- 650
GS-4	655- 850
GS-5	855-1100
GS-6	1105-1350
GS-7	1355-1600
GS-8	1605-1850
GS-9	1855-2100
GS-10	2105-2350

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FACTOR LEVEL DESCRIPTIONS

FACTOR 1, KNOWLEDGE REQUIRED BY THE POSITION

Factor 1 measures the nature and extent of information or facts which radiological control technicians must understand to do acceptable work (e.g., steps, procedures, practices, rules, policies, theories, principles, and concepts) and the nature and extent of the skills needed to apply those knowledges. To be used as a basis for selecting a level under this factor, a knowledge must be required and applied.

Level 1-2--200 points

Knowledge and skill to learn the radiological control skills, information, procedures, rules, regula tions, and techniques used at higher levels. This includes the ability to learn and perform mathematical, verbal, analytical, and judgmental tasks which utilize knowledge gained through satisfac tory completion of a high school "academic" curriculum which in cluded two or more full year courses in algebra, geometry, or trigonometry, and two or more courses in science such as chemistry, physics, and general science; or, equivalent ability developed through self study, training, experience, or indicated by valid related tests.

AND

Skill to operate simple radiation counting devices, record read ings from meters, "frisk" personnel, and check identification of per sonnel. Although these radiation survey skills require some training or experience, the key abilities applied are those described in the paragraph above. Positions at this level are typically developmental or "trainee" in nature, and provide for development, through class room and on-thejob training, of these basic (as well as more ad vanced) equipment operation, record keeping, and radiation survey and control skills.

Level 1-3--350 points

Knowledge of the body of standardized, technical radiological survey and control practices and requirements such as those used in controlling radiation in storage, decontamination, and control points of moderate activity.

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Skill in detecting obvious radiation deficiencies, conducting sur veillance, properly posting areas, enforcing controls, and assuring proper gear, clothing, protective devices, etc., in a variety of areas, such as storage, warehouse, dock, and ship sections with limited, on-going, industrial activity.

Skill in selecting, sizing, and placing pumps, filters, and access sleeves in containment facilities of standard design.

Skill in reading a variety of standard radioactivity counters.

Level 1-4--550 points

In addition to the knowledge, skills, and abilities described at level 1-3 applies knowledge of the radiological control procedures involved in handling, processing, transferring, and transporting contaminated waste (such as water), knowledge of a limited range of work procedures in one or two trade processes; and knowledge of ship and shipyard layout, and functions and au thority of various shops and organizations.

Skill in monitoring industrial activities of limited radiological complexity. This includes applying skill in calculating maximum po tential doses to individuals in case of an accident, controlling poten tially exposed personnel and activities in the event of radiation leak, and reading work plans and specifications for a variety of operations sufficient to detect unacceptable deviations from approved operations.

Level 1-5--750 points

In addition to the knowledges, skills, and abilities described at the previous levels, general knowledge of a wide range of radiation control procedures; detailed knowledge of the design and layout of nuclear

propulsion systems; detailed knowledge of a range of complex project phases, e.g., several of the phases involved in monitoring fuel cell replacement; and knowledge of work procedures in several high-skill trades (e.g., pipefitting, machining, shipfitting and welding).

Applies the above knowledges to review planned work operations and procedures and checks on-going operations to determine the adequacy of radiation control procedures and to improve the radiological safety of work procedures, engineering tests, or the local environment. Uses knowledge to detect deficiencies and de termine if "stop work" orders are warranted.

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Applies skill in controlling and investigating a variety of accidents with radiation and non-radiation complications. During on-site inci dents, takes immediate charge and implements best course of action (until a senior radiological control official arrives). Applies skill in determining personnel or procedures which contributed to incidents and recommends ways to prevent recurrence.

Level 1-6--950 points

In addition to the knowledges, skills, and abilities described at level 1-5, detailed knowledge of the full range of technical radiation control principles, theories, and practices suf ficient to:

--determine causes of serious incidents and solve local radiological control prblems which lower grade technicians are unable to resolve;

--monitor work procedures in numerous high level trades and test procedures (e.g., those involving combinations of machining, pipefitting, shipfitting, welding, insulation, rig ging, and electrical processes on radioactive items;

--plan and recommend more efficient, safe, radiation related work procedures for complicated operations, or appraise similar recommendations of other personnel;

--adapt segments of training programs to local, changing needs (e.g., changes in background of trainees such as those which result from changing recruitment source from junior college graduates to high school graduates; and extensive changes in basic radiological control regulations and techniques);

--review portions of local radiological control practices, plans, or procedures. This includes determining deficiencies in the actions taken by control technicians or other personnel, and recommending additional or changed training or radiological control procedures.

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Skill in providing radiological control services sufficient to:

--serve as senior radiological control technician during active shifts and, as necessary, assume control of serious incidents;

--provide, alone or as a senior control technician over one or two others, the full range of radiological control services for a wide range and variety of complicated operations such as most of the phases involved in fuel cell replacement, primary coolant system component replacement, and other difficult projects .

FACTOR 2, SUPERVISORY CONTROLS

"Supervisory Controls" covers the nature and extent of direct or indirect controls exercised by the supervisor (including those exer cised through leaders or other personnel), the employee's responsi bility, and the review of completed work. Controls are exercised by the supervisor in the way the assignments are made, instructions are given to the employees, priorities and deadlines are set, and objectives and boundaries are defined. Responsibility of the em ployee depends upon the extent to which the employee is expected to develop the sequence and timing of various aspects of the work, to modify or recommend modification of instructions, and to partici pate in establishing priorities and defining objectives. The degree of review, e.g., close and detailed review of each phase of the assign ment; detailed review of the finished assignment; spot-check of finished work for accuracy; or review only for adherence to policy.

Level 2-1--25 points

The supervisor gives clear, detailed, and specific instructions for all tasks.

The employee works and studies as directed and consults with supervisor or higher graded technician on matters not understood or not covered in instructions, guides, or texts.

The work is closely controlled, observed, and limited until the employee can demonstrate through job-related tests or exercises that he or she can perform competently. (Trainees are expected to perform with increasing independence and competence as their training progresses.)

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Level 2-2--125 points

The supervisor assigns a project, project segment or phase, area of responsibility, or comparable assignment; and indicates generally what is expected regarding limitations quality and quantity, deadlines, and priority of assignments.

The employee carries out recurring assignments independentl.v, but receives assistance or training on new, difficult, or unusual as signments including suggested work methods and advice on avail able and applicable source material.

A supervisor or senior technician is usually available, on-site, as suring that the employee's training is adequate and current, fre quently observing developmental work in progress, reviewing completed

reports, and checking for compliance with required radiological procedures. Review or training increases if the employees not previously performed a particular kind of project.

Level 2-3--275 points

The supervisor assigns areas, e.g., seg ments of a ship or shipyard, and project (e.g., main coolant valve removal), and defines priorities, objectives, and deadlines.

The technician plans and carries out the various steps and proce dures and is expected to act independently to prevent accidents, solve problems, and investigate incidents in accordance with exist ing policies and accepted practices. The technician typicallv receives help on difficult, unusual situations which lack clear precedents. An on-site supervisor is often not immediately avilable to deal with the initial moments of emergencies.

Completed work is appraised for technical soundness, success in preventing incidents, and conformity with policy and requirements. For example, handling an emergency might be reviewed, after the fact, for taking (in a desirable sequence) the proper technical ac tions, using good judgment, meeting regulatory requirements, and following existing policy.

FACTOR 3, GUIDELINES

This factor covers the nature of guidelines and the judgment needed to apply them. Guides used in General Schedule occupations include, for example, desk manuals; established procedures and policies; traditional practices; and reference materials, such as dictionaries, style manuals, engineering terminology handbooks, the Pharmacopoeia, and the Federal Personnel Manual.

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Individual jobs in different occupations vary in the specificity, applicability, and availability of the guidelines for performance of assignments. Consequently, the constraints and judgmental de mands placed upon employees also vary. For example, the existence of specific instructions, procedures, and policies may limit the opportunity of the employee to make or recommend decisions or ac tions. However, in the absence of procedures, or under broadly stated objectives, employees in some occupations may use consider able judgment in researching literature and developing new methods .

Guidelines should not be confused with the knowledges described under Factor 1, Knowledge Required by the Position. Guidelines either provide reference data or impose certain constraints on the use of knowledges.

Level 3-1-- 25 points

Specific, detailed guidelines covering all important aspects of the assignments are furnished to the employee. Typically, extensive classroom and on-thejob training are provided covering basic radiological survey and control procedures and guides.

Level 3-2--125 points

Guidelines are available in the form of technical work procedures, technical manuals, engineering specifi cations and drawings, and Federal, agency, and local regulations. The employee selects the most appropriate guidelines and deter mines whether to recommend minor deviations for improved efficiency, safety, containment, and economy, or to adapt them to changed equipment and circumstances.

Level 3-3--275 points

Due to large variety of complex work situations encountered, guidelines such as those described at Level 3-2 are not specifically applicable to a particular assignment or task. The technician must exercise judgment in selecting the appropriate radiological control procedure and apply a thorough under standing of radiological control procedures and techniques in interpreting the guidelines, determining their applicability to situations not specifically covered, and adapting procedural instructions as necessary and appropriate. The employee evaluates the results of such adaptation and recommends changes to improve the applicability of certain guidelines.

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FACTOR 4, COMPLEXITY

This factor covers the nature, number, variety, and intricacy of tasks, steps, processes, or methods in the work performed; the difficulty in identifying what needs to be done; and the difficulty and originality involved in performing the work.

Level 4-2--75 points

The work includes related steps and procedures such as those involved in routine surveys and monitoring, moving, storing, or decontaminating radioactively contaminated waste or tools where work is done by local individuals or small groups.

The employee must recognize and apply different procedures appropriate to situations and conditions found as the result of inspections, checks, and surveys, such as, checks of radioactive liquid collection tanks, surveys of components for gamma radiation levels, and inspection of filters and containment facilities.

Actions taken by the employee will vary with the type and degree of contamination, presence of personnel, availability of shielding, on-going work, and other similar concerns.

Level 4-3--150 points

The work involves the radiological con trol of different work processes and methods such as those involved in several high-skill trades (e.g., rigging, welding, pipefitting, and shipfitting) used in numerous phases of refueling projects or com plex, radioactive component replacement projects and comparable work.

Decisions regarding what needs to be done vary with each project phase and type of incident, and with the specific, actual conditions as the work progresses or accidents occur. The employee evaluates numerous alternatives and selects the best course of action in the event of an accident or emergency.
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Conditions and elements such as design deviations, personnel re sponsible for deficiencies, responsibilities of various personnel and organizations, extent of training of maintenance personnel, degree of contamination, fatigue, and worst possible accident, must be identified and analyzed to establish causes and extent of accidents and prevent recurrence.

Level 4-4--225 points

The assigned work includes the full range of complex, nonsupervisory radiological control assignments found at a typical nuclear shipyard.

The work requires experience, training, and demonstrated success in handling varied, difficult, new, and unusual projects; successful handling of accidents; and decisiveness in emergency situa tions where information is conflicting or incomplete.

The employee is regularly assigned special projects which require: development, refinement, or adaptation of procedures or training to local needs; recommendation of improved radiological control and related trade procedures; or analysis of incidents to pin point responsibility and recommend ways to prevent recurrence in situations where lower grade technicians were unable to resolve these matters satisfactorily; or comparably complex work.

FACTOR 5, SCOPE AND EFFECT

Scope and Effect covers the relationship between the nature of the work, i.e., the purpose, breadth, and depth of the assignment, and the effect of work products or services, both within and outside the organization.

In General Schedule occupations, effect measures such things as whether the work output facilitates the work of others, provides timely services of a personal nature, or impacts on the adequacy of research conclusions. The concept of effect alone does not provide sufficient information to properly understand and evaluate the impact of the position. The scope of the work completes the picture, allowing consistent evaluations. Only the effect of properly per formed work is to be considered.

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Level 5-2--75 points

The work involves enforcing or executing specific radiological survey and control rules, regulations, or proce dures in one segment of a project or area (e.g., specific portion of a shipyard or ship) which involves other radiation controllers under a team leader, experienced radiological control technician, or physi cally present supervisor.

The service performed determines the areas inside facilities which require radiological control, limits personnel access to these areas, and affects the acceptability of other processes (e.g., insures accep tability of storage or decontamination activities).

Level 5-3--150 points

The work involves treating a variety of conventional problems, questions, and situations such as those in volved in a small number of the more standardized, though highly complicated, refueling activities where such work is recurrently performed in conformance with established procedures, or rotating through a variety of assignments (shipyard and ship areas, control points, etc.) during periods of moderate industrial activity.

The service performed preserves the physical well being of numerous employees and others in the vicinity of the shipyard.

Level 5-4--225 points

The work performed involves assessing or investigating unusual radiological control situations and acting independently drawing on intensive specialized training to deal with radiation incidents involving an intense radiation source during those critical minutes before a more knowledgeable employee can take over, so as to head off potentially severe accidents (e.g., those directly affecting many people inside and outside the shipyard).

The service performed (e.g., taking charge during a major accident which impacts on radiological control, issuing a stop work order affecting production deadlines, developing local improvements in procedures, or determining causes of incidents and ways to prevent recurrence, prevents nuclear work from affecting the harbor ecology and the health of numerous agency employees, other personnel, and local citizens. This level of work is most typical of radiological technicians who perform their work without on-site supervision, who have shift responsibility, or who are responsible for small, two- to three-person teams in areas where complex, in dustrial operations are underway.

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FACTOR 6, PERSONAL CONTACTS

This factor includes face-to-face contacts and telephone and radio dialogue with persons not in the supervisory chain. (NOTE: Personal contacts with supervisors are covered under Factor 2, Super visory Controls.) Levels described under this factor are based on what is required to make the initial contact, the difficulty of com municating with those contacted, and the setting in which the con tact takes place (e.g., the degree to which the employee and those contacted recognize their relative roles and authorities).

Above the lowest level, points should be credited under this factor only for contacts which are essential for successful performance of the work performed.

The relationship between Factors 6 and 7 presumes that the same contacts will be evaluated for both factors. Therefore, the personal contacts which serve as the basis for selecting a level for this factor must be the same as the contacts which are the basis for selecting a level for Factor 7.

Level 6-2--25 points

Personal contacts are with employees in the employee's agency, and sometimes other agencies or non Government activities. People contacted are engaged in a variety of work, e.g., various trades and crafts work, military occupations, engineering tests, inspections, visits, sales, and represent several organizational levels in one or a few agencies. Most contacts readily understand and accept the employees role as a radiological control official. Typical contacts would be those in storage areas and control points of limited industrial activity where most other personnel un derstand the radiological control function and those with visitors, sales persons, officials, etc., who, once informed, readily accept and follow the technician's authority and instructions.

Level 6-3--60 points

Personal contacts are with individuals from inside and outside the agency and frequently involve nonroutine establishment of the controller's role and authority with other officials. For example, production supervisors, managers, in spectors, military officers, professional engineers, contractors, news reporters, and community officials are dealt with in circum stances where they are often reluctant to accept the controller's au thority to stop work, identify causes of incidents, deny entry, order evacuation, etc. Contacts from the local community may include in dividuals opposed to any radiation-related activity.

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FACTOR 7, PURPOSE OF CONTACTS

In General Schedule occupations, the purpose of personal contacts range from factual exchanges of information in situations involving significant or controversial issues and differing viewpoints, goals, or objectives. The personal contacts which serve as the basis for the level selected for this factor must be the same as the contacts which are the basis for the level selected for Factor 6.

Level 7-2--50 points

The purpose of personal contacts is to learn, perform, and enforce radiation survey and limited control re quirements, learn work sequences and procedures used by other personnel in controlled areas, point out deficiencies (deviations from authorized practices), and motivate personnel to maintain or im prove high radiological control standards, correct deficiencies, prevent radiological incidents, and promote the program. At this level, the people dealt with are generally cooperative.

Level 7-3--120 points

In addition to purposes described at level 7-2, contacts at this level involve greater skill in influencing, motivating, persuading, and gaining compliance from others, for example:

--persuading uncooperative officials, e.g., in insisting on a dis puted "stop work" order or denying entry to work site be cause of (disputed) inadequacies in plans;

--calming and directing fearful people inside and outside of the shipyard's radiological control program during a suspected or actual incident;

--explaining lack of danger to people who mistake a test inci dent for an actual nuclear accident;

--persuading production officials and trades and crafts mechanics to adopt radiologically improved or more efficient work procedures which meet radiological control require ments;

--gaining compliance with radiological control regulations by persuasion, training, or gaining rapport with production offi cials and workers who initially disagree with the technicians interpretation of radiological control requirements.

FACTOR 8, PHYSICAL DEMANDS

The "Physical Demands" factor covers the requirements and physical demands placed on the employee by the work assignment. This includes physical characteristics and abilities (e.g., specific agility and dexterity requirements) and the physical exertion in volved in the work (e.g., climbing, lifting, pushing, balancing, stooping, kneeling, crouching, crawling, or reaching). To some extent the frequency or

intensity of physical exertion must also be considered (e.g., a job requiring prolonged standing involves more physical exertion than a job requiring intermittent standing).

Level 8-2--20 points

The work requires regular and recurring walking over areas in various stages of repair; recurring bending, crouching, stooping, reaching, or similar movement; lifting and car rying moderately heavy (usually under 2 kilograms[50 pounds]) radiation coun ters, air pumps, or comparable equipment; walking over railroad tracks and near dry docks; or comparable exertion.

Level 8-3--50 points

The work regularly and recurringly requires strenuous physical exertion, e.g., to climb scaffolding and vertical ladders, lift objects over 2 kiograms (50 pounds) crouch and move in physically restrictive areas, e.g., portions of submarines or vessels undergoing repair, and agility to avoid damaging containment facilities and avoid physical interference with the work or movement of others.

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FACTOR 9, WORK ENVIRONMENT

The "Work Environment" factor considers the risks and discom forts in the employee's physical surroundings or the nature of the work assigned and the safety regulations required. Although the use of safety precautions can practically eliminate a certain danger or discomfort, such situations typically place additional demands upon the employee in carrying out safety regulations and techniques.

Level 9-2--20 points

The work involves regular and recurring work near stationary, stored, shielded radiation sources (such as shielded, contained, contaminated tools, equipment, or water) where industrial activity is limited and excessive exposure to radiation is highly unlikely.

The employee is frequently exposed to other conditions, such as moving vehicles, cranes, machines, etc., which require safety pre cautions such as constant alertness, use of protective clothing, gear and devices, and implementation of standard radiological survey and control regulations.

Level 9-3--50 points

The work environment subjects the em ployee to potentially dangerous, stressful situations which require a wide range of radiation control and industrial safety precautions and procedures. This environment is generally in areas where on-going maintenance, transportation, or testing procedures

involve equipment with relatively high levels of contained radiation; where acci dent frequency or potentially adverse consequences of accidents are above normal; where fire, personnel injury, multiple power source failures, extreme temperatures or weather, or comparable conditions are sometimes part of a situation which must be controlled; or where work operations are performed on crane booms or on staging on ships in dry dock during adverse weather.

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OPM BENCHMARK DESCRIPTION

PHYSICAL SCIENCE TECHNICIAN, GS-1311-3, BMK #1

Duties

As a trainee Radiological Control Technician at a shipyard that services nuclear vessels, performs duties which, through classroom training and on-thejob experience, provide:

--familiarization with elementary radiological control princi ples, practices, and equipment usage and a review of basic mathematics and science knowledges needed to learn and perform higher level assignments;

--proficiency in communications-related skills such as listening techniques, methods of study, use of technical references and agency regulations, use of technical terminology, and proper English usage;

--orientation to the techniques for reading shipyard plans and drawings such as those which show ship and shipyard layout, the less complex trades procedures (such as those involved in decontamination of tools), and the functions and authority of various shipyard organizations and staffs.

Performs a variety of standard radiological control/monitoring tasks normally working along with and under the immediate direc tion of an experienced technician. Typical tasks include, but are not limited to, the following:

--assembles radiation survey and sampling equipment for radiological control areas aboard ship or in a shipyard;

--conducts simple radiation surveys and establishes radiation and loose radioactive contamination perimeters;

--checks identification of personnel at control points;

--delivers radiation monitoring equipment to radioactive work areas;

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--counts swipe samples and records the results observed on the instrument without making interpretations;

--uses radiation detection instruments to determine if objects are radioactive and to "frisk" personnel; and

--keeps radiological control areas neat and orderly.

Factor 1, Knowledge Required by the Position--Level 1-2--200 points

Knowledge and skill sufficient to learn the radiation control skills, information, procedures, rules, regulations, and techniques neces sary to perform satisfactorily at higher levels. This includes the ability to learn and perform mathematical, verbal, analytical, and judgmental tasks which utilize knowledge gained through satisfac tory completion of a high school "academic" curriculum which in cluded two or more full courses in algebra, geometry, or trigonome try; and two or more courses in science such as chemistry, physics, and general science; or, equivalent ability developed through self study, training, experience, or indicated by valid job-related tests. For example, reviews basic algebra, geometry, trigonometry, and physics including mensuration of cylinders, spheres, polygons, etc.; use of exponents, radicals, scientific notation, and logarithms; force and pressure in liquids; and heat quantities. Uses these and related knowledges to learn to calculate doses of radiation to individuals, groups, and environment; compute volumes, half lives, shielding re quirements, etc.; and study more advanced texts, problems, and calculations.

Skill in operating simple, radiation counting devices, recording readings from meters, "frisking" personnel, and checking identifica tion of personnel.

Factor2, Supervisory Controls--Level 2-1--25 points

The supervisor gives clear, detailed, and specific instructions for a11 tasks.

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The employee works and studies as directed and consults with supervisor or higher graded technician on matters not understood or not covered in instructions, guides, or texts.

Assignments are closely controlled, observed, and limited until employee can demonstrate through job-related tests or exercises that he/she can perform competently. Trainee technicians are expected to perform recurring tasks with increasing independence and competence as their training progresses.

Factor 3, Guidelines--Level 3-1--25 Points

Specific, detailed guidelines usually in the form of agency regula tions covering all important aspects of the assignment, are fur nished to the employee. Extensive classroom and on-thejob train ing are provided covering basic radiological survey and control procedures and guides, and the employee is expected to memorize some and demonstrate understanding of others.

Factor4, Complexity--Level 4-2--75 points

Assignments involve learning and applying related steps and procedures such as those involved in routine radiation surveys and monitoring contaminated tools, equipment, or clothing in storage.

The employee must learn to recognize and apply different procedures appropriate for different situations found as the result of inspections, checks and surveys, such as checks of radioactive liquid collection tanks, surveys of components for gamma radiation levels and inspection of filters and containment facilities. The technician learns to identify facts and conditions which affect the determina tion of actions necessary to contain and control radiation, e.g., presence of personnel, availability of shielding, and type of on-going work.

Factor 5, Scope and Effect--Level 5-2--75 points

The work involves assuring compliance with radiological control rules, regulations, and procedures in a single area of on-going industrial activity, e.g., a storage area or segment of a vessel. The technician's work determines the areas of facilities which require radiological control and assures the acceptability of local storage or decontamination activities.

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Factor 6, Personal Contacts--Level 6-2--25 points

Personal contacts are with production supervisors, mechanics, engineers, technicians, ships officers, and others in the department. Most persons contacted understand the technician's actions and purposes and accept instructions.

Factor 7, Purpose of Contacts--Level 7-2--50 points

The purpose of personal contacts is to learn, implement, and enforce radiological survey and control requirements; observe work procedures to detect and point out control deficiencies; and influence Personnel to maintain higher radiological control standards.

Factor8, Physical Demands--Level 8-2--20 points

The technician frequently:

--walks over areas in various stages of repair or uneven surfaces such as railroad tracks;
--stoops, crouches, bends, reaches; and
--lifts and carries equipment which weights up to18 kilogram(40pounds).

Factor 9, Work Environment--Level 9-2--20 points

The employee works near shielded radiation sources where industrial activity is limited and excessive exposure to radioactivity is highly unlikely. The employee also works near operating machines, moving vehicles, drydocks, etc.

This environment necessities constant alertness, frequent use of protective clothing and devices. and compliance with standard radiation controls and safety regulations.

TOTAL POINTS--515

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PHYSICAL SCIENCE TECHNICIAN, GS-1311-04, BMK #1

Duties

As a trainee Radiological Control Technician at a shipyard that overhauls and refuels nuclear submarines, performs duties which, through classroom training and on-the-job experience, provide:

--familiarization with a wide range of the principles, practices, equipment use, and deficiency detection and correction techniques applied in independent, radiological monitoring of industrial activities in ship and shipyard areas and projects;

--familiarization with the design and layout of nuclear propulsion systems on nuclear vessels;

--familiarization with some of the more common, recurring work processes in one or two trades, for example, procedures involving the installation or removal of shielding, contain ment tents or tanks, and insulation;

--proficiency in monitoring the storage and treatment of contaminated clothing, equipment, and waste;

--proficiency in maintaining radiological records related to the work above.

Performs standard, recurring air, water, and surface radiological surveys in radiological material storage and dockside areas. Surveys radiologically controlled areas, posts warning signs, and arranges for construction of barriers.

Enforces regulations concerning matters such as the use of anti contamination clothing; frisking requirements; known or predete mined shielding requirements for stored items, and entry, radiation and exposure, and activity limitations for personnel in posted areas. Requires on-the-spot corrections and recommends ways to prevent recurrences of deficlencies.

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Factor 1, Knowledge Required by the Position--Level 1-3--350 points

Knowledge ancl skill to learn and perform standard agency techni cal radiation surveys and control principles, practices, and require ments sufficient to monitor and control radiation and personnel traffic in storage, decontamination, and control points of moderate activity. This knowledge and skill also must be sufficient to learn specialized radiation control applications of science and mathematics, and maintain an adequate rate of progress in programs designed to utilize, generally, a background of two years of experience, training, and/or education comparable to one of the following:

--college or junior college courses (including courses in mathematics, science, and composition, expository writing, or similar communications skills; or

--radiation or marine trades related technical school or apprenticeship; or

--military experience involving radiation control or mainte nance of ships propulsion systems and equipment aboard nuclear vessels; or

--technical "center" study in fields such as nuclear engineering technology, civil engineering technology, or health physics; or

--combinations of any of the above.

Skill in selecting and operating radiation detection and monitoring equipment in a variety of ship and shipyard areas, and in maintaining surveillance over contaminated tools, equipment, and clothing in storage areas.

Factor 2, Supervisory Controls--Level 2-1--25 points

The supervisor gives clear, detailed, and specific instructions for all assignments.
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Technicians are required to consult with supervisor, instructor, or higher graded employee on matters not understood or not cov ered in instructions, guides, or texts.

Technicians are closely observed and coached until they demon strate through successful performance, tests, or exercises that they can perform competently. Trainee technicians are expected to perform recurring tasks with increasing independence and competence as their training progresses.

Factor 3, Guidelines--Level 3-1--25 points

Specific, detailed guidelines, usually in the form of agency regula tions covering all important aspects of the assignment, are furnished to the employee. Extensive classroom and on-the-job training are provided covering radiological survey and control principles, procedures, and guides, and the employee is expected to memorize many of these guides and procedures to detect, on-site, radiation control

deficiencies, respond immediately to emergencies, and to learn to prevent and control numerous possible incidents.

Factor4, Complexity--Level 4-2--75 points

The work involves learning and applying related steps and procedures, such as those involved in routine air, water, and surface radiation surveys; monitoring contaminated tools, equipment, or clothing in storage; and detecting and correcting radiation control deficiencies in areas of low radiation or moderate industrial activity.

The employee learns to recognize and apply different procedures appropriate to different situations and abnormal conditions found during inspection, such as checks of radioactive collection tanks, surveys of components for gamma radiation levels, and inspection of filters and containment facilities.

The technician learns to identify facts and conditions which affect the determination of actions necessary and contain and control radiation, e.g., presence and condition of personnel, availability of shielding, type of on-going work, and maximum potential of both likely and unlikely accidents.

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Factor 5, Scope and Effect--Level 5-2--75 points

The work involves assuring compliance with radiological control rules, regulations, and procedures in an area of moderate on-going industrial activity, e.g., a storage area or segment of a vessel. The technician's work determines the areas of facilities which require radiological control and assures the acceptability of local storage or decontamination activities.

Factor 6, Personal Contacts--Level 6-2--25 points

Personal contacts are with production supervisors, mechanics, engineers, technicians, ships officers, and others at various organizational levels in the department and a few other Government agen cies. Also, visitors, sales persons, contract personnel, students, and similar non-Government personnel are sometimes encountered. Most contacts understand the technician's purpose and accept instructions.

Factor 7, Purpose of Conltacts--Level 7-2--50 points

The purpose of personal contacts is to learn, implement, and enforce radiation survey and control requirements; prevent incidents; inform production and other personnel of known ways to radiological safety of work procedures; point out deficiencies; and encourage personnel to maintain high radiological control standards.

Factor 8, Physical Demands--Level 8-3--50 points

The technician frequently performs the following:

--walks over rough areas undergoing repair, and uneven surfaces such as railroad tracks;
--stands and walks for long periods;
--stoops, crouches, bends, reaches;
--lifts and carries equipment which weighs 23 kilograms(50 pounds) or more;
--climbs vertical ladders, staging, and scaffolding; and

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--works in cramped, restrictive areas where movement requires caution to avoid interferring with on-going work, to avoid falls and bumps, and to avoid damaging containment facilities.

Factor 9, Work Environment--Level 9-2--20 points

The employee works near shielded or contained radiation sources where industrial activity is limited and excessive exposure is highly unlikely. The employee also works indoors and outdoors, near machines, moving vehicles, cranes, drydock, etc., in good and bad weather. This environment necessitates constant alertness, frequent use of protective clothing and devices, and compliance with standard radiation control and safety regulations.

TOTAL POINTS--695

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PHYSICAL SCIENCE TECHNICIAN, GS-1311-5, BMK #1

Duties

As a Radiological Control Technician at a shipyard or other indus trial facility which serves nuclear vessels, performs duties which, through classroom training and on-the-job experience, provide:

--proficiency in making and interpreting air, water, and sur face radiation surveys in most, if not all, vessel and shipyard areas, posting areas, and arranging for erection of barriers;

--proficiency in checking out deviations from normal or antici pated radiation levels to determine if the deviations are tran sient, instrument is defective, shielding has moved, equipment or the area has higher than expected radiation levels;

--proficiency in interpreting work plans, drawings, specifications, and procedures pertaining to maintenance, overhaul, refueling, or alteration of nuclear vessels;

--proficiency in implementing radiological control procedures related to the storage, local transportation, and local transporation of small volumes of nuclear waste;

--familiarization with the work methods and procedures of a few skilled trades and the radiation control procedures for monitoring them;

--familiarization with accident and casualty prevention and control procedures, as well as detection and correction of routine deficiencies;

--understanding of the layout and functioning of the nuclear propulsion system for a few variations of particular vessel design.

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Factor 1, Knowledge Required by the Position--Level 1-4--550 points

Knowledge and skill sufficient to learn and apply the following:

--numerous department and local shipyard radiation survey and control practices and requirements necessary to imple ment radiation control requirements in assigned ship or ship yard area(s), which involve, in addition to recurring storage and decontamination activities, processes in a few higher skilled trades activities such as rigging and moving items, or removing insulation or pipe sections;

--knowledge of ship and shipyard layout (including location of safety and emergency equipment, drainwater and sewage systems, harbor, contaminated equipment, and radiation sources) to plan ways to control possible incidents;

--knowledge of ventilation, detection, filtration, and containment material, equipment, and systems to assure adequacy of various standard containment and ventilation systems and procedures;

--skill in monitoring on-going equipment decontamination op erations and procedures related to one or two trades to de tect and correct deficiencies, prevent incidents, and improve radiological safety of on-going work;

--skill in interpreting work plans to detect deviations from approved procedures and assure compliance with radiological safety requirements;

--comprehension of the design and layout of nuclear propulsion systems on vessels and their operation; knowledge of the location of specific components; probable and possible radioactive areas and equipment, best locations for control points, possible incidents and accidents and their potential severity, degree of surveillance and control required, types and performance ratings of radiation control instruments appropriate for various areas or projects, control of personnel traffic and exposure, and other similar concerns.

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Factor 2, Supervisory Controls--Level 2-2--125 points

The supervisor assigns the technician specific responsibilities in designated ship or shipyard areas, control points, or comparable functions.

Clear, detailed, and specific instructions or training are provided for new, difficult, or unusual assignments, but recurring assign ments are carried out independently. The employee consults with a supervisor or higher graded technician to clarify matters not fully understood or covered in the instructions, guides, or standard pro cedures. The supervisor discusses work methods and refers the technician to appropriate regulations and guides. A supervisor or senior technician is usually available, on-site or nearby, frequently checks developmental work in progress, reviews records and re ports for adequacy, and assures that the radiation control procedures applied by the technician are adequate.

The employee's work is also appraised in terms of success in preventing and controlling incidents and success in acquiring knowledge and skills needed to perform higher level assignments.

Factor 3, Guidelines--Level 3-1--25 points

Numerous agency and shipyard regulations and procedural guides are directly applicable to the technician's assignments. The technician must maintain a current knowledge of guidelines and satisfac torily complete on-the-job and classroom training and testing to as sure that a current knowledge of guidelines is maintained and to enlarge the technician's knowledge of more difficult guidelines which cover more advanced assignments. The technician works in strict adherence to the applicable regulations, procedures, and instructions .

Factor 4, Complexity--Level 4 -2--75 points

The work involves learning and applying numerous radiological control procedures such as those involved in monitoring the storage and transportation of contaminated equipment and the control of operations involving skilled-trades, as well as those for recurring surveys.

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The technician must learn to recognize and apply different procedures appropriate for different situations, such as, leaking tanks of contaminated water, high rate of escaping radiation from contami nated tools due to inadequate shielding, unsafe trades techniques, or malfunctioning ventilation systems. The technician must identify facts and conditions which affect the determination of actions necessary to contain and control radiation, e.g., presence and condition of personnel, availability of shielding, type of on-going work, and maximum potential of both likely and unlikely accidents.

Factor 5, Scope and Effect--Level 5-2--75 points

The work involves assuring compliance with radiological control rules, regulations, and procedures in an area of moderate, on-going industrial activity, e.g., a warehouse or segment of a vessel. The technician's work safeguards the well-being of other persons and as sures the acceptability of local storage or decontamination activities.

Factor 6, Personal Contacts--Level 7-2--50 points

The purpose of personal contacts is to learn, implement, and enforce radiation survey and control requirements; prevent incidents; inform production and other personnel of known ways to improve the radiological safety of their work procedures; point out deficien cies; and encourage personnel to maintain high radiological control standards.

Factor8, Physical Demands--Level 8-3--50 points

The technician frequently performs the following:

--walks over rough areas undergoing repair and uneven sur faces such as railroad tracks;
--stoops, crouches, bends, reaches;
--lifts and carries equipment which weighs 23 kilograms (50 pounds) or more;
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--climbs vertical ladders, staging, and scaffolding; and
--works in cramped, restrictive areas where movement re quires caution to avoid interfering with on-going work, to avoid falls and bumps, and to avoid damaging containment facilities.

Factor 9, Work Environment--Level 9-2--20 points

The employee frequently works near shielded or contained radia tion sources where industrial activity is limited and excessive exposure is highly unlikely. The employee also works indoors and out doors near machines, moving vehicles, drydocks, etc., in good and bad weather. This environment necessitates constant alertness, frequent use of protective clothing and devices, and compliance with standard radiation control and safety regulations.

TOTAL POINTS--995

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PHYSICAL SCIENCE TECHNICIAN, GS-1311-6, BMK #1

Duties

Conducts continuing radiation control surveillance of activities, personnel, and material in assigned area(s) within a nuclear vessel or shipyard. The areas require use of radiation containment and control procedures related to: (1) storing contaminated equipment and water, (2) processing contaminated clothing; and (3) maintain ing surveillance over cleaning and decontamination of equipment and tools or other operations of limited radiation hazards involving related processes in one or two skilled trades. Examples of specific assignments, performed mostly on-site, include the following:

--checks assigned shipyard area(s) for radiological control problems, performs a variety of air and surface surveys, and applies standard procedures to correct existing deficiencies and prevent anticipated problems;

--verifies the adequacy of proposed and installed containment enclosures, ventilation and filtration systems, and temporary shielding; provides guidance during their installation; and as sures their proper use;

--responds to alarms such as those from installed radiation detection devices and determines cause of alarm and corrective action necessary, e.g., if increases in radiation continue to be above limits;

--verifies adequacy of protective clothing and equipment planned for use by various personnel in relation to the ap proved areas and planned work procedures or other activities;

--assures that workers have and display required training in radiological safety practices; provides on-the-spot instruction and correction of deficiencies, as necessary, during decontamination procedures, and, in areas of low radiation, insulation removal or pipefitting operations;
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--performs radiological evaluations of specific worksites and situations for proper containment, ventilation, tools, detec tion devices, filters, etc., and compliance with approved plans;

--monitors ship's components and determines radiological status; collects radiation and radioactivity data and deter mines (changes in) necessary degree of control;

--conducts reactor compartment entry and routine surveys; evaluates radioactivity of systems and areas; determines radiation control areas and perimeters; posts or directs placement of proper signs and barriers:

--assists in the selection, set-up, and operation of remote control points during highly complex operations by reviewing the plans and equipment of personnel who request access to controlled areas to assure conformance with approved operations and radiation control requirements.

Continues to receive classroom, on-the-job, and other advanced training to develop skills in handling more complex radiation control assignments. This includes, for example, rotation among various shops to learn radiation-related procedures and practices in several trades, participating in "dry run," practice sessions of complicated procedures, and learning the design and layout of nuclear propulsion systems on vessels of varying design.

Factor 1, Knowledge Required by the Position--Level 1-4--550 points

Knowledge of a body of department and local shipyard radiation survey and control practices and requirements sufficient to imple ment recurring storage and decontamination activities.

Knowledge of shipyard layout (including location of safety and emergency equipment, drainwater and sewage systems, harbor, and contaminated equipment and radiation sources) sufficient to plan ways to control possible incidents.

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Detailed knowledge of ventilation, detection, and filtration and containment material, equipment, and systems sufficient to assure adequacy of containment material and ventilation systems, or de termine changes necessary to remedy deficiencies.

Skill in monitoring on-going equipment decontamination opera tions and installation or removal of pipes, insulation, or equipment which emits little radiation, using knowledge of radiologically preferable techniques in the trades processes involved to correct deficiencies, prevent incidents, and improve radiological safety of on going work. Skill in interpreting work plans such as those involved in the work processes mentioned above sufficient to detect deviations from approved procedures and assure compliance with radiological safety requirements.

Knowledge and skill to learn a wide range of the radiation control knowledges and skills used in higher level assignments.

Factor 2, Supervisory Controls--Level 2-3--275 points

The supervisor assigns one or a few ship or shipyard areas to the technician, indicates activities and areas to be given special attention, what activities are planned or anticipated, and which have priority.

The employee independently carries out recurring tasks such as surveys and alarm checks.

A supervisor is available (though often not "immediately") to provide guidance on new assignments and unusual situations, to check and observe developmental work in progress, and to review completed reports.

Fa ctor 3, Guidel ines--Level 3-2--125 points

Navy and shipyard regulations cover all assignments, and the employee continues to receive classroom and on-the-job training to maintain and enlarge a current knowledge of them. Guidelines are very detailed and directly applicable to situations encountered. Some judgment is exercised by the technician in identifying and selecting appropriate guidelines and deciding among alternative approaches to a given situation.

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Factor4, Complexity--Level 4-2--75 points

The work includes related steps and processes involved in monitoring the local, off-ship transportation, decontamination and storage of contaminated waste, equipment, and tools, and processes such as the rigging of items for movement, the removal of insula tion, valves, etc., which have low radiation levels. The employee implements radiation control procedures for the preceding ac tivities. These procedures

differ according to the degree of contamination or radiation, kind of on-going work, presence of personnel etc.

Factor 5, Scope and Effect--Level 5-3--150 points

The technician's assignments involve, over a period of time, a number of shipyard and/or ship areas. The technician is expected to control common conventional problems, prevent radiological inci dents, and protect employees, visitors, and others in the area from unnecessary exposure to radiation.

Factor 6, Personal Contacts--Level 6-2--25 points

The technician must deal with a variety of people including trades and crafts employees, production supervisors, military officers, "contract" employees, and visitors, who nearly always cooperate with the instructions of the technician.

Factor 7, Purpose of Contacts--Level 7-2--50 points

The purpose of the technician's personal contacts is to implement radiation control procedures, prevent incidents, and correct de ficiencies in situations where personnel are usually cooperative.

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Factor 8, Physical Demand--Level 8-3--50 points

The employee frequently climbs vertical ladders, staging, or scaffolding; in work or training assignments, works in physically restrictive areas, and lifts heavy objects of about 23 kilograms (50 pounds).

Factor 9, Work Environment--Level 9-2--20 points

The work is performed in various shipyard, drydock, or shipboard areas during or prior to maintenance or overhaul activities. Most work is indoors or under cover, near well-protected (shielded) radi ation sources. Occasionally work areas are unpleasantly hot or cold, or involve warning near moving vehicles or machinery. The em ployee must exercise constant caution, use protective equipment, and follow standard radiation survey and control requirements.

TOTAL POINTS--1320

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PHYSICAL SCIENCE TECHNICIAN, GS-1311- 7, BMK #1

Duties

Serves as Radiological Control Technician at a shipyard which services nuclear vessels, with responsibility for protection of ship yard employees and prevention and control of nuclear incidents in assigned shipyard work areas. Work assignments typically include the following:

--performs radiological evaluations of various worksites; i.e., industrial work areas, areas aboard ships, non-industrial work areas; and reviews work situations for proper contain ment, ventilations, tools, detection devices, etc., and com pliance with approved radiological control (RADCON) plans;

--checks various shipyard work areas for radiological control problems; performs a variety of air, surface and other sur veys, applying standard procedures and occasionally non standard procedures to correct existing deficiencies and prevent anticipated problems;

--participates in all phases of radiation-related emergencies and incidents under the guidance of the supervisor or a more experienced radiological control technician; and

--monitors work and test procedures including those in several high skill level trades; e.g., pipefitting, rigging, and welding.

Factor 1, Knowledge Required by the Position--Level 1-5--750 points

Knowledge of a wide range of radiological principles, requirements, and procedures issued by higher commands and the shipyard, work techniques and procedures in several high skill-level trades, and design and layout of Navy nuclear propulsion systems aboard nuclear vessels, sufficient to monitor complicated operations (e.g., phases of refueling and main coolant valve replacement), to assure compliance with radiological safety requirements, to recommend improved procedures, to identify and correct deficiencies, and to determine when and if to "stop work."

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Skill in preventing and controlling incidents during complicated operations and in deciding, directing, and controlling the activities of all personnel during serious incidents.

Factor 2, Supervisory Controls--Level 2-2--125 points

The supervisor assigns work indicating objectives to be accomplished, time limitations, and priorities. The incumbent independ ently carries out recurring tasks (e.g., radiation and surface con tamination surveys), conducts reactor compartment entry and other surveys, assures adherence to radiological control requirements, etc., but receives assistance on new, difficult, or unusually hazard ous operations from his supervisor or a more experienced radiologi cal control technician who typically suggests control methods and recommends regulations or precedents from similar past projects. The supervisor frequently observes and checks the technicians work on-site, and reviews work for success in preventing and controlling incidents .

Factor 3, Guidelines--Level 3-2--125 points

The incumbent must have a sound knowledge of a large number and variety of Department of the Navy and Shipyard radiological control regulations, work procedures, and related guides. He must exercise judgment to select those guidelines and procedures re quired and appropriate for radiological control work assigned. The incumbent may make recommendations and justify in writing his recommendations for changes to established procedures.

Factor 4, Complexity--Level 4-3--150 points

The work involves planning and accomplishing radiation control for various phases of refueling projects, primary coolant system components removal, in addition to those for surveying assigned shipyard areas for radiological control problems.

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The incumbent's plans, procedures, and decisions vary depending upon the radiation control work being performed, which trade processes are involved, the actual conditions which exist at the time, etc.

Complications such as ship systems design deviations, degree of contamination, extent of previous training of trades personnel, fatigue factor, etc., must be considered in preventing and control ling incidents.

Factor 5, Scope and Effect--Level 5-3--150 points

The work of the position involves a number of varying work situations involving nuclear reactor refueling, nuclear propulsion plant repairs and modifications.

The incumbent is responsible for insuring the physical well being of numerous employees; i.e., trade and craft employees, engineers, technicians, and others working within the Shipyard.

Factor 6, Personal Contacts--Level 6-2--25 points

Contacts are with all levels of shipyard personnel (e.g., trade and craft, engineering, inspectors, military, and management) and personnel from outside the shipyard e.g., higher command representa tives, contractor personnel, visitors, and employees from other shipyards).

Factor 7, Purpose of Contacts--Level 7-2--50 points

The purpose of the incumbent's personal contacts is to implement radiation control procedures, prevent incidents, and correct deficiencies in situations where personnel are usually cooperative.

Factor 8, Physical Demands--Level 8-3--50 points

The incumbent frequently climbs vertical ladders, staging, or scaffolding in vessel and drydock areas; works in physically restric tive areas; and lifts heavy objects weighing up to about 23 kilograms (50 pounds).

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Factor 9, Work Environment--Level 9-3--50 points

The work is conducted in an industrial environment (e.g., near fuel cell and primary coolant system) requiring a wide range of industrial safety precautions to be applied. For example, the work of a radiological control technician involves performing work operations on crane booms, on staging in ships in drydock, and under adverse weather conditions which require significant attention to personnel safety. The stress of those kinds of environmental factors significantly increases the danger which exists in an environment of heavy industrial work.

TOTAL POINTS--1475

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PHYSICAL SCIENCE TECHNICIAN, GS-1311-08, BMK #1

Duties

Serves as Radiological Control Technician at a shipyard which services nuclear vessels with on-going responsibility for protection of personnel, and prevention and control of incidents in areas or work projects which typically include the following:

--performing various phases of complicated operations with radioactive systems projects, (e.g., several phases of refuel ing or main coolant valve replacement);

--representing the radiation control function in planning and practice sessions with responsibility for assuring compliance with radiological safety requirements and recommending changes to improve safety or efficiency of procedures and prevent anticipated deficiencies;

--monitoring of a variety of work and test procedures including those in several high skill level trades (e.g., rigging, boiler making, and shipfitting; or welding, machining, and pipefit ting);

--assuring the adequacy of large, complex, non-standard ven tilation, containment, and filtration systems.

Factor 1, Knowledge Required by the Position--Level 1-5--750 points

Knowledge of a wide range of radiaticn control principles, requirements, and procedures; work techniques and procedures in several high skill level trades; and design and layout of nuclear pro pulsion systems aboard nuclear vessels, sufficient to monitor com plicated operations (such as phases of refueling and main coolant valve replacement), to assure compliance with radiological safety requirements, to recommend improved procedures (e.g., during practice sessions), to identify and correct deficiencies, and to determine when and if to "stop work."

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Skill in preventing and controlling incidents during complicated operations and in deciding, directing, and controlling the activities of all personnel during serious incidents.

Factor 2, Supervisory Controls--Level 2-3--275 points

The supervisor assigns one or a few ship or shipyard areas to the technician, indicates activities and areas to be given special atten tion, what activities are planned or anticipated, and which have priority.

The employee independently carries out recurring tasks such as surveys and alarm checks.

A supervisor is available, nearby, to provide guidance on new as signments and unusual situations, to check and observe work in progress, and to review completed reports. The employee inde pendently carries out recurring tasks, but receives assistance on new, difficult, or unusually complex operations from a supervisor or senior technician who typically suggests control methods and rec ommends regulations or precedents from similar past projects which should be reviewed and used.

The supervisor frequently checks and observes the technician's work, on-site, and reviews work for success in preventing and controlling incidents.

Factor 3, Guidelines--Level 3-2--125 points

The technician is required to know and understand a large number and variety of Department of the Navy and local shipyard radiation control regulations, work procedures, and related guides. The technician selects those which are required and appropriate for assigned projects, and, during practice sessions, assures that they are adequate for actual, local conditions and vessel design. The technician recommends and justifies, in writing, any changes to written procedures considered essential and informs production supervisors of others necessary to avoid deficiencies or to improve radiological safety.

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Factor 4, Complexity--Level 4 -3--150 points

The work involves planning and accomplishing radiation control for various phases of refueling projects, primary coolant system components removal, and other comparable work.

The technician's plans, procedures, and decisions vary with each project phase, each of several trades processes involved, the actual conditions which develop as the work progresses or incidents occur, the relative experience of participating personnel, and other similar concerns.

Complications such as ship's systems design deviations, degree of contamination, functions of various individuals and organizations, extent of previous training of maintenance personnel, fatigue, etc., must be considered in preventing and controlling incidents. The employee must constantly evaluate various, changing alternatives in the event of an incident; assume full control of activities (until relieved by a senior official); direct necessary emergency action to contain radiation, minimize effects, etc.; determine causes of de ficiencies; correct deficiencies; and identify ways to prevent recurrences.

Factor 5, Scope and Effect--Level 5-4--225 points

The technician's work is performed, in part, to prevent and con trol radiation-related incidents. Because of the industrial nature of the work phases supported, the technician must plan to control any and all emergencies which could occur and take charge during the initial critics minutes of incidents until relieved. This work affects and protects the health and safety of numerous employees in the shipyard and vicinity, and, in some instances, the ecological, social, and economic well being of surrounding areas.

Factor 6, Personal Contacts--Level 6-2--25 points

Personal contacts are mainly with military and civilian employees of the department, including production supervisors, ships officers, trades and crafts workers, engineers, and test technicians. Contacts sometimes include "contract" employees, sales persons, visitors and observers from other agencies, private industry, or the local community.

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Factor 7, Purpose of Contacts--Level 7-3--120 points

The technician must often persuade, influence, motivate, or gain compliance from others in implementing radiological safety re quirements. This includes: (1) implementing "stop work" orders which affect production schedules; (2) calming and directing fearful personnel during incidents; (3) persuading trades and crafts work ers or their supervisors that a safer procedure is preferable; and (4) gaining immediate, voluntary cooperation in situations where changes may require resolution of work schedule conflicts.

Factor 8, Physical Demands--Level 8-3--50 points

The work involves frequent, strenuous activities such as climbing vertical ladders, staging, or scaffolding in drydock and vessel areas; working in cramped quarters undergoing repair; and working in areas where footing can be insecure. Lighter activities such as lift ing and carrying items up to 23 kilograms (50 pounds); frequent bending, reaching, stooping, and crouching, and walking over rough areas, also are frequent.

Factor 9, Work Environment--Level 9-3--50 points

The work is conducted in an industrial environment (e.g., near fuel cell and primary coolant system) requiring a wide range of in dustrial safety precautions to be applied. For example, the work of a radiological control technician involves performing work opera tions or crane booms, on staging in ships in drydock, and under ad verse weather conditions which require significant attention to per sonnel safety. The stress of these kinds of environmental factors significantly increases the danger which exists in an environment of heavy industrial work.

TOTAL POINTS--1770

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PHYSICAL SCIENCE TECHNICIAN, GS-131-9, BMK #1

Duties

Serves as Radiological Control Technician in a wide range of radiation control operations including complicated, demanding projects, which typically involve the following:

--serves as a major radiological control representative in "dry run," planning, practice, or "mock-up" sessions in prepara tion for major repairs and overhaul or refueling operations such as replacement of primary coolant system parts, and removal and replacement of fuel cells; recommends improve ments to procedures or plans as needed;

--reviews all radioactivity control related plans and procedures to assure that radiological controls are adequate for anticipated and actual on-the-job conditions;

--assures adherence to radiological control requirements for assignments which involve numerous processes in several high skill level trades, e.g., pipefitting, welding, machining, and rigging in vessels of different designs; recommends changes to work plans, trades procedures, etc., to improve radiological controls, correct deficiencies, increase efficiency, minimize exposure to radiation, and prevent nuclear inci dents; stops work if necessary to assure compliance with radiological control requirements;

--takes charge of total situation during radiation-related emergencies and incidents until replaced by a relieving or senior radiological control official;

--calculates immediately, in first seconds of danger, actual or anticipated consequences of the occurrences, and worst possible consequences; determines and executes appropriate actions to contain and control radiation, control effects, control all personnel movement in area; assigns emergency duties to other Federal personnel present; and determines if and when other operations may proceed;

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--suggests ways to adapt portions of training and exercises to new projects and local needs;

--investigates deficiencies or accidents which were not fully resolved by lower grade technicians; determines causal factors and ways to prevent recurrence;

--as required, serves as a senior technician and directs the ef forts of one or two subordinate technicians for the duration of a project;

--improvises plans, procedures, or equipment set ups to meet unusual, but occasionally recurring needs, e.g.: improvises TV monitoring procedures and equipment in cramped areas, or adapts procedures for unexpected deviations in vessel structure, layout, or work problems encountered during on going operations.

Factor 1, Knowledge Required by the Position--Leuel 1-5--750 points

Detailed knowledge of a wide range of radiation control practices and requirements, together with knowledge of various processes in several trades sufficient to monitor and control several phases of refueling and primary systems components replacement, suggest radiological improvement to local procedures, and control complex incidents .

Detailed knowledge of the principles, theories, techniques, and methodologies for the surveillance of nuclear propulsion plant work processes, control of radioactive material and control of radiation exposure and radioactive contamination.

Detailed knowledge of the proper technical application of radiological principles, techniques, and methodologies of surveil lance necessary to control and eliminate deviations from proper work processes and procedures.

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Detailed knowledge of potential radiological control casualty situations and of the appropriate corrective or mitigating action which must be taken.

Detailed knowledge of the function, nomenclature, location, and physical structure of naval nuclear propulsion plants in naval ves sels and their support systems. This includes a detailed knowledge of both physical and structural similarities and differences between propulsion plants and a practical knowledge of plant systems and components which interface or do not interface with the remaining vessel systems and components.

Skill in preventing and controlling incidents and accidents during complicated operations.

Skill in determining, directing, and controlling the activities of all personnel during potentially complex emergency situations.

Skill in providing the full range or radiological control services for a wide variety of operations in industrial or other work.

Factor 2, Supervisory Controls--Level 23--75 points

The technician's supervisor assigns projects such as various phases of refueling and primary systems components replacement, and indicates priorities, general objectives, and any deadlines. The employee is expected to carry out independently the various steps and procedures necessary to prevent, control, or investigate inci dents, but receives help on difficult, unusual, or unanticipated problems. The supervisor is often not on-site during the initial mo ments of emergencies.

The technician's completed work is appraised in terms of success in preventing incidents, properly controlling emergencies, resolving deficiencies. Completed work is also appraised in terms of the ade quacy of the technician's recommendations for changing procedures, adapting segments of training exercises to local situations, or other comparable matters.

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Factor 3, Guidelines--Level 3-3--275 points

The technician is frequently assigned projects, e.g., practice sessions and analysis of segments of training plans, which require adaptation of procedures to local needs, and work operations which require quick analyses and "on-the-spot" judgment in applying and adapting guides to emergency situations. Even though guidelines are available and appropriate, the technician must interpret and apply them in emergency situations without assistance whenever it becomes necessary.

Factor 4, Complexity--Level 4-4--225 points

The work requires expertise and demonstrated success in handling the full range of varied, difficult projects found at the employing installation, including success in handling incidents and emergency situations where information is incomplete or confilicting reports are received. Also, the employee is regularly assigned proj ect phases or special work which involves recommending changes in work procedures, adapting portions of training or regulatory mate rial to accommodate local needs, and analysis of problems, deficien cies, and causes of incidents that could not be fully resolved by other technicians.

Factor 5, Scope and Effect--Level 5-4--25 points

The technician's work is performed, in part, to prevent and control radiation-related incidents. Because of the hazardous nature of the work phases supported, the technician must formulate plans to control

life-threatening emergencies and take charge during their execution. This work affects and protects the health and safety of numerous employees in the shipyard and vicinity and, in some in stances, the ecological, social, and economic well being of sur rounding areas.

Factor 6, Personal Contacts--Level 6-2--25 points

Personal contacts are mainly with military and civilian employees of the Department of the Navy, including production supervisors, ships officers, trades and crafts workers, engineers, test technicians, and similar people. Occasionally, contacts also include "contract" employees, sales persons, visitors and observers from other agencies, private industries, or local communities.

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Factor 7, Purpose of Contacts--Level 7-3--120 points

The technician must often persuade, influence, motivate, or gain compliance from others in implementing radiological safety re quirements. This includes implementing "stop work" orders which affect production schedules, calming and directing fearful personnel during incidents, and persuading trades and crafts workers that a safer procedure is preferable, thus gaining voluntary cooperation in a situation where the change may require resolution of work schedule conflicts.

Factor 8, Physical Demands--Level 8-3--50 points

The work involves frequent, strenuous activities such as climbing vertical ladders, staging, or scaffolding in drydock and vessel areas; working in cramped quarters undergoing repair; and working in areas where footing can be insecure. Lighter activities such as lift ing and carrying items up to 27kilograms (60 pounds); frequent bending, reaching, stooping, and crouching; and walking over rough areas also are performed.

Factor 9, Work Environment--Level 9-3--50 points

The work is conducted in an industrial environment (e.g., near full cell and primary coolant system) requiring a wide range of in dustrial safety precautions to be applied. For example, the work of a radiological control technician involves performing work opera tions on crane booms, on staging in ships in drydock, and under adverse weather conditions which require significant attention to personnel safety. The stress of these kinds of environmental factors significantly increases the danger which exists in an environment of heavy industrial work.

TOTAL POINTS--1995