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Industrial Hygiene Series

GS-0690

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SERIES DEFINITION

This series includes all classes of positions the duties of which are to advise on, administer, supervise, manage, or perform professional and scientific work in industrial hygiene, including the identification and evaluation of conditions affecting the health and efficiency of employees, or the citizens of the adjacent community, the formulation and recommendation of measures to eliminate or control occupational health hazards, and the promotion of occupational health programs for instructing and motivating managers and employees in the prevention as well as correction of potential health hazards.

EXCLUSIONS

Excluded from this series are the following classes of positions:

1. Positions which primarily involve the elimination or control of physical (such as mechanical) conditions, operating practices or other factors which may result in traumatic injury to persons or damage to property and which require knowledge of the principles, standards, and techniques of safety are classified in the [Safety Management Series, GS-018](#). Industrial hygiene, on the other hand is concerned with potential health hazards associated primarily with chemical, biological, and physical agents, and requires a fundamental grounding in the basic sciences. Thus, safety management primarily focuses on the workplace and industrial hygiene primarily focuses on the prevention of occupational illness or disease. However, some overlap occurs between these occupations. For example, either might conduct evaluations of stresses involving ergonomic factors, or observe safety hazards and suggest corrective measures.
2. Pharmacologists and toxicologists apply professional and scientific knowledge of the source, chemical and physical properties, action, absorption, distribution, metabolism, excretion, and use of drugs or toxic substances and related chemicals. Such positions are classified to the [Pharmacology Series, GS-0405](#). The industrial hygienist, on the other hand, is concerned with those toxic substances found in the workplace, and with their methods of control.
3. Positions primarily concerned with the elimination and prevention of biological health hazards for the promotion of a clean and healthful environment, and the prevention of the spread of communicable disease are classified in the [Sanitarian Series, GS-0688](#). Sanitarians typically perform work in environmental health relating to such matters as milk and dairy products, food sanitation, water supply, refuse and waste control, insect and rodent control. They may inspect recreation areas, housing and care facilities and institutions for cleanliness, ventilation, and other health conditions. Industrial hygienists, on the other hand, are primarily concerned with occupational health hazards arising in or from the workplace.

4. Positions concerned with the control or elimination of industrial health hazards through the design and installation of engineering controls, which require full professional competence in a branch of engineering, are classified in the appropriate professional engineering series. Industrial hygienists also recommend (or prescribe) engineering controls to eliminate industrial health hazards; however, the work requires only limited knowledge of engineering, covering such areas as ventilation, air sampling, personal protective equipment, noise, and engineering control methods.
 5. Positions that involve professional engineering work to eliminate or control physical conditions, operating practices, and other factors which may result in traumatic injury to persons, or damage to property, and which require professional knowledge of the principles, methods, and techniques of engineering are classified in the [Safety Engineering Series, GS-0803](#).
 6. Professional engineering positions concerned with the design, construction, and operation of facilities for the protection and improvement of air, land, and water resources in order to provide a clean and healthful environment are classified in the [Environmental Engineering Series, GS-819](#). In matters of air and water pollution control, and waste disposal, there is an overlap of interest, although in general the industrial hygienist provides expert guidance on the types of facilities or controls required, while the environmental engineer is primarily concerned with the actual design and construction of such facilities. However, it should be noted that industrial hygienists recommend action on unsanitary conditions observed in the course of industrial hygiene surveys, and investigate the of disease and infection which may result from inadequate waste disposal systems, contamination of water supply or sterilization equipment, defective plumbing, or similar conditions. Additionally, industrial hygienists may specialize in air pollution aspects of occupational health, which includes a knowledge of toxicology, chemistry, and engineering pertinent to air pollution.
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7. The [Mechanical Engineering Series, GS-0830](#), includes positions concerned with (a) heating, ventilating, and air-conditioning systems (temperature and humidity control of a confined environment); (b) mechanical aspects of water supply systems such as pumps, plumbing, and boiler water treatment systems; and (c) automotive and other powerplants affecting air pollution. (See the classification standard for the Mechanical Engineering Series, GS-0830.) The industrial hygienist is concerned with those aspects of mechanical engineering, such as ventilation and air pollution, which pertain to use of engineering methods to control health hazards found in the workplace.
 8. Positions involving professional work in the design or layout of chemical processing plants, chemical processing equipment, chemical production processes, work methods, and procedures are classifiable to the [Chemical Engineering Series, GS-893](#), when the design or layout work is based predominantly upon a professional knowledge of the chemical reactions occurring in the materials being produced. While chemistry and engineering are both significant to the practice of industrial hygiene, the industrial hygienist concentrates on

identifying and controlling chemical as well as other toxic agents in a variety of work environments which are potential hazards to health.

9. Professional work concerned primarily with protection from unwanted exposure to ionizing radiation, and which has as its paramount requirement a professional knowledge of health physics is classified in the [Health Physics Series, GS-1306](#). It should be noted that the identification, evaluation and control of radiological health hazards is one aspect of industrial hygiene and typically the industrial hygienist is trained to deal with radiological health problems common to most industrial activities. The need for health physics positions becomes pronounced as sources of radiation increase in variety and intensity.

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10. Positions involving work that requires full professional education and training in the field of chemistry are classified to the [Chemistry Series, GS-1320](#).

11. Technical support work in conducting inspections or surveys, calibrating and maintaining instruments, collecting samples and related duties requiring less than full professional competence in the field of industrial hygiene is classified in the [Environmental Health Technician Series, GS-698](#), the [Health Aid and Technician Series, GS-699](#), the [Physical Science Technician Series, GS-1311](#), or other appropriate technician for Federal Wage System series.

TITLES

"Industrial Hygienist" is the authorized title for nonsupervisory positions classifiable to this series. "Supervisory Industrial Hygienist" is the little authorized for positions which involve supervisory duties and responsibilities as defined in the [Supervisory Grade-Evaluation Guide](#).

"Industrial Hygiene and Safety Manager" is the title authorized for positions in this series responsible for managing an occupational health program, usually of sufficient breadth to require the services of other specialists, such as safety specialists or engineers, health physicists, sanitarians or environmental engineers, chemists, toxicologists, or similarly related occupations.

OCCUPATIONAL INFORMATION

Industrial hygiene is the profession within the broad field of occupational health and safety which is concerned with the recognition, evaluation, and control of those environmental conditions or stresses arising in or from the workplace which may cause sickness, impaired health, significant discomfort, or inefficiency.

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As summarized by the American Industrial Hygiene Association in a pamphlet entitled "Industrial Hygiene, the key to occupational health", industrial hygiene "brings together a variety of scientific disciplines to prevent, eliminate or reduce chemical, physical and biological risks to the well-being

of all. Generally, these disciplines are physiology, chemistry, physics, engineering, medicine and biochemistry. These specialties, augmented by special applications in the workplace, allow the industrial hygienist to perform many important functions. Involved are:

- anticipating health hazards and recommending preventive measures
- identifying-existing health hazards and prescribing controls
- evaluating, studying and reporting findings to establish new standards and increase professional knowledge
- cooperating with safety and health consultants in providing a safe working environment .

"After predicting or finding a threat to the well-being of people, the industrial hygienist has the challenging task of taking corrective measures. They may be:

- isolation of a process or operation to limit the number of persons exposed
- enclosure of harmful material to reduce or eliminate its escape to other areas
- substitution of less harmful materials or processes
- alteration of the process to reduce or eliminate human exposure
- ventilation and air cleaning to improve the atmosphere
- protective clothing and respiratory equipment
- sanitary safeguards to prevent the spread of disease
- medical controls to supplement engineering controls."

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The recognition of occupational health hazards requires knowledge of and experience with a wide variety of industrial operations and processes, materials and equipment, energy used in the processes, intermediates, products and by-products. The stresses commonly encountered by workers can be broken into four broad categories:

1. Stresses involving chemical agents include a great variety of liquids, dusts, fumes, mists, vapors, and gases. The majority of occupational health hazards to which workers are exposed result from inhalation, ingestion, or skin contact of excessive amounts of toxic or irritant chemicals. It has been estimated that there are well over one million known chemical compounds of which many thousands are in use and production. While many of these are not toxic in their present use, many thousands of other widely used compounds are known to be harmful in varying dosages, except under controlled use. An ever growing number are suspected cancer causing substances, adding to the relatively small number of currently known carcinogenic, mutagenic, and teratogenic materials. In addition, many new substances are developed each year, including hundreds which eventually are produced commercially.
2. Stresses involving physical agents encountered by workers include extremes of temperature, pressure, noise, and radiation. While excessive exposure to some of these stresses may produce only minor discomfort or illness, others can be extremely dangerous. Ionizing radiation, such as gamma and X-radiation, is highly penetrating and may produce damage to any body tissue if the exposure time is of long enough duration. Repeated exposure to high noise levels can lead to permanent hearing loss and or speech interference. Other results of

harmful physical stresses include thermal stresses (hot and cold) such as heat exhaustion, changes in atmospheric pressure such as decompression sickness (the "bends"), and eye damage from welding arcs or laser beams.

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3. Stresses involving biological agents found in the work place include pathogenic and nonpathogenic organisms, such as fungi, bacteria, and viruses. These agents can produce diseases such as brucellosis, tuberculosis, and infections of the various organ systems of the body, particularly the respiratory system.
4. Stresses involving ergonomic factors include body positions in relation to work, monotony, mechanical vibration, repetitious motion, and comfort conditions related to air temperature, humidity, motion, illumination. All of these stresses can adversely affect the well-being and efficiency of the worker.

Evaluation of occupational health hazards involves the use of experienced judgment and quantitative measurement techniques to assess the magnitude of environmental stresses in relation to their potential to impair workers' health and well-being. Employing wide variety of sampling instrumentation and techniques, and having an appreciation of the types and limitations of analytical methods used in interpreting sample results, the industrial hygienist determines the degree of hazard to which workers are exposed after ascertaining the intensity and duration of exposure.

The need for control measures is indicated when test results demonstrate exposure levels to harmful substances or stresses above accepted safe limits. Threshold Limit Values (TLV's), as well as other criteria (viz. American National Standards Institute (ANSI) standards, criteria documents, etc.) have been established for many chemical substances and physical agents. These values represent conditions to which nearly all workers may be repeatedly exposed without adverse effect. When these levels are approached or exceeded, control measures are indicated. (It is important to note that TLV's are basically health guidelines and their use must be tempered by sound professional judgment.) Measures to reduce or eliminate hazardous exposure conditions are formulated through the use of engineering controls, administrative controls, or personal protective devices. Engineering controls, which are generally the preferred method, include isolation or alteration of work processes, substitution of less harmful materials, and the use of local exhaust and general ventilation systems. Administrative controls are also employed, such as limiting exposure time of the workers, restricting the number of people working in a particular area, or posting and labeling hazardous materials and areas. Personal protective devices may be recommended as a temporary control measure or may be employed as the method of last resort.

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Industrial hygienists in the Federal service perform a variety of functions related to the identification, evaluation, and control of occupational health hazards and to the promotion of healthful and safe working conditions. Major functions performed include:

Surveys and Evaluations - The majority of Federal industrial hygienists perform inspections or surveys of worksites to identify and evaluate conditions which may be hazardous to workers' health and to recommend measures to eliminate or control those hazards identified. Some conduct inspections of private business concerns to assess compliance with published health standards, cite violations, recommend penalties, and insure that hazardous conditions are properly abated. Others evaluate the potential toxicity of materials-in response to requests from employers or employee representatives. These industrial hygienists search the literature for information on the toxic substance identified and participate in environmental-medical evaluations of the worksite. When appropriate, the industrial hygienist then recommends measures for control of the observed hazards.

Agency industrial hygienists also survey Federal worksites. Some are assigned responsibility for a particular installation, while others are located in a centralized environmental health organization and perform industrial hygiene services at a variety of installations throughout a region, or nationwide. These evaluations include comprehensive industrial hygiene surveys carried out on a recurring basis, special investigations of specific problems, and in-depth surveys of specific installations.

Some Federal industrial hygienists monitor and evaluate State industrial hygiene programs conducted under grant agreements with the Federal government. This involves evaluation of the State program to determine if State industrial hygiene activities are in conformity with published guidelines and approval plans. The industrial hygienist reviews proposed plan changes for conformity with sound industrial hygiene practices. The hygienist reviews the technical industrial hygiene aspects of the state program, as well as its laboratory, administrative, and training activities.

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Development of Criteria and Standards - Federal industrial hygienists manage contracts for the development of criteria for standards for the control of chemical, biological, and physical hazards to the health of the working population. Drawing on the expertise of a variety of occupational health specialists -- toxicologists, physicians, chemists, epidemiologists, engineers, other Federal industrial hygienists -- these employees are responsible for a completed criteria document. They also provide industrial hygiene expertise in the development of other criteria documents. The criteria document, which is essentially a recommendation for a standard, includes conclusions on safe levels of exposure to the particular agent, sampling and analytical methods, biological effects of exposure, environmental data, work practices, and monitoring requirements.

Industrial hygienists also develop the legally enforceable standards which govern conditions, practices, or operations to assure safe and healthful workplaces. Published in the Federal Register, these standards apply to most employers, and failure to comply can result in citations and penalties for private businesses. In addition to establishing limits on exposure levels to particular agents, standards include requirements for monitoring employee exposure, as well as material on medical surveillance, methods of compliance, handling and use of the hazardous substances, employee training, recordkeeping, and sanitation.

Other Functions - Federal industrial hygienists also perform a variety of other functions.

- Consulting and advising -- Because of their broad knowledge of technical work processes and equipment, and of the effect of these processes on the health and efficiency of employees, industrial hygienists often serve as an advisor to top management in matters concerning modification to or evaluation of new work processes, equipment, or facilities related to the health of the workforce. As experts in the comprehensive practice of industrial hygiene, or in a specialty area, they also advise technical program managers and supervisors, medical officers, private employers, State and local health officials, employee groups, and other health and safety specialists. They influence management to establish and maintain an effective industrial hygiene program. For the agency or local facility they maintain contacts with health representatives of other Federal agencies, State and local governments, and colleges and universities.

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- Managing and administering -- Supervising an industrial hygiene staff or working alone, industrial hygienists may organize and direct the industrial hygiene program for the agency or for the local facility. They formulate instructions and specific control procedures relative to the program, such as guides to control the handling of hazardous materials or disposal of hazardous wastes; instructions to control the issuance, labeling, and storage of such materials; and standards and procedures to protect employees and materials from ionizing radiation. Industrial hygienists develop and justify operating budgets and requirements for staff, equipment, and facilities. They also review purchase requests for potentially hazardous equipment, and evaluate new materials and processes to assure the provision of adequate health safeguards or to recommend control measures. They analyze progress reports, determine exposure trends, and evaluate program accomplishments in order to coordinate the program properly and to be in a position to plan for training, special studies, surveys, or indicated corrective action. They supervise the collection of data for employee health records and prepare and submit reports as may be indicated or requested. They maintain close liaison and cooperation with all parts of the organization to assure a complete integration of the industrial hygiene program.

- Designing - Industrial hygienists review plans for new or modified processes and facilities which involve potential health hazards. Hazard control criteria may have to be justified based on long term, intangible health benefits, or may be unjustifiable from cost effectiveness analysis alone. Industrial hygienists also design modifications to specific systems, such as ventilation, to control health hazards resulting from existing work processes or from new equipment and materials. Industrial hygienists also advise on radiological aspects of facilities, equipment, or experiments. In some cases they conduct limited research and development on work methods, techniques, instrumentation, and personal protective devices.

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- Managing an industrial hygiene laboratory -- Some industrial hygienists manage an analytical chemistry laboratory using sophisticated electronically-controlled

instrumentation. They assure that laboratory facilities are adequate to meet contemplated work loads. Industrial hygienists may supervise or perform macro- and micro- organic and inorganic chemical laboratory work to identify and make quantitative determinations on specific compounds and materials, and to determine the effect of such substances on the human body. They may also conduct physical tests such as particle size determinations or gas analyses to determine the presence of toxic substances or radiation. They conduct special tests and research studies in the laboratory as the need arises.

- Investigating occupational diseases -- Some industrial hygienists participate with the medical and nursing staff in identifying causative agents for occupational illnesses, handling emergency exposure problems relative to toxicity of materials and medical tests and treatment, bioassays, determining examination inclusions and schedules for periodic physical examinations of employees who are exposed to hazardous substances. Some industrial hygienists manage eye, ear, and respiratory protective gear programs. Industrial hygienists may also conduct a personnel dosimetry program in which all personnel exposed to X-ray, gamma, or other radiation from radioactive materials, and the areas in which they work, are constantly monitored by film badges or other devices sensitive to such radiation. Some industrial hygienists prepare information and review claims for occupational injury/disease compensation.

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- Educating and training -- Some industrial hygienists develop training courses and programs in occupational health and safety, or teach industrial hygiene courses. This may involve determining the nature and extent of training and guidance required, preparing manuals and other literature on industrial hygiene matters, directing occupational health promotional campaigns, and participating in conferences and safety meetings to inform professional and supervisory personnel about industrial hygiene concerns.
- Studies -- Some industrial hygienists conduct industry-wide studies and surveys to determine environmental exposures and hazards to which the workers in that industry are exposed. They may prepare instructions and guides on occupational health matters for use by industry and government personnel.

EVALUATION OF POSITIONS

The factor level descriptions and benchmarks provided in this standard are to be used to classify nonsupervisory industrial hygiene positions at grades GS-5 through GS-15 in functional areas for which there is not an applicable grade-evaluation guide. Benchmarks as provided in this standard cover non-supervisory industrial hygiene positions at grades GS-5 through GS-15.

Excluded from the coverage of the grade-level criteria in this standard are the following categories of work:

- Research -- Research positions should be evaluated by reference to the [Research Grade-Evaluation Guide](#).
- Development -- Positions concerned with the development of industrial hygiene instruments, equipment, and techniques should be evaluated by reference to the [Equipment Development Grade-Evaluation Guide](#), Part III.

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- Supervision -- Supervisory aspects of positions should be evaluated by reference to the [General Schedule Supervisory Guide](#).
- Research Grants -- Reviewing, evaluating, and recommending approval of research grants and contracts should be evaluated by reference to the [Research Grants Grade Evaluation Guide](#).
- Education-Training -- Education and training duties should be evaluated by the [Grade-Evaluation Guide for Instructor and Specialist Positions Involving Education and Training Work](#).

Positions should be evaluated on a factor-by-factor basis, using one or more of the comparable Office of Personnel Management benchmarks or factor level descriptions for the Industrial Hygiene Series, or both. Only the designated point values may be used. More complete instructions for evaluating positions are contained in the [introductory material for the Factor Evaluation System](#). The absence of benchmarks for positions at any grade GS-5 through GS-15 does not preclude evaluation of positions at those grades.

GRADE CONVERSION TABLE

Total points on all evaluation factors are converted to GS grade as follows:

GS Grade	Point Range
5	855-1100
6	1105-1350
7	1355-1600
8	1605-1850
9	1855-2100
10	2105-2350
11	2355-2750
12	2755-3150
13	3155-3600
14	3605-4050
15	4055- up

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FACTOR LEVEL DESCRIPTIONS

FACTOR 1, KNOWLEDGE REQUIRED BY THE POSITION

This factor measures the nature and extent of information or facts which the industrial hygienist 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 areas of knowledge. To be used as a basis for selecting a level under this factor, a knowledge must be required and applied.

Level 1-5 -- 750 points

A basic foundation in one of the physical or life sciences, or engineering, is required at this level, including a knowledge of the fundamental laws and theories of chemical activities which would enable the employee to develop an understanding and appreciation of industrial production processes, materials, and methods; and the physiological action of toxic materials, biological entities, and physical stresses encountered in the workplace.

Level 1-6 -- 950 points

In addition to the basic foundation in the physical or life sciences, or engineering, described at level 1-5, a knowledge of the conventional methods, techniques, and principles of industrial hygiene is required at this level, which enables the employee to independently perform

assignments related to the identification, evaluation, and control of industrial health hazards. These assignments are limited in scope and depth by such characteristics as:

- The industrial processes are of limited size and/or complexity.
- Associated hazards of the operation, such as the toxicity of the materials used, are generally known; standard sampling and analytical methods have been developed; and safe limits have been established and are generally accepted within the profession.
- The control of hazards can be accomplished by conventional means.

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Illustration -- applies knowledge and skills necessary to conduct relatively routine industrial hygiene inspections of private companies when: work processes are of limited size and complexity, standards cover the majority of hazards encountered, and hazard abatement can be accomplished by the application of established practices or by minor adaptation of precedents.

Illustration -- applies knowledge and skills necessary to conduct surveys and evaluate health hazards in industrial shops, laboratories, supply depots, warehouses where hazardous material is stored or transported, building construction or similar work areas. The industrial hygienist determines compliance with established threshold limit values and evaluates exposures using standard methods to determine the nature and amount of toxic material present in a variety of materials, such as environmental samples, body fluids, and industrial processes. The industrial hygienist independently determines measurements to be made and methods to be used, and calibrates and selects a variety of standard equipment. Recommendations made concern the use of standard control measures and changes to work procedures or schedules to comply with established health requirements.

Level 1-7 -- 1250 points

This level requires professional knowledge and skills applicable to the performance of industrial hygiene duties related to a wide range of industrial settings; or, an intensive knowledge of a specialty area of industrial hygiene (chemical aspects, etc.). Examples of assignments representing this level of knowledge are: skill in identifying, evaluating, and controlling a wide variety of occupational health hazards associated with the entire range of industrial work operations; skill in modifying approaches or applications within a specialty area to such difficult problems as sampling method development, high temperature exhaust ventilation control, and establishing personal protective equipment requirements; or a knowledge of the full range of sampling techniques and control measures, as well as a knowledge of administrative and managerial principles and procedures, to plan, implement, and evaluate an industrial hygiene program covering occupational health hazards found in all but the most complex industrial environments.

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Illustration -- applies knowledge and skills to conduct surveys and evaluate health hazards in large and complex industrial operations, including heavy industry such as large foundries, steel mills, or shipyards, which are characterized by some or all of the following: technically complex and diverse work processes, frequent changes in operations, the introduction of new or exotic materials, labor relations problems, and difficult engineering and/or economic feasibility considerations in the control of hazards.

Illustration -- applies a knowledge of the full range of industrial hygiene sampling techniques and control measures, and a knowledge of administrative practices necessary to manage an industrial hygiene program covering light to moderately complex industrial operations, such as industrial shops, laboratories using some hazardous materials, supply depots, warehouses where hazardous material is stored or transported, building construction, and similar environments. Directs or performs such functions as planning and initiating surveys or work operations, processes and materials to detect potentially hazardous conditions; determines the location and number of sampling points, equipment requirements, and methods and techniques of data analysis; prescribes control measures and designates areas requiring control; establishes requirements for protective clothing; adapts guides and searches the technical literature when usual problems are encountered; reviews plans for modifications to facilities to ensure that proper engineering controls have been provided for potential health hazards; adapts existing equipment or recommends the purchase of new instruments.

Level 1-8 -- 1550 points

This level includes: mastery of the professional concepts, principles, and practices of industrial hygiene that would enable the industrial hygienist to apply experienced judgment and a knowledge of new developments to solve novel or obscure problems; an ability to extend and modify existing techniques; and skill in developing new approaches which may be used by other industrial hygienists in solving a variety of occupational health problems. Typically, the employee is recognized by the agency as being an expert in the broad practice of industrial hygiene or in a major specialization, such as chemical, toxicological, or engineering aspects.

OR

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Knowledge and skill necessary to serve as an agency expert and to make decisions or recommendations that significantly affect the context, interpretation or development of agency policies or programs concerning critical industrial hygiene matters.

Illustration -- applies knowledge and skills sufficient to serve as a recognized expert for the agency in industrial hygiene, having responsibility for developing policy and program objectives, appraising programs, and providing consultative services to management and technical personnel on a wide variety of occupational health problems.

Illustration -- applies expert knowledge of industrial hygiene and of administrative practices necessary to manage a comprehensive industrial hygiene program for a major facility or region when the industrial hygiene program covers large, complex industrial operations; or experimental work involving a wide variety of new chemical agents; or hazardous chemical, bacteriological, or radiological agents in undeveloped or critical stages; or equivalent situations. Directs or performs a variety of functions, such as developing instructions and control procedures covering complex potential health hazards; reviewing plans for new or modified processes and facilities when criteria must be justified based on long term or intangible health benefits or when preventive measures may be considered unjustifiable from a cost effectiveness analysis alone; providing expert advice and consultation to management officials on industrial hygiene matters; justifying operating budgets and requirements for staff, facilities, and equipment; evaluating program accomplishments, analyzing reports, and determining exposure trends; initiating surveys of potential health hazards and work processes or operations; directing a training program in industrial hygiene; assuring program integration with other departments of the activity, with higher organizational echelons, and with other Federal, State, and local agencies and health officials.

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Level 1-9 -- 1850 points

In addition to the knowledges described at Level 1-8, this level includes outstanding creativeness in industrial hygiene in generating new hypotheses, developing new concepts, and planning and evaluating extensive, long-range programs and projects; or knowledge and skills necessary to function as a nationally or internationally recognized consultant and expert in the field.

Illustration - applies authoritative knowledge of industrial hygiene to develop long-range health conservation requirements for all phases and functions of a critical national program of an agency, ranging from research and development through test and evaluation to production or operations, when highly complex and hazardous chemical, physical, and biological processes are involved, when other agencies or private companies have extensive participating or interfacing programs, and when other health occupations are closely involved, such as those dealing with health physics and environmental pollution.

FACTOR 2, SUPERVISORY CONTROLS

Supervisory controls covers the nature and extent of direct or indirect controls exercised by the supervisor, the employee's responsibility, and the review of completed work. Controls are exercised by the supervisor in the way assignments are made, instructions are given to the employee, priorities and deadlines are set, and objectives and boundaries are defined. Responsibility of the employee 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 participate in establishing priorities and defining objectives. The degree of review of completed work depends upon the nature and extent of the review, e. g., close and detailed review of each phase of the assignment; detailed review of the finished assignment; spotcheck of finished work for accuracy; or review only for adherence to policy.

Level 2-1 -- 25 points

For both one-of-a-kind and repetitious tasks, the supervisor makes specific assignments that are accompanied by clear, detailed and specific instructions.

The employee works as instructed and consults with the supervisor as needed and on all matters not specifically covered in the original instructions or guidelines. On any field work the employee accompanies an experienced industrial hygienist who is available to assist in solving any problem.

The work is closely reviewed. This review may include checking progress, as well as reviewing completed work for accuracy, adequacy, and adherence to instructions and established procedures.

Level 2-2 -- 125 points

The supervisor provides individual assignments by indicating generally what the employee can expect to encounter, what is to be done, limitations, deadlines, and priority of assignments. The supervisor provides additional, specific instructions for new, difficult, or unusual assignments including suggested work methods or advice on source material available.

The employee uses initiative in independently carrying out recurring assignments without specific instructions, but refers deviations, problems, and unfamiliar situations not covered by instructions to the supervisor for decision or help.

The supervisor assures that methods used, and findings or recommendations made, are technically accurate and are in compliance with instructions or established procedures. Review of the work increases with more difficult assignments if the employee has not previously performed similar inspections, evaluations, or studies.

Level 2-3 -- 275 points

The supervisor makes assignments by, defining objectives, priorities, and deadlines; and assists employee with unusual situations which do not have clear precedents. In some cases the employee may have continuing responsibility for a particular geographical or subject-matter area.

The employee reviews relevant literature, plans and carries out the successive steps, and handles problems and deviations in the work assignments in accordance with instructions, policies, previous training, or accepted industrial hygiene practices.

Completed work is usually evaluated for technical soundness, appropriateness of recommendations, and conformity to policy and requirements. The methods used in arriving at the end results are not usually reviewed in detail.

Level 2-4 -- 450 points

The supervisor sets the overall objectives and resources available. The employee and supervisor, in consultation, develop the deadlines, projects and work to be done; or in some cases, the employee may have continuing responsibility for a particular geographical or subject-matter area.

The employee, having developed expertise in industrial hygiene, is responsible for planning and carrying out the assignment, for resolving most conflicts that arise, for coordinating the work with others as necessary, and for interpreting policy on own initiative in terms of established objectives. For most inspections, evaluations, and special studies, the employee determines the approach to be taken and the methodology to be used. The employee keeps the supervisor informed of progress, potentially controversial matters, or far-reaching implications.

Completed work is reviewed only from an overall standpoint in terms of feasibility, compatibility with other work, or effectiveness in meeting requirements or expected results.

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Level 2-5 -- 650 points

The supervisor provides administrative direction with assignments in terms of broadly defined missions or functions. The employee has responsibility for planning, designing, and carrying out programs, projects, studies, or other work independently. Results of the work are considered to be technically authoritative and are normally accepted without significant change. If the work should be reviewed, the review concerns such matters as fulfillment of program objectives, effect of advice, and influence of the overall program, or contribution to the advancement of technology. Recommendations for new projects or alteration of objectives are usually evaluated for such considerations as availability of funds and other resources, broad program goals, or national priorities.

FACTOR 3, GUIDELINES

This factor covers the nature of guidelines and the amount of judgment needed to apply them. Since individual assignments vary in the specificity, applicability, and availability of guidelines, the constraints and judgmental demands placed upon industrial hygienists also vary. The existence of specific instructions, procedures, and policies may limit the opportunity of the industrial hygienists to make or to recommend decisions or actions; however, in the absence of procedures or under broadly stated objectives, industrial hygienists may use considerable judgment in researching literature and developing new methods. For this factor, guidelines refer to standard guides, precedents, methods, procedures, and techniques, including:

- Agency manuals of instructions and operating procedures;
- Federal occupational health and safety standards and criteria documents (proposals for standard);

- National consensus standards (e.g. American National Standards Institute) and proprietary standards (e.g. American Conference of Governmental Industrial Hygienists);

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- Standard textbooks;
- Professional journals;
- Reports on past inspections or evaluations;
- Literature on various industries and industrial processes;
- Standard work practices in the area of application, as taught in industrial hygiene courses or as generally accepted by industrial hygienists as a result of experience;
- Governing policies and procedures of the agency.

Level 3-1 -- 25 points

The industrial hygienist is provided specific, detailed guidelines. The supervisor is to be consulted on and must authorize any deviations.

Level 3-2 -- 125 points

Established procedures and specific guidelines are available to the employee in the performance of assignments. When detailed written guidelines are lacking, the employee is provided with oral instructions. Judgment is required in locating and selecting the most appropriate guidelines and references for use in specific cases. Established procedures are to be used in the performance of work, but the employee may exercise discretion in selecting among alternative approaches. The employee may, on an infrequent or irregular basis, make minor deviations and adapt the guidelines to specific cases. Situations requiring significant deviations from existing guidelines are referred to the supervisor.

Level 3-3 -- 275 points

Guidelines include Federal standards and criteria documents, standards published by recognized organizations and professional societies, technical literature, agency policies and regulations, precedents, office files, and standard practices. While these guidelines are available, they are not always completely applicable to the work. The industrial hygienist independently selects, evaluates, and applies the guides, making adaptations then necessary, or recommending changes. In addition, the industrial hygienist must exercise judgment in applying standard practices to new situations and in relating new work situations to precedent ones.

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Level 3-4 -- 450 points

The guidelines are essentially the same as in Level 3-3. However, the work assignments are such that these guidelines are often inadequate in dealing with the more complex or unusual problems, such as treating hazards for which very little information on toxicity is available. The industrial hygienist must adapt and apply industrial hygiene principles and practices to situations where precedents are not directly applicable and must use experienced judgment and initiative in selecting approaches, evaluating findings, and researching new developments in the field. In some cases, the employee must engage in an extensive literature search to locate suitable information. Some situations require the employee to devise new approaches or develop new methods for evaluating or controlling a health hazard.

Level 3-5 -- 650 points

Working chiefly under broad and general policy statements, regulations, and laws, the employee must exercise considerable judgment and ingenuity in interpreting and adapting the guides that exist, and in developing new and improved techniques and methods where appropriate guidelines are totally lacking. Frequently, the industrial hygienist is recognized as an authority in a specialty area of industrial hygiene, having responsibility for the development of agencywide or nationwide standards, procedures, and instructions to guide operating personnel.

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.

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Level 4-2 -- 75 points

Assignments usually consist of specific, limited assignments designed to orient the industrial hygienist in the work. Work often includes detailed tasks or portions or larger projects performed for experienced industrial hygienists in the organization, such as calibrating equipment, technical searches, taking samples, observing workers during sampling, and preparing factual portions of reports. At this level, tasks may be similar to those of nonprofessional employees, but are assigned primarily for training or development purposes.

Level 4-3 -- 150 points

Assignments involve various interrelated tasks applicable to the recognition, evaluation, and control of occupational health hazards, such as determining compliance with established threshold limit values, evaluating exposures, and advising on control measures and changes in work procedures or schedules to comply with established health requirements. Analyses require many different standard methods to determine the nature and amount of toxic material present in

various materials, such as environmental samples, body fluids, and industrial products. The employee determines measurements to be made, and the methods and equipment to be used. Projects assigned are generally conventional and pose few unusual problems. Work activities to be inspected or evaluated typically cover small industrial operations where work processes are relatively straightforward, and hazardous exposures can be identified and controlled through established practice or minor adaptation of precedents.

Level 4-4 -- 225 points

Assignments cover the full spectrum of occupational health hazards found in all but the most complex industrial environments. Thus, the assigned work activities involve a substantial amount and variety of exposure to chemical, physical, bacteriological and/or radiological hazards. The employee must recognize hazards which are uncommon, evaluate a variety of data, and institute or recommend effective control measures to protect the workers. Factors to be considered include unusual work processes or operations, exotic chemicals for which toxicological information may be incomplete, and the need to adapt or modify precedent methods in the control of hazardous exposures.

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Level 4-5 -- 325 points

Work includes a broad range of activities and involves the identification and treatment of novel or obscure problems which require the employee to be versatile and innovative in adapting and modifying precedents, methods and techniques. Assignments are characterized by many difficult considerations due to breadth, diversity, or intensity of occupational health problems encountered. Examples of factors to be considered include (1) major areas of uncertainty resulting from complicated work processes, such as highly complex research and developmental work; (2) the need to develop new methodologies for the evaluation and control of a particular health hazard where relevant literature is inadequate or nonexistent; (3) serious conflicts between industrial hygiene and management considerations; (4) health effects from long-term, chronic exposures are unknown or poorly defined; or (5) exposures are complicated by mixtures of toxic and/or physical hazards. Work often includes originating new techniques and developing new information for use by other occupational health personnel.

Level 4-6-450 points

Assignments include the need to conceive, plan, and conduct broad programs in areas where issues and factors to be considered are largely undefined. Work concerns areas where little or no established practices or precedents are available to assist in problemsolving, where progress is difficult, and where new techniques and approaches need to be devised. Often, the work involves the development of new concepts, theories, or programs which will influence the procedures and ideas of others, or resolve unyielding problems.

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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.

Effect measures such things as whether the work output facilitates the work of others, provides timely services of a personal nature, or affects 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 performed work is to be considered.

Level 5-1 -- 25 points

The purpose of the work is to orient the industrial hygienist in the application of scientific principles and concepts to the practice of industrial hygiene. Work tasks are specific and limited, and are designed primarily for training purposes to equip industrial hygienists to assume more responsible duties. The effect of the work is to facilitate the work of other industrial hygienists within the immediate organization.

Level 5-2 -- 75 points

The primary purpose of the work is to provide assistance to experienced industrial hygienists by relieving them of detailed and routine work (such as maintaining and calibrating equipment), by performing portions of inspections or surveys, or by following up to determine conformance with previously made judgments or decisions. Work efforts affect the accuracy and reliability of the work being performed by higher level industrial hygienists.

Level 5-3 -- 150 points

The purpose of the work is to investigate and analyze a variety of problems or conditions in the workplace which may adversely affect the health of workers, and to provide or recommend ways of eliminating problems. The work affects the design and operation of equipment, work processes, or systems (such as evaluation of the adequacy of occupational health protection devices); the adequacy of inspections or surveys; and the health and well-being of the workers.

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Level 5-4 -- 225 points

The purpose of the work is to provide expertise as a specialist in the broad practice of industrial hygiene, or in a specialty area of industrial hygiene, by furnishing advisory, planning, or reviewing services on specific problems, projects, or programs, and operating conditions directly affecting worker health and safety. The work may include the development of criteria, procedures, or

instructions for major agency activities, or the investigation, analysis, and evaluation of complex problems and situations.

Work products or decisions affect a wide range of the agency's occupational health and safety programs, or major activities of industrial concerns.

For example, decisions involve more than the removal of the hazardous situation alone. They affect complex work processes which may adversely affect productivity patterns, financial posture, and competitive industrial relationships, requiring delicate balances in professional judgments and conclusions.

Level 5-5 -- 325 points

The purpose of the work is to resolve critical problems, to isolate and define unknown conditions, or to develop new approaches, methods, guides or standards for use by other occupational health specialists. Often serving as a consultant or project coordinator, the industrial hygienist provides expert advice and guidance covering a broad range of activities to officials, managers, and other occupational health professionals within or outside the agency. Results affect the work of other occupational health experts both within and outside the agency or the development of major aspects of the agency's occupational health program.

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Level 5-6 -- 450 points

The purpose of the work is to plan and conduct vital occupational health programs for the agency, which are often of national or international scope and impact. The employee's recommendations and decisions on highly complex technical and policy areas frequently establish the agency's position, create agency precedents, and guide field installations on matters of major significance. The employee's actions directly and significantly affect the agency's industrial hygiene program on a long-term and continuing basis, and often influence the programs of other agencies and outside organizations.

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, Supervisory Controls.) Levels described under this factor are based on what is required to make the initial contact, the difficulty of communicating with those contacted, and the setting in which the contact 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 and which have a demonstrable impact on the difficulty and responsibility of the work performed.

The relationship of Factors 6 and 7 presumes that the same contacts will be evaluated for both factors. Therefore, use the personal contacts which serve as the basis for the level selected for Factor 7 as the basis for selecting a level for Factor 6.

Level 6-1 -- 10 points

Personal contacts are primarily with higher grade industrial hygienists or with other occupational health and safety personnel within the immediate office or related units within the agency.

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Level 6-2 -- 25 points

Personal contacts are with a number of employees in the agency, but outside the immediate office, including other industrial hygienists, occupational physicians, attorneys, toxicologists, laboratory chemists, safety engineers and specialists, design and maintenance engineers, and supporting technicians. Also, included at this level are contacts with workers in the private sector during the monitoring of possible hazards.

Level 6-3 -- 60 points

In addition to the intra-agency contacts described in Level 6-2, contacts include a variety of officials, managers and professionals of other agencies or outside organizations. Included are contacts with industrial hygiene experts from other agencies, universities, and professional associations; with management representatives in private industry or Federal agencies; with labor representatives, contractors, engineers, and safety specialists within private companies or agency plants; and with a variety of experts within related occupational health and safety fields. These contacts are not established on a routine basis, but vary as to the purpose and extent of the contacts, and as to the roles and authority of the parties involved.

Level 6-4 -- 110 points

Personal contacts are with high-ranking officials from outside the agency, including top managerial, health, or scientific personnel of other agencies, State and local governments, private industry, and public groups (e. g., Assistant Secretaries, Department heads for State Governments or for major cities). These contacts are characterized by highly unstructured settings (e.g., unprecedented situations, difficulties in obtaining access to the officials, or unclear or widely varying roles and authorities).

FACTOR 7, PURPOSE OF CONTACTS

The purpose of personal contacts ranges from factual exchanges of information to 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 7-1 -- 20 points

Contacts are for the purpose of exchanging information about the work. Contacts with workers during inspections are for the purpose of attaching sampling equipment to the workers to monitor potentially hazardous exposures and to observe work operations.

Level 7-2 -- 50 points

In addition to the exchange of information, the purpose of contacts is to plan and coordinate work efforts with co-workers and plant management, and to provide advice to management and employees concerning the potential health hazards associated with their work operations. Although there may be difficulties encountered in coordinating these efforts and although there may be many disagreements in resolving problems encountered, the persons contacted are usually working toward mutual goals and generally have cooperative attitudes.

Level 7-3 -- 120 points

The purpose of contacts is to promote good industrial health practices, and to investigate and evaluate working conditions in order to gain compliance with occupational health and safety standards, policies, and regulations. These contacts often involve dealing with skeptical or uncooperative persons, and include serious technical disagreements and difficult labor-management relations. Thus, the employee is required to exercise tact and to be skillful in gaining the confidence and cooperation of those contacted.

Level 7-4 -- 220 points

Contacts are to justify, defend, negotiate, or settle highly significant or controversial occupational health matters. The industrial hygienist often represents the agency in professional conferences or committees for planning extensive and long-range occupational health programs and for developing standards and guides for broad application. Often, those contacted have different viewpoints or objectives, requiring the industrial hygienist to convince others or to arrive at compromises or suitable alternatives.

FACTOR 8, PHYSICAL DEMANDS

The Physical Demands factor covers the requirements and physical demands placed on the employee by the work assignment. This include physical characteristics and abilities (e.g., specific agility and dexterity requirements) and the physical exertion involved in the work (e.g., climbing, 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.

NOTE: Regulations governing pay for irregular or intermittent duty involving unusual physical hardship or hazard are in Chapter 550, Federal Personnel Manual.

Level 8-1 -- 5 points

The work is generally sedentary, although there may be some walking or bending during infrequent walk-through inspections of worksites.

Level 8-2 -- 20 points

The work includes frequent inspections or surveys of industrial workplaces, requiring the employee to carry a considerable amount of equipment, and involve a good deal of walking, standing, bending, and climbing.

Level 8-3 -- 50 points

The work requires frequent and protracted periods of strenuous physical exertion, such as long periods of climbing, crouching, or crawling in confined spaces or around and between operating equipment while carrying moderately heavy equipment (20-30 pounds or more) and while wearing protective clothing.

FACTOR 9, WORK ENVIRONMENT

The Work Environment factor considers the risks and discomforts 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.

NOTE: Regulations governing pay for irregular or intermittent duty involving unusual physical hardship or hazard are in Chapter 550, Federal Personnel Manual.

Level 9-1 -- 5 points

Work is usually performed in an office setting, although there may be occasional exposure to industrial hazards during infrequent walk-through surveys that are conducted as part of a larger study.

Level 9-2 -- 20 points

During inspections or surveys, there is regular exposure to all of the hazards and discomforts to which the workers are subjected, including a wide range of toxic chemicals, physical stresses, and safety hazards. The employee must use a variety of protective equipment and clothing, such as respirators, ear plugs, gloves, coveralls, hard hats, etc.

Level 9-3 -- 50 points

Work involves regular and recurring exposure to potentially dangerous or hazardous situations, such as working with explosives or incendiary materials; working at great heights under temperature extremes; or working around fatal viruses, areas devoid of oxygen, containing harmful bacteria, or emitting hydrogen sulfide. A variety of health and safety precautions are necessary as two or more potentially hazardous conditions may occur simultaneously.

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OPM BENCHMARK DESCRIPTIONS:

INDUSTRIAL HYGIENIST GS-0690-05, BMK #1

Duties

As a trainee, receives instruction in industrial hygiene principles and practices, industrial work processes and the related health hazards, and agency operating procedures.

- Receives formal and on-the-job instruction and training designed to familiarize the employee with the functions and operations of the organization and to provide experience in the practical application of basic industrial hygiene concepts, principles and techniques.
- As a team member, assists higher grade industrial hygienists in the conduct of industrial hygiene surveys, investigations, or inspections of private business concerns; of state plan or monitoring activities; or of work operations in government facilities (such as, shops and industrial areas, ships, aircraft, laboratories, and offices) to detect exposures; or in the performance of related projects. Attends opening and closing conferences. Performs selected tasks, such as:
 - (1) Maintaining, calibrating, and operating field and laboratory instruments and equipment to measure noise, heat, light, ventilation, humidity and air contaminants;
 - (2) Collecting samples during investigations/surveys, including setting up equipment and observing employees being monitored;
 - (3) Performing selected laboratory analyses of materials for toxic chemicals; making computational analysis of test results; or preparing samples for shipment to laboratory for analysis;
 - (4) Studying manuals, directives, professional literature, activity organization and operations, and other selected reference material;
 - (5) Reviewing reports, such as accident and inquiry reports; writing limited reports of surveys, data collected, and analytical results.

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Factor 1. Knowledge Required By the Position -- Level 1-5 -- 750 points

- A basic foundation in the physical or life sciences, or engineering, including the fundamentals of chemistry, which enable the employee to develop an understanding of industrial processes and materials, and the related health hazards.
- Ability to perform trainee-level industrial hygiene duties, which include assisting in inspections or surveys.

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

Supervisor assigns work with specific and detailed instructions as to what is required, what to look for, and probable results. Work is carried out under the close supervision of a higher grade industrial hygienist, who is consulted on matters not specifically covered in the original instructions or guidelines. On inspections, the employee's work is closely controlled by a more

senior employee. Work is reviewed in progress and upon completion for technical adequacy, accuracy, and conformance to instructions and is evaluated to measure employee's aptitude and capacity to perform more difficult assignments.

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

Guidelines include published Federal occupational health and safety standards, agency standards, textbooks, technical memoranda and directives, office files, as well as technical manuals and training materials which include specific operating instructions. These are detailed and directly applicable to the employee's assignments. Additional instructions are provided to cover any work for which these guidelines are inadequate. The employee works in strict adherence to the guidelines and must obtain approval of any deviations.

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

Assignments consist of specific tasks designed to orient the trainee in the practical application of scientific principles and concepts.

These tasks are usually the routine and detailed work involved in the investigations, surveys, or projects performed by senior industrial hygienists.

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Factor 5. Scope and Effect -- Level 5-1 -- 25 points

The purpose of the work is to orient the trainee industrial hygienist in the practical application of academic theory and basic principles. The effect of the work is to facilitate the work of other industrial hygienists within the immediate office.

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

Personal contacts are primarily with supervisory and/or higher grade industrial hygienists and safety personnel within the immediate office or local worksite. In addition, on investigations and surveys the employee has contacts with workers during the monitoring of possible hazards. (The employee's role in opening and closing conferences with management and labor representatives is primarily that of an observer and, therefore, is not credited.)

Factor 7. Purpose of Contacts -- Level 7-1 -- 20 points

Contacts are primarily for the purpose of obtaining advice and direction, and for reporting on findings. Contacts with workers or their supervisors during investigations and surveys are for the purpose of attaching sampling equipment to the workers to monitor hazardous exposures, to observe work operations, and to obtain information related thereto.

Factor 8. Physical Demands -- Level 8-2 -- 20 points

Inspections involve moderate physical exertion, including carrying equipment, standing, climbing, walking, and bending, as well as use of personal protective devices and occasional work in confined spaces.

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

The employee is exposed to a variety of unpleasant and hazardous conditions during inspections, including noise and toxic chemicals. Protective equipment is required in some situations.

TOTAL POINTS -- 985

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INDUSTRIAL HYGIENIST GS-0690-07, BMK #1*Duties*

Receives developmental assignments, including formal and on-the-job training in general and specific health and safety matters, and performs duties related to the identification and evaluation of conditions in the workplace which may adversely affect the health of employees of private business concerns.

- Performs portions of industrial hygiene inspections which are being conducted by a higher grade industrial hygienist.
- As a team member, attends opening and closing conferences with management and labor representatives.
- Reviews company's required recordkeeping, interviews employees, takes photographs and collects environmental samples using a variety of sampling equipment.
- Presents data and makes recommendations to higher grade industrial hygienist on actions to be taken.
- Drafts reports or portions of reports on industrial hygiene investigations.
- Performs field calibration of equipment.
- May accompany higher grade industrial hygienists in State plan monitoring activities for such purposes as spot-check monitoring visits, case file review, investigations of complaints against State Program Administration.

Factor 1. Knowledge Required By the Position -- Level 1-6 -- 950 points

- Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the performance of portions of industrial hygiene inspections of a variety of private industrial concerns.
- Knowledge of sampling equipment and techniques.
- Skill in calibrating and using a wide variety of industrial hygiene sampling instrumentation.

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

Supervisor or senior employee makes new assignments by providing specific instructions as to what to look for, scope of inspection, procedures to be used, and possible problems to expect. In addition, the supervisor or senior employee normally screens assignments to eliminate complex aspects. The employee works with a more experienced industrial hygienist in carrying out an inspection. The employee performs routine work independently, but frequently consults with the supervisor or higher grade industrial hygienist on any deviations, problems, or unusual situations. Findings and recommendations are reviewed carefully for accuracy and adherence to standard practices and policies.

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

Guidelines include published Federal occupational health and safety standards, agency manuals and technical memoranda, textbooks, professional journals, and office files. As the employee's assignments are screened to eliminate unusual or complex aspects, these guidelines generally cover the work to be performed. The employee is required to exercise judgment in selecting appropriate references and procedures for application to specific assignments. Problems to which existing guidelines cannot be applied are referred to the supervisor.

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

Assignments consist of a variety of duties related to industrial hygiene inspections and are designed to provide diversified experience as a foundation for future responsibility for conducting inspections. Assignments are typically screened to eliminate difficult or unusual problems. Work requires familiarity with and use of a number of standard industrial hygiene principles, methods, and practices in order to solve relatively limited professional problems.

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

The purpose of the work is to assist in or perform parts of industrial hygiene inspections being conducted by higher level industrial hygienists. The employee's assignment relieve senior employees of the more routine work, and affect the accuracy and reliability of the overall inspection results.

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

Personal contacts are primarily with higher grade industrial hygienists and safety personnel within the immediate office. In addition, on inspections the employee has contacts with workers during the monitoring of possible hazards. (The employee's role in opening and closing conferences is primarily that of an observer and is therefore not credited.)

Factor 7. Purpose of Contacts -- Level 7-1 -- 20 points

Contacts are essentially for the purpose of obtaining advice, discussing inspections, and reporting on findings. Contacts with workers during inspections are for the purpose of attaching sampling equipment to the workers to monitor hazardous exposures, and for observing and asking questions about work operations.

Factor 8. Physical Demands -- Level 8-2 -- 20 points

Inspections involve moderate physical exertion, including carrying equipment, standing, walking, and bending.

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

The employee is exposed to a variety of unpleasant and hazardous conditions during inspections, including noise and toxic chemicals. Protective equipment is required in some situations.

TOTAL POINTS -- 1435

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INDUSTRIAL HYGIENIST GS-0690-07, BMK #2

Duties

Carries out limited assignments, in any area of the industrial hygiene program, selected to accomplish program objectives and to expand the incumbent's training and experience in the various phases of the program. Most assignments cover investigation, analysis, and solution of a problem by applying methods outlined by the supervisor.

Performs duties related to the identification and evaluation of conditions in the workplace which may adversely affect the health of

employees at military commands within a region.

- Performs portions of industrial hygiene investigations or surveys which are being conducted by a higher grade industrial hygienist.
- As a team member, attends opening and closing conferences with management and labor representatives.
- Performs or arranges for the calibrating of equipment; places, operates, and maintains field and laboratory instruments and equipment to measure physical agents such as noise, heat, light, ventilation, humidity and air contaminants.
- Performs laboratory and work-site sampling and analysis of organic and inorganic material and physical phenomena; reviews and maintains records for the branch; interviews employees, takes photographs and collects environmental samples using a variety of sampling equipment and techniques; makes computational analysis of test results. Presents data and makes recommendations to higher grade industrial hygienist on actions to be taken.
- Drafts reports of moderately extensive investigations or surveys and analytical results.

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- Assists with health hazard evaluation in controlling potentially hazardous materials and with processing of compensation claims.

Factor 1. Knowledge Required By the Position -- Level 1-6 -- 950 points

- Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the performance of portions of industrial hygiene investigation or surveys of a variety of commands and activities.
- Knowledge of common sampling equipment and techniques.
- Skill in calibrating and using a wide variety of common industrial hygiene sampling instrumentation.

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

Supervisor or senior employee makes new assignments by providing specific instructions as to what to look for, scope of inspection procedures to be used, and possible problems to expect. In addition, the supervisor or senior employee normally screens assignments to eliminate complex aspects. The employee works with a more experienced industrial hygienist in carrying out

moderate to extensive investigations or surveys. The employee performs routine work independently, but frequently consults with the supervisor or higher grade industrial hygienist on any deviations, problems or unusual situations. Findings and recommendations are viewed carefully for accuracy and adherence to standard practices and policies. Supervisor reviews work for correct application of procedures and validity of data, conclusions, recommendations and their presentation, and evaluates the employee for aptitude, capacity, and professional development.

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

Guidelines include published Federal occupational health and safety standards, agency manuals and technical memoranda, textbooks, professional journals, and office files. As the employee's assignments are screened to eliminate unusual or complex aspects, these guidelines generally cover the work to be performed. The employee is required to exercise judgment in selecting appropriate references and procedures for application to specific assignments. Problems to which existing guidelines cannot be applied are referred to the supervisor.

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

Assignments consist of a variety of duties related to industrial hygiene investigations and surveys, and are designed to provide diversified experience as a foundation for future responsibility. Assignments are typically screened to eliminate difficult or unusual problems. Work requires familiarity with and use of a number of standard industrial hygiene principles, methods, and practices in order to solve relatively limited professional problems.

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

The purpose of the work is to assist in or perform parts of industrial hygiene investigations and surveys being conducted by higher level industrial hygienists. The employee's assignments relieve senior employees of the more routine work, and affect the accuracy and reliability of the overall investigation or survey results.

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

Personal contacts are primarily with higher grade industrial hygienists and safety personnel within the local command area. In addition, on investigations/surveys the employee has contacts with workers and supervisors during the monitoring of possible hazards. (The employee's role, if attending opening and closing conferences, is that of an observer and is therefore not credited.)

Purpose of Contacts -- Level 7-1 -- 20 points

Contacts are essentially for the purpose of obtaining advice, discussing investigations or surveys, obtaining data, and reporting on findings. Contacts with workers and supervisors during

investigations and surveys are for the purpose of attaching sampling equipment to the workers to monitor hazardous exposures, and for observing and asking questions about work operations.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

Investigations and surveys involve moderate physical exertion, including carrying equipment, climbing, standing, walking, and bending, as well as use of personal protective devices, and occasional work in confined spaces.

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

The employee is exposed to various unpleasant and potentially hazardous conditions during inspections, including noise and toxic chemicals. Protective equipment is required in some situations.

TOTAL POINTS -- 1435

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INDUSTRIAL HYGIENIST GS-0690-09, BMK #1

Duties

Conducts industrial hygiene inspections of private businesses to assess work practices and environmental conditions for hazards to the health and safety of workers, and to detect violations of published health standards. Generally, employee performs a segment of an inspection under higher grade industrial hygienists conducting complex and difficult inspections; or, independently performs inspection of establishments where work processes are of limited size and complexity. Performs a variety of additional industrial hygiene functions, such as providing technical assistance to employers, following up on abatement actions to be taken by businesses, conducting literature searches related to a specific hazard.

- Prior to inspection, becomes familiar with work operations. materials and other relevant facts about the workplace.
- Conducts or participates in pre-inspection conference with management and employee representatives to explain the nature and scope of the inspection.
- Reviews company's occupational health and safety records.
- Conducts walk-through inspection, accompanied by employer and employee representatives. Takes notes of conditions and of any apparent violations of standards, takes samples for those substances having established ceiling limits, and determines what long-term samples have to be taken on a subsequent day.

- On subsequent visit, attaches personal sampling equipment to several employees and observes their work operations.
 - Upon completion of sampling, conducts or participates in closing conference with management to discuss preliminary findings, answer questions, and discuss possible control measures and abatement periods.
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- Upon return to office, sends samples to laboratory for analysis.
 - Prepares report or portion of report, citing violations and recommending penalties and abatement dates.
 - Promotes sound industrial hygiene practices by working with higher grade employees to provide technical assistance to employers and by participating in public information activities.
 - Performs special studies of limited scope, such as conducting literature search on the control of a particular hazard.
 - May perform State program monitoring activities, such as conducting spot check monitoring visits, case file reviews, and investigations of complaints against State Program Administration. Prepares comprehensive and legally sufficient written reports of all monitoring activities performed which are subsequently incorporated into semi-annual reports prepared to assess the effectiveness of the State program.

Factor 1. Knowledge Required By the Position -- Level 1-6 -- 950 points

- Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the performance of relatively routine industrial hygiene inspections, or to portions of large and complex inspections.
 - Knowledge required to identify and evaluate occupational health hazards found in industrial operations where processes are still relatively simple and literature on the hazards is, in most cases, readily available; also, knowledge required to assist in more complex inspections.
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- Knowledge required to suggest, in general terms, possible approaches to the control of harmful exposures.

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

- Supervisor assigns inspections, indicating generally what the employee can expect to encounter, priorities, and unusual problems which may arise. The employee plans and carries out routine inspections independently, but higher level industrial hygienists are available to discuss complex or unusual situations. When confronted with unexpected or controversial

problems during inspections, the employee is expected to call the office for advice.

- On more difficult inspections, the employee participates as a team member under the direction of a senior employee.
- Reports of inspections are reviewed for technical accuracy, appropriateness of methods used and of recommendations, and consistency with policy and accepted practice.

Factor 3. Guidelines -- Level 3-3 -- 275 points

Guidelines include Federal occupational health and safety standards, agency operations manuals and directives, professional journals, literature on the industries to be inspected and the industrial processes used, office files of past inspections and established practice. The employee selects, studies, and evaluates available reference information; searches literature related to specific health hazards; and adapts established methods to meet the needs of the assignment. The employee must exercise judgment in relating current inspections to precedent ones.

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

Assignments involve independent inspections of industries where problems encountered are generally well-understood and easily identified. However, the work does require the employee to identify and analyze a variety of industrial health hazards. In addition, the employee participates, as a team member, in more difficult inspections. Some unusual situations arise in the course of inspections, but assistance is available for their resolution.

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

The purpose of the work is to conduct inspections of a variety of workplaces in order to identify and evaluate conditions which may be hazardous to the health of workers. Inspections may result in the fining of companies found to be in violation of standards, and in the requirement to take corrective measures which usually require substantial abatement costs. Thus, the adequacy of inspections affects the health and well-being of the workers.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts include occupational health and safety professionals within the agency and other Federal agencies, agency attorneys, management and labor representatives in the companies inspected, outside consultants, and State occupational safety and health personnel. The industrial hygienist may be called as a witness to testify in hearings.

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

The purpose of contacts is to investigate and analyze working conditions for compliance with occupational health and safety standards. These contacts are frequently with uncooperative or

skeptical people, requiring the employee to exercise skill in gaining the confidence and cooperation of the people contacted. When called as a witness in hearings, testifies as to calibration and/or operation of instruments, sampling procedures, and similar matters used in the specific inspection. In addition, the contacts with other occupational health and safety specialists are to exchange information, coordinate work efforts, and resolve technical issues.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

Industrial hygiene inspections are frequent and require the employee to carry moderately heavy equipment. Inspections also involve a good deal of standing, walking, and bending.

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

The employee is exposed to a wide range of hazardous and unpleasant conditions during inspections, including toxic materials, high noise levels and temperature extremes. Use of protective clothing and equipment is required.

TOTAL POINTS -- 1870

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INDUSTRIAL HYGIENIST GS-0690-09, BMK #2

Duties

Performs various duties to assess work practices and environmental conditions for hazards to the health and safety of workers. Generally, work is auxiliary to a higher grade industrial hygienist. Duties include conducting studies, analyzing findings, and preparing various reports. Environmental conditions involve a variety of hazards, e.g., chemical, noise, heat, actinic rays, ionizing and non-ionizing radiation, and other environmental physical agents. Assigned work includes industrial shops, production areas, laboratories, confined areas, and outdoor work sites.

- Conducts surveys to identify and evaluate health hazards and potential health hazards. Surveys involve determining compliance with established threshold limit values (TLV), evaluating exposures, and advising on control measures and changes in work procedures or schedules to comply with the established health requirements and to provide information for evaluation purposes.
- Performs analysis using standard methods to determine nature and degree of toxic material present in a variety of materials, such as environmental samples, body fluids, and industrial products. Determines measurements to be made and methods to be used, calibrates and adapts various kinds of equipment, such as standard spectrophotometers, PH meters, and gas chromatographic apparatus.
- Consults with and advises occupational health personnel on matters of epidemiology relative to health hazards in the work area.

Factor 1. Knowledge Required By the Position -- Level 1-6 -- 950 points

- Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the performance of relatively routine industrial investigations, or to portions of large and complex investigations.

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- Knowledge required to identify and evaluate occupational health hazards found in industrial operations where processes are of a conventional nature and literature on the hazards is, in most cases, readily available; also, knowledge required to assist in more complex investigations involving a wide variety of conditions.
- Knowledge required to recommend control measures or possible approaches to the control of harmful exposure.

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

- Assignments are given in terms of objectives, priorities, and deadlines. When unusual or non-standard techniques are necessary, assignments are usually accompanied by instructions as to methods and procedures to use. However, incumbent applies the full range of standard techniques without guidance.
- Employee plans and carries out day-to-day assignments independently and handles problems and deviations in work assignments in accordance with previous instructions, policies, or accepted industrial hygiene practices. Incumbent determines measurements to be made and methods to be used, and selects a variety of equipment. Incumbent coordinates the work with others such as the occupational health clinic, physician, and employee's work schedules.
- Completed work and reports of survey are reviewed for technical soundness, appropriateness of recommendations, and conformance to policy requirements.

Factor 3. Guidelines -- Level 3-3 -- 275 points

Guidelines include Federal occupational health and safety standards, agency operations manuals and directives, professional journals, literature, etc. The employee selects, studies, and evaluates available reference information, searches literature related to specific health hazards, and adapts established methods to meet the needs of the assignment. The employee must exercise judgment in relating current investigations to precedent ones.

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

Assignments involve varied interrelated tasks where problems encountered are generally of a conventional nature and pose few unusual problems. However, work does require the employee

to identify and analyze a variety of health hazards. In addition, the employee participates or assists as a team member in the more complex or difficult studies. Some unusual situations arise during the course of assignment, but assistance is available.

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

The purpose of the work is to conduct surveys and investigations of work operations in order to identify and evaluate conditions which may be hazardous to the health of workers. Investigations result in identifying undue hazards and in recommendations for corrective or preventive measures. The adequacy of these surveys and investigations affects the health and well-being of employees.

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

Personal contacts are primarily with higher grade industrial hygienists, with safety personnel and with occupational health personnel within the immediate office or local area. In addition, employee has contact with workers and supervisors during the monitoring of possible hazards.

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

The purpose of contacts is to investigate and analyze working conditions for compliance with occupational safety and health standards and to provide advice to management and employees concerning the potential health hazards associated with the work operations. Additionally, the incumbent consults with the occupational health physician in determining appropriate tests, in the evaluation of test results, and in the identification and scheduling of personnel for health examinations, based on exposure.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

Industrial hygiene surveys are frequent and require the employee to carry moderately heavy equipment. Investigations also involve a good deal of standing, walking, and bending.

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

The employee is exposed to a wide range of hazardous and unpleasant conditions during investigations, including toxic materials, high noise levels, and temperature extremes. Use of protective clothing and equipment is required.

TOTAL POINTS -- 1915

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INDUSTRIAL HYGIENIST GS-0690-11, BMK #1

Duties

Conducts industrial hygiene inspections of private businesses and worksites to determine compliance with occupational health and safety standards and regulations. In addition, investigates accidents, which may include those involving fatalities and serious injury, investigates complaints of employees concerning work conditions, prepares necessary reports and records, issues citations, proposes penalties for violations, and provides technical assistance to employers, public officials, and representatives of labor and business organizations.

- Performs inspections in a full range of industries in a given geographical area. Visits industries, conducts walk-through to identify potential health hazards, and makes analysis for presence of toxic materials. Where potential hazards are indicated, selects measuring instruments and takes samples to measure hazard to specific individuals.
 - Conducts a background review of the industry and of the characteristics of the work process, reviews applicable standards and requirements contained in compliance manual.
 - Visits worksites, explains purpose of visit, and reviews recordkeeping.
 - Conducts detailed inspections, taking testimony from union representatives and from employees who were exposed to hazards. Using a variety of measuring devices, takes a number of samples.
 - Requests immediate action to correct conditions which might be expected to cause death or serious illness, and negotiates through supervisor with regional solicitor when immediate voluntary action cannot be secured.
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- Holds closing conference to inform management representatives of alleged violations found, of citations and penalties which can be expected, cites applicable standards, and negotiates reasonable abatement dates. Also, explains provisions for posting citations, rights to informal conferences, and procedures for contest.
 - Arranges for shipment of samples to laboratory for analysis. Prepares citations and proposed penalties, showing in detail alleged violations, standards applicable, and abatement dates.
 - Reviews correspondence from employer to assure that abatement action is taken on a timely basis, and may conduct follow-up inspection.
 - Reviews and comments on proposed new standards and changes to compliance manual.
 - Responds to telephone inquiries from employers and employees concerning occupational health matters.
 - May perform State program monitoring activities, including spot check monitoring visits, case file reviews, and investigations of complaints against State Program Administration. Prepares

comprehensive and legally sufficient written reports of all monitoring activities performed which are subsequently incorporated into semi-annual reports prepared to assess the effectiveness of the State program. Provides instruction, training, and advice to other professional employees of the agency.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

- Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the conduct of industrial hygiene inspections in a wide variety of industries.
- Knowledge of industrial operations and processes, materials

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and equipment used, and by-products generated.

- Skill in the use of a variety of sampling instrumentation, knowledge of sampling strategies, and knowledge of the types and limitations of analytical methods.
- Knowledge of methods of control for a wide variety of health hazards, including toxic chemicals, radiation, and noise.

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

Receives assignments from supervisor, or by referrals from safety personnel. Assignments are given in terms of scope, objectives and priorities. The employee independently plans and carries out inspections, handling problems in accordance with office policies, previous training, and accepted industrial hygiene practice. Complex or unusual problems are handled by researching relevant literature and by consulting with the supervisor or senior level industrial hygienists. Completed work is reviewed for adequacy, and achievement of objectives.

Factor 3. Guidelines -- Level 3-4 -- 450 points

Guidelines include published health standards, criteria documents, the agency compliance manual, agency directives and instructions, professional journals, literature on industries and industrial processes, office files, and established practice. In many situations, these guidelines are insufficient or do not directly apply, requiring experienced judgment, adaptation of past practices, and research into new developments in the field. For example, the industrial hygienist may be called on to investigate and determine the cause of a sudden outbreak of illness among a group of workers. In addition, the industrial hygienist encounters exposure of workers to exotic chemicals for which there are no standards, nor available information on appropriate sampling techniques and chemical analysis.

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Factor 4. Complexity -- Level 4-4 -- 225 points

Inspections cover the full range of industries, including such large and diverse industries as the automotive, plastic, and rubber industries. These industries pose a number of complex problems for the industrial hygienist, resulting from the size and diversity of work operations, the use of exotic chemicals, and the combinations of hazardous materials. The employee must adapt or modify past practices and research trends in the field in order to identify and evaluate a wide variety of occupational health hazards. Fatality investigation is complicated by the requirement to investigate conditions which existed prior to the accident and may have changed.

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

The purpose of the work is to investigate working conditions in a variety of industrial settings to determine compliance with published occupational health standards. Inspections may result in citations for non-compliance and in the requirement to correct the hazardous conditions, thereby affecting the health and well-being of the workers. Additionally, citations may result in substantial abatement costs to the employer.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Contacts during inspections are with top management officials and employee representatives. Other contacts include industrial hygienists and safety personnel within the office, in the regional and national offices, other Federal agencies, and with regional office attorneys, educators, union officials, physicians, as well as with court officials, and employer attorneys during hearings.

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

The purpose of contacts is to exchange information, discuss technical issues, and gain compliance with published health standards. Parties contacted during inspections may be skeptical and technical disagreements often develop, requiring tact and a professional manner on the part of the industrial hygienist.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

Inspections require moderate physical exertion in carrying equipment, as well as extended periods of walking and standing.

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

During inspections the employee is exposed to a variety of hazards and discomforts, requiring the use of protective equipment and clothing.

TOTAL POINTS -- 2570

INDUSTRIAL HYGIENIST GS--0690-11, BMK #2

Duties

Provides technical industrial hygiene services which are concerned primarily with problem identification, quantification, and solution, affecting Federal, State, and local governments and private industrial activities. In addition, serves as liaison with labor organizations, technical associations, and the private sector for the development, compilation, and distribution of informational and educational material resulting from service activities.

- Plans and conducts walk-through surveys of various types of industrial plants and government installations to appraise existing environmental hazards. Based on this evaluation, recommends proper sampling strategy to perform the environmental survey, including procedures, equipment, and staffing. Participates in survey by setting up equipment, taking samples, and recording data. Based on data, recommends methods, such as ventilation improvements or other engineering controls, to alleviate existing hazards.
- Conducts short-term studies within a particular industry to identify potential occupational health hazards, and control measures, and develops technical reports of findings and recommendations. For example, conducts literature search and field study related to a problem with an existing standard or Threshold Limit Value.
- Monitors contracts being performed by industrial hygiene firms or universities, to see that the contractor meets the specifications of the contract.
- Provides instructions and consultative services to government installations and private industries on occupational health matters, such as the potential hazards associated with a particular operation, or the use of contaminant measuring equipment.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

- Professional knowledge of industrial hygiene concepts, principles and practices applicable to a wide range of duties concerned with the identification, evaluation, and control of occupational health hazards found in a variety of industrial settings.
- Knowledge required to recognize potential health hazards associated with a particular work environment and to select appropriate sampling techniques for measuring the extent of exposure.

- Skill in using virtually all types of industrial hygiene instrumentation, including an appreciation of the capabilities and limitations of each type of equipment.
- Knowledge required to recommend appropriate measures to control hazards identified.

Factor 2. Supervisory Controls -- Level 2-4 -- 450 points

Supervisor assigns surveys or special studies in general terms, and in consultation with the employee defines objectives, priorities, and deadlines. The employee has responsibility for planning and carrying out surveys or projects, for developing recommendations and for assuring appropriate coordination. The supervisor is available for consultation on novel or highly complex matters, but the employee is expected to search the literature for available information and to present recommendations or alternatives. Reports are reviewed by the supervisor for feasibility and effectiveness in meeting objectives. Studies which will be published by the agency receive higher level review.

Factor 3. Guidelines -- Level 3-3 -- 275 points

Guidelines include agency publications, professional journals, textbooks, published standards and criteria documents. While these guidelines are generally applicable to the work, the employee must interpret and adapt guidelines to deal with specific situations. In addition, the employee may need to conduct literature searches for dealing with new processes or materials.

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Factor 4. Complexity -- Level 4-4 -- 225 points

Assignments consist of surveys and studies involving a variety of industrial processes and materials. The industrial processes may be marked by frequent changes in operations or by the introduction of new materials. Additional complicating factors include possible interaction among several materials that may pose other types of health hazards. Thus, the employee is required to interpret a variety of data in the evaluation of hazards, and to vary the approaches used to effect a satisfactory control of the hazards.

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

The purpose of the work is to identify, evaluate and control health hazards found in the workplace, which result from exposure to chemical, physical, and biological stresses. Thus, the work results in the protection of the health and well-being of the workers.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts include industrial hygienists, safety professionals, toxicologists, engineers, physicians, and other occupational health and safety specialists within local, State and Federal government agencies, and universities. In addition, contacts during surveys include company presidents, general managers, engineers, and safety and industrial hygiene personnel.

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

The purpose of contacts is to exchange information, provide technical advice, coordinate work efforts, and discuss solutions to technical problems. Because surveys are generally prompted by request, industry personnel are usually very cooperative.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

Surveys involve the carrying of a good deal of equipment, as well as extended periods of walking and standing.

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

The employee is exposed to a wide variety of potential industrial health hazards, necessitating the use of protective equipment and clothing.

TOTAL POINTS -- 2500

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INDUSTRIAL HYGIENIST GS-0690-11, BMK #3

Duties

Plans and conducts complete evaluations of work operations involving potentially hazardous environmental conditions, analyzes findings, and recommends corrective measures and controls. Evaluations are conducted in agency facilities located within the region, both civilian and military. Evaluations may include chemical health hazards resulting from inhalation of vapors, fumes, mists, gases, and dusts, or from skin contact; and from physical hazards, such as noise, heat or pressure above and below normal atmospheric, and ionizing and non-ionizing radiation.

- Performs, organizes and/or directs on-site surveys and investigations in offices, shops, aboard ships and aircraft, and conducts literature search to determine nature and severity of hazards present.
- Conducts pre-evaluation briefing with shop, departmental and/or safety supervisors at activities to discuss the purpose of the evaluation and the general approach to be taken, and to obtain information of unusual problem areas.

- Using standard chemical and physiological sampling techniques and procedures, accumulates the information and material required for laboratory analysis and evaluation.
- Performs analysis of some samples; the remainder of samples are sent back to the main laboratory for analysis.
- Briefs operational and safety supervisory personnel to outline preliminary findings and possible means of correcting problems. Following comprehensive evaluation, formulates specific recommendations for control of health hazards found.
- Prepares technical report identifying health hazards and recommending measures for their reduction or elimination.

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- Participates in the review of plans for new or modified facilities, processes, and materials for evaluation of the adequacy of health hazard controls.
- Participates in special studies or investigations related to a particular occupational health problem, complaint, or suspected occupational medical condition related to environmental factors and stresses, including development and preparation of information in processing compensation claims.
- Provides advice to activity personnel on a variety of occupational health matters.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

- Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the conduct of industrial hygiene evaluations of a wide variety of operations and processes at agency facilities.
- Knowledge of interpreting and evaluating process and facility plans and specifications for health hazard controls as well as related standards; knowledge of evaluating material safety data sheets for non-standard materials; knowledge of techniques for planning and arranging for limited surveys.
- Knowledge required to recognize potential health hazards associated with a variety of operations and processes at agency facilities; knowledge of symptomatology of occupational diseases for investigating alleged or suspected occupational medical conditions in order to provide information requested in processing claims for occupational injuries and/or diseases.
- Knowledge of techniques and skill in preparing and presenting training concerning specific industrial hygiene subject matter.

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- Knowledge required to recommend effective measures to reduce or eliminate hazardous working conditions.
- Skill in the use of industrial hygiene sampling instrumentation; skill in the performance of analyses associated with industrial hygiene evaluations; skill in technical report writing.

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

Supervisor assigns survey evaluations, determining objectives, priorities, scope, and number of personnel needed to carry out evaluations. The employee has independent responsibility for carrying out the assigned evaluations, including searching the literature for information on complex hazards encountered. The employee may act as a team leader, directing an evaluation involving several technicians and/ or lower grade industrial hygienists. Evaluation reports are reviewed through two levels for technical adequacy, appropriateness of recommendations, and consistency with the organization's mission and policies.

Factor 3. Guidelines -- Level 3-3 -- 275 points

Guidelines consist of published Federal occupational health and safety standards and criteria documents, standards published by recognized professional organizations, agency manuals and policies, professional journals, reports from past evaluations, and established practices. Specific guidelines are sometimes incomplete or inadequate for application to assignments and require supplementing by personal knowledge and the exercise of ingenuity and originality.

Factor 4. Complexity -- Level 4-4 -- 225 points

Industrial hygiene evaluations and surveys cover a wide range of agency operations at facilities located in various parts of the region. The work activities and work environment involve a substantial amount and variety of exposure to physical, chemical and/or radiological health hazards. For example, the employee may conduct an evaluation of an activity which may include such industrial operations as machining, foundry work, paint stripping, cleaning, degreasing, spray painting, plating and welding. On other surveys the employee is confronted with industrial processes which are frequently changing, and with new materials for which composition and/or toxicological information may be sketchy. The employee may be called on to adapt and modify established methods of control to meet the requirements of the particular situation. For example, exposure to an irritant chemical may pose a skin absorption problem in one situation and an inhalation problem in another.

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Factor 5. Scope and Effect -- Level 5-33 -- 150 points

The purpose of the work is to identify, evaluate, and control occupational health hazards in agency facilities. The work results in the reduction or elimination of health hazards, thereby providing workers with a more healthful working environment.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts during evaluations are primarily with military and civilian personnel including supervisors of the agency facilities, but also involve department heads, medical staff, engineers, safety personnel, and industrial workers. Other contacts are with occupational safety and health professionals at the facility and in the agency, and in professional associations.

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

The employee conducts a pre-evaluation briefing with shop, departmental and/or safety supervisors to explain the purpose, scope, and a general methodology of the evaluation. Other pre-evaluation contacts are with safety personnel and medical staff to gain information on potential problems. During evaluations, the employee also has contacts with workers in order to observe and gather information on work operations. Following the investigation or survey, the employee briefs operational and safety supervisory personnel to explain preliminary findings and discuss possible control measures. Frequently, the employee is required to persuade skeptical supervisors of the existence of health hazards and the need for preventive measures. Contacts with facility engineers are to discuss possible engineering controls, such as ventilation systems or changes in work processes. Other contacts are for the purpose of exchanging information, discussing possible solutions to specific problems, and exploring trends in the field with other professionals.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

Investigations and surveys involve moderate physical exertion, including carrying equipment, climbing, standing, walking, and bending, as well as use of personal protective devices and occasional work in confined spaces.

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

The employee is exposed to a variety of unpleasant and potentially hazardous conditions during inspections, including noise and toxic chemicals. Protective equipment is required in some situations.

TOTAL POINTS -- 2395

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INDUSTRIAL HYGIENIST GS-0690--12, BMK #1*Duties*

Performs a variety of industrial hygiene functions. Primary responsibility is for conducting health and safety inspections of private businesses and industrial firms in an assigned geographical

area. Inspections are conducted to determine compliance with published health standards and regulations, but often involve situations involving the application of general duty citations, the making of immediate decisions on imminent danger situations, and the analysis of procedures used to eliminate, reduce, or abate occupational health dangers. Having responsibility for highly complex and sensitive inspections, the industrial hygienist may act as team leader on inspections of complex, high-hazard workplaces. These inspections may require several occupational health and safety specialists and the employee exercises overall responsibility for the inspection. In addition, performs special industrial health studies, provides advisory services to private employers and less experienced employees within the agency, and generally promotes industrial practices that are consistent with the goals and principles of industrial hygiene, requiring a comprehensive knowledge of a wide variety of chemicals and work practices affecting employee health.

- Conducts inspections of worksites to observe work practices and environmental conditions for hazards to health and safety, and to detect violations of published health standards.
- In an entrance interview, consults with management officials and employee representatives concerning the nature and purpose of the inspection and the procedures which will be followed.
- Conducts walk-through of worksite, noting which operations could constitute potential health problems, takes samples where ceiling limits have been established, and determines where to take longer samples (e.g., 8-hour samples) on a subsequent visit.

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- Upon completion of walk-through, advises management of results and whether a return visit is necessary to take further samples.
- When another visit is necessary, prepares necessary equipment and returns to business firm.
- At operations when hazards are suspected, attaches personal sampling instruments to several employees; keeps employees under observation and takes notes on operations.
- Upon completion of survey, conducts closing conference with management, advising them of preliminary findings, explaining their right to contest the citations, and informing them of the requirement to post citations. May discuss, in general terms, possible abatement procedures.
- Prepares report of inspection findings, including supporting documents, recommendation of proposed penalty, abatement dates, and classification of citation as to serious or non-serious.
- Follows up to ensure that required abatement measures are completed, which, in some cases, require additional inspections.
- Provides instructions, training, and advice to other professional employees of the agency.

- Performs special studies; also participates in the development of area office policy or in new applications of existing policy.
- Renders advice to private employers concerning industrial health hazards and possible approaches to their control.
- As industrial hygiene specialist representing the agency, testifies in hearings where companies are contesting agency findings and penalties.

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- Individually or as a team leader, conducts fatality or catastrophe investigations where critical on-the-spot decisions must be made.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the conduct of occupational health inspections of a wide range of private business firms, including large and complex industrial operations.

Knowledge required to recognize environmental factors and stresses associated with complex work operations, and to ascertain their effects on the health and well-being of workers.

Knowledge, based on experience and on the use of quantitative measurement techniques, for evaluating the magnitude of environmental stresses and their effects on health, well-being, and efficiency.

Knowledge required to suggest possible approaches to eliminate or reduce such stresses.

Knowledge and ability necessary to serve as an industrial hygiene specialist for the agency in hearings where companies are contesting agency findings and penalties.

Factor 2. Supervisory Control -- Level 2-4 -- 450 points

Supervisor schedules inspections, but the employee is responsible for virtually all other details of the work-preparing for and carrying out inspections, writing the report, indicating proposed citations, and generally determining approaches to be taken in handling most situations encountered. The supervisor is available to discuss highly unusual or controversial matters and, together with the employee, develops approaches for their resolution. Reports are reviewed for effectiveness and comparability with similar inspections. The citations may be reviewed more thoroughly in cases where the proposed monetary penalty or abatement period deviates significantly from standard policies of the office, or where the recommendation involves extremely complex professional judgments.

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Factor 3. Guidelines -- Level 3-4 -- 450 points

The principle guidelines consist of published Federal occupational safety and health standards. Other guidelines include the agency field operations manual, office files, national or regional policy directives, intra-office memoranda, and the office library which contains information on the various industries, work operations, chemicals involved, etc. The employee is confronted with situations for which these guidelines are inapplicable, such as when there are no appropriate standards, or when it is uncertain whether feasible engineering controls to reduce or eliminate a hazard are available. The employee must use initiative and judgment in adapting industrial hygiene principles and practices, or, in some cases, developing new methods, and in researching potential approaches.

Factor 4. Complexity -- Level 4-5 -- 325 points

Assignments consist of industrial hygiene inspections, including fatality investigations, involving a variety of types of industries, work operations and processes, materials and equipment, products and by-products. As a senior industrial hygienist, incumbent is assigned inspections which include heavy industries which are among the most complex and sensitive. Physical and chemical hazards are numerous and inspections may require several days to complete, using a team of occupational safety and health personnel. (This employee exercises overall responsibility for the inspection.) The complex nature of the work processes and/or the use of exotic chemicals may require the employee to conduct extensive literature searches in order to identify and evaluate the nature and extent of hazard. Often, hazards are not adequately covered by standards, so that controversial citations must be made under the general duty clause in the law. Frequently, the workplace is such that several serious and willful violations can be anticipated, complex abatements are expected, antagonism to the agency mission is known to exist, and contests requiring expertise in hearings are predictable. In addition, labor relations problems often exist.

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

The purpose of the work is to plan and conduct inspections, which include major industries located within a geographical area, to analyze and investigate a variety of health hazards associated with the work environment. These industries use complex work processes, exotic chemicals, or present other unusual problems or conditions which require extensive investigation on the part of the industrial hygienist, or which are not adequately covered by standards. Findings, decisions, and judgments usually affect or set precedents affecting groups of workers who are in hazardous or potentially hazardous environment. Citations result in substantial abatement costs to the employer.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts include top management officials and employee representatives at the business being inspected, consultants employed by the company and by the agency, other industrial hygienists, safety specialists and laboratory personnel of the agency and other agencies, agency attorneys, and representatives of the State environmental health agency.

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

The primary purpose of contacts is to evaluate working conditions for hazards to health and safety and to gain compliance with published standards. Also, contacts are for exchanging information, for providing advice, and for coordinating work efforts. (Potential safety hazards noted during inspections may be referred to safety specialists within the office.) Employers and employees contacted are at times uncooperative, skeptical or guarded. Thus, contacts require skill in gaining the confidence, respect and trust of both parties. In addition, the employee testifies in hearings on contests.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

The inspections require moderate physical exertion, including walking, standing and carrying many items of equipment used in sampling.

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

The employee is regularly exposed to all the types of hazards and unpleasantness associated with industrial work environments. Frequently, the employee must wear protective equipment, including respirators, hearing protection, and various types of protective clothing.

TOTAL POINTS -- 2920

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INDUSTRIAL HYGIENIST GS-0690-12, BMK #2*Duties*

Serves as a specialist in the evaluation of occupational hazards. Conducts surveys of worksites throughout a region to identify and evaluate the potential toxicity of materials used or found in the workplace. For some of the materials evaluated, there is little information available on the nature and extent of hazard.

- Upon receipt of written request from employer or employee representative, and upon the determination by the central agency staff that the request is legitimate, the employee is assigned to conduct a survey of the plant area specified in the request.
- Contacts plant management and employee representatives and schedules initial field visit.
- Conducts observational survey of workplace, accompanied by local representatives, to determine the nature of the problem and the number and type of environmental samples to be collected.

- Conducts interviews with medical staff and employees to identify adverse symptomatology.
- Findings of initial survey are sent to headquarters where it is determined whether or not a physician will participate in environmental-medical evaluation.
- Returns to plant and conducts sampling, generally by attaching personal sampling devices to several employees, and observes employees during sampling.
- After laboratory completes analysis of samples and reports results, employee writes preliminary report which includes findings and recommendations for control of hazards.

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- Writes final report, incorporating medical findings and recommendations.
- Participates in educational program designed to inform industry representatives and employees of applicable legislation, latest techniques, and general occupational health matters.
- Furnishes technical advice on occupational health problems to companies and employee groups throughout the region, which includes suggesting solutions to specific problems.
- Prepares health and safety guides for specific industries, emphasizing common problems found in plants.
- Assists in the development of training plans, including planning courses to meet specific and general needs.
- Participates in program designed to monitor and report on the incidence of occupational injury and illness in particular industries.
- Works with agency grants personnel in developing and monitoring research grants.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

Professional knowledge of industrial hygiene concepts, principles, and practices which enable the employee to carry out health hazard evaluations of a wide variety of industrial worksites, including heavy industry, which are characterized by new and complex work processes, chemical compounds for which reliable standards do not exist, and complications in hazard evaluation resulting from synergistic effects.

Skill in the use of the full range of industrial hygiene sampling techniques and instrumentation.

- Knowledge of industrial hygiene control measures.

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Factor 2. Supervisory Controls -- Level 2-4 -- 450 points

Health hazard evaluations are assigned after validation by headquarters staff. The supervisor primarily provides administrative direction, delegating most technical responsibility to the employee. As a recognized specialist, the employee independently plans and carries out the evaluation, determining the approach to be taken and coordinating the work with other professionals and technicians, as necessary. The employee keeps headquarters staff informed of controversial or far-reaching matters. Reports receive several layers of review for feasibility, effectiveness, and consistency with other evaluations.

Factor 3. Guidelines -- Level 3-4 -- 450 points

Guidelines include Federal standards and criteria documents, agency manuals, established practice, past evaluation reports, and a variety of technical literature, including professional journals, textbooks, literature on industries and industrial processes. In addition, for some substances, recognized standards are not readily available and the employee must conduct a literature search for any existing standard which is adequately documented. Many problems arise for which established practice is not applicable, such as combinations of hazardous materials or the use of new materials for which toxicity information is lacking. The employee must apply experienced judgment and must keep abreast of new developments in the field in order to deal with the unusual situations.

Factor 4. Complexity -- Level 4-5 -- 325 points

Assignments include conducting evaluations of a variety of industrial environments and involve the identification and evaluation of hazards about which little may be known. Surveys measuring airborne contaminants often involve chemical combinations for which toxicity levels are unknown. Other complicating factors may include new or unusual processes and difficult control problems. The employee must exercise resourcefulness in planning and carrying out individualized approaches to obtain a valid and complete evaluation.

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Factor 5. Scope and Effect -- Level 5-5 -- 325 points

The purpose of the work is to identify or investigate health hazards in a variety of industries throughout a five-state region. The employee furnishes expert advice and assistance to employers and employee groups on specific problems, some of which have little information available, and on occupational health programs in general. The work has a direct effect on worker health through the identification and elimination of health hazards in the workplace, and on the industrial hygiene programs of the industries involved. In addition, evaluation reports are used in assessing the validity of existing standards and in developing new standards where toxic substances are found for which no standards exist.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts include managers of large and small industrial firms, the engineering, safety and/or industrial hygiene staffs of such organizations, professional consultants employed by the firm being surveyed, company medical personnel, union officials, and all levels of employees. The employee also has contacts with a variety of occupational health specialists within the agency and in other Federal agencies.

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

Contacts are to investigate and evaluate working conditions in order to identify and control occupational health hazards and to promote effective occupational health practices. The cooperation of all parties is necessary to carry out evaluations effectively. Some surveys are complicated by strained relations between management and labor, particularly when the request for the evaluation comes from a union group or from a group of employees.

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Factor 8. Physical Demands -- Level 8-2 -- 20 points

Surveys involve moderate physical exertion, including standing, walking, and carrying many items of equipment used in sampling.

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

Surveys expose the employee to many health and safety hazards found in industrial environments, necessitating the use of protective equipment and clothing.

TOTAL POINTS -- 3020

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INDUSTRIAL HYGIENIST GS-0690--12, BMK #3

Duties

Provides industrial hygiene expertise in the development of criteria for recommended national occupational health and safety standards for specific hazards. Incumbent is responsible for conversion of research data and technical information into criteria for health and safety standards.

(1) Provides technical direction and monitors contracts for the development of criteria documents by carefully following the technical aspects of contractor's work.

-- Reviews relevant scientific and engineering literature and assesses the adequacy of contractor's literature search and review.

- Reviews drafts prepared by contractor for technical and editorial adequacy, as well as for compliance with agency policy.
 - Makes corrections, recommendations for changes, and suggestions for additional material needed in draft.
 - Arranges for and acts as chairman of formalized internal and external reviews of draft, along with professionals having expertise in a variety of related fields, including medicine, chemistry, toxicology, pharmacology, physiology, etc. (Internal reviews are carried out within the agency; external reviews include representatives from industry, unions, universities, and State health departments)
 - Incorporates changes in criteria documents resulting from comments or new information provided by reviewers.
- (2) Provides industrial hygiene expertise in the development of other criteria documents.
- (3) Writes and revises contracts or portions of contracts, with emphasis on industrial hygiene, in order to assure the scientific soundness of the resultant criteria document.
- (4) Maintains a current awareness of developments in the field of industrial hygiene by keeping up with the professional literature and attending scientific meetings.
- (5) May be called on to defend agency's recommendations before other Federal agencies and advisory committees.

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Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

Professional knowledge of the concepts, principles, and practices of industrial hygiene applicable to the development of criteria for occupational safety and health standards for a variety of health hazards. Skill in dealing effectively with private sector contractors and in relating to them on a professional level.

Knowledge of toxicology, physiology, and biochemistry sufficient to understand the technical literature dealing with the physical effects of toxic substances or harmful physical agents.

Factor 2. Supervisory Controls -- Level 2-4 -- 450 points

The employee is assigned responsibility for the development of particular criteria documents and receives only general direction as to overall objectives and priorities. The employee is independently responsible for monitoring the contract, coordinating with other professionals on reviews, and making necessary revisions. During the course of the project, the supervisor or team

leader is kept informed of progress and is available to discuss controversial matters. Upon completion of the project, formal reviews of the work are made by a variety of technical experts, with the employee acting as chairman of the reviews.

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Factor 3. Guidelines -- Level 3-4 -- 450 points

Primary guidelines consist of the technical literature cited by the contractor in developing the draft, all of which must be reviewed in detail. Other guidelines include agency policy, previously published criteria documents, and a variety of technical literature in the industrial hygiene fields, as well as in related scientific disciplines. The employee must use professional judgment in evaluating the broad range of material and the resulting conclusions to insure that the contractor's work is consistent with the technical literature and that the conclusions are supported by sound analysis and defensible scientific evidence.

Factor 4. Complexity -- Level 4-5 -- 325 points

The development of criteria documents involves a comprehensive and in-depth review and analysis of technical literature, from a wide variety of scientific fields related to occupational health, including industrial hygiene, medicine, chemistry, physiology, toxicology, epidemiology and physics. The work requires a multi-disciplinary approach, and the employee must recognize and evaluate relevant material from the broad range of scientific fields, including the recognition of personal limitations in technical knowledge for which subject-matter experts should be consulted. Thus, the difficulty of the work arises from the breadth of technical information involved, and from the need to resolve differing viewpoints in order to arrive at scientifically sound and defensible conclusions.

Factor 5. Scope and Effect -- Level 5-5 -- 325 points

The primary purpose of the work is to critically evaluate scientific information in order to convert research data and other relevant technical information into criteria for occupational health and safety standards, including recommendations for safe exposure levels for specific hazards.

Completed criteria documents, as recommendations for standards from the agency, directly affect in the development of national workplace standards for specific hazards.

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Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Contacts are with consultants and with a variety of other occupational health and safety specialists, including physicians, chemists, toxicologists and epidemiologists within the agency, other Federal agencies, State agencies, and private industry. Additionally, the employee contacts educators and labor representatives.

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

Contacts with contractors are to monitor contracts for the preparation of criteria documents. Questions concerning the adequacy of treatment, or technical disagreements over the validity of conclusions, often have to be handled. Other contacts are to exchange information, coordinate projects, discuss technical issues, and, in some cases, defend final recommendations before other agencies.

Factor 8. Physical Demands -- Level 8-1 -- 5 points

Work is principally sedentary.

Factor 9. Work Environment -- Level 9-1 -- 5 points

Most work is performed in an office setting, although occasional plant visits are necessary primarily to consult with plant management.

TOTAL POINTS -- 2990

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INDUSTRIAL HYGIENIST GS-0690-12, BMK #4*Duties*

Serves as an industrial hygienist, responsible for developing new, or for modifying existing, health standards to protect employees from exposure to toxic substances, harmful physical agents, and other health hazards.

- Studies Federal Criteria Document, which contains recommendation for permissible exposure level, and collects references in bibliography for review.
- Studies developments in industry, standards developed by other organizations, health and safety reports and journals, scientific and technical periodicals, and other sources of background information to identify pertinent factors in the work processes which create health hazards.
- Conducts field visits to industrial facilities to analyze work processes and to evaluate evidence of health hazards.
- Develops draft standard for assigned health hazard, which includes requirements for monitoring employee exposure, medical surveillance, limits on exposure levels, methods of

compliance, handling and use of hazardous substances, employee training, recordkeeping, and sanitation.

- Meets with employees, employers, scientists, and other interested parties regarding the standard.
- Evaluates public comments and hearing records with respect to the draft standard and modifies standard, as necessary.
- Prepares requests for studies to develop additional technical material or to satisfy statutory requirements for environmental impact statements and inflationary impact statements. Reviews completed studies and impact statements for adequacy.

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- Represents the agency on technical committees and boards and at hearings, to present and discuss information relating to proposed standards.
- Evaluates petitions requesting modifications to standards and recommends appropriate action.
- Prepares replies to technical inquiries.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

Professional knowledge of industrial hygiene concepts, principles, and practice applicable to the development of a wide variety of occupational health standards.

Knowledge of toxicology, physiology, and biochemistry sufficient to understand and evaluate technical articles on the physical effects of toxic substances or harmful physical agents.

Skill in the technical writing of government regulations.

Factor 2. Supervisory Controls -- Level 2-4 -- 450 points

The employee is assigned a particular standard and has responsibility for the conduct of the study, including planning, coordinating with others, and developing the standard. The supervisor provides general guidance at the outset of the project and is kept informed of progress. Working within the framework of established policies and procedures, the employee has broad latitude in carrying out the project. Draft standards are published for review. The work is reviewed by the supervisor for successful attainment of goals.

Factor 3. Guidelines -- Level 3-4 -- 450 points

Principal guidelines include the Federal Criteria Document, standards developed by other organizations, health and safety reports and journals, scientific and technical periodicals, and agency manuals and directives. Considerable judgment is required in selecting appropriate references and in determining where the preponderance of evidence is with regard to such issues as safe exposure levels, effective protective equipment, or an appropriate medical surveillance program.

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Factor 4. Complexity -- Level 4-5 -- 325 points

The development of an occupational health standard involves a comprehensive and in-depth analysis of virtually all of the available technical material on the subject. Complicating factors include the variability in the literature, the dearth of information on some subjects, and the need to resolve differing viewpoints. Final standards must be scientifically sound and defensible.

Factor 5. Scope and Effect -- Level 5-5 -- 325 points

The purpose of the work is to develop a legally enforceable standard for a specific health hazard. The standard governs conditions, practices, or work operations to assure healthful workplaces. Compliance with standards is the responsibility of each employer covered by the Occupational Safety and Health Act of 1970. The work affects a wide range of major industries, the work of other occupational health experts and the health and well-being of substantial numbers of people.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts are with other occupational health and safety professionals within the agency, other Federal agencies, and private industry, members of the scientific community, consultants, public interest groups and labor organizations.

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

Contact are to persuade, convince, and resolve technical issues and disagreements, such as objections or proposed modifications to draft standards. This includes representing the agency on technical committees and boards, and testifying at hearings. Contacts with field activities are to gain information to be used in developing national health standards.

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Factor 8. Physical Demands -- Level 8-1 -- 5 points

Work is chiefly sedentary with some minor physical activity during plant visits.

Factor 9. Work Environment -- Level 9-1 -- 5 points

Most work is performed in an office setting, although there is occasional exposure to industrial environments during field studies.

TOTAL POINTS -- 2990

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INDUSTRIAL HYGIENIST GS-0690--12, BMK #5

Duties

Is responsible for planning and administering an industrial hygiene program for one or more small to moderate-sized military activities engaged in a range of light to moderately complex industrial processes. Workers are exposed to a variety of physical, chemical and radiological hazards, including some for which the nature and extent of hazard is not completely understood.

- Conducts periodic surveys of working conditions to determine the nature and magnitude of hazardous exposures and the effectiveness of existing control measures, such as chemical hoods, paying close attention to changes in work processes, or the use of new materials.
- Where hazardous exposures are discovered, devises, or works with engineers to develop control measures, such as changes in work procedures, ventilation systems, material substitution, or the use of personal protective devices.
- During planning and developmental phase, evaluates proposed new work processes or materials, particularly in experimental operations, to assure incorporation of adequate measures for prevention of occupational disease hazards.
- Investigates health problems which arise among workers, such as individuals having allergy problems related to their work, and determines corrective measures.
- Investigates radiological health hazards for the safe-guarding of personnel exposed to ionizing radiation, using a number of radiation monitoring techniques.
- Establishes a program for physical screening of employees exposed to particular toxic materials or physical hazards, concentrating on specific effects, such as the increased possibility of cataracts among laser workers.

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- Formulates directives, laboratory orders, and information bulletins related to the 'occupational health program at the installation.
- Plans, and directs a health education program designed to educate the activity's personnel as to means of preventing occupational disease and their role in controlling hazards.

- Provides consultation and advice to other agency activities on occupational health problems. Consultative services may include (1) providing toxicological data, (2) arranging for and interpreting laboratory analyses of chemical and biological specimens, (3) directing studies of specific industrial processes to evaluate potential health hazards, and (4) providing advice on other administrative and technical aspects of the occupational health program.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

Professional knowledge of industrial hygiene concepts, principles, and practices applicable to planning and carrying out an industrial hygiene program for a military activity concerned primarily with light to moderately complex industrial processes.

Knowledge of administrative and managerial practices applicable to planning, implementing, and evaluating an industrial hygiene program for an activity.

Knowledge required to recognize and evaluate occupational health hazards, including those for which the nature and extent of hazard is not completely understood.

Knowledge required to devise a variety of control measures, including ventilation, shielding, material substitution, change in work procedures, isolation, education, personal protective devices, and the management of waste materials.

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Knowledge required to evaluate proposed new work processes and/or materials, and to recommend measures to minimize health hazards.

Knowledge required to investigate health problems which arise among workers, to determine probable cause, and to recommend measures to protect the workers' health.

Factor 2. Supervisory Controls -- Level 2-4 -- 450 points

The supervisor sets overall objectives, but the employee, as the technical expert in industrial hygiene, is responsible for planning the day-to-day work to be done, determining priorities, and scheduling surveys. The employee is independently responsible for carrying out the industrial hygiene program, resolving most problems which arise, and coordinating with the laboratory and engineering staff, as needed. The industrial hygienist may discuss employee's symptoms with an occupational physician or consult with industrial hygienists at other locations when faced with highly complex or unusual problems. Recommendations are usually presented to the occupational physician for further action. Completed work is assessed for effectiveness in meeting program objectives.

Factor 3. Guidelines -- Level 3-4 -- 450 points

Guidelines include published Federal occupational safety and health standards and criteria documents, standards published by recognized professional organizations, agency manuals and instructions, professional journals, textbooks and past practices. Many situations arise for which these guidelines are inadequate. For example, the employee is called on to evaluate new work processes and materials used at the activity for which information on hazards is lacking and precedents for the control of hazards are only partially applicable. In some cases, the employee must engage in an extensive literature search in order to locate suitable material. In addition, the employee must exercise experienced judgment in evaluating survey findings and is required to adapt past practices and to revise new approaches to control hazardous exposures.

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Factor 4. Complexity -- Level 4-5 -- 325 points

The employee's responsibility for planning and carrying out a comprehensive industrial hygiene program for a military activity entails the recognition, evaluation, and control of a wide variety of occupational health hazards, some of which are not completely understood or defined. The breadth and intensity of occupational health hazards to which workers are exposed requires wide-ranging experience and resourcefulness to identify the hazards, to adapt precedents, and to modify techniques to control them. In some cases, the nature and extent of hazard related to certain substances are not known. In other situations, the employee must weigh the extent of hazard against the cost of corrective action in order to determine the most feasible approach.

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

The purpose of the work is to plan and conduct a comprehensive industrial hygiene program for a military activity. In addition, the employee provides consultation and advice to other agency activities on a variety of occupational health concerns. The work affects the health and well-being of agency employees, the full range of work operations at the installation, and the effectiveness of the installation's industrial health program.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts are with agency safety personnel, health physicists, engineers, occupational physicians, laboratory personnel, other industrial hygienists, and the supervisors and workers throughout the installation. Contacts outside the agency are with occupational health and safety professionals from other Federal agencies, from local governments and local health and sanitation departments, and with private contractor representatives and members of professional associations.

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

The purpose of contacts is to gather information on work operations and materials, to coordinate surveys, and to discuss findings and possible corrective measures. The employee also discusses proposed new operations and materials with agency scientists and engineers in order to develop preventive measures to minimize potential dangers to employees. Contacts with other industrial hygienists are to exchange information, discuss developments in the field, and to provide advice on specific problems. Contacts with agency managers and supervisors require persuasion to convince them of the existence of hazardous conditions and of the preferability of certain control measures. Contacts with private contractors and with representatives of local governments are to resolve health problems affecting workers at the installation and the citizens of the adjacent community.

Factor 8. Physical Demands -- Level 8-2 -- 20 points

The work requires the employee to carry sampling equipment and involves extended periods of standing and walking during surveys.

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

During surveys, the employee is exposed to all the risks and discomforts associated with the installation's function. This exposure necessitates the use of a variety of protective clothing and equipment, such as respirators, face masks, coveralls, etc.

TOTAL POINTS -- 2920

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INDUSTRIAL HYGIENIST GS-0690-12, BMK #6*Duties*

Performs a wide variety of industrial hygiene functions. Primary responsibility is for performance monitoring and evaluating State programs, inspections, citations, and reports to determine compliance with approved occupational health standards and programs. In addition, performs the full range of responsibilities identified in Benchmark GS-690-12, #01 based on occupations which cannot be delegated to the States (i.e., Maritime) or for which Federal authority has not been delegated or has been withdrawn. Performs assignments in State program performance monitoring and for Federal enforcement work, which requires investigations of workplace health hazards, citing violations of Federal health standards, and assessing proposed penalties for violations.

- Identifies areas of State program operation which significantly deviate from Federal requirements.

- Provides factual data and information to State officials on occupational health matters covered by standards.
- Reviews State developed case files.
- Conducts spot check monitoring visits in work places previously inspected by the State agency.
- Assesses the ability of state compliance personnel to perform enforcement activities of the State compliance program and abatement process.
- Prepares reports of evaluation and recommendations for the improvement of State program operations and activities.
- Investigates complaints about State plan administration.

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Conducts health and safety inspections of all types of industry encountered in the State. The industrial hygienist is responsible for highly complex and sensitive inspections, and may act as team leader on inspections of large, high-hazard workplaces. These inspections are characterized by the presence of such issues as the expectation of serious and/or willful violations, complex work processes and operations, entry problems, extensive research on new or complex substances, general duty citations, and complex abatements. In addition, performs special industrial health studies, provides advisory services to private employers and less experienced employees within the agency, and generally promotes industrial practices that are consistent with the goals and principles of industrial hygiene.

Factor 1. Knowledge Required by the Position -- Level 1-7 -- 1250 points

Knowledge of Federal and State occupational health standards, and State plans and legislation in order to monitor and evaluate State program for compliance with approved occupational health standards.

Professional knowledge of industrial hygiene concepts, principles, and practices applicable to the conduct of occupational health inspections of a wide range of private business firms, including large and complex industrial operations.

Knowledge required to recognize environmental factors and stresses associated with complex work operations, and to ascertain their effects on the health and well-being of workers.

Knowledge, based on experience and on the use of quantitative measurement techniques, for evaluating the magnitude of environmental stresses and their effects on the health, well-being, and efficiency of the workplace.

Knowledge required to suggest possible approaches to eliminate or reduce such stresses.

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Knowledge and ability necessary to serve as an industrial hygiene specialist for the agency in hearings where companies are contesting agency findings and penalties.

Factor 2. Supervisory Control -- Level 2-4 -- 450 points

Supervisor schedules inspections or State monitoring assignments, but the employee is responsible for virtually all other details of the work-preparing for and carrying out inspections, writing the report, indicating proposed citations, and generally determining approaches to be taken in handling most situations encountered. The supervisor is available to discuss highly unusual or controversial matters and, together with the employee, develops approaches for their resolution. Reports are reviewed for effectiveness and comparability with similar inspections. The citations may be reviewed more thoroughly in cases where the proposed monetary penalty or abatement period deviates significantly from standard policies of the office.

Factor 3. Guidelines -- Level 3-4 -- 450 points

The principle guidelines consist of published Federal occupational safety and health standards or State standards approved as consistent with Federal standards. Other guidelines include the agency field operations manual, office files, national or regional policy directives, intra-office memoranda, and the office library which contains information on the various industries, work operations, and chemicals involved. In addition, the incumbent must apply approved State plans, State legislation, State procedures, and policy developed under federally approved state plans in carrying out day-to-day monitoring responsibilities. The employee is confronted with situations for which these guidelines are inapplicable, such as when there are no appropriate standards, or when it is uncertain whether feasible engineering controls to reduce or eliminate a hazard are available. The employee must use initiative and judgment in adapting methods, or, in some cases, developing new ones, and in researching potential approaches. Incumbent also applies a knowledge of State law and standards and the contents of approved State plans in addition to a thorough background in health and related sciences in accomplishing assigned duties.

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Factor 4. Complexity -- Level 4-5 -- 325 points

Assignments consist of evaluating and monitoring State inspection processes and conducting industrial hygiene inspections involving a variety of types of industries, work operations and processes, materials and equipment, products and by-products. As an industrial hygienist, incumbent is assigned inspections which include heavy industry such as steel mills, foundries, automotive plants, and others which are among the most complex and sensitive. Physical and chemical hazards are numerous and inspections may require several days to complete, using a team of occupational safety and health personnel. (This employee exercises overall responsibility for the inspection.) The complex nature of the work processes and/or the use of exotic chemicals may require the employee to conduct extensive research in order to identify and evaluate the nature and extent of hazards. Often, hazards are not adequately covered by standards, so that controversial citations must be made under the general duty clause in the law. Frequently, the workplace is such that several serious and willful violations can be anticipated, complex abatements are expected, antagonism to the agency mission is known to exist, and contests requiring expertise in hearings are predictable. In addition, labor relations problems often exist.

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

The pulse of the work is to review and evaluate State occupational health programs and the programs of private industries which are not covered by State programs. Evaluations include heavy industries, the use of exotic chemicals, or other unusual conditions. The work performed affects the effectiveness of the State occupational health program and on the private industries located within the State, and, through them, the health and well-being of a large number of workers.

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Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts include management and employee representatives at the business being inspected, consultants employed by the company and by the agency, other industrial hygienists, safety specialists and laboratory personnel of the agency and of other agencies, and agency attorneys. In addition, the employee has significant contacts with state government officials. Also, serves as agency industrial hygiene specialist in hearings related to contests of agency citations.

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

The primary purpose of contacts is to evaluate working conditions for hazards to health and safety and to gain compliance with published standards. Also, contacts are for exchanging information, for providing advice, and for coordinating work efforts. Contacts with state agency personnel are designed to evaluate and monitor the effectiveness of the enforcement program administered by the state, and to motivate them to make improvements in their program operations and activities. (Potential safety hazards noted during inspections may be referred to

safety specialists within the office.) Employers and employees contacted are at times uncooperative, skeptical, or guarded. Thus, contacts require skill in gaining the confidence, respect, and trust of both parties. In addition, the employee testifies in hearings on contested issues.

Factor 8. Physical Demands -- Level 8-2 -- 20 points

The inspections require physical exertion, including walking, standing, and carrying many items of equipment used in sampling.

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

The employee is regularly exposed to all types of hazards and unpleasantness associated with industrial work environments. Frequently, the employee must wear protective equipment, including respirators, hearing protection, and various types of protective clothing.

TOTAL POINTS -- 2920

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INDUSTRIAL HYGIENIST GS-12, BMK #7

Duties

Plans, coordinates, and conducts assigned detailed surveys and investigations related to recognition, evaluation and formulation of controls for occupational, health hazards. Conducts or serves as team leader, directing surveys of worksites throughout a medical region or a large, complex facility to identify and evaluate the potential for excessive exposure to toxic materials and harmful physical agents found in the workplace. For some of the materials evaluated, there is little information available on the nature and extent of hazard.

- The employee is assigned to conduct surveys of a plant or shop, offices, laboratory facilities, work areas aboard ships or aircraft under-going repair. The assignment is made either upon initiation within the immediate office, or upon receipt and appropriate review of written requests from the commanding officer or management representatives of supported activities, or other agency commands.
- Contacts facility and plant management to conduct presurvey briefing and coordinate operational activities with scheduled field visits.

- Observes workplaces, frequently accompanied by management, supervisory, and safety representatives, to determine the types of agents and controls involved, and nature of the problem, and the number and type of environmental samples or measurements to be collected, or instrumental measurements to be made.
- Discusses occupational medical conditions with staff physicians and interviews employees referred by them for consultation to identify adverse symptomatology and/or potential etiology.

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- Conducts and/or directs sampling. This generally involves attaching personal sampling devices to employees and observing them during sampling; collecting area samples and making appropriate instrumental measurements in fulfilling survey strategy.
- After the laboratory completes analysis of samples and reports results, employee writes preliminary and final reports which includes findings, evaluations, and specific recommendations for control of hazardous conditions.
- Participates in educational program designed to inform management, supervisors, and employees of potential hazardous exposures, applicable directives, latest control techniques, and general occupational health matters. Assists facility management in the development and review of training plans, including planning courses to meet specific and general needs.
- Furnishes technical consultation and advice on occupational health problems to management, supervisors, and employee groups at a large facility or at several smaller activities throughout the region, which includes suggesting solutions to specific problems, including follow-on guidance and assistance toward implementation.
- Prepares guides for using specific materials and reviews management drafts of processes, procedures and instructions with respect to adequacy of treatment of health hazards.
- Makes hazard evaluation of new products introduced at supported activities for determining health hazard assignment and recommends rejection, substitution, or unique controls, as appropriate, of items proposed for procurement including those which contain prohibited or highly toxic materials posing severe health hazards.

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- Advises management personnel, line supervisors and employees on industrial hygiene matters. Serves as a witness to give expert testimony in court or before administrative boards on matters concerning industrial hygiene, as required. Also serves as permanent consulting member on management boards/committees to advise on industrial hygiene.

- At the request of the Office of Workers Compensation Programs, reviews claimants work histories to find information related to claims, and investigates occupational medical conditions referred by physician.
- Perform certain laboratory analysis of chemical agents and measurements of physical phenomena, as assigned.
- Evaluates adequacy of controls for health hazards in initial and final plans and specifications for facility construction, alteration and repair, as well as modification or relocation of processes. Makes appropriate recommendations for correcting deficiencies. Provides advice regarding health hazard controls to facilities engineers, and to contractor engineers during design phases, or in resolving areas of disagreement.
- Consults extensively with various scientific and other Federal agency experts in coordinating techniques and gathering information concerning evolving technology, particularly with respect to occupational carcinogens, mutagens, or teratogens.

Factor 1. Knowledge Required By the Position -- Level 1-7 -- 1250 points

- Professional knowledge of industrial hygiene concepts, principles, and practices which enable the employee to carry out health hazard evaluations of a wide variety of industrial worksites which are characterized by complex work processes, chemical compounds including those for which reliable standards do not exist, and complications in hazard evaluation resulting from synergistic effects.

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- Knowledge of industrial hygiene control criteria measures.
- Skill in the use of the full range of industrial hygiene sampling techniques and instrumentation; skill in technical report writing.

Factor 2. Supervisory Controls -- Level 2-4 -- 450 points

Health hazard surveys and evaluations are assigned after review by the supervisor. The supervisor primarily provides administrative direction, delegating most technical responsibility to the employee. As a recognized specialist, the employee independently plans and carries out the evaluation, determining the approach to be taken, techniques to be used, and coordinating the work with other professionals, as necessary. The employee keeps the supervisor informed of controversial or far-reaching matters. Reports receive several layers of review for feasibility, effectiveness, and consistency with other evaluations.

Factor 3. Guidelines -- Level 3-4 -- 450 points

Guidelines include Federal standards and criteria documents, agency manuals, established practice, past evaluation reports, and a variety of technical literature, including professional journals, textbooks, and literature on industries and industrial processes. In addition, for some substances, recognized standards are not readily available and the employee must conduct a literature search for any existing standard which is adequately documented. Many problems arise for which established practice is not applicable, such as combinations of hazardous materials or the use of new materials for which toxicity information is lacking. The employee must apply experienced judgment and must keep abreast of new developments in the field in order to deal with unusual situations.

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Factor 4. Complexity -- Level 4-5 -- 325 points

Assignments include conducting evaluations of a variety of industrial environments, including heavy industry or highly complex research and development work, and involve the identification and evaluation of hazards about which little may be known. Surveys measuring airborne contaminants often involve combinations of exposures for which acceptable concentrations must be determined. Other complicating factors include new or unusual processes and difficult control problems. The employee must exercise resourcefulness in planning and developing individualized methods and approaches to obtain a valid and complete evaluation.

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

The purpose of the work is to conduct health hazard evaluations in a large military facility or in a variety of facilities within the medical region. The employee furnishes technical advice and assistance to managers, supervisors, employees, and other specialists on the occupational health program and on specific problems encountered. The work has a direct effect the occupational health program for the facility or region, on the industrial work operations of the activities involved, and on the health of workers through the identification and elimination of health hazards in the workplace.

Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts during evaluations are with military and civilian personnel including supervisors of the agency facilities, and may involve department heads, medical staff, engineers, safety personnel, and industrial workers. Other contacts are with occupational safety and health professionals at the facility and in the agency, and in professional associations. Also, the industrial hygienist serves on boards and committees concerned with occupational health, and provides testimony in hearings, as required.

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

Contacts are to investigate and evaluate working conditions in order to identify and control occupational health hazards and to promote effective occupational health practices. The cooperation of all parties is necessary to carry out evaluations effectively. Contacts with facility engineers are to discuss possible engineering controls, such as ventilation systems or changes in work processes. Other contacts are for the purposes of exchanging information, discussing possible solutions to specific problems, exploring trends in the field with other professionals, serving as witness in hearings or in court, serving as consulting member on management committees, and serving as adviser to management and employee groups.

Factor 8. Physical Demands -- Level 8-2 -- 20 points

Investigations and surveys involve moderate physical exertion, including carrying equipment, climbing, standing, walking, and bending as well as the use of personal protective devices, and occasional work in confined or otherwise uncomfortable environments.

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

The employee is exposed to a variety of unpleasant and potentially hazardous conditions during inspections, including noise and toxic chemicals. Protective equipment is required in some situations.

TOTAL POINTS -- 2920

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INDUSTRIAL HYGIENIST GS-0690-13, BMK #1

Duties

Serves as a regional technical authority in industrial hygiene, providing expertise and advice to agency area office directors and industrial hygienists within the region, as well as to managers of major industries, other employers, State officials, employee organizations, and other Federal agencies. Advice concerns occupational health hazards associated with a wide variety of industrial work situations, including large-scale, complex, and hazardous industrial operations. Serves as team leader in the investigation of occupational deaths and industrial disasters of unknown cause.

-- Provides expert advice and direction on industrial hygiene matters, including:

- a. Workplace health surveys, including selection of sampling equipment and of analytical tests to be performed on samples taken;

- b. Use of toxic and hazardous substances;
 - c. Control measures for dealing with hazardous exposures;
 - d. Application of Federal occupational health standards to employee hazards;
 - e. Evaluation of exposures not covered by health standards;
 - f. Evaluation of unusual hazards resulting from complex work processes or from combinations of hazardous materials.
- Provides technical assistance to area office industrial hygienists in such matters as:
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- a. Area office needs regarding equipment, equipment calibration, supplies, and similar requirements;
 - b. Sampling techniques;
 - c. Interpretations of health standards;
 - d. Insuring legal sufficiency of data for citations;
 - e. Penalties;
 - f. Technical information, such as articles describing manufacturers' products, professional journals and newspaper items.
 - g. Abatement dates and/or extension of abatement dates.
- Represents the agency as a member of professional committees and boards, gives speeches or lectures, and appears on panels dealing with occupational health matters and the application of Federal health standards.
- Audits records of work related deaths, injuries, and illnesses.
- Reviews proposed new standards and revisions of standards to assist national office in standards development.
- Advises regional solicitors on validity of cases or on standards pertinent to a contested case, and may serve as an expert witness.
- Participates in special field surveys, such as:

- a. By request from the national office, to obtain exposure data on a specific compound in specific industries for the purpose of ascertaining what industrial exposures exist and for determining possible safe limits for the compound;

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- b. By request from the area director, to lead highly complex inspections.

-- Provides training to agency industrial hygienists, to employees, and to employer groups.

-- Serves as monitor for evaluating participating State health laboratories on matters such as qualified personnel, analytical procedures, instrumentation, and time frames for completing analyses.

Factor 1. Knowledge Required By the Positions -- Level 1-8 -- 1330 points

Professional knowledge of industrial hygiene concepts, principles, and practices that enables the employee to serve as a technical authority by providing expert advice and direction in a broad range of industrial hygiene matters, including the conduct of the most complex inspections.

Knowledge required in applying current advances and experienced judgment in solving novel or obscure problems which are not readily treatable by conventional methods.

Knowledge required to provide expert interpretations of published occupational health standards.

Knowledge required to evaluate State health laboratories to assure that staff, equipment, and procedures are adequate to insure the State's effectiveness in carrying out legal requirements.

Knowledge and skill required to serve as an expert witness in contested cases.

Factor 2. Supervisory Controls -- Level 2-3 -- 630 points

Working under general administrative direction, the employee has independent responsibility for actions and decisions within the broad area of assignment. Results of work and advice rendered are considered technically authoritative and are normally reviewed only for administrative considerations.

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Factor 3. Guidelines -- Level 3-4 -- 450 points

Guidelines include Federal occupational health and safety standards and criteria documents, technical publications of professional associations and commercial organizations, agency manuals, directives and instructions, textbooks, and established practices. These guidelines are often

inadequate, requiring the employee to adapt or modify established practices or to research new developments in the field. The employee must keep abreast of new developments in occupational health and safety in order to disseminate pertinent information to agency industrial hygienists within the region.

Factor 4. Complexity -- Level 4-5 -- 325 points

The employee is responsible for providing expert advice and direction on a broad range of industrial hygiene activities and must treat problems for which available methodology is inadequate. For example, the employee may be called on to advise on the evaluation of unique health hazards resulting from mixtures of liquids, vapors, dusts, and physical agents. In addition, the employee is required to give advice and assistance with regard to experimental operations where protection of workers from hazards must be considered in the developmental needs for new products or processes. The employee is also responsible for gathering and disseminating new information for use by industrial hygienists in the region.

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

The primary purpose of the work is to provide expert advice and technical services in industrial hygiene matters to agency occupational health and safety personnel, to private employers, and to employee groups in the region. Thus, the work affects the region's industrial hygiene inspection program on a continuing basis as well as the occupational health programs of private employers.

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Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Personal contacts are with a wide variety of occupational health and safety professionals, as well as with managers and employees of private businesses in the region. Intra-agency contacts include area office directors and industrial hygienists, solicitors, and occupational health specialists in other regions and in the national office. Other contacts are with State officials, management, labor representatives, and employees at the plants, employer and employees calling for advice, occupational health and related scientific specialists in other Federal agencies.

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

Contacts are to render expert advice and direction on complex industrial hygiene issues arising within the region, to provide guidance to subordinate agency offices, to gain compliance with published health standards, to give lectures on occupational health and the application of Federal health standards to discuss technical issues, to resolve technical disagreements, and to conduct investigations involving serious health hazards. In addition, the employee serves as an expert witness in contested cases.

Factor 8. Physical Demands -- Level 8-2 -- 20 points

Inspections require extended periods of walking and standing, as well as carrying a considerable amount of equipment.

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

Plant inspections involve exposure to many hazards and discomforts, such as toxic chemicals, high noise levels, and excessive heat. The employee is required to use a variety of protective equipment and clothing.

TOTAL POINTS -- 3420

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INDUSTRIAL HYGIENIST GS-0690-13, BMK #2

Duties

Serves as a technical expert in industrial hygiene for the agency, with responsibility for conducting comprehensive industrial hygiene surveys and special studies, as well as for providing expert advice to agency installations nationwide.

- In addition to routine industrial hygiene surveys, conducts the more unusual or difficult studies, including those where new or exotic materials are involved in the industrial process.
- Selects and adapts appropriate sampling procedures, taking some samples on the initial inspection and determining what subsequent sampling needs to be done.
- On the basis of sampling results, observation of the operation, and knowledge of toxic or hazardous materials, prepares a technical report citing health hazards and setting forth recommended actions for their control or elimination.

- Plans, conducts, or directs special studies concerned with occupational health problems which require the development or modification of air sampling equipment or protective devices, or the evaluation of control measures for a specific operation. Often serves as teamleader during special studies.
- Assists lower grade industrial hygienists in developing study plans for installations to be visited based on knowledge of prior surveys, industrial operations, and their associated health hazards.
- Drafts technical bulletins, instructions, regulations, and sections of field manuals for guidance of agency personnel, requiring research into various technical publications and coordination with related occupational health professionals, such as medical officers or bio-acoustics specialists.

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- Participates in developing courses of instruction for agency personnel, preparing course agenda, making arrangements for demonstrations and field trips, and giving technical instruction on industrial hygiene subjects.
- Evaluates new instruments and air sampling procedures.
- Answers inquiries and provides advice to agency or contractor occupational health and safety personnel.

Factor 1. Knowledge Required By the Position Level 1-8 -- 1550 points

Professional knowledge of industrial hygiene concepts, principles, and practices that enables the employee to conduct the most difficult types of industrial hygiene studies, to develop new sampling or control methods, and to provide expert advice to agency and contractor personnel in a broad range of industrial hygiene matters.

Knowledge required in evaluating and applying new methods and equipment to the practice of industrial hygiene, particularly in dealing with problems not readily treatable by standard methods.

Knowledge required to research technical publications and coordinate with related occupational health specialists in order to develop technical bulletins, instructions, regulations, training materials, and sections of field manuals for guidance of agency personnel.

Factor 2. Supervisory Controls -- Level 2-4 -- 450 points

Supervisor schedules surveys and provides general information on type of problem to be investigated in special studies. Once given the assignment, the employee, as survey officer, is

responsible for planning and carrying out the study and for developing a final report for coordinating work efforts with other agency occupational health professionals. Controversial problems are discussed with the supervisor and highly specialized problems are referred to the appropriate specialist. Work is reviewed for feasibility and for accomplishment of objectives.

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Factor 3. Guidelines -- Level 3-4 -- 450 points

Primary guidelines are published Federal occupational health and safety standards, agency manuals and directives, technical journals and other publications of various professional associations, textbooks, reports on past studies, and established practice. These guidelines are frequently inadequate for dealing with the most complex problems, such as hazards for which standards do not exist or for which established practices are not applicable. The employee may be required to develop new sampling techniques or research trends in controlling a particular hazard.

Factor 4. Complexity -- Level 4-5 -- 325 points

Surveys involve virtually all industrial-type operations found on agency military bases, nationwide. The employee must identify, evaluate and recommend control measures for any type of health hazard to which workers are exposed. At times, this involves dealing with new materials or processes which require the employee to develop or modify techniques of evaluation and control. In addition, the employee is called on to research technical publications and develop new information for use by other agency industrial hygienists and safety personnel.

Factor 5. Scope and Effect -- Level 5-5 -- 325 points

The purpose of the work is the investigation and analysis of a variety of agency industrial operations to determine the presence and magnitude of occupational health hazards and to recommend means for their control. The incumbent, as an expert for the agency, is called on to provide instruction and expert advice to agency personnel. The work affects a wide range of agency industrial activities and the agency's overall occupational health and safety program.

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Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Contacts on surveys include the base commanding officer or his representative, safety personnel, industrial hygienists, employees and their supervisors. Other contacts include contractor personnel, industrial hygienists and safety personnel within the agency and within other Federal agencies, as well as agency engineers, chemists, bio-acoustics personnel and physicians.

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

Contacts are to provide expertise on a wide range of industrial hygiene problems and to gain compliance with and support for effective industrial hygiene practices. Contacts with contractors and agency management require skill and tact to overcome technical disagreements or to convince them of the necessity of certain control measures, particularly since control measures frequently result in higher costs, such as new equipment or processes, and in delays to production schedules or mission accomplishment.

Factor 8. Physical Demands -- Level 8-2 -- 20 points

The work requires the employee to carry a good deal of equipment and involves walking, standing, bending, climbing, or crawling during surveys.

Factor 9. Work Environment -- Level 9-2 -- 26 points

During surveys, the employee is subjected to all the risks and discomforts associated with industrial activities of the agency. This exposure requires the use of protective clothing and equipment, including respirators, hardhats, and ear protectors.

TOTAL POINTS -- 3320

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INDUSTRIAL HYGIENIST GS-0690-14, BMK #1

Duties

Serves as a recognized expert in industrial hygiene for the agency with responsibility for developing policy and objectives, appraising programs, and initiating requirements for the elimination or control of industrial environmental health hazards at their source. The industrial hygiene assignments are of such breadth as to cover complex problems in industrial and maintenance operations, and/or research, development, test, and evaluations.

- Provides program direction by preparing instructions and issuing directives to formulate policy, establish objectives, provide procedural guidance, and assign responsibilities to subordinate commands for participation in the occupational health and safety program.
- Provides guidance on health standards and criteria, and ensures that appropriate consideration is given to occupational health matters in the plans and programs for the development of facilities, equipment, and procedures.
- Provides guidance or recommends action to eliminate or control health hazards by convincing management to initiate new operational procedures or new engineering procedures as in

research, development, and test and evaluation efforts (e.g., those found in weapons and weapons systems).

- Represents the agency in inter-agency meetings involving policy matters related to industrial hygiene, and coordinates programs with other Federal agencies.
- Directs the preparation of and maintains status reports of progress toward meeting industrial hygiene program objectives. Based on evaluations made from progress reported, determines where objectives are not being met and initiates instructions to correct deficiencies.

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- Provides consultative services to agency industrial hygienists employed at field installations or regional offices in dealing with complex occupational health problems.
- Advises top agency management on occupational health and safety matters.

Factor 1. Knowledge Required By the Position -- Level 1-8 -- 1550 points

Knowledge of industrial hygiene principles and practices that enables employee to serve as a recognized expert for the agency, to develop policy and program objectives, and to provide consultative services to management and technical personnel.

Knowledge required to generate new occupational health and safety programs for the agency.

Knowledge required to apply new developments to problems for which existing guidelines or techniques are inadequate.

Knowledge and skill required to represent the agency in policy matters in inter-agency meetings or task groups.

Factor 2. Supervisory Controls -- Level 2-5 -- 650 points

Works under administrative direction only, having independent responsibility for actions, decisions, and technical advice provided in industrial hygiene matters. Completed work is considered technically authoritative and is normally accepted without significant change. Review is generally limited to evaluating the effects on the overall occupational health and safety program.

Factor 3. Guidelines -- Level 3-5 -- 650 points

In addition to standard industrial hygiene references, guidelines are broadly stated agency regulations and policy statements. Because most of the work involves policy matters or dealing with technical areas which are little understood, the guidelines often have very limited applicability to the work performed. The employee must exercise considerable judgment and ingenuity in interpreting or adapting guidelines that do exist and in developing new approaches

when required. Additionally, as a recognized authority for the agency, the employee develops a number of instructions and directives for agency-wide application, such as instructions on the control of a specific toxic substance or detailed plans for the agency's inspection program.

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Factor 4. Complexity -- Level 4-5 -- 325 points

Work includes a broad range of activities related to the agency's overall industrial hygiene programs. Assignments involve the planning and development of broad programs, determining the effectiveness of the programs, developing guidelines for use by agency occupational health specialists, serving as a n expert consultant on complex problems, developing agency objectives and assessing progress toward meeting them, and generally providing program and technical guidance to agency managers and occupational health and safety professionals.

Factor 5. Scope and Effect -- Level 5-5 -- 325 points

The primary purpose of the work is to develop, plan and evaluate the effectiveness of the agency's occupational health and safety activities.

The employee's recommendations and decisions ordinarily have considerable influence on the development of the overall agency industrial hygiene program and on the establishment of objectives and guidelines for agency field installations. Also, as a consultant and advisor to top level agency mangers, the employee's efforts influence the amount of consideration given to occupational health and safety matters in planning a wide variety of agency programs and projects.

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Factor 6. Personal Contacts -- Level 6-3 -- 60 points

Contacts include top agency program managers and occupational health and safety personnel throughout the agency, as well as in other Federal and state agencies, and in private industry. The employee represents the agency, as an authority, in inter-agency meetings concerned with occupational health programs and problems.

Factor 7. Purpose of Contact -- Level 7-3 -- 120 points

Contacts are to discuss technical issues, to render expert advice, to evaluate the agency's program, and to resolve problems among agencies and with industry involving related or interrelated programs. In addition, the employee must convince top agency management of the importance of effective industrial hygiene practices in its various programs. For example, the employee will emphasize the importance of a preventive approach in occupational health through the inclusion of industrial hygiene considerations in the design phase of various research and development projects.

Factor 8. Physical Demands -- Level 8-1 -- 5 points

Work is generally sedentary.

Factor 9. Work Environment -- Level 9-1 -- 5 points

Work is performed in an office setting, with some travel to attend meetings or to review field operations.

TOTAL POINTS -- 3690

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INDUSTRIAL HYGIENE AND SAFETY MANAGER GS-0690-15, BMK #1*Duties*

Manages the complete industrial hygiene program for an agency, involving complex and hazardous chemical, physical, and biological processes in research and development, production, test and evaluation, and operations. Incumbent is responsible for developing policy and objectives, evaluating programs, and providing advice to field activities, private contracting companies, other agencies which have participating or related programs, and top agency management. Advice concerns health conservation requirements vis-a-vis long-range mission and construction plans. In addition to the management of the industrial hygiene program, the incumbent provides consultation, direction, or management control over health physics, environmental pollution, and food sanitation.

- Conceives, formulates, establishes, and coordinates basic requirements for industrial health activities for the agency headquarters and field installations. This consists of complex technical and administrative activities for the control of a highly diversified range of health hazards, including toxic atmospheric contaminants, noise, heat and cold stresses, oxygen deficient atmospheres, ionizing and non-ionizing radiations, pesticides, sources of environmental pollution, potable water, food sanitation, and hazardous wastes.

- Establishes agency-wide objectives, policies, standards, guides, and practices and integrates these with occupational medicine, safety, and other agency disciplines. Coordinates medical surveillance and bioassay requirements for occupationally exposed personnel with the Chief of Occupational Medicine.
- Evaluates the effectiveness of field installation, industrial environmental health programs and provides guidance on health standards and criteria. Ensures that appropriate consideration is given to environmental health matters in plans and programs for the development of facilities, equipment, and procedures. The necessity for preventive activities is stressed. Provides guidance on matters which cannot be resolved on-site; coordinates efforts among the various installations.

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- Advises top management on environmental health matters and provides guidance throughout the agency relative to complex program-related problems and interfaces with pertinent institutional and program offices. Reviews for headquarters, long-range mission plans, along with five-year construction plans, relative to conformity with health and environmental conservation requirements.
- Works closely with research agencies relative to materials suspected to be carcinogenic, teratogenic, and mutagenic and those undergoing bioassays. Maintains a registry of suspect carcinogens and keeps the agency and its contractors informed of early warnings. Provides policy, guidelines, and procedures relative to the use of carcinogenic materials which are uniquely required for agency projects. Due to the dependence of long-range missions on use of special materials, it is very important that the incumbent keep abreast of developments which may significantly affect the mission, including the future availability of such materials.
- Represents the agency in meetings, conferences, and committees involving policy and other matters pertinent to industrial health and coordinates programs with other Federal agencies. Deals with several other agencies concerning the interpretation of regulatory requirements, impacts, and other issues.
- Reviews proposed environmental health legislation for potential impact on the agency, submits comments, and participates on committees established to provide input for such legislation. Provides review and appropriate modification of proposed environmental impact statements, work statements, project plans, policies, systems, handbooks, and procedures.

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- Plans and coordinates the development of industrial health training programs for agency-wide application and promotes installation educational efforts, including professional development.

- Reviews program plans in closely related environmental health areas, such as pesticide program plans, and coordinates such efforts with other Federal agencies as necessary. Specifies procurement inclusions pertinent to health conservation efforts.
- Develops information systems necessary for program management purposes, and reports pertinent information to top management and to other agencies as necessary

Factor 1. Knowledge Required by the Position -- Level 1-9 -- 1850 points

- Mastery of advanced principles and practices of industrial hygiene that enable the incumbent to plan and evaluate extensive long-range programs and projects, and to develop innovative approaches, for an agency which has a mission critical to the Nation's scientific technology.
- Knowledge of related environmental health fields, such as radiological health and environmental protection (air and water pollution, pesticide control, drinking water, and food sanitation).
- Knowledge and skill to serve as a nationally recognized consultant and expert on the state-of-the-art to advise officials within and outside the agency concerning occupational health conservation and standards.

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- Knowledge of occupational diseases (their causes, symptoms, and test procedures), preventive approaches applicable to health conservation, and the ability to work with occupational physicians and other health professionals in developing policies and procedures for the recognition and control of job related illnesses.
- Knowledge of managerial and administrative techniques, and the ability to plan, implement, and manage a broad, agency-wide program.
- Knowledge and skill to apply new developments and experienced judgment to a variety of highly complex problems, including technical processes and controls, economic considerations, and health conservation.

Factor 2. Supervisory Controls -- Level 2-5 -- 650 points

The supervisor provides general direction in terms of mission objectives. The employee plans and initiates projects independently. As the agency expert, recommendations and conclusions are considered to be technically authoritative. Incumbent coordinates activities with other program specialists such as those in safety, facility management, medicine, and policy analysis. Recommendations are subject to evaluation for such considerations as availability of funds and other resources, impact on broad program goals, and adherence to agency administrative policy in fields other than industrial hygiene.

Factor 3. Guidelines -- Level 3-5 -- 650 points

Guidelines include basic legislation and legislative proposals, regulatory issuances of other Federal agencies, agency mission goals and policies, and standards and criteria applicable to industrial health. Toxicological information, exposure criteria, or health standards exist for only a small percentage of the chemicals currently in use, while several hundreds of thousands of chemicals in use have never been tested. Synergistic potentials must also be considered. Most of the employee's work involves policy matters and obscure technical areas for which no guidelines exist. Professional judgment and a knowledge of good health practices and Federal guidelines are used in developing standards and practices suited to Unique agency requirements.

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Deviations from and interpretation of guidelines are based on professional judgment and recognized risk procedures. Innovative approaches and new methods for evaluating and controlling potential hazards are major concerns of this position. Additionally, the employee develops guidelines, policies and directives for agency-wide application, and collaborates with enforcement and regulatory agencies, universities, and private industries in the recommendation or development of national standards.

Factor 4. Complexity -- Level 4-6 -- 450 points

Work includes planning, implementing, and managing the industrial hygiene program covering the agency's worldwide activities, as well as interfacing with various intra-and inter-agency organizations. Consideration must be given to potential health hazards associated with unique and diversified agency activities which use new or unusual chemicals, physical agents, processes, and operations. Since most of the chemicals in use have never been tested for toxicity, carcinogenicity, mutagenicity, and teratogenicity, much judgment must be used in evaluating their impact on persons exposed to them and on the environment. Many projects have no prior background of health practices and require the creation of new and innovative problem-solving methods.

Factor 5. Scope and Effect -- Level 5-6 -- 450 points

The overall purpose of this position is to conceive, implement, and manage a vital agency-wide program aimed at preventing occupational illnesses and conserving the environment. Since corrective steps can be very costly in terms of money and health, the program is geared to prevention. This necessitates considerable involvement in planning stages of missions, projects, and building designs. Environmental health activities have a major impact on the full scope of agency activities, including planning, procurement, design, construction, research, production, and operations. Imposed constraints may have far reaching effect. Exceptional scientific judgment must be exercised to assure that adequate protection is afforded without unnecessary effect on mission funding and scheduling.

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As agency expert, furnishes highly advanced technical guidance and information over a broad range of topics to top level administrative and technical agency and contractor personnel, other government agencies, and outside organizations. Results of the employee's technical guidance affect the agency's worldwide activities on a long-term and continuing basis, and often influence programs of other agencies and outside organizations. Additionally, environmental health policies and practices affect the health, performance and safety of personnel involved with various agency projects, some of which involve exceedingly high risks to employees' lives.

Factor 6. Personal Contacts -- Level 6-9 -- 60 points

The position requires frequent contacts with health specialists in universities, private industry, and scientific and professional societies. A close working relationship is maintained with program managers and staff officials at headquarters and field installations, and with occupational physicians, toxicologists, engineers, attorneys, researchers, and labor representatives. Personal contacts are maintained with high ranking officials of other agencies, State, and local government. The incumbent represents the agency on inter-agency task forces and national councils and committees.

Factor 7. Purpose of Contacts -- Level 7-4 -- 220 points

The purpose of contacts is to provide expert advice in industrial hygiene and related environmental health matters, and to justify or resolve complex and controversial issues among various project directors, technical specialist, and other authorities concerning agency research or operational objectives, resources required, and the significance of human risks. The incumbent represents the agency with other Federal agencies for the purpose of establishing arrangements for joint efforts, defending the agency's position, and providing technical assistance. The employee serves on several task forces and interagency committees concerned with developing national standards and guidance, exchanging highly technical information, cooperative emergency responses, and other similar goals. At special hearing or seminars, the employee presents the agency viewpoints on pending guidance, joint ventures, and impacts of regulations. Contacts with industry, universities, professional groups, and other agencies are maintained for the purpose of exchanging information concerning the state-of-the-art and for recommending and contributing to health criteria studies.

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Factor 8. Physical Demands -- Level 8-1 -- 5 points

The work is generally sedentary and performed in an office environment, although travel to field installations involves a considerable amount of walking, climbing, and other forms of physical exertion associated with program evaluation activities.

Factor 9. Work Environment -- Level 9-1 -- 5 points

Work is usually performed in an office setting; however, during visits to field installations, exposures to various types of potential health hazards may occur. There is some use of respirators, ear muffs, safety glasses, and other forms of personal protective gear, although such use does not occur on a very frequent basis.

TOTAL POINTS -- 4340