



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

EPA-SAB-RSAC-89-026

June 16, 1989

OFFICE OF  
THE ADMINISTRATOR

The Honorable William K. Reilly  
Administrator  
U.S. Environmental Protection Agency  
401 M. Street, S.W.  
Washington, D.C. 20460

Dear Mr. Reilly:

The Advancement Criteria Subcommittee of the Science Advisory Board's Executive Committee has completed its review of the Office of Research and Development's (ORD's) criteria for promoting research scientists and engineers as stipulated in "Career Ladders for ORD Field Scientific and Engineering Positions." The Executive Committee of the Science Advisory Board, in turn, has reviewed the Subcommittee's report and changes recommended by the Board have been incorporated herein. The review was requested by the Assistant Administrator for ORD, and was conducted on January 31, 1989 in Washington, D.C.

The major conclusion is that both the criteria and the process are too internally directed. Therefore, participation by scientists and engineers external to the Agency and with stature in their fields in the review and evaluation of the accomplishments of candidates for promotion is recommended. Such participation of external parties is essential to the success of the advancement system in promoting scientific excellence within the Environmental Protection Agency.

Recommendations are provided to ensure credibility and equity in the evaluation system. Other suggestions are offered to provide for individual growth opportunities and to promote involvement of high quality researchers.

The Subcommittee appreciates the opportunity to conduct this review. We request that the Agency formally respond to the advice transmitted in the attached report.

Sincerely,

Handwritten signature of Raymond C. Loehr in cursive.

Dr. Raymond Loehr, Chairman  
Executive Committee

Handwritten signature of Paul F. Deisler, Jr. in cursive.

Dr. Paul F. Deisler, Jr.  
Chairman, Advancement Criteria  
Subcommittee

United States  
Environmental Protection  
Agency

Office of the Administrator  
Science Advisory Board  
Washington, DC 20460

EPA-SAB-RSAC-89-026  
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# **Report of the Science Advisory Board**

## **Evaluating ORD's Criteria for Career Advancement**

## ABSTRACT

This report presents the conclusions and recommendations of the U.S. Environmental Protection Agency's Science Advisory Board summarizing a review of EPA's "Career Ladders for ORD Field Scientific and Engineering Positions". The Board's major conclusion is that both the criteria and the process are too internally directed. Therefore, participation by scientists and engineers external to the Agency and with stature in their fields in the review and evaluation of the accomplishments of candidates for promotion is recommended. Such participation of external parties is essential to the success of the advancement systems in promoting scientific excellence within the Environmental Protection Agency.

Key Words: Career Advancement; scientific management; laboratory management

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE

This report has been written as a part of the activities of the Science Advisory Board, a public advisory group providing extramural scientific information and advice to the Administrator and other officials of the Environmental Protection Agency. The Board is structured to provide a balanced expert assessment of scientific matters related to problems facing the Agency. This report has not been reviewed for approval by the Agency; and hence, the contents of this report do not necessarily represent the views and policies of the Environmental Protection Agency or other agencies in Federal government. Mention of trade names or commercial produces does not constitute a recommendation for use.

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Career Ladders for ORD Field Scientific and  
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## 1.0 EXECUTIVE SUMMARY

EPA's Office of Research and Development (ORD) requested that the Science Advisory Board review the criteria developed to provide their staff with career advancement opportunity beyond the GM-15 level. The Advancement Criteria Subcommittee, an Ad Hoc Committee, was established and charged with preparing a report for the Science Advisory Board's approval.

The Subcommittee discussed the special circumstances of EPA's research scientists and engineers, and described the need for credibility and equity in any evaluative system. The criteria and process as presented in the ORD document "Career Ladders for ORD Field Scientific and Engineering Positions" was believed to be fundamentally appropriate and well presented.

The major conclusion is that the criteria are essentially adequate, but that both the criteria and the process are too internally directed. The participation of scientists and engineers external to the Agency and with stature in their fields is therefore recommended. Such participation is essential to the success of the advancement system in promoting scientific excellence within the Environmental Protection Agency.

Other recommendations include incorporation of provisions for down-grading along with advancement of researchers to ensure continued quality in the senior grades and provision of room for individual growth at the top. Procedures for out-placing researchers should be incorporated into this process.

Recommendations are provided on ways to establish and maintain the credibility of the peer review process. Actual decisions to reward, promote (or demote) should lie in the hands of internal EPA management. Finally, existing systems of other organizations should be studied by ORD staff and relevant, tested practices should be incorporated into the final process.

## **2.0 INTRODUCTION**

### **2.1 Request for Science Advisory Board Review**

#### **2.1.1 Background**

The Office of Research and Development (ORD) is exploring mechanisms for providing their staff with career advancement opportunity beyond the GM-15 level. Scientists who excel in research pursuits, rather than management pursuits, would be eligible for this advancement. ORD has asked the Science Advisory Board to review the criteria developed to guide this process based on their experience and understanding of the characteristics and attributes of senior career scientists in academia, industry, and other government installations.

#### **2.1.2 Charge**

The Advancement Criteria Subcommittee will review a set of criteria generated by ORD. ORD proposed to use these criteria in evaluating candidates for promotion to levels beyond GM-15. Conclusions will be provided by the Subcommittee as to the appropriateness of these criteria. In addition, the recommendations will be provided for improving the process or the criteria themselves.

The Board will not be involved directly in applying these criteria to selection processes involving specific individuals since this is the appropriate domain of Agency management. Members may nominate qualified scientists or engineers to serve on selection committees, if the Agency so desires.

The Board has been requested to consider two topics in its review of the Advancement Criteria for promoting Agency scientists. They are as follows:

- a. Are the proposed criteria adequate for identifying personnel for promotion?
- b. Is the process for applying the criteria appropriate?

### **2.2 Subcommittee Review Procedures**

The Advancement Criteria Subcommittee met on January 31, 1989 in Washington, D.C. Briefings were provided on the criteria formulation process by Dr. Roger Cortesi, Sandy Wells and Rick Garman of the ORD. In addition, Hector Suarez of the Office of Human Resource Management provided insight and information.

Prior to receiving this briefing, the Committee was provided with a document entitled "Career Ladders for ORD Field Scientific and Engineering Positions". This document is attached as Appendix A. Following the receipt of the draft document and the described briefings, the Committee discussed the



guidelines in detail. Suggestions, conclusions, and recommendations were developed at the meeting. In addition, both general and specific written comments on the guidelines were submitted for assembly by the Chair. These comments were assembled into a draft report, which was circulated for comment and consensus.

### 3.0 GENERAL COMMENTS

EPA scientists are a special lot. They and their activities cover the spectrum from the fundamental to the very applied and include engineers, along with the physical and biological scientists. The scientific issues they have to face are often inter- or multi-disciplinary, requiring a greater share of team work than one would find in academia or in a discipline-specific laboratory. The working mode is often that of problem solution - reacting to what amounts to political exigencies. Deadlines are often court-mandated requiring the scientist to come up with an "answer" before research efforts have ripened. Add to this the requirement to transfer all research findings and technological advances to program offices and state enforcement agencies. These necessary tasks result in a mix that most non-Agency scientists would find difficult to evaluate.

Any peer review system developed for evaluation must have credibility. The system must have credibility and equity for those who are affected and those who use the results in their decision-making. It is important to bear in mind that the ultimate decisions evolving from such a system have significant impacts on individuals, their organizations, their co-workers and their families. With this in mind, it is particularly important to involve managers and the employees affected by the process in the development of and critique of the specific criteria and guidelines. Ideally, the peer review system should be designed by those individuals within the system who are recognized within and without as being highly productive research scientists. To do otherwise gives rise to an imposed system rather than a collegial system.

The advancement criteria as presented have an overall shortcoming in their internal focus. The process is too internal, and, in many respects, the criteria are also too internal. The basis for promotions or rewards for scientists should include recognition of their accomplishments as scientists in the respective areas of expertise. These accomplishments should be reviewed and evaluated by the peers and deans of their disciplines, not by their administrators and close working colleagues. Recommendations based on these evaluations should go to the appropriate administrator for his/her consideration in making a recommendation for promotion.

In larger measure than current proposals, this peer representation must come from outside the agency - certainly from outside the candidate's immediate office or laboratory. This will provide for greater balance between external and internal reviewers.

It is also recommended that a companion procedure be developed for the opposite event. It may be necessary to demote individuals to prevent perpetuating undeserved tenure at these high levels. This will continue to assure that quality is

maintained and that there is room within the organization for individual growth based on recognition and accomplishment.

### 3.1 Adequacy of Criteria

In general, the procedures and criteria outlined in the document are appropriate and well presented. It is important that the evaluation be thorough and critical, but that it remain a subjective evaluation and not be reduced to formulae.

Assessment of qualifications, achievements and professional stature (paragraph 3.a.) is appropriate. The evaluation should assess the nominee's continuing growth, particularly since the last previous promotion in grade. One attribute of a superior scientist or engineer at the senior level is continuing growth in knowledge and stature. The criteria should be structured to assess the new knowledge, techniques, or skills that the nominee has acquired since previous promotion. In addition, considerations of professional stature should include evaluation of the candidate's role in professional and other related societies and groups. Recognition by peers for honors, awards and election to leadership positions in professional or scientific society offices can be quantified although the latter is sometimes the result of astute politicking or willingness to serve rather than real, scientific accomplishments.

Quantification may be useful but unquestioning reliance on a numerical system as a kind of formula should be avoided. The quality represented by the numbers is also of importance.

The bullets listed (Appendix 2 of Appendix A, page 10 [C.3.a]) do not appear to be in any priority order. Projects executed successfully may deserve a higher priority than projects conceived but not without question. This points to the need for careful assessment, case by case.

Although one significant discovery is better than many insignificant ones or no discoveries at all, several significant discoveries are better than one. In other words, quality and quantity are not necessarily independent of each other. The number of significant publications in highly regarded, peer-reviewed journals is an important criterion for measuring an individual's quality as a scientist.

An attempt should be made to evaluate the nominee's contribution to co-authored papers, reports, etc. Is the nominee the senior author? Did the listing as co-author signify a substantial contribution or was it a recognition of a senior staff person's position in the research organization. In addition, the criteria should be structured to allow determination of the sequence of publications, especially the most important papers. Were the best of them all published early in the nominee's career or has there been evidence of continued productivity? The criteria should provide weighted advantage to

a continuous stream of publications and evidence of recent high-quality papers in refereed journals.

Evaluation of citations is a proper tool for assessing the impact of a publication. Citation review should be subjective, however, and not dependent on citation indices which merely enumerate citations. In particular, self-citation of the authors previous papers in his/her subsequent publications should not be considered as important as citation by other workers in the same field.

The bullets in Appendix 2 of Appendix A (page 10, [C.3]) are very appropriate. The EPA's own award for excellence in published papers should be included, since the awards are recommended by a review panel of the Science Advisory Board adding an additional layer of independent peer review.

The first paragraph of section [C.3.b], "Work Situation", is very good. The importance of the "relative role and significance of the incumbent's contributions" should be stressed.

The issue of technology transfer could be resolved with the creation of technology transfer units in each of the laboratories taking the burden of that responsibility from the scientist and freeing the scientist for science. The only technology transfer he/she should be responsible for is the production of peer-reviewed scientific papers and necessary internal reports. In any case, evaluating the effectiveness of technology transfer is an administrative responsibility and should be evaluated independent of scientific accomplishment.

Evaluation criteria should vary with the level of maturity of the candidate to allow consideration of a progression of activities and accomplishments from grades 11 through 18. The maturation of a scientist can be viewed as falling into three major stages: 1) The early career, creative stage when fresh ideas seem to come easily to those young, fertile minds unencumbered by a lot of inhibitory knowledge; 2) the mid-career paradigmatic stage when the scientist spends much of his/her time demonstrating earlier ideas; and finally 3) the mature career stage when the scientist has gained a breadth of knowledge to allow synthesis and integration to come easily. There are exceptions, of course, but one would not expect an entry level scientist at the 12, 13 level to perform at the super grade synthesis level and would evaluate those people accordingly. Those who maintain a font of fresh ideas, demonstrate the capacity to synthesize and receive the respect and acceptance of their peers should, perhaps, be the only ones advanced to an 18 level.

### 3.3 Adequacy of the Advancement Process

Effective peer review is of prime importance to the credibility and operation of system. To be effective, the panel should truly be peers, not only in the real sense, but in the perceived sense as well. Having review bodies with fixed memberships provides for continuity, but does not necessarily result in true peer review. It is important to assure flexibility for expanding any review body to accommodate to the expertise of the person being reviewed. Also, peer review, if done well, is a labor intensive effort and that effort should be shared so as not to become burdensome.

Broad participation will prevent the system from taking on the cast of any one individual and will provide an appropriate balance of internal and external scientific and technical viewpoints. Final selection of participants should remain with the chair/Agency.

Also, review committees may solicit letters of recommendation or reference from external scientists of relevant disciplines. A side benefit is that those on the outside become more familiar with the skills and accomplishments of Agency staff. Reviewers or references should be scientists of stature including members of the National Academy of Sciences, National Academy of Engineering, National Institutes of Health and Science Advisory Board.

The wisdom of appointing the Deputy Assistant Administrator (DAA) as Chair of the review committee was questioned. This assumes that the DAA has scientific or engineering expertise, and this is not always the case. The Chair should not be in a position of direct line management or line authority. Ultimate decisions, to promote or not to promote, must be made by line managers and this aspect of personnel action should be completed separately to ensure objectivity of incorporation of scientific peer review recommendations.

The plan should recognize and specify that the individual being reviewed has substantial responsibility for preparing the materials that will form the basis of the review. Such an approach has the effect of educating individuals, providing them with some control over their destiny, and most importantly assures the accuracy and currency of information.

The credibility of the process is also reflected by and contingent on the implementation of the process. It is important to define the interactions and implications of other or outside factors that affect the process. Numerous factors, controls and requirements from outside the Agency may come into play in the overall advancement process, and these should be specified to ensure system credibility. If the system and peers accord recognition to an individual and their accomplishments, then it is imperative that management see to it that those results are implemented quickly and efficiently.

Finally, it is recommended that EPA obtain and become familiar with systems developed for similar purposes and activities, such as those developed by the National Center for Toxicology Research in Jefferson, Arkansas. Careful scrutiny of these systems may allow EPA to profit through the experience of others and adopt aspects that are both relevant and proven to be effective.



# **Career Ladders for ORD Field Scientific and Engineering Positions**

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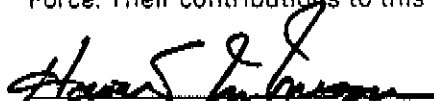
### Foreword

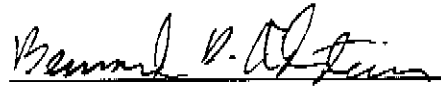
If the U.S. Environmental Protection Agency is to fulfill its role of providing a clean healthy environment to the American people, it must maintain and foster the excellence of its most precious asset—the people who are the organization.

The *Career Ladders for ORD Scientific and Engineering Positions* handbook contributes to this effort. The handbook firmly establishes the Agency's commitment to a dual-career path for all ORD scientists and engineers working in the laboratories making it possible for a scientist or engineer to progress based on technical expertise or on supervisory/managerial responsibilities. It establishes the ORD policy for the use of peer panels in position classification evaluations of laboratory and field positions when the grade is based on the technical expertise of the incumbent and provides guidance for administering the peer panel process. A section covering GS-16 and above positions is also included.

The guidelines in the handbook are based on existing Office of Personnel Management classification standards. Our intent in publishing these guidelines is to provide a uniform approach throughout ORD for the classification of positions and to provide employee awareness of the distinctions between grade levels and the duties and responsibilities that can be undertaken to develop and advance one's career.

This document was developed with input from the three servicing Personnel Management Divisions, Michael Watkins, lead person; key officials in ORD, Robert Booth, lead person; and members of the ORD Staffing Flexibility Task Force. Their contributions to this final product are gratefully acknowledged.

  
Howard M. Messner  
Assistant Administrator for  
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## ***Career Ladders for ORD Field Scientific and Engineering Positions***

### **I. Introduction**

ORD scientists and engineers and the Personnel Management Division have developed a career ladder for all ORD field and laboratory scientific and engineering positions. The career ladder defines promotional opportunities to the GS-15 level based on technical expertise and responsibility regardless of managerial or supervisory responsibility. This will create a dual career ladder for ORD personnel whereby a scientist or engineer may achieve the GS-14 and 15 levels based on technical expertise and responsibilities or on supervisory/managerial responsibilities. Positions proposed for upgrading to the GS-14 and 15 levels based on technical expertise will be subject to peer panel review.

Employees who are recommended for supergrade status based on technical expertise and responsibility will be reviewed and ranked by a panel of scientists and engineers and compete for any available supergrade slots.

### **II. Coverage**

A career ladder is defined as a series of developmental positions of increasing difficulty in the same line of work through which an employee may progress based on his or her personal development and performance.

#### ***A. Categories of Scientific and Engineering Positions***

Before establishing a career ladder, it is necessary to define the major categories of scientific and engineering positions within ORD and to identify the classification standards used to analyze and grade these positions.

ORD has five major categories of scientific and engineering positions.

1. **Research:** The Research Grade Evaluation Guide is used to classify positions engaged in basic or applied research in the biological, medical, agricultural, physical or mathematical sciences, in engineering or in psychology. The Guide defines research as "systematic, critical, intensive investigation directed toward development of new or fuller scientific knowledge of the subject studied. It may be with or without reference to a specific

application. Such research includes but is not limited to, theoretical and experimental investigations (1) to determine the nature, magnitude and interrelationships of physical, biological and psychological phenomena and processes; (2) to create or develop theoretical or experimental means of investigating such phenomena and processes; and (3) to develop principles, criteria, methods, and a body of data of general applicability for use by others."

To determine whether or not a scientist or engineer is engaged in research, it is necessary to review the purpose of the position as determined by management as well as the output or products of the position and the qualifications and stature of the incumbent.

2. **Development:** The Equipment Development Grade Evaluation Guide is used to classify positions involved in the systematic application of scientific knowledge to create new or substantially improved equipment, systems, materials, processes, techniques and procedures that will perform a useful function or be suitable for a particular duty. Like research, development is a creative process involving theoretical, experimental, and/or applied concepts. Like research, development advances the state of the art. However, the primary focus of development is the creation of new or substantially improved end items in the form of equipment, processes, procedures and techniques.
3. **Operations:** Operational positions are professional scientific and/or engineering positions which require the application of scientific or technical training equivalent to that represented by graduation from a college or university. The essential difference between research and operational positions lies in the objectives of the work. Operational positions involve the following types of activities:
  - a. Collection, processing, and analysis of scientific or engineering data that support scientific research but stop short of theoretical and experimental utilization of data to develop new or fuller scientific knowledge of the subject studied.

- b. Management of and exclusive participation in scientific data processing, storage, and retrieval systems.

The appropriate classification standard, i.e., Chemist, GS-1320, Environmental Engineer, GS-819, etc., is used to evaluate these positions.

4. **Contracts or Grants:** The Research Grants Evaluation Guide is used to evaluate positions primarily concerned with the analysis, evaluation, planning, organizing, coordination, and approval of scientific research programs that are carried out by educational, research, or other institutions.

It is important to remember that the scientist or engineer who is responsible for inhouse research activities may also use contracts to continue or extend his/her own work and may monitor contracts, advise the contractor, and evaluate the findings. The evaluation of this scientist's position would be based on his/her primary research responsibility since the extramural research duties are an extension of that responsibility.

5. **Mixed:** Some positions within ORD involve a combination of operational, research, developmental and contracts and grants work. These positions will be evaluated by the use of the various classification standards cited earlier as appropriate.

### B. Occupations

The career ladder includes ORD laboratory and field positions in the following disciplines:

Occupation	Series
<b>Biological Sciences</b>	<b>(GS-400)</b>
Biologist/Toxicologist	GS-401
Microbiologist	GS-403
Pharmacologist	GS-405
Ecologist	GS-408
Physiologist	GS-413
Entomologist	GS-414
Botanist	GS-430
Plant Pathologist	GS-434
Plant Physiologist	GS-435
Horticulturalist	GS-437
Geneticist	GS-440
Soil Scientist	GS-470
Agronomist	GS-471
<b>Engineering</b>	<b>(GS-800)</b>
General Engineer	GS-801
Civil Engineer	GS-810
Environmental Engineer	GS-819
Mechanical Engineer	GS-830
Electrical Engineer	GS-850

Electronics Engineer	GS-855
Biomedical Engineer	GS-858
Mining Engineer	GS-880
Agricultural Engineer	GS-890
Chemical Engineer	GS-893

Occupation	Series
<b>Health Sciences</b>	<b>(GS-600)</b>
Health Scientist	GS-601
Medical Officer	GS-602
Industrial Hygienist	GS-690
<b>Physical Sciences</b>	<b>(GS-1300)</b>
Physical/Environmental Scientist	GS-1301
Health Physicist	GS-1306
Physicist	GS-1310
Hydrologist	GS-1315
Chemist	GS-1320
Geologist	GS-1350
Oceanographer	GS-1360
<b>Mathematics</b>	<b>(GS-1500)</b>
Operations Research Analyst	GS-1515
Mathematician	GS-1520
Mathematical Statistician	GS-1529
Statistician	GS-1530
<b>Psychology</b>	<b>(GS-180)</b>
Psychologist	GS-180

### III. Career Ladder Guidelines

- A. Appendix 1 is a chart which shows the career ladder for the five major categories of ORD positions. The chart contains general information on the work situation, supervision received, guidelines and professional qualifications that would be found at each grade level as well as typical work assignments found in ORD. These descriptions should be considered as general characteristics of a particular grade. Literal conformance with every item in the descriptions is not necessary. For example, greater emphasis would be placed on professional qualifications and scientific contributions for a research position than for an operational position. For a research contracts and grants position greater emphasis might be placed on the work situation and supervision factors.
- B. The career ladder cannot replace or change existing classification standards. It is intended to provide ORD scientists, engineers

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and management with a general guideline as to how positions are graded, the differences between the grade levels and the activities they must undertake to develop and advance their careers.

mended for supergrade status by their Laboratory Director or Headquarter's Office Director. The AA ORD will use this list as supergrade slots become available (see Appendix 2 for more details).

#### **IV. Peer Panels**

ORD laboratories and field programs will use Peer Panels to assist in the evaluation of employees recommended for GS/GM-14/15 level positions in research, development and research contracts and grants and for the GS/GM-13, 14 and 15 level operational scientific or engineering positions.

A Peer Panel is composed of a Chairperson (normally a Laboratory or Deputy Director) and three to five voting members, consisting of a representative of the Servicing Personnel Office (SPO) and scientists and/or engineers familiar with the work of the position and who can evaluate the qualifications and scientific contributions of the candidate/incumbent. At least one scientific or engineering member of the Panel and the Chairperson must be from an EPA organization outside the laboratory/program where the position is located. At least one of the scientific or engineering members of the Panel must come from outside EPA.

Scientific and/or engineering Panel members must be at the same or higher grade level equivalence than the position being evaluated and must not have a supervisor/subordinate relationship with the candidate.

Peer Panels are especially helpful in classifying positions at these levels. The scientists and engineers who serve as Panel members provide an authoritative professional review of the candidate's qualifications, stature, research accomplishments and technical expertise. Concurrently, the SPO provides the required expertise on the factors used in classification of the positions, i.e., work situation, work assignments, supervision received, guidelines, and how these relate to the candidate's professional qualifications and scientific contributions. These elements are critical in the classification of positions at these levels. The Peer Panel process encourages the maintenance and retention of a high quality cadre of scientists and engineers in both research and nonresearch positions in EPA ORD (see Appendix 2 for more details).

#### **V. Supergrade Panels**

A panel of supergrade scientists and engineers will review and rank all candidates recom-

## Appendix 1

### Career Ladders for ORD Field Scientific and Engineering Positions

Work Situation	Typical Work Assignment Example(s)	Supervision Received	Guidelines	Professional Qualifications and Scientific Contributions
<b>GS-11</b>				
<p>Conducts scientific investigations of limited scope with readily definable objectives. Participates in problem definition, planning, execution, analysis and interpretation and reporting of findings. Projects are expected to result in a contribution to the development of a new or recognizably improved method or technique.</p>	<p>Incumbent is responsible for the preparation of trace organic sample concentrates for water and wastewater analyses by modifying and adapting standard methods and procedures. The changes are designed to improve the efficiency and accuracy of the methods and to extend their applicability to other substances or situations. The incumbent writes technical instructions for the development and preparation of these organic samples and prepares reports which are used in the design of future samples of various organic pollutants.</p>	<p>Supervisor assigns a specific problem with instructions as to scope and objectives and advises on problem definition and the development of a plan of attack. The researcher is responsible for the completeness and adequacy of the study. Receives technical guidance on unusual or complex problems. Completed work is reviewed for adequacy of method, completeness and results.</p>	<p>Existing theory and methods are generally applicable to most parts of the problem. The researcher must select and adapt available methods and techniques. Only a limited amount of innovation or modification of procedures.</p>	<p>Requires sufficient professional training and experience to perform as a fully trained researcher capable of performing the necessary background studies, developing a plan of attack, conducting the research and evaluating the results with some direction as to objectives and occasional technical guidance. Serves as assistant to higher level scientist who is responsible for a subject matter or program area.</p>
<b>GS-12</b>				
<p>Carries out complex or novel assignments requiring the development of new or improved techniques or procedures. Takes responsibility for the assigned study and pursues it to completion. Work is expected to result in the development of new or improved techniques, equipment or procedures.</p>	<p>Incumbent has primary responsibility for reviewing the quality of air monitoring data and advising project manager as to what corrective actions are needed prior to data output. Assignments include: reviews of sample collection procedures, sample handling methods, laboratory processing, and data processing, involves personnel in state/ local agencies and regional offices at all levels; prepares instructions and oversees contractor personnel working on data validation; conducts meetings to bring together personnel from different phases of air monitoring to resolve problem areas; participates as team leader on special projects which requires expertise in all areas of air monitoring.</p>	<p>Supervisor makes assignments and provides guidance on overall objectives, critical issues, new concepts and policy methods. Carries out assigned research independently, analyzes and interprets results and prepares reports of findings. Consults with supervisor concerning unusual problems and developments. Completed work is reviewed for soundness and for overall results.</p>	<p>Existing theory and available guidelines are insufficient. The researcher must use advanced techniques and must be able to modify and extend existing theory, practices and techniques. Problems studied are characterized as complex.</p>	<p>Represents the organization in conferences to resolve important questions and to plan and coordinate work for assigned area of responsibility. Is expected to make decisions independently on scientific and/or engineering problems and methods. Work may have resulted in secondary authorship of major reports or primary authorship of minor reports or papers.</p>

Work Situation	Typical Work Assignment Example(s)	Supervision Received	Guidelines	Professional Qualifications and Scientific Contributions
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GS-13\*

Plans and conducts research on a problem area of considerable scope and complexity. The scope of the problem is such that it must be approached through a series of complete and conceptually related research studies. Problems are typically difficult to define, require unconventional or novel approaches and require sophisticated research techniques.

As a technical authority, incumbent is responsible for developing, adapting, and evaluating methods that detect, identify, and quantify specified pollutant emissions. Develops and evaluates stationary source emission test methods. Conducts and coordinates field studies at appropriate sites to determine whether methods developed and evaluated under laboratory conditions will produce reliable results under conditions representative of actual use. Develops new methods evaluation techniques and applies such techniques to the evaluation of stationary source emission test methods.

Identifies research needs, formulates hypotheses, develops and carries out a plan of attack, analyzes and interprets results and prepares reports of findings. Keeps the supervisor informed of general plans and progress of the work. The supervisor makes final decision concerning the direction of the work, changes in research direction and major investments of time and equipment. Completed work is reviewed to evaluate overall results.

Available guidelines are limited in usefulness, contain critical gaps or are only partially related to the problem. The researcher uses originality in adapting and/or extending existing theory, in developing new approaches and methods and interpreting results. The problems studied are highly elusive and very complex.

The researcher typically has authored one or more publications of considerable interest or value to the field and has presented papers to professional societies. Represents the assigned area of specialization within and outside the organization. The researcher's ideas serve as the basis for productive studies by others. The researcher is sought out to serve on important committees of professional groups.

GS-14\*\*

Provides technical leadership and guidance in a subject matter area of major importance to the Agency. Conceives, plans, and conducts investigations of broad areas of considerable novelty and importance for which precedents are lacking in areas critical to the Agency's programs. Studies are expected to result in major technological advances or in solutions to exceptionally difficult problems. Decisions and interpretations are recognized as authoritative and have an impact on important Agency programs.

Serves as a recognized leader and authority on the development of methodology for characterizing organic gases, vapors and particulate matter in ambient air. Conceives, plans, and conducts research investigations in these areas. Follows national and international developments in the areas of hazardous organic air pollution and defines specific problems related to these developments. Represents the Agency in collaborative national and international research activities. Participates in interlaboratory conferences on hazardous pollutants, and serves on technical committees. Directs research projects through extramural contracts.

Receives administrative supervision limited to approval of staffing, funds, facilities and broad agency policies. Conceives and plans investigations to further Agency objectives and carries them through to completion. Decisions and interpretations are recognized as authoritative and have an important impact on Agency programs.

Demonstrated creativity, foresight and judgment are required to solve unprecedented problems in areas critical to the Agency's programs. Problems are characterized as exceptionally difficult and unyielding to research analysis so that their solution would represent significant advance.

Serves as a consultant to scientists and engineers both within and outside the Agency. Scientific advice and interpretations are accepted as authoritative. The researcher typically has contributed new inventions, designs, or techniques which are regarded as major advances in their field. Typically, the researcher has written a number of important publications for recognized technical journals.

Work Situation	Typical Work Assignment Example(s)	Supervision Received	Guidelines	Professional Qualifications and Scientific Contributions
<b>GS-15**</b>				
<p>Responsible for formulating and guiding a research attack on problems which have been recognized as critical obstacles to progress or development in areas of exceptional interest. Ordinarily serves as a leader of a research team but may function as an individual researcher. The solution of such problems would represent a major advance, opening the way for extensive related development.</p>	<p>Responsible for formulating, guiding and conducting in-house and extramural research on the prevention, control and abatement of multi media pollution from oil and hazardous material spills and oil and gas producing facilities. Functions as an Agency expert in the field of chemical and hazardous chemical emergency response activities. Functions as an authority in the management of hazardous material incidences and serves as a national and international technical spokesman for the Agency in this area of expertise.</p>	<p>Receives broad administrative supervision, takes complete responsibility for formulating research plans and hypotheses and carrying them through to completion, for planning and organizing programs and facilities, for interpreting findings, including their applicability to activities and interests of the Agency and their broader applicability to basic scientific methodology. These interpretations are accepted as technically authoritative and becomes the basis for necessary administrative action within the Agency.</p>	<p>Applies a very high degree of imagination and creativity in the solution of problems of marked importance to the scientific field, to health or to major segments of the national economy. Problems are characterized by an almost complete absence of applicable guidelines, pertinent literature and methodology.</p>	<p>Sought as a consultant by colleagues who are, themselves, specialists in the subject matter field. The subject matter field may be a broad area or may be a narrow but intensely specialized field. The researcher typically has written a number of important publications which have had a major impact on the field or are accepted as definitive of importance to the scientific field, the Agency or the public. Contributions at this level are of such importance that other researchers must take note of the advance in order to keep abreast of development in the field. As a recognized authority, the researcher receives invitations to address national professional organizations and performs extensive advisory and consulting work.</p>

\*GS-13 *non-research* (operational) positions are subject to peer panel review.

\*\*Positions at this level must be reviewed by a peer panel.

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## **Appendix 2**

### **Peer Panel Guidelines**

#### **I. Introduction**

This document states the ORD policy for the use of peer panels in position classification evaluations of laboratory and field positions, provides guidance for administering the peer panel process, and assigns responsibility for its execution.

#### **II. Policy**

ORD laboratories and field installations will use peer panels in position classification evaluations to provide an authoritative professional review of an incumbent's qualifications, stature, contributions and technical expertise, including:

- the quality of the research conducted by the candidate.
- the relevance, significance and importance of engineering/scientific achievement to the mission of the lab, program, ORD, the Agency and to the engineering/scientific discipline.
- the extent to which the incumbent represents the Agency or laboratory in dealing with regions, other laboratories, other federal and non-federal agencies, private industry, etc.
- recognition by peers as an expert in one's field.
- impact of the incumbent's recommendations and interpretations on Agency and office programs.
- the quality, quantity, and relevance of any publications authored or co-authored.

#### **III. Coverage**

- A.** Promotion recommendations to non-supervisory/monmanagerial scientific and engineering positions in research, development and research contracts and grant positions at the GS-14 and 15 levels.

**B.** Promotion recommendations to non-supervisory/nonmanagerial operational scientific and engineering positions at the GS-13, 14, and 15 levels.

**C.** Promotion recommendations to supervisory scientific and engineering positions in research development and research contracts and grants positions at GM-14 and GM-15 when the grade level is based on personal technical expertise rather than supervisory/managerial responsibilities.

**D.** Promotion recommendations to supervisory/managerial operational scientific and engineering positions at the GM-13, 14, and 15 level when the grade level is based on personal technical expertise rather than supervisory managerial responsibilities.

**E.** Reassignment or "new hire" actions at the GS/GM-13, 14, and 15 level if the SPO determines that the grade level proposed is dependent on the technical expertise of the candidate.

#### **IV. Membership**

- A.** Peer Panels consist of a chairperson and three to five voting members including a representative of the SPO. Scientific and engineering panel members must be at the same or higher grade level equivalence than the position being evaluated and must be technically knowledgeable of the expertise required by the position. Panel members may not have a supervisor-subordinate relationship with the candidate under review. At least one of the scientific or engineering members of the panel must be from an EPA organization outside the Laboratory where the subject position is located. In addition, at least one of the other scientific and engineering panel members must come from outside EPA.



- B.* A representative of a professional bargaining unit may be permitted as an observer to a peer review process if called for in the Union contract or otherwise negotiated. This representative will not be a voting member of the peer panel.

## **V. Peer Panel Chairperson**

- A.* The peer panel chairperson must be a Laboratory or Deputy Laboratory Director or equivalent and must be from outside the laboratory/program where the position is located.
- B.* The SPO will consult with the Laboratory Director and/or AA ORD to determine the methods for selecting a peer panel chairperson. Options include selecting two chairpersons from different organizations to serve in an alternating capacity, selecting a single chairperson from ORD headquarters or appointing a chairperson on a case-by-case basis. The SPO will consult with the Laboratory/Program Directors and/or the AA ORD to select the Peer Panel Chairperson.
- C.* Peer panel chairpersons may serve a two-year term and may be reappointed.

## **VI. Responsibilities**

### **A. AA ORD**

1. Nominate qualified headquarters employees to serve as peer panel chairpersons as appropriate.
2. Approve the need to establish positions in accordance with existing ORD delegated authorities.

### **B. Program/Laboratory Directors**

1. Recommend the establishment of positions at the GS-13/14 and 15 levels in accordance with existing ORD delegated authorities.
2. Recommend qualified employees to serve as peer panel chairpersons.
3. Recommend individuals (both employees and non-employees of EPA) to serve as peer panel members, upon request from the SPO or peer panel chairperson.

### **C. Peer Panel Chairperson**

1. Select peer panel members from nominations received from Laboratory/Program Directors, selecting officials, SPO or from own knowledge of exper-

tise available from within or outside the Agency.

2. Chair individual panel meetings, explain process to panel members, prepare reports of the results of panel meetings, and submit a summary memorandum of the panel's recommendations to SPO.
3. Serve as tie-breaker if panel cannot reach majority decision.

### **D. Peer Panel Members**

1. Review and evaluate the information provided in each case. The evaluation of qualifications and experience will be made in accordance with the appropriate guidance provided by the Office of Personnel Management (OPM) and SPO and shall be made without regard to race, sex, religion, national origin, age or handicap.
2. Request additional information as needed, interview the candidate and/or the supervisor and any other individual necessary to evaluate the position.
3. Prepare a written recommendation to the peer panel chairperson indicating whether the candidate's impact upon the position warrants the proposed grade.

### **E. Servicing Personnel Office**

1. Consult with Laboratory/Program Directors and/or the AA ORD to select the Peer Panel Chairperson.
2. Determine when a peer panel is needed in accordance with this policy and request the peer panel chairperson to convene a panel meeting.
3. Request supporting documentation from nominee and review for completeness.
4. Provide a representative to serve as a voting member on all peer panels.
5. Provide technical advice at all panel meetings.
6. Exercise final classification authority on all actions resulting from panel recommendations.
7. Assure that a report is properly filed documenting the recommendation of each panel.

8. Notify the professional bargaining unit of peer panel meetings and notify the chairperson that an "observer" will be attending the panel meeting as appropriate.
9. Maintain separate files for each peer panel case including the panel summary memorandum and official position description. Panel rating forms and summary memorandum must be attached to the file copy of the position description and maintained in the SPO organizational files.

## VII. Procedures

- A. Laboratory/Program Director submits an SF-52 that has received all required approvals within ORD, position description, a listing of proposed peer panel members, and an appropriate peer panel support package to the SPO in accordance with local procedures. Peer panel support package should include such items as the incumbent's updated SF-171, listing of publications, presentations, memberships, awards, and other recognitions as well as a narrative of significant accomplishments and contributions. Requirements for peer panel support packages will be detailed in local procedures.
- B. SPO reviews position description and peer panel package to assure completeness and conformance with local procedures and determines that a panel is required.
- C. SPO notifies Peer Panel Chairperson that a panel is required.
- D. Peer Panel Chairperson reviews the position description and support package, confers with SPO and finalizes panel membership.
- E. SPO sets up panel meeting, sends necessary information to panel members, and notifies the professional bargaining unit, if required, of panel's meeting.
- F. Panel members review the position description and peer panel support package, request any additional information they may need, interview the supervisor and/or incumbent if necessary, and document the results of their review and recommendations for the Chairperson.
- G. Chairperson summarizes the results and prepares a memorandum of the panel's findings for the SPO.
- H. SPO reviews the panel's findings, classifies the position, notifies the Laboratory/Program Director of the final results and maintains required records and files.
- I. If the employee is dissatisfied with the final classification decision, he or she may lodge a position classification appeal at any time with the Headquarter's Personnel Office or with the appropriate Office of Personnel Management. This appeal is a formal, written request by an employee to have the pay category, title, series, or grade of his or her position changed. An employee need not appeal through EPA channels before appealing to OPM, but the latter encourages employees to use Agency channels first before appealing to OPM.

## VIII. Annual Position Review

All peer panel approved actions will be reviewed as part of the annual position classification review. Individuals will be requested to update personal qualifications and accomplishments, if necessary. The SPO and the supervisor will review position descriptions to assure they are accurate and current.

The SPO will determine which, if any, positions require peer panel re-evaluation.

## IX. Supergrade Panel

Because the number of supergrade slots is limited, employees recommended for supergrade status based on technical expertise and responsibility will be reviewed and ranked by a panel of scientists and engineers in the following manner:

- A. At the request of the AA, ORD, an ORD-wide supergrade panel will be convened as needed (normally once every 12 months) to review non-managerial positions recommended for promotion to supergrade level (GS-16, 17, 18).
- B. The Panel will consist of the following six members:
  1. Chairperson - the DAA for ORD
  2. Headquarters - two designees of the AA for ORD

3. Laboratories – three Laboratory Directors selected by the Chairperson
4. The Director of OHRM, or designee, will serve as an advisor to the Panel.

**C. Procedures:**

1. The AA for ORD will request Laboratory Directors and Headquarter's Office Directors nominations through appropriate channels.
2. SPOs will assist Laboratory Directors and Headquarter's Office Directors in the preparation of position descriptions and supplemental information needed to document classification at the supergrade level.
3. The Panel will review all recommendations with special attention to the following factors which are indicative of professional growth to the supergrade level:
  - a. Qualifications, Achievements, and Professional Stature of Incumbent.

This factor is concerned with the knowledges, abilities, personal qualities, professional stature, continuing growth, contributions, productivity, and attainments of the incumbent as measured by the following:

(1) Specific accomplishments in one's field as evidenced by:

- theories or concepts evolved
- techniques and methods developed
- inventions and developments accomplished
- technical criteria developed
- projects conceived and/or executed
- impact or influence of work on Agency objectives on the Agency and on the state of the art.

(2) Publications authored including government reports and papers in professional journals and books considering the quality, recency, and impact as evidenced by reviews, citations, and developments in the field (undue weight will not be accorded to mere numbers of publications).

(3) Specific professional stature in the government, professional and academic communities as a leader and scientific authority, including:

- extent to which he or she is sought out as a consultant and advisor by specialists and others in and out of the field.
- reliance placed on his or her advice and recommendations.
- awards and honors received from local, national, or international organizations or institutions.

**b. Work Situation**

This factor is concerned with the nature and effort of studies undertaken, consultative and advisory services and participation in program planning, coordination, and evaluation. Included here are the difficulty, complexity, and novelty of work activities as these require creativity, mastery of one's field, scientific and engineering leadership; the scope and importance of programs affected by the incumbent's recommendations and advice; and the relative role and significance of the incumbent's contributions.

Typical assignments at the supergrade level are the following:

- Responsibility for formulating and guiding a broadscale attack on problems in frontier areas which are of critical importance to major national programs or are subject to widespread public and Congressional concern and scrutiny. The project is of such complexity and scope that it must be subdivided into numerous planning, experimental and theoretical phases, several of which require significant scientific or technological contributions.
- Responsibility for attacking problems of such novelty, importance, and extraordinary difficulty that (1) there have been numerous attempts by competent scientists to explore the area and gain a fundamental understanding of the processes and phenomena;

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(2) new hypotheses, concepts and techniques must be developed for attack, analysis, and interpretation; and (3) the successful performance of the work will lead to new theory, major modification of current theory, or a new level of scientific or technological capability.

- Extensive use as a consultant by other agencies, by higher authority within the organization, and by the professional community for critical evaluation and advice on proposed new projects, new approaches, and complex problems in a broad or intensely specialized area of investigation at the frontiers of science and technology. At higher levels such consultation may have a broader coverage and impact, e.g., across many diverse fields of interest to a bureau.

(4) The panel will rank nominations for supergrade submission in accordance with the above listed factors and forward the rankings to the AA ORD.

(5) The AA, ORD will use this ranked list, along with other relevant information, for assigning supergrade "slots" as they become available. The rankings will be upgraded as needed (normally once every 12 months).