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**VALUATION ENGINEERING
GRADE-EVALUATION
GUIDE, GS-0800**



**Workforce Compensation
and Performance Service**



Valuation Engineering Grade Evaluation Guide

GS-800

TABLE OF CONTENTS

INTRODUCTION	3
SERIES AND TITLES DETERMINATION	3
OCCUPATIONAL INFORMATION ON THE VALUATION FUNCTION	4
QUALIFICATIONS	5
CLASSIFICATION FACTORS	6
NOTES ON USE OF GUIDE	7

INTRODUCTION¹

This guide is applicable to positions of professional engineers who determine the valuation of property, natural resources, or of facilities and costs related to providing services. The purpose of the valuation work of these professionals is varied, and they are concerned with many kinds of property. They include valuation of manufacturing or processing plants, machinery, equipment, and facilities (including those used to exploit natural resources or to provide services such as public transportation or communications, gas or electric utilities); royalties, contracts, patents, licenses, leases, etc., for the purpose of (1) taxation under Federal internal revenue laws; (2) purchase or sale by the Government; (3) adjustments of claims against the Government for damages to property; and (4) determination of adequate rates of depreciation for property and equipment owned or leased by utilities subject to Federal regulation and control. Valuation work includes as a part of fixing fair market value the determination and consideration of (a) depreciation or depletion, (b) the probable useful service life of equipment and salvage value, © allowances, (d) overhead (e) propriety of ordinary or extraordinary losses, (f) contract requirements, and (g) allocation of profits or depreciation.

In the Federal service the professionals primarily called upon to perform the valuation engineering function are mining, petroleum, electrical, civil, mechanical and electronic engineers. In order to perform their duties, engineers concerned with valuation must apply (1) a broad fundamental knowledge of the principles, techniques, and standards of their profession: (2) a special knowledge of the industry or industries with which they are primarily concerned, including knowledge of the details of the manufacturing processes, transportation facilities, machinery, and equipment used; (3) a knowledge of valuation principles, techniques, standards, and the cost and accounting procedures applicable to the industry or industries concerned; and (4) a knowledge of the laws, regulations, and policies governing the operations and functions of their agency.

With the issuance of this guide the standard for the Valuation Engineering Series, GS-897 (originally issued in February 1949 under the code of P-892-0) is rescinded and the series is abolished.

SERIES AND TITLES DETERMINATION

Positions will be classified to the professional series which is most appropriate to the qualifications required. The most appropriate professional series may be selected from definitions published in the Office of Personnel Management "[Handbook of Occupational Groups and Families](#)," and amplifying material in the published classification standards.

¹ This document is identified as a "guide"-rather than a "standard" because it provides grade-evaluation criteria for positions in several occupations rather than describing different classes of positions in one occupation. However, it has the same force and effect as a standard and is issued under the authority of Section 401 of the Classification Act of 1949. as amended.

Positions identified with series for which classification standards have been issued will be titled in accordance with published titling instructions. All other positions will be titled in accordance with the practice described in the [Introduction to Position-Classification Standards](#). This requirement does not preclude an agency from using the organizational title "Valuation Engineer" for purposes of internal operation or public contact. However, such would not be an official class title.

OCCUPATIONAL INFORMATION ON THE VALUATION FUNCTION

The Federal Government uses engineers in carrying out the valuation function for the very good reason that, in many situations, decisions turn on professional judgments involving facts and principles of engineering. The valuation function in the Federal Government covers a broad area, frequently requiring a background in the special techniques and knowledges related to the purpose of the valuation work. When these valuation problems arise interested parties often present their cases on the issues with the help of professional engineers. In order to resolve problems and issues fairly and intelligently, the Government must have competent professional people so that the representatives of parties concerned can express their positions on engineering or other technical points to someone who understands the technical issues. The importance of technical issues in Federal programs connected with regulatory programs, land acquisition or sale, and tax collection has been considerably heightened in recent years because of our rapidly advancing technology, automation, stepped up oil and mineral exploitation, the emergence of new industries such as electronics, nuclear power, and a number of statutory changes relating to problems in these areas. Thus, there is an ever increasing number of questions centering mainly on the technical aspects related to deductions for depletion, depreciation, and the evaluation of property. Valuation problems usually require engineers to team up with, and provide the indispensable technical background and support for lawyers and accountants.

Some agencies have extensive contracts with public utilities for such services as water, sewage, electric power, etc. Because of the scope of operations in these areas, the costs run into millions of dollars. Variations in contracts resulting from technical problems can have an effect on costs, so the engineering and economic aspects must be carefully checked to insure that the Government purchases these services at fair and reasonable rates. Since a knowledge of the technical operations of the utilities are invaluable, engineers specialized in this area are frequently called upon to do the valuation work required to arrive at a fair price for these services.

The professional in valuation work tends to specialize in such broad fields as public utilities (transportation, communication media, power, water, etc.), manufacturing and industrial processes, petroleum and gas, and mining. Valuation work differs from cost estimating (normally a part of most professional technical work) because the factors due to economic fluctuations which affect fair market value must be considered; likewise allowances must be made for depreciation and depletion.

Market value varies from time to time, and occasions arise when the professionals working on valuation must determine the market value of a property or other items in relation to fixed dates in the past. Such assignments require the professionals to apply their knowledge, training, and

experience in the specialized field of their competence to reconstruct the economic and operating factors in the problem, such as labor cost, cost of materials, market conditions, etc., from available records, and an inspection of the present condition of property. With this information they make an estimate of the value of the property at the date in the past.

Most of the engineers in valuation work in the Federal service have had prior professional experience in the industry associated with their field or fields of specialization. Such backgrounds are necessary to provide the fundamental knowledge of variable elements affecting decisions in the industry, the working interrelationships between these elements, and their effect upon values. This practical operating experience in the field, supported by the training in theory which the professional receives, provides the fundamental background which enables them to take known facts related to a particular problem in their field of specialization, and convert them into values with respect to the past, the present, and the future potential. In some instances, the professional in this functional area has to determine whether the proposals to exploit mineral resources on public lands are feasible, practical, and accurate from a technical and economic standpoint; and that they represent the best use to be made of the land. They must look at the land as it stands and envision it as it would be if the proposed plans are followed to completion. In the valuation functions the engineers necessarily works with a great deal of independence and their conclusions are relied on heavily by their agencies. It is most important that they have a wide degree of professional latitude, and, in fact, the conclusions which they reach must be their own. The highest degree of such independence is exemplified best by service as an expert witness in cases tried in the courts.

Valuation work involves a field which is not easily buttoned down with slide rule determinations and incontrovertible formulas. Frequently, there are several different viewpoints. In order to reach proper conclusions these viewpoints must be heard and considered. This brings the professional into contact with corporation executives, lawyers, accountants, engineers, and other professional people. In valuation work, knotty problems of corporate structure, accounting, law, and industrial management frequently arise. It is often important to understand the legal relationships in technical problems. Accounting questions develop around such matters as whether a particular item represents a capital expenditure or an operating expense.

QUALIFICATIONS

In valuation work it would be extremely useful if the engineer would have training or experience in the fields of law and accounting. Occasionally, there is an engineer in valuation work who has a degree in one of these fields. However, most professional engineers in the valuation field obtain their background in law and accounting through experience in the actual work situation.

In valuation work the engineer must first and foremost be at home in several branches of his profession or be capable of absorbing and working in several different facets of the field. In addition to the professional knowledge of engineering, they must have an almost equal knowledge of the industry or industries in the area of assignment, and an understanding of the legal, accounting and economic relationships which exist. Not only must they be able to develop facts which will stand up in court, they must be able also to apply sound professional judgment in rendering opinions as an expert witness. He must be skillful in personal work relationships

with the ability to negotiate effectively. Finally, they must have high ethical standards and inspire others to follow such standards. In addition to be able to review cases and furnish advice on specific questions some engineers are called upon to assist in formulating policies on technical questions.

To participate in establishing policy and benchmarks, the professional in valuation work must have, in addition to the other requirements, a depth of understanding and knowledge of the program objectives, statutory, and regulatory requirements of the agency. This background is rarely acquired outside the Federal service. Because of the impact of valuation decisions on the private sector of the Nation's economy, the professional doing valuation work must constantly study and grow in knowledge of their profession and in knowledge of the special area of the economy, or the industry in which they are specialized, as well as in knowledge of the legal, regulatory and policy matters related to his agency's operations.

CLASSIFICATION FACTORS

Two factors are used herein to differentiate grade levels for professional engineers performing valuation work: (1) the nature and complexity of the valuation problems assigned, and (2) the level of judgment and responsibility exercised. The variety and depth of the qualifications and abilities required to carry assignments successfully to completion really represents the other side of the same coin, being so related to the nature of the problems and responsibilities that they are reflected in the discussions of the assignments and responsibilities.

The complexity of the valuation problem should be considered: first in terms of its scope--the need for breaking the assignment into separate phases or parts, the variety of activities involved in each of the parts, and the effort required to coordinate and integrate the findings into a unified conclusion; then in terms of its nature--situations of ordinary difficulty as contrasted with those that are unique or exceptional, the intricacy of methods, techniques, and procedures which must be used, and/or the degree of imagination and ability to adapt, create, or innovate. (This is particularly significant at the higher levels where problems require the professional to use considerable judgment, originality, and resourcefulness because no two problems are identical, and there are many variables inherent in each assignment. Frequently there is a lack of precedents which exactly fit a problem, and the professionals must use their ability in adapting and applying to the immediate problem methods and principles which have been used under somewhat similar conditions, or in developing new techniques and methods.)

The level of judgment and responsibility exercised is reflected in large part by the economic and social effects of a conclusion in a valuation problem; and by the nature of the personal contacts made in resolving valuation problems--the relative ease or difficulty involved in dealing with individual or corporate property owners, or their representatives, for such purposes as the compilation or dissemination of information relative to the settlement of disputed valuation or engineering issues. One reflection of successful contacts is the settlement of issues in dispute in conferences rather than in long and expensive formal hearings or court litigations. In considering and evaluating personal contacts, their purpose, importance, and manner of initiation should be examined, as well as the difficulties involved in informing, persuading, obtaining cooperation, and settling controversies with others in the particular area of valuation problems.

In considering the responsibility for final action on technical or policy matters, it should be kept in mind that generally final approval is reserved for formal action by other or higher levels in an organization because of legal or other requirements. Therefore, in grade-level determinations it is important to consider not only who makes the decision, but the weight given the professionals' recommendations by their superiors, peers, and by the very circumstances surrounding the recommendations.

NOTES ON USE OF GUIDE

Professional engineers engaged in valuation work require a background of experience in their area of specialization. Since, generally, engineers in grades GS-5 through GS-9 are engaged in other functional activities that provide a background of experience for valuation work, the grade-level criteria in this guide begin at GS-11. However, there may be some a typical valuation engineering positions in grade GS-9. Such GS-9 positions with assignments similar to those at GS-11 are characterized by substantial preliminary and in-process guidance by the supervisor.

In some organizations, professionals engaged in valuation work are assigned to lead teams and coordinate the work on a given problem. In determining the grade level of the work, supervisory duties may not be as significant a factor as are the demands of the problem on the professional knowledge and ability of the employee. Thus, an employee performing work of a certain difficulty and scope may work with or without the assistance of a team, but the problem involved is equally demanding insofar as the professional ability required. Positions for which the supervisory duties and responsibilities are significant may be evaluated by reference to the [General Schedule Supervisory Guide](#).

GS-0800-11 Level

At the GS-11 level valuation engineers are equipped by training and experience to carry out assignments requiring proven professional experience and ability in their area of specialization.

Projects assigned are conventional and require technical judgment to interpret the relationship of their various aspects to agency valuation guides and precedent cases. The supervisor typically provides guidance on novel problems or controversial issues. Employees at this level are expected to proceed independently with conventional projects in gathering information, and to work out most of the problems they encounter. Occasionally, employees of this level are assigned to assist a higher grade professional on larger and more difficult assignments with the investigation and examination of prescribed phases of the larger project.

Assignments at the GS-11 level are less difficult than those at the higher levels because (1) GS-11 assignments involve completion of one major technical phase or segment of a large project, e.g., developing depreciation, cost, or maintenance data for railroad equipment or structural accounts, or developing unit prices and multipliers for common carrier inventory accounting, or computing depreciation reserve requirements of communications common carriers; or (2) they involve smaller properties, in terms of both physical size and value. Some typical examples of assignments at this level:

- (a) To perform independently field investigations and examinations of engineering features involved in income-tax returns of taxpayers, including estates, partnerships, and smaller corporations, determining deductible allowances for depreciation of tangible and intangible assets, gain or loss from sales of property and securities or exchanges of assets, probable service lives of property, or losses due to abandonment or obsolescence. To meet with the taxpayer or his representative in a disputed case in order to attempt to arrive at agreements on facts and interpretations for prompt out-of-court settlement where the payment of additional taxes may result. To examine records and taxpayers' property where necessary in order to develop the facts needed to determine current maintenance, depreciation, operating characteristics, or other applicable features. To make recommendations as to the proper application of laws, regulations, and decisions in accordance with the engineering problems of the case being investigated. To defend successfully recommendations in conferences, and, as an expert witness, in formal hearings and court litigations.
- (b) To conduct and prepare reports necessary for the determination of depreciation rates and reserve requirements for communications carriers involving detailed analyses of carriers' records and data; physical inspections of extent of maintenance and condition of carrier property; engineering and actuarial determinations of plant service life and remaining service lines of property from the standpoint of physical causes, obsolescence, and inadequacy; as required, supervision of physical inventories; and preparation of reports and recommendations.

- (c) To make independent field examinations for the purpose of obtaining the necessary data needed to arrive at a gross estimate of costs involved in the acquisition or disposal of mining or mineral interests. To prepare preliminary mining and mineral appraisal reports including all data pertinent to the land, such as owners, location and general geography, condition of roads, availability of water and timber, general geological conditions in the area, principal minerals or metals found, extent of mining development, value and extent of ore reserves, appraisal of mining and milling equipment and surface improvements, and a summary of estimated value of the property.
- (d) To establish original costs or fair value of utility properties and subsequent additions thereto to complete plants and systems, consisting of such items as dam, powerhouse, reservoir, transmission and distribution lines, substation, and land. To make engineering appraisals and estimates on costs of projects where accounting records are inadequate, and to test and examine costs of construction where the utility report is based entirely on appraisal methods. To examine the utility's analysis of costs for the various phases of construction to determine whether such costs have been properly classified for depreciation purposes.

Contacts are with attorneys, accountants, engineers, and other professionals representing business firms or other clients, State agencies, or their own or other Government agencies. The contacts are made independently. However, they are usually assignments of a regular or recurring nature, and GS-11 engineers are usually operating within a set of instructions which specifically limit authority to commit the agency or the area to be covered in the discussion.

The GS-11 engineer in valuation work has authority to confer on disputed issues and to make interpretations and explanations reflecting the official viewpoint of his agency with respect to the problems under discussion; to determine what information is needed and the work methods to use (unless prescribed by established procedures) to obtain reasonable results; to make findings as to valuation or other related matters; to make decisions on questions of fact and regulation involved in the technical features of the assignment, making necessary adjustments in accordance with rules, regulations, and precedent decisions; and to arrive at tentative agreements or stipulations concerning the disputed issues. However, the professional at this level cannot commit his agency to a definite course of action, and all decisions, recommendations, agreements, and stipulations made by him are subject to review and approval by the supervisor before becoming effective. At this level recommendations and decisions are an inherent part of the process of carrying assigned projects to completion, and the recommendations and decisions are relied upon when the facts adduced sustain them. The completed work is reviewed by supervisors for technical accuracy, soundness of conclusions reached, and for achievement of established technical objectives.

GS-0800-12 Level

Employees at the GS-12 level in valuation work are recognized as mature professionals equipped by training and experience to deal with advanced technical aspects and problems in their area of professional specialization. They have demonstrated their ability to apply an intense and highly specialized, or a broad and diversified knowledge of the engineering, accounting, and legal principles and practices to valuation problems. They analyze complex or troublesome problems concerned with novel or controversial aspects of professional practice in their field.

Assignments are given to GS-12 engineers in terms of broad general objectives, with information on special requirements, relative priorities, and completion dates being supplied occasionally. They plan and organize their work which, because of its nature, requires careful coordination of its various phases, plus initiative and ingenuity to bring all aspects to a satisfactory conclusion. Each assignment must be analyzed to determine the work methods likely to produce results inasmuch as, typically, there are no fully applicable precedents, or the work involves the development of adequate factual data from missing or incomplete records.

Positions at grade GS-12 are distinguished from those at GS-11 by greater complexity and broader scope and diversity of projects, and relative freedom from supervisory direction. This means there are added demands on experience and judgment at GS-12. Supervisors of employees at this level review the finished products (reports and recommendations) for adherence to schedules, technical adequacy, and conformance to agency objectives.

Some typical examples of assignments at this level:

- (a) To prepare preliminary investigation reports on the mineral producing potential and value of land being considered for public use where there are novel or controversial problems; to investigate the status of mineral leasing, mineral royalties, and the extent of mineral development through personal contacts with industry, study of geological maps, and personal examination of the property in question; and through the application of technical theory and practical experience in working with, studying, and evaluating the present worth of primary and secondary oil and gas and mineral properties, to determine the worth, the value of production equipment, the cost of plugging and abandonment, or the cost of rehabilitating such properties for continued operation, the potential annual production, ultimate reserves, and their accessibility.
- (b) To conduct investigations and prepare reports on cases involving a variety of interrelated complex and controversial technical problems in connection with tax return audits related to the exploitation of natural resources. Typical problems entail determinations of the cost of property and estimates of recoverable units, the adjusted basis for depletion when both cost and percentage depletion have been used in previous years, the reestimate of recoverable units and the adjustment of the depletion rate, the transition point between the exploration and the development stage, and between the development and the production stage, losses resulting from hurricanes, floods, etc., and whether costs of

repairs to machinery and equipment should be capitalized or charged off to operating expenses.

- (c) To make special analyses and compilations of technical information as a basis for considering changes in regulations or for recommending legislative changes.
- (d) To review technical reports on valuation work prepared by field offices to ascertain whether policy and technical requirements are being followed and uniformly interpreted.
- (e) To examine technical phases of statements of cost of hydro-electric projects submitted by licenses, correlating the technical report on the examination of the statement with the accounting reports. Attends conferences with company officials and staff members of other agencies to discuss conclusions resulting from the examination of the statement, and in connection with public hearings gives expert testimony.

At this grade level the professionals in valuation work establish and maintain extensive professional and working contacts with individual or corporate property owners, officials of State tax or regulatory commissions, manufacturers, contractors, and officials and professionals of other Federal agencies. These contacts differ from those at the GS-11 level in that they have a wider range, many of them are at a higher level, and require highly developed skill in negotiations of technical issues.

Professionals at this level make decisions with respect to engineering aspects of their work excepting those involving policy. In policy matters they give their recommendations to their supervisors with reports setting forth the facts and the rationale supporting the recommendations. Because of the difficulty or the importance of assignments at this level, the professional's decisions and recommendations on factual or related issues either result in final settlement or run the gamut of formal hearings or judicial litigation in which GS-12 valuation engineers serve as expert witnesses.

GS-0800-13 Level

In addition to their marked professional ability in their area of specialization, GS-13 engineers are recognized specialists in valuation work with a depth of knowledge and experience in the policy, program requirements, and operation problems of their agency. The professionals at this level perform advanced work relating to difficult or critical problems, and may lead teams carrying out broad assignments in the area of their specialization. Some of the following conditions are usually found in assignments: a broad range of phases, subsystems, or components arising from the greater scope and technical complexity of the properties and issues involved; questions of fact that cannot be determined from actual measurement or observation; controversial technical or economic issues with national scope or impact; and required negotiation and persuasion in dealings with consultants.

At this level in valuation work the professionals must draw perception and judgment from their experience in order to analyze in depth the variety of interrelated and conflicting elements in assignments, and to select or develop the best approach, considering the problems particularly from the technical, economic, and public policy standpoints. On such projects they must be able to explain the controlling policies, objectives, and needs to the various authorities and groups of the public who are concerned.

Some typical examples of assignments at this level:

- (a) To make detailed studies to determine the position to be taken at hearings on requests for rate increases, and in disputes with, or on claims of utilities suppliers over contract provisions. The studies involve a review of all pertinent facts, i.e., operating reports, financial statements, cost and rate analyses. The basic data is obtained from information on file with public service commissions, and the suppliers' records. Testimony is prepared and presented at hearings before regulatory commissions or in Court, after conferring with and coordinating findings with representatives of the Department of Justice.
- (b) To direct a major valuation project such as compiling, analyzing, and preparing for the United States and its territories common cost indices covering construction, operations, and maintenance for public utilities of various kinds, or for common carriers.
- (c) To conduct investigations and prepare reports on outstandingly important, complex, and sensitive tax cases, typically involving very large corporations and characterized by all of the following: extensive investigation and analysis; controversial technical issues requiring precedent-setting interpretations; major economic, social, or political impact and interest; and tax-payer representation by prominent consultants.

GS-13 engineers have full responsibility for all technical aspects of their work. Technical supervision and review, when it occurs, is usually limited to discussions of controversial issues, problems involving an interpretation of, or departure from policy, or problems that may change the scope of an assignment.