

Management Handbook for Plant Engineers

Edited by

BERNARD T. LEWIS, P.E.

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Foreword

Concern over management of the plant engineering function, both in industry and government, is increasing at a great rate. This concern stems from the need to reduce resources required to design, construct, operate, and maintain our facilities and equipment in order to remain competitive. It leads, inevitably, to pressure by corporate managers on plant engineers to reduce costs and optimize efficiency and effectiveness. The central question in better plant engineering management is no longer whether; it is how. The *Management Handbook for Plant Engineers* is designed to answer the question of how best to manage the plant engineering function with the latest technology. It should provide a major contribution to the dissemination of management control techniques and the encouragement of sound corporate decisions in plant engineering management. The implementation of an effective plant engineering management improvement program depends on the coordinated efforts of corporate managers and plant engineers. I am encouraged by the publication of this handbook as evidence of private industry's growing awareness of the need to improve plant engineering management practices as a contribution to sound business practice.

EDWARD J. SHERIDAN; *Formerly,
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for Installations and Housing
Department of Defense*

Preface

Plant engineering management in all sectors, public and private, is changing rapidly. High-speed computers, new mathematical and statistical tools, and data from the behavioral sciences are providing a "knowledge explosion" which is of inestimable value to the modern plant engineer.

As modern management techniques change, plant engineering management changes too. This handbook has been prepared for the express purpose of presenting to the plant engineer the latest developments in plant engineering management systems, procedures, and techniques that should prove intellectually stimulating and useful.

Chapters in the handbook, and its section organization, reflect major developments that have occurred in plant engineering management over the last decade. All chapter authors represented have contributed the results of their original thought and research plus the invaluable background and experience which is reflected in their writings.

This handbook will be of service to plant engineering managers and supervisors at all levels in any industry, institution, or government agency. It contains treatment of plant engineering *management* to an extent found nowhere else. There are 63 chapters grouped into 10 sections: Organization and Staffing; Facilities Planning and Programming; Engineering and Construction Management; Maintenance Management; Utilities Management; Materials Management; Systems and Reports; Budget and Costs; Personnel and Administration; and Safeguarding the Facility.

In editing this handbook, I have drawn upon the learning, knowledge, and skills of 59 specialists representing a wide range of disciplines and covering the gamut of plant engineering management. Without their help this handbook would not have been written.

Since we live and work in a technological society continually thrust forward by new learnings, this handbook should have relevance not only to the modern plant engineer but to other management personnel as well. I hope that the *Management Handbook for Plant Engineers* will give plant engineers new insights into their work and will help them in the performance of their jobs.

Bernard T. Lewis

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Section 1

Organization and Staffing

Section 1

Organization and Staffing

Chapter 1

General

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INTRODUCTION

The purpose of this chapter is to provide an understanding of the elements that comprise an organization or staff. Note the distinction: The organization and the staff are *not* one and the same. In the following pages the distinction of each of these terms will be enlarged. The premise which supports all further definition is as follows: The organiza-

1-4 Organization and Staffing

tion is the inflexible structure that provides authority and avenues of response to each position regardless of who holds the position. The staff then must operate within the constraints of the organization and within the capability of the weakest member. The staff is changeable by personal interactions and new talents. The organization is changeable by administrative edict.

Organizing and staffing are prime functions of every manager. Both the foreman and the president must provide themselves with the proper people and the people with the proper mode to complete work. "Proper" in this context is then "that which best suits the manager's view of productivity."

It is well to remember that changing the organization will not cure a staffing problem, nor will changing the staff solve the deficiencies of the organization.

ORGANIZING—GENERAL

The need to organize, or more commonly reorganize, is most prevalent during periods of failure. The pressures of not getting the job done or the continual need to catch up tend to drive the group manager toward the decision to either reorganize or restaff. Other reasons to consider such changes might be future expansion, new facilities, new processes or products, changes in top management with a new perspective of plant engineering, and centralization or decentralization of the management staff. In the preceding circumstances, there are two basic categories: (1) the manager's self-determination to reorganize to meet the work requirements and (2) higher levels causing lower-level organizational changes. In either case, the group manager should be the best equipped to set up the structure.

Preparing to Organize

Though there are no common rules of organization, most personnel departments have an established policy that is considered to be acceptable to the enterprise. These policies are more stringent in large corporations than in small ones, but in either case it is advisable to contact the personnel office first and discuss what the company requires.

Some questions to ask are:

1. Is there a company manual on organizational policy?
2. Are there parallel structures elsewhere in the company?
3. Is there a maximum or minimum number of subordinates ("span of control") for a given grade level or title?
4. How does the company view overlapping accountabilities and split reporting?

There is a tendency during this type of discussion to shift the conversation to personalities, talent, training, and other staffing-related topics. Avoid this—stick to matters of structure.

Company policy may seem inhibiting, but the rule for the first attempt at reorganizing is *Try to stay within the policy*. Company policy is a major part of the organizational makeup. The group manager who establishes an organization is in reality establishing more policy. It is hoped that the total effect of these policies will enhance the productivity of the enterprise.

ELEMENTS OF ORGANIZATIONAL POWER: AUTHORITY, ACCOUNTABILITY

The need to change implies a change for the better. This should not exclude from improvement the existing, acceptable qualities of the current structure. Rather than setting out to analyze what is wrong, analyze what is. This requires further definition of organization:

1. Organizational objectives are definable and must be determined for each position.
2. The organization vests limited power, which is called authority, in the staff.
3. These power limits are defined by policy and detailed job descriptions.
4. Organizational power, position power, authority, is available to whoever holds the position.
5. Organizational objectives equal organizational obligation.
6. Each position is accountable for acts that meet organizational obligations or objectives.