

Manual on Installation of Refinery Instruments and Control Systems

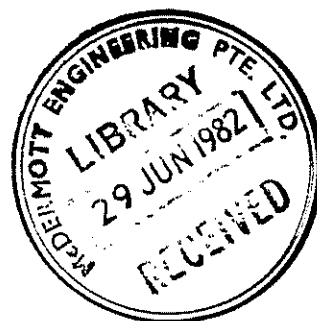
Part I — Process Instrumentation and Control Section 2 — Level

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API RECOMMENDED PRACTICE 550
FOURTH EDITION, FEBRUARY 1980



American Petroleum Institute
2101 L Street, Northwest
Washington, D.C. 20037



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Refining Department

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FOREWORD

This recommended practice is based on the accumulated knowledge and experience of engineers in the petroleum industry. Its purpose is to aid in the installation of the more generally used measuring, control, and analytical instruments; transmission systems; and related accessories to achieve safe, continuous, accurate, and efficient operation with minimum maintenance. Although the information contained has been prepared primarily for use in petroleum refineries, much of it is applicable without change in chemical plants, gasoline plants, and similar installations.

Successful instrumentation depends upon a workable arrangement which incorporates the simplest systems and devices that will satisfy specific requirements. Sufficient schedules, drawings, sketches, and other data should be provided to enable the constructor to install the equipment in the desired manner. Various industry codes and standards as well as laws and rules of regulating bodies should be followed where applicable.

For maximum plant personnel safety, transmission systems are used to eliminate the piping of hydrocarbons, acids, and other hazardous or noxious materials to instruments in control rooms. Proper installation is essential to use fully the capabilities that are built into the instrument or transmission system.

When installing an instrument, the various components must be accessible for efficient maintenance, and certain of these elements must be readable for good operation. Orifices, control valves, transmitters, thermocouples, level gages, and local controllers as well as analyzer sample points generally should be readily accessible from grade, permanent platforms, or fixed ladders. In this manual, special consideration is given to the location, accessibility, and readability of the elements.

Users of this manual are reminded that in the rapidly advancing field of instrumentation no publication of this type can be complete nor can any written document be substituted for qualified engineering analysis.

Certain systems are not covered in this section because of their highly specialized nature and limited use. When any of these systems gains wide-spread usage and installation reaches a fair degree of standardization, this section will be revised to incorporate such additional information.

Acknowledgment is made to all the engineers and operating and maintenance personnel who, through years of study, observation, invention, and sometimes trial and error, have contributed to the technology of instrumentation.

Suggested revisions are invited and should be submitted to the director, Refining Department, American Petroleum Institute, 2101 L Street, N.W., Washington, D. C. 20037.

PREFACE

This section is one of a series which make up RP 550, *Manual on Installation of Refinery Instruments and Control Systems*. RP 550 is composed of four parts:

- Part I — Process Instrumentation and Control
- Part II — Process Stream Analyzers
- Part III — Fired Heaters and Inert Gas Generators
- Part IV — Steam Generators

Part I analyzes the installation of the more commonly used measuring and control instruments, as well as protective devices and related accessories; Part II presents a detailed discussion of process stream analyzers; Part III covers installation requirements for instruments for fired heaters and inert gas generators; and Part IV covers installation requirements for instruments for steam generators. These discussions are supported by detailed information and illustrations to facilitate application of the recommendations.

The format of RP 550, Part I has been changed to facilitate continuity of presentation, convenience of reference, and flexibility of revision. Each section is now being published individually as follows:

- Section 1 — Flow
- Section 2 — Level
- Section 3 — Temperature
- Section 4 — Pressure
- Section 5 — Automatic Controllers
- Section 6 — Control Valves and Positioners
- Section 7 — Transmission Systems
- Section 8 — Seals, Purges, and Winterizing
- Section 9 — Air Supply Systems
- Section 10 — Hydraulic Systems
- Section 11 — Electrical Power Supply
- Section 12 — Control Centers
- Section 13 — Alarms and Protective Devices
- Section 14 — Process Computer Systems

When preparing these documents, it was necessary to decide on a logical method of presentation—should each point be explained as fully as possible, or should extensive cross-referencing be done between sections?

The publications contain a combination of these methods of presentation. Each section has been made as complete as possible, with cross-referencing done only where very extensive repetition would have been required.

Users of this recommended practice are cautioned to obtain a complete set of sections in order to accomplish efficiently any cross-referencing that is required for a better understanding of the subject matter.

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