Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms

API RECOMMENDED PRACTICE 14C
SEVENTH EDITION, MARCH 2001

American Petroleum Institute

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Upstream Segment

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FOREWORD

This standard was developed as an API recommended practice under the jurisdiction of the API Upstream Segment Executive Committee on Drilling and Production Operations.

This recommended practice presents a standardized method to design, install, and test surface safety systems on offshore production platforms and is intended for use by design engineers and operating personnel. Recognized systems analysis methods are used to develop requirements for a safety system and procedures are included to document the safety system and verify conformance with the recommended practice.

Other API recommended practices for safety and antipollution systems used in offshore oil and gas production include the following:

RP 14E	*Design and Installation of Offshore Production Platform Piping Systems*
RP 14F	*Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class 1, Division 1 and Division 2 Locations*
RP 14G	*Fire Prevention and Control on Open Type Offshore Production Platforms*
RP 14J	*Design and Hazards Analysis for Offshore Production Facilities*
RP 75	*Development of a Safety and Environmental Management Program for Outer Continental Shelf (OCS) Operations and Facilities*

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1. GENERAL

1.1 INTRODUCTION

For many years the petroleum industry has prepared documents representing the combined knowledge and experience of industry on various phases of oil and gas producing operations. In continuation of this effort, this recommended practice presents a systematization of proven practices for providing a basic surface safety system for offshore production platforms. Proper application of these practices, along with good design, maintenance, and operation of the entire production facility, should provide an operationally safe platform.

1.2 SCOPE

This document presents recommendations for designing, installing, and testing a basic surface safety system on an offshore production platform. The basic concepts of a platform safety system are discussed and protection methods and requirements of the system are outlined.

This recommended practice illustrates how system analysis methods can be used to determine safety requirements to protect any process component. Actual analyses of the principal components are developed in such a manner that the requirements determined will be applicable whenever the component is used in the process. The safety requirements of the individual process components may then be integrated into a complete platform safety system. The analysis procedures include a method to document and verify system integrity. A uniform method of identifying and symbolizing safety devices is presented and the analysis method is exemplified by a sample process system.

In addition to the basic surface safety system, this recommended practice covers ancillary systems such as pneumatic supply and liquid containment. Procedures for testing common safety devices are presented with recommendations for test data and acceptable test tolerances.

This recommended practice emphasizes pneumatic systems since they are the most commonly used; however, the same principles and procedures are applicable to hydraulic and electrical systems and to systems incorporating two or more control media. Instrumentation logic circuits are not discussed since these should be left to the discretion of the designer as long as the recommended safety functions are accomplished. Rotating machinery is considered in this recommended practice as a unitized process component as it interfaces with the platform safety system. When rotating machinery (such as a pump or compressor) installed as a unit consists of several process components, each component can be analyzed as prescribed in this recommended practice.

1.3 ORGANIZATION OF TECHNICAL CONTENT

The technical content of this recommended practice is arranged as follows:

a. Section 2: Recommended standard symbols and abbreviations for safety device and process component identification.

b. Section 3: The general purpose, functional requirements, and basic premises of platform safety system analysis and design.

c. Section 4: A detailed discussion of recommended safety analysis techniques, the concepts of protection from which they were developed, and a step-by-step procedure for analyzing and establishing design criteria for a basic platform safety system.

d. Appendix A: A safety analysis for each process component commonly used in a production process, including a checklist of additional criteria that should be considered when the component is used in a specific process configuration.

e. Appendix B: A sample Safety Analysis Table (SAT), a composite Safety Analysis Checklist (SAC), and a sample Safety Analysis Function Evaluation (SAFE) Chart.

f. Appendix C: A discussion of supporting systems that perform specific safety functions common to the entire platform.

g. Appendix D: Testing procedures and reporting methods for the accumulation of safety system test data that can be used for operational analysis, and reports that may be required by regulatory agencies.

h. Appendix E: An example Safety Analysis Function Evaluation (SAFE) Chart prepared using procedures presented in this recommended practice.

i. Appendix F: A discussion of procedures and location of detectors for platforms that process toxic hydrocarbons.

1.4 GOVERNMENT CODES, RULES, AND REGULATIONS

Regulatory agencies have established certain requirements for the design, installation, and operation of facilities on offshore production platforms. In addition to federal regulations, certain state and local regulations may be applicable. The following federal documents pertain to offshore oil and gas producing operations and should be used when applicable.