Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities

API RECOMMENDED PRACTICE 14J
SECOND EDITION, MAY 2001

REAFFIRMED, SEPTEMBER 2019

AMERICAN PETROLEUM INSTITUTE

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Upstream Segment

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Abbreviations

AGA	American Gas Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AWWA	American Water Works Association
CAA	Clean Air Act
Chapt	Chapter
CFR	Code of Federal Regulations
DOT	Department of Transportation
EPA	Environmental Protection Agency
ESD	Emergency Shutdown
FAR	Federal Aviation Regulation
FCC	Federal Communications Commission
HA	Hazards Analysis
IEEE	Institute of Electrical and Electronics Engineers
ISA	Instrument Society of America
MAWP	Maximum Allowable Working Pressure
MMS	Minerals Management Service
MSDS	Material Safety Data Sheet
NEC	National Electric Code
NFC	National Fire Code
NEMA	National Equipment Manufacturers Association
MPMS	Manual of Petroleum Measurement Standards
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PES	Programmable Electronic Systems
PLC	Programmable Logic Controller
P&ID	Process and Instrument Diagram
PFD	Process Flow Diagram
PSV	Pressure Safety Valve
PTC	Power Test Code (ASME)
Publ	Publication
RP	Recommended Practice
SAFE Chart	Safety Analysis Function Evaluation Chart
SCADA	Supervisory Control and Data Acquisition Systems
SEMP	Safety and Environmental Management Plan
SOLAS	International Convention of the Safety of Life at Sea
Std, S	Standard
TEMA	Tubular Exchanger Manufacturers' Association
USCG	United States Coast Guard

Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities

1 General

1.1 PURPOSE

The purpose of this recommended practice is to assemble into one document useful procedures and guidelines for planning, designing and arranging offshore production facilities, and performing a hazards analysis on open-type offshore production facilities. This will promote safe, pollution free and efficient production of oil and gas. This publication is only a guide and requires the application of sound engineering judgment. Furthermore, it is not intended to override or otherwise supersede any existing code or governmental rule or regulation, nor is it intended as a comprehensive document containing all useful and appropriate information.

1.2 SCOPE

This document recommends minimum requirements and guidelines for the design and layout of production facilities on open-type offshore platforms, and it is intended to bring together in one place a brief description of basic hazards analysis procedures for offshore production facilities. This recommended practice discusses several procedures that could be used to perform a hazards analysis, and it presents minimum requirements for process safety information and hazards analysis that can be used for satisfying the requirements of API RP 75.

The concepts contained herein recognize that special hazard considerations exist for offshore production facilities. As a minimum, these include:

1. Spatial limitations that may cause potential ignition sources being installed in or near production equipment.

2. Spatial limitations that may result in quarters being installed near production equipment, pipeline/flow line risers, fuel storage tanks, or other major fuel sources.

3. The inherent fire hazard presented by the release of flammable liquids or vapors, whether during normal operations or as a result of any unusual or abnormal condition.

4. The severe marine environment, including corrosion, remoteness/isolation, and weather (i.e., wind, wave and current, ice).

5. High-temperature and high-pressure fluids, hot surfaces, and rotating equipment located in or near operating areas.

6. The handling of hydrocarbons over water.

7. Large inventories of hydrocarbons from wells/reservoirs and pipelines connected to or crossing a producing platform.

8. Storage and handling of hazardous chemicals.

9. Potential H_2S releases.

This recommended practice is directed to those permanent and temporary installations associated with routine production operations. The guidelines presented herein should provide an acceptable level of safety when used in conjunction with referenced industry codes, practices and standards.

1.3 INDUSTRY CODES, PRACTICES, AND STANDARDS

Various organizations have developed numerous codes, practices and standards that have substantial acceptance by industry and governmental bodies. Codes, practices, and standards useful in the design, fabrication, installation, layout, and operation of offshore production facilities are listed in Appendix C. These references are not to be considered a part of this recommended practice except for those specific sections of documents referenced elsewhere in this recommended practice.

1.4 GOVERNMENT CODES, RULES, AND REGULATIONS

Government regulatory agencies have established certain requirements for the design, fabrication, installation, layout and operation of facilities on offshore production platforms. These requirements may supersede the recommendations of this document. Refer to Appendix D for applicable government codes, rules and regulations related to the outer continental shelf of the United States.

1.5 ORGANIZATION OF TECHNICAL CONTENT

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

Section 2—Introduction. Presents an overview of the general principles of safe facilities design. It addresses the importance of containing flammable hydrocarbons, minimizing the chances of hydrocarbon ignition, preventing fire escalation, and providing personnel escape routes.

Section 3—Basic Facilities Design Concepts. Presents a detailed discussion on basic facilities design. It addresses both general and special safety considerations as well as operational and maintenance considerations.