Overfill Protection for Storage Tanks in Petroleum Facilities

API RECOMMENDED PRACTICE 2350
THIRD EDITION, JANUARY 2005

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FOREWORD

This publication was prepared under the direction of a Support Group comprised of members of the API Safety and Fire Protection Subcommittee. The second edition of API RP 2350 *Overfill Protection for Storage Tanks in Petroleum Facilities* was rewritten and expanded with emergency spill prevention programs in mind and replaced the previous edition in whole and in part. This third edition builds on the second edition with an expansion of the Scope to include both Class I and Class II hydrocarbon liquids as well as tankage in broader usage. Appendixes to the document are intended to provide additional information only.

This document covers overfill protection for all aboveground storage tanks in petroleum facilities, including refineries, terminals, bulk plants, and pipeline terminals that receive Class I (flammable) or Class II (combustible) liquids. It is not intended to include service station tanks, process tanks or tanks used in initial crude oil production activities.

During the development of the current and prior editions of API RP 2350, careful consideration was given to the benefits provided by overfill protection for tanks in petroleum facilities relative to:

- Safety and environmental protection
- Optimization of the work place and operating practices
- Inspection, testing, and maintenance
- Equipment and system selection and installation
- Safe work and emergency procedures and training
- Management of change programs relative to tank overfill protection

All of the sections and appendixes in the document were revised and expanded with the second edition. Illustrations and a tank overfill protection summary chart are provided to help understand the tank capacity and level definitions. API RP 2350 covers overfill protection only. It does not address other issues related to aboveground storage tanks, such as management of large diameter storage tanks, tank fire protection, leak control, drainage, and other subjects that are covered by a number of API standards and other publications listed in the references.

Starting with the second edition the previous definitions for *overfill level*, *tank fill level*, and *normal fill level* were changed. For example, *safe fill level* became the normal maximum allowable tank capacity (normal operating level). The definitions used in the second edition continue in this third edition.

The essential elements of this publication are based on current industry safe operating practices and existing consensus standards. Federal, state, and local regulations or laws may contain additional requirements that must be taken into account when a tank overfill protection program is developed for a specific facility.

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Suggested revisions are invited and should be submitted to API, Standards department, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

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1 General

1.1 INTRODUCTION

Preventing petroleum storage tanks from being overfilled is an important safety and environmental concern. The safe operation of a petroleum storage facility is dependent on the receipt of product into the intended storage tank within its defined capacity. Tank overfills can be effectively reduced by developing and implementing practical and safe operating procedures for storage facilities and by providing for careful selection and application of equipment, scheduled maintenance programs, and employee training.

In providing for overfill protection for storage tanks, the objective is to minimize product overflows that can result in environmental and safety hazards, loss of inventory, and damage to tanks and adjacent areas. Because the level of risk and potential loss varies from location to location, a flexible approach should be used in providing alternatives for meeting the objectives of the facility overfill protection program. Procedures should provide for options that include the use of trained personnel, safe operating practices, and technology.

Recognizing the need for flexibility, this document covers both manual procedures and automatic systems that can be used successfully to protect against overfills.

1.2 SCOPE

1.2.1 Applicability

The scope of this recommended practice (RP) is specifically limited to tanks associated with marketing, refining, pipeline and similar facilities containing Class I or Class II petroleum liquids. This RP does not apply to:

- Underground storage tanks
- Aboveground tanks of 1320 U.S. gallons (5000 liters) or less
- Tanks that are integral to a process
- Tanks containing Class III liquids
- Tanks containing non-combustible liquids
- Service stations
- Loading or delivery from wheeled vehicles (such as tank trucks or railroad tank cars)

1.2.2 Relationship of This Recommended Practice to NFPA 30

This document was prepared to include consistency with NFPA 30-2003 Edition, Chapter 4.6, which includes the following requirements:

> **4.6.1.1** Aboveground tanks at terminals receiving transfer of Class I liquids from mainline pipelines or marine vessels shall follow formal written procedures to prevent overfilling of tanks utilizing one of the following methods of protection:
>
> 1. Tanks gauged at frequent intervals by personnel continuously on the premises during product receipt with frequent acknowledged communication maintained with the supplier so that flow can be promptly shut down or diverted.
> 2. Tanks equipped with a high-level detection device that is independent of any tank gauging equipment. Alarms shall be located where personnel who are on duty throughout product transfer can promptly arrange for flow stoppage or diversion.
> 3. Tanks equipped with an independent high-level detection system that will automatically shut down or divert flow.
> 4. Alternatives to instrumentation described in 4.6.1.1(2) and 4.6.1.1(3), where approved by the authority having jurisdiction as affording equivalent protection.
>
> **4.6.1.2** Instrumentation systems covered in 4.6.1.1(2) and 4.6.1.1(3) shall be electrically supervised or equivalent.
>
> **4.6.1.3** Formal written procedures required 4.6.1.1 shall include the following:
>
> 1. Instructions covering methods to check for proper line-up and receipt of initial delivery to tank designated to receive shipment.
> 2. Provisions for training and monitoring the performance of operating personnel by terminal supervision.
> 3. Schedules and procedures for inspection and testing of gauging equipment and high-level instrumentation and related systems. Inspection and testing intervals shall be acceptable to the authority having jurisdiction but shall not exceed 1 year.

1.3 DEFINITION OF TERMS

For the purposes of this document, the following definitions apply:

1.3.1 attended facility: A facility that has assigned personnel continuously on the premises during receipt of product from a mainline pipeline or marine vessel. An unattended facility does not have assigned personnel on the premises continuously during product receipt from a mainline pipeline or marine vessel.