Terminal Piping Inspection—Inspection of In-Service Terminal Piping Systems

API RECOMMENDED PRACTICE 2611
FIRST EDITION, JUNE 2011

AMERICAN PETROLEUM INSTITUTE

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Downstream Segment

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Foreword

This Standard is intended to provide guidance to terminal personnel for the inspection and repair of existing metallic piping systems at terminal facilities. This Standard is based largely on accepted industry practice for the inspection and repair of terminal piping.

It is the intent of the American Petroleum Institute (API) to keep this publication up-to-date. All terminal piping system Owner/Users are invited to report their experiences in the inspection and repair of piping systems whenever such experiences may suggest a need for revising or expanding the practices set forth in API 2611.

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

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1 Scope

1.1 General

API 2611 covers the inspection of typical terminal piping systems within terminal boundaries, which includes off-plot piping. Off-plot piping includes, but is not limited to piping between facilities, piping that comes from or goes to a refinery, or other type facility, or piping that may cross a road, ditch or other property outside the confines of a terminal facility.

Piping for transportation of finished fuel products such as gasoline, diesel, lubricating oils, jet fuel and aviation fuel are covered by the scope of this document. Also covered are piping systems for nonfuel-type fluids. The piping for other terminal nonfuel-type fluids typically found in terminals, include asphaltic products, process water, transmix, slop water and biofuels.

The scope of this document does not include piping in a refinery facility, sanitary waste piping, cast iron piping and nonmetallic gravity flow piping systems.

1.2 General Application

The purpose of this document is to align current terminal piping inspection practices with the appropriate and applicable elements of API 570. API 2611 covers the inspection of existing terminal piping systems. Figure 1 illustrates typical piping configurations that are encountered at terminals. In addition, the figure indicates possible delineation of United States Department of Transportation [USDOT] (i.e. ASME B31.4/API 1104, Breakout) and non-USDOT (i.e. ASME B31.3, Storage) facilities. Understanding the Codes to which facilities were constructed can facilitate the evaluation of the piping systems. Minor repairs include the restoration or replacement of piping systems to a safe operating condition. Where local or federal regulations apply, more stringent requirements may be applicable.

Terminal management may choose to comply with the requirements of other piping inspection standards, when appropriate. An example of this might be a terminal located within or adjacent to a refinery where there are already piping inspection programs governed by other standards such as API 570 or company specific programs or when specifically required by regulation.

API 2611 incorporates industry accepted practice for terminals as well as selected principles from API 570. This document addresses the piping and associated failure modes commonly found in terminals with piping systems operating at a maximum process design pressure of 300 psi at ambient temperature (an exception on design temperatures is made for asphaltic products). If any repair or alteration results in a change of design conditions, a rerating per API 570 shall be satisfied. For asphaltic products this document covers the maximum process design pressure of 150 psi at a temperature range of 25 °F to 450 °F (–3.9 °C to 232 °C).

In general, with regard to non-regulated off-plot piping, the terminal Owner/User may elect to base their inspection requirements on API 2611, the more stringent API 570 requirements, a combination of the two, or a combination of selected requirements from API 2611 and API 570 in conjunction with their own set of requirements. Regardless of the source, the Owner/User shall have inspection procedures established, documented and adhered to for their terminal facilities.

With the advent of new products, including the use of various oxygenated fuels; special consideration shall be given to the compatibility of the piping system. Of particular interest are seal materials, gaskets, and other elastomers with additives and oxygenates, such as ethanol or methanol. In addition, consideration shall be given to the possibility of stress corrosion cracking (SCC) agents. Additional information can be found on the topic of SCC in API 939-D.