

ASME B31.8S-2018
(Revision of ASME B31.8S-2016)

Managing System Integrity of Gas Pipelines

**ASME Code for Pressure Piping, B31
Supplement to ASME B31.8**

AN INTERNATIONAL PIPING CODE®



**The American Society of
Mechanical Engineers**

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CONTENTS

Foreword	v
Committee Roster	vi
Summary of Changes	x
1 Introduction	1
2 Integrity Management Program Overview	2
3 Consequences	7
4 Gathering, Reviewing, and Integrating Data	9
5 Risk Assessment	12
6 Integrity Assessment	17
7 Responses to Integrity Assessments and Mitigation (Repair and Prevention)	21
8 Integrity Management Plan	28
9 Performance Plan	29
10 Communications Plan	34
11 Management of Change Plan	34
12 Quality Control Plan	35
13 Terms, Definitions, and Acronyms	36
14 References and Standards	42
Nonmandatory Appendices	
A Threat Process Charts and Prescriptive Integrity Management Plans	45
B Direct Assessment Process	63
C Preparation of Technical Inquiries	64
Figures	
2.1-1 Integrity Management Program Elements	3
2.1-2 Integrity Management Plan Process Flow Diagram	4
3.2.4-1 Potential Impact Area	9
7.2.1-1 Timing for Scheduled Responses: Time-Dependent Threats, Prescriptive Integrity Management Plan	26
13-1 Hierarchy of Terminology for Integrity Assessment	36
A-2.1-1 Integrity Management Plan, External Corrosion Threat (Simplified Process: Prescriptive)	46
A-3.1-1 Integrity Management Plan, Internal Corrosion Threat (Simplified Process: Prescriptive)	48
A-5.1-1 Integrity Management Plan, Manufacturing Threat (Pipe Seam and Pipe; Simplified Process: Prescriptive)	52
A-7.1-1 Integrity Management Plan, Construction Threat (Pipe Girth Weld, Fabrication Weld, Wrinkle Bend or Buckle, Stripped Threads/Broken Pipe/Coupling; Simplified Process: Prescriptive)	54
A-7.1-1 Integrity Management Plan, Equipment Threat (Gasket and O-Ring, Control/Relief, Seal/Pump Packing; Simplified Process: Prescriptive)	56
A-8.1-1 Integrity Management Plan, Third-Party Damage Threat [Third-Party Inflicted Damage (Immediate), Vandalism, Previously Damaged Pipe; Simplified Process: Prescriptive]	57

A-9.1-1	Integrity Management Plan, Incorrect Operations Threat (Simplified Process: Prescriptive)	59
A-10.1-1	Integrity Management Plan, Weather-Related and Outside Force Threat (Earth Movement, Heavy Rains or Floods, Cold Weather, Lightning; Simplified Process: Prescriptive)	61
Tables		
4.2.1-1	Data Elements for Prescriptive Pipeline Integrity Program	10
4.3-1	Typical Data Sources for Pipeline Integrity Program	11
5.6.1-1	Integrity Assessment Intervals: Time-Dependent Threats, Internal and External Corrosion, Prescriptive Integrity Management Plan	17
7.1-1	Acceptable Threat Prevention and Repair Methods	23
8.3.4-1	Example of Integrity Management Plan for Hypothetical Pipeline Segment (Segment Data: Line 1, Segment 3)	30
8.3.4-2	Example of Integrity Management Plan for Hypothetical Pipeline Segment (Integrity Assessment Plan: Line 1, Segment 3)	30
8.3.4-3	Example of Integrity Management Plan for Hypothetical Pipeline Segment (Mitigation Plan: Line 1, Segment 3)	31
9.2.3-1	Performance Measures	32
9.4-1	Performance Metrics	33
9.4-2	Overall Performance Measures	34
A-4.4-1	SCC Crack Severity Criteria	51
A-4.4.1-1	Actions Following Discovery of SCC During Excavation	51

FOREWORD

Pipeline system operators continuously work to improve the safety of their systems and operations. In the United States, both liquid and gas pipeline operators have been working with their regulators for several years to develop a more systematic approach to pipeline safety integrity management.

The gas pipeline industry needed to address many technical concerns before an integrity management standard could be written. A number of initiatives were undertaken by the industry to answer these questions; as a result of two years of intensive work by a number of technical experts in their fields, 20 reports were issued that provided the responses required to complete the 2011 edition of this Code. (The list of these reports is included in the reference section of this Code.)

This Code is nonmandatory, and is designed to supplement B31.8, ASME Code for Pressure Piping—Gas Transmission and Distribution Piping Systems. Not all operators or countries will decide to implement this Code. This Code becomes mandatory if and when pipeline regulators include it as a requirement in their regulations.

This Code is a process code that describes the process an operator may use to develop an integrity management program. It also provides two approaches for developing an integrity management program: a prescriptive approach and a performance- or risk-based approach. Pipeline operators in a number of countries are currently utilizing risk-based or risk-management principles to improve the safety of their systems. Some of the international standards issued on this subject were utilized as resources for writing this Code. Particular recognition is given to API and their liquids integrity management standard, API Std 1160, which was used as a model for the format of this Code.

The intent of this Code is to provide a systematic, comprehensive, and integrated approach to managing the safety and integrity of pipeline systems. The task force that developed this Code hopes that it has achieved that intent.

The 2018 Edition of the Supplement is a compilation of the 2011 Edition and the revisions that have occurred since the issuance of the 2016 Edition. This Edition was approved by ANSI on July 2, 2018.

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Code for Pressure Piping

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ASME B31.8S-2018

SUMMARY OF CHANGES

Following approval by the ASME B31 Committee and ASME, and after public review, ASME B31.8S-2018 was approved by the American National Standards Institute on July 2, 2018.

ASME B31.8S-2018 includes the following changes identified by a margin note, **(18)**.

<i>Page</i>	<i>Location</i>	<i>Change</i>
3	2.2	(1) Subparagraphs (c) and (c)(3)(-a) through (c)(3)(-d) revised (2) Subparagraph (c)(3)(-e) added
4	Figure 2.1-2	Revised
8	3.3	(1) Subparagraphs (a), (c), and (g) revised (2) Subparagraph (j) added
16	5.8	Second paragraph revised
23	Table 7.1-1	Nineteenth column and General Note revised
26	7.2.5	Revised
34	10	Revised in its entirety
36	Figure 13-1	Final line in bottom box of “Category” column revised
42	14	Updated

MANAGING SYSTEM INTEGRITY OF GAS PIPELINES

1 INTRODUCTION

1.1 Scope

This Code applies to onshore pipeline systems constructed with ferrous materials and that transport gas. The principles and processes embodied in integrity management are applicable to all pipeline systems.

This Code is specifically designed to provide the operator (as defined in [section 13](#)) with the information necessary to develop and implement an effective integrity management program utilizing proven industry practices and processes. The processes and approaches described within this Code are applicable to the entire pipeline.

1.2 Purpose and Objectives

Managing the integrity of a gas pipeline system is the primary goal of every pipeline system operator. Operators want to continue providing safe and reliable delivery of natural gas to their customers without adverse effects on employees, the public, customers, or the environment. Incident-free operation has been and continues to be the gas pipeline industry's goal. The use of this Code as a supplement to the ASME B31.8 Code will allow pipeline operators to move closer to that goal.

A comprehensive, systematic, and integrated integrity management program provides the means to improve the safety of pipeline systems. Such an integrity management program provides the information for an operator to effectively allocate resources for appropriate prevention, detection, and mitigation activities that will result in improved safety and a reduction in the number of incidents.

This Code describes a process that an operator of a pipeline system can use to assess and mitigate risks in order to reduce both the likelihood and consequences of incidents. It covers both a prescriptive-based and a performance-based integrity management program.

The prescriptive process, when followed explicitly, will provide all the inspection, prevention, detection, and mitigation activities necessary to produce a satisfactory integrity management program. This does not preclude conformance with the requirements of ASME B31.8. The performance-based integrity management program alternative utilizes more data and more extensive risk analyses, which enables the operator to achieve a greater degree of flexibility in order to meet or exceed the requirements of this Code specifically in the areas of inspection intervals, tools used, and mitigation techniques employed. An operator cannot proceed with the performance-based integrity program until adequate inspections are performed that provide the information

on the pipeline condition required by the prescriptive-based program. The level of assurance of a performance-based program or an alternative international standard must meet or exceed that of a prescriptive program.

The requirements for prescriptive-based and performance-based integrity management programs are provided in each of the sections in this Code. In addition, [Nonmandatory Appendix A](#) provides specific activities by threat categories that an operator shall follow in order to produce a satisfactory prescriptive integrity management program.

This Code is intended for use by individuals and teams charged with planning, implementing, and improving a pipeline integrity management program. Typically, a team will include managers, engineers, operating personnel, technicians, and/or specialists with specific expertise in prevention, detection, and mitigation activities.

1.3 Integrity Management Principles

A set of principles is the basis for the intent and specific details of this Code. They are enumerated here so that the user of this Code can understand the breadth and depth to which integrity shall be an integral and continuing part of the safe operation of a pipeline system.

Functional requirements for integrity management shall be engineered into new pipeline systems from initial planning, design, material selection, and construction. Integrity management of a pipeline starts with sound design, material selection, and construction of the pipeline. Guidance for these activities is primarily provided in ASME B31.8. There are also a number of consensus standards that may be used, as well as pipeline jurisdictional safety regulations. If a new line is to become a part of an integrity management program, the functional requirements for the line, including prevention, detection, and mitigation activities, shall be considered in order to meet this Code. Complete records of material, design, and construction for the pipeline are essential for the initiation of a good integrity management program.

System integrity requires commitment by all operating personnel using comprehensive, systematic, and integrated processes to safely operate and maintain pipeline systems. In order to have an effective integrity management program, the program shall address the operator's organization, processes, and the physical system.

An integrity management program is continuously evolving and must be flexible. An integrity management program should be customized to meet each operator's unique conditions. The program shall be periodically evaluated and modified to accommodate changes in pipeline