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**Earthquake-Actuated
Automatic Gas Shutoff
Devices**



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STANDARDS

In 2003, the Board of Direction approved the revision to the ASCE Rules for Standards Committees to govern the writing and maintenance of standards developed by the Society. All such standards are developed by a consensus standards process managed by the Society's Codes and Standards Committee (CSC). The consensus process includes balloting by a balanced standards committee made up of Society members and nonmembers, balloting by the membership of the Society as a whole, and balloting by the public. All standards are updated or reaffirmed by the same process at intervals not exceeding five years.

The following Standards have been issued:

ANSI/ASCE 1-82 N-725 Guideline for Design and Analysis of Nuclear Safety Related Earth Structures
ANSI/ASCE 2-06 Measurement of Oxygen Transfer in Clean Water
ANSI/ASCE 3-91 Standard for the Structural Design of Composite Slabs and ANSI/ASCE 9-91 Standard Practice for the Construction and Inspection of Composite Slabs
ASCE 4-98 Seismic Analysis of Safety-Related Nuclear Structures
Building Code Requirements for Masonry Structures (ACI 530-02/ASCE 5-02/TMS 402-02) and Specifications for Masonry Structures (ACI 530.1-02/ASCE 6-02/TMS 602-02)
ASCE/SEI 7-05 Minimum Design Loads for Buildings and Other Structures
SEI/ASCE 8-02 Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members
ANSI/ASCE 9-91 listed with ASCE 3-91
ASCE 10-97 Design of Latticed Steel Transmission Structures
SEI/ASCE 11-99 Guideline for Structural Condition Assessment of Existing Buildings
ASCE/EWRI 12-05 Guideline for the Design of Urban Subsurface Drainage
ASCE/EWRI 13-05 Standard Guidelines for Installation of Urban Subsurface Drainage
ASCE/EWRI 14-05 Standard Guidelines for Operation and Maintenance of Urban Subsurface Drainage
ASCE 15-98 Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD)
ASCE 16-95 Standard for Load Resistance Factor Design (LRFD) of Engineered Wood Construction
ASCE 17-96 Air-Supported Structures
ASCE 18-96 Standard Guidelines for In-Process Oxygen Transfer Testing
ASCE 19-96 Structural Applications of Steel Cables for Buildings
ASCE 20-96 Standard Guidelines for the Design and Installation of Pile Foundations

ANSI/ASCE/T&DI 21-05 Automated People Mover Standards—Part 1
ASCE 21-98 Automated People Mover Standards—Part 2
ASCE 21-00 Automated People Mover Standards—Part 3
SEI/ASCE 23-97 Specification for Structural Steel Beams with Web Openings
ASCE/SEI 24-05 Flood Resistant Design and Construction
ANSI/ASCE/SEI 25-06 Earthquake-Actuated Automatic Gas Shutoff Devices
ASCE 26-97 Standard Practice for Design of Buried Precast Concrete Box Sections
ASCE 27-00 Standard Practice for Direct Design of Precast Concrete Pipe for Jacking in Trenchless Construction
ASCE 28-00 Standard Practice for Direct Design of Precast Concrete Box Sections for Jacking in Trenchless Construction
SEI/ASCE/SFPE 29-05 Standard Calculation Methods for Structural Fire Protection
SEI/ASCE 30-00 Guideline for Condition Assessment of the Building Envelope
SEI/ASCE 31-03 Seismic Evaluation of Existing Buildings
SEI/ASCE 32-01 Design and Construction of Frost-Protected Shallow Foundations
EWRI/ASCE 33-01 Comprehensive Transboundary International Water Quality Management Agreement
EWRI/ASCE 34-01 Standard Guidelines for Artificial Recharge of Ground Water
EWRI/ASCE 35-01 Guidelines for Quality Assurance of Installed Fine-Pore Aeration Equipment
CI/ASCE 36-01 Standard Construction Guidelines for Microtunneling
SEI/ASCE 37-02 Design Loads on Structures During Construction
CI/ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data
EWRI/ASCE 39-03 Standard Practice for the Design and Operation of Hail Suppression Projects
ASCE/EWRI 40-03 Regulated Riparian Model Water Code
ASCE/EWRI 42-04 Standard Practice for the Design and Operation of Precipitation Enhancement Projects
ASCE/SEI 43-05 Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities
ASCE/EWRI 44-05 Standard Practice for the Design and Operation of Supercooled Fog Dispersal Projects
ASCE/EWRI 45-05 Standard Guidelines for the Design of Urban Stormwater Systems
ASCE/EWRI 46-05 Standard Guidelines for the Installation of Urban Stormwater Systems
ASCE/EWRI 47-05 Standard Guidelines for the Operation and Maintenance of Urban Stormwater Systems
ASCE/SEI 48-05 Design of Steel Transmission Pole Structures

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FOREWORD

The material presented in this publication has been prepared in accordance with recognized engineering principles.

This standard and commentary should not be used without first securing competent advice with respect to their suitability for any given application. The publication of the material contained herein is not intended

as a representation or warranty on the part of the American Society of Civil Engineers, or of any other person named herein, that this information is suitable for any general or particular use or promises freedom from infringement of any patent or patents. Anyone making use of this information assumes all liability from such use.

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HISTORY OF THE DEVELOPMENT OF THE STANDARD

Initiation of a standard for earthquake-actuated automatic gas shutoff devices began in 1977 with a request from the American National Standards Committee Z21 to the Automatic Gas Valve Working Committee of its Subcommittee on Standards for Gas Appliance Control Devices. In 1978, a working group was appointed to proceed with this task and a draft standard was prepared.

The draft standard was distributed for review and comment in mid-1979. A revised draft standard was adopted by the Z21 Committee by letter ballot in December 1979. The first edition of the Standard for Earthquake-Actuated Automatic Gas Shutoff Systems was approved as an American National Standard by the American National Standards Institute on April 16, 1981.

In 1981, the secretariat for this standard was transferred from the American Gas Association to the American Society of Mechanical Engineers (ASME). The ASME committee responsible for the standard did not initiate any changes. In 1991, a proposal was approved for the formation of a Pre-standards Committee within the Gas and Liquid Fuel Lifelines Committee of the American Society of Civil Engineers' (ASCE) Technical Council on Lifeline Earthquake Engineering to revise the shutoff valve standard.

A full Standards Committee was formed in late 1992 and met for the first time in early 1993. The Committee was formed of manufacturing, engineering, local and state government, and insurance representatives.

The aggressive data collection effort following the January 17, 1994, Northridge earthquake provided a unique opportunity to assess the risk posed to the public by natural gas-related post-earthquake fires and ground motions for which automatic gas shutoff would be beneficial. The ASCE Standards Committee met in the months following the Northridge earthquake and finalized the scope of research needed to support development of the revised standard.

Research focused on two key areas. It was decided that dynamic testing of current devices was needed to quantify performance characteristics. The other key area was in-depth examination of Northridge earthquake data on ground motions, structural damage, fire initiation, and actuation of existing earthquake shutoff devices.

A proposal to perform research in these two areas was prepared for ASCE by the Standards Committee and the project was jointly funded by the Federal Emergency Management Agency (FEMA), natural gas utilities, and shutoff device manufacturers. The research project was initiated in March of 1995 and completed in November of 1995.

Performance characteristics of the devices tested were determined and evaluated for both discrete dynamic loads and complex motions such as simulated earthquakes. The results of the dynamic testing of the devices currently on the market bracketed the ranges that were used in defining the actuation requirements in response to seismic disturbances.

The revised ASCE standard, ASCE 25, was first published in 1997.

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Martin Asbra
Antonio Braga
Paul Brooks
Don Clyde
John Diehl, Chair (1999–2004)
Donald Dockray
Douglas Honegger, Chair (2004–2006)
John Jarrell
Peter McDonough, Vice Chair
Jim McGill

government, insurance industry, education, and private practice. This standard was prepared through the consensus standards process by balloting in compliance with procedures of ASCE's Codes and Standards Activities Council. Individuals serving on the Standards Committee are listed below.

Tom McIntyre
Jerry Moore
James Nishimoto
Steve Nolan
Richard Shaw
Raffy Stepanian
Carl Strand
Brad VanDyck
Eric Youngberg