

North America Functional Safety Market Size and Forecast (2021 - 2031)

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Abstracts

The North America Functional Safety Market is projected to grow significantly, reaching an estimated US\$ 4,873.7 million by 2031, up from US\$ 2,871.6 million in 2024. This growth reflects a compound annual growth rate (CAGR) of 8.1% from 2025 to 2031.

Executive Summary and Market Analysis

The North America functional safety market encompasses the United States, Canada, and Mexico, with the region being a leader in the adoption of cutting-edge technologies. It boasts a robust manufacturing sector, particularly in industries such as automotive, chemicals, and oil and gas. The oil and gas sector, in particular, has a critical need for functional safety systems due to the hazardous nature of its operations and stringent regulatory requirements for emergency shutdown (ESD) and fire and gas (FandG) systems. According to the International Energy Agency (IEA), North America's total crude oil production reached 48,602,021 Terajoules (TJ) in 2022, marking a 75% increase since 2000.

In March 2025, Venture Global announced an ambitious expansion of its Plaquemines LNG project in Louisiana, which will increase its capacity by 18 Metric Tonnes per Year (Mt/year), bringing the total to over 45 Mt/year. This expansion, backed by an investment of nearly US\$ 18 billion, underscores the growth of the oil and gas industry and its positive impact on the functional safety market in North America.

Strategic Insights

Market Segmentation

The North America Functional Safety Market is categorized by several factors:

By Offering: The market is divided into Components and Services, with the Components segment leading in 2024.

By System: This includes Emergency Shutdown Systems (ESD), High Integrity Pressure Protection Systems (HIPPS), Burner Management Systems (BMS), Fire and Gas Monitoring, Turbo Machinery Control (TMC), and others. The ESD segment was the largest in 2024.

By End-user Industry: The market is segmented into Power Generation, Oil and Gas, Chemicals, Pharmaceuticals, Food and Beverages, and others, with Power Generation being the dominant segment in 2024.

Market Outlook

Industries such as aerospace, automotive, oil and gas, food, and pharmaceuticals are increasingly integrating software-based solutions and automated processes to enhance functional safety. This involves designing safety systems that account for operational risks and complexities. Functional safety standards play a crucial role in identifying areas where safety measures are necessary, beginning with the identification of potential dangerous failures and employing a risk-based approach to establish safety integrity levels (SIL) or performance levels (PL) for safety functions.

Various international standards guide businesses in demonstrating functional safety. For instance, IEC 61508 serves as the foundational international standard for functional safety, applicable to any safety-related electronic or programmable electronic product. Other relevant standards include EN ISO 13849-1 for mechanical and hydraulic systems, IEC 62061 for safety control systems in the equipment industry, and ISO 26262 for automotive systems. The medical device industry adheres to IEC 62304, which outlines software lifecycle procedures, while the nuclear power sector follows IEC 60880 for safety function software. The rail industry is governed by EN 50128, which addresses electric and electronic protection software. Compliance with these standards is essential for industries to avoid penalties and maintain operational licenses, driving investment in functional safety systems.

Country Insights

The North America Functional Safety Market is further segmented by country, with the United States holding the largest market share in 2024. The demand for functional safety is rising across various sectors in the US, particularly in oil and gas. As of January 1, 2023, the US had 129 operational petroleum refineries, which are essential for meeting global petroleum product demands. The US leads the world in crude oil production, averaging 12.9 million barrels per day (b/d) in 2023, surpassing the previous record of 12.3 million b/d set in 2019. Additionally, the US accounts for nearly 40% of the global ethane-based petrochemical production capacity. This surge in crude oil, petroleum, and petrochemical production is expected to further drive the demand for functional safety systems in the country.

Company Profiles

Key players in the North America Functional Safety Market include ABB Ltd, Schneider Electric SE, Emerson Electric Co, Honeywell International Inc, Rockwell Automation Inc, Siemens AG, OMRON Corp, Yokogawa Electric Corp, GE Vernova Inc., and HIMA Paul Hildebrandt GmbH. These companies are actively pursuing strategies such as expansion, product innovation, and mergers and acquisitions to enhance their offerings and increase market share.

In conclusion, the North America Functional Safety Market is poised for substantial growth, driven by advancements in technology, regulatory compliance, and the increasing need for safety in high-risk industries.

Contents

1. INTRODUCTION

- 1.1 Report Guidance
- 1.2 Market Segmentation

2. EXECUTIVE SUMMARY

- 2.1 Key Insights
- 2.2 Market Attractiveness

3. RESEARCH METHODOLOGY

- 3.1 Secondary Research
- 3.2 Primary Research
 - 3.2.1 Hypothesis formulation:
 - 3.2.2 Macroeconomic factor analysis:
 - 3.2.3 Developing base number:
 - 3.2.4 Data Triangulation:
 - 3.2.5 Country-level data:

4. FUNCTIONAL SAFETY MARKET LANDSCAPE

- 4.1 Market Overview
- 4.2 PEST Analysis
- 4.3 Ecosystem Analysis
- 4.4 List of Vendors in the Value Chain

5. NORTH AMERICA FUNCTIONAL SAFETY MARKET – KEY MARKET DYNAMICS

- 5.1 Market Drivers
- 5.2 Market Restraints
- 5.3 Market Opportunities
- 5.4 Future Trends
- 5.5 Impact of Drivers and Restraints:

6. FUNCTIONAL SAFETY MARKET - NORTH AMERICA MARKET ANALYSIS

6.1 North America Functional Safety Market Revenue (US\$ Million), 2024 – 2031

6.2 North America Functional Safety Market Forecast and Analysis

7. NORTH AMERICA FUNCTIONAL SAFETY MARKET REVENUE ANALYSIS – BY OFFERING

7.1 Component

7.1.1 Overview

7.1.2 Component: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

7.2 Services

7.2.1 Overview

7.2.2 Services: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

8. NORTH AMERICA FUNCTIONAL SAFETY MARKET REVENUE ANALYSIS – BY SYSTEM

8.1 Emergency Shutdown System (ESD)

8.1.1 Overview

8.1.2 Emergency Shutdown System (ESD): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

8.2 High Integrity Pressure Protection System (HIPPS)

8.2.1 Overview

8.2.2 High Integrity Pressure Protection System (HIPPS): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

8.3 Burner Management System (BMS)

8.3.1 Overview

8.3.2 Burner Management System (BMS): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

8.4 Fire and Gas Monitoring

8.4.1 Overview

8.4.2 Fire and Gas Monitoring: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

8.5 Turbo Machinery Control (TMC)

8.5.1 Overview

8.5.2 Turbo Machinery Control (TMC): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

8.6 Others

8.6.1 Overview

8.6.2 Others: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

9. NORTH AMERICA FUNCTIONAL SAFETY MARKET REVENUE ANALYSIS – BY END-USER INDUSTRY

9.1 Power Generation

9.1.1 Overview

9.1.2 Power Generation: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

9.2 Oil and Gas

9.2.1 Overview

9.2.2 Oil and Gas: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

9.3 Chemicals

9.3.1 Overview

9.3.2 Chemicals: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

9.4 Pharmaceutical

9.4.1 Overview

9.4.2 Pharmaceutical: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

9.5 Food and Beverages

9.5.1 Overview

9.5.2 Food and Beverages: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

9.6 Others

9.6.1 Overview

9.6.2 Others: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

10. NORTH AMERICA FUNCTIONAL SAFETY MARKET – COUNTRY ANALYSIS

10.1 North America

10.1.1 North America Functional Safety Market Revenue and Forecast and Analysis – by Country

10.1.1.1 North America Functional Safety Market Revenue and Forecast and Analysis – by Country

10.1.2.2 United States: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

10.1.2.2.1 United States: North America Functional Safety Market Share – by Offering

10.1.2.2.2 United States: North America Functional Safety Market Share – by System

10.1.2.2.3 United States: North America Functional Safety Market Share – by End-user Industry

10.2.3.3 Canada: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

10.2.3.3.1 Canada: North America Functional Safety Market Share – by Offering

10.2.3.3.2 Canada: North America Functional Safety Market Share – by System

10.2.3.3.3 Canada: North America Functional Safety Market Share – by End-user Industry

10.3.4.4 Mexico: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

10.3.4.4.1 Mexico: North America Functional Safety Market Share – by Offering

10.3.4.4.2 Mexico: North America Functional Safety Market Share – by System

10.3.4.4.3 Mexico: North America Functional Safety Market Share – by End-user Industry

11 COMPETITIVE LANDSCAPE

11.1 Heat Map Analysis by Key Players

11.2 Company Market Share Analysis, 2024

12 INDUSTRY LANDSCAPE

12.1 Overview

12.2 New Product Development

12.3 Merger and Acquisition

12.4 Other Strategic Developments

13 COMPANY PROFILES

13.1 ABB Ltd

13.1.1 Key Facts

13.1.2 Business Description

13.1.3 Products and Services

- 13.1.4 Financial Overview
- 13.1.5 SWOT Analysis
- 13.1.6 Key Developments
- 13.2 Schneider Electric SE
 - 13.2.1 Key Facts
 - 13.2.2 Business Description
 - 13.2.3 Products and Services
 - 13.2.4 Financial Overview
 - 13.2.5 SWOT Analysis
 - 13.2.6 Key Developments
- 13.3 Emerson Electric Co
 - 13.3.1 Key Facts
 - 13.3.2 Business Description
 - 13.3.3 Products and Services
 - 13.3.4 Financial Overview
 - 13.3.5 SWOT Analysis
 - 13.3.6 Key Developments
- 13.4 Honeywell International Inc
 - 13.4.1 Key Facts
 - 13.4.2 Business Description
 - 13.4.3 Products and Services
 - 13.4.4 Financial Overview
 - 13.4.5 SWOT Analysis
 - 13.4.6 Key Developments
- 13.5 Rockwell Automation Inc
 - 13.5.1 Key Facts
 - 13.5.2 Business Description
 - 13.5.3 Products and Services
 - 13.5.4 Financial Overview
 - 13.5.5 SWOT Analysis
 - 13.5.6 Key Developments
- 13.6 Siemens AG
 - 13.6.1 Key Facts
 - 13.6.2 Business Description
 - 13.6.3 Products and Services
 - 13.6.4 Financial Overview
 - 13.6.5 SWOT Analysis
 - 13.6.6 Key Developments
- 13.7 OMRON Corp

- 13.7.1 Key Facts
- 13.7.2 Business Description
- 13.7.3 Products and Services
- 13.7.4 Financial Overview
- 13.7.5 SWOT Analysis
- 13.7.6 Key Developments
- 13.8 Yokogawa Electric Corp
 - 13.8.1 Key Facts
 - 13.8.2 Business Description
 - 13.8.3 Products and Services
 - 13.8.4 Financial Overview
 - 13.8.5 SWOT Analysis
 - 13.8.6 Key Developments
- 13.9 GE Vernova Inc.
 - 13.9.1 Key Facts
 - 13.9.2 Business Description
 - 13.9.3 Products and Services
 - 13.9.4 Financial Overview
 - 13.9.5 SWOT Analysis
 - 13.9.6 Key Developments
- 13.10 HIMA Paul Hildebrandt GmbH
 - 13.10.1 Key Facts
 - 13.10.2 Business Description
 - 13.10.3 Products and Services
 - 13.10.4 Financial Overview
 - 13.10.5 SWOT Analysis
 - 13.10.6 Key Developments

14. APPENDIX

- 14.1 About The Insight Partners

List Of Tables

LIST OF TABLES

Table 1. North America Functional Safety Market Segmentation

Table 2. List of Vendors

Table 3. North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

Table 4. North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by Offering

Table 5. North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by System

Table 6. North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by End-user Industry

Table 7. North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by Country

Table 8. United States: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by Offering

Table 9. United States: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by System

Table 10. United States: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by End-user Industry

Table 11. Canada: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by Offering

Table 12. Canada: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by System

Table 13. Canada: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by End-user Industry

Table 14. Mexico: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by Offering

Table 15. Mexico: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by System

Table 16. Mexico: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million) – by End-user Industry

Table 17. Heat Map Analysis by Key Players

List Of Figures

LIST OF FIGURES

- Figure 1. North America Functional Safety Market Segmentation – Country
- Figure 2. PEST Analysis
- Figure 3. Ecosystem: Functional Safety Market
- Figure 4. North America Functional Safety Market – Key Market Dynamics
- Figure 5. Impact Analysis of Drivers and Restraints
- Figure 6. North America Functional Safety Market Revenue (US\$ Million), 2024 – 2031
- Figure 7. North America Functional Safety Market Share (%) – by Offering, 2024 and 2031
- Figure 8. Component: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 9. Services: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 10. North America Functional Safety Market Share (%) – by System, 2024 and 2031
- Figure 11. Emergency Shutdown System (ESD): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 12. High Integrity Pressure Protection System (HIPPS): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 13. Burner Management System (BMS): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 14. Fire and Gas Monitoring: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 15. Turbo Machinery Control (TMC): North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 16. Others: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 17. North America Functional Safety Market Share (%) – by End-user Industry, 2024 and 2031
- Figure 18. Power Generation: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 19. Oil and Gas: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 20. Chemicals: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)
- Figure 21. Pharmaceutical: North America Functional Safety Market – Revenue and

Forecast, 2021 – 2031 (US\$ Million)

Figure 22. Food and Beverages: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

Figure 23. Others: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

Figure 24. North America Functional Safety Market Breakdown by Key Countries, 2024 and 2031 (%)

Figure 25. United States: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

Figure 26. Canada: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

Figure 27. Mexico: North America Functional Safety Market – Revenue and Forecast, 2021 – 2031 (US\$ Million)

Figure 28. Company Market Share Analysis, 2024

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