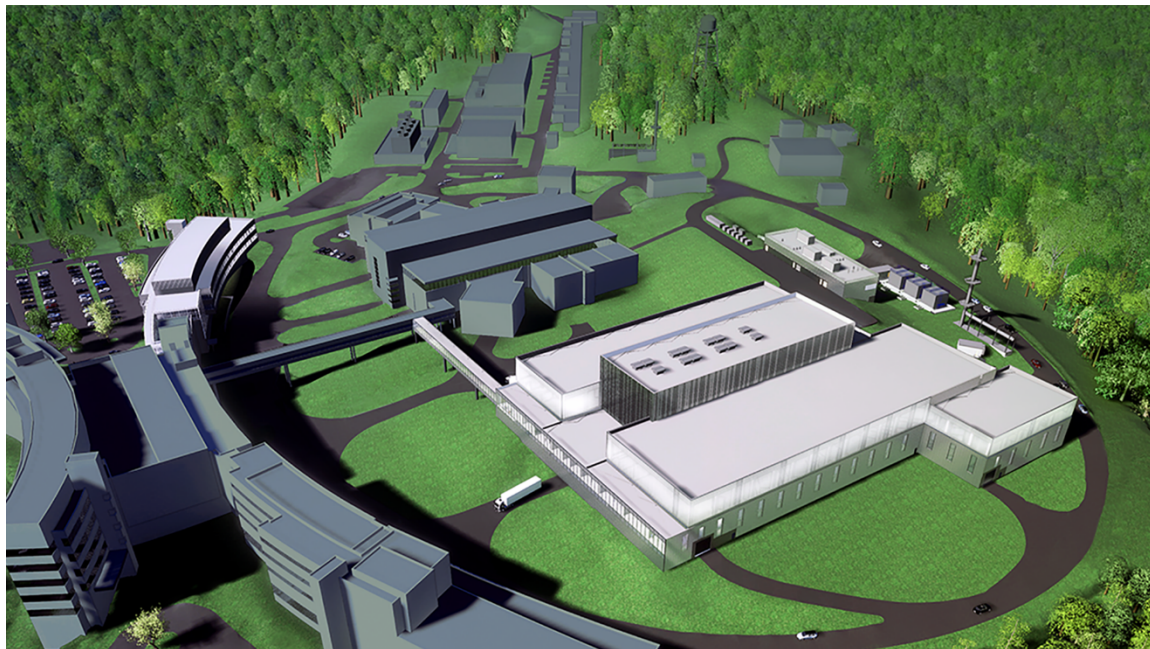


Second Target Station (STS) Project Code of Record



April 2024



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S01020500-COR10000

Second Target Station Project

SECOND TARGET STATION (STS) PROJECT CODE OF RECORD

April 2024

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US DEPARTMENT OF ENERGY
under contract DE-AC05-00OR22725

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Approvals

Second Target Station (STS) Project Code of Record		ISSUE DATE: April 2024
PREPARED BY David C Anderson	PROJECT Second Target Station	DOCUMENT NUMBER: S01020500-COR10000

	Signature / Date					
	Rev. 00	Date	Rev. 01	Date	Rev. 02	Date
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Revision		Description				
00		Initial Release – supersedes S01030100-ST0001 Standards for Design and Construction				

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Acronyms

AABC	Associated Air Balance Council
AASHTO	American Association of State Highway and Transportation Officials
ABA	Architectural Barriers Act
ACGIH	American Conference of Governmental Industrial Hygienists
ACI	American Concrete Institute
ADA	Americans with Disability Act
AHRI	Air Conditioning, Heating and Refrigeration Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
ASA	American Subcontractors Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Safety Engineers
ASTM	ASTM International (formerly known as American Society for Testing and Materials)
AWS	American Welding Society
BOD	Basis of Design
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CMAA	Crane Manufacturer's Association of America
COR	Code of Record
CSN EN	Czech Standardization Agency - English
CTI	Cooling Technology Institute
DOD	Department of Defense
DOE	Department of Energy
DOJ	Department of Justice
FGMA	Flat Glass Marketing Association
HPR	Highly Protected Risk
IBC	International Building Code
ICC	International Code Council
IECC	International Energy Conservation Code
IEEE	Institute of Electrical and Electronics Engineers
IFC	International Fire Code
IFGA	International Fuel Gas Code
IMC	International Mechanical Code
IPC	International Plumbing Code
ISA	Instrument Society of America
ISO	International Organization for Standardization
ITSDF	Industrial Truck Standards Development Foundation
MBMA	Metal Building Manufacturer's Association
NBBI	The National Board of Boiler and Pressure Vessel Inspectors
NEBB	National Environmental Balancing Bureau
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFPA	National Fire Protection Association
NPH	Natural Phenomena Hazard

NRCA	National Roofing Contractors Association
OFR	Office of Federal Register
OR	Oak Ridge
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
NACE	National Association of Corrosion Engineers
NRCS	Natural Resources Conservation Service
SDI	Steel Deck Institute
SIA	Scaffolding Industry Association
SMACNA	Sheet Metal and Air Contracting Contractors' National Association
SNS	Spallation Neutron Source
STS	Second Target Station
TIA	Telecommunications Industry Association
TMS	The Masonry Society
TN	Tennessee
UL	Underwriters Laboratory
US	United States
USDA	United States Department of Agriculture
USC	United States Code
UT-B	UT-Battelle, LLC
WSS	Work Smart Standards

1. INTRODUCTION

The purpose of this document is to formally establish the Code of Record (COR) for the Second Target Station (STS) project. The STS is a Department of Energy (DOE) capital asset project to be constructed at the Oak Ridge National Laboratory (ORNL) Spallation Neutron Source (SNS). It will provide wholly new capabilities for the study of a broad range of materials with neutron scattering and support thousands of users from the physical, materials, and applied sciences and industry. The STS will deliver the highest peak brightness of cold neutrons in the world, ensuring US leadership in neutron scattering for decades to come.

2. CODE OF RECORD

Federal and state regulations, as indicated below in Table 1 and Table 2, do not have a date associated with them because the UT-Battelle, LLC 2020 contract clause I.126, “Laws, Regulations, and DOE Directives,” states, “In performing work under this contract, the contractor shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), unless relief has been granted in writing by the appropriate regulatory agency.”

Industry codes and standards in Table 3 and Table 4 include the applicable year.

The laws, regulations, codes, standards (etc.) listed in the tables have embedded or referenced codes and standards within them, all of which are also applicable.

Because the STS will be an accelerator facility, not a nuclear one, the International Building Code (IBC), as well as the other so called “I-Codes” (cited in Table 3), and their associated codes and standards, are applicable. ORNL Work Smart Standards (WSS) specify the 2018 versions of these codes. See S01030100-ESH10001 *STS Natural Phenomena Hazard Basis of Design - STS Seismic, STS Extreme Straight-Line Wind/Tornado, Precipitation/Flood, Lightning, and Snow/Ice/Cold Requirements*, Section 3 *Regulatory Basis* for a more detailed discussion on this subject. Although the IBC is commonly used in commercial construction, S01030100-ESH10001 *Natural Phenomena Hazard Basis of Design* (NPH BOD) requires modified importance factors and response modification coefficients to mitigate the unique NPH hazards associated with the STS. In addition to the NPH related coefficients specified in section 6 *Credited SSC Function of Mitigating Design Features* of S01030100-ESH1000 *NPH BOD*, the roof covering must be categorized as Class A to comply with DOE Highly Protected Risk (HPR) expectations.

Table 4, in addition to listing guides and manuals (not requirements or regulations), lists codes and standards that cannot be strictly followed (for example, a standard may not be directly applicable in a radiation environment) but should be followed “in the spirit” of the code or standard by the responsible engineer under the guidance of their engineering manager.

Table 1 Regulations and Executive Orders

Number	Name
10 CFR 431	Energy Conservation Program for Certain Commercial and Industrial Equipment: Energy Conservation Standards for Distribution Transformers
10 CFR 436	Federal Energy Management and Planning Programs
10 CFR 835	Occupational Radiation Protection
10 CFR 851	Worker Safety and Health Program (with notes)
10 CFR 962	By-product Material
10 CFR 1021	National Environmental Policy Act (NEPA) Implementation Procedures
10 CFR 1022	Compliance with Floodplain/Wetlands Environmental Review Requirements
29 CFR 1904.4 through 1904.11, 1904.29 through 1904.33 and 1904.46	Recordkeeping and Reporting Occupational Injuries and Illnesses
29 CFR 1910 excluding 29 CFR 1910.1096 and 29 CFR 1910.1000	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1977	Discrimination Against Employees Exercising Rights under the Williams-Steiger Occupational Safety & Health Act of 1970
40 CFR 50-99	Clean Air Act Implementing Regulations
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR Part 82 Subpart F	Recycling and Emissions Reduction
40 CFR Part 82 Subpart G	Significant New Alternative Policy Program
40 CFR 104-149	Implementing Regulations for Federal Water Pollution Control Act & Safe Drinking Water Act
40 CFR 141	National Primary Drinking Water Standards
40 CFR 142	National Interim Primary Drinking Water Regulations Implementation
40 CFR 232	Program Definitions: Exempt Activities Not Requiring 404 Permits
40 CFR 260-280	Federal Hazardous Waste Regulations
40 CFR 302	Designation, Reportable Quantities & Notification
40 CFR 311	Worker Protection
40 CFR 355	Facility Notification & Release Reporting Requirements
40 CFR 370	Hazardous Chemical Inventory Reporting Requirements
40 CFR 372	Toxic Release Reporting Requirements
40 CFR 50-99	CAA Implementing Regulations
40 CFR 1500-1508	Council on Environmental Quality
41 CFR 101-19.6	Uniform Federal Accessibility Standards

Number	Name
49 CFR 106-199	U.S. Department of Transportation (DOT) Hazardous Materials Regulations
42 USC 126	Equal Opportunity for Individuals with Disabilities
42 USC 13101-13109	Pollution Prevention Act
42 USC 300f to 300j-26	Safe Drinking Water Act
47 USC 5	Wire or Radio Communication
49 USC 1813 et seq	Hazardous Materials Transportation Act
Public Law 101-336	Americans with Disability Act (ADA)
Architectural Barriers Act	Architectural Barriers Act (ABA) Standards
CFR 1926 Subpart M	Fall Protection
EISA 438	Storm water runoff requirements for Federal development projects
Executive Order 11988	Floodplain Management
Executive Order 11990	Protection of Wetlands
Executive Order 14008	Executive Order on Tackling the Climate Crisis at Home and Abroad
FED-STD-795	Uniform Federal Accessibility Standards
1-2016	Stormwater Management Ordinance
Tennessee Code Annotated 65-15-101 et seq.	Motor Carriers
Tennessee Code Annotated 68-120-101 et seq.	Statewide building construction safety standards Promulgation Applicability.
Tennessee Code Annotated 68-140-307	Standards for Vehicles and Equipment
Tennessee Rules and Regulations 0400-11-01	Solid Waste Processing and Disposal
Tennessee Rules and Regulations 0400-12-01	Hazardous Waste Management
Tennessee Rules and Regulations 0400-40	Tennessee Water Quality Regulations
Tennessee Rules and Regulations 0400-45-01	Public Water Systems
Tennessee Rules and Regulations 0400-48-01	Regulation to Govern Subsurface Sewage Disposal System
Tennessee Rules and Regulations 0400-18-01	Underground Storage Tank Program
Tennessee Rules and Regulations 0400-40	Tennessee Water Quality Regulations
Tennessee Rules and Regulations 0400-45-01	Public Drinking Water Systems
Tennessee Rules and Regulations 0400-48-01	Regulation to Govern Subsurface Sewage Disposal Systems

Number	Name
Tennessee Rules and Regulations 1200-3	Division of Air Pollution Control Regulations
Tennessee Rules and Regulations 1660-01-32	Wildlife Resources

Table 2 DOE Directives

Number	Name
DOE O 414.1D, Change 2	Quality Assurance
DOE O 420.1C, Change 3	Facility Safety
DOE O 420.1C, Change 3	Attachment 2, Chapter II, “Fire Protection,” with Implementation Assumptions
DOE O 420.1C, Change 3	Attachment 2, Chapter IV, “Natural Phenomena Hazards Mitigation,” with Implementation Assumptions
DOE O 420.1C, Change 3	Invoked and applicable standards, with Implementation Assumptions:
DOE O 420.1C, Change 3	DOE Standard 1189-2016, Integration of Safety into the Design Process
DOE O 420.1C, Change 3	DOE Standard 1020-2016, Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities, with implementation assumptions
DOE O 420.1C, Change 3	IEEE 323-2003 (R2008), IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations
DOE O 420.1C, Change 3	IEEE 384-2008, IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits
DOE O 420.2D	Safety of Accelerator Facilities
DOE O 435.1, Change 2	Radioactive Waste Management
DOE O 458.1, Change 4	Radiation Protection of the Public and the Environment
DOE O 460.1D Change 1	Hazardous Materials Packaging and Transportation Safety
DOE O 460.2B	Departmental Materials Transportation and Packaging Management
DOE-STD-1020-2016	Natural Phenomena Hazards Design and Evaluation Criteria for DOE Facilities
DOE-STD-1066-2023	Fire Protection
DOE STD 1073-2016	Configuration Management
DOE STD 1090-2011	Hoisting and Rigging, with Implementation Assumptions
DOE-STD-1189-2016	Integration of Safety into the Design Process
DOE-TEMA Emergency Management Coordination	DOE-TEMA Emergency Management Coordination (With Assumptions), Agreement Between the United States Department of Energy and the State of Tennessee for Emergency Management Coordination, Dated November 19, 2019
DOE-STD-3020	Specification for HEPA Filters Used by DOE Contractors
Pelletier Letter	Table 1, “Surface Activity Guidelines” (and footnotes)

Table 3 Industry Codes and Standards

Number	Name	Year
ACGIH	Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices	2016
ACI 318	American Concrete Institute, Building Code Requirements for Structural Concrete	2014
AISC 341	Seismic Provisions for Structural Steel Buildings	2016
AISC 360	Specification for Structural Steel Buildings	2016
AISI S202	Code of Standard Practice for Cold-formed Steel Framing	2015
AMCA 500-L	Laboratory Methods of Testing Louvers for Rating	2015
AMCA 2500-D	Laboratory Methods of Testing Dampers for Rating	2018
AMCA 2500-L	Laboratory Methods of Testing Louvers for Rating	2015
ANSI A13.1	Scheme for the Identification of Piping Systems	2020
ANSI A14.3	American National Standard for Ladders, Fixed, Safety Requirements	2008
ANSI N14.6	Special Lifting Devices for shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials	1993
ANSI Z88.2	American National Standard for Respiratory Protection	2015
ANSI Z358.1	Emergency Eye Wash and Shower Equipment	2014
ANSI/ASA S12.2	Criteria for Evaluating Room Noise	2015
ANSI/ASSE Z359.6	Specifications and Design Requirements for Active Fall Protection Systems	2017
ANSI/ITSDF B56.5	Safety Standard for Driverless, Automatic Guided Industrial Vehicles and Automated Functions of Manned Industrial Vehicles	2005
ANSI/ITSDF B56.6	Safety Standard for Rough Terrain Forklift Trucks	2016
ANSI MH29.1	Safety Standard for Industrial Scissor Lifts	2020
ANSI/NECA/BICSI 568-2006	Standard for Installing Commercial Building Telecommunications Cabling	2006
ANSI/PSAI Z 4.1	Sanitation - In Places of Employment - Minimum Requirements	2016
ANSI/SIA A92.2	Vehicle-Mounted Elevating and Rotating Aerial Devices (equipment design specification only)	1990
ANSI/TIA 568.1-D	Commercial Building Telecommunications Cabling Standard	2020, Rev. E
ANSI/TIA 568.3-D	Optical Fiber Cabling and Components Standard	2022, Rev. E
ANSI/TIA 758-B	Customer-Owned Outside Plant Telecommunications Infrastructure Standard	2012, Rev. B
ANSI/TIA 862-B	Building Automation Systems Cabling Standard	2022, Rev. C
ANSI/TIA 942-B	Telecommunications Infrastructure Standard for Data Centers	2017, Rev. B

Number	Name	Year
ANSI/TIA-5017	Telecommunications Physical Network Security Standard Working	2016
ANSI/TIA-5018	Structured Cabling Infrastructure Standard to support Distributed Antenna System	2016
AHRI 310/380	Packaged Terminal Air Conditioners and Heat Pumps	2017
AHRI 410	Forced Circulation Air Cooling and Air Heating Coils	2001
AHRI 430	Standard for Central Station Air Handling Units	2020
AHRI 550/590 I-P	Performance Rating of Water-chilling and Heat Pump Water-heating Packages Using the Vapor Compression Cycle	2023
ASCE 7-16	American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures	2016
ASHRAE 15	Safety Standard for Refrigeration Systems	2019
ASHRAE 34	Designation and Safety Classification of Refrigerants	2019
ASHRAE 52.2	Methods for Testing for Removal Efficiency by Particle Size in Air Cleaning Devices	2017
ASHRAE 55	Thermal Environment Conditions for Human Occupancy	2017
ASHRAE 62.1	Ventilation for Acceptable Indoor Air Quality	2019
ASHRAE 90.1	Energy Standard for Buildings Except Low-Rise Residential Buildings	2013
ASHRAE 188	Legionellosis: Risk Management for Building Water Systems (ANSI Approved))	2018
ASME AG-1	Code on Nuclear and Gas Treatment	2023
ASME A17.1a	Safety Code for Elevators and Escalators	2016
ASME B16.9	Factory Made Wrought Butt welding Fittings	2018
ASME B18.2.1	Square, Hex, Heavy Hex, and Askew Head Bolts, and Lag Screws	2012
ASME B18.2.2	Nuts for General Applications: Machine Screw Nuts, Hex, Square, Flange and Coupling Nuts	2015
ASME B30.1	Jacks, Industrial Rollers, Air Casters, and Hydraulic Gantries	2015
ASME B30.2	American Society of Mechanical Engineers, Overhead and Gantry Cranes, Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist	1967
ASME B30.3	Tower Cranes	2016
ASME B30.4	Portal and Pedestal Cranes	2015
ASME B30.5	Mobile and Locomotive Cranes	2014
ASME B30.6	Derricks	2015
ASME B30.7	Winches	2016
ASME B30.9	Slings	2018
ASME B30.10	Hooks	2014
ASME B30.11	Monorails and Underhung Cranes	2004

Number	Name	Year
ASME B30.12	Handling Loads Suspended from Rotorcraft	2011
ASME B30.13	Storage/Retrieval Machines and Associated Equipment	2017
ASME B30.14	Side Boom Tractors	2015
ASME B30.16	Overhead Hoists (Underhung)	2017
ASME B30.17	Overhead and Gantry Cranes, Top Running Bridge, Single Girder, Underhung Hoist	2015
ASME B30.20	Below-The-Hook Lifting Devices	2013
ASME B30.21	Lever Hoists Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings	2014
ASME B30.22	Articulating Boom Cranes	2016
ASME B30.23	Personnel Lifting Systems	2016
ASME B30.24	Container Cranes	2013
ASME B30.25	Scrap and Material Handlers	2013
ASME B30.26	Rigging Hardware	2015
ASME B30.27	Material Placement Systems Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings	2014
ASME B30.28	Balance Lifting Units	2015
ASME B31.1	Power Piping	2018
ASME B31.12	Hydrogen Piping and Pipelines	2019
ASME B31.3	Process Piping	2020
ASME B31.4	Pipeline Transportation Systems for Liquids and Slurries	2022
ASME B31.5	Refrigeration Piping and Heat Transfer Components	2022
ASME B31.8	Gas Transmission and Distribution Piping	2020
ASME B31.8S	Managing System Integrity of Gas Pipelines	2020
ASME B31.9	Building Services Piping	2017
ASME / ANSI B4.1	Preferred Limits and Fits for Cylindrical Parts	2020
ASME / ANSI B4.2	Preferred Metric Limits and Fits	2020
ASME BPVC	Boiler and Pressure Vessel Code	2023
ASME BTH-1	Design of Below-the-Hook Lifting Devices	2023
ASME HST-1	Performance Standard for Electric Chain Hoists	2023
ASME HST-2	Performance Standard for Hand Chain Manually Operated Chain Hoists	2023
ASME HST-3	Performance Standard for Manually Lever Operated Chain Hoists	2022
ASME HST-4	Performance Standard for Electric Wire Rope Hoists	2021
ASME HST-5	Performance Standard for Air Chain Hoists	2020
ASME HST-6	Performance Standard for Air Wire Rope Hoists	2020
ASME PASE	Safety Standard for Portable Automotive Service Equipment	2019

Number	Name	Year
ASME Y14.100	Engineering Drawing Packages	2017
ASME Y14.36	Surface Finish	2018
ASME Y14.38	Abbreviations	2019
ASME / ANSI Y14.5	Dimensioning and Tolerancing	2018
ASME Y14.6	Screw Thread Representation	2018
ASNT SNT-TC-1A	Qualification of Nondestructive Testing Personnel	2016
ASSP A10.18	Safety Requirements for Temporary Roof and Floor Holes, Wall Openings, Stairways, and Other Unprotected Edges in Construction and Demolition Operations	2012
ASTM A36	Standard Specification for Carbon Structural Steel	2019
ASTM A391/A391M	Standard Specification for Grade 80 Alloy Steel Chain	2021
ASTM B29	Standard Specification for Refined Lead	2019
ASTM B749	Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products	2020
ASTM B774	Standard Specification for Low Melting Point Alloys and Solders	2021
ASTM B777	Standard Specification for Tungsten Base, High-Density Metal	2015
ASTM C478-12	Standard Specification for Precast Reinforced Concrete Manhole Sections, Part II, Steps and Ladders, Section 16	2017
ASTM C637	Standard Specification for Aggregates for Radiation-Shielding Concrete	2020
ASTM C1036-01	Standard Specification for Flat Glass	2001
ASTM C 1572	Standard Guide for Dry Lead Glass and Oil-Filled Lead Glass Radiation Shielding Window Components for Remotely Operated Facilities	2018
ASTM C1572	Standard Guide for Dry Lead Glass and Oil-Filled Lead Glass Radiation Shielding Window Components for Remotely Operated Facilities	2018
ASTM C1831	Standard Guide for Gamma Radiation Shielding Performance Testing	2017
ASTM E108	Standard Test Methods for Fire Tests of Roof Coverings	2020
ASTM E165/E165M	Standard Practice for Liquid Penetrant Testing for General Industry	2023
ASTM E408	Standard Test Method for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques	2013
ASTM E709	Standard Guide for Magnetic Particle Testing	2021
ASTM E1592	Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference	2012
ATC-105	Acceptance Test Code	2019
ATC 128	Code for Measurement of Sound from Water Cooling Towers	2014

Number	Name	Year
AWS A2.4	Standard Welding Symbols	2020
AWS A5.8	Specification for Filler Metals for Brazing and Braze Welding	2019
AWS B2.1/B2.1M	Specification for Welding Procedure and Performance Qualification	2021
AWS D1.1/D1.1M	Structural Welding Code—Steel	2015
AWS D1.2/D1.2M	Structural Welding Code—Aluminum	2020
AWS D1.3/D1.3M	Structural Welding Code—Sheet Steel	2018
AWS D1.4	American Welding Society, Structural Welding Code - Reinforcing Steel	2011
AWS D1.6/D1.6M	Structural Welding Code—Stainless Steel	2017
AWS D9.1/D9.1M	Sheet Metal Welding Code	2018
AWS D14.1/D14.1M	Specification for Welding of Industrial and Mill Cranes and Other Material Handling Equipment	2017
AWS QC-1	Specification for Qualification and Certification of Welding Inspectors	2016
CGA-G-4.1	Cleaning of Equipment for Oxygen Service	2018
CGA-G-4.15	Vacuum Jacketed Piping in Oxygen Service	2019
CGA-G-5	Hydrogen	2017
CGA-G-5.3	Commodity Specification for Hydrogen	2017
CGA-G-5.4	Standard for Hydrogen Piping Systems at User Locations	2019
CGA-G-5.5	Hydrogen Vent Systems	2014
CGA-H-3	Standard for Cryogenic Hydrogen Storage	2019
CGA-P-48	Reciprocating Cryogenic Pumps and Pump Installations	2014
CGA-P-74	Standard for Tube Trailer Supply Systems at Customer Sites	2019
CGA-V-6	Standard Bulk Refrigerated Liquid Transfer Connections	2014
CMAA No. 70	Multiple Girder Cranes	2020
CMAA No. 74	Single Girder Cranes	2020
CSN EN 253	District heating pipes - Bonded single pipe systems for directly buried hot water networks - Factory made pipe assembly of steel service pipe, polyurethane thermal insulation and a casing of polyethylene	2019
FGMA	Flat Glass Marketing Association's Sealant and Glazing Manual	1990
FM DS 1-6	Property Loss Prevention Data Sheets 1-6—Cooling Towers, (Name and Number Change from FM Global Class Number 4930.)	2020
FM DS 5-1	Property Loss Prevention Data Sheets 5-1—Electrical Equipment In Hazardous (Classified) Locations	2012
FM DS 5-4	Property Loss Prevention Data Sheets 5-4—Transformers	2023

Number	Name	Year
FM Global Class Number 4930	Approval Standard for Cooling Towers	2009
GDHS	A Policy on Geometric Design of Highways and Streets	2018
IBC	International Building Code	2018
IECC	International Energy Conservation Code	2018
IEEE 80	IEEE Guide for Safety in AC Substation Grounding	2013
IEEE C2	National Electrical Safety Code	2023
IEEE 1584	IEEE Guide for Performing Arc-Flash Hazard Calculations	2018
IFC	International Fire Code	2018
IFGC	International Fuel Gas Code (IFGC), 2018 with implementation assumptions. Exception: Include all appendices as reference only.	2018
IMC	International Mechanical Code	2018
IPC	International Plumbing Code	2018
ISA 5.1	Instrumentation Symbols & Identification	2009
ISA 5.4	Instrumentation Loop Diagrams	1991
ISO-1609	Vacuum Technology - Flange Dimensions	2020
ISO-9803-1	Vacuum Technology – Mounting Dimensions of Pipeline Fittings	2020
ISO-9803-2	Vacuum Technology – Mounting Dimensions of Pipeline Fittings	2020
ISO-21013-3	Cryogenic Vessels - Pressure Relief Accessories for Cryogenic Service - Sizing and Capacity Determination	2016
MBMA	Metal Building Systems Manual	2018
MOP 60	Gravity Sanitary Sewer Design and Construction	2007
MUTCD	Manual on Uniform Traffic Control Devices, version 11	2023
NB-23	National Board Inspection Code (NBIC) for existing and new pressure vessels (see NBIC foreword for specific applicability)	latest edition
NEBB 15950	Procedural Standards for Testing, Adjusting, and Balancing of Environmental Control Systems	2019
NFPA 1	Fire Code	2021
NFPA 2	Hydrogen Technologies Code	2020
NFPA 3	Standard for Commissioning of Fire Protection and Life Safety Systems	2018
NFPA 4	Standard for Integrated Fire Protection and Life Safety System Testing	2021
NFPA 10	Portable Fire Extinguishers	2018
NFPA 13	Installation of Sprinkler Systems	2019
NFPA 14	Installation of Standpipe and Hose Systems	2019

Number	Name	Year
NFPA22	Water Tanks for Private Fire Protection	2018
NFPA 24	Installation of Private Fire Service Mains and Their Appurtenances	2019
NFPA 25	Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	2020
NFPA 30	Flammable and Combustible Liquids	2020
NFPA 45	Fire Protection for Laboratories Using Chemicals	2019
NFPA 54	National Fuel Gas Code	2018
NFPA 55	Compressed Gases and Cryogenic Fluids Code	2020
NFPA 68	Standard on Explosion Protection by Deflagration Venting	2018
NFPA 69-2019	Standard on Explosion Prevention Systems	2019
NFPA 70	National Electrical Code	2020
NFPA 70E	Electrical Safety in the Workplace	2018
NFPA 72	National Fire Alarm and Signaling Code	2022
NFPA 75	Electronic Computer/Data Processing Equipment	2020
NFPA 80	Standard for Fire Doors and Other Opening Protectives	2019
NFPA 80A	Protection of Buildings from Exterior Fire Exposure	2022
NFPA 85	Boiler and Combustion Systems Hazards Code	2019
NFPA 90A	Installation of Air Conditioning and Ventilating Systems	2022
NFPA 90B	Installation of Warm Air Heating and Air Conditioning Systems	2021
NFPA 91	Standard for Exhaust Systems for Air Conveying Vapors, Gases, Mists, and Particulate Solids	2020
NFPA 92	Smoke Control Systems	2018
NFPA 101	Life Safety Code	2021
NFPA 110	Emergency and Standby Power Systems	2019
NFPA 111	Stored Electrical Energy Emergency and Standby Power Systems	2019
NFPA 220	Types of Building Construction	2021
NFPA 221	Standard for High Challenge Fire Walls, Fire Walls and Fire Barrier Walls	2021
NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment	2021
NFPA 497	Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas	2021
NFPA 505	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations	2018
NFPA 520	Standard on Subterranean Spaces	2021
NFPA 750	Standard on Water Mist Fire Protection Systems	2019

Number	Name	Year
NFPA 780	Installation of Lightning Protection Systems	2021
NFPA 801	Facilities Handling Radioactive Materials	2021
NFPA 1141	Standard for Fire Protection Infrastructure Land Development in Wildland, Rural, and Suburban Areas	2017
NRCA	National Roofing Contractors Association Manual	2018
ORNL, MPO-DES-001 R2	Facilities and Operations Performance Requirements Master Design Criteria	2017
SDI C	Standard for Composite Steel Floor Deck	2017
SDI NC	Standard for Noncomposite Steel Floor Deck	2017
SDI RD	Standard for Steel Roof Deck	2017
SMACNA 1520	Round Industrial Duct Construction Standards	2013
SMACNA 1922	Rectangular Industrial Duct Construction Standard	2011
SMACNA 1966	HVAC Duct Construction Standards - Metal and Flexible	2005
Soil Survey of Anderson County, Tennessee	Soil Survey of Anderson County, Tennessee	1981
SPO169-2013	Control of External Corrosion on Underground or Submerged Metallic Piping Systems	2013
Technical Release 55 - Urban Hydrology for Small Watersheds	Technical Release 55 - Urban Hydrology for Small Watersheds	1986
TIA TSB-162	Telecommunications Cabling Guidelines for Wireless Access Points	2021, Rev B
TIA 526-7-A	Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant	2015, Rev A
TIA 526-14-C	Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant	2023, Rev D
TIA 568.2-D	Balanced Twisted-Pair Telecommunications Cabling and Components Standards	2018, Rev D
TIA 569-D-1	Telecommunications Pathways and Spaces: Addendum 1 - Revised Temperature and Humidity Requirements for Telecommunications Spaces	2023, Rev E
TIA 569-E	Telecommunications Pathways and Spaces	2019, Rev E
TIA 606-C	Administration Standard for Telecommunications Infrastructure	2021, Rev D
TIA 607-D	Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises	2019, Rev D
TMS 402	Building Code Requirements for Masonry Structures	2016
TMS 602	Specification for Masonry Structures	2016
UL 508	Standard for Industrial Control Equipment	2018
UL 558	Standard for Safety Industrial Trucks, Internal Combustion Engine-Powered	2021

Number	Name	Year
UL 583	Standard for Safety Electric-Battery-Powered Industrial Trucks	2022
UL 1278	Standard for Safety Movable and Wall- or Ceiling-Hung Electric Room Heaters	2014
UL 1995	UL Standard for Safety Heating and Cooling Equipment	2022
National Standards for Total System Balance	National Standards for Total System Balance	2016

Table 4 Guides and Manuals

Number	Name	Year
DOE G 420.2-1A	Accelerator Facility Safety Implementation Guide	2014
DOE-HDBK-1092-2013	Electrical Safety	2013
DOE M 435.1-1 Chg 3 (LtdChg)	Radioactive Waste Management Manual	2021
DOE G 414.1-2B Chg 2 (Admin Chg)	Quality Assurance Program Guide	2013
ACGIH 2100	Industrial Ventilation: A Manual of Recommended Practice for Design, 31st Edition	2024
AASHTO-GL-7	Roadway Lighting Design Guide	2018
AASHTO-RDG	Roadside Design Guide	2011
AISC 325	Manual of Steel Construction, 15th edition	2017
ANSI/ISA 61511-1	Safety Instrumented Systems for the Process Industry - Framework, Definitions, Hardware, and Application Programming Requirements	2018
ANSI/ISA 61511-2	Safety Instrumented Systems for the Process Industry - Guidelines for Application	2018
ANSI/ISA 61511-3	Safety Instrumented Systems for the Process Industry- Guidelines for Determination of the Required Safety Integrity Levels	2018
ASHRAE Guideline - 0	The Commissioning Process	2019
ASHRAE Guideline 22	Instrumentation for Monitoring Central Chilled-Water Plant Efficiency	2012
ASHRAE Handbook	Fundamentals	2021
ASHRAE Handbook	Refrigeration Systems and Applications	2018
ASHRAE Handbook	HVAC Systems and Equipment	2020
ASHRAE Handbook	HVAC Applications	2019
ASME B31G	Manual for Determining the Remaining Strength of Corroded Pipelines	2023
CEQ-OFS-2020-01	Guiding Principles for Sustainable Federal Buildings	2020
IEC 61508-3	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 3: Software requirements - Edition 2.0	2010
IEC 61508-4	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 4: Definitions and abbreviations - Edition 2.0	2010
IEC 61508-5	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 5: Examples of methods for the determination of safety integrity levels - Edition 2.0	2010

IEC 61508-6	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3 - Edition 2.0	2010
IEC 61508-7	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 7: Overview of techniques and measures - Edition 2.0	2010
ISA 62443-1-1	Security for industrial automation and control systems, Part 1: Terminology, Concepts, and Models - 99.01.01	2007
ISA 62443-2-1	Security for industrial automation and control systems, Part 2-1: Establishing an Industrial Automation and Control Systems Security Program - 99.02.01	2009
ISA 62443-2-4	Security for industrial automation and control systems, Part 2-4: Security program requirements for IACS service providers	2018
ISA 62443-3-2	Security for industrial automation and control systems, Part 3-2: Security risk assessment for system design	2020
ISA 62443-4-1	Security for industrial automation and control systems, Part 4-1: Product security development life-cycle requirements	2018
ISA 62443-4-2	Security for industrial automation and control systems, Part 4-2: Technical security requirements for IACS components - Second Printing: August 28, 2019	2018
ISA 62443-3-3	Security for industrial automation and control systems, Part 3-3: System security requirements and security levels - 99.03.03	2013
ISA-TR84.00.09	Cybersecurity Related to the Functional Safety Lifecycle	2017
IEEE 379	Application of the Single-Failure Criterion to Nuclear Power Generating Station Safety Systems	2014
ANSI/NEMA MG-1	Motors and Generators	2021
NETA ATS	Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems	2021
SMACNA 1958	HVAC Duct System Design	2006
Tennessee Native Plant Guide	Tennessee Native Plant Guide	n/a