



SSTD-8070-0112-IDCODES  
Revision E  
JUNE 2022

National Aeronautics and  
Space Administration

**John C. Stennis Space Center**  
Stennis Space Center, MS 39529-6000

# COMPLIANCE IS MANDATORY

## JOHN C. STENNIS SPACE CENTER TEST COMPLEX LINE DESIGNATOR NUMBERS

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ISSUED CEF  
Central Engineering Files

6-24-2022  
Date

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## Document History Log

Change/ Revision	Change Date	Originator/ Phone	Description
Basic	04/30/01	Doug Dike ext. 8-2803	Initial release – supersedes SSC STD 97-012, with the following changes: New document number and format per SPG 1400.1; Edit and complete reorganization, with section title changes/additions, and text mods to reflect current SSC operations; Intro text relocated to 1.0, 2.0 and 5.1; 1.0 Test Support Utility changed to SSC Facilities Piping; added ref to STD 66-500; 2.0 added Special Test Equipment; 3.0 added references per text changes; 4.0 “Responsibilities” added new; 5.2 example A01 changed to A1001; 5.2.2, 5.2.3 deleted tabular listings of System Fluid Abbreviations & Area No. Descriptions; added ref to 54000-P001; 5.2.5 added “or by contract requirement”; 6.0 and 7.0: added new.
A	05/18/07	Doug Dike ext. 8-2803	Updated referenced documents throughout per document re-numbering. 5.2.5 removed “in the 47- series (piping/tubing)” per new document numbering system for standards. Changed NASA SSC Center Operations Facilities Engineering Division to NASA SSC Center Operations Project Management Division, per NASA organization re-structuring. Deleted SSLP-1440-0001 per cancellation, replaced with superseding SPR 1440.1. Deleted references to SSC STD 66-500 per cancellation, replaced with superseding SSTD-8070-0001-CONFIG. Deleted references to SSC STD 99-008, replaced with superseding SSTD-8070-0005-CONFIG.

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B		Doug Dike Ext. 8-2803	<p>Corrected typographical and grammatical errors, and formatting. Added Section 5.1(d) All non-metallic, underground piping systems shall have a magnetic trace tape installed above the pipe for locating the pipe. Section 5.2, changed piping material to piping designator. Section 5.2.5, changed to: The end letter(s) or alphanumeric identifier indicates the governing SSC Standard or piping specification that defines the following: a. governing industries standards; b. pressure and temperature ratings; c. allowed service fluid(s); d. types of mechanical connectors; e. manual(s) used to fabricate the piping system, including those for fitting, pipe, tubing, flanges, bosses, hubs, clamps, seal rings, gaskets, bolting; f. pressure boundary wall thicknesses and tolerances; g. welding and weld inspection requirements; h. pressure and leak test requirements; i. cleaning requirements; j. special geometry requirements of pipe and fitting in addition to those covered by industry standards where applicable, and; k. special installation and external pipe support requirements where applicable.</p>
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C	06/30/15	Doug Dike ext. 8-2803	<p>Five-year review. Renamed standard “John C. Stennis Space Center Test Operations Line Designator Numbers”. Revised cover sheet to require approval from NASA SSC Center Operations Design &amp; Construction Project Management Division and NASA SSC Engineering and Test Directorate, with concurrence by NASA SSC Safety and Mission Assurance. Updated references and acronyms. Revised 2.0, Applicability, to read: “This SSC STD (SSTD) applies to all SSC facility and Special Test Equipment (STE) piping systems and pipe lines (including but not limited to those for chilled water, heating water, potable water, and natural gas) when these systems are used for processes related to test operations; e.g., piping that appears on Piping Sketch (PSK) Drawings. Exceptions may be made for STE piping systems and pipe lines with the approval of the Configuration Control Board (CCB) Chairman without a deviation or a waiver. Existing piping systems, piping system sections, and pipe spools that are modified, repaired, tested, or in operational service prior to the issue date of this standard are exempt from requirements of this standard. However, these existing piping systems, piping system sections, and pipe spools shall conform to this standard at specific locations where modifications and repairs are made and where new pipe and pipe fittings are installed into or joined to lines and components of these existing systems after the issue date of this standard.”</p> <p>5.1 General Requirements: Deleted 5.1.a, which was a repetition of 2.0; and revised 5.1.e, 5.1.f and 5.1.g.</p> <p>5.2 Number Format: Added: “The line designator number is not a serial number; it is tied to a specific system location on a schematic drawing. The line designator number identifies...” Revised 5.2.1.b, 5.2.3.b, 5.2.4 and 5.2.5. Added 8.0, Definitions.</p>
C-1	02.12.16	R. Carol Wolfram x8-1164	Administrative change. Replaced “Test Operations” with “Test Complex” throughout document.

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D	06.30.2020	Skip Wright 8-1782  Pat Mitchell 8-2246	<p>Five-year review.</p> <p>Updated directorate titles on cover sheet and in header, re Responsible Office, as necessary. Updated references and acronyms.</p> <p>2.0: “(Including but not limited to those for chilled water, heating water, potable water, and natural gas)” was deleted from the first sentence.</p> <p>4.0-b: The responsibility for the assignment and logging of line designator numbers was changed from “CEF” to “Design Engineer.”</p> <p>4.0-c: Added “The Product Data Lifecycle Management (PDLM) Manager, and ultimately EA01, shall be responsible for Design and Data Management System (DDMS) activity as it relates to the automated generation of Test Complex Line Designator Numbers, as described herein.”</p> <p>5.1-c: Line designator numbers shall be obtained from “DDMS” rather than “CEF.”</p> <p>5.1-d: Deleted “All non-metallic, underground piping systems shall have a magnetic trace tape installed above the pipe for locating the pipe.”</p> <p>5.1-1: “Shall not be numbered” was changed to “are excluded from this SSTD.”</p> <p>5.2: “Normally” was added before “used in the system.”</p> <p>5.2.1-b: “Will” was changed to “may.”</p> <p>5.2.4: “CEF” was replaced with “DDMS.”</p> <p>5.2.5: “Governing SORD piping specification” was changed to “governing piping system.”</p>
E	06.20.2022	Paula Hensarling X-2419	<p>Revised 5.2.1-b to read: “A spool that has a branch or reducer with a different NPS from the run shall have one (1) line number with the NPS of the majority of the spool. For example, if a 10 foot long 4-inch line has a 2-inch branch, the line number for the entire spool would be 4”-GH-2A1001-L. If a spool has a reducer, the design engineer may choose which NPS to put in the line number. A label should be used for minor sections indicating size and specification/schedule. For example, in the case of the 2-inch branch on 4”-GH-2A1001-L, it would be labeled as 2”-L.”</p>

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## 1.0 PURPOSE

This John C. Stennis Space Center (SSC) standard (SSTD) establishes the numbering system and the procedure for assigning Test Complex Line Designator Numbers to SSC facilities (Real Property) piping systems drawings in accordance with the Site-wide Operational and Repair Documentation (SORD) system defined in SSTD-8070-0001-CONFIG.

## 2.0 APPLICABILITY

This SSTD applies to all SSC facility and Special Test Equipment (STE) piping systems and pipe lines when these systems are used for processes related to the Test Complex; e.g., piping that appears on Piping Sketch (PSK) drawings.

Exceptions may be made for STE piping systems and pipe lines with the approval of the Configuration Control Board (CCB) Chairman without a deviation or a waiver.

Existing piping systems, piping system sections, and pipe spools that are modified, repaired, tested, or in operational service prior to the issue date of this SSTD are exempt from requirements of this SSTD. However, these existing piping systems, piping system sections, and pipe spools shall conform to this SSTD at specific locations where modifications and repairs are made and where new pipe and pipe fittings are installed into or joined to lines and components of these existing systems after the issue date of this SSTD.

## 3.0 REFERENCES

Referenced documents shall be the latest version, unless otherwise specified.

ASME B36.10M, *Welded and Wrought Steel Pipe*

ASME B36.19M, *Stainless Steel Pipe*

SORD DWG 54000-P001, *Legend for Piping Schematics*

SPR 1440.1, *Records Management Program Requirements*

SSTD-8070-0043-PIPE, *Index of the Standards for Facility Piping Systems*

SSTD-8070-0001-CONFIG, *SSC Facilities Engineering Documentation Standard*

SSTD-8070-0005-CONFIG, *Preparation, Review, Approval and Release of SSC Standards*

## 4.0 RESPONSIBILITIES

- a. The Design Engineer has final responsibility for determining the line identification, line size, system fluid, piping specification, and service area.
- b. The Design Engineer is responsible for the assignment and logging of line designator numbers.

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- c. The Product Data Lifecycle Management (PDLM) Manager, and ultimately EA01, shall be responsible for Design and Data Management System (DDMS) activity as it relates to the automated generation of Test Complex Line Designator Numbers, as described herein.
- d. Responsibilities for the maintenance and control of this SSTD shall be in accordance with the requirements of SSTD-8070-0005-CONFIG.

## 5.0 LINE DESIGNATOR NUMBERING PROCEDURES

### 5.1 GENERAL REQUIREMENTS

- a. Instrumentation lines and blanked or capped stub-out lines are excluded from this SSTD.
- b. Line designator numbers will be used on SSC piping schematics (flow diagrams), Engineering Modification Instruction (EMI) documents, and other documentation as required for ease of line identification and reference.
- c. Line designator numbers shall be obtained from the Design and Data Management System (DDMS) in accordance with the format identified in Section 5.2.
- d. Line designator numbers may be added physically to the actual field hardware. This should be done whenever practicable to assure proper tracking of the hardware.
- e. Whenever a line designator number is changed and this number is physically marked on the hardware, the prior line designator number being replaced shall be completely obliterated or removed. Obliteration or removal of the markings shall be made such that the pressure boundary wall thicknesses of pipes and fittings are not less than the minimum allowed wall thicknesses specified by the Piping Designer.
- f. Special Cases for Field Welds
  - 1. For special cases where field welds are used to join separate pipe spools that have been separately pressure or leak-tested before being welded together, it is permitted to either maintain separate spool numbers (having different “Distinctive Numbers” as defined under Section 5.2) or assign a single spool number to all of these spools joined by field welds.
  - 2. For each special case where a field weld is used to join a pair of pipe spools that have been manufactured and delivered to SSC by different contractors or where ownership has been transferred to SSC from different contractors, separate spool



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numbers (having different “Distinctive Numbers” as defined under Section 5.2) shall be assigned to these spools.

3. For all cases where different and distinct spool numbers are assigned and maintained for pairs of spools joined by a field weld, the following requirements apply:
    - Spool drawings, plan and elevation drawings, or isometric drawings that are to scale or that include dimensions, shall indicate exact locations of all field welds defined as boundaries between spools having different “Distinct Numbers.”
    - All the spool numbers shall be indicated on these drawings.
    - These drawings shall be submitted to the CCB for approval and retained in DDMS.
    - Both sides of each field weld that connects two spools having different “Distinctive Numbers” as defined under Section 5.2 shall be marked.
      - The markings on each side of the weld shall include the statement “FIELD WELD JOINS SPOOLS WITH DIFFERENT NUMBERS,” an arrow pointing to the field weld, and the full spool number of the spool where the marking is placed.
      - The markings shall be stamped or etched into the pipe or fitting outside wall or they shall be affixed to the pipe or fitting outside wall using tack-welded plates that are stamped or etched with the markings.
      - For steel pipe and fittings, the plate material shall be a 300-series stainless steel.
      - For pipe and fittings not made of steel, the plate material shall be an alloy having the same nominal composition as the pipe or fitting material where the plate is affixed.
      - Stamping, if used, shall not reduce pipe or fitting wall thickness below the minimum required by its Piping Designator.
- NOTE:** An example of a case where different and distinct spool numbers may be assigned and maintained for pairs of spools joined by field welds may be a long (nominally longer than 80 foot) length of piping run with one or more joined branches where one or more of these branches are also long runs of piping.
4. For cases where a single spool number is assigned to separate spools that were pressure or leak-tested prior to being joined by field welds:
    - Spool drawings, plan and elevation drawings, or isometric drawings that are to scale or that include dimensions shall indicate exact locations of all field

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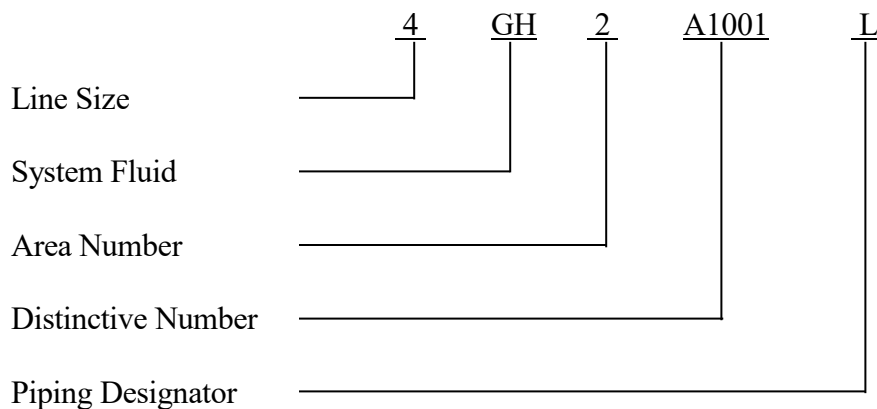
welds defined as boundaries between spools and sections that were separately pressure or leak tested.

- These drawings shall clearly indicate the date, test pressure, test duration, and test fluid of each separately tested spool or section.
- These drawings shall also be included with pressure and leak test records.
- Documents for each tested spool shall be submitted to the CCB for approval and retention in DDMS.

## 5.2 NUMBER FORMAT

The line designator number is not a serial number; it is tied to a specific system location on a schematic drawing. The line designator number identifies the line size, the fluid that is normally used in the system, the area where the system is located, a distinctive number, and the piping designator.

### EXAMPLE:



### 5.2.1 Line Size

- a. This number indicates the Nominal Pipe Size (NPS) of the line in inches.
- b. A spool that has a branch or reducer with a different NPS from the run shall have one (1) line number with the NPS of the majority of the spool. For example, if a 10 foot long 4-inch line has a 2-inch branch, the line number for the entire spool would be 4"-GH-2A1001-L. If a spool has a reducer, the design engineer may choose which NPS to put in the line number. A label should be used for minor sections indicating size and specification/schedule. For example, in the case of the 2-inch branch on 4"-GH-2A1001-L, it would be labeled as 2"-L."

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### 5.2.2 System Fluid

The type of fluid that is normally used in the system shall be identified according to the abbreviations in SSC SORD DWG 54000-P001.

### 5.2.3 Area Number

- a. The general area on site where the piping system is located shall be identified according to SSC SORD DWG 54000-P001.
- b. When a pipe spool is moved from one system location to another or from one system to another system, a new line designator number shall be assigned.

### 5.2.4 Distinctive Number

Each line has a distinctive alphanumeric number that is generated in DDMS. Each pipe spool shall have a unique Distinctive Number.

### 5.2.5 Piping Designator

The end letter(s) or alphanumeric identifier indicates the governing piping system that defines the following:

- a. Governing industry standards;
- b. Pressure and temperature ratings;
- c. Allowed service fluid(s);
- d. Types of mechanical connectors;
- e. Materials(s) used to fabricate the piping system, including those for fitting(s), pipe, tubing, flanges, bosses, hubs, clamps, seal rings, gaskets, bolting;
- f. Pressure boundary wall thicknesses and tolerances;
- g. Welding and weld inspection requirements;
- h. Pressure and leak test requirements;
- i. Cleaning requirements;

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- j. Special geometric requirements of pipe and fitting in addition to those covered by industry standards where applicable; and,
- k. Special installation and external pipe support requirements where applicable. In the example above, "L" references the carbon steel piping system for medium temperature gas service as listed in SSTD 8070-0043-PIPE.

For pipe spools that do not have a governing SSTD or piping specification, the piping designator shall be "SCH-" followed by the pipe schedule, as called out by ASME B36.10M or ASME B36.19M, or "SPL."

## 6.0 RECORDS AND FORMS

Records and forms required by the procedures of this SSTD shall be maintained in accordance with SPR 1440.1. All forms are assumed to be the latest edition unless otherwise specified and may be obtained from the SSC Electronic Forms repository or from the NASA SSC Forms Management Officer.

## 7.0 ACRONYMS AND ABBREVIATIONS

<b>ASME</b>	American Society of Mechanical Engineers
<b>CCB</b>	Configuration Control Board
<b>CEF</b>	Central Engineering Files
<b>DDMS</b>	Design and Data Management System
<b>DWG</b>	Drawing
<b>EMI</b>	Engineering Modification Instruction (form SSC-151 series)
<b>GH</b>	Gaseous Hydrogen (valence subscript deleted)
<b>NASA</b>	National Aeronautics and Space Administration
<b>NPS</b>	Nominal Pipe Size
<b>PDLM</b>	Product Data Lifecycle Management
<b>PSK</b>	Piping Sketches
<b>SCH</b>	Schedule
<b>SORD</b>	Site-wide Operational and Repair Documentation
<b>SPL</b>	Special
<b>SPR</b>	SSC Procedural Requirement
<b>SSC</b>	John C. Stennis Space Center
<b>STD</b>	Standard
<b>STE</b>	Special Test Equipment
<b>SSTD</b>	SSC Standard

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## 8.0 DEFINITIONS

**Piping Sketches (PSKs):** Piping system process and schematic drawings for the Test Site.

**Pipe Spool:** A pipe spool is defined as an assembly of one or more pipes, pipe fittings, or combinations of these that are all joined by pressure containing welds and that has at least one mechanical joint end attached to another pipe spool, instruments, or tubing system. For cases where a pipe spool has more than one end, one or more of the ends may be open to atmosphere. A mechanical joint that connects piping system sections shall always be defined as a boundary between two pipe spools, and these spools shall always have different “Distinctive Numbers” as defined by the number format under Section 5.2.

**Mechanical Joint:** For purposes of this SSTD, a mechanical joint is defined as a flange, clamped-hub, threaded pipe, or threaded fitting that connects to another flange, hub, or threaded pipe or fitting without the use of welding. Instrumentation, tube fittings and, by extension, tubing systems may also be connected to threaded pipe fittings.