



National Aeronautics and
Space Administration

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

SSTD-8070-0013-WELD
Rev. C
JULY 2022

COMPLIANCE IS MANDATORY

John C. Stennis Space Center CLASSES OF WELDING INSPECTION

Approved in DDMS by:

Scott Olive
NASA SSC Center Operations
Directorate Facilities Engineering
Test Complex Support

7-5-2022
Date

Concurrence in DDMS by:

Todd Mannion
NASA SSC Center Operations Directorate
Facility Services Branch

6-27-2022
Date

Harry Ryan
NASA SSC Engineering & Test Directorate

6-27-2022
Date

Son Le
NASA SSC Safety and Mission Assurance

6-28-2022
Date

Issued by

ISSUED CEF
Central Engineering Files

7-5-2022
Date

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 2 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

Document History Log

Status/ Change/ Revision	Change Date	Originator/ Phone	Description
Basic	09.28.10	Doug Dike/2803	Initial release, supersedes SSC STD 34-004.
A	09.18.15	Doug Dike/2803	Five-year review. Revised cover sheet to require approval from NASA SSC Center Operations Design & Construction Project Management Division, with concurrence from NASA SSC Center Operations Directorate Operations & Maintenance Division, NASA SSC Engineering and Test Directorate, and NASA SSC Safety and Mission Assurance. Updated references and acronyms. Administrative changes throughout. Added General Requirements 5.0-i and 5.0-j. Added SSC NDT Level III inspector approval to that of Authorized Inspector throughout document.
B	09.18.20	Benny McGrath / 2969	Five-year review. Updated directorate titles on cover sheet as necessary. Updated references and acronyms. Sections 5.0-d, 5.0-g, 13.0-e, and 15.0-c: Added "IIIA". 5.0-g: Added "Additionally, Class IIIA would be used on design codes that are not ASME, including but not limited to gas, HVAC, plumbing, vacuum, and drainage systems." Sections 6.6, 7.6, 8.2, and 9.6: Retitled "Pressure Systems Repairs." Deleted "All Pressure Vessels and Pressure Systems". Sections 7.1.a-7.5.a, 8.1.a, 9.1.a-9.5.a, 11.0.a: Added "1. All welds shall be one hundred (100) percent visually inspected." Sections 9.1.b-1-9.5.b-1: Added "or NASA Pressure Systems Manager." Section 10.0: Added "Class IIIA Weld Inspection" section in its entirety. "NDT Level III" changed to "NDE Level III" throughout document

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 3 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

C	07.01.22	Benny McGrath / 2969	Added “of the welder/welder operator” and “boss fitting,” as required throughout document.
---	----------	----------------------------	--

This is an uncontrolled document when printed. Verify that the document is current before use.

RELEASED - Printed documents may be obsolete; validate prior to use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 4 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

Table of Contents

1.0	PURPOSE	6
2.0	APPLICABILITY	6
3.0	REFERENCES	6
4.0	RESPONSIBILITIES	7
5.0	GENERAL	7
6.0	CLASS I WELD INSPECTION	8
6.1	Newly Constructed Pressure Vessels.....	8
6.2	In-Service Code Stamped Pressure Vessels.....	9
6.3	In-Service Non-Code Stamped Pressure Vessels	10
6.4	Newly Constructed Piping/Pressure Systems	11
6.5	In-Service Piping/Pressure Systems	12
6.6	Pressure Systems Repairs	13
7.0	CLASS II WELD INSPECTION	13
7.1	Newly Constructed Pressure Vessels.....	13
7.2	In-Service Code Stamped Pressure Vessels.....	14
7.3	In-Service Non-Code Stamped Pressure Vessels	15
7.4	Newly Constructed Piping/Pressure Systems	16
7.5	In-Service Piping/Pressure Systems	18
7.6	Pressure Systems Repairs	19
8.0	CLASS IIA WELD INSPECTION	19
8.1	Newly Constructed Piping/Pressure Systems	19
8.2	Pressure Systems Repairs	20
9.0	CLASS III WELD INSPECTION	21
9.1	Newly Constructed Pressure Vessels.....	21
9.2	In-Service Code Stamped Pressure Vessels.....	22
9.3	In-Service Non-Code Stamped Pressure Vessels	22
9.4	Newly Constructed Piping/Pressure Systems	23
9.5	In-Service Piping/Pressure Systems	24
9.6	Pressure Systems Repairs	25
10.0	CLASS IIIA WELD INSPECTION	25
10.1	Newly Constructed Low Pressure Retaining Piping/Piping System	25
10.2	In-Service Low Pressure Retaining Piping/Piping System.....	26
10.3	Pressure Systems Repairs	27

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 5 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

11.0	CLASS IV WELD INSPECTION	27
12.0	CLASS V WELD INSPECTION.....	28
13.0	GENERAL INSPECTION.....	28
14.0	ATTACHMENT WELDS.....	29
15.0	REPAIR OF WELD DEFECTS	29
16.0	RECORDS AND FORMS.....	29
17.0	ACRONYMS AND ABBREVIATIONS.....	30

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 6 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

1.0 PURPOSE

This John C. Stennis Space Center (SSC) standard (SSTD) sets forth the criteria for each class of inspection required for welding at SSC.

2.0 APPLICABILITY

This SSTD applies to contractors and/or subcontractors involved with welding at SSC.

3.0 REFERENCES

- a. All references are assumed to be the latest version unless otherwise indicated.

ANSI/ASNT CP-105, *Training Outlines for Qualification of Nondestructive Personnel*
 API 510, *Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration*

API 570, *Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems*

ASME B31.3, *Process Piping*

ASME Boiler & Pressure Vessel Code, Section V, *Nondestructive Examination*

ASME Boiler & Pressure Vessel Code, Section VIII, Division 1, *Rules for Construction of Pressure Vessels*

ASME Boiler & Pressure Vessel Code, Section IX, *Welding, Brazing, and Fusing Qualifications*

AWS D1.1, *Structural Welding Code-Steel*

NAS 410, *Certification And Qualification Of Nondestructive Test Personnel*

NB-23, *National Board of Inspection Code*

SPR 1440.1, *SSC Records Management Program Requirements*

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

SSTD-8070-0033-WELD, *SSC Standard for Certified Welding Electrodes and Rods*

- b. Order of Precedence

In case of conflict between this SSTD and another applicable technical requirement or document, the most stringent technical requirements shall take precedence.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 7 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

4.0 RESPONSIBILITIES

- a. Users of this SSTD shall comply with its requirements, ensure use of the correct version of this SSTD and the documents it references, and inform the appropriate organization of needed changes in accordance with SSTD-8070-0005-CONFIG.
- b. Responsibilities for the use and control of this SSTD and for the review and approval of revisions or cancellation of this SSTD shall be as specified in SSTD-8070-0005-CONFIG and the applicable documents referenced therein.

5.0 GENERAL

- a. Only Weld Wire/Rod qualified per SSTD-8070-0033-WELD shall be used. Class of welding inspection is a requirement specified on drawings or other documents.
- b. The class of inspection shall be as delineated by this SSTD. Welding requiring Classes I, II, IIA, III, or IV inspection require certified procedures and certified welders.
- c. The welding setup for qualifying a welding procedure shall be inspected to assure that material, fit-up tolerances, surface preparation and joint tooling comply with the requirements of the written welding standards.
- d. Classes I, II, IIA, III, and IIIA are applicable to pressure retaining welds and welds to pressure retaining boundaries.
- e. Class IIA is applicable to welding, alterations, or repairs of pressure piping.
- f. Classes IV and V are not applicable to pressure retaining welds.
- g. Class IIIA and V shall be used only when no other class of welding inspection applies. Additionally, Class IIIA would be used on design codes that are not ASME, including but not limited to gas, HVAC, plumbing, vacuum, and drainage systems.
- h. Throughout this SSTD, the “code of construction” shall be considered the governing standard or specification for the construction, fabrication, manufacture or repair project.
- i. Any acceptance criteria for B31.3 shall be Normal Fluid Service/Category M, unless otherwise specified.
- j. All personnel performing welding for construction and repair projects and other field work at NASA/SSC, including employees of off-site contractors performing work on site

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 8 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

at NASA/SSC, shall be qualified for all groove and fillet weld positions in accordance with requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section IX. For each of these welders, this qualification for all positions applies to all governing Weld Procedure Specifications (WPSs) that cover welds he or she produces on site.

6.0 CLASS I WELD INSPECTION

6.1 Newly Constructed Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the edition and addenda of the ASME BPVC used in the construction of the pressure vessel.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. One hundred (100) percent radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the edition and addenda of the ASME BPVC used in the construction of the pressure vessel.
3. Radiography shall at a minimum meet the requirements specified in the code of construction, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
4. Alternative examinations in lieu of radiographic examination shall be performed as specified in the code of construction.
5. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC Non-Destructive Examination (NDE) Level III.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on the root and final pass of all welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 9 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

2. The acceptance criteria shall be per the edition and addenda of the ASME BPVC used in the construction of the pressure vessel.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

6.2 In-Service Code Stamped Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most recent edition and addenda of the National Board Inspection Code, NB-23.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. One hundred (100) percent radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of the National Board Inspection Code, NB-23.
3. Radiography shall at a minimum meet the requirements specified in the inspection code, ASME BPVC Sect. V, article 2 and state and local jurisdictional requirements.
4. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
5. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on the root and final pass of all welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of the National Board Inspection Code, NB-23.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 10 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

6.3 In-Service Non-Code Stamped Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most recent edition and addenda of the API-510.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. One hundred (100) percent radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of API-510.
3. Radiography shall, at a minimum, meet the requirements specified in the inspection code, ASME BPVC Sect. V, article 2 and state and local jurisdictional requirements.
4. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
5. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on the root and final pass of all welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of API-510.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 11 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

6.4 Newly Constructed Piping/Pressure Systems

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. One hundred (100) percent radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
3. Radiography shall, at a minimum, meet the requirements specified in the code of construction, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
4. Alternative examinations in lieu of radiographic examination shall be performed as specified in the code of construction.
5. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on the root and final pass of all welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 12 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

6.5 In-Service Piping/Pressure Systems

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most recent edition and addenda of the API-570.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. One hundred (100) percent radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of the API-570.
3. Radiography shall, at a minimum, meet the requirements specified in the inspection code, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
4. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
5. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on the root and final pass of all welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 13 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

2. The acceptance criteria shall be per the most recent edition and addenda of the API-570.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

6.6 Pressure Systems Repairs

- a. When a discrepancy is indicated to be in excess of the limits specified in the applicable code of construction, inspection code, or this document, additional examination may be required as specified in the applicable code, by the Authorized Inspector, and the SSC NDE Level III.
- b. Repairs shall be performed in a manner consistent with the requirements specified in the applicable code of construction or inspection code and are subject to the approval of the Authorized Inspector and the SSC NDE Level III.
- c. A maximum of two (2) weld repairs shall be allowed in any single repair area.
- d. After two (2) unsuccessful repair attempts, the weld shall be removed in its entirety and re-welded, unless otherwise approved by the Pressure Systems Manager and the SSC NDE Level III.

7.0 CLASS II WELD INSPECTION

7.1 Newly Constructed Pressure Vessels

- a. Visual Inspection
 1. All welds shall be one hundred (100) percent visually inspected.
 2. The acceptance criteria shall be per the edition and addenda of the ASME BPVC used in the construction of the pressure vessel.
 3. The welds shall be full, smooth, and well profiled.
 4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
 5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
 6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 14 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

b. Radiographic Testing

1. Twenty-five (25) percent of the welder/welder operator radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the edition and addenda of the ASME BPVC used in the construction of the pressure vessel.
3. The weld or weld footage to be radiographed is subject to approval of Quality Control and/or the Authorized Inspector and the SSC NDE Level III.
4. Radiography shall, at a minimum, meet the requirements specified in the code of construction, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
5. Alternative examinations in lieu of radiographic examination shall be performed as specified in the code of construction
6. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
7. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on twenty-five (25) percent of the welder/welder operator of the root and final pass of welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
2. The acceptance criteria shall be per the edition and addenda of the ASME BPVC used in the construction of the pressure vessel.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

7.2 In-Service Code Stamped Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most recent edition and addenda of the National Board Inspection Code, NB-23.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 15 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. Twenty-five (25) percent of the welder/welder operator radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of the National Board Inspection Code, NB-23.
3. The weld or weld footage to be radiographed is subject to approval of Quality Control and/or the Authorized Inspector and the SSC NDE Level III.
4. Radiography shall, at a minimum, meet the requirements specified in the inspection code, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
5. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on twenty-five (25) percent of the welder/welder operator of the root and final pass of welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of the National Board Inspection Code, NB-23.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

7.3 In-Service Non-Code Stamped Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most recent edition and addenda of the API-510.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 16 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. Twenty-five (25) percent of the welder/welder operator radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of API-510.
3. The weld or weld footage to be radiographed is subject to approval of Quality Control and/or the Authorized Inspector and the SSC NDE Level III.
4. Radiography shall, at a minimum, meet the requirements specified in the inspection code, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
5. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on twenty-five (25) percent of the welder/welder operator of the root and final pass of welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of API-510.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

7.4 Newly Constructed Piping/Pressure Systems

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
3. The welds shall be full, smooth, and well profiled.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 17 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. Full random radiographic examination shall be performed on a minimum of twenty-five (25) percent of the welder/welder operator of full penetration welds to the extent specified in the code of construction.
2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
3. The weld or weld footage to be radiographed is subject to approval of Quality Control and/or the Authorized Inspector and the SSC NDE Level III.
4. Radiography shall, at a minimum, meet the requirements specified in the code of construction, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
5. Alternative examinations in lieu of radiographic examination shall be performed as specified in the code of construction and shall be approved by the Authorized Inspector and the SSC NDE Level III.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on twenty-five (25) percent of the welder/welder operator of the root and final pass of welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 18 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

7.5 In-Service Piping/Pressure Systems

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most recent edition and addenda of the API-570.
3. The welds shall be full, smooth, and well profiled.
4. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
5. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

b. Radiographic Testing

1. Twenty-five (25) percent of the welder/welder operator radiographic examination shall be performed on all full penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of the API-570.
3. The weld or weld footage to be radiographed is subject to approval of Quality Control and/or the Authorized Inspector and the SSC NDE Level III.
4. Radiography shall, at a minimum, meet the requirements specified in the inspection code, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
5. Alternative examinations in lieu of radiographic examination shall be approved by the Authorized Inspector and the SSC NDE Level III.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

c. Magnetic Particle or Dye Penetrant Testing

1. Magnetic particle or dye penetrant examination shall be performed on twenty-five (25) percent of the welder/welder operator of the root and final pass of welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
2. The acceptance criteria shall be per the most recent edition and addenda of the API-570.
3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 7.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 6.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 19 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

7.6 Pressure Systems Repairs

- a. When a discrepancy is indicated to be in excess of the limits specified in the applicable code of construction, inspection code, or this document, additional examination may be required as specified in the applicable code, by the Authorized Inspector, and by the SSC NDE Level III.
- b. Repairs shall be performed in a manner consistent with the requirements specified in the applicable code of construction or inspection code and are subject to the approval of the Authorized Inspector and the SSC NDE Level III.
- c. A maximum of two (2) weld repairs shall be allowed in any single repair area.
- d. After two (2) unsuccessful repair attempts, the weld shall be removed in its entirety and re-welded, unless otherwise approved by the Pressure Systems Manager or SSC NDE Level III.

8.0 CLASS IIA WELD INSPECTION

8.1 Newly Constructed Piping/Pressure Systems

- a. Visual Inspection
 1. All welds shall be one hundred (100) percent visually inspected.
 2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
 3. The welds shall be full, smooth, and well profiled.
 4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
 5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
 6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
- b. Radiographic Testing
 1. Full random radiographic examination shall be performed on a minimum of ten (10) percent of the welder/welder operator of full penetration welds to the extent specified in the code of construction.
 2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
 3. The weld or weld footage to be radiographed is subject to approval of Quality Control and/or the Authorized Inspector and the SSC NDE Level III.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 20 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

4. Radiography shall, at a minimum, meet the requirements specified in the code of construction, ASME BPVC Sect. V, article 2, and state and local jurisdictional requirements.
 5. Alternative examinations in lieu of radiographic examination shall be performed as specified in the code of construction and shall be approved by the Authorized Inspector and the SSC NDE Level III.
 6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
- c. Magnetic Particle or Dye Penetrant Testing
1. Magnetic particle or dye penetrant examination shall be performed on ten (10) percent of the welder/welder operator of the root and final pass of welds which cannot be radiographed, such as socket, boss fitting, fillet and partial penetration welds.
 2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
 3. Magnetic particle examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 7.
 4. Magnetic particle examination shall be used only on ferro-magnetic materials.
 5. Dye penetrant examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 6.
 6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

8.2 Pressure Systems Repairs

- a. When a discrepancy is indicated to be in excess of the limits specified in the applicable code of construction, inspection code or this document, additional examination may be required as specified in the applicable code, by the Authorized Inspector and by the SSC NDE Level III.
- b. Repairs shall be performed in a manner consistent with the requirements specified in the applicable code of construction or inspection code and are subject to the approval of the Authorized Inspector and the SSC NDE Level III.
- c. A maximum of two weld repairs shall be allowed in any single repair area.
- d. After two (2) unsuccessful repair attempts, the weld shall be removed in its entirety and re-welded, unless otherwise approved by the Pressure Systems Manager or SSC NDE Level III.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 21 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

9.0 CLASS III WELD INSPECTION

9.1 Newly Constructed Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the edition and addenda of the ASME BPVC used in the construction of the pressure vessel.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
7. The thickness of the weld reinforcement shall not exceed the maximum specified by the code of construction or the applicable weld procedure.
8. The root penetration shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

b. Non-Destructive Testing

1. Non-destructive testing may be required if deemed necessary by the SSC NDE Level III or Authorized Inspector or Pressure Vessel Engineer or NASA Pressure Systems Manager.
2. Acceptance criteria shall be per the edition and addenda used in the construction of the pressure vessel.
3. All required non-destructive testing shall be performed in accordance with the requirements of the ASME BPVC for the applicable non-destructive testing method.
4. Non-destructive examination shall, at a minimum, meet the requirements specified in the applicable article of ASME BPVC Sect. V for the applicable testing method.
5. Magnetic particle examination shall be used only on ferro-magnetic materials.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 22 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

9.2 In-Service Code Stamped Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most current edition and addenda of the National Board Inspection Code, NB-23.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminants.
5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
7. The thickness of the weld reinforcement shall not exceed the maximum specified by the code of construction or the applicable weld procedure.
8. The root penetration shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

b. Non-Destructive Testing

1. Non-destructive testing may be required if deemed necessary by the SSC NDE Level III or Authorized Inspector or Pressure Vessel Engineer or NASA Pressure Systems Manager.
2. The acceptance criteria shall be per the most current edition and addenda of the National Board Inspection Code NB-23.
3. All required non-destructive testing shall be performed in accordance with the requirements of the inspection code for the applicable non-destructive testing method.
4. Non-destructive examination shall, at a minimum, meet the requirements specified in the applicable article of ASME BPVC Sect. V for the applicable testing method.
5. Magnetic particle examination shall be used only on ferro-magnetic materials.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

9.3 In-Service Non-Code Stamped Pressure Vessels

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most current edition and addenda of API-510.
3. The welds shall be full, smooth, and well profiled.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 23 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
7. The thickness of the weld reinforcement shall not exceed the maximum specified by the code of construction or the applicable weld procedure.
8. The root penetration shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

b. Non-Destructive Testing

1. Non-destructive testing may be required if deemed necessary by the SSC NDE Level III or Authorized Inspector or Pressure Vessel Engineer or NASA Pressure Systems Manager.
2. The acceptance criteria shall be per the most current edition and addenda of API-510.
3. All required non-destructive testing shall be performed in accordance with the requirements of the ASME BPVC for the applicable non-destructive testing method.
4. Non-destructive examination shall, at a minimum, meet the requirements specified in the applicable article of ASME BPVC Sect. V for the applicable testing method.
5. Magnetic particle examination shall be used only on ferro-magnetic materials.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

9.4 Newly Constructed Piping/Pressure Systems

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 piping code used in the construction of the pressure system.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
7. The thickness of the weld reinforcement shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 24 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

8. The root penetration shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

b. Non-Destructive Testing

1. Non-destructive testing may be required if deemed necessary by the SSC NDE Level III or Authorized Inspector or Piping Engineer or NASA Pressure Systems Manager.
2. The acceptance criteria shall be per the edition and addenda of the applicable ASME B31 Piping Code used in the construction of the pressure system.
3. All required non-destructive testing shall be performed in accordance with the requirements of the applicable ASME B31 Piping Code for the applicable non-destructive testing method.
4. Non-destructive examination shall, at a minimum, meet the requirements specified in the applicable article of ASME BPVC Sect. V for the applicable testing method.
5. Magnetic particle examination shall be used only on ferro-magnetic materials.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

9.5 In-Service Piping/Pressure Systems

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected.
2. The acceptance criteria shall be per the most current edition and addenda of the API-570.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the inspection code and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
7. The thickness of the weld reinforcement shall not exceed the maximum specified by the code of construction or the applicable weld procedure.
8. The root penetration shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

b. Non-Destructive Testing

1. Non-destructive testing may be required if deemed necessary by the SSC NDE Level III or Authorized Inspector or Piping Engineer or NASA Pressure Systems Manager.
2. The acceptance criteria shall be per the most current edition and addenda of API-570.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 25 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

3. All required non-destructive testing shall be performed in accordance with the requirements of the applicable ASME B31 Piping Code for the applicable non-destructive testing method.
4. Non-destructive examination shall, at a minimum, meet the requirements specified in the applicable article of ASME BPVC Sect. V for the applicable testing method.
5. Magnetic particle examination shall be used only on ferro-magnetic materials.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

9.6 Pressure Systems Repairs

- a. When a discrepancy is indicated to be in excess of the limits specified in the applicable code of construction, inspection code, or this document, additional examination may be required as specified in the applicable code, by the Authorized Inspector, and by the SSC NDE Level III.
- b. Repairs shall be performed in a manner consistent with the requirements specified in the applicable code of construction or inspection code and are subject to the approval of the Authorized Inspector and the SSC NDE Level III.
- c. A maximum of two weld repairs shall be allowed in any single repair area.
- d. After two (2) unsuccessful repair attempts, the weld shall be removed in its entirety and re-welded, unless otherwise approved by the Pressure Systems Manager and the SSC NDE Level III.

10.0 CLASS IIIA WELD INSPECTION

10.1 Newly Constructed Low Pressure Retaining Piping/Piping System

- a. Visual Inspection
 1. All welds shall be one hundred (100) percent visually inspected to the extent specified in the code of construction.
 2. The acceptance criteria shall be per the edition and addenda of code used in the construction.
 3. The welds shall be full, smooth, and well profiled.
 4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
 5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 26 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
7. The thickness of the weld reinforcement shall not exceed the maximum specified by the code of construction or the applicable weld procedure.
8. The root penetration shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

b. Non-Destructive Testing (NDT)

1. NDT may be required if deemed necessary by the SSC NDE Level III or Authorized Inspector or Pressure Vessel Engineer or NASA Pressure Systems Manager.
2. Acceptance criteria shall be per the edition and addenda used in the construction.
3. All required NDT shall be performed in accordance with the requirements of the ASME BPVC Section V for the applicable NDT method.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

10.2 In-Service Low Pressure Retaining Piping/Piping System

a. Visual Inspection

1. All welds shall be one hundred (100) percent visually inspected to the extent specified in the code of construction.
2. The acceptance criteria shall be per the edition and addenda of code used in the construction.
3. The welds shall be full, smooth, and well profiled.
4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
5. Visual examination shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
6. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.
7. The thickness of the weld reinforcement shall not exceed the maximum specified by the code of construction or the applicable weld procedure.
8. The root penetration shall not exceed the maximum specified by the code of construction or the applicable weld procedure.

b. Non-Destructive Testing (NDT)

1. NDT may be required if deemed necessary by the SSC NDE Level III or Authorized Inspector or Pressure Vessel Engineer or NASA Pressure Systems Manager.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 27 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

2. Acceptance criteria shall be per the edition and addenda used in the construction.
3. All required NDT shall be performed in accordance with the requirements of the ASME BPVC Section V for the applicable NDT method.
4. Magnetic particle examination shall be used only on ferro-magnetic materials. Incomplete fusion, incomplete penetration, or surface cracks shall be cause for rejection.

10.3 Pressure Systems Repairs

- a. When a discrepancy is indicated to be in excess of the limits specified in the applicable code of construction, inspection code, or this document, additional examination may be required as specified in the applicable code, by the Authorized Inspector, and by the SSC NDE Level III.
- b. Repairs shall be performed in a manner consistent with the requirements specified in the applicable code of construction or inspection code and are subject to the approval of the Authorized Inspector and the SSC NDE Level III.
- c. A maximum of two weld repairs shall be allowed in any single repair area.
- d. After two (2) unsuccessful repair attempts, the weld shall be removed in its entirety and re-welded, unless otherwise approved by the Pressure Systems Manager and the SSC NDE Level III.

11.0 CLASS IV WELD INSPECTION

- a. Visual Inspection
 1. All welds shall be one hundred (100) percent visually inspected to the extent specified in the AWS Structural Code used for construction.
 2. The acceptance criteria shall be per the edition and addenda of the AWS Structural Code used in the construction of the Structure.
 3. The welds shall be full, smooth, and well profiled.
 4. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
 5. Visual examination process and inspector examiner shall, at a minimum, meet the requirements specified in the code of construction and ASME BPVC Sect. V, article 9.
 6. In addition to the acceptance criteria specified by the code of construction, incomplete fusion or incomplete penetration shall be cause for rejection.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 28 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

7. Neither the thickness of the weld reinforcement nor the root penetration shall exceed the maximum specified by the code of construction or the applicable weld procedure, whichever is less.

b. Non-Destructive Testing (NDT)

1. Any or all NDT may be required if deemed necessary by the Design Engineer with assistance of the NDE Level III.
2. All required NDT acceptance criteria shall be performed in accordance with the requirements of the latest edition and addenda of the AWS Structural Code for the applicable NDT method.
3. Non-destructive examination process and inspector/examiner shall, at a minimum, meet the requirements specified in the applicable article of ASME BPVC Sect. V for the applicable testing method.
4. Magnetic particle examination shall be used only on ferro-magnetic materials.
5. Dye penetrant examination can be used on non-ferro-magnetic materials and ferro-magnetic materials.
6. In addition to the acceptance criteria specified by the code of construction, incomplete fusion or incomplete penetration shall be cause for rejection.

12.0 CLASS V WELD INSPECTION

- a. Class V shall be used only when no other class of welding inspection applies.

b. Visual Inspection

1. Class V inspection shall be designated at the option of the responsible Quality Assurance and/or Design Engineer.
2. The Class V welder shall be responsible for performing the following visual inspections:
 - i. The form and dimension of the welds shall be in accordance with the applicable drawing(s).
 - ii. Flaws which are crack-like in appearance shall be cause for rejection.
 - iii. The welds shall be full, smooth, and well profiled.
 - iv. The welds shall be free from flux, salt bath residue, weld spatter, and other contaminates.
3. While the welder should be a professional, Class V does not require qualification in accordance with applicable national consensus standards.

13.0 GENERAL INSPECTION

- a. Following each pass of multiple-pass welding, the weld shall be visually inspected for slag inclusions and for proper cleaning, fusion, and weld contour.

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 29 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

- b. Any defect shall be removed before depositing the next pass.
- c. Adequate checks shall be made to ensure the use of correct preheat temperatures, proper electrodes, and correct welding sequence.
- d. The above requirements will be verified one hundred (100) percent by the welder and on a random basis by the responsible Quality Assurance Inspector and the SSC NDE Level III.
- e. The certified welder shall stamp adjacent to weld requiring Class I, II, III, IIIA or IV inspection in order to establish his/her identity.
- f. No impression stamping of High Strength Low Alloy (HSLA) material is allowed.
- g. When welds are designated for lab test, the Work Package Number and Weld Number shall be shown by a tag, painted on, or etched in for lab identification.

14.0 ATTACHMENT WELDS

Attachment welds which are directly on the pipe or vessel shall be inspected under the same inspection class as the welds on the pipe or vessel to which they are attached.

15.0 REPAIR OF WELD DEFECTS

- a. Weld defects beyond limits prescribed shall be removed by mechanical means.
- b. The defective area shall be re-welded using the same procedure used for the original weld.
- c. When repair-weld that requires Class I, II, III, IIIA or IV inspection has been accomplished, the certified welder shall identify by stamping adjacent to the repaired weld with his/her weld stamp.

16.0 RECORDS AND FORMS

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

This is an uncontrolled document when printed. Verify that the document is current before use.

Stennis Standard	SSTD-8070-0013-WELD	C
	<i>Number</i>	<i>Rev.</i>
	Effective Date:	July 1, 2022
	Review Date:	September 18, 2025
Page 30 of 30		
Responsible Office: NASA SSC Center Operations Facilities Engineering Test Complex Support		
SUBJECT: Classes Of Welding Inspection		

17.0 ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASNT	American Society for Non-Destructive Testing
AWS	American Welding Society
BPVC	Boiler and Pressure Vessel Code
HSLA	High Strength Low Alloy
NAS	National Aerospace Standard
NASA	National Aeronautics and Space Administration
NB	National Board
NDE	Non-Destructive Examination
NDT	Non-Destructive Testing
SPR	Stennis Procedural Requirement
SSC	John C. Stennis Space Center
SSTD	John C. Stennis Space Center Standard
UW	Unfired Welding

This is an uncontrolled document when printed. Verify that the document is current before use.