

QUALITY MANUAL

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7. Process Controls

HOW WORK IS CARRIED OUT

7.1. OVERVIEW

The fabrication process plan defines how project work is to be done and approved for the overall project. The fabrication process plan is communicated to all key personnel, subcontractors and suppliers in a startup meeting. As the project proceeds, work task plans provide additional details of how each individual work task is carried out. Work tasks planning meetings are used to communicate expectations of the work task plan to key personnel responsible for carrying out the work task.

7.2. PROJECT STARTUP AND QUALITY CONTROL COORDINATION MEETING

Prior to the commencement of work, the Project Manager holds a meeting to discuss and coordinate how project work will be performed and controlled. Key personnel from [CompanyName], subcontractors and suppliers meet to review expectations for project quality results as well as quality assurance and quality control policies and procedures including:

- Key requirements of the project
- The Project Quality Assurance/Quality Control Manual
- Required quality inspections and tests
- The project submittal schedule
- Quality policies and heightened awareness of critical quality requirements
- Project organization chart and job responsibilities
- Methods of communication and contact information
- Location of project documents and records

7.3. PREPARATORY PROJECT QUALITY ASSURANCE/QUALITY CONTROL MANUAL PLANNING

7.3.1. WORK TASK REQUIREMENTS REVIEW

In preparation for the start of an upcoming work task, the Superintendent reviews an integrated and coordinated set of documents that collectively define quality requirements for the work task including:

- Objectives and acceptance criteria of the work task
- Quality standards that apply to the work task
- Work instructions, process steps, and product installation instructions that apply to the work task
- Shop drawings
- Submittals
- Tools and equipment necessary to perform the work
- · License, certification, or other qualification requirements of personnel assigned to work
- Required records of the process and resulting product
- The subcontractor contracted to perform the work, if applicable
- Customer contract requirements
- Required quality inspections and tests
- Method for clearly marking nonconformances to prevent inadvertent use
- Location of quality system records and documents
- Personnel training

7.3.2. PREPARATORY SITE INSPECTION

The Superintendent also performs a quality inspection of the work area and:

- Assesses completion of required prior work
- Verifies field measurements
- Assures availability and receiving quality inspection status of required materials
- Identifies any nonconformances to the requirements for the work task to begin
- Identifies potential problems

7.3.3. WORK TASK PREPARATORY QUALITY PLANNING MEETINGS

Prior to the start of a work task, the Superintendent conducts a meeting with key company, subcontractor personnel responsible for carrying out, supervising, or inspecting the work, and interested customer representatives.

During the meeting, the Superintendent communicates the work task quality requirements and reinforces heightened awareness for critical requirements. Topics for a work task quality plan meeting include:

- Conflicts that need resolution
- Required quality documents and a verification of availability to personnel carrying out, supervising, or inspecting the work task
- · Record keeping requirements and the availability of necessary forms
- Review methods and sequences of installation
- Special details and conditions
- Standards of workmanship
- · Heightened awareness of critical quality requirements
- Quality risks
- Work tasks quality inspection form

7.4. WEEKLY QUALITY PLANNING AND COORDINATION MEETINGS

The Superintendent conducts a meeting with key company, subcontractor and supplier personnel responsible for carrying out, supervising, or inspecting the work, and interested customer representatives.

The meeting is held on a nominal weekly schedule. During the meeting, the Superintendent facilitates coordination among the participants, communication among the participants, and reinforces heightened awareness for critical requirements.

The Superintendent maintains a record of the meeting event on the Daily Quality Control Report.

7.5. PROCESS CONTROL STANDARDS

7.5.1. JOB-READY START WORK STANDARDS

Work on a work task starts only when conditions do not adversely impact quality, comply with government regulations, contract technical specifications, industry standards, or product installation instructions.

The Quality Manager identifies supplemental start-work requirements that apply to a specific project when they are necessary to assure quality results.

7.5.2. WORK IN PROCESS STANDARDS

Work is conducted only when conditions do not adversely impact quality; comply with government regulations, contract technical specifications, industry standards, or product installation instructions.

The Quality Manager identifies supplemental work in process requirements that apply to a specific project when they are necessary to assure quality results.

7.5.3. PROTECTION OF COMPLETED WORK STANDARDS

[CompanyName] will preserve and protect work in process, completed work, component parts, materials, and when applicable, delivery to the destination so as to maintain so that compliance with project requirements and standards. This includes handling, storage, protection from natural elements, and reducing risks of damage.

Completed work is protected from damage as specified by government regulations, contract technical specifications, industry standards, or product installation instructions.

The Quality Manager identifies supplemental protection requirements that apply to a specific project when they are necessary to assure quality results.

7.5.4. MATERIAL STORAGE

The Superintendent ensures all materials will be delivered, stored and handled in a manner that protects them from damage, moisture, dirt and intrusion of foreign materials.

Delivery of materials will be planned according to the work progress to minimize storage on site, where there are higher possibilities of damages and deterioration of materials.

Stored materials will be segregated to prevent cross contamination and limit losses should a delivery be rejected.

The Superintendent surveys stored materials during daily jobsite reviews and identifies any material that have incurred damage or otherwise become defective and therefore unfit for use.

7.5.5. CONTROLLED USE OF MATERIALS

The Project Manager ensures that contracts and purchase orders are awarded only to outside organizations qualified to perform the work task and/or supply materials as required for the specific project.

Only approved materials are used in the fabrication process. Only approved materials are specified in purchase and/or subcontracts.

Materials that are defective, deteriorated, damaged, or not approved are not used. The Superintendent clearly marks such materials for non-use or otherwise holds them aside.

When customer-supplied materials are lost, damaged, or otherwise found unsuitable for use, the Superintendent reports such findings to the customer.

When subcontractor—supplied materials are damaged or otherwise found unsuitable for use, the Superintendent reports such findings to the subcontractor.

The Superintendent ensures that fabrication uses only materials specified in the contract technical specifications, contract drawings, and approved submittals. Substitutions are made only by agreement of the customer and documented by a change order (see section 2.1.3.6).

7.5.5.1. FILLER MATERIALS CONTROLS

Welders must verify the filler material meets specification and welding procedure requirements before welding.

Filler materials of different filler metal types, sizes and heat numbers (if applicable) will be labeled and stored in separately to prevent intermixing.

Filler materials will be stored in a controlled environment to prevent contamination and degradation. The storage environment will conform to any elevated temperature holding requirements of the filler metal manufacturer and the applicable AWS code or filler metal specification.

Filler material issuance and return log sheets will be used to control time sensitive filler materials.

Filler metals which have exceeded the maximum allowable exposure time to the atmosphere must not be used. They may be used only after redrying (baking) requirements of the filler manufacturer are met.

Unusable or damaged filler metals must be clearly marked to prevent inadvertent use and removed from the filler material storage area.

7.5.6. CONTROLLED PRODUCT USE AND INSTALLATION

[CompanyName] fabrication activities conform to manufacturers' product use and installation instructions that apply to the fabrication process.

When installing a product, the Superintendent has access to all applicable product installation instructions.

7.6. DAILY QUALITY CONTROL REPORT

The Superintendent records a summary of daily work activities. The report will include:

8. Inspections and Tests

ASSURE COMPLIANCE

8.1. OVERVIEW

Inspections are necessary to verify that work processes and results conform to both contract requirements and [CompanyName] quality standards.

Qualified personnel inspect every project throughout the fabrication process. Additional reviews validate the accuracy of the field quality inspections and ensure that the quality standards apply uniformly.

An inspection and test plan defines the quality inspections and tests required for a specific project.

Personnel may only inspect work activities for which they are have been qualified by the Quality Manager.

8.2. Required Work Task Quality Inspections and Tests

The Quality Manager identifies each Task that is a phase of fabrication that requires separate quality controls to assure and control quality results. Each Task triggers as set of requirements for quality control inspections before, during and after work tasks.

Tasks are divided into two categories:

- Discrete Tasks are standard type of work where a completion inspection is performed one time at the completion of a phase of work.
- Process Tasks are tasks where completion inspections are performed continuously. Continuous
 inspections are required when there is a limited window of time to perform a completion
 inspection before the next task begins. Process tasks may also be characterized by independent
 monitoring of a work process, such as welding, where the observer verifies conformance to work
 procedures.

Process tasks undergo additional quality controls that continuously monitor compliance to specifications.

Independent quality audits are conducted to verify that the task quality controls are operating effectively.

Fabrication projects may execute a work task multiple times in a project, in which case a series of quality inspections are required for each work task.

8.3. MATERIAL INSPECTIONS AND TESTS

Material quality inspections and tests ensure that purchased materials meet purchase contract quantity and quality requirements.

8.3.1.1. MATERIAL RECEIVING INSPECTION

The Superintendent inspects or ensures that a qualified inspector inspects materials prior to use for conformance to project quality requirements. The receiving inspection includes a verification that the

Correct material has been received

The material is identified and meets the traceability requirements for the material Material certifications and/or test reports meet the specified requirements Materials are tested and approved for the specific application

The Superintendent ensures that each work task that uses the source inspected materials proceed only after the material has been accepted by the material quality inspection or test.

8.3.1.2. SOURCE INSPECTIONS

Source quality inspections are required when quality characteristics cannot or will not be verified during subsequent processing. The Quality Manager determines if a source inspection is necessary to validate supplier quality before materials are delivered to the project jobsite.

The Superintendent ensures that each work task that uses the source inspected materials proceed only the material has been accepted by the source inspection.

8.4. Work in Process Inspections

Work in process quality inspections continuously verify compliance project quality standards beginning at the start of a work task, as work is conducted, and continues until the work task is complete.

8.4.1.1. INITIAL JOB-READY INSPECTIONS

For each work task, the Superintendent or a qualified inspector performs job-ready quality inspections to ensure that work activities begin only when they should begin. Job-ready quality inspections verify that conditions conform to the project quality requirements.

8.4.1.2. INITIAL WORK IN PROCESS INSPECTION

For each work task, the Superintendent or a qualified inspector performs an initial work in process inspection when the first representative portion of a work activity is completed.

8.4.1.3. FOLLOW-UP WORK IN PROCESS INSPECTIONS

The Superintendent or a qualified inspector performs ongoing work in process quality inspections to ensure that work activities continue to conform to project quality requirements. Punch Items

If the Superintendent or inspector observes an item for correction prior to a work task completion inspection, the item is identified for correction. During the work task completion inspection each punch item correction is verified.

Any outstanding punch items remaining after the work task completion inspection is deemed a nonconformance.

8.4.2. ADDITIONAL INSPECTION REQUIREMENTS FOR PROCESS TASKS

For each process task, a qualified person inspects the ongoing completion work for conformance to project quality requirements. This is in addition to discrete task completion inspections that are performed one time at the end of a phase of work.

The continuous monitoring inspections are conducted before starting other work activities that may interfere with an inspection.

8.5. Work Task Completion Inspections

14. FORMS

[CompanyName] Controlled Materials Form	56
[CompanyName] Material Inspection and Receiving Report	57
[CompanyName] Daily Production Report	58
[CompanyName] Work Task Inspection Form	59
[CompanyName] Nonconformance Report	60
Form QW-484A Welding Operator Qualification	61
Form QW-484B Welding Operator Qualification	62
Form QW-483 Welding Procedure Qualification Record	63
Form P-4A Welded Piping Inspection	65
Form P-4R Assembled Pining Inspection	67

	Co	[CompanyName] ontrolled Materials F	orm	
		Version 20141020		
Contract ID	Contract Name	Preparer	Date	
[ProjectNumber]	[ProjectName]			

Contract Section/ Activity		Intended Use	Lot Traceability	Method for identification of
ID	Material	(if description is necessary)	Requirements	Approved Inspection Status
		_0	Θ	
		×		
		7)		

	[Compan Nonconforma	ince Report
Nonconformance Report	version 20.	141020
Control ID	Project ID	Project Name
	[ProjectNumber]	[ProjectName]
Preparer Signatu	re/ Submit Date	Quality Manager Signature / Disposition Date
Description of the requirement or specification		
Description of the nonconformance, location, affected area, and marking		
Disposition	Replace Repair Rework Approval of disposition required by cus Customer approval signature /date:	
Corrective Actions	Corrective actions completed Name Customer acceptance of corrective actions	
Preventive Actions	☐ Preventive actions completed Name	e/Date:

Form QW-484A Welding Operator Qualification

Velder's name		Identificat	ion no.		
		Test D	escription		
dentification of WPS followed		59757636		Test coupon	☐ Production weld
pecification and type/grade or UN	S Number of base r	metal(s)			i kazilikan matalahan
	Te	etino Variables a	nd Qualification Limits		
Walden West	ables (QW-350)	sting variables at	Actual Valu	and the same of th	nes Orallicat
Welding process(es)	ables (Civi-350)		Actual Valu	les na	inge Qualified
Type (i.e.; manual, semi-automat	tic) used				
Backing (with/without)			=		
Plate Pipe (enter diameter	r if pipe or tube)				
Base metal P-Number to P-Numi		SC-ASSAURT	3		
Filler metal or electrode specifica		C C C C C C C C C C C C C C C C C C C	7		
Filler metal or electrode classific Filler metal F-Number(s)	ation(s) (info. only)		-		
Consumable insert (GTAW or PA	NAN.			1 8	
Filler Metal Product Form (solid/		powder) (GTAW c	or PAW)		
Deposit thickness for each proce			MINIMA S		
Process 1 3 la	yers minimum	☐ Yes ☐ No	2		
Process 2 3 far	yers minimum	Yes No			
Position qualified (2G, 6G, 3F, etc.			0		
Vertical progression (uphill or do	awnhill)			10 22	
Type of fuel gas (OFW) Inert gas backing (GTAW, PAW, C				A 8	
	20002000	iii.cmawi			
Transfer mode (sprey/globular or GTAW current type/polarity (AC, isual examination of completed w Transverse face and root bends	r pulse to short circo DCEP, DCEN) weld (OW-302.4) [OW-462.3(a)]	RES	SULTS Idinal bends [QW-462.3(b)]		DW-462.2)
Transfer mode (sprey/globular or GTAW current type/polarity (AC, //isual examination of completed w Transverse face and root bends	r pulse to short circl DCEP, DCEN) veld (OW-302.4) [OW-462.3(a)] lipe bend specimen, late bend specimen	RES Longitu corrosion-resista corrosion-resista		-462.5(c)] /-462.5(d)]	F11611111848819F6
Transfer mode (sprey/globular or GTAW current type/polarity (AC, fisual examination of completed with transverse face and root bends in Pipe specimen, r	r pulse to short circl DCEP, DCEN) veld (OW-302.4) [OW-462.3(a)] lipe bend specimen, late bend specimen	RES Longitu corrosion-resista corrosion-resista	dinal bends [QW-462.3(b)] or weld metal overlay [QW ant weld metal overlay [QW	-462.5(c)] /-462.5(d)]	FILE CLEROSCOPIC
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http://files.asme.org/asmeorg/Codes/Publications/BPVC/16605.pdf

Form P-4A Welded Piping Inspection

(Name and address of manufactured for	(Name and address of manufactured for	gistration No
Location of installation	(Name and address of purchaser) Location of installation	(Name of Co.) ASME BOILER AND PRESSURE VESSEL SEL CODE (Year)
Location of installation	(Name and address of purchaser) Location of installation	(Name of Co.) ASME BOILER AND PRESSURE VESSEL SEL CODE (Year)
Identification	Design Conditions of Piping Piping Record Piping Record Piping Record Piping Record Piping Record Piping Piping Record Pipi	(Name of Co.) ASME BOILER AND PRESSURE VESSEL SEL CODE (Year)
Obesign Conditions of Piping	(Main staum, boiler feed, blow-off, or other service piping — state which) Design Conditions of Piping — (Pessaure) (Temperature) . Specified by — (Temperature) . Specified by — (Temperature) . Specified by — (Temperature) . The chemical and physical properties of all piping meet the requirements of material specifications of the XODE. The construction and workmanship conform to Section I of the ASME BOILER AND PRESSURE VESTAND PRESSURE VESTAND PRESSURE VESTAND PRESSURE VESTAND PRESSURE VESTAND PRESSURE SPECIFICATION OF Piping (include material identifications by ASME specification or other recognized Code of the Shop Hydrostatic Test — . Remarks CERTIFICATE OF SHOP COMPLIANCE No certify the statement in this data report to be correct and that all details of design, material, construction of the ASME BOILER AND PRESSURE VESSEL CODE. Dur Certificate of Authorization No. —	(Name of Co.) ASME BOILER AND PRESSURE VESSEL SEL CODE [Year]
Code Design by	Code Design by	ASME BOILER AND PRESSURE VESSEL SEL CODE
The chemical and physical properties of all piping meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSE CODE. The construction and workmanship conform to Section I of the ASME BOILER AND PRESSURE VESSEL CODE (Yeard) Addends to (I) Date! (if applicable), and Code Cases (Neuroperis) Date! (if applicable), and Code Cases (Neuroperis) Description of Piping (include material identifications by ASME specification or other recognized Code designation) Shop Hydrostatic Test (Shop Comptiance) We certify the statement in this data report to be correct and that all details of idensign, material, construction, and workmanship of the describe iping conform to Section I of the ASME BOILER AND PRESSURE VESSEL CODE. The Certificate of Authorization No. (I) Designator (Expires) Dur Certificate of Authorization No. (I) Designator (I) Desig	The chemical and physical properties of all piping meet the requirements of material specifications of the CODE. The construction and workmanship conform to Section I of the ASME BOILER AND PRESSURE VESTA Addends to	SEL CODE (Year)
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(Muthorinet Representative) CERTIFICATE OF SHOP INSPECTION the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by have inspected the piping described in this Manufacturer's Data Report and state that, to the best of my knowledge an seller, the manufacturer has constructed this piping in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE. By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the piping described his Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury property damage or a loss of any kind arising from or connected with this inspection. Commission	(Minufacturer of Fatericater) CERTIFICATE OF SHOP INSPECTION the undersigned, holding a valid commission issued by the National Board of Boiler and Pressur	
(Multiplicate Representative) CERTIFICATE OF SHOP INSPECTION The undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by have inspected the piping described in this Manufacturer's Data Report and state that, to the best of my knowledge an belief, the manufacturer has constructed this piping in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE. By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the piping described his Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury property damage or a loss of any kind arising from or connected with this inspection. Commission	(Minufacture of Fatericater) CERTIFICATE OF SHOP INSPECTION the undersigned, holding a valid commission issued by the National Board of Boiler and Pressur	
the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by have inspected the piping described in this Manufacturer's Data Report and state that, to the best of my knowledge an sellef, the manufacturer has constructed this piping in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE. By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the piping described his Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury property damage or a loss of any kind arising from or connected with this inspection. Imm/ddf/yyyyi	the undersigned, holding a valid commission issued by the National Board of Boiler and Pressu	(Authorized Representative)
the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by have inspected the piping described in this Manufacturer's Data Report and state that, to the best of my knowledge an elief, the manufacturer has constructed this piping in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE. By signing this certificate, neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the piping described his Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury property damage or a loss of any kind arising from or connected with this inspection. Imm/ds/yyyyi	the undersigned, holding a valid commission issued by the National Board of Boiler and Pressu	
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his Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury property damage or a loss of any kind arising from or connected with this inspection. Nate	elief, the manufacturer has constructed this piping in accordance with the applicable sections of the ASME B	[10] 이번 시간에 가면 작곡이 보다 보면 된 것이 없었다. 보기주에 없었다. 이 유명 (20) (10) (10)
Commission	his Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in	장애 아이들이 맛이 되었다. 그리 왕이라는 나를 가게 하는 것이다.
	lateimm(dd)yyyyi	
(National Sound Commission Number and Endonsement)		
	(National Sound	ommission Number and Endorsement[

Form P-4B Assembled Piping Inspection

. Manufactured by	Order No.	P-48 ID No.
Manufactured for		= 400 M S M S
	Order No.	
Landing of hydellating	Pallan Paniston	
Location of Installation	Boiler Registra	tion ivo.
Identification(Main steam, bolker feed, blow-off, or other service piping — state which)	Piping Registra	tion No
전해 전 11:3 - 12:21 Particular and Annie (1980 - 1980 - 1980 - 1980 - 1980 - 1980 - 1980 - 1980 - 1980 - 1980 -		
Design Conditions of Piping (Freeuers) (Temperature) - Specified by	(N	ame of Co.)
	Code Design by	
The chemical and physical properties of all piping meet the requirements of n		
VESSEL CODE. The construction and workmanship conform to Section I of the A	SME BOILER AND PRESS	URE VESSEL CODE
Addends to (if applicable), and	Code Cases	(Year) (Numbers)
Description of Piping (include material identifications by ASME specification or oth		The state of the s
Field Hydrostatic Test		
Remarks		
CERTIFICATE OF FIELD ASSEMBLY We certify that the field assembly of the described piping conforms with the requiesses CODE. Our Certificate of Authorization No		tor expires
We certify that the field assembly of the described piping conforms with the requirements of Authorization No	irements of Section I of the (A), (S), or (PP) Designa	
CERTIFICATE OF FIELD ASSEMBLY We certify that the field assembly of the described piping conforms with the requiested. ESSEL CODE. Our Certificate of Authorization No	irements of Section I of the (A), (S), or (PP) Designa Name INSPECTION	tor expires
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http://files.asme.org/asmeorg/Codes/Publications/BPVC/10717.pdf



For More Information:

Contact: Ed Caldeira

410-451-8006

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