Category II, AP4 Item 16

BROWN & ROOT, INC. CPSES	NUMBER	REVISION	ISSUE DATE	PAGE
JOB 35-1195 PPRV	QI-QAP-11.1-31	3		1 of 9

TITLE: INSTALLATION INSPECTION OF MECHANICAL JOINTS

ORIGINATOR: R. Faulkner 1-25-82 DATE

REVIEWED BY: D. L. Gunderson 1-25-82 DATE

APPROVED BY: _____ Site QA Manager DATE

1.0 REFERENCES

1-A QI-QAP-11.1-26, "ASME Pipe Fabrication and Installation Inspection"

1-B QI-QAP-11.1-37, "Instruction for QA/QC Review, Approval and Utilization of Construction Operation Travelers."

1-C CP-QAP-16.1, "Control of Nonconforming Items"

2.0 GENERAL

2.1 PURPOSE AND SCOPE

This instruction delineates the requirements to be used when performing installation inspection of mechanical joints.

2.2 RESPONSIBILITY

The Site Quality Assurance Manager is responsible for review, approval and implementation of this instruction.

2.3 BOUNDARIES

The boundaries of a component to which piping is attached shall be at the limit of reinforcement. This boundary shall not be closer to the main shell of a vessel, pump, or valve than:

a. the first bolted flange face; the bolts shall be considered part of the piping;

b. the first threaded joint in screwed connections.

M387

3.0 INSTRUCTION

3.1 IDENTIFICATION

The Quality Control Inspector (QCI) shall verify that pipe spools to be joined are identified as described in Reference I-A. Additionally, the QCI shall record the Material Requisition number the pipe spool is released on for threaded connections only.

3.2 THREADED CONNECTIONS

3.2.1 Pipe Wall Thickness

The QCI shall verify the pipe wall schedule is as specified on the applicable drawing by review of pipe markings and the Material Requisition Sheet.

3.2.2 Thread Compound

The QCI shall verify that only Neolube No. 2 is used as a thread compound and is applied as follows:

a. Neolube is limited to threads and shall not protrude onto the unthreaded portion of the pipe;

Why not?

b. Neolube is applied in an even, uninterrupted coat and allowed to dry prior to thread engagement.

3.2.3 Threads

The QCI shall verify the following:

a. all threaded ends are reamed and free of burrs;

b. threaded ends are not damaged and free of obstruction.

3.2.4 Pipe Thread Engagement

The QCI shall verify the minimum thread engagement of threaded connections as shown in Attachment 1, column L_2.

3.2.5 Threaded Connections Requiring Seal Welding

3.2.5.1 Prior to Welding

The QCI shall verify:

a. a minimum of 2 inches on each side of the weld joint shall be degreased prior to welding. Mechanical preparation shall result in a clean surface 1/2 inch to 1 inch on each side of the joint;

b. no thread compound used.

3.2.5.2 After Welding

The QCI shall visually inspect seal welds on threaded connections (to include 1/2 inch on each side of the weld) in accordance with the following acceptance criteria:

a. exposed threads are completely covered with weld metal;

b. weld edges are free from overlap forming a re-entrant angle less than 90°;

c. undercut shall not exceed 1/32 inch or cause a reduction in base metal below minimum wall;

d. no cracks;

e. no incomplete fusion;

f. no slag;

g. no porosity;

h. no arc strikes; and

i. no weld spatter.

3.2.6 Documentation

The results of QCI verifications shall be recorded on the Construction Operation Traveler (Reference 1-B), if utilized by Construction, and on Inspection Report, Attachment 3 with the following exceptions:

an

(B)

why both; why not one or the other?

a. Threading QCI verification (see 3.2.1) shall be documented on the Manufacturing Record Sheet (Reference 1-A).

b. Visual inspection of seal welding (see 3.2.5) shall be documented on the Weld Data Card and on an Inspection Report, Attachment 3, for acceptable conditions. Unacceptable conditions shall be documented on a NDER, Attachment 4.

Why both? How married up?

On completion of all QCI verification, the responsible QC Superintendent shall review the documented results and indicate approval by signing and dating the appropriate document.

3.3 FLANGE CONNECTIONS

3.3.1 Cleanliness

How stay assembly?

The QCI shall verify flange faces are thoroughly cleaned to remove rust, scale, dirt, paint, etc.

3.3.2 Traceability

The QCI shall verify Material Requisition number and color code of gasket material, heat number or lot number of nuts and bolts or studs are recorded on the Construction Operation Traveler (Reference 1-B).

3.3.3 Alignment

(Thought this was being eliminated!

The QCI shall verify flanges are aligned as follows:

a. within 3/64 inch normal and with respect to flange outside diameter; except

b. when pipe is to connect to a flange on equipment (i.e., valves, pumps, etc.), the face of the flange is aligned to the lesser of 25% of the gasket thickness or as described in a. above.

3.3.4 Bolting

The QCI shall verify at least one complete thread is exposed above the nut face.

3.3.5 Documentation

The Construction Operation Traveler shall be used to document the QCI verifications described in this section (Reference 1-B).

4.0 NONCONFORMANCES

All nonconforming conditions will be reported in accordance with Reference 1-C.

Same comment as 3.3.2

ATTACHMENT 1

Table 2. Basic Dimensions of USA (American) Standard Taper Pipe Thread, NPT[1]

Nominal[2] Pipe Size	Outside Diameter of Pipe, D	Threads per inch, n	Pitch of Thread, p	Pitch Diameter at beginning of External Thread, E_0	Handtight Engagement			Effective Thread, External		
					Length[3], L_1		Dia[3], E_1	Length[4], L_2		Dia, E_2
					in.	Thds.		in.	Thds.	
1	2	3	4	5	6	7	8	9	10	11
1/8	0.405	27	0.03704	0.35351	0.1615	4.36	0.37360	0.2639	7.12	0.38000
1/4	0.540	18	0.05556	0.47739	0.2278	4.10	0.49163	0.4018	7.23	0.50250
3/8	0.675	18	0.05556	0.61201	0.240	4.32	0.62701	0.4078	7.34	0.63750
1/2	0.840	14	0.07143	0.75843	0.320	4.48	0.77843	0.5337	7.47	0.79179
3/4	1.050	14	0.07143	0.96768	0.339	4.75	0.98887	0.5457	7.64	1.00179
1	1.315	11.5	0.08696	1.21363	0.400	4.60	1.23863	0.6828	7.85	1.25630
1 1/4	1.660	11.5	0.08696	1.55713	0.420	4.83	1.58338	0.7068	8.13	1.60130
1 1/2	1.900	11.5	0.08696	1.79609	0.420	4.83	1.82234	0.7235	8.32	1.84130
2	2.375	11.5	0.08696	2.26902	0.436	5.01	2.29627	0.7565	8.70	2.31630
2 1/2	2.875	8	0.12500	2.71953	0.682	5.46	2.76216	1.1375	9.10	2.79062
3	3.500	8	0.12500	3.34062	0.766	6.13	3.38850	1.2000	9.60	3.41562
3 1/2	4.000	8	0.12500	3.83750	0.821	6.57	3.88881	1.2500	10.00	3.91562
4	4.500	8	0.12500	4.33438	0.844	6.75	4.38712	1.3000	10.40	4.41562

ATTACHMENT 2

COMANCHE PEAK STEAM ELECTRIC STATION

INSPECTION REPORT

SHEET ___ OF ___ NO.

ITEM DESCRIPTION VERIFY OF THREADED SPOOLS | INSTALLATION IDENTIFICATION NO. | SYSTEM / STRUCTURE DESIGNATION

QCI, QCC & REV. & CHANGE NO. | MEASURE OR TEST EQUIP. CENT. NO.

☐ IN PROCESS INSPECTION ☐ PRE INSTALLATION VERIFICATION ☐ INSTALLATION INSPECTION ☐ FINAL INSPECTION ☐ PRE TEST INSPECTION

INSP. RESULTS

☐ INSPECTION COMPLETED, ALL APPLICABLE ITEMS SATISFACTORY

☐ INSPECTION COMPLETED, UNSATISFACTORY ITEMS LISTED BELOW

QC INSPECTOR ___ DATE ___

ITEM NO.	INSPECTION ATTRIBUTES	SAT	UNSAT	DATE	QC SIGNATURE
1.	Spool is properly identified per QI-QAP-11.1-26				
2.	Spool is released on MR# ___				
3.	There are no obstructions inside spool				
4.	Threads are not damaged (Flat, Burred, Chipped)				
5.	Neolube properly applied				
6.	Thread engagement correct per QI-QAP-11.1-31, Atchmnt 2				
7.	Excess neolube removed				
8.	Record the following:				
	A. Spool * ___ to Spool ___				
	B. Line No. ___ Rework ☐ **				
	*Indicates Threaded Spool				
	**Check Rework If Applicable				

REMARKS (DWGS, SPECS, ETC.)

RELATED NCR NO. | L.R. CLOSED ☐ | DATE | SIGNATURE QC Superintendent

ATTACHMENT 3

Brown & Root Inc.

Post Office Box 1001, Glen Rose, Texas 76043

QUALITY ASSURANCE DEPARTMENT
VISUAL EXAMINATION CHECKLIST

PROJECT COMANCHE PEAK JOB NO. 35-1196 UNIT ____ PAGE ____ OF ____

DRAWING | SYSTEM | CLASS 1☐ 2☐ 3☐ OTHER
WELD IDENTIFICATION NUMBER | LOCATION

Enter NA adjacent to attribute when not applicable. Enter Sat./Unsat. or NA above results in each section 1 through 4 as applicable.

WDC#

SKETCH AND REMARKS (If)

CHECK LIST

1. FITUP (Prior and During)

Base Material
Joint Design
Cleanliness
Root Spacing
Joint Fitup
Joint Alignment
Backing Engagement
Backing Gap
Temporary Attachment Welds
Backing
Orientation/Direction of Flow

Procedure ____ Rev. ____
Results
Inspector Level Date

2. AFTER WELDING OF ROOT

External Surface
Internal Surface

Procedure ____ Rev. ____
Results
Inspector Level Date

3. COMPLETION OF WELD (ID)

Surface
Reinforcement
Concavity
Undercut
Weld Fit
Unacceptable Inserts
Inc. Fusion (Inc. Penetration)
Burn-Through
Underbead

Procedure ____ Rev. ____
Results
Inspector Level Date

4. COMPLETION OF WELD (OD)

Surface
Reinforcement
Undercut
Fillet Size
Blending of Surface
Laps/Unacceptable Inserts
Suitability of Surface for NDT
Removal of Tabs, Attachments
Surface Free from Arc Strikes
Weld Spatter, etc.
Purge Dam Removed

Procedure ____ Rev. ____
Results
Inspector Level Date

QC Supervision | Date

Procedure | Rev. | CERTIFICATION LEVEL

NCP 200/290 12/30/75 QA-600-6

ATTACHMENT 4

Brown & Root Inc.
QUALITY ASSURANCE DEPARTMENT
NDE REPORT

PROJECT: COMANCHE PEAK JOB NO. 35-1195 UNIT _____ PAGE _____ OF _____

DRAWING	SYSTEM	CLASS 1☐ 2☐ 3☐ OTHER
WELD/ITEM NUMBER	LOCATION	

MTL. TYPE	MTL. THICK	DIA/LENGTH
STAGE OF MFG. ☐REPAIR ☐ROOT ☐INTERMEDIATE ☐FINAL		JOINT DESIGN ☐BRN ☐BKS ☐INS ☐OPEN BUTT ☐OTHER

SKETCH AND REMARKS

ACCEPTANCE STD	ACCEPT ☐ REJECT ☐	DATE / /

INSPECTOR	
NDE PROCEDURE	CERTIFICATION LEVEL

QA-903 ®

BROWN & ROOT, INC. CPSES JOB 35-1195	NUMBER	REVISION	ISSUE DATE	PAGE
	QI-QAP-11.1-31	3	JAN 27 1982	1 of 9

TITLE:

INSTALLATION INSPECTION OF MECHANICAL JOINTS

ORIGINATOR: R Faulkner 1-26-82 DATE

REVIEWED BY: D. L. Gandy 1-26-82 DATE

APPROVED BY: [signature] Site QA Manager 1/26/82 DATE

1.0 REFERENCES

1-A QI-QAP-11.1-26, "ASME Pipe Fabrication and Installation Inspection"

1-B QI-QAP-11.1-37, "Instruction for QA/QC Review, Approval and Utilization of Construction Operation Travelers."

1-C CP-QAP-16.1, "Control of Nonconforming Items"

2.0 GENERAL

2.1 PURPOSE AND SCOPE

This instruction delineates the requirements to be used when performing installation inspection of mechanical joints.

2.2 RESPONSIBILITY

The Site Quality Assurance Manager is responsible for review, approval and implementation of this instruction.

2.3 BOUNDARIES

The boundaries of a component to which piping is attached shall be at the limit of reinforcement. This boundary shall not be closer to the main shell of a vessel, pump, or valve than:

a. the first bolted flange face; the bolts shall be considered part of the piping;

b. the first threaded joint in screwed connections.

M388

3.0 INSTRUCTION

3.1 IDENTIFICATION

The Quality Control Inspector (QCI) shall verify that pipe spools to be joined are identified as described in Reference 1-A. Additionally, the QCI shall record the Material Requisition number the pipe spool is released on for threaded connections only.

3.2 THREADED CONNECTIONS

3.2.1 Pipe Wall Thickness

The QCI shall verify the pipe wall schedule is as specified on the applicable drawing by review of pipe markings and the Material Requisition Sheet.

3.2.2 Thread Compound

The QCI shall verify that only Neolube No. 2 is used as a thread compound and is applied as follows:

a. Neolube is limited to threads and shall not protrude onto the unthreaded portion of the pipe;

b. Neolube is applied in an even, uninterrupted coat and allowed to dry prior to thread engagement.

3.2.3 Threads

The QCI shall verify the following:

a. all threaded ends are reamed and free of burrs;

b. threaded ends are not damaged and free of obstruction.

3.2.4 Pipe Thread Engagement

The QCI shall verify the minimum thread engagement of threaded connections as shown in Attachment 1, Column L_2.

3.2.5 Threaded Connections Requiring Seal Welding

3.2.5.1 Prior to Welding

The QCI shall verify:

a. a minimum of 2 inches on each side of the weld joint shall be degreased prior to welding. Mechanical preparation shall result in a clean surface 1/2 inch to 1 inch on each side of the joint;

b. no thread compound used.

3.2.5.2 After Welding

The QCI shall visually inspect seal welds on threaded connections (to include 1/2 inch on each side of the weld) in accordance with the following acceptance criteria:

a. exposed threads are completely covered with weld metal;

b. weld edges are free from overlap;

c. undercut shall not exceed 1/32 inch or cause a reduction in base metal below minimum wall;

d. no cracks;

e. no incomplete fusion;

f. no slag;

g. no porosity;

h. no arc strikes; and

i. no weld spatter.

3.2.6 Documentation

The results of QCI verifications shall be recorded on the Construction Operation Traveler (Reference 1-8), if utilized by Construction, and on Inspection Report, Attachment 2 with the following exceptions:

a. Threading QCI verification (see 3.2.1) shall be documented on the Manufacturing Record Sheet (Reference 1-A).

b. Results of final visual inspection (see 3.2.5) shall be documented on the Weld Data Card and on the Visual Inspection Checklist, Attachment 3. Unacceptable conditions shall be documented on NDER, Attachment 4.

On completion of all QCI verification, the responsible QC Superintendent shall review the documented results and indicate approval by signing and dating the appropriate document.

3.3 FLANGE CONNECTIONS

3.3.1 Cleanliness

The QCI shall verify flange faces are thoroughly cleaned to remove rust, scale, dirt, paint, etc.

3.3.2 Traceability

The QCI shall verify Material Requisition number and color code of gasket material, heat number or lot number of nuts and bolts or studs are recorded on the Construction Operation Traveler (Reference 1-B).

3.3.3 Alignment

The QCI shall verify flanges are aligned as follows:

a. within 3/64 inch normal and with respect to flange outside diameter; except

b. when pipe is to connect to a flange on equipment (i.e., valves, pumps, etc.), the face of the flange is aligned to the lesser of 25% of the gasket thickness or as described in a. above.

3.3.4 Bolting

The QCI shall verify at least one complete thread is exposed above the nut face.

3.3.5 Documentation

The Construction Operation Traveler shall be used to document the QCI verifications described in this section (Reference 1-B).

4.0 NONCONFORMANCES

All nonconforming conditions will be reported in accordance with Reference 1-C.

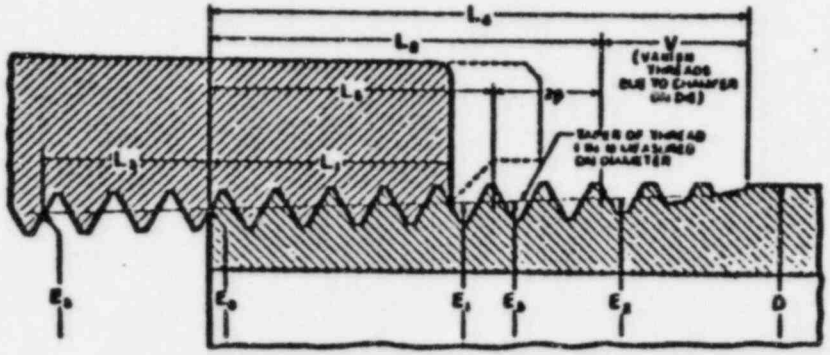

Table 2. Basic Dimensions of USA (American) Standard Taper Pipe Thread, NPT[1]

Nominal[6] Pipe Size	Outside Diameter of Pipe, D	Threads per inch, n	Pitch of Thread, P	Pitch Diameter at beginning of External Thread, E_0	Handtight Engagement			Effective Thread, External		
					Length[3], L_1		Dia[5], E_1	Length[4], L_2		Dia, E_2
					in.	Thds.		in.	Thds.	
1	2	3	4	5	6	7	8	9	10	11
1/8	0.405	27	0.03704	0.36351	0.1615	4.36	0.37360	0.2639	7.12	0.38000
1/4	0.540	18	0.05556	0.47739	0.2278	4.10	0.49163	0.4018	7.23	0.50250
3/8	0.675	18	0.05556	0.61201	0.240	4.32	0.62701	0.4078	7.34	0.63750
1/2	0.840	14	0.07143	0.75843	0.320	4.48	0.77843	0.5337	7.47	0.79179
3/4	1.050	14	0.07143	0.96768	0.339	4.75	0.98887	0.5457	7.64	1.00179
1	1.315	11.5	0.08696	1.21363	0.400	4.60	1.23863	0.6828	7.85	1.25630
1 1/4	1.660	11.5	0.08696	1.55713	0.420	4.83	1.58338	0.7068	8.13	1.60130
1 1/2	1.900	11.5	0.08696	1.79609	0.420	4.83	1.82234	0.7235	8.32	1.84130
2	2.375	11.5	0.08696	2.26902	0.436	5.01	2.29627	0.7565	8.70	2.31630
2 1/2	2.875	8	0.12500	2.71953	0.682	5.46	2.76216	1.1375	9.10	2.79062
3	3.500	8	0.12500	3.34062	0.766	6.13	3.38850	1.2000	9.60	3.41562
3 1/2	4.000	8	0.12500	3.83750	0.821	6.57	3.88881	1.2500	10.00	3.91562
4	4.500	8	0.12500	4.33438	0.844	6.75	4.38712	1.3000	10.40	4.41562

ATTACHMENT 2

COMANCHE PEAK STEAM ELECTRIC STATION

INSPECTION REPORT

SHEET ___ OF ___ NO.

ITEM DESCRIPTION VERIFY INSTALLATION/IDENTIFICATION NO. OF THREADED SPOOLS | SYSTEM/STRUCTURE DESIGNATION

SPEC NO. | REV. | REF QC DOC & REV. & CHANGE NO. | MEASURE OR TEST EQUIP. CERT. NO.

☐ IN PROCESS INSPECTION ☐ PRE INSTALLATION VERIFICATION ☐ INSTALLATION INSPECTION ☐ FINAL INSPECTION ☐ PRE TEST INSPECTION

INSP. RESULTS

☐ INSPECTION COMPLETED, ALL APPLICABLE ITEMS SATISFACTORY

☐ INSPECTION COMPLETED, UNSATISFACTORY ITEMS LISTED BELOW

QC INSPECTOR ____ DATE ____

ITEM NO.	INSPECTION ATTRIBUTES	SAT	UNSAT	DATE	QC SIGNATURE
1.	Spool is properly identified per QI-QAP-11.1-26				
2.	Spool is released on MR# ____				
3.	There are no obstructions inside spool				
4.	Threads are not damaged (Flat, Burred, Chipped)				
5.	Neolube properly applied				
6.	Thread engagement correct per QI-QAP-11.1-31, Atchmnt 2				
7.	Excess neolube removed				
8.	Record the following:				
	A. Spool * ____ to Spool ____				
	B. Line No. ____ Rework ☐ **				
	*Indicates Threaded Spool				
	**Check Rework If Applicable				
9.	QC Superintendant Review				

REMARKS (DWGS, SPECS, ETC.)

RELATED NCR NO. | L.R. CLOSED ☐ | DATE | SIGNATURE QC Inspector

ATTACHMENT 3

Brown & Root Inc.

Post Office Box 1001, Glen Rose, Texas 76043

QUALITY ASSURANCE DEPARTMENT
VISUAL EXAMINATION CHECKLIST

PROJECT: COMANCHE PEAK JOB NO. 35-1195 UNIT _____ PAGE ____ OF ____

DRAWING	SYSTEM	CLASS 1☐ 2☐ 3☐ OTHER
WELD/ITEM NUMBER	LOCATION	

Enter NA adjacent to attribute when not applicable. Enter Sat./Unsat. or NA above results in each section 1 through 4 as applicable.

WDC#

SKETCH AND REMARKS (S)

CHECK LIST

1. FITUP (Prior and During)

Base Material
Joint Design
Cleanliness
Gap Spring
Joint Prep
Joint Alignment
Seal or Engagement
Square End Gap
Identification Stamp
Orientation/Direction of Flow

Procedure _____ Rev. ____

Results

Inspector Level Date

2. AFTER WELDING OF ROOT

Procedure _____ Rev. ____

Results

Exposed Surface
Inverse Surface

Inspector Level Date

3. COMPLETION OF WELD (ID)

Procedure _____ Rev. ____

Surface
Reinforcement
Concavity
Undercut
Cluster Pits
Linear Indications (Cracks)
Inc. Fusion (Inc. Penetration)
Burn-Through
Underfill

Results

Inspector Level Date

4. COMPLETION OF WELD (OD)

Procedure _____ Rev. ____

Surface
Reinforcement
Undercut
Fillet Size
Blending of Surface
Linear/Planar Indications
Suitability of Surface for NDT
Removal of Tack, Attachments
Surface free from Arc Strikes
Weld Spatter, etc.
Purge Gas Removal

Results

Inspector Level Date

INFORMATION COPY

OC Supervision Date

Procedure Rev. Certification Level

ATTACHMENT 4

Brown & Root Inc.
QUALITY ASSURANCE DEPARTMENT
NDE REPORT

PROJECT: COMANCHE PEAK JOB NO. 35-1195 UNIT _____ PAGE _____ OF _____

DRAWING	SYSTEM	CLASS 1☐ 2☐ 3☐ OTHER
WELD/ITEM NUMBER	LOCATION	

MTL. TYPE	MTL. THICK	DIA/LENGTH
STAGE OF MFG. ☐ REPAIR ☐ ROOT ☐ INTERMEDIATE ☐ FINAL		JOINT DESIGN ☐ BRN ☐ BXS ☐ INS ☐ OPEN BUTT ☐ OTHER

SKETCH AND REMARK (S)

ACCEPTANCE STD	ACCEPT ☐ REJECT ☐	DATE / /

INSPECTOR	
NDE PROCEDURE	CERTIFICATION LEVEL

QA-962-0

PROCEDURE/INSTRUCTION REVIEW FORM

Procedure/Instruction No: QI-QAP 11.1-31 rev 3	Title: Installation Inspection of Mech. Joints	
Originator: P Faulkner	Reviewing Organization: Pipe Supv.	Page 1 of 1

Paragraph	Comment	Resolution
	OK	

Resolution(s) Acceptable

Signature

1-27-92
Date

CP-QAP-6.1

PROCEDURE/INSTRUCTION REVIEW FORM

Procedure/Instruction No: SI-QAP-11.1-31 rev 3	Title: Installation Inspection of Mechanical Joints
Originator: K. Faulkner	Reviewing Organization: Owner Rep.

Page ___ of 1 thru 9

Paragraph	Comment	Resolution
3.2.5.2	OVERLAP BY DEFINITION IS REENTRANT angle < 90°	3.2.5.2 – Yes, this is true.
3.2.6 (a)	Where on MRS?	3.2.6(a) – On or at the operation designated as the QCI's verification of threading acceptability.
3.2.6 (b)	① Is this to say all visually unacceptable welds will have an NDER? ② QC Superintendents Signature on IR is not what that space has been allocated for.	3.2.6 b.① yes ② CP-QAP-18.05 is being revised to reflect "QC Superintendent.

1/21/82

Per Speedletter dated 1-26-82 T. Brandt to G. Purdy

3.2.5.2 – Overlap definition has been deleted.

3.2.6.b – ② – "Typical" attachment #2 has been corrected to allow close-out by Inspector as required by CP-QAP-18.05

~~CP-QAP-18.05 will~~ QC Superintendent will sign as shown on Attachment #2.

CP-QAP-18.05 will not be revised at this time.

Resolution(s) Acceptable

Signature

1/26/82

Date

PROCEDURE/INSTRUCTION REVIEW FORM

Procedure/Instruction No: QI-QAP-11.1-3, Rev 3	Title: Installation Inspection of Mechanical Joints	
Originator: R. Faulkner	Reviewing Organization: Project Manager	Page ~~of~~ 1 thru 9

Paragraph	Comment	Resolution
	Comments marked on copy. 1/26/82	

Resolution(s) Acceptable

Signature

1/29/82
Date

Speed Letter.

To G. R. Purdy From C T Bolton

Subject Resolution of Comments on QE-QAP-11.1-31 R-3

MESSAGE Date 1/26 19 82

The resolution of Comments is unacceptable for following reasons:

1. OVERLAP IS POSSIBLE WITH REENTRANT ANGLE 790°; hence your definition is NOT ALL INCLUSIVE.
2. YOU CANNOT ISSUE A PROCEDURE WHICH VIOLATES A REFERENCED PROCEDURE. The IR AS YOU HAVE CONSTRUCTED IT IN QE-QAP 11.1-31 LEAVES NO CLOSEOUT SIGNATURE

Signed T. Bolton

REPLY cc: Tolson Date 19

Signed

Wilson Jones Company

RECIPIENT—RETAIN WHITE COPY, RETURN PINK COPY

BROWN & ROOT, INC. CPSES JOB 35-1195	NUMBER	REVISION	ISSUE DATE	PAGE
	QI-QAP 11.1-26	7	MAR 12 1982	1 of 52

TITLE:

ASME PIPE FABRICATION AND INSTALLATION INSPECTIONS

ORIGINATOR: Ronald C. Washington — DATE 3-4-82

REVIEWED BY: [signature] — DATE 3-4-82

APPROVED BY: [signature], Site QA Manager — DATE 3/12/82

1.0 REFERENCES

1-A ASME Boiler & Pressure Vessel Code, Section III, 1974 Edition with Addenda through Summer, 1974

1-B CP-QAP-2.1-5, "Training and Certification of Inspection Personnel"

1-C CP-QAP-8.1, "QC Receiving Inspection"

1-D CP-QAP-16.1, "Control of Nonconforming Items"

1-E QI-QAP-11.1-31, "Installation Inspection of Mechanical Joints"

1-F CP-QAP-10.3, "QC Surveillance of Welder Performance Qualification"

1-G CP-QAP-16.1-2, "Documenting Base Metal Repairs, Minimum Wall Violations, and Arc Strike Repairs"

1-H CP-QAP-18.2, "QA Review of ASME Section III Documentation"

2.0 GENERAL

2.1 PURPOSE AND SCOPE

This instruction delineates the requirements and criteria to be used when performing fabrication or installation inspection of ASME Code piping (Reference PTRV

2.2 RESPONSIBILITY

The Quality Control Manager shall be responsible for implementation of this instruction.

2.6 ROUTINE OBSERVATIONS

Inspection personnel performing inspections shall routinely observe general workmanship conditions in all areas of plant construction. Observations shall include such items as:

a. Handling/Rigging

b. Housekeeping/Storage Maintenance

c. Contamination of Stainless Steel (Material Segregation)

d. Physical Damage

Observations which are adverse to quality and existing site procedures shall be documented using Field Deficiency Reports (FDR's). The FDR's shall be forwarded to Quality Engineering for evaluation.

2.7 INSPECTION OF MECHANICAL JOINTS

Inspection of flanged joints, threaded joints, etc., shall be accomplished in accordance with Reference 1-E.

3.0 IDENTIFICATION, MARKING, CLEANING, FIT-UP AND FINAL VISUAL INSPECTION REQUIREMENTS

3.1 MATERIAL IDENTIFICATION AND MARKING REQUIREMENTS

Material identification shall be maintained on all items during fabrication and installation activities. The material identification shall be such that traceability is maintained between the item and its associated documentation.

3.1.1 Maintenance of Material Identification during Cutting Operations

When cutting is performed in order to modify a vendor-supplied piping spool, a B&R fabricated piping spool, or cut process bulk pipe for fabrication purposes, the QCI shall verify the following is transferred legibly, and in accordance with paragraph 3.1.4, to each cut piece prior to cutting:

a. Vendor supplied piping spool - the spool number and drawing number.

b. Process bulk pipe - the heat number, ASTM/ASME type and grade, schedule/wall thickness, spool number, drawing number, and piece number.

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TITLE:

ASME PIPE FABRICATION AND INSTALLATION INSPECTIONS

ORIGINATOR: Ronald C Washington — DATE: 4-14-82

REVIEWED BY: Pvcm Lahoti — DATE: 4-14-82

APPROVED BY: [signature] Site QA Manager — DATE: 4-14-82

1.0 REFERENCES

1-A ASME Boiler & Pressure Vessel Code, Section III, 1974 Edition with Addenda through Summer, 1974

1-B CP-QAP-2.1-5, "Training and Certification of Inspection Personnel"

1-C CP-QAP-8.1, "QC Receiving Inspection"

1-D CP-QAP-16.1, "Control of Nonconforming Items"

1-E QI-QAP-11.1-31, "Installation Inspection of Mechanical Joints"

1-F CP-QAP-10.3, "QC Surveillance of Welder Performance Qualification"

1-G CP-QAP-16.1-2, "Documenting Base Metal Repairs, Minimum Wall Violations, and Arc Strike Repairs"

1-H CP-QAP-18.2, "QA Review of ASME Section III Documentation"

2.0 GENERAL

2.1 PURPOSE AND SCOPE

This instruction delineates the requirements and criteria to be used when performing fabrication or installation inspection of ASME Code piping (Reference 1-A).

2.2 RESPONSIBILITY

The Quality Control Manager shall be responsible for implementation of this instruction.

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2.6 ROUTINE OBSERVATIONS

Inspection personnel performing inspections shall routinely observe general workmanship conditions in all areas of plant construction. Observations shall include such items as:

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b. Process bulk pipe - the heat number, ASTM/ASME type and grade, schedule/wall thickness, spool number, drawing number, and piece number.

3.3.4 Cold Springing

The QC Inspector shall verify at fit-up, prior to welding, that cold springing does not exist, and document results on the Visual Examination Checklist.

3.4 PREHEAT/INTERPASS TEMPERATURE

The preheating and interpass temperatures to be used for welding shall be in accordance with the applicable WPS.

Where the temperature of the surface of material to be welded falls below 60°F and a higher preheat is not required by the WPS, the weld area shall be preheated to a hand warm condition.

The preheat specified on the WPS shall be established before any welding. However, except for P4 and P5 materials, preheating above 60°F is not required before tacking.

Preheat and interpass temperatures shall be measured by the use of approved temperature indicating crayons, attached thermocouples, pyrometers or any other method approved by the Owner. Temperature indicating crayons shall be of the special lead-free, sulphur-free and halogen free type such as Tempilstick.

The area to be preheated on any weld joint shall be 3 times the wall thickness on each side of the maximum weld width. The area shall be uniformly preheated to the required temperature before the start of production welding.

Temperature indicating crayons, when used for preheat and interpass temperature measurement shall be applied to avoid direct contact with the surface to be welded.

The interpass and preheat temperature shall be measured on the surface of the base material, on the side which the welding is performed, within 1 inch of the weld joint edge, and along the joint 1 inch from the starting point for the next weld pass.

Preheat and Interpass (if necessary) temperatures are verified by the QCI in accordance with the above and documented on the Preheat and Interpass temperature blocks on the applicable WDC.

ATTACHMENT 16

Brown & Root Inc.

Post Office Box 1001, Glen Rose, Texas 76043

QUALITY ASSURANCE DEPARTMENT
VISUAL EXAMINATION CHECKLIST

PROJECT: COMANCHE PEAK JOB NO. 35-1196 UNIT PAGE OF

DRAWING | SYSTEM | CLASS 1 2 3 other

WELD/ITEM NUMBER | LOCATION

Enter NA adjacent to attribute when not applicable. Enter Sat./Unsat. or NA above results in each section 1 through 4 as applicable.

WDC#

WELDER AND WELDING OP. QI-QAP-11.1-26 Rev.

CHECK LIST

1. FITUP (Prior and During)

Results

INSPECTOR LEVEL DATE

2. AFTER WELDING OF ROOT QI-QAP-11.1-26 Rev.

Results

INSPECTOR LEVEL DATE

3. COMPLETION OF WELD (ID) QI-QAP-11.1-26 Rev.

Results

INSPECTOR LEVEL DATE

4. COMPLETION OF WELD (OD) QI-QAP-11.1-26 Rev.

Results

Inspector Level Date

QC Supervision Date

WELD PROCEDURE QI-QAP-11.1-26 Rev. EXAMINER'S VISA LEVEL

REMARKS