

**PROJECT****Standby SRU & Additional Tanks****IOCL Paradip Refinery****CLIENT****INDIAN OIL CORPORATION LIMITED****JOB CONSTRUCTION
SPECIFICATION FOR WELDERS
MANAGEMENT****Project No.**
080557C001**Document No.**
080557C-000-PP-821**Rev. No.**
0

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JOB CONSTRUCTION SPECIFICATION FOR WELDERS MANAGEMENT

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REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED	AUTHORIZED

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1. **INTRODUCTION:**

INDIAN OIL CORPORATION LIMITED (IOCL) has awarded Fax of Acceptance (FOA) dated 29th August 2019 to M/s. Technip India Limited (TPIL) for Consultancy services (PMC/EPCM services) for overall project management, FEED Review / FEED, Detailed Engineering, Procurement & expediting services, Tendering & award, Construction Management & Supervision, Assistance in start-up, Commissioning & performance test runs for installation of a Standby SRU of 525 TPD capacity and execution of Additional tanks for Paradip Refinery, Odisha, India.

2. **DEFINITIONS & ABBREVIATIONS**

Abbreviation	Definition /Expanded form
IOCL/ CLIENT	Indian Oil Corporation Limited
PMC/ CONSULTANT	Technip India Limited
LICENSOR	Party selected by IOCL for Process Technology Ownership for any UNIT
CONTRACTOR	Party whose services are obtained for performing the works specified as part of LSTK / packages.
EPCM	Engineering, Procurement & Construction Management Services.
LSTK	Lump Sum Turn Key portion of the work to be executed by CONTRACTOR
SUBCONTRACTOR	Any person/ Company / Person or Body who may be engaged by Contractor / LSTK for works and services connected with construction/ Installation/ Erection /commissioning of the facilities for the project with or without the supply of equipment and material.
FEED	Front End Engineering Design
VENDOR SUPPLIER	Any third party supplying the equipment/materials for setting up the Plant
LLI	Long Lead Item – Any equipment / Package / Work order taking 16 months or more completion time from the date of award
PROJECT	Indicates Standby SRU & Additional tanks Project,Paradip Refinery
SITE	Indicates ,Paradip Refinery,Odisha

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UNIT	Indicates any particular portion of the project to be built which can be Process related or Utilities/Off sites related
ENGINEER-IN-CHARGE	PMC represented looking over the CONTRACTOR's/ LSTK Job or Part thereof
MR	Material Requisition
PURCHASER	The Party That Issues the Purchase Order for The Package
KOM	Kick Off Meeting
AUTHORISED REPRESENTATIVE	OWNER's/CONSULTANT's representative authorized to act for and on behalf of OWNER/CONSULTANT
PLANT	the units and facilities comprised in the project, and if divided into different packages for the award of LSTK Contracts

3. **SCOPE**

The purpose of this specification is to define:

- the activities and the documents to be adopted to confirm, evaluate and monitor qualification and performance of welders and welder's operator.
- the Q.C. activities to be carried out and forms to be adopted for the welding inspection procedure;
- duties and responsibilities of the parties involved.

For this specification "welder" has the meaning of welder and welder operator.

4. **FIELD OF APPLICATION**



The present specification is prepared to be applied to project IOCL- Paradip Standby SRU & Tankages LSTK packages.

5. **CORRELATION WITH OTHER PROCEDURES/SPECIFICATION**

This specification is to be correlated with the following documents:

- | | |
|---|----------------------------|
| • Welding & NDE Specification for Fabrication of Piping | 080557C-000- PP- 814 |
| • Quality Control Plan for Welders Management | 080557C-000- -QCP-1399.01 |
| • Standard Specification for Fabrication and Erection of Piping | 080557C-000- -JSC-1300-001 |

All other documents referenced in these specifications shall be considered applicable.

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6. ACTIVITIES AND DOCUMENTATION

6.1 WELDER'S QUALIFICATION AT PREFABRICATION SHOP

Before they are proposed to PMC / OWNER all Contractor welders shall already have a qualification certified by an Independent Recognized Third-Party Organization (I.R.T.P.O.) according to ASME IX, AWS D1.1

- For all the other welders is necessary a confirmation with "test coupon" as per para.6.3

During production at Prefabrication Shop, all the welders will be evaluated according the "Periodical Evaluation" procedure (applicable Form W22) as specified in para. 6.5.2 and will be monitored according to para. 6.5.3.

6.2 Transfer of welders from "Prefabrication Shop" to "Site"

All the welders that have worked at Prefabrication Shop having good performances could be transferred for working at Site after a confirmation (Control Evaluation) as specified in para. 6.5.1

6.3 Confirmation of Welder's Qualification at Site

Confirmation of welder's qualification consist of one welding test coupon execution, one per each qualification type (i.e. materials, range of thickness and diameter, processes, positioning, etc.), to be checked by visual and radiographic examination. See APPENDIX "A".

Welding execution on test coupons must be done at CONTRACTOR Welding Inspector presence.

If examination result is acceptable:

- welder's qualification is confirmed;
- welder's identification is assigned;
- welder's list is up-to-date.



If examination result is not-acceptable:

- welder's qualification is not confirmed.

6.3.1 Test Coupons

Welded Test Coupons must be marked by Contractor with the welder name and progressive numbering and made available for visual check and evaluated by PMC/OWNER Welding Inspector (see attached Form W 19).

After visual inspection, the welded test coupons are verified by radiographic examination tests at Contractor care.

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Test results shall be recorded on Form W 19 and submitted to PMC /OWNER Welding Inspector for approval.

6.3.2 Categories

Welders shall be classified into three categories:

- **Piping Welders**

These welders must be qualified according to ASME IX.

These qualified welders are authorized for the butt welding of piping in the selected ASME IX ranges including tack, temporary, repair welds and for any kind of fillet welds for this category.

- **Equipment Welders**

These welders must be qualified according to ASME IX.

These qualified welders are authorized for the butt welding of plates with selected ASME IX ranges including tack, temporary, repair welds and for any kind of fillet welds for this category.

- **Structural Welders**

These welders must be qualified according to AWS D1.1 or ASME IX.

Welders qualified for full penetration welding are authorized to perform repair, fillet and tack welds of structural assemblies and for piping supports.

In addition to piping, equipment and structural welders' categories, it's possible to qualify tack welders as follows:

- **Structural tack welders**

Tack welder's qualification consists of test coupon execution in position 3F and 4F with visual examination and bend (or fracture) test as per ASME IX.



Welding and bend (or fracture) test execution on test coupons must be done at CONTRACTOR welding inspector presence.

These qualified tack welders are authorized for tack welding of structural assemblies and piping supports.

- **Piping tack welders**

Piping tack welder's qualification is applicable for carbon steel material P-Number N° 1 Group 1 & 2 only.

Piping tack welder's qualification follows the same requirements as per structural tack welders.

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REMARK:

Concerning equipment and piping other than carbon steel materials P-Number N°1 Group 1 & 2, tack welds must be done by welders qualified in accordance to ASME IX.

6.4 Identification and Registration

6.4.1 Identification Stamp

Contractor shall assign to each approved welder an identification number (stamp) that will be approved by PMC

Such identification number (stamp) shall be marked or punched by the welder, close to each weld he has carried on. The identification number shall be used to record the welding activities of the related welder

6.4.2 Registration

For all approved welders all data relevant to confirmation examinations (visual and radiographic examination) shall be recorded by Contractor on Form W19.

Contractor shall also fill-in the main data of the welder qualification made by Independent Recognized Third-Party Organization in the attached Form W07 - Welders List.

The Contractor will register all historical information about each welder (i.e. confirmation, penalty, etc.) in the attached Form W21.



For all approved tack welders, visual examination and bend (or fracture) test shall be recorded on a dedicated form like form W19 proposed and fulfilled by Contractor. That form shall be additionally approved by PMC /OWNER welding inspector.

6.5 Inspection and Evaluation on Production

6.5.1 Control Evaluation (at site only)

To check the welders ability at site the initial welding production of piping and equipment welders after their qualification confirmation is controlled by the CONTRACTOR Welding Inspector as below specified: first two production welded joints of each confirmed welder are 100% radiographically examined and evaluated according to the applicable codes; the following criteria of acceptance are applied:

- When the production welds are acceptable, the welder is confirmed.
- If one production weld is rejected, two additional joints, made by the same welder, shall be 100% radiographically examined. If additional joints are acceptable, the welder is confirmed. If any of the penalty joints reveal defects requiring repair, the welder is rejected.
- If both production welds are rejected, the welder is rejected.

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- After a welder passes the initial evaluation, he shall be monitored as per ASME B31.3 by “WELDER’S RT%” weekly report (FORM W22).

6.5.2 Periodical Evaluation

Contractor must continuously control the welder’s production through periodical performance evaluation, as per the percentage explained below.

The welder’s performance evaluation is based on the “Repair Rates” (RR). The Repair Rates shall be calculated on linear basis.

The maximum weekly repair rate for each welder should not exceed 2%.

$$RR(\%) = \frac{L_r}{L_w} \times 100$$

L_r = welder’s total length of repairs in one week, mm

L_w = welder’s total length of weld radiographed in one week, mm

The results of the radiographic examinations relevant to each welder are summarized in the Welder Repair Rates Weekly Report (FORM W22) which is kept by Contractor and delivered to PMC /OWNER Welding Inspector on weekly basis.



Welders are confirmed or disqualified according to the results summarized in the

Welder RR Weekly Report and criteria given below:

RR	ACTIONS TO BE TAKEN
RR ≤ 2%	Welder is confirmed.
2% < RR ≤ 10%	Increase control + 1 penalty shall be registered on Welder Historical Report (Form W 21)
RR > 10%	Welder is rejected.

Note 1: Welders that cumulate two penalties in 10 weeks are rejected or downgraded at PMC / OWNER Welding Inspector decision.

Note 2: Radiographic increase shall be at Contractor expense. PMC/OWNER Welding Inspector will decide the number of the joints to be checked in accordance with the ASME B 31.3/B31.1 and AWS D1.1 requirements.

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6.5.3 Monitoring

Contractor is responsible that the welders are operating according to their qualifications and to the approved welding procedures.

PMC / OWNER Welding Inspector that has found a welder not applying the welding procedure or working outside of his qualification can issue a notice to the Contractor requesting the cut-out of the incorrectly executed joints and the application of penalty note to the welder in his historical data report.

Welders that have two recorded penalties notices in 10 weeks are rejected or downgraded at PMC / OWNER Welding Inspector decision.

6.5.4 Welders Card

Contractor shall provide a Welders Card (to each welder) which shows the welder name, stamp and photo and essential data of welder qualification.

Welders Card shall be coloured to permit an easy identification of the job category and welding process for which welder is qualified.

LABEL COLOUR (*)	JOB CATEGORY
WHITE/material code	PIPING
YELLOW	EQUIPMENT
RED	STEEL STRUCTURES (FULL PENETRATION)
BLUE	TACK WELD – S. STRUCTURES / C. S. PIPING

7. ATTACHMENTS

ATT. 1 - APPENDIX “A” PROCEDURE FOR WELDERS CONFIRMATION



ATT. 2 - FLOW DIAGRAM FOR WELDERS Q.C. ACTIVITY

ATT. 3 - QCF W07 WELDERS LIST

ATT. 4 - QCF W19 TEST COUPONS VISUAL & RADIOGRAPHIC EXAMINATION

ATT. 5 - QCF W21 WELDER HISTORICAL REPORT

ATT. 6 - QCF W22 WELDER'S RT% & WELDER REPAIR RATES - WEEKLY REPORT

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ATTACHMENT 01

APPENDIX "A"

PROCEDURE FOR WELDERS & TACK WELDERS QUALIFICATION

1. PREPARATION OF TEST COUPON

Pipe/Plate test coupon for confirmation of welder and tack welder qualification shall be prepared by Contractor, according to ASME IX, AWS codes standard.

Machining, oxygen-acetylene flame cutting, or proper methods shall bevel test coupons. Test coupon shall be ground after flame cutting to match WPS joint preparation.

Each test coupon shall be marked as follows:

- Progressive test number (+ "TW" for tack welding)
- Coupon identification number (+ "TW" for tack welding)
- Welder Identification / Tack Welder Identification

2. TEST COUPON EXECUTION

Before starting the weld of test coupon Contractor's Welding Inspector shall verify and check the followings:

- Marking of test coupon;
- Material, Position, Range of thickness and diameter, etc. according to the qualification;
- WPS requirements.

All welding requirements as welding rods and shielding shall be in accordance with the applicable approved WPS.



3. TEST ACCEPTANCE CRITERIA

PMC /OWNER Welding Inspector shall witness the welder test.

PMC /OWNER Welding Inspector shall authorize the coupon radiographic examination only after his visual check and approval of welding by Form W19.

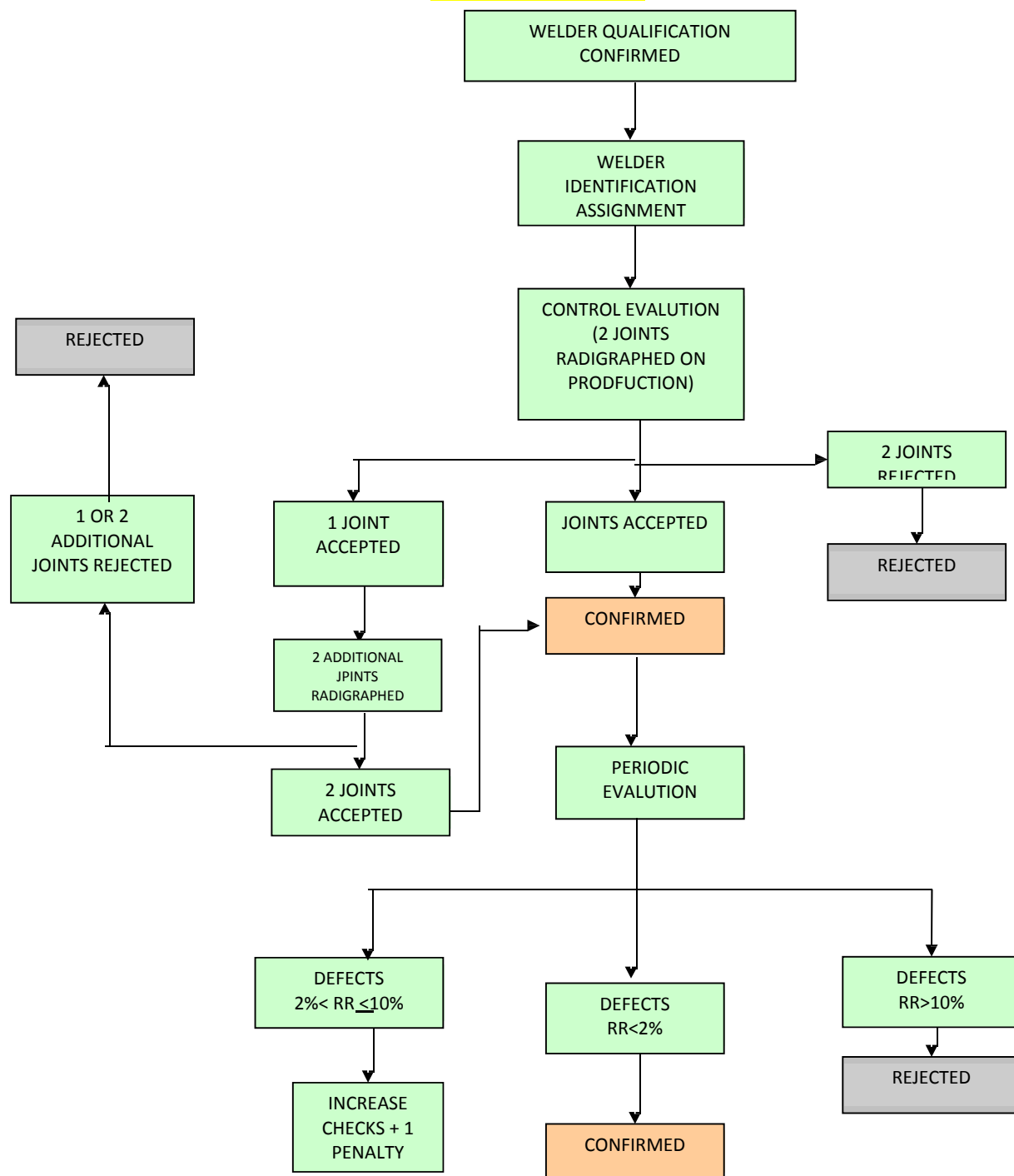
Acceptance criteria for visual inspection and radiographic examination shall be in accordance to ASME IX, ASME VIII, ASME B31.3 and ASME B31.1.

Visual and bend (or fracture) test acceptance criteria for tack welding shall be in accordance to ASME IX.

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ATTACHMENT 02

LOW DIAGRAM FOR WELDERS Q.C. ACTIVITY WELDERS EMPLOYED FOR PRESSURE RETAINING WELDS



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COMPANY:

W 19

QCF REV. 0

SH. OF

TEST COUPONS VISUAL & RADIOGRAPHIC EXAMINATION

CONTRACTOR:

W 19 N° _____

[illegible]

NOTE: (1) YES MEANS APPROVAL FOR RADIOGRAPHIC EXAMINATION

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				PROJECT: Standby SRU & Additional Tanks							
				COMPANY:							
QUALITY CONTROL FORM W 21				PROJ. No.:		QCF REV. 0		SH. 1 OF 1			
WELDER HISTORICAL REPORT				CONTRACTOR:				W 21 N° _____			
WELDER NAME _____				WELDER STAMP _____		WELDER PERFORMANCE QUALIFICATION (WPQ) N° _____					

AT WORK SHOP AT SITE	WEEKS PERIOD EVALUATION (Note 2)	PENALTIES		PENALTIES				WELDER		REMARKS												
		RR (%) = REPAIR RATES (W 22)		OTHER (MONITORING)				DISQUALIF. DATE	DOWN GRADED DATE													
		DATE	DATE	DATE	(*)	DATE	(*)															
1. TEST COUPON EXAMINATION (W 19 N°) : _____ 2. CONTROL EVALUATION ON PRODUCTION <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td colspan="2">FIRST TWO JOINTS</td> <td colspan="2">ADDITIONAL JOINTS</td> </tr> <tr> <td>(Note 1)</td> <td>DATE</td> <td>(Note 1)</td> <td>DATE</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	FIRST TWO JOINTS		ADDITIONAL JOINTS		(Note 1)	DATE	(Note 1)	DATE					From Week N° ____ To Week N° ____									
	FIRST TWO JOINTS		ADDITIONAL JOINTS																			
	(Note 1)	DATE	(Note 1)	DATE																		
		□																				
(*) PENALTY NOTE: W = INCORRECT WPS APPLICATION Q = INCORRECT WPQ APPLICATION																						
(1) ACC = ACCEPTABLE UN-ACC = UNACCEPTABLE A = APPLICABLE N.A. = NOT APPLICABLE (2) From the first welder working week																						



PROJECT: **Standby SRU & Additional Tanks**

COMPANY:

QUALITY CONTROL FORM

W 22

PROJ. No.:

QCF REV. 0

SH. OF

WELDER'S RT % & WELDER REPAIR RATES (RR) WEEKLY REPORT

SUBCONTRACTOR:

W 22 N° _____

MATERIAL : _____ PIPING CLASSES: _____ RT% _____

WEEK N°	FROM	TO
---------	------	----

CUMULATIVE DATA

[illegible]

Filled up by:

Date:

Received by:

Date: