


Supplier's LOGO	Supplier's Name and Address		Quality Plan for 16Mo3 Spacer Flats (Size:19.4x20x6000mm)					Project: GHAVP 1& 2 W.O : D157 to D160-001-1-93-171				
			Item : 16Mo3 Spacer Flats Sub-system: Steam Generator		QP No.: To be filled by Supplier Rev.No.: To be filled by Supplier Date: To be filled by Supplier Page No: 1 of 4							
Sl. No	Component & Operations	Characteristics	Type of Check	Quantum of check	Reference Document	Acceptance Norms	Format of Record		Agency			Remarks
									M	B	N	
1.	2.	3.	4.	5.	6.	7.	8.	D*	9. **			10.
<b>1.0 Raw Material :</b>												
1.1	Steel Melting : :Melting in electric arc furnace :Vacuum Degassing	Temperature	Record Verification	100%	PC-M-964 Rev 0 Annexure-1 MPP: To be submitted	TC	√	P	R	R	Steel shall be fully killed and fine grain	
1.2	Ladle Analysis	Chemistry	Chemical analysis	1/Melt	PC- M-964 Rev 0 Annexure-1 EN 10028-2 MPP: To be submitted	TC	√	P	R	R		
1.3	Semi Product (Slab) casting	Free from defects	Visual/Record verification	100%	MPP: To be submitted	RD	--	P	--	--	--	
<b>2.0 In process Controls :</b>												
2.1	Rolling Process	Rolling Process	Record verification	100%	PC- M-964 Rev 0 Annexure-1 MPP: To be submitted	--	--	P	--	--	--	
2.2	Marking after Rolling	Identifications	Verification and Visual	100%	PC- M-964 Rev 0 Annexure-1	RD	--	P	R	R	--	
2.3	Heat Treatment (Normalization)	R.O.H , Soaking Temp & Time, R.O.C	Review of HT Chart	100%	PC- M-964 Rev 0 Annexure-1 HT Plan: To be submitted	TC	√	P	W	R	Chart Shall be signed at the start and End of HT cycle. Chart shall be submitted along with TC	

				<b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( √ ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: SUPPLIER B: BHEL , N: NPCIL/TPI P: PERFORM R: REVIEW W: WITNESS AND H: HOLD TC:TEST CERTIFICATE RD:RECORD
Prepared	Reviewed & Approved	Reviewed & Approved	Reviewed & Approved	
SUPPLIER'S NAME: To be filled		BHEL	NPCIL	

  
 24/02/18  
 (M/THAN.O.R)

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2.4	Identification of Test coupon and Cutting	Location and orientation	Visual & Measurement	100%	PC- M-964 Rev 0 Annexure-1 MPP & MSTP: To be submitted	RD	√	P	H	H	---	
2.5	Mechanical descaling (if required)	Surface Inspection , Free from Visual Defects	Visual	100%	PC- M-964 Rev 0 Annexure-1 Free from Visual Defects	RD	√	P	---	R	Surface Should be smooth and free of scales	
2.6	Final Dimensional check (Note-2)	Dimensions	Measurement	100%	Drg No/P.O No: To be filled	TC	√	P	W	W	---	
		Thickness	Ultrasonic method	100%	Drg No/P.O No: To be filled						At random locations on each Flats	
2.7	Visual Inspection	Free from visual defects	Verification and Visual	100%	PC- M-964 Rev 0 Annexure-1	TC	√	P	W	W	---	
2.8	Magnetic Particle Examination	Surface and shallow sub surface defects	MPI	100%	PC- M-964 Rev 0 Annexure-1 ASME SEC III-NB-2545 ,2545.3 MPI Procedure: To be submitted	TC	√	P	W	W	To be demagnetized after test	
2.9	Ultrasonic Inspection	Internal soundness	Ultrasonic Test	100%	PC- M-964 Rev 0 Annexure-1 SA578 UT Procedure: To be submitted	TC	√	P	H	W	Surface shall be cleaned after USI. Acceptance as per PC-M-964.	
2.10	Specimens preparation	Dimensions	Measurement	100%	MSTP: To be submitted PC- M-964 Rev 0 Annexure-1	RD	--	P	--		---	
2.11	Mechanical and Metallurgical Tests :											
2.12	Product analysis	Chemistry	Chemical analysis	1	PC- M-964 Rev 0 Annexure-1 MSTP: To be submitted EN10028-2	TC	√	P	W	W	---	


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Prepared	Reviewed & Approved	Reviewed & Approved	Reviewed & Approved	
SUPPLIER'S NAME: To be filled		BHEL	NPCIL	

  
 24/09/18  
 (M.T.H.N.O.R.)



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2.13	Tensile at RT	Tensile Strength, Yield Strength (0.2% offset), % Elongation	Destructive Test	1	PC- M-964 Rev 0 Annexure-1 MSTP: To be submitted EN10028-2	TC	√	P	W	W	---	
2.14	Tensile at 350° C	0.2% proof strength	Destructive Test	1	PC- M-964 Rev 0 Annexure-1 MSTP: To be submitted EN10028-2	TC	√	P	W	W	---	
2.15	Impact Test at +20°C	absorbed energy	Destructive Test	3	PC- M-964 Rev 0 Annexure-1 MSTP: To be submitted EN10028-2 EN ISO 148-1	TC	√	P	W	W	---	
2.16	Bend Test	Yield property	Destructive Test	1	PC- M-964 Rev 0 Annexure-1 MSTP: To be submitted ASME SEC II SA-20 Minimum Inside radii for bending:1.5x specimen thickness Acceptance: No crack	TC	√	P	W	W	Cold Bend angle- 180°	
2.17	Hardness	Hardness	Brinell	3 locations	PC- M-964 Rev 0 Annexure-1 Value to be reported(For information only).	TC	√	P	w	W	---	
3.0	Final Inspection											
3.1	Visual Inspection of Spacer Flats	Free from visual defects	Verification and Visual	100%	PC- M-964 Rev 0 Annexure-1	TC	√	P	R	R	---	

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Prepared	Reviewed & Approved	Reviewed & Approved	Reviewed & Approved	
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3.2	Marking	SI No, Heat Number, Material designation, Supply condition, Inspectors Seal, Manufactures name , P.O Number.	Verification and Visual	100%	PC- M-964 Rev 0 Annexure-1	TC	√	P	R	R	---
3.3	Mix up Test	Positive Material Identification	PMI Test	100%	PC- M-964 Rev 0 Annexure-1	TC	√	P	R	--	
3.4	Certification and Documentation Control	Order compliance	Certificate compilation	100%	PC- M-964 Rev 0 Annexure-1	TC	√	P	R	R	---
3.5	Documents (Test Certificates) shall be sent to BHEL/Trichy prior to dispatch. Dispatch clearance will be given after Acceptance of Test Certificates by BHEL&NPCIL)					RD	--	P	H	H	---
3.6	Packing & Shipment	Packing	Visual	100%	PC- M-964 Rev 0 Annexure-1	---	--	P	--	--	---

**Note:**

1. MSTP (Material Sampling Plan) , MPP(Manufacturing Process plan), Heat Treatment Plan, Ultrasonic & Magnetic Particle Test Procedures etc. shall be submitted by Supplier and the same will be subjected to both BHEL&NPCIL approval.
2. Tolerance in thickness shall be as per class "C" of clause No:6.1 of EN 10029 and as per EN 10029 for other dimensions also.

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