						r	NPCIL		внег	be filled	SUPPLIER'S NAME: To be filled	S
				:			Reviewed & Approved	_	Reviewed & Approved	Reviewed & Approved		Prepared
LEGEND: * RECORDS, INDENTIFIED 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	DENTIFIED WI Y SUPPLIER IN N: NPCIL/TPI WITNESS AND	LEGEND: * RECORDS, INDENTIFIED WIT BE ESSENTIALLY INCLUDED BY SUPPLIER IN Q 8* M: SUPPLIER B: BHEL, N: NPCIL/TPI 9: PERFORM R: REVIEW W: WITNESS AND TC:TEST CERTIFICATE RD: RECORD	EST CERTIFICATE RD	E * RIPIC	LEGEND: * RECOI BE ESSENTIALLY INCLL BE ESSENTIALLY INCLL ** M: SUPPLIER B: P: PERFORM R: REVI TC: TEST CERTIFICATE	10: 1 8: 8 8: 8 8: 8 8: 8 8: 8 8: 8 8: 8 8						
10% random witness by BHEL& NPCIL	\$	8	p	4	TC		PC-M-961, ASTM A380	100%	Visual and Passivity Check	Completeness	Pickling and Passivation	2.4 Pi
HT chart to be signed & submitted along with TC.	R	R	ъ	~	TC	PC-M-961 HT Plan: To be submitted	PC-M-961 HT Plan: To I	100%	Review of HT Chart	R.O.H , Soaking Temp & Time, R.O.C,	Heat Treatment (Solution Annealing)	2.3 H _s
* 1	1	R	P	ŀ	R B		PC-M-961	100%	Verification and Visual	Visual & Identification	Visual & Identification of Tubes	2.2 Vi
	R	R	P	~	77	submitted	PC-M-961 MPP: To be submitted	100%	Record Verification	Process parameters	Operations from Billet to Tube : To be elaborated by Supplier	2.1 to
										••	In process Controls	2.0 It
1	i	1	P	ł	R	submitted	MPP: To be submitted	100%	Visual/Record verification	Free from defects	Billet casting	1.3 Bi
i	P	R	P	۷.	TC	6-5	PC-M-961 DIN EN 10216-5	1/Melt	Chemical analysis	Chemistry	Ladle Analysis	1.2 La
Steel shall be fully killed	1	ı	Р	~	TC	ubmitted	PC-M-961 MPP: To be submitted	100%	Record Verification	Steel melting	Steel Melting: :Melting in electric furnace :Vacuum Degassing	1.1 St fu :V
										-	Raw Material:	1.0 R:
10.		9. **		Ō*	8.	7.	6.	5.	4.	3.	2.	1.
Remarks	2	Agency	3 >	Format of Record	of Record	e Acceptance it Norms	Reference Document	Quantu m Of check	Type of Check	Characteristics	Component & Operations	SI.
QP NO: SPACER TUBE:01 Rev 01 Project: GHAVP 1& 2 W.O : D157 to D160-001-1-93-171	ACER IAVP	QP NO: SPACER TUBE Project: GHAVP 1& 2 W.O : D157 to D160-	Proje	ier er	ed by Suppli led by Supp by Supplier	be filled filled	thick))25x4mn L6-5	Item: Spacer Tubes(OD25x4mm thick) Material: DIN EN 10216-5 1.4550/1.4571 Sub-system: Steam Generator		Supplier's Name and Address	Suppl sier's
						r Tubes	Quality Plan for Spacer Tubes	שלוֹ בּיוּ	2			

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							NPCIL			BHEL	be filled	SUPPLIER'S NAME: To be filled	SUPP	
	è			,	<u>[</u>		Reviewed & Approved	Review	-	Reviewed & Approved	Reviewed & Approved	Reviewed	Prepared	70
LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (v') SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: SUPPLIER B: BHEL, N: NECIL/TPI P: PERFORM R: REVIEW W: WITHESS AND H: HOLD P: PETTST CERTIFICATE RD: RFORD	TFIED V PLIER I PCIL/T IESS AN	LEGEND: * RECORDS, INDENTIFIED WIT BE ESSENTIALLY INCLUDED BY SUPPLIER IN (** M: SUPPLIER B: BHEL, N: NPCIL/TPI P: PERFORM R: REVIEW W: WITNESS AND TC:TFST CERTIFICATE RD: RECORD	ECORDS, NCLUDEC B: BHEI REVIEW V	PPLIER RTIFIC	LEGEND: * RECORDER SE ESSENTIALLY INCLUMENTALLY INCLUMENTA	P: #ES								
Randomly 10% will be witnessed by BHEL & NPCIL	8	₩	P	4	TC	ď.	PC-M-961 DIN EN 10216-5 Procedure: To be submitted.	PC-M-961 DIN EN 10 Procedure	100%	Hydro Test	Leak Tightness Check	Test	Hydro Test	2.14
1	€	\$	p	۷.	тс	rted	PC-M-961 Hardness value to be reported		1/ melt / HT Batch	Brinell / Rockwell /Vickers Hardness	Hardness	ess	Hardness	2.13
-	8	8	ъ	۷.	だ		PC-M-961 ASTM E112 Grain Size to be reported.		1/ melt / HT Batch	Micro test , Grain size check	Micro structure, Grain Size	Micrograph & grain size	Microg size	2.12
1	н	I	P	۷.	TC	ISO	DIN EN10216-5, EN ISO 8495:2004 or EN ISO 8493:2004		10% per melt / HT Batch	Destructive Test	Ring Expanding Test or Drift Expanding Test	Ring Expanding Test or Drift Expanding Test	Ring E Drift E	2.11
Sensitization-650° x 30 Minutes	₩	8	Р	٧	TC		PC-M-961 ASTM A 262 Practice-E		1 /melt / HT Batch	IGC Test	Inter Granular Corrosion	Corrosion Test (after sensitization)	Corros sensiti	2.10
	Н	П	ρ	٧	тс		PC-M-961 DIN EN 10216-5		1 /melt/ HT Batch	Destructive Test	0.2% & 1.0% proof strength	Tensile at 350° C	Tensile	2.9
!	Ι	Ι	P	~	TC		PC-M-961 DIN EN 10216-5		2 / melt/ HT Batch	Destructive Test	Tensile Strength, Yield Strength (0.2% offset), % Elongation	Tensile at RT	Tensile	2.8
-	٤	8	P	~	тс		PC-M-961 DIN EN10216-5		1 /melt/ HT Batch	Chemical analysis	Chemistry	Product analysis	Produc	2.7
										••	Mechanical and Metallurgical Tests	anical and Met	Mech	2.6
	8	¥	P	<	R		PC-M-961 DIN EN 10216-5	PC-M-961 DIN EN 1	100%	Visual	Identification	Identification of Test coupon	Identifi coupon	2.5
QP NO: SPACER TUBE:01 Rev 01 Project: GHAVP 1& 2 W.O : D157 to D160-001-1-93-171	ACER IAVP	QP NO: SPACER TUBI Project: GHAVP 1& 2 W.O : D157 to D160-	QP N Proje W.O	ier	Suppl y Suppl y Supplier	filled by Stilled by Stilled by ed by Sul	QP No.: To be filled by Supplier Rev.No.: To be filled by Supplier Date: To be filled by Supplier Page No:2 of 3	m thick)	D25x4mr 16-5 enerato	Item: Spacer Tubes(OD25x4mm thick) Material: DIN EN 10216-5 1.4550/1.4571 Sub-system: Steam Generator		Supplier's Name and Address	0 <u>2</u>	Suppl ier's LOGO
							Quality Plan for Spacer Tubes	lan for	uality P	Q				



			0	uality Pla	Quality Plan for Spacer Tubes	r Tubes						
Suppl ier's LOGO	Supplier's Name and Address		Item: Spacer Tubes(OD25x4mm thick) Material: DIN EN 10216-5 1.4550/1.4571 Sub-system: Steam Generator)D25x4mm 216-5 Generator		QP No.: To be filled by Supplier Rev.No.: To be filled by Supplier Date: To be filled by Supplier Page No.3 of 3	oy Suppli by Supp Supplier	blier	Proje W.o	QP NO: SPACER TUBE Project: GHAVP 1& 2 W.O : D157 to D160-	ACER HAVP	QP NO: SPACER TUBE:01 Rev 01 Project: GHAVP 1& 2 W.O : D157 to D160-001-1-93-171
2.15	Final Dimensional check of Tubes	Dimensions	Measurement	100%	Drg No/P.O N	Drg No/P.O No: To be filled	ТC	٧	þ	Ξ	Η	
3.0	Final Inspection											
3.1	Visual Inspection of Tubes	Free from visual defects	Verification and Visual	100%	PC- M-961		тс	٧	Р	I	∜	
3.2	Marking	SI No, Heat Number, , Material designation, , Supply condition, Inspectors Seal, Manufactures name , P.O Number.	Verification and Visual	100%	PC- M-961		тс	~	ס	8	R	;
3.3	Mix up Test	Positive Material Identification	PMI Test	100%	PC- M-961		70	٧	þ	I	٧	10% random witness by NPCIL
3.4	Certification and Documentation Control	Order compliance	Certificate compilation	100%	PC- M-961		70	7	Р	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)	ates) shall be sent Certificates by BHI	to BHEL/Trichy prior L&NPCIL)	to dispatch	n. Dispatch clea	rance will be given	RD	1	P	I	I	***
3.6	Packing & Shipment	Packing	Visual	100%	PC- M-961		ŀ	1	P	1		
			and the second s			AND						Making and War War and Defended in the second and an extension of the second and

- approval. Note:

 1. MPP(Manufacturing Process plan), Heat Treatment Plan, Hydro Test procedure shall be submitted by Supplier and the same will be subjected to both BHEL&NPCIL
- 2. Surface finish of CFG tubes: 3.2 microns(CLA) for both internal and external surfaces.
 3. Spacer tubes are in Secondary Side of steam Generator. (Not in Primary Side of Steam Generator).

TO SE
4/02/19

SUPPLIER	Prepared	
SUPPLIER'S NAME: To be filled	Reviewed & Approved	
BHEL	Reviewed & Approved	
NPCIL	Reviewed & Approved	
	SELECTION SELECTION	LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (\(\) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: SUPPLIER B: BHEL, N: NPCIL/TPI P: PERFORM R: REVIEW W: WITHESS AND H: HOLD **TOTTEST OF THE OFFICE OFFICE OF THE OFFICE OFFIC