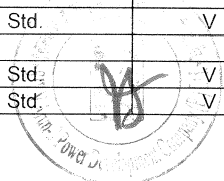
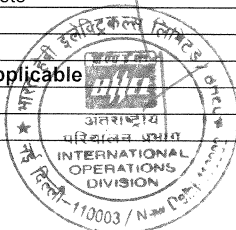


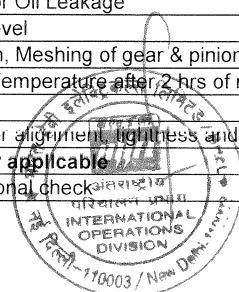


Manufacturing Quality Assurance Test Requirements

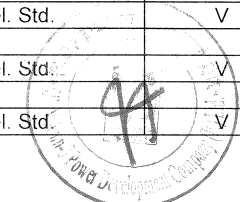
Project Name: Arun - 3 HEP (4x225 MW)		Doc. No. QAI/A/M/EM/EOT/01	Rev. No. 02
Item Description: EOT Crane		Issue Date: 30.05.17	Pages : 3
Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks
1	2	3	4
EOT CRANE			
1 Incoming Material			
1.1	Box Girder, End carriage, Crab Frame, Bed frame, Load frame / cradle.		
	Chemical Analysis & Mechanical Properties	TS/DRG/ REL.STD.	V
	UT of plates	TS/DRG/ REL.STD.	V
	Dimensional Check	TS/ DRG	V
	Material Identification & transfer stamping	TS /Manufacturer standard practice / REL. STD.	V
1.2 Casting/plate for Rope Drum			
	Chemical Analysis & Mechanical Properties	TS/DRG/ REL.STD.	V
	Heat Treatment of Casting	TS/DRG/ REL.STD.	V
	UT of casting/plate	TS/DRG/ REL.STD.	V
	Dimensional Check	TS/ DRG	V
	Material Identification & transfer stamping	TS /Manufacturer standard practice / REL. STD.	V
1.3 Wheels			
	Chemical analysis & Mechanical Properties including hardness	TS/DRG/ Rel. Std.	V
	UT & DPT	TS/DRG/ Rel. Std.	V
	Dimensional Check	TS/DRG/ Rel. Std.	V
	Heat Treatment	TS/DRG/ Rel. Std.	V
1.4 Wire Rope, Slings			
	Identification & Grade	TS/DRG/ Rel. Std.	V
	Dimensional Check	TS/DRG/ Rel. Std.	V
	Check for twist, kinks, proper thimble end connection & splicing	TS/DRG/ Rel. Std.	V
	Braking Strength	TS/DRG/ Rel. Std.	V
1.5 Gear Box casing			
	Chemical analysis & Mechanical Properties	TS/DRG/ Rel. Std.	V
	Surface condition	TS/DRG/ Rel. Std.	V
1.6 Gears, pinions, shaft, coupling shaft & Axles			
	Chemical Composition & Mechanical Properties including Hardness	TS/ DRG/REL.STD	V
	Dimensional Check	TS/ DRG/REL.STD	V
	UT after proof machining	ASME Sec VIII & V	V
	DP Test on teeth	ASME Sec VIII & V	V
	Heat Treatment	TS/ DRG/REL.STD	V
1.7 Bearings			
	Make & type	TS/DRG/ Rel. Std.	V
1.8 Lifting Hook and Block			
	Mechanical Properties on integral test bar Chemical analysis	TS/DRG/ REL.STD.	V
	Heat Treatment	TS/ DRG	V
	UT on raw material of Hook	TS/DRG/ Rel. Std.	V
	Forging operation of Hook	TS/DRG/ REL.STD.	V
	Proof Load Test	TS/DRG/ REL.STD.	W
	UT & MPI after proof load test (UT on shank portion only)	TS/DRG/ ASME Sec- VIII & V	W
	Material Identification	TS/DRG/ REL.STD.	V
1.9 Rails (CT rail as well as run way rails)			
	Chemical Composition & Mechanical Properties including Hardness	TS/DRG/ Rel. Std.	V
	Dimensional check	TS/DRG/ Rel. Std.	V
1.10. Pulleys, brake drums, coupling & other major steel casting & forging			
	Chemical Composition & Mechanical properties	TS/DRG/ Rel. Std.	V
	Hardness except pulleys	TS/DRG/ Rel. Std.	V
	Final Dimensional Check	TS/DRG/ Rel. Std.	V
	DPT in groove after machining of pulleys	TS/DRG/ Rel. Std.	V
1.11 Electric Motors			
	Routine Test & Verification of IP class	TS/DRG/ IS:325	V
	Type test	TS/DRG/ IS:325	V
1.12 Master controllers Radio Remote, Pendant Controller, if applicable			
	HV, IR, Functional tests	TS/DRG/ Rel. Std.	V
1.13 Brakes			
	Routine Test	TS/DRG/ Rel. Std.	V
1.14 Resistance Box if applicable			
	IR Test & HV Test	TS/DRG/ Rel. Std.	V
	Temperature Rise	TS/DRG/ Rel. Std.	V



	Measurement of Resistance	TS/DRG/ Rel. Std.	V
	Verification of IP class	TS/DRG/ Rel. Std.	V
1.15	Power & Control Cables		
	Acceptance Test& Routine Test	TS/DRG/ Rel. Std.	V
1.16	Limit switch		
	HV, IR & Functional Check & Verification of IP class	TS/DRG/ Rel. Std.	V
1.17	Current collector arm, if applicable		
	Dimensional check	TS/DRG/ Rel. Std.	V
1.18	DSL guard, if applicable		
	Dimensional check	TS/DRG/ Rel. Std.	V
1.19	Sockets for wire rope		
	Destructive tensile test in which rope shall fail first than the socket or joints	TS/DRG/Rel. Std.	V
1.20.	Sole Plates & Clamps		
	Chemical composition and Mechanical Properties.	TS/DRG/Rel. Std.	V
	NDT & Diemions.	TS/DRG/Rel. Std.	V
2	In process Inspection		
2.1.	Welding		
2.1.1	Butt weld, if any, in Box Girder, End carriage, Crab Frame, Rope Drum, Gear Casing, Load Frames / Cradle		
	DP/MPI test after root run.	ASME Section V & VIII/BS 5135/DRG/TS	V
	RT.	ASME Section V & VIII/BS 5135/DRG/TS	V
	UT, DPT & MPI.	ASME Section V & VIII/BS 5135/DRG/TS	W
2.1.2	Fillet Welds in Box Girder, End carriage, Crab Frame, Rope Drum, Gear Casing, Load Frames / Cradle.		
	NDT of all fillet weld joint as per drawing or MPI / DP of all fillet joints if it is not specified in drawing. NDT of inaccessible weld joints in Box Girder (before closing) shall be witnessed by SAPDC.	ASME Section V & VIII/BS 5135/DRG/TS	W / V
2.1.3	All weld joints: Visual Examination for final weld appearance, cracks, undercut, Excess reinforcement, burn through or excess penetration, root concavity , non-uniform width of fillet weld joint, distortion & misalignment.	ASME Section VIII &V/DRG	W / V
2.1.4	Stress relieving of assemblies /sub-assemblies / item (rope drum, gear box casing & rope drum) after welding as per DRG.	TS/ASME Section V&VIII/ DRG	V
2.1.5	Dimensional check of weld joints/ Weld size (Weld size shall be checked with universal weld gauge).	ASME Section VIII/DRG	W / V
2.1.6	Welding & welder records to be maintained for Box Girder, End carriage, Crab Frame, Rope Drum, Load Frames / Cradle in weld Log book.	Relevant standard ASME/IS/IEC	V
2.2	Machining: Machined Components		
	Visual examination	TS/DRG/ Rel. Std.	V
	Dimensional check	TS/DRG/ Rel. Std.	V
	Surface finish	TS/DRG/ Rel. Std.	V
	Material traceability control	TS/DRG/ Rel. Std.	V
2.3	Box Girder		
	Dimensional check including camber, verticality & bend	TS/ DRG/ IS 3177/ IS 807	W for girder before closing.
	Material Identification & transfer stamping	TS/DRG/ Rel. Std.	V
2.4	End carriage		
	Dimensional check	TS/ DRG/ IS 3177/ IS 807	V
2.5	Rope Drum		
	Dimensional check	TS/ DRG/ IS 3177/ IS 807	V
	DP test after machining	TS/ DRG/ ASME	V
	Visual check for surface defects after machining	TS/DRG/ Rel. Std.	V
	Stress relieving after welding, if applicable	TS/ASME Section V&VIII/ DRG	V
2.6	Gear Box casing		
	Dimensional check	TS/ DRG/ IS 3177/ IS 807	V
	Stress relieving after welding	TS/ASME Section V&VIII/ DRG	V
2.7	Platforms, LT Frames, Hand Railings, Crab Assembly		
	Dimensional Check	TS/DRG/ Rel. Std.	V
2.8	Gear Box Assembly and Idle Running		
	Check for Oil Leakage	TS/DRG/ Rel. Std.	V
	Noise Level	TS/DRG/ Rel. Std.	V
	Backlash, Meshing of gear & pinions teeth	TS/DRG/ REL. STD.	V
	Rise in Temperature after 2 hrs of running	TS/DRG/ Rel. Std.	V
2.9	Brakes		
	Check for alignment, tightness and capacity	IS/DRG/ Rcl. Std.	V
2.10.	Cabin, If applicable		
	Dimensional check	TS/DRG/ Rel. Std.	V



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2.11	Bridge with LT		
	Dimensions, wheel level alignment	TS/DRG/ Rel. Std.	V
2.12	Crab assembly		
	Dimensions, wheel level alignment.	TS/DRG/ Rel. Std.	V
3	Final Inspection (EOT Crane at Manufacturer's Works)		
	Overall inspection of crane, dimensions, Span, Diagonal Dimensions check, clearances, ratings, hook reaches, Equipment Layout on bridge platform, skewness, cambering of girder. Visual & Dimension check of Load frame / cradle. Visual & dimension check of slings.	TS/ DRG/ IS 3177/ IS 807	W
	Electrical & Electronic Panels.	TS/ DRG/ IS 3177/ IS 807	W
	Insulation Test on Electrical Components of Crane.	TS/ DRG/ IS 3177/ IS 807	W
	No Load tests and load tests as per Technical Specification	TS/ DRG/ IS 3177/ IS 807	W
	No load Running of Machinery for Direction & Speed, Check of working range.	TS/ DRG/ IS 3177/ IS 807	W
	No load Test of Hoists, CT, LT, Speed & Current Measurement. Testing of fault panel functions, Test of emergency stop at no load.	TS/ DRG/ IS 3177/ IS 807	W
	SWL test: Hoisting, Travel operation, Speed, Current & Deflection Measurement.	TS/ DRG/ IS 3177/ IS 807	W
	Overload Test at 125% of SWL: Check for Hoisting & Travel operation.	TS/ DRG/ IS 3177/ IS 807	W
	Simultaneous Operation of main and auxiliary Hoists.	TS/ DRG/ IS 3177/ IS 807	W
	Braking Test.	TS/ DRG/ IS 3177/ IS 807	W
	Functional check for emergency stop, limit switch operation & overload protection.	TS/ DRG/ IS 3177/ IS 807	W
	Oil leakage check in gear box.	TS/ DRG/ IS 3177/ IS 807	W
	Visual inspection of Hook & accessible weld joints after load test.	TS/ DRG/ IS 3177/ IS 807	W
	DP test of Hook & accessible weld joints after load test.	TS/ DRG/ IS 3177/ IS 807	W
	Measurement of throat opening of hook after load test.	TS/ DRG/ IS 3177/ IS 807	W
	Other tests as per Technical Specification		
	De-energized tests as per TS.	TS/ DRG/ IS 3177/ IS 807	W
	Energized tests as per TS.	TS/ DRG/ IS 3177/ IS 807	W
4	Cleaning, Coating and Painting		
	Surface Preparation.	TS/ DRG	V
	Check for Paint thickness and adhesion test.	TS/ DRG	V
LEGENDS			
TS: TECHNICAL SPECIFICATION		REL. STD.: RELEVANT STANDARD	
W: CUSTOMER HOLD POINT (CHP)		DRG: DRAWING	
V: VERIFICATION OF REPORT/TEST CERTIFICATE			
NOTES			
1	Any test at any stage not covered in Quality Assurance Test Requirement (QATR), but part of technical specification of contract, shall also be carried out by Contractor/ firm.		
2	QATR shall be read in conjunction with General Quality Assurance Requirement given as part of Technical Specification		



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