

## Format for the Vendor Qualification Criteria (VQC)

NOMENCLATURE & DRAWING NO.: SPADE ARMOUR PLATE HARDENED AND TEMPERED CONDITION, LF No.0339020050 DRG/SPC No.HVF/T-90/50MM/148, JSS:9515-021:2014, 1800X2100X50MM

1	2	3	4	5	6
<p>MANUFACTURING TECHNOLOGY &amp; TESTING / INSPECTION FACILITIES REQUIRED TO PRODUCE THE ITEM</p>	<p>MUST BE POSSESSED BY THE VENDOR IN HIS OWN PREMISES - (P&amp;M LIST &amp; TESTING/INSPECTION EQUIPMENT LIST TO BE SUBMITTED)</p>	<p>PROVIDE DETAILS OF THE FACILITIES ASKED IN COLUMN (3) THAT ARE AVAILABLE IN-HOUSE (SELF-DECLARED P&amp;M LIST (Nomenclature of machine, Make/Model, Capacity/Size &amp; accuracy, Date of Installation, Vintage of machine/Year of Manufacturing of machine) AND TESTING/INSPECTION EQUIPMENT LIST (Nomenclature of the Testing/Inspection Equipment, Make/Model, Size &amp; Range, Date of calibration) ALSO TO BE SUBMITTED)</p>	<p>MAY BE POSSESSED BY THE VENDOR IN HIS OWN PREMISES OR OUT SOURCED - (MOU/TIE-UP WITH THE OUTSOURCING VENDOR/SUB-VENDOR AND THEIR P&amp;M LIST &amp; TESTING/INSPECTION EQUIPMENT LIST TO BE SUBMITTED)</p>	<p>PROVIDE DETAILS OF THE FACILITIES ASKED IN COLUMN (5) THAT ARE AVAILABLE IN-HOUSE OR OUT-SOURCED FIRMS (NAME AND ADDRESS OF THE OUTSOURCING VENDOR TO BE DECLARED BY THE FIRM IN FIRM'S LETTERHEAD, SELF-DECLARED P&amp;M LIST (Nomenclature of machine, Make/Model, Capacity/Size &amp; accuracy, Date of Installation, Vintage of machine/Year of Manufacturing of machine) AND TESTING/ INSPECTION EQUIPMENT LIST (Nomenclature of the Testing/Inspection Equipment, Make/Model, Size &amp; Range, Date of calibration) AND MOU/TIE-UP ALSO TO BE SUBMITTED)</p>	
<p>Technology 1</p>	<p>STEEL MAKING</p>	<p>The steel is to be manufactured by electric arc furnace/open hearth furnace (Furnace Minimum 10T Capacity) followed by vacuum degassing treatment, ESR process (ESR Facility with minimum 10 MT capacity. Suitable measure is to be taken by the steel maker to avoid harmful defect such as seams, flaws, piping, cracks, segregation/banding, inclusion, surface defect etc. in the ingots. Calcium silicide treatment shall be given in steel during ingot casting. Other technical parameters as per JSS: 9515-021:2020 (First Revision) for material SPADE M1</p>			
<p>Technology 2</p>	<p>FORGING</p>	<p>Hot Forging: Heating Furnace min 1200° C and Press of min 2000 MT Capacity.</p>			

Technology 3	HOT ROLLING		Hot Rolling mill of suitable capacity to manufacture the finished plates of thickness 50 mm with dimensional tolerance of the thickness as per JSS:9515-021:2020 (First Revision) for Material Spade M1.	
Technology 4	CUTTING		CNC Laser Cutting Machine/CNC Plasma & Gas Cutting Machine.	
Technology 5	SOFT ANNEALING	Heating Furnace of suitable size min 1.8X2.1 meters for Heat Treatment of the Plates temperature min 750° C.		
Technology 6	HARDENING	Heating furnace of suitable size min 1.8 X2.1 m and capacity min 1000° C for Heat Treatment of the finished Plates. Oil Quenching Tanks of suitable size min width 1.8 m X Length 2.1 m		
Technology 7	TEMPERING	Heating Furnace of suitable size min 1.8X2.1m for Heat Treatment of the Plates temperature min 750° C.		
Test/ Inspection 1	CHEMICAL TESTING	Spectrometer Suitable for Analysis of material as per Table 3 of JSS 9515-021:2020 (First Revision)		
Test/ Inspection 2	MECHANICAL TESTING	Brinell Hardness Tester, Universal Testing Machine for UTS, YS, %E and %RA, Charpy Impact tester for Room Temp and Sub Zero (-40deg C)		
Test/ Inspection 3	METALLOGRAPHY TESTING	Microscope min 100 X Magnification for Microstructure, De-Carburization Layer, NMIR and Weld ability Test.		
Test/ Inspection 4	BALLISTIC TESTING		Final Acceptance will be after clearance in Ballistic test on Heat treated plate as per JSS: 9515-021:2020 (First Revision). Test will be arranged by HVF at PXE Balasore	

Note: Facilities must be available with vendors own premises - including facilities available with **Sister / Parent Concerns / Strategic Partners** shall be considered for Capacity Verification subjected to documentary evidence to prove the relationship / ownership.