



MINISTRY OF DEFENCE (DGQA)

STANDARD QUALITY ASSURANCE PLAN
SINGLE FALL & HOOK TYPE BOAT DAVIT

**STANDARD QAP NO.DGQA/DQA(WP)/ SINGLE FALL & HOOK TYPE
BOAT DAVIT /04/2022/REV 01
20 JUL 22**

Total Nos. of Pages: 24

ISSUING AUTHORITY


**DIRECTORATE OF QUALITY ASSURANCE (WARSHIP PROJECT)
MINISTRY OF DEFENCE (DGQA)
6TH FLOOR, 'B' BLOCK, DEFENCE OFFICE COMPLEX
NETAJI NAGAR PO, NEW DELHI – 110 023**



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RECORD OF AMENDMENTS

<u>Sl. No.</u>	<u>Date of Amendment</u>	<u>Amendments</u>	<u>Authority</u>	<u>Remarks</u>

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MINISTRY OF DEFENCE (DGQA)
STANDARD QUALITY ASSURANCE PLAN
FOR SINGLE FALL & HOOK TYPE BOAT DAVIT

STANDARD QAP NO.
DGQA/DQA(WP)/ SINGLE FALL & HOOK TYPE
BOAT DAVIT/04/2022/REV 01
20 JUL 2022


(S N Alamanda)
Rear Admiral
ADGQA (WP)

Promulgated by:-

DIRECTORATE OF QUALITY ASSURANCE (WARSHIP PROJECT)
MINISTRY OF DEFENCE (DGQA)
6TH FLOOR, 'B' BLOCK, DEFENCE OFFICE COMPLEX
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CONDITION OF RELEASE

1. This standard QAP has been prepared for use of the Indian Navy and of its contractors to follow the specified Quality Assurance procedure during the execution of the contracts. No alteration is to be made to this Standard QAP except by the issue of authorised amendment by DQA (WP).
2. It is to be applied as required in the Quality Assurance procedures covering manufacture of Single Fall & Hook Type Boat Davit for IN Ships.
3. The website <http://www.dggadefence.gov.in> may also be referred for other QA requirements.
4. The Standard QAP has been prepared on the basis of decisions made in consultations with leading manufacturers of Anchor Capstan, representatives of professional directorates and inspection agencies. Any user of this Standard QAP either within DGQA / Indian Navy or in industry may propose an amendment to it with valid justification. Proposals not applicable to particular contract can be sent directly to DQA(WP), New Delhi, and those directly applicable to a particular contract are to be dealt with using contract procedures.
5. DQA(WP) reserves the right to amend or modify the contents of this Standard QAP without consulting or informing any holder of this document.
6. When this Standard QAP is incorporated into contracts, users are responsible for their correct application and for complying with contractual and other statutory requirements. Compliance with Standard QAP does not of itself confer immunity from legal obligations.
7. Enquiries in connection to these requirements may be made from:

Directorate of Quality Assurance (Warship Projects)
Ministry of Defence
6th Floor, 'B' Block,
Defence Office Complex
Sarojini Nagar P.O.
New Delhi – 110 023



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LIST OF ANNEXURES


<u>Ser.</u>	<u>Annexure No.</u>	<u>Topic</u>
1.	Annexure – I	DQA(N) Policy No. 66301/POLICY/DQA(N)/SG dated 14 Nov 17 regarding inspection of imported items
2.	Annexure – II	DQA(N) Policy No. 12575//POLICY/DGQA/WP-TC dated 25 Mar 22 regarding Qualification of NDT Personnel through ASNT
3.	Annexure – III	DQA(WP) Policy letter 12575/POLICY/DGQA/WP-TC dated 28 Sep 20 regarding Guidelines for approval of SQAPs/QAPs.
4.	Annexure – IV	DQA(WP) Policy letter 12575/POLICY/DGQA/WP-TC dated 14 Jun 21 regarding use of approved QAP for replenishment order.
5.	Annexure – V	DQA(WP) Policy letter 29814/MISC/DGQA/WP-TC dated 24 Feb 21 regarding SOP for Remote Inspection.

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STANDARDS INVOKED


<u>S. No.</u>	<u>Specification No.</u>	<u>Description</u>
1	BR 3021, Vol I & II	Shock Manual
2	EED-Q-071-R3 (Rev 3)	Motors and Starters for Naval Ships
3	MIL-STD-461E	Control of electromagnetic interference Characteristics of sub systems & equipment
4	EED/VI/1535/R6	Requirement for Cable Glands
5	DEFSTAN 02-636(NES 636)	Requirement for AC & DC starting & Control Gear
6	BR 67/95	Admiralty Manual of Seamanship
7	IS 4460	Gear Box specification
8	NCD 1500	Specifications For Single Fall & Hook Type Boat Davits
9	BS 1458	Specification for Gear
10	IS 2062	Specification for Structure Steel

Note: - The Standards given are indicative only. The specifications / standards and parameters given in the SOTR / Technical Specification (TSP) / MoM of TNC / Approved drawings will be final and binding.

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SPECIFIC REQUIREMENTS

1. Testing of physical, chemical properties and specific tests (wherever mentioned) has to be done by NABL accredited lab (including firm's NABL accredited lab).
2. Make of the outsourced Items should be as per approved PIL/Detailed Bill of Material (DBOM) or Naval approved sources.
3. Imported items will be inspected i.a.w DQA(N) Policy No. 66301/Policy/DQA(N)/SG dated 14 Nov 17 (Annexure-I), as amended from time to time. Normally, following documents are inspected: -
 - (a) Bill of Lading / Shipping Bill / Airway bill.
 - (b) Invoice by OEM or Country of Origin Certificate with Packing List
 - (c) Bill of entry to warehousing
 - (d) OEM confirmation Certificate
 - (e) Firm's Guarantee Certificate as per PO
4. All NDT to be performed in accordance with DQA(WP) Policy No. 12575/Policy/DGQA/WP-TC dated 25 Mar 22 (Annexure-II) and guidelines regarding qualification of NDT personnel are as follows:-
 - (a) NDT Certification: All NDT procedures are to be performed and / or sentenced by NDT personnel who have acquired the desired minimum qualification (Level II /III) through Central Certification Programs conducted by Certification Bodies like ISNT, ASNT and BINDT. The certification of these personnel should be in-date and verifiable through the websites of the Certification Bodies. Certification of personnel through Employer Based Programs is not to be treated at par with Central Certification Programs.
 - (b) **Radiography (RT) and Ultrasonic Testing (UT).**
 - (i) RT and UT procedures/technique sheets are to be approved by ISNT Level-III or ASNT Level-III or PCN Level-III other equivalent Level-III NDT personnel, certified through Central Certification Programs.
 - (ii) RT and UT are to be performed by ISNT Level-II/III or ASNT Level II/III or PCN Level-II/III or other equivalent Level-II/III NDT personnel, certified through Central Certification Programs.

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(iii) Interpretation/sentencing of RT and UT reports are to be done by ISNT Level – III or ASNT Level-III or PCN Level-III or other equivalent Level-iii NDT personnel, certified through Central programs.

(c) **Magnetic Particle Testing (MPT) and Dye Penetrant Testing (DPT).**

(i) MPT and DPT procedures/technique sheets are to be approved by ISNT Level-III or ASNT Level-III or other equivalent Level-III NDT personnel, certified through central certification programs.

(ii) MPT and DPT are to be performed by ISNT level-II/III or ASNT Level-II/III or ASNT (SNT-TC-1A) Level-II/III or PCN Level-II/III or other equivalent level-II/ III certified NDT personnel.

(iii) Interpretation/ sentencing of MPT and DPT reports are to be carried out by ISNT Level-III or ASNT Level-III or PCN Level-III or other equivalent Level-III NDT personnel, certified through Central Certification Programs, only if there is any ambiguity/ difference of opinion between QA Agency and the supplier.


5. If Type Testing have already been done in earlier projects on identical units, it will not be done again & the original reports of earlier tested units will have to be provided for review of Inspection Agency.

6. Guidelines for approval of SQAPs/QAPs, DQA(WP) policy letter 12575/POLICY/DGQA/WP-TC dated 28 Sep 20 (Annexure-III) is relevant.

7. For replenishment order, DQA(WP) policy letter 12575/POLICY/DGQA/WP-TC dated 14 Jun 21 (Annexure- IV) is relevant.


8. The SQAP along with the proposed inclusions/ exclusions approved by DQA(WP) shall be deemed as the approved QAP for the particular PO.

9. SOP for Remote Inspection, DQA(WP) policy letter 29814/MISC/DGQA/WP-TC dated 24 Feb 21 (Annexure- V) is relevant.

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10. Post promulgation of this SQAP. The manufacturer shall be required to submit confirmation to concerned QA Agency and OPA towards acceptance of SQAP either in totality or with some design specific inclusions and/or exclusions, if any, along with the following details.

- (a) Equipment name.
- (b) Equipment technical details (as applicable).
- (c) Purchase Order reference.
- (d) Sub/Sub-Sub Orders reference (as applicable).
- (e) Name of Main Indenter/ Ordering Authority.
- (f) Name of end user, if available.
- (g) Name of firm / manufacturer.
- (h) SOTRs reference, if available.
- (j) Yard No./ Name of ship where to be fitted (if available)/ End user.
- (k) References of relevant drawings.
- (l) QAP No. & Date (as indicated by the firm).
- (m) Contractual delivery date.
- (n) Inspection Authority
- (p) Inspection Agency.
- (q) Quantity (as applicable).
- (r) Inclusions, if any.
- (s) Exclusions, if any.

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ABBREVIATIONS

ABN	Air Borne Noise
ACCP	ASNT Central Certificate Program
ASME	American Society of Mechanical Engineers
ASNT	American Society of Non-destructive Testing
ATP	Approved Test Procedure
BINDT	British Institute of Non-Destructive Testing
CHP	Customer Hold Point
CoC	Certificate of Conformance
COTS	Commercial-off-the-shelf
DBOM	Detailed Bill of Material
DFT	Dry Film Thickness
DGQA	Directorate General of Quality Assurance
DI	Dimensional Inspection
DPT	Dye Penetrant Test
DQA(N)	Directorate of General Assurance(Naval)
EMC	Electro Magnetic Conduction
EMI	Electro Magnetic Induction
ESS	Environment Stress Screening
ETT	Environmental Type Testing
FATs	Factory Acceptance Trials
GA	General Arrangement
HT	Heat Treatment
I-Note	Inspection Note
IFATs	Integrated Factory Acceptance Trials
IR	Inspection Report by Vendor
IN	Indian Navy
ITC	Inspection and Test Certificate
ISNT	Indian Society of Non-destructive Testing
MO	Material Organisation
MoM	Minutes of Meeting
MPT	Magnetic Particle Test
MTC	Manufacture Test Certificate
NABL	National Accreditation Board for Testing and Calibration Laboratories
NCD	Naval Construction Document
NDE	Non Destructive Evaluation
NDT	Non Destructive Testing
NSS	Naval Shock Standard
NSTL	Naval Science and Technological Laboratory
OEM	Original Equipment Manufacturer
OPA	Order Placing Authority
P	Perform by
PCN	Personnel Certification in Non Destructive Testing

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ABBREVIATIONS

PIL	Parts Identification List
PO	Purchase Order
PQR	Procedure Qualification Record
QA	Quality Assurance
QAE	Quality Assurance Establishment
QAO	Quality Assurance Officer
QAP	Quality Assurance Plan
R	Review by
RT	Radiography Testing
SBN	Structure Borne Noise
SOTR	Statement of Technical Requirement
SQAP	Standard Quality Assurance Plan
STC	Supplier Test Certificate
TC	Test Certificate
TEC	Technical Evaluation Committee
TNC	Technical Negotiation Committee
TPI	Third Party Inspection
TSP	Technical Specification Particulars
TT	Type Test
UT	Ultrasonic Testing
VI	Visual Inspection
W	Witness by QA Rep.
WPQ	Welder Performance Qualification
WPS	Welding Procedure Specification

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SCOPE

Scope of Quality Assurance The scope of Quality Assurance will cover witness and review of all manufacturing activities during all stages viz. raw material stage inspection including, bought out items, in-process stage inspection and final inspection stage. The scope also covers the review and witness of Type Test of equipment, wherever applicable.

This Standard Quality Assurance Plan contains comprehensive list of inspections and/or trials that is to be applicable for quality assurance of the equipment. In addition, quality assurance of equipment will also be governed by specific conditions laid down in SOTRs and 'Approved Drawings'. The inspections/ trials must be contemporary to latest technology/ techniques available in the industry at the time of placement of orders

The following quality assurance activities will be carried out during the quality assurance of equipment:

- (a) Visual Inspection.
- (b) Dimensional Inspection.
- (c) Witness of Pouring in absence of integral test bar.
- (d) Review of Lab Test Certificates.
- (e) Witness of in-house Lab Testing, if applicable.
- (f) Witness of Non-destructive testing viz. UT & DPT
- (g) Review of Heat Treatment Charts
- (h) Functional Checks as per approved ATP
- (i) Witness of Painting, Preservation, Packing & Marking.
- (j) Review of draft documentation and witness/ stamping of final documentation, as applicable.
- (k) Issue of CHP clearance.
- (l) Issue of I-Note/ Form-IV or Dispatch Clearance as applicable.


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SYSTEM DESCRIPTION

A Davit is any of various crane like devices used on a ship for supporting, raising, and lowering boats, anchors etc.

Davit systems are most often used to lower an emergency lifeboat to the embarkation level to be boarded. Davits can also be used as man-overboard safety devices to retrieve personnel from the water. The lifeboat davits have falls (now made of wire, historically of manila rope) that are used to lower the lifeboat into the water. Davits can also refer to single mechanical arms with a winch for lowering and raising spare parts onto a vessel and for lowering any other equipment from the deck of a vessel or a pontoon to the water.



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STANDARD QUALITY ASSURANCE PLAN

Part – I: General Information


1. The following generic information must generally be indicated on each QAP as its identity:-

- (a) Equipment Name
- (b) Equipment Technical Details (as applicable)
- (c) Purchase Order Reference
- (d) Sub/Sub-Sub Orders reference (as applicable)
- (e) Name of Main Indenter/ Ordering Authority
- (f) Name of End User
- (g) Name of Firm / Manufacturer
- (h) SOTRs Reference
- (j) Yard No./ Name of Ship where to be fitted (if available)/End User
- (k) References of Relevant Drawings
- (l) QAP No. & Date (as indicated by the firm)
- (m) Contractual Delivery Date
- (n) Inspection Authority
- (p) Inspection Agency
- (q) Quantity (as applicable)

Part – II: Technical Inspection / Trials

Standard QAP of Single Fall & Hook Type Boat Davit Appendix "A"

STANDARD QUALITY ASSURANCE PLAN FOR SINGLE FALL & HOOK TYPE BOAT DAVIT

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		APPENDIX-A Technical Inspection / Trials in form of SQAP Part II (Refers to Page No. 14)	DATE	20 J

SL. NO	MATERIAL/ COMPONENT/ DRG.NO/ QUALITY ACTIVITY	CHARACTERISTIC/ TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE CRITERIA	FORMAT OF RECORD	AGENCIES		REMARKS
							FIRM	QAE	
1.0.0	DRAWINGS/DOCUMENTS/TYPE TEST								
1.1.0	GA Drawings of all Assemblies & sub assemblies along with DBOM & Binding Data	Check for availability of approved drawings and DBOM & Binding data	100%	As per PO/ SOTR/ TNC Minutes	All approved drawings along with DBOM & Binding data are available	List of Approved Binding Drawings	P	R	CHP Approved binding data/dra to be verified
1.2.0	Type Test /ETT/ EMI/EMC reports*	Verification of Type Test Report	100%	Purchase Order, GA drawings, Component drawing & SOTR/ TNC Minutes	Equipment should have successfully undergone Type Test (as applicable)	Type Test Report	P	R	CHP Shipyard Orders. Type Qualification test are to be conducted if not under earlier or test certificate no or equipment has unde changes. MO Orders. Type / Qualifi tests undertaken only mentioned in PO. *EMI/EMC test mandator Motors, Starter & Control pa Decision of IHQ MoD(N) is for all tests.

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							FIRM	QAE	
2.0.0	RAW MATERIALS INSPECTION/ IDENTIFICATION								
2.1.0	Plate, Sheet, Sections, Rods for Rotating Column, Platform, Cover, Support Bracket, Stationary Column, Rope Drum, Davit Arm, Pull Wire Drum, Seating for Slewing Motor, Cylinder Body, Fixed Plate, Eye, etc	Chemical & Mechanical	One sample per heat per thickness	Approved Drawing	Approved Drawing	NABL TC	P	R	Sample to be drawn in presence of QA Rep and Report to be reviewed.
2.2.0	Shaft	Chemical & Mechanical	One sample per heat	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.3.0	Pulley	Chemical, Mechanical & Physical	One sample per heat	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.4.0	Pinion	Chemical, Mechanical & Physical	One sample per heat	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.5.0	Piston Rod	Chemical, Mechanical & Micro Test (If forged)	One sample per heat	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.6.0	Wave Compensation Device and its allied parts	Chemical & Mechanical	One sample per heat	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.7.0	Locking Plate	Chemical & Mechanical	One sample per heat	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.8.0	Key	Chemical & Mechanical	One sample per heat	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.9.0	Pin	Chemical & Mechanical	One per lot	Approved Drawing	Approved Drawing	NABL TC	P	R	
2.10.0	Bushes	Chemical & Mechanical	One per lot	Approved Drawing	Approved Drawing	NABL TC	P	R	

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							FIRM	QAE	
2.11.0	Misc Raw Material inputs (As per DBOM)								
	Rope Clamp, Pipe, Sheeve, Rope Guard, Clamp, Adaptor, Guard, Spacer, Pipe for Limit Switch Wire, Manifold	Chemical & Mechanical	One per lot	Approved Drawing	Approved Drawing	NABL TC	P	R	No of components/ items (under misc components/ Bought out/ COTS items) may vary from design to design. This list is indicative only. Actual components/ items would be as per approved DBOM/ drawings
3.0.0	Bought Out Items / COTS items (As per approved DBOM)								
3.1.0	Packing, Hex Bolt, Accumulator, Allen Head Bolt, Rigid Pipe, Circlip, O Ring, Piston Seal, Guide Ring, Seals, Nuts, Coupling, Counter balance valve, Dog Screw, Grease, Rope, Safety Preventer, Stabilizing Wire, Pull Wire for gravity operation, etc.	Chemical & Mechanical	100%	Approved Drawing	Approved Drawing	STC/OEM TC/OEM CoC	P	R	
3.2.0	Rope (Corrosion Resistant Steel Wire Rope)	Chemical & Physical, Proof load test, VI & DI	100%	Approved Drawing / DBOM	Approved Drawing	NABL TC	P	R	Grade of Steel (Tensile designation) & Type of Galvanising to be specified as per IS:1835
3.3.0	Foundation bolts & Bolts for connection of Davit arm assembly to pedestal.	Chemical & Physical,	One sample per Lot	Approved Drawing / DBOM	Approved Drawing	NABL TC	P	R	
		VI & DI	Random/ Size	Approved Drawing / DBOM	Approved Drawing	STC/OEM TC /OEM COC	P	R	
3.4.0	Gasket	VI & DI	Random/ Size	Approved Drawing / DBOM	Approved Drawing	STC/OEM TC /OEM COC	P	R	

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							FIRM	QAE	
3.5.0	Shock Mounts	As per latest SQAP of S &V Mounts				Form IV / I-Note	P	R	
3.6.0	Bearings	Product Identification	100%	Approved Drawing / DBOM	Approved Drawing	STC/OEM TC/OEM CoC	P	R	
3.7.0	Gear Box	Product Identification & DI	100%	Approved Drawing / DBOM	Approved Drawing	STC/OEM TC/OEM CoC	P	R	-
3.8.0	Pulley	Product Identification & DI	100%	Approved Drawing / DBOM	Approved Drawing	STC/OEM TC/OEM CoC	P	R	-
3.9.0	Auto Tensioning Device	Product Identification & DI	100%	Approved Drawing / DBOM	Clause 43-45 of NCD 1500	STC/ OEM TC/OEM CoC	P	R	-
3.10.0	Dampening/ Wave compensation Device	Product Identification & DI	100%	Approved Drawing / DBOM	Clause 46 of NCD 1500	STC/ OEM TC/OEM CoC	P	R	-
3.11.0	Safety Preventer	VI, DI and load testing	100%	Approved Drawing / DBOM	Clause 70 & 71 of NCD 1500	STC/ OEM TC/OEM CoC	P	R	Spring Hook & Shackle to be tested as per SOTR. Load testing during FATS also acceptable.
4.0.0	Electrical Bought Out / COTS Items								
4.1.0	MCB	Product Identification	100%	Approved Drawing	Approved Drawing	STC/ OEM TC/OEM CoC	P	R	
4.2.0	Relays	Product Identification	100%	Approved Drawing	Approved Drawing	STC/ OEM TC/OEM CoC	P	R	
4.3.0	Push button	Product Identification	100%	Approved Drawing	Approved Drawing	STC/ OEM TC/OEM CoC	P	R	
4.4.0	Limit Switch	Product Identification	100%	Approved Drawing	Approved Drawing	STC/ OEM TC/OEM CoC	P	R	
4.5.0	Cables	Product Identification	100%	Approved Drawing	Approved Drawing	STC/ OEM TC/OEM CoC	P	R	

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							FIRM	QAE	
4.6.0	Cable Gland	Product Identification	100%	Approved Drawing	DG Ships EED/VI/1535/R6	STC/ OEM TC/OEM CoC	P	R	
4.7.0	Motor, Control Panel, Remote Control Unit & Starter	As per latest SQAP				Form IV/ I-Note	P	R	
5.0.0	Imported Item								
5.1.0	Automatic Release Hook (ARH)	Product Identification	100%	Approved Drawing	Against import document	Import Documents	P	R	To be imported from IHQ MOD(N) approved OEM only
5.2.0	Slew Bearing	Product Identification	100%	Approved Drawing	Against Import document	Import Documents	P	R	
5.3.0	Hydraulic Motor with Brake and Gear Box	Product Identification	100%	Approved Drawing	Against Import document	Import Documents	P	R	
5.4.0	Pump	Product Identification	100%	Approved Drawing	Against Import document	Import Documents	P	R	If pump is not imported, QA coverage will be provided as per approved SQAP.
6.0.0	IN PROCESS INSPECTION								
6.1.0	Fabrication / Welding								
6.1.1	Welding Procedure and Welder Qualification	Review of Documents. Before fabrication of assemblies – Welding Procedure & Welder Qualification Record	-	Approved Drawing	ASME IX / Approved Drawing	WPS/PQR/ WPQ	P	R	
6.1.2	Davit Arm/ Pedestal/ Boom	VI, DI	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	MTC	P	R	
		RT/UT	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	NDE Report	P	W	For UT/RT, Annexure II to be referred. For RT, NDE report along with radiographic film to be submitted for review.

STANDARD QUALITY ASSURANCE PLAN FOR SINGLE FALL & HOOK TYPE BOAT DAVIT

<u>SL. NO</u>	<u>MATERIAL/ COMPONENT/ DRG.NO/ QUALITY ACTIVITY</u>	<u>CHARACTERISTIC/ TYPE OF CHECK</u>	<u>QUANTUM OF CHECK</u>	<u>REFERENCE DOCUMENTS</u>	<u>ACCEPTANCE CRITERIA</u>	<u>FORMAT OF RECORD</u>	<u>AGENCIES</u>		<u>REMARKS</u>
							<u>FIRM</u>	<u>QAE</u>	
6.1.3	Rope Drum	VI, DI	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	IR	P	R	
		DP	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	NDE Report	P	W	
6.1.4	Gear Box	VI	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	IR	P	R	
		DI	100% by firm and 10% Critical/Major dimensions by QA	Approved Drawing	Approved Drawings, SOTR,TSP & PO	IR	P	W	
		DP	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	NDE Report	P	W	
6.2.0	Machining								
6.2.1	Shafts & Keys	VI & DI	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	IR	P	W	
6.2.2	All Gears and Pinions	VI, DI	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	IR	P	W	
		Hardness	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	IR	P	R	
		DPT	100%	Approved Drawing	Approved Drawings, SOTR,TSP & PO	NDE Report	P	W	
6.3.0	Sub-Assembly								
6.3.1	Pulley, Shaft & Bearings	VI & DI	100%	Approved drawing	Approved drawing	IR	R	R	
6.3.2	Rope Sling with ARH	VI & DI	100%	Approved drawing	Approved drawing	IR	P	R	

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							<u>FIRM</u>	<u>QAE</u>	
6.3.3	Hoist Drive Arrangement	VI & DI	100%	Approved drawing	Approved drawing	IR	P	R	
6.3.4	Arrangement of Brakes	VI as per layout	100%	Approved drawing	Approved drawing	IR	P	R	
7.0.0	Final Assembly								
7.1.0	Final Assembly of Boat Davit	Visual Inspection to check completeness of assembly and overall dimension.	100%	Approved Drawing	Conformity to approved Drawings	IR	P	W	
8.0.0	Functional/ Performance Tests/ Pre-Requisite FATs								
8.1.0	Min Hoisting Speed at maximum specified load	Functional check & Measurement	100%	Clause 25 of NCD 1500 , issue 1/11	NCD 1500, Approved Drawing & SOTR	IR	P	W	
8.2.0	Minimum Lowering Speed	Functional check & Measurement	100%	Clause 26 of NCD 1500 , issue 1/11	NCD 1500, Approved Drawing & SOTR	IR	P	W	
8.3.0	Lowering speed of fully equipped boat without crew	Functional check & Measurement	100%	Clause 27 of NCD 1500 , issue 1/11	NCD 1500, Approved Drawing & SOTR	IR	P	W	Dead weight to be used in case of non availability of boat
8.4.0	Testing for brake system	Functional check	100%	Clause 28 of NCD 1500 , issue 1/11	NCD 1500, Approved Drawing & SOTR	IR	P	W	
8.5.0	Manual Lowering / Raising	Functional check	100%	Clause 34 of NCD 1500 , issue 1/11	NCD 1500, Approved Drawing & SOTR	IR	P	W	
8.6.0	Functioning of Electro Magnetic Brake	Functional check	100%	Clause 35 of NCD 1500 , issue 1/11	NCD 1500, Approved Drawing & SOTR	IR	P	W	
8.7.0	Auto Tension Device	Functional Check	100%	Clause 43-46 of NCD 1500	NCD 1500, Approved Drawing & SOTR	IR	P	W	Changeover time as per NCD or SOTR to be complied.
8.8.0	Dampening / Wave Compensation Devices	Functional Check	100%	Clause 46 of NCD 1500	NCD 1500, Approved Drawing & SOTR	IR	P	W	

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							FIRM	QAE	
9.0.0	Final Inspection								
9.1.0	Factory Acceptance Trial	Tests as per approved FAT	100%	SOTR, Approved FAT, ATP, Purchase Order & Approved Drgs	Performance Test To be satisfactory	Inspection Report	P	W	CHP Internal FAT report to be submitted to CQAE prior to FAT. FATs to be conducted as per IHQ MOD(N) approved FATs protocol.
10.0.0	Type testing								
10.1.0	Hoisting & Lowering of boat at max hoisting load with combined List of up to 20° & Trim of up to 10° at an ambient temperature of 45°C (Speed of hoisting & lowering as per Para 26 & 27 of NCD 1500)	Type testing check	One/ Model	Approved drawing, SOTR & Applicable Std	NCD 1500	IR	P	R	
10.2.0	Shock test	Shock Analysis	One/ Model	SOTR/NSS-II/ BR3021/ Applicable Std	NSS-II as per BR 3021 & PO/SOTR	NSTL Test Report / NSTL approved Test Report	P	R	
10.3.0	Vibration Test	Vibration Analysis	One/ Model	SOTR/NSS-II/ BR3021/ Applicable Std	NSS-II as per BR 3021 & PO/SOTR		P	R	
10.4.0	Noise Test	ABN & SBN	One/ Model	SOTR/ Applicable Std	ABN & SBN meeting the limits specified in SOTR	ABN & SBN Report	P	R	

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SL. NO	MATERIAL/ COMPONENT/ DRG.NO/ QUALITY ACTIVITY	CHARACTERISTIC/ TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE CRITERIA	FORMAT OF RECORD	AGENCIES		REMARKS
							FIRM	QAE	
11.0.0	Pre-Requisite-Issue of FORM IV								
11.1.0	Submission of as-built binding drawings	Verification	100%	Appd. Drgs./ Concessions & Deviations	As built drawings are approved and complete	As Built Drawing	P	R	
11.2.0	Liquidation of all observations during FAT, if any	Defect Rectification	100%	Approved Drawing, SOTR & FAT document	All Defects liquidated	Inspection Report	P	R	
11.3.0	Weight Recording	Weight measurement	100 %	Approved Drawing, PO, SOTR	To be within specified limits as per Approved Drawing, PO & SOTR	Weight Certificate	P	W	CHP Annexure-V be referred for Remote Mode Inspection
11.4.0	Painting	Visual Inspection	100%	Approved Drawing, SOTR, Approved Paint Scheme	TSP / Approved Drawing / Approved Paint Scheme	Inspection Report	P	W	CHP DFT to be checked by QAE Reps.
11.5.0	Preservation, Packing and Marking	Visual Inspection	100%	Approved Drawing, SOTR, OEM Preservation Plan	Conforms to Approved Packing Procedure / TSP / Approved Drawing	Inspection Report	P	W	
11.6.0	Submission of Form IV (I&T Certificate)	Correctness	100%	As per PO & SOTR	As per PO & SOTR	Form IV	P	P & Issue	

IMPORTANT NOTE:-

- For Motor and Control Panel the Type Test, EMI/EMC and Environmental test are to be conducted in accordance with EED-Q-071-(R4) after QA agencies clearance and sealing of equipment. If Type Testing, EMI/EMC and ETT have already been done in earlier projects on same item, it will not be repeated again. The reports of earlier tested units will be submitted for review of Inspection Agency. In case of any difficulty/discrepancy in carrying out the above, matter be referred to IHQ MoD(N)/DEE within 10 days of receipt of approved QAP under intimation to HQ DQA(WP).
- EMI EMC test and ETT will be done at NABL/Govt Approved Lab.
- Motor is to be procured only from IHQ MoD(N) approved lab.
- Automatic Release Hook (ARH) should be type tested in accordance with IMO/SOLAS 81(70) and latest LSA code (Firm to provide a copy of Type Test Certificate)

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5. **Bought Out items:** Bought out items are those which are in the regular production range of the manufacturing firm/ sub vendor and manufactured on placement of specific order by main firm and production is covered by main firm's quality control program.
6. **COTS items:** COTS items cover those items/equipment which are available in the open market, are under the regular production of the firm and can be procured off the shelf without having to give a specific manufacturing order.
7. No of components/ items (under misc components/ Bought out/ COTS items) may vary from design to design. This list is indicative only. Actual components/ items would be as per approved DBOM/ drawings. You are ignore.
8. Witnessing of inspections can be done in remote mode, wherever feasible. The modalities of remote inspection are to be worked out jointly by the firm and QAO.