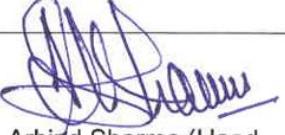


SAFE OPERATIONS OF PICK & CARRY CRANE (PICK & CARRY NEW GENERATION)

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00	28-11-2022	New Issue
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1. Purpose:

To prevent accidents & property damage while Material handling by using Pick & Carry Crane (Farana/ Hydra - New Generation).

2. Scope : This procedure shall apply to all AMNS project sites and related work areas including contractors to meet –

- 2.1. Legal and regulatory requirements
- 2.2. project specific HSE requirements
- 2.3. ISO 45001 and ISO 14001 standard requirements
- 2.4. AMNS HSE Policy

3. **Responsibility:** Responsibility for implementation of this standard lies with all executing departments like Projects, OIG and Contract Partners, Consultants.

4. Definitions And Abbreviations:

- 4.1. Competent person: One who can identify existing or predictable hazards in the surroundings that are unsanitary, hazardous, or dangerous to employees. Also has authorization or authority by the nature of their position to take prompt corrective measures to eliminate them. The person shall be knowledgeable about the requirements of this part.
- 4.2. Qualified person - One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve or resolve problems related to the subject matter, the work, or the project.
- 4.3. Pick & Carry Crane: It is a kind of telescopic crane that can pick the material from one place and travel to another. It can be a very simple machine with just a telescopic boom on its platform, or a full-sized crane equipped with various attachments.
- 4.4. Operator: The person operates pick & carry crane from Cabin for material loading & unloading

5. **Associated Hazards:** The potential hazards associated with Pick & Carry Crane are:

- 5.1. Equipment failure
- 5.2. Toppling due to uneven surface
- 5.3. Toppling due to Heavy wind
- 5.4. Toppling due to swaying load (large dimensions)
- 5.5. Collapse of Pick & Carry due to telescopic boom failure
- 5.6. Hitting a person or material
- 5.7. Nip/ pinch points (Including caught between Road and Pick & Carry tyre)

6. Pick & Carry Crane Usage - Safety Assurance Process

6.1. General Requirements:

- 6.1.1. A site-specific risk assessment should be performed for the specific work environment to identify and control hazards such as overhead power lines, unstable ground

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condition, or unauthorized personnel access etc before operation of Pick & Carry Crane.

- 6.1.2. Selection of Pick & Carry Crane to be done based on type of task, worksite constraints, ground conditions, site access, proximity to other worker
- 6.1.3. Access, preparation and maintenance of site, as required, to include an assessment that support surface is adequate to support weight of Pick & Carry Crane.
- 6.1.4. The operator must read, understand, and follow the specific operator's manual and rated capacity manual for the machine being used.
- 6.1.5. Following safety interlocks / system should be available - Delay Start Mechanism, Driver Fatigue Monitoring System, Positive Isolation provision on SLI, SUPD/RUPD/FUPD, Rear Vision Camera, Side Indicator, Reverse Buzzer, Fuel Tank Strainer, Seat Belt with Reminder, Fire Extinguisher, Proximity Sensor, Load Moment Indicators (LMI)/ Safety Radar, Beacon light, First Aid Box, Area Barricading Cone with Chain.
- 6.1.6. Movement of equipment on plant roads is strictly prohibited during Safety Hours excluding emergency scenario.
- 6.1.7. Ensure pasting of following stickers on pick and carry crane
 - Authorized driver details,
 - Inspection Status with Checklist,
 - Dos and Don'ts
 - Declaration/ Oth of Operator for Safety Operation
 - Valid Third-Party Certificate

6.2. SELECT

- The correct type of Pick & Carry (new generation only) to handle the load
- SLI shall be linked to start switch and with rear camera
- Not older than 8 years
- Based on capacity required (SWL), condition of work location, size of load

6.3. CHECK

- The condition of the Pick & Carry vehicle (With valid inspection sticker from P&M Department and must be inspected before use)
- The working conditions while in use
- Surroundings where such task is being carried out

6.4. USE

- For intended purpose only
- For intended capacity only
- Adopt correct practices

6.5. Pre-Mobilisation Requirements

- 6.5.1. All Pick & Carry equipment brought to project site shall meet age criteria not more than 8 years from date of manufacturing. The vendor shall provide at least 3 years maintenance records stating accidental damages/ modifications/ alterations/ replacement of critical parts. Anti-Two Block System and Safe Load Indicator (SLI) is a mandatory requirement for all types of lifting equipment.
- 6.5.2. Once the equipment reaches site, it shall be inspected by AMNS appointed inspection team for integrity and fitness before load test & certification by Competent Person (TPI).

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- 6.5.3. If the equipment leaves the AMNS Project site, it must be re-inspected if it returns irrespective of the time away from the site

6.6. Using Pick & Carry Crane

- 6.6.1. Pre-operating and after start checks - Pre-operating and after start checks must be made in line with the operator's manual by operator. After walk around checks and engine checks have been made, operate all controls to their full extent from the ground.

- 6.6.2. Logbook - Check the entries in the Pick & Carry Crane logbook. Ensure maintenance has been carried out by the owner within the prescribed period of time. Check any faults, and that those faults have been rectified, or that those faults will not make the Pick & Carry Crane hazardous to operate. Fill and sign the pre-operating checks as per checklist.

6.6.3. Pre-Operation Safety Checks

- TPI certificate must be displayed in the operator's cabin
- Automatic reverse horn must be present in all the pick & carry cranes
- Daily Inspection checklist to be duly filled and signed by operator
- Seat Belt must be installed and used
- SWL must be marked on the Pick & Carry
- Ensure SLI is in working condition and not bypassed
- Load chart shall be pasted in operator cabin
- Fire Extinguisher must be fixed in the cabin
- Soil and ground condition must be checked & levelled
- All lifting tools & tackles must be validated by a Competent person and colour coded
- Condition of tyres and tyre inflation.
- Rear view camera
- Delay start mechanism

6.7. Operation

- 6.7.1. Trained and crane licensed (Heavy Motor Vehicles Driving License) operator with valid Eye Test Certificate and able to perform pre and post operational checks shall only operate Pick & Carry crane.

- 6.7.2. Operate the Pick & Carry Crane as per the manufacturer's instructions.

- 6.7.3. Risk assessment shall be done based on limitations / deficiencies of hydras before taking applicable permit.

- 6.7.4. Points to be checked before planning any activity of lifting by Pick & Carry.

- Load- Know the exact load to be lifted. No Guessing. Always refer to the load chart available with the Pick & Carry Crane
- Ensure the SWL is not exceeded.

- 6.7.5. The Rated Capacities are for lifting the load in straight un-slewed position and level ground condition. It should not be taken as capacities for pick and carry operations. As the maximum load acts upon the tyres, it is essential to maintain proper inflation in all tyres

- 6.7.6. While travelling without load, boom should be in horizontal position with telescoping extension fully retracted and pulley block fully raised. With travelling, consideration should be given to the presence of proximity hazards such as, overhead cables, telephone lines, nearby structure or other cranes, public access areas etc.

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6.7.7. Centre of Gravity

- Hook should be placed right over the centre of gravity of the load.
- While marching ensure that centre of gravity always fall between the Front Tyres.

6.7.8. Lifting Loads

- Lift Loads with Pick & Carry in un slewed (central) position
- Plan the lift so as to minimize turning with load as far as possible
- Don't use Pick & Carry for long distances with the load (Max 50 Meters).
- Don't use Pick & Carry for dragging or pulling the loads either sideways or back & forth

6.7.9. Ground Condition / Side Slope

- The terrain should be reasonably hard and should be able to bear the load of the crane. Soft, Marshy land is likely to bog down the crane. During rainy season beware of soft ground conditions and ditches.
- Check for any Inclination any soft surface, and uneven ground. Always keep the loading area as level as possible. Check your route before marching with the load.
- Never march on sideways sloping surface. Terrain with gradients larger than 10% should be avoided.
- Monitor ground conditions at all times in case they may change.

6.7.10. Boom should be fully retracted and hook block should be fully raised.

6.7.11. Traveling speed without load should be less than 10 km/h.

6.7.12. Travelling is prohibited beyond 60% of boom extension

6.7.13. Centre of Gravity of the load should always fall between the front tyres.

6.7.14. Safe load indicator must be in working condition.

6.7.15. Hoist Limit Switch must be operational.

6.7.16. Safety latch of hook must be properly installed.

6.7.17. Oil leak must be checked daily.

6.7.18. Wire and slings free from any damage.

6.7.19. Head and tail lamps must be in working condition.

6.7.20. Front & Reverse horn shall be in working condition.

6.7.21. Single point communication with the rigger/ signalman.

6.7.22. When working on machinery or using tools, make sure that any extra pressure may be applied does not compromise the SWL or tools / other items placed in the Pick & Carry Crane do not exceed the SWL of the Pick & Carry Crane.

6.7.23. Conduct Toolbox talk with Pick & Carry Crane operator, signalman and crew intended to use Pick & Carry Crane prior to lift covering topics like the location of work, nature of work, size of the load, communication.

6.7.24. Use for load & unloading the material during storms and wind >25 KMPH prohibited

6.7.25. Keep an eye out for any new hazards that may arise, or existing hazards that may change.

6.7.26. Communication shall be established between personnel in the cabin and the signalman on ground.

6.7.27. Don't use a Pick & Carry Crane on sloping ground.

6.7.28. Always keep the booms in retracted position while parking.

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- 6.7.29. No component of the Pick & Carry Crane should be altered at site

6.8. Marching With Load

- 6.8.1. Before moving the Pick & Carry Crane with load, the route map must be surveyed and same should be approved by AMNS Project Manager / Engineer.
- 6.8.2. Load should not sway left /right forward or back ward direction, which is caused due to uneven surface.
- 6.8.3. Maximum traveling speed : ≤ 1.44 KMPH or Low Speed Position with 1st gear only and don't change the gears while marching.
- 6.8.4. The bottom of load should be approx. 400-500mm above ground and pulley block fully raised. The boom should be in its lowest convenient position.
- 6.8.5. Maximum Articulation Angle - $\leq 10^\circ$ from centre at right and left side (Keep boom as straight as possible in the direction of travel)
- 6.8.6. Maximum Allowable Wind Speed - ≤ 30 KMPH
- 6.8.7. Load should be stable while marching and always use tag lines (at both ends).
- 6.8.8. Avoid Stopping / Lifting the Load with a Jerk.
- 6.8.9. Match with the speed of riggers / helper walking along with load.
- 6.8.10. Tag line rope must be used for lifting materials in Pick & Carry with minimum 6 Meter expansion and thickness of 16mm or more.
- 6.8.11. Over dimension item should not be taken for distance march
- 6.8.12. Maximum length of object to be marched should not be more than 12 meters long.
- 6.8.13. Avoid gradients above 10% and travel with the load facing up the slope
- 6.8.14. Flagman is required
- 6.8.15. Usage of a Pick & Carry crane for Tailing & Tandem Lift is strictly prohibited.
- 6.8.16. Tyre must be free from cuts/ damages. Tyre Inflation pressure must be maintained as per inflation chart recommended by Crane Manufacturer

6.9. After Operation Safety Checks

- 6.9.1. Place all controls in off position
- 6.9.2. Park the Pick & Carry at designated location
- 6.9.3. Make visual check before leaving the equipment
- 6.9.4. The crane should not be parked in on gradient.
- 6.9.5. The wheel should be jacked up to avoid damage to tyres.

6.10. Don'ts

- 6.10.1. Do not overload, always lift up to Safe working load.
- 6.10.2. Do not use mobile phones while operating.
- 6.10.3. Avoid any sudden movement such as jerking or stopping the Pick & Carry crane abruptly.
- 6.10.4. Do not do tandem lifting with Pick & Carry crane. Pick and carry cranes shall not be used for erection activities due to stability limitations, as they lack outriggers (front & back) required for static lifting operations.
- 6.10.5. Avoid traveling over un-even surfaces during traveling with/without load.
- 6.10.6. Do not operate in heavy wind (36 km/h) or extreme weather conditions.
- 6.10.7. No passenger allowed inside the operator cabin while travelling.

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- 6.10.8. No dragging or pulling of material is allowed with Pick & Carry crane.
- 6.10.9. Under no circumstance, pick and carry crane should be used in below ISBL pipe racks.
- 6.10.10. Handling of personnel from the boom head or other arrangement like man basket is restricted.
- 6.10.11. Do not allow the winch rope to unwind fully. Always ensure a minimum of 2 wraps of rope remain on the winch drum.
- 6.10.12. When driving or operating the machine, do not wear clothing with dangling parts, which might catch on control levers or mechanical parts.
- 6.10.13. Do not operate the crane when you are excessively fatigued or unwell.
- 6.10.14. Never leave the crane seat with the load raised and never leave the crane unattended while engine is running.
- 6.10.15. No structural alterations or repairs or modification affecting safe work limit, integrity and performance should be made to any part of equipment.

6.11. Pick & Carry Crane Operator and Signalman Control Measures

- 6.11.1. Hoist a load only after a clear signal is given from the signalman
- 6.11.2. Flagman should be present during the Pick & Carry marching
- 6.11.3. Signal baton must use during the night operation
- 6.11.4. Min. of 100 lux illumination level should maintain for transportation at night.
- 6.11.5. Ensure all parts of the Pick & Carry crane and load remain at least 3 meters away from overhead power lines
- 6.11.6. Do not leave Pick & Carry cranes unattended while a load is suspended in mid-air
- 6.11.7. Report any failure or malfunction of the Pick & Carry crane to the concerned supervisor. Take malfunctioning crane out of service until repairs are made.

6.12. Maintenance

- 6.12.1. Maintain Pick & Carry Crane according to manufacturer's recommendations.
- 6.12.2. Perform any operator level maintenance authorized to conduct (as per OEM manual).
- 6.12.3. This would include ensuring that the Pick & Carry Crane is left in a clean condition, and all tools, rubbish and other equipment is removed from the cabin and parked correctly.

6.13. Minimum PPE Requirement

Head Protection	Helmet with Chin strap	Hand Protection	Cut Resistance Gloves
Eye protection	Safety glasses	Foot Protection	Safety shoes

6.14. Inspections - Checking, Corrective and Preventive Action

There are several different types /modes / capacities of Pick & Carry Crane inspections. Inspections must be performed by personnel qualified to inspect specific make and model of Pick & Carry Crane.

- Inspection schedule as per the OEM manual
- If out of service for longer than 3 months, or
- If environmental conditions require inspections

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- Prior to deployment and monthly inspections by AMNS P&M using the checklist - AMNS/Project/SOP/HSEM/02/F01
- Pre-start inspections performed at the beginning of each shift by operator using operator daily checklist - AMNS/Project/SOP/HSEM/02/F02
- All Pick & Carry Crane shall be inspected once in six months by Competent Person as per regulatory requirements and certificates shall be made available along with the equipment
- All Pick & Carry Crane shall be verified for their valid certificates along with the operator licenses (If applicable) prior to hiring

6.15. TRAINING

There are many types of training for the different groups that use the Pick & Carry Crane. These include Pick & Carry Crane operators, Pick & Carry users, Signalman & personnel who maintain and repair Pick & Carry Crane, as well as training for Job supervisors.

6.16. Operator Training

Pick & Carry Safe Operation training by authorized providers (preferably by OEM representative) for each type/ classification of equipment is required.

6.17. Maintenance and Repair Personnel Training

Maintenance and repair training by qualified personnel is required to inspect and maintain Pick & Carry in accordance with the manufacturer's recommendations.

6.18. Records

S. No.	Title	Location	Retention period
01	Third party inspection certificate of the Pick & Carry Crane	HSE Department/ Project site	Completion of Project
02	Periodic inspection reports	HSE Department/ Project site	Completion of Project
03	Operator Competency certificate	HSE Department/ Project site	Completion of Project
04	Operator periodic training	HSE Department/ Project site	Completion of Project

6.19. Reference Documents

AMNS-HSE-PROJ-TS-11- Lifting Operations safety Technical Standard

6.20. Annexures

AMNS-Project-SOP-HSEM-02-F01 -Pick & Carry Crane inspection checklist

AMNS-Project-SOP-HSEM-02-F02 -Pick & Carry Crane daily inspection checklist by operator