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## STANDARD OPERATING PROCEDURE

### 1.0 TITLE **Log Loading onto Barges at Log Yard**

### 2.0 OBJECTIVE

- To load ready graded, cut to length and ready bundled *Acacia mangium* plantation logs onto barges to be transported to the customer(s).

### 3.0 PERSON IN CHARGE (PIC)

- This procedure applies to the Barge Crew of the Barging Contractor including the Crane Operator.
- This procedure applies further to AFI Team Leader Log Yard, Supervisor Log Yard (Scaler & Grader) and the Log Yard Manager.
- Further it applies to the appointed Log Yard Contractor, Contractor Foreman Log Yard and Machinery Operators.


### 4.0 JUSTIFICATION AND SCOPE

Most *Acacia mangium* plantation logs are transported to the customer(s) by barge (sales within Malaysia & overseas). This SOP shall assure that loading works to barge are carried out according to higher specifications and shall ensure safety for everybody involved at all times. This SOP shall further assure that negative impacts on local communities and the river ecosystem, containing protected mangrove forest and animal species, are avoided or kept to an absolute minimum.

#### SCOPE

- 1.) Forward logs by wheel loader to:
  - A.) Jetty in case of long side loading and usage of crane.
  - B.) Or direct drive the wheel loader on the barge in case of no crane available and front side loading is required.
- 2.) Loading logs from jetty/ river bank by crane on barge (long side loading).
- 3.) Personnel Safety Equipment (PPE) for Wheel Loader Operator, Crane Operator, Barge Crew and AFI Log Yard Staff.
- 4.) Recording, monitoring and quantification of cargo loaded.

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- 5.) Mitigation measures to avoid logs from falling into the water & strategies for reduced negative impact on local communities & river/ mangrove ecosystem.
- 6.) Other procedures

Scope 1.)A.):

- Before and/ or during barge loading, assigned logs need to be forwarded to the jetty/ river bank by wheel loader, model Caterpillar 950 or 966.
- Wheel Loader Operator shall assure that the whole cargo for a shipment is forwarded to jetty/ river bank before or at barge arrival, provided the storage place at river bank is sufficient.
- Logs to be loaded must be bundled/ hold together by steel strapping or metal sling wires.
- Maximum weight per bundle shall not exceed 6 metric tons.
- Wheel Loader Operator has to approach log bundles with appropriate, reduced speed using low gear.
- Wheel Loader Operator to adjust front grapple at suitable height in order to load log bundle to grapple.
- Wheel Loader Operator to open front grapple and maneuver front stanchions/ forks underneath the bundle.
- Wheel Loader Operator to close upper claws of grapple and fasten the log bundle
- Wheel Loader Operator shall drive at appropriate speed not exceeding 20 km/hr using low gear to jetty/ river bank.
- Wheel Loader Operator places log bundle carefully into iron frame which is located at a distance within reach of the crane.
- Log bundle to be placed in frame of portable weigh bridge, in case of no draft survey where logs need to be weighed by portable weigh bridge (located in reachable distance for crane).
- Wheel Loader Operator shall reverse and turn and proceed again to log storage area.
- Log bundle forwarding speed shall be increased by usage of 2 units of wheel loader.
- Wheel Loader Operator must be fully trained and experienced to carry out his work.
- Wheel Loader Operator must be aware of the position and movement of other workers/ persons at the log yard at any time.
- Wheel Loader Operator shall assure to drive/ operate at slow speed, not exceeding 20 km/hr, carefully and that others are aware of him approaching.
- Wheel Loader Operator must stop the machine in case others approach the machine.
- If log yard conditions are too wet and slippery operator has to stop work and wait for surface to dry up (applicable to log yard sections without gravel).
- Wheel Loader Operator shall only operate the machine if sufficient visibility is ensured. If visibility is too low, work has to be stopped. Any night shift work is only permitted if sufficient illumination/spot light have been installed in all operating areas.

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- Wheel Loader Operator and other log yard staff shall use a clear system of signaling for all routine activities and situations, particularly emergency situations. This signal language must be agreed and understood by all staff involved in the log yard operations and management.
- The operator shall ensure safe turning radius of the machine and never lift, move a load over any person
- The operator to ensure to maintain a safe distance from other machines, and pass them cautiously, ensuring both ends of the log load are at safe distance from other machines and staff moving around the logyard
- The operator to ensure he is fully familiar with the load limits if the machine's lifting capacity and does not exceed it. All wheels of the loader must always be safely on ground at any time.
- Before lifting log bundles the wheel loader must be positioned at a suitable, safe location to lift up logs/ bundles.
- The Operator must ensure bundles/ logs are lifted at the centre point of balance.
- The operator to ensure the machine is sent for servicing /maintenance as scheduled.
- Keep the stock piles at a reasonable height for the wheel loader to extract logs.

Scope 1.):

- For loading by crane/along side the Crane Operator positions the crane lifting cable near the bundle which is placed in the iron frame or frame of portable weigh bridge.
- Attached to the hook of the main crane cable are 2 other cables with loop holes.
- 1 to 2 workers sling the 2 cables around the bundle and attach the loop hole of each cable to the hook of the main crane cable.
- If cables are attached the Crane Operator lifts up the main cable which is holding the bundle and turns the crane of about 90 degree onto the barge and lowers the main cable to place the bundle on the barge.
- By lowering the main cable the loop holes open automatic from the hook and by lifting up the main cable the 2 attached cables are pulled free from underneath the bundle.
- Crane Operator swings the crane by about 90 degree again to attach another bundle.
- The Crane Operator must be aware of the location/ position of all workers involved at all times.
- No person is allowed underneath or nearby moving bundles, lifted up or lowered down.
- Crane Operator must assure that other workers involved are not hit by steel cables when swinging around and lowering the hook close to the bundle.
- Crane Operator must wait until worker attaching the cable has reached a safe distance from the hooked bundle before lifting up the bundle.

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- Workers on the log yard must face in direction of Crane Operator/ barge and be aware of crane cables approaching at all times.
- Log yard workers have to keep a safe distance to crane working radius and only approach after main cable has been lowered down and stopped movement.
- Crane Operator, Barge Crew and AFI Log Yard Staff shall have a clear system of signaling which is agreed and understood by everybody involved.
- No person is allowed to climb onto the log pile to open the cable and release it from the bundle.
- Opening of cable must be done by lowering crane arm or main cable, not by hand or persons climbing on the log pile.
- Only during sufficient visibility work can be carried out, if visibility is not enough work must be stopped.
- Crane Operator shall not exceed the maximum lifting capacity of the crane.
- Crane Operator must be fully trained and experienced.

Scope 3.):

➤ **Mandatory Safety Equipment (PPE):**

❖ Wheel Loader Operator

- Helmet
- Safety Boot with Steel Cap
- High Visibility Signal Vest
- Ear Plug/Muff


❖ AFI Log Yard Staff

- Helmet
- Safety Boot with Steel Cap
- High Visibility Signal Vest

❖ Worker connecting cable to bundle: (can be AFI Staff or Barge Crew)

- Helmet
- Safety Boot with Steel Cap
- High Visibility Safety Vest
- Strong Leather Hand Gloves

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Scope 4.):

➤ **Saw Logs**

- Volume quantification for saw logs (SLE & SLL) based on log measurement and volume calculation in cubic meter (m3).
- During barge loading AFI Log Yard Staff records every saw log bundle loaded in the loading list, containing the assigned cargo and volume for the shipment/ customer(s).
- Loading List contains bundle code number, pieces per bundle and volume per bundle, each bundle loaded has to be ticked in the loading list by AFI Yard Staff.
- Only bundles which are included in the loading list are permitted to be loaded.
- AFI Log Yard Staff must ensure that bundle code for each bundle tallies with the loading list.
- Workers musto keep a safe distance to the wheel loader.
- Workers must keep a safe distance to the working radius of the crane.
- A clear system of signaling has to be used, which is agreed and understood by all persons involved.
- Workers have to face approaching wheel loader, approaching crane cables.


➤ **Chip logs & DSL**

- Volume quantification based on weight in metric ton (mt).
- Volume quantification by A.) weighing by portable weigh bridge or B.) by draft survey.

A.) Weighing by portable weigh bridge:

- Weighing by portable weigh bridge is used only in exceptions.
- Wheel Loader Operator places each bundle carefully in the frame of the portable weigh bridge.
- Wheel Loader Operator drive slowly in low gear not to collide with or damage the portable weigh bridge.
- Weight per each bundle will be shown on the weigh bridge display.
- Staff operating the portable weigh bridge must check weight shown on display for plausibility.
- Weigh Bridge Operator shall press save button to save data to system.
- Weigh Bridge Operator to record data additional in daily record book.
- Weigh Bridge Operator to signal to Crane Operator when bundle is ready to be lifted up.
  - Weigh Bridge Operator shall give a daily summary print out of all weighing transactions and check again for plausibility of recorded data.

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- If portable weigh bridge is moved or transported to different location the bolts & nuts near the load cell sensors must be locked/ fastened to avoid that sensors get lost or damaged.
- Portable weigh bridge sensors must be correctly calibrated.
- For each weigh bridge a ‘certificate & determination of weights and measures’ must be obtained by the ‘Metrology Corporation Malaysia SDN BHD’ to certify correct measurement.
- Safety procedures as under 3) above.

B.) Draft survey:

- Weight of loaded cargo calculated in metric ton (mt) based on the depth by which barge is submerged below the water line.
- Draft survey carried out by independent surveyor: SGS- (Malaysia) SDN BHD from Kota Kinabalu.
- Surveyor takes meter reading from scalar at front, middle and back side of barge.
- Further calculations based on barge size/ model, density of water, salt content...etc.
- Survey only to be carried out during low surf and sufficient visibility, allowing a correct reading of the barge scalar.
- Independent Surveyor to forward a draft survey report.
- During high waves or strong winds no draft survey can be carried out.
- Tug boat men to keep safe distance to the barge in order not to collide.
- Tug boat men must have sufficient experience to operate the tug boat and must know the surrounding waters in detail.
- Tug boat and engine must be in a well maintained/ serviced condition, equipped with sufficient fuel for the voyage.
- All passengers must wear life jacket.

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Scope 5.):


❖ **Possible negative impacts by barging or by logs loading onto barges include:**

- A.) Logs fall in water and damage, when floating down the river, fish farms, fishing nets and boats of local communities.
- B.) Oversized barges entering the loading destination can cause damage to the river or mangrove forest ecosystem.
- C.) oversized barges entering the loading destination can block the river and make river traffic by boat of local communities difficult or impossible as well as dangerous.
- D.) If logs hang over the side walls, damage/ brakeage is caused to mangrove trees and loaded logs, which will float in the river and cause above mentioned negative impacts.
- E.) Stumping work near villages can disturb local communities and cause safety hazards such as falling down logs, logs drifting in water or drifting off barges, etc.
- F.) Insufficient illumination at night for incoming and outgoing barges can cause safety hazards for river traffic by boats of local communities.

❖ **Mitigation Measures**

- A.) All saw logs and chip logs must be cut to length (3- 6 m max.) and tied by either steel strapping with metal clips or by metal wire sling. Minimum amount of 2 steel straps/ wire slings per log bundle, one in front and one at backside. 5 m saw logs must be bundled with 4 steel straps, 4 m saw logs must be tied with 3 steel straps, while 2 wire slings are sufficient. By cutting to length and bundling it is most unlikely that logs would fall into the water and drift away. No loose or unbundled logs are allowed for loading Logs are not allowed to protrude over the side walls of the barge, logs must only be stored within the area between both side walls. By this damage/ damage to mangrove trees and loaded logs is avoided. Floating logs or wood debris in the river caused during loading is reduced to a minimum or completely avoided. Barge Operator must provide net of thick tows or chains attached to floating buoys which is spanned across the river down streams to hold back logs which

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fell into the water during loading and can be recollected. An opening has to be left to allow small boats of local communities to pass by.

B.) Maximum barge size must be orientated on the river width and depth at the loading destination. For Sungai Telaga and Sungai Bawing the maximum allowed barge length is 220 feet with a maximum loading capacity of 2,500 metric tons. The 220 feet barge still allows a clearance of about 5 m and more to the river bank and does not form an obstacle to boat traffic of local communities. Further more the mangrove forest is not damaged due to any over sized barge.

- C.) See under B.)
- D.) All logs must be cut to length (3- 6 m max.) and bundled either by steel strapping or metal wire rope/ sling.
- E.) Stumping works from ‘feeder barge’ to ‘mother barge’ must be well clear of local communities, at a minimum distance of 300 m.
- F.) Lighting of tug boat and barge must follow the national & international sea/ marine regulations. Sufficient lighting at back side and front of tug boat and barge must be ensured to allow other participants in river and sea traffic to be aware early enough of an approaching barge during night or under reduced visibility.

Scope 6.):

- Centralization of barging activities to 2 rivers/ central log yards only, not all suitable rivers are used for log extraction.
- Captain of tug boat must have a valid license, he must be well trained/ experienced and familiar with the local waters and its special conditions.
- The international & national sea regulations/ laws must be followed at all times.
- Oldest logs at log yard must be loaded first. Principle: First in, first out.
- Effective procedures to be in place for salvaging floating logs, bundles or other woody material from the river (SOP Salvage of Log/ Wood Flotsam).

**5.0 RELATED DOCUMENTATION**

- NIL

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