



Code of Good Practice for Bulking Facilities of Palm Oil and Palm Kernel Oil and their Products

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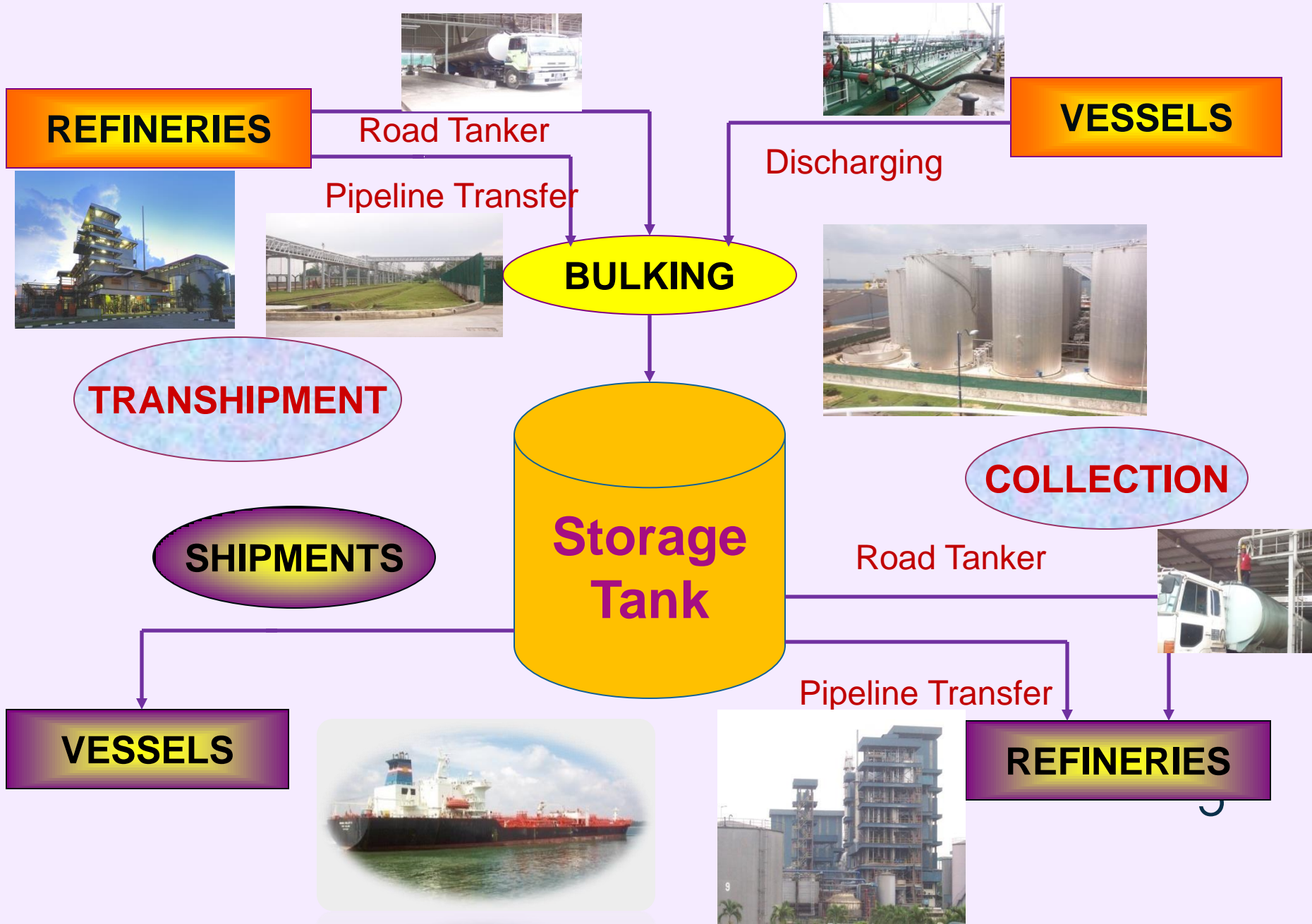
SHORE TANK OPERATION

- ❖ Oils and fats are normally being traded internationally in large volumes(bulk liquid).
- ❖ The oils and fats that are meant for exports have to be first transported to the shore tanks in a bulking installation before the arrival of the vessels.

ROLES AND FUNCTIONS OF BULKING INSTALLATION

- i. as a custodian of the products – to store and handle customer's liquid products according to the terms and conditions of the agreement;
- ii. as a third party to whom customer delivers its products in trust for safe keeping during transit;
- iii. facilitate the import, export and transshipment of liquid oils in bulk;

OPERATIONAL OVERVIEW



OBJECTIVES

- Establish good practices in handling and storage of palm oil and palm kernel oil and its products
- Minimize deterioration
- Minimize contamination
- Promote good hygiene & food safety
- Results in good quality and safe product



REQUIREMENTS

Traceability & Documentation

- ❖ Documented system that enables the tracking of the movement of the oils
- ❖ System should be able to identify at any point of time, the type, grade, quantity, quality and origin of oils that are being received, stored and dispatched
- ❖ Information on products (SDS, receipt & handling, specifications)
- ❖ Records should be maintained & kept up-to-date for minimum 2 years.



STORAGE AND HANDLING

Tank

Facilities/ancillary equipments		Reasons
Shape of tank	cylindrical, tall and narrow subjected to an optimized ratio of height to diameter	<ul style="list-style-type: none"> ❖ stability ❖ minimize the exposed surface of the oil to air
Tank bottom	conical or sloped (with a sump)	<ul style="list-style-type: none"> ❖ facilitate draining
Stirring/agitator		<ul style="list-style-type: none"> ❖ homogeneity ❖ facilitate heating efficiency ❖ prevent localised heating
All openings : manholes, inlets, outlets, draining out points	can be locked and / or effectively sealed	<ul style="list-style-type: none"> ❖ contamination ❖ security
Storage capacity, size and number of tanks	should be related to size & frequency of intakes, rates of turnover & number of products handled	<ul style="list-style-type: none"> ❖ adequate storage capacity ❖ To avoid spillage



Material of Construction

- ❖ All materials used should be inert to oils & fats and suitable for use in contact with food

Material	Product
preferably stainless steel	<ul style="list-style-type: none">❖ refined oil❖ oleochemicals
mild steel epoxy coated	<ul style="list-style-type: none">❖ refined Oil
*mild steel	<ul style="list-style-type: none">❖ crude oil

*Deterioration of oil can take place if the crude oil and / or products stored have high acid values.

- ❖ No copper, brass or bronze fittings
- ❖ Thermometer containing mercury should not be used
- ❖ bund-wall should be constructed around the tanks farm to contain any oil of spillage /overflow

HEATING FACILITIES

- ❖ All tanks for solid, semi-solid, high viscosity oils & fats should be installed with heating facilities

Ancillary equipments	Material	Reasons
Heating coils	Stainless Steel	<ul style="list-style-type: none"> • product can be heated to liquid • homogenous to facilitate transfer / unloading
Heating Methods		
<ul style="list-style-type: none"> • Bare hot water pipes (~80°C) 		Best method because it is least likely to cause local overheating.
<ul style="list-style-type: none"> • Bare steam pipes 		Heating using steam with pressure up to 150 kPa (1.5 bar) gauge (temperature of 127°C) is also acceptable.



- ❖ Hot water, steam heating coils should be regularly checked for any sign of leakage

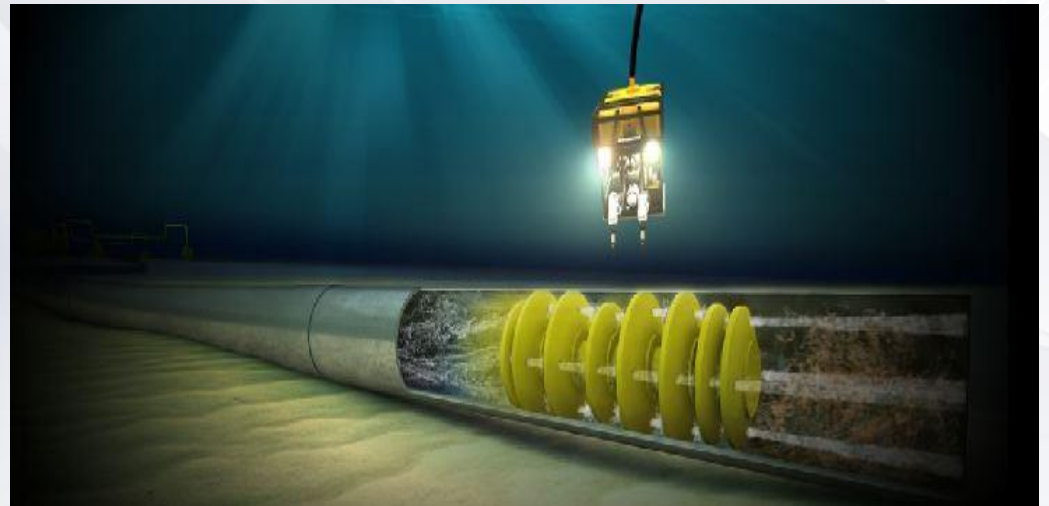
PIPELINE



- ❖ Stainless steel for fully refined products, mild steel for crude, semi-refined oils & fats
- ❖ should be sited above ground where possible, in order to make inspection, repair easier
- ❖ Clear marking / identification systems for pipelines & storage tanks
- ❖ Flexible hoses : inert material, suitable reinforced, can cleaning easily

Pigging system

- ❖ should be installed at the tank terminal,
- ❖ Should not contain any copper/copper alloys
- ❖ Used to clear remnant oil inside the pipeline



LOADING & UNLOADING

Heating up

- Before transfer – solid, semi-solid, high viscosity oils & fats should be heated slowly – liquid, homogeneous.
- Maximum rate : 5° C over a 24 hour if the product is not stirred. For storage tank fitted with stirrer / agitator, 25° C per 24 hour or more without overheating
- Steam pressure should not exceed 150kPa (1.5 bar) gauges to prevent localized overheating

Temperatures during storage, voyage, loading and discharge

- Oil in bulk tanks should be maintained within temperature ranges given in Table 1 - to prevent excessive crystallization & solidification during short term storage & shipping

Product	During Storage ^a / Voyage (°C)		At time of loading/unloading (°C)	
	Min	Max	Min	Max
Palm oil (Crude/Processed)	32	40	50	55
Palm olein (Crude/Processed)	25	30	32	35
Palm stearin (Crude/Processed)	40	45	55-60 ^b	65-70 ^b
Palm kernel oil (Crude/Processed)	27	32	40 ^c	45 ^c
Palm kernel olein (Crude/Processed)	25	30	30	35
Palm kernel stearin (Crude/Processed)	32	38	40	45
Palm fatty acid distillate/Palm acid oil	45	50	55	70
Palm kernel acid distillate/ Palm kernel acid oil	27	32	35	45

LOADING AND UNLOADING SEQUENCE

- Different types & grades of oils should be kept separate and preferable to transfer through segregated lines.
- Sequence of pumping should be observed:
 - fully refined oils before partially refined
 - partially refined oils before crude oils
 - edible oils before technical grades
 - fatty acids / acid oils should be pumped last
- The 'first-in-first-out' is recommended when discharging the same grade of products from more than one storage tanks.



TRANSPORTATION BY LORRY TANKERS

- Inspect interior of the lorry tanker & all connecting hoses for any irregular, cleanliness prior to loading of products, free from previous cargoes before used for carrying refined products
- All accessible points should be tightly closed and sealed after completion of loading
- Each consignment should be accompanied with a Dispatch Document, MPOB L3
- The driver must maintain a time log of the vehicle



Cleaning

- Tank previously carrying non-edible products must be clean thoroughly and inspected to be residue-free;
- Tanks should be cleaned regularly, methods of cleaning & inspection should be documented & record of inspection must be kept

Maintenance

- Regular checks including functioning of steam pressure regulation valves, coils, thermometers, thermostats, weighing equipment, pumps, tank coating, flexible hoses, conditions of tanks and ancillary equipments etc.

Inspection of vehicle at unloading point

- Check dispatch document & security seals – no sign of tampering of seals & irregular fittings / facilities
- Irregular incidences – suspicion of pilferage, contamination :- must be recorded, reported to management & relevant parties, MPOB

CALIBRATION OF EQUIPMENT OR TANK

- Equipment : measuring tape, thermometers, weighing equipment - should be regularly calibrated & records/documentation maintained
- Reference equipment shall be recalibrated at regular intervals
- Storage tanks should be calibrated, recalibration :- in 15 year, any adverse verification result, modifications of tank / changes to tank geometry

CONTROL OF NON-CONFORMITIES

- Any occurrence of non-conformities - product affected are identified & isolated. Documented procedure should be established
- Establish & maintain documented procedures that specify appropriate actions to identify & eliminate cause of non-conformity, to prevent recurrence

ENVIRONMENT

- Comply to all relevant environmental legislation eg. Environmental Quality Act 1974 and Regulations
- Waste should be appropriately disposed of in accordance with the existing legislation

WORKER HEALTH, SAFETY AND WELFARE

- Action plan to promote safe and good working conditions
- Accident & emergency procedures should be explained & displayed to all workers
- Hazards clearly identified by appropriate warning language
- Employment conditions should comply with relevant regulations

TRAINING

- Operation activities should be carried out by competent personnel
- Identify training needed for personnel & establish continuous training programmed
- Trainings should be recorded, evaluated for effectiveness & reviewed regularly

LEGAL REQUIREMENT

All handling and storage activities must comply with current local laws in force

CONCLUSION

Adequate facilities and operating a good handling system, the bulking installation will be able to:

- Minimize variances in the quantity of oil stored in the tanks
- Maintain the quality of oil
- Minimize deterioration and contaminations
- Help maintain and monitor the quantity and quality of product during storage and handling



Thank You for your kind Attention

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