


# ROAD TANKER SAFETY:

## Equipment, Environment and Human Factor

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### Overview

- Petroleum products (gasoline, diesel, and aviation fuel) distributed in Nigeria are transported in tanker trucks.
- Petroleum tankers move these items which are classified hazardous cargo on Lagos roads, hence endangering the populaces.
- Downstream Petroleum marketers are at the forefront of the operation process that ensures bulk petroleum products are delivered to the end users.
- With deplorable condition of roads, poorly maintained tanker trucks, incompetent tanker operators or drivers and the unsafe behaviours of other road users, the result has been frequent incidents recorded in recent time in Lagos and Nigeria, as a whole.




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### Overview



- Therefore, the need to address factors identified as potential root causes and measures to control the causes to ALARP by the industry players and government agencies in ensuring zero incident in the operation.
- This presentation will address key areas such as the Equipment (i.e. tanker trucks, Environmental conditions, Human factors and Enforcement.
- Take away of this presentation is to achieve zero incidents across the petroleum delivery chains in Lagos.

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### Where we are presently




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### Records of Death

**13 December 2017:** 20 cars burnt, one injured as fuel tanker explodes in Lagos. It was learnt that 18 cars, including a 2010 Toyota Highlander, three commercial buses and five motorcycles were burnt

**August 20 2018:** Twelve (12) die, eight injured in Lagos-Ibadan Expressway multiple crash involving a petrol tanker.

**June 28 2018:** (Otedola Tanker Explosion) The incident, which occurred at about 5:30pm on Thursday, left about 54 vehicles burnt, with at least nine people dead and an unspecified number sustaining various degrees of injuries

**Feb. 6 2018:** Four (4) killed in tanker explosion on Lagos – Ibadan expressway while unspecified number of others was still trapped in a burning container truck following an tanker explosion when a truck bearing fuel collided with it on Tuesday

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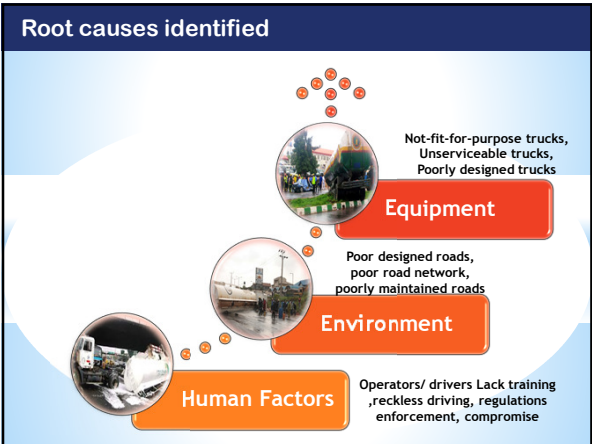
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**Equipment Design**

Trailers are designed to meet specification of the variety of liquefied loads to be lifted.

Why are do we spillages and fatalities? The answer can be credited to several factors;

- ❑ Design of the tankers and safety equipment being fitted
- ❑ Equipment such as highly-engineered manifolds /manholes,
- ❑ Vapor recovery equipment (valves and vents),
- ❑ Foot valves/emergency valves/internal valves,
- ❑ API (American Petroleum Industry) adaptors/tank units,
- ❑ Manifolds & dust caps and
- ❑ Electronic Stability Control Systems
- ❑ Formal driver training,

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**Equipment Design**

Trailers are designed to meet specification of the variety of liquefied loads to be lifted.

Overflow Sensor  
Vapor recovery hose connect  
Emergency drain cut outs  
Baffle  
Internal Vapor Recovery  
Bulkhead  
Vapor  
Safety Valves contain liquid when sheared  
Liquid Drain

Tank Truck Safety Features

SafeRack

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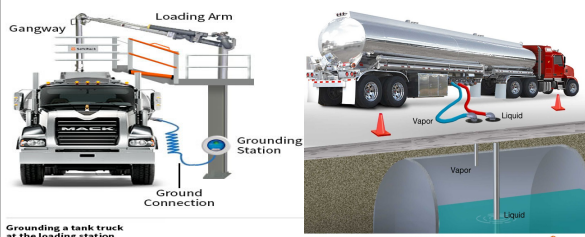
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## Equipment Design

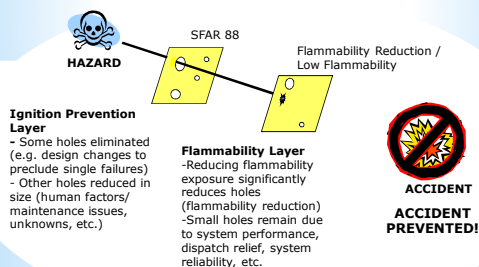
- ❑ When loading or unloading liquids, the liquid moving through the pipes, top loading arms and bottom loading arms generate **static electricity**.
- ❑ Because simple static electricity can generate an electrical charge sufficient to ignite vapor from flammable liquids, vapor recovery and grounding is important.



## EQUIPMENT DESIGN:

## Flammability Reduction A Balanced Approach

**Flammability Reduction** significantly reduces hole size in flammability layer, eliminating future accidents.




## EQUIPMENT DESIGN:

## Selection and Manufacturing process

- ❑ Choosing and maintaining the right model of a tank trailer is important because of the associated risks with petroleum products that are harmful to human health and the environment.
- ❑ In case of leakages, product may explode and cause loss of lives.
- ❑ Hence, the need to insist on selecting the right tank trailer that is built in align with the manufacturing process specific for each product type.

### Driver's Training



- ❑ A petrol trailer will often be transporting 10,000 / 33,000litres of fuel classified as hazardous substance, requires is a highly skilled professional and trained operators.
- ❑ Lack of training /retraining are potential causes of accident involving tanker truck.
- ❑ Standard training guideline should set and drivers /operators must undergo the training program in the sector.
- ❑ Training guideline /matrix should be flexible to accommodate changes such as any significant changes any part of the value chain (i.e. terminal, road tanker, delivery area or legislations)

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### Driver's Training

❑ Training guideline below specifies minimum requirements to be considered for all operators

Description	New to Industry	New to Employing Organisation	New to Terminal *	New to Industry Sub-sector	Return to Industry (after 3 months or more absence)
1. Be able to prepare to deliver petroleum products tanker trucks on road	✓	X	X	X	✓
2. Be able to load petroleum products into tanker trucks on road	✓	X	X	X	✓
3. Be able to drive petroleum product tanker trucks on road	✓	X	X	X	✓
4. Be able to offload petroleum products safely	✓	X	X	X	✓
5. Be able to deliver petroleum products by road tanker --- industry sub-sector requirements #	✓	X	X	X	✓
Annual Refresher Training	✓	X**	X	X**	✓

- ❑ \* Drivers should undergo terminal specific induction only when they are new to a terminal, they should already be trained to meet the Petroleum Fuel Tanker Driver.
- ❑ \*\* Annual refresher training not immediately required as drivers should already have the required knowledge, but practical assessment may be conducted for the driver .

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## Tanker Operations

What you should pay attention and how to stay safe when driving a tank trailer

- ❑ Loading the tank
  - ❑ One of the most important safety measures when handling a tank trailer is following the right procedure when loading the tank.
  - ❑ Proper loading is important to avoid liquid surge, which is common when a tank is half filled.
  - ❑ The most important factors to consider in determine the amount of liquid to load in a tank include:
    - The expansion rate of the liquid
    - Legal weight limits in the country
    - The weight of the liquid
    - The temperature of the load




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## Tanker Operations

To stay safe when driving a tank trailer

- ❑ Inspecting the tank trailer
- ❑ Inspecting all around the trailer to ensure that there are no leakages.
- ❑ Do not drive if the loaded gas or liquid is leaking, even if the leakage is small.
- ❑ Check if all the manholes and valves are covered.
- ❑ Driving a tank trailer with open valves is risky. It's an invitation to accident
- ❑ Re-check the parts before loading new cargo.




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## Tanker Operations

To stay safe when driving a tank trailer



- ❑ Control the surges
- ❑ liquid surges can cause the trailer to roll over when stepping on the brakes.
- ❑ keep the pressure on the brakes steady.
- ❑ Avoid releasing the brakes when stopping the trailer.

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## Conclusion

- ❑ Accident involving petrol tanker trucks on our roads is on the increase basically due to equipment, operations and human factors.
- ❑ Zero accident on our roads is achievable if we put all efforts into it.
- ❑ Only fit-for-use tanker trucks should be used at all times and trained drivers to drive, too.
- ❑ Training and re-training of operators and petrol truck drivers should be rigorous, aggressive and robust.
- ❑ Daily routine inspection of tanker trucks is vital in nipping accident in the bud.
- ❑ Follow standard procedures while loading or offloading petrol at times.
- ❑ Drive to conditions of the road and do away with reckless acts that are capable of causing accident.

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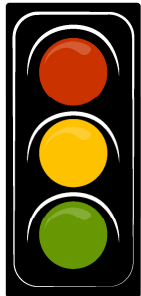
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## Punchline



**THINK SAFE**  
**ACT SAFE**  
**BE SAFE**

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## Reference and further reading

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