RULES on Trailer Stability are needed!!

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OVERVIEW

Introduction

Why are Stability Rules Needed?

Accidents

How it can be done correctly

Accident Analysis

Stability of Trailer

Recommendations
Why am I addressing this subject?

JUMBO SHIPPING
The Heavy Lift Shipping Company

JUMBO LOGISTICS
Total Transport

JUMBO OFFSHORE
Lift - Ship - Install, All in one go
Loading & Unloading of Heavy Cargo
Why Is Jumbo addressing this subject?

- **Leaders** in Heavy Lift Shipping want to lead in **Safety as well**
- **Jumbo pays a lot of attention to safety** and **detailed Project Preparation & Planning**
- **Training & Education of Staff and Crew members**
- **Innovation is Key to the Game**
- **All lifting gear is Certified** and replaced in planned intervals
Why are Stability Rules for Trailers needed?

- There are still too many accidents and we want:
  - No Injury to people
  - No Damage to the environment
  - No Damage to equipment and cargo
  - No Project delays

IMPROVE SAFETY IN THE HEAVY TRANSPORT INDUSTRY
RULES on Trailer Stability needed or not??

- There are stability rules for Ships (IMO)
- There are stability rules for Cranes (75% of Tipping)
- There are NO stability Rules for Trailers

Can that be changed?
It is **not the intention** to embarass any individual or **Company** by showing the following accidents.

I am trying to **improve Safety in the Heavy Transport Industry**.

What you see in the next slides **can happen to all of us at anytime!**

**LET US STOP THESE ACCIDENTS as all of these can be prevented!!**
Accidents
Accidents
Trailer was about to enter the corner

3-point suspension with the single point (1) at the rear (Wrong? or Correct?)

When entering the corner, suspension point 3 will tilt the trailer immediately without warning

With the tractor unit pulling it around the corner this will help tilting the transport combination

If the single point suspension was at the front we would have noticed that the front axle went down due to the lower part of the road and the trailer could have been leveled in time
A Transformer Tipped Over

Mechanical Failure?.. or Operators error?
A Transformer Tipped Over

Mechanical Failure?  or  Operators error?
A Transformer Tipped Over
Accidents
Accidents caused by Electronic failure

- Almost **all accidents** are caused by **human error**
- Sometimes a **mechanical, hydraulic or electronic failure** causes tipping of the trailer
How it can be done right

- It can be done correctly if you know how
- The Human error can be avoided by:
  - Training
  - Detailed engineering
  - Correct operating instructions
  - Follow procedures and instructions
How it can be done right
Transport of complete boiler Module

- Equipment Failure can be avoided by:
  - Proper Maintenance & Inspection
  - Make equipment Failsafe
Transport of fully rigged Platform Ringer Crane
Transport of a Pressure vessel
Accident Analysis

STARTING POINTS:

1. Platform trailer: **12 axel lines**
2. Diam. reactor approx. **5,8 m; Weight.203 Ton**
3. Cap. Trailer: **300 ton**
4. A **4 point suspension** was selected
5. At first site nothing to worry about
6. Center axles **were closed-off**, due to loads at end of trailer
7. **Instruction:** Use spirit level due to critical stability and **keep trailer leveled** at all times and use a 4 point suspension system!!
The Accident

WHY DID IT TIP OVER?

1. Camber of road: 2.8°
2. No spirit level was used
3. Trailer was not leveled
4. Too high pressure at one side, so they could not level the trailer anymore
5. Trailer tips over gradually and the lashings break off
6. Trailer falls back on the road
7. The reactor ends in the ditch next to the road
Accident analysis

**NOTE**: it was assumed that the CoG was on the center line of the reactor
Accident analysis

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Conclusion Accident

1. It was indicated that both saddles were equally loaded

2. This appeared not to be the case. The CoG was a lot more to the aft of the trailer

3. Aft axlelines of the trailer were loaded up to their maximum (25 Ton/axleline).

4. Due to tilting of the trailer the axles at the lower side will be loaded even more and tilt the trailer more

5. With a 3-point suspension, the trailer would have tipped over even earlier, due to the smaller theoretical tipping angle.

Which mistakes were made:

1. The spirit level was not used (it was stowed in the tractors cabin)

2. The operators did not pay attention to the level of the transport combination

3. As the trailer was not leveled in time, the whole transport combination tipped over.
How do we avoid these Accidents?

1. Establish **Stability Rules**
   - Theoretical Tipping angle
   - Hydraulic pressure

2. **Issue Operating Guide Lines**

3. **Involve Trade Organisations**

4. **Make them Universally applicable**

5. **Training and Education of Personnel**

6. **Use of the right equipment**
This is how it should have been done!

1. **Transport of Sphere of 260 Ton diam. 16 m, on 12 lines of SPMT’s coupled side by side**

2. **The SPMT’s demonstrate the Caroussel Mode (turning on the spot)**

3. **Stability is critical, so use a spirit level and keep the trailer leveled at all times!!**

This is the **same turn** as where the reactor tipped over, but now the trailer **was leveled**
1. **Monitor trailer level** at all times during transport *(Spirit level, Electronic device etc.)*

2. **My rule of thumb is:** A load which is *2 x as high as the width of the trailer* on which it will be transported: **WATCH OUT FOR STABILITY OF THE TRANSPORT COMBINATION!**

3. **Preference** for a *3 point suspension* system due to equal axle loads

4. At *high loads* a *4 point suspension* system gives a **better stability**

5. **Watch the pressure** in each hydraulic suspension point, and adjust if necessary

6. **Always avoid sudden movement** *(braking, fast change of direction, bumps etc.)*
1. A Joint Industry Project or Forum involving ESTA and SC&RA to be founded to develop Stability Rules for Trailers and make them Universally applicable

2. Support from Industry Leaders is needed (ALE, Fagioli, Mammoet, Sarens, Scheuerle, Goldhofer, Nicolas etc.)

3. TRAIN & EDUCATE MANAGEMENT STAFF AND OPERATIONAL PERSONNEL
Thank you for your attention

ANY QUESTIONS?

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