# DROPS in Manufacturing

Topics:

- Cranes
- Forklift
- Racking/Storage Systems

# 5 Basics Of a Perfect Job


| | |
|---|---|
| Start | • Hazard Identification<br>• Hazard Control (Barriers) |
| Execute | • Use the Right Processes<br>• Utilize Change Management |
| Finish | • Learn (Improve Future Work) |

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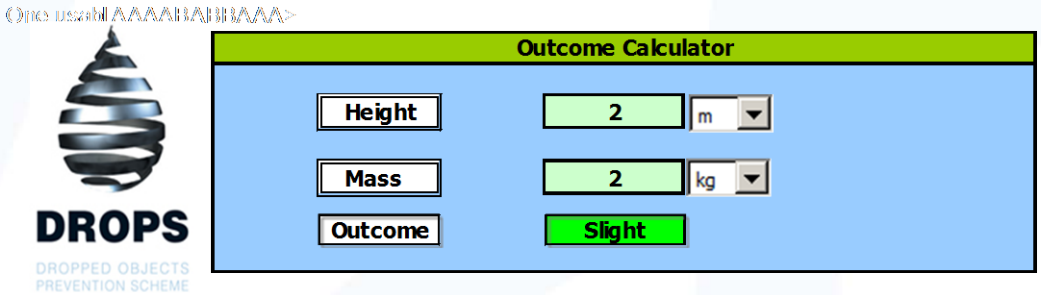
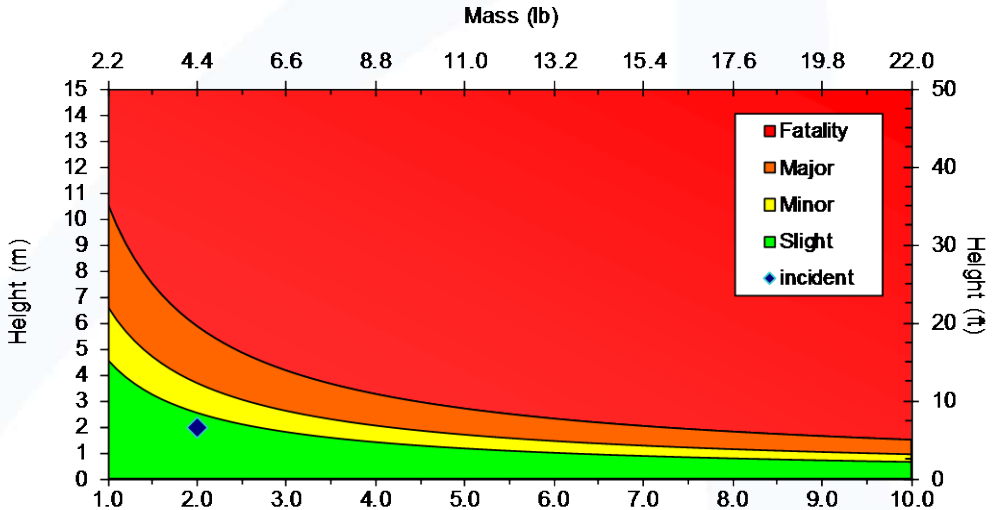
# Methodology

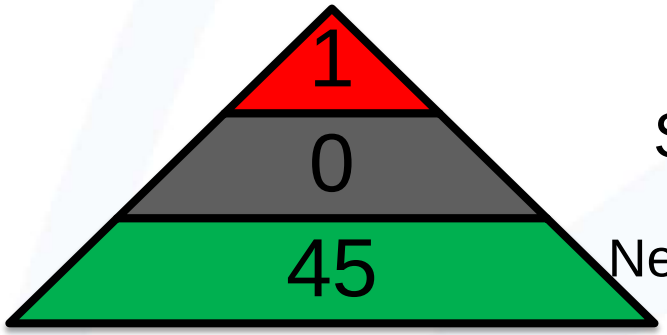
- "Could happen" severity determined by Electronic DROPS Calculator (Mass x Distance = Potential Consequence)
  - Calculator provides a common benchmark in the classification of the potential consequence



# Hidden Risk of DROPS

4 foot drop

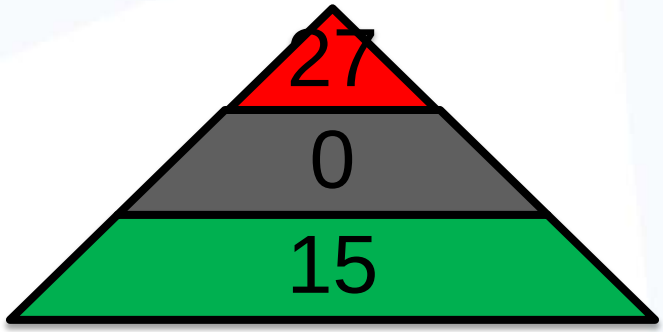



What happened

Catastrophic

Serious & Major

Near Miss & HIPO NM



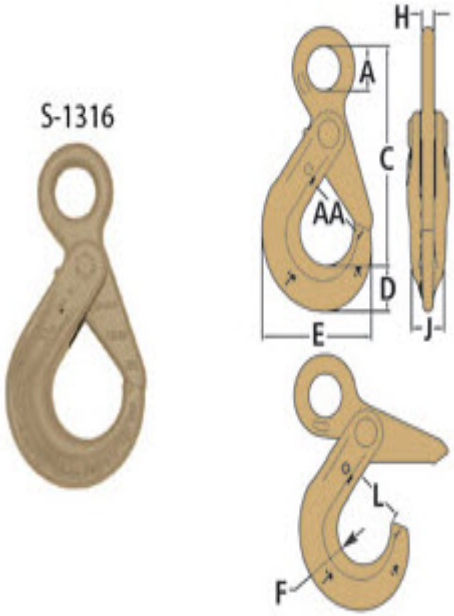

Could have happened

46 incidents from 2014 were analyzed

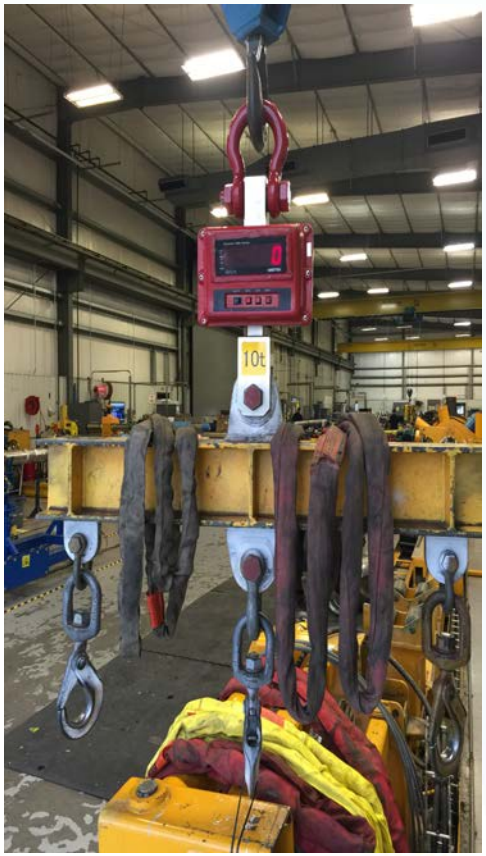
 

# Mandatory Practices-Overhead Cranes

- **Use of BH Approved Standardized Training- Classroom and hands on**
- **Crane and rigging inspections- Slings and Rigging ID tags legible, Inspected**
- **Mandatory function check of every crane daily before use**
- **STOP WORK if found faulty or questionable**
- **Use of Shur-lock hooks**





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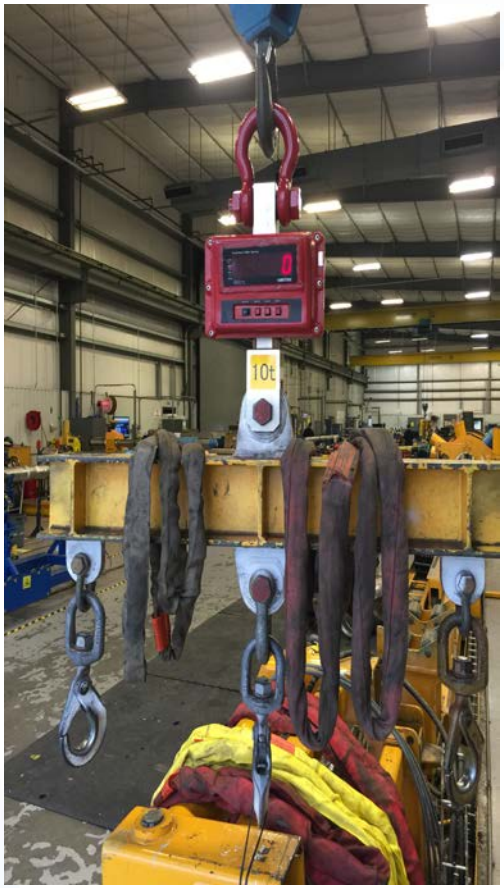
# Best Practices-Overhead Cranes

- **Center balancing of loads**
  - **Proper balance of load during lift and move**
  - **Center line scribing or marking- tape or other visual indicator**

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# Best Practices

- **Limit lifted object height to head high whenever possible**
- **Utilize another system to move materials than cranes whenever possible**
- **Must have knowledge of the weight being moved BEFORE lift and BEFORE placement**
  - **Published lists of tool weights mounted on racks**
  - **Meters installed to give visual weights or equivalent**

**MOTORS**

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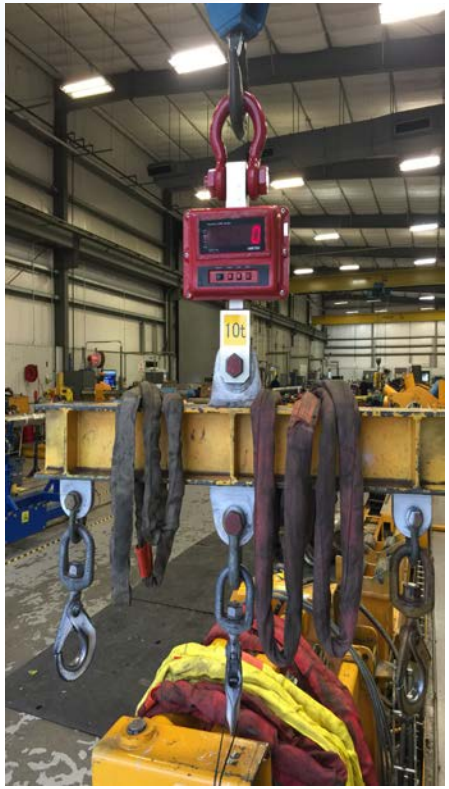
| | PRODUCT LINE | Tool Size | LENGTH | WEIGHT | MINIMUM SLING REQUIREMENT |
|---|---|---|---|---|---|
|  | UTR Motor | 4-3/4" | 9.75m | (625 kg) | 2 TON SLING ( GREEN ) QTY : 2 NO'S |
| | | 6-3/4" | 9.75m | (1350kg) | 2 TON SLING ( GREEN ) QTY : 2 NO'S |
| | | 9-1/2" | 11m | (7910 kg) | 3 TON SLING ( YELLOW ) QTY : 2 NO'S |
| | | 11-1/4" | 9.75m | (9700 kg) | 3 TON SLING ( YELLOW ) QTY : 2 NO'S |
|  | XTR MOTOR | 4-3/4" | 9.75m | (1440kg) | 2 TON SLING ( GREEN ) QTY : 2 NO'S |
| | | 6-3/4" | 11.09m | (1440kg) | 2 TON SLING ( GREEN ) QTY : 2 NO'S |
| | | 9-1/2" | 8.84m | (2041kg) | 3 TON SLING ( YELLOW ) QTY : 2 NO'S |
|  | MMTR | 4 3/4" | 7.92m | (700kg) | 2 TON SLING ( GREEN ) QTY : 2 NO'S |
| | | 6-3/4" | 7.92m | (985kg) | 2 TON SLING ( GREEN ) QTY : 2 NO'S |
| | | 9-1/2" | 9.45m | (2650kg) | 3 TON SLING ( YELLOW ) QTY : 2 NO'S |

The above is a guide to the weights of the Motors using the weights listed in SAP. There will be variations due to stabiliser variation. None of the weights will exceed an 11 1/4" (3700kg) motor with a 25 3/4" (558kg) stabiliser which will have a combined weight of 4258kg.



# Forklift Dropped Objects

**Causes:**

- Lack of skill
- Uneven weight distribution of load
- Failure to get a spotter when vision is compromised
- Failure to recognize hazards
- Inattention to overhead hazards
- Handling too many tools at one time
- Operating in inclement weather conditions
- Rushing to get the job done
- Uneven driving surfaces
- Improper loading on forks
- Moving too quickly with loads

**When heavy objects are dropped, there is high risk for serious injury or worse**

# Forklift-Do Not Do This!


**No sling directly on fork**


**Carrying load to high**

**Load not all the way back and only one fork**

**Exceeding forklift capacity**


**Not wearing seat belt**

**Loading trailer without a spotter**

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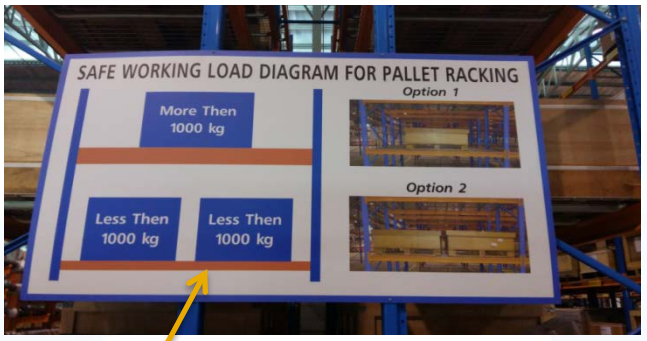
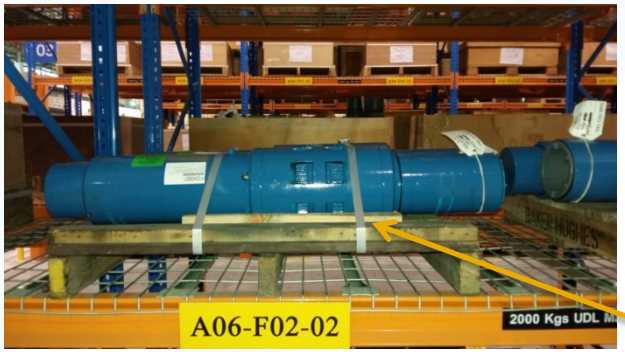
# Warehouse Best Practices


- **Wooden boxes are used to secure the tools.**
  **Safe Working Load Diagram safety signage is placed near scale for forklift operators to verify and confirm weight before loading equipment into racking.**

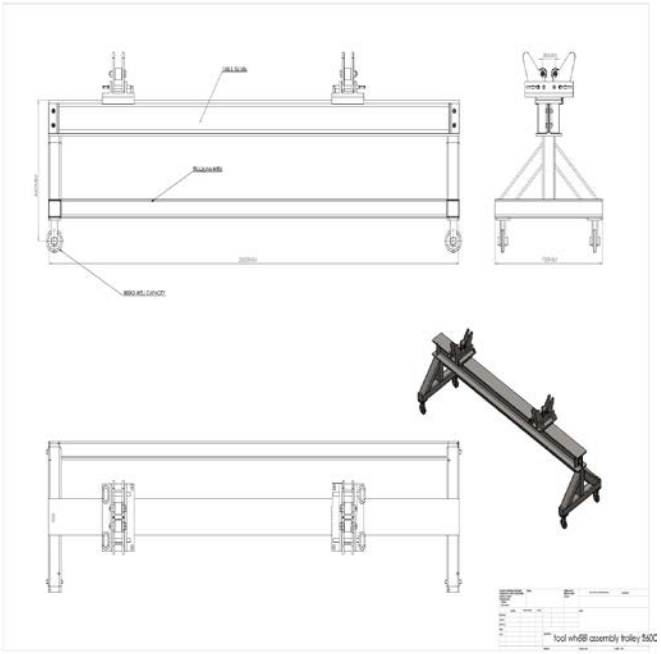


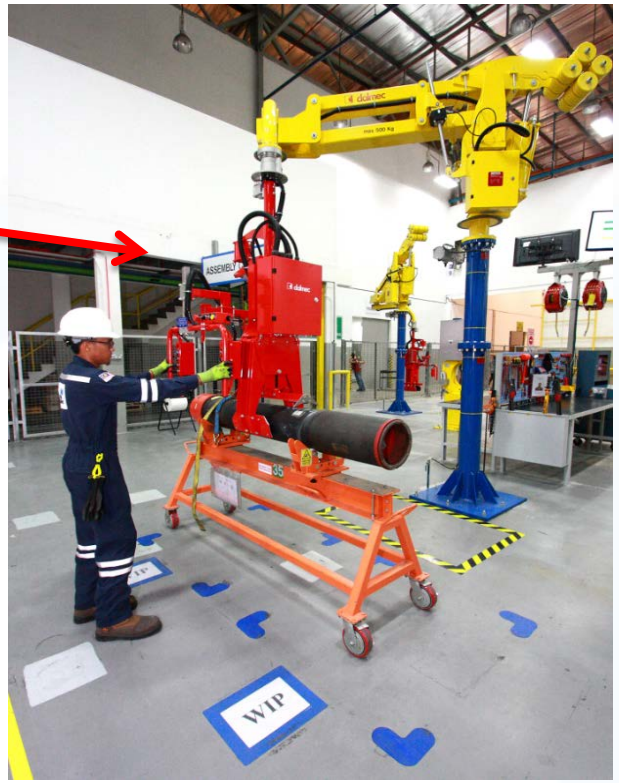

- **Tools are strapped with cord strap and stored on the rack to prevent tools from dropping**

# Assembly Best Practices

- **Hands Free Lifting Arms can lift up to 500 KG avoiding the use of the overhead crane.**

- **Long Material trolleys to transport equipment from warehouse to assembly which avoids forklift traffic in workshop.**





# Assembly Best Practices

- **Side load test enclosure which eliminates cranes to load/unload tools up to 40 feet in length.**

- **Hydraulic adjustable vises that align with material transport trolleys to avoid crane usage for standard assembly processes and stabbing of liner packers**


# Racks-Best Practices

- Storage system (racks) must comply with design specifications
- Inspect racks daily for stress cracks and damage
- Label arms with weight limits
- Label rack unit with maximum weight limit
- Certified as fit for duty (weight and specific design requirements) by engineer
- Tag out damaged racks for repair or disposal
- Forklift drivers must be trained to prevent dynamic stress loading of arms
  - Dynamic stress loads due to dropped materials can be 6X-10X static load
- Center loads to prevent tool deflection

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# Pallet Rack with Backstop