

# **Delayed Coker**

## **Coke Drum Winch and Cables**



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@ Galveston coking.com May-2015

# Coke Drum Winch and Cables

Presenter – Evan Hyde

[http://www.nola.com/news/baton-rouge/index.ssf/2014/11/contractor\\_working\\_with\\_exxonm.html](http://www.nola.com/news/baton-rouge/index.ssf/2014/11/contractor_working_with_exxonm.html)

- A man working as a contractor at the ExxonMobil Baton Rouge Refinery lost both of his legs on Thanksgiving Day, according to WAFB-TV.
- ExxonMobil officials say the contractor was injured during the regular course of operations.
- The man, who has yet to be identified, was treated at the scene and taken to a local hospital.
- "We regret that this incident occurred. Our thoughts and prayers are with the contractor and his family" Refinery Manager Mark Northcutt told WAFB.
- An investigation has been launched to look into the incident.

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## Purpose for this Presentation:

To reemphasize key design and procedural points associated with winch and cable operations, particularly when equipment behavior is abnormal.

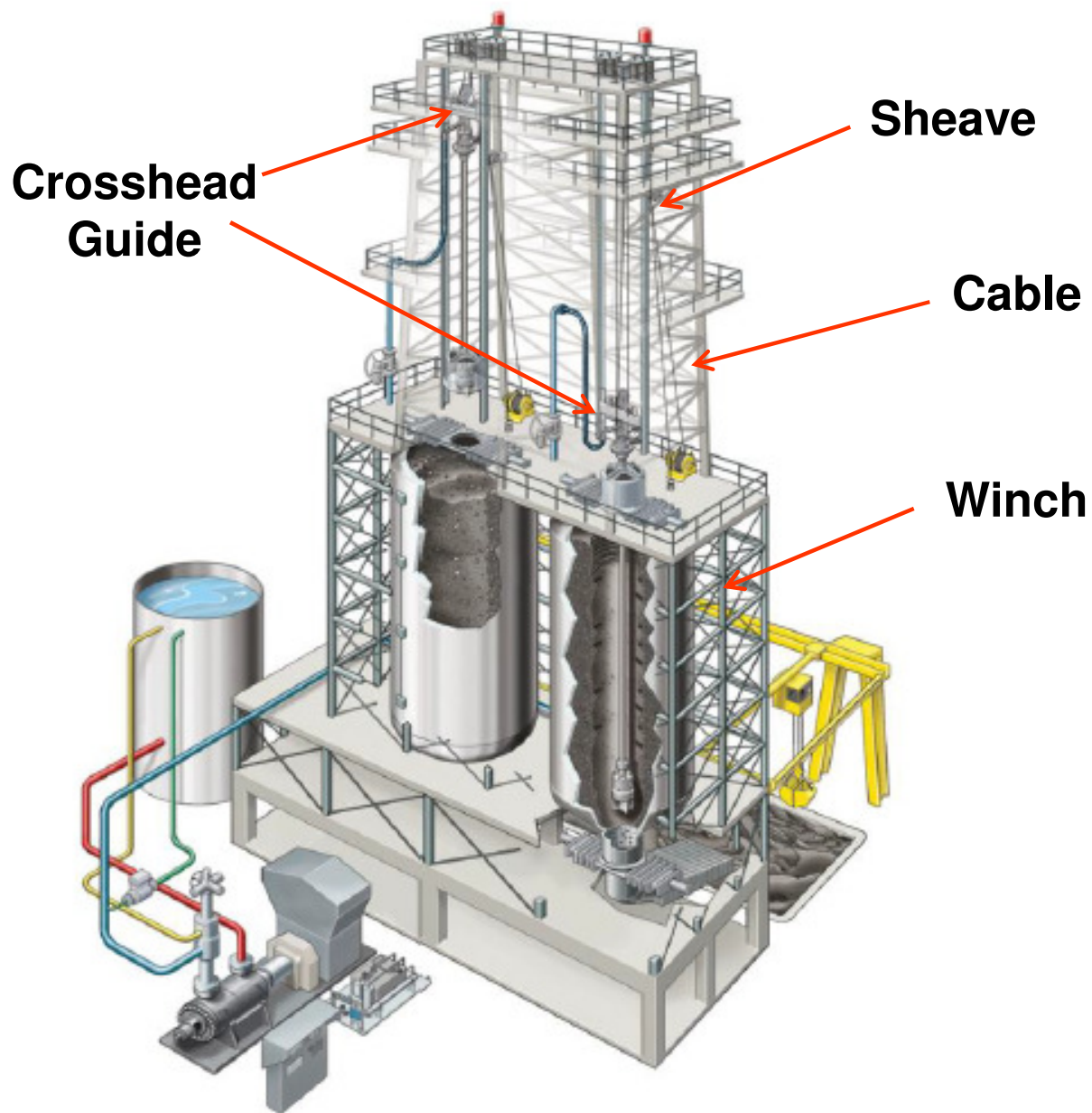
Please return to your site and make sure that these points are covered in your Delayed Coker Operating Procedure

# Coke Drum Winch and Cables

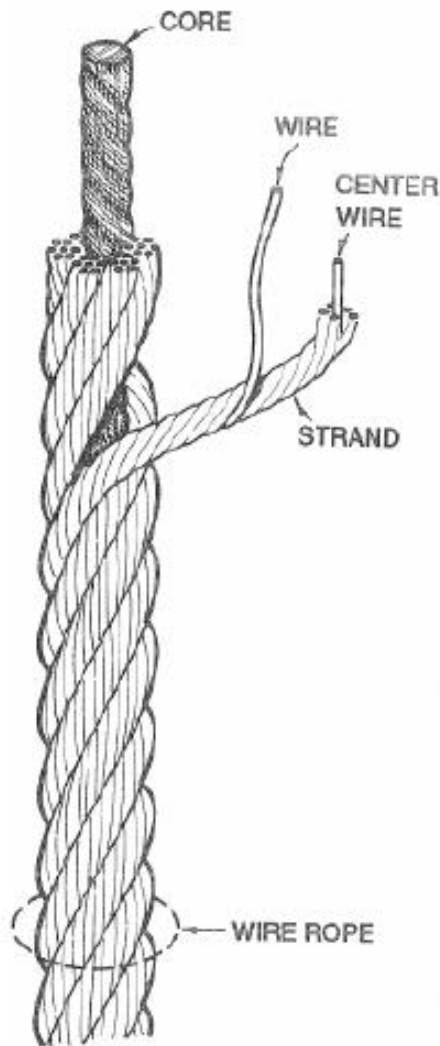
Presenter – Andrew Worley

## Items for Consideration

- Winch
- Cable
- Sheaves
- Crosshead Guide



## Basic Wire Rope Construction:

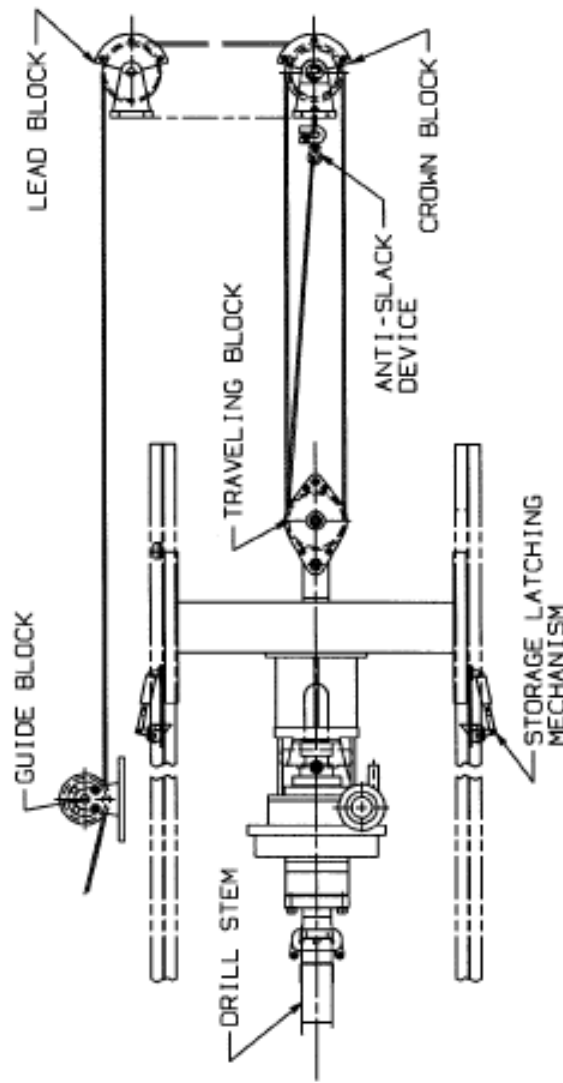


Wire rope has three basic structural components:

1. **The core:** provides the foundation for the wire rope. Three materials are commonly used: fiber core (FC), independent wire rope core (IWRC), and wire strand core (WSC). In this service, IWRC type core is used.
2. **Multi-wire strands:** these are wound in a helix around the core.
3. **Wires:** form the strands. The wires come in a variety of materials and grades. In this service, the extra improved plow steel (EIP) grade of steel wire is used. It is used in the “bright” uncoated condition. Galvanized wire usually reduces the strength of the wire rope by 10%, and is therefore not used.

**Summation:** For decoking service hoisting systems, use bright EIP IWRC wire rope

## Wire Rope and Pulley System (API 8C) :



**Crosshead assembly:** guides and centers the cutting assembly in the coking structure

**Traveling block:** raises and lowers the cutting assembly in the coking structure via the wire rope

**Crown block:** sits directly above the traveling block and is the complementary stationary block to the traveling block

**Lead block:** makes the wire rope transition between its horizontal run from the crown block and its vertical run to the hoist

**Guide block:** controls the fleet angle and spooling of the wire rope onto the hoist drum

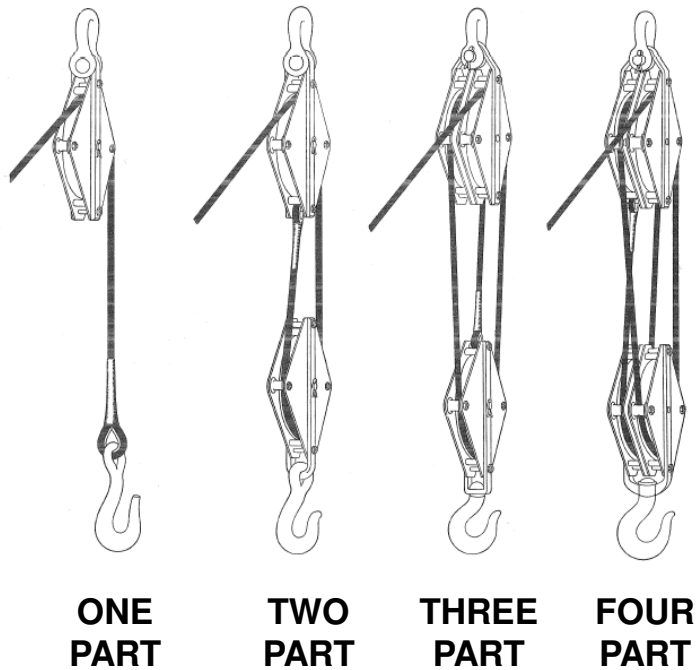
**Hoist (not shown):** provides the motive force for raising and lowering the cutting assembly

**Wire rope:** transfers the cutting assembly loads through the pulley block system to the hoist

**Load cell:** part of the instrumentation sensing the tension load of the hoisting system



## Reeving and UnSpooled Cable:



⇒ Reeving refers to the number of wire rope cables supporting the load (number of ropes passing through a horizontal plane between the traveling block and the crown block)

⇒ Most decoking systems use four part

⇒ 4-Part Reeving means:

- The weight load in the wire rope is  $\frac{1}{4}$  the cutting assembly weight.
- Conversely, when the hoist stalls, the wire rope system will impart a vertical load to the structure of 4X the hoist stall.
- **MOST IMPORTANTLY, 1 ft of drill stem movement will equate to 4 ft of unspooled cable movement**

## Key Points:

### => **Facilities Design Features to Consider**

- Winch Cable Guard Locked in Place
- Cable Enclosed in a Locked Cage from Winch to Shed Roof
- Auto Winch Stop on Slack Cable
- Cable Tensiometer

### => **Regular Preventive Maintenance is Essential**

- Winch Tasks (regular, seasonal and turnaround overhaul)
- Cable, Sheave & Guide Rail Tasks (regular, seasonal and end-of-life)

### => **Procedures Need to Clearly State the Following Points and All Technicians & Supervisors Need to be Thoroughly Trained**

- ANY work with the cable requires installation of drill stem clamps to prevent uncontrolled movement UNLESS the drill stem is already resting on its stops and secured
- Cages must be locked and only opened by authorized personnel



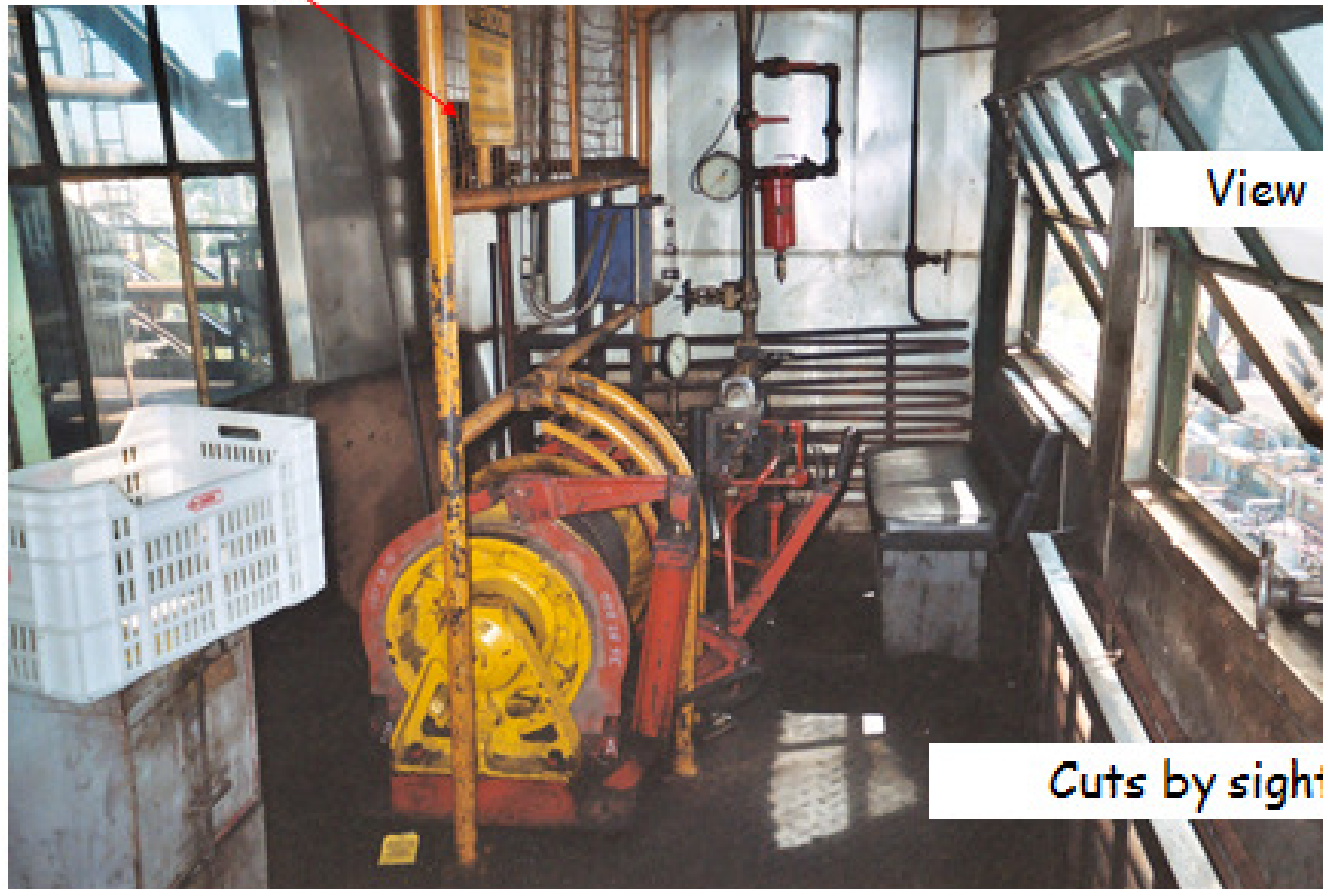
# Coke Drum Winch, Guides and Cable Safety

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## Old Design with Winch in Cutting Shack

Complete Cage Enclosure of the Winch Spool and Cable in the Shack is Recommended

Cable Guard



View of Coke Pad

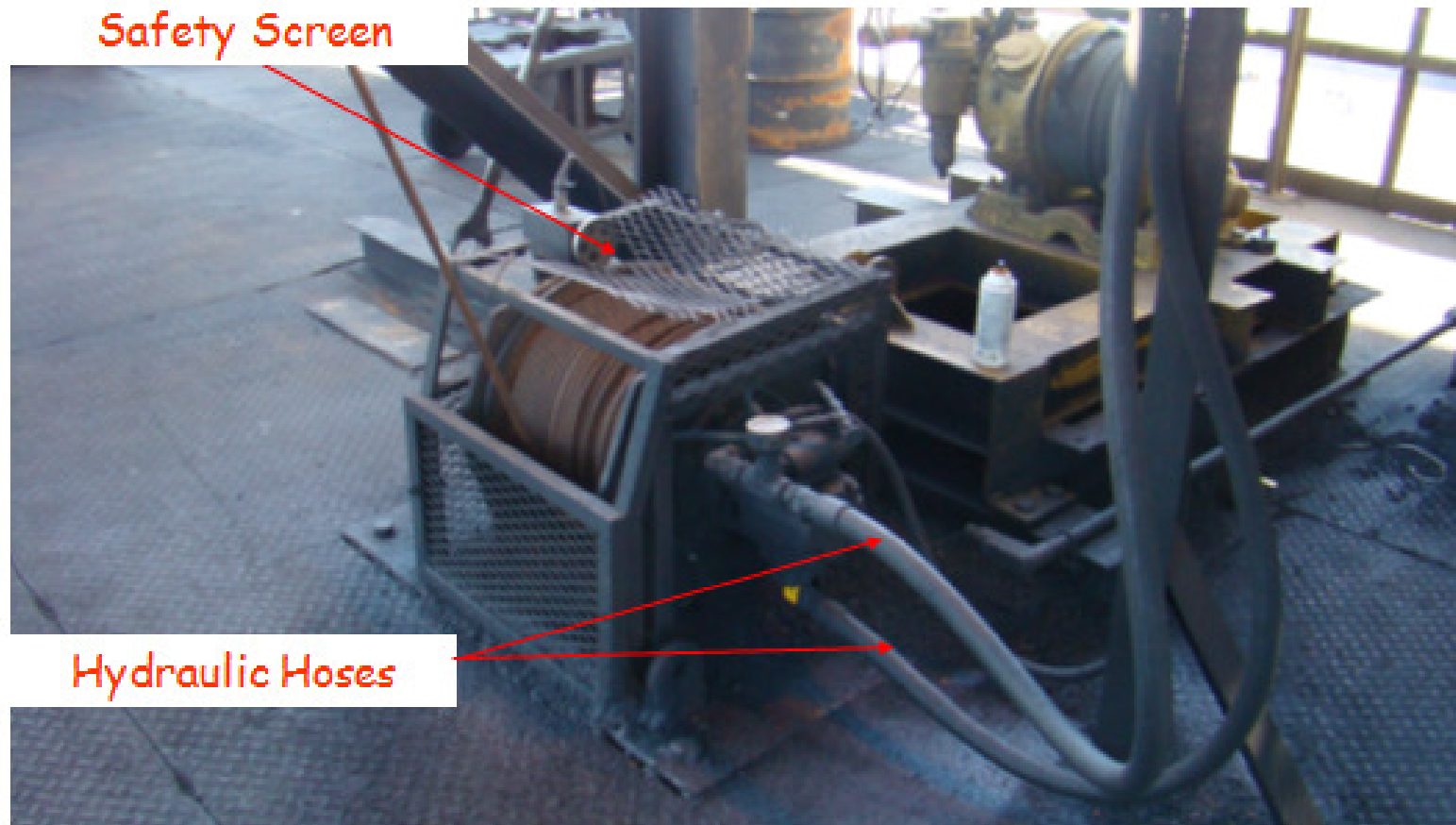
Cuts by sight & sound

# Coke Drum Winch, Guides and Cable Safety

## Coke Cutting Winch Outside Shack

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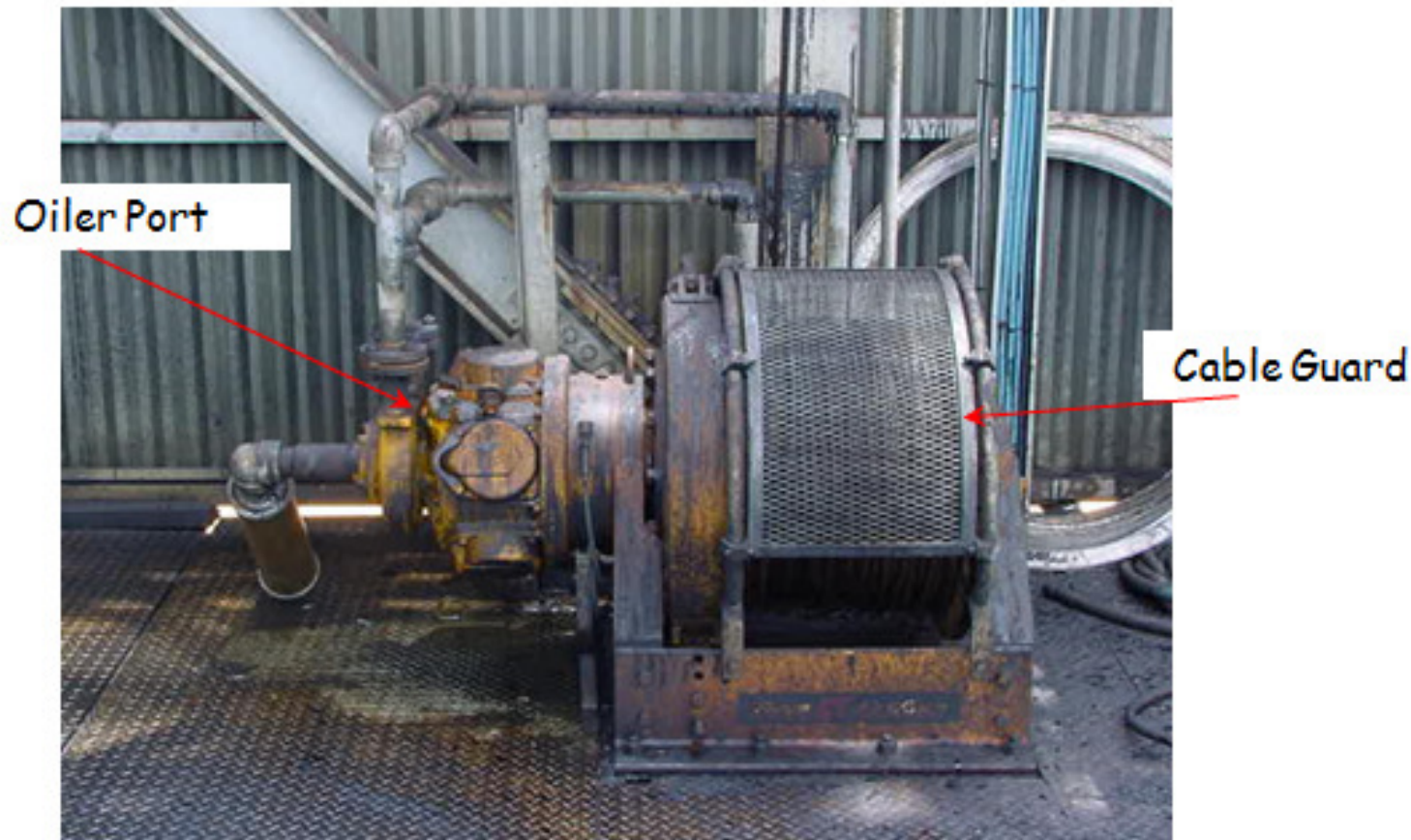
- Complete Winch Cable Guard Recommended



# Coke Drum Winch, Guides and Cable Safety

**Coke Cutting Winch Outside Shack  
- Complete Winch Cable Guard in Place**

Presenter – Evan Hyde



## Procedural Warnings to Consider:

Operating decoking console in bypass without proper authorization can result in damage to equipment and injury to personnel.

Prior to Cut, the cutter should verify that:

- All personnel are clear of the structure at grade, on the bottom head deck, the cutting deck and stairways.
- Telescope is secured to the bottom of the drum (if no slide valve)
- Signs and chains restricting access are appropriately in place
- All LOTO (Lock-Out, Tag-Out) locks are in place
- Communicate with Coke Handlers to ensure there is room for the coke and they are aware cutting will begin

Additionally:

- Equipment PM's are up-to-date
- Cable rope is in good repair
- Guide Rails are in good repair visually and no none issues per previous cutter

## Procedural Warnings to Consider:

In the event that the drill stem hoist cable becomes Tangled or Unspooled: STOP AND NOTIFY YOUR SUPERVISION. DO NOT ATTEMPT TO REPAIR OR STRAIGHTEN CABLE. THIS IS A MAINTENANCE ACTIVITY REQUIRING PROPER AUTHORIZATION.

In the event that the drill stem hoist cable becomes Tangled or Unspooled, or the Crosshead Guide is stuck, drill stem clamps must be installed on the drill stem.

=> The only exception is when the crosshead is already resting on the bottom stops or the drill stem is resting on the top head or deck.