



# Safety

2019 OACES / ODOT BRIDGE MAINTENANCE  
A Pilot Training Course / Workshop

## Slide 1

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**NL1**

Slides pulled from:

1. NHI Bridge Maintenance M1L2.
2. NHI Bridge Maintenance M2L1.
3. NHI Bridge Maintenance M3L2.

NGUYEN Lisa, 9/4/2018

# Health, Safety, Security

- *“Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthful workplace. No person should ever have to be injured, become ill, or die for a paycheck.”*



# Causes of Accidents

- Improper attitude – Time, effort, peer pressure
- Personal limitations
  - Physical impairment
- Boredom and/or Carelessness
- Faulty equipment
- Inappropriate or loose fitting clothing
- Lack of planning
- Lack of proper training
- Lack of pre-safety meeting
- Cowboys and Heroes

Cowboys and Heroes – Do you work with any of these individuals?



The craziest things happen --



# On your last day of Work!!

- Call an Engineer?
- Don't Call?





# The Fatal Four

- Falls,
- Electrocution
- Struck by object
- Caught-in/between





# Common Worker Safety Hazards & Risks

Hazard	Risk
Working at Heights	Falling
Fumes, Dust, Smoke	Respiratory Impairments
Chemical exposure	Bodily harm
Equipment/Machinery	Injury
Power lines	Shock or electrocution
Confined Space	Oxygen deficiency
Trenches & Excavations	Collapse/cave-in
Traffic	Collision and bodily injury



# Required Training

- Fall Protection Training
- GHS – Globally Harmonized System: Hazard Communication
- Respiratory Safety, Silica Table 1
- Lock-Out Tag-Out
- Blood Borne Pathogens
- Excavation – Trenching / Shoring
- CPR – First Aide

# Addressing Worker Safety Hazards in the Field

- Training, Training, Training - Documentation
- Use fall protection
- Use appropriate personal protective equipment (PPE) for the job
- Apply accident prevention and proper safety measures





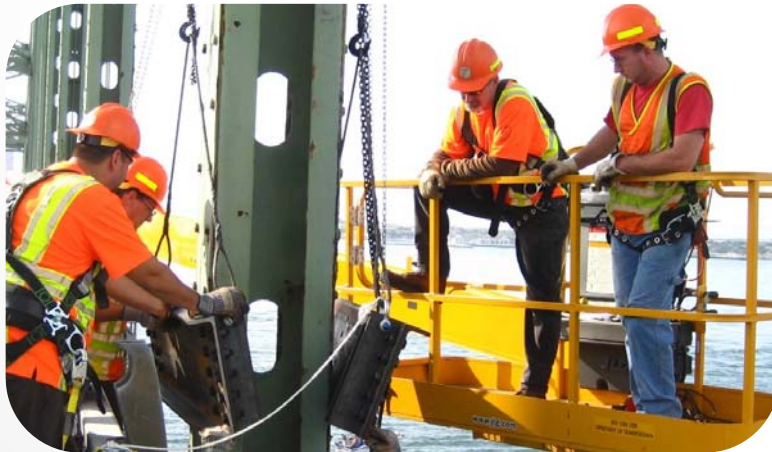
# Fall Protection

- What is a “Safe” Height ???
  - Scaffold & Construction Work vs General Industry Work
- Scaffold Standard ([29 CFR 1926.451\(g\)\(1\)](#)) - 10 Feet
- Construction Standard ([29 CFR 1926.501\(b\)\(1\)](#)) - 6 Feet
- General industry standard, ([29 CFR 1910.28\(b\)\(1\)\(i\)](#)) – 4 Feet

CFR – U.S. CODE OF FEDERAL REGULATIONS

# Fall Protection

- Fall Prevention, Fall Restraint, Fall Arrest
- Survey the site for potential fall hazards before working
  - Applies to unprotected side or edge
- Complete proper training before using fall protection



# Fall Protection (con.)

- A,B,C,&D = Anchor, Body Wear, Connection, getting Down
- Fall Gear – Service Life
- Must be anchored to structurally sound attachment point.
  - Separate anchorage points for each line





# Fall Protection - Ladders

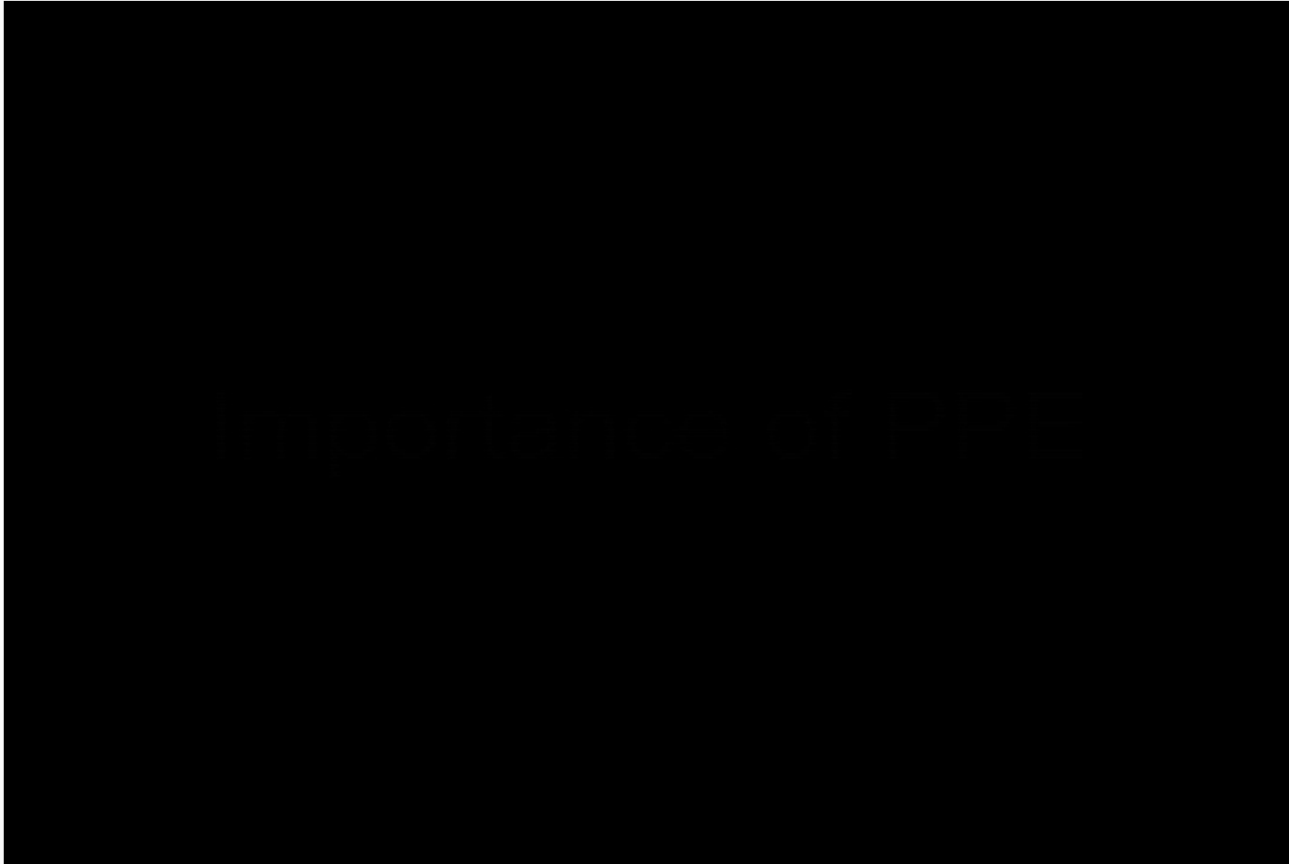
- LADDERS ([29 CFR 1910.23](#))
- Always inspect a ladder before use.
- Verify level footing and rigid support at top
- Follow manufacturers Warnings!
- Use the proper lean ratio when using a ladder:
  - 1 foot out from base, for every 4 feet of elevation



# Bridge Rail



# Importance of PPE Video



# Appropriate PPE

- OSHA, OR-OSHA, and ANSI Guidelines
- Head protection
  - Hardhats or helmets
- Eye and face protection
  - Safety glasses, goggles, face shields
- Foot protection
  - Boots with impact resistant toes, electrical, slip resistance and puncture resistant soles



# Appropriate PPE (con.)

- Hand protection
  - Gloves
- Hearing protection
  - Ear plugs or muffs
  - Two Way Headsets
- Respiratory protection
  - Respirator or dust mask
  - Air monitoring device
- Protection from motorists
  - Safety reflector vest – 1000 Ft
- Drowning prevention
  - Life jacket





# Over/Near Water

- Anywhere there is a chance of drowning!
- Life Jacket
- Skiff





# Respirable Crystalline Silica

- Know the Rules
- Table 1



# Appropriate PPE (con.)

- Skin Protection
  - Proper clothing coverage
  - Gloves
  - Sunblock
  - Face shields



# Safety Measures

- Safety attitude and awareness
- Safety Data Sheets (SDS) – The RIGHT to UNDERSTAND
- Equipment and machinery
- Forklift Safety
- Boom Truck Safety
- Electrical safety
- Excavation – Trenching/Shoring
- Confined space
- Traffic configuration and management



# Safety Data Sheets (SDS)

9 Pictograms, 16 Section, Two Signal Words – Warning and Danger

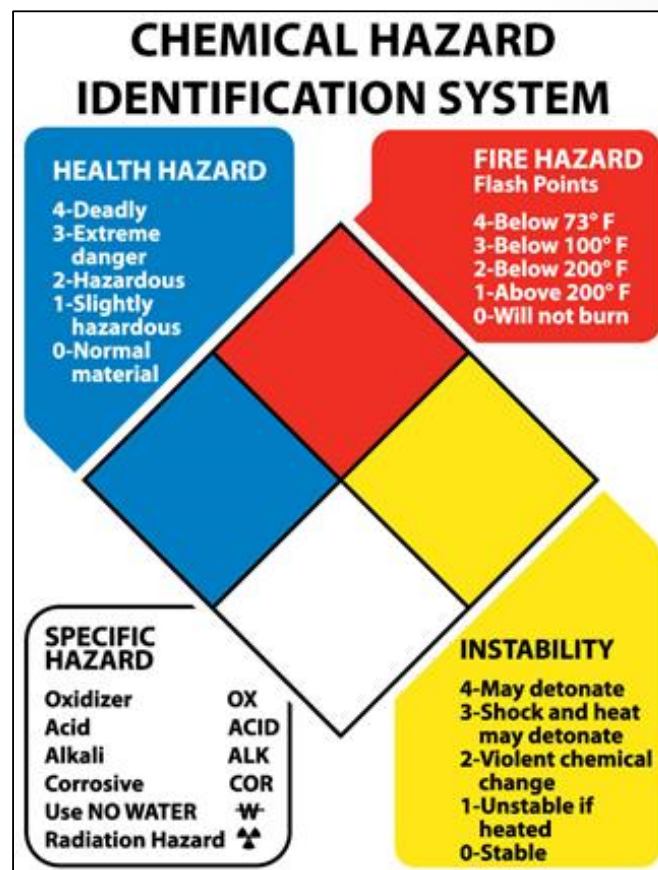
**Safety Data Sheet**  
**Gasoline, Unleaded**

NFPA: Hazardability

Special Hazard

**TESORO**

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION	
Product name	: Gasoline, Unleaded
Synonyms	: Blend of Highly Flammable Petroleum Distillates, Regular, Mid Grade, Premium, 888100008809
SDS Number	: 888100008809      Version : 1.1
Product Use Description	: Fuel
Company	: For: Tesoro Refining & Marketing Co., 19100 Ridgewood Parkway, San Antonio, TX 78259
Tesoro Call Center	: (877) 783-7876      Chemtrec (Emergency Contact) : (800) 424-9300
SECTION 2. HAZARDS IDENTIFICATION	
Classifications	: Flammable Liquid – Category 1 or 2 depending on formulation. Agitation Hazard – Category 1 Carcinogenicity – Category 2 Specific Target Organ Toxicity (Repeated Exposure) – Category 2 Specific Target Organ Toxicity (Single Exposure) – Category 3 Skin Irritation – Category 2 Eye Irritation – Category 2B Chronic Aquatic Toxicity – Category 2
Pictograms	:
Signal Word	: <b>Danger</b>
Hazard Statements	: Extremely flammable liquid and vapor. May be fatal if swallowed and enters airways – do not siphon gasoline by mouth. Suspected of causing blood cancer if repeated over exposure by inhalation and/or skin contact occurs. May cause damage to liver, kidneys and nervous system by repeated and prolonged inhalation or skin contact. Causes eye irritation. Can be absorbed through skin. May cause drowsiness or dizziness. Extreme exposure such as intentional inhalation may cause unconsciousness, asphyxiation and death. Repeated or prolonged skin contact can cause irritation and dermatitis.



# Safety Data Sheets (SDS) (con.)

- Globally Harmonized System (GHS) Pictograms:



Acute Toxicity  
(fatal or toxic)



Skin Corrosion / Burns  
Eye Damage  
Corrosive to Metals



Explosives  
Self-Reactive  
Organic Peroxides



Gases Under  
Pressure



Aquatic Toxicity



Flammables, Pyrophorics  
Self-Heating,  
Emits Flammable Gas  
Self-Reactive, Organic Peroxides



Irritant (skin and eye)  
Skin Sensitizer  
Acute Toxicity  
Narcotic Effects  
Respiratory Tract Irritant  
Hazardous to Ozone



Oxidizers



Carcinogen  
Mutagenicity  
Reproductive Toxicity  
Respiratory Sensitizer  
Target Organ Toxicity  
Aspiration Toxicity



# Equipment and Machinery

- Keep work areas uncluttered
- Be aware of all moving equipment
- Do not operate any equipment without appropriate training
  - Be aware of all overhead power lines





# What's Wrong with this Picture

- Cowboy or Super Hero



# Forklift Safety

- Training is required by law.
- Study the Operator's Manual
- Keep the blades low whenever possible.



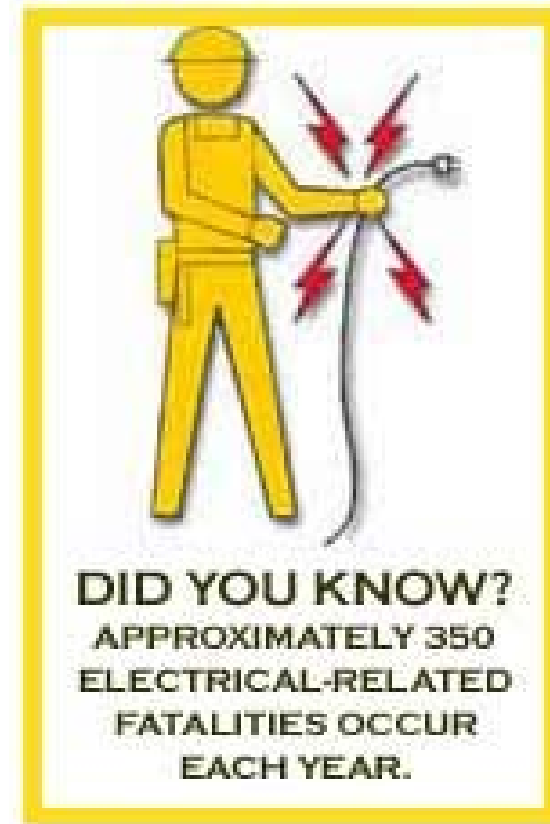
# Boom Trucks

- NCCCO Requirements  
National Commission for the  
Certification of Crane Operators
- Delayed (again) until April 15, 2019
- Rigging and Signaling



# Electrical Safety

- Always perform a pre-work walk through to identify potential sources of danger
- Look for overhead power lines and buried power line indicators





# Excavation Safety

- Designed by an Engineer
- Sloped no Steeper than 1 ½ : 1
- Certified to identify soil types.



# Confined Space

- Potential hazards include:
  - Asphyxiation
  - Toxic materials
  - Entrapment
- You must have the proper training and permit to enter an confined space!

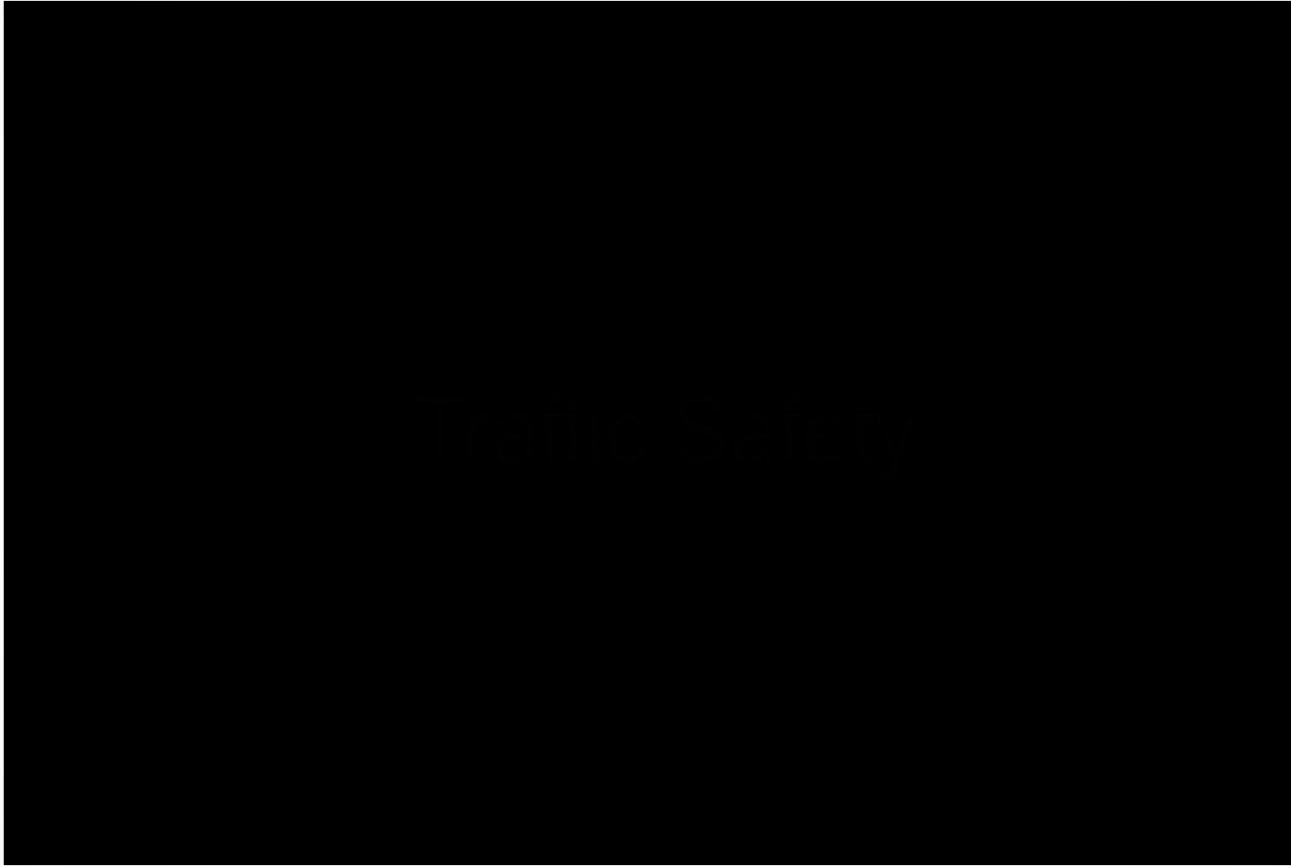




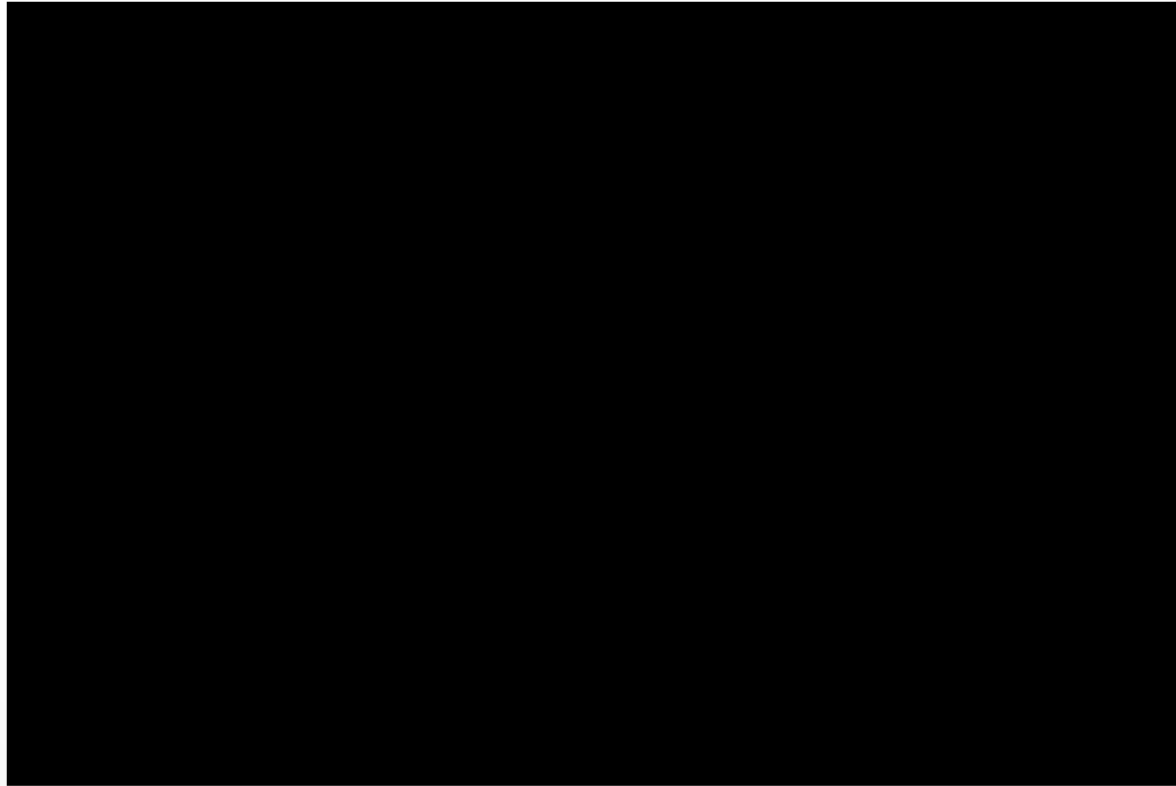
# Traffic Hazards



# Traffic Safety Video

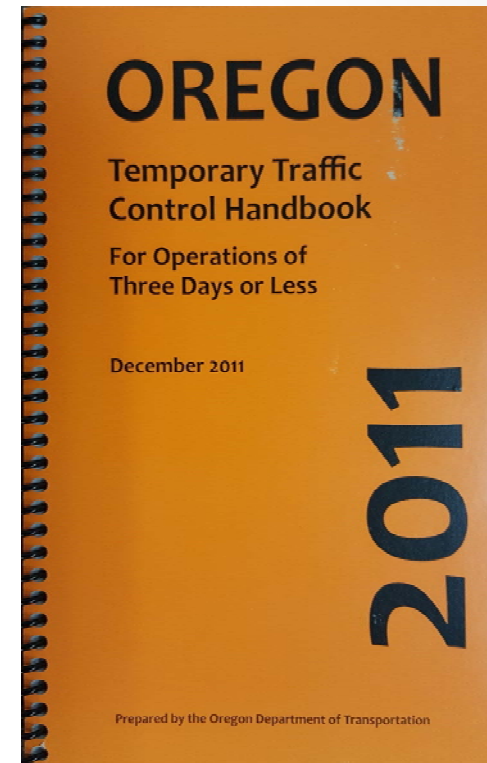


# Healer Sealer Surface Preparation Video



# Traffic Control Planning

- Develop a Plan
- Know the Plan
- Follow the Plan
- Trained Flaggers
- Dedicated Flaggers.



# Reminders!

- Fatal Accidents happen very quickly
- Caused by “Legacy” practices
- Lack of Situational Awareness

