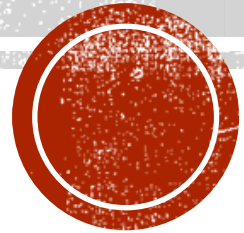
USE THE ENERGY WHEEL TO END THE GAME OF CHANCE



James A. Woodward Sr., MS

- Father of 3
- Youth Baseball Coach
- Youth Basketball Coach
- Tournament Director
- Baseball Umpire
- ASSP Chesapeake Chapter Vice President
  - 2022 Safety Professional of the Year

AMERICAN SOCIETY OF
SAFETY PROFESSIONALS
Chesapeake Chapter

SAFETY PROFESSIONAL OF THE YEAR AWARD - 2022

Presented to

JAMES WOODWARD

In recognition of your outstanding achievement in the occupational safety and health (OSH) field while supporting and advancing the profession overall for your organization, colleagues and The Chesapeake Chapter, American Society of Safety Professionals.

- University of Baltimore 2005- BA Criminal Justice
- University of Baltimore 2007- MS Courts & Law
- Regional Safety Manager- McLean Contracting Company

- Introduction
- Hazard Identification Overview
- Training Workers in Hazard Identification
- Success Story
- Energy Wheel & Pre-Planning
- Moving Forward- Energy Wheel & Leading Indicators
- Moving Forward- Energy Wheel & Lagging Indicators
- Summary

HAZARD IDENTIFICATION OVERVIEW

HAZ-ARD

'A POTENTIAL SOURCE OF HARM.'

Hazard recognition is the first step in situational awareness

What is the meaning of situational awareness?

Being aware of what is happening around you in terms of where you are, where you are supposed to be, and whether anyone or anything around you is a threat to your health and safety.

TRAINING WORKERS IN HAZARD IDENTIFICATION

What HAZARDS Do You See?

What HAZARDS Do You See?

- Heavy Equipment
- Suspended Load
- Trip Hazards
- Vehicular Traffic


TEST
TIME

HAZARD RECOGNITION – COUNT THE FS

THE CAPE FEAR IS ONE OF MANY IN MCLEAN'S FLEET OF FLOATING CRANES. IF IT WASN'T FOR THE FACT OF THE MATTER OF ITS FLOATING ABILITIES, IT WOULD HAVE A LIFTING CAPACITY OF MORE THAN FOUR HUNDRED TONS.

HOW MANY LETTER F'S WERE IDENTIFIED?

?

HAZARD RECOGNITION – COUNT THE F'S

THE CAPE FEAR IS ONE OF MANY IN MCLEAN'S FLEET OF FLOATING CRANES. IF IT WASN'T FOR THE FACT OF THE MATTER OF ITS FLOATING ABILITIES, IT WOULD HAVE A LIFTING CAPACITY OF MORE THAN FOUR HUNDRED TONS.

14


WHY?


TRY AGAIN!

HAZARD RECOGNITION – COUNT THE FS

THE SAFETY OF ALL OF MCLEAN'S FIELD PERSONNEL IS FOCUSED ON FINDING AND FIXING HAZARDS. IF HAZARDS ARE FOUND AND IF FOCUS BECOMES CONTROL OF THOSE HAZARDS, FIELD PERSONNEL ARE LESS LIKELY TO BE INJURED.

HOW MANY LETTER F'S WERE IDENTIFIED?

?

HAZARD RECOGNITION – COUNT THE FS

THE SAFETY OF ALL OF MCLEAN'S FIELD PERSONNEL IS FOCUSED ON FINDING AND FIXING HAZARDS. IF HAZARDS ARE FOUND AND IF FOCUS BECOMES CONTROL OF THOSE HAZARDS, FIELD PERSONNEL ARE LESS LIKELY TO BE INJURED.


WHY?

ENERGY SOURCES & HAZARD RECOGNITION

HAZARD RECOGNITION: THE ENERGY WHEEL

- Energy Creates Hazards
- Every Hazard comes from an Energy Source
- There are 10 Sources of Energy

10 SOURCES OF ENERGY

- MECHANICAL
- ELECTRICAL
- PRESSURE
- TEMPERATURE
- CHEMICAL
- BIOLOGICAL
- RADIATION
- SOUND
- GRAVITY
- MOTION

follow the data

Dr. Matthew R. Hallowell, Ph.D.

Professor- University of Colorado @ Boulder

Executive Director- Construction Safety Research Alliance

Hallowell, M. R. (2021). The Energy Wheel: The Art & Science of Energy-Based Hazard Recognition. *Professional Safety*, *66*(12), 27-33.

follow the data

- Examined 4,800 Worker Hours of Observation
- Workers Identified Approximately 45% of Present Hazards
- Using the Energy Wheel Increased Hazard Identification by 30%

follow the data

"Every injury is the result of some undesirable contact between a human being and an energy source."

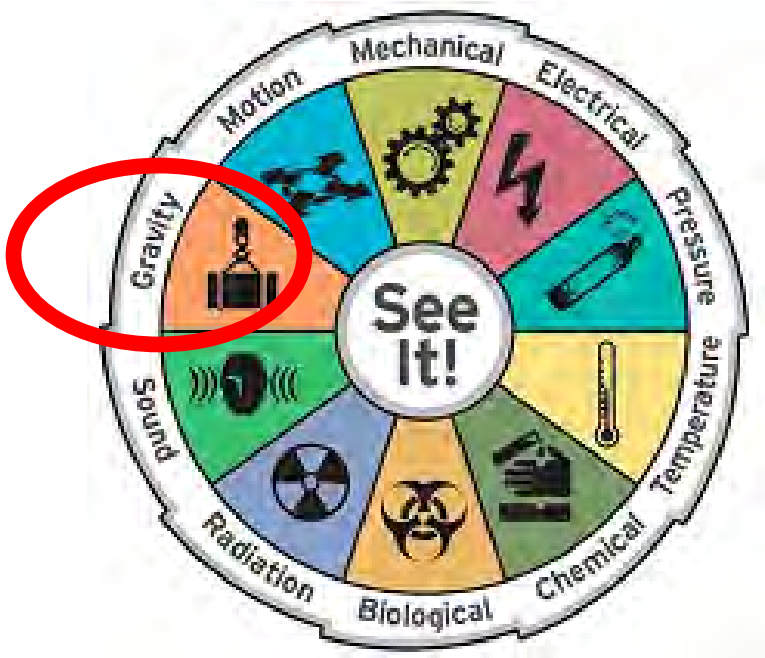
-Dr. Matthew Hallowell


WHAT'S
THE
POINT?

What ENERGY SOURCES Do You See?

GRAVITY

Force caused by the attraction of all masses to the mass of the earth



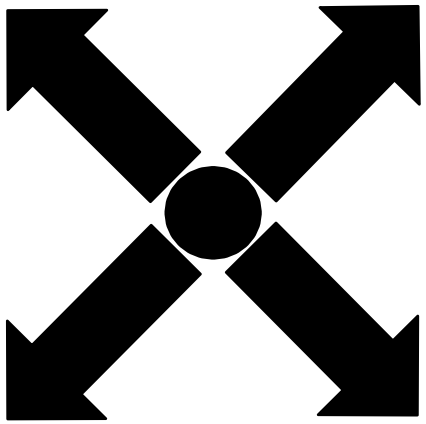
EXAMPLES:

- Falls from Above
- Dropped Objects
- Suspended Loads

Gravity: Force caused by the attraction of all masses to the mass of the earth

MOTION

Change in position of objects or substances



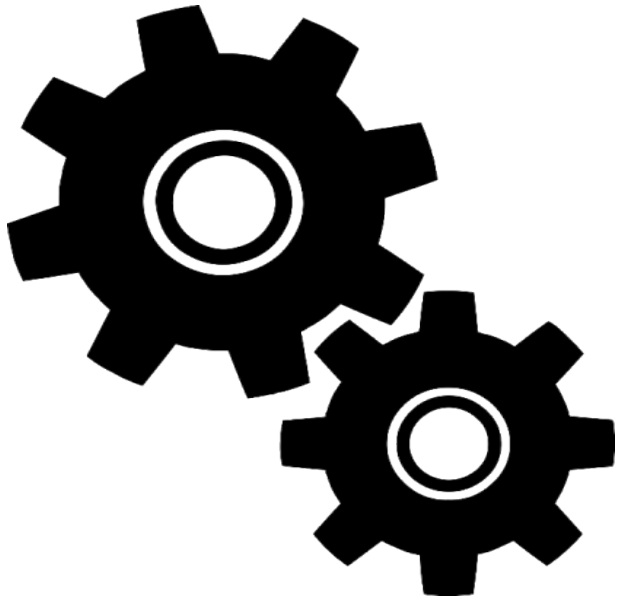
EXAMPLES:

- Moving Equipment
- Moving Parts
- Struck By
- Caught In/Between

Motion: Change in position of objects or substances

MECHANICAL

Rotation, vibration, or motion of equipment, materials, or tools.



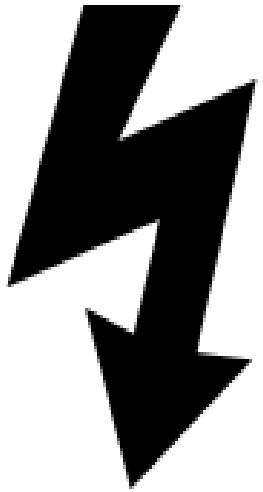
EXAMPLES:

- Gears
- Belts
- Pulleys
- Sprockets

Mechanical: Rotation, vibration, or motion of equipment, materials, or tools.

ELECTRICAL

The presence of an electrical charge or current.



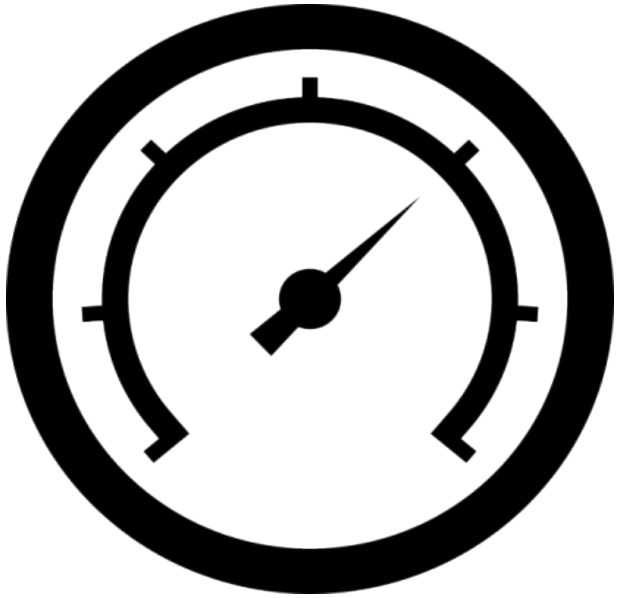
EXAMPLES:

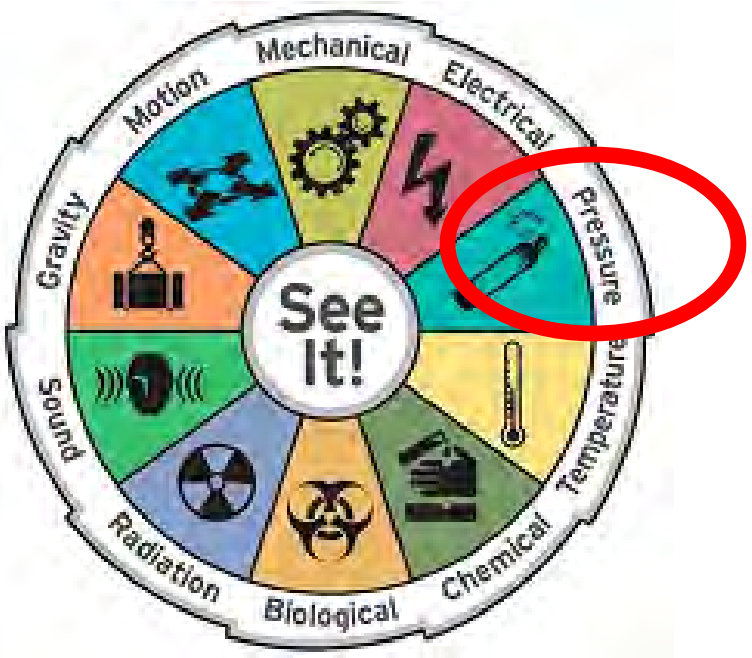
- Hand Tools
- Power Cords & Extension Cords
- Welding Leads
- Overhead Power Lines
- Underground Power Lines

Electrical: The presence of an electrical charge or current.

PRESSURE

Liquid or gas compressed or under a vacuum





EXAMPLES:

- Hydraulic
- Propylene/Oxygen
- Argon

Pressure: Liquid or gas compressed or under a vacuum

TEMPERATURE

Extreme Heat or Extreme Cold

EXAMPLES:

- Extreme Heat
- Extreme Cold
- Heat from Equipment
- Welding
- Torch Cutting

Temperature: Extreme Heat or Extreme Cold

CHEMICAL

Reactive elements in the environment

EXAMPLES:

- Hydraulic Fluid
- Paint
- Paint Thinner
- Concrete
- Epoxy
- Fuels
  - Gasoline
  - Diesel
  - Propane

Chemical: Reactive elements in the environment

BIOLOGICAL

Living organisms that pose health risks

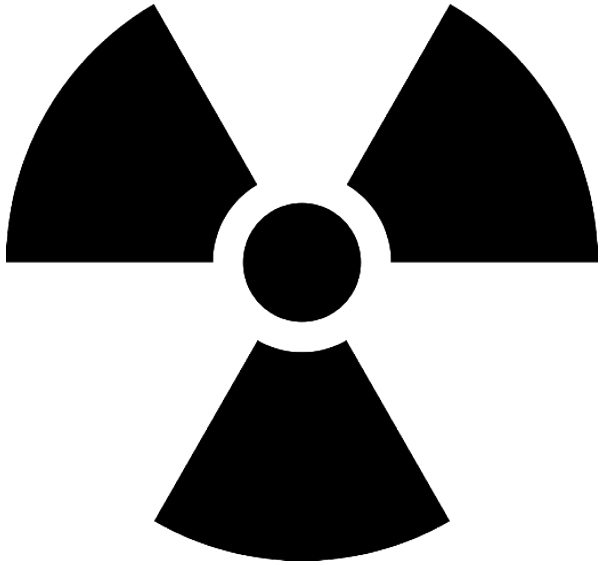
EXAMPLES:

- Mosquitos
- Ticks
- Spiders
- Snakes
- Rodents
- Marine Life
- Poison Ivy

Biological: Living organisms that pose health risks

RADIATION

Elements that emit ions or atomic particles



EXAMPLES:

- Ultra-Violet Rays
  - Sunlight
  - Welding Flash
- Site Specific
  - Soil
  - Dredge Material
  - Excavated Material

Radiation: Elements that emit ions or atomic particles

SOUND

Audible vibrations caused from the contact of two or more objects

EXAMPLES:

- Tractor Trailer
- Equipment
  - Welding Machines
  - Generators
  - Air Compressors
- Power Tools
  - Electric Tools
  - Pneumatic Tools

Sound: Audible vibrations caused from the contact of two or more objects

What ENERGY SOURCES Do You See?

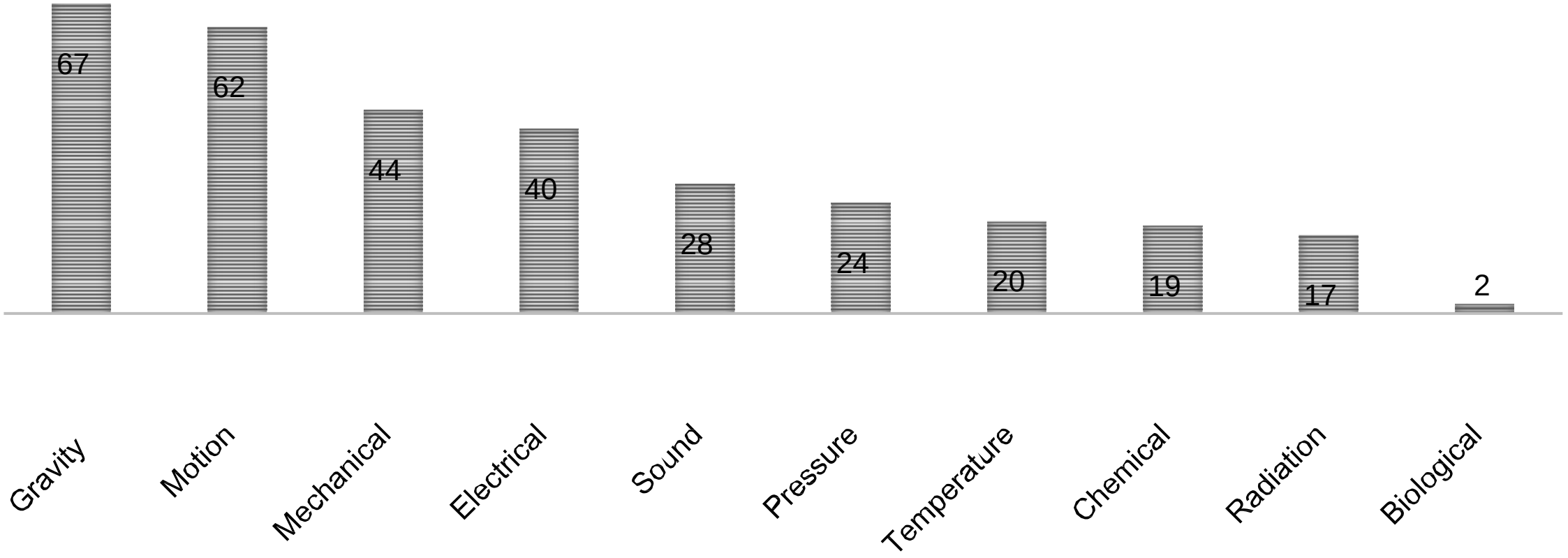
- MECHANICAL
- ELECTRICAL
- PRESSURE
- TEMPERATURE
- CHEMICAL
- BIOLOGICAL
- RADIATION
- SOUND
- GRAVITY
- MOTION

What ENERGY SOURCES Do You See?

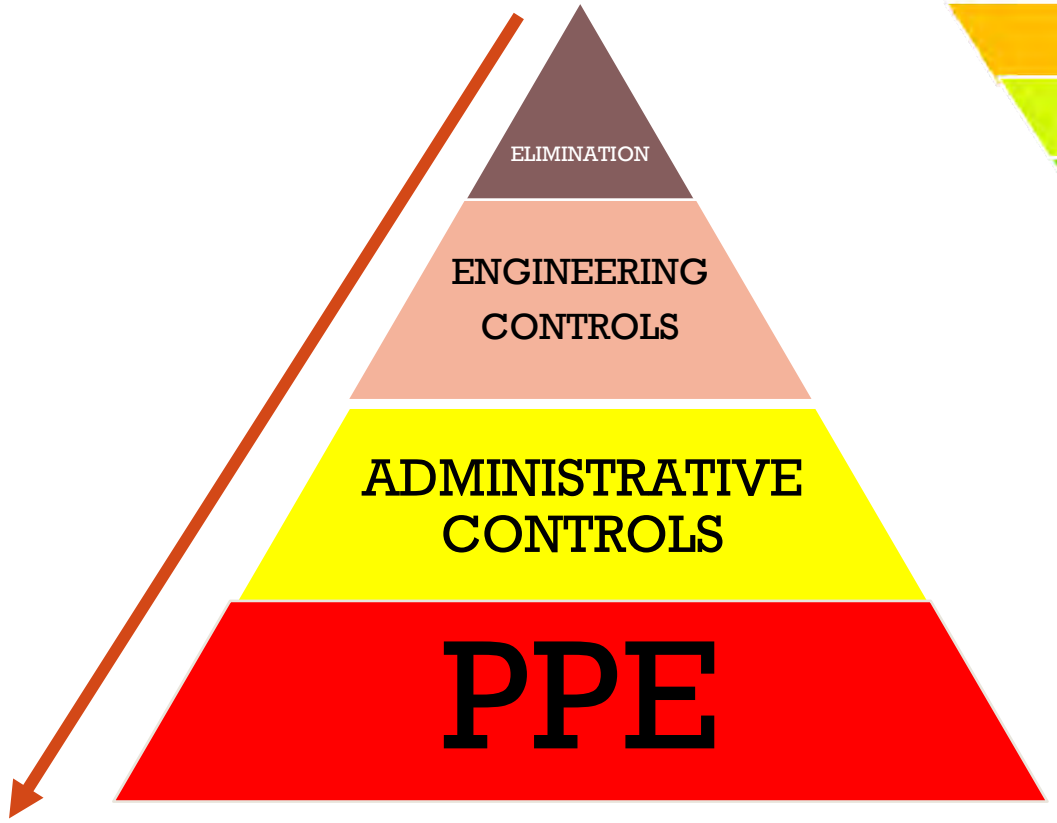
1. Recognize Energy Sources
2. Identify Hazards
3. Implement Controls

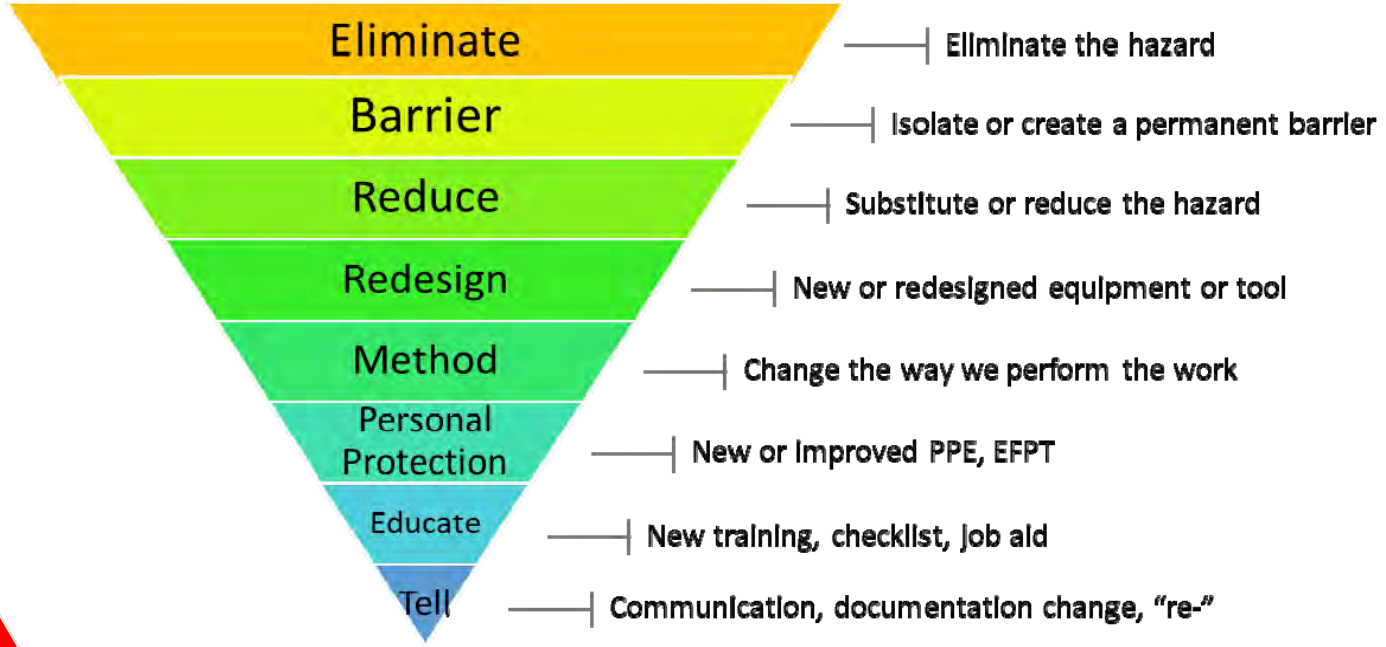

WHAT'S
THE
POINT?

Percent of Hazards Identified by Type

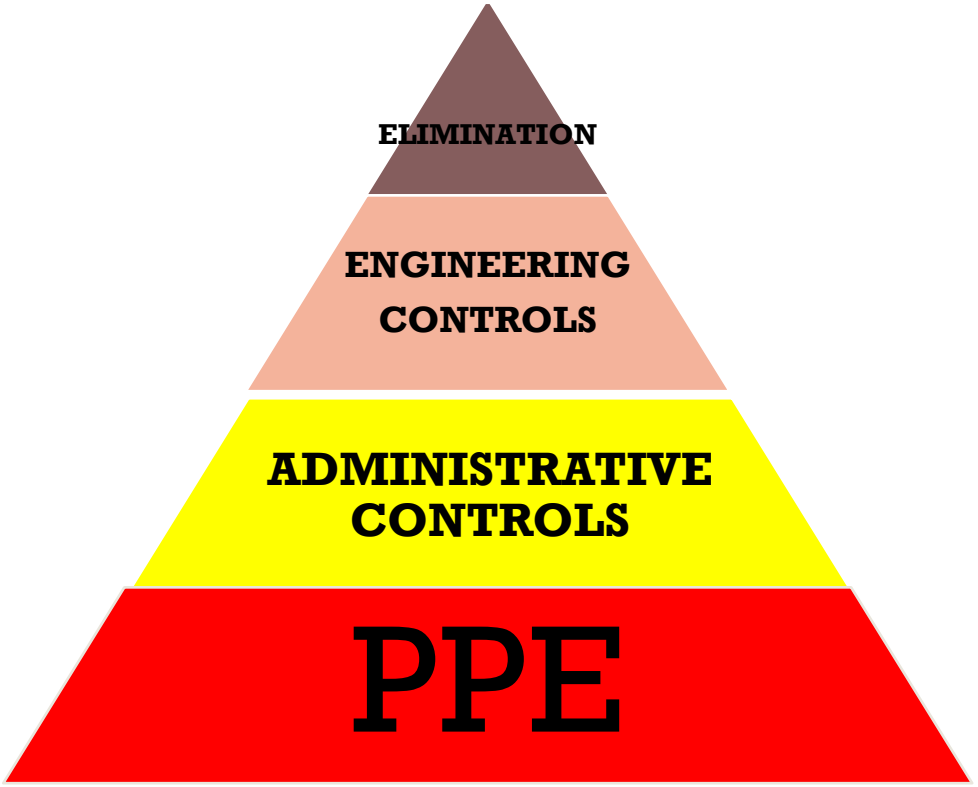


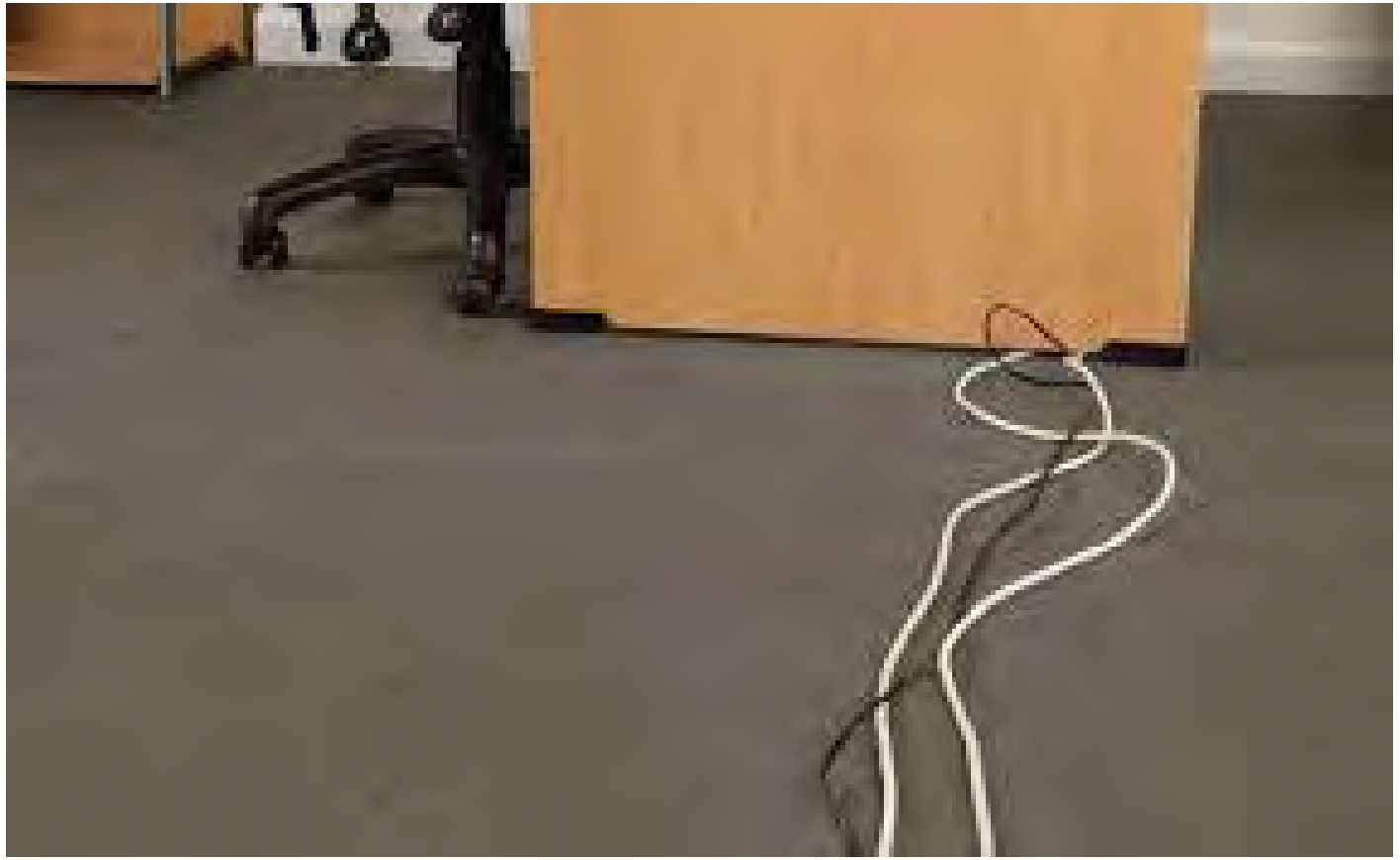
HIERARCHY OF CONTROLS





HOW ARE HAZARDS CONTROLLED?






SUCCESS
STORY!

ENERGY WHEEL & PRE-PLANNING

- Work Plans
- Activity Hazard Analyses
- Job Briefs

ACTIVITY WORK PLANS

McLean
CONTRACTING COMPANY

ACTIVITY WORK PLAN

Work Plan No.: _____

Job Name: BGE Key Crossing Reliability Initiative McLean Job No. 5965
Activity Description: Installation of Fender System
Plan Completed By: Zach Fuller Date: 9/13/21
Reviewed / Approved By: _____ Date: _____
AHA Attached: ____ Yes ____ No (If "No" address safety issues on separate paper)

PHASE CODES & BUDGET:

Phase Code	Description	Qty	UM	Rate	Total
26200-4-1	10"x10" Plastic Lumber – Furnish & Install	15,052.28	LF	3.525 LF/MH	4271 MH
26200-4-2	10"x12" Plastic Lumber – Furnish & Install	436.32	LF	1.797 LF/MH	243 MH
26200-4-3	2.5" UHMW-PE – Furnish & Install	32,267	SF	4.818 SF/MH	6698 MH

Production Goal Description	Rate	Shifts	Crew Size	Milestone Dates (if applicable)
Install 10"x10" Plastic Lumber at Tower 2 Foundation	2.42 LF/MH	5.25	8	
Install 10"x12" Plastic Lumber at Tower 2 Dolphins	1.80 LF/MH	3	8	
Install 10"x10" Plastic Lumber at Tower 3 VCP	3.75 LF/MH	16	8	
Install 10"x10" Plastic Lumber at Tower 4 VCP	3.75 LF/MH	19.75	8	
Install 10"x10" Plastic Lumber at Tower 5 VCP	3.75 LF/MH	7.25	8	
Install 10"x10" Plastic Lumber at Tower 6 Foundation	2.42 LF/MH	5.25	8	
Install UHMW-PE Panels at Tower 2 Foundation	4.86 SF/MH	5.5	8	
Install UHMW-PE Panels at Tower 2 Dolphins	2.44 SF/MH	2	8	
Install UHMW-PE Panels at Tower 3 VCP	5 SF/MH	25.75	8	
Install UHMW-PE Panels at Tower 4 VCP	5 SF/MH	31.5	8	
Install UHMW-PE Panels at Tower 5 VCP	4.38 SF/MH	13.75	8	
Install UHMW-PE Panels at Tower 6 Foundation	4.86 SF/MH	5.5	8	

WORK PLAN/SEQUENCE

Activity Steps:

Prerequisite Activities

Rub and patch the concrete

Activity Hazard Analysis (AHA)

ACTIVITY/WORK TASK:		Overall Risk Assessment Code (RAC) (Use highest code)	
		Activity #	AHA #
PROJECT LOCATION:		**Risk Assessment Code (RAC) Matrix**	
JOB NUMBER:			
CONTRACT NUMBER:			
PRIME CONTRACTOR:			
SUBCONTRACTOR:			
DATE PREPARED:			
PREPARED BY:			
REVIEWED BY:			
SITE SAFETY and HEALTH OFFICER			

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

ACCEPTANCE BY GOVERNMENT DESIGNATED AUTHORITY (GDA)	
E = EXTREMELY HIGH (PWO/OICC/ROICC)	
H = HIGH RISK (FEAD DIRECTOR)	
M = MODERATE RISK (CM or ET or PAR)	
L = LOW RISK (ET or PAR)	

Review each **"Hazard"** with identified safety **"Controls"** and determine (RAC)

Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" .Place the highest RAC at the top of AHA. This is the overall risk assessment code for this activity

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible after controls are in place

"Probability" is the likelihood to cause an incident, near miss, or accident did occur and identified as: Frequent, Likely, Occasional, Seldom, or Unlikely after controls are put in place.

Job Steps	Hazards	Controls	RAC

The AHA shall be reviewed and modified as necessary to address changing site condition, operations or change of competent/qualified person's

JOB BRIEFS

McLean

JOB SAFETY ANALYSIS

Document Number: FRM-01

Job Number:		Job Name:		First Aid Station:	
Date/Time:		JSA Facilitator:		Eyewash/Shower:	
Unit/Equipment #		Emergency (phone/radio)		Assembly Area:	

Was there a Change in Conditions from the previous shift/day? ☐ Yes ☐ No Comments: _____

BOSS cards from previous shift have been reviewed with the crew? ☐ Yes ☐ No Comments: _____

List the task(s) that will be completed today. Examples of a work task include: demolition, material placement, and form work. Individual steps associated with this task should not be listed in this section.

List the hazards associated with the task	How can we protect ourselves from the hazards?	Personnel Responsible
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.
7.	7.	7.
8.	8.	8.
9.	9.	9.
10.	10.	10.

What will the crew do to ensure the Company's safety, quality, and planning processes are followed? *(Discuss and document the specific actions that the team will complete today to ensure the work is done according to the plan.)*

1. _____
2. _____
3. _____
4. _____
5. _____

If there is more than one work location or multiple tasks, crews should fill out a separate JSA.

JOB BRIEFS


EVERYONE
YOU WILL EVER MEET
KNOWS SOMETHING
YOU DON'T.
~ Bill Nye

JOB BRIEFS

JSA HAZARD ID CHEAT SHEET

HAND & POWER TOOL HAZARDS
Pinch Points
Moving Parts
Kickback
Electrical Hazards
Flying Debris

HEAVY EQUIPMENT HAZARDS
Suspended Loads/Overhead Hazards
Moving Equipment
Rigging Failure
Travel Path
Blind Spots/Swing Radius

EQUIPMENT REPAIR HAZARDS
Chemical Hazards
Fuel Spills
Pinch Points
Moving Parts
Stored Energy

HIERARCHY OF CONTROLS PYRAMID


ENERGY WHEEL


9 LIFE SAFETY RULES
- Always Utilize Fall Protection, per policy
- Never Position Yourself Under a Suspended Load
- Always Wear a PFD, per policy
- Never Use Unapproved Rigging
- Always Follow Trenching and Excavation Procedures
- Never enter a confined space without a permit
- Always Follow LOTO Procedures
- Never Disconnect or Override a Safety Device
- Never operate equipment, prior to inspection

PILE DRIVING HAZARDS
Noise Exposure
Pinch Points
Falling Loads
Slips, Trips, and Falls
Temperature Extremes

30-30-30
Every **30** minutes
Take **30** seconds
And look **30** feet around you

WELDING & BURNING HAZARDS
Arc Flash
Burns
Fire
Electrocution
Noise Exposure

McLean *Bringing Peace of Mind to Those We Serve*

ENERGY WHEEL & LEADING INDICATORS

- Job Brief Audits
- Safety Alert Database
- Root Cause Analyses
- Safety Assessments
- Toolbox Talks
- Behavior Based Safety Tools
- $afety Dollar$
- OSHA 10 Training
  - Focus Four
- OSHA 30 Training
  - Safety Leadership Training

ENERGY WHEEL & LEADING INDICATORS

- Job Brief Audits

What will the crew do to ensure the company's safety, quality, and planning processes are followed?

Add note... Attach media Create action

Was someone assigned to do a BOSS card walk around for the day?

Yes No

Add note... Attach media Create action

Does the JSA identify all the required PPE to preform each task?

Yes No

Add note... Attach media Create action

Does then JSA identify all the hazards associated with the job steps?

Yes No

Add note... Attach media Create action

Does the JSA appropriately identify all actions to mitigate each hazard listed?

Yes No

Add note... Attach media Create action

ENERGY WHEEL & LEADING INDICATORS

- Safety Alert Database

Distributed: September, 2021

SAFETY ALERT
FRACTURED ANKLE

INCIDENT

On the afternoon of Saturday, September 18, 2021, a member of the McLean team was assisting with housekeeping tasks, at the end of a shift. The team member was tasked with cleaning up brick rubble, that was lying on the ground. A welder, who was working out of an aerial lift had lowered his welding lead down to the ground. When he lowered the lead, the electrode holder, or 'stinger,' got caught on the top rail of a section of portable chain link fence.

The laborer who was cleaning up, at the end of the shift, saw the lead lying on the ground, with the stinger draped over the top rail. With his back turned, the worker picked up the lead, at the base of the fence, and began pulling it. This resulted in three sections of fence falling to the ground, and striking the worker. As the worker was hit, with the chain portion of the fence, he fell to the ground, and rolled his ankle. The worker was taken to a nearby urgent care facility and diagnosed with a fractured right ankle.

FINDINGS OF THE INVESTIGATION

- The supervisor facilitated a thorough JSA, prior to starting the shift, with the entire crew
- The employee that was attempting to pull the lead did not recognize that the stinger was caught on the top rail and did not ask for help in properly removing the stinger
- The employee who dropped the welding lead did not realize that the stinger was caught on the top rail and continued to park the aerial lift

CORRECTIVE ACTIONS

- A safety stand-down was conducted, with the entire crew to discuss:
  - Practicing good situational awareness
  - Being cognizant of your surroundings
  - Asking for help, when needed
- The entire crew was re-trained on McLean's 30-30-30 program
- Additional weight was added to the fence stands to add rigidity and prevent any occurrence of a tip over.

ENERGY WHEEL & LEADING INDICATORS

- Root Cause Analyses

Incident Type (Please Check all that apply)

☐ Assault/ Violent Act	☐ Environmental Exposure	☐ Slip, Trip and Fall
☐ Diving	☐ Over Exertion	☐ Man Overboard
☑ Electrical Shock/Burns	☐ Fire	☑ Material Handling Equipment
☐ Equipment Installation/Repair	☐ Hazardous Material	☐ Vehicle
☐ Equipment Failure	☐ Industrial (see Below)	☐ Other (Please List below)

Industrial Incident Additional Information (Please Check all that apply)

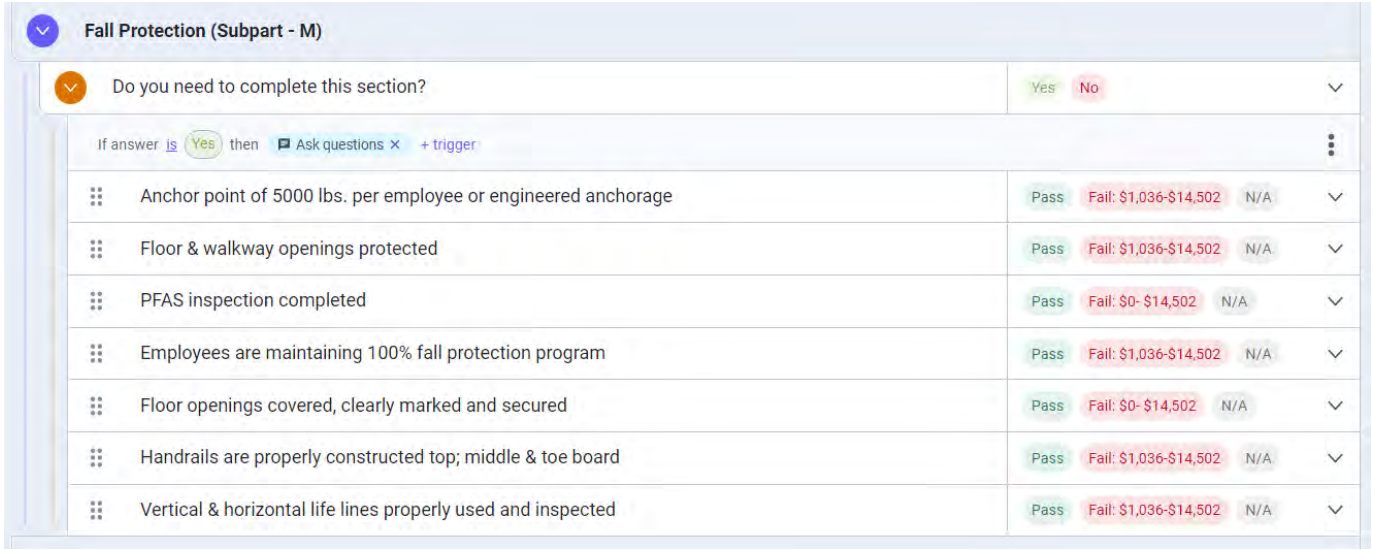
☐ Confined Space	☐ Hand and Power Tools	☐ Work Platforms
☐ Demolition	☐ Rigging	☐ Underground Construction
☐ Trenching and Excavation	☐ Cranes and Hoisting equipment	☐ Concrete and Masonry Construction
☐ Form Work	☐ Traffic Control	☐ Marine activities
☐ Site preparation	☑ Welding and Cutting	☐ Pressurized Equipment and systems
☐ Control of Hazardous energy	☐ Fall protection	☐ Other (please list below)

Polices and Procedure:

☐ Not developed or Inadequate	☐ Developed and Communicated	☐ Developed and Not communicated
■ Developed and Not followed or enforced	☐ Developed not understood	☐ Lack of Disciplinary policy
☐ Disciplinary policy not enforced		

ENERGY WHEEL & LEADING INDICATORS

- Safety Assessments
  - Citation Values



ENERGY WHEEL & LEADING INDICATORS

- Toolbox Talks

McLean

TOOLBOX TOPIC-

BACK TO SCHOOL SAFETY

Good morning. Although many jurisdictions have already begun the 2022-2023 school year, for many students, today is the first day of school. Please keep the following tips in mind to keep the kids in your family and community safe for the next 180 school days.

School Zone Driving Safety Tips

- Be on the lookout for school zone signals and ALWAYS obey the speed limits.
- When entering a school zone, be sure to slow down and obey all traffic laws.
- Always stop for school busses that are loading or unloading children.
- Watch out for school crossing guards and obey their signals.
- Be aware of and watch out for children near schools, bus stops, sidewalks, in the streets, in school parking lots, etc.
- Never pass other vehicles, change lanes, make u-turns, or text while driving in a school zone.
- Avoid using a cell phone, unless it is completely hands-free, while driving in a school zone.
- Unless licensed to do so, never use handicap or emergency vehicle lanes or spaces to drop off or pick up children at school.

REMIND YOUR CHILDREN

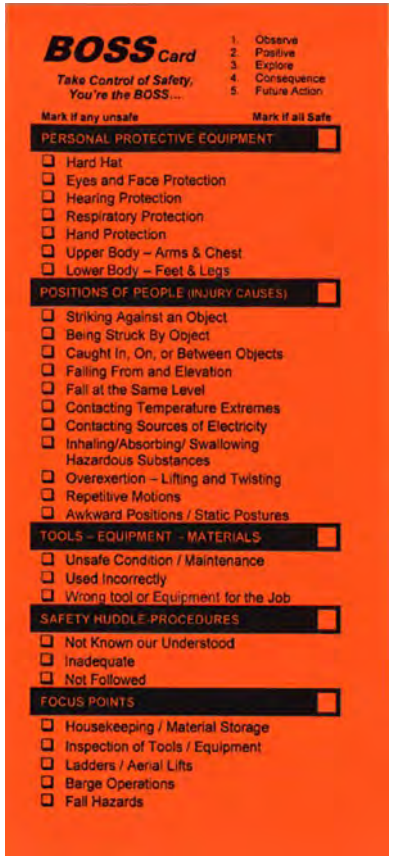
Walking to School

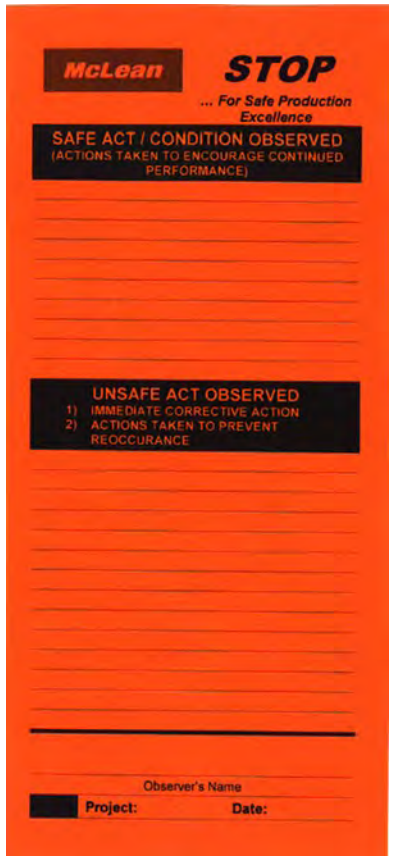
- Leave early enough to arrive at school at least 10 minutes prior to the start of school.
- Use the same route every day and never use shortcuts.
- Go straight home after school and do not go anywhere else without permission.
- Always use public sidewalks and streets when walking to school.
- Demonstrate traffic safety awareness and pick the safest route between your home and the school and practice walking it with your children.
- Try and walk to school with other students. There is strength in numbers.
- Teach your children to recognize and obey traffic signals, signs, and pavement markings.
- Only cross streets at designated crosswalks, street corners and traffic controlled intersections.
- Always look both ways before crossing the street and never enter streets from between obstacles like parked cars, shrubbery, signs, etc.
- Always walk and never run across intersections.
- Avoid talking to strangers. Teach your children to get distance between themselves and anyone who tries to approach or make contact with them.
- If a stranger does approach your child, make sure they know to immediately report the incident to you or a teacher.

Bringing Peace of Mind to Those We Serve

ENERGY WHEEL & LEADING INDICATORS

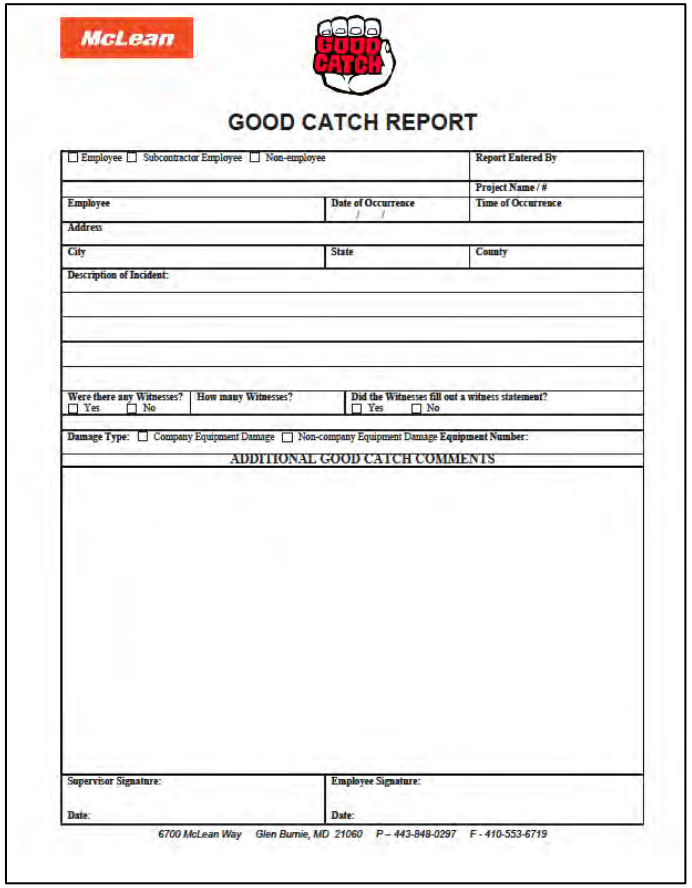
- Behavior Based Safety
  - BOSS Cards





ENERGY WHEEL & LEADING INDICATORS

- Behavior Based Safety
  - Good Catch Reports



McLean

GOOD CATCH

GOOD CATCH REPORT

☐ Employee ☐ Subcontractor Employee ☐ Non-employee | Report Entered By

Project Name / #

Employee | Date of Occurrence | Time of Occurrence

Address

City | State | County

Description of Incident:

Were there any Witnesses? ☐ Yes ☐ No | How many Witnesses? | Did the Witnesses fill out a witness statement? ☐ Yes ☐ No

Damage Type: ☐ Company Equipment Damage ☐ Non-company Equipment Damage Equipment Number:

ADDITIONAL GOOD CATCH COMMENTS

Supervisor Signature: Date: | Employee Signature: Date:

6700 McLean Way Glen Burnie, MD 21060 P – 443-849-0297 F - 410-553-6719

ENERGY WHEEL & LEADING INDICATORS

- $afety Dollar$

ENERGY WHEEL & LEADING INDICATORS

- OSHA 10 Training
  - Focus Four
- OSHA 30 Training
  - Safety Leadership Training

OSHA 10- Day 1 & Safety On-Boarding

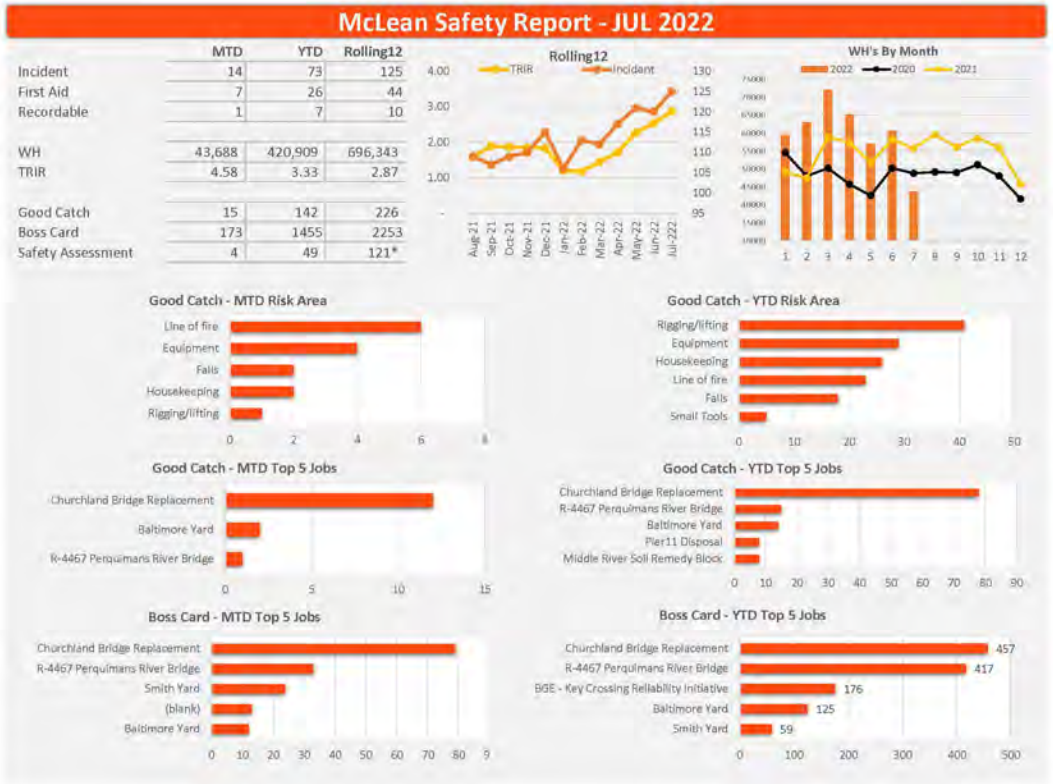
TRAINING TITLE	OSHA CLASS DESIGNATION	LENGTH	TIME
Site Safety	Optional	.5 Hours	9:00-9:30
McLean Safety Rules PPT	PPE	.5 Hours	9:30-10:00
BREAK			10:00-10:10
Fall Protection Part 1	Focus Four	1 Hour	10:10-11:10
Hazard Communication	Health Hazard	.5 Hours	11:10-11:40
Struck By	Focus Four	.5 Hours	11:40-12:10
LUNCH			12:10-12:40
Caught Between	Focus Four	.75 Hour	12:40-1:25
Confined Space Awareness	Optional	1 Hour	1:25-2:25
BREAK			2:25-2:35
Hand Tool Safety	Elective	.5 Hours	2:35-3:05
Barge Access/Ladder Safety	Health Hazard	.5 Hours	3:05-3:35
TOTAL			**5.75 Hours**

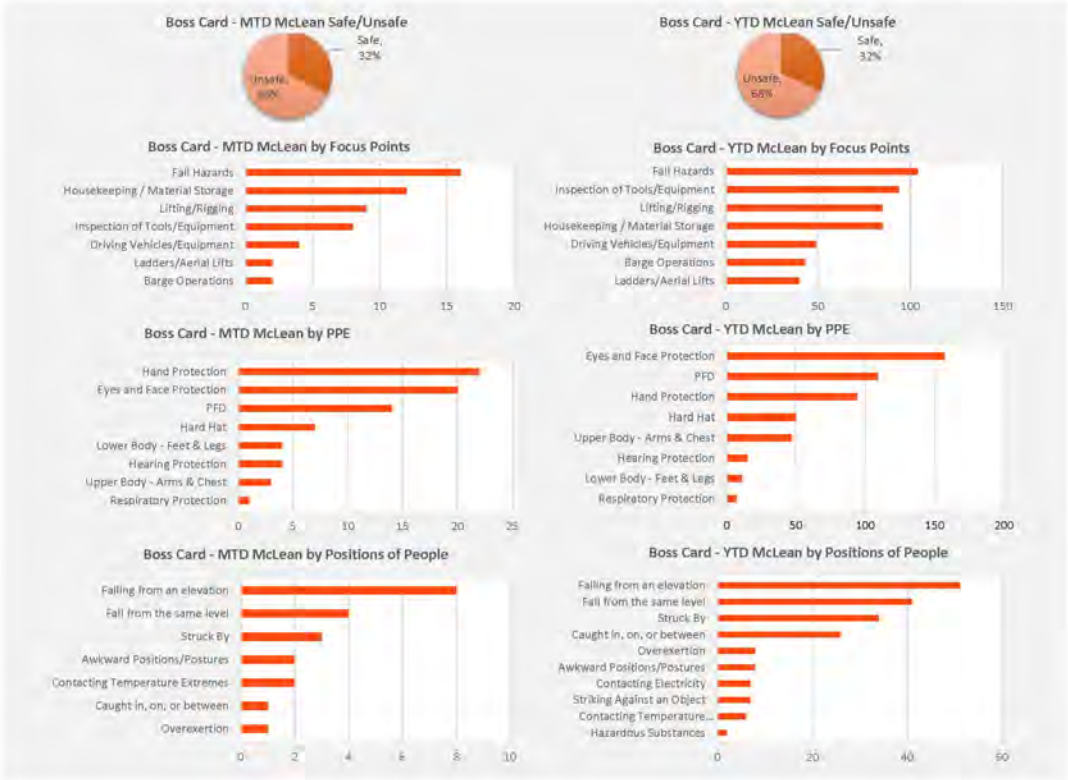
LAGGING INDICATORS?

ENERGY WHEEL & LAGGING INDICATORS

- Number of Incidents
- Number of Regulatory Fines/Citations
- Workers Compensation Claims
- Total Recordable Incident Rate (TRIR)
- Experience Modification Rate (EMR)

TRACKING LEADING & LAGGING INDICATORS





- There are 10 Sources of Energy
- Energy Creates Hazards
- Every Hazard Comes From an Energy Source
- Recognize Energy Sources, Identify Corresponding Hazards, Implement Controls
- Hazard Recognition Should Occur at all Levels of Pre-Planning
- Leading Indicators Should be Utilized
- Lagging Indicators Cannot be Ignored

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Any Questions?
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