OBJECTS AT HEIGHTS

// AWARENESS AND SOLUTIONS

AGENDA

- Introduction
- Course Objectives
- Safety at Heights Overview
- Risk Awareness
- Costs
- Controls and Best Practice
- Summary

O@H TRAINING

LEVELS OF COMPETENCY

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O@H TRAINING

**Refresher requirements – 2 years for each level*

	LEARNING MODULES				
O@H TRAINING COURSE* (COMPETENCIES)	**BASIC AWARENESS (1 HR)**	**EQUIPMENT SELECTION AND USE (2 HRS)**	**EQUIPMENT INSPECTION (1 HR)**	**EQUIPMENT INSTALLER (4 HRS)**	**PROGRAM POLICY AND SITE INSPECTION (4 HRS)**
BASIC AWARENESS (1 HR)	X				
AUTHORIZED USER AND INSPECTOR (4 HRS)	X	X	X		
EQUIPMENT INSTALLER (6 HRS)	X		X	X	
COMPETENT PERSON (1 DAY // 8 HRS)	X	X	X	X	
PROGRAM MANAGER AND TRAINER (1.5 DAYS // 12 HRS)	X	X	X	X	X

COURSE OBJECTIVES

- O@H Basic Awareness participants should
  1. Have a general knowledge of Objects at Heights risks including dropped objects, housekeeping and equipment transport.
  2. Have a basic sense for how to position Objects at Heights in a safety at heights program.
  3. Gain awareness of industry conditions including injury statistics, regulations and affected applications.
  4. Be introduced to the Hierarchy of Controls (HOC), best practices within it and solutions to mitigate risks.

SAFETY AT HEIGHTS OVERVIEW

SAFETY AT HEIGHTS HIERARCHY

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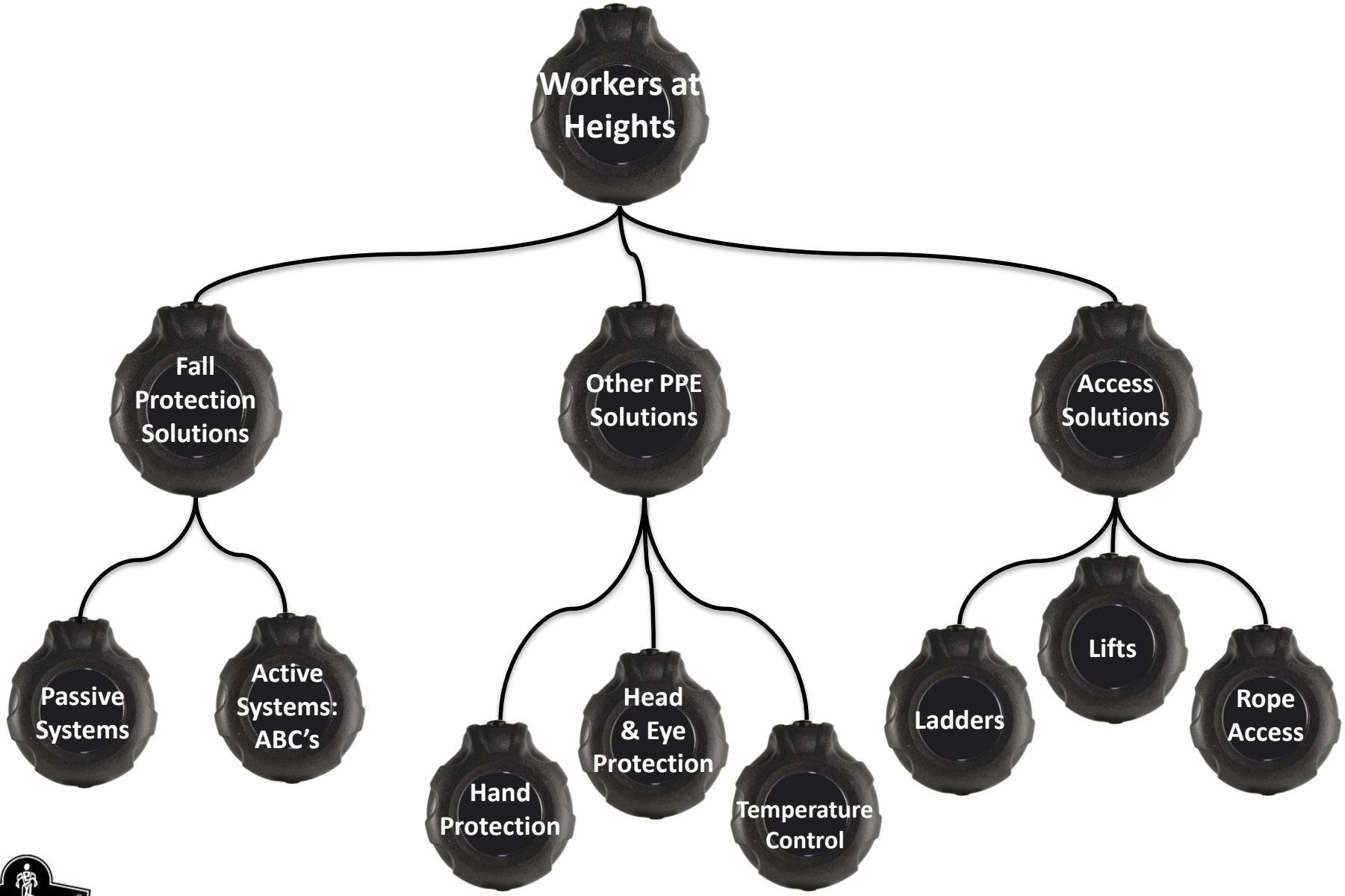

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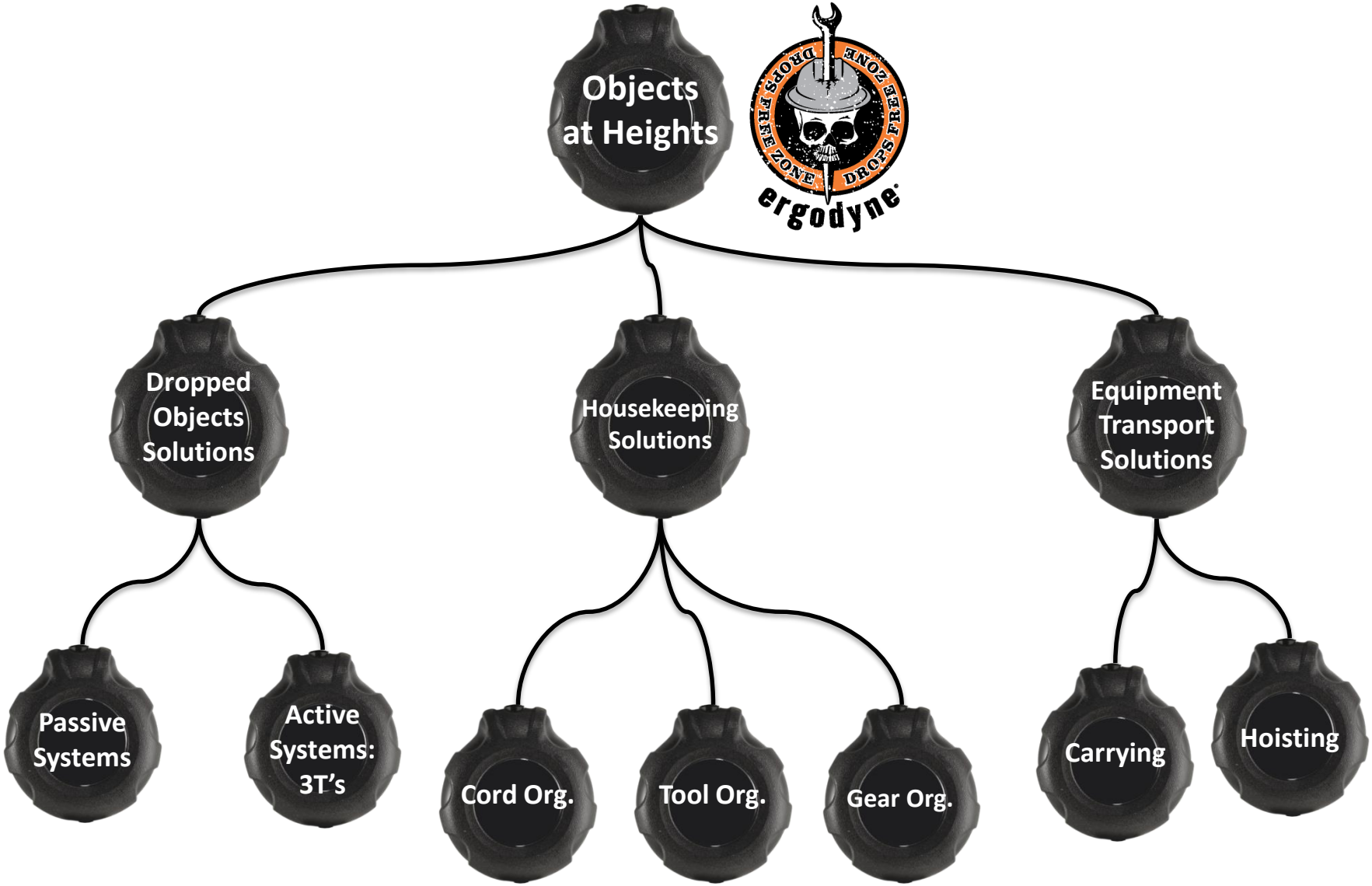

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AWARENESS IS KEY

RISK AWARENESS

DROPPED OBJECTS

- Defining Dropped Objects
  - Any object/item that falls from its previous position
  - Typically considers workers {themselves} as separate category (fall protection)
  - Can be large or small:
    - Tools
    - PPE
    - Equipment
    - Structure
    - Other loose items

RISK AWARENESS

DROPPED OBJECTS

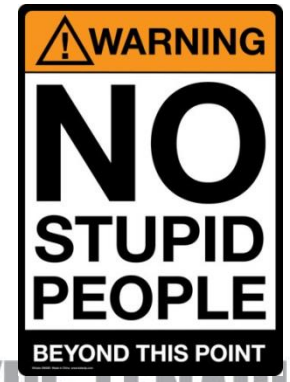
- **Static Dropped Objects**
  - Any object that falls from a stationary position under its own weight

- **Dynamic Dropped Objects**
  - Any object that falls as a result of a secondary force such as being struck by another object or involved in a collision

RISK AWARENESS

DROPPED OBJECTS

- Dropped Object Causes
  - Elements:
    - Environmental (wind, rain, snow, sea motion)
    - Corrosion or other deterioration
    - Vibration
    - Body effects (sweaty or numb hands, fatigue)
  - Worker or Equipment Generated:
    - Tripping or colliding
    - Poor housekeeping
    - Not following procedures
    - Miscalculations and poor design
    - Missed or inadequate inspections
    - Homemade tools and equipment



RISK AWARENESS

HOUSEKEEPING

- Poor housekeeping
  - Unorganized // unclean workplace
  - Unnecessary movement and time at height
  - Cords laying across walkways, platforms, etc.
  - Foreign material concerns

RISK AWARENESS

EQUIPMENT TRANSPORTATION

- Improper equipment transport
  - Not maintaining 3 points of contact
  - Overloading a climber
    - Physical toll on body
    - Exceeding fall protection capacity
  - Overflowing containers
  - Using improper rated containers

COSTS OF NOT TAKING ACTION:

1. Injury or Fatality
2. Damage
3. Lost Productivity

COSTS

INJURY OR FATALITY

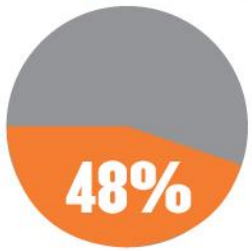
- Dropped Objects
  - Struck by falling object (worker or bystander)
  - Falls from height
    - Gut reaction trying to catch falling object
    - Tool pulling worker down with it if tethered improperly
- Poor housekeeping and transport
  - Slips, trips and falls (same level or from height)
  - Sprains and strains
  - Struck by falling objects

COSTS

INJURY OR FATALITY

IN THE U.S IN 2014 THERE WERE
498 FATALITIES
FROM BEING STRUCK BY AN OBJECT OR EQUIPMENT
[509 IN 2013]

240 WERE CAUSED BY A FALLING OBJECT [245 IN 2013]



REPRESENTS 48% OF ALL STRUCK BY FATALITIES

REPRESENTS 5% OF ALL WORKPLACE FATALITIES

*BUREAU OF LABOR STATISTICS

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COSTS

INJURY OR FATALITY

2014 NONFATAL OCCUPATIONAL INJURIES IN THE U.S. PRIVATE SECTOR

42,400 STRUCK BY FALLING OBJECT OR EQUIPMENT

REPRESENTS 4.6% OF ALL WORKPLACE INJURIES

A TOP TEN NONFATAL INJURY

*BUREAU OF LABOR STATISTICS

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COSTS

INJURY OR FATALITY

AVERAGE COST FOR A MEDICALLY CONSULTED INJURY:

$42,000

AVERAGE COST FOR A FATAL ACCIDENT:

$1.45M PER FATALITY

240 FATALITIES [IN 2014] X $1.45M =

$348 MILLION

NOT ALL INDIRECT COSTS INCLUDED. * NATIONAL SAFETY COUNCIL INJURY FACTS 2015 EDITION

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COSTS

INJURY OR FATALITY

ASSOCIATION OF WORKERS' COMPENSATION BOARD OF CANADA

8,916 INJURIES FROM BEING STRUCK BY A FALLING OBJECT IN 2014 [8,609 IN 2013]

24 FATALITIES OCCURED IN 2014

REPRESENTS 2.6% OF ALL FATALITIES

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COSTS

INJURY OR FATALITY

UNITED KINGDOM
HEALTH AND SAFETY EXECUTIVE

7,583 REPORTED STRUCK BY INCIDENTS IN 2014 AND 2015

12 FATALITIES // 1,782 NONFATAL

SPECIFIED INJURIES // 5,789 OVER

SEVEN DAY INJURIES

REPRESENTS 10% OF ALL REPORTED ACCIDENTS

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COSTS

INJURY OR FATALITY

SAFE WORK AUSTRALIA IN 2014 THERE WERE

17 FATALITIES FROM BEING STRUCK BY A FALLING OBJECT

REPRESENTS 9% OF WORKPLACE FATALITY IN 2014

TWENTY FATALITIES FROM FALLS AT HEIGHTS IN 2014

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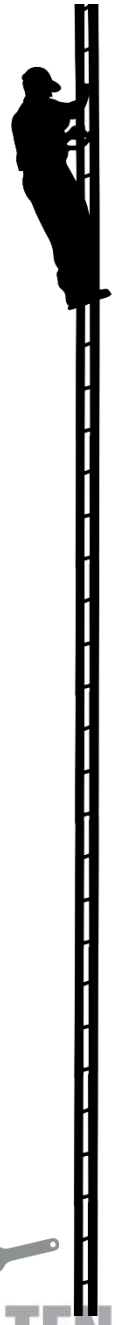
COSTS

DAMAGE

- **Dropped objects can cause damage to…**
  - The Dropped Item Itself
  - An Object Below
  - The Structure Being Worked On
  - Equipment From Foreign Objects
  - The Environment

COSTS

LOST PRODUCTIVITY



- **Lost productivity can result from…**
  - Work stoppage to investigate a near miss
  - Descending back down to retrieve a job essential tool and climbing back up to complete task

WHO IS AT RISK

AERIAL APPLICATIONS

- Utilities
- Telecommunications
- Construction
- Wind Energy
- Oil & Gas
- Mining
- Electricians/Service Techs
- Transportation

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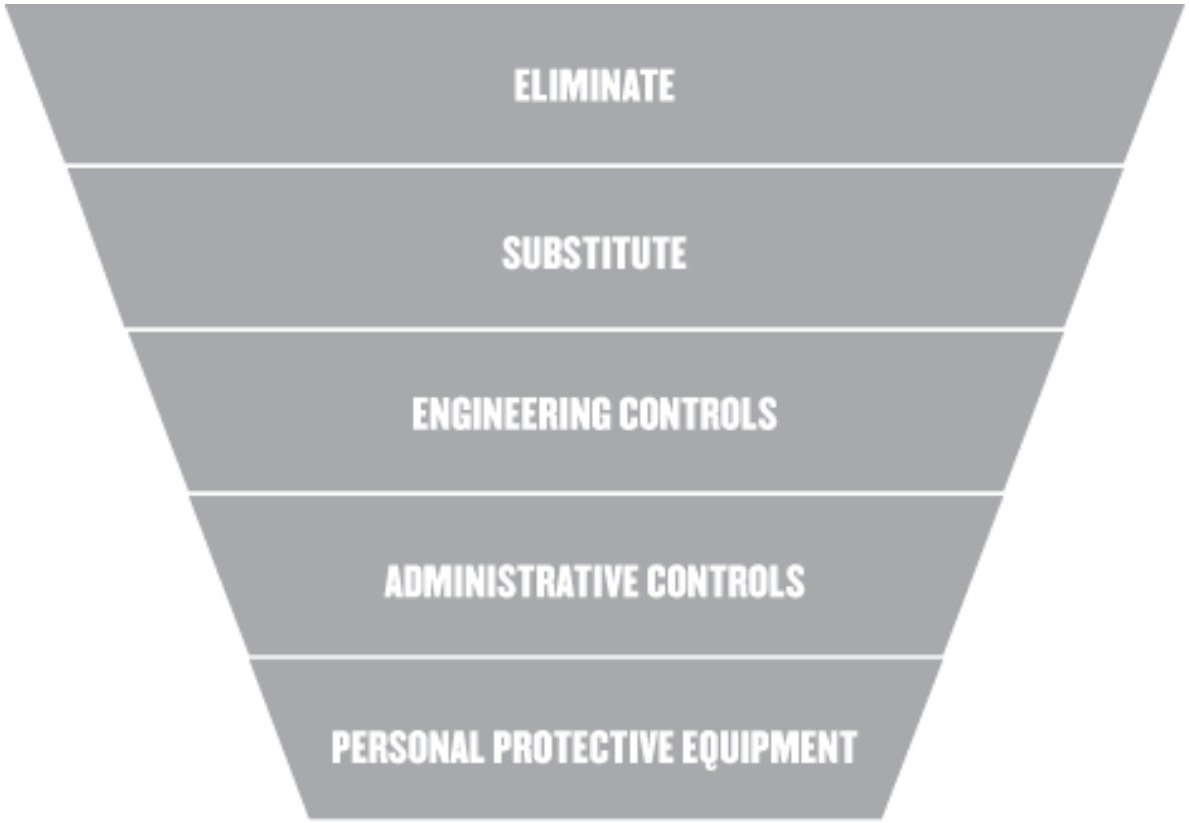
WHO IS AT RISK

NON-AERIAL APPLICATIONS

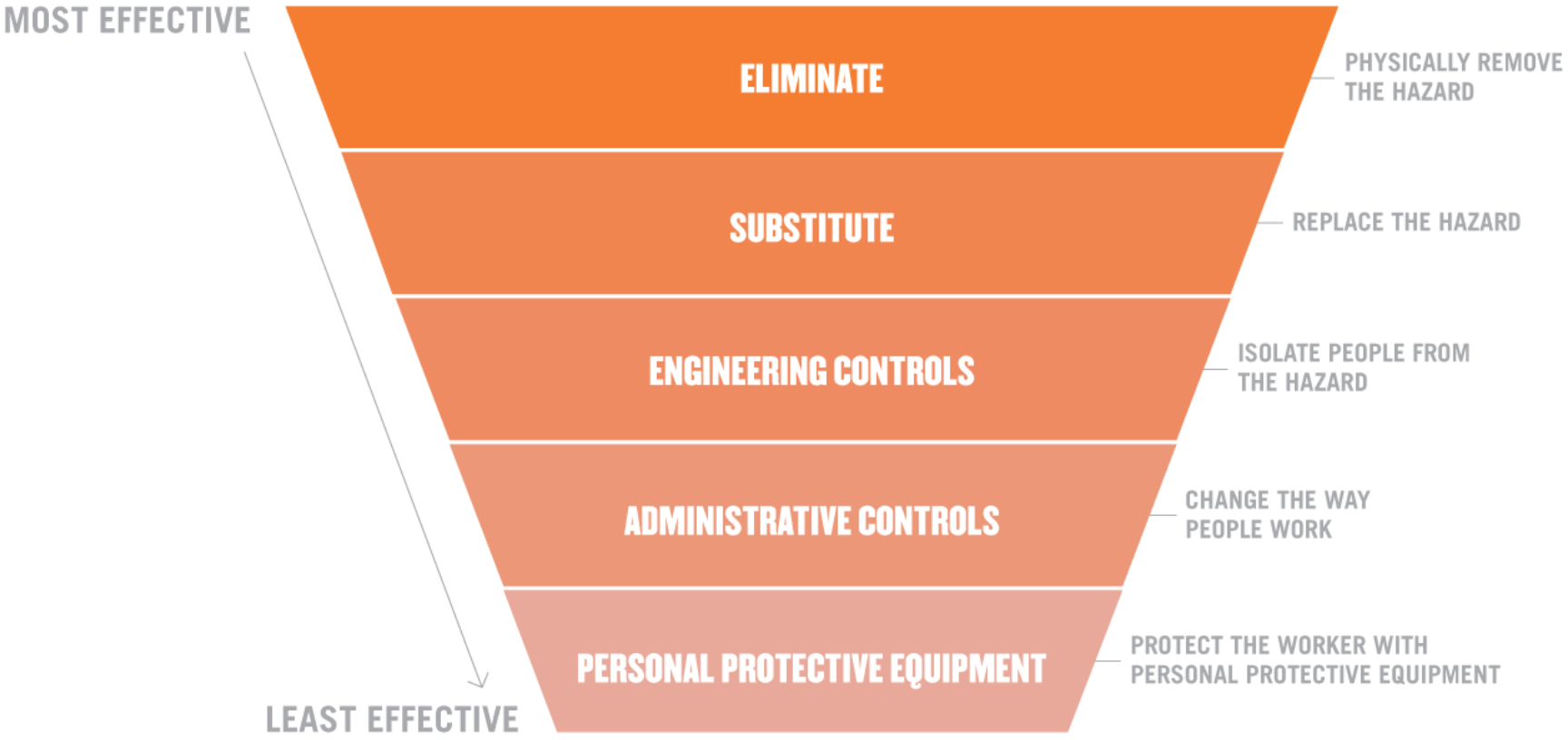
- Nuclear
- Manufacturing
- Food Processing
- Transportation (Aviation)
- Underwater MRO
- Oil & Gas
- Mining
- Construction

CONTROLS & BEST PRACTICE

O@H HIERARCHY OF CONTROLS (HOC)



HOC OVERVIEW



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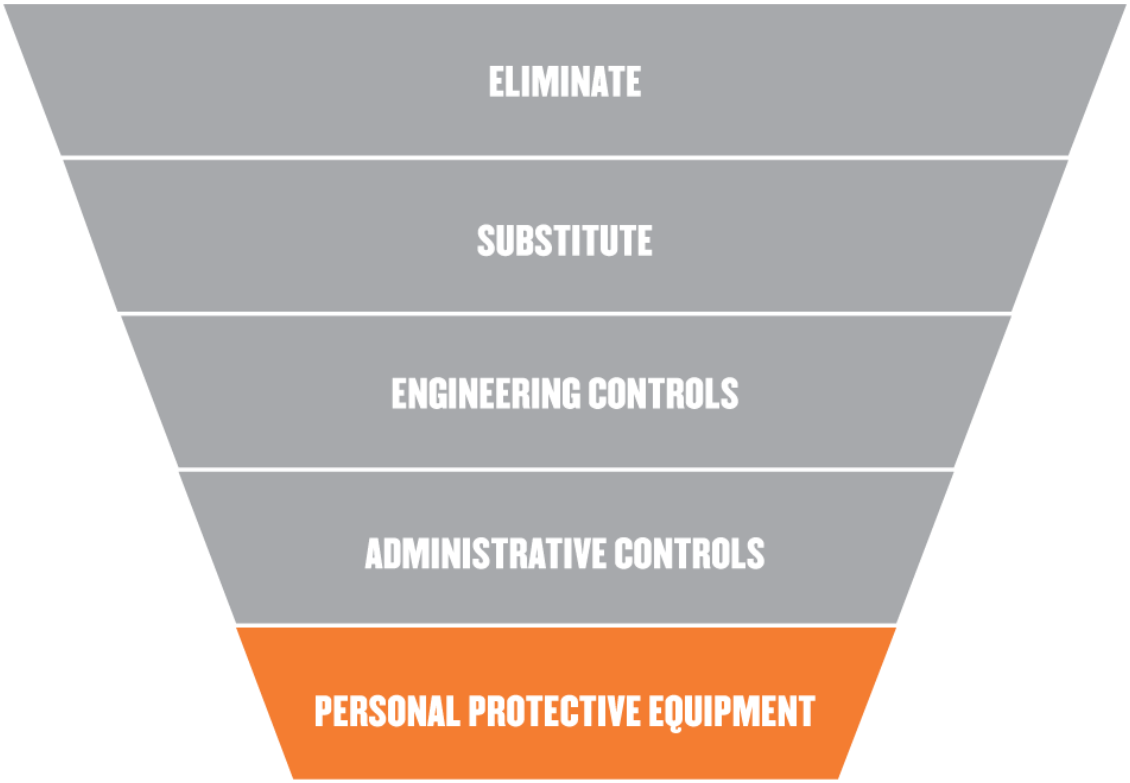
O@H HIERARCHY OF CONTROLS

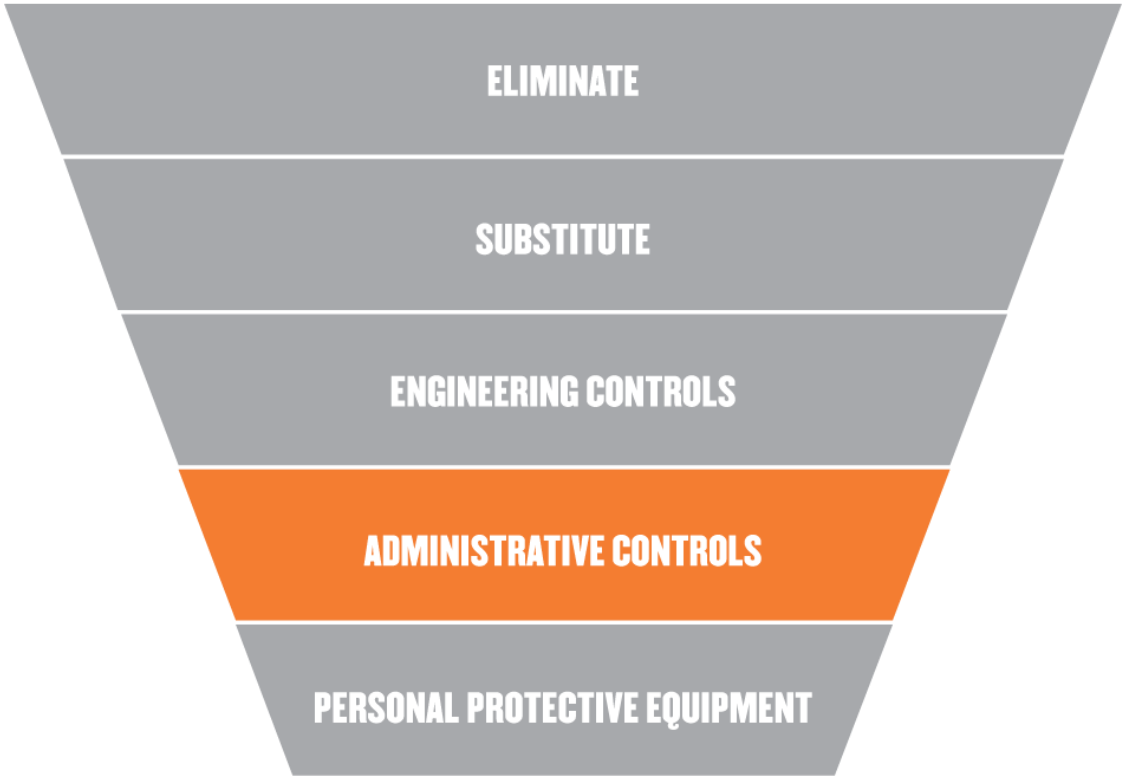


HIERARCHY OF CONTROLS

PERSONAL PROTECTIVE EQUIPMENT {PPE}

- O@H Definition
  - Secondary Protection Solutions
  - Protects/covers the worker or deflects an object after it has fallen
- Examples:
  - Hard Hats, Steel Toe Boots, Eyewear, Hand Protection

O@H HIERARCHY OF CONTROLS



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HIERARCHY OF CONTROLS

ADMINISTRATIVE CONTROLS

- O@H Definition
  - Changing the behavior of individuals
- Awareness & Communication
  - Signs, Stickers, Barricade Tape
  - Tool Box Talks
  - Training, Training, Training!
- Policies & Procedures
  - Checklists (Pre, During, Post Job)
  - “Red Areas” or “Drop Zones”
  - Hoisting vs Carrying Procedures

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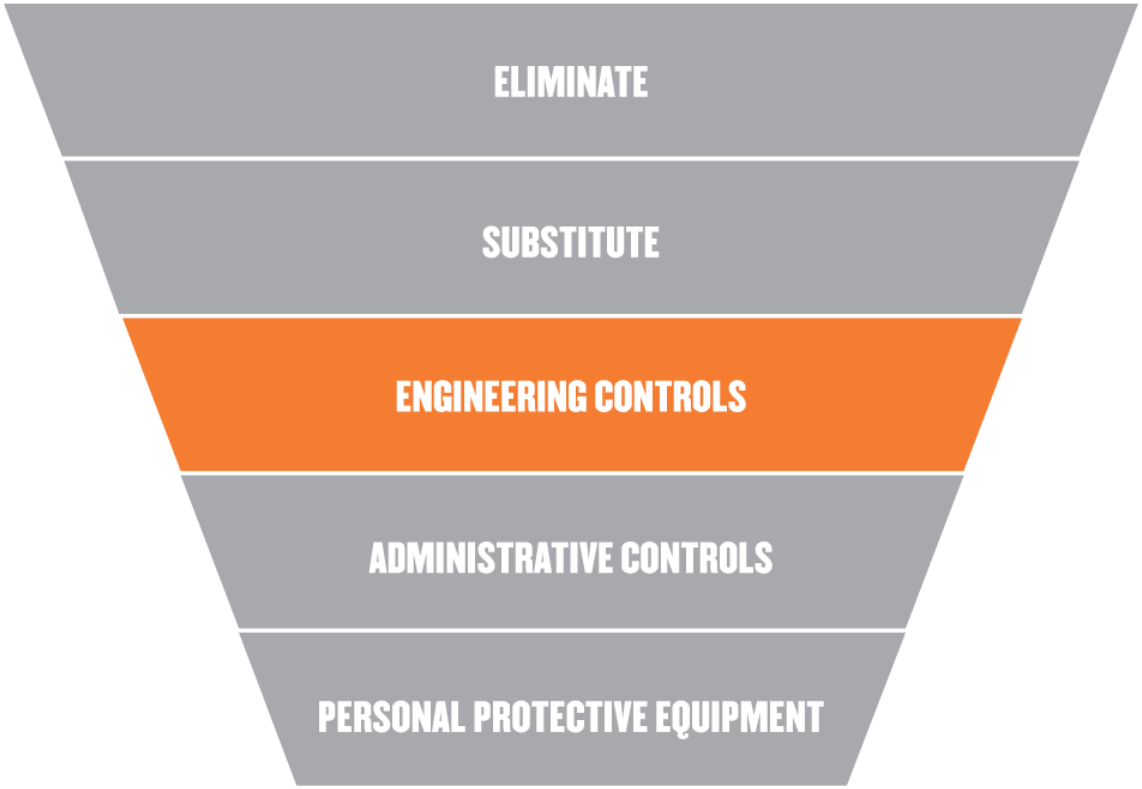
O@H HIERARCHY OF CONTROLS



HIERARCHY OF CONTROLS

ENGINEERING CONTROLS

- O@H Definition
  - Aims to prevent the object from falling (keeps them from happening)
- Two types
  - Passive Engineering Controls
    - Does not require active participation from the worker
  - Active Engineering Controls
    - Requires active participation from the worker

HIERARCHY OF CONTROLS

ENGINEERING CONTROLS

- Passive Engineering Controls
  - Toe Boards, Netting, Guarding, Barricading, Secondary Retention

HIERARCHY OF CONTROLS

ENGINEERING CONTROLS

- Active Engineering Controls
  - Connectors, Lanyards, Topped Containers

WHAT DO THE REGULATORS SAY?

REGULATIONS

- US: OSHA
  - Scaffolds: 1926.451(h) – “falling object protection”
  - Fall Protection: 1926.501(c) – "Protection from falling objects"
  - Steel Erection:1926.759(a) – “Securing loose items aloft”
  - General Duty Clause

- CAN: Canada OH&S Regulations
  - National regulation mentions risk in 3 specific applications
  - *“Protect Your Head!”* article: “Hard hats are the only piece of equipment that can protect you against these risks.” – NOT TRUE!

*USA Department of Labor – OSHA 1926: www.osha.gov
*Govt of Canada: www.labour.gc.ca

DROPS

- **DROPS: Dropped Objects Prevention Scheme**
  - Focused on preventing dropped objects in the Oil & Gas industry
  - Work to spread awareness, create best practices, and promote safety
  - Over 130 members worldwide
  - Ergodyne is a proud member
  - www.dropsonline.org


aaa access all areas
ADDAX PETROLEUM
A-ESCO
AkerSolutions
ALL AREAS ACCESS
ALMANSOORI
ALP ACCESS
AMOSCO
Apache
apave
AquaTerra
Arabian Drilling Co.
Archer The well company
AREAVERTICAL
ASCO
ATLANTICA
AtwoodOceanics
AXESS
AXIOM
BAKER HUGHES
BG GROUP
BILFINGER
BLACK LAKE
safetysolutions
bp
Britannia
CAN
cape
Caspian Drilling Company Ltd
centrica energy
Chevron
CLIMB
climbtec
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CNR International
TECH
CUDD
CONTROLUNION
DIAMOND
DETNORSKE
DJ Global Inspection Services Ltd.
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GE
Global Lifting Services
globalREMOTE
GRIDIRON GROUP
GSP
GULF DRILLING INTERNATIONAL
HALLIBURTON
HARSCO
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K2
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SETCORE
Firstrank
SILVERDOT
SPS
siwa
SKYSITE
Safety Management Systems
S.M.P
Snap-on
Songa Offshore
Southey CONTRACTING
sparrows
Statoil
STEP CHANGE IN SAFETY
STORK TECHNICAL SERVICES
SUNCOR ENERGY
swift Drilling
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trac
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TUBESTAR
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UNICABLE
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Engineering For A Safer World
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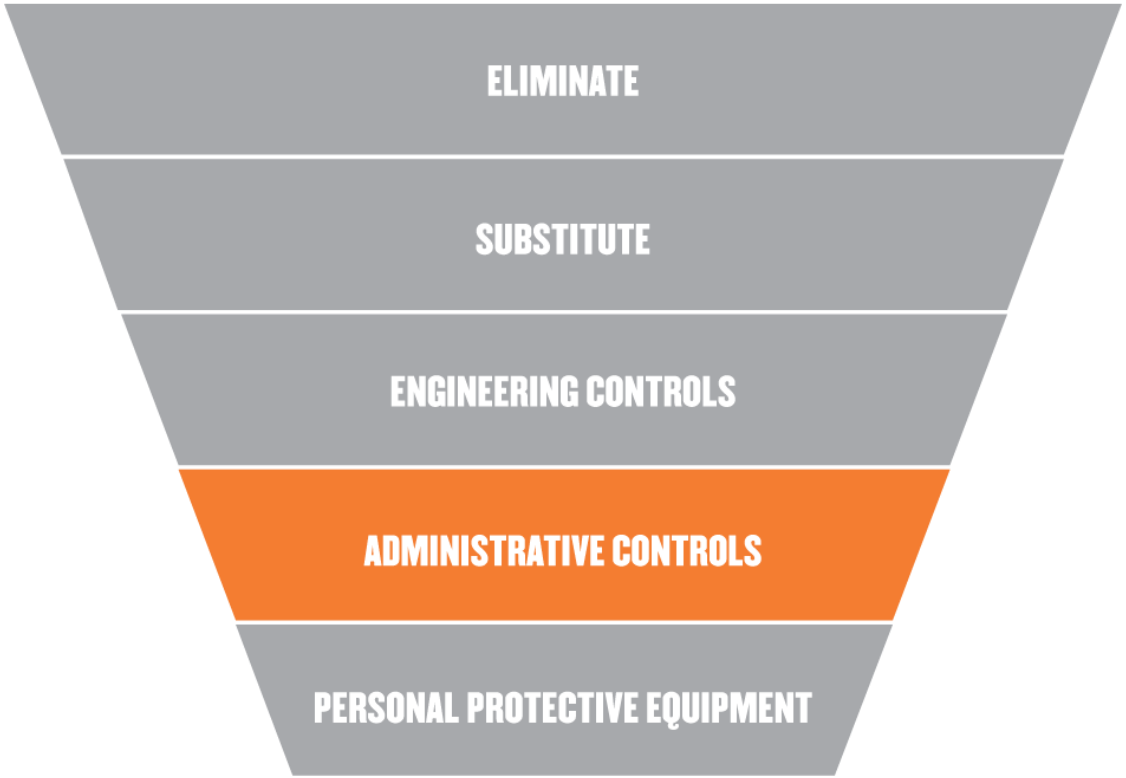
SOLUTIONS

HIERARCHY OF CONTROLS

OBJECTS AT HEIGHTS SOLUTIONS



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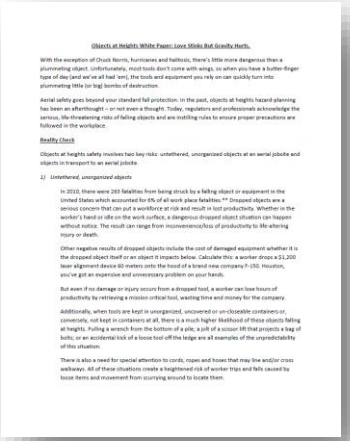
ADMINISTRATIVE CONTROLS

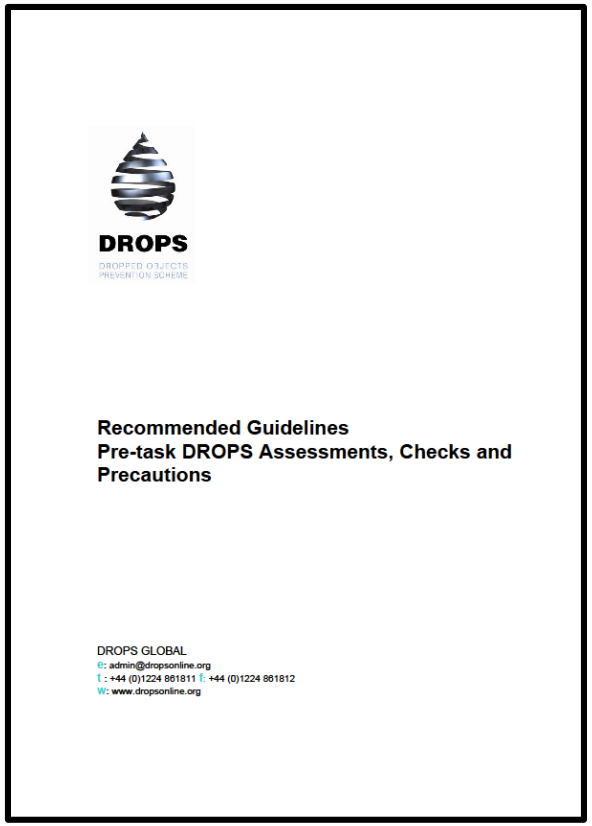
AWARENESS & EDUCATIONAL MATERIALS



ADMINISTRATIVE CONTROLS

POLICIES & PROCEDURES: DROPS GUIDELINES

- Pre-task Assessments, Checks and Precautions:
  - Static and Dynamic Dropped Objects Controls
  - Task Planning
  - Before Starting Work
  - Working at Height
  - Tasks Involving Loading or Lifting
  - Lift Plans and Collision Checklist Examples

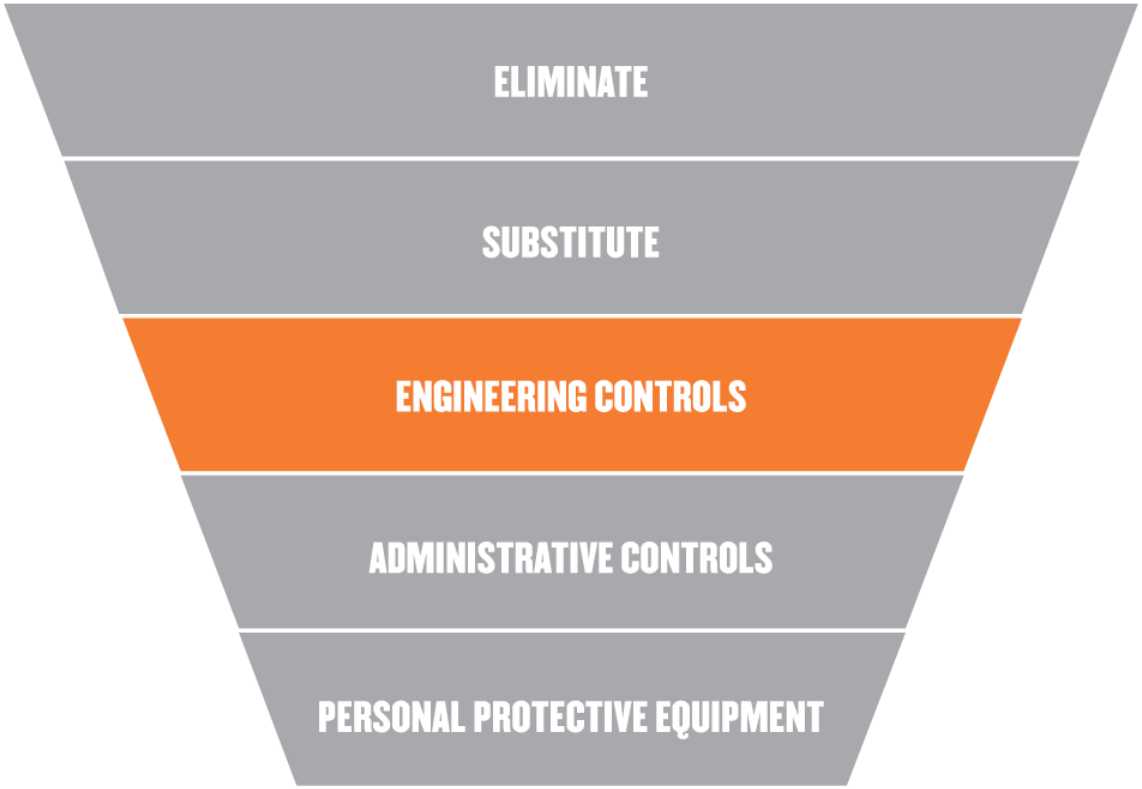

DROPS
DROPPED OBJECTS PREVENTION SCHEME

Recommended Guidelines
Pre-task DROPS Assessments, Checks and Precautions

DROPS GLOBAL
e: admin@dropsonline.org
t : +44 (0)1224 861811 f: +44 (0)1224 861812
w: www.dropsonline.org

HIERARCHY OF CONTROLS

OBJECTS AT HEIGHTS SOLUTIONS



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ENGINEERING CONTROLS

ACTIVE SOLUTIONS: THE 3 T's OF O@H SAFETY

- **Trapped**
  - Captures a connection point on tools that do not have one built in.
- **Tethered**
  - Prevents object from falling by securing to a worker or other anchor point.
- **Topped**
  - Cover buckets, pouches, and other containers to avoid spilling their contents.


//TRAPPED
DROPS FREE ZONE
DRONES FREE ZONE
ergodyne

THE ISSUE

A LACK OF BUILT-IN CONNECTION POINTS

- Overview
  - Most tools lack convenient connection points.
  - Attaching a lanyard is the most challenging part of tethering.
  - Until tool manufacturers change designs, retrofit solutions are needed.

THE SOLUTION

A COMPLETE TETHERING SYSTEM

ONE STEP TOOL TRAPS

3770

3780

3790

TWO STEP TOOL TRAPS

3700
WEB TOOL TAILS

3703/3103/3713
ELASTIC TOOL TAILS

3755/3750
TAPE TRAPS

3755/3750
TAPE TRAPS

OR

3723/3724/3726
COLD SHRINK TRAPS


KASK
DROPS FREE ZONE
DROPS FREE ZONE
ergodyne
//TETHERED

THE ISSUE

CHOOSING THE RIGHT TOOL LANYARD

- **Factors**
  - **1. Capacity**

    Weight of tool vs. capacity of solution
  - **2. Connectors**

    Type, material, and function of connection needed for tool and anchor point.
  - **3. Body**

    Material and style of lanyard.

TETHERED

- Tool Lanyards
  - Know the type of lanyard needed to do the job.


//TOPPED
ergodyne

THE ISSUE

HOW TO TRANSPORT EQUIPMENT TO HEIGHTS

- Factors

1. Capacity

Weight of the equipment being transported or contained.

2. Type of Equipment

Characteristics of equipment being transported or contained.

3. Transportation

How the equipment will be carried or hoisted.

4. Container Materials

Connectors, handles, body, and other components.

TOPPED

- Carrying
  - Pouches & Bags
  - Avoid spilling contents when bending, twisting, or reaching

5518

5538

5725

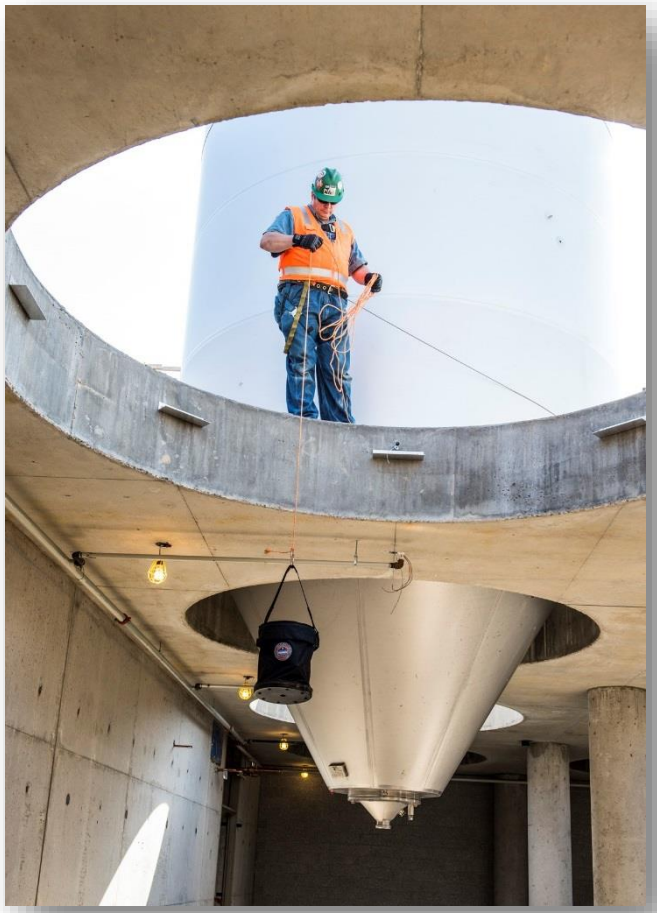
TOPPED

- Hoisting
  - Buckets & bags
  - Secure contents if container tips over or catches while in transit

5760T

5843

5653T



TESTED & TAGGED

RECOMMENDED GUIDELINES FOR O@H EQUIPMENT

- All solutions are third party certified
- Stringently tested using a safety factor
  - Tool Lanyards = 2:1 (dynamic) dropped multiple times
  - Bags and Buckets = 4:1 (static) held for length of time
- Why safety factors?
  - Individuals know their weight but likely guess their equipment's
  - High potential for misuse
- All equipment marked with certified capacity information

ONE FINAL CONSIDERATION

Your primary prevention to dropped objects…

...YOUR GRIP!

- Hand Protection
  - Choose a glove with ample grip and dexterity
  - Consider the elements being worked in (hot/cold temps)
  - Consider the materials being worked with (grease, oil, etc.)
  - Consider the other hand protection risks on the job

921

712

LET'S REVIEW...

SUMMARY

- Objects at Heights Safety should be a part of every safety at heights plan: secure people and objects!
- Objects at Heights Plans should have drop prevention, housekeeping, and safe transport practices in place for increased safety.
- Use the hierarchy of controls by implementing Engineering Controls (PREVENTION) in addition to Administration Controls and PPE Controls (PROTECTION).
- Remember the 3 T's: Trapped, Tethered, and Topped.
- Make sure your equipment is Tested and Tagged by the manufacturer.

FOR MORE INFORMATION ON ERGODYNE AND/OR FOR MORE OBJECTS AT HEIGHTS RESOURCES, EMAIL ORDERS@ERGODYNE.COM OR VISIT WWW.ERGODYNE.COM.

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