Showcase Webinar Series

Positive, Negative, and Unintended Consequences of Using Visual Aid Technologies: Mobile, Tower, and Overhead Cranes

Presenter: Chris Machut, Founder & Chief Technology Officer
Netarus

Host: Jonah Hobson
ITI

Industrial Training INTERNATIONAL

TRAINING | FIELD SERVICES | CERTIFICATION | BOOKSTORE | E-LEARNING | WEBINARS | WORKSHOPS

Cranes ▪ Rigging ▪ Lift Planning ▪ Engineering

The “Why” of ITI:
We exist to serve and learn everyday.

TRAINING CENTERS

CLIENT SITE

ITI ONLINE

ITI FIELD SERVICES

VIRTUAL REALITY

ITI BOOKSTORE

For more info visit: **iti.com/solutions**

Chris Machut

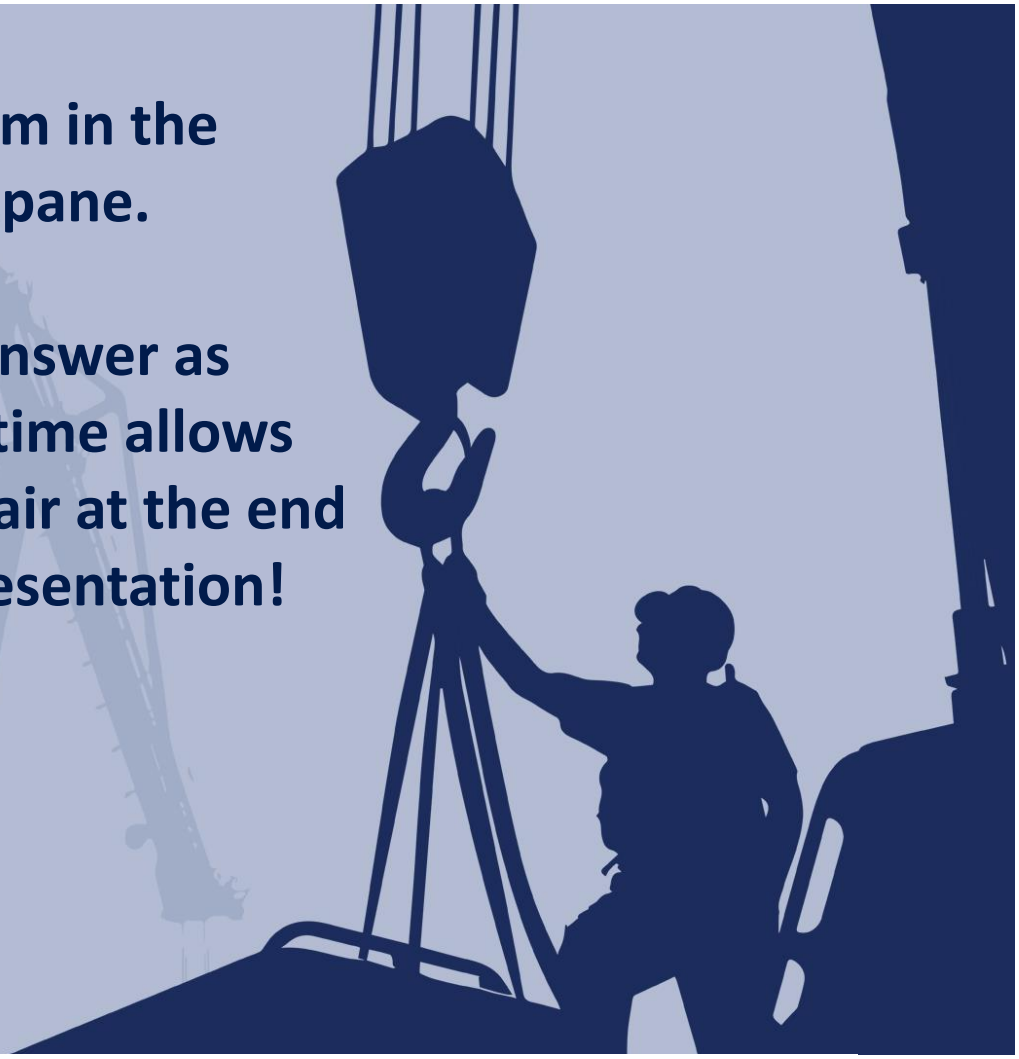
- **Chief Technology Officer, Netarus**
- **BS, Computer Engineering Virginia Tech**

Netarus specializes in developing rugged situational awareness platforms systems - HoistCam, TugCam and ThreeSixtyCam. From tugs to cargo ships to vehicles, Netarus engineers and manufacturers weatherproof and marine-grade situational awareness platforms based on rugged camera, video and DVR solutions. For the last decade, Netarus creates innovative technology solutions by integrating and developing systems for construction, industrial, transportation and marine industries.

Questions?

Enter them in the question pane.

We will answer as many as time allows over the air at the end of the presentation!



Industrial Training INTERNATIONAL

TRAINING | FIELD SERVICES | CERTIFICATION | BOOKSTORE | E-LEARNING | WEBINARS | WORKSHOPS

Cranes ▪ Rigging ▪ Lift Planning ▪ Engineering

Positive, Negative, and Unintended Consequences of Using Visual Aid Technologies mobile, Tower, and Overhead Cranes

Chris Machut

Chief Technology Officer

Netarus

ITI Showcase Webinar Series

February 22, 2017

Netarus

Rapidly Deployable Situational Awareness

HoistCam™

TugCam™

Construction - Marine - Industrial - Transportation

Netarus

HoistCam™

TugCam™

Construction - Marine - Industrial - Transportation

Agenda

- Situational Awareness
- Visual Aid Technologies
- Pros, Cons, and Unintended Consequences
- Applications

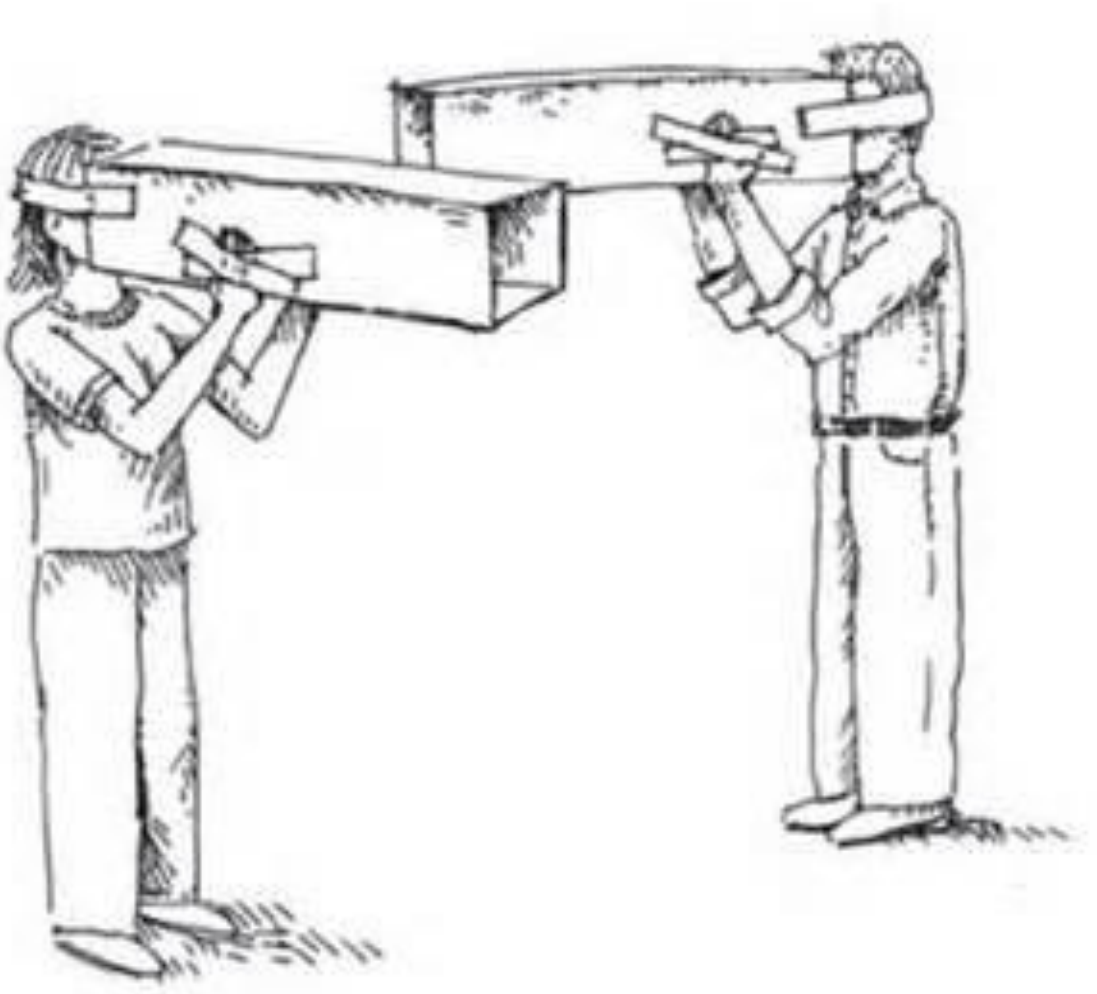
Situational Awareness

Visual Aid Technologies

Pros, Cons, and Unintended Consequences

Applications

SITUATIONAL AWARENESS



WHAT IS GOING ON AROUND ME?

"**Situational Awareness** is the ***ability to identify***, process, and comprehend the critical elements of information about ***what is happening*** in the ***environment*** with ***regards to operation***.

Source: http://www.uscg.mil/auxiliary/training/tct/chap5.pdf

Experience

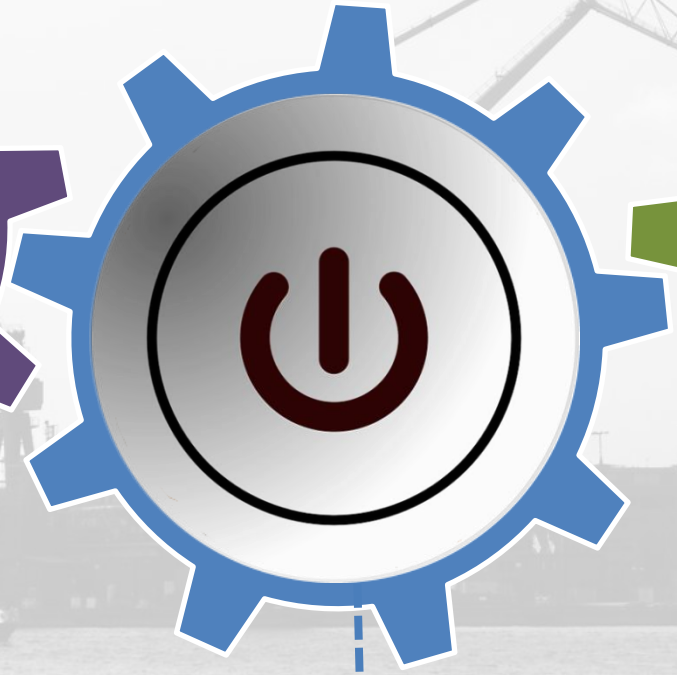
Crane operator

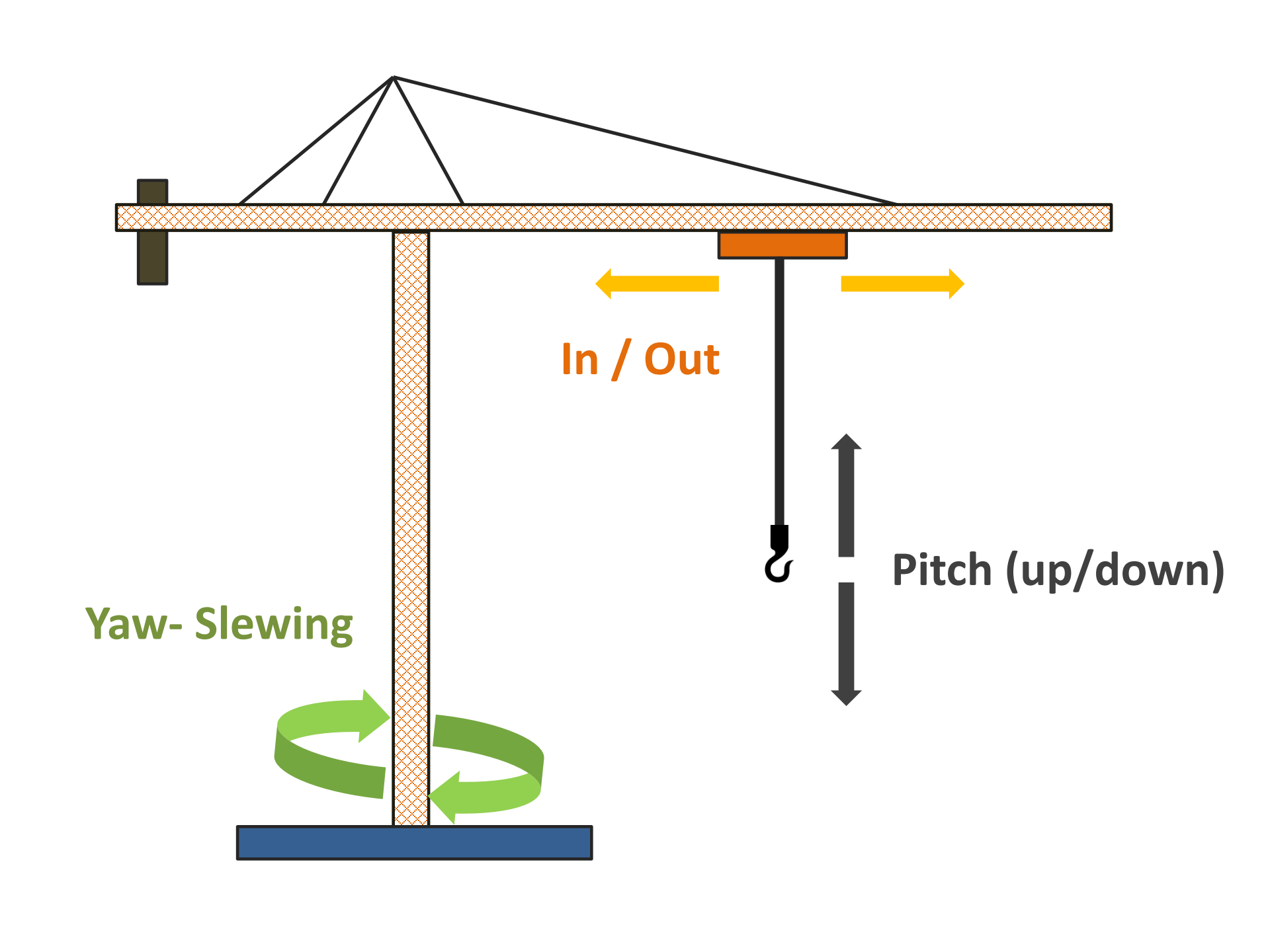
Inputs

Information available

Communication

Crew tasks




In / Out
Pitch (up/down)
Yaw- Slewing

Situational Awareness (SA)

- ✓ Levels of Awareness
  - ✓ Correct Levels
- ✓ Losing SA
- ✓ Barriers to SA
- ✓ How to Maintain SA
- ✓ Human Errors
- ✓ Time Critical Tasks
- ✓ SA Aids

Levels of Awareness

- *Unaware*
- *Relaxed*
- *Heightened Alertness*
- *High Alert*
- *Freeze*

- USAF had the OODA Loop
- Others

Correct Level – Crane Operation

- *Never!*

In service

- *Waiting…*

- *Placing boom in position…*

UNAWARE | RELAXED | HEIGHTENED

- *Pick the Load…*

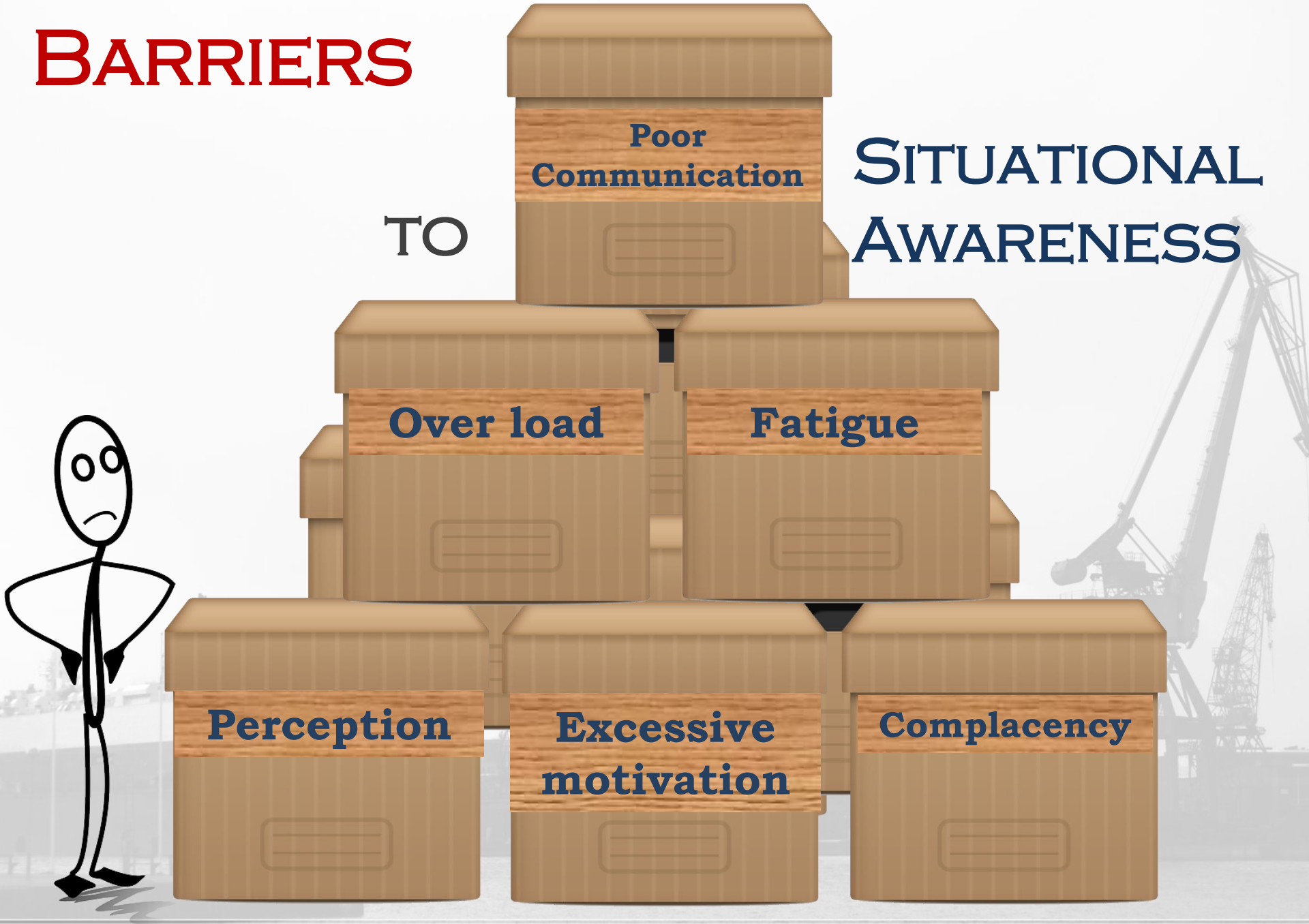
- *Load is landed…*

- *Waiting…*

HEIGHTENED | RELAXED

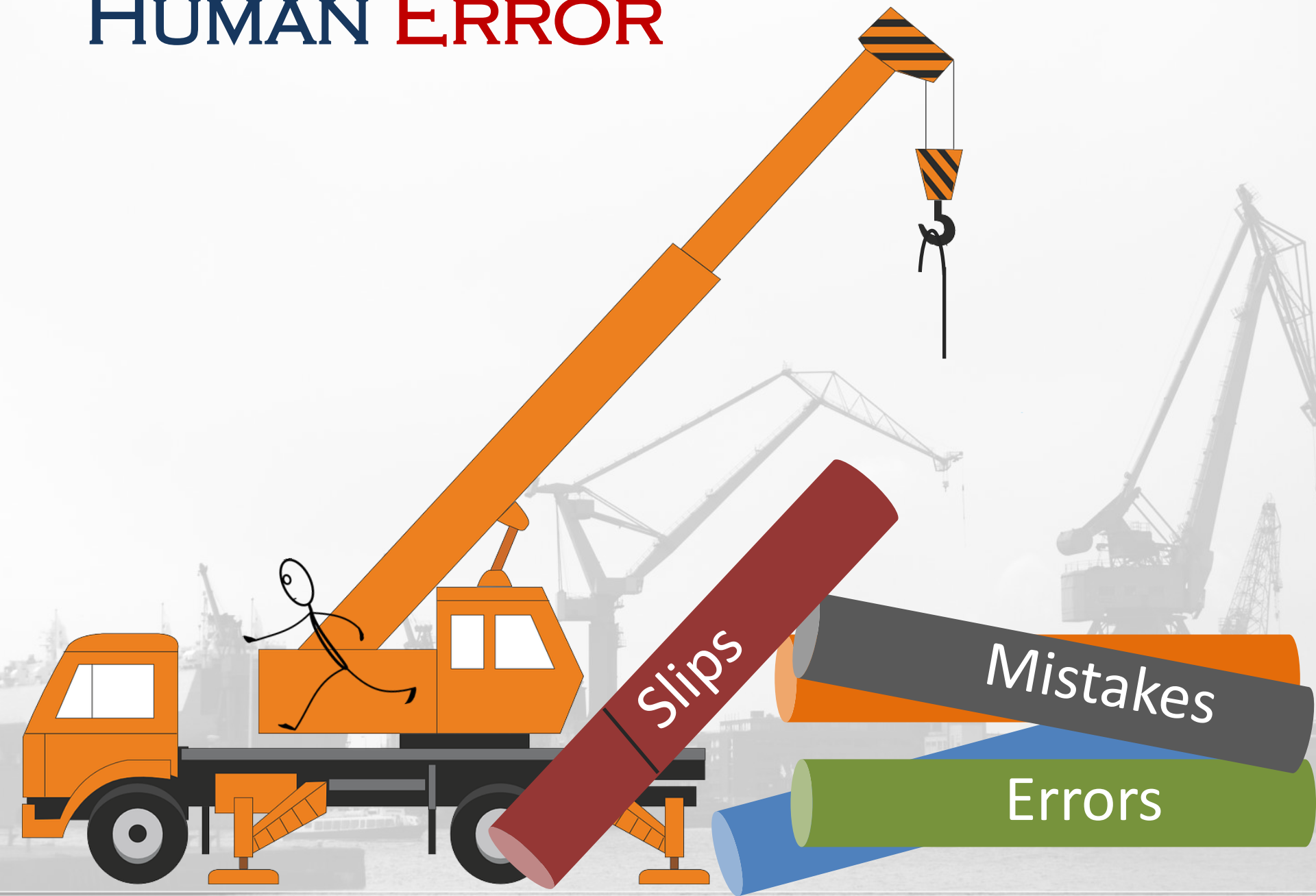
Losing Situational Awareness??

Barriers to Situational Awareness

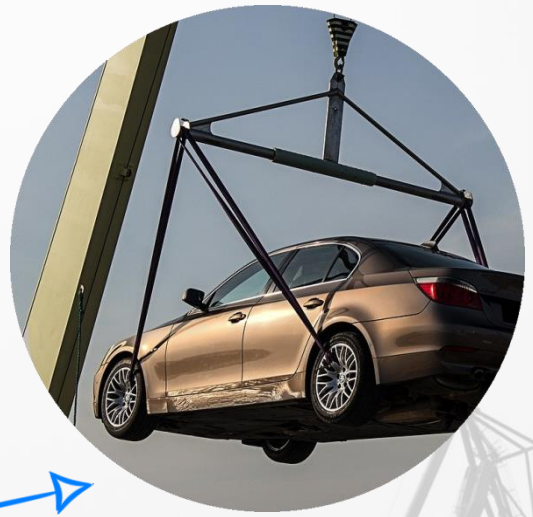


How to maintain Situational Awareness ?

Human Error



Training

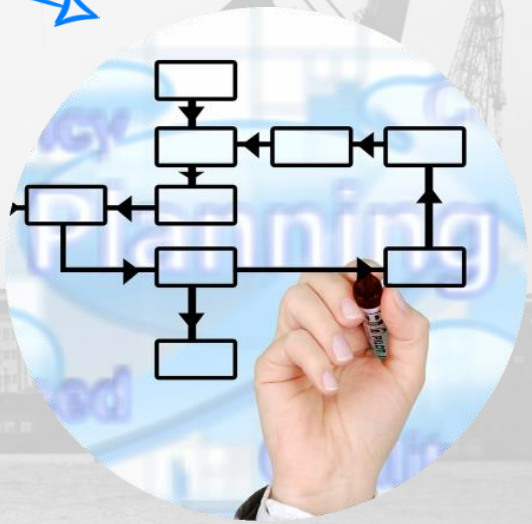


Experience

Improve Situational Awareness

Appropriate
Sensor Input

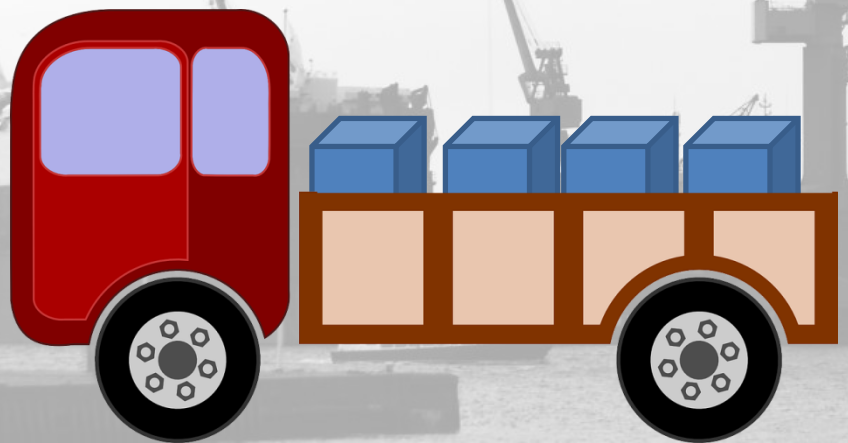
Review and add *technologies* that *provide* relevant *data/information*

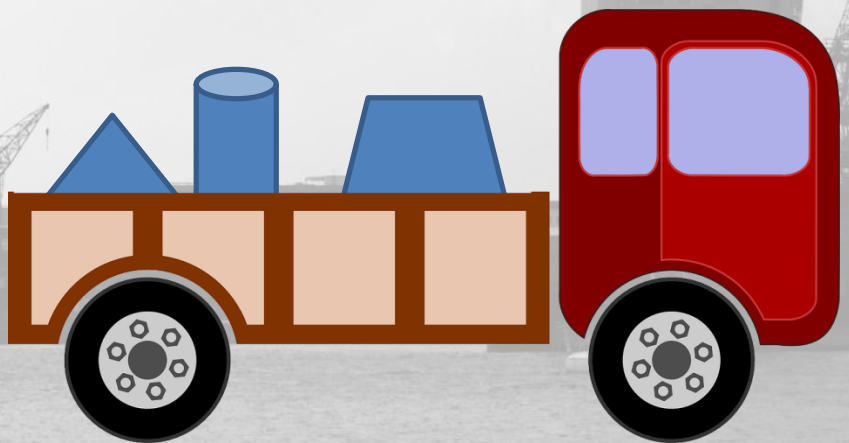


Time Critical Tasks

Standard

Non-Standard





Everyone and everything on the job site, affects Crane Situational Awareness!

Operator *Safety Personal* *Job Site Personal* *Management*

Situational Awareness

Visual Aid Technologies

Pros, Cons, and Unintended Consequences

Applications

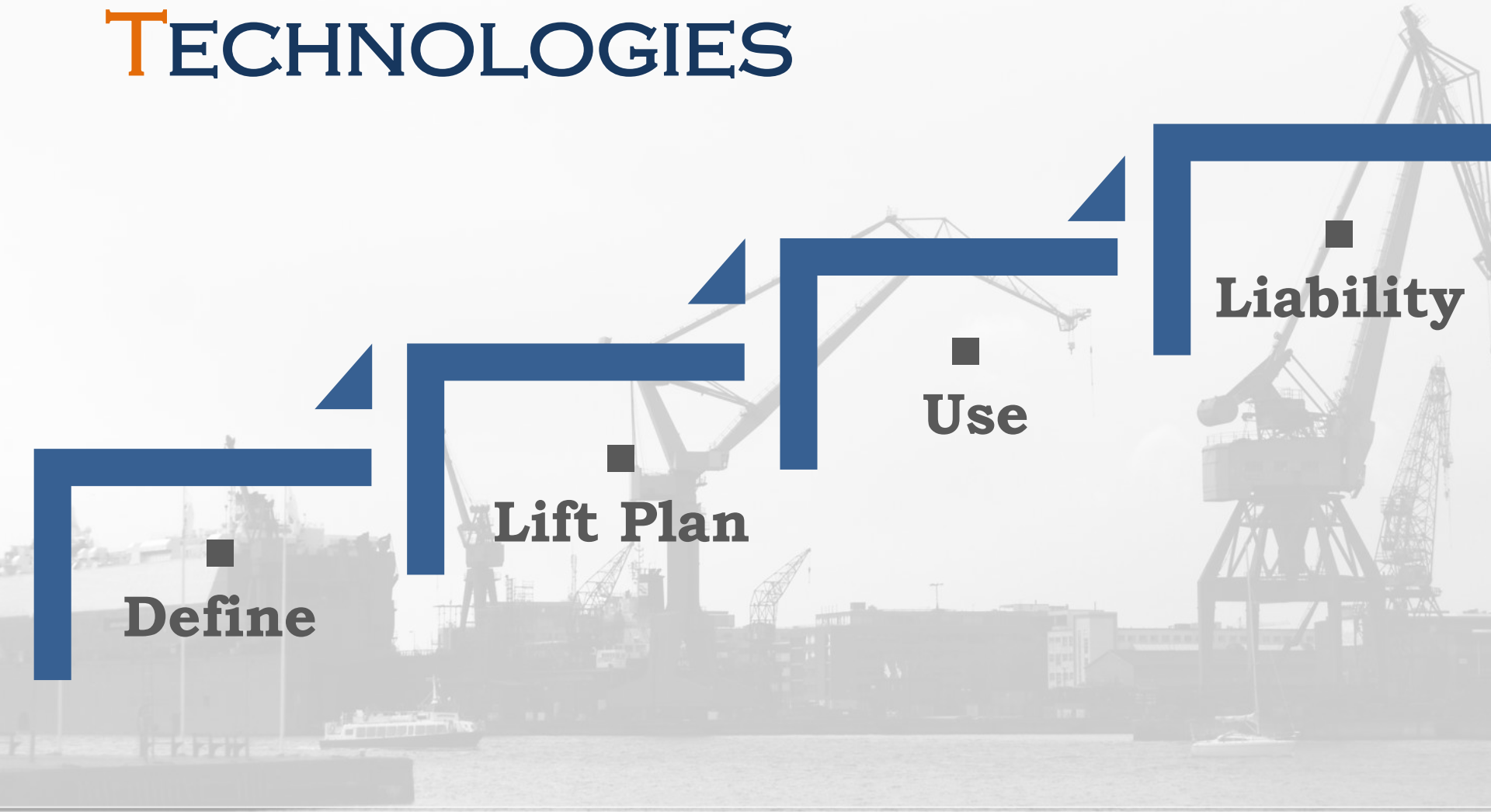
Visual Aid Technologies

Situational Awareness

Pros, Cons, and Unintended Consequences

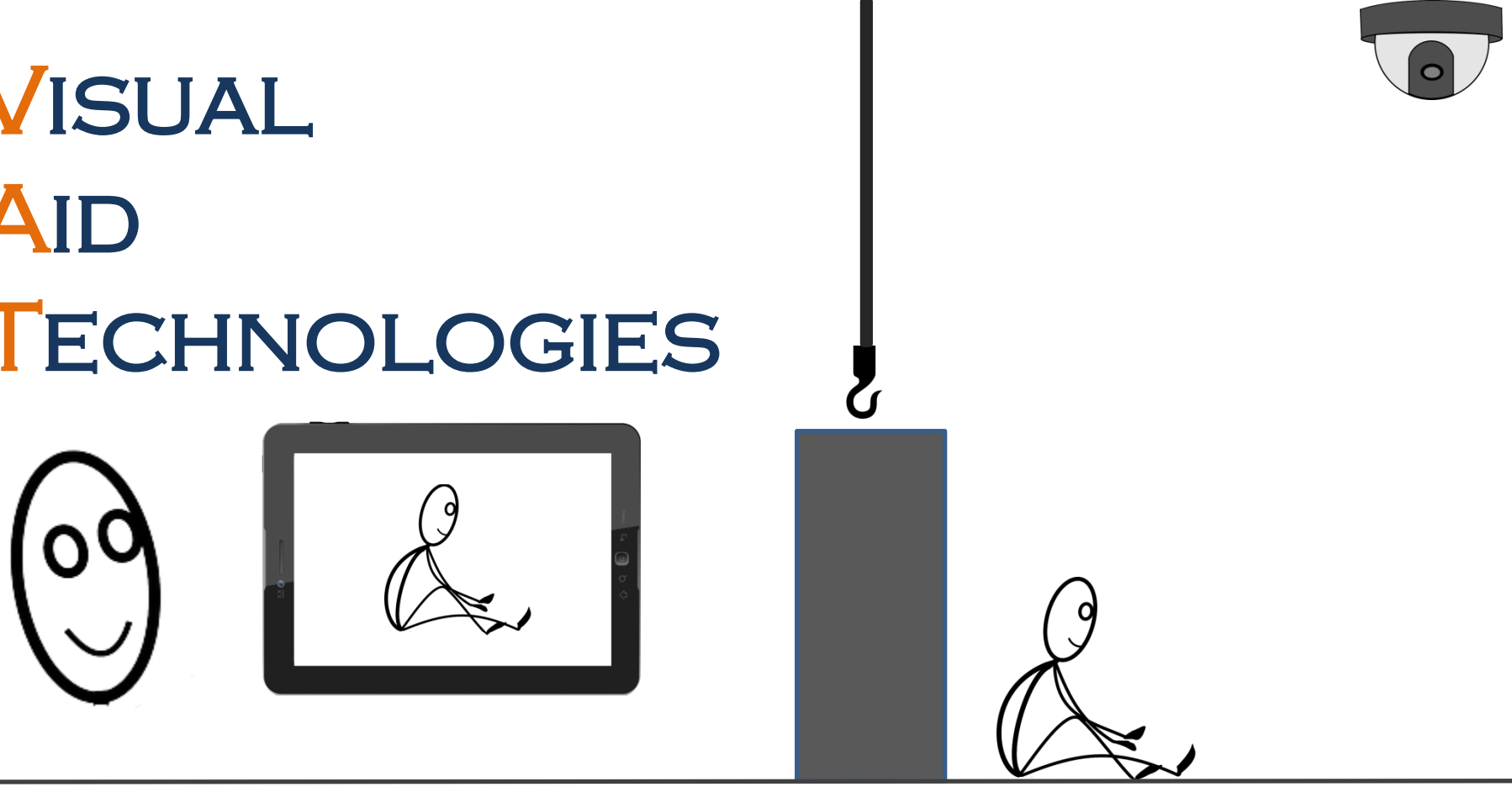
Applications

VISUAL AID TECHNOLOGIES



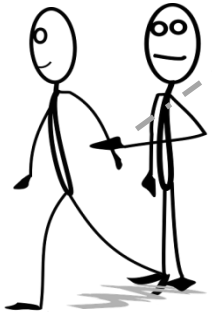
Visual Aid Technologies

Visual Aid Technologies



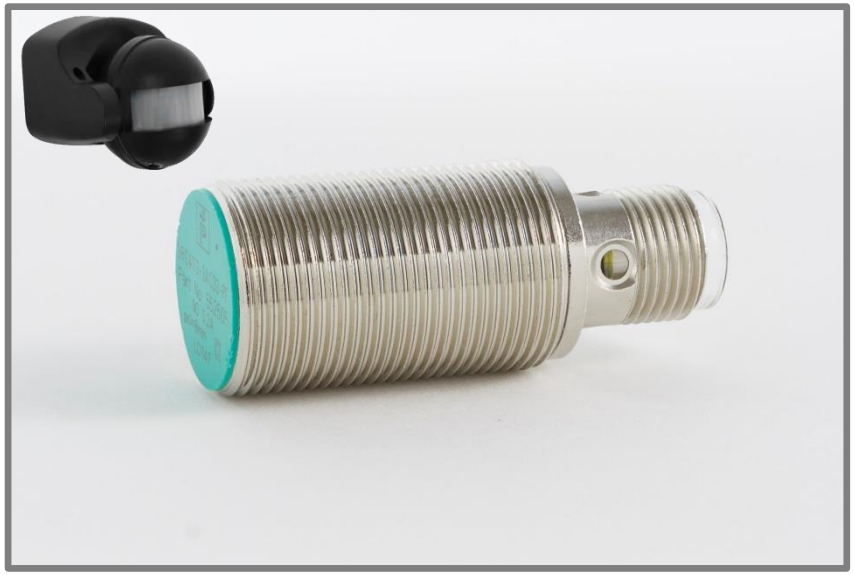
Extends the vision of the user into an area he/she cannot see from their current vantage point

Visual Aid Technologies



Situational Awareness - Aids

Sensors

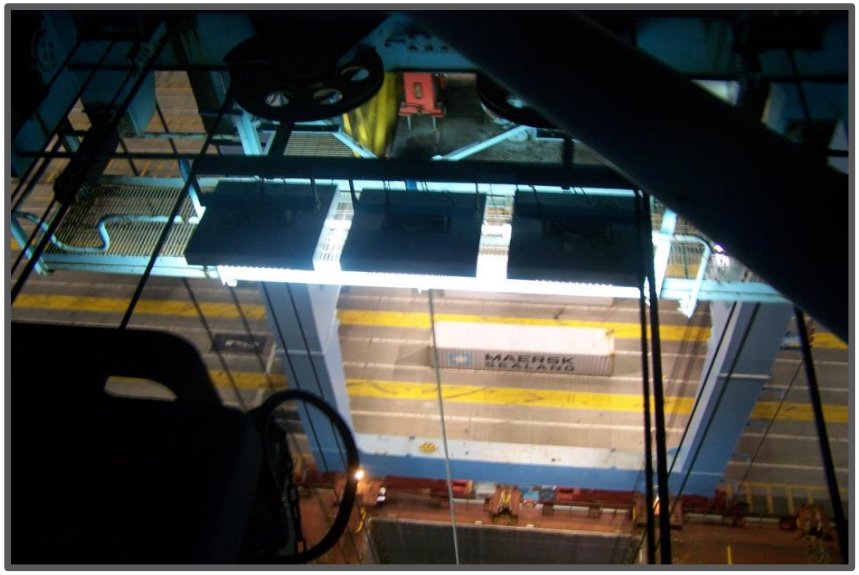


Cameras

Situational Awareness - Aids

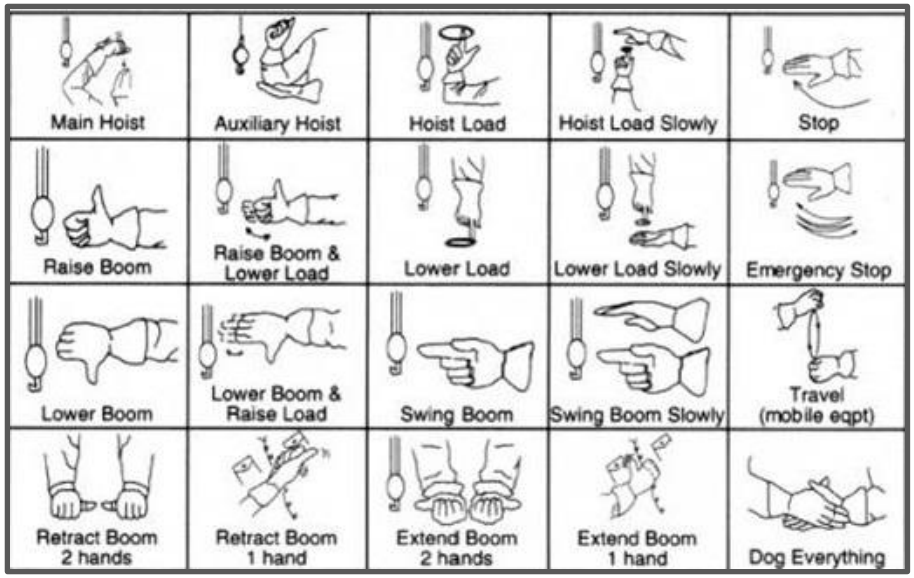
Lasers

Lighting



Situational Awareness - Aids

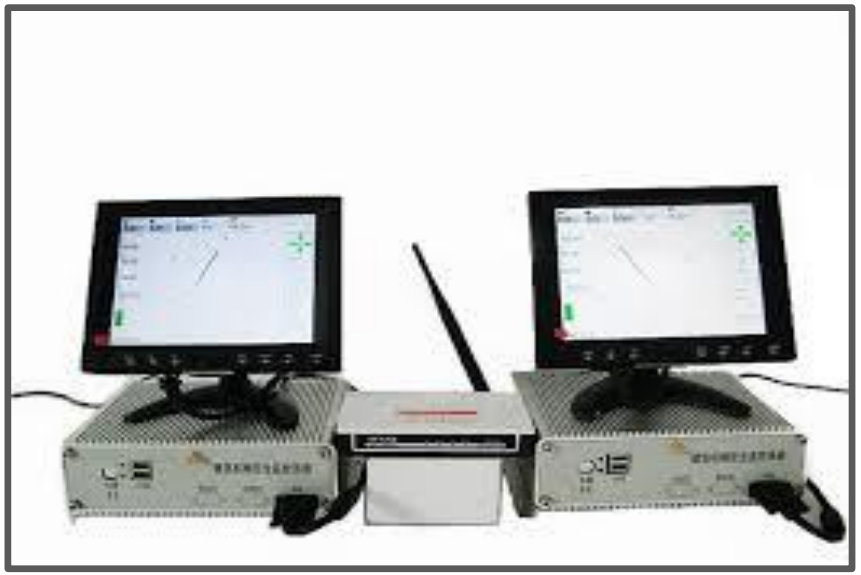
Hand Communication



Radios

Situational Awareness - Aids

Anti Collision Systems



Anti 2 Block Device

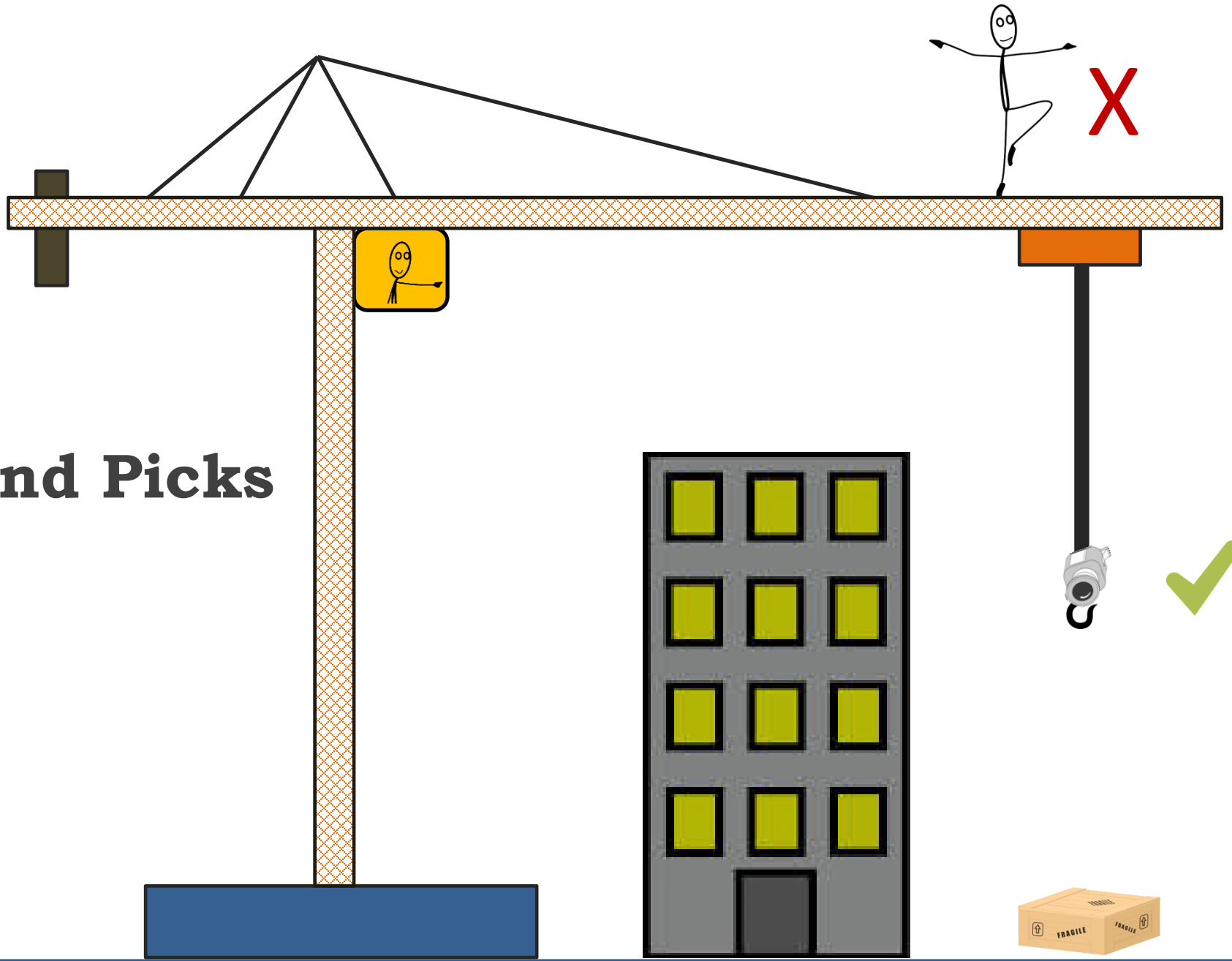
Situational Awareness - Aids

Load Sensing Device

Back up camera/alarms

Visual Aid Technologies

Blind Picks



Visual Aid Technologies

Camera Systems

Visual Aid Technologies

- **Lift Plan**

- List of picks

- Included in the daily inspection

- Use VAT as required

– Shut crane down for evening

Visual Aid Technologies

- Power source
- Installation time
- Wired versus Wireless
- Wired – install more costly and time consuming
- Wireless – recharging batteries
- Recording options

Visual Aid Technologies

Height of equipment

+ 1,000’

- 1,000’

Type of equipment

fork lifts

excavator

paving equipment

tower cranes

lattice cranes

concrete pumps

telescopic boom cranes

etc.

Types of Cameras

day

night

thermal

Durability

temperature

water ingress protection

ruggedness

VISUAL AID TECHNOLOGIES

- ✓Always practice standard operational and safety practices
- ✓Verify placement and orientation
- ✓Visual **Aid** or **Assist**

Visual Aid Technologies

Situational Awareness

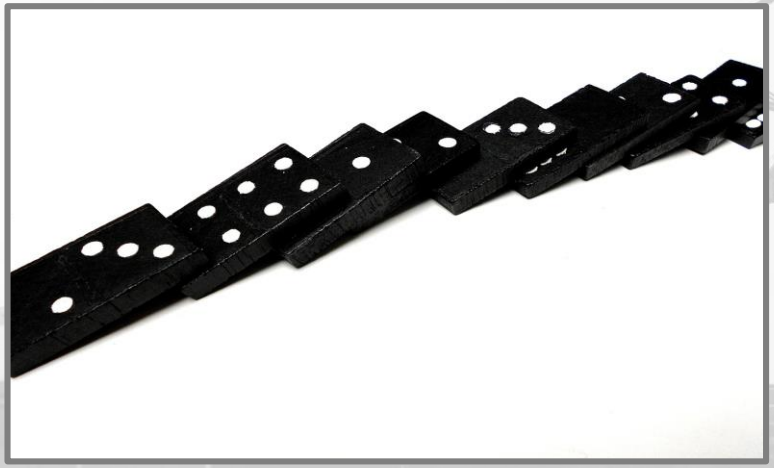
Pros, Cons, and Unintended Consequences

Applications

Pros, Cons, and Unintended Consequences

Situational Awareness

Visual Aid Technologies

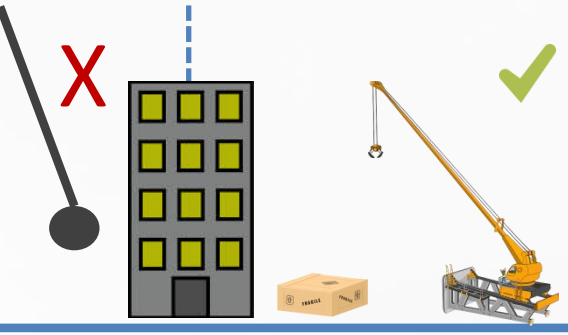


Applications

Pros (benefits)

Eliminate!

Blind lifts or maneuvers



Increase!

Productivity

Positioning!

Hook block

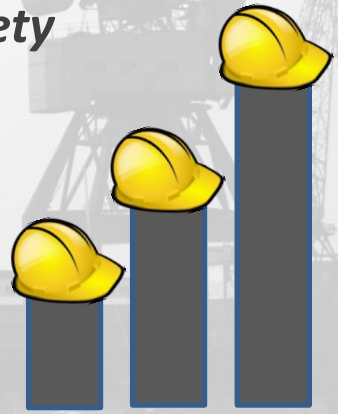
Load alignment

Visually confirming!

Load size
Rigging
Signaling and personnel

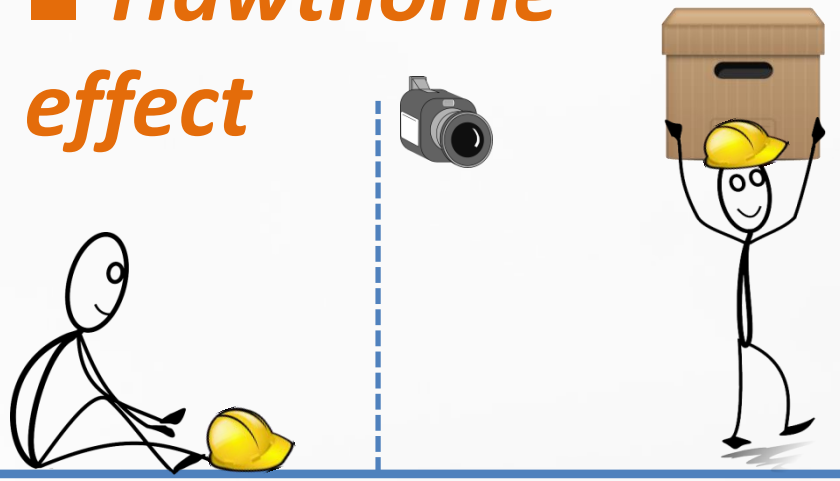
Increase!

Safety

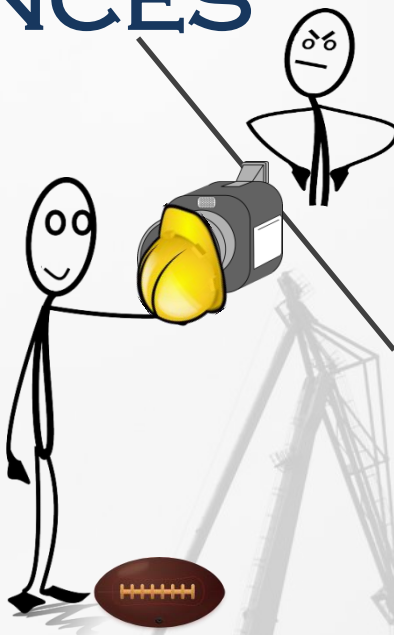


Unintended Consequences

- ***Hawthorne effect***

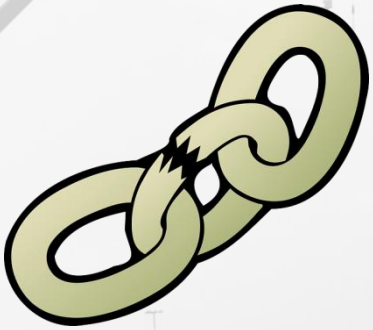


- ***Big brother***
  - *Watching*



- ***Interpret cameras as invasion of privacy and lack of trust***

- ***Operator perceived liability***



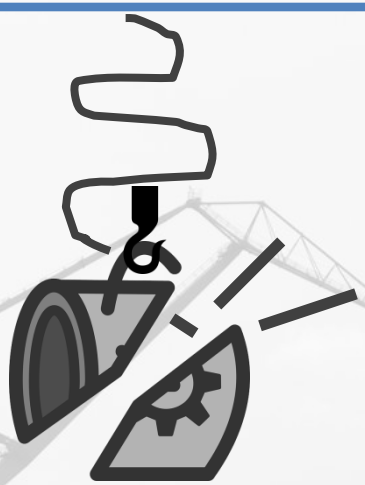
Cons (Disadvantages)

■ Distraction

To operator if not properly trained

■ Install time and availability

of equipment



■ Micro positioning

Depth perception

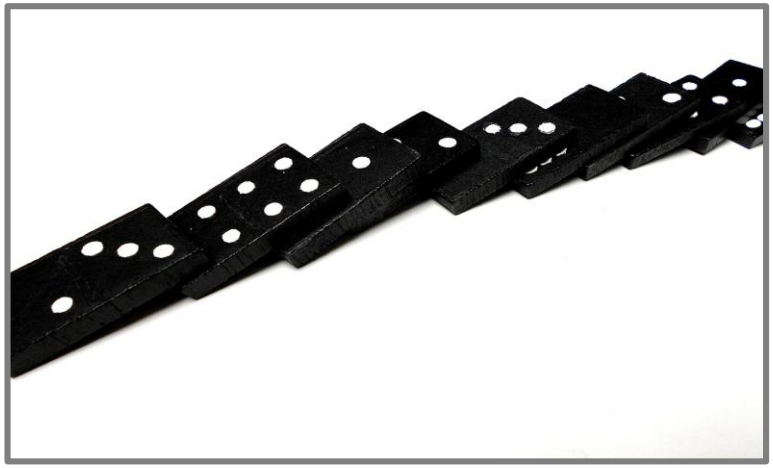
■ Incorrectly installed or configured

■ Extreme conditions

Pros, Cons, and Unintended Consequences

Situational Awareness

Visual Aid Technologies



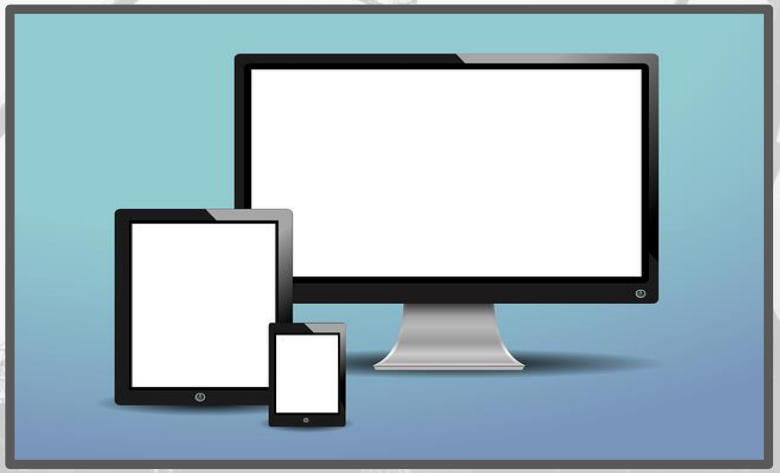
Applications

Applications

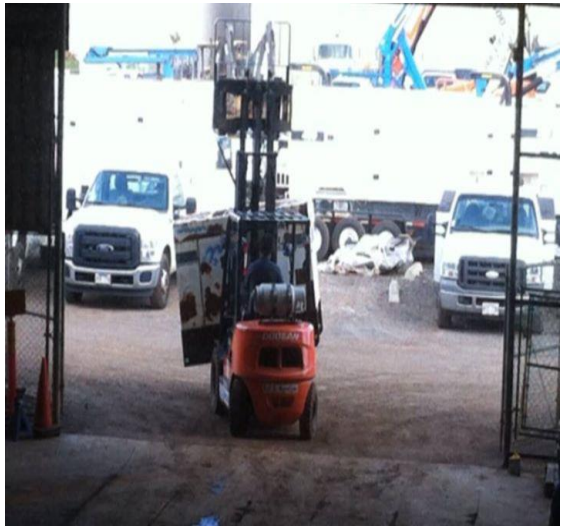
Situational Awareness

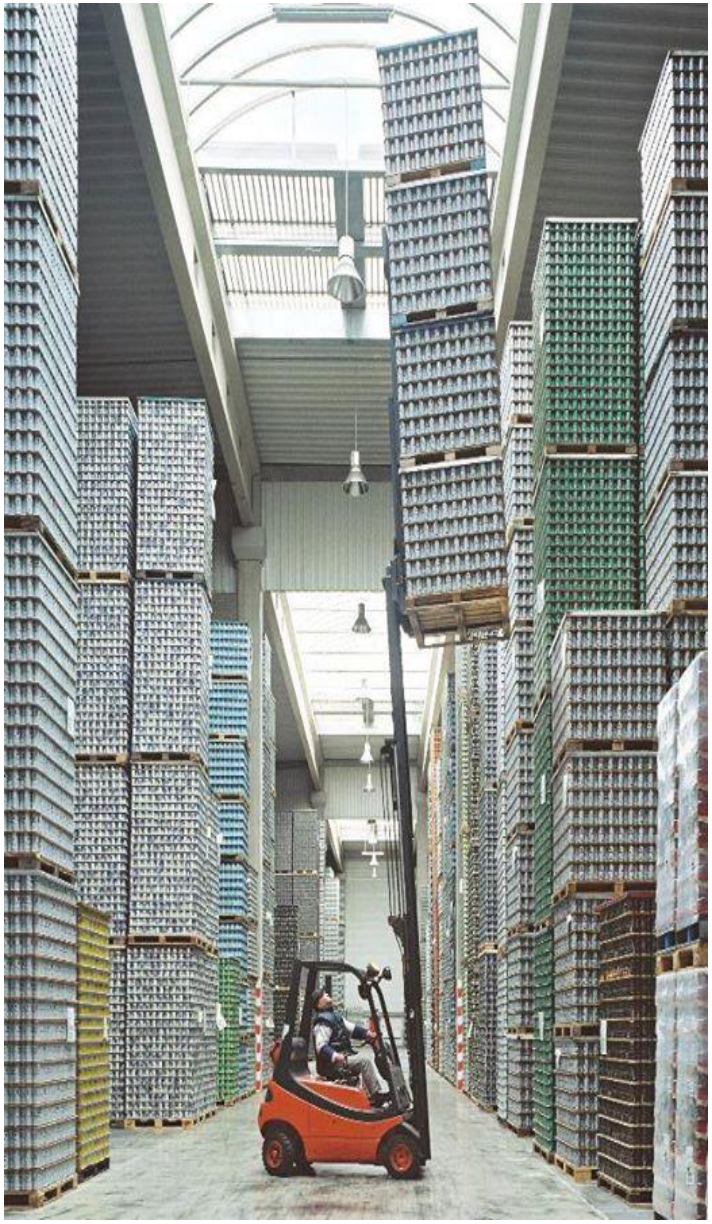
Visual Aid Technologies

Pros, Cons, and Unintended Consequences



Applications

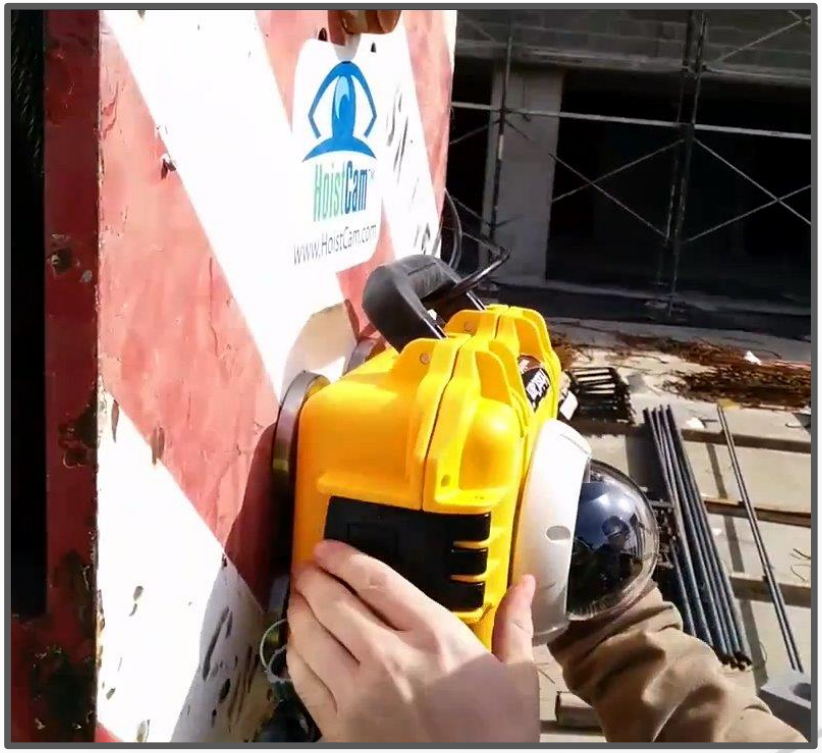




Applications

Applications

Applications



Applications

Applications

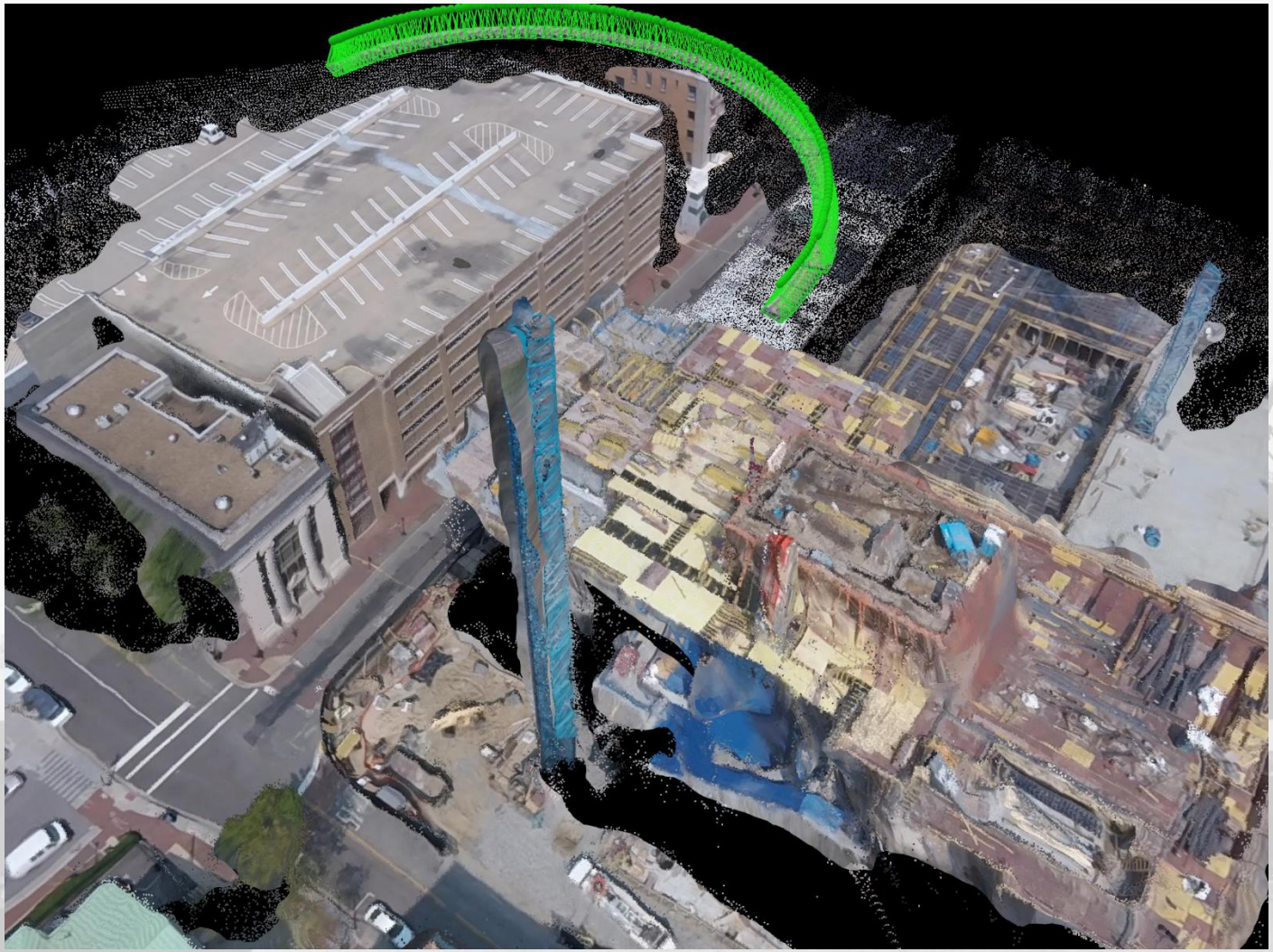
Supervisors – remote video access via computer / tablet / phone

Applications

Analysis: Orthomosaics, 3D Point Clouds Digital Surface Maps

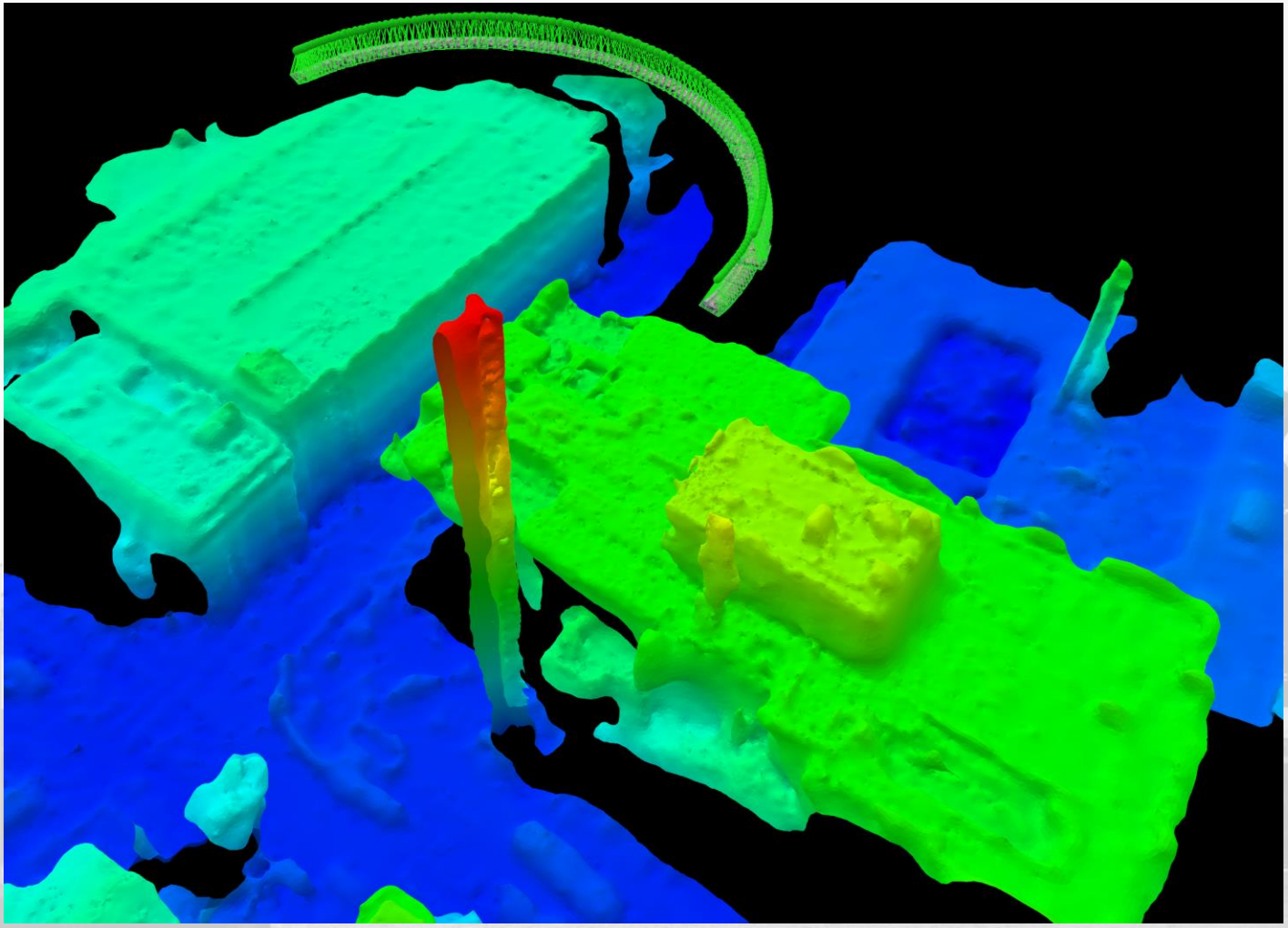
Applications

Analysis: Orthomosaics, 3D Point Clouds Digital Surface Maps



Applications

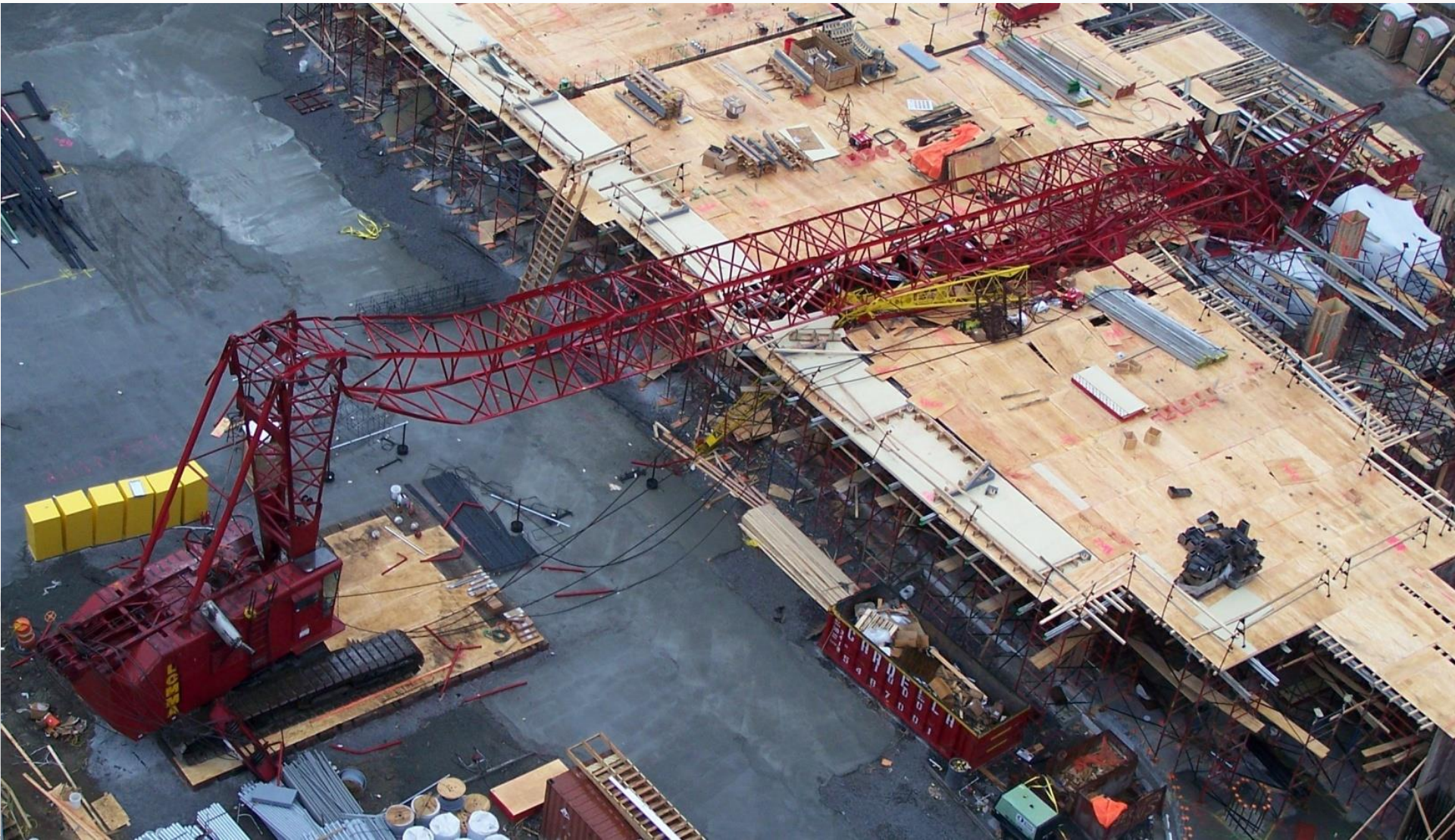
Analysis: Orthomosaics, 3D Point Clouds Digital Surface Maps



HoistCam Options

1. Wireless Encryption
2. Repeater
3. DVR
4. Winch Camera
5. Job Site Overview Camera
6. Ignition Protection Rating (SAE J1171)
7. Remote/Internet Enabled Systems
8. Power - 12VDC, 24VDC, 110VAC, 220VAC

Example Where VAT May Have Helped



Example Where VAT May Have Helped

New Standards For Blind / Distant Lifts?

Q&A Time

Situational Awareness – Mobile Equipment and You

Questions?

Visit Us @ CONEXPO!

Gold Hall

HoistCam (Netarus) Booth #G71913 & Tech Experience (Sliver Lot 3)

www.netarus.com/conexpo2017

ITI Booth #G71407
www.iti.com/conexpo

Industrial Training INTERNATIONAL

TRAINING | FIELD SERVICES | CERTIFICATION | BOOKSTORE | E-LEARNING | WEBINARS | WORKSHOPS

Cranes ▪ Rigging ▪ Lift Planning ▪ Engineering