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Safety in the Workplace

Hierarchy of controls

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What protects YOU?

- There are many processes that are implemented in a workplace to protect employees

- We call this the hierarchy of controls
  - The method of identifying and ranking safeguards to protect workers from hazards

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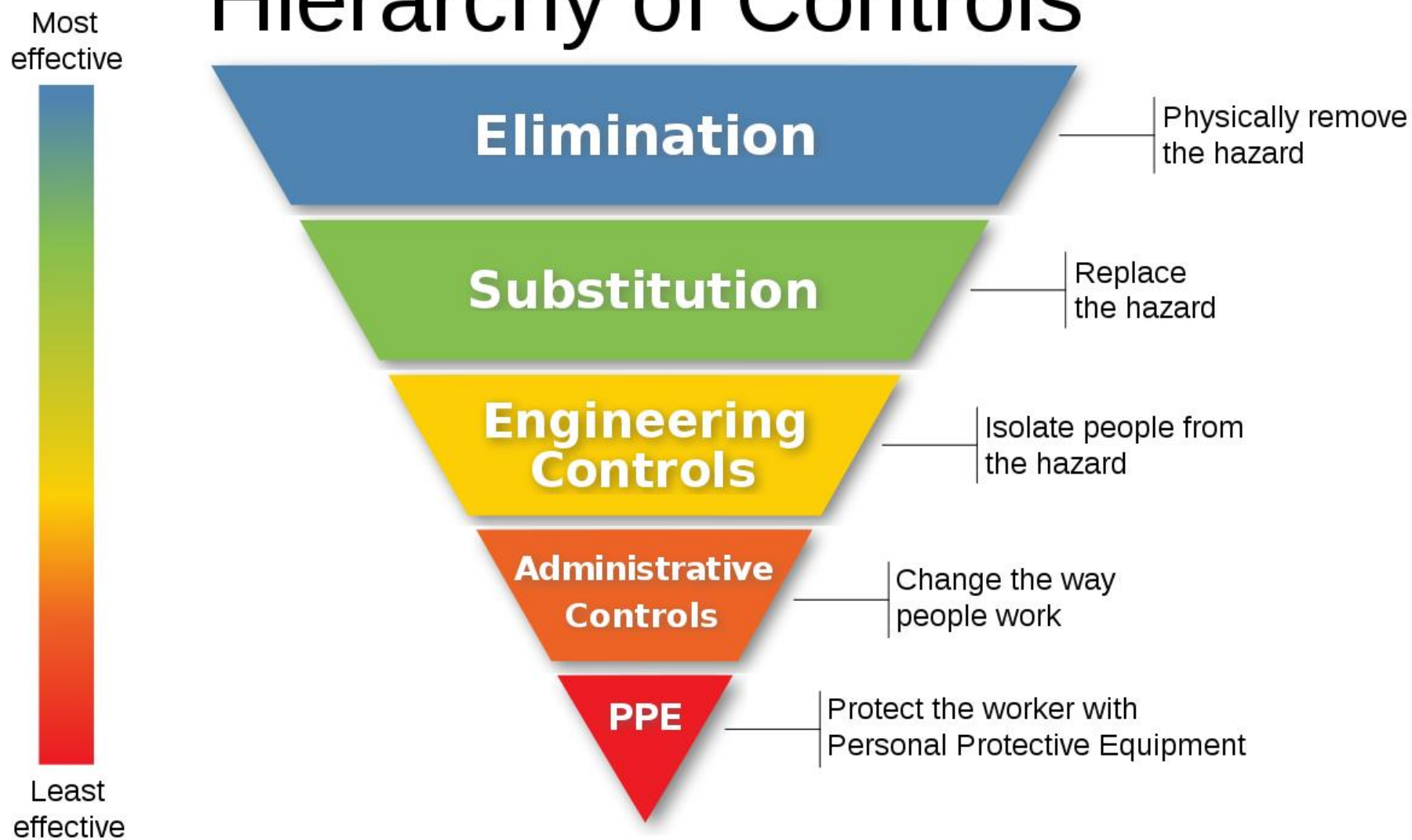
Hierarchy of Controls



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Elimination

- Removing the hazard and making sure it no longer exists
- This is the most effective method
- Examples include:
  - No longer using a hazardous material
  - Trying to ensure all work is done at ground level
  - Removing noise from the process

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Substitution

- Changes out a more hazardous material or process for a less hazardous one

- Examples include:
  - Switching out chemicals in a process
  - Switching a process that involves less force, speed, temperature, or electrical current

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Engineering Controls

- Reduce the exposure to the hazard so workers cannot accidently come into contact with it
- This allows workers to still do their jobs effectively while being safe

- Examples include:
  - Noise enclosures
  - Cabinet doors around electrically live components
  - Machine guards
  - Guardrails

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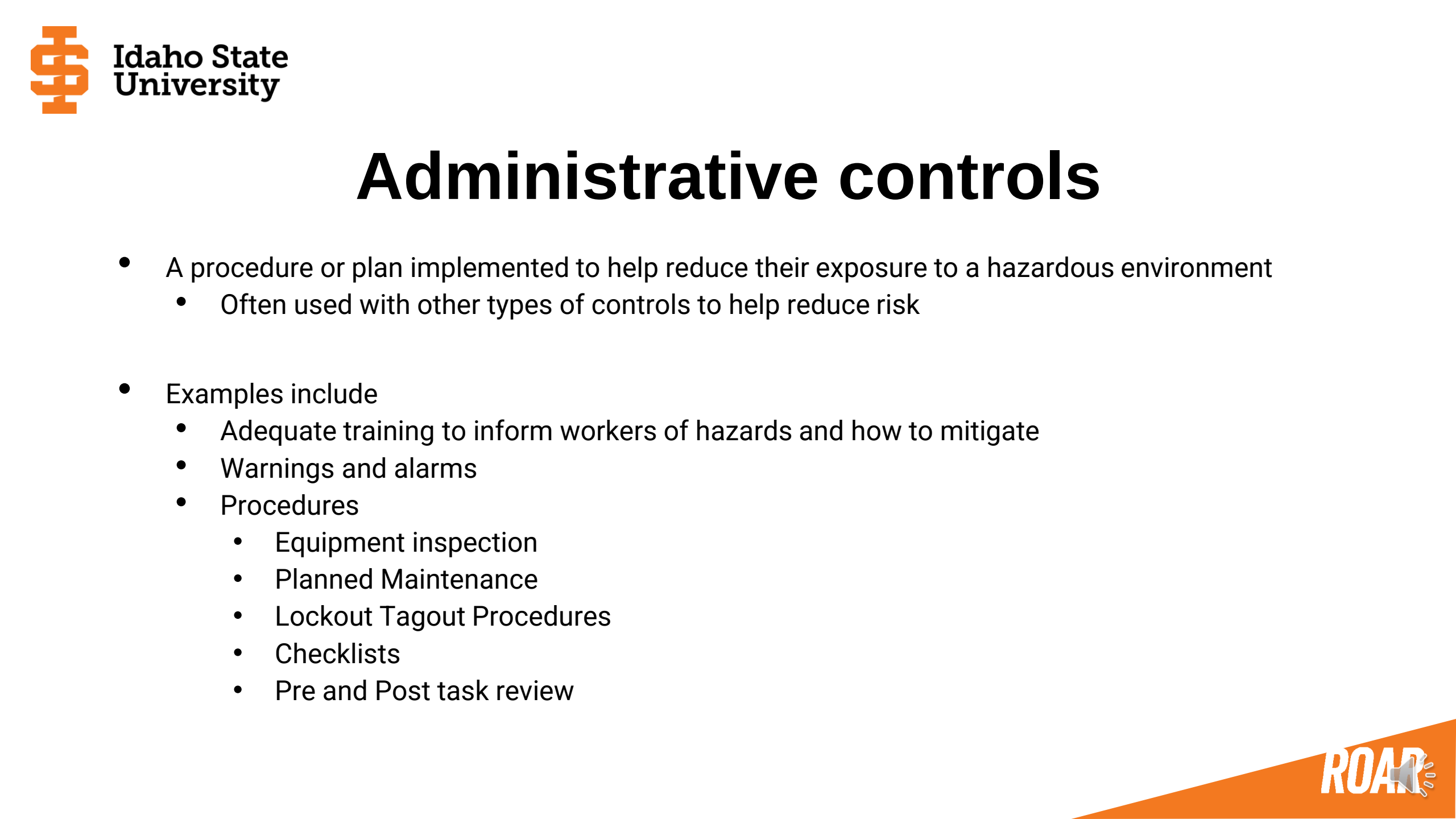
Administrative controls

- A procedure or plan implemented to help reduce their exposure to a hazardous environment
  - Often used with other types of controls to help reduce risk

- Examples include
  - Adequate training to inform workers of hazards and how to mitigate
  - Warnings and alarms
  - Procedures
    - Equipment inspection
    - Planned Maintenance
    - Lockout Tagout Procedures
    - Checklists
    - Pre and Post task review



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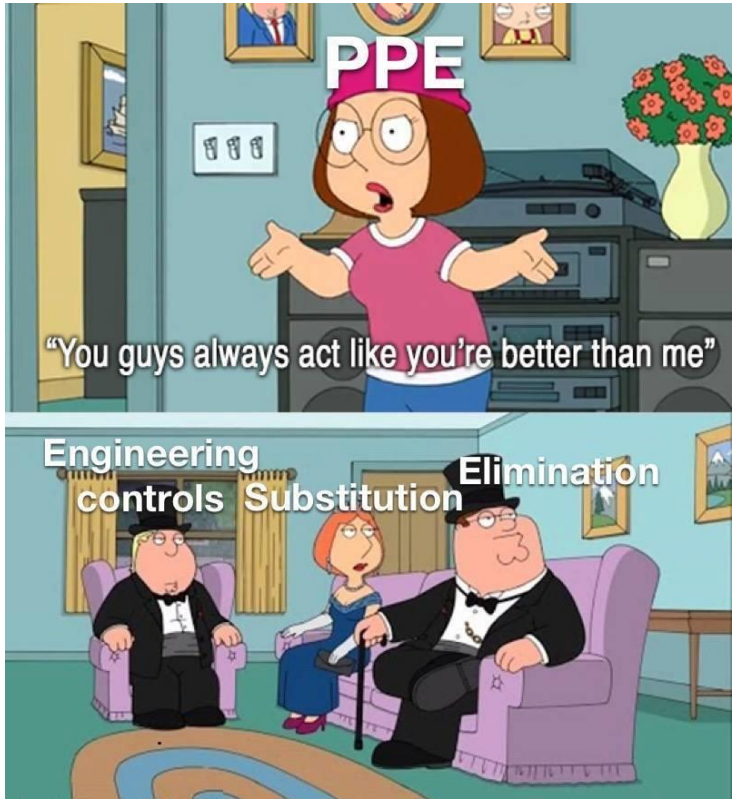
Personal Protective Equipment (PPE)

- The least effective control to protect employees (still important to follow proper PPE guidelines however!)
- A device or piece of clothing that will help protect workers from injury
  - Requires adequate training for some PPE
  - Usually used in conjunction with other measures when those measures aren't enough to protect

Examples include

- Safety glasses
- Fall Protection
- Hardhats
- Respirators
- Hearing Protection



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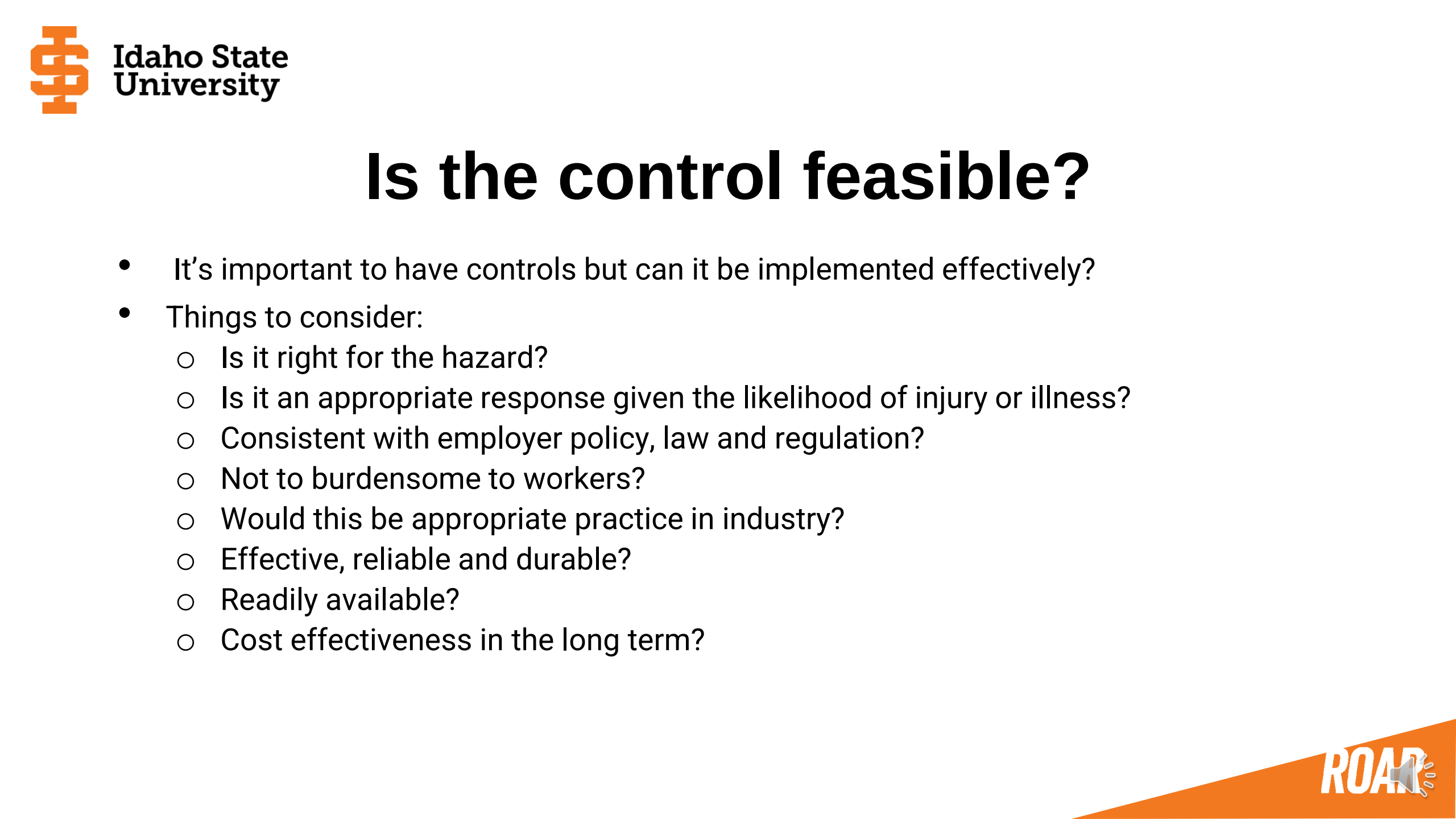
Is the control feasible?

- It’s important to have controls but can it be implemented effectively?
- Things to consider:
  - Is it right for the hazard?
  - Is it an appropriate response given the likelihood of injury or illness?
  - Consistent with employer policy, law and regulation?
  - Not to burdensome to workers?
  - Would this be appropriate practice in industry?
  - Effective, reliable and durable?
  - Readily available?
  - Cost effectiveness in the long term?



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To develop a new control plan…

- Involve the workers
  - They often have the most insight on how the job needs to be accomplished
- Evaluate options for controls
  - What types of controls can be implemented if not eliminated or replaced?
    - Engineering
    - Administrative
    - Personal
- Develop measures to protect workers in an emergency situation
  - What happens if these controls fail?
  - Assign roles in an emergency situation
  - Purchase equipment for emergency situations to mitigate the hazard

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To develop a new control plan…

- Evaluate the selection of controls and existing controls
  - Are the existing controls at all effective?
  - Will the selected controls work for this situation?
  - Can the new controls be implemented with the existing?
- Implement new controls
  - Install new safety equipment or write procedures
- Evaluate new controls down the road and decide if they are effective
  - This one is often overlooked. It is important to evaluate if the controls are effective
  - Its IMPORTANT to know that if the controls are too cumbersome, workers might not use them properly or at all!

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Knowledge Check: Situation 1

- You are working in a paper processing facility. A grinder that is used to pulp the paper product outputs a loud noise, around 120 dB. The safe exposure of noise is 85 decibels for an 8 hour period and anything over 100 dB requires double hearing protection. The grinder is old, and is needing to be replaced. They make models that output around 90 dB. This would still require some hearing protection but not as extensively as before. Your company agrees to buy one of the higher end models to accommodate noise reduction

What types of controls are in place to prevent injury to hearing?

Elimination?

Yes! The old machine that was much noisier was removed

Substitution?

Yes! It was replaced with a newer model

Engineering?

No. No engineering controls were involved here

Administrative?

No. No administrative controls were involved here

PPE?

Yes! Employees are still required to wear hearing protection but no longer required to wear double hearing protection

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Knowledge Check: Situation 2

- You are working in a large industrial shipyard. These shipyards have large drydocks for servicing ships that are roughly 50 ft deep. The drydocks are surrounded by guardrails that also have warning signs posted all around them warning not to lean on the railing and warning of a fall hazard. When you were hired, you also had to take an introductory safety course for the shipyard that warned you to not lean on the guardrails around the drydocks. The workers who are trained and qualified to work on the vessels in the drydock must always wear their fall protection, hard hats and safety glasses.

What types of controls are in place to prevent injury in and around the drydocks?

Elimination?

No. the drydocks cannot be removed

Substitution?

No. the drydocks are the only way to effectively service vessels

Engineering?

Yes! The guardrails are a type of engineering control

Administrative?

Yes! The mandatory training, and warning signs as well as the additional training for the qualified workers are all types of administrative control

PPE?

Yes! The workers who are qualified must wear their fall protection as well as other PPE before beginning work on the vessel

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Knowledge Check: Situation 3

- You were hired in a lab that uses temperature baths with a silicone based oil heat transfer medium. You are curious about the health effects of the off-gas product because you notice that you get headaches and nauseous and don't feel well when the bath gets up past a certain temperature. You look at the Material Safety and Data Sheet (MSDS) for the oil and it says that it off-gasses formaldehyde when heated past 200 °C. You bring this up to your boss and a fume hood is installed. They also tell you to only use the bath if absolutely necessary (it is required for some equipment), opting for a device that doesn't have an oil medium and an exception procedure will be written.

What types of controls are in place to prevent illness?

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Elimination?

No. the bath is a requirement for some equipment

Substitution?

Yes! The bath doesn't have to be used all the time and a non oil medium can be substituted

Engineering?

Yes! The fume hood is a type of engineering control

Administrative?

Yes! The procedure can be rewritten to allow for the use of a non oil medium

PPE?

No. While it is a requirement for technicians to wear safety glasses around the bath, it does not apply to this particular scenario

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Key Take Away

- If something doesn’t feel safe, talk to your supervisor
- You can work with management to create effective safety controls
- Take your safety into your own hands, and protect yourself and others by reporting suspected unsafe working conditions
- Ask for PPE when other control methods aren’t an option
- Know your rights to safety as an employee by visiting OSHA’s website

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End of Show

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