ROOT CAUSE ANALYSIS (RCA)

Root Cause Analysis (RCA)
A structured evaluation method that identifies the root causes for an undesired outcome and the actions adequate to prevent recurrence. Root cause analysis should continue until organizational factors have been identified, or until data are exhausted.

RCA is a method that helps professionals determine:
• What happened.
• How it happened.
• Why it happened.
• Allows learning from past problems, failures, and accidents.

The objective of RCA is to identify "root cause(s)" so that these latent failures may be eliminated or modified and future occurrences of similar problems or mishaps may be prevented. When performing root cause analysis, it is necessary to look at more than just the immediately visible cause, which is often the proximate cause. There are underlying organizational causes that are more difficult to see, however, they may contribute significantly to the undesired outcome and, if not corrected, they will continue to create similar types of problems.

• **Analysis Pitfall:** If root cause analysis is not performed, and the analyst only identifies and fixes the proximate causes, then the underlying causes may continue to produce similar problems or mishaps in the same or related areas.

• *For example:* A fuse blows out and cause(s) the lights to go off. You can identify the proximate cause, "fuse blew", and replace the fuse. You can also identify the intermediate cause "a short" and repair the wire that shorted. However, if you do not identify and correct the organizational factor that led to the fuse going out (e.g., wiring not maintained because there was insufficient maintenance budget), other systems may have similar failures due to lack of maintenance. Root cause analysis seeks to identify the systemic problems, such as lack of maintenance budget, and correct these so that related problems or mishaps do not occur.

RCA Process:

1. Describe in as much detail as possible what the production process was, what the employee(s) was doing, what happened leading up to the injury, and what the end result was – the injury or damage.

2. Start at end result. Working from the end, ask the question “why” five times or until there are no more answers to your question - answering at each point.

3. Assign a cause to each answer if at all possible using the attached causal flow chart. Causes should be reviewed for Acts, Preconditions, Supervision, and Organizational Influences.

4. Determine necessary corrective actions.

5. Assign the corrective action and date of completion.

6. Follow up to ensure the corrective actions have been completed.

It is beneficial to conduct a brain storming session with management and field personnel. Brainstorming should have no boundries and should be a totally open environment where people feel free to share ideas without fear of repercussion. It is suggested that an Accident Review Committee or management team hold regular meetings to discuss and address recent incidents and injury. Corrective actions should be shared and made available to all affected parties and locations.

Root Cause Example:
A man was using a riding lawn mower to cut grass working with a crew of 3 guys and when he slipped and cut his toes of the right foot off. Starting at the end result:

1. Why did the employee amputate toes?– Answer; he slipped and his foot went into the mower deck.
2. Why did he slip – Answer; grass was wet and soles of shoes were designed for smooth surfaces (indoor uses).
3. Why did his foot go into the mower deck? - Answer; The guard was removed so he could get close to walls and trees.
4. Why did the guarding issue pass pre-use inspection? – Answer; It has always been that way and kind of an unwritten rule of acceptance.
5. Why was the mower running when he got off? – The interlock switch was cross wired (bypassed) to allow this.
6. Why was the interlock safety bypassed? – The guys in the field did this so they didn't have to start and stop every time they got off to move a table.

Sample Identifiable "Root Causes"

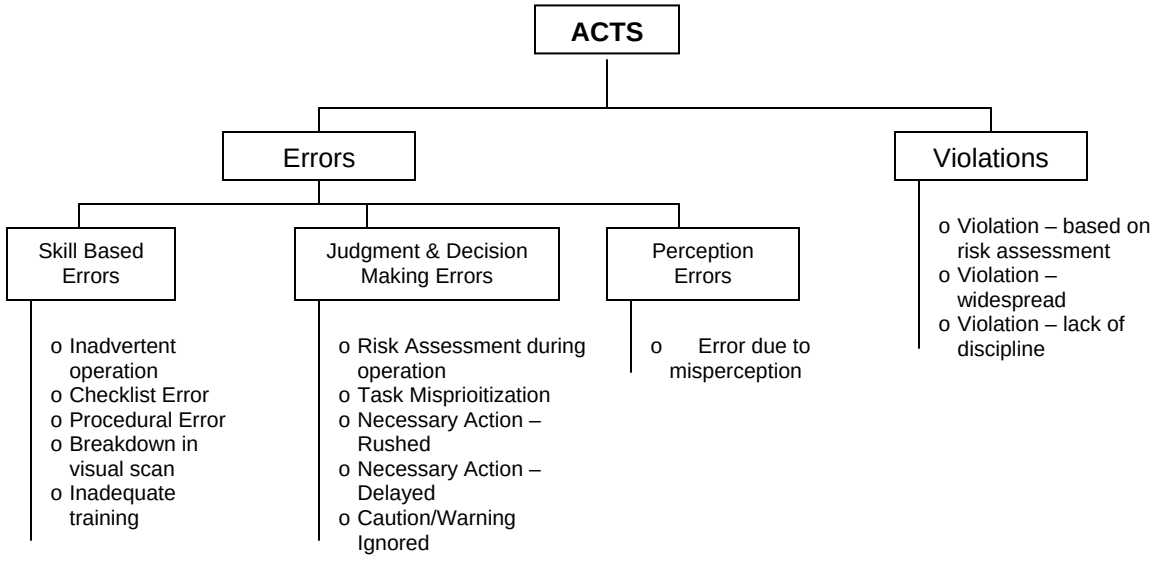
A. Improper shoe for the job potentially
B. Could be a process issue with cutting grass when wet
C. Improper guarding – guard removed from mower deck.
D. Poor employee training on equipment safety inspection and machine guarding requirements.
E. Failure with management safety oversight for not enforcing machine guarding requirements – cultural.
F. Failure with management safety oversight for not enforcing machine guarding requirements – training.
G. Failure with management safety equipment inspections

Sample Corrective Actions

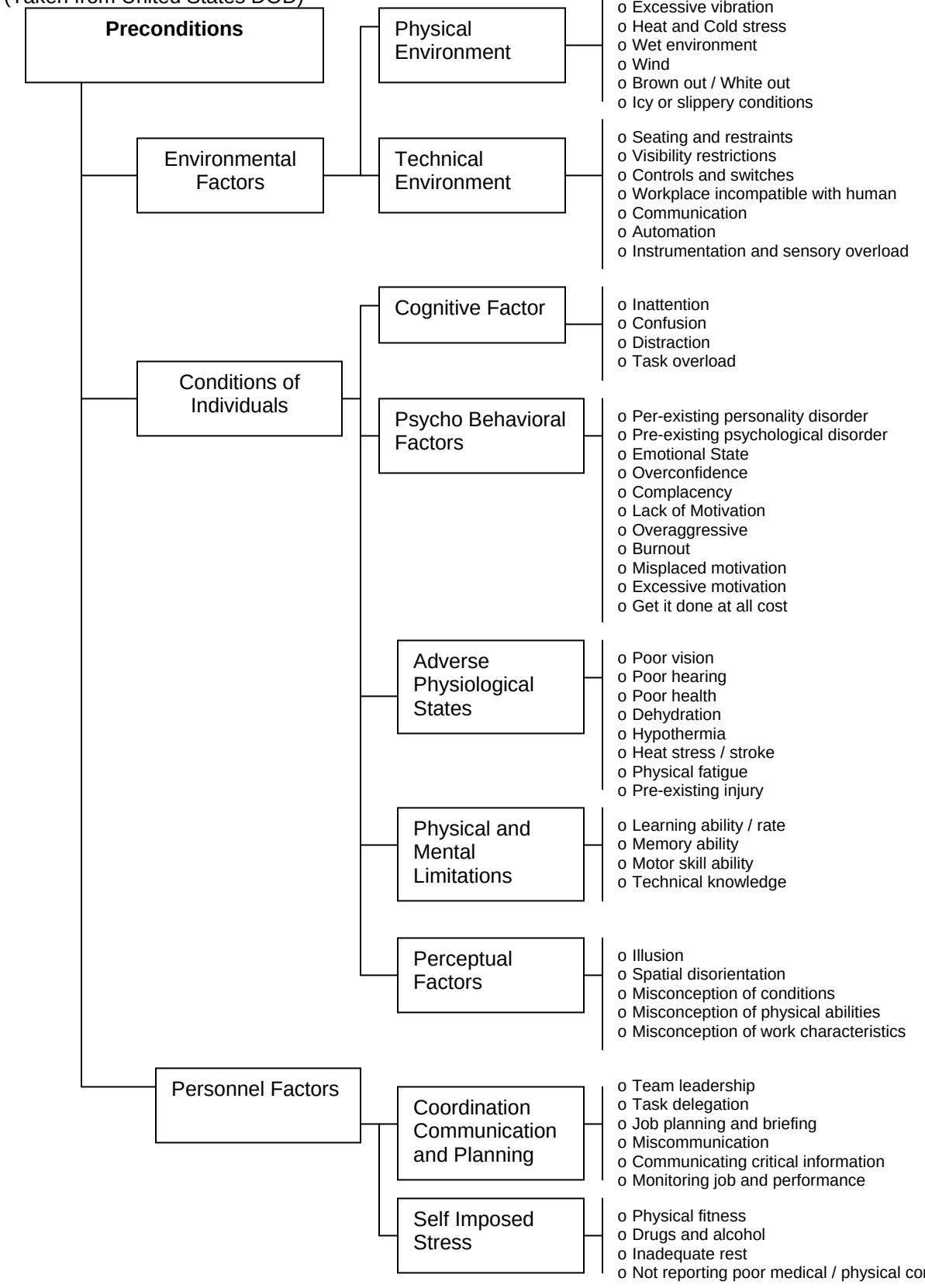
1. Establish new policy for work. Review cutting grass while wet.
2. Look at changes to boot program; require a different sole for maintenance persons.
3. Retrain employees on equipment safety inspection and machine guarding requirements.
4. Inspect and Replace the guards on ALL lawn equipment.
5. Supervisors will be retrained on safety rules and will be expected to educate and reinforce on site.
6. Supervisors in department will be disciplined for their lack of enforcement to company rules.

ROOT CAUSE ANALYSIS TABLES

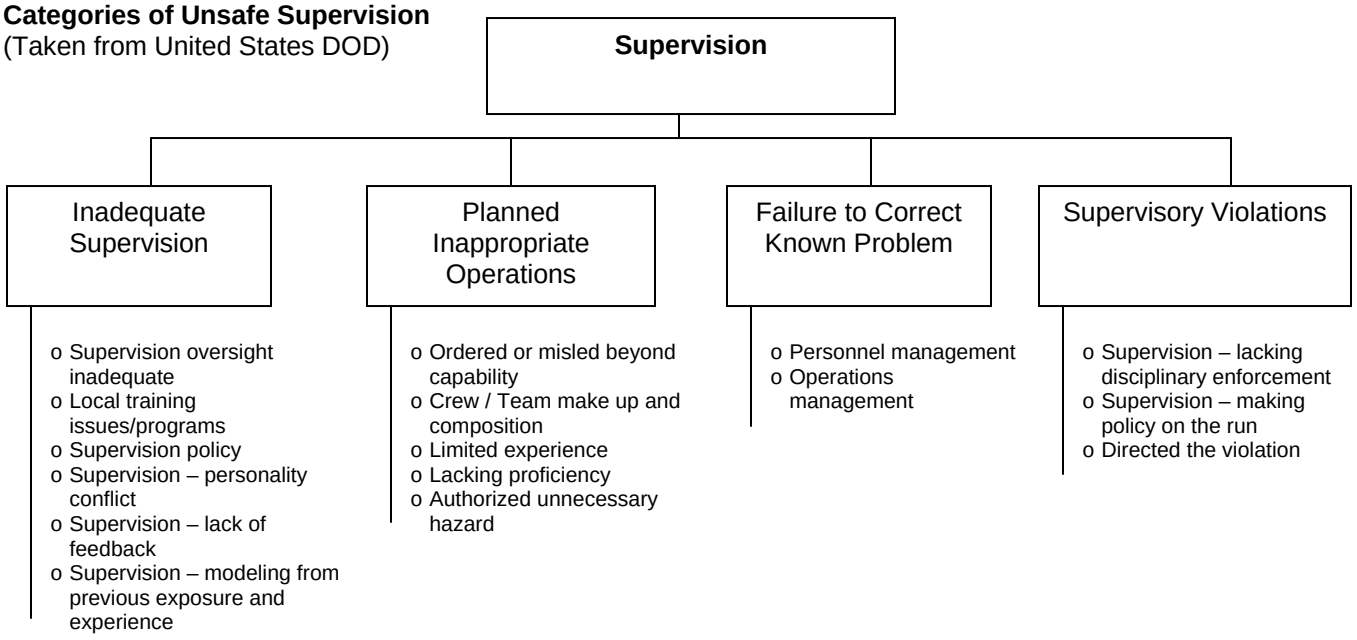
Categories of Unsafe Acts
(Taken from United States DOD)



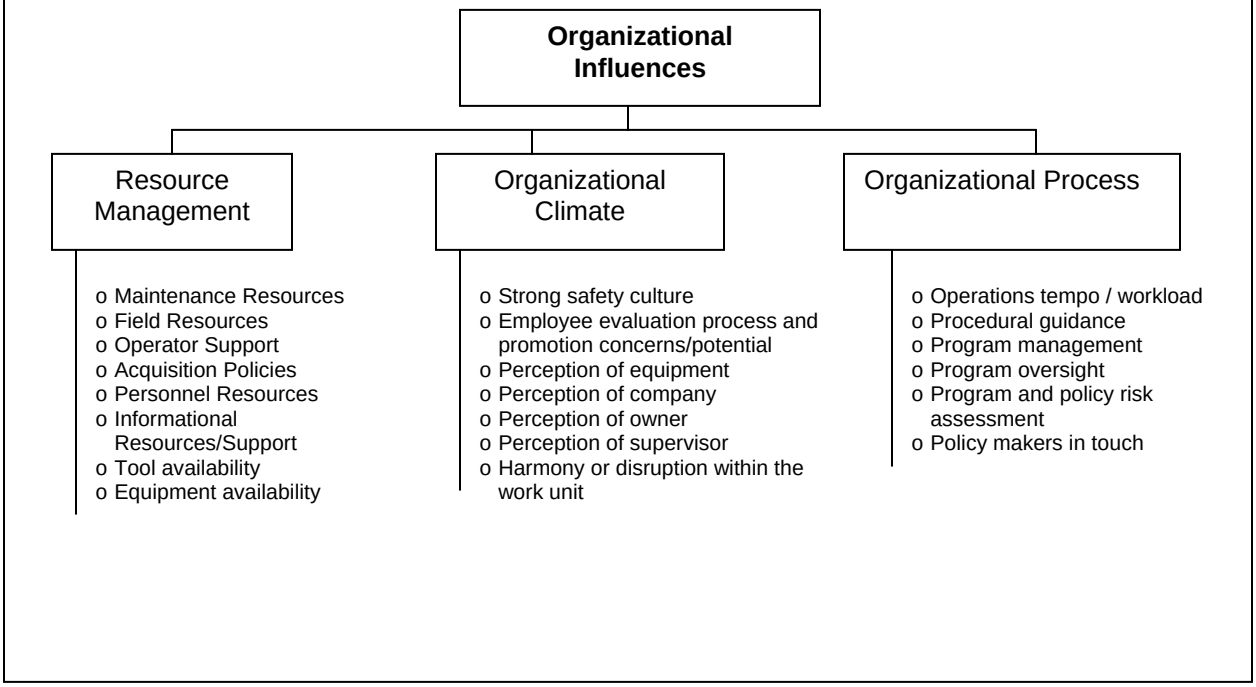
Preconditions for Unsafe Acts
(Taken from United States DOD)



Categories of Unsafe Supervision
(Taken from United States DOD)



Categories of Organizational Influences
(Taken from United States DOD)



RCA Form

Injured Worker:	Date:
Job Location	Supervisor:

Description of Accident / Incident:

5Y Process; Start at end result and work backwards. Review sample attached if necessary

A. WHY DID THE EMPLOYEE (INSERT INJURY)

B. WHY DID (A) HAPPEN?

C. WHY DID (B) HAPPEN?

D. WHY DID (C) HAPPEN?

E. WHY DID (D) HAPPEN?

F. WHY DID (E) HAPPEN?

Continue on back or add second sheet if you run out of space.

Root Cause	Corrective Action	Assigned to:	Date Completed

Continue on back or add second sheet if you run out of space.