

Root Cause Improvement (RCI) Program



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The UW Facilities RCI program is based on information found in *Root Cause Analysis Handbook, Third Edition*, ABS Consulting, publisher Rothstein Associates Inc. Houston, TX (2008).



B. PURPOSE

Our organization experiences a wide range of incidents from near misses to major accidents. Investigating incidents is important to identify causes so we can prevent re-occurrence and continually improve our processes. The Root Cause Improvement process is designed to help our organization learn from past performance and develop strategies to improve our safety, quality and reliability performance.

C. DEFINITIONS

Additional Information is included in the timeline to include less significant events or conditions that provide better understanding of the incident. Additional Information is represented as blue ovals  on the timeline diagram. There may be as many blue ovals as needed.

Causal Factor(s) are actions by frontline personnel, performance gaps or equipment failures that caused an incident, allowed an incident to occur, or allowed the consequences of the incident to be worse than they might have been. Causal factors are represented as yellow 'sails'  on the timeline diagram.

Direct Cause is the specific event that leads immediately to the adverse effect without any intervening events. The direct cause is represented as a black trapezoid  with text and labeled direct cause, on the timeline diagram. There is only one direct cause for each timeline.

Frontline Personnel is an individual in the organization who is directly involved in providing the organization's final product or service.

Intermediate Cause is an underlying reason why a causal factor occurred, but it is not deep enough to be a root cause. They also link causal factors and additional information to root causes.

Management system is a system put in place by management to encourage desirable behaviors and discourage undesirable behaviors.

Positive Actions are the desirable decisions, actions, processes, practices or existing documents that were in place or occurred during the incident. Positive actions are represented as a green circle  on the timeline diagram, and there can be as many green circles as needed.

Root Cause(s) are deficiencies in management standards, policies or administrative controls (SPACs) that allow causal factors to occur or exist. Root causes must be within the control of

management to address. There are one to four root causes for a typical causal factor. Root causes are represented as red hexagons  on the timeline diagram.

SPACs are management systems such as standards, policies or administrative controls.

Timeline is a chronological sequence of events, which should include date and time if relevant to the incident. Only one detail or event should be in each building block, but there can be as many rectangles as needed. The main timeline event is represented by the purple squares  with text on the timeline diagram.

D. IMPROVEMENT PROCESS

Selecting Incidents for Improvement Evaluation

UW Facilities Safety staff may investigate incidents/accidents that will promote policies and procedures which will drive dynamic behavioral change.

Examples of such cases are:

- Incidents that are repetitive, for example three custodians injure their arm tossing garbage into a dumpster
- Incidents that are chronic, for example multiple cases of hearing loss each year
- Incidents that require medical aid beyond first aid, for example stitches, sling, brace
- Incidents with lost work days or restricted work days
- Incidents that are near misses with potential for serious injury or loss
- Incidents that expose management system flaws, for example incidents that occurred because no Job Hazard Analysis (JHA) or Hazard Review Checklist (HRC) existed, no good faith survey, etc.

Serious incidents, as defined by Environmental Health & Safety (EH&S), will be investigated by EH&S with the assistance of UW Facilities. The UW Facilities process will not be used.

1. Assemble the Team

The Team Leader will be the embedded Safety staff of the affected Department, or if none, a member of the Facilities Employee Safety unit. The Team Leader will solicit the assistance of another Facilities Safety staff member based on availability and/or subject matter expertise.

The team would also include frontline personnel involved in the incident, second frontline personnel as the same job title (from different shop/zone if feasible), and the Supervisor of the frontline personnel involved in the incident. If appropriate, the Team Leader would invite a subject matter expert (SME) from EH&S.

2. Initiate Data and Information Collection

Data collection is an important step in analyzing the hazard. Without complete information and an understanding of the event, the causal factors and root causes associated with the event cannot be identified.

Prioritize your data gathering based on how fragile the information is. Data may include:

Pictures

General photos of incident scene, wide field of vision to close up of individual components or scene. Photographs or video of failed components/scene from multiple angles, stains, residues, foreign components.

Interviews

- Schedule group interview for all identified participants and team members to attend
- Explain the intent of process. Emphasize it is not linked to disciplinary action, but rather to improve safety
- Have the affected frontline personnel re-enact the incident step by step, include the time of day, physical conditions (raining, lighting, etc)
- Ask open-ended questions. Do not use leading or accusatory questions
- Maintain impartially and avoid assigning fault or blame
- Don't try to solve the problem; collect facts only

Logs

- Equipment logs
- Daily/weekly/monthly inspections

Reports

- AiM reports
- TMS Reports
- Department specific reports

3. Create Timeline

Develop a chronological sequence of events using Post-Its™ as the individual tasks or building blocks in the event. (Post-Its™ allow you to move the building blocks into the final version). Allow one event or condition per building block. Each building block should contain:

- A complete sentence
- Only one idea
- Avoid using and, but, or, because, then, why
- Be specific: who, what, where, when, how

Once developed, check that each of the four rules for completeness are present on the chart for each building block.

1. Why did the event or condition occur?
2. If the events and/or conditions occur, will the event or condition ALWAYS occur?
3. Are there any safeguards that should have prevented the event or condition for occurring?
4. Are there any other potential causes of the event or condition?

Insert additional building blocks as needed to complete the event/condition. Then repeat the four rules for completeness.

a) Narrative Section

From the building blocks, create a narrative description based on the completed timeline. Have the affected parties and supervisors review the narrative section for accuracy and feedback.

b) Timeline Flowchart

Transfer each building block's information into a purple "rectangle" on the Timeline Flowchart template (see Appendix A). If the building block information is informative, use a blue "oval" on the Timeline Flowchart template.

4. Identify Causal Factors

Using the Timeline Flowchart, look at each building block to determine the casual factors (personnel actions or equipment failures. Ask yourself, "If this building block did not happen – would the incident been prevented or reduced its severity). List each casual factor in the yellow 'sail' box above the associated building block on the Timeline Flowchart.

An incident will typically have several causal factors. Rarely is there just one causal factor; events are usually the result of a combination of causal factors.

5. Identify Root Causes

Every causal factor will have an associated root cause(s). Use the Root Cause Map to determine the management SPAC involved and action necessary to correct the casual factor.

Note - if you select Personnel/Performance issue - Individual Issue, you have probably selected the WRONG cause. Check other parts of the root cause map thoroughly before using this section.

a) Root Cause Summary Table

After all causal factors and root causes are identified complete the Root Cause Summary Table (see Appendix B).

Assign an individual to implement each improvement. The individual must have the authority to correct the item.

Completion dates should be based on the risk associated with the root cause and be timely to prevent reoccurrence of any similar incident.

6. Improvement Plan

The Improvement Plan Summary Table can be found on the RCI Report – Section 9).

7. Document the Investigation – RCI Report

Use the RCI Report template (see Appendix C) to communicate the team’s findings. The report should include:

- General Incident information
- Executive summary
- Previous incidents
- Incident description
- Immediate actions taken
- Timeline Flowchart
- Positive Actions
- Root Causes Identified
- Improvement Plan

Hints for successful reporting:

- **It is mandatory to leave people’s names out of the report.** Refer to them by their title (eg Operator #2, Technician B).
- Do not wait until the investigation is over to begin writing the report.
- Have a peer review it for technical accuracy, writing clarity, and grammatical error.

- Reference all materials used during the investigation, but only include the information required to communicate the results to your audience.
- Identify equipment and positions of individuals in the incident in enough detail to allow the reader to understand the incident (include a drawing and/or pictures).

8. Report Review by Affected Department Manager and Director

Submit the draft RCI Report to the affected department manager and director for review and comment.

Incorporate any comments as necessary and finalize report.

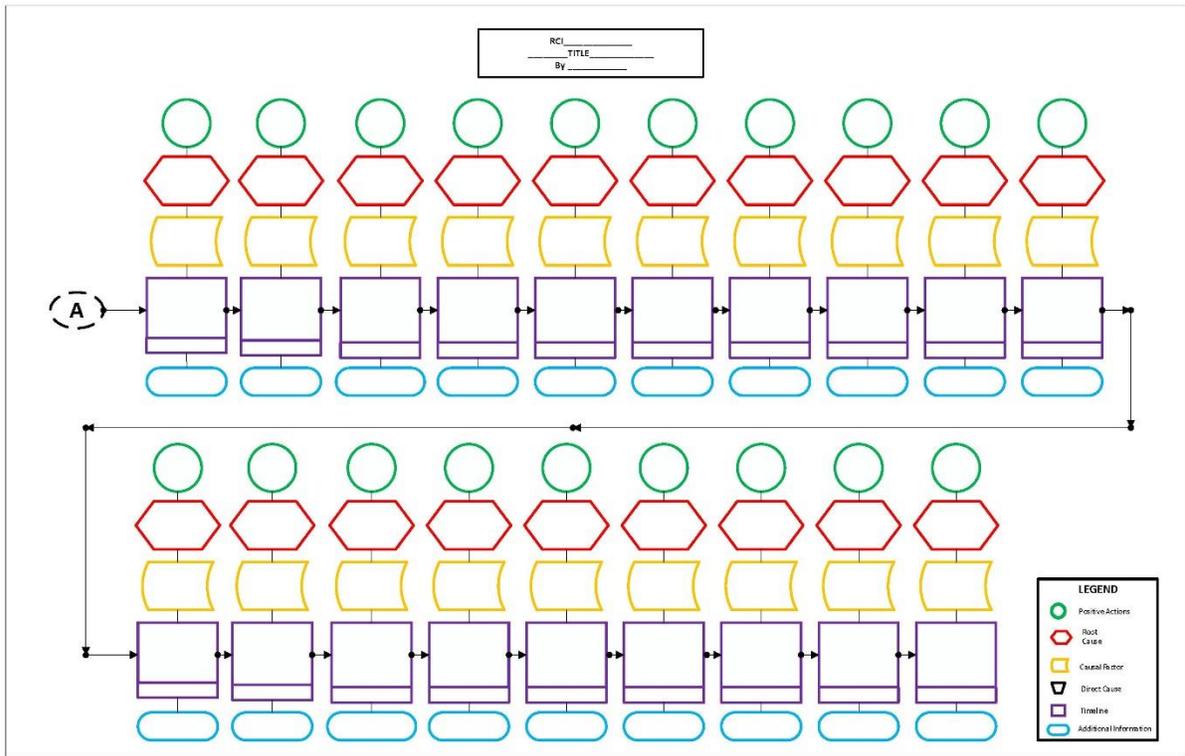
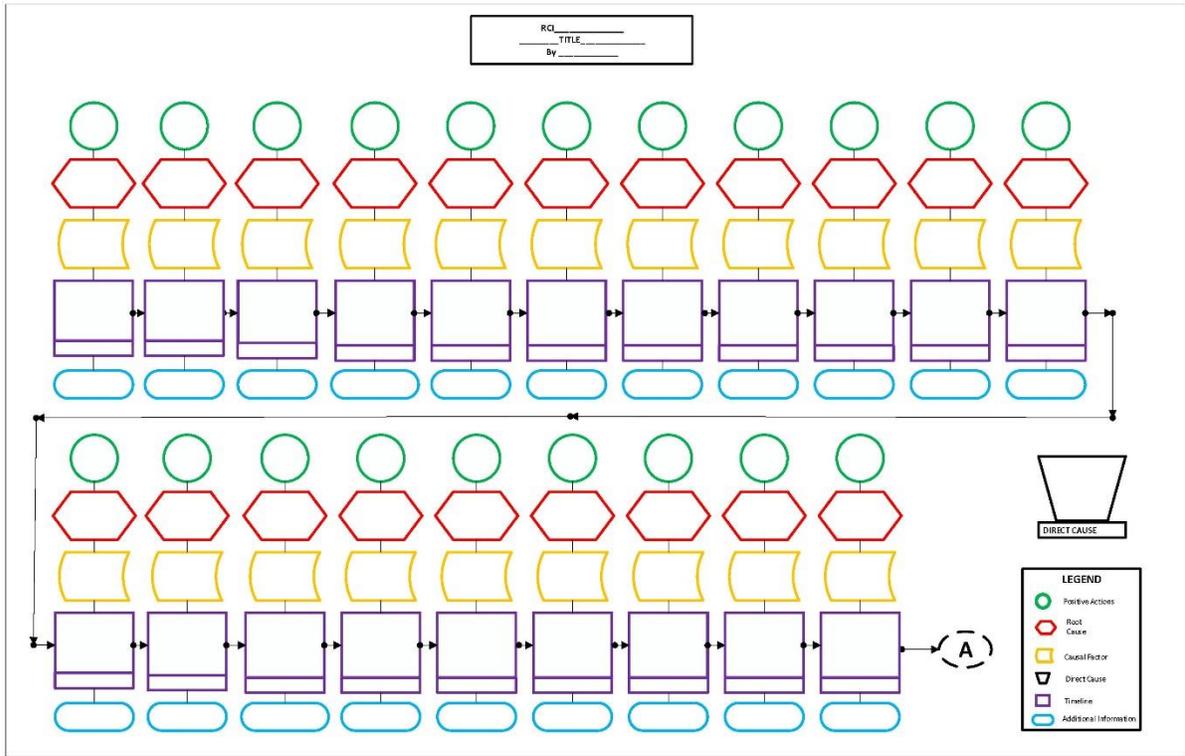
9. Improvement Tracking

Input the RCI Report information into the RCI Application.

10. Present Case to Leadership

Upon completion of the case, it will be presented to UW Facilities executive leaders to endorse improvements, so incidents are not repeated.

Appendix A – Timeline template example



Appendix B – Root Cause Summary Table Worksheet example

Root Cause Summary Table Worksheet for Case _____ Date: _____

Event Description:

Casual Factor	Root Cause
1.	1.
2.	2.
3.	3.
4.	4.

Root Cause	Improvements	Assigned To	Completion Date
1.			
2.			
3.			
4.			

Appendix C – Root Cause Improvement Report template

<https://root-cause-improvement.firebaseio.com/app.htm>