

# Environmental Management System

## How to Conduct a Root Cause Analysis

### *What is a Root Cause Analysis?*

Root cause analysis is the process of finding and correcting an underlying problem. Organizations use root cause analysis in investigating Environmental Management System (EMS) non-conformances, typically at the direction of the Environmental Management Representative (EMR). Root cause analysis will primarily be performed by supervisory staff or the EMR. The EMS Core Team will review selected root cause analyses and monitor systemic issues identified. The three basic steps of root cause analysis are: (1) Define, (2) Analyze, and (3) Prevent.

### Step 1: Define

Investigate to gather data to better understand the issue. Relevant sources of information could be audit results, on-site observations, or staff interviews. When conducting the investigation, be collaborative and non-accusatory. The purpose of root cause analysis is to identify and prevent the underlying cause, not to assign blame. When gathering data, consider the situation from various perspectives and investigate multiple paths, such as:

- The conditions of staff when the incident occurred,
- Any vendor involvement,
- The mechanical systems and physical environment,
- The environmental legal obligations,
- Existing policies and procedures, and
- Other applicable factors.

#### Example Investigation Questions

- What were the conditions?
- What proof exists?
- When did the problem start/end?
- What is the impact?

### Step 2: Analyze

Evaluate the available data to determine the root cause(s). The “Five Whys” tool is one good method. Start by asking, “Why did this situation occur?” Then ask “why?” to that answer. Continue to probe into the matter by asking “why?” up to 5 times to get past the superficial, immediate causes. Although this sounds like a simplistic approach, solutions to a complex problem can be unveiled by not simply accepting the first obvious answer. Notes: (1) You may not always need all 5 “whys” to reach the root cause and (2) the last answer may not always be the root cause.

Consider an example non-conformance where a drum containing hazardous waste is not labeled.

**1<sup>st</sup> Why:** Why was the drum not labeled?

**Answer:** We ran out of the labels.

**2<sup>nd</sup> Why:** Why did we run out of labels?

**Answer:** The employee who used the last label didn't inform the inventory manager because he didn't know the regulatory requirements.

#### Example Root Causes

- Human factors (training, supervision, distraction, etc.)
- Design defect
- Equipment defect
- Records/Documentation
- Purchasing practice
- Permit incomplete
- Maintenance failure
- SOP deviation
- Lack of SOP

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**3<sup>rd</sup> Why:** Why didn't the employee know the regulatory requirements?

**Answer:** He wasn't trained on the waste handling work instructions.

**4<sup>th</sup> Why:** Why wasn't training provided on the work instructions?

**Answer:** The employee was on vacation when the manager provided training on work instructions.

**5<sup>th</sup> Why:** Why didn't the employee get trained when he got back from vacation?

**Answer:** Poor tracking of employee training.

If the analysis had stopped at the first why, the immediate problem of getting a label for the drum may get fixed, but the systemic problem in the training program may not have been uncovered.

### Step 3: Prevent

Determine both long- and short-term corrective/preventive actions to reduce the likelihood of a future occurrence. This is part of the EMS continuous improvement cycle. Provide a detailed description of the



actions needed to correct and prevent the root cause. There may be several corrective/preventive actions or multiple steps for a single action. In the unlabeled drum example above, immediate corrective action is needed to label the drum and a longer-term preventive action is needed to improve the employee training program.

Seek input from staff at the affected facility or department. Identify potential responsible parties to implement the actions.

The EMR will review the recommendations and notify the appropriate manager for implementation. The EMR will also verify that corrective/preventive actions which are implemented have addressed the non-conformance.

### *Why Do Root Cause Analysis?*

Root Cause Analysis goes beyond the "find and fix" approach by:

- Reducing risk of reoccurrence, which reduces overall costs.
- Addressing the underlying problem, reducing the potential for another, larger impact.
- Providing a longer term solution by treating more than just the "symptoms" of the problem.
- Meeting the Iowa standard for EMS.

If you have questions or suggestions, contact your supervisor or the EMR.

#### Example Corrective/Preventive Actions

- Clean up spill
- Revise the SPCC/SWPP Plan
- Develop an SOP
- Use a different material
- Change design/construction
- Develop an approval process
- Provide training
- Revise content of training
- Audit more frequently
- Share results with another facility