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ROOT CAUSE ANALYSIS TEMPLATE

ROOT CAUSE ANALYSIS (RCA)

<PROJECT NAME>

COMPANY NAME
STREET ADDRESS
CITY, STATE ZIP CODE

DATE

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INTRODUCTION

This section highlights the purpose and importance of the root cause analysis (RCA). It provides a discussion of the approach taken to identify and document the root cause of a particular problem and the follow-up actions necessary to properly address the root cause. It also highlights what root causes should/should not consist of.

The purpose of this root cause analysis (RCA) is to determine the causes that contributed to the recent fiber optic cable project's material failure in the research lab. From this RCA we will determine exactly what happened during the failure event, how it happened, and why it happened. In order to accomplish this, a formal investigation will take place among an investigative team assigned by the Vice President of Technology. Once the team identified what, how, and why this event occurred, a list of root causes will be developed. This list of root causes will then be used to implement any changes necessary in order to prevent another similar failure.

It is important to note that for the purpose of this RCA, root causes should be:

- As specific as possible
- Reasonably identifiable
- Able to be managed/controlled

Careful consideration must be given to all findings related to this RCA as these findings, as well as their corrective measures, will impact the TruWave project. Formal communication with the TruWave project team must be conducted throughout and upon completion of this RCA.

EVENT DESCRIPTION

This section provides a description of the event that is being analyzed. It provides a clear and concise description of the problem that triggered this Root Cause Analysis. It should state the date, time, detailed description of the event/problem, who detected the problem, who it affected, and how it affected them. It is important that the descriptions are as detailed as possible since this problem is the source of the entire RCA.

On Friday morning, June 1, 20xx at 9:18am a failure occurred on cable line #2 during the trial run of our new fiber optic cable product, TruWave. The line technician on duty, Joe Smith, noticed that the polyethylene cable jacketing was deformed as it exited the extrusion device. Instead of a uniform distribution of the jacketing material, the jacketing material was thicker in some areas and thinner in others. The technician also noted that there were significant tears in the material and other areas with no jacketing leaving the cable core exposed. Mr. Smith immediately shut the cabling line down, preserved all of the data in the cabling line computer, and notified his supervisor, Janet Brown, per company procedure.

This event affects the entire TruWave project team and stakeholders as it may require changes in the scope, cost, and/or schedule of the project. This investigation may result in the need to make design changes, process changes, or other modifications that may delay project completion and product release currently scheduled for October 1, 20xx and January 1, 2010 respectively. As previously stated, all findings and corrective actions must be formally communicated with the project team.

CHRONOLOGY OF EVENTS / TIMELINE

In this section you are to provide a detailed chronology of the events leading up to, and following, the problem. This is an important piece of the RCA as the chronology of events may lead to clues in determining how or why the problem occurred. Be sure to include names, times and detailed descriptions of all activities.

9:00 AM - Friday June 1st 20xx
Cabling line #2 was powered up in the research lab by technician Joe Smith.

9:02 AM - Friday June 1st 20xx
Technician Joe Smith manually enters process data and parameters for experimental cabling run of TruWave product.

9:07 AM – Friday June 1st 20xx
Technician Joe Smith completes loading of cable core material onto feeder spool and awaits cabling line computer acknowledgement that the line components have reached all temperatures and are ready for operation.

9:13 AM – Friday June 1st 20xx
Technician Joe Smith receives acknowledgement that the line is ready for operation and initiates cabling start.

9:16 AM – Friday June 1st 20xx
Technician Joe Smith notices the first anomalies in the cable jacketing as it exits the extrusion device. No steps are taken as it is considered normal for there to be a high degree of deformity within the first 20-30 meters of a cable run.

9:18 AM – Friday June 1st 20xx
Technician Joe Smith notices that the deformity is still present beyond any reasonably expected length of a cable run. He immediately initiates the shutdown sequence of the cable line which includes preserving all data in the computer for any follow on investigation.

9:20 AM – Friday June 1st 20xx
Technician Joe Smith completes line shutdown procedures and data preservation and immediately notifies his supervisor, Janet Brown.

9:22 AM – Friday June 1st 20xx
Supervisor Janet Brown arrives at cabling line #2 and verifies that all shutdown sequences and data preservation have been performed. She speaks with Technician Joe Smith and records his version of the event. She then assigns technician Joe Smith to another task and reports the incident to the TruWave Project Manager, Dan White.

INVESTIGATIVE TEAM AND METHOD

This section should describe how the investigative team is assembled, who it consists of, and how it gathers the data to be used in the analysis. As with any process, it is important in the RCA that clear roles and methodologies be established in order to allow for the process to move in a controlled and deliberate manner. This is also an important part of the RCA because a majority of time spent in RCA is gathering data about the event/problem.

The investigative team for this RCA has been selected by the Vice President of Technology who oversees all research and development projects. The following individuals comprise the team:

Marcy Black – Lead Material Engineer and RCA Team Lead
John White – Lead Process Engineer
David Green – Lead Design Engineer
Jane Brown – Quality Assurance Engineer

For this RCA the investigative team will use interviews with employees involved in the event. The team will also download and analyze the process data from the cabling line #2 computer that was preserved immediately following the event. The team will utilize other tools and techniques at its discretion based on the complexity of the data and event (e.g. Ishikawa diagram).

Once the findings and root cause(s) are determined and the corrective actions are identified, this analysis will be communicated to the TruWave project team. The purpose of this is to allow the project team to implement corrective actions, make appropriate changes to the project plan and schedule as well as other project documentation, and communicate these changes to the appropriate stakeholders. This will also serve as a lessons-learned and be archived for reference on future cable development projects so this root cause does not occur again.

FINDINGS AND ROOT CAUSE

This section should describe the findings of the investigation and explain the root cause(s) based on these findings. It is possible that a RCA results in findings that are not directly related to the root cause of the problem. These should also be captured as product/process improvement steps in an effort to improve the product/project. It is important to note that this section does not describe the corrective actions to be taken as a result of identifying root cause. Corrective action will be discussed separately in the next paragraph. All findings must be formally communicated with the project team in order to ensure any project changes can be made in accordance with the project's change management process.

Based on the investigation conducted for the TruWave cable failure event on June 1st 20xx, the team has determined several findings regarding this event:

1) The temperature of the extrusion device was found to be too low at 400 degrees F instead of the approved 525 degrees F.
2) The low extrusion temperature did not melt the polyethylene properly to ensure uniform distribution along the cable length.

3) The technician, Joe Smith, manually entered the temperature as well as other process parameters. According to the computer log he manually entered 525 degrees F but did not hit the <Enter> key and after 10 seconds the computer defaulted back to the 400 degree F temperature.
4) Technician Joe Smith performed all shut down and data preservation procedures correctly and notified his supervisor within an appropriate amount of time.
5) All other cable products have process profiles built into the lines to prevent any manual entry of process and temperature data. This safeguards against any operator error in manually entering process parameters.

Based on the above findings the investigative team has determined that the root cause for the TruWave trial cable failure was operator error in that the manual temperature setting for the extrusion device was incorrect. While the operator attempted to set the temperature correctly, he did not hit the <Enter> key after setting the temperature and did not ensure all settings were correct before initiating the cable run.

CORRECTIVE ACTION

As the purpose of the RCA is to determine the root cause of a problem, it should result in some corrective actions that may be taken to ensure the same problem is not repeated. Often, these corrective actions will result in changes to a project's scope, schedule, or cost. It is imperative that all of the findings and corrective actions are detailed and formally communicated with the project team so changes can go through the change management process and be implemented in the project plan upon approval.

Based on the findings of the TruWave cable failure event on June 1st, 20xx the RCA team has determined the following corrective action to prevent a repeat of this incident:

All project teams establish process parameters within which their trial cables must be built on the cabling line. Previously, line technicians would manually enter process parameters into the line computer since these cables were not yet part of production. The RCA team proposes that process parameters for trial run cables also be pre-programmed into the line computers prior to trial runs in order to prevent entering incorrect data as a result of human error. Under this new process line technicians would simply select the correct pre-programmed file name associated with the trial cable instead of manually entering 30 lines of process parameters. The expected result of this corrective action is the elimination of human error associated with future trial cables runs.

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