3.4.1 CURRENT REALITY TREE

The purpose of the current reality tree (CRT) is to identify the cause and effect relationships that characterize current reality. In the process of developing the cause–effect relationships the CRT tree lends itself to distinguishing between root cause/s and symptoms. At this stage it may not be clear what the system is, it’s purpose, its scope or what is constraining its performance. The CRT forces those preparing the tree to create logical links between the cause and effect entities to help build out the purpose and the system. Identifying the root causes is then a pursuit of what is currently stopping the system from achieving more of its stated goal or to identify a system’s core strength.

Creating a current reality tree involves the following sequential steps:

3.4.1.1 RECORD A LIST OF UNDESIRABLE EFFECTS (UDE’S) THAT DESCRIBE THE SYSTEM’S BEHAVIOR OR PERFORMANCE

UDE’s are statements that provide evidence a problem exists. UDE’s are a standalone statement of reality that describe the negative effect. Select the top say 5 UDE’s to start the CRT development process. e.g.

1. Equipment is failing during normal operations.
2. Equipment is failing frequently within a regular shift.
3. Regular maintenance does not appear to improve the performance of the equipment.
4. Repair times are getting longer for the same repair job.
5. When new operators operate equipment, the incidence of equipment breakdowns increases.

Avoid entity statements that propose the absence of a solution. This tends to infer that you already know the solution (or part thereof) before the analysis has been completed.

3.4.1.2 Diagrammatically represent the entities that explains the effect-cause-effect-relationship

Identify relationships where either one entity is the cause for another or where two or more entities have a common cause (using the question ‘why’ to define the branches in a downward direction. Repeat this approach for all remaining entities. Use categories of legitimate reservation to ensure that ‘cause sufficiency’ exists (i.e. assuming the existing connection is valid, what other entity would need to exist in order for the logic to be complete?) and additional

91 Refer to Appendix 1 for a detailed explanation of the categories of legitimate reservation
cause\textsuperscript{92}. e.g. **IF** the supply dept. is continuously reducing the amount of spares held on site **AND** it is likely that some equipment is being pushed to operate well above its installed design capacity **THEN** repair times are getting longer and longer for the same repair job.

3.4.1.3 **Check for clarity and completeness**

Look to expand the tree by connecting the other effects and missing connections. Identify areas of incomplete or missing logic using an ‘if’ (preceding entity), and ‘then’ (succeeding entity)’ statement starting at the bottom of the tree. Where the ‘if then’ statement does not flow correctly, use the categories of legitimate reservation

\textsuperscript{92} This is the essence of the effect-cause-effect relationship which aims to validate the existence of a cause-and-effect relationship where proof of the relationship is difficult to establish. The cause-effect relationship is therefore validated by proving the existence of an additional effect that could only be present if the proposed cause actually exists.
to correct. E.g. IF there is the company’s equipment maintenance strategies are not up to date AND equipment maintenance practices are not in accordance with the preferred maintenance strategies AND a portion of the existing equipment continues to operate beyond their economic use date, THEN equipment fails frequently within the regular shift.

3.4.1.4 Validate Using the ‘So What’ Test

The ‘so what’ test seeks to identify that subset of the current reality tree entities that no longer qualify as UDE’s and need to be reworded or trimmed (removed) from the tree in order for the tree to clearly represent the system’s current reality.

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93 The CRT shown here has been developed for illustrative purposes and kept brief in order to not distract the reader from the purpose of providing a relevant example to help understand the TOC concepts and methodology.
Look for all entities with no incoming arrows – these are root causes. Look for any root cause which appears to have approximately 70% of the UDE’s connected to it; this is the core problem. If no core problem is evident look for and insert missing connections between the root causes to find the core problem. In the diagram, the root causes are circled in blue and the core problem is circled in red.