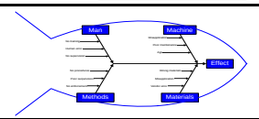
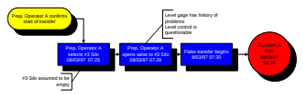
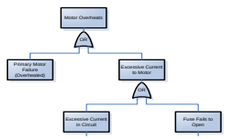
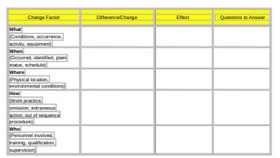
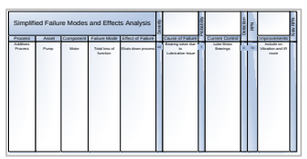
LIFE CYCLE INSTITUTE

ADVANCED ROOT CAUSE ANALYSIS TECHNIQUES

	TECHNIQUE	PURPOSE	APPLICATION	MEMORY JOGGER
1	Design and Application Review	Compares how a system is designed versus how it is applied; specifically in the areas of installation, maintenance, and operating requirements and limitations	Applies to all problems—not just asset related Non-asset problems—evaluate processes and practices	
2	Cause and Effect (Ishikawa or Fishbone diagram)	Plots the relationship between various factors that contribute to a specific event	Quality systems, product design, troubleshooting, brainstorming	4M – Man Machine, Method, Materials 
3	Sequence of Events	Displays the sequence of events leading to a failure, event, or incident graphically	Incidents where the time sequence is deemed critical to the evaluation of combined contributing factors	
4	Fault Tree Analysis (FTA)	States undesirable end (top) events and examines casual scenarios in a branched method	Systems wherein undesirable end events can be linked to all major contributing factors - equipment failures, design reviews	
5	Change Analysis	Compares the normal situation with the undesirable situation and determines changes that have occurred	Situations in which a change from normal configuration, operation or activity is likely to contribute or lead to an undesirable condition	What When Where How Who 
6	Failure Mode and Effects Analysis (FMEA)	Identifies likely modes of failure, occurrence frequency and detection mechanism for a given system, in a top-down approach	Product design, troubleshooting, generation of proactive measures for prevention of undesirable events	
7	Event and Causal Factor (ECF) Analysis	Describes, graphically, the time sequence of contributing events and existing conditions associated with an incident	Analysis of accidents and undesirable events Particularly effective for incidents that have primary and secondary events