

Abstract

Failure Modes and Effect Analysis (FMEA) is a fundamental reliability analysis tool used in industrial systems with many interacting components for failure modes identification and prioritization with the ultimate goal of eliminating the failure modes causal factors. It entails identifying equipment failure modes using a structured approach. The ability to perform effective failure modes identification and accurate procedure for failure elimination is critical for effective maintenance management. This paper aims to identify and prioritise critical recurrent and potential failures in corn milling plants using selected control parameters through the application of FMEA for purposes of improving critical milling plant sub systems reliability. Past research on corn milling plant case studies show that these industries experience frequent shutdowns and lack of equipment optimization resulting to high operations and maintenance costs. This research evaluated a corn milling plant's critical sub-systems failure modes and established that corn milling plants have priority sub-systems with critical failure modes whose failure consequence caused prolonged downtime and high downtime cost. Moreover, it was established that 'run to failure' (RTF) was critical and required close condition monitoring. This condition forced the milling plant maintenance team to apply failure based maintenance policy, a reactive corrective measure which was applied after sub-system failure to solve the failure occurrence. This crisis maintenance approach did not optimize maintenance function but instead led to failure effect characterized by unplanned prolonged downtime and hence correspondingly high down time cost. This paper presents a frame work for corn milling plant failure modes identification and prioritization for purposes of failure elimination to enhance milling plant equipment availability.