Center for Diagnostic Maintenance (CDM)
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Condition-Based Maintenance (CBM) and Prognostics has emerged over recent years as a significant technology that is making an impact on industrial maintenance practices. Technology is indeed witnessing a true paradigm shift in the way complex dynamic systems are designed, monitored, and maintained. Fault diagnosis and prognosis of the failing component's remaining useful life, as well as logistics support activates required to maintain, repair, or overhaul such critical systems, require active contribution from multiple disciplines. CBM technology is characterized by the merging and strong coupling of interdisciplinary trends from the engineering sciences, computer sciences, reliability engineering, communications, management, etc.

Engineering system designer can take advantage of CBM studies in order to design or redesign critical systems or processes so that they exhibit improved attributes of fault tolerance and high confidence. Prognosis is the capability that provides a prediction of the lead time to failure event in sufficient time for it to be acted on. Prognostic methods can range from the very simple to the very complex. To understand the role of predictive prognosis, one has to understand the relationship between diagnosis and prognosis capabilities. Envisioning an initial fault to failure progression timeline is one way of exploring this relationship.

Some of the major system diagnosis functional capabilities are in the domine of fault detection, fault isolation, advanced diagnostic technologies, predictive prognostic technologies, useful life remaining, time-to-failure predictions, component life usage tracking, performance degradation trending, false-alarm mitigation, fault accommodation, information management, right information to right people at right time.

The diagnostic and prognostic capabilities are the key enablers of the new and revolutionary maintenance concept being implemented today. All these diagnostic and prognostic technology elements, techniques, and capabilities must be applied and implemented wisely to obtain the maximum benefit impacts. The applications are in manufacturing systems, power plants, turbines, bearings, chemical plants, on-board car-engine diagnosis.

Condition monitoring equipment is used extensively in the energy, petrochemical, cement, steel, paper and pulp industries. In addition, these industries are constantly under economic pressure to reduce costs while increasing service and productivity.