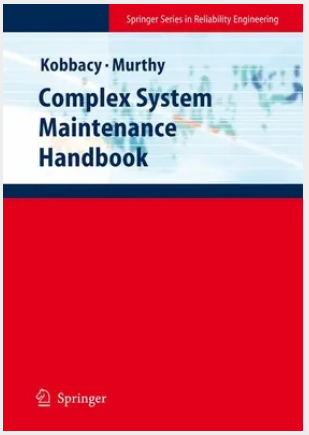
Kobbacy / Murthy

Complex System Maintenance Handbook



Modern societies depend on the smooth operation of many complex systems (designed and built by humans) that provide a variety of outputs (products and services). These include transport systems (trains, buses, ferries, ships and ae- planes), communication systems (television, telephone and computer networks), utilities (water, gas and electricity networks), manufacturing plants (to produce - dustrial products and consumer durables), processing plants (to extract and process minerals and oil), hospitals (to provide services) and banks (for financial tra- actions) to name a few. Every system built by humans is unreliable in the sense that it degrades with age and/or usage. A system is said to fail when it is no longer capable of delivering the designed outputs. Some failures can be catastrophic in the sense that they can result in serious economic losses, affect humans and do serious damage to the environment. Typical examples include the crash of an aircraft in flight, failure of a sewerage processing plant and collapse of a bridge. The degradation can be c- trolled, and the likelihood of catastrophic failures reduced, through maintenance actions, including preventive maintenance, inspection, condition monitoring and design-out maintenance. Corrective maintenance actions are needed to restore a failed system to operational state through repair or replacement of the components that caused the failure. Maintenance has moved from being an engineering activity after a system has been put into operation into an important issue that needs to be addressed during the design and manufacturing or building of the system.

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