

Assignment brief

Qualification		Lesson Title	
		ME 4000 Predictive Maintenance Techniques	
Student name and Number		Instructor	
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Date issued:		Deadline: Until Final Exam	Submitted on
Assignment title	System Condition Monitoring and Reliability		
Purpose :			
<p>The purpose of this assignment is to provide a framework where the learner:</p> <ol style="list-style-type: none"> 1. is able to describe a condition monitoring method and technique related to a given engineering system. 2. is able to use given data to calculate failure rates for a range of components and equipment. 3. is able to describe the factors affecting reliability for a given engineering system. 			
Scenario:			
<p>You are a newly appointed engineering support supervisor at your workplace facilities. Some key engineering systems are fast becoming unreliable and the production manager is very concerned about this; as a result, he has given you the responsibility to monitor these systems and their components and improving them using relevant monitoring and test equipment and to report back to him in a written format that he can refer to when discussing equipment failure/reliability issues with the directors of the company. To kick-start your new role you have decided to choose a system that you have worked with as an engineer.</p>			
Task 1			
<ol style="list-style-type: none"> 1. Give a detailed description of this system (including key components) and its importance in your engineering process. 2. Explain how you will plan the condition monitoring activities to cause minimum disruption to normal working 3. Select and describe appropriate condition monitoring methods that can be applied to this system. 4. Identifying the types of equipment (as applicable) that you would require 5. Show the benefits of using the chosen condition monitoring methods and corresponding equipment (as applicable) 6. Carry out the monitoring activities to identify the factors affecting the reliability of the system (and its key components) and give a step by description of how the how the activities were carried out 7. Describe the effect of each factor affecting the reliability of this system. 			

Task 2

Define failure rate and discuss its importance in monitoring engineering systems specific to your work context.

Task 3

Assuming that ten components in your select engineering system were tested until failure or 1000 hours of operation. Given the table of data below calculate:

- a. The failure rates for each of the components.
- b. The failure rates for the system as a whole.

Component	Hours	Status
#1	1000	No failure
#2	1000	No failure
#3	467	Failed
#4	1000	No failure
#5	630	Failed
#6	590	Failed
#7	1000	No failure
#8	285	Failed
#9	648	Failed
#10	882	Failed

NB: Express in per million hours of operation (10^6)

Sources of information