ECICM01

Review an engineering asset to determine the condition monitoring requirements

Overview

This standard is about reviewing an engineering asset to determine the condition monitoring requirements.

You will need to be able to establish the condition monitoring requirements through identification, evaluation and consideration of customer requirements, operational, environmental, financial and engineering factors whilst adhering to health and safety legislation, regulations and safe working practices.

In the context of this standard, your responsibility is to interpret and work within given specifications, selecting techniques and making variations to achieve the best possible result. In some cases, you may still be expected to refer to others for final authorisation, even though you remain responsible for identifying and implementing decisions.

Who this standard is for

This standard is for condition monitoring practitioners.
Performance criteria

You must be able to:

P1 work safely at all times, complying with health and safety and other relevant legislation, regulations, guidelines and local rules or procedures

P2 ensure that the work environment, material, tools and condition monitoring equipment and instrumentation are suitably prepared for the work activities to be undertaken

P3 establish the significance of the asset and the need for condition monitoring

P4 obtain accurate and relevant information

P5 identify the significant failure modes

P6 identify accurately the technical requirements to be met and ensure they

P6.1 take account of working conditions

P6.2 meet the needs of the customer

P7 establish to what extent the condition of the component or asset can be monitored and the effect on the asset, process or systems

P8 plan the most effective way to apply condition monitoring to the component or asset

P9 determine acceptable sample collection, measurement points, monitoring intervals and operational state

P10 establish resources required to ensure compliance with customers' and site requirements

P11 confirm the requirements with the appropriate people

P12 reinstate the work area

P13 deal promptly and effectively with problems within your control and report those that cannot be solved
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Knowledge and understanding

You need to know and understand:

You must be able to:

K1 relevant legislative, regulatory and local requirements or procedures and safe working practices

K2 preparation and reinstatement requirements in respect of the work area, material, and equipment, and the possible consequences of incorrect actions in these areas

K3 information that is required for the condition monitoring activity including

K3.1 safe access arrangements

K3.2 engineering drawings and specifications

K4 the operational conditions, related sources of variability and how they impact on the measurement

K5 the tools, terminology and practices used within condition monitoring

K6 the tools, terminology and practices used when determining condition monitoring requirements

K7 sample collection or measurement points

K8 sampling intervals and what influences the periods

K9 your responsibilities for ensuring care and security of tools and equipment used

K10 your responsibilities with regard to reporting lines and procedures in your working environment
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Scope/range

Work environment

Typical work environments could include:

1 buildings and facilities
2 hazardous and sterile environments
3 manufacturing and process plant
4 power generation facilities
5 working at height and/or on access structures (scaffold)
6 working inside plant and systems
7 working submerged

Condition monitoring equipment and instrumentation

This could include:

8 bespoke equipment
9 flue gas analysers
10 frequency counters
11 frequency generators
12 gauges
13 LCR testers
14 leak detectors
15 meters
16 oscilloscopes
17 probes
18 pyrometers
19 relevant laboratory equipment
20 thermography cameras
21 thermometers
22 spectrum analysers

Condition monitoring

Typical condition monitoring techniques could include:

23 acoustic emissions
24 motor current signature analysis
25 oil analysis
26 performance monitoring
27 thermography
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28 ultrasonic
29 vibration

Information

Typical information could include:

30 asset location and objectives
31 codes and related standards
32 customers' orders and instructions
33 environmental and safety measures
34 design criteria
35 engineering drawings and specifications
36 historic and current operational data
37 limitations (environmental/access)
38 manufacturers' data
39 records of modifications to the asset
40 reports of past failures

Technical requirements

These could include:

41 component or asset specification
42 customers' orders and instructions
43 engineering drawings
44 maintenance specifications
45 manufacturers' data
46 monitoring methods, techniques and limitations
47 monitoring objectives
48 materials, equipment and consumables to be used
49 reporting requirements
50 severity criteria
51 timescales
52 working environment

Component or asset

This could include:

53 electrical and electronic components
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54 engineering plant and equipment
55 exchangers (boilers, furnaces)
56 heat exchangers
57 mechanical components
58 pipes and ancillary equipment
59 process plant
60 refractory and insulation
61 rotating equipment
62 tanks
63 vessels

Resources

These could include:

64 condition monitoring equipment and consumables
65 logistics
66 monitoring plan and schedules
67 qualified people
68 safety clothing, equipment and consumables
69 space required for condition monitoring activities (environment)
70 support facilities required for monitoring and equipment
71 third party resources

Reinstate the work area

This term could include:

72 returning the work area to a safe condition
73 correctly disposing of waste materials
74 storage of re-usable materials, consumables and equipment in accordance with appropriate procedures
75 completion of all necessary documentation

Engineering drawings and specifications

Engineering drawings could include:

76 assembly
77 detail
78 exploded views
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| 79  | general arrangements                  |
| 80  | isometrics                            |
| 81  | sections                              |
| Specifications could include: |
| 82  | codes and standards                   |
| 83  | manufacturer’s instructions           |
| 84  | materials’ list and specifications    |
| 85  | method statements                     |
| 86  | product data sheets                   |
Customer

Customer in this context could mean someone outside of the organisation such as a client, another contractor, site engineers, master of the vessel, shift engineers, quality inspectors, construction managers, health and safety representatives and agents. Within the organisation, customer could mean supervisors, safety personnel, other departments, managers, engineers, technicians and colleagues.

Rotating equipment

Machinery that has associated revolving parts. This group would include: pumps, compressors, circulators, fans, blowers, engines, generators, turbines, motors, Gear box. They are typically electrically, hydraulically, pneumatically, steam or wind driven.
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