

Reliability Task Assignments



GPAllied Training Series

Task	Reliability Engineer	Maintenance Engineer	Planner
Preventive Maintenance Procedures	<ul style="list-style-type: none"> Ensures failure modes addressed are appropriate Performs cost/benefit analysis to set correct frequency of task(s) 	<ul style="list-style-type: none"> Responsible for technical accuracy of the job plan Resource for the Planner to establish specific equipment tolerances and specifications 	<ul style="list-style-type: none"> Ensures correct parts and consumables are called out in the procedure Responsible for consistency of format and management of the PM program on daily basis
Job Plans and Job Plan Library	<ul style="list-style-type: none"> Ensures that all assets in the EMP have a job plan on file (both proactive and reactive) 	<ul style="list-style-type: none"> Responsible for technical accuracy of the job plan Resource for the Planner to establish specific equipment tolerances and specifications 	<ul style="list-style-type: none"> Ensures correct parts and consumables are called out in the procedure Responsible for consistency of format and management of the Job Plan Library on daily basis Responsible for verification of parts kits
Bill of Materials	<ul style="list-style-type: none"> Supports the Maintenance Engineer and Store with availability simulation to verify stores adjustments Alerts stores function when stocking modifications are warranted based on usage and failure analysis 	<ul style="list-style-type: none"> Responsible for accuracy of information Responsible for verifying that the BOM has been updated after equipment modifications 	<ul style="list-style-type: none"> Alerts Maintenance Engineer when discrepancies are identified. Works with Maintenance Engineer to determine appropriate stores levels for parts by tracking parts usage.
Engineered Maintenance Strategy	<ul style="list-style-type: none"> Responsible for changes to the Equipment Maintenance Plan based on analysis of asset failure data Alerts Stores to changes in stocking levels to match changes in task frequency 	<ul style="list-style-type: none"> Resource for the Reliability Engineer with assistance in collection and analysis of machinery failure data 	<ul style="list-style-type: none"> Manages the CMMS output of inspection schedules for the PM and PdM routes. Prepares and analyzes reports on inspection route compliance and satisfaction of noted action items

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Outage/Turn Around Planning	<ul style="list-style-type: none"> Ensures use of Condition Monitoring information is included in turn-around the master plan decision making process 	<ul style="list-style-type: none"> Optimizes the Mean-Time-To-Repair (MTTR) Responsible for technical accuracy of the job steps 	<ul style="list-style-type: none"> Completes job plans with manpower scheduling and parts verifications per standard Responsible to develop the master plan for outages and turn-arounds Prepares outage schedules and manpower requirement estimates
Equipment Modifications	<ul style="list-style-type: none"> Assists Maintenance Engineer with reliability analysis of proposed equipment modifications Makes specific recommendations to improve machinery performance and reliability based on analysis of process and failure data 	<ul style="list-style-type: none"> Develops equipment modification plans based on failure data, crafts feedback and OEM design modifications Makes specific equipment recommendations to improve machinery performance, maintainability and reliability 	<ul style="list-style-type: none"> Completes job plans with manpower scheduling and parts verifications per standard
Parts Standardizations	<ul style="list-style-type: none"> Assists Maintenance Engineer with reliability analysis of proposed changes 	<ul style="list-style-type: none"> Creates plans to standardize parts across like machines taking into account specific component performance and maintainability Verifies that the BOM reflects the changes Works with stores to delete unnecessary spares 	<ul style="list-style-type: none"> Updates Job Plans to reflect changes in parts
MRO Adjustments	<ul style="list-style-type: none"> Responsible for analysis of spares usage and failure data to determine proper stocking levels based on failure data, usage and simulation modeling of the Engineered Maintenance Strategy 		

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Equipment Documentation Management		<ul style="list-style-type: none"> Responsible to maintain current and correct OEM specifications, manuals and procedures for plant assets in support of planning functions and in support of daily maintenance function 	<ul style="list-style-type: none"> Keeps current copy of all OEM specifications, manuals and procedures as job planning reference
PdM/NDT	<ul style="list-style-type: none"> Develops and manages the PdM/NDT process for the purpose of the early identification and elimination of asset defects 2nd tier resource for technical assistance Responsible for alarm management 	<ul style="list-style-type: none"> Resource for the Reliability Engineer with specific machine performance information and detailed component and parts data 	<ul style="list-style-type: none"> Plans the work and places it on the schedule in a timely manner such that machinery breakdown are mitigated or eliminated
Work Order System Management			<ul style="list-style-type: none"> Manages the life of the of Work Requests/Work Order Completes Job Plans Follows-up on job plans completion
CMMS Failure Data (FRACAS)	<ul style="list-style-type: none"> Responsible to performs statistical analysis on machinery failure data and work order closing codes to determine whether adjustments to the Engineered Maintenance Strategy are warranted Responsible for the development of (failure) codes for the WO system 	<ul style="list-style-type: none"> Resource for the Reliability Engineer with specific machine performance information and detailed component and parts data 	<ul style="list-style-type: none"> Responsible for ensuring that all work orders are closed with correct closing codes Ensures the "As Found", "As Left" fields on the Job Plan Procedures are completed by the craft and entered into the CMMS

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Asset Repair Techniques		<ul style="list-style-type: none"> Develops new and innovative methods for timely repair of assets Prepares specific job plans steps with detailed procedures for completion of repair in the most effective and efficient manner 	<ul style="list-style-type: none"> Completes job plan to specified standard
Asset Test Procedures (Return to Service)	<ul style="list-style-type: none"> Develops specific procedures for verification of an assets fitness for return to service Verifies return-to-service procedures were performed 		<ul style="list-style-type: none"> Converts and maintains procedures in standardized format
Failure Investigation RCA & RCFA	<ul style="list-style-type: none"> Leads the Root Cause Analysis effort as a part of a proactive strategy Leads the Root Cause Failure Analysis effort for sporadic failures (typically uses Logic Tree incident analysis) Develops specific operational procedure changes to help mitigate future system failures Catalogues and databases the RCA/RCFA results and subsequent action items Analyzes plant wide failure data and downtime scenarios to calculate relevant trigger points for RCFA 	<ul style="list-style-type: none"> Leads the Root Cause Failure Analysis effort for chronic failures (typically uses Cause Mapping incident analysis) Catalogues and databases the RCA/RCFA results and subsequent action items Develops specific maintenance procedure modifications to help mitigate future machinery failures Develops specific machinery modifications to help mitigate future failures 	<ul style="list-style-type: none"> Responsible for verifies that all work orders are closed with correct closing codes Verifies the "As Found", "As Left" fields on the Job Plan Procedures are completed and entered into the CMMS Facilitates a 5-Why discussion with crafts and supervision for all failure maintenance activities

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Technical Support of Daily Maintenance Effort	<ul style="list-style-type: none"> Provides technical assistance to maintenance supervisors, planners and crafts personnel in the form of specific, technical data on system configuration and performance 	<ul style="list-style-type: none"> Provides technical assistance to maintenance supervisors, planners and crafts personnel in the form of specific, technical data on machinery configuration and performance 	
Asset Hierarchy and Technical Specifications	<ul style="list-style-type: none"> Responsible for the design of the plant asset hierarchy 	<ul style="list-style-type: none"> Responsible to maintain a current and correct technical specifications library 	<ul style="list-style-type: none"> Responsible to maintain a current and correct copy of the technical specifications library Responsible for the upkeep of the hierarchy in the CMMS
Criticality Analysis	<ul style="list-style-type: none"> Responsible for the design and management of the asset criticality database and the failure modes criticality database 		<ul style="list-style-type: none"> Supports the Reliability Engineer with specific, detailed failure data and component configuration information Responsible for the upkeep of the criticality database in the CMMS
Metrics	<ul style="list-style-type: none"> Develops and utilizes specific metrics for the process, system, asset and component reliability 	<ul style="list-style-type: none"> Utilizes metrics for system, asset and component maintainability 	<ul style="list-style-type: none"> Prepares and analyzes reports on system, asset and components metrics
Materials Management	<ul style="list-style-type: none"> Develops the preventive maintenance strategy for the stored spares Develops a testing strategy incoming new and rebuilt spares Develops a testing strategy for OEM testing compliance 	<ul style="list-style-type: none"> Develops specific maintenance activities to ensure spare fitness for duty Develops specific equipment preservation techniques for pre-commissioning storage of equipment 	<ul style="list-style-type: none"> Ensures correct parts and consumables are called out in the procedure

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Reliability Centered Design	<ul style="list-style-type: none"> • Applies reliability analysis methods to new designs to determine the process, system, asset and component reliability • Determines single-point failures • Reviews and/or develops commissioning procedures for new system, asset and component design • Reviews and/or develops strategies for OEM warranty issues and claims • Reviews and/or develops machinery modification plans to deal with single-point failure scenarios • Develops specific maintenance and operational start-up procedures for new installations • Responsible to develop/review new equipment purchase specifications for reliability and maintainability 	<ul style="list-style-type: none"> • Creates new equipment purchase specifications around improved maintainability 	

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Operational Reliability	<ul style="list-style-type: none"> • Uses reliability analysis tools to determine operational reliability of systems, assets and components • Helps determine the QA/QC test points and procedures to maximize operational reliability • Aides in the development of alarms designed to determine and verify acceptable operations • Develop assessment activities centered around operability and performance optimization • Develops operator care tasks as a part of the Equipment Maintenance Plan • Develops the Risk Management Strategy 		
Reliability Economics	<ul style="list-style-type: none"> • Responsible for performing quantitative analysis on new projects/strategies and determining project/strategies viability based on corporate values and standards 	<ul style="list-style-type: none"> • Supports the Reliability Engineer with supporting data specific to equipment maintainability 	
Technical Training	<ul style="list-style-type: none"> • Analyzes process and/or failure data to determine the need for improved craft skills • Identifies/conducts/arranges technical training for PdM/NDT personnel • Conducts/arranges general reliability training for all plant personnel 	<ul style="list-style-type: none"> • Analyzes process and/or failure data to determine the need for improved craft skills • Conducts/arranges craft skills training 	<ul style="list-style-type: none"> • Verifies that Supervisors and Craft personnel have adequate knowledge of maintenance procedure formats • Verifies maintenance workflow continuity

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Reliability Engineering Tools and/or Techniques	Reliability Engineer	Maintenance Engineer	Planner
Statistical Analysis (Basic)	Evaluation	Synthesis	Comprehension
Statistical Analysis (Advanced)	Synthesis	Analysis	Awareness
Root Cause Analysis	Evaluation	Synthesis	Analysis
Reliability Centered Maintenance	Synthesis	Analysis	Comprehension
Condition Monitoring	Synthesis	Analysis	Comprehension
Reliability Centered Design	Synthesis	Analysis	Comprehension
Availability Simulation	Synthesis	Analysis	Comprehension
Life Cycle Cost Analysis	Synthesis	Comprehension	Comprehension
Criticality Analysis	Evaluation	Analysis	Comprehension

Reference: *Bloom's Taxonomy of Learning Objectives*

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Knowledge

Attendee can recall basic information about the subject. Has knowledge of major ideas and can match names of concepts with major ideas.

Example: Who, What, When, Where, How...?

Comprehension

Understands information and can grasp meaning of concepts. Attendee can explain the meaning of concepts in their own words.

Example: Explain in one's own words the steps for completing a given task.

Application

Can use the information in new situations to solve problems or produce results.

Example: Why is...an example of...?

Analysis

Recognize hidden meanings. Attendee can see patterns, organize parts and identify components of ideas.

Example: How does...compare/contrast with...?

Synthesis

Attendee can draw conclusions on related knowledge from other areas. Can generalize from given facts and use old ideas to create new ones.

Example: What solutions would you select for...?

Evaluation

Attendee can compare and discriminate between ideas. Can assess the value of theories and presentations, and can make choices based on reasoned arguments. Can verify the value of evidence and recognize subjectivity.

Example: Select the most effective solution.