



How to Implement Asset Care

Value Chain Competitiveness (VCC)

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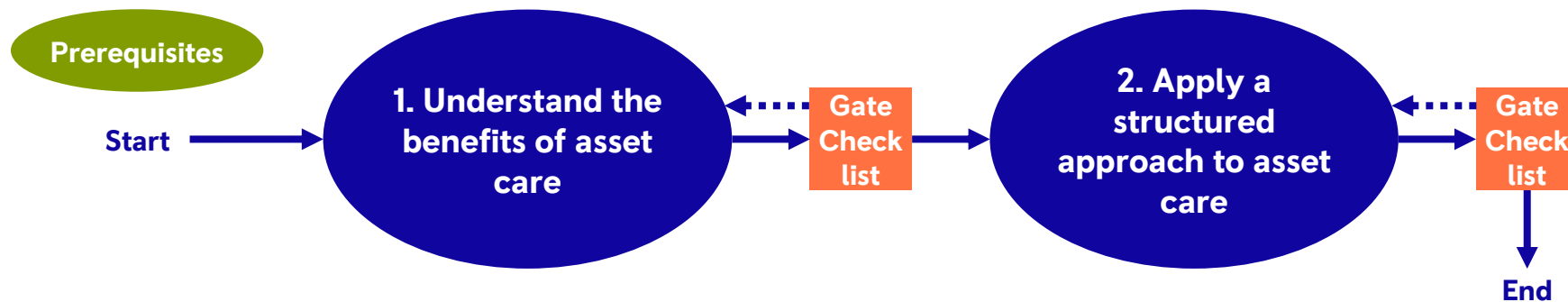
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How to Implement Asset Care



Scope

Objectives & Principles





Scope



This 'How To' will enable you to:

- Baseline the existing condition of plant and equipment
- Identify the appropriate actions to improve the plant performance



Objective and Principles



Implement asset care to:

- Keep equipment safe and reliable
- Gain autonomous care of equipment to maximise availability and effectiveness
- Minimise availability losses (eg. breakdowns) and reduce waste



Prerequisites



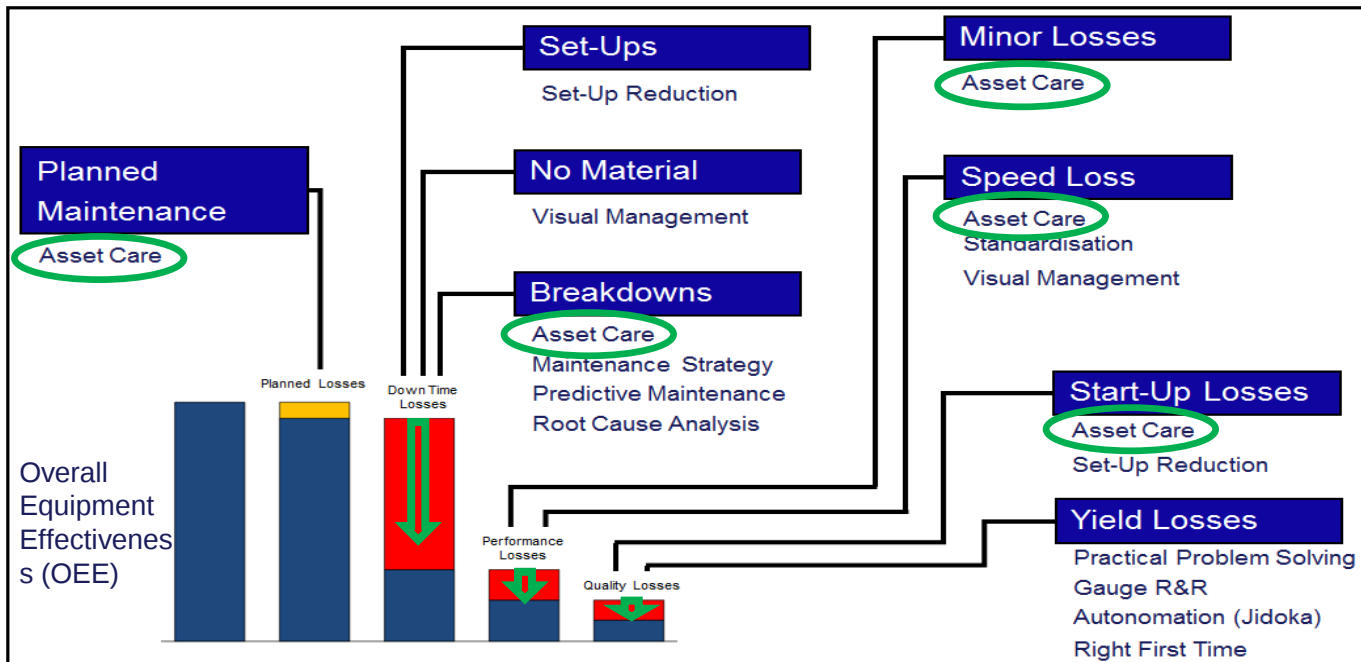
Knowledge of:

- Maintenance strategy principles
- Failure Mode and Effects Analysis (FMEA)

1. Understand the benefits of asset care



Asset Care is key planned preventative maintenance activity to minimise OEE losses



1. Understand the benefits of asset care



Implementing all steps of asset care delivers many goals and benefits

GOALS

ASSET CARE



- Operator teams manage their own equipment care activities, supported by maintenance
- Abnormalities in the process, equipment and products are determined 'at a glance'
- Provide and use visual controls so that any minor deviation from normal / optimal conditions are visually detected
- Make inspection and maintenance easier and more effective
- Improve predictability
- Increase skill levels
- Control or prevent deterioration
- Stop accelerated deterioration
- Stabilise equipment conditions



Gate checklist 1: Understand the benefits of asset care



- ☒ Asset Care benefits are understood in relation to Overall Equipment Effectiveness (OEE) improvement

- ☒ Delivering all steps of Asset Care provides benefits to all members operating and supporting plant and equipment

Perform a condition assessment of equipment

Score plant elements against assessment criteria

[illegible]

Scoring Criteria

3 = 'high impact' 2 = 'medium impact' 1 = 'low impact'



2. Apply a structured approach to asset care



Perform a condition assessment of equipment

High' priorities are identified and strategies for improvement developed

Element	Priority	Hi-Lo	Maintenance	Breakdown	Quality	Environment	Speed	Safety
Nip Rollers	24	Hi	1	2	3(2)	1	2	2
Web Guides	12	Hi	1	2	3(2)	1	2	1
Drive Roller	6	Hi	1	1	3(2)	1	2	1
Path Rollers	2	Lo	1	1	2	1	1	1
Severer	2	Lo	1	1	1	1	1	2
QTMS Sensor	2	Lo	1	2	1	1	1	1
Web Meter	1	Lo	1	1	1	1	1	1

Strategy	Ease of Maintenance	Breakdown Rate	Quality	Speed	Environment	Safety
Modify						
Re-design						
Repair						
Refurbish						
Operator Care Routines						
Preventive Maintenance						
Deep-Clean						

Select appropriate action



Strong Correlation



Weak Correlation

2. Apply a structured approach to asset care



The Asset Care Process

1. Initial cleaning and tagging

1 Form the Team



2 Identify fault with asset through cleaning and inspection



3 Obtain new Asset tag

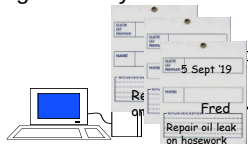


4 Write fault / improvement details onto tag and attach to asset

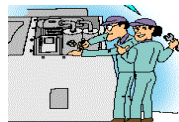


9 Asset Improvement sheet updated - filed in ASSET log book

8 Tags taken off asset and entered onto Maintenance Management System



7 Maintenance carry out repair / improvement on the asset and record details on rear of tag



5 Rear sheet of tags collected and given to Maintenance representative

6

Rolls-Royce PLANT IMPROVEMENTS									
Asset No.	Asset Name	Asset Location	Asset Status	Asset Age	Asset Type	Asset Category	Asset Sub-category	Asset Condition	Asset Remarks
1	Asset 1	Asset 1 Location	Asset 1 Status	Asset 1 Age	Asset 1 Type	Asset 1 Category	Asset 1 Sub-category	Asset 1 Condition	Asset 1 Remarks
2	Asset 2	Asset 2 Location	Asset 2 Status	Asset 2 Age	Asset 2 Type	Asset 2 Category	Asset 2 Sub-category	Asset 2 Condition	Asset 2 Remarks
3	Asset 3	Asset 3 Location	Asset 3 Status	Asset 3 Age	Asset 3 Type	Asset 3 Category	Asset 3 Sub-category	Asset 3 Condition	Asset 3 Remarks
4	Asset 4	Asset 4 Location	Asset 4 Status	Asset 4 Age	Asset 4 Type	Asset 4 Category	Asset 4 Sub-category	Asset 4 Condition	Asset 4 Remarks
5	Asset 5	Asset 5 Location	Asset 5 Status	Asset 5 Age	Asset 5 Type	Asset 5 Category	Asset 5 Sub-category	Asset 5 Condition	Asset 5 Remarks
6	Asset 6	Asset 6 Location	Asset 6 Status	Asset 6 Age	Asset 6 Type	Asset 6 Category	Asset 6 Sub-category	Asset 6 Condition	Asset 6 Remarks
7	Asset 7	Asset 7 Location	Asset 7 Status	Asset 7 Age	Asset 7 Type	Asset 7 Category	Asset 7 Sub-category	Asset 7 Condition	Asset 7 Remarks
8	Asset 8	Asset 8 Location	Asset 8 Status	Asset 8 Age	Asset 8 Type	Asset 8 Category	Asset 8 Sub-category	Asset 8 Condition	Asset 8 Remarks
9	Asset 9	Asset 9 Location	Asset 9 Status	Asset 9 Age	Asset 9 Type	Asset 9 Category	Asset 9 Sub-category	Asset 9 Condition	Asset 9 Remarks
10	Asset 10	Asset 10 Location	Asset 10 Status	Asset 10 Age	Asset 10 Type	Asset 10 Category	Asset 10 Sub-category	Asset 10 Condition	Asset 10 Remarks

Summarise all tag details onto a asset Improvement sheet and post on asset Care board - agree with Maintenance target dates for each item

- Introduces routine cleaning and inspection by operators
- Focuses on main body of machine
- Exposes abnormal conditions such as :
 - broken or damaged parts
 - wear and tear
 - play or looseness
 - misalignment
 - leaks
 - defects hidden by dirt



2. Apply a structured approach to asset care



The Asset Care process

2. Eliminate causes of contamination - make cleaning easier

Objectives

- ➔ To prevent deterioration by stopping problems at source
- ➔ To make cleaning and inspection easier
- ➔ To encourage teams to be creative in controlling equipment

Targets

- ➔ Eliminate contamination that appears after thorough cleaning
- ➔ Reduce time spent in daily cleaning to 10 mins
- ➔ Improve the ease of inspecting the machine





2. Apply a structured approach to asset care



The Asset Care process

3. Prepare cleaning and lubrication standards

Objectives



Standardise cleaning, inspection and lubrication tasks

Targets



Determine who, how and where to perform cleaning and lubrication



Label lubrication inlets and inspection sites



Organise lubricants and equipment



Develop provisional standards



Document standards in simple, visual procedures

CLEAN & INSPECT SCHEDULE
Plant :- LASTEC LASER last No. 291

KEY: ○ Cleaning activity required ● Cleaning activity completed

Item No.	Team Member	Item Description	Clean / Check Requirement	Criteria	Frequency of Cleaning/Check	Time (mins)
1	CELL	Clean work area	Clean and clear			
2	CELL	Vacuum m/c interior				
3	CELL	Vipe m/c exterior				

Raised By: _____

LUBRICATION SCHEDULE
Plant :- LASTEC LASER Plant No. 2970

KEY: ○ Lubrication activity required ● Lubrication activity completed

ITEM No.	Team Member	Location	Method	Lubrication Requirement	Frequency of Lubrication					Time (mins)
					SHIFT	DAY	WEEK	MTWTF	3	
1	CELL	Bottom rear of M/C	OIL	Auto H 32				○		2
2	MTM	M/C doors	Grease gun	L 52					○	10
3	MTM	Air bottle bottom rear of M/C	OIL	Auto H 32					○	5
Tot. (mins)										

Raised By: _____ Version / Date: _____



2. Apply a structured approach to asset care



The Asset Care process

4. Improve inspection and technical skills

Objectives



Provide education and training for operators on general elements; lubrication, pneumatics hydraulics, drive systems

Targets



To build operators machine knowledge, inspection and diagnostic skills through hands-on application



Expand the scope of routine inspection



Promote restoration of the machine and enhance preventative maintenance using visual controls



- Inspection elements
 - lubrication
 - asset elements
 - pneumatics
 - hydraulics
 - drive systems
- Determine what will be taught and how
 - train the trainer
 - guided inspection
 - one point lessons
 - cut-away models
 - visual controls
 - refine Step 3 routines



2. Apply a structured approach to asset care



The Asset Care process

5. Operator self-managed standards and visual controls

Objectives



Provide and use visual controls so that any minor deviation from normal / optimal conditions are visually detected

Targets



Review clean/lubricate standards set in Step 3 in light of improved equipment condition



Identify and eliminate reasons for not meeting time standards



Apply simple visual controls that reduce the time taken to inspect the equipment



- Visual controls to see
 - Oil level is sufficient in hydraulic tanks
 - Pressure gauges show correct working pressure
 - Airline snap-ins clearly identified
 - Greasing points clearly identified
 - What types of oil and grease to use
 - Status of asset care activities

2. Apply a structured approach to asset care



The Asset Care process

6. Standardise procedures

Objectives



Abnormalities in the process, equipment and products are determined 'at a glance'

Targets



All working practices are standardised and visually documented



Equipment operating conditions and standards can be seen from a single view-point



The process prevents the passing of defective product to the subsequent process

- Standard working practices
- Ensure consistent repeatable operation of the equipment
- Act as training and reference material
- Must be continually reviewed

The collage displays several key documents used in the asset care process:

- Process Instructions:** A document for 'Operator Maintenance' with fields for Date, Version, and Status.
- One-point Lessons:** A form for identifying types of failures, with a 'START HERE' box and a '17-Nov-01' date.
- Schedules:** A 'SCHEDULE' form with a photo of a person working on equipment.
- Equipment FMEA:** A Failure Modes and Effects Analysis (FMEA) form with columns for Failure of Failure, Current Condition, and a table for failure modes.
- Improvements:** A table for tracking improvements, with columns for Target Date, Progress, and Status.

2. Apply a structured approach to asset care



The Asset Care Process

7. Full cell based care routines

Objectives

- ➡ Cell based team manage their own equipment care activities, supported technically by maintenance technicians

Targets

- ➡ Basic equipment conditions are maintained by following the standards set in Steps 1 - 6
- ➡ Process losses are reduced to a minimum
- ➡ The cell have all the 'resources' they require for complete Asset Care



- Full cell based care routines
 - Asset care
 - Visual control
 - Communication
 - FMEA
 - Problem solving
 - Workplace org (5S)
 - Improve OEE

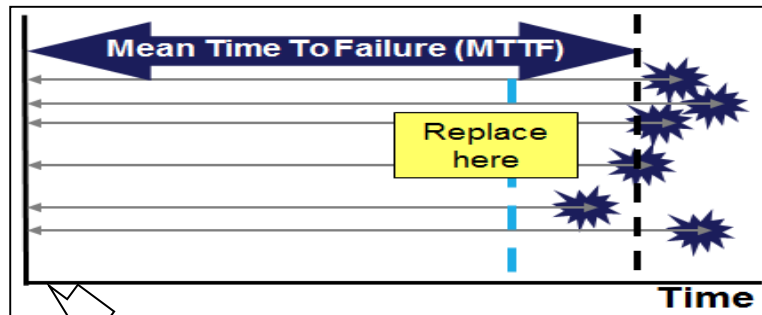
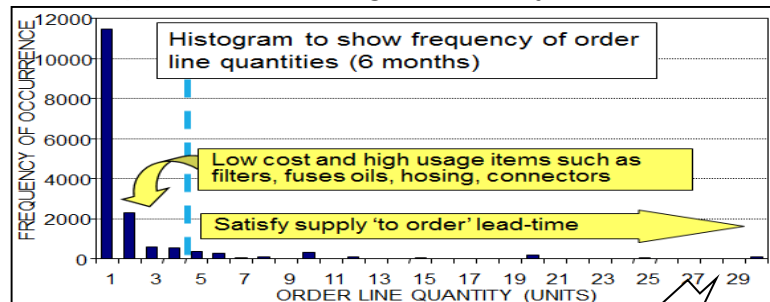
2. Apply a structured approach to asset care



Spares and their management

For the management of equipment spares

- Determine what plant spares to hold in stock to minimise plant downtime and match the selected maintenance strategy
- Minimise cost of holding spares
- Ensure spares are managed visually at cell level



Replacement Frequency	Low Value	Med Value	High Value	Notes
Daily	Store in cell	Identify why failure is occurring		Any parts that require replacing daily or weekly must be investigated (excl. consumables). Design-out the need to replace or improve part life. Set up a visual replenishment system in the cell. Calculate what stock to hold based upon MTTF. Parts failing before suppliers recommended replacement frequencies must be investigated
Weekly	Store in cell	Identify why failure is occurring		
Monthly	Store at cell perimeter	Store at cell perimeter	Bonded / secure store	
> 6 Monthly	Locate in central stores	Locate in central stores	Bonded / secure store	



Gate checklist 2: Apply a structured approach to asset care



- ☒ Immediate actions and strategies have been selected & planned following an equipment condition assessment
- ☒ The 7 steps of asset care are fully understood by operations and support function teams
- ☒ Operators own and complete asset care, maintenance technicians focus on improvement of equipment and skill
- ☒ Spares management analysis and process is in place