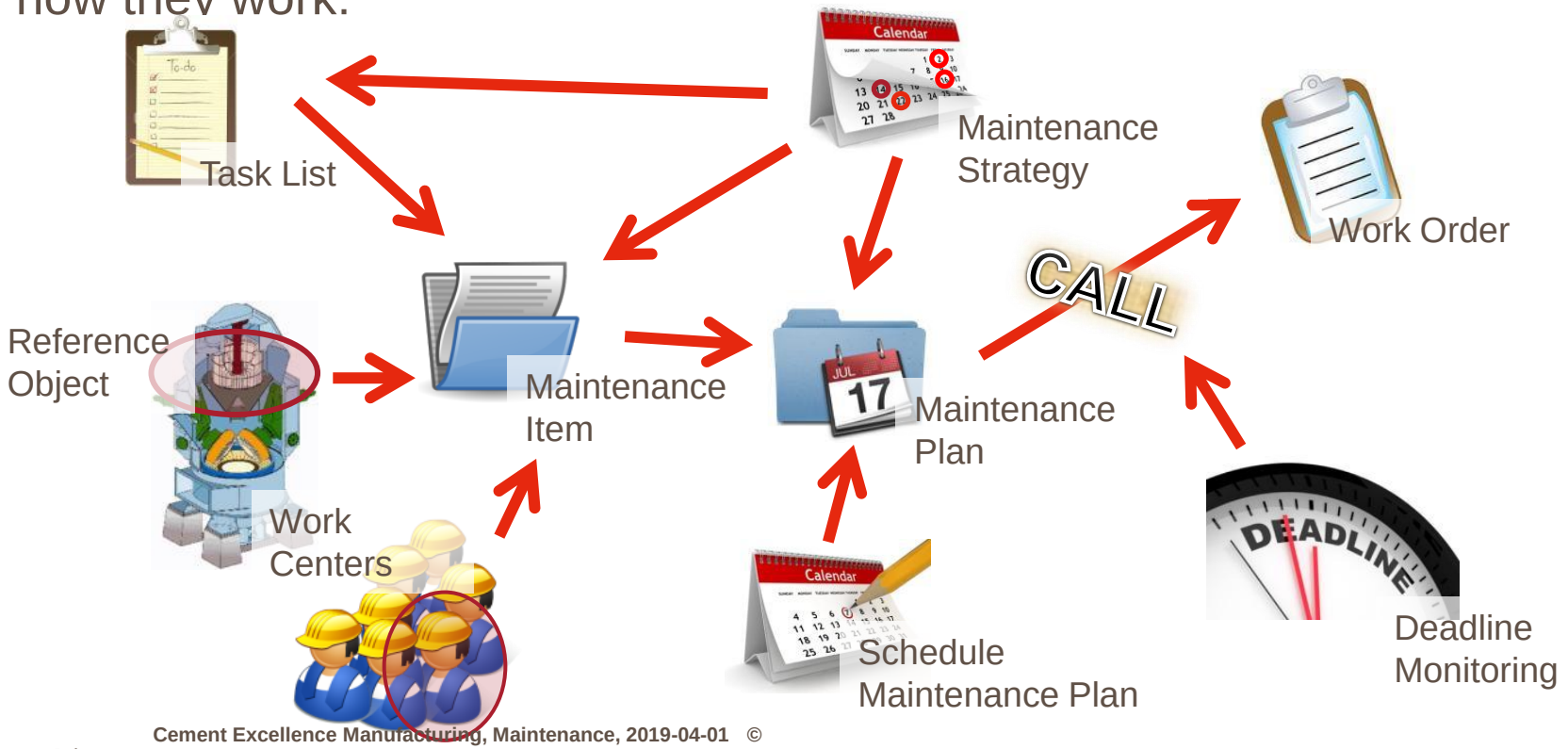
Preventive Maintenance

SAP Maintenance Training

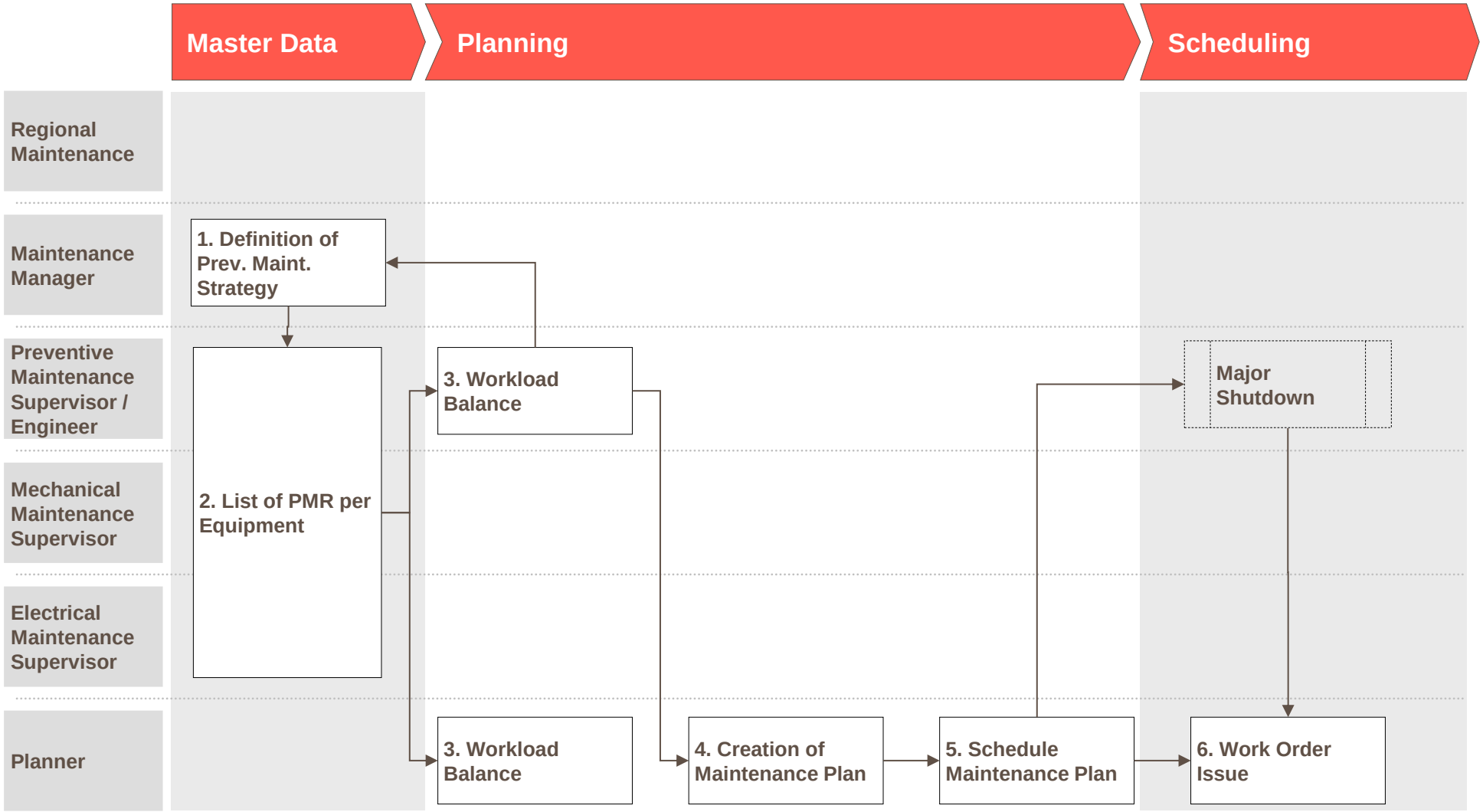
LafargeHolcim

Objectives of the Module

- Understand what are the prerequisites before the preventive maintenance program can be set up in SAP
- Understand which components in SAP are used for preventive maintenance and how they work:



Process Map



Process Overview

Process Objectives	Preventive Maintenance are cost-effective maintenance tasks carried out at predetermined intervals to check the current physical condition, to reduce probability and/or impact of a failure in operation, or to maintain a desired level of performance of an equipment The objective of this process is to establish a systematic approach to implement, control and update the Preventive Maintenance program. This process intends to establish a homogeneous standard system in Holcim to assess it and evaluate the Preventive Maintenance flow in practice and in SAP PM. The main elements of the assessment of the Preventive Maintenance are: • Task lists: definition of the sequence of maintenance tasks and resources for work planning and scheduling. • Work load balance: establishing a constant preventive tasks work load taking account the frequency and the risk profile. • Maintenance Strategies: definition of the rules and general scheduling information for preventive maintenance activities. • Maintenance Items: the objects to identify the maintenance tasks required at regular interval. • Maintenance Plans: specification of the dates, sequences and tasks to be performed upon maintenance objects.
Key Inputs	• SAP Master data • Preventive Maintenance Activities definition (manufacturers manuals, existing PMRs, equipment history, FMEAs)
Key Outputs	• Adequate # of PM02 Work Orders (created automatically) for different disciplines of PM (Inspection, Lubrication, Condition Monitoring, etc.)
Process Indicators	• KPI: PMR % (K4) and PMR efficiency (K5) • SPI: PMR Not performed (S5) PM02 manual call ratio (S11)
Process Owner	• HGRS Cement Excellence Manufacturing – Maintenance

Process Step Description

#	Step Name	Input	Description of Step	Output
1	Definition of Prev. Maint. Strategy	• Packages • Hierarchy • RMSO	• Definition of the general scheduling information for the PMRs. With the packages it will define the when and the frequency of generation of the maintenance calls. • Definition of the PMR to be implemented	• Preventive Maintenance Strategy

2	List of PMR per Equipment	• Data from manufacturers manuals
		• FMEAs
		• Existing PMRs
		• Equipment history
		• Maintenance strategy
			• Definition of activities designed to minimize the risk of unplanned failures	• Task list
				  ◦ Operations
				  ◦ Duration
				  ◦ Workforce requirements
				  ◦ Recommended Frequency
				  ◦ Materials
				  ◦ Services

3	Workload balance	• Task lists	• Task lists distribution through time and based on recommended frequency and risk profile in order not to have weekly workload peaks.	• PMRs Master Schedule
4	Creation of Maintenance Plan	• PMRs Master Schedule • Maintenance Strategy • Task list	• Elaboration of the Maintenance Plan which specifies the dates, sequences, and tasks to be performed upon maintenance objects.	• Maintenance Item • Maintenance Plan
5	Schedule Maintenance Plan	• Maintenance Plan	• Launch the maintenance plan for work order creation upon the specific details defined in the maintenance plan being schedule • Setup deadline monitoring	• System setup for PM02 Work Orders generation
6	Work Order Issue	• Deadline monitoring for PM02 Work Orders	• Release the work orders through Deadline Monitoring	• Automatic release of PM02 Work Orders

RACI matrix (Responsible, Accountable, Consulted, Informed)

#	Step Name	Plant Manager	Maintenance Manager	Preventive Maintenance Superv. / Eng.	Mechanical Maintenance Supervisor	Electrical Maintenance Supervisor	Planner [2]
1	Definition of Prev. Maintenance Strategy	C, I	A [1]	C, I	I	I	I
2	List of PMR per Equipment		A	R	R	R	C, I
3	Workload Balance		A	R	C, I	C, I	R
4	Creation of Maintenance Plan			A	C, I	C, I	R
5	Schedule Maintenance Plan			A	C, I	C, I	R
6	Work Order Issue			A	I	I	R

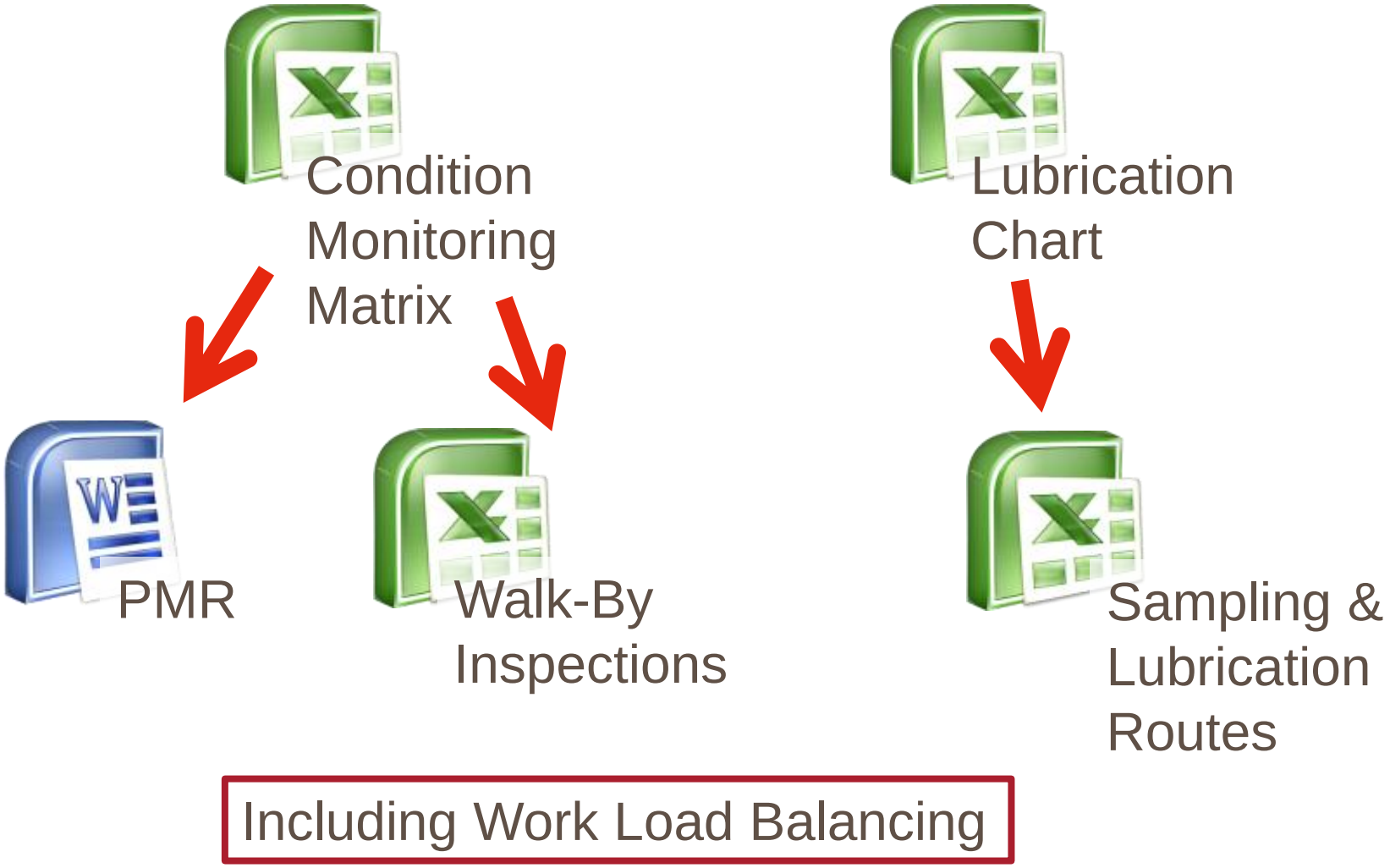
[1] Input Head of Regional Maintenance

[2] Planning function may be covered by supervisor

The way maintenance is performed in the field does not depend on SAP

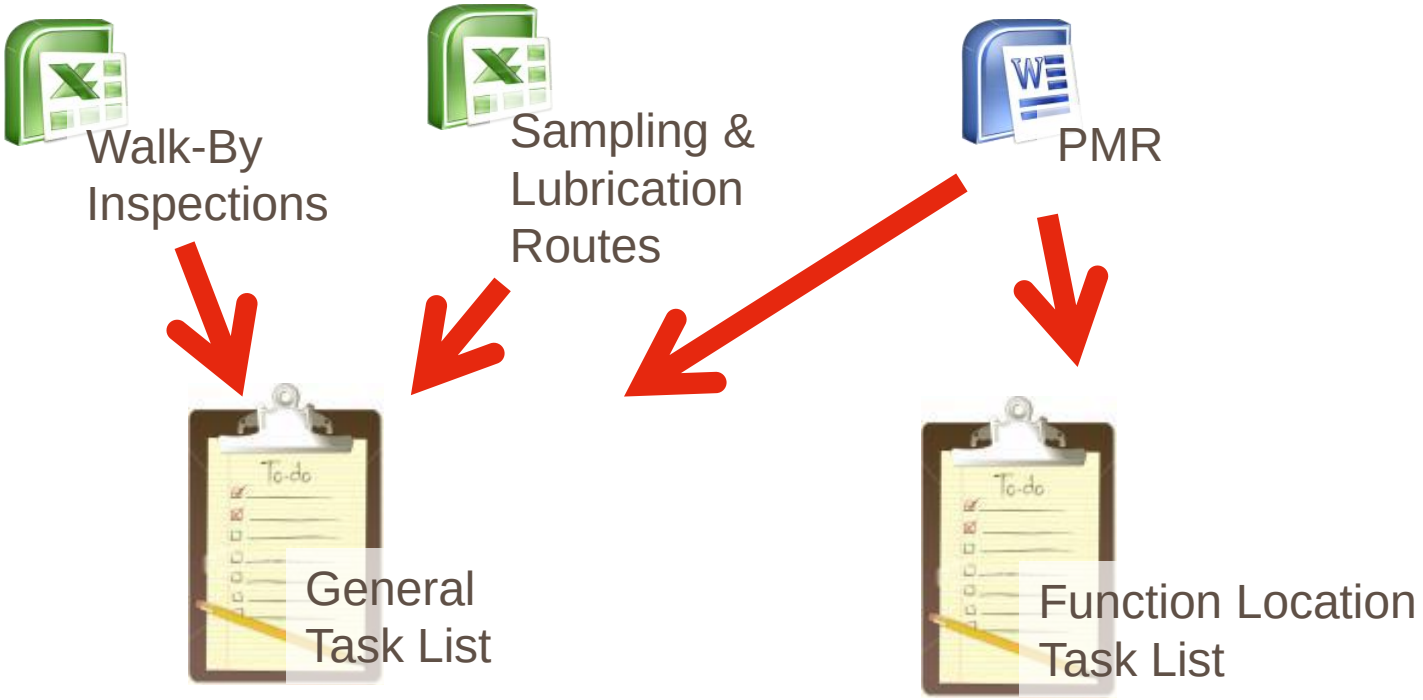
SAP only supports the maintenance team to perform their maintenance tasks but does not influence them!

Before the preventive maintenance program is implemented in SAP all documents need to be ready



Including Work Load Balancing

Task lists contain all information about work that is performed on a recurrent basis



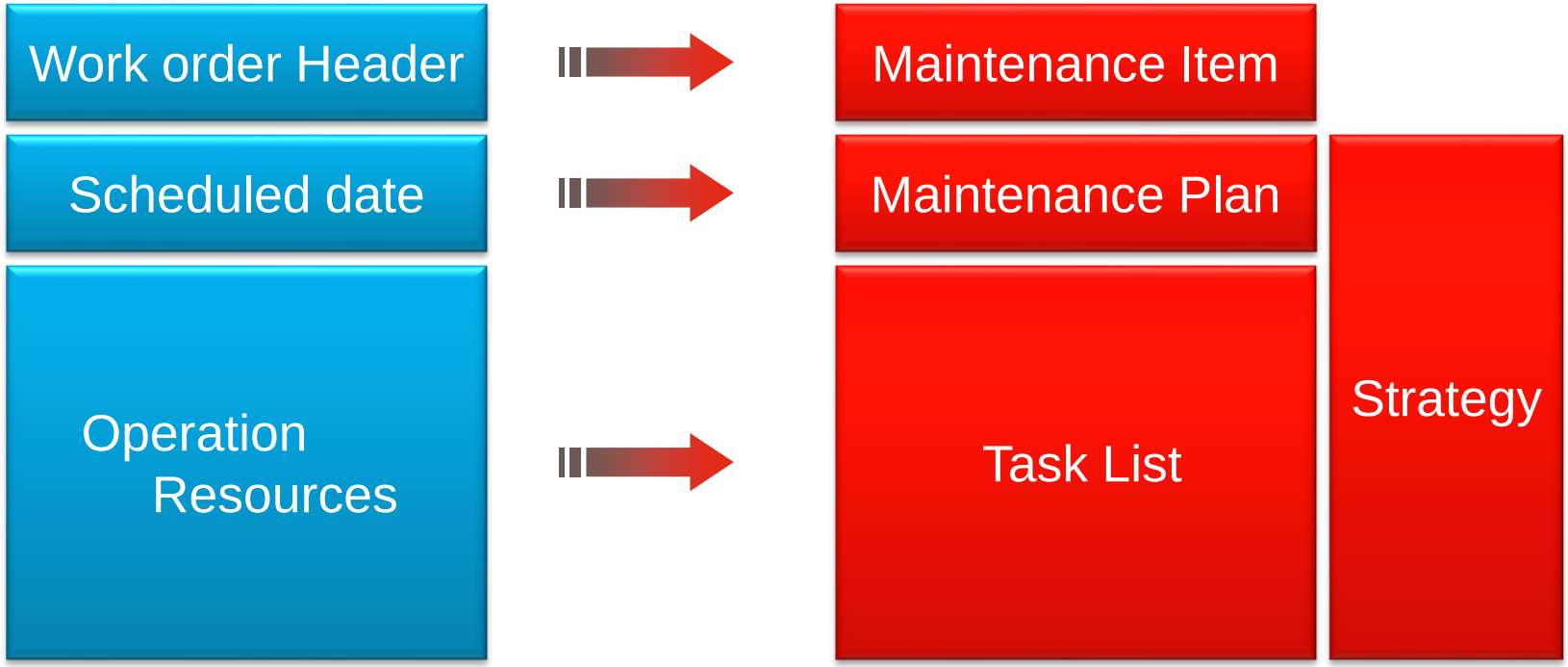
Non object specific tasks
e.g. lubrication routes

Object specific tasks
e.g. PMR on VRM

Use DMS to attach Excel/Word documents to operations

PRT

In the PM module the same components are available as in a corrective work order



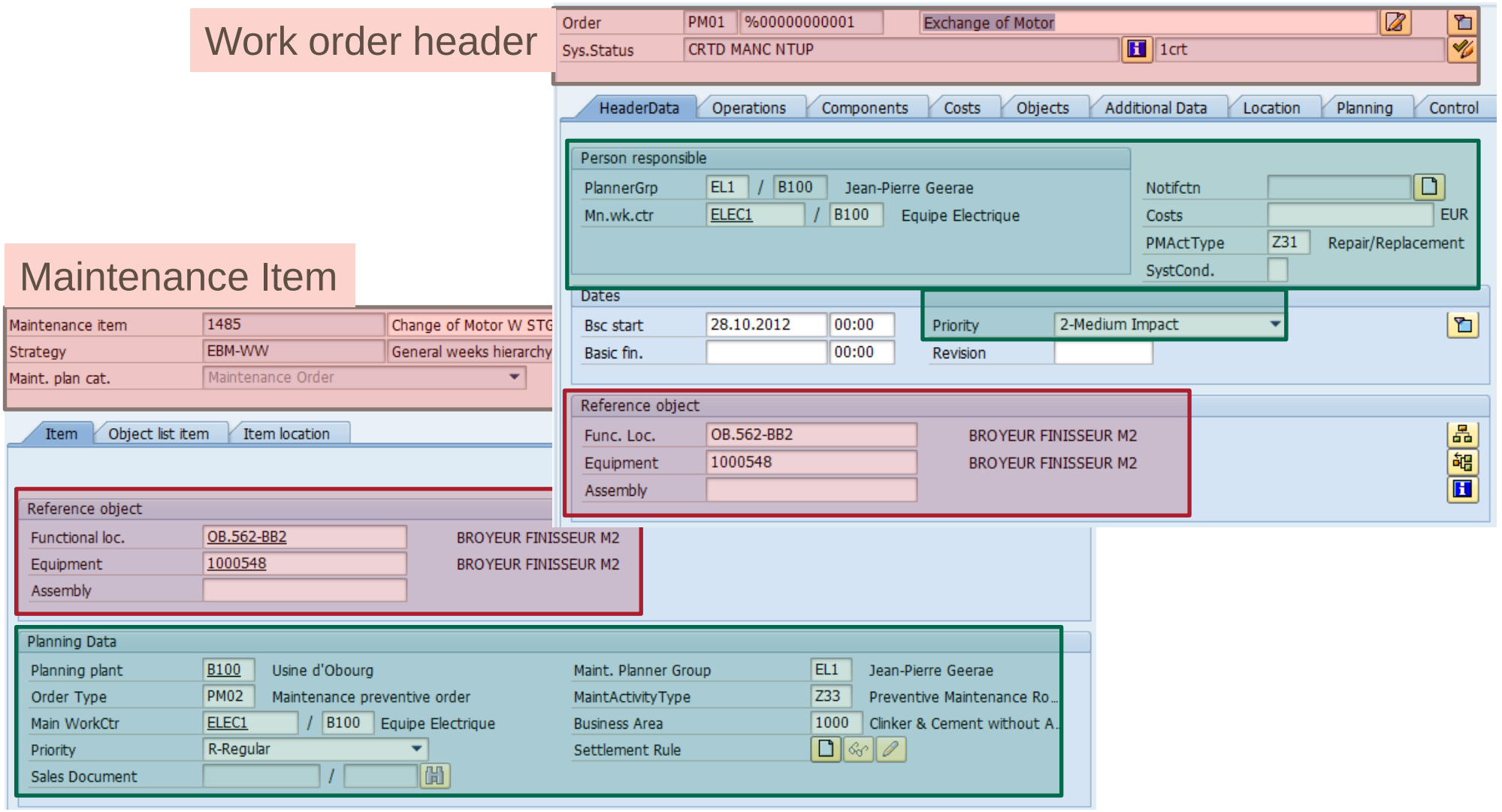
Work Order

Preventive Maintenance module

Maintenance item corresponds to the work order header

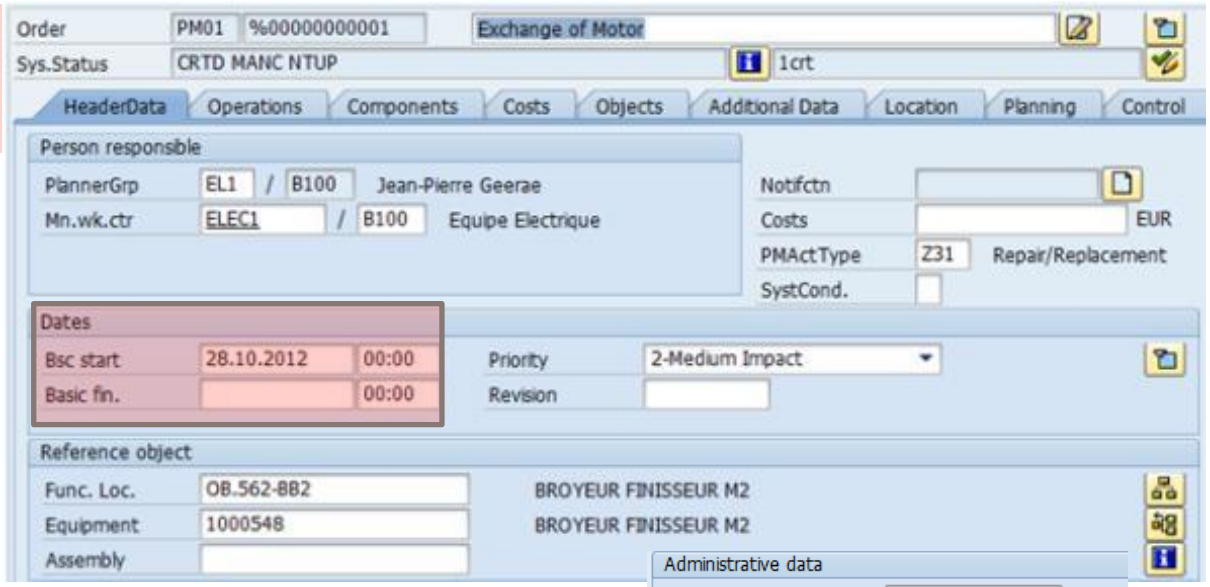
Work order header

Maintenance Item

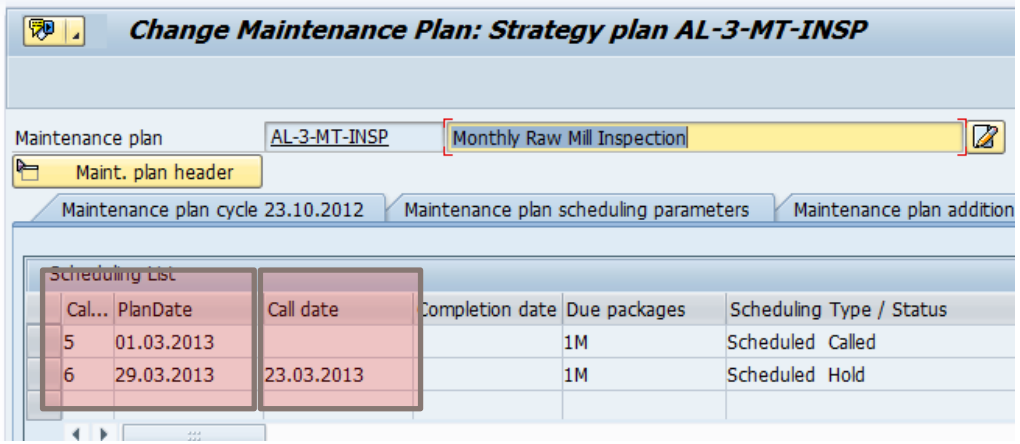


Maintenance plan corresponds to the basic start date

Work Order
Basic Start Date



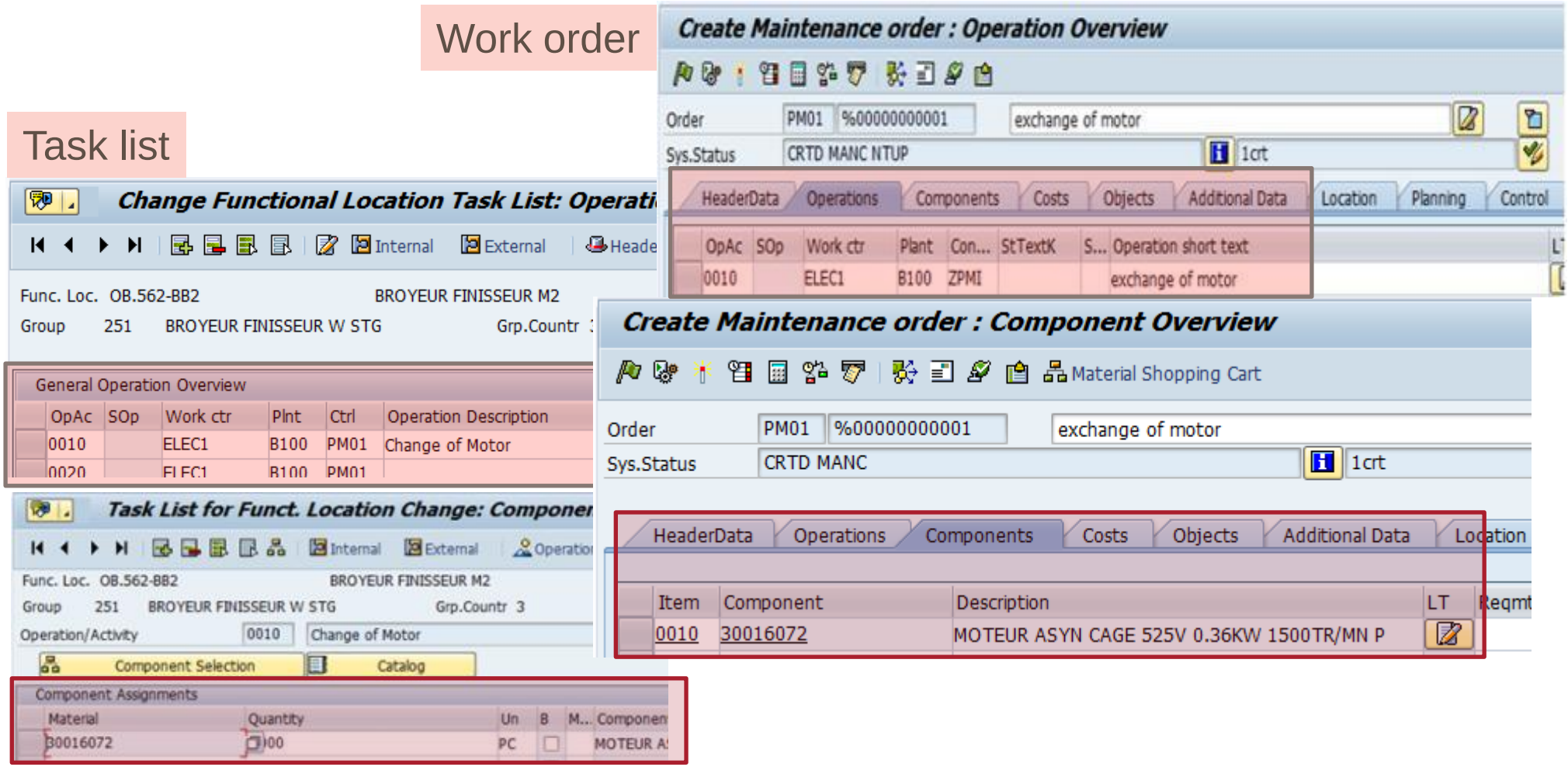
Maintenance Plan



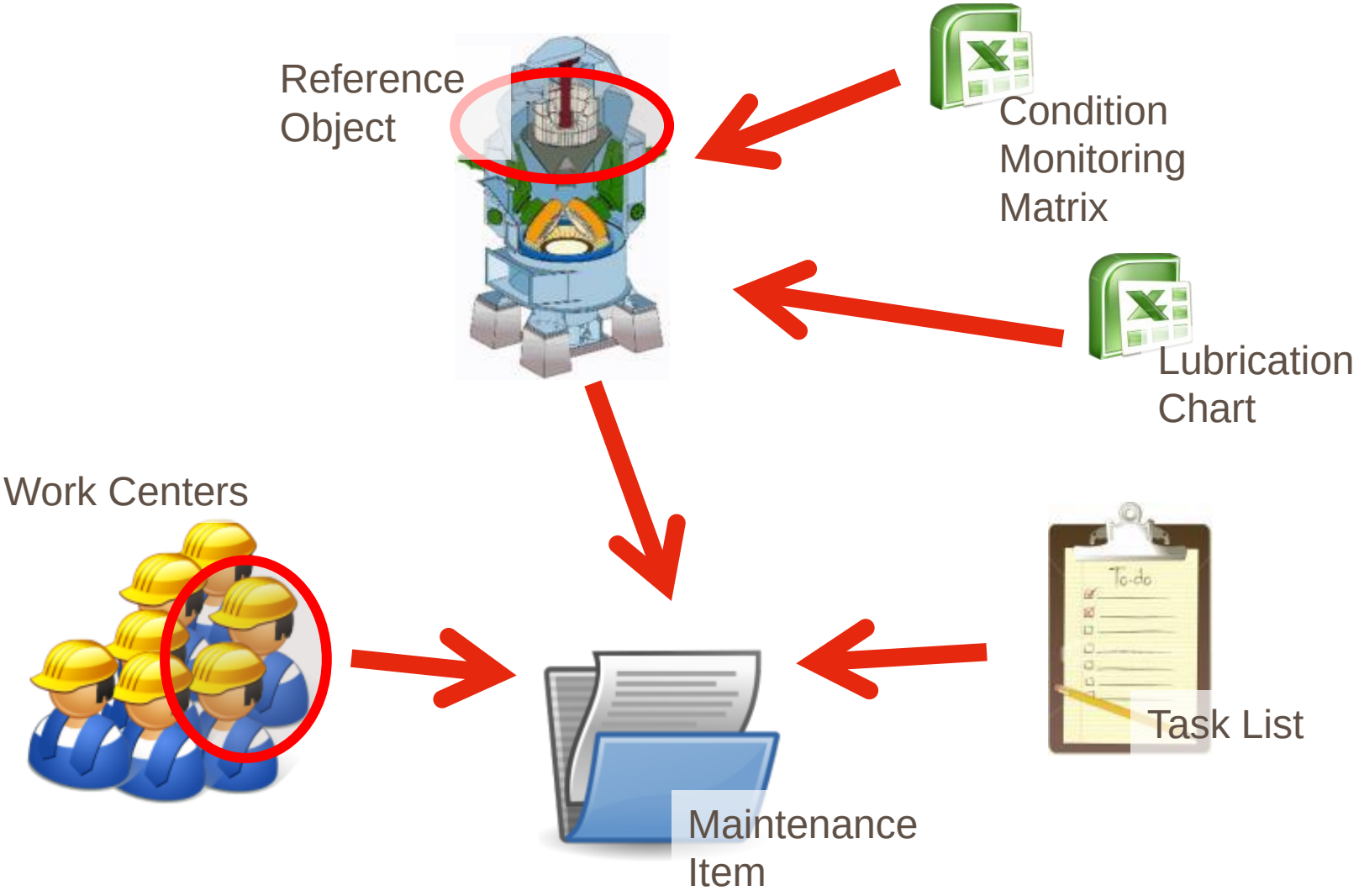
Task lists corresponds to work order operations and components

Work order

Task list



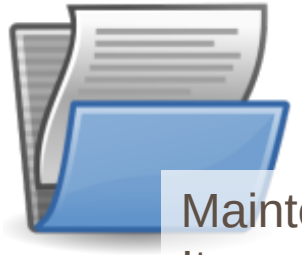
The maintenance item defines where and by whom the tasks defined in the task list should be planned and executed



The maintenance plan defines when a maintenance item should be executed and a call generates the work order

Maintenance Strategy

Schedule Maintenance Plan



Maintenance Item

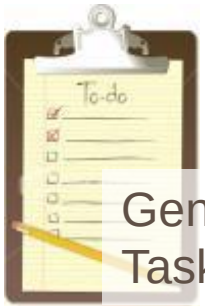
Maintenance Plan

CALL

Work Order

How to use task lists

Groups and group counters help to organize task lists



General Task List

Follow naming conventions, as every plant can see all task list of the region, therefore start the group names always with the plant code.

- Always start with the plant code : *AE*
  - For Walk By Inspection use WBI: *AE-WBI*
  - Mechanical WBI: *AE-WBIM*
  - Raw Ball mill Mechanical inspection: *AE-3BMM*

Function Location Task List

Group counters are organize different task lists within a group.

Functional Location Task Lists get their group automatically as the reference is the functional location.

Recommendation of task list and maintenance item usage

Condition Monitoring Techniques		Example	Level for Work Order	Task List	Code
Lubrication	Greasing route	All routes with greasing and quantity of grease	Area/Line	General Task List	LUB
	Oil and grease replacement	Fixed time replacement of oil for small GB - No oil analysis performed	Equipment	General Task List	OIL
	Oil Sampling & Analysis	Sampling analysis of oil of main equipment	Area/Line	General Task List	OIL
Condition Monitoring	Walk By inspection	Maintenance walk by inspection	Area/Line	General Task List	WBI
	Vibration route	All routes used for Vibration analysis with data collector	Area/Line	General Task List	VIB
	Thermography	Routes for thermography analysis	Area/Line	General Task List	THM
	EMD	Either static of Dynamic measurements	Functional location Level 5 / Equipment	General Task List	EMD
	NDT	VT, PT, MT, UT, E Current	Functional location Level 5	General or Functional Location Task List	NDT
	Equipment specifc measurement	Shell test, lead wire, Run out etc	Functional location Level 5	General or Functional Location Task List	Equipment HAC in 2 digits
	Downtime Inspection	Visual inspection, calibration, cleaning, replacement, adjustment or services	Functional location Level 5 / Equipment	General or Functional Location Task List	Equipment HAC in 2 digits
	Wear mesurement	Liners, thickness, elegation, hardness…	Functional location / Equipment	General or Functional Location Task List	Equipment HAC in 2 digits

Operations organize your task list – a small exercise

Situation Pressure Transmitters

- There are 120 pressure transmitters in you plant
  - 5 in the crusher area
  - 70 in the raw mill area
  - 10 in the kiln area
  - 35 in the cement mill area

PMR Routines on Pressure Transmitters

- Once per day production checks all of them on a WBI if the pressure is within the limits
- One per week maintenance checks all of them on a WBI and writes down the actual values, together with other task
- Once per year a all transmitters need to be calibrated by maintenance. 1 person needs 2 days for it: on the first day he calibrates the first half on the second day the second half.

Exercise How would you organize this within SAP

- What documents are needed?
- How do organize your task lists?
- Discuss with your neighbor (5 minutes)
- Discussion in the plenum

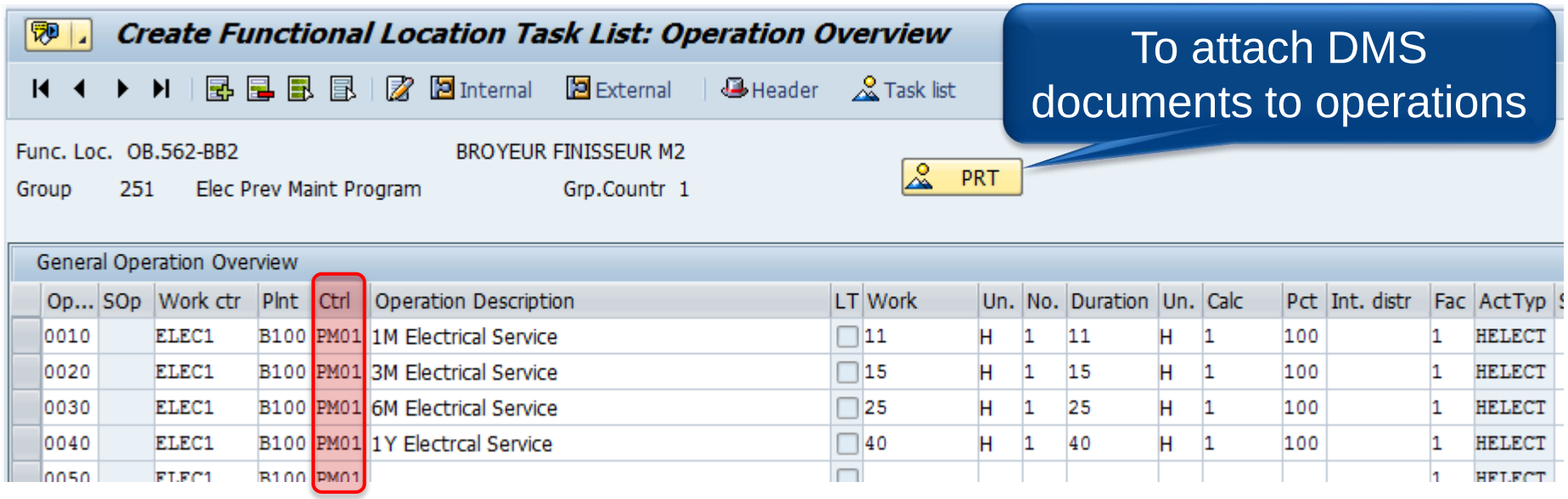
Operations organize your task list – a small exercise

Solution A recommendation

- Production WBI not organized in SAP
- Maintenance WBI checks are organized in routes by area → using general task lists using 1 task list with 1 operation per route. Each task list is linked to the corresponding area.
- Calibration organized with 1 task list with 2 operations, one for the first day and one for the second day. Linked to functional location of the raw mill area as there is the largest amount of transmitters. An alternative for the link to the functional location would be a link to an auxiliary cost center lie the electrical work shop, which would be finally transferred to Clinker Production / Cement Grinding work centers with the split of 70% / 30%.

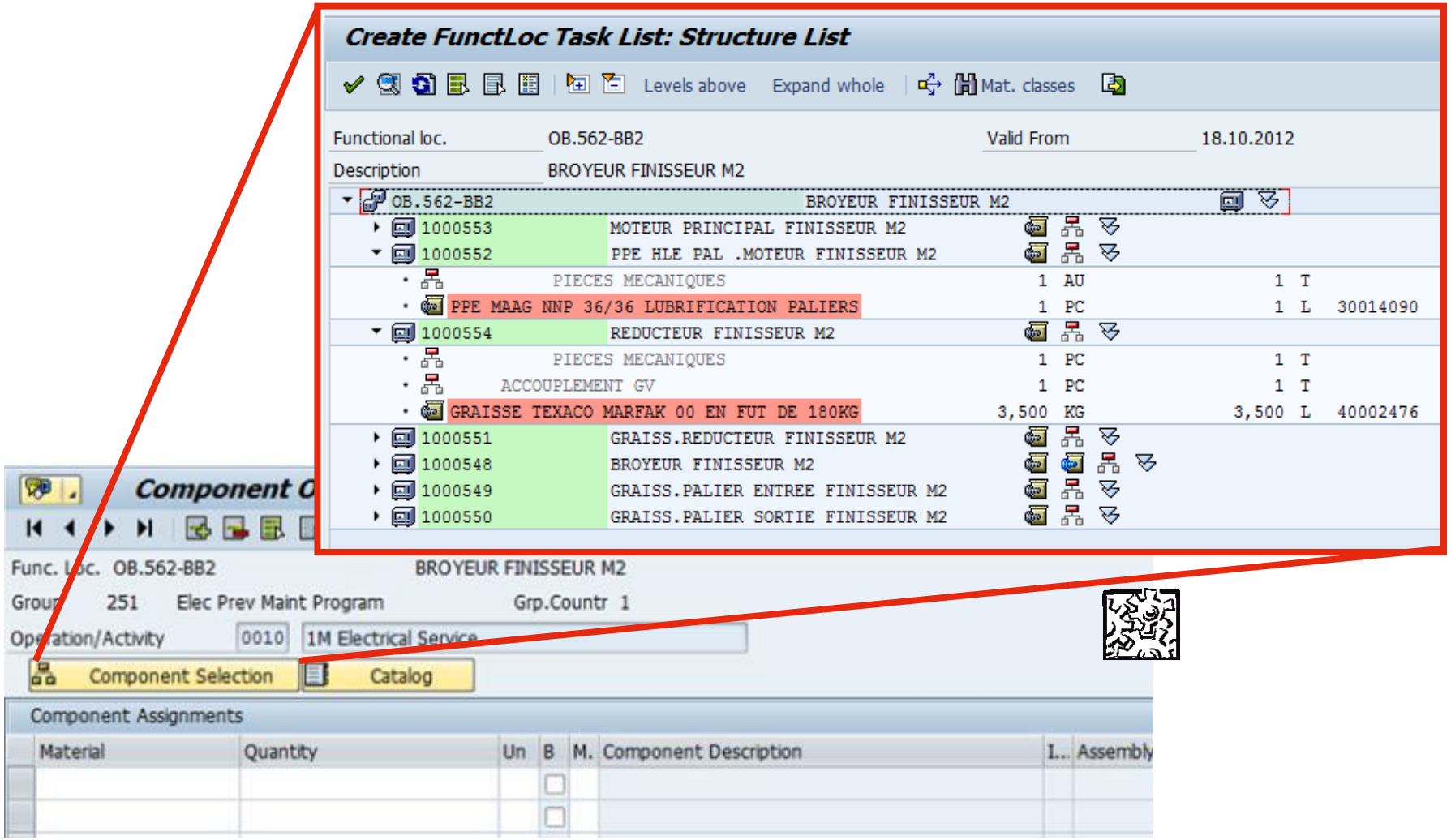
Use task list operations for major steps. Task list instructions to be attached via DMS to the operation

- The operations are expressed in such way they describe the frequency, and the function
- The personnel (work center) needed and the duration of the executions is also defined in this step
- Purchase request for service can be created using ControlKey PM02 or PM03 like in a work order

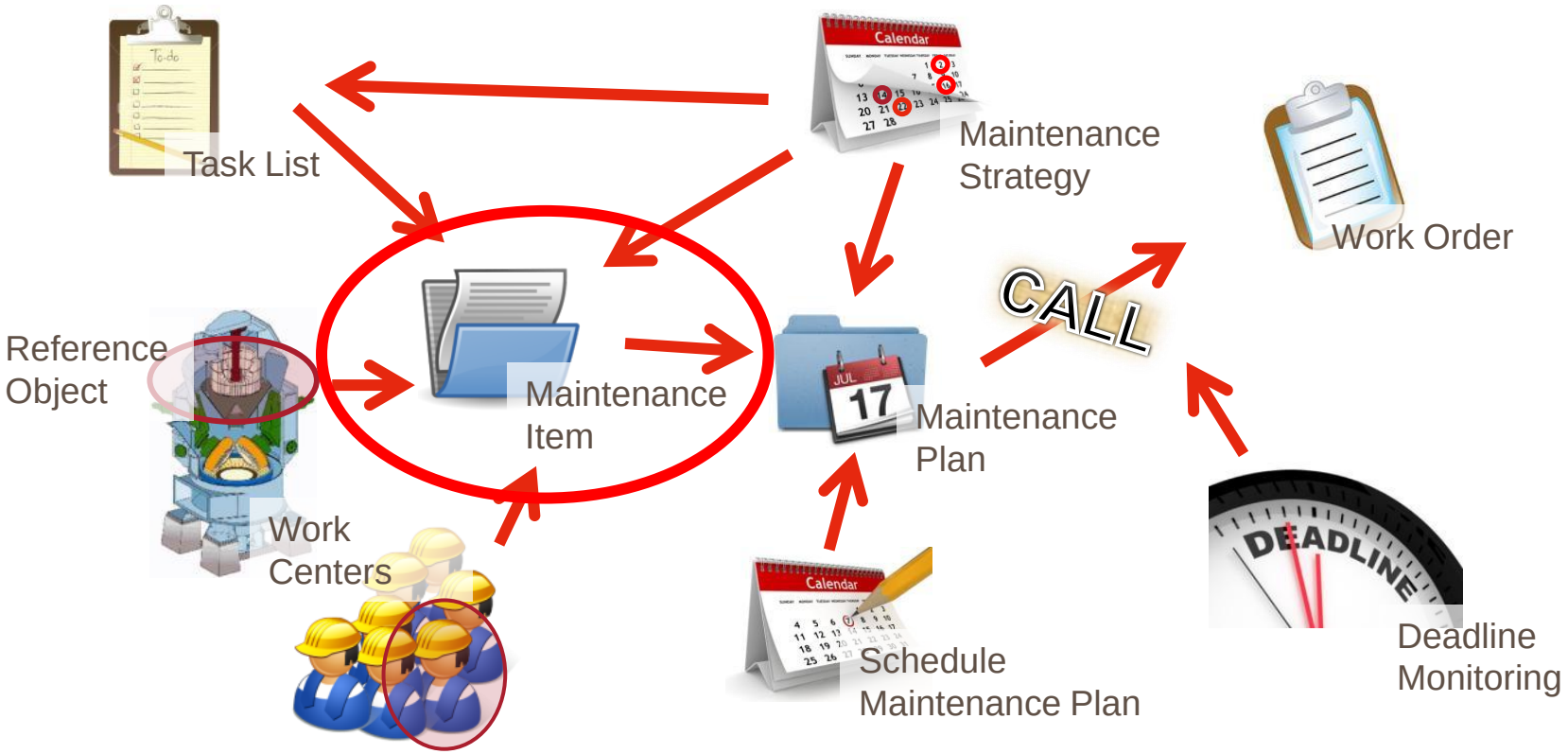


Op...	SOp	Work ctr	Plnt	Ctrl	Operation Description	LT	Work	Un.	No.	Duration	Un.	Calc	Pct	Int. distr	Fac	ActTyp
0010		ELEC1	B100	PM01	1M Electrical Service		11	H	1	11	H	1	100		1	HELECT
0020		ELEC1	B100	PM01	3M Electrical Service		15	H	1	15	H	1	100		1	HELECT
0030		ELEC1	B100	PM01	6M Electrical Service		25	H	1	25	H	1	100		1	HELECT
0040		ELEC1	B100	PM01	1Y Electrcal Service		40	H	1	40	H	1	100		1	HELECT
0050		ELEC1	B100	PM01											1	HELECT

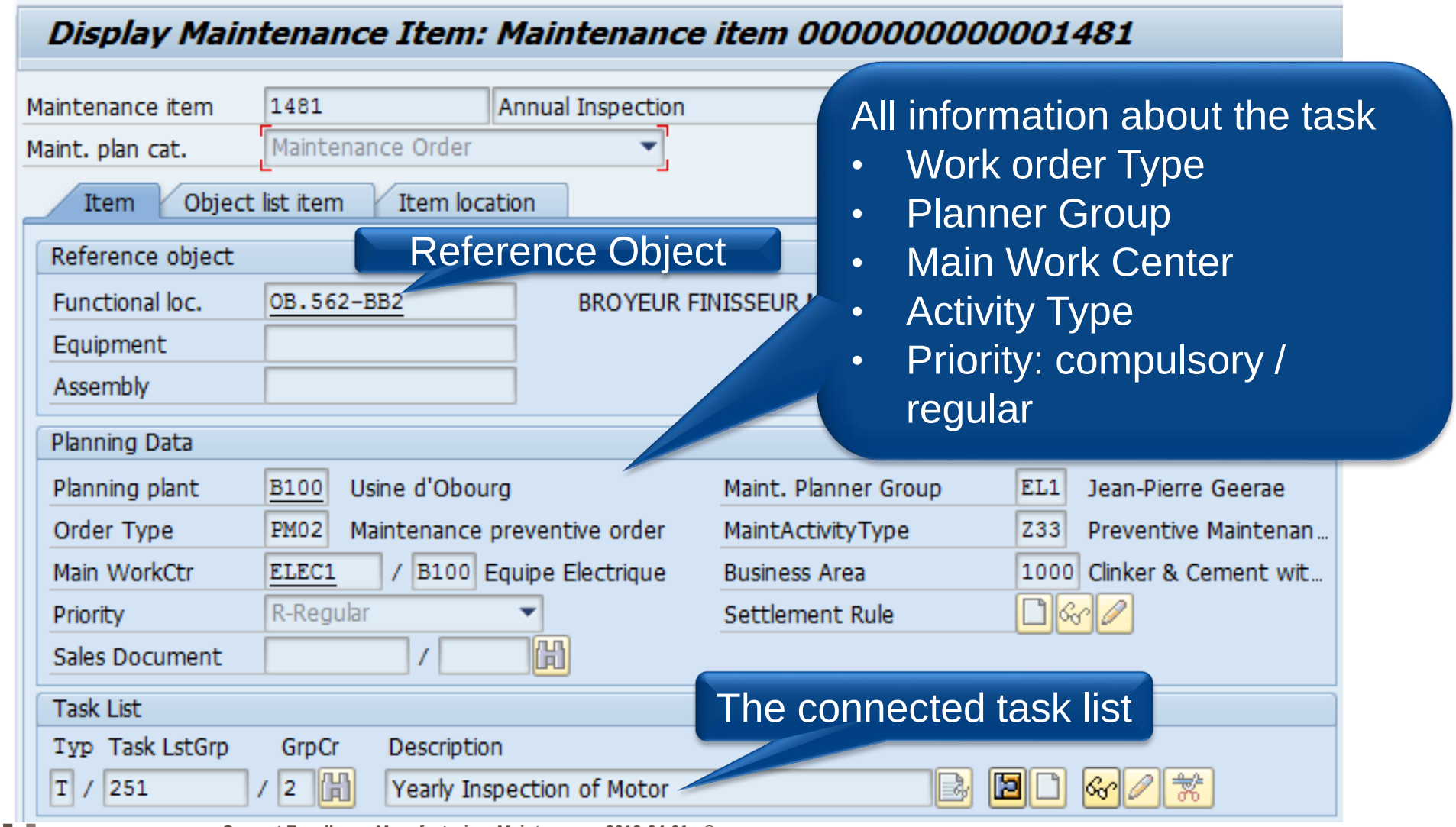
Components can also be assigned to each operation: Can be used for corrective maintenance standard procedure



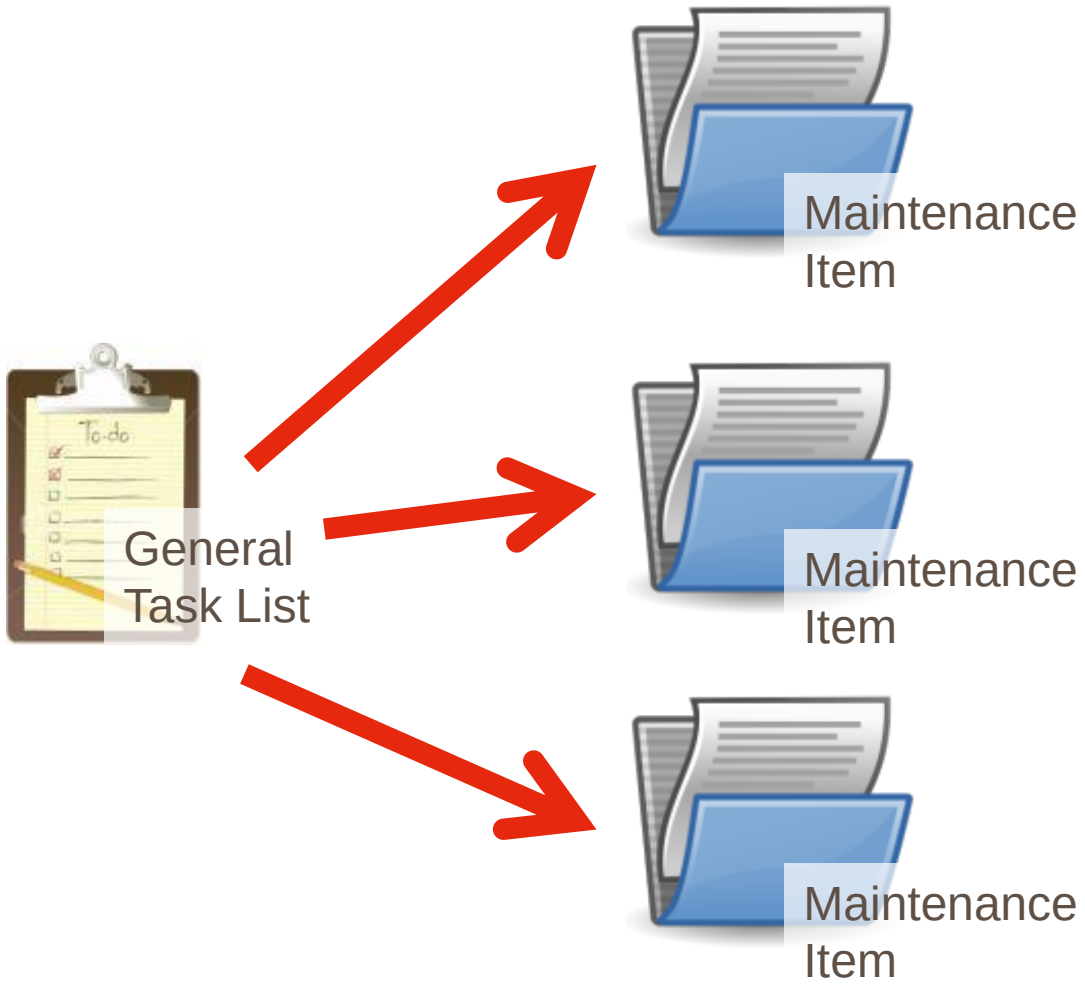
How to use maintenance items



The maintenance item contains all managerial information about the tasks



A general task list can be linked to various maintenance items



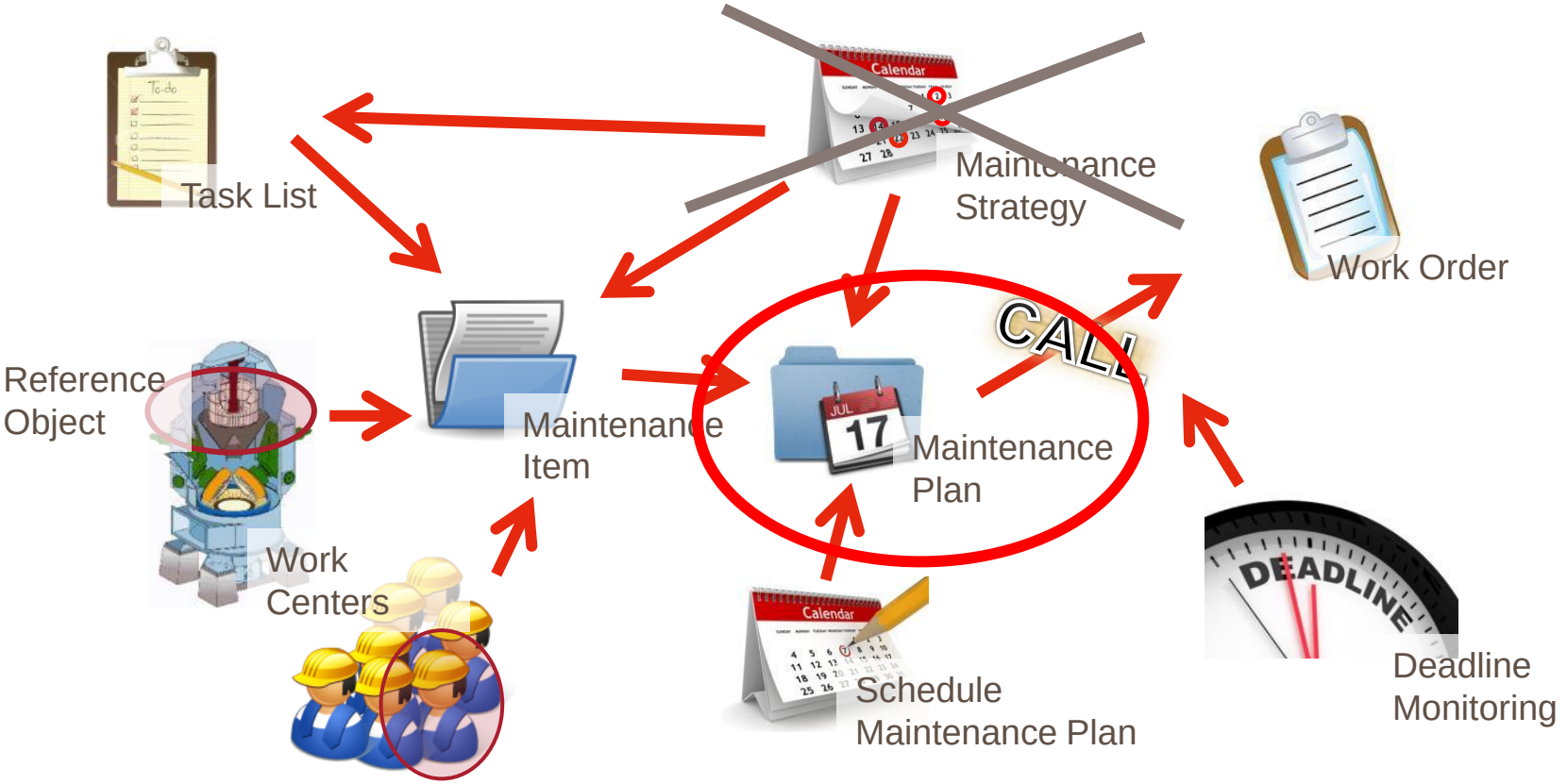
Example:

The task list contains the information about the PMR (calibration) of a weight belt feeder.

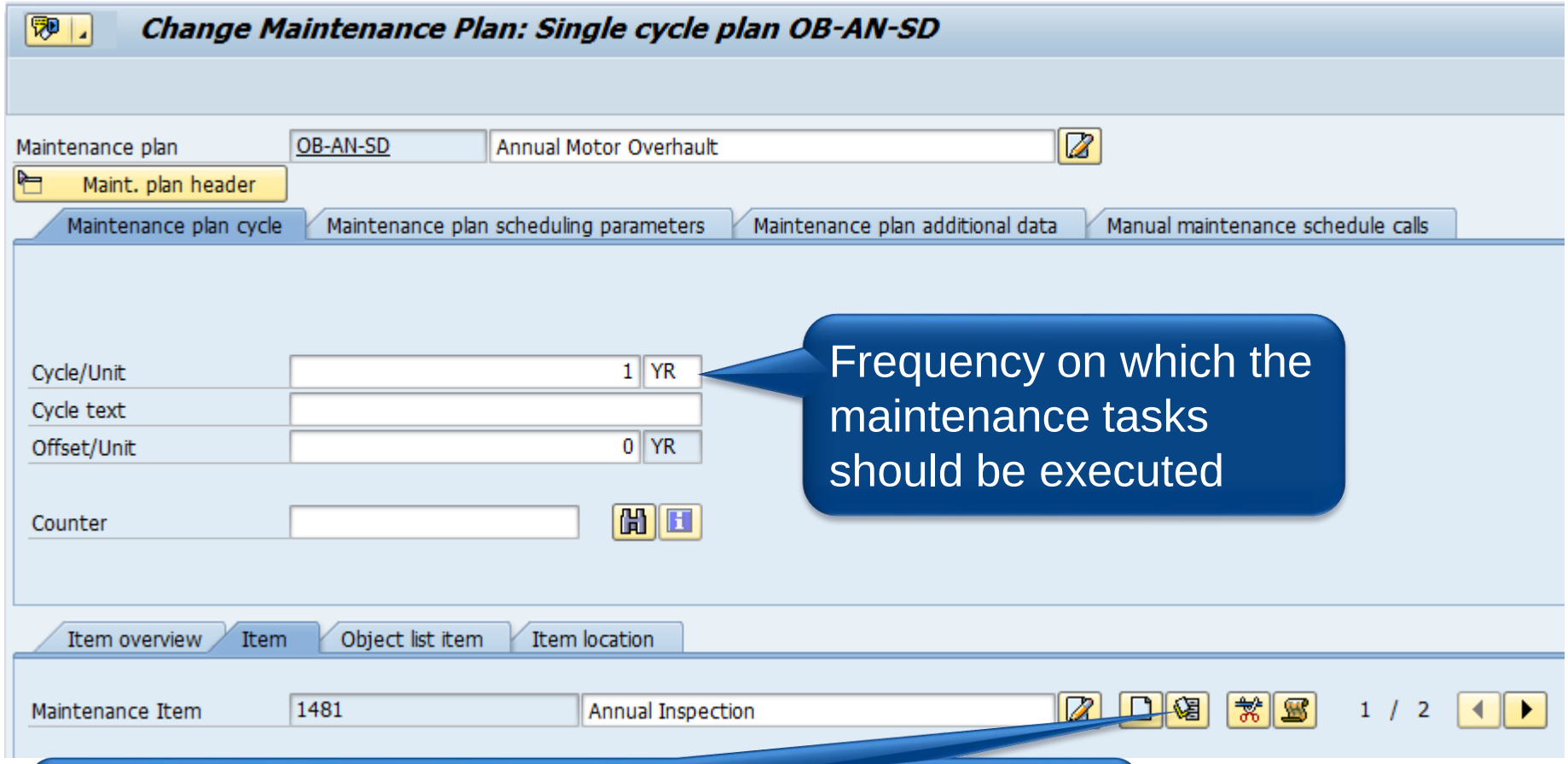
For each weight belt feeder a maintenance item is created.

If PMR that should be executed on various weight belt feeders are exactly the same, they can share the task list.

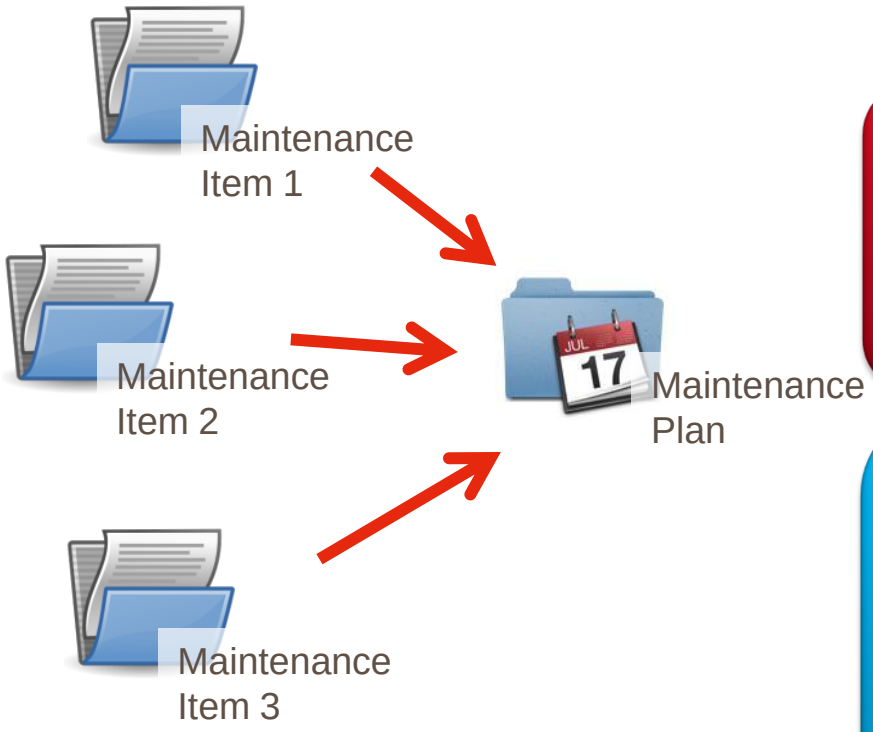
How to use single cycle maintenance plans



A single cycle maintenance plan can manage reoccurring activities which do not interfere with other activities



To avoid disadvantages, only 1 maintenance item should be assigned to 1 maintenance plan

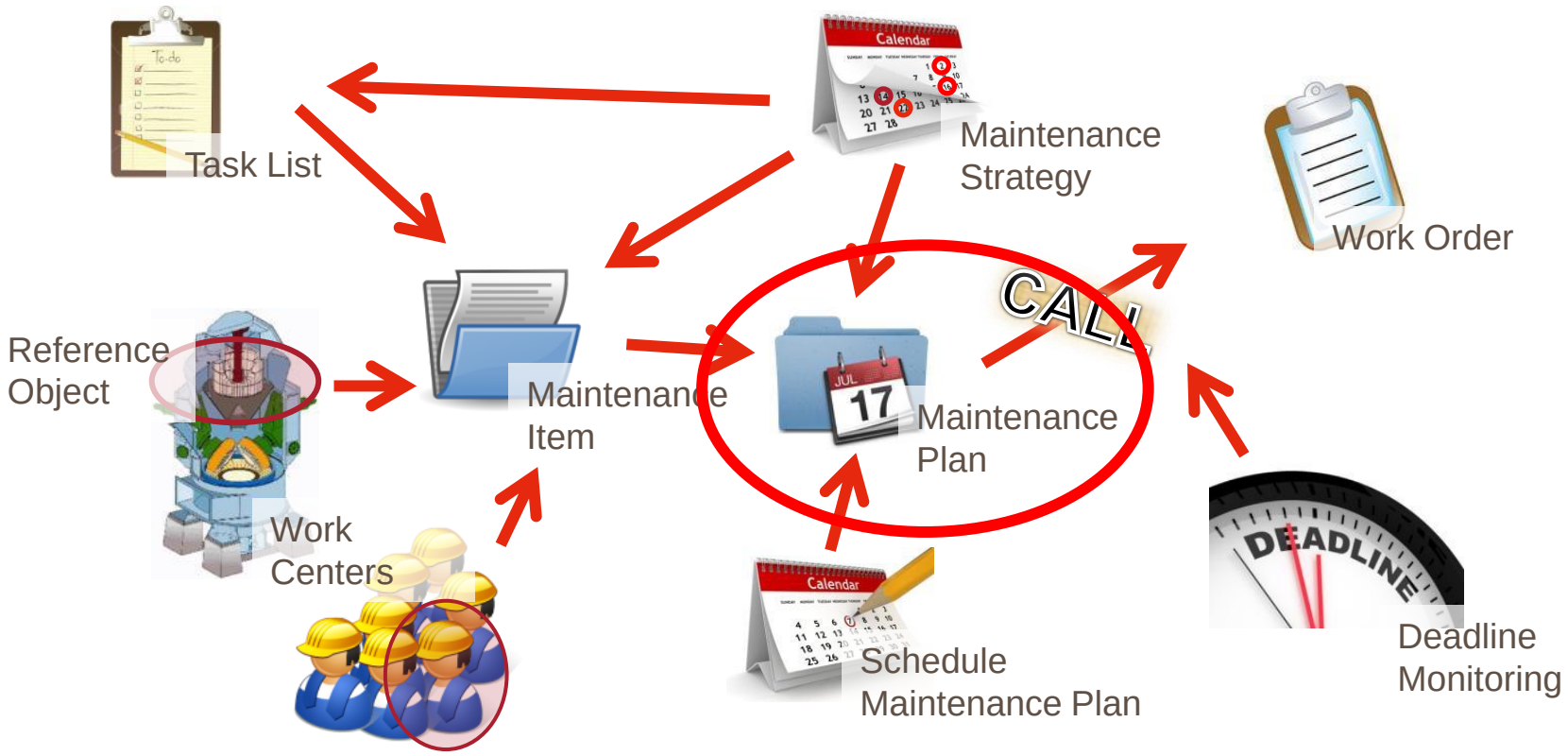


Advantages/Disadvantages of attaching several Maintenance Items to the same Maintenance plan:

- With 1 call several work orders can be created
- The number of maintenance plans can be reduced

- All work orders have the same basic start date
- Difficult to manage maintenance items as cycle length can not be separately managed
- If not properly managed work orders can be accidentally deleted

How to use TIME BASED strategy plans



A maintenance strategy is built up of maintenance packages which are either “linked” or not to each other

Name	WEEK_H
Description	Weekly Based with Hierarchy
Scheduling indicator	Time

Package No.	Cycl.length	Unit	Maintenance cycle text	Cycle ShortT...	Hierarchy	Hierarc
10	1	WK	1 Week	1W	10	1W
20	2	WK	2 Week	2W	20	2W
30	4	WK	1 Month	1M	30	1M
40	8	WK	2 Month	2M	40	2M
50	12	WK	3 Month	3M	50	3M
60	16	WK	4 Month	4M	60	4M
70	24	WK	6 Month	6M	60	6M
80	48	WK	1 Year	1Y	70	1Y
90	96	WK	2 Years	2Y	80	2Y

Packages are defined through their cycle length and hierarchy level

Packages are “linked” to each other → Hierarchy

Name	WEEK_N
Description	Week Based w/o Hierarchy
Scheduling indicator	Time

Package No.	Cycl.length	Unit	Maintenance cycle text	Cycle ShortT...	Hierarchy	Hiera
10	1	WK	1 Week	1W	10	NH
20	2	WK	1 Weeks	2W	10	NH
30	4	WK	1 Month	1M	10	NH
40	8	WK	2 Month	2M	10	NH
50	12	WK	3 Month	3M	10	NH
60	16	WK	4 Month	4M	10	NH
70	24	WK	6 Month	6M	10	NH
80	48	WK	1 Year	1Y	10	NH
90	96	WK	2 Years	2Y	10	NH

Packages are NOT “linked” to each other → NO Hierarchy

In a strategy with hierarchy, for each cycle, only 1 Work Order gets generated. Work Orders with lower hierarchy are ignored

Strategy: WEEK_N — Week Based w/o Hierarchy — **Without hierarchy**

Pk	Cycle text	1 WK	2 WK	3 WK	4 WK	5 WK	6 WK	7 WK	8 WK	9 WK	10 WK	11 WK	12 WK	13 WK	14 WK	15 WK
1	1 Week	1W	1W	1W	1W	1W	1W	1W	1W	1W	1W	1W	1W	1W	1W	1W
2	1 Weeks		2W		2W		2W		2W		2W		2W		2W	
3	1 Month				1M				1M				1M			
4	2 Month								2M							
5	3 Month												3M			

Strategy: WEEK_H — Week Based with Hierarchy — **With hierarchy**

Pk	Cycle text	1 WK	2 WK	3 WK	4 WK	5 WK	6 WK	7 WK	8 WK	9 WK	10 WK	11 WK	12 WK	13 WK	14 WK	15 WK
1	1 Week	1W		1W		1W		1W		1W		1W		1W		1W
2	2 Week		2W				2W				2W				2W	
3	1 Month				1M											
4	2 Month								2M							
5	3 Month												3M			

A strategy has to be assigned to a task list in order to assign operations to maintenance packages

Func. Loc. OB.562-BB2 BROYEUR FINISSEUR M2

Group 251 Weekly Mill Inspection

Group	251	
Group Counter	5	Weekly Mill Inspection
Planning plant	B100	

Assignments to Header

Work center	MECH1 / B100	Equipe M
Usage	4	Plant maintenance
Planner group	ME1	Nicolas Fierro
Status	4	Released (general)
System Condition	1	in operation
Maintenance strategy	WEEK_H	Week Based with Hierarchy
Assembly		

Strategy has to be assigned

Name	WEEK_H
Description	Weekly Based with Hierarchy
Scheduling indicator	Time

Package No.	Cycl.length	Unit	Maintenance cycle text	Cycle ShortT...	Hierarchy	Hierarc
10	1	WK	1 Week	1W	10	1W
20	2	WK	2 Week	2W	20	2W
30	4	WK	1 Month	1M	30	1M
40	8	WK	2 Month	2M	40	2M
				3M	50	3M
				4M	60	4M
				6M	60	6M
80	48	WK	1 Year	1Y	70	1Y
90	96	WK	2 Years	2Y	80	2Y

Maintenance Packages are defined at operation level

Func. Loc. OB.562-BB2 BROYEUR FINISSEUR M2

Group 251 Weekly Mill Inspection Grp.Countr 5

General Operation Overview

OpAc	SOp	Work ctr	Plnt	Ctrl	Operation Description	LT	Work	Un
0010		MECH1	B100	ZPMI	Weekly Inspection		5	H
0020		MECH1	B100	ZPMI	Monthly inspection		8	H
0030		MECH1	B100	ZPMI				

MntPack

Func. Loc. OB.562-BB2 K FINISSEUR M2

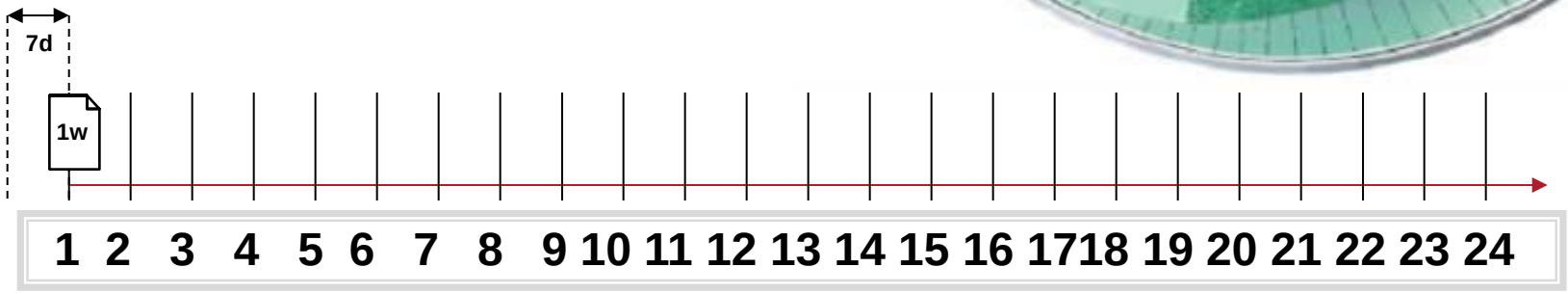
Group 251 Weekly Mill Inspection Grp.Countr 5

Operat. Overview Maint. Packages

Op.	SOp	Operation Description	1W	2W	1M	2M	3M	4M
0010		Weekly Inspection	☑	☐	☐	☐	☐	☐
0020		Monthly inspection	☐	☐	☑	☐	☐	☐

Usage of hierarchy demonstrated through an example

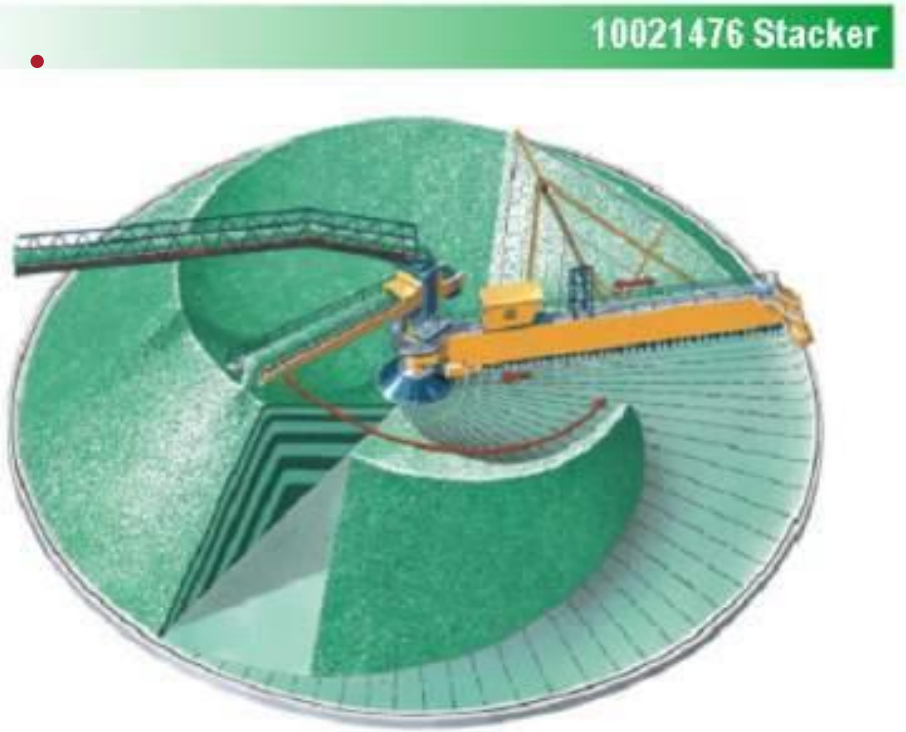
- Consider a specific piece of equipment, certain maintenance tasks have to be carried out at weekly intervals.

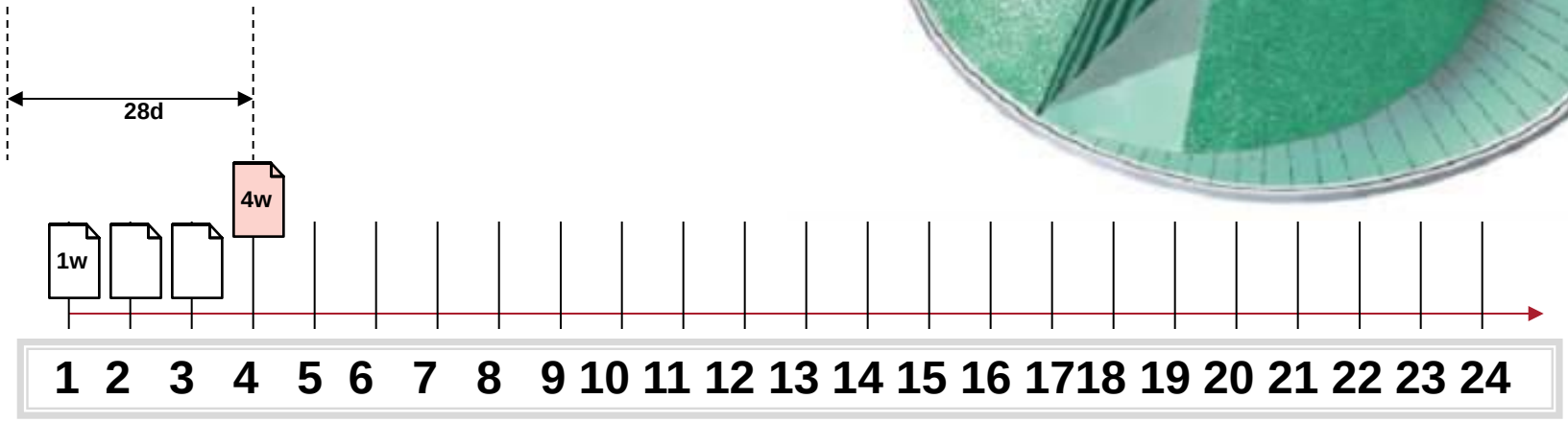


Weekly Maintenance Cycle

If 2 tasks of a task list should be executed at the same time, only the one with the higher hierarchy level gets created

- Some other tasks have to be carried out once every four weeks.

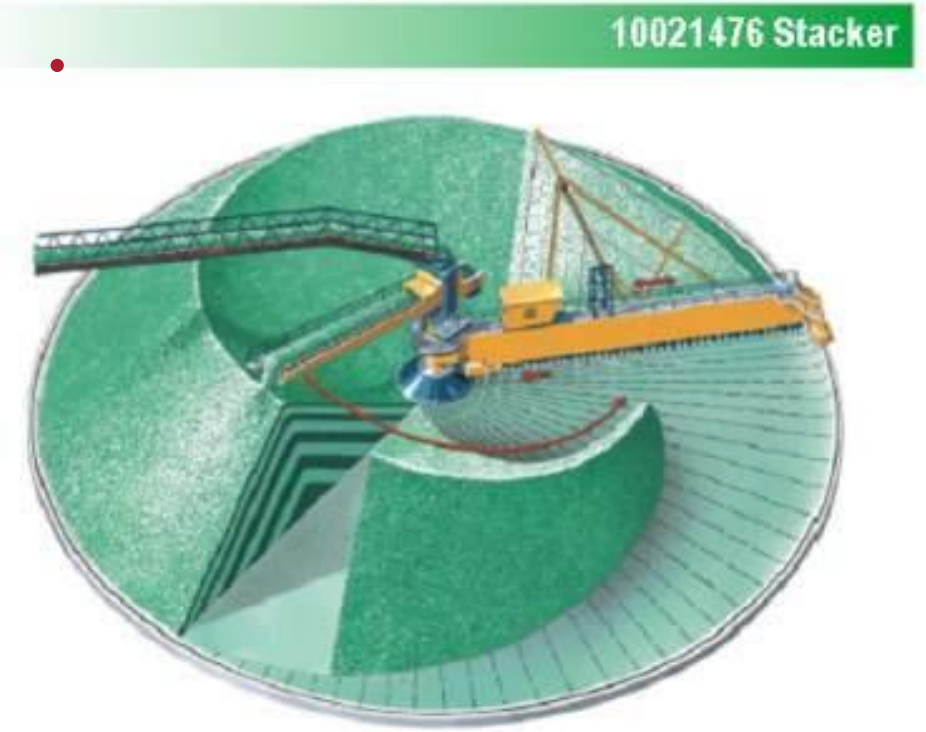


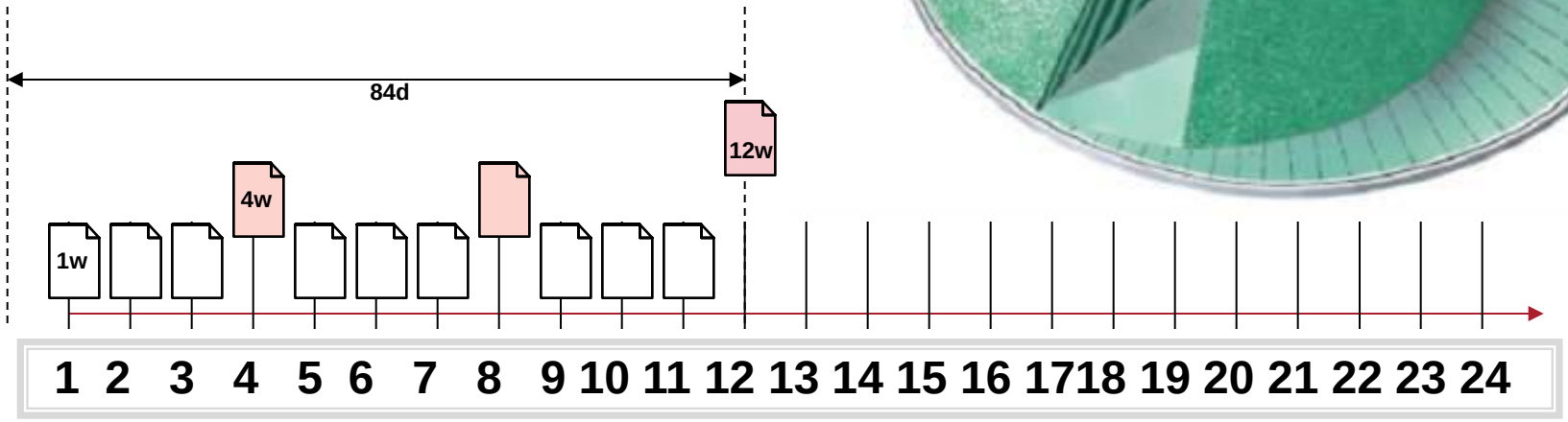


Weekly Maintenance Cycle

The same applies for more than 2 tasks

- Some other tasks have to be carried out once every 12 weeks.

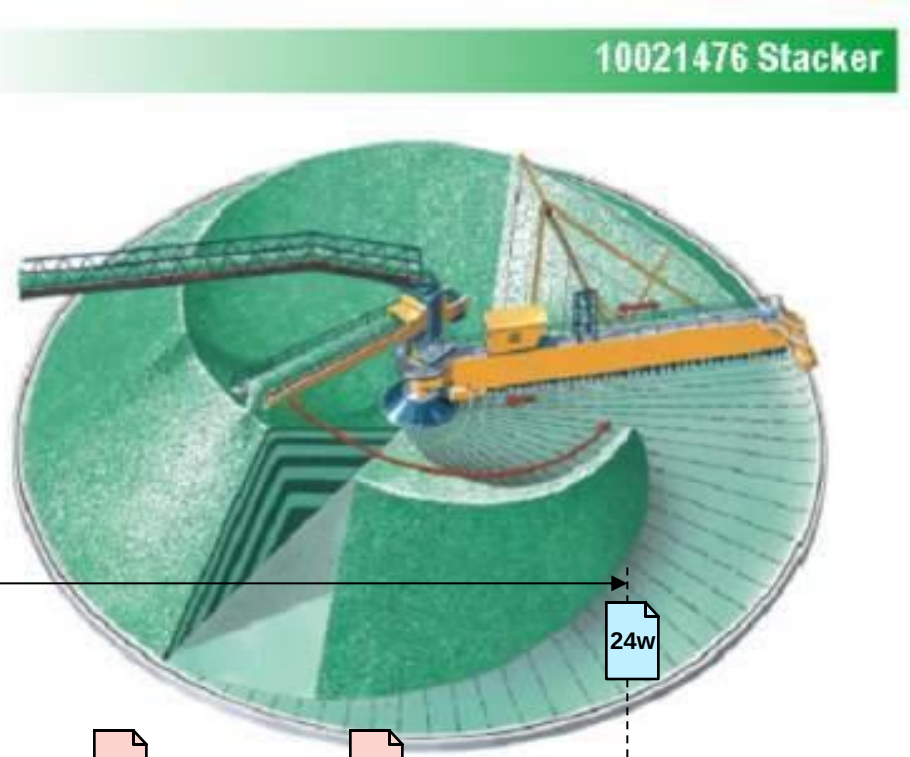


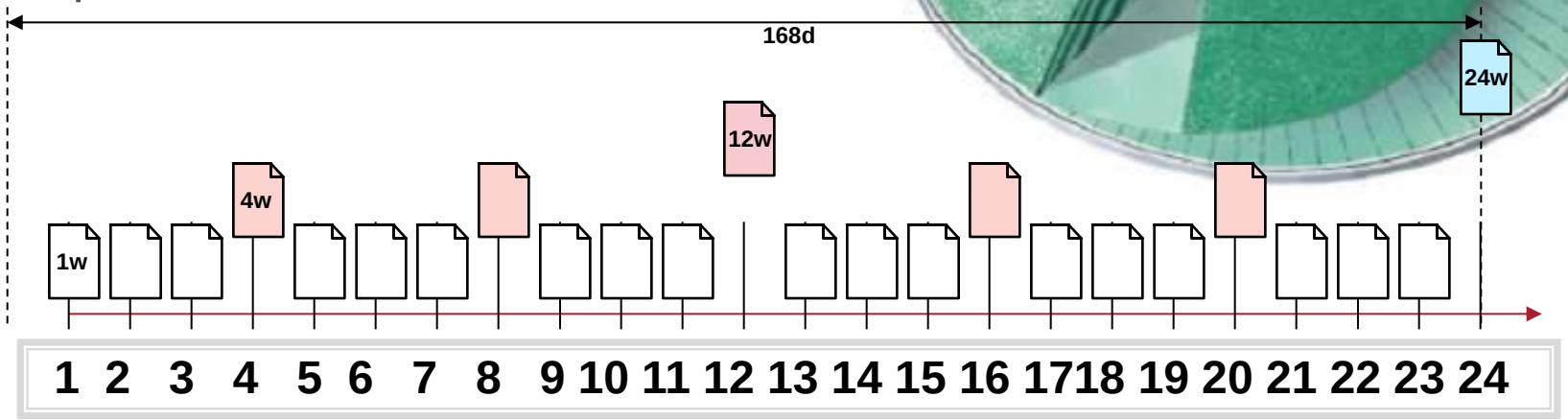


Weekly Maintenance Cycle

Example : Time Based Plans

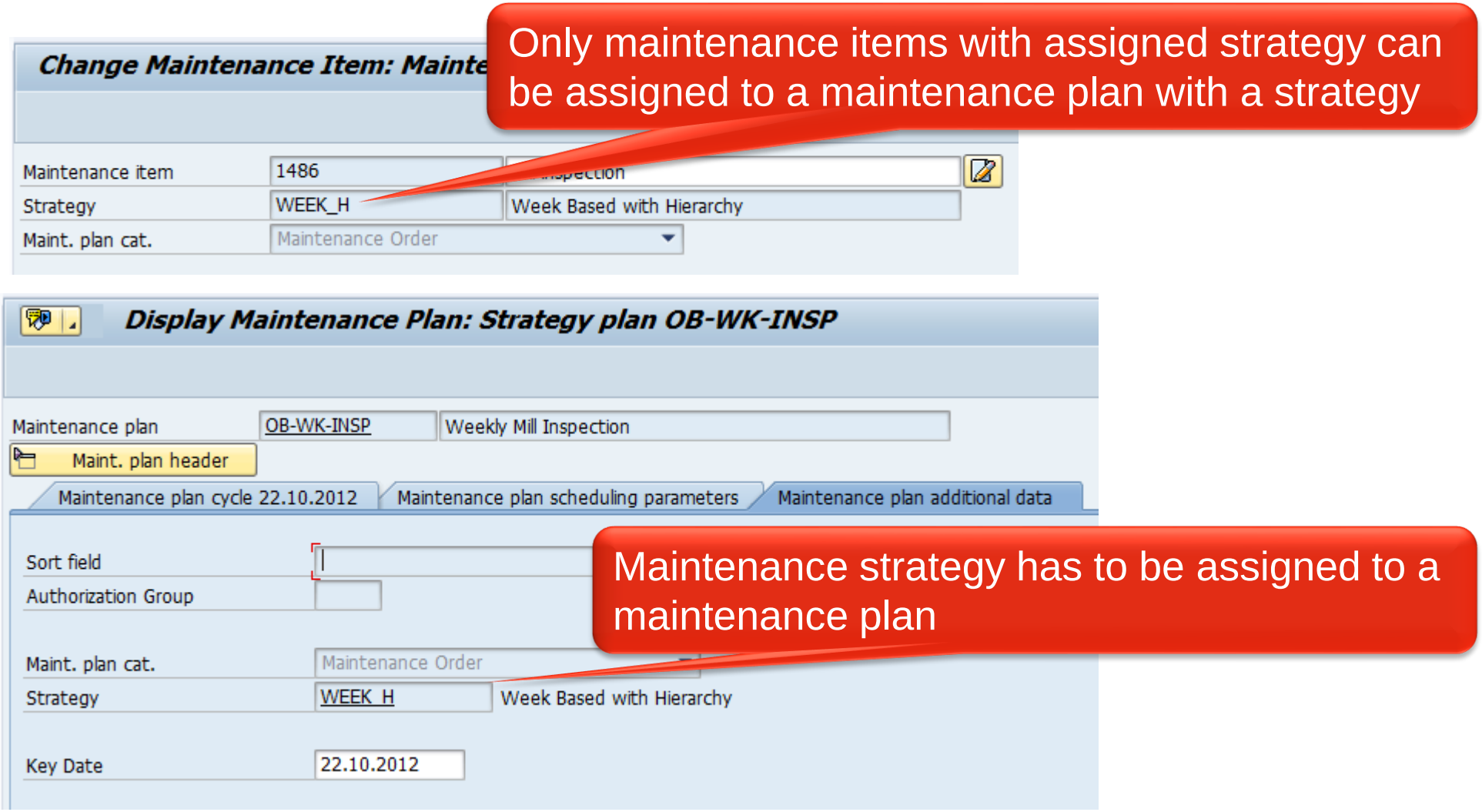
- And some other tasks have to be carried out once every 24 weeks.
- The Task List is the tool for preventive maintenance
- The purpose of the task list is to provide the Planned Order with its Operations



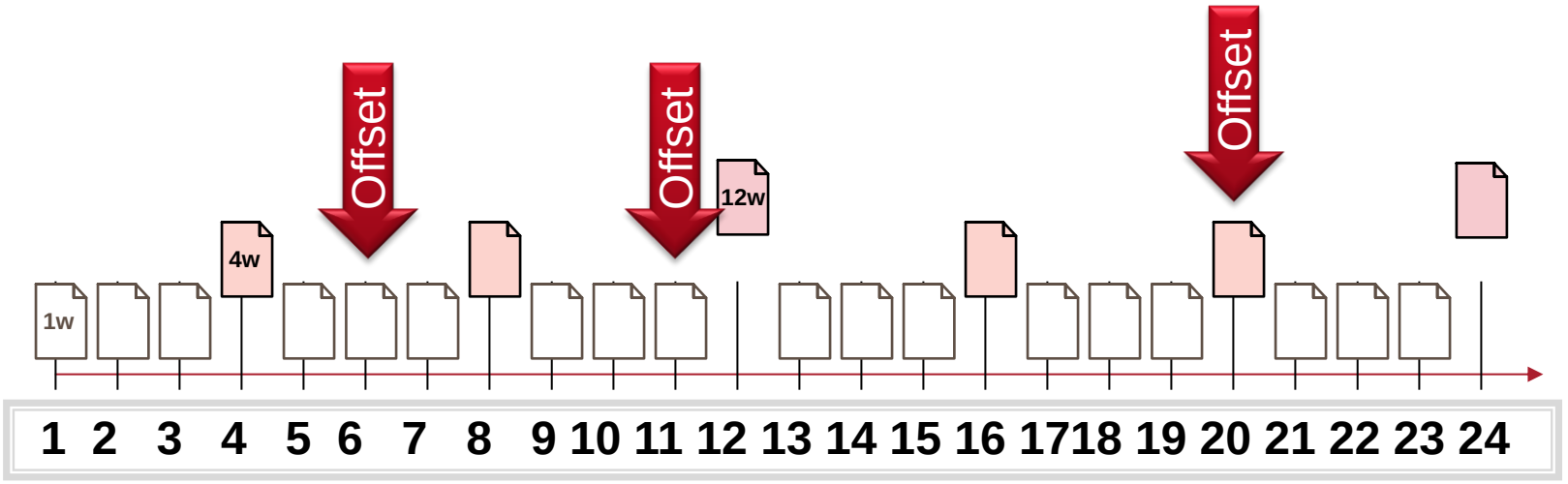


Weekly Maintenance Cycle

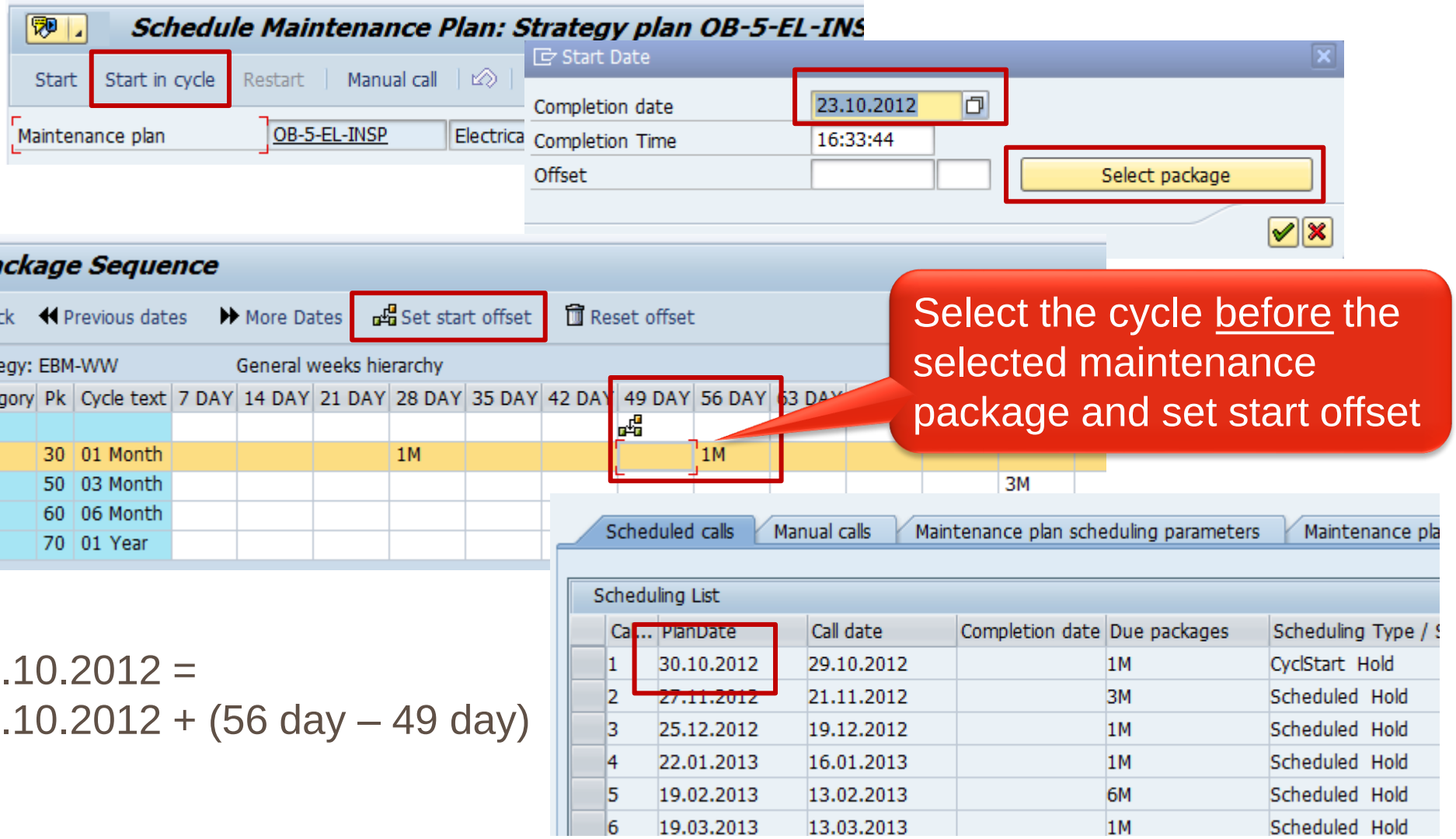
Only task lists with assigned strategy can be assigned to maintenance items with the same strategy



A maintenance strategy plan can be started anywhere within the cycle

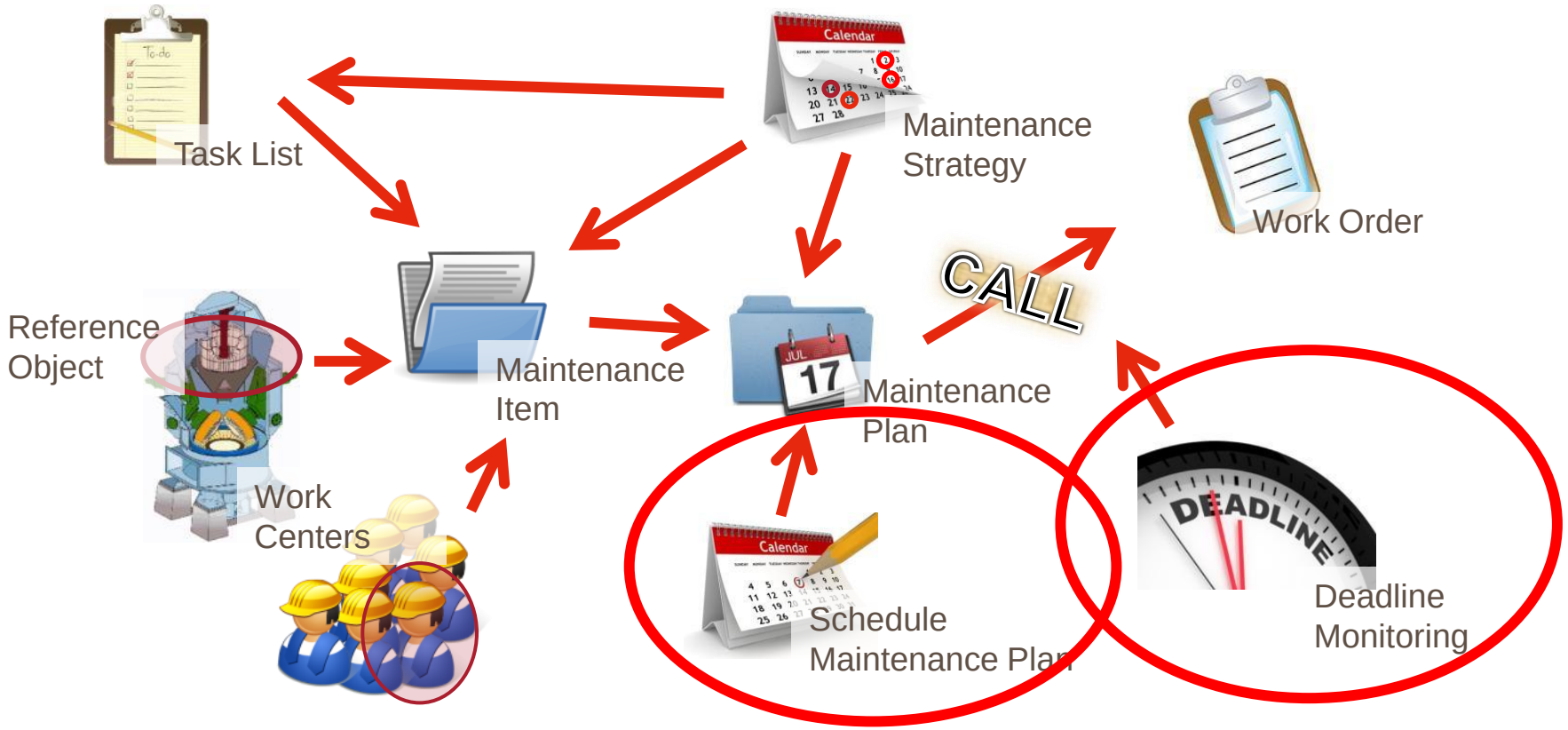


To start anywhere inside the strategy plan an offset has to be set when the maintenance plan is scheduled

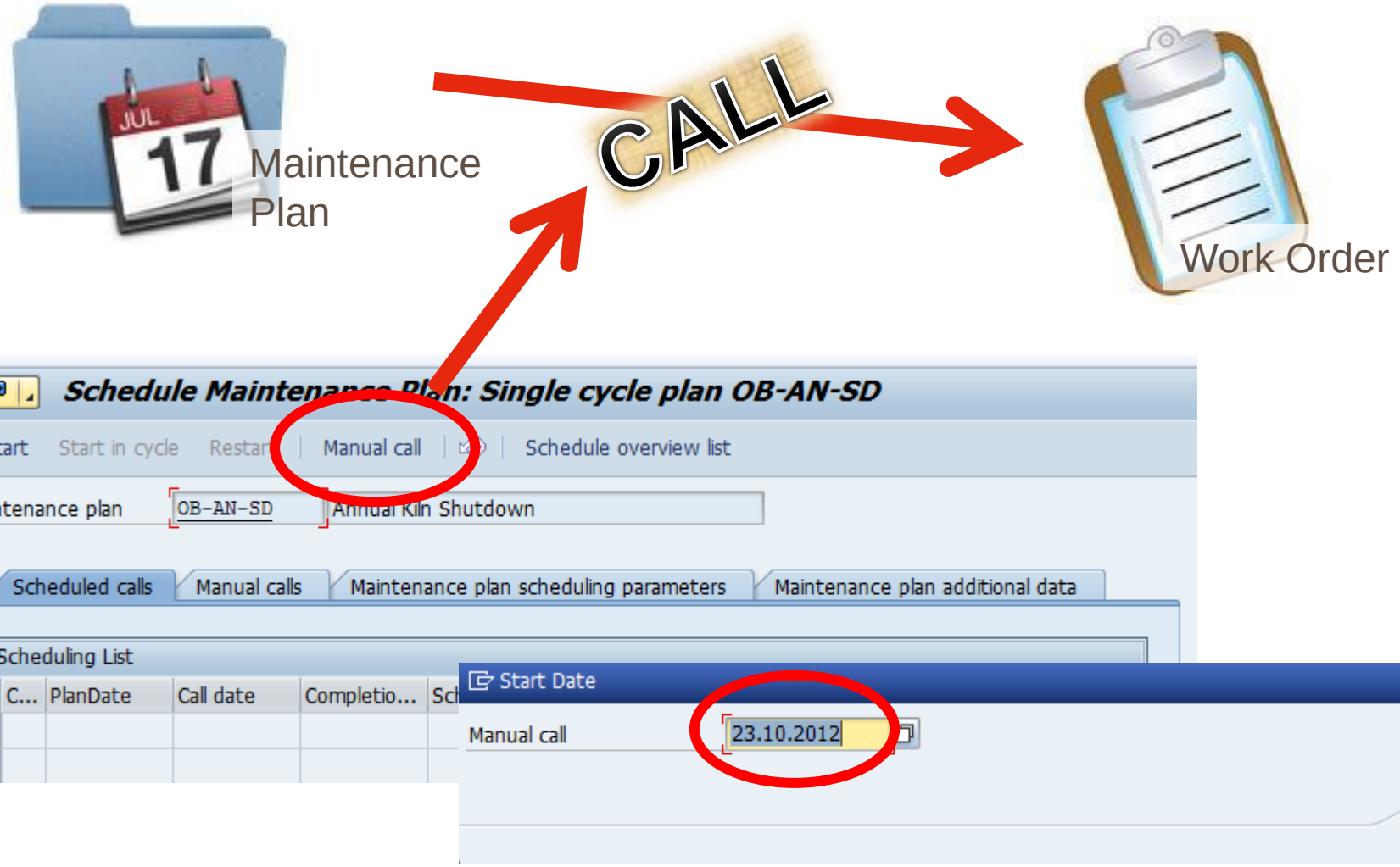


30.10.2012 =
23.10.2012 + (56 day – 49 day)

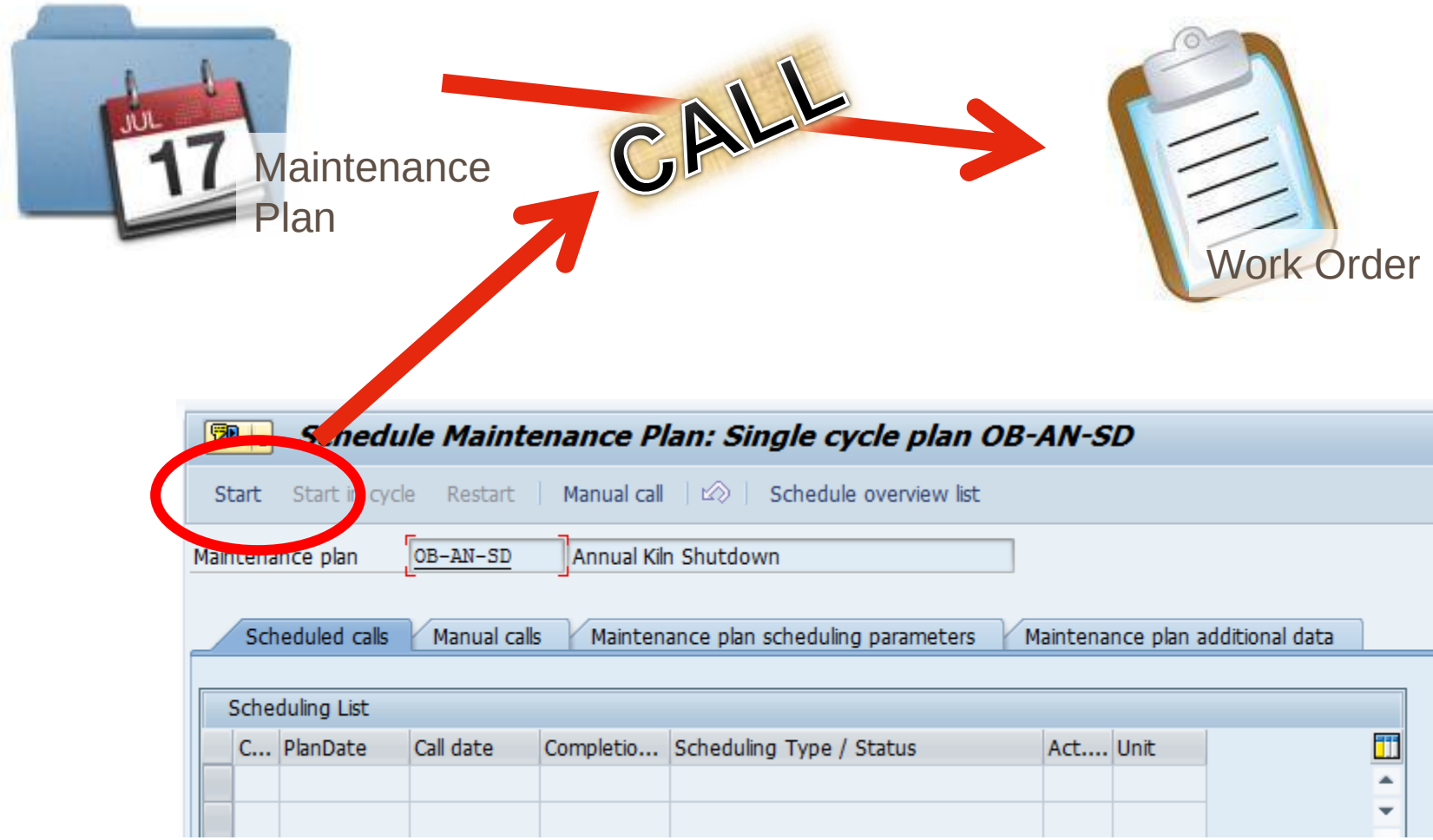
How to schedule a maintenance plan and how to use deadline monitoring



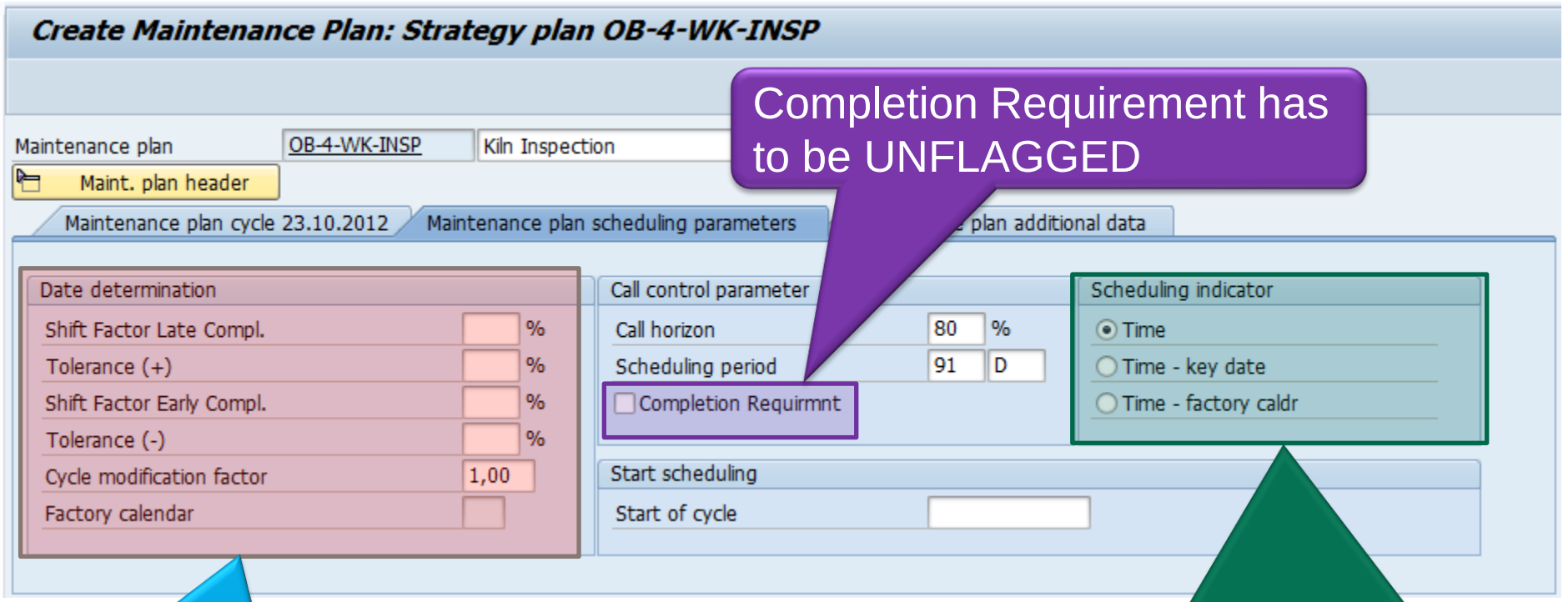
If the execution date of a maintenance plan regularly moves the call should be done manually and set the date

- 

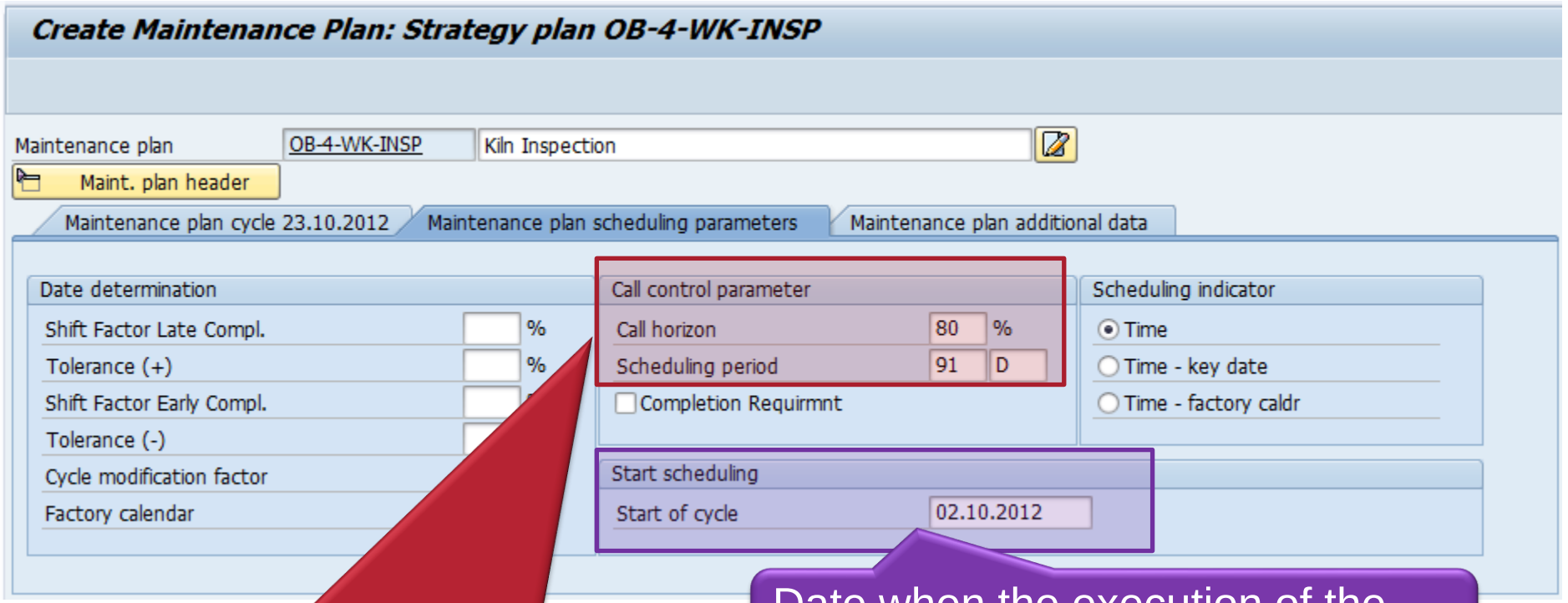
If there is a maintenance program with reoccurring tasks SAP can take care about the timing



For time based maintenance plans not all parameters are needed



The scheduling parameters should always have the same values



Date when the execution of the maintenance plan should start

Call horizon: 80% (defined through strategy)
Scheduling period: 91 days (only if package length is >3month a scheduling period of 1 year should be chosen

Example to illustrate the parameters: basic parameters

Cycles

Cycle	Unit	Maintenance cycle text	Offset
4	WK	1 Month	0

Call control parameter

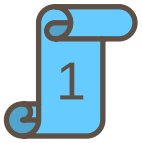
Call horizon	80	%
Scheduling period	30	D
Completion Requirmnt		

Start scheduling

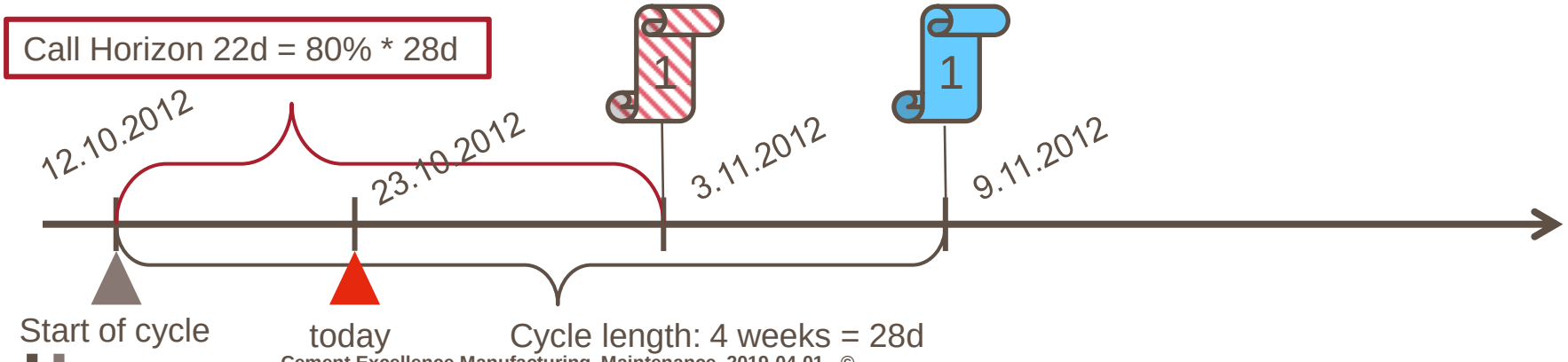
Start of cycle	12.10.2012

Planned Creation of WO 1

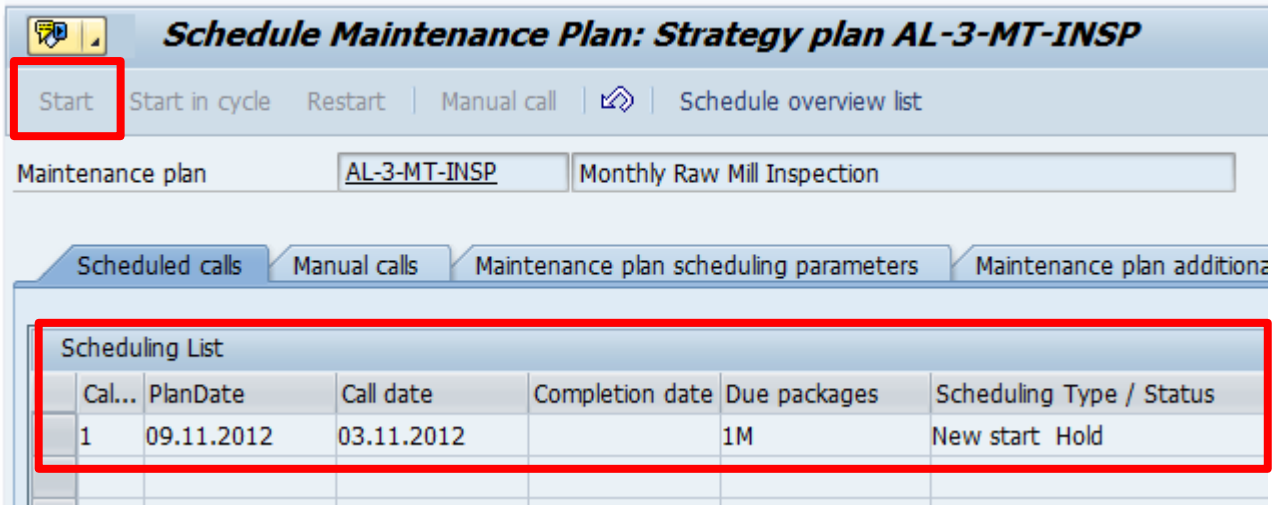
Creation of WO 1



Basic Start Date of WO 1



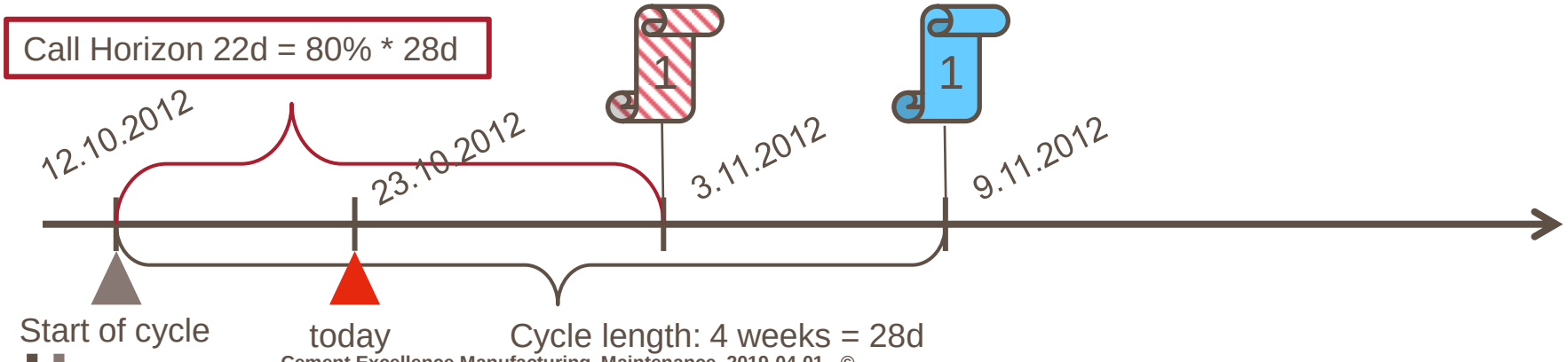
If the plan is started with IP 10, all WO which fall within the scheduling period will be visible



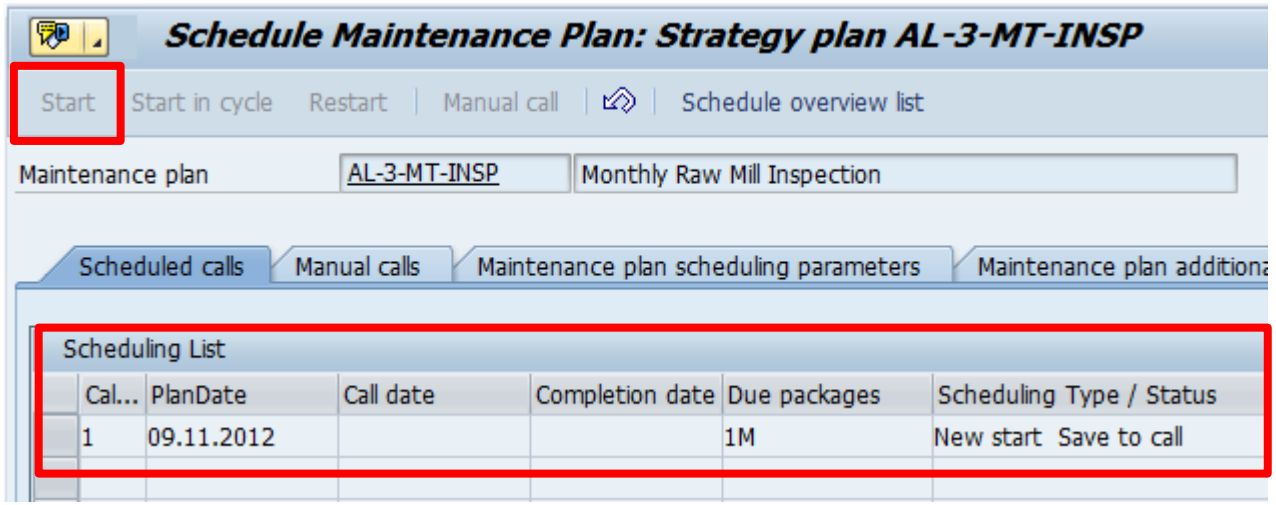
Planned Creation of WO 1

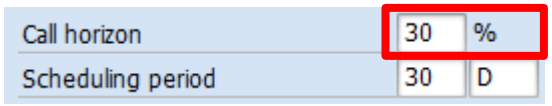
Creation of WO 1

Basic Start Date of WO 1



If the call date is beyond the call horizon, the WO will be created

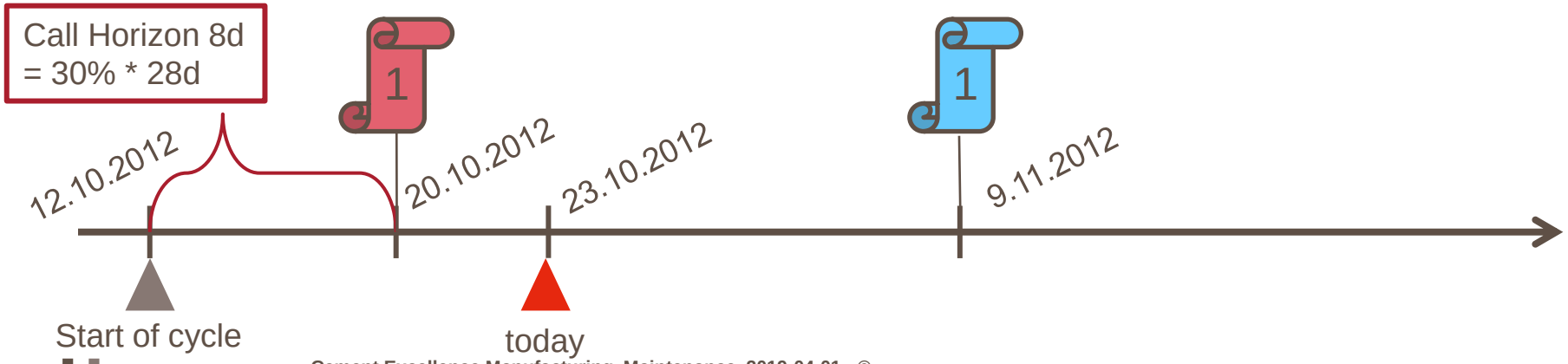




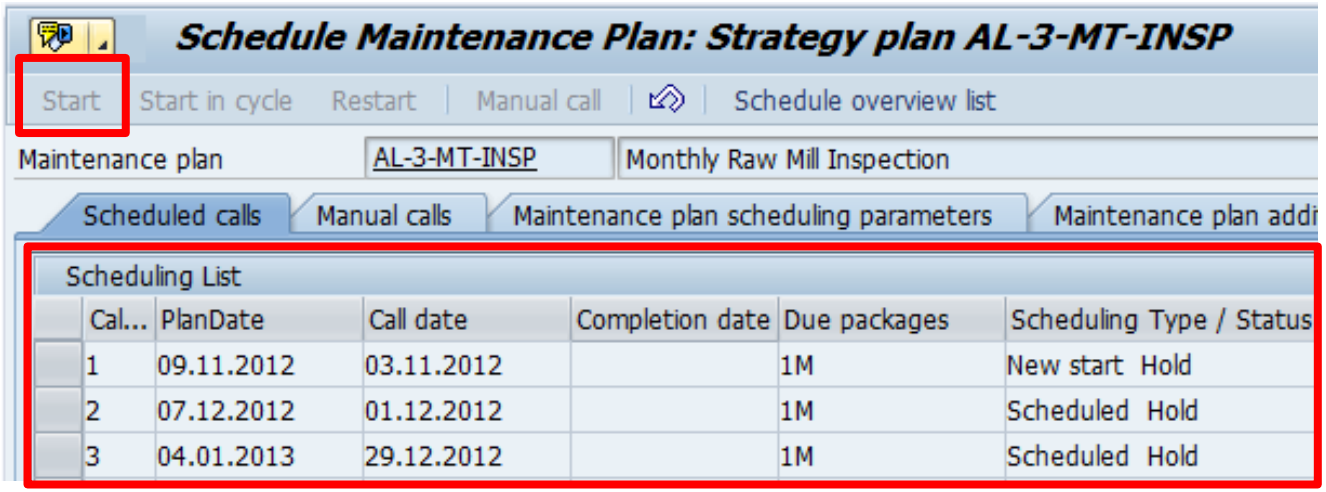
Planned Creation of WO 1

Creation of WO 1

Basic Start Date of WO 1

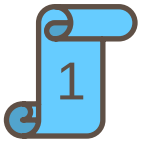


The scheduling period defines the period in the future where the WO should be visible

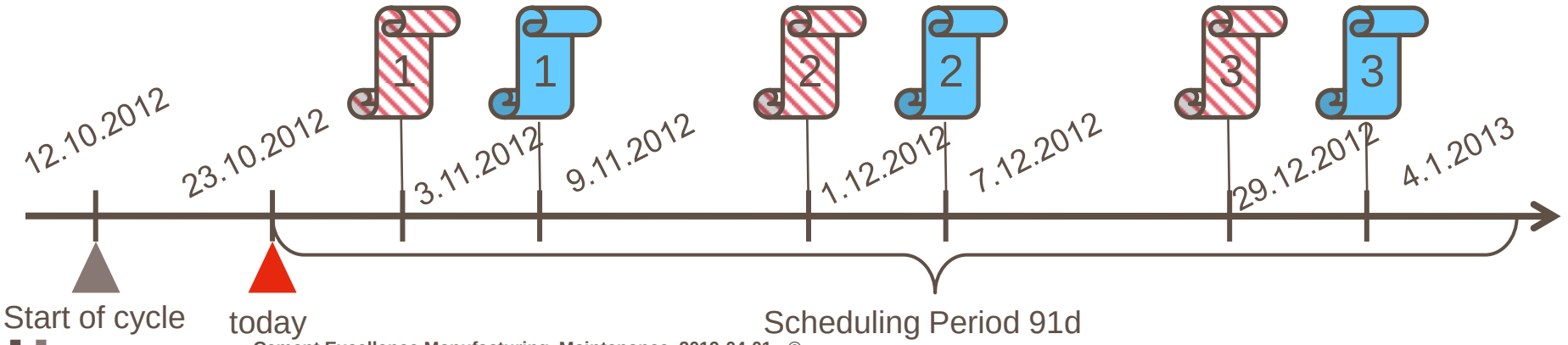


Planned Creation of WO 1

Creation of WO 1

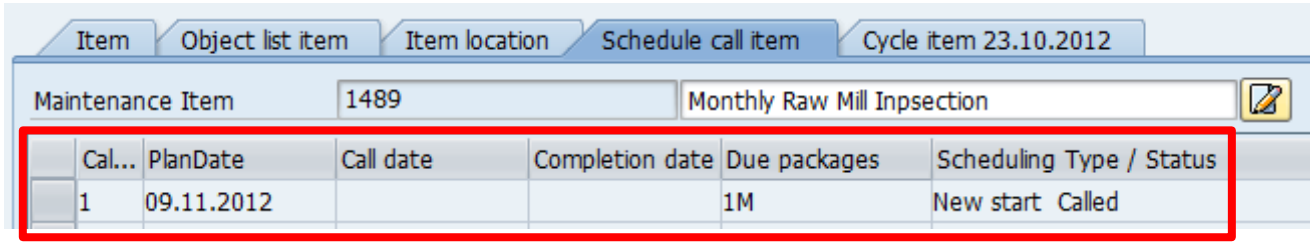


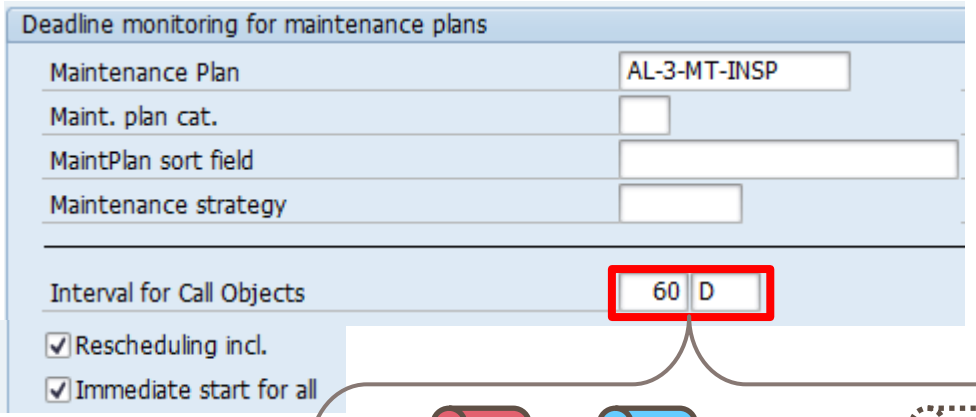
Basic Start Date of WO 1



Deadline Monitoring is taking care about the calls by executing them automatically on the right time

Dead line monitoring [IP30] is creating all visible WO within the Interval for Call Objects

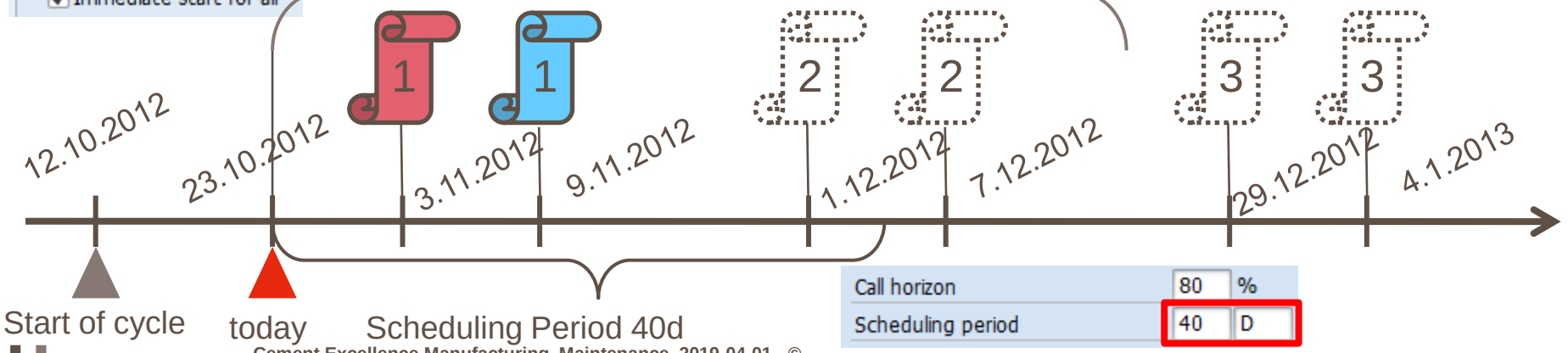




Planned Creation of WO 1

Creation of WO 1

Basic Start Date of WO 1



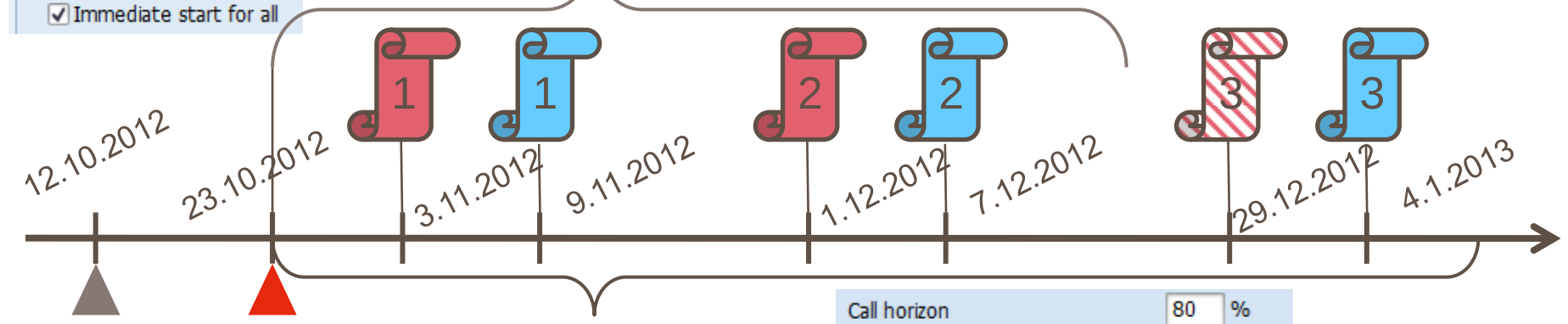
Dead line monitoring [IP30] is creating all visible WO within the Interval for Call Objects

Cal...	PlanDate	Call date	Completion date	Due packages	Scheduling Type / Status
1	09.11.2012			1M	New start Called
2	07.12.2012			1M	Scheduled Called
3	04.01.2013	29.12.2012		1M	Scheduled Hold

Deadline monitoring for maintenance plans

Maintenance Plan	AL-3-MT-INSP
Maint. plan cat.	
MaintPlan sort field	
Maintenance strategy	
Interval for Call Objects	60 D

☑ Rescheduling incl.
☑ Immediate start for all



Call horizon	80	%
Scheduling period	91	D

Planned Creation of WO 1

Creation of WO 1

Basic Start Date of WO 1

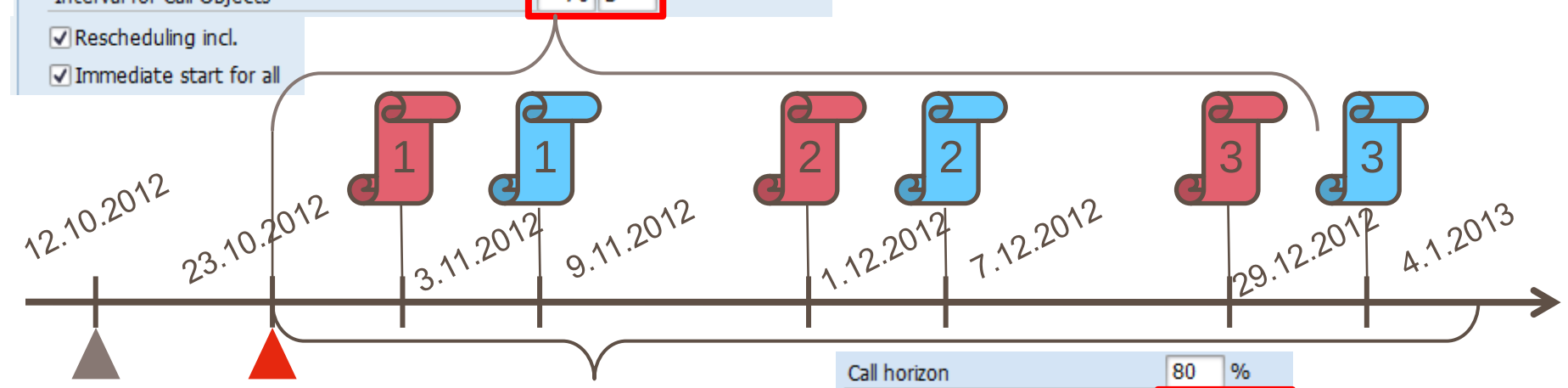
Dead line monitoring [IP30] is creating all visible WO within the Interval for Call Objects

Cal...	PlanDate	Call date	Completion date	Due packages	Scheduling Type / Status
1	09.11.2012			1M	New start Called
2	07.12.2012			1M	Scheduled Called
3	04.01.2013			1M	Scheduled Called

Deadline monitoring for maintenance plans

Maintenance Plan	AL-3-MT-INSP
Maint. plan cat.	
MaintPlan sort field	
Maintenance strategy	
Interval for Call Objects	70 D

☑ Rescheduling incl.
☑ Immediate start for all



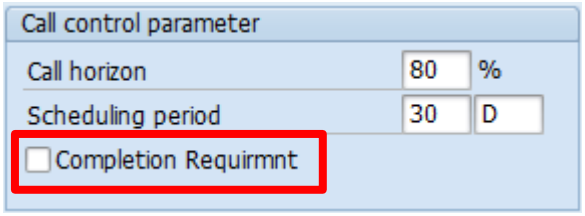
Call horizon	80	%
Scheduling period	91	D

Planned Creation of WO 1

Creation of WO 1

Basic Start Date of WO 1

Completion Requirement would create workload balancing issues

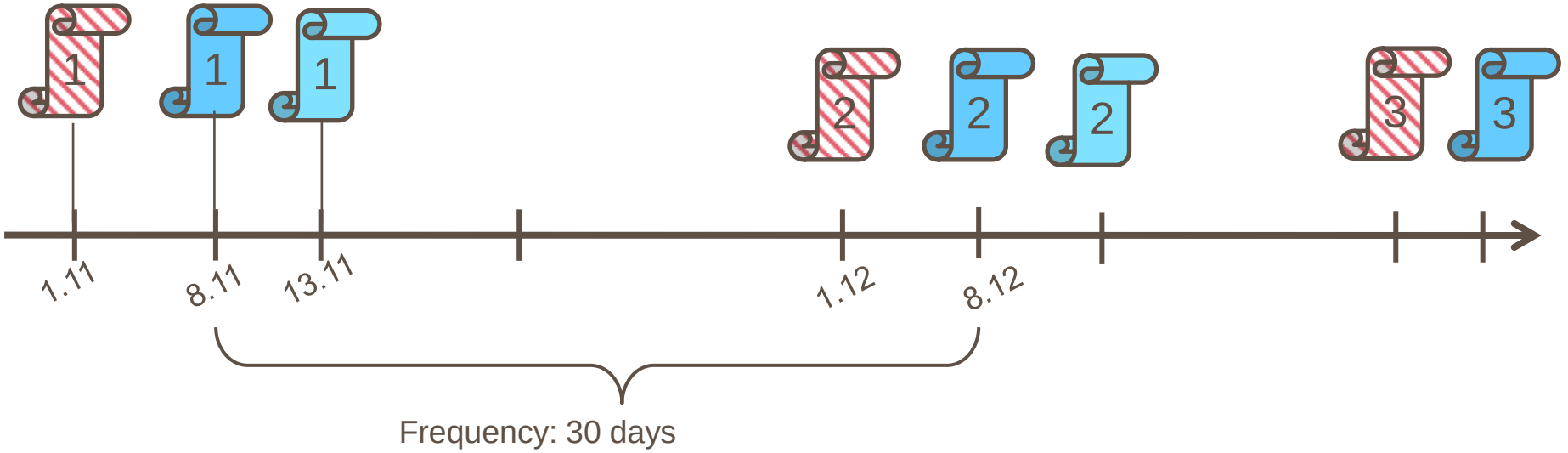


Correct behaviour –
Workload is kept balanced

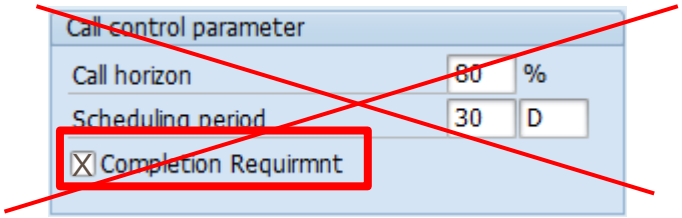
Planned Creation of WO 1

Basic Start Date of WO 1

Completion of WO 1



Completion Requirement would create workload balancing issues



Incorrect behaviour – Workload balancing will be shifted each time

Planned Creation of WO 1

Basic Start Date of WO 1

Completion of WO 1

Δ

Δ

1.11

8.11

18.11

1.12

8.12

11.12

18.12

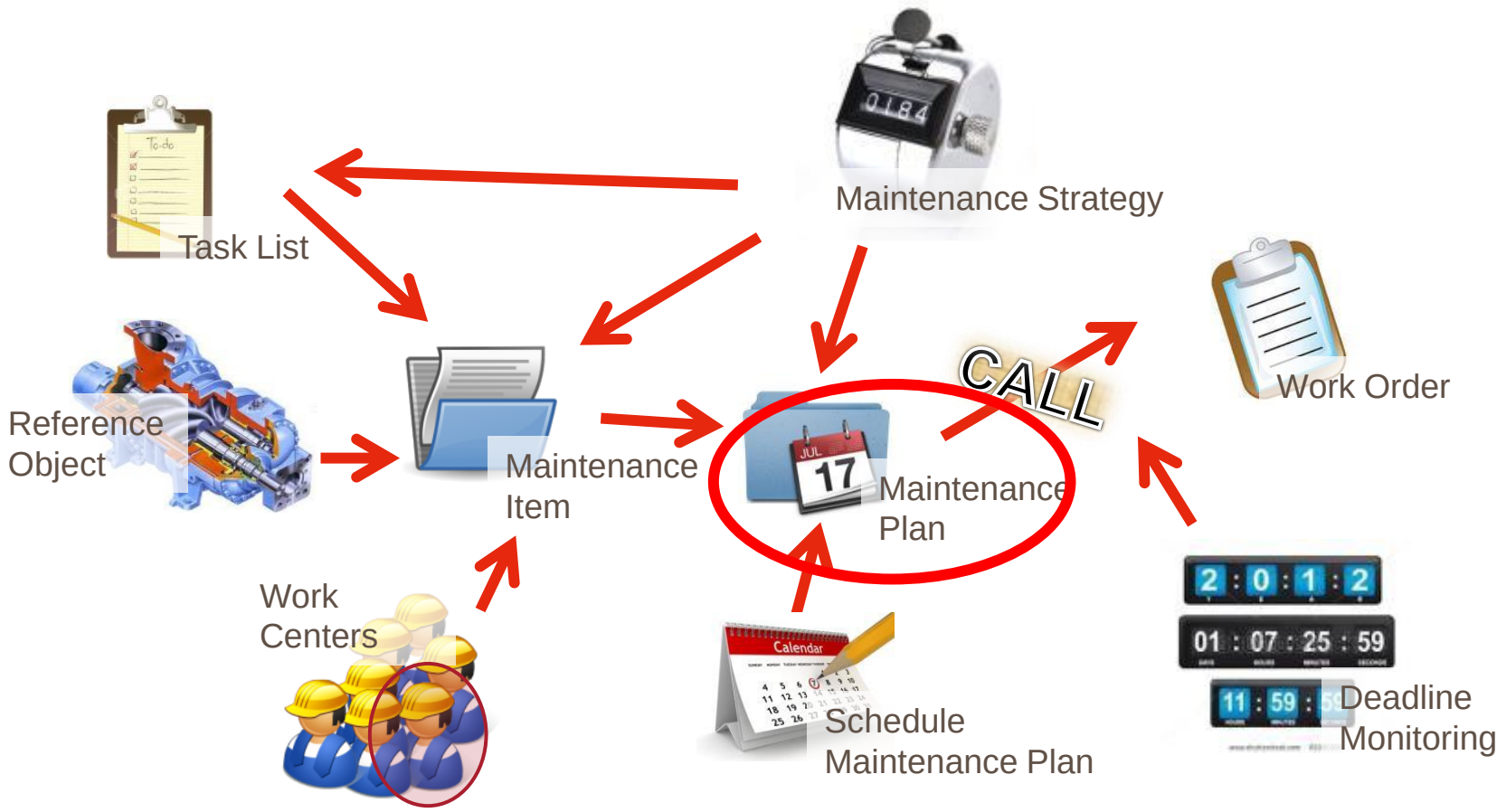
Frequency: 30 days

The IT-Service Center can create 4 sort fields which can be assigned to a maintenance plan

Maintenance Plan Sort Field	Interval for Call Objects
Auto 30 days	30 days
Auto 13 weeks	13 weeks
Auto 1 year	52 weeks
Manual	-

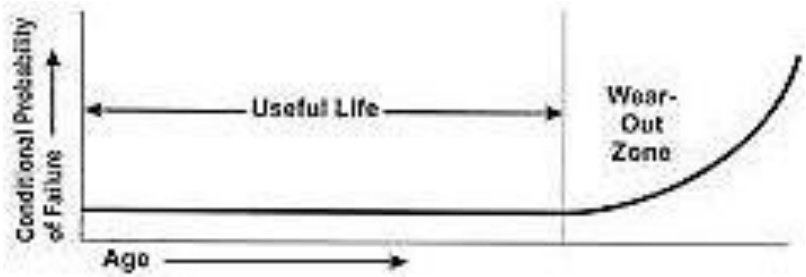
Dead line monitoring will be configured so that a maintenance plan with a "*Sort Field"* assigned get automatically linked to the corresponding *Interval for Call Objects*.

How to use PERFORMANCE (COUNTERS) BASED strategy plans



Not everything is about time based. It is also related with its performance…

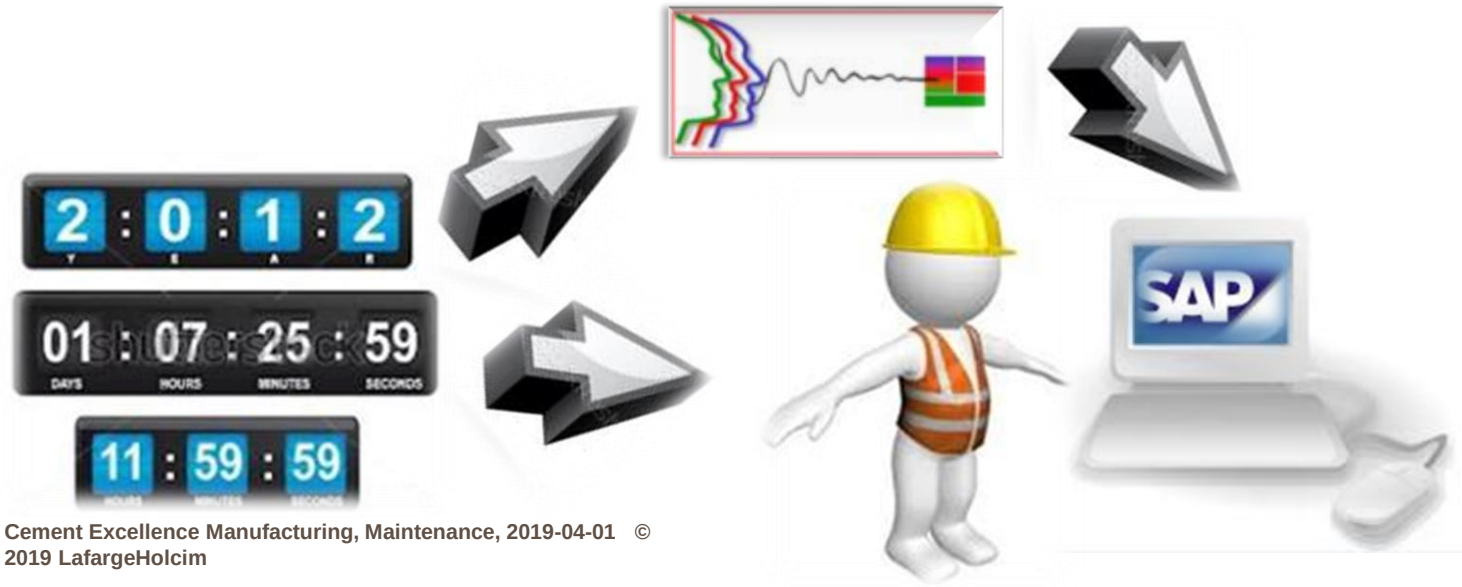
- Wear-out characteristics are often found where equipment comes into direct contact with the product
- However, age-related failures are also often associated with fatigue, corrosion, abrasion and evaporation



- It has been demonstrated that compressors and mobile equipment show a clear degraded state before a failure state during their useful life
- A degraded state is associated with a requirement for maintenance. Therefore those equipment require a strict maintenance based in counters

Not everything is about time based. It is also related with its performance…

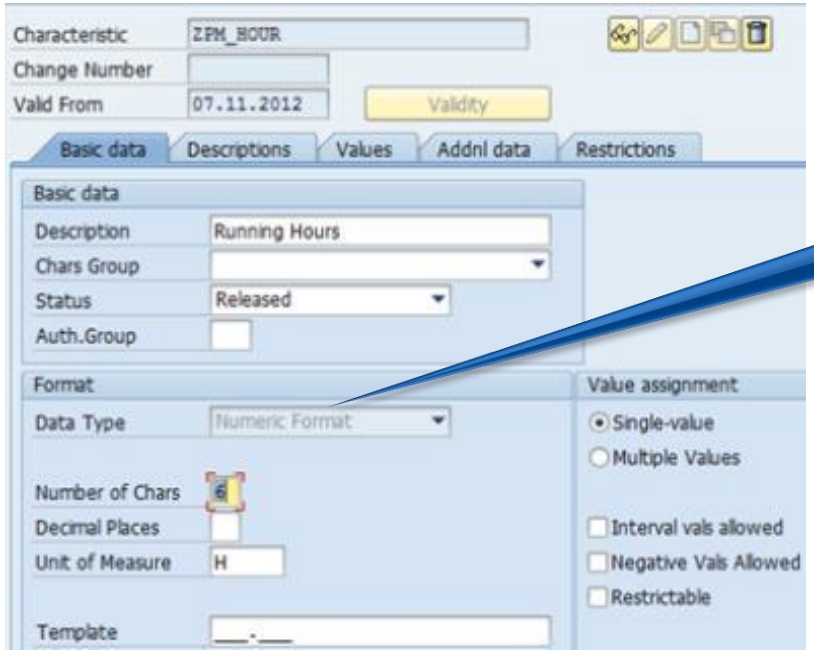
- A preventive maintenance plan can be scheduled on the basis of operating hours, kilometers traveled, and so on. For example, to schedule tasks at regular service intervals every 500 operating hours or every 1,000 km.
- *(Compressors in our industry are therefore good candidates!)*
- A counter system is required to measure the units needed. Such system is called Measuring Points
- The data (e.g. operating hours) can be fed either manually or automatically by TIS into SAP



The difference in the Strategy

A Characteristic is needed which specifies the properties of an object. First step, CT04.

- The system calculates the planned date in respect of the following counter data:
  - annual estimate
  - current counter reading
  - current date
- The values or units for a Counter are specified by a Characteristic in SAP

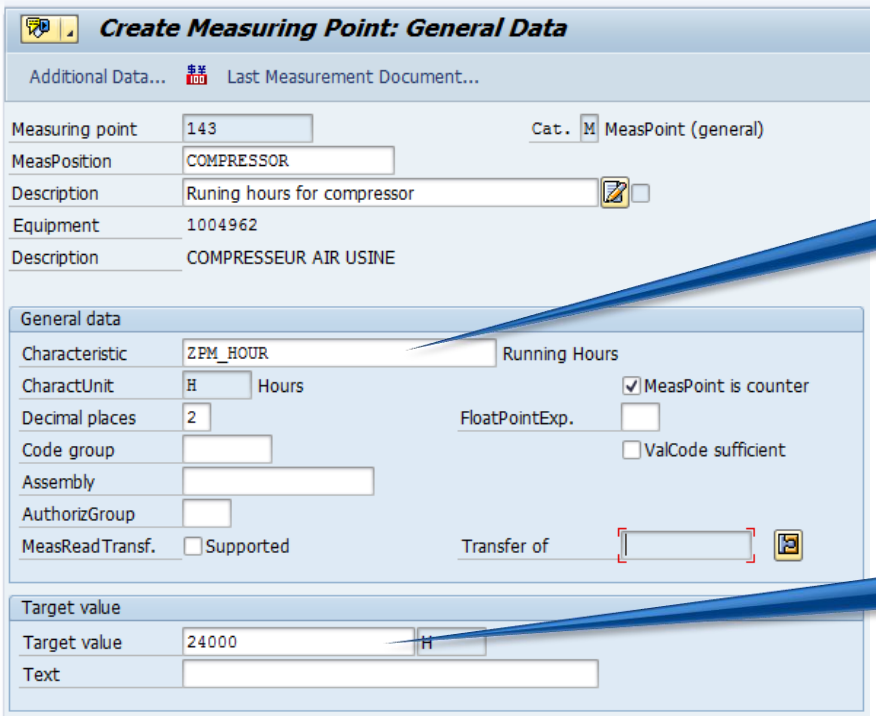


Format specifies the data format and unit of measure.

Numeric format must not be confused with TIME format for a "running-hours" strategy!!!

Measuring Points and Counters. IK03

- Measurement documents register the measurement and counter readings for the equipment.
- Standard Work Orders are performed when the counter of an equipment has reached a particular counter reading, for example, 1000 hours of operating hours of a air compressor

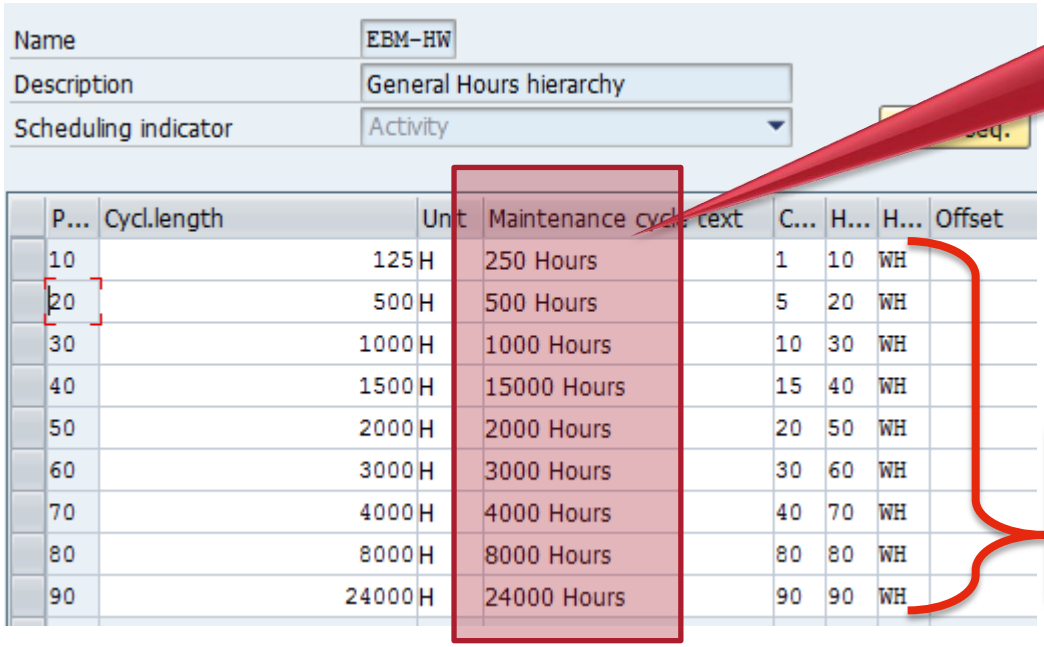


Measuring point must be linked with the characteristic

A target value (estimated annual reading) is also needed

The Maintenance Strategy

- Same principles like hierarchy are applicable to Performance-based Maintenance Strategy
- Packages could be linked or not to each other



Name EBM-HW
Description General Hours hierarchy
Scheduling indicator Activity

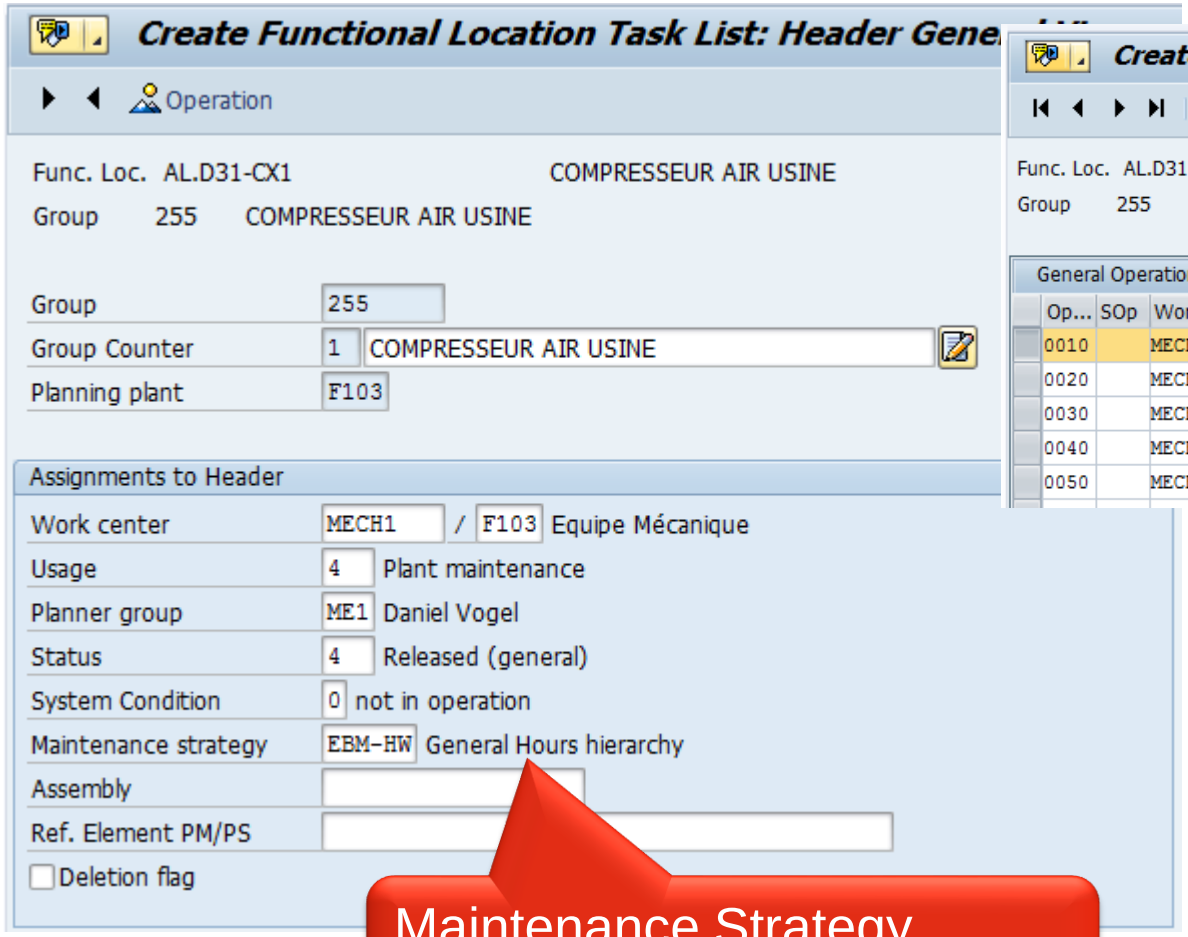
P...	Cycl.length	Unit	Maintenance cycle text	C...	H...	H...	Offset
10	125	H	250 Hours	1	10	WH	
20	500	H	500 Hours	5	20	WH	
30	1000	H	1000 Hours	10	30	WH	
40	1500	H	15000 Hours	15	40	WH	
50	2000	H	2000 Hours	20	50	WH	
60	3000	H	3000 Hours	30	60	WH	
70	4000	H	4000 Hours	40	70	WH	
80	8000	H	8000 Hours	80	80	WH	
90	24000	H	24000 Hours	90	90	WH	

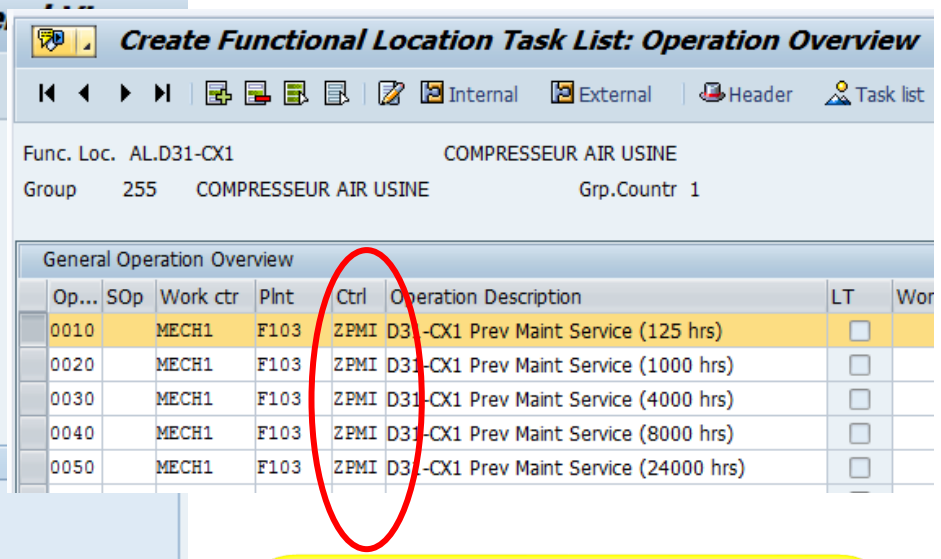
Packages are established according to pre-defined intervals (depending of the activity)

The usage of Hierarchy for running hours of compressors is highly recommended

The Task List and the Scheduling Process

Tasks List of Performed based Strategy do not differ so much of the others

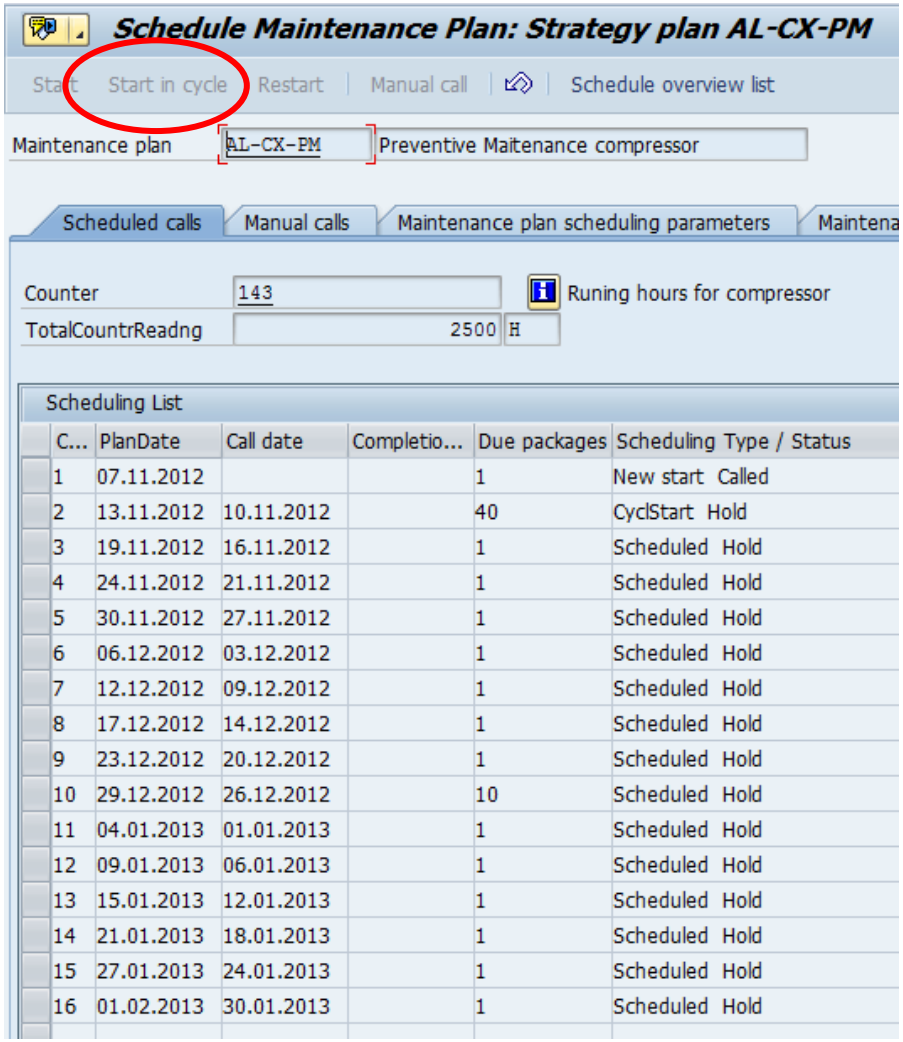




Maintenance Strategy based in Hours

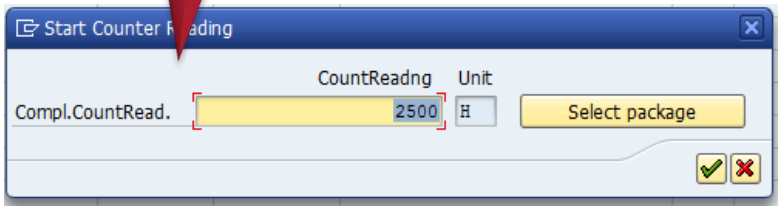
Description of the operations must be related with the length of the services and the selection of a third party services to generate the PO automatically

Neither the scheduling process differs



C...	PlanDate	Call date	Completio...	Due packages	Scheduling Type / Status
1	07.11.2012			1	New start Called
2	13.11.2012	10.11.2012		40	CyclStart Hold
3	19.11.2012	16.11.2012		1	Scheduled Hold
4	24.11.2012	21.11.2012		1	Scheduled Hold
5	30.11.2012	27.11.2012		1	Scheduled Hold
6	06.12.2012	03.12.2012		1	Scheduled Hold
7	12.12.2012	09.12.2012		1	Scheduled Hold
8	17.12.2012	14.12.2012		1	Scheduled Hold
9	23.12.2012	20.12.2012		1	Scheduled Hold
10	29.12.2012	26.12.2012		10	Scheduled Hold
11	04.01.2013	01.01.2013		1	Scheduled Hold
12	09.01.2013	06.01.2013		1	Scheduled Hold
13	15.01.2013	12.01.2013		1	Scheduled Hold
14	21.01.2013	18.01.2013		1	Scheduled Hold
15	27.01.2013	24.01.2013		1	Scheduled Hold
16	01.02.2013	30.01.2013		1	Scheduled Hold

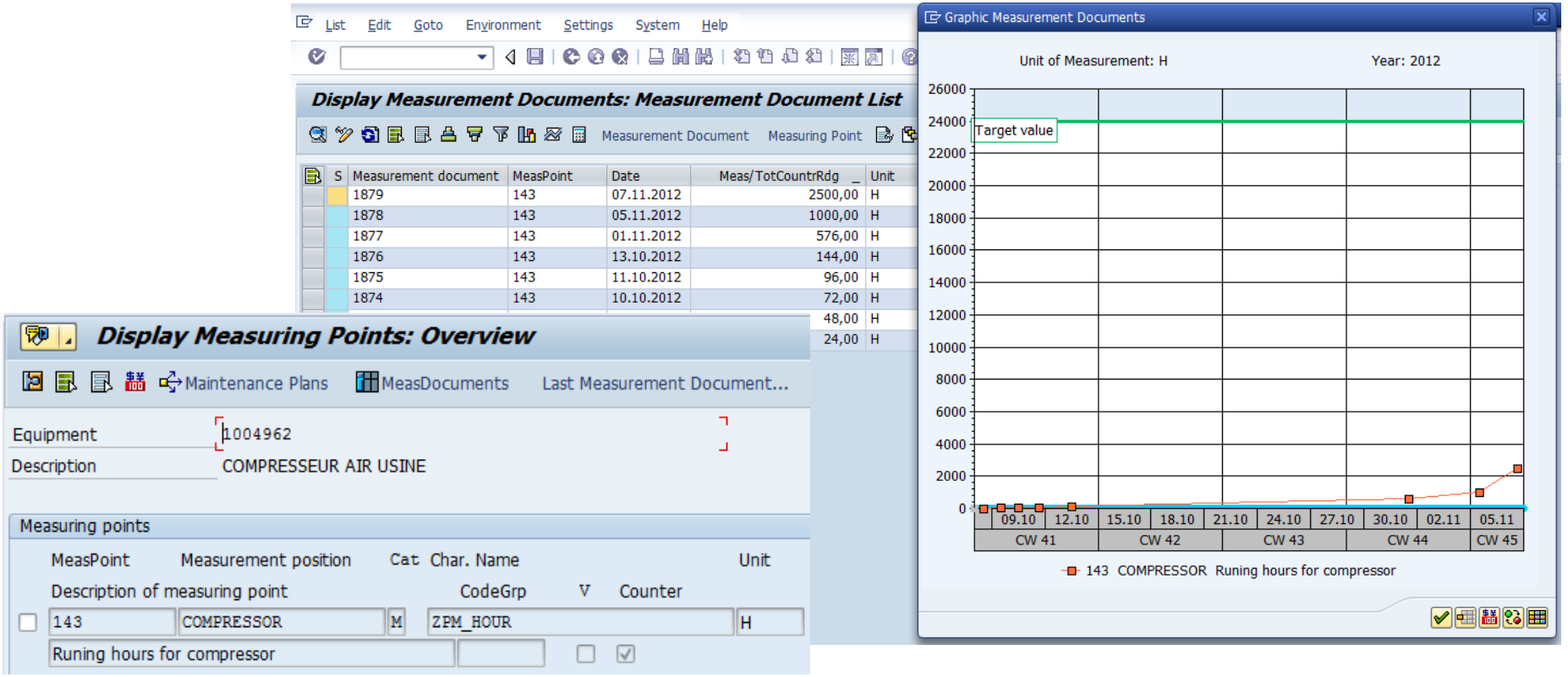
The counter reading must be set to zero after completion of a maintenance cycle



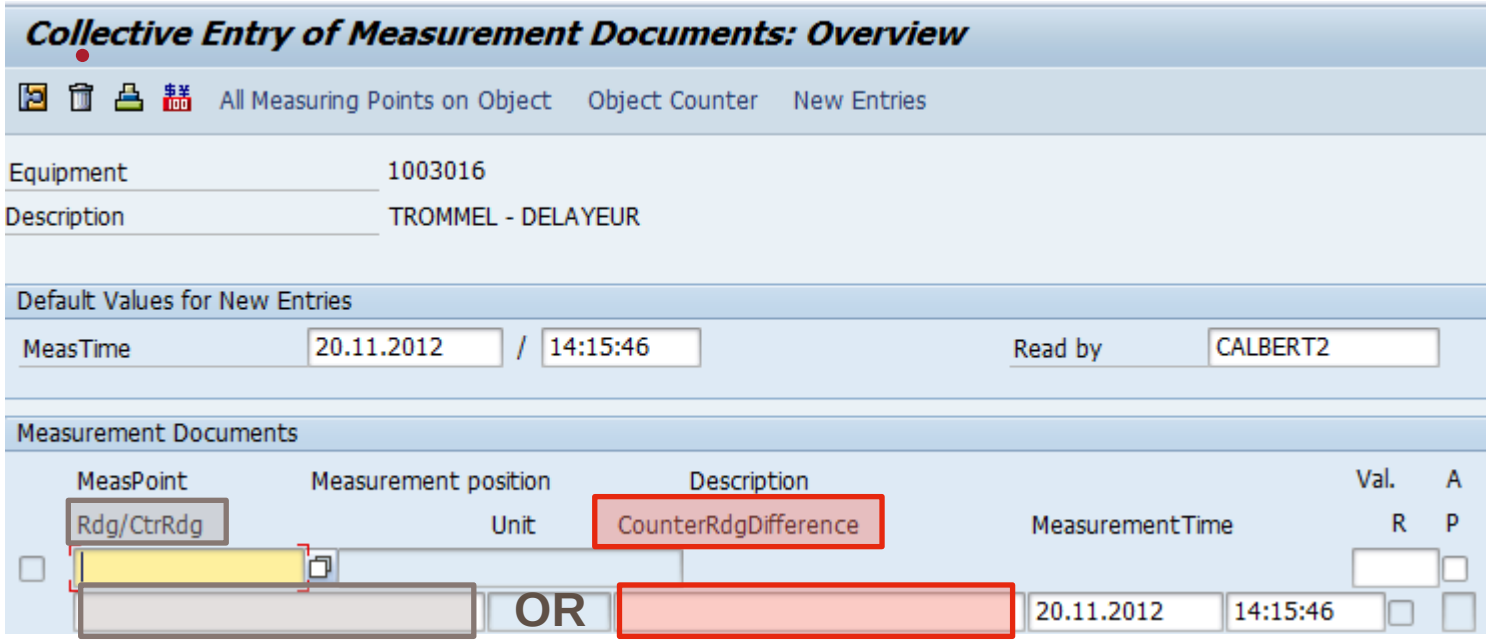
Neither the scheduling process differs

Measuring Points and Counters. IK03

- Measuring points and counters are created as master records. This enables to make reference to the equipment.
- Measurement documents register the measurement and counter readings for the equipment



Recording single measurement – IK22

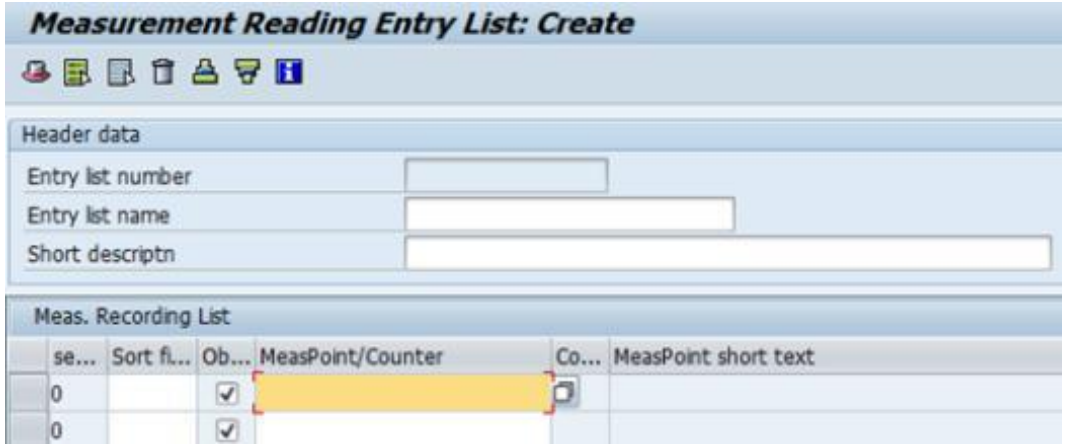


1. Select the equipment (Selection screen)
2. Select measuring point
3. Enter reading (see picture)

2 ways to enter data:

- Absolute reading: e.g total running hours of the equipment
- Differential reading: e.g running hours since last measurement (in case of a “reset” of the counting device)

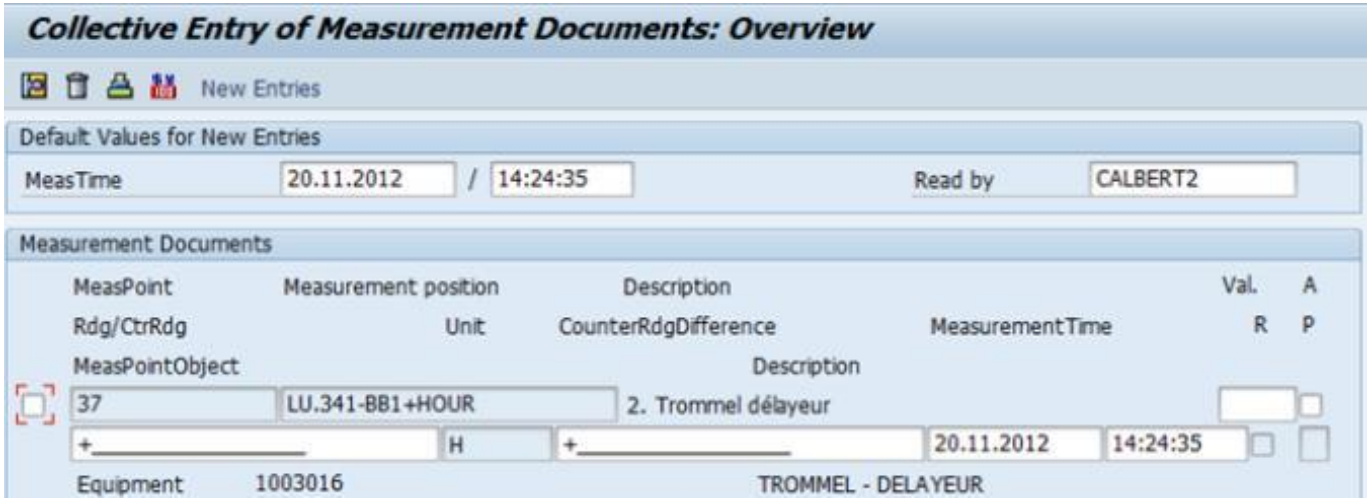
Creation of a reading entry list – IK31 & Measure recording – IK34



1. Enter a name and description
2. List all measuring points which have to be recorder at once (e.g: during a route or a PMR)

(“Obligatory” field to select if measurement is compulsory)

3. Save



1. Enter the list name (Selection Screen)
2. All measurements from the list are displayed and can be entered
3. Save

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