SAP-HANDBOOK

Checklists in Plant Maintenance

December 2024

Author Directory

Table 1 Author Directory

Last Name / First Name	Company	Function in DSAG
Khuu Siu Loon	BLS AG	Speaker Topic Group Checklists
Degenhardt Thorsten	Deutsche Bahn AG	Deputy Speaker Topic Group Checklists
Schepers Günter	CLAAS KGaA mbH	Core Team Member Topic Group Checklists
Bitzer Gerd	WESSENDORF Software + Consulting GmbH	Core Team Member Topic Group Checklists
Kappler Tom	SachsenEnergie AG	Core Team Member Topic Group Checklists
Dr. Kicherer Gerhard	Kicherer Training & Tools UG	Core Team Member Topic Group Checklists
Malzahn Uwe	SAP (Germany)	Core Team Member Topic Group Checklists
Schäfer Thomas	RES Consulting GmbH	Core Team Member Topic Group Checklists Deputy Speaker AC Maintenance
Schöneberg Jens	SAP SE	Core Team Member Topic Group Checklists
Stenzel Gunnar	Electricity grid Hamburg GmbH	Core Team Member Topic Group Checklists
Teschke Ingo	BLS ER	Core Team Member Topic Group Checklists
Wendschuh Heike	BTC Business Technology Consulting AG	Core Team Member Topic Group Checklists

Table of Contents

Table Directory

Figure Directory

1 Introduction

For the first time in 2010, DSAG formulated requirements for a solution for audit-proof documentation of inspections, inspections and measurements in maintenance processes. The aim was to replace the existing solution variety in the form of order operations, measuring points, notification items, and so on, and to make it available in a standardized application.

This led to the development of the SAP consultant solution integrated in the QM module. “EAM Checklists” in 2013, their ongoing development until 2020, and SAP’s announcement that the solution was restored to the S/4HANA standard.

The DSAG theme group “Checklists” accompanied the transition to the standard, from the formulation of 38 user stories to participation in the final tests.

As a result, since the fall on-premise release OP2021-FPS0, the S/4 HANA standard provides the option to document the legally binding documentation for the execution of activities, as well as check and measurement values.

The large functional scope of the solution, together with high flexibility in customer-specific use, as well as the intensive use of QM master data and transaction data, nevertheless lead to a certain complexity in the implementation.

This guide provides experience and best practices and is designed to

“Respect” for complexity and integration. However, it does not replace online documentation or qualified consulting.

Chapter 2 describes the effects on the organization and the business processes; in unit 3, we give you tips for an implementation project, and in unit 4, we want to explain the data objects relevant for checklists in more detail. Chapter 5 is intended to give you ideas on which additional options a checklist solution could offer.

Please keep in mind that we were far from able to shed light on all aspects of the document. It is intended as an entry-level aid and should encourage you to explore the wide field of the checklists even more intensively.

We hope you enjoy reading and hope that this guide will help you successfully implement the checklist functionality in your company. If you have any questions or suggestions, please contact the DSAG topic group Checklists.

1.1 References

In this chapter the relevant documents are listed of of SAP for the checklist solution in SAP EAM.

Table 2 Links to SAP Documentation for Checklist Solution

Object	Meaning
SAP Help (DE)	https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/e72f747389b340229f7fa343975bfa57/11 cea40ba63546c98356b38bf8c48ce2.html?locale=d e-DE
What's new	https://help.sap.com/viewer/e296651f454c4284ade 361292c633d69/2021,000/-US/efbe41b505c74ad8bcadffec475bacf3.html
Settings in Client 000: Order Type, Inspection Type	https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/efc7922405fd4d56b7571930c5eaa798/d 2e53ed3fdd34d65b9bee9e4e0fbb606.html?locale=d e-DE
Follow Inspection Checklists of Asset Management in Road Map Explorer:	https://roadmaps.sap.com/board?range=2021Q4- LAST&q=inspection%20checklist
There also under "Features" for delivery 2021 on-premise	https://support.sap.com/content/dam/productfeatures/assets/00039/000D3AADBCE1EDC91D7BB671 721CDC1/presentations/EAM_Inspection_checklists _2021_OnPremise_Feature.pdf
Blog: Set up your SAP S/4HANA system for EAM Inspection Checklists	https://blogs.sap.com/2022/01/12/set-up-your-sap- s-4hana-system-for-eam-inspection-checklists/
Fiori Apps	https://dsagnet.de/dsag-event?id=329966&app=info
DSAG Topic Group Checklists	https://dsagnet.de/dsag-resource?id=91778&app=info

1.2 Overview of Relevant Fiori Applications

This chapter lists the SAP Fiori apps that exist in the S/4HANA release OP2022-FPS0 and that are relevant for the checklist solution in SAP EAM. For the next on-premise releases, SAP has provided further Fiori applications.

Table 3 Overview of Relevant Fiori Applications

Fiori Application	Meaning
F1685A	Record Inspection Results
F2343	Manage Inspection Lots
F2345	Manage Usage Decisions
F2428	Results History
F3365	Inspection Results Recording in Table Form
F3788	Manage inspection plans (but without classification maintenance)
F2360	Quality Planner Overview
F2361	Quality Inspector Overview

These Fiori apps from the QM Quality Management application do not contain any data and functions specifically for the data related to maintenance orders, for example: a filter or display of operation data of the PM order. An exception to this are the filter and the display of equipment and functional location for the inspection lot. So far, the following apps support this: F2343, F1685A, F2345.

1.3 Overview of Relevant SAP GUI Transactions

This unit outlines the most important SAP GUI transactions that play a role in the use of checklists.

Transaction	Meaning
IW91	Checklists: Check Results Overview
IW92	Checklists: Generate Inspection Lots
IW93	Checklists: Collective Usage Decision
IW97	Checklists: Master Data and Inspection Lot Simulation
IW98	Link Characteristic Name for Inspection Plan and Object
IW99	Maintain Checklist Type
IW31/IW32/IW37N	Create/Change/Mass Change Maintenance Order
IA05/IA06/IA38	Create/Change/Mass Change General Maintenance Task List
IL01/IL02/IE01/IE02	Functional location or Create/Change Equipment
CL02	Create/Change Class
CT04	Create/Change Characteristic
QS41	Create/Change Code Group
QS51	Create/Change Selected Set
QS21/QS23/QS27	Create/Change/Replace Master Inspection Characteristic
QS31/QS33/QS37	Create/Change/Replace Inspection Method
QP01/QP02	Create Inspection Plan
QP11/QP12	Create Standard (Inspection) Plan
MM01/MM02	Create/Change Material

2 High-level process overview checklists in EAM

2.1 Business Background “Checklists in Plant Maintenance”

Many companies need to document in detail how maintenance, inspections, repairs, and improvements are carried out. These specifications, as well as their content and form, mainly result from

- Legal or regulatory requirements
- Recognized rules of technology
- Company internal regulations

The increasing digitalization, in maintenance, usually using mobile solutions, also requires a continuous and integrated data flow, which is therefore an elementary part of maintenance. The checklists are therefore an essential part of a technical task list and documentation and thus supplement the commercial confirmation, which has been

established in many companies for a long time.

Technical documentation in the form of checklists usually means documenting measurements, collecting health assessments and/or confirming performed activities. In safety-critical task areas, this is also part of a legally fixed documentation.

If deviations to the target condition of an asset are detected during maintenance, this usually results in further measures, in particular repairs.

The systematic collection of results helps to identify asset weaknesses, initiate constructive improvements, and automate process steps. As a result, the digitalization of these process steps results in an additional benefit that does not exist with a paper-based procedure or individualized software.

Checklists occur in virtually all industries and application areas of maintenance. The more intensive the share of technical assets in the overall value of the company and the more critical the operation of the assets, the more intensive the maintenance and therefore the use of checklists.

2.2 Role and Process Overview

This chapter describes in general which roles and which processes are required in business practice to use checklists in maintenance processing with SAP EAM:

1. Master Data Management (Techn. Objects, Inspection Plans, and Routings)
2. Maintenance Processing with Inspection Checklists
3. QA and Content Evaluations

The descriptions of the process steps are not an instruction manual for the SAP EAM solution, but describe general workflows with links to SAP data objects that are created or changed as part of these process steps.

The roles that are assigned to the individual process steps correspond to the view of the DSAG Maintenance Management work group. These roles are known to SAP, but have not yet been finalized with SAP.

Table 4 Relevant Roles in the Processes from the Perspective of the DSAG Work Group Maintenance Management

Pictogram	Description	Short Description
PM	Plant Manager	The plant manager is responsible for ensuring the correct operation of all technical systems in his or her area of responsibility under Adherence to legal requirements and adherence to business goals, usually KPI driven. The focus is on: • Achieving economic goals • Adherence to and documentation of the correct operation of all organizational areas involved
OP	Operator	The operator assumes responsibility for the operator in the sense of legal requirements and is responsible for an effective, productive operation of defined technical systems while adhering to business objectives, usually KPI-controlled. The focus is on: • Ensuring high system availability at the lowest possible cost • Compliance and documentation of legal requirements and requirements
AS	PM Asset Supervisor	The PM asset manager is the strategic expert for the clarification of general maintenance questions: • Decide on maintenance strategy (preventive, reactive, curative, condition-based, or proactive) for concrete technical assets • Decisions in the life cycle of technical assets as to whether they are to be checked, renewed, repaired, or renewed; if necessary, by means of short-term, medium-term, and long-term planning Management of plant documentation; sample checks (secondary quality assurance)

 **CE**	Maintenance Asset Category-Responsible, Better PM Asset Category Expert	The PM asset category expert is generally responsible for the definition of specifications and the standardization of maintenance tasks, usually for one or more asset categories. The following are defined: • Best Practice for Performing Recurring Maintenance Tasks • Regulatory Compliance • Documentation of maintenance tasks (e.g. B. Checklists) • Compliance with requirements for certifications Implementation of results from audits
 **WS**	PM work scheduler	The PM work scheduler is responsible for planning the relevant activities and their resources (materials, production resources/tools, documents, and tools) that /professional execution of a maintenance task are required, as well as all auxiliary works (e.g. B. scaffolding, construction site protection, suction trolley, disposal, etc.). The focus is therefore on the question: "What needs to be done with what for the proper/professional execution of a maintenance task?" To do this, orders are created and the required activities are planned as operations, taking relationships into account, if necessary. For the order operations, you plan which services are to be performed by your own personnel or for which operations the use of external companies is planned. For recurrent maintenance tasks, planning takes place in the form of reusable task lists, which must be continuously optimized at intervals or adapted to new legal requirements/to the operating experience. Periodic recurring maintenance tasks and their task lists are included in maintenance plans. Order Prioritization

SC	PM Scheduler	The maintenance appointment planner is responsible for planning the periods for the execution of maintenance tasks, taking into account available capacities and qualifications. The focus is therefore on the question: "When should a planned maintenance task be executed?" For this purpose orders and/or order operations are assigned start and end dates – possibly even with times. (MRS/RSH)
RP	Maintenance resource planner (resource planner)	The maintenance resource planner is responsible for determining which specific person or person group is to execute a planned maintenance task correctly/professionally in the planned appointment window. The focus is therefore on the question: "Who is to execute a planned and scheduled maintenance task?" To do this, orders or order scenarios are assigned to personnel numbers or work centers. (MRS/RSH)
MS	PM Maintenance Supervisor	The PM execution supervisor usually leads a team of PM specialists and is planned for timely and proper/professional execution Maintenance tasks responsible. To do this, he takes care of the following: • Capacity planning for his team • Procurement of Non-Stock Material • Procurement of External Capacities Quality assurance of the work carried out
SP	PM Specialist	The PM specialist is responsible for the proper and professional execution of maintenance tasks as well as for: • Documentation of required working time and materials • Filling Out Forms and Checklists Documentation of identified defects in technical systems

DM	PM Master Data Manager	The PM master data manager is responsible for complete technical and organizational master data in the SAP system: • Planner groups, plants, plant sections, work centers Functional locations, equipments

Important: Roles are independent of persons and summarize the responsibility for the proper execution of process steps at the right time. Multiple roles can be assigned to a person.

In practice, you often experience that a person is assigned exactly one role that is “overloaded” with responsibilities. The person thereby delegates tasks, resulting in a fragmentation of the role. It makes more sense to narrow down the roles and assign them to the people who actually perform the tasks in practice.

2.3 Managing Master Data for Checklists

A checklist is always dependent on the activity to be performed and the specific technical object on which this activity is performed. This makes it possible to use different checklists for the same activity for a group of technical objects that meet object-specific requirements (e.g. depending on the type of installation).

The master data for work scheduling (maintenance and task lists) must also be kept up-to-date; e.g. For deleted technical objects, planning objects must also be deactivated or deleted.

Note / Useful tips for master data

- The checklists require a high quality and timeliness of the master data, in particular the technical objects (As-built). If the data is not maintained correctly or is up-to-date, incorrect checklists or no checklists are generated, which can be serious in critical situations.
- Existing data structures of the technical objects (e.g. B. Classification, Detailing of Asset Structure), you may have to add the parameters that are required to control the checklist determination.
- As part of the implementation of digital checklists, it should be checked whether existing data maintenance processes ensure the required completeness, quality, and timeliness. A fairly new SAP standard workflow helps e.g. For example, during the deactivation of maintenance plans if the technical objects are deactivated.

The figure below shows an overview of how you set up and manage the data in SAP after the technical development of the specifications in order to be able to use inspection checklists in maintenance processing.

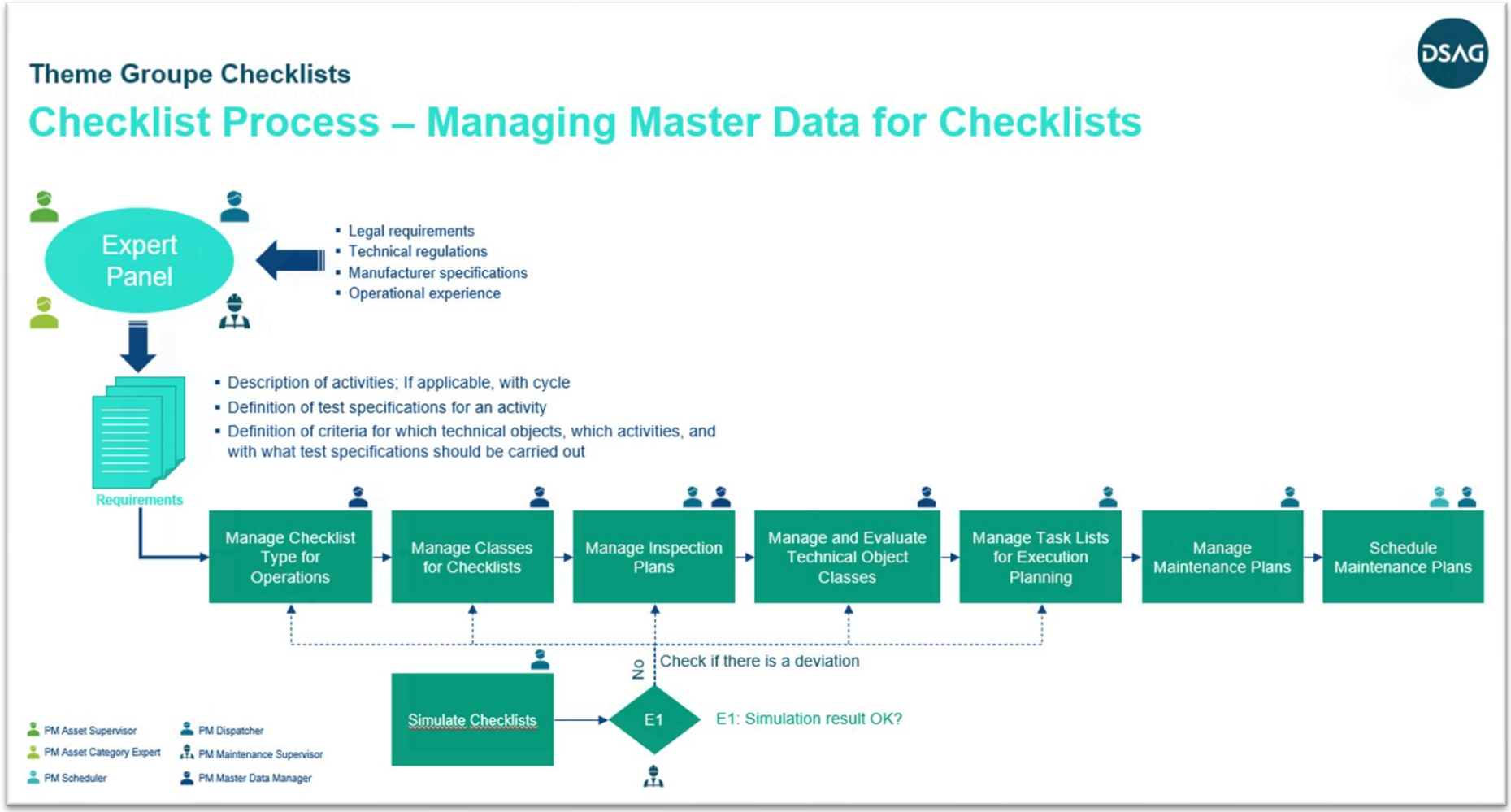


Figure 1 Master Data Management Process for Using Checklists

Table 5 Essential Master Data Processes in Checklist Processing

Process Step	Role	Short Description
Expert Panel		A panel of experts takes into account legal requirements, technical regulations and manufacturer specifications, as well as operational experience. It uses these specifications to develop the requirements for recurrent and, if necessary, reactive maintenance tasks and their documentation in the form of checklists.
Manage Checklist Type	DM	Activity codes must be defined so that checklists can be identified. These occupational codes are used to define the checklist type in task lists/orders.
Manage Classes for Checklists		Classes that are managed in the classification system are used to control checklist determination. These classes must contain at least one characteristic that defines the checklist type. Further characteristics are possible. These are then used to combine different checklists into one checklist type.
Manage Inspection Plans		The contents of a checklist are managed in inspection plans that contain an inspection characteristic for each point to be inspected or documented. The expert panel elaborates the specifications.
Manage and Evaluate Technical Object Classes		To accommodate the fact that checklists are relevant for technical objects, the class for controlling the checklist determination must be assigned to the affected objects, and the characteristics must be valuated.
Manage Routings		Task lists are managed to plan recurrent maintenance tasks efficiently. For inspection checklists to be found, the operations must be defined using the checklist type.
Manage Maintenance Plans		For maintenance tasks that recur periodically, there are maintenance plans (object, frequency, activity). If checklists are to be used, task lists with the corresponding checklist type must be used. The technical object in the maintenance plan (more precisely, in the maintenance item) must be able to derive a checklist or – using the object hierarchy – be able to generate an object list.
Schedule Maintenance Plans		For maintenance plans to be able to generate periodically recurring call objects, they must be scheduled.
Simulate Checklists		Before the (initial) execution, you can simulate whether the checklist determination leads to the correct results (see chapter 4.5.2).
Evaluate Simulation Result		The result of the checklist simulation must be evaluated to determine whether all content requirements are met. If not, the master data must be adjusted that is the cause of the identified deviations.

What is important to keep in mind?

- If the introduction of checklists is accompanied by a redesign of the checklists – and this is almost always the case from experience – experts from different business roles should define the design together. This is the only way to achieve sufficient acceptance of the system and content.
- The complexity of the checklist determination, which is based on the master data, should be kept as simple as possible. In addition to the characteristic for the checklist type, only a few other characteristics should be required to uniquely identify a checklist – rather, combine two similar checklists if possible.
- For inspection plans or maintenance plans, you can do the following: document with the help of the classification which business background the respective data object has. In particular, a reference to existing standards can be helpful for later maintenance/adjustment.
- You should ensure that the master data is up-to-date. Has been an asset has been rebuilt, the checklists for a changed asset type must also be used as of now.
- The checklist simulation is an important QA task that should be performed on a recurring basis. It prevents missing or incorrect inspection checklists during the execution phase of maintenance tasks. The latter significantly reduces user acceptance**.**

2.4 Maintenance Processing with Inspection Checklists

Maintenance processing with inspection checklists requires a maintenance order in SAP and can be triggered by

- Maintenance Plan Call
- Manual creation with/without inclusion of a task list

The order operations for which a checklist is to be entered for each technical object must contain a checklist type for which the inspection checklist is defined. Ideally, the checklist type is copied to the task list.

The following figure shows the process of maintenance processing using inspection checklists. The following description describes only the steps in which activities for using checklists are required. All other process steps correspond to classic maintenance processing.

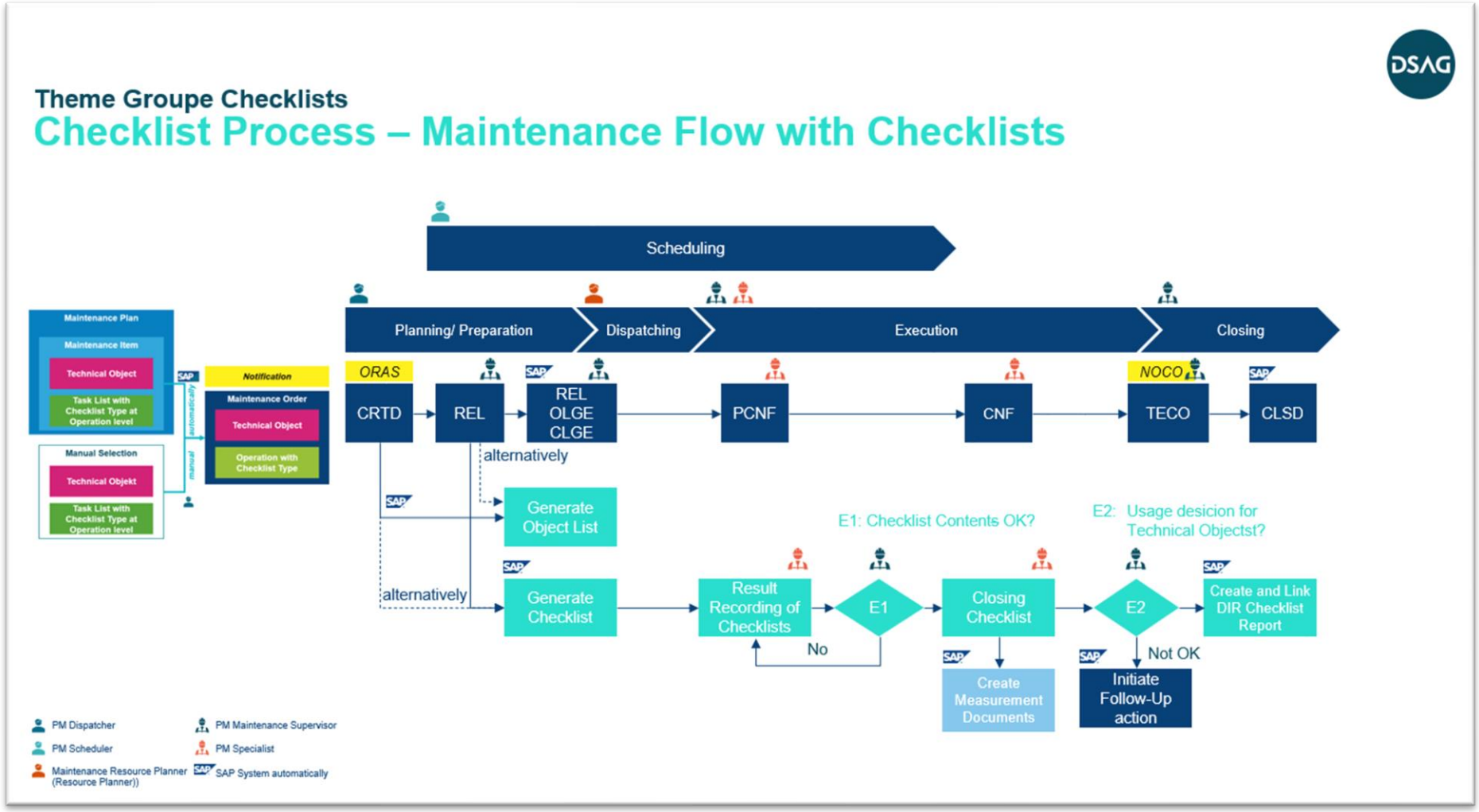


Figure 2 Rough Maintenance Processing with Checklists

Table 6 Essential Process Steps for Checklists in Maintenance Processing

Process Step	Role	Short Description
Order from a scheduled Maintenance Plan **Generate**		Order creation from a scheduled maintenance plan corresponds to the standard SAP system and does not require any further action.
Create Order Manually		When you manually enter an order with/without reference to notifications, you must ensure that the operations contain a checklist type. This can be specified manually or copied to the order using a task list. The technical object (reference object) of the order or objects derived from it in the object list must have been assigned the control class for inspection checklists.
Release Order		The SAP system automatically generates both an object list and the corresponding checklists based on the determination logic using the characteristic value assignments in the classes (the time can be set differently in Customizing).
Entering Checklists		During the execution phase of a maintenance task, the executing PM specialist records the inspection results (data of the inspection checklists).
Review recorded checklists		During the execution phase, the maintenance supervisor can check the contents of the already recorded inspection results. The number of recorded inspection results also indicates work progress.
Usage Decision meeting		All Inspection Lots (Checklists) are used “Usage Decision” completed. This process step can be fully or partially automated in the first place.
Technically Complete Order		Provided that all inspection lots in an order have a usage decision, the order can be technically completed. This “settlement lock” can be deactivated in Customizing if required.

What is important to keep in mind?

- For manually created orders, the simulation function should be used to ensure that the master data used would lead to the correct inspection lots.
- As a rule, the object list and inspection lots are created when the order is released. However, you can use Customizing to control this depending on other system statuses or user statuses. The inspection lots in particular should be generated as soon as possible before execution, since they are not updated automatically if changes are made to the inspection plan at a later point in time.
- The usage decision is an SAP technical construct to complete an inspection lot. Closing can be completely or partially automated. So you can e.g. setting that only serious deviations have to be closed manually by a human, while inspection lots without defects or inspection lots with minor defects are closed automatically.
- The usage decision can also automatically trigger follow-up actions.
- For example: the updating of measurement documents. The automatic creation of (malfunction) notifications is also possible in principle; however, you must be aware that There may be a very large number of messages. Therefore, many companies regulate the creation of messages for negative check results more organizationally.

2.5 Evaluation of Checklists

The ability to evaluate digital checklists is a great added value in maintenance processing. In general, the following types of reporting should be distinguished with regard to the use of checklists:

Table 7 Key Reporting Needs for Checklist Processing

Reporting Type	Role	Short Description
Quality		Do all required technical objects have the correct checklist(s)? → Check to Data Quality in Before Maintenance Task
Evidence		Are all prescribed measures (legal and operational) implemented and documented on time? → Inspection as part of the usage decision for the individual order

State		Which status of the checked technical object can be read from the data of checklists? What does this mean in terms of system availability and remaining life? Can periodically recurring cycles be stretched in compliance with legal requirements? → Analytical evaluation after several maintenance activities within a period of time
Relationships		Where are the focus of errors and trends in comparable systems? → Targeted Evaluations for B. Upfront Revisions or Renewals

The reporting options provided by SAP (see chapter 4.5) using transaction IW97 offer a large number of selection and detail options.

The following are conceivable: B. Evaluations to track trends for defined ingestion values or to trigger condition-based maintenance. For the latter, the inspection characteristics of the inspection checklists should be linked to measuring points and, when the inspection checklist is saved, measurement documents should be automatically assigned to the inspection characteristic value generated. Using measuring point integration, inspections or maintenance from the maintenance plan can be controlled again.

What is important to keep in mind?

- Evaluations and statistics are not an end in themselves. It should always be clear which conclusions a report recipient can potentially draw from a report.
- Checklists quickly combine large amounts of data. Therefore, you should carefully consider the level of detail from which you can really draw information. Do I really need to see each individual inspection characteristic, or is it sufficient that I only recognize whether an inspection lot had defects or not? Do I need to see each individual technical object, or is it sufficient to have an overview of all comparable assets?
- The data of filled checklists provides a good basis for a large number of conceivable evaluations. To standardize evaluations, we recommend that you also formulate user stories for information requirements:

As *a role*,

I want *a description of the evaluation and note in which frequency the evaluation is required*

Reason why *the evaluation is required*

The requirement is fulfilled if:

- *Description of Selection Variables*
- *Description of Fields in Result List*
- *Filter Description*

3 Approach in an implementation project

The topic of “checklists” sounds simple at the first moment, because according to Wikipedia, the following applies: “*A checklist is a list of processes that need to be processed..*“

And in many cases, there are already existing processes and forms before an IT implementation, e.g. B.

- In the header of the individual
- on paper
- in Excel
- in Word
- In SAP using notifications, measuring points, operations, documents, Z tables
- and the like

However, in an integrated software solution with various participants, checklist implementation is a procedural topic! Chapter 2 of this guideline has already been discussed in detail.

The procedural topic is accompanied by a software solution with many different data objects, which you must first understand. This is not an accusation to SAP. Instead, the checklists can be as complex as you like, with different types for each asset category, with contingency items, with measured value limits, with graphics, and many other special features. You should not primarily strive to implement a one-to-one checklist that looks simple on paper or in Excel. A closer analysis of the actual checklist often reveals that complex requirements are contained there.

A project plan should be designed in such a way that you approach the requirements step by step according to the motto “Think big, start small”.

In the project, a very simple example should first be set up, perhaps even a checklist with only one point. Define and A concept phase with prototype, because it is necessary to gain experience in system usage and to get to know the different data objects and their relationships. The project team also has a shared success experience when the first checklist has been generated in the system and may even be processed with an app.

The project team should be motivated to try something. And later adjustments and optimizations after the end of the project should be possible, even forced. This is the only way to bring in the practical experience on site at the plant.

The following tips and notes have been compiled based on the experience of some SAP users who are using the checklist consulting solution (predecessor of the new S/4HANA standard). This is based on feedback and discussions from practical use.

What is important to keep in mind? (dos)

- Start with simple checklists
- Think about clarity of checkpoints and their possible outcomes. There is a “positive yes” and a “negative yes”. For example, on the question “Is everything OK?“ YES means a positive result, while the question
- “Are there any errors?” the YES is something negative. Accordingly, the results should be differentiated in the selected sets, otherwise these points could not be evaluated (even in a perspective).
- Thinking generally of evaluations/verification obligations – is there any added value for the inspection characteristic? The rule “No click without added value” also applies here!
- Different roles have different requirements for data collection. The expectation “all” should be fulfilled as far as possible. This means that a PM specialist has a different information requirement than a product manager.
- Think of those who need to record inspection results. This includes:
- Does the sequence of the checklist items correspond to the processing sequence?
- Integrate all results recording in checklist entry, that is, do not fill any measuring points by the way (use measuring point integration)
- Is it really possible for the employee to fill out an electronic checklist (hands free, hands clean)?
- Can graphics/documents improve editing?
- You should schedule an optimization phase after the implementation project. Experience has shown that the situation on site in the actual application is different from that at the green table or in the test laboratory.

What should be avoided? (Don’ts)

- You should not try to map the existing paper form one-to-one as an inspection plan.
- If possible, you should not use contingency items.
- Not every handle should be mapped; rather, only checkpoints should be mapped that also bring added value with regard to documentation, evaluation, work progress, and so on.
- Traceability e.g. ensure object list creation, that is, too many individual solutions (e.g. via BAdI) raise many questions.
- Evidence not even on the technical object, sometimes on the order – once fundamentally decide and adhere to.
- Give up if a requirement cannot be fulfilled at first glance. There are so many BAdIs and other enhancement options – use the exchange with other colleagues or in the DSAG net forums; someone will find a solution there.

4 Data Objects in SAP S/4HANA Checklists

4.1 QM Master Data

SAP components of the QM module are used for the checklist solution. The following unit explains the relevant objects/terms of the QM module in connection with the checklists. SAP inspection plans are used for the checklist template.

The following graphic shows the objects and their relationships:

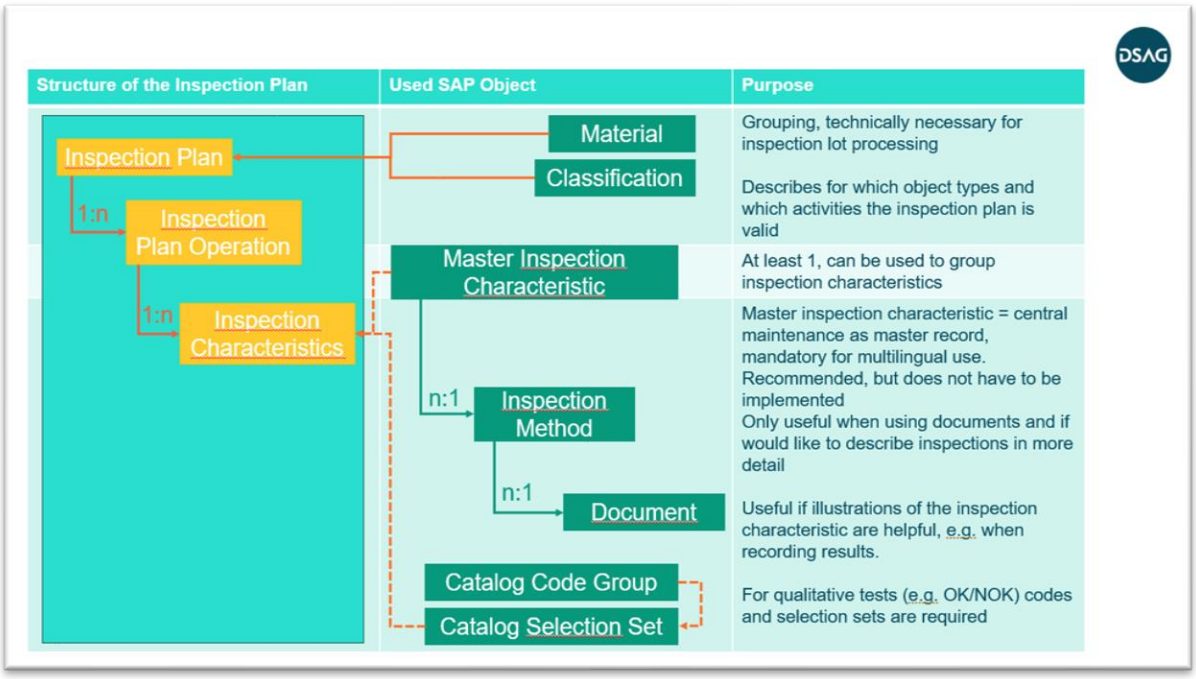


Figure 3 Master Data Objects of SAP Quality Management for Checklists

The graphic shows the relationships of the master data. The following unit first explains the two objects Material (4.1.1) and Classification (4.1.2) that are required for the inspection plan to be used in inspection checklist processing. Afterwards, the actual inspection plan (4.1.3, 4.1.4, 4.1.5.) and, finally, the various options for simplifying life using master data (4.1.6, 4.1.7, 4.1.8) are explained. Modular checklists are also described using the standard plan (4.1.9).

Note/Useful Tips for the First Checklist Inspection Plan

At the start of an implementation project, a lean path should be deliberately taken so that a basic understanding of the relationships is developed first. You can use an inspection plan with steps 4.1.1 **to** 4.1.5. This recommendation can also be used as a step-by-step guide.

4.1.1 Material

At least one material master record is required to use QM inspection plans. This material has nothing to do with the equipment to be inspected or other checklist contents; it is an SAP technical requirement to set up the inspection plans. Therefore, this material number is also referred to as a phantom material.

All inspection plans of the inspection checklists can then be assigned to this "dummy material". The Quality Management view must be maintained in this material master record for all plants of the inspection plans to be set up.

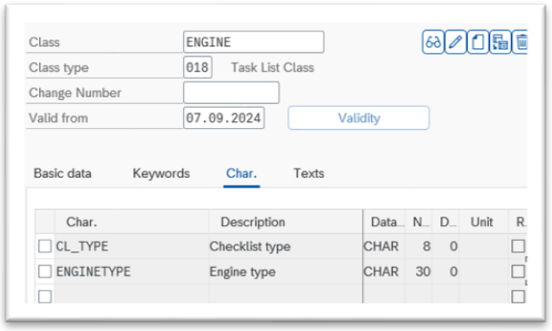
Note / Useful tips for material

- Technically, at least one material number (dummy material) is required to use the checklist solution. However, several different materials are also possible, so that these material numbers are used as a force element to facilitate the management of inspection plans. Example:
  - Material 1 for electrical installations
  - Material 2 for mechanical systems
- The material type must be set up in such a way that the task list types Q (inspection plan) and S (reference operation set) are allowed for the material type (Customizing SAP QM Inspection Planning General).
- If you want to work with quality scores and use different calculation methods, you must create a new material number for each calculation method (see also chapter 4.5.3).

4.1.2 Inspection Plan Classification

The inspection plans for the objects are determined using classification (see Section 4.3.3). This means that the inspection plan must be classified. The inspection plan must have the same class with the same name in class type 018 as the technical object (class type 002 or 003) for which it is to be used as a reference during order creation when the inspection lot is generated.

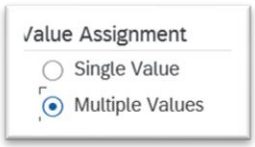
For example, the inspection plan should be valid for equipment that is assigned to the ENGINE class (class type 002). Therefore, a EINGINE class in class type 018 must be set up for the inspection plans.



The inspection plan class must have at least one characteristic, namely the checklist type (see Section 4.2.3).

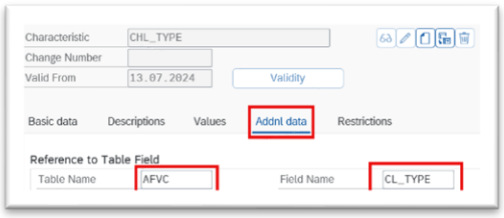
However, the inspection plan class can have other characteristics. These characteristics are used to define which properties the technical object must have for the inspection plan to be valid there.
For example, in the ENGINE class, there are objects with different engine types. The engine type characteristic specifies for which engine type(s) this inspection plan is to apply.

When you create the characteristics for the class, note the following:

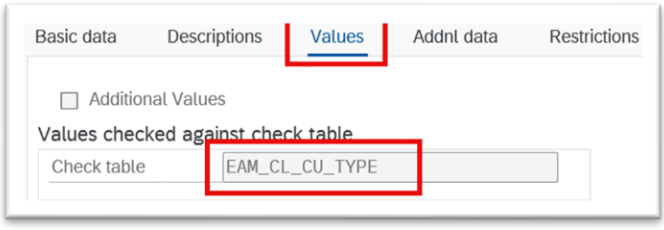


Characteristics for Properties (e.g. B. ENGINETYPE): The value assignment in the characteristic should be set to “multi-value”. This is the only way to Inspection plan can be used for several engine types at the same time.

Characteristic for checklist type: The characteristic should be directly with reference to the fields AFVC-CL_TYPE or PLPO-CL_TYPE so that the data type character format/8-character/uppercase letters is transferred in the same way. It should also be created with multiple values.



On the "Values" tab page, "Value Check by Check Table" to use the check table EAM_CL_CU_TYPE so that only the settings from transaction IW99 can be used.



Note: This data is still used in an application example in chapter 4.2.2.

Note / Useful tips for classifying inspection plans

- The class name of the inspection plan must be created identically to the class name of the technical object.
- The inspection plan class must contain at least the characteristic of the checklist type. This characteristic should be created with multiple values.
- Other characteristics specify which properties the object must have. Ideally, you can use the same characteristic that is maintained in the corresponding classes of the functional locations or pieces of equipment.
- In many cases, however, the same characteristic cannot be used because characteristics for functional locations/pieces of equipment are usually flagged as "single-value". However, you want to You may like to have multiple values (e.g. B. petrol engine, diesel engine), for which the characteristic is
- "Multiple Values" indicator must be selected. To map characteristics that do not have the same name, **you** must **use transaction IW98.**

4.1.3 Inspection Plan

The inspection plan is the copy template for the individual inspection lots (checklists) that are generated in order processing.

Only a small amount of data is to be maintained in the inspection plan header, for example: the short text as well as the usage (usually "Plant Maintenance" and a status "Released (General)"). All other QM fields such as lot size, the parameters for dynamic modification/inspection points, or other QM data are not relevant for the inspection checklists and can be left empty.

The class of the inspection plan is also assigned to the inspection plan header (see Section 4.1.2).

The inspection plan can only be saved and used as a checklist if at least one operation (see Section 4.1.4) and inspection characteristics (cf. chapter 4.1.5).

Note / Useful Tips for Inspection Plan

Since a large number of inspection plans can be created very quickly, you should consider how it is easier to find the inspection plans later. This can be
For example: by uniform short texts, the use of different material numbers, or by "mnemonic numbers" of the inspection plans (task list group, group counter).

4.1.4 Inspection Operation

At least one operation is required in the inspection plan. However, all fields of the operation have no significance in checklist processing and can be left empty or required entry fields (e.g. B. Workplace) can be filled with values from other usage areas.

You can use the operations in inspection plans to group the contents of the inspection characteristics (checklist items). This is useful if the checklist contains a large number of checks. This grouping should then be used in results recording when processing the checklists (e.g. by means of mobile solutions, see chapter 4.4. Many applications simply display inspection characteristics for all operations.

Note / Useful tips for inspection operation

The option of using operations in inspection plans should be used more sparingly. As a rule, only one operation is used.

4.1.5 Inspection Characteristics in the Inspection Plan

The inspection characteristics are the actual "checks" in the checklists. Each inspection checklist item to be processed is an inspection characteristic.

Text Characteristics/Master Inspection Characteristics

The fastest way to create inspection characteristics in an inspection plan is to use text characteristics. The text that will be visible later during results recording can simply be entered in the Short Text for Inspection Characteristic field.

The disadvantage is that these text characteristics can only be evaluated to a limited extent, the maintenance effort increases quickly if an inspection characteristic appears identically in several inspection plans, or the control parameters must be entered several times. Text characteristics cannot be multilingual, and they cannot transfer values to measurement documents in Plant Maintenance. These reasons mean that

text characteristics are often only used in very simple checklists or in test phases of an implementation project. Despite the initially higher maintenance effort, master inspection characteristics are usually used (see Section 4.1.6).

Independent of the question “Text characteristic or master inspection characteristic?“ note the following points:

A distinction is made between quantitative and qualitative inspection characteristics.

Quantitative inspection characteristics

Checklist items whose result is a (measurement) value must be created as "quantitative" inspection characteristics.

Values that are entered in results recording (see 4.3.4) can be checked for various plausibility checks:

- Target Value, Lower Limit Value, Upper Limit Value: This defines the values up to which a result is evaluated as "OK (Accepted)". Values outside of the limit values are then "not OK (Rejected)".
- Plausibility limits: Here you specify that an error message is displayed during entry if a value is entered outside the plausibility limit. Example: The fill level of a 5000 liter tank is to be read. Specifies Entered By 10000 as a value, it cannot save at all because the value entered is not logical.

Qualitative inspection characteristics

For checklist items that require a descriptive confirmation,
"Qualitative" inspection characteristics created. For this type of inspection characteristics, the selection of possible answers is defined and assigned in the form of a catalog (see chapter 4.1.8).

Each inspection characteristic also requires control indicators that describe technical system properties. QM offers a large number of control indicators; only the checklist-relevant are displayed here:

The most important checklist-relevant tax codes:

- Specifies whether the characteristic is quantitative or qualitative.
- Sampling data (à usually select Sampling Procedure)
- Data for results confirmation (usually set "Summarized Recording")
- Results Confirmation: Required Characteristic or Optional Characteristic
- Results confirmation: Conditional inspection of a characteristic depending on the acceptance or rejection of the previous required characteristic. This means that the inspection characteristic is only relevant if the previously recorded value

was OK / Not OK. Otherwise, this characteristic is not offered for results recording.

- Check scope information (usually select “Fixed Scope”)
- For quantitative characteristics, type of values to be inspected (target value, lower specification limit, upper specification limit, plausibility limits, optionally two further specification limit pairs)
- Check the characteristic attribute for qualitative characteristics (catalog of selected set codes)

Note / Useful Tips for Inspection Characteristics in the Inspection Plan

- The text of the inspection characteristic should be based on the language used by the person who created the inspection characteristic. The texts should be clear and unambiguous.
- The sequence in which the inspection characteristics are set up within an inspection plan should be based exactly on the sequence in which the PM specialist actually performs the inspection at the installation. It is perceived as extremely unpleasant if the processor has to constantly jump back and forth in an entry screen. The affected PM specialists should be able to: test of the inspection plan directly; ideal is a test run directly at the plant.
- For quantitative characteristics, the upper and lower limits and plausibility limits must be maintained. A value entered incorrectly by mistake may be It may be necessary to carry out an extensive subsequent survey on site; therefore, it is usually worthwhile to use the value limits. To simplify the data setup, so-called "Tolerance Key" can be defined in Customizing, which ± 10 %.
- For qualitative characteristics, the catalog and the valuation of the result must match the question. Example: When asked “Is the filter blocked?“ or “Is the filter still usable?“ the answer “Yes” to the first question is a rejection and the second question is an assumption.
- For the many control parameters, you can set up an input help in Customizing ("Default for Control Indicators of Characteristic"). If you use this input help, the many tax codes are already preassigned correctly.
- The advantages of master inspection characteristics over text characteristics are already explained in the text.

4.1.6 Master Inspection Characteristics

As described in chapter 4.1.5, master inspection characteristics have the advantage of reusability, multilingual capability, evaluability across several inspection plans/inspection lots, and the option of transferring data to measuring points. Several

master inspection characteristics can in turn refer to an inspection method in which, for example, B. photos can be stored. For more information about inspection methods, see chapter 4.1.7.

At least one short text and the differentiation of qualitative/quantitative inspection characteristics (see chapter 4.1.5) must be stored in the master inspection characteristic.

You must also specify whether the characteristic is a reference characteristic or a copy template. In the case of a copy template, values such as e.g. B. Measurement tolerances are copied to the actual inspection plan, but can be changed there. For a reference characteristic, the values are automatically copied from the master inspection characteristic to the inspection plan. In the inspection plan, a reference can also be removed retroactively, and you can then handle it like a changeable copy.

For quantitative inspection characteristics, you can maintain target values and tolerance values. For qualitative inspection characteristics, you can maintain the catalogs to be used.

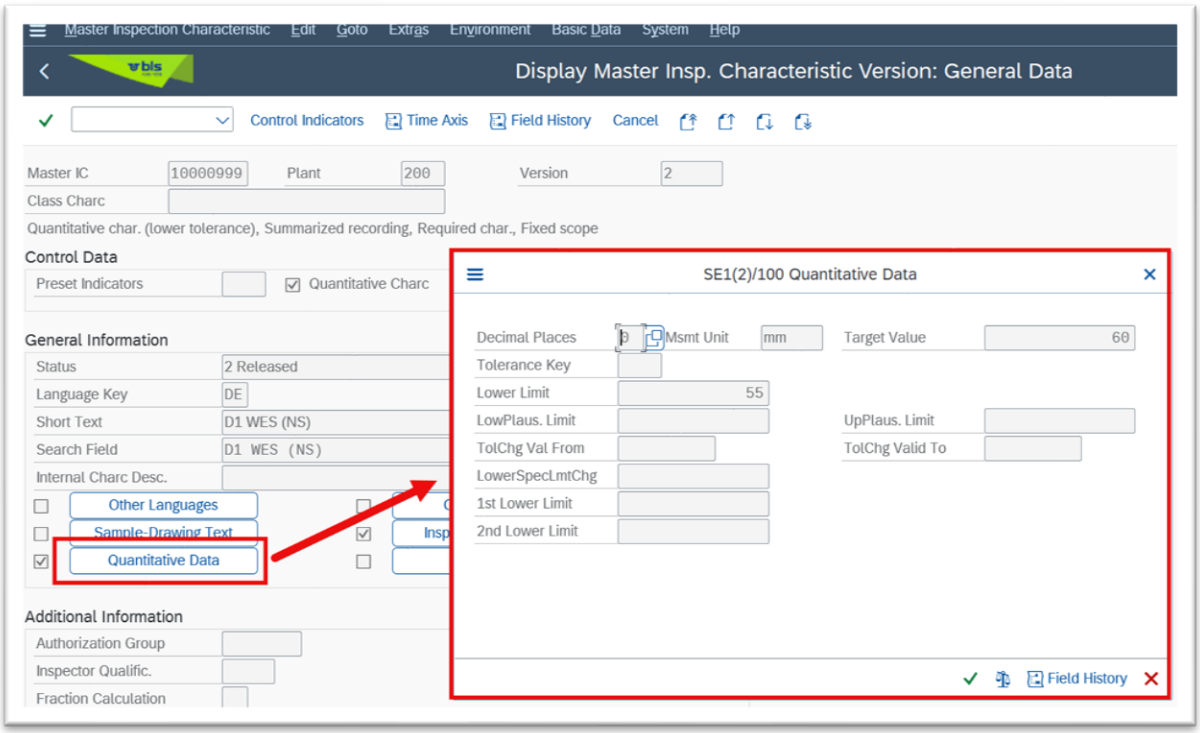


Figure 4 Target and Tolerance Values in the Master Inspection Characteristic

A characteristic can be stored in the master inspection characteristic. For quantitative characteristics, this is used to control the updating of inspection results in measurement documents (see Section 4.3.6).

Master inspection characteristics can be versioned. As a result, changes can be specifically planned and used in a traceable way. There are SAP standard reports for

this to be able to execute the central where-used list and replace function of master inspection characteristic versions.

Note / Useful Tips for Master Inspection Characteristics

- We recommend that you use master inspection characteristics. This prevents later expensive adaptation work, e.g. for the introduction of multilingual capability or also for subsequent functional changes such as adjustments to the texts.
- There are standard SAP reports in QM that you can use to execute where-used lists and replace functions for master inspection characteristics and master inspection characteristic versions.
- When setting up the master inspection characteristics, you should carefully consider whether defined catalogs and target values/tolerances are a binding specification for all inspection plans (then the master inspection characteristic must be flagged as a reference characteristic), or whether the catalogs and target values/tolerances have a default character that can still be changed in each inspection plan (then the master inspection characteristic must be flagged as a copy model).

4.1.7 Inspection Method

Inspection methods are only necessary if the PM specialist is to be supported in results recording with graphics ("one image says more than a thousand words"). A document info record can be stored in the inspection method.

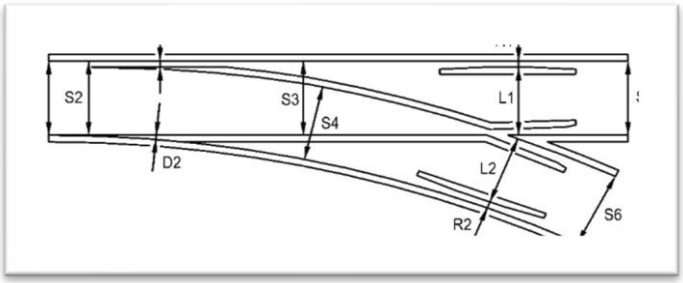


Figure 5 Example Graphic for Supporting the PM Specialist in Track/Guide Width Measurement of Switches

The respective measurement designations (e.g. B. S1, L2 …) are the corresponding descriptions of the inspection characteristics.

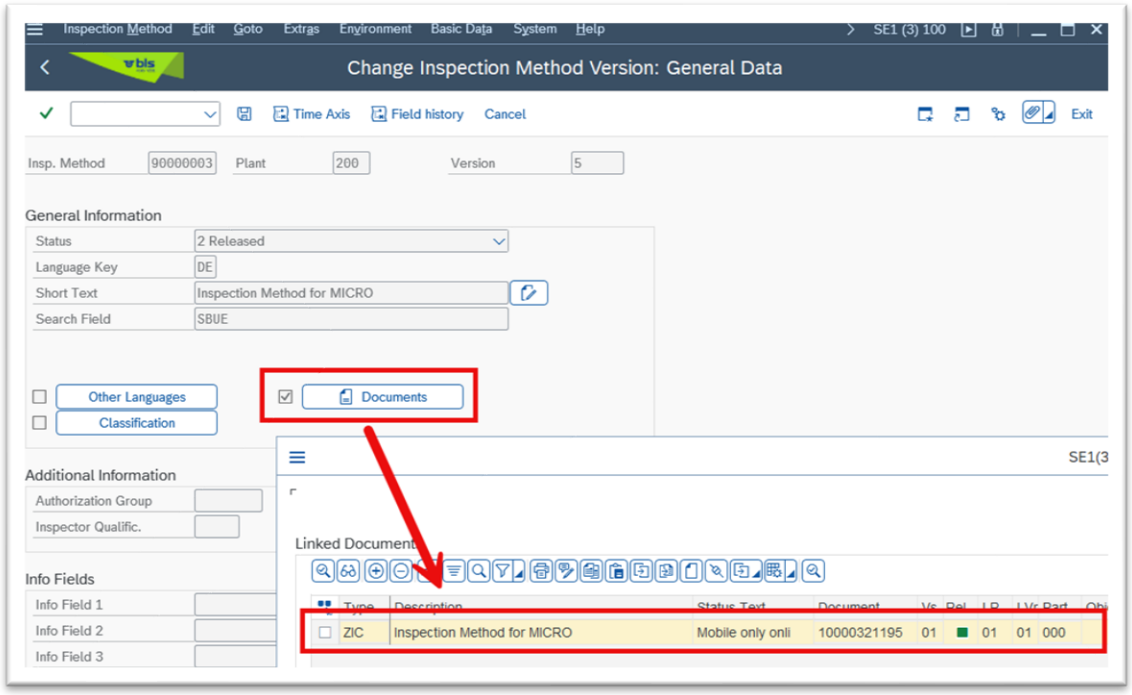


Figure 6 Linked Document Info Record in the Inspection Method

An inspection method can be used in several master inspection characteristics or directly in inspection plans. Inspection methods can be maintained in multiple languages.

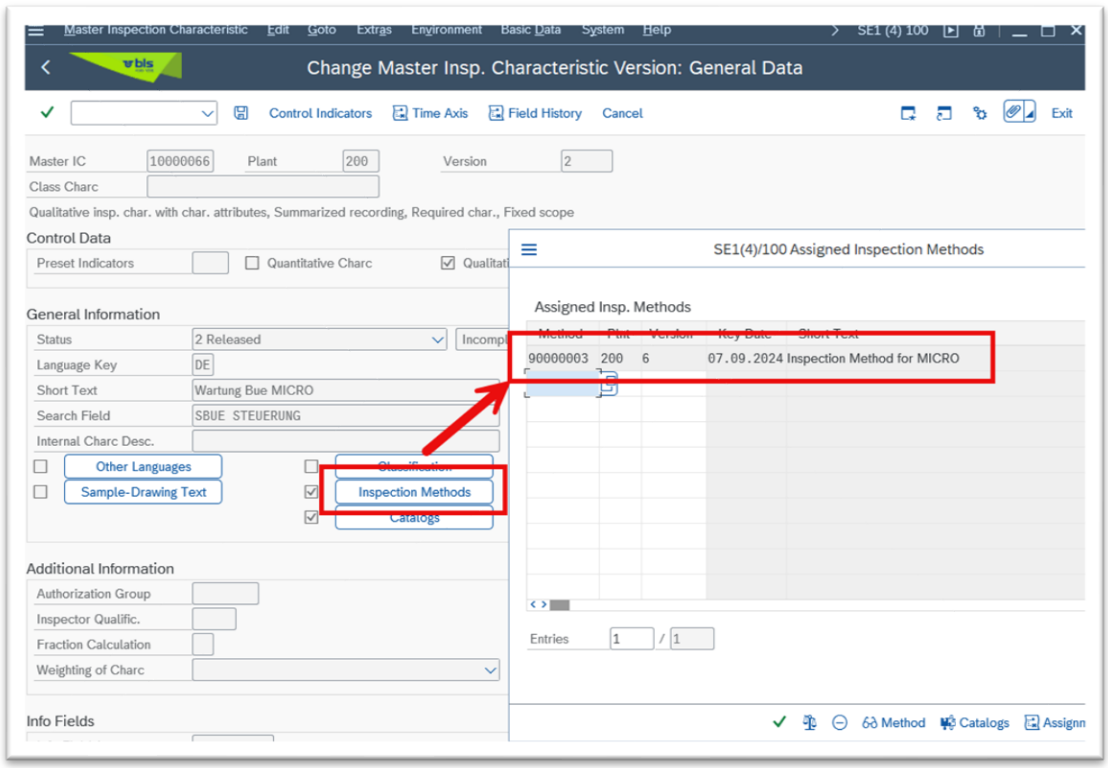


Figure 7 Inspection Method Included in the Master Inspection Characteristic

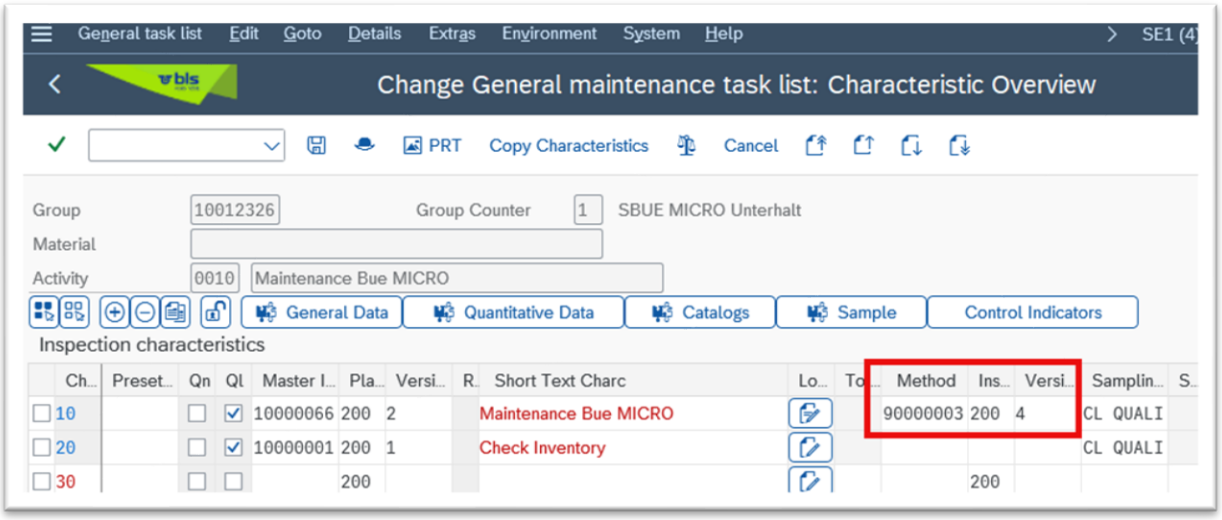


Figure 8 Inspection Method Included in the Inspection Plan

Inspection methods are versioned, which means that changes can be specifically planned and used in a traceable way. There are standard SAP reports for central where-used list and replacement functions of inspection method versions for this purpose.

Many detection solutions such as e.g. SAP Service and Asset Manager integrate the documents/graphics directly into the entry screen.

Note / Useful tips for inspection methods

- Inspection methods are not absolutely necessary for creating inspection plans and for creating inspection lots. They are only required if you want to use documents, especially graphics.
- When using inspection methods, the recording application to be used (e.g. mobile solution). Not all solutions support all file formats. The use of graphics (JPEG or PNG) or PDF documents has proven successful.
- The inspection method should only be used as a supporting aid. It is not useful if e.g. B. Target or tolerance values are in the document. These values belong to the inspection characteristics.
- A separate document type for documents in inspection methods is advantageous in order to be able to restrict the change of the graphics to a small group of users.

4.1.8 Catalog/Codes

The standard catalog types 1 and 3 are required in the checklist solution:

C	Short text for the catalog	Keyword
1	Characteristic Attributes	Attribute
2	Tasks	Task
3	Usage Decisions	Decision

Figure 9 Checklist Relevant Catalog Types

The codes must be grouped into two hierarchy levels - code group and code. You can maintain language-dependent texts for code groups and codes.

Catalog type 1 (characteristic attributes) is used to ensure unique and evaluable entry during qualitative inspections. Typical codes are e.g. B. OK / Not OK or Yes/No or good/satisfactory/bad.

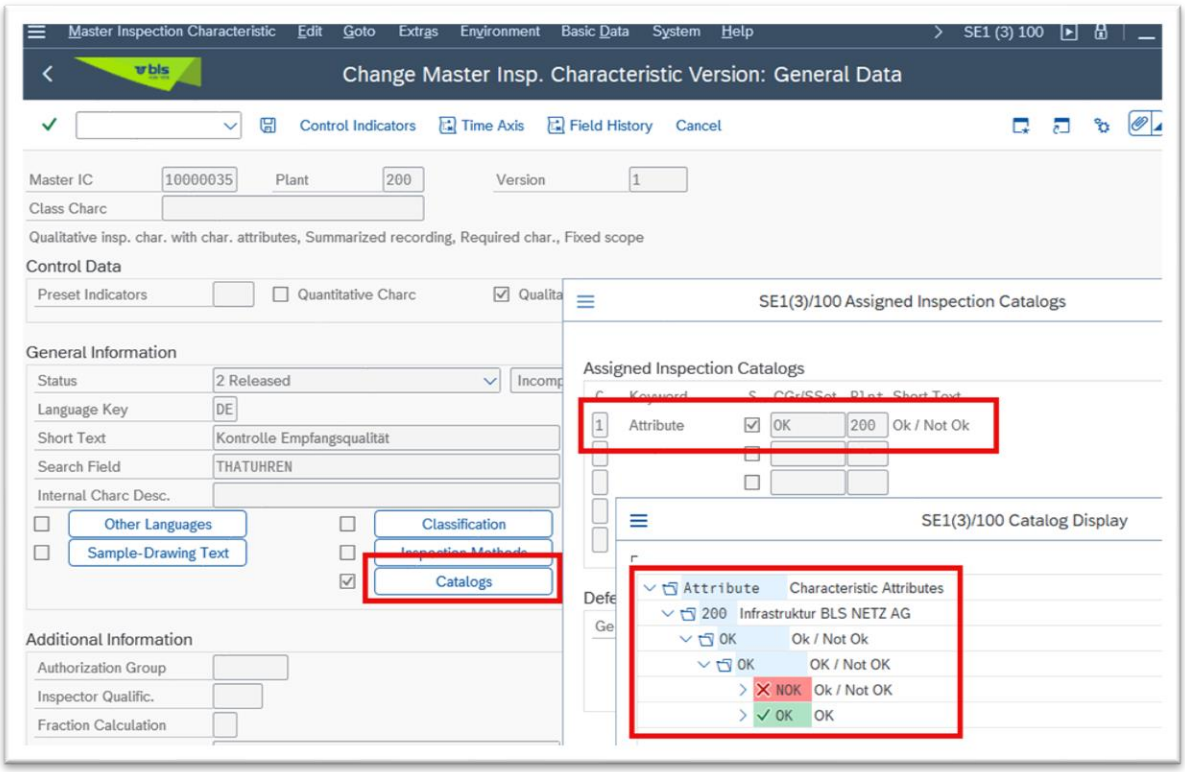


Figure 10 Catalog Included in the Master Inspection Characteristic

In a second step, the codes of catalog type 1 must also be "Selected sets" (transaction QS51), that is, the system must specify that, for example, B. OK is a positive value (and therefore the check is successful) and Not OK is a bad value.

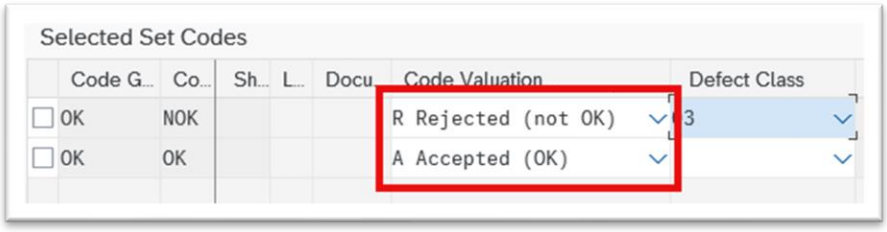


Figure 11 Selected Set with Valuation of Codes

In addition, the defect class that a code has is defined in the selected set. The defect class is used to control automatic inspection lot completion (see Section 4.3.5). Conventional is e.g. a division into “severe errors” and “soft errors”. During automatic inspection lot completion, you can then specify that, for example, B. “soft errors” are completed automatically, while “hard errors” always require one person to complete.

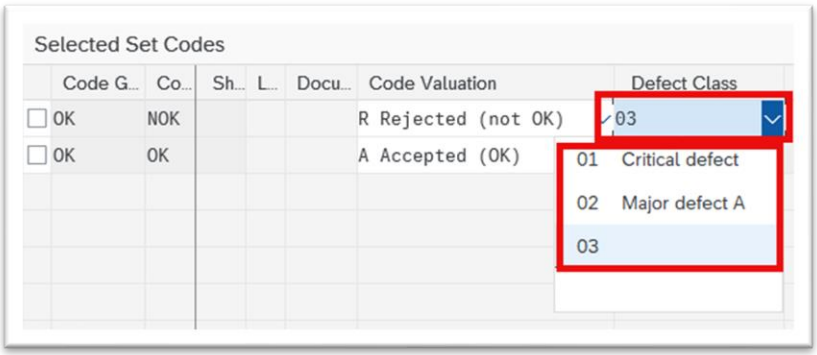


Figure 12 Definition of Defect Class for Code

Note / Useful tips for catalog 1 Characteristic attributes

- The user who is to record the inspection results sees these codes. The code names should therefore be precise and concise and should be based on the language concept of the user.
- For the same subject of codes, only one standard should be used to avoid unnecessarily confusing the users. If there is e.g. If there is already a catalog “OK / not OK”, further catalogs such as “correct / incorrect” or “good / incorrect” should be avoided.
- In the early days of using checklists, you can: Values such as "Does Not Exist" / "Not Relevant" may also be allowed. In an optimization, however, the inspection plans confirmed in this way should be adjusted so that the PM specialist does not still work for the 20th Inspection on 20th time has to say that the object does not exist!

The catalog type 3 (usage decisions) is used to categorize the usage decision.

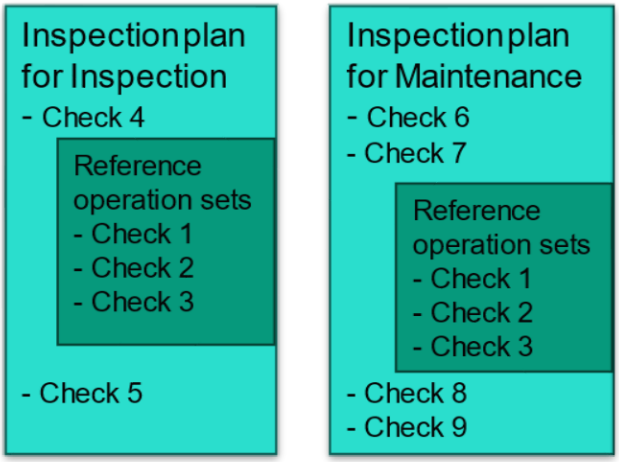
Note / Useful Tips for Catalog 3 Usage Decisions

- It makes sense e.g. B. to group whether the inspection checklist was completely filled out or whether the inspection lot was rejected manually. It is also helpful to note whether the batch program has completed the inspection lot automatically or whether a user has set the completion.
- As a result, you often find such codes for the usage decision:

0010	DE	Checkliste OK - automatisch gesetzt
0011	DE	Checkliste OK - manuell gesetzt
9999	DE	Prüflos nicht durchgeführt

4.1.9 Reference Operation Set

Reference operation sets (also known as standard inspection plans) can be used as referenced objects for inclusion in inspection plans. The inspection characteristics from the reference operation set are used in the actual inspection plan and can be enriched with specific inspection characteristics that are only required in the inspection plan. The graphic is intended to illustrate the correlations.



The great advantage results from the fact that e.g. A group of inspection characteristics that occurs identically in many inspection plans, must be maintained only once, and must be kept up-to-date. Only the specific inspection characteristics must then be added to the respective inspection plans. This can be used to create “modular checklists”.

(Note: For reasons of clarity, the standard plan was deliberately omitted from the graphic at the beginning of chapter 4.1.)

Note / Useful tips for standard plan

- The advantage of using the reference operation set is the multiple use in inspection plans and the resulting central maintenance. In this way, the checklists can be structured in a modular way. This simplifies and reduces the maintenance effort and subsequent changes. Changes to reference operation sets have an immediate effect on all inspection plans in which the reference operation set is included.
- There are standard SAP reports with a where-used list and replace function for the reference operation sets that are included in inspection plans.
- You can subsequently unlock referenced reference operation sets in a task list, thus removing the reference and then handling it as a modifiable copy. In this case, the system still supports at least the where-used list.

4.2 PM Master Data

The order of the subchapters is a recommended procedure. It is not mandatory to adhere to the steps in every case. However, it is in the nature of the matter that e.g. for example, first a class (e.g. B. Equipment Class) must be created before a classification characteristic can be stored in the class.

4.2.1 Technical Objects

In Plant Maintenance, the assets are represented as functional locations and pieces of equipment in a multi-level hierarchical structure. Functional locations are usually fixed functions/locations, whereas equipment can also be exchanged, placed in stock, and installed elsewhere. Checklists/inspection lots can be created for functional locations as well as for pieces of equipment.

In order processing with checklists, the asset structure plays an important role because the checklists are based on the object list in the order, and this object list must first be filled in a meaningful way. In the standard version, the system reads the asset structure hierarchically downwards from the header object (functional location or equipment in the order header) and writes it to the object list of the order (see also section 4.3.2). The inspection plans are then searched for or created for the objects in the object list, depending on the checklist type (see chapter 4.3.3).

To generate the required inspection lot for a functional location or piece of equipment, the technical objects for the checklist determination must be prepared accordingly by assigning them a class and classification characteristics (optional) (see chapter 4.2.2).

Note / Useful tips for technical objects

- When setting up the checklists, you should check whether the structure of the functional location/equipment is sufficient for the checklists. Often there are still collectors (e.g. B. "All Fire Extinguishers"). However, if verification is required for each object (that is, for each individual fire extinguisher), the installation structure must be enhanced.
- If an order should also contain objects that do not correspond to the installation structure, these can also be enhanced using the object list in the maintenance item. Therefore, no modification of the structure of the functional location/equipment would be necessary for these exceptional cases. Caution: The object list of the maintenance item is not updated automatically.

4.2.2 Classification Technical Objects

The classification of technical objects categorizes or groups objects of the same type (functional location and equipment). You can also use the class characteristics to describe the objects. It is therefore possible to store all relevant asset information for technical objects.

The following example explains the advantages of classification of the same type:

Initial situation:

In a food production, there are two filling plants A and B in which different types of electric motors are used. Some of these electric motors have different maintenance requirements or different measurement tolerances that must be observed. For example, a filling plant has two different inspection facilities. Maintenance Cycles:

- Every filling plant A and B must be subjected to a visual inspection daily. A confirmation that the asset has been checked is sufficient.
- The filling system A must also be maintained every two weeks.
  - Measurements are carried out that match the type of electric motors used.
  - The object is greased.
- The filling plant B must also be maintained once a month.
  - Measurements are carried out that match the type of electric motors used.
  - A wear part is replaced.

Solution:

For daily visual control, it is sufficient to use the same inspection plan regardless of the type. In this case, the inspection plan is determined only using the class of the

technical object and the class of the inspection plan.

On the other hand, the type of filling plant must be included in the maintenance. In this case, the inspection plan is determined using the classification of the technical object and the inspection plan. If the two classes match, the classification characteristic (in this case, the engine type as classification characteristic) is used to determine the correct inspection plan. Therefore, a characteristic that is relevant for determining the correct inspection plan must be set up and maintained for the class of the functional location/equipment and in the inspection plan. The characteristic should have a list of possible/permitted values. For more details on the determination logic of inspection plans, see chapter 4.3.3.

Note / Useful tips for classification

- Similar objects (e.g. B. electric motors) should be assigned to the same class to reduce the number of test plans. It should be possible to differentiate between different objects using characteristics. The characteristics should have a list of possible/allowed values.
- The class types for technical objects (equipment = 002 / functional locations = 003) should be used wherever possible.

4.2.3 Checklist Type

In the order for which inspection lots are to be processed, you must define the activity for which the checklists are to be generated, since the checklists
For example: for maintenance and inspection. For this reason, there is a "Checklist Type" field in the order operation for the order types that are flagged as relevant for the checklist in Customizing.

The checklist type field is also available in task list operations so that the task lists can still be used as a template for the orders.

The possible input values for the checklist type are maintained using transaction IW99. It is possible to store the description in several languages.

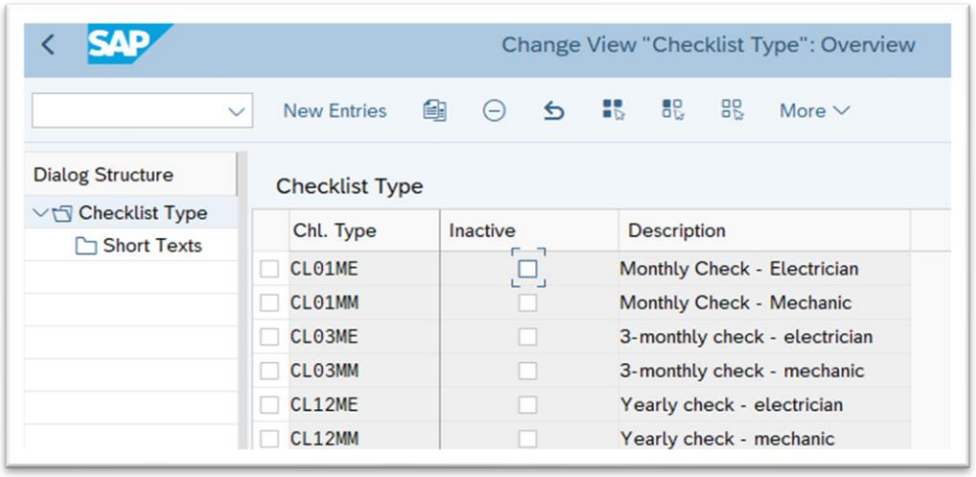


Figure 13 Maintenance Table for Checklist Type

Note / Useful Tips for Checklist Type

- The checklist type is used in the order operation and task list operation and controls for which activity the checklist is to be generated.
- Each inspection plan class must contain the checklist type characteristic. The characteristic must be assigned values. It should reference this checklist type table (see chapter 4.1.2).
- The number of entries should be kept to a minimum.
- The entries should be based on common activity concepts such as visual inspection, inspection, functional inspection, maintenance. The same activities take place on the same object by different specialist teams (e.g. B. Mechanics, Electrics) and if each specialist team is to receive its own checklist, different checklist types must be set up for the different specialist teams.

4.2.4 Routing/Task List Operation

In the task list operation, when using the Checklist Functionality, select the Checklist Type field (see 4.2.3) so that the orders for which inspection checklists are to be generated are already

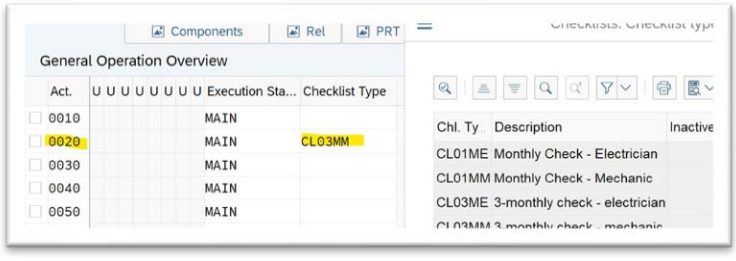


Figure 14 Field for the Checklist Type in the Task List Operation

Order creation contains the correct activity and inspection plan determination can be controlled depending on the activity.

Note / Helpful Tips for Task List and Order Operation

- You can continue to use task lists that already existed before the introduction of the checklist functionality. The checklist type must be added to the operation.
- When you use strategy maintenance plans, this also ensures that the checklists can be structured differently for each maintenance package, since the assignment to maintenance packages is also made using operations.

4.2.5 Maintenance Plan

The maintenance plan is used for cyclical maintenance and describes how often what has to be done for which technical object. The “how often” is described in the form of the strategy and the “what” in the form of the routing.

You can enter individual functional locations/pieces of equipment in the object list of the maintenance item. This should only be done if the structure of the technical object cannot be formed using the hierarchy (see chapter 4.2.1). These objects are always transferred to the order during order generation.

The intended object list explosion should be used on behalf of the checklist solution.

Note / Useful tips for maintenance plan

- Existing maintenance plans do not have to be changed by using the checklist functionality.
- The object list of the maintenance item should only be used in exceptional cases. This can be useful in some cases if the objects to be checked are not in the hierarchy of the order header object. The disadvantage is that the maintenance effort increases and the topicality of the objects to be checked cannot be guaranteed in this way, since the object list of the maintenance item is never updated automatically.

4.3 Maintenance Processing

Inspection checklists are processed as part of order processing in Plant Maintenance or Customer Service. The order bundles the processing in the form of planning, confirmations, and also the valuation of the inspection checklists. Each individual inspection checklist (each individual inspection lot) is assigned to an order operation and a technical object from the object list.

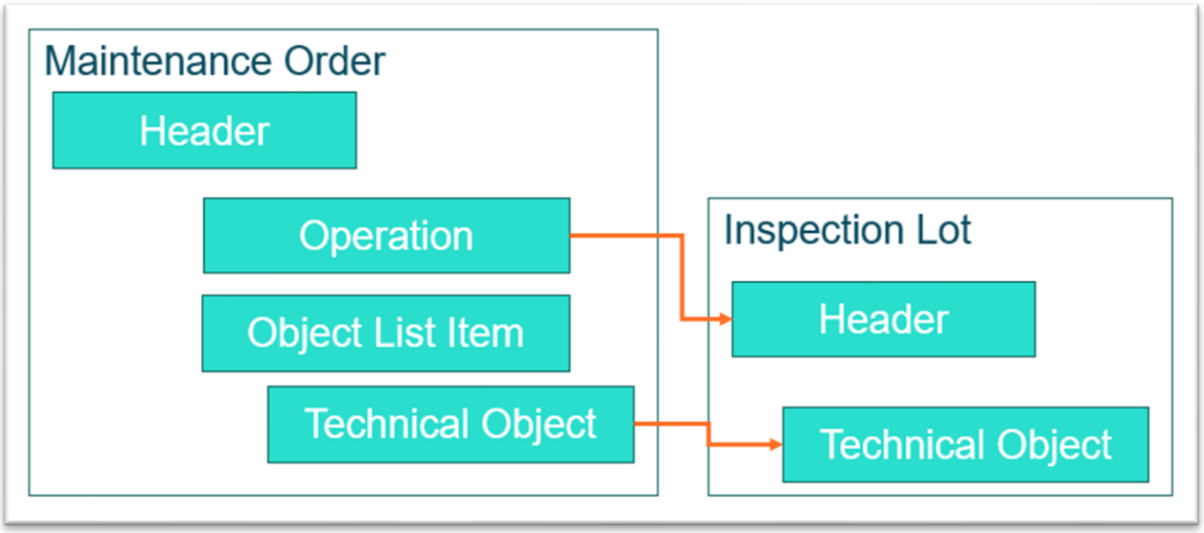


Figure 15 Linking of Checklist to Order Operation and Technical Object

4.3.1 Maintenance Order and Operation

The order (Plant Maintenance and Customer Service) is the central planning tool for the concrete implementation of a task with reference to one or more technical objects. The measure can be a maintenance, inspection, repair, or other activity. In the order header, the assignment is made to the technical reference object and to other relevant information, such as the basic dates.

The concrete activities are mapped in one or more operations. The operations are used for structuring, detailed scheduling, scheduling, and description different activities as well as resource planning of personnel, materials and tools. The basic differentiation of the operations with regard to the checklists is defined with the newly introduced Checklist Type field.

The orders can be created on the basis of a task list (see Section 4.2.4) can already be prestructured with default values.

Three system statuses in the order header are relevant for the inspection checklist application:

- OLGE (Object list generated)
- CLGE (Checklists Generated)
- CLNO (No checklists found)

There are also two new business transactions “Generate OLGE Object List” and “Generate CLGE Checklist”. In this way, you can use Customizing to influence the time at which the object list and the checklists are generated. Thus, e.g. Checklist generation can be controlled depending on a user status. The control also works in conjunction with the phase model for orders. Control codes can be defined in the phase model and then influenced with the business transactions using a user status profile.

Sample Request: Checklist generation is to be done at phase "Ready for Scheduling" with system status "ABPL Ready for Planning". The following settings are made:

- For order type and plant in the customizing node Configure Checklists for PM Order Types and Planning Plants the flag
- Set Automatic Checklist Generation on Order Release
- Define Status Profile for Order Type
- Enter user status BLCL block checklist generation (without status number) with indicator "Initial Status" (activate when creating the order)
- Enter influences for user status BLCL:
  - Prohibit the business transaction "Generate Checklist"
  - Deletion of user status for business transaction "Set Ready for Planning"

Note / Useful tips for order and operation

- The order types and plants for which inspection checklists are to be created must be set up in Customizing.
- The operations in the order should be structured in such a way that they describe the different activities. Since the checklists are assigned to a transaction, you can use them to control exactly which checks are to be performed for which operation. For example, an order is processed with three operations: "Preprocessing", "Main Work",
- "Postprocessing". Each operation can have its own checklist type. In this way, three different inspection checklists can be generated for each technical object for this order.

4.3.2 Object List in Maintenance Order

The object list in the request enables the free assignment of all objects on which the request is executed. Functional locations, equipment, assemblies, materials, and notifications are possible. When you use the checklist solution, the object list is automatically filled and exploded using the assigned object in the order header. In the standard system, all functional locations and pieces of equipment that are sorted below the reference object in the hierarchy of the functional location/equipment are written to the object list. In addition, there may be Object list entries from maintenance items that are also copied automatically.

As soon as the object list has been created, the request receives the system status OLGE (Object list generated).

As a rule, the object list is created immediately after the order is created. However, it

is possible to make generation dependent on a user status. To do this, you can influence the business transaction Generate Object List in Customizing.

Note / Useful tips for the object list

- In the standard system, the object list is generated directly when the order is created and is also updated each time you save. If the object list is to be created at a later point in time, you can define a user status that contains the business transaction
- Generate Object List.
- If you do not want to transfer all objects to the object list using the hierarchical explosion of the technical object structure, you can use an enhancement here.

4.3.3 Inspection Lot and Inspection Lot Determination

An order can contain an unlimited number of inspection lots (checklists). The inspection lots are always assigned to an object from the object list and to an operation. The checklists are displayed on a separate tab page in the order.

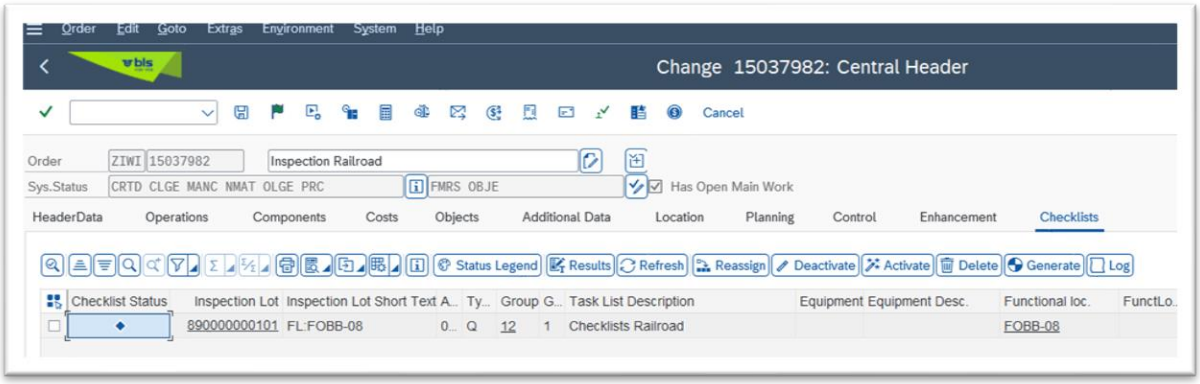


Figure 16 New Checklist Tab in the SAP GUI Transactions for Orders

- An inspection lot contains all tasks/checklist items for concrete execution; the inspection lot is directly assigned to a concrete maintenance order and is R. Created automatically when the order is released.

The inspection lots are either generated automatically using the Generate Checklist function or by the user using transaction IW92. The content of a checklist (inspection lot) is always dependent on the characteristic value of the technical object and the activity.

As soon as the inspection checklists have been generated, the order receives the system status CLGE (Checklists Generated). If no checklists could be created, the order is assigned the system status CLNO (no checklists found).

As a rule, the checklists are created after the order has been released. However, it is possible to make generation dependent on a user status. To do this, you can influence the business transaction Generate Object List in Customizing.

The challenge is to find the appropriate checklist for the respective technical object. The logic seems complicated at first glance, but allows for a high degree of automation. The determination takes place in seven steps, which are described in the following example:

The maintenance/service order involves a recurring inspection of all electric motors within a production area. Both direct current and alternating current motors are installed there, whereby different checklists are to be used for each type of electric motor.

All electric motors are entered as equipment or functional location in the object list of the order (see Section 4.3.2). The storage of the type of electric motor takes place in the classification. This is described in chapters 4.1.2 (Classification of Inspection Plans) and 4.2.2 (Classification of Technical Objects). The order operation contains the information “Inspection” in the Checklist Type field (see Sec. 4.2.3 / 4.3.1).

The following steps are performed:

1. The name of the class(s) in the functional location or equipment is determined, that is, the engine is described by the class E-MOTOR for class type 002 (equipment) or 003 (functional location).
2. The system checks whether there is an E-MOTOR class in class type 018 (inspection plans and routings). Therefore, the system checks whether the names of the class names are the same.
3. The system checks whether there are characteristics in the inspection plan class E-MOTOR/018 that go beyond the inspection checklist type. Example: An engine type characteristic still exists.
4. A mapping table (to be maintained using transaction IW98, see below) is used to determine the name of the corresponding characteristic in the structure of the technical objects. If there is no entry in the mapping table, the system checks with the same technical characteristic name.
5. For the technical object, the system now determines the characteristic value for the characteristic that has just been determined.
6. All inspection plans are determined for which the characteristic value is stored in the inspection plan classification.
7. Using the inspection checklist type in the order operation, the system now checks which of the determined inspection plans have an identical classification of the activity.

An inspection lot is created on the basis of the inspection plan determined. These seven steps are repeated for each entry in the object list with each operation, so that a corresponding number of checklists can be created for an order.

The following graphic provides an overview of how this determination works.

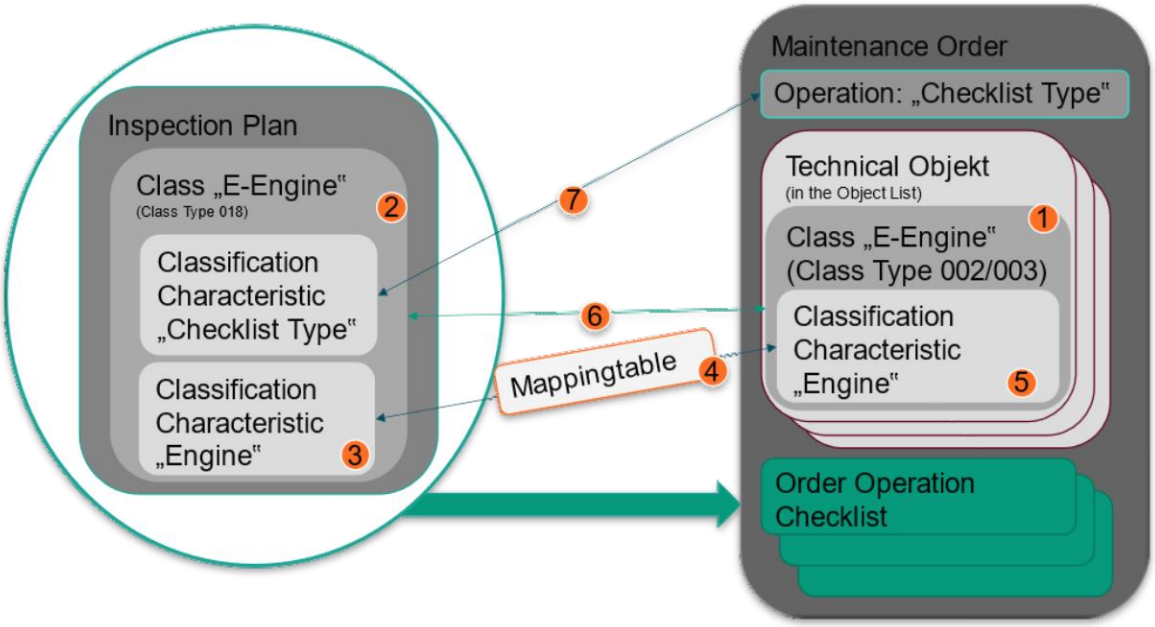


Figure 17 Determination Logic with Classes

Note / Useful tips for inspection lot and inspection lot determination

- It is not necessary that the technical objects are described using characteristics. It is also sufficient if the class (in the example “E- MOTOR”) is defined. In this case, all electric motors (in the example, regardless of whether they are DC or AC motors) would receive the same checklist.
- In step 4 of the example, a mapping table was mentioned. This is maintained using transaction IW98. In many cases, it is necessary because characteristics are often flagged as "multi-value" for inspection plans (an inspection plan can, for example, valid for several engine types); for functional locations and pieces of equipment, however, the characteristics are usually “single-value”, since e.g. a motor may only be assigned to one type.
- The material assignment of the inspection plan is not relevant for inspection plan determination. The classification is compared!
- When comparing the characteristics of equipment/functional location and inspection plan, you can also access characteristics of higher-level equipment/functional locations in the object hierarchy. To do this, you must activate a BAdI (Business Add-In) in programming.

The standard determination logic can be changed according to a customer-specific plan determination logic. For example, a BAdI could be used to determine the inspection plan using the Object Type field in the technical object or using the construction type of the equipment.

4.3.4 Results Recording

The results of an order execution are mostly recorded using mobile apps. Therefore, this part of the process is described in a separate chapter 4.4.

4.3.5 Usage Decision and Order Completion

The usage decision controls what should happen to the recorded results of an inspection lot (inspection checklist).

A usage decision can be made

- Fully automatic
- Automatically, if an inspection lot has no fatal defects
- Manual

Automatic usage decisions are set using a background program. You can also specify a defect class. The defect class describes the severity of a deviation (see Section 4.1.8).

When the usage decision is made, all inspection characteristics (checklist items) that are still open are closed; a confirmation is then no longer possible. A usage decision can be reset; inspection characteristics can then be processed again.

You can use the usage decision to start further automatic processes in the system (follow-up actions). This is described in chapter 4.3.6.

The technical completion of the order is rejected if the order still has open inspection lots. Alternatively, you can make a setting in Customizing so that this check can only take place at the business completion of the order.

The results recorded are always checked in the order. To do this, you can jump directly from the order transaction to the reporting transaction IW91. Reporting is described in chapter 4.5.1.

In the reporting transaction, functions for processing inspection lots are also available directly. These functions are almost exclusively in the view
“Inspection Lot” can be found:

- Deactivate or (Re-)Activation of Inspection Lots
- Making the usage decision
- Copying Inspection Lots
- Replacement of Inspection Lots

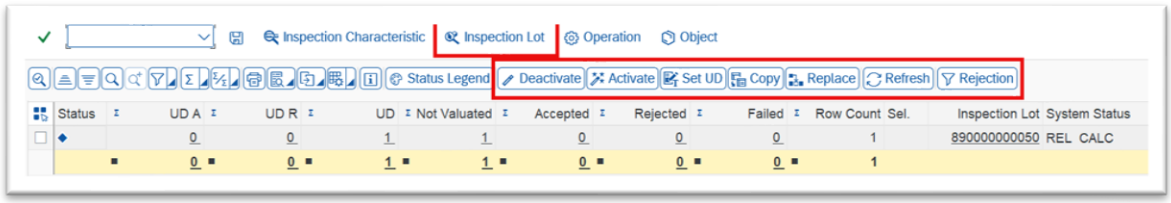


Figure 18 Functions in the Results Overview

In addition, it is possible to subsequently record missing results for inspection lots in the results overview and then make a usage decision directly:

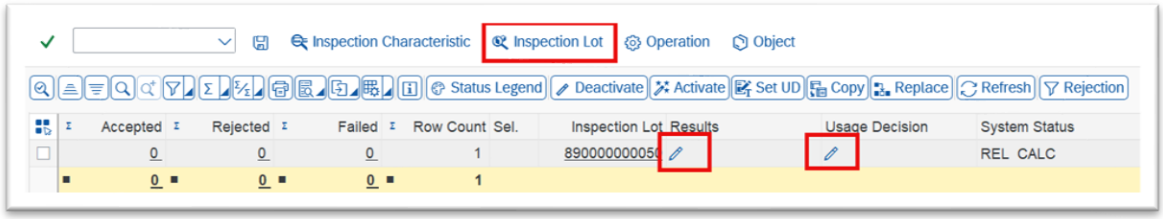


Figure 19 Recording Results and Usage Decisions

Note / Useful tips for the usage decision

- Depending on the requirements of the business process, the usage decision can be controlled. If the checklist results
- For example: are to be checked using the principle of dual control, the usage decision should be used for this.
- If it is not absolutely necessary, a high level of automation should be sought, solely because a considerable amount of documents can arise.

4.3.6 Follow-Up Action for Usage Decision

Once a usage decision has been made, functions can be started automatically. These functions are described in the form of "function modules". SAP delivers four function modules for the checklist application, but self-programmed function modules can also be added via Customizing.

The SAP standard modules:

Update Measurement Documents

Results that were recorded in inspection lots can be automatically recorded at measuring points in the functional locations or pieces of equipment. To do this,Measurement documents that receive a reference to the inspection lot are created. The inspection characteristic is linked to a measuring point.

- For quantitative inspection characteristics, by defining a characteristic name in the master inspection characteristic (e.g. for the transfer of meter readings collected in the context of the checklist)
- For qualitative inspection characteristics, by comparing the code group of the inspection characteristic and the code group in the measuring point (for example, for transferring condition valuations)

Create/Assign PDF Document to Order

When the usage decision of the last open inspection lot of an order is made, a PDF document is automatically created that contains all inspection results with specification of the technical objects and inspection characteristics including date and creator of the inspection result individually. This document can be used for proof e.g. to authorities, because external auditors usually do not have direct system access.

The document is attached to the order as a document master record and can be viewed using the document view.

Create/Assign PDF Document for Inspection Lot

When you set the usage decision, the system automatically creates a document (document master record) and assigns it to the inspection lot.

Create PM Notification for Inspection Lot

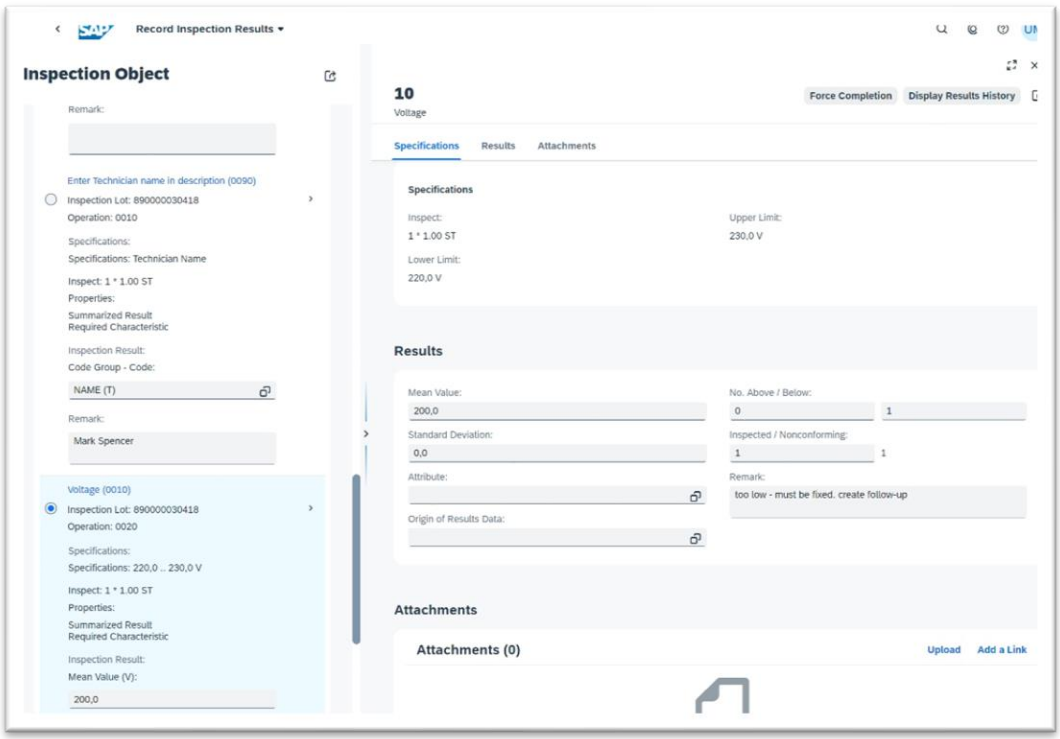
For negative inspection results, a maintenance notification is created with reference to the inspection lot.

Note / Useful Tips for Follow-Up Actions for Usage Decision

- The follow-up actions enable numerous automations of business processes. Ideas are e.g. described in Chapters 5.2 and 5.3.
- All function modules have technical documentation in the SAP system.
- The delivered standard module for notification creation should be checked to see whether its design meets the company requirements or whether an individually adapted copy is better. This is because the use of the maintenance notification in the companies is very different – e.g. B. Notification types, notification catalogs used, one notification per inspection lot, or one notification per inspection characteristic – to give just a few examples of the necessary considerations.

4.4 Results Recording with Mobile Solution

For results recording of inspection checklists, SAP provides two Fiori apps in the standard system. These apps (F1685A and F3365) are well received by many companies, so it's always worth looking at them.



However, there are also good reasons for using mobile solutions in many companies, e.g. because the checklists are only part of a complex overall process or because an offline capability is required.

The following section provides information about the implementation of checklists in mobile interfaces. It does not address concrete implementation recommendations, but rather issues that should be considered when developing a solution.

4.4.1 General Notes on Checklists in Mobile Solutions

When designing a mobile interface, you should ensure that the user requires as few clicks as possible to enter data or retrieve information. Often selected catalog values can be placed on separate buttons, for example, so that they can be selected with one click.

The font size and the screen layout should be adapted to the resolution of the mobile device used and be designed as large as possible.

Buttons should be constructed as large as possible, especially in the case of a surface designed for touch-operation, so that even the coarsest engine specialist meets the

buttons in a targeted manner.

To remove possible uncertainties when processing transactions, we recommend that you guide the user through transaction processing. This can be done, for example, by displaying all work steps and highlighting the current work step. Input objects or fields that are not relevant for the specific transaction should be omitted. On the one hand, this makes the interface clearer and saves space on the surface on the other hand, in order to be able to display the remaining information larger.

Note / Useful tips for checklists in mobile solutions

- There are already various solutions for the results recording of checklists from SAP (e.g. B. Service and Asset Manager, Fiori app from Quality Management) as well as third-party providers. Diversity is likely to increase as more companies use the SAP standard checklist application.
- Particular importance should be attached to the usability of results recording, since this function is used very often by maintenance specialists (as a constant companion of the work). A low user experience could have a massive impact on the acceptance and therefore on the quality of the confirmed data.

4.4.2 Checklist Specific Notes for Mobile Solutions

When inspecting more complex assets, the dilemma always arises as to whether the checklist is attached to the top object in the TPL hierarchy or whether several checklists are assigned to the inner layer objects. The advantage of attaching the checklists to the interior-life objects in this case is that components are removed from a plant and reinstalled elsewhere, keeping their maintenance history. The disadvantage is that the PM specialist has to fill out several checklists. The most elegant solution here is to “virtually” combine the checklists into a higher-level object in the mobile interface.

In other use cases, inspections for different objects are to be processed in a concrete sequence. For this reason, the mobile interface should also be able to process sequences transferred from SAP – on the one hand in the display of the list of checklists to be processed, on the other hand, but also in the case of objects located far apart when transferring the “round” to a coupled navigation system.

A detailed examination is also necessary for the general conditions of checklist processing. In particular, these can be:

- Edited by a person or in the team?
- Are the individual steps dependent on each other?
- Is the required flexibility given?

Specifically, this can mean that in mobile processing, one or more checklists must also be processed by a team in parallel. The application should provide the flexibility to react to the current situation and to support the transfer of checks of others, while preventing duplicate processing.

In addition to the time coordination listed above, there may also be the additional requirement of spatial coordination. This is necessary if a concrete check has to be carried out at different locations by several persons at a certain point in time. This would be, for example, the testing of a loudspeaker system in different rooms. If this is necessary, the individual checks should be flagged accordingly and may even be subject to a common validation.

The user should also be provided with a detailed description of the activity to be performed. Only then will existing documentation on the tasks become obsolete. The great advantage of this is that the data is made available centrally and always provides the current status for all users. In addition to the additional security achieved in this way, this also provides the opportunity to support knowledge transfer. Optionally, it can also help if changes to the specifications are flagged in the application and must be confirmed by each individual user.

The time of processing a checklist on site at the plant is also the ideal time for enhanced documentation of the system condition. This can mean either the concrete check result or other anomalies. For this purpose, the application should help to capture photos that can be assigned to the inspection and optionally also to the technical object. It is also conceivable to define the entry of a photo or another file, for example, a measurement log, as the concrete checklist item. The assignment of documents to the check result is restricted in the standard SAP system, but can be enhanced individually.

If a defect is identified on site during the processing of the checklist, the following options are simplified:

- The deficiency is known and scheduled for remediation.
- The deficiency is new.
    - He is immediately repairable.
    - It can be fixed later

This can be used to derive the following requirements for the mobile application:

- Open tasks/defects for the asset are visible in order to prevent a new entry or to record a change.
- It is possible to enter a defect independently of the checklist for the technical object.
- The newly entered defect can also be dealt with directly on site.

On this basis, the history for the technical object can be mapped completely and effectively. This can then also be the basis for future planning.

When designing solutions for recording checklists, it is always discussed whether or not you want to implement a function “everything OK”. In principle, there is no blanket answer for this, but this is always linked to individual considerations. The following aspects can be considered as a small support for decision-making:

Table 8 Overview Pro and Contra for the “Everything OK” Function

Arguments for a “Everything OK” Function	Arguments against a function “Everything OK”
Reduced effort in confirming defect-free assets	Conscientious completion of the checklists increases the likelihood that all checkpoints will also be viewed.
	Changes in the scope of inspection are more likely to be perceived.

Another topic that is often discussed is the representation of the last result of a valuation. It can support, but also influence, the user on site. Here, too, it is important to weigh up the advantages and disadvantages.

In general, we recommend that you provide the PM specialist with feedback on the values entered and selected valuations. Particularly for measuring points, you should maintain the limit values here, the exceeding or falling short of which defines a defective value.

Note / Useful tips for checklist specific notes on mobile solutions

- Entry screens have proven useful that enable fast entry in the overview, from which you can navigate to a detail view for complex information (photos, long texts, historical results) if required.
- The designers of the screen templates should note that many users
- For example: with gloves or other operating obstacles. A dropdown button in a selection list that is too small can lead to desperation.
- Large picklists should be avoided. Research has shown that users with selection lists with more than 5 entries quickly tend to fill in any value. Therefore, it is important to avoid selection lists as much as possible and to make the operation very simple.

4.4.3 Technical Framework for Mobile Solutions

A separate topic field is the requirement for offline enablement of the application. This is particularly important in maintenance at remote locations. However, it can also simplify the use of the mobile application in a factory hall if the functions are also guaranteed offline. System architecture, user management, and device selection are other relevant areas that go beyond the scope of this recommendation.

4.5 Reporting

The technical objects exist and are classified correctly. The inspection plans/reference operation sets, master inspection characteristics, and inspection methods have been created and maintained accordingly. The orders have been set up and create the corresponding inspection lots. The PM specialist enters the results for the inspection lots diligently.

So everything that has to do with the checklists is done, right? Not quite yet:

The points mentioned are the conditions that must be met to create inspection lots and record results at all. An important and essential part of the checklists is evaluation and reporting.

4.5.1 Result Overview (IW91)

The analysis and evaluation of the results can be carried out at different levels or – in other words – in different granularities. This means that, depending on the function of the viewer, there are different requirements of analysis or data preparation or of the data content – be it:

- the PM specialist himself who wants to know how much water the pump has delivered in the last six months, or
- the PM asset type expert who wants to analyze the development of an engine or a specific engine type to plan the replacement of an engine or even all engines of an engine type; or
- The PM work scheduler who wants to know whether all inspection lots of the operation (order) have been completed, or
- The plant manager who wants to know what the processing status of all generated inspection lots of a specific organization is, or
- the authorities that require proof of the work carried out on an object in the event of an incident.

As you can see, it will rarely be the case that a specific role or organization of a company needs or wants to access all data. This does not mean that it is not possible to access or display the data.

The delivered result evaluation for the checklists fulfills many requirements for many roles in the company in the standard system. To exploit the potential of the evaluation, it is advisable to start thinking about the evaluation at the start of the implementation of the checklists. The decisions you make when designing the checklists influence the evaluation and the filter and sorting options of the results lists. This means that the requirements of the PM specialist up to the management (KPI) must be taken into account in the concept.

SAP offers the new transaction IW91 for the evaluation. You can use this function to evaluate by inspection characteristics, inspection lots, order operation (order), or technical objects. Separate variants can be created for each evaluation:

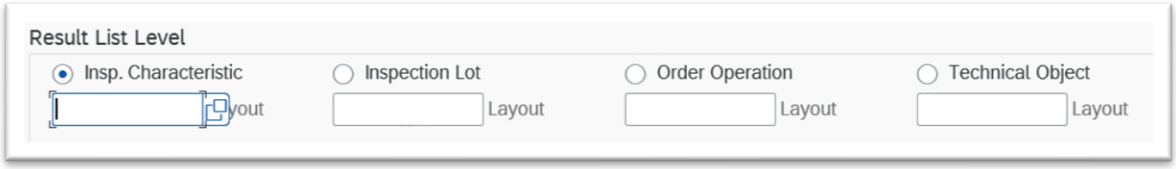


Figure 20 IW91 Selection of Results Display

To carry out an evaluation, the corresponding selection fields must be filled as usual, and you must first create a specific analysis type (e.g. B. Inspection Lots). However, in the list output, the view (e.g. B. Order Operation) as required. In the list output, you can sort and filter as usual, including Creation of totals and subtotals. This alone can be used to answer many reporting questions. Caution: The longer the checklist application is used, the longer the search can take.

We recommend that you set up role-based variants for filling the search and the list output. This makes it easier for users to perform role-based evaluations.

Jump from the order to the results overview

The analysis is not only possible as a whole, but also order-specific. To perform an order-specific analysis, IW91 can also be used. However, the PM orders (IW32/IW33) now offer a jump to the results overview. This result overview offers the same functions as IW91.

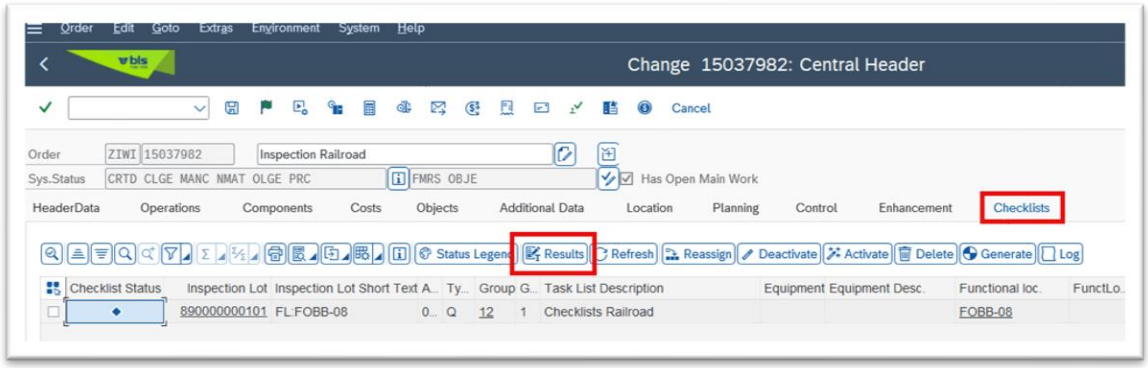


Figure 21 Jump to Results Overview of an Order

Note / Useful tips for the results overview (IW91)

- At first glance, the transaction needs to be used when you use other SAP GUI transactions for many years. But the transaction meets the information requirements of many user groups – some want to see all the details, the others are only interested in a rough overview; some want everything for the object, the others want to see everything about the order.
- With a skillful summation – for this reason, a large number of columns are available that represent a number – the desired results can be achieved quickly at the required depth.
- Setting up layout variants is a huge simplification for the different user groups. This set of tools should be used in a variety of ways, preferably with the help of a preconfigured deployment for the user groups.

4.5.2 Inspection Lot Simulation (IW97)

In addition to the evaluation, SAP delivers a simulation function. As the name implies, the function can be used to simulate the order or maintenance plan.

What is such a feature good for? On the one hand, orders, e.g. for capacity planning, already opened early. On the other hand, however, you want the inspection lots to be generated as late as possible so that they are based on the current variant of the inspection plan. Ideally, the inspection lot is therefore only generated shortly before the inspection lots are processed.

However, there is an entitlement that the request should be checked to see whether the correct checks would really be generated. Therefore, object list creation and inspection lot determination can be simulated.

The transaction is rarely used in daily use. This means that if all master data has been created for inspection lot creation and no or hardly any changes have been made in the past, the result should actually fit. The main focus of the simulation is therefore in the following use cases:

- Creation of new maintenance plans/orders
- Adjustments to existing maintenance plans/orders
- Error analysis in existing orders

When creating new maintenance plans or adjusting existing maintenance plans and/or orders, the transaction is very useful. The most important point is that no unnecessary or incorrect inspection lots are created in the production system.

Note / Useful tips for inspection lot simulation (IW97)

When the organization decides to introduce or adapt new checks, prototyping is usually set up in a test system and finalized together. Experience has shown that a new checklist requires several iteration steps until all participants agree with the content and sequence.

During the conversion in the productive system, settings in the large number of master data may be forgotten and therefore no inspection lots or incorrect inspection lots may be created. Errors such as e.g. B.:

- The master inspection characteristic does not yet have a catalog.
- The inspection plan has the status Creation.
- The functional location does not yet exist or has the status INAK.
- The equipment has not yet been classified.
- Important characteristic value assignments are missing in the classification of the technical objects.

You can use the simulation to prevent the unwanted premature inspection lot creation and to ensure that the order/order operation creates the correct inspection lots before the inspection checklist is used productively.

The simulation takes into account the maintenance packages of strategy maintenance plans. You can use transaction IW97 to simulate the maintenance plan to find out which inspection characteristics/inspection lots would be created for which maintenance package.

In addition to the benefit of creating new checklists, the simulation is a tool for defect analysis for an order (which already contains inspection lots). If errors occur in the order, you can make corrections to the master data and simulate the effects in the order. You can then check whether the result of the correction meets the requirements. If you agree with the adjustments, incorrect inspection lots can be deactivated in the order, the defective inspection lot can be replaced, or the missing inspection lot can be recreated.

4.5.3 Quality Scores

A quality score is often used in standard evaluations of SAP Quality Management. A quality score can be used to identify trends as to how well or how poorly a quality level develops.

Quality scores are calculated with each inspection lot. The individual inspection characteristics can be weighted differently. The weighting per inspection characteristic can be entered in selected set maintenance using transaction QS51 (see Section 4.1.8).

If the weighting calculations are carried out using different methods, different material

numbers must be created in each case, since the calculation method is defined in the material master record.

For more information about quality scores, see the SAP documentation for Quality Management.

5 Checklists – More than Checklists

5.1 Calculation from Planned Times in Task Lists and Order Operations

The planned work in order operations is elementary for costing, as well as for resource and capacity planning. However, manual maintenance of the data is time-consuming and often leads to points of dispute between different parties. The checklist solution can help minimize and objectify maintenance. Here is an example:

The planned time can be calculated from

- The number of objects that are processed in a request, and
- The work required for each object (you can also enter different times for each object type) that can be stored in the inspection plan.

In addition, fixed times such as travel, setup, and queue times can be added.

The checklist solution provides a simulation function that can be used to simulate the orders and the objects to be processed. Using this simulation, it would be possible to determine the planned times using a customer development. If you repeat this calculation at regular intervals, the planned times no longer have to be maintained if, for example, New objects are added, objects are removed, the time per checklist is extended or shortened, and so on. Internal discussions can then be conducted on the basis of objective criteria, e.g. different processing times per object type or adjustment of the times when inspection characteristics are added or removed from inspection plans. The rest is math then.

5.2 Calculate Order Progress/Percentage of Completion

The number of object list entries and inspection lots in an order also indicates how extensive the order to be processed is. Has an order for B.

123 Fire extinguishers to be checked in the object list, a plan number can be derived from this. This plan figure can be stored for reporting purposes.

For example: in the form of a statistical key figure or a user field.

With the results recording and the usage decision for inspection lots, you can now monitor how many objects (in the above Example e.g. B. fire extinguisher) have already

been processed. Here, too, e.g. a counter is updated in a further user field or in a further statistical key figure, e.g. By means of a follow-up action that is called automatically after a usage decision and increases the counter by the value 1 in each case.

A comparison of the planned number and the actual number now outputs a percentage of completion.

For example: B.: planned 123 fire extinguishers, completed so far 56. This results in a percentage of completion of approximately 45%. Now compare this number with the posted hours, you can quickly see whether the planned time is still current or whether over- or under-expenses will be incurred.

5.3 Supplier Control for Services (e.g. B. Site Monitoring)

Evidence obligations/quality control/supplier evaluation – customers often want to evaluate and document the performance of suppliers/service providers. You should use your own logic to set up your own operations with a maintained checklist type for the check (if necessary: Samples – but there is no standard solution here); inspection lots with the required inspection characteristics are then created for the operations. The “Vendor” field must be filled using a BAdI.

It can be evaluated using transaction IW91 – the vendor from the inspection lot is included in the standard scope of list. If you want an update to the vendor evaluation of the SAP procurement solutions, you can use a follow-up action from the usage decision to implement an automatic update.

5.4 Checklists in Customer Service

The SAP ERP solution Customer Service (CS) is replaced in S/4HANA by billed maintenance as a combination of service order and maintenance order. With the maintenance orders, the inspection checklist application is therefore also available in Customer Service and not only in Plant Maintenance.

For restrictions and the status of the delivery, see SAP Note 3209741 - SAP S/4HANA 2022: Release information and restrictions for maintenance service in SAP S/4HANA.

5.5 Quality Control during Refurbishment

In contrast to the other maintenance order types, the creation of inspection lots is not supported when using the order type delivered by SAP for refurbishment orders. However, it is not technically prevented from generating checklists using further separate order operations in these orders, for example: for mapping inspections during production as part of refurbishment.

This means that the following are possible:

- Quality control before the refurbished material is returned to the warehouse – generate your own operation, inspection checklists for each piece of equipment
- Clean equipment history (a test of the DSAG topic group has shown that the object list is currently filled only with workaround solutions) can be used. This topic was addressed to SAP as part of a customer engagement initiative on refurbishment.)

5.6 General: Establish Quality Control in Plant Maintenance

The topic of quality assurance in plant maintenance (e.g. B. Controls during a maintenance/revision etc. for own or external processors) is becoming increasingly important. It is therefore not only a question of whether a maintenance task has been carried out, but also of whether it took place in the required quality.

The QM module offers interesting solutions; e.g. there is also a quality inspection in production. Without the DSAG topic group having already dealt with it more intensively, it is certainly worthwhile to have a closer look at QM, and the checklist solution already provides a technical basis for this.

5.7 Have Security Instruction Confirmed

In many cases, it is necessary to be able to prove that deployed employees have sufficient qualifications or safety instructions before starting the actual maintenance, inspection, or repair. This applies to both internal and external workers.

This proof can also be defined as the first point of a checklist, through which the employee confirms the regularity from his or her point of view. Conditional characteristics can be used to control that the actual checklist can only be filled when it has confirmed point 1.

5.8 Consider Spatial Arrangement

As a rule, the plant structure primarily follows the technology and less of the spatial arrangement. For example, a single functional location may need to be processed from two sides. This is the case, for example, when repairing local trains. However, it is not possible to switch from the right side to the left side without wide distances.

When defining and modeling inspection plans, you can take the spatial arrangement into account and create separate inspection plans for the right and left sides. The inspection lots generated from this can be sorted, for example, using a separate characteristic for the work sequence in the inspection plan during execution. This results in a gear sequence that follows the system structure and accessibility. For the repair of a train, for example, this would be from front to rear on one side and then forward again on the other side.

5.9 Rounds Planning – Measurement Recording – Calibration Processing

In many companies, there are defined tours, especially for regular inspections. Until now, SAP has provided various solutions for this, for example: based on measuring points as production resources/tools and measurement reading entry lists.

For these solutions, SAP is not expected to make any further developments, including standard Fiori applications.

The checklists are SAP's new solution for this task.

Calibration processing is stored similarly – an existing integration between plant maintenance and quality inspection, but with only one inspection lot for each order. This solution is also not developed further in the form because the checklist solution can take on these tasks.

5.10 Extensibility Options

The standard functions can be enhanced with the following enhancement spots:

- ES_EAM_CHECKLIST_BADI: 9 BAdIs with various enhancement options – see documentation and delivered example implementations for the individual BAdIs
- ES_EAM_CL_RESULT: Enhancement options for transaction IW91

Delivered follow-on functions can be simply copied and changed according to your own requirements. See the documentation for the follow-on functions in the function group EAM_CL_FOL.

Checklist functions can also be called from your own Z programs or enhancements. There are completed function modules for this in the function group EAM_CL_API, which are all documented.

Functional enhancements also provide the activation of the business feature EAM_IDMS; for more information, see SAP Note 3306826 - EAM IDMS: Business Feature EAM_IDMS.

6 Recommendation for Action/Final Remark

The checklist solution described offers many options in configuration and master data definition and is therefore complex. This also leads to a great deal of respect for the SAP QM module for experienced maintenance users. And vice versa, QM experts have respect for the complexity of the maintenance solution.

However, we want to encourage all companies to use the new checklist solution and to gather and share experiences. If you don’t start with the most complex scenario, you can grow well into the topic.

Other solutions are often referred to in S/4HANA implementation projects. Yes, this always means additional developments and, above all, you leave the best practices and therefore the standard path that SAP and SAP customers intend to follow. The solution approach is already established by the previous consulting solution and tested in many companies. And it is the foundation that SAP and DSAG will use for further development.

Therefore, if there are business processes that cannot be mapped with the checklist solution, you should search for the dialog with SAP and/or the DSAG topic group.

Give feedback and join us!

About the DSAG

The German-speaking SAP User Group e. V. (DSAG) is one of the most influential user associations in the world. Over 4,000 member companies and more than 70,000 members form a strong network that extends from SMEs to DAX companies and across all economic sectors in Germany, Austria and Switzerland (DACH). Based on this reach, the industry association gains in-depth insights into the digital challenges in the DACH market. DSAG uses this knowledge advantage to represent the interests of SAP users and pave the way to digitalization for its members.

Further information can be found at:

www.dsag.de, www.dsag.at, www.dsag-ev.ch

Imprint

We expressly point out that this document cannot anticipate and cover all regulatory requirements of all DSAG members in all business scenarios. In this respect, the issues and suggestions raised must naturally remain incomplete. The DSAG and the authors involved cannot assume any responsibility with regard to the completeness and suitability of the suggestions.

German-speaking SAP® User Group e.V.
Altrottstraße 34 a 69190 Walldorf | Germany
Telefon +49 6227 35809-58
Telefax +49 6227 35809-59
E-Mail info@dsag.de
dsag.de