



IPM PROJECT REALIZATION GUIDELINE

**Version 23
SSI SCHÄFER**

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Abbreviations for roles

- AIM: Automation Integration Manager
- BM: Bid Manager
- CE: Concept Engineer
- CEM: CE Manager
- Head Global PM BU LS: Head of Global Project Management Business Unit Logistics Solutions
- IMA: Installation Operations Manager (responsible in-house for coordination of installation)
- ISVE: Installation Supervisor Electrics
- ISVM: Installation Supervisor Mechanics
- IT Sys Admin: IT System Administrator (formerly: IT-Systems)
- ITSC: IT Sales Consultant
- LDP: Lead Developer Projects
- LLC: Lead Logistic Consultant
- MHEM: Material Handling Equipment Manager
- Network Admin: Network Administrator (formerly: IT-Systems)
- OHP: Occupational Health Practitioner
- PCO: Project Controller
- PCT: Project Core Team
- PCTM: Project Core Team Member
- PEC: Project Engineer Controls
- PEE: Project Engineer Electrics
- PEM: Project Engineer Mechanics
- PES: Project Engineer SCADA
- PMA: Project Manager
- PMA – Assistant: Project Manager – Assistant
- PMSW: Project Manager Software
- PO: Product Owner (in PL Automation formerly: Product Manager)
- PS: Project Sponsor
- QAM: Quality Assurance Manager (Software Realization)
- RM: Resident Maintenance
- RMM: Resident Maintenance Manager
- SIM: System Integration Manager
- SLEC: System Lead Engineer Controls
- SLEE: System Lead Engineer Electrics
- SLEM: System Lead Engineer Mechanics
- SMA: Site Manager
- SOM: Service Operations Manager
- SWM: Steelwork Manager
- TD: Technical Director (Sales)
- TW-CD: Technical Writer – Customer Documentation

In case of several roles assigned to an item in quality gates the role written in **bolt** letters is primarily responsible. For role descriptions see CWA for [Project Management & Fulfillment Roles](#).

Abbreviations

- CS: Customer Service
- FAT: Factory Acceptance Test
- FLT: Forklift truck
- QG: Quality Gate
- GUI: Graphical User Interface
- HOPS: Handover Protocol to Service
- LS PMO: Business Unit **L**ogistics **S**olutions **P**roject **M**anagement **O**ffice
- LSOP: Business Unit **L**ogistics **S**olutions, organizational area **O**rders **P**rocessing
- MFS: Material Flow System
- MPIS: MFS PLC Interface Specification (Interface to subordinated control)
- P&E: Product & Equipment (former ISS = Integrated Standard Systems)
- PLC: Programmable Logic Control
- SCS: Schaefer Carousel System
- SMC: Schaefer Miniload Crane
- WCS: Warehouse Control System
- WMS: Warehouse Management System

Links to Subsystem Realization Guidelines

- [Cuby Realization Guideline](#) / [Cuby Realization Guideline Compare Versions](#)
- [Flexi Realization Guideline](#)
- [OCS Realization Guideline](#) / [OCS Realization Guideline Compare Versions](#)

Further important Links

- [TeamDoc](#)
- [GPR](#)
- [Planisware](#)
- [Teamcenter](#) (after the training, access will be activated)
- [Project Review Report](#)
- [SharePoint "Project Initiation view"](#)
- [Compliance with IPM Realization Guideline](#)
- [CWA master process map](#)

Introduction

Application area

The procedural instruction "IPM Project Realization Guideline" is valid for the realization of all projects within the SSI Schäfer group. The intention is to achieve the uniform, economical, quality-compliant, on-schedule and low risk performance of projects by using this procedural instruction.

Objectives

This procedural instruction, "IPM Project Realization Guideline", defines the general procedure for the entire realization process incl. transfers from Sales and to CS organization. Due to harmonized process steps and milestones projects are processed uniformly and with the same quality standards within in the SSI Schäfer group.

Customers will not feel any differences in processing projects between the various SSI Schäfer entities, especially not within integrated projects where several entities work together.

Boundary definition

These guidelines deal with the definition of standards in the interest of a uniform execution of projects. Detailed information regarding other processes (Business Dev. & Sales Process, Project Management Process, Customer Service etc.) is specified within the particular process descriptions.

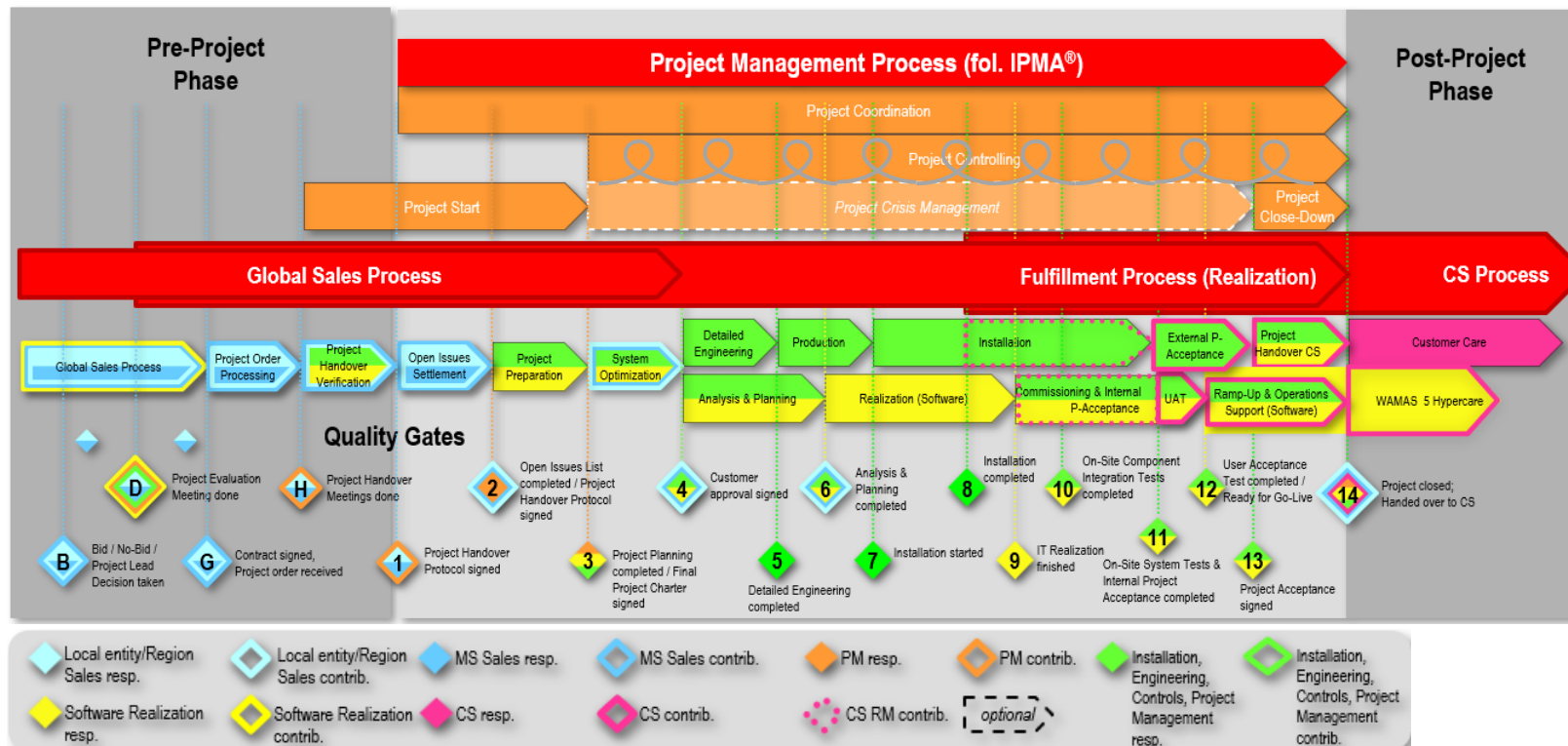
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1 OVERVIEW – Project Realization Process and Quality Gates

Important:

- The [Project Governance Policy](#) describes the basic rules to manage the Sales, Project Management and Fulfillment process and is superordinate.
- Document proofs / approvals are to be filed as PDF, not as email, in [TeamDoc](#).



2 QUALITY GATE D – Project Evaluation Meeting done

Target:

Quality Gate D – Project Evaluation Meeting done ensures that all projects are reviewed by specialist areas before the finalized offer document including the fix price and all requested attachments is sent to the customer.

For details please refer to the Sales sub-process [“Perform Project Evaluation”](#) which is located in sub-process [“Proposal”](#).

Content to be reviewed:

- Introduction of the project (Customer, location, Business Model, hours of operation, Project Lead, ...)
- Special requirements (e.g., vendors, engineering standards, urgent orders, documentation, ...)
- Delivery Matrix (who delivers what – e.g., Software Realization, Controls; Installation, fire protection, 3rd party systems, steelwork, ...)
- What do we have to guarantee (availability, technical performance, system performance, ...)?
- Logistical Concept (provided data, material flow)
- Transport Units
- Sales layout in the direction of the material flow
- Timeline
- Hours for services (PM, Engineering, Controls, Installation, ...) and business trips

Previous process step:

“Convert Budget to Fix Price Offer” in Sales sub-process [“Proposal”](#)

Items – Perform Project Evaluation Meeting up to QG D „Project Evaluation Meeting done”	Resp.
All mandatory documents are stored in the “Evaluation” folder in SaX Online / with 04/2025: Teamcenter (Sales Layout, Material Flow/Schematic Layout, ISAAC File, GCT, MS project schedule (TL-02545) ...) at least 2 days before the meeting.	BM
Chapter 1 of the Project Evaluation Meeting Protocol (TL-00487) prefilled at least two days before the meeting. Also, chapter 2 (risk assessment) should be prefilled.	BM
Layout and technical/logistical requirements presented during the Project Evaluation Meeting.	BM
Potential risks and countermeasures documented in the Project Evaluation Meeting Protocol.	BM
Requested technical and budgetary adaptations, documented in the Project Evaluation Meeting Protocol.	BM
Technically, timely and budgetary feasibility confirmed and “signed” via note of name in the protocol by the present representatives of the fulfillment organization.	Fulfillment
Signed Project Evaluation Meeting Protocol with name and screenshot of the signature of the responsible person for technical / project evaluation stored in the “evaluation” folder in SaX Online / with 04/2025: Teamcenter .	BM
Requested adaptations and modifications considered in the further sales process.	BM
In case an additional evaluation meeting is required the initial Project Evaluation Meeting Protocol must be continued.	BM

Project Lead decision made (final decision is made during project evaluation).

BM

Find all details (e.g. project classification, Project Lead decision, default decision & exceptions, etc.) in the [SSI Schaefer Project Governance Policy \(Customer Projects\)](#).

Sales Sub-Process Proposal / [Perform Project Evaluation Meeting](#) (before **QG - Project Evaluation Meeting** done):

If the project lead is in the Region the [Project Setup - Overview](#) filled out by the Bid Manager is checked by LS PMO. If necessary, the LS PMO contacts the Head of BU LS for a decision.

(In CS it is up to the size of the offer.

* For 2 million Euro or more CS projects, the final decision will be made by SVP / Head of CS. For projects smaller than 2 million Euro, the decision is made by the Regional CS Head.).

(CS,
see *)

- Sales Layout discussed in the meeting
- ISAAC File for the overall project and the derived reports
- Signed Project Evaluation Meeting Protocol with name and screenshot of the signature of the responsible person for technical / project evaluation
- Requested changes from the project evaluation meeting implemented by Sales.

Target:

The quality gate ensures that only fully completed sales opportunities are closed. This especially includes the mutually signed contract reflecting all results of the final negotiation. All sales process results that are relevant for the project realization process (see also project handover protocol) have been developed and agreed with the customer. This ensures a solid mutual basis that is crucial for successful project start according to SSI's IPM standard. Further it is made sure that the lessons learned of the sales process are properly processed and documented by the BID team. All relevant systems (CRM, ERP) are updated to the latest, final status.

Sales sub-process "Negotiation & Decision"

In case of an LOI or Pre-Project Execution (= Management Override) the [LS Project Initiation](#) (define and inform Project Core Team for projects > 5 Mio or LOI/ Pre-Project Execution (= Management Override), create project tools) already has been triggered in the Sales sub-process ["Negotiation & Decision"](#).

For CS: See [CS Project Initiation](#).

Items – QG G “Contract signed, Project order received”

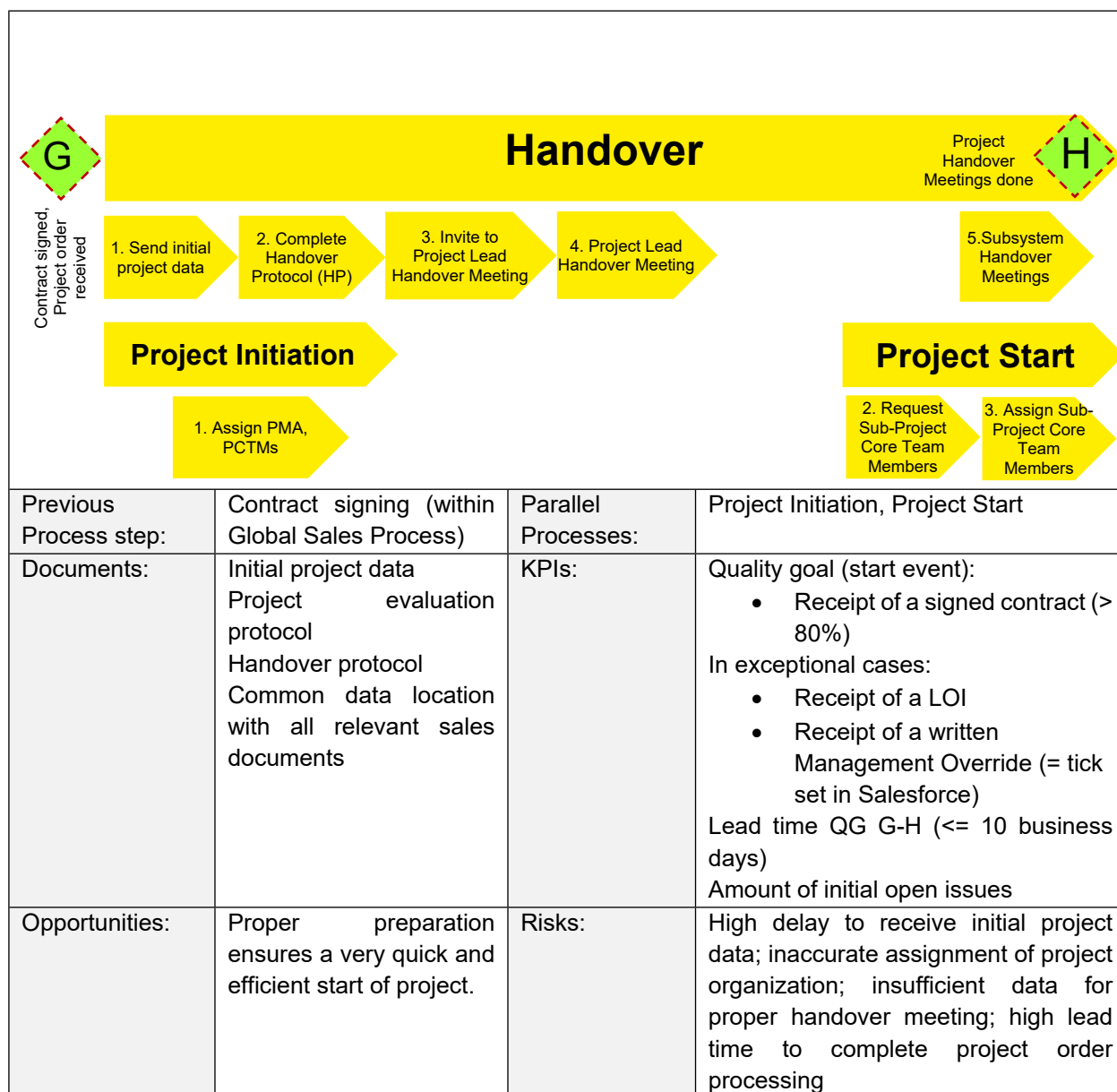
Resp.

Group Calculation Tool (GCT) available (reflects contract amount) and stored in SaX Online / with 04/2025: Teamcenter . On-/Offshore budget split roughly defined.	BM
Mutually signed contract reflecting all results of the final negotiation. Note: In exceptional cases LOI (refer to process step LOI (Letter of Intent) for details), or pre-project execution (confirmation done via tick set in Salesforce) (refer to process step Pre-Project Execution for details) from the Head of Business Unit LS Sales and Head of Order Processing.	BM
Local requirements clarified (on legal base).	BM
All relevant systems (CRM, ERP) updated to the latest, final status.	BM
Official purchase order received from customer (within SSI group).	BM
First invoice sent to customer.	Accounting

Obligatory documents:

Signed contract / LOI / Written management override (= tick set in Salesforce)

4 IPM MACRO PROCESS: Handover up to QG H



Input: The Global Sales Process features the mutually signed contract / purchase order from the customer. In exceptional cases a LOI (which covers Project Realization efforts) or a pre-project execution (= tick set in Salesforce) is provided.

For details please refer to the Sales [sub-process "Handover"](#).

Parallel to Sales sub-process "Handover" the process [LS Project Initiation](#) (define and inform Project Core Team Members for projects > 5 Mio or LOI/Pre-Project Execution, create project tools) is triggered as soon as the customer signed the contract.

CS: Parallel to Sales sub-process "Handover" the process [CS Project Initiation](#) (define and inform Project Core Team Members for projects > 500.000 or LOI/Pre-Project Execution, create project tools) is triggered as soon as the customer signed the contract. After the PIM, the tools should be set (LPID necessary to set [TeamDoc](#)). It must be done before QG H.

NOTE:

In case of an LOI or Pre-Project Execution the [LS Project Initiation](#) (CS: [CS Project Initiation](#)) already has been triggered in the previous Sales sub-process "[Negotiation & Decision](#)".

Process steps:

1. [LS Project Initiation](#) done (CS: [CS Project Initiation](#))

All ERP-systems (Project Lead, Legal Entities/Regions) are ready for project accounting (project IDs created by sales department). All budgets are booked in the ERP Systems according to the final signed and frozen GCT (Sales sub-process [Handover](#) → "[GCT Freeze](#)".)

2. After [LS Project Initiation](#) the Project Lead handover meeting with BM, PMA and PCTMs takes place:
 - a. The BM provides the PMA and PCTMs with the compiled information and documents.
 - b. The PMA checks against the handover protocol completed by the BM that all relevant information and documents are available (PMA does not check the quality of the contents at this time).
 - c. The open issues from the handover meeting are documented in the handover protocol / Jira and completion dates are agreed upon. The BM starts solving the open issues as soon as possible. The handover protocol is not signed off at this meeting.
3. The subsystem handover meetings (must be explicitly agreed upon as part of the handover meeting; mandatory if the person responsible for the subsystem did not attend the handover meeting) with Concept Engineer (CE) and PCTMs take place using the same procedure as for the Project Lead handover meeting but focused on the subsystem scope of supply. For Software Realization the IT sales consultant hands over the Software Realization documents to the Software PCTMs. Open issues from the handover meeting are documented and sent to BM, CE, and PMA.

(CS: The subsystem handover meetings only take place for projects with PMSW and other PCTM.)

Output: Based on the initial project data the project organization (PMA, PCTMs) has been mutually agreed among the line managers. The skill level of PMA, and PCTMs has been considered to assign a balanced team in respect to the requirements of the project and its classification. The project core team members are assigned. All project relevant documents and information have been placed in a common data location that is known and accessible by the PMA and PCTMs. The Handover Meeting at the Project Lead and the subsystem handover meetings have taken place and a quantitative check of the handed over project documents and project information has been performed. Missing documents and information are documented in the open issues list of the Project Handover Protocol / Jira.

NOTE:

All project relevant documents must be stored in [TeamDoc](#).

5 QUALITY GATE H – Project Handover Meetings done

Target:

Transfer of all relevant information, experience, and documentation according to the "project handover protocol" from Bid Manager (BM), Concept Engineers (CE) to Project Manager and Project Core Team Members.

For details please refer to the Sales [sub-process "Handover"](#).

Parallel to Sales sub-process "Handover" the process [LS Project Initiation](#) (define and inform Project Core Team for projects > 5 Mio or LOI/ Pre-Project Execution, create project tools) is triggered as soon as the customer signed the contract.

For CS the [CS Project Initiation](#) is triggered for projects > 500.000 or LOI/ Pre-Project Execution.

NOTE:

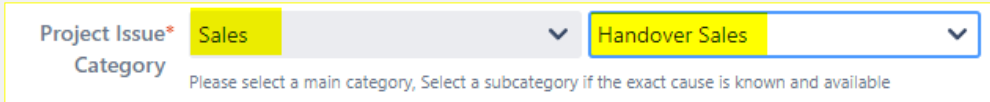
In case of an LOI or Pre-Project Execution the [LS Project Initiation](#) already has been triggered in the previous Sales sub-process ["Negotiation & Decision"](#).

For CS the [CS Project Initiation](#) has been triggered.

Previous process:

Sales [sub-process "Negotiation & Decision"](#)

Items – Handover up to QG H "Project Handover Meeting done"	Resp.
<i>Send initial project data</i>	
All ERP-systems (Project Lead, local entity/region) are ready for project accounting (project IDs created).	BM
Initial project data (overall layout, calculation, offer, signed contract / LOI etc.) stored in SaX Online / with 04/2025: Teamcenter and link sent to mailbox of the Project Lead's Project Realization (see Project Initiation Email templates).	BM
<i>Complete Handover Protocol</i>	
All documents compiled and stored in SaX Online / with 04/2025: Teamcenter according to handover protocol.	BM
ISAAC calculation and SSI Group calculation tool incl. onshore/offshore split completed. (Sales sub-process "Handover" → process step "GCT Freeze" .)	BM
Intercompany Purchase Orders (IC POs) filled out and sent to the companies involved in the project. IC orders triggered by companies involved in the project (Sales sub-process "Handover" → process step "GCT Freeze")	BM Companies involved in the project
Initial risk analysis (TL-00348) done and documented.	BM
<i>Invite to Project Lead & Subsystem Handover Meetings</i>	
Project Lead handover meeting (Bid Manager, Project Manager, Project Core Team Members) took place. (See also Sales work instruction WI-01406)	BM, PMA
GCT including all necessary information for issuing IC purchase orders (as e.g. On-/Offshore budget split and confirmed cost structure of each entity) completed and stored in SaX Online / with 04/2025: Teamcenter.	BM
Completeness of handed over sales data and documents checked by Project Manager (quality of documents is not checked yet).	BM, PMA
Open issues (e.g., missing documents) listed in the handover protocol.	BM, PMA

Items – Handover up to QG H “Project Handover Meeting done”	Resp.
<p>Further it is recommended to record the open issues also in Jira according to the valid definitions regarding open point handling using Jira Issue Type “Project Issue”; to find the open issues easily in Jira choose the following in this case:</p>  <p>Project Issue* Sales Handover Sales Category Please select a main category, Select a subcategory if the exact cause is known and available</p>	
Project Lead handover protocol is available also for the Concept Engineers of involved legal entities/regions in SharePoint “Handover folder”.	BM
<p>Project organization set up and members as of now working on the project (IC purchase orders within SSI not required at this time). Project organization chart (TL-00313) created.</p> <p>Note: The project core team members (PCTM) and their project team members are assigned to the project for the whole duration of the project → Fundamental “Projects will be started and finished as a team”.</p> <p>Changes of project core team members / project team members can be made in alignment with the PMA (for project core team members) and PCTM (for project team members) only. Those changes are subject to be communicated / discussed in Project Core Team Meetings.</p> <p>If a PCTM or project team member is temporarily not working on the project, a substitute must be nominated for the duration of the absence. The absent PCTM or project team member must know the current status of their work package(s) after their return.</p>	PMA
Subsystem Handover Meetings	
<p>Subsystem handover meetings (Concept Engineer (CE), Project Core Team Members) took place.</p> <p>Agreement in Handover to conclude. Mandatory, if responsible for sub-system has not participated in the handover meeting.</p> <p>(See also Sales work instruction WI-01406)</p>	CE, PCTM
Open issues (e.g., missing documents) listed in the handover protocol / Jira and additionally sent to PMA and BM.	PCTM, CE, PMA

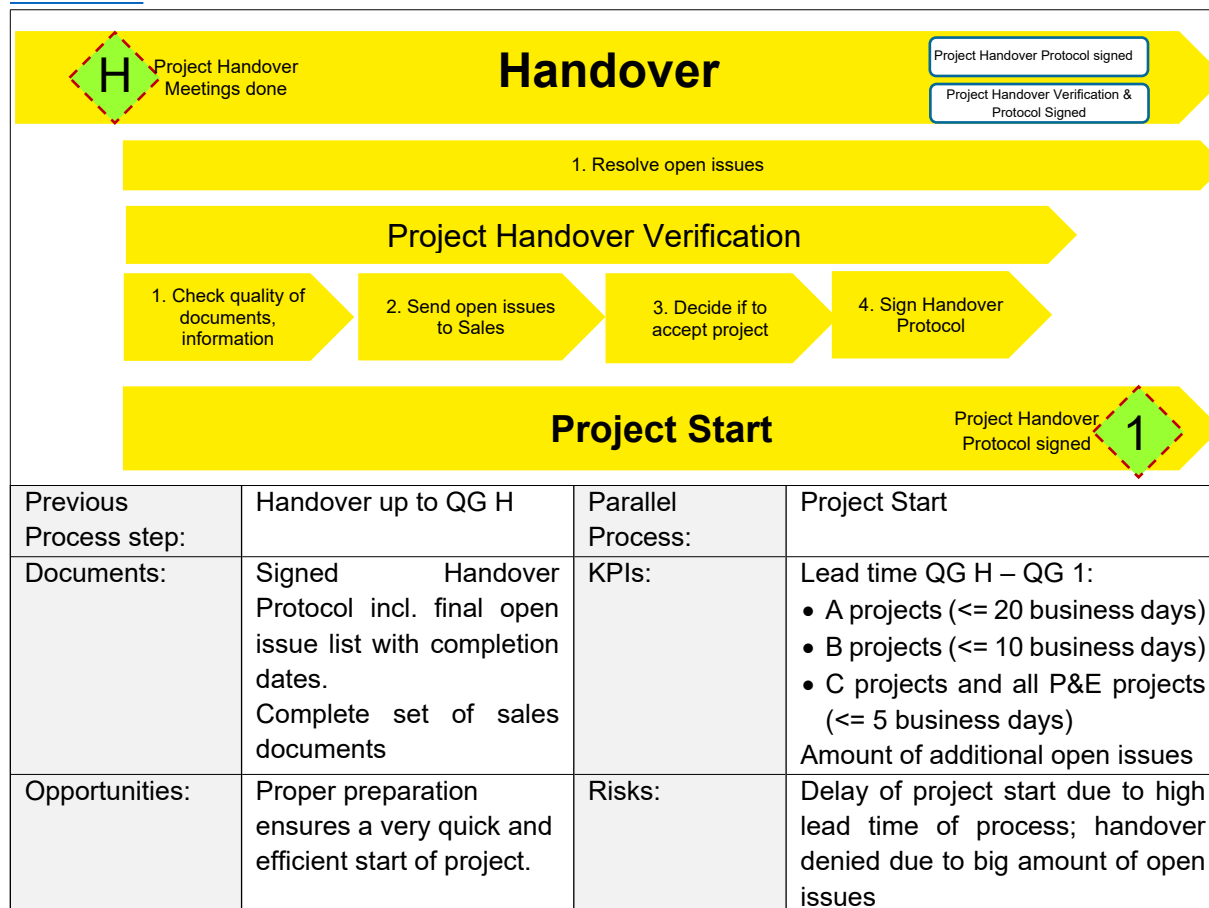
Obligatory documents:

- Initial project data stored on SaX Online / with 04/2025: [Teamcenter](#)
- Project evaluation meeting protocol
- Project Handover protocol (not signed)
- Common data location with all relevant sales documents
- ISAAC calculation and final, signed GCT (freeze) including onshore/ offshore split completed
- Sales Layout
- Contract / LOI / Management decision
- Project Classification

- Project Risk Analysis
- Quotation
- Schematic drawing/Material flow chart
- Request for Quotation
- Cash Planning Tool (necessary for contracts over € 2 million)
- Project Initiation Meeting Protocol (for projects > 5 Mio EUR or LOI/Pre-Project Execution);
(CS: for projects > 500.000 EUR or LOI/Pre-Project Execution)

6 IPM MACRO PROCESS: Handover QG H up to QG 1 (Project Handover Verification)

The Project Handover Verification by ORDER PROCESSING takes place in Sales [sub-process "Handover"](#).



Input: The Handover Protocol and the complete set of enclosed documents optionally with an open issue list from the handover meeting.

Process steps:

1. The PMA and PCTMs check the contents of the information and documents provided in the handover meeting (quality assessment). Main items to be checked in detail: contractual documents, scope of supply, schedule incl. relevant milestones, budgets, available resources, process descriptions, risks identified by sales etc.
The PMA checks the calculation in detail in collaboration with technical departments. The initially defined onshore/offshore split is checked. The budgets are entered in the local ERP-systems by Sales department. Beside the legal review of contract, terms & conditions by a Legal Counsel in the Sales phase, the contract is analyzed in detail by the Legal Counsel in the Project Start phase (for details refer to the [process](#), process step "[Carry out Contract Analysis](#)") and contractual risks are identified. Basic data and all relevant milestones are entered in local ERP-system. The internal project organization chart is created.
2. In case additional open issues were raised during the contents check, the PMA forwards these issues to the Bid Manager to be solved and added to the open issue list in the Handover Protocol. Additionally, the PMA creates and tracks the open issues in Jira.

3. The PMA decides based on the quantitative and qualitative check of the handed over documents, information, and final open issues list if the project is accepted. If the PMA refuses accepting the project due to the significant open issues and the Bid Manager does not agree with this decision, the Project Sponsor (PS) takes the final decision.
4. Provided the project is accepted by the PMA, the BM and the PMA sign the handover protocol and the open issue list including completion dates. In case the decision is overruled by the PS both, PMA and PS must sign (in this case add the signature line for the PS in the handover protocol).
5. After documenting the open issues, the BM continues to resolve the open issues according the completion dates in the project handover protocol.

Output: Signed Handover Protocol incl. open issue list.

7 QUALITY GATE 1 – Project Handover Protocol signed (with Open Issues)

Target:

The data and documents handed over by the Bid Manager have been verified in detail by the Project Manager and relevant members of the designated Project Core Team. The high quality of handed over items and the small number of open issues should enable the Project Manager to accept the project according to the handover protocol.

Previous process steps:

Sales [sub-process "Handover"](#)

Items – Handover & Project Start: from QG H up to QG 1 "Project Handover Protocol signed (with Open Issues)"	Resp.
Review of handed over sales data and documents by Project Manager and Project Core Team finished.	PMA, PCTM
All contractual documents checked and understood by PMA. Relevant items communicated to project core team.	PMA, PCTM
Comments of project evaluation protocol have been considered in handed over sales data.	PMA, PCTM
Initial open issues list of Project Lead handover meeting updated based on review results and feedback from subsystem handover meetings (open issues also updated in Jira).	PMA
Ensure that orders/intercompany contracts regarding steel construction are concluded immediately and without delay with Neunkirchen. Refer to WI-01027 Steel Price (German version).	PMA
Documents according to handover protocol updated and stored in SaX Online / with 04/2025: Teamcenter .	BM
Project Handover Protocol incl. final open issue list with completion dates signed by Bid Manager and Project Manager. Project officially taken over to Project Realization.	PMA, BM

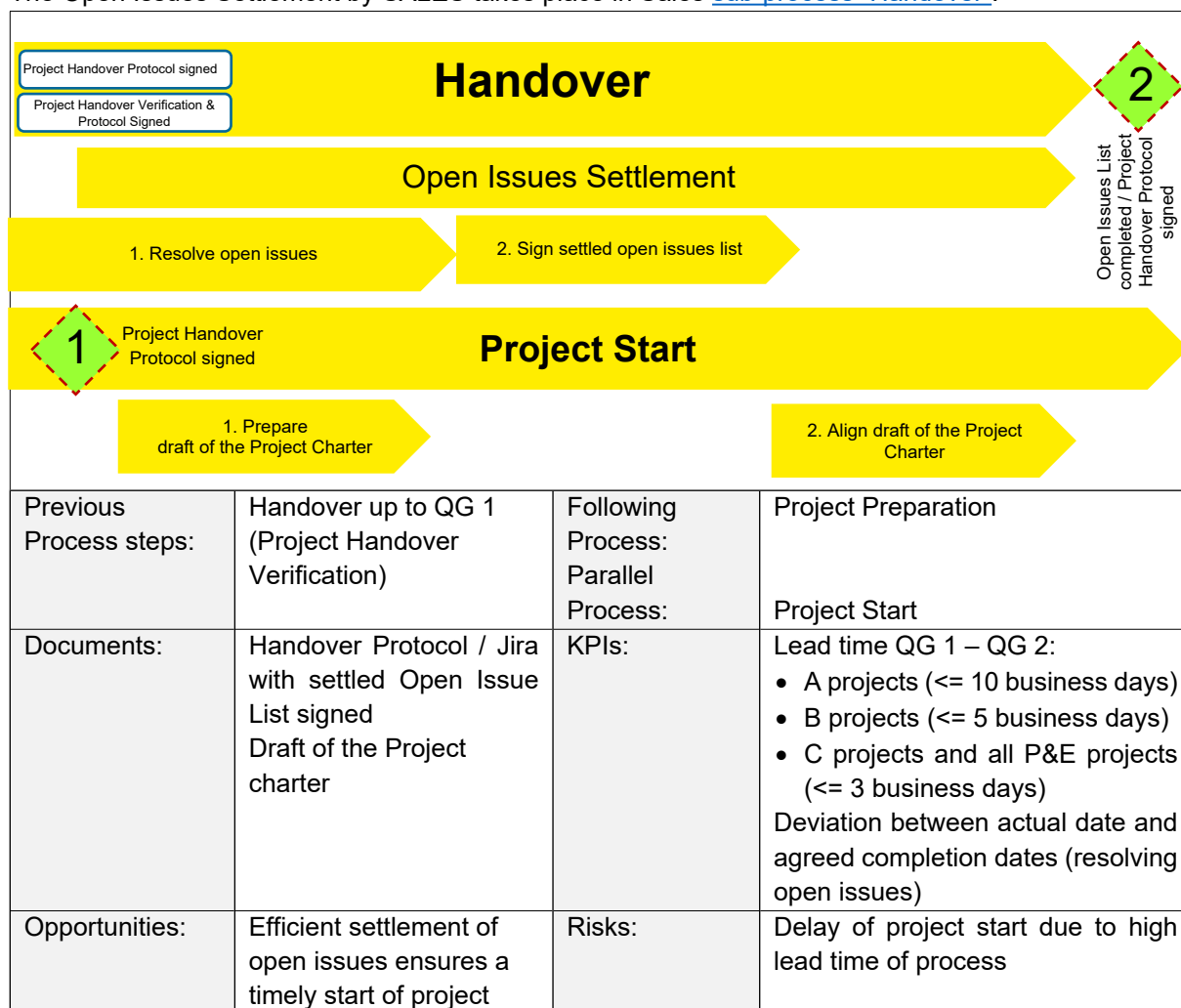
Obligatory Outputs QG 1

Documents:

- Signed Project Handover Protocol (including the final open issue list and their completion dates) by the Bid Manager and Project Manager (if necessary, also by the Project Sponsor)

8 IPM MACRO PROCESS: Handover QG 1 up to QG 2 (Open Issues Settlement)

The Open Issues Settlement by SALES takes place in Sales [sub-process "Handover"](#).



Input: The signed Handover Protocol incl. final open issue list with completion dates.

Process steps:

- The PMA prepares the draft of the Project Charter ([TL-00182](#)). For P&E projects, an *Order to Proceed* (assigned PMA and project data) is sufficient.
- The BM resolves all open issues in accordance with the agreed completion dates of the Handover Protocol (open issue list).
- After solving all open issues, the BM and PMA sign the settled open issue list of the Handover Protocol.
- The PMA aligns the draft of the Project Charter with the PS. The project is formally started.

Output: Handover Protocol with settled open issue list signed; draft of the Project Charter.

9 QUALITY GATE 2 – Open Issues List completed / Project Handover Protocol signed

Target:

All open issues related to the project handover protocol have been settled. The draft of the project charter has been prepared and aligned between PMA and PS. The project is formally started in Project Realization organization by PS.

NOTE:

Sales remains responsible for the layout until the system-optimized layout for project realization is approved by the customer (QG 4).

That means:

- With the kick-off, responsibility for the respective project is transferred to LSOP. Sales continues to have conceptual responsibility for the layout sold and is available for questions and SSI internal clarifications.
- The Project Manager and his core team lead the project from kick-off. The Bid Manager or a deputy is a member of this core team until the layout has been approved and therefore takes part in the regular project core team meetings. If the project runs largely smoothly, the Bid Manager no longer appears to the customer from the kick-off.
- The entire layout takes place under the responsibility of LSOP and Engineering within the project team. The know-how required for this (assembly parts, sensor layout, cabling) is only available there.
- The goal of the process change is to deliver to the customer what was sold (no less, no more).

Previous process step:

Sales [sub-process "Handover"](#)

Items – Handover & Project Start: From QG 1 up to QG 2 “Open Issues List completed / Project Handover Protocol signed”	Resp.
All open issues from Handover Protocol resolved and signed.	BM, PMA
Obvious commercial deviations are in the system.	PMA
Project resources (project roles), budgets and main project milestones (incl. penalty regulations) essentially checked.	PMA
First project review meeting done.	PMA, PS
CS only: First project sponsor review meeting done. Project targets and non-targets aligned (including customer expectations).	PMA, PS
Project Sponsor accepted the draft of the Project Charter (TL-00182 , Example Project Charter Boohoo) and project is formally started (not for P&E projects).	PS

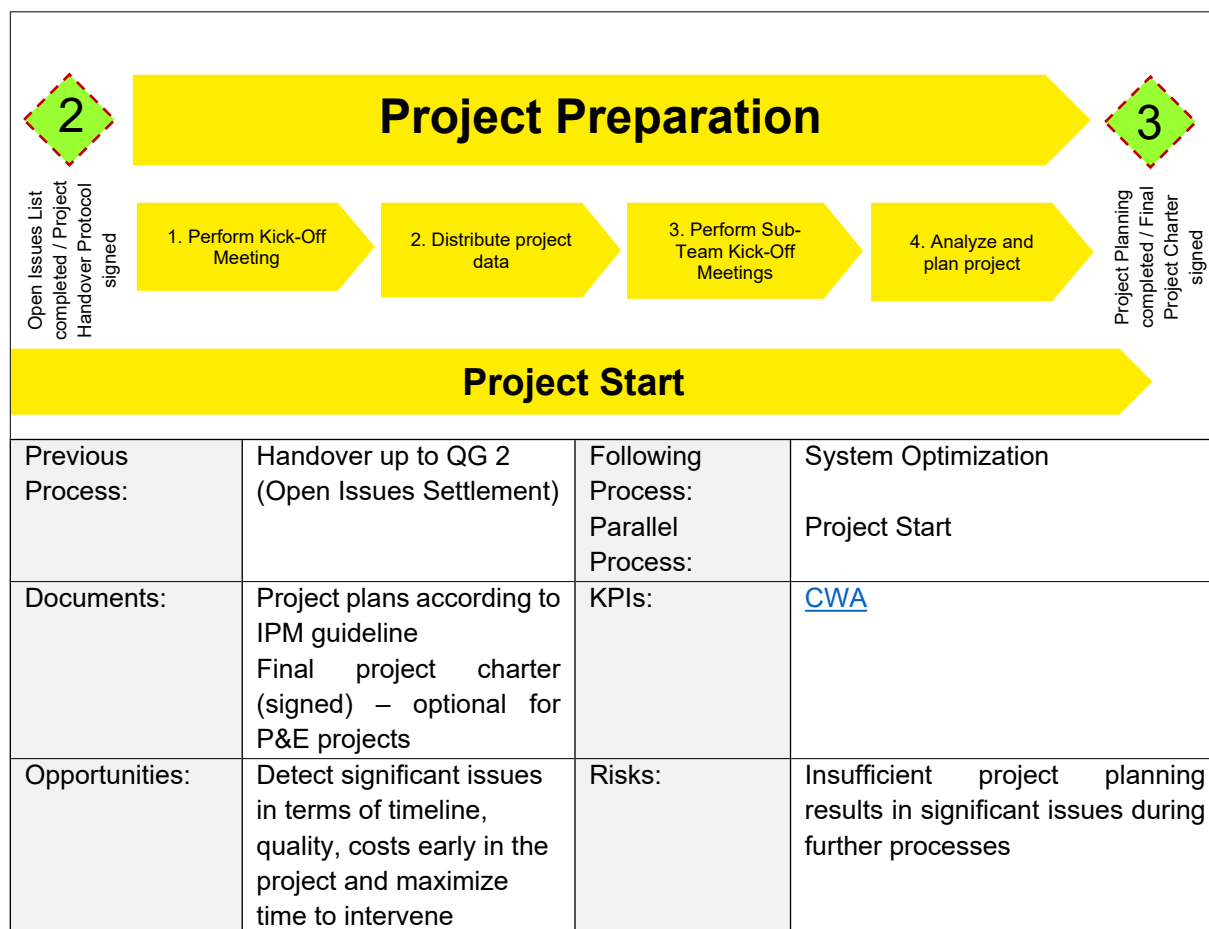
Project budgets entered in internal ERP-system and figures match with GCT. This is checked by local Project Controller (PCO). Commercial setup in ERP-system done (start for commercial controlling by PMA).	PCO
<p>Lessons Learned (LL)</p> <ol style="list-style-type: none"> 1. are continuously recorded (Jira "Project Issue"), 2. if already possible, actions derived, and then 3. reviewed by the CI Team Speaker / Responsible person of the respective specialist area <p>Mark "Project Issue" as lessons learned:</p> <div> <p>Relevant <input type="checkbox"/> Documentation</p> <p><input type="checkbox"/> Spareparts</p> <p><input checked="" type="checkbox"/> Lessons Learned</p> <p><input type="checkbox"/> Customer Open Issue List</p> <p>Which sector of SSI is affected.</p> </div> <p><u>Jira Dashboards:</u></p> <ul style="list-style-type: none"> • BU LS Lessons Learned Overview: LL selected from specialist areas to be implemented in standard. • Lessons Learned in LS Customer Projects: LL recorded by Project Team, not reviewed yet, reviewed & rejected, reviewed & approved by CI Team Speaker / Responsible person 	PMA, PCTM
Organize a Lessons Learned workshop with the customer whenever required.	PMA

Obligatory Outputs QG 2

Documents:

- Final signed Project Handover Protocol by the Bid Manager and Project Manager (all open points from the Project Handover Protocol have been resolved and completed).

10 IPM MACRO PROCESS: Project Preparation



Input: The Handover Protocol with settled open issues and the complete set of enclosed documents, draft of the Project Charter.

Process steps:

1. Within the Kick-Off meeting the project is introduced from PMA and SIM to the global project core team and the Bid Manager (or a representative) in order to achieve the “big picture” view. This includes information regarding customer, location, solution overview, overall layout. In addition, the project management relevant topics like scope, timeline, budgets, goals, risks, and challenges are presented as defined in the IPM guideline. The Kick-Off meeting should be done preferably via MS Teams conference.
2. All relevant project documents (layouts, process descriptions, IT concepts, quotation etc.) are distributed to project core team members via [TeamDoc](#).
3. Based on the provided information the project core team members (e.g., MHEMs) are executing the Kick-Off Meeting with their project teams.
4. The relevant project data is analyzed by the PCTMs and their specialists to identify questions, uncertainties and improvement potentials regarding to their local scope and possible impacts on the overall project. Those aspects are consolidated by the project core team to be further discussed in the start-workshop resp. in the system optimization phase.
The project is planned within the start-workshop as defined in the IPM guideline.

Output: Project plans created. Final project charter signed (optional for P&E projects). Consolidated list of questions, uncertainties and improvement potentials compiled.

11 QUALITY GATE 3 - Project Planning completed / Final Project Charter signed

Target:

PMA and PCTMs have commonly elaborated all relevant plans necessary for handling the project and have a common view on scope of supply, requirements, targets, schedule, budget etc. The project data has been analyzed in detail by the PCTMs and their specialists. Questions, uncertainties, and improvement potentials have been identified and consolidated.

Previous process:

Project Preparation

Items – Project Preparation & Project Start up to QG 3 “Project Planning completed / Final Project Charter signed”	Resp.
<p><u>Carry out Contract Analysis</u> (= Process step of <u>Project Start</u>)</p> <p>Contract analysis completed.</p> <p>Contract between SSI and end-customer studied by PMA. Questions summarized and sent to Group Function (GFC) Legal / Head of Legal BU LS (particularly relevant with regard to acceptance criteria and penalties).</p> <p><u>BU LS:</u> For A- and B-Projects, the PMA must organize and conduct a contract workshop with GFC Legal / Head of Legal BU LS and the Project Controller (can also be an agenda item for the Project Start Workshop). GFC Legal/Head of Legal BU LS then prepares a contract risk assessment for A-/B-Projects including instructions and recommended mitigation measures.</p>	<p>PMA, GFC Legal / Head of Legal BU LS, PCO</p>
<p><i>Perform Kick-Off meetings</i></p> <p>Internal Kick-Off meeting done and “big picture” view within entire project organization achieved (preferably via MS Teams to reduce travel efforts).</p> <ul style="list-style-type: none"> • <u>Templates: Invitation Kick-Off-Meeting / Kick-Off Meeting Presentation</u> • <u>“Project Initiation” SharePoint View</u> where you can find the nominated Project Core Team Members in the respective project. <p>Bid Manager must be invited. The CE Manager (CEM) must also be invited; Include ssi-ce-plantsafety@ssi-schaefer.com in your invitation to the Kick-Off meeting.</p> <p>It is at the discretion of the PMA which other stakeholders are invited to the Kick-Off meeting in addition to the PCTM.</p>	<p>PMA, BM, PCTM, CEM</p>
<p>Project organization chart (TL-00313) completed (including local project organizations at local entities/regions, 3rd parties etc.), steering committee, project core team, project subteams, customer).</p>	<p>PMA</p>

<p>Kick-Off Meeting with customer done. Alignment of initial technical clarifications (e.g., preliminary foundation loads etc.). Communication plan* (TL-01456) aligned; rules of collaboration defined.</p> <p>* Optional template for the definition of the project communication and regular meeting structures. The communication structure is also part of the Project Start Workshop, the important result must be a set up project team communication / meeting structure.</p>	PMA, PCTM, PMSW
Interface list between customer and SSI discussed and clarified.	PMA
Procedure regarding change requests agreed with customer (e. g. list of adds and omits).	PMA
<i>Distribute project data</i>	
Central data exchange platform defined (SSI internally and to customer).	PMA
Documentation of minutes defined (e.g., continuous protocol, Jira tasks etc.).	PMA, PCTM
<i>Perform Sub-team Kick-Off meetings</i>	
<p>Project Sub-team Kick-Off meetings done.</p> <p><u>Note:</u> Can be carried out together with the main Kick-Off Meeting (e.g. if it makes sense for C-/D-Projects).</p>	PCTM
<i>Analyze and plan project</i>	
<p>Project start workshop (TL-01491, Example Project Start Workshop - Project Boohoo) according to IPM guideline done. Depending on the project complexity, the entire Project Core Team including the Bid Manager meets physically, if possible.</p> <p><u>Note:</u> For complex projects the meeting may last 1 or 2 days.</p>	PMA, PCTM, BM, SLEM
<p>Context analysis (targets, non-targets, stakeholder analysis) done and draft of the Project Charter revised after Project Start Workshop. Among other things, targets and non-targets flow directly into the Project Charter.</p>	PMA, PCTM
Planning of scope of supply (deliverables, work packages etc.) done. Focus laid on identification of special work packages which are not covered in the standard work packages.	PMA, PCTM

<p>Project preparation carried out.</p> <p><u>Purpose:</u> Check scope of the project and sales documentation to ensure the efficient realization of the customer project.</p> <p><u>Goal:</u> PMSW, LLC and LDP have a common view on the scope of supply, requirements, targets, schedule & budget.</p> <p>PMSW, LLC and LDP analyze relevant project data and documentation to identify questions, risks and improvement potentials regarding their scope and possible impacts on the overall project. Those aspects are consolidated to be further discussed in the next process steps.</p> <p><u>Results:</u> Consolidated list of questions, risks and improvement potentials</p>	<p>PMSW, LLC, LDP</p>
<p>Assignment of a Site Manager (SMA) by Project Lead entity; utilization time according to the following definition:</p> <ul style="list-style-type: none"> • A projects: from QG 7 of 1st subsystem to QG 11 • B projects: from QG 7 of 2nd/3rd subsystem to QG 10 (last subsystem) • C projects: from QG 7 of 2nd/3rd subsystem to QG 8 (last subsystem) <p>Different aligned on-site times of the Site Manager can be defined by the PMA if it is crucial for the project success and progress.</p>	<p>IMA, PMA</p>
<p>Project schedule created (milestones, Gantt chart) Templates in CWA</p> <p>Depending on the size of the project, a period must be defined in the schedule at the beginning of the project during which project team members from Controls and suppliers (3rd party) are still present on site during WAMAS Commissioning.</p> <p>Necessary time overlaps between the specialist areas on site should also be taken into account initially.</p>	<p>PMA, PCTM</p>
<p>Budgets double-checked in accordance to cost planning and if applicable budgets revised in ERP-system.</p>	<p>PMA, PCTM</p>
<p>Risk analysis conducted considering initial risk analysis from sales process and mitigation measures defined.</p>	<p>PMA, PCTM</p>
<p>Final project charter signed (optional for P&E projects).</p>	<p>PS</p>
<p>Regular Project Core Team Meetings (Outlook serial appointment) with the PCTM set up to ensure a proper project coordination over the whole project duration.</p> <p>The nominated Bid Manager (or a representative) takes part in the regular Project Core Team Meetings, until the customer approves the layout (QG 4).</p> <p>Project Core Team Meetings must be done regularly as defined according to GL-00079 IPM Project Management (Customer Projects) (i.e. weekly / every two weeks, dependent on the project phase, for D also larger intervals possible) and must be actively managed by the PMA.</p> <p><u>Purpose and goal of Project Core Team Meetings:</u></p>	<p>PMA, PCTM, BM</p>

<ul style="list-style-type: none"> • Coordination of the PCTM • Ensuring an overall view of the entire project for all PCTM • Agreeing interfaces between work packages • Distribute work packages/tasks among the PCTM • Checking progress of the work packages • Maintaining communication as defined (e.g. according communication plan TL-01456) • Resolution of problems and conflicts • Answering questions • Continuous deviation management • Crisis and escalation management • Maintenance of project tools • Coordinating activities regarding the project environment (customer, suppliers, authorities, internal line organization, etc.) 	
<p>Project team communication/meeting structure set up (regular meetings among others) to ensure proper coordination in the project teams for the subsystems over the whole project duration and, to identify points to be further discussed in the Project Core Team Meetings.</p> <p><u>The coordination activities of the Project Core Team Members include:</u></p> <ul style="list-style-type: none"> • Coordination of the project team members • Ensuring an overall view of the entire project for all project team members • Agreeing interfaces between work packages • Distribute work packages/tasks among project team members • Checking progress of the work packages • Maintaining communication as defined (e.g. according communication plan) • Resolution of problems and conflicts • Answering questions • Continuous deviation management • Crisis and escalation management • Maintenance of project tools • Coordinating activities regarding the project environment (customer, suppliers, authorities, internal line organization, etc.) <p>Note: All project team members (not only those mentioned in the current Project Organization Chart template) must be considered when setting up the communication structure (e.g., also ISVM/ISVE and IMA attend Project Team Meetings).</p>	<p>PCTM</p>
<p>The respective PCTM has informed her/his project team that direct communication with the respective project team members of other subsystems is essential to ensure efficient work between the project team members over the whole project duration (e.g., PEC with LDP and vice versa).</p>	<p>PCTM</p>
<p>Service GC to be defined. The Service Operations Manager (SOM) is informed about the new project via CS Power Automate Flow "LSOP Projects - Item added or changed" on the basis of the SharePoint List "LS Customer Projects", as soon as:</p> <ul style="list-style-type: none"> • it is in the SharePoint list AND • has a PMA entered • AND has the corresponding project phase ">= Engineering, Analysis & Planning" (is automatically calculated based on the data from GPR). 	<p>LS PMO / SOM Team, SOM</p>

<p>Project setup in "Passion" done. Within "Passion" the login details for the on-site SSI IT equipment are managed. Basic data for the customer location is sent to the Passion System Administrators via ITSM and to all PCTMs.</p> <p>How to: Create a Service Request "Passion" in ITSM</p> <ol style="list-style-type: none"> 1. Enter required data: <ul style="list-style-type: none"> • Customer name • Warehouse location • Salesforce Account ID • SSI global project ID 2. Submit request <p>(This information will soon also be available in the process "Passion - Create / change location")</p>	PMA
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Obligatory Outputs QG 3

Documents:

Project Start

- Project Organization Chart created ([TL-00313](#))
- Internal Kickoff meeting protocol/presentation filed ([TL-01492](#))
- Documentation of contract workshop incl. contract risk assessment (mandatory for A- and B-Projects)
- Project schedule created*
 - * As soon as the project schedule is managed in [Planisware](#), the output is a result, not a document
- Project Start workshop protocol(s)/presentation(s) filed ([TL-01491](#))
- Project charter signed (optional for P&E projects) ([TL-00182](#))
- Customer Kickoff meeting protocol/presentation filed

Results:

Project Start

- Initial Risk Analysis conducted, and mitigation measures defined
- Project team communication/meeting structure set up (e.g. according to [TL-01456](#))
- Resource Plan (e.g. ERP System, [Planisware](#)) created
- Cost Plan (e.g. ERP System, [Planisware](#)) created

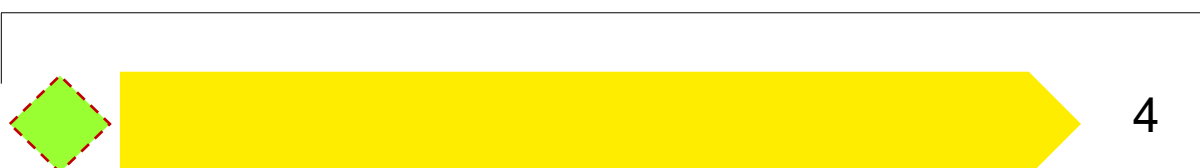
Project Coordination

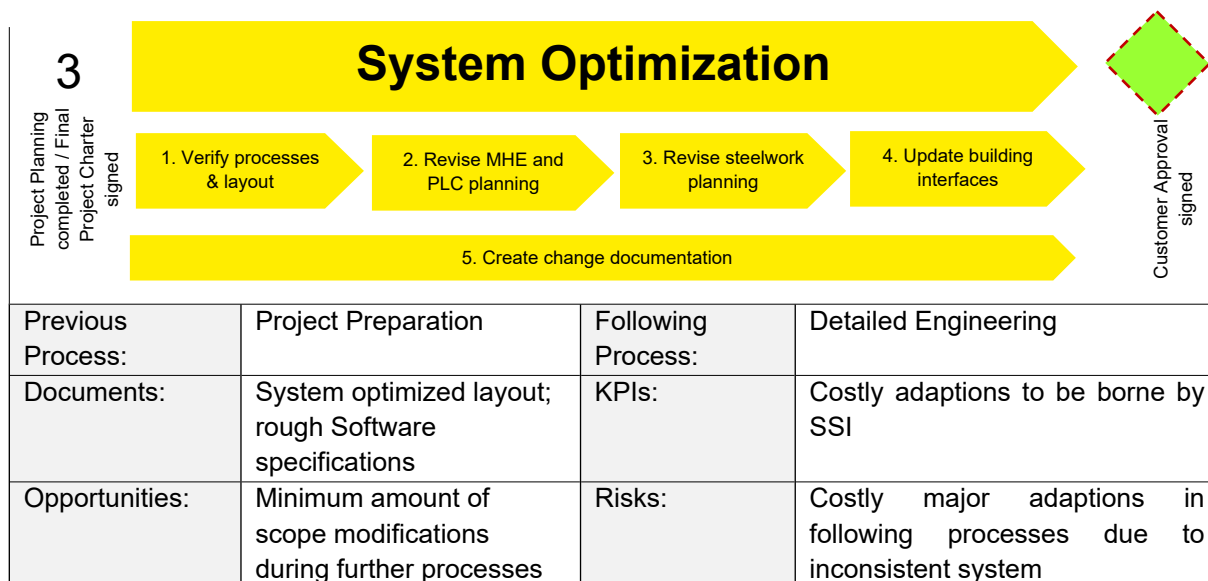
- Continuous meeting minutes of "Project Core Team Meeting" created (e.g. OneNote in MS Teams)

Project Preparation

- Project setup in "[Passion](#)" done

12 IPM MACRO PROCESS: System Optimization





Input: Based on the information from sales the project planning has been finished. Work packages (deliverables), schedule, resource-planning have been elaborated by project core team. Questions, uncertainties, and improvement potentials resulting from project preparation process are incorporated.

Process steps:

- The process descriptions (part of quotation) are analyzed in detail. In case of gaps or lack of clarity the appropriate processes are discussed with the customer. The provided customer data (amount of articles, order structure, picking volume, replenishment, slotting, peak times, material flow requirements etc.) and the quoted logistic concept are verified in order to be consistent. Necessary modifications of the logistic concept are evaluated and agreed with the customer. To verify such modifications a simulation is done (for complex systems or sub-systems). In addition, simulation experiments are executed in order to identify boundary values.
- Sales stays responsible for the concept of the sold layout and is available for questions and internal clarifications. If the project runs smoothly, the Bid Manager no longer appears to the customer.
- The layout is revised in accordance to possible modifications derived from the verification of processes. Furthermore, optimizations of layout in terms of material flows, required MHE, throughput, functionality and availability are done. Costly optimization of MHE is done as long as they are not in contrast to above mentioned attributes (value engineering).
The layout shows the entire scope of supply (including 3rd party components and relevant building components) and has been double-checked to be free of errors and omissions.
The definition of control areas (FAST) is done including positioning of main and operator panels. Based on the definition of control areas the project schedule is further detailed. The schematic layout / material flow chart are derived from the revised layout. Throughput is shown / defined for all relevant points.
The visualization system is discussed with the customer. All relevant functionalities are defined (operation, definition of components / conditions which are visualized, definition of exclusions). Quotations for SSI internal components and 3rd party components are requested to be updated. Mock-ups are defined and layouts created. FATs are scheduled with customer.
The revised system optimized layout is approved by the customer.
- The steelwork layout is revised accordingly. Foundation loads are updated and shown in the layout. The position of grounding points is defined. The sprinkler design is considered. The information regarding floor of mezzanines and area loads are shown on the layout.

5. All relevant interfaces to building / customer systems are updated and shown in the layout. This covers position of power supply feeding points (including power consumption for each point), position of all network connection points, position of compressed air feeding points (including compressed air consumption for each point), wall openings etc. Based on the revised SSI overall system design the “make or buy” decision is taken if the Realization organization and/or the CS organization will conduct the SSI system maintenance trainings with the customer’s maintenance staff. This is relevant for customers without RM contract, new customers with not enough maintenance knowledge and experience and SSI systems with medium to high complexity.
6. All modifications compared to the sold quotation are documented. The modifications are evaluated and classified in internal and external modifications. Internal modifications could be necessary in order to optimize the system or because it was not considered in the quotation. External modifications could be implemented via change requests or new requirements which are billed to the customer. Deliver, what has been sold (not more, not less).

System Review Workshop

The **purpose** of the System Review Workshop is to prevent an information gap between specialist areas within LSOP on the one hand, and between LSOP and Sales on the other hand, and so to achieve significant improvements in results or to avert deterioration in an early phase.

The **goals** of the System Review Workshop are:

1. Avoidance of "over and under engineering" through LSOP as a result of incorrect interpretation of contract contents or misleading information from the customer. Delivery and service content are compared between Sales and Order Processing, to ensure conformity of the implemented system with the contract.
2. Identification of claim potentials because of customer requirements that are not contractually covered.
3. Feedback from LSOP to Sales about price shortfalls and overshoots during the project realization phase.

A System Review Workshop Protocol ([TL-05355](#)) is mandatory.

Logistics Concept and Layout Review / Key Performance Indicator (KPI) Definition

Purpose:

The layout and the main business processes/logistics concept have to be approved to secure a suitable customer solution.

Goal:

The layout and the main business processes/logistics concept are approved and can be used to work out the customer solution.

Input: Sales documentation (e.g. offer), logistics concept (Layout, MF diagram, requirement specification/information incl. customer business processes)

Logistics Concept and Layout Review

The PMSW, LLC and LDP review the layout and the customer business processes (logistics concept) from the sales phase to secure the same view on the layout and the processes in the project organization. In addition, the system performance is checked for technical feasibility.

In the review is ensured, that all material flow concepts and components in the warehouse can be successfully controlled by the planned and calculated software features. It should be discussed how the requirements are implemented in the project and which adjustments are necessary in the layout. If necessary, optimization potential for the layout is derived.

If necessary, an MFS expert, a Solutions Architect, the System Integration Manager (SIM) or the PLC responsible (SLEC - System Lead Engineer Controls) is consulted. This internal review in the Project Team Software serves as preparation for the System Review Workshop.

The SIM organizes the System Review Workshop and held together with all relevant specialist areas.

Key Performance Indicator (KPI) Definition

Based on the acceptance criteria agreed with the customer in the contract (promised performance of the system), result performance indicators (-> KPIs) which must be achieved and proven to the customer during the acceptance test.

These performance indicators are recorded in the specification, must be made available via the WAMAS software or WAMAS Control Center, and presented in the form of performance reports (Performance Reports / Dashboards).

Further performance indicators can be defined in the specification with the customer, as well as performance indicators which reflect better information about the system status, and which the project team can use to control and optimize the system.

The defined performance indicators form the input for the [Realization \(Software\)](#) process in which the performance reports are created and the necessary raw data for the performance measurement are generated in WAMAS.

Results:

1. The layout has been checked by the PCT Software, all questions have been clarified and suggestions for optimizing the layout have been reported to the SIM (PMA organizes the customer approval of the layout and the customer business processes or the logistics concept)
2. Key performance indicators and internal key figures are defined
3. Initial process description (from sales)

Output: The whole project scope has been revised, optimized, and straightened out where necessary. The processes of the system are clear, and the revised layout is consistent. The resulting documents containing all relevant rough (20-80 rule) specifications for later detailed planning and production phases ensure the full alignment with the customer. All scope changes and modifications defined and accepted by all parties (Project Lead, IC, 3rd party suppliers, customer). Changes of scope are now strictly restricted to change request process. System Review Workshop Protocol ([TL-05355](#))

13 QUALITY GATE 4 – Customer approval signed

Target:

The whole project scope has been revised, optimized, and straightened out where necessary. According to their relevance the customer's business case, the derived logistics, operations, ramp up concept including all major processes, the resulting WAMAS and Controls specifications, the physical components (mechanical, hardware, electrical) as well as the building have been streamlined to ensure a fully consistent SSI Schäfer system. The applicable acceptance standard and procedure (preferably SSI Schäfer's) have been agreed with the customer. The resulting documents containing all relevant rough (80-20 rule) specifications for later detailed planning and production phases ensure the full alignment with the customer by having been countersigned. Costly major adaptations due to scope changes will thereby be prevented. Changes of scope are now strictly restricted to change request process.

Previous process:

System Optimization

Items – System Optimization up to QG 4 “Customer approval signed”	Resp.
Verify Processes & Layout	
The major processes are discussed and aligned with the customer in case of gaps or uncertainties.	PMSW, LLC
Relevant logistic data provided by customer analyzed, in order to verify logistic concept.	PMSW, LLC
Simulation of material flow based on provided customer data done and requirements verified (depending on complexity of system). On the one hand, the request can come from the customer, and he pays for it. Second option: We are not sure internally and don't trust the layout -> You either get to it in the technical evaluation or at the latest when optimizing the system.	SIM , PMA, PMSW, Head of Simulation/Si mulation Manager
Simulation experiments done in collaboration with customer. Results taken into consideration and derived modifications updated in specifications (WAMAS specifications, MHE specifications, Layout). Simulation results confirmed by customer (if included in scope).	PMSW , SIM
KPIs defined for evaluating the performance of the system (e.g. loading units per hour) Clarify: Do we know what kind of KPIs we need to proof? If not, we need to define the KPIs.	PMSW , PMA
Logistics concept and layout checked. The layout has been checked by the LLC, LDP and BM, all questions have been clarified and suggestions for optimizing the layout have been reported to the SIM (PMA organizes the customer approval of the layout and the customer business processes or the logistics concept).	PMSW , LLC, LDP, BM, SIM
Revise MHE & PLC Planning	
System review workshop (Control meeting / workshop) done and documented (System Review Workshop Protocol Template).	SIM , AIM, PMA, PMSW,

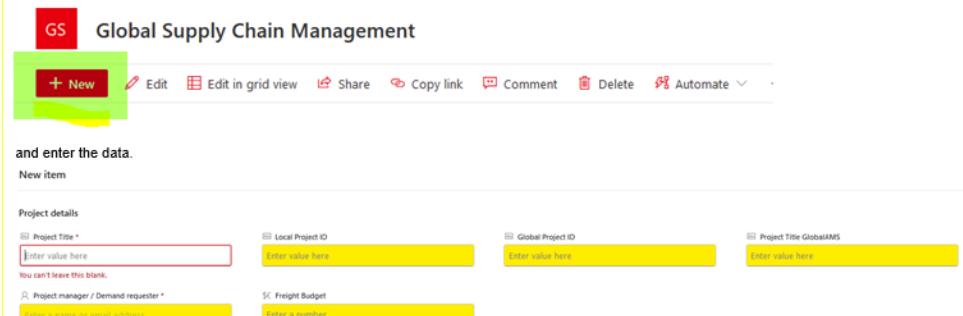
Items – System Optimization up to QG 4 “Customer approval signed”	Resp.
<p>Material flows, processes, throughputs, visualization requirements incl. WAMAS Control Center checklist CL-00221, technical specifications, safety control concept aligned between Software Realization, Controls, and project engineers; interfaces used by the individual subsystems and machines (e.g. PCX) must be discussed with Software Realization.</p> <p>Concept Engineers, IT Sales Consultant and Bid Manager to participate at system review workshop to minimize information gap.</p> <p>Minimum requirement for C- and D-Projects (BU CS: for C-Projects): A meeting to ensure that the status of the layout is known and confirmed; the confirmation must be documented.</p>	<p>SLEC, PEC, PES, SLEM, SLEE, MHEM, CE, ITSC, BM</p>
<p>Layout of transport units created by PEM; Merge of the overall view by SLEM; Check if rack fulfills requirements for all TU's by SLEM + PEM + SWM. SIM sent overall view to the customer who approved it.</p> <p>All attached barcodes demonstrated for each transport unit and shown on transport unit drawing. This includes also barcodes which are not read by the SSI system (highlighted). This needs to be considered to avoid reading issues (e. g. customer barcode with same code-type close to control barcode).</p>	<p>SIM, SLEM, PEM</p>
<p>Gather all foundation loads for all subsystems in scope of SSI and create foundation load overview drawing (by SLEM), submit all loads to the customer (by SIM), if necessary</p>	<p>SLEM (drawing) SIM (submit)</p>
<p>Detailed analysis of transport units done (representative transport units physically checked) and conditions considered for technical specifications (handling machines, robots etc.).</p> <p>Detailed analysis of goods inside transport units done. E. g. apparel which is compressed into totes and might expand during transportation. This needs to be considered for design of clearances in the system (conveyors, ASRS etc.). Angle of inclined conveyors to be correctly designed to prevent transport units from slipping (e. g. at belt conveyors in deep freeze environment).</p>	<p>MHEM, SLEM, PEM, for 3rd party: SIM, AIM</p>
<p>Reference point (for layout) agreed with all partners (internal and external).</p>	<p>SLEM, SIM</p>
<p>Onsite measurements of the building, existing installation or any interfering contours taken to clarify available space, interfaces to the new system and to avoid collisions.</p>	<p>PEM, for 3rd party: SLEM, SIM</p>
<p>Sales layout revised / optimized in accordance with modifications derived from system review workshop. PEM contributes for the subsystem.</p>	<p>SLEM, PMSW, SIM, AIM, PEM</p>
<p>Subsystem schematic layout / material flow chart is updated, and throughput is defined at all relevant points by PEM. Overall schematic layout / material flow chart in responsibility of SLEM.</p>	<p>SLEM, PEM</p>
<p>Safety Briefing 1 (must be done before approval by the customer): The complete layout is internally checked in terms of safety regulations and maintenance access. All relevant changes due to safety regulations and access must be considered and included in the final layout. See also WI-01389 Assurance of machine and system safety.</p>	<p>SIM, PMA, SLEM, PEM, SLEE, PEE, SLEC, CEM</p>
<p>Layout approval meeting done and documented (protocol).</p>	<p>SIM, MHEM, PMSW, AIM, SLEC,</p>

Items – System Optimization up to QG 4 “Customer approval signed”	Resp.
<ul style="list-style-type: none"> Revised layout approved by PCTM and if simulation study was performed, simulation team → Confirmation that system performance can be achieved. If simulation study was performed, then feedback to Head of Simulation or Simulation Manager regarding IT strategies, abstraction levels, simulation strategies. 	SLEM, SLEE, Site Manager, Head of Simulation/Simulation Manager
Emergency and error strategies considered (e.g., drop out of certain components/machines).	PMSW, LLC
Layout includes the entire scope of supply (incl. 3 rd party components). Drive ways for FLTs, walkways and clear heights at crossings, escape routes, staircases, safety devices etc. are considered.	SLEM, PMA, SIM
Confirmation that all contractual defined functionalities, processes and performance can be achieved with the revised system optimized layout.	SIM, AIM, PMA
Allocation of subsystem PLC control areas (FAST) done by PEE. Overall FAST definitions done by SLEE. Installation phases resulting on FAST allocation checked by IMA. Safety PLC allocation across the subsystems and responsibilities is clear.	SIM, SLEE, PEE, SLEC, PEC, IMA, MHEM, PMSW
Installation concept defined. The concept needs to include details about special requirements for unloading of machines /parts on site and the insertion/ installation procedures according to construction sequence timeline. (e.g., insertion and installation of cranes, opening needs, sprinklers, and rack installation interface, required equipment ...)	SIM, PMA, IMA, SLEM, MHEM
Logical names for aisles of automatic storage systems defined by PEE (e.g., miniloads, Cuby, Flexi, Exyz) and drawn into the layout by SLEM.	SIM, PMSW, SLEM, PEE
Storage, retrieval, and distribution of loads (weights) strategies defined and documented. Any special requirements for load handling in the rack need to be defined by the SWM and to be aligned between the SIM, the SWM and the PMSW, taking into account the product management's storage strategy documents .	SIM, AIM, PMA, MHE, PMSW, PEC
Network workshop done and basic information regarding network defined. <ul style="list-style-type: none"> Scope of supply for network (provided by customer or SSI, interface) Required Ports Provider of secure customer remote access (SRA/VPN) (e.g., Friesach, Giebelstadt) VPN access list (involved SSI entities and third-party providers) Network clustering (VLANs in accordance to included sub-systems, WAMAS Control Center server and PLC in same VLAN) Amount of required commissioning computers 	SIM, MHEM, Network Admin, SLEC, PEC, PES, PMSW, SLEE
Project schedule further detailed in accordance to building sequence (subdivided into PLC control areas / installation phases). Installation sequence and delivery dates of main components aligned and considered in project schedule. <u>Note:</u> Project schedule considers hand-over of logistical areas to Software Realization (e.g., goods-in area).	PMA, SIM, IMA, PMSW, MHEM, SLEC
Door to door – delivery time for materials in the scope of SSI requested from shipping department and considered in project schedule.	PMA, MHE, Shipping

Items – System Optimization up to QG 4 “Customer approval signed”	Resp.
Note: depending on INCOTERM definition additional delivery durations such as customs clearance, transportation from port to site etc. may apply and needs to be requested by PMA at the contract partner. Frequency of shipments and pick-up location for 3rd-party equipment must be considered as well.	
Definition of mock-ups (for internal use) and factory acceptance tests for customer (FATs) done. Note: Mock-ups are subject to the current construction guidelines / installation guides and must be carried out according to the specifications (risk assessment, STOP principle for safety designs). Based on the risk assessment, documented user training must be carried out + reference to the residual risk (with acceptance of this). The instruction is documented in the training protocol with reference to the risk assessment and the residual risk.	MHEM, PMA
Layouts and part lists for production of mock-ups and FATs created. PLC software to be created. Software-FATs for WAMAS functionalities to be considered in QA Plan (Software-FAT -> test level “In-house Acceptance Test WAMAS”).	PEM, PEE, PEC, PMSW
Financial impacts of all modifications considered. All scope changes since QG1 managed by change request process and accepted by all parties (incl. 3rd party suppliers and customer). If applicable ISAAC calculation, SSI Group calculation incl. onshore/offshore split updated.	PMA, BM
Revised layout (system optimized layout) approved by customer (layout – freeze).	PMA
Revised schematic layout / material flow chart approved by customer.	PMA
Request of updated SSI internal and 3 rd party supplier quotations.	SIM, AIM, PMA
Color Definition according to sales quotation / contract considered for engineering and purchase of 3 rd party components. IMPORTANT: Deviations from the color definitions supplied with the offer or contract must be discussed and coordinated with the respective Product Owner (PO, formerly Product Manager). Deviations from the standard definition are allowed with approval of the Product Owner only.	PMA, MHEM, SIM, PO
Revise Steelwork Planning	
Onsite measurements of the building taken (e.g., columns, height limited area, floor joints, floor evenness, any possible collision to the system, etc.). In case of a new building still under construction, this task should be done as soon as the new building is concluded.	SWM, SLEM, PEM,
Steelwork layout revised / optimized in accordance with modifications derived from “revise MHE& PLC planning” sub-phase.	SWM, PEM, SLEM, SIM
Allocation of installation phases for steelwork done and detailed steelwork schedule created.	SWM

Items – System Optimization up to QG 4 “Customer approval signed”	Resp.
Foundation loads for steelwork calculated and drawn in the layout.	SWM
Sprinkler regulations for racks defined and considered in layouts (e.g., for mini load rack, Cuby rack etc.).	SLEM , SWM, SIM, PEM
Floor of mezzanines (wood, mesh grid etc.) and area loads defined.	SWM , SIM
Execution of flow rack channels (e.g., for picking areas) defined (e.g., correct push-back protections considered).	SWM , SIM
Execution of static rack locations (e.g., for miniload) defined (e.g., shape of totes for selection of push-through protection considered).	SWM , SIM
Update building interfaces	
Preliminary power consumption calculation created (SLEE merges all subsystems). PEE delivers data for subsystem. SIM delivers data for 3 rd party.	SLEE , PEE, SIM
Electrical requirements specified: <ul style="list-style-type: none"> - Earthing system (TT, TN-S etc.) - Voltage, frequency - Installation standards (e.g., mandatory suppliers for electrical components) 	SLEE , SIM
Local technical requirements specified: <ul style="list-style-type: none"> - Escape routes - Fire protection requirements 	SLEM , SIM
Preliminary compressed air calculation created (SLEM merges all subsystems). PEM delivers data for subsystem. SIM delivers data for 3 rd party.	SLEM , PEM, SIM
Position and amount of power supply feeding points and compressed air feeding points defined.	SLEE , SLEM, SIM
Position and amount of network connection points defined. SLEE in the lead as it captures the drawing for the drop points. The SLEE should organize two meetings between <ol style="list-style-type: none"> 1. SLEE+SIM+PMSW = Determination of power requirements and network requirements at workstations 2. SLEE+SIM+PEE(s) = Determination of network requirements in the control cabinets 	SLEE
Position of grounding points defined (e.g., miniload steelwork, PCS).	SLEE
Interfaces to building clarified (e.g., wall openings).	PMA, SLEM, SIM
Openings for material insertion and storage area defined.	SIM , SLEM
All above mentioned interfaces shown in a separate “Interface Layout” (power infeeds, network connections, compressed air infeeds etc.) and handed over to customer.	SLEM , PMA, SIM
Colour scheme defined and approved by customer.	SIM

Items – System Optimization up to QG 4 “Customer approval signed”	Resp.
Ambient conditions defined when system is in operation (e.g., temperature, humidity, earthquake zone etc.).	SIM
Create change documentation	
All relevant modifications documented, i.e. everything that has changed significantly from the sales layout and sales offer. Especially in terms of layout and technology.	PMA, SIM, MHEM, PMSW
<p>Lessons-Learned-Meeting between project engineer (= System Lead Engineer Mechanics), and Sales application engineer (= Concept Engineer) done and documented (TL-04453 Engineering Lessons Learned).</p> <p>From Sales also the Technical Director (TD) and the Bid Manager (BM) must be invited.</p> <p><u>Note:</u></p> <ol style="list-style-type: none"> Record lessons learned via Jira "Project Issue", if already possible, derive actions. Select “Project Issue Category”-> Sales. <p>How to mark “Project Issue” as Lessons learned:</p> <div> <p>Relevant <input type="checkbox"/> Documentation</p> <p><input type="checkbox"/> Spareparts</p> <p><input checked="" type="checkbox"/> Lessons Learned</p> <p><input type="checkbox"/> Customer Open Issue List</p> <p>Which sector of SSI is affected.</p> </div> <ol style="list-style-type: none"> Main modifications of final layout compared to sales layout are discussed to ensure regular feedback-loops back to Sales organization (additional input from System Review Workshop Protocol, Simulation (if sold & available), technical changes due to layout improvements (savings & maintenance access), additional CR's). Please use template TL-04453 Engineering Lessons Learned for preparation of the LL Meeting and store the project-specific presentation in TeamDoc under Fulfillment > System Optimization > Project Lead. 	SLEM, PEM, CE, TD, BM, SIM
Freight Management	
<p>Procedure for bundling transportation demands out of the plants Neunkirchen, Graz and Hranice.</p> <p>Target: savings for transportation costs (see also information attached).</p> <p>PMA / MHEM / SWM are entering the relevant information regarding transportation into SharePoint table “Transport Demands” of Global Supply Chain Management – this applies for the scope of the project for which they are responsible:</p> <p>Usually, several plants are delivering goods to one customer project. The data needs to be entered for each plant.</p> <p>E.g.</p> <ul style="list-style-type: none"> SWM enters the data for the steelwork deliveries out of Neunkirchen or Hranice. MHEM BCS enters the data for conveyor deliveries out of Graz. MHEM Flexi enters the data for Flexi deliveries out of Hranice. 	PMA, MHEM, SWM

Items – System Optimization up to QG 4 “Customer approval signed”	Resp.
<p>Important: Only the number of transports + budget are taken over from ISAAC. It is not possible to check whether this transport volume is suitable.</p> <p>Entering the data is done like in any other SharePoint table. Just click on “New”:</p>  <p>and enter the data.</p>	
SSI Data Acquisition / Predictive Maintenance	
<p>For SSI linkage we need to have written confirmation from the customer to collect machinery data. If this is not signed by customer in basic contract, a separate agreement (request the template from Stefan Unterberger) must be signed by both parties.</p>	PMA

Obligatory Outputs QG 4

(refer to CWA [QG 4](#) for details)

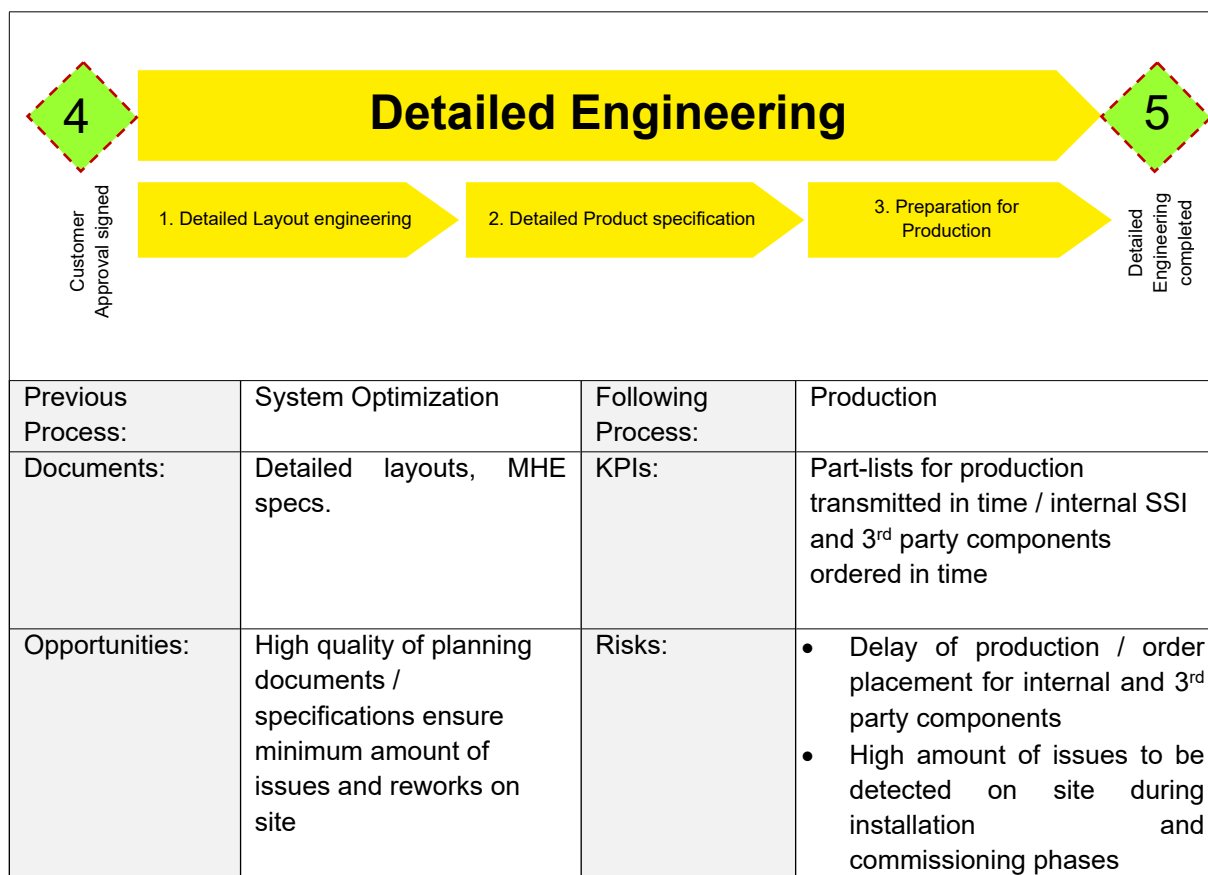
Documents

- System Review Workshop Protocol (minimum requirement for C-/D-Projects: Documented confirmation of the status of the layout) ([TL-05355](#))
- Layout approval meeting done and documented (protocol)
- Revised layout (system optimized layout / parts of system optimized layout) approved by customer (layout freeze)
- Revised schematic layout / material flow chart approved by customer
- Foundation loads for all subsystems in scope of SSI gathered and foundation load overview drawing created
- Engineering Lessons Learned (PowerPoint) ([TL-04453](#))
- Layout of transport units created (PEM, merge overall view: SLEM) and approved by customer (SIM)
- Interface layouts available (SLEM) and handed over to customer (SIM)
 - Position of grounding points defined
 - Position and amount of power supply feeding points and compressed air feeding points defined
 - Position and amount of network connection points defined

Results:

- Engineering Lessons Learned (Jira “Project Issues”)
- Color Definition done, and approved by customer
- Transport demands list created

14 IPM MACRO PROCESS: Detailed Engineering



Input: Confirmed system optimized layout, confirmed rough IT specifications from “System Optimization” process.

Process steps:

- Based on the system optimized layout the detailed layouts are engineered. The mechanical layout includes the entire scope of supply including 3rd party components. All relevant components which are affecting the system are shown in the layout (e.g., building, sprinkler, ventilation, joints, machines etc.). Collision checks between all components are done regularly (internal and together with customer) and necessary modifications are defined.
Based on the detailed mechanical layouts the electrical engineering is done. For each control area a meeting between Engineering and Controls is done to define all relevant parameters (typicals, position of sensors and labeling, hardware specification, definition of desk areas etc.). The emergency stop areas are defined.
The schematic layout / material flow chart are updated accordingly.
Final power- and compressed air consumption are calculated.
Layout includes all interfaces to the customer side (power supply points, network connection points, compressed air connection points, connection points to fire alarm system etc.).
- All internal products are specified in detail (e.g., SMC, SCS, Navette, Cuby etc.). Deviations from standard implementations are especially considered.
3rd party products are specified in detail (schedule, technical specification, FATs, general requirements for integration, interfaces, availability, acceptance procedure etc.). For products with high complexity or high quantities a Kick-Off Meeting is done with the appropriate suppliers. Mock-

ups for FATs are produced, tested and approved in advance. All modifications are updated in the detailed layouts in order to eliminate errors in series production. Start with the creation of the availability model; basic parameters are defined (weighing factors defined and agreed with customer, procedure for error recording defined, observation period defined, filter for operational caused errors defined, downtimes relevant for calculation defined – e.g., only time to solve the issue). Acceptance procedure is aligned with customer.

3. Based on the detailed layouts and specifications the parts-lists for production are created. Orders for internal and 3rd party products / components are placed.
 Building site equipment layout is created which shows all relevant information (space for office containers, position of power distributors, entrances for material, storage place, parking spaces etc.) and is agreed with all partners (customer, 3rd party suppliers of SSI and customer etc.).
 Conditions for delivery (including clearing formalities) are clarified. All production and delivery dates are double-checked to fit into the project schedule.

Output: Detailed layouts. System is ready for production.

15 QUALITY GATE 5 – Detailed Engineering completed

Target:

Overall layout has been planned in detail based on the revised overall system optimized layout and the other rough specification documents resulting from the preceding “System Optimization” process step. All scope, system performance, functionalities and contract relevant aspects have been considered. There have not been any major changes to the scope that caused costly adaptations.

Previous process:

System Optimization

Items – Detailed Engineering up to QG 5 “Detailed Engineering completed”	Resp.
<i>Detailed Layout engineering</i>	
Layout / parts of layout mechanically finished.	PEM
Overall layout consolidated (includes all internal and 3 rd party components).	SLEM, SIM
Collision check between all sub-systems done (internal SSI components, sprinkler, lighting, cooling, building etc.). NOTE: This is an ongoing activity performed during the whole project duration (e.g. also defined in the role description SLEM).	SLEM, PMA, SIM
Signal interfaces between sub-systems and machines defined (to each sub-system / machine). Detailed elaboration by PEC.	SLEC, PEC, MHEM
Interfaces between sub-systems for handing over transport units incl. positioning of transport units defined. I.e., PEM and PEE provided the input to the MHEM and SIM. E.g., interface between conveyor and miniload. Transport units with different width classes (e. g. cartons) are centered on the load handling device (C-Gripp) and not on the conveyor.	SIM, SLEM, SLEC MHEM, PEM, PEE

Items – Detailed Engineering up to QG 5 “Detailed Engineering completed”	Resp.
<u>SSI Data Acquisition / Predictive Maintenance</u> SSI Linkage and its hardware is planned in layout (hardware article information Confluence Link)	PEE
Safety Briefing 2 conducted. Discussion of the detailed layout including all final interfaces.	SIM , PMA, SLEM, SLEE, PEM, PEE, SLEC, CEM
Schematic overview of all signal interfaces for the entire system created.	SLEC , SLEE
Allocation of all sensors defined for each control area (FAST).	PEE , PEC
Design of scanners for all situations done and layout for scanner positions created. For special scanning situations requests for quotation are created.	PEE , PEC
Detailed layout (mechanic, electric) including all 3 rd party components finished.	PEM , PEC, PEE
Overall schematic layout / material flow chart updated.	SLEM , SLEC, SLEE
Final power consumption calculation done (SLEE merges all sub-systems). PEE delivers data for subsystem. SIM delivers data for 3 rd party.	SLEE , PEE, SIM
Final compressed air calculation done (SLEM merges all sub-systems). PEM delivers data for subsystem. SIM delivers data for 3 rd party.	SLEM , PEM, SIM
List of devices needing network finished (template "TL-02301 Network Addresses") and provided to the Network Admin via TeamDoc for the final check.	SLEE , Network Admin
<u>Final network planning done:</u> <ul style="list-style-type: none"> - Creation of IP address and Subnet listing - Coordination of IP Subnets and routing towards customer - Coordination and documentation of VPN connectivity with VPN provider - Logical (schematic) network overview created - Network connection points named (IDF ID) - IP ranges clarified with customer (incl. VPN and customer VLANs) - <u>SSI Data Acquisition / Predictive Maintenance</u>: SSI Linkage: Internal (reserve IPs in controls network) & public facing communication is done (outbound communication requirements Link) <u>How-To:</u> The order for logical network planning is carried out via Jira project SUPPITSYS , service “Logical Network Planning”. After the task has been created, the responsible team leader assigns it to an employee - who is then the central contact person for all network topics relevant to the IT system in the project.	Network Admin , SLEE, PMSW, SLEC

Items – Detailed Engineering up to QG 5 “Detailed Engineering completed”	Resp.
Electrical planning for network done for each sub-system (cables type and length, network cabinets, port assignment etc.).	PEE, SLEE
Checklist Safety light grids PCS initially filled. Template CL-00056 Checklist Safety Light Grids PCS: EN / DE	PEE, PEM
Emergency stop planning done. Special requirements considered if applicable (e.g., dual channel cabling of E-stops, fortress locks for doors etc.). Safety Matrix and/or Emergency stop protocol created.	PEE, SLEE, SLEC, PEC
Overall pneumatic layout finished.	SLEM, PEM, SLEE
Necessary site facilities (storage area, office containers, tools, consumables, lifting equipment, power distributors, waste containers etc.) and responsibility for this scope of supply defined within “installation organization meeting” (refer to Installation sub-process “ Preparation for Installation ” in CWA for details).	IMA, SMA, MHEM, SIM, PMA,

Items – Detailed Engineering up to QG 5 “Detailed Engineering completed”	Resp.
<p>Creation of the specification of the interface between MFS and PLC supported for each sub-system which has an interface to the WAMAS Software.</p> <p>Documents and an excerpt of document contents that can be relevant for the specification of the MFS-PLC interface are listed in chapter "Overview of Input Documents" → WI-00944 MFS PLC Interface Specification Creation/Overview</p> <p>For details refer to process Analysis & Planning, process step “Specify interface between MFS and PLC”.</p>	SLEC, PEC
<p>Test concept for PLC created. Covers in-house and on-site tests for all sub-systems on PLC level as well as interface tests between PLC and MFC incl. visualization system (WAMAS Control Center).</p> <p>Standard tests are in Jira for in-house and in Excel for on-site tests. There will be Controls test concept templates where these are described.</p>	SLEC, PMSW, SIM
Detailed Product specification	
Mock-ups successfully tested, approved and modifications considered for series production.	PMA, PEM, SIM
<p>3rd party products specified by using the standardized templates (e.g., for scales, strapping machines, belt curves etc.).</p> <ul style="list-style-type: none"> Automation Germany 3rd party product scope: Templates (Confluence) Automation Austria 3rd party product scope: Template TL-05365 (CWA) <p>For complex 3rd party products, a detailed specification is done.</p> <p>If you have any questions, please contact procurement</p> <ul style="list-style-type: none"> Germany: projectdemand.GIE@ssi-schaefer.com Austria: projectdemand.GRZ@ssi-schaefer.com 	MHEM / SIM, AIM, PEM, PEE, PEC
3 rd party approval criteria and corresponding acceptance criteria defined.	SIM, AIM, PMA
<p>Parts provided by the customer, <u>shipped directly to Graz</u> (no direct delivery to the site) must be organized (recording and ordering). For details refer to GL-00078 Parts provided by the customer (shipped directly to Graz) (German version).</p> <p>The parts must be in-house during the production phase.</p>	PMA, MHEM, PEM, PEE
Visualization system (WAMAS Control Center) specification done (PES) and approved by customer (PMA).	PMA, PES
Test cases for PLC and visualization system (WAMAS Control Center) created. All standard and project-specific test cases on PLC level defined in Jira (for all sub-systems).	SLEC, PEC, PES
Acceptance standard and procedure defined (within MHE spec).	PMA, SIM
Door locks for safety doors defined and organized.	SLEM
Complete set of planning documents (EPLAN, layout with sensors etc.) finished and handed over to Controls (optional for P&E projects).	PEM, PEE, PEC
Orders for 3 rd party products / components placed.	MHEM / SIM

Items – Detailed Engineering up to QG 5 “Detailed Engineering completed”	Resp.
<i>Preparation for Production</i>	
Parts list for production created (for entities with production facility). <u>Note:</u> Production doesn't start without layout approval of customer.	PEM, PEE
Meeting with production department in order to align project specific assembly requirements done.	PEE
Conditions of delivery (customs) clarified. - Shipping checklist submitted and aligned with shipping department 4 weeks prior 1 st delivery (MHEM) → CL-00236 Checklist Transport Logistics For non-EU countries: - Contract / IC purchase order sent to shipping department in order to derive export value for customs clearance (correctness of billing address, delivery address and Incoterm checked) (MHEM) - Component list of ISAAC calculation (Massenblatt) incl. position number for each component sent to shipping department (MHEM). - Layout demonstrating position numbers of component list sent to shipping department (MHEM).	MHEM, PMA, Shipping
Purchase orders for SSI internal and 3 rd party products / components placed. <u>Note:</u> Production within SSI resp. purchasing 3 rd party components doesn't start without purchase order and IC purchase order received from official contractor (see also Global Policy No PO No PAY (EN) (DE version)).	PMA
Creation of initial spare parts offer triggered in CS Organization	PMA / MHEM
Initial spare parts offer created and sent to customer (after all parts lists for production created).	SAM, PMA
CS service offer (service level agreement) sent to customer.	CS, PMA
CI (configuration items) list sent to PMA, filled out and returned to CS. CS to integrate customer in ITS (incident tracking system).	CS, PMA
Building site equipment layout created and aligned with all partners (unloading material area, storage area, office containers, power distributors, parking area etc.).	SLEM, SIM, SMA, IMA, MHEM
Safety layout showing all hazard zones and safety signs defined. Ordered the signs by SLEM using TL-00529 Purchase Order Signage - Order Data (formerly: Request form for signs).	SLEM
On site network infrastructure defined. This covers the SSI internal network on site to have full access to SSI systems and tools. Covers LTE routers, firewall, switches, access points etc. <u>Note:</u> This is about a commissioning WLAN and not about the permanent network infrastructure. Depending on the interface list in the offer, this can even be the customer's responsibility, in which case the PMA, as the highest authority, is required to demand this for everyone. Otherwise he buys an LTE router and is fine.	PMA, Internal IT

Items – Detailed Engineering up to QG 5 “Detailed Engineering completed”	Resp.
Office container facilities defined. This covers projector, CAD-workstations, printers, plotter for layouts etc.	PMA, IMA, MHEM, PMSW
On site marketing activities initiated, if required (SSI-banner, SSI coffee cups, SSI calendars etc.).	PMA, Marketing
Set of necessary documents defined which must be submitted prior start of installation (e.g., Health & Safety documents, method statements, risk analysis, specific requirements). Clarification supported by local entity/region. Information forwarded to all involved parties who are carrying out installation works / commissioning works – SSI internal and external parties). Link (BU LS): Template Health & Safety (HSE) Plan	PMA, SIM, Local Entity/Region
Set of personnel documents defined which must be provided by each individual working on site under the contract of SSI according to local requirements (e.g., copy of passport, certificate of medical check, insurance confirmation, working permit / registration, visa, safety certificates like IPAF, first aid certificate, FLT driving license etc.). Information forwarded to all involved parties who are carrying out installation works / commissioning works – SSI internal and external parties). PMA triggers the relevant coordination meeting(s).	PMA, SIM, Local Entity/Region, HR Responsible
Installation schedule (derived from project schedule) created together with IMA to prepare resource planning for installation team.	MHEM, IMA
Risk analysis with regards to machine safety for each sub-system (incl. 3 rd party machines, special constructions, workstations and interfaces) done (Excel file or Safexpert).	PEM, SLEM, SLEC, SLEE, CEM
System risk analysis including different interfaces between subsystems done (Excel file) <u>Note:</u> The templates for system risk analysis are in creation. CWA template TL-05361 will be available by Q3/2025.	SLEM, CEM, SIM
List of all complete and partly complete 3 rd party machines handed over to safety department to prepare the overall CE-declaration or declaration of incorporation (for complete 3 rd party machines a CE declaration must be delivered by the supplier – e.g., strapping machine). IMPORTANT: In order to provide a CE declaration of conformity, the documents in CL-00619 CE Required Documents are in the responsibility for completeness and correctness by the assigned employee.	SIM, OHP, CEM

Obligatory Outputs QG 5

(refer to CWA [QG 5](#) for details)

Documents:

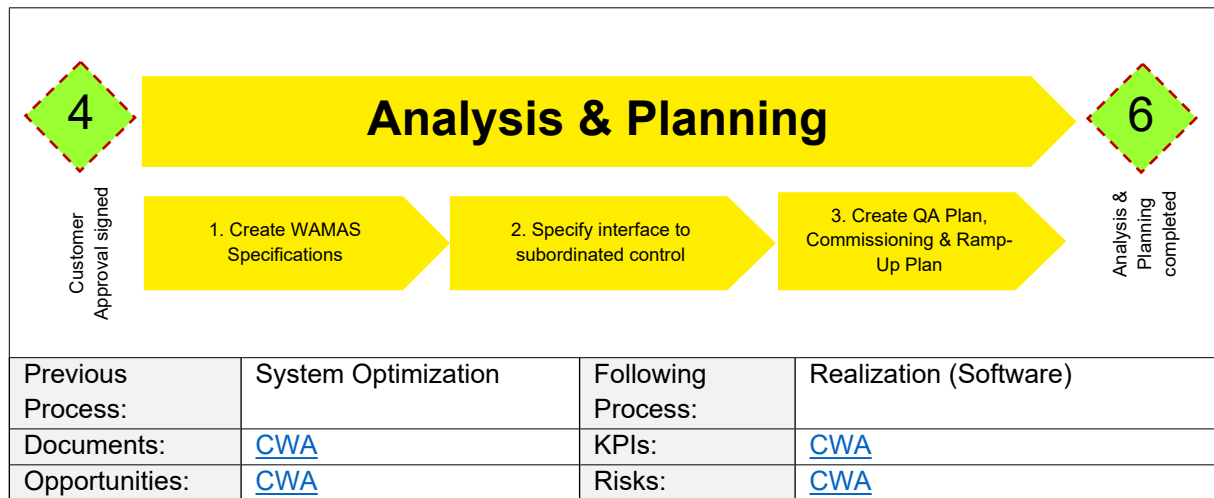
- System risk analysis (Excel file or Safexpert) including different interfaces between subsystems done

- Safety Matrix and/or Emergency stop protocol created (Emergency stop planning done; special requirements considered if applicable)
- Building site equipment layout created, and aligned with all partners
- Finished list of devices needing network

Results:

- Complete set of planning documents (EPLAN, layout with sensors etc.)
- Parts-lists Mechanic created, and released to ERP system
- Parts-lists Electric created, and released to ERP-System
- Creation of initial spare parts offer triggered in CS Organization

16 IPM MACRO PROCESS: Analysis & Planning



Inputs:

- Defined System description with major processes
- Material flow chart
- Simulation of Material flow is conducted and accepted

The main purpose is

- To have a detailed understanding of the customer's business
- To write the specifications (functional and interface specification)
- To estimate the work needed
- To plan time, cost, and resources adequately
- To create the QA Plan, Commissioning Plan & Ramp-Up Plan

A failure to adequately plan greatly reduces the project's chances of successfully accomplishing its goals.

Process steps:

1. Based on the inputs from the system optimization phase, the project content and scope is clarified and defined in detail. The results of the clarification are the basis to write the IT specifications, where it is taken care of the customers' business, and the clarification and coordination of the definite customer requirements. The described IT specifications (e.g., customer process description, interface description to the HOST system) must contain a sufficient level of detail for the customer, so that the customer knows exactly what SSI is delivering. The risk of wrong steps in software configuration and development is minimized as a technical review of the IT specifications is done by Quality Assurance. If necessary, specifications are revised according to the feedback.
An internal process review of the customer process descriptions is conducted to ensure the process consistency and a sufficient level of detail. Moreover, a review from the customer takes place, to ensure that the customer's needs are covered. After a successful review the customer must sign the specification.
2. The specification of the interface to the subordinated control is essential to provide details for MFS development which results in minimized risk of wrong steps in software configuration and MFS development. Especially, the following items must be defined:
 - Transport unit types
 - Barcodes and labels
 - Storage locations

- Subordinated control points
- Transfer points
- Network overview
- Telegram specifications
- PLC Datasheet (for SMC, Exyz etc.)

3. The Commissioning Plan, Ramp-Up Plan and customer needs for operations are discussed, described, and revised by the customer. The QA Plan is created and documented.

Output:

- The customer's business, the project content and scope are understood.
- The specifications are completed, reviewed, and signed by the customer
- Processes specification
- HOST Interface specification
- The specification of the interface between MFS and PLC is coordinated and described.
- The detailed schedule is available (realization plan, training plan, commissioning plan, Ramp-Up plan, QA Plan)
- Work orders are determined and planned in detail.
- IT Hardware / Server & Network specification is done
- Procurement of IT Hardware / Server procurement was triggered
- VPN settings are defined
- Ramp Up Plan is defined
- GUI screens for non-standard dialogues are approved
- QA Plan & KPIs are defined
- Customer trainings are defined & training documents compiled
- Visualization system is specified and approved
- Requirements set up in Jira

17 QUALITY GATE 6 - Analysis & Planning completed

Target:

The detailed Logistics, Operations, Ramp-Up specification, as well as the QA Plan and the detailed specifications have been completed, approved, and signed by the customer (optional for P&E projects). There have not been any major changes to the scope which prevented costly adaptations in "Detailed Planning" and "Production" process steps.

Previous process step:

Analysis & Planning

Items – Analysis & Planning completed up to QG 6 "Analysis & Planning completed"	Resp.
All customer business processes defined in IT specifications.	PMSW
All material flows specified including IT implications. Minor modifications in layout considered.	PMSW
Host Communication Protocol (interface) specification signed.	PMSW
IT specifications approved by customer.	PMSW
Detailed planning of interfaces between MFS and PLC done and documented in <ul style="list-style-type: none"> MFS PLC Interface Specification (MPIS, Description of the telegrams) Communication Point Overview (Schematic image of the system with all reporting points and direction marks including project-specific comments) 	PMSW
Note: In case no Software Realization but SWAN is involved in the project, the MPIS is created by SWAN.	
Server specification done (including server for visualization system – WAMAS Control Center). Details on server sizing, hardware offer and license calculation, as well as the installation of customer systems find in WI-00523 Offer customer system . General procedure: <ul style="list-style-type: none"> Generate a service request for IT Systems via Jira Project Jira Projekt SUPPITSYS (may be also be done already by IT Sales Consultant) For LS projects provide a Jira Issue in the respective LS Jira customer project for working on the server order and implementation and assign it to the Team Leader IT Sys Operations Team e.g. Hofer Lieboch: https://jira.ssi-schaefer.com/browse/AT2000036-460	PMSW, (SIM*), SLEC, PES, IT Sys Admin
* In case of WAMAS Control Center Server only (no Software Realization involved) the responsibility lies with the SIM. In this case, the server is usually provided by the customer or external IT suppliers. There is a specification of the product where the requirements are defined → "System Requirements (Runtime only)" (see Confluence). This is then to be passed on to the customer or external IT suppliers.	
Please be aware to forward the correct specification according to the WAMAS Control Center Release used in your project!	
Server for WAMAS and visualization system (WAMAS Control Center): <u>If supplied by customer:</u>	PMSW, (PMA*), PMA, SLEE

Items – Analysis & Planning completed up to QG 6 “Analysis & Planning completed”	Resp.
<p>Server specification sent to customer including date when server must be available on site.</p> <p><u>If supplied by SSI:</u> Server to be purchased and part list for additional material (rack, switches, cables etc.) created.</p> <p>Details on server sizing, hardware offer and license calculation, as well as the installation of customer systems find in WI-00523 Offer customer system.</p> <p>* In case of WAMAS Control Center Server only (no Software Realization involved) the responsibility lies with the PMA.</p>	
<p>VPN settings defined and aligned with customer (also in terms of IT security). PMA provides customer contact details for VPN clarification.</p>	Network Admin, PMA, SLEC
<p>Definition of acceptance procedure done and confirmed by customer (scope of supply, performance, functionality, availability).</p>	PMA
<p>Ramp up plan defined together with customer.</p>	SIM, PMSW
<p>GUI screens defined and approved by customer (within IT specification).</p>	PMSW
<p>All Software relevant topics clarified with 3rd party components and taken into consideration in WAMAS specifications.</p>	PMSW
<p>KPIs defined and agreed with customer for external acceptance (e.g., picked pieces or lines /h) including conditions (e.g., order structure).</p>	PMSW, SLEC
<p>Software test strategies defined – e.g., in-house component integration tests between MFS and PLC for certain functionalities (e.g., for order start, sequencing, new developments etc.).</p>	PMSW, SLEC, QAM
<p>Under the responsibility of the SIM, the QA plan (TL-03145) is created and developed in detail as follows:</p> <ul style="list-style-type: none"> • SLEC for Controls • QAM for WAMAS • MHEM for purchased components • SIM for external subsystems <p>Shared activities are planned jointly.</p> <p>The prerequisite for QA plan creation is the review of all documents regarding contractual specifications concerning quality-relevant activities.</p> <p>If it is necessary that Installation and/or Controls resources are on-site during UAT this must be also defined in the QA plan.</p> <p>Details can be found in process “Analysis & Planning”, process step “Create QA Plan”.</p> <p>The high-level descriptions of the test levels and test level implementations are documented in the QA Glossary.</p> <p>Further information can be found in the “Global QA Knowledge Base – QA in Project Realization” in Confluence (QA best practice, knowledge, tool, standard test cases).</p>	SIM, AIM, SLEC, QAM, MHEM, PMSW, PMA
<p>Measuring points for verifying KPIs defined.</p>	PMSW
<p>For A-projects CS (service GC) is informed to be able to plan resources for being on site during user acceptance tests.</p>	PMA, CS

Items – Analysis & Planning completed up to QG 6 “Analysis & Planning completed”	Resp.
Customer trainings concept defined (user manual for key-user).	PMSW
Commissioning (Software) phase planned and aligned with project schedule.	PMSW
Ramp-up (Software) phase planned and aligned with project schedule.	PMSW
Visualization system (WAMAS Control Center) specified and approved by customer.	PES , PMA
Provided CS component list in HOPS Online to SOM (according to HOPS QG 5 + 2 weeks) Note: CS takes over the contact level and the first level support at Go Live.	PMA

Obligatory Outputs QG 6

(refer to CWA [QG 6](#) for details)

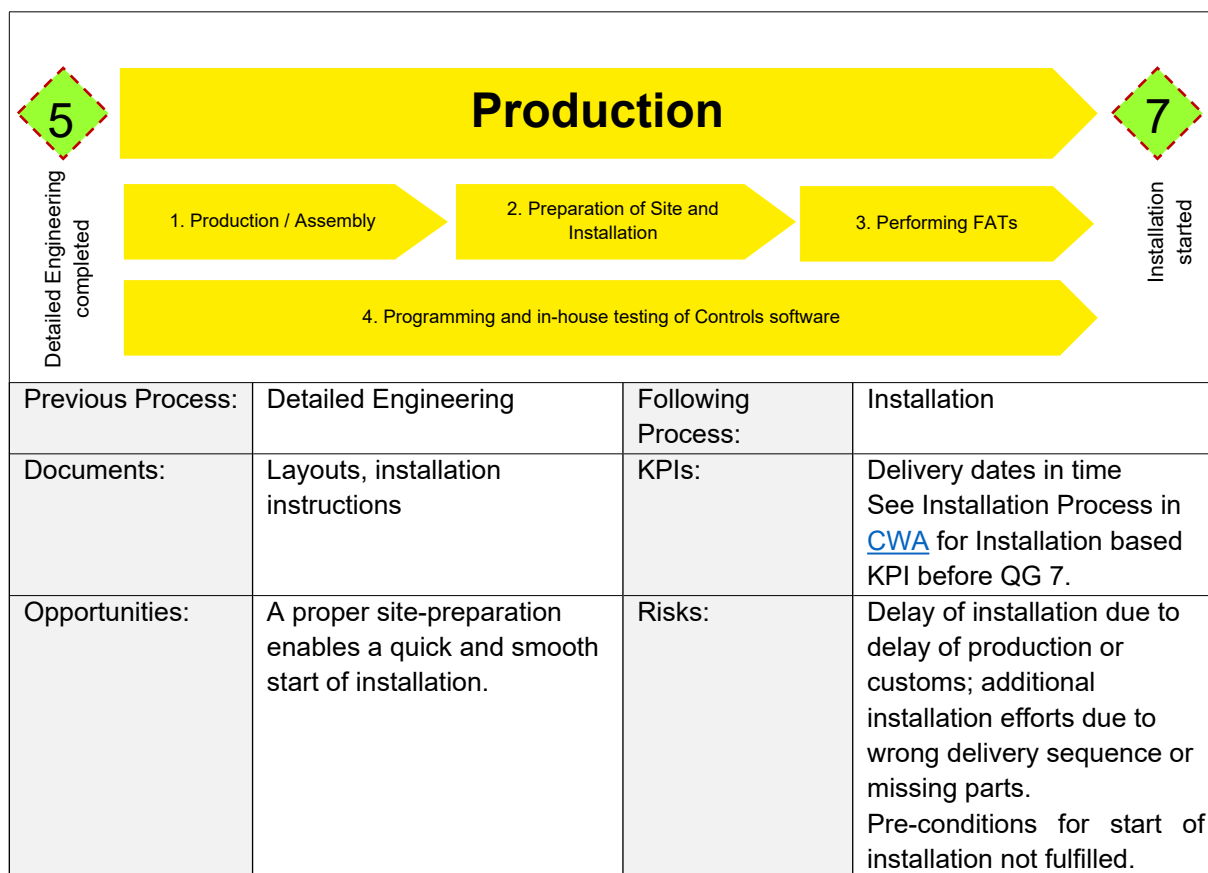
Documents:

- WAMAS Specifications (= Functional Specification WAMAS and Host Interface Specifications) signed by customer
- Detailed planning of QA activities done (= QA Plan created) and coordinated internally and on demand with the customer
- MFS PLC Interface Specification (MPIS, Description of the telegrams)
- Communication Point Overview (Schematic image of the system with all reporting points and direction marks including project-specific comments)
- Commissioning plan (including training plan) was designed, and coordinated internally and with the customer ([TL-00589-EN](#) / [TL-00589-DE](#))
- Ramp-up plan was created, and coordinated internally and with the customer ([TL-00610-EN](#) / [TL-00610-DE](#))
- WAMAS WMS/MFS & WCC: IT Hardware designed and procurement triggered (server and other devices relevant to the software solution)
- WCC only: Server designed and procurement triggered

Results:

- Complete CS component list (in [HOPS Online](#))
- Warehouse modeling and configuration data was generated and coordinated with the customer

18 IPM MACRO PROCESS: Production



Input: Part-lists and layouts have been transferred in time to production department resp. to suppliers.

Process steps:

1. Assembly drawings for production are created. All components / modules are produced according to project schedule. Production progress of key-components and 3rd party components is monitored. The shipping documents are prepared including unloading conditions on site.
2. The site is being checked and prepared for installation phase (according to specification of building site equipment): Office containers, tools, lifting equipment, power distributors etc. are organized, if required. Installation team is settled. Relevant documents for the installation are being prepared and ready for sign-off. Stock and storage management is being organized for the site. All relevant layouts (e.g., detailed layouts etc.) are run through last inspections prior to being handed over to the installation team within installation meeting. All relevant planning documents are prepared and handed over to Controls to enable start of programming PLC code.
3. The FATs are performed and accepted by customer.
4. Simultaneously to the production phase the PLC software is programmed.co
Based on the complete set of planning documents from engineering department the PLC source code is generated (e.g., with PTC). The PLC software is tested in-house by use of jSim and WAMAS Control Center.
For PCX controlled machines the software is programmed and in-house tested.

Output:

- All components produced; readiness for installation given.

19 QUALITY GATE 7 – Installation started

Target:

All internal and external components have been produced according to the detailed specifications. There have not been any major changes to the scope that caused costly adaptations. The site clearance has been assured by the customer.

Previous process:

Production

Items – Production up to QG 7 “Installation started”	Resp.
<i>Production / Assembly</i>	
Assembly drawings for production created and sent to production.	PEM
Monitoring of production progress of key-components and scheduled delivery dates confirmed. Keep SIM informed and up to date during the whole project. <u>Note:</u> In case of collisions or conflicts between the subsystems the SIM must finally decide on the further procedure.	MHEM, SIM
Shipping lists (= Lieferscheine) stored on the project document management system (TeamDoc).	Shipping MHEM
All relevant documents for shipping clarified and prepared.	Shipping, PMA
Components / modules produced including inspection certificates (e.g., for electrical panels).	Production, QA
<i>Preparation of Site and Installation</i>	
3 rd party installation guides ordered and stored in TeamDoc under the respective supplier folder under "Supplier Exchange" at least in English and the customer language; and in German, if German project participants.	MHEM, IMA
Technical Site Manager Declaration Global (TL-00493-EN) / Fachbauleitererklärung Global (TL-00493-DE) created (acc. to local standards) and stored in DMS. IMA ensures, that ISVM/ISVE and Supervisors of third party suppliers sign the document.	IMA
Set of defined documents necessary for start of installation created, compiled and ready to be submitted (SSI internal and external parties). Submission of complete documents done by PMA.	IMA, PMA, SIM, OHP
Installation team settled. Working permits / visa organized.	IMA, MHEM
General travel arrangements (e.g., agreement for long-term stay with hotels, rental agreement for apartments etc.) organized. Information shared within SSI group.	PMA, MHEM
Travel arrangements / bookings for installation team done (hotels, flights, rental cars) from “Global Mobility” / “Service Center”.	IMA, HR Responsibl, Travel Manageme nt

Items – Production up to QG 7 “Installation started”	Resp.
Site conditions checked, site clearance assured by customer, readiness for installation given in accordance with site clearance protocol (handover conditions of building defined). Site clearance protocol (EN / DE) sent by the PMA via email to IMA, SMA, ISVM, ISVE and site clearance protocol stored in TeamDoc.	PMA , SIM, SMA, IMA, ISVM, ISVE
All relevant layouts (e.g., detailed layouts etc.) handed over to installation team.	PEM , PEE, IMA, SMA, ISVM, ISVE, MHEM
Meeting with installation team done (technically and organizationally).	IMA , ISVM, ISVE, PEM, PEE, PEC, SLEC, MHEM, SLEM, SLEE
Site facilities available (storage area, office containers, tools, consumables, lifting equipment, power distributors, waste containers etc.) in accordance with “building site equipment layout”.	PMA , MHEM, SMA
Installation team arrived on site to prepare installation works.	IMA
Before the start of the installation, the customer hands over the storage areas for the installation material of the subsystems to the Site Manager. These areas are defined with the customer in advance, according to WI-01055 Definition Storage Area BCS, OCS, PCS, Shuttle Systems , by the MHE Manager (for each subsystem) and PMA overall. The Site Manager checks whether the requirements are met.	SMA , ISVM, ISVE, PMA, MHEM
On-site network infrastructure established and tested (access to Internet, SSI systems and tools). See checkpoint in Site Clearance Protocol (EN / DE).	PMA , Internal IT
Construction sign, SSI-banners, signs for trucks installed.	SMA , PMA
Set of individual documents checked (from each person by arrival on site) under consideration of the privacy policy.	ISVM , ISVE, SMA
MHEM collects the information about who comes to the construction site for his subsystem and passes it on to the SMA.	MHEM , SMA
Communicate and coordinate required site-specific safety inductions to all entities (SSI internal and external) that are on-site during the installation phase. <u>Note:</u> Working-specific safety trainings to be done by each entity (e.g., working at height certificate).	SMA , PMA, SIM, MHEM, IMA, PEC, PMSW
Training concept for the customer created (participants, pre-conditions, scope, dates etc.), i.e., training plan incl. training protocol(s). If a standard is already available, use that standard (to avoid longer discussions with the customer).	PMA , SIM, MHEM, PMSW, PEC
Performing FATs* <i>* If FAT not included in the contract, it might not be necessary, depending on the scope of the Software</i>	
FATs successfully performed and approved by customer.	PMA , PEM, PEC, SIM

Items – Production up to QG 7 “Installation started”	Resp.
FATs at 3 rd party suppliers performed and approved.	PMA, PEM, PEC, SIM
<i>Preparation of performance tests</i>	
Performance test protocol for components created and handed over to PEC. Standard templates (if available) can be found in the CWA folder .	MHEM , SIM, PEC
Availability model defined, if sold (weighing factors, procedure for error recording, observation period, filter for operational caused errors, downtimes relevant for calculation etc.).	PMA
<i>Programming and in-house testing of Controls software</i>	
Controls software created (e.g., PTC) and in-house tested (jSim). -> Controls Test Execution Templates & How To Currently the jSim elements for simulating bin and pallet conveyor systems are available (available jSim elements)	PEC
The test cases for PLC must be handled in Jira (i.e., description of TCs, test status, processing of tests).	
Visualization system (WAMAS Control Center) configuration finished and tested in-house by Controls.	PES , SLEC, PEC, PMA
See also QA Glossary -> In-House Visualization Test.	
All test levels implementations of “In-house Component Integration Tests” (i.e., Controls only, WAMAS only, Controls & WAMAS), to be executed.	PMSW , SLEC, PEC
There is a test level implementation “i.H. Integration Test SOC/MFS” per control area defined and planned.	
The Controls software of each control area (subordinate control) is connected to the WAMAS software via jSim (or equivalent simulation tool).	
See also QA Glossary -> In-House Integration Test SOC/MFS.	
After the test level implementations for the specific control area have been executed successfully the Controls software is released by the PMSW for each control area.	
<i>RM Team</i>	
CS RM Team is planned to be on-site at least starting from QG 8. If no RM Team is planned for the project, the responsible customer service organization (= legal entity) has been nominated to ensure know-how transfer.	CS , RMM

Obligatory Outputs QG 7

(refer to CWA [QG 7](#) for details)

Documents:

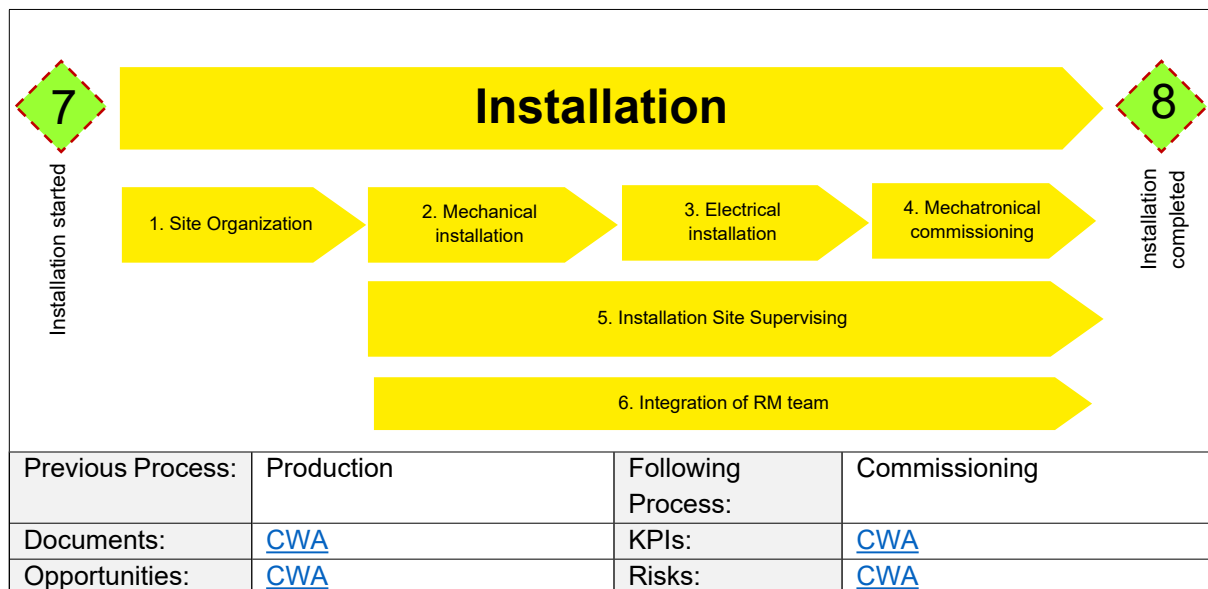
- Defined availability model (if availability is sold)
- 3rd party installation guides for the installation stored in the DMS
- Site clearance protocol filled out and handed over from PMA to IMA. ([CL-00617 Site Clearance Protocol](#) (EN) / [CL-00617 Site Clearance Protocol](#) (DE))

- Risk Assessments and Method Statements for Installation Team
- Performance test protocol for components created and handed over to PEC

Results:

- Layouts and parts lists for the installation linked in the DMS
- On-site network infrastructure established
- Health and Safety documents for Installation Team
- The CS RM Technicians must be planned to be on-site at least starting with QG 8. If no RM Team is planned for the project, the responsible service provider has been nominated to ensure know-how transfer.

20 IPM MACRO PROCESS: Installation



Input: Readiness for Installation given (conditions of building, facilities, etc.). Installation guides in DMS (3rd party in [TeamDoc](#), other: SharePoint – Collaboration), layouts and part lists in DMS. Material, tools, measuring-devices, safety equipment, auxiliary equipment delivered to site. Risk assessments and method statements are prepared.

Process steps:

1. The site manager is doing the registration and introduction to the responsible customer on-site manager. Site facilities are set up (office containers, storage area etc.). The site manager is instructing the installation personnel in his responsibility in terms of health and safety and general on-site rules according to the specifications of the occupational health and safety practitioner and customer. The site manager is responsible for overall health and safety execution and is collecting all relevant documents from all installation parties and personnel working for SSI onsite during the installation phase. The auxiliary equipment provided is checked for completeness and function, if applicable using a protocol, and their acceptance is confirmed. Safety equipment is inspected on expiry date and visual damages by the owner.
2. Incoming deliveries are unloaded, checked on completeness (colli level). Installation progress is reported weekly. Additional works and resulting issues are documented. Relevant open issues are reported in issue tracking system (e. g. Jira) by site manager/site supervisor. Each site supervisor is tracking and solving open issues in his responsibility. Weekly team meetings take

place to coordinate staff, timeline, material, and quality of work. Missing and/or necessary additional material is ordered. Accidents on site are reported to occupational health practitioner, the Installation Operations Manager and Project Manager. Site manager is doing regular site inspections together with the customer to check general implementation (position of floor fixings, maintenance access, installation of cable trays, potential collisions with building components etc.). Relevant information is documented (e.g., site inspection protocol). Return deliveries are prepared subsequently at the end of mechatronic commissioning. General status, installation progress as well as open issues are coordinated with Installation Operations Manager on a weekly basis. The Installation Operations Manager is controlling the installation progress of the respective subsystem in terms of relevant manpower, quality, and timeline. Installation Operations Manager is adjusting manpower of installation staff accordingly.

3. Components including 3rd party components are being delivered, checked for completeness, and mechanically installed according to installation guides, project schedule and layouts. All defined measurements are done (e.g., tolerances of steelwork for miniloads). Mechanical safety devices (e.g., fence, railings) are installed.
4. Electrical installation is executed according to installation guides, project schedule and layouts (EPLAN, assembly plans). Electrical safety devices (e.g., emergency stops) are installed. VPN / internet connection is set up according to SSI specifications.
5. All defined electrical installation measurements and inspections are executed according to defined standards. Engineering is checking and confirming the correctness of the measurements. For each control area (FAST) the hardware configuration and the lists of I/O variables are handed over to the electrical installation team. All safety devices (e.g., emergency stops) are electrically tested and documented (safety matrix for Safety PLC; Test protocol - Safety functions). The mechatronic commissioning is executed based on mechatronic commissioning instructions and handover protocol (currently available for BCS, OCS, Cuby) for each control area (FAST) including all internal components and 3rd party components. All modifications are documented according to as-built progress. Necessary technicians for support of 3rd party components are on site. The installation team supports the PLC commissioning team for two weeks (all open points must be solved) in order to rectify defects quickly. At the end of installation process, the completeness of delivery is checked and documented (by project manager) together with the customer (preparation for acceptance).
6. All necessary preparation works are carried out in order to integrate the RM team on site. RM team is trained in accordance with CS training procedures.

Note:

Each subsystem has a site supervisor. The Project Lead needs to assign a site manager, who is coordinating all site supervisors of suppliers (internal suppliers, 3rd party suppliers) according to interface list.

Output: System ready for Controls commissioning. Open issues are continuously tracked in Jira.

21 QUALITY GATE 8 – Installation completed

Target:

The installation team has received all documents and deliveries in the correct sequence and in time. The installation has been finished and mechatronical commissioning of all modules has been executed. The mechatronical system has been handed over to the Controls commissioning team according to Handover Protocols Installation to Controls *Subsystem*. Trained RM-team has been integrated on-site.

Previous process:

Installation

Items – Installation up to QG 8 “Installation completed”	Resp.
Site Organization	
Registration and introduction of the site manager, the Installation Supervisor Mechanics and Installation Supervisor Electrics to customer on-site manager.	PMA, SMA, ISVM, ISVE
Ensure that safety instructions are executed for the entire Installation personnel working under the contract of SSI. Procedures for first-aid, rescue from height, on-site medical assistance defined. Note: Necessary certificates (e.g., working at height, rescue from height etc.) to be provided from each party carrying out such installation works.	SMA, PMA, OHP, RM
Instruction of installation personnel of the respective subsystem in terms of health and safety and general rules executed.	ISVM, ISVE, IMA, MHEM
Personal protective equipment (PPE) available (helmet etc.) for SSI installation personnel.	IMA, MHEM, ISVM, RM
Material within the scope of supply of the subsystem received by ISVM / ISVE. Completeness of material on site checked (where possible on colli level), prepared, and sorted for installation.	ISVM, ISVE
Auxiliary equipment and tools received and acknowledged.	ISVM, ISVE
The Installation Supervisor Mechanics / Installation Supervisor Electrics makes sure that the assigned installation personnel have the prescribed PPE at their disposal and arranges for a visual inspection to be carried out to ensure that the personal safety equipment is functional and in good condition.	ISVM, ISVE
Site Management	
On-site Coordination The Site Manager coordinates all on-site installation activities included in the scope of delivery from SSI Schäfer, considering the coordinated overall schedule, the interfaces to the customer/construction and external 3 rd party components. He is responsible on site for overall priorities in terms of project success and ensures that installation runs smoothly and in an orderly manner. The site status is reported in the site report (template TL-03560) and picture report (template TL-03561).	SMA, PMA
On-site Health and Safety management The Site Manager ensures in his area of responsibility by collecting and checking the relevant documents that the legal requirements regarding health and safety, including personal protective equipment, are complied with. This is done in consultation with and as directed by the Occupational Health and Safety Practitioner. The individual	SMA, PMA, OHP

Items – Installation up to QG 8 “Installation completed”	Resp.
subsystems/departments/external companies are responsible for coordinating their specifications with their Occupational Health and Safety Practitioner and for complying with the specifications and must provide the Site Manager with the relevant documents. The Site Manager requests the necessary safety instructions from all persons on site and regular follow-up instructions according to specifications.	
Installation Site Supervising	
Weekly installation progress documented and reported.	ISVM, ISVE
Additional works and resulting issues documented.	ISVM, ISVE
Relevant open issues reported in issue tracking system (Jira).	ISVM, ISVE, SMA
Weekly team meetings held in order to ensure adherence to schedule and quality.	ISVM, ISVE
Missing and/or necessary additional material ordered.	ISVM, ISVE, PEM, PEE, PMA
Accidents reported to occupational health practitioner, Installation Operations Manager and PMA.	ISVM, ISVE, OHP, IMA, PMA, MHEM
Regular site inspections together with the customer done to check general implementation (position of floor fixings, maintenance access, installation of cable trays, potential collisions with building components etc.). This is documented e.g., in an inspection protocol / installation protocol.	SMA, ISVM, ISVE, SIM, MHEM
Preparation of return delivery (material, packaging etc.). e.g. for Graz the guideline “Decision support for return deliveries” is valid	ISVM, ISVE
Coordination of general status, installation progress and open issues.	IMA, ISVM, ISVE
Adherence to schedule, quality and budget is coordinated regularly between ISVM/ISVE and IMA.	IMA, ISVM, ISVE
Adjusting manpower of installation personnel (SSI and subcontractors) according to progress.	IMA, ISVM, ISVE
CE Manager organizes the site visit to check all safety relevant topics in coordination with the PMA. <u>Note:</u> In case of commercial use of subareas of the system (phased go-live), there may have to be visits per subarea, as in this case it is mandatory to have a CE declaration on QG 12 signed by the CEM for each subarea of the system.	CEM, PMA
CE site inspection: Identify open issues in the area of safety at an early stage; if needed, CEM creates “Project Issues”, and assigns them to the PMA. For details on the decision tree CE Site Inspection / photo documentation refer to GL-02932 . <u>Note:</u> The open issues must be clarified and closed at latest at QG 12.	CEM, SMA, ISVM, ISVE, PMA, MHEM

Items – Installation up to QG 8 “Installation completed”	Resp.
<i>Mechanical installation</i>	
Mechanical installation completed in accordance with drawings, layouts, and schedule.	ISVM , IMA
All defined mechanical measurements documented (e.g., tolerances according to FEM) and checked.	ISVM , PEM, MHEM
Mechanical safety equipment correctly installed (fences, railings etc.). E.g., distances according to the checklist Safety light grids PCS were checked	PMA, SIM, ISVM
All PPE-attachment points installed, checked, and documented, if necessary (e.g., storage-retrieval machines and pallet conveying system).	ISVM , PMA, SIM, RM
Spare parts on site and registered (at least starter kit if final spare parts package not agreed yet).	CS , PMA, RM
Spare parts package (SSI and 3 rd party components) ordered by customer (to be on site at QG-11).	CS , PMA
<i>Electrical installation</i>	
Electrical installation completed in accordance with electrical plans, layouts, and schedule.	ISVE , IMA
Connection of the grounding points to SSI subsystem done.	ISVE
All electrical safety devices (e.g., emergency stops) installed.	ISVE
WLAN and Network are available and functional onsite.	SIM
VPN connection (to server and PLCs) is successfully running according to SSI specification.	Network Admin , PMSW, SIM, SLEC
<i>Mechatronic commissioning</i>	
Power supplies and compressed air available.	PMA
Full range of defined transport units (dimensions) and barcodes available – according to transport unit drawing.	PMA
All defined electrical installation measurements and inspections executed according to defined standards (electrical installation, ProfiNet, ProfiBus, etc.).	ISVE , IMA, PEE, PMA
Correctness of electrical installation measurements checked and approved by PEE	PEE
PLC software handed over to Software Realization for each control area by PEC and released by PMSW for the Controls commissioning on-site e.g. per email with ok on the test end report “In-House Integration Test SOC/MFS”.	PEC / PMSW , LDP
<u>BU CS:</u> PLC software handed over to Software Realization for each control area by PEC and released for the Controls commissioning on-site.	
For each control area (FAST) the hardware configuration and the lists of I/O variables are handed over to the electrical installation team.	PEC , ISVE

Items – Installation up to QG 8 “Installation completed”	Resp.
For each control area (FAST) the safety PLC program and the lists of I/O variables are handed over to the ISVE. <u>Note:</u> The commissioning PC is an advantage (but CPM also works on any laptop).	PEC, ISVE
PLC program and Safety PLC program deployed to CPUs. Remote support by PEC as defined in the according work instruction in folder Interface Definition Installation/Controls .	ISVE, PEC
In case of safety relays: All safety devices (e.g., emergency stops) are electrically tested (incl. functional tests). In case of safety PLC: The I/Os of all safety devices are checked by ISVE. The functional test is done by PEC."	ISVE, PEC
Documentation of modifications handed over to PEM / PEE (layout modifications, EPLAN modifications etc.).	ISVM, ISVE, IMA, PEM/PEE
Technicians for the support of the commissioning of the 3 rd party components arrived on site.	PMA, ISVM, ISVE, PEC
Mechatronic commissioning executed (incl. 3 rd party products). Handover from Installation to Controls commissioning team for each control area done and where applicable, confirmed in Handover Protocol Installation to Controls <i>Subsystem</i> (Link to available handover protocol templates). Handover Protocols Installation to Controls <i>Subsystem</i> stored in DMS and confirmed by <i>Controls</i> . If necessary, open issues are reported in issue tracking system Jira.	ISVM, ISVE, IMA, PEC, MHEM
Labelling of system done, including safety labels (e.g., components, aisle labelling of mini loads, load label for racks and mezzanines etc.).	ISVM, ISVE
On site Controls / Software Realization team settled. Working permits / visa, health and safety documents organized. Travel arrangements / bookings done (hotels, flights, rental cars).	SLEC / PMSW, PEC, PMA, HR Responsible, Travel Management
If in project scope: Maintenance devices and spare parts available (e.g., device for replacement of mini-load or SCS drives).	SIM, PMA, MHEM, RM
Completeness of delivery confirmed by customer (acceptance of physical completeness of scope of supply).	PMA, SIM
Status and condition of SSI internal and third-party components regularly checked.	SMA, SIM
Leakage test of piping to air distributors of SSI done by supplier must be confirmed by the PMA.	PMA
Configuration of visualization system (WAMAS Control Center) finished and available on site.	PES
Hardware (server system) configured and available on site.	IT Sys Admin, PMSW, SLEC

Items – Installation up to QG 8 “Installation completed”	Resp.
<i>Integration of RM team</i>	
RM-Manager introduced to the SSI Schaefer structure, as well as to the onsite project team and the customer organization. SSI On-boarding process has been executed.	CS, RMM
RM team introduced to the onsite project team, especially to ISVM, ISVE and to PLC engineers.	RMM
RM team received the CS internal basic training (in-house training & on-site practice at CS site(s)) incl. all necessary Planet Learning certifications. A detailed on-site training plan has been set up by CS, in alignment with ISVM, ISVE and Project Manager.	CS, RMM, PMA

Obligatory Outputs QG 8

(refer to CWA [QG 8](#) for details)

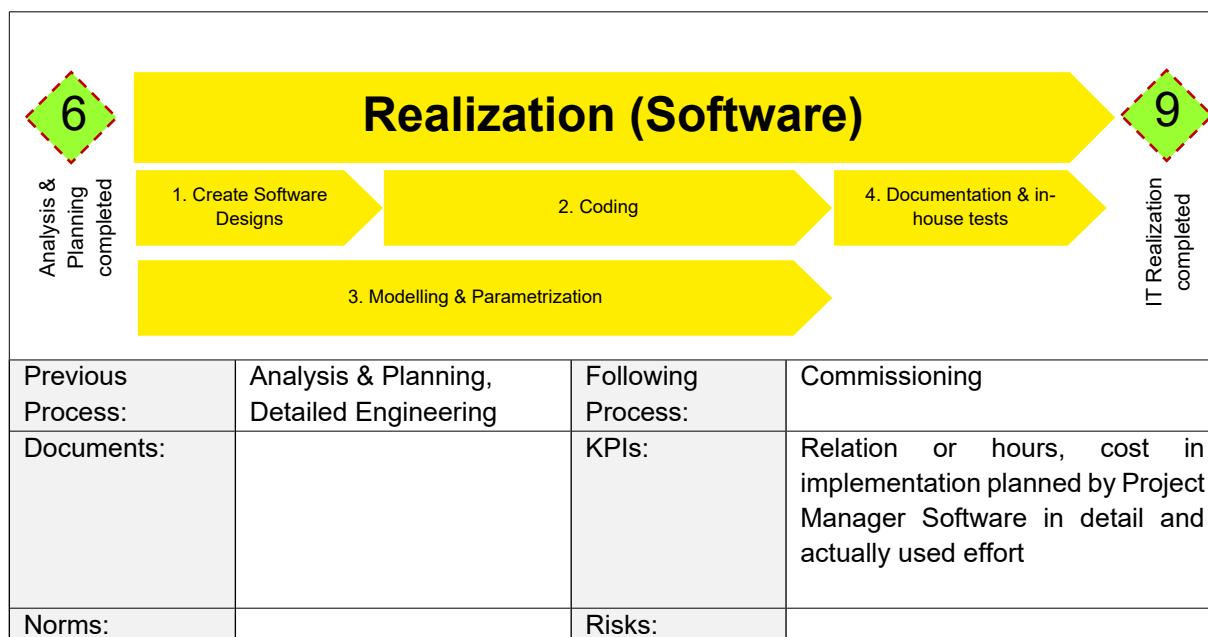
Documents:

- Handover Protocols Installation to Controls *Subsystem* acc. QA Plan (= mechatronical test)
 - Approved electrical installation measurement protocols
 - * In-House Component Test Controls & In-House Component Integration Test Controls: Test end reports of the test level implementations acc. QA Plan (PDF or Jira issue), e.g. test end report of “In-House Integration Test SOC”
 - * In-House Component Integration Test Controls & WAMAS: Test end report of the test level implementation “In-House Integration Test SOC/MFS” acc. QA Plan (PDF or Jira issue)
- * If the test end reports are documented in a Jira issue, the output is a result, not a document.
- Weekly installation progress reports: Site Report + Picture Report

Results:

- PLC software released after successful “In-House Integration Test SOC/MFS”
- Health and Safety documents for Controls commissioning team
- Spare parts on site and registered (if in the project scope)

22 IPM MACRO PROCESS: Realization (Software)



Input:

- Signed WAMAS Specifications incl. Network & Server specification as well as approved visualization system
- Specification of interfaces to subordinated control (MPIS)
- Requirements

The Realization consists of the processes needed, to complete the defined work out of the project plan in order to accomplish the customer's requirements. Coordinating people and resources, as well as integrating and performing the activities of the project in accordance with the project management plan are included in this process phase. The main purpose is to create and test the software in accordance to the customer requirements as well as modelling and parametrizing the system. In huge projects software development can be divided in several cycles, where each cycle has its own testing phase. The internal release test represents a very important step.

Process steps:

1. By creating the WAMAS Specification the customer's requirements as well as the solution are described within requirements. Due to this description Software Development can create software designs where designing decisions are comprehensibly written down. Moreover, Software Development creates developer test scenarios for all requirements.
2. The warehouse is modelled, and the system is parametrized in a two-stage process, starting with initial modelling and parametrization in order to get real data for software developer testing. After successfully conducting the software developer tests the warehouse modelling and the system parametrization is adapted, when necessary, with the target of having the complete relevant modelling data as well as relevant parameters in a system.
3. The software coding is done parallel to modelling and parametrization. When modelling and parametrization activities finished the first stage, the created software developer test cases are conducted before finally building the WAMAS software version.
4. After finishing coding, WAMAS release tests must be prepared and conducted as well as testing the interfaces. Moreover, the WAMAS documentation is created and other relevant documentation for commissioning and training is prepared.

Output:

- Defined hardware available on site
- The required configuration is implemented and documented
- Software design documents
- Requirements are implemented in the source code according to the specifications
- Customer documentation
- Final version of source code documentation
- Test cases are completely performed, as required in the QA Plan
- Test end reports of the test level implementations
- Up-to-date test schedule for Commissioning (Software)

23 QUALITY GATE 9 – IT Realization completed

Target:

The software development has been finished and the quality assurance has successfully tested in-house according to the QA Plan. The WAMAS commissioning has been planned and the test cases are defined. Controls Commissioning is on track and the conditions for start of WAMAS commissioning are fulfilled (Installation team supports the Controls commissioning team for two weeks (all open points must be solved) to rectify defects quickly).

Previous process:

Realization (Software)
 Installation

Items – Realization (Software) up to QG 9 “IT Realization completed”	Resp.
Software development finished.	LDP
Software configuration finished.	LLC
Host communication interface successfully tested according to specification.	LDP
Preliminary version of software documentation finished.	LLC
Commissioning (Software) phase planned and aligned with project schedule.	PMSW
Test cases derived from WAMAS Specifications and assigned to test levels (created in Jira).	QAM , PEC
Test procedure specified to verify functionalities and performance on site.	PMSW , AIM
WAMAS test cases for overall system fully described, assigned to test levels, and scheduled in the project schedule.	QAM , PMSW, SLEC
WAMAS test cases for each sub-system described and scheduled in project schedule (including interfaces to HOST systems).	QAM , PMSW, PEC

Items – Realization (Software) up to QG 9 “IT Realization completed”	Resp.
All test level implementations of the In-House Component Integration Tests (Controls only, WAMAS only, Controls & WAMAS) verifying WAMAS and PLC via jSim executed (in-house).	SLEC / PMSW, PEC, LDP
In-House System test WAMAS (incl. “Release Test WMS/MFS”) done via ANTSIM and approved.	PMSW, QAM
Test end reports of the test level implementations created.	QAM

Obligatory Outputs QG 9

(refer to CWA [QG 9](#) for details)

Documents:

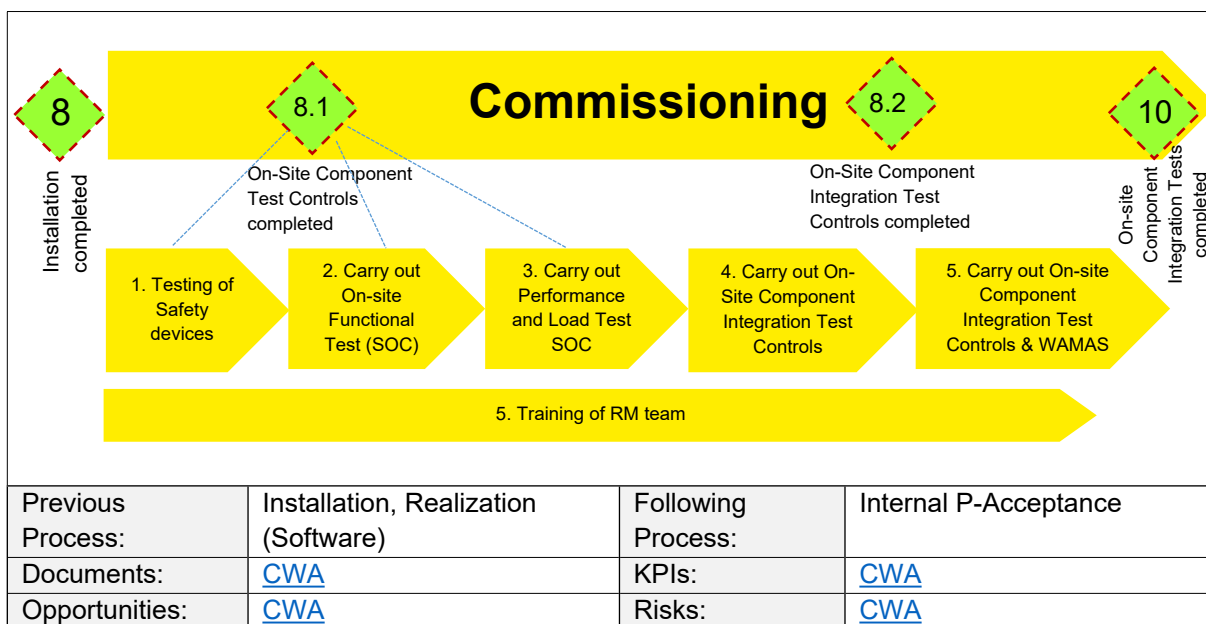
- * In-House Component Test WAMAS & In-House Component Integration Test WAMAS: Test end reports of the test level implementations acc. QA Plan (PDF or Jira issue)

* If the test end reports are documented in a Jira issue, the output is a result, not a document.

Results:

- Test Cases (also used for On-Site Component Integration Tests)

24 IPM MACRO PROCESS: Commissioning up to QG 10



Input: Installation of mechatronical system has been finished according to *handover protocols Installation to Controls Subsystem*. 3rd party components are integrated (QG 8). Working MHE components (QG 8.1 / QG 8.2), Working software according to specifications (QG 10)

The Commissioning is the process by which an equipment or facility is tested to verify if it works according to its design objectives or specifications.

The tasks and objectives of the commissioning phase are:

- Provide the complete system, ready for use
- Transfer the system into continuous operation in accordance with the contract/specifications
- Elimination of bugs and defects (deviation from the requirements) of the preliminary phases
- Training of the operating personnel
- Targeted know how transfer
- Optimization of the system
- Evidence of contractually agreed performance parameters
- Evidence of functionality, performance, and stability of the system
- Short commissioning time and low costs

Process steps:

Controls

On-site Component Test Controls:

1. All safety devices (safety PLC, emergency stop buttons, safety light barriers, limit switches, safety catch etc.) tested. Emergency stop areas checked according to electric planning. Coupling between emergency stop areas and to 3rd party components/machines tested. Visualization of safety devices checked.
2. Functional tests and performance tests for components (incl. 3rd party components) are executed. The performance is tested at designated measuring points according to Performance Test Protocol for components resp. schematic layout / material flow chart. Performance tests for ASRS executed according to defined double-cycle calculation. Tests are executed with entire range of transport units. Component tests are evaluated via visualization system (WAMAS Control Center).
3. Based on the successfully executed functional and performance tests, a load test within a sub-system (e.g., conveying system) is done with sufficient amount of transport units. The performance according to schematic layout and the availability of the sub-system is evaluated and documented in the visualization system (WAMAS Control Center). Errors which occurred during these tests are evaluated, analyzed, and corrected (evaluation of errors shown in visualization system (WAMAS Control Center)). RM Team resp. maintenance staff of customer to be integrated into these tests in order to gain experience (training).

On-site Component Integration Test Controls:

4. Overall tests between sub-systems (e.g., conveying system and miniloads) are executed. The interfaces (including safety) between the sub-systems are tested and all functionalities for the integration of the sub-systems are implemented. Finally, a load test between the sub-systems is done with sufficient amount of transport units.

Controls & Software Realization

On-site Component Integration Test (WAMAS, Controls & WAMAS):

5. Within the On-site Component Integration Tests (WAMAS and Controls & WAMAS) each WMS & MFS component is tested separately. After checking the preconditions, the tests are conducted by SSI Schäfer project team. Therefore, it is necessary to ensure that trained staff is appointed, or training is done in advance. Moreover, the correct display of the MHE components, conveyor occupations, system and error messages in the visualization system (WAMAS Control Center) are tested in collaboration with Controls as well as the communication to the HOST interfaces.

If the On-Site Component Integration Tests were run successfully, the On-Site System Test Controls & WAMAS follow up (see chapter 26 IPM MACRO PROCESS: Commissioning QG 10 to QG 11 & Internal Project Acceptance).

RM Team

6. RM team to participate in all relevant commissioning steps. RM and project team are working hand in hand as one team. RMM aligns with installation site supervisor, PLC engineers and project manager in order to make sure that RM team is well integrated in all relevant commissioning steps and successively run through the detailed on-site RM training plan. At the latest after Controls commissioning is finished, all RM technicians need to have executed the entire training plan. The RM team has to gain as much knowledge as possible. Therefore, the RM team shall not be used for simple/monotonous tasks on a regular basis. In case of urgency (e.g., necessary modifications or reworks) the RM team will support the project team. Such support requests must be communicated as soon as possible from the PMA to the RMM including expected efforts. The RMM is requested to report to the RM Contract Manager. RMM aligns on a weekly basis with installation site supervisor, PLC engineers and project manager in order to optimize the use of the RM technicians.

Note: Repetitive tasks (e.g., replacement of parts due to serial defects) must be covered by the project team.

Output: System is fully tested on Controls level (Controls tests) as well as the Component Integration Test Controls & WAMAS successfully completed. Functionalities and performance are achieved. Visualization system (WAMAS Control Center) is tested according to specification and available for evaluation of errors during WAMAS Commissioning. All 3rd party IT functions are successfully tested. Test protocols (e.g., via Zephyr Test Cases, Jira Dashboards) and Test end reports of the test level implementations. Open issues are continuously tracked in Jira. A well-trained RM team that can handle specific operational and maintenance tasks. RM team is able to execute functional tests independently.

25 QUALITY GATES 8.1 - On-site Component Test Controls completed, 8.2 - On-site Component Integration Test Controls completed & 10 – On-site Component Integration Tests completed

Find the process description in [CWA](#).

Target:

Starting with Controls commissioning, the function of the subsystem's control software was checked as well as the functional interaction of all components (= mechatronic components without MFS) across several subordinate controls (SOC) (= overarching subsystem) including external subsystems. The Controls commissioning has been supported by the Installation team. The Component Integration Controls & WAMAS has been successfully done.

Previous process:

Installation

Items - Commissioning up to QG 8.1 "On-site Component Test Controls", QG 8.2 "On-site Component Integration Test Controls" & QG 10 "On-site Component Integration Tests completed"	Resp.
<p>Daily Stand-Up-Meetings initiated by SIM to ensure that the project team is well informed and aligned. If the SIM is not on site, he will appoint someone to organize the daily stand-up meeting.</p> <p>Duration: ~ 15 min</p> <p>Important - Physical presence of the on-site project team members in the daily stand-up-meeting.</p> <p><u>Content of daily stand-up-meeting, presented by each participant:</u></p> <ul style="list-style-type: none"> - What has been achieved since yesterday? - What is the plan for today? - Are the materials and resources available? <p>What are the issue which are impeding my work?</p>	<p>SIM, MHEM, SLEC, PEC, ISVM, ISVE, PMSW, LDP, LLC</p>
<p align="center">On-site Component Test Controls (QG 8.1) <i>More details find in the according process steps in CWA</i></p>	
<p align="center">Testing of Safety devices</p>	
<p>In case of safety PLC: All safety devices (e.g., emergency stop buttons, door contacts, fortress locks, safety light barriers etc.) tested and confirmed in safety matrix for each subsystem. Safety matrix for entire system signed incl. safety signatures demonstrated</p>	<p>PEC, SLEC SIM</p>
<p>All necessary safety labels and safety signage attached.</p>	<p>ISVM, ISVE, SM, SIM</p>
<p align="center">Carry out Functional / Interface Test 3rd Party Components / Visualization / Performance Test SOC</p>	
<p>Visualization system (WAMAS Control Center) installed on site. Hence WAMAS Control Center can be used for the PLC commissioning.</p>	<p>PES, SLEC, PEC, Network Admin</p>
<p>Visualization system (WAMAS Control Center) running on site and basic functionalities available (error visualization, error confirmation, switch on/off control areas etc.).</p>	<p>PES, SLEC, PEC</p>
<p>Functional tests on component level done (e.g., conveyor stations, handling machines, mini-load cranes etc.) according to specification.</p>	<p>PEC</p>
<p>Functional tests for all sub-components (incl. for 3rd party components controls done by SSI, e.g., scales, PCX (A-Frame, PTT...) done according to specification.</p>	<p>PEC</p>
<p>Functional tests for all 3rd party components controls NOT done by SSI are performed according to the specifications by the supplier and approved by the</p> <ul style="list-style-type: none"> • MHEM, if purchase of third-party components, i.e., a machine (printer, stretch wrapping machine, carton erector, carton closing machine etc.) or • SIM/AIM, if purchase of an external subsystem (DS Automotion, Rober, filling machine, palletizing machine, etc.) 	<p>MHEM</p> <p>SIM/AI M</p>
<p>Interfaces to all 3rd party components / machines / visualization system (WAMAS Control Center) tested on PLC level (e.g., scales, strapping machines, label printers, camera systems etc.).</p>	<p>PEC, SLEC, PES</p>

Items - Commissioning up to QG 8.1 "On-site Component Test Controls", QG 8.2 "On-site Component Integration Test Controls" & QG 10 "On-site Component Integration Tests completed"	Resp.
Performance tests SOC for components successfully done and documented in the performance test protocol for components (provided by MHEM at QG 7). Optional / at the request of the PMA, videos of each test will be recorded. E.g., performance test for conveyor station, handling machine, cycle test for mini-load cranes etc.	PEC
The On-Site Component Tests Controls are evaluated via visualization system (error messages, scanner reading statistic etc.). Arising issues are solved resp. communicated to installation team.	PEC
Correct display of faults in visualization system (WAMAS Control Center) tested during PLC commissioning. All issues in WAMAS Control Center configuration documented and fixed.	PEC, SLEC, PES
<p align="center">Carry out Load Test SOC More details find in the according process step in CWA</p>	
Load Test SOC for each control area of a subsystem successfully done (without weight, with different weights and dimensions, with maximum weight and maximum dimensions, preferably looping for several days with high amount of loading units)	PEC
Load Test SOC executed with the full range of defined transport units (dimensions, weight). Note: For transport units with compartments also test unbalanced loading (e.g., only 1 compartment filled with weight).	PEC
The Load Test SOC is evaluated via visualization system (error messages, scanner reading statistic etc.).	PEC
RM team resp. maintenance staff of customer integrated into tests for training purposes.	PEC, RM, PMA
QG 8.1 - On-site Component Test Controls completed (CWA)	PEC
<p align="center">On-site Component Integration Test Controls (QG 8.2) More details find in the according process steps in CWA</p>	
In case of safety PLC: Safety matrix incl. test results (Git repository) requested from all subsystems. Safety couplings between subsystems tested and confirmed.	SLEC, SIM, PEC
Interfaces (mechatronical and PLC) between sub-systems successfully tested.	SLEC, PEC
All work stations fully equipped and available (e.g. scanner, printer, PCs etc.).	SIM
All machines filled up with consumables (paper, labels, cartons, straps etc.).	SIM
All transport units in sufficient amount for Load Integration Test SOC available (incl. weights, barcodes).	SIM
Safety Integration and Functional Integration Test SOC between sub-systems done according to specification.	SLEC, PEC
Load Integration Test SOC between several sub-systems done (preferably looping for several days with high amount of transport units – e.g., conveyor in- and outfeeds via mini-load cranes). Performance, functionalities, and availability achieved.	SLEC, PEC

Items - Commissioning up to QG 8.1 "On-site Component Test Controls", QG 8.2 "On-site Component Integration Test Controls" & QG 10 "On-site Component Integration Tests completed"	Resp.
The Load Integration Test SOC is evaluated via visualization system (error messages, scanner reading statistic etc.). Error messages regularly analyzed, and root causes fixed resp. communicated to installation department.	SLEC, PEC
Organized component trainings (components controlled by SSI and 3 rd party components); for details see process description	MHEM
Organized trainings for external subsystems; for details see process description	SIM
SSI Data Acquisition / Predictive Maintenance	
Edge Device(s) have been configured. For details refer to „Installation and configuration de / en“ in Confluence SSI Linkage / Schäfer Data Acquisition - LS Products .	SLEC
QG 8.2 - On-site Component Integration Test Controls completed (CWA)	SLEC
On-site Component Integration Test Controls & WAMAS <i>More details find in the according process steps in CWA</i>	
Basic operator training executed (for internal SSI sub-systems, standard-3 rd party components/machines). <ul style="list-style-type: none"> Target group: Controls and Software Realization project team; if already nominated employees of the customer Content: Switch on/off system (components, machines), error handling for all sub-systems For details see process description .	PEC, MHEM, PMSW
Visualization system (WAMAS Control Center) tested together with Software Realization. See definition of the On-site Integration Test SOC/MFS in the QA Glossary . Items to be commonly tested: <ul style="list-style-type: none"> - Visualization system accessible remotely - Visualization system represents entire scope of supply (incl. all 3rd party components) and connected to visualization system - Automatic daily export of error messages configured and files accessible remotely - Visualization of all devices fully tested (incl. all 3rd party components) - Suppression of subsequent errors tested - Defined demonstration of KPIs and reports within visualization system available 	SLEC, SIM, PMSW, PES
All open issues updated in issue tracking system Jira.	SLEC, PMSW, IMA, PMA
General conditions for Commissioning (Software) checked.	PMSW

Items - Commissioning up to QG 8.1 "On-site Component Test Controls", QG 8.2 "On-site Component Integration Test Controls" & QG 10 "On-site Component Integration Tests completed"	Resp.
<ul style="list-style-type: none"> Interface functionality of all components including shuttles, 3rd party components and external subsystems that are connected to the WMS/MFS system is ensured. The functionality of the WMS/MFS system in combination with all connected components including shuttles, 3rd party components and external subsystems at the software and hardware level is ensured. <p>Tests are based on in-house test cases but are now executed under real conditions with the real infrastructure. For details see process description.</p>	LDP, SLEC, PEC, MHEM* * In case of shuttles
Pick by Light (or Multi Light)-system configured (incl. addressing) and all tested.	LDP, ISVE
RF picking devices configured and tested (all devices).	LDP
Visualization system is fully tested according to WAMAS Control Center Specification.	PES, PEC
Master data (e.g., stock, article data etc.) and order data (e.g., transport orders) prepared for performance tests.	LDP, PMSW
Performance tests for relevant components / routes successfully done with test orders (internally created on MFS) and documented in test protocol.	LDP, PEC
Status of On-site Component Integration Tests is continuously documented (in Jira via Zephyr Test Cases, Jira Dashboards). A decision about starting the Functional System Test is made. If the performance cannot be achieved, this must be discussed in the project core team.	PMSW, LDP, SIM, PEC
Final test end report for "On-Site Component Integration Test Controls & WAMAS" created.	PMSW
Handover from Controls to Software Realization done for each control area / logistical area (Templates "Checklists PLC MFS Commissioning Subsystems") Software team to be supported during WAMAS Commissioning. Details of handover protocol to be discussed personally between PEC and LDP.	SLEC, PEC, PMSW, LDP
Completion works	
Completion works (side covers, closing of cable trays etc.) done.	ISVM, ISVE
All modifications (mechanically, electrically) carried out during commissioning documented and documentation handed over to project engineers.	ISVM, ISVE
As-built layouts (mechanically, electrically) updated by project engineers and handed over to Technical Writer – Customer Documentation (TW-CD).	SIM, PEM, PEE, TW-CD
Spare parts offer (for each sub-system) updated if applicable and submitted to customer. The updated spare parts offer covers additional components which have been installed due to Change Requests or internal changes.	CS, PMA, MHEMs
Training of RM team	

Items - Commissioning up to QG 8.1 "On-site Component Test Controls", QG 8.2 "On-site Component Integration Test Controls" & QG 10 "On-site Component Integration Tests completed"	Resp.
Detailed on-site RM training plan successfully executed by all RM technicians.	RMM, RM, PMA
RM team is able to carry out defined maintenance and operational activities.	RM, RMM
RM team is able to analyze and to solve error situations independently.	RM, RMM
Regular (e.g. weekly) team meetings held between RMM and project team. RM team effectively coordinated.	RMM, ISVM, ISVE, PMA
If RM contract including IT services exists, in-house-trained RM technicians (IT) to be on site. RM team is collaborating with WAMAS commissioning team in order to be able to fulfill 1 st and 2 nd level support on site when warehouse is in operation.	CS, RM
QG 10 – On-site Component Integration Tests completed (CWA)	LDP, PEC, CS

Obligatory Outputs QG 8.1 - On-Site Component Test Controls completed

(refer to CWA [sub-process](#) and [QG 8.1](#) for all details)

Documents:

- * On-Site Component Test Controls: Test end report "Safety Test for the subsystem" acc. QA Plan incl. SAFETY Matrix with test results (Git Repository) (PDF or Jira issue)
- * On-Site Component Test Controls: Test end report "On-Site Functional Test for the subsystem" acc. QA Plan incl. "PLC MFS Commissioning Subsystem" checklist with test cases, error scenarios for the test level, and test results (PDF or Jira issue)
- * On-Site Component Test Controls: Test end report "Third Party Component Test" acc. QA Plan incl. "PLC MFS Commissioning Subsystem" checklist with test cases, error scenarios for the test level, and test results (PDF or Jira issue)
- * On-Site Component Test Controls: Test end report "Performance Test SOC for the subsystem" acc. QA Plan incl. confirmed performance test protocols for components (throughput or cycle time measuring protocol) excl. shuttles (PDF or Jira issue)
- * On-Site Component Test Controls: Test end report "Load Test SOC for the subsystem" acc. QA Plan incl. KPIs that are originated in the WAMAS Control Center (PDF or Jira issue)
- * On-Site Component Test Controls: Test end report "On-Site Visualization Test" acc. QA Plan incl. test results of Jira test cases (screenshot) (PDF or Jira issue)

* If the test end reports are documented in a Jira issue, the output is a result, not a document.

Obligatory Outputs QG 8.2 - On-Site Component Integration Test Controls completed

(refer to CWA [sub-process](#) and [QG 8.2](#) for all details)

Documents:

- On-Site Component Integration Test Controls: Test end report "Safety Integration Test SOC" acc. QA Plan incl. SAFETY Matrix with test results (Git Repository) for entire system (PDF or Jira issue)
- * On-Site Component Integration Test Controls: Test end report "On-Site Functional Integration Test" acc. QA Plan incl. "PLC MFS Commissioning Subsystem" checklist with test cases, error scenarios for the test level, and test results (PDF or Jira issue)
- * On-Site Component Integration Test Controls: Test end report "Load Integration Test SOC" incl. KPIs that are originated in the WAMAS Control Center (PDF or Jira issue)

* If the test end reports are documented in a Jira issue, the output is a result, not a document.

Obligatory Outputs QG 10 – On-Site Component Integration Tests completed

(refer to CWA [process](#) and [QG 10](#) for all details)

Documents:

- * On-site Component Integration Test WAMAS: Test end report "Prodserver Benchmark Test" acc. QA Plan (PDF or Jira issue)
- * On-site Component Integration Test WAMAS: Test end report "Disaster Recovery Test" acc. QA Plan (PDF or Jira issue)
- * On-site Component Integration Test Controls & WAMAS: Test end report "On-Site Integration Test SOC/MFS" acc. QA Plan incl. test results of "PLC MFS Commissioning Subsystem" checklist (PDF or Jira issue)

* If the test end reports are documented in a Jira issue, the output is a result, not a document.

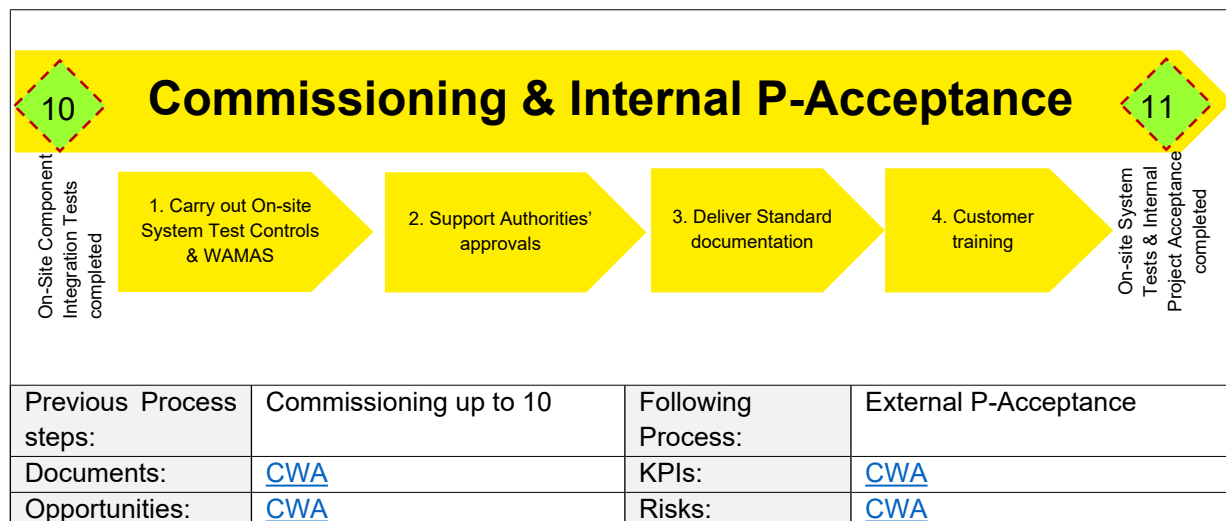
- On-site Component Integration Test Controls & WAMAS: Test results of the test level implementation "On-Site Integration Test SOC/MFS" are documented and stored in the "PLC MFS Commissioning Subsystem" checklist (=> complete checklist filed)
- Signed Controls training protocol (= confirmation of participation from the training participants)

Results:

- If applicable (i.e., additional components installed due to change requests or internal changes):
Trigger updated spare parts offer (for each sub-system) sent to the customer

26 IPM MACRO PROCESS: Commissioning QG 10 to QG 11 & Internal Project Acceptance

Find the process description in [CWA](#).



Input: System has been successfully tested on Controls level and WAMAS commissioning incl. component and system integration with Controls is ongoing.

Process steps:

1. The test level On-site System Test Controls & WAMAS is executed according the defined responsibilities in the [Commissioning Process](#).
All test scenarios and test cases that verify the complete system (subsystems incl. 3rd party components and external subsystems) are completed successfully.
The results are documented in Jira Dashboards. Load testing are supported, and the performance figures are evaluated. All acceptance relevant topics are checked / documented to be prepared for the following external project acceptance phase with the customer. All arising issues are updated and prioritized in issue tracking system (e.g., Jira).
2. The On-Site System Test Controls & WAMAS is the first test level that tests all systems and subsystems as well as the automated components of the warehouse together and across the board. The aim is to carry out a complete and continuous material flow process. At the end of this test type, a test level takes place that provides an assessment of the system's performance and stability (= scalability and reliability). The On-Site System Test Controls & WAMAS is intended to ensure the system's functionality with respect to the customer processes and the defined performances. Non-functional requirements (e.g., server performance) must also be checked and ensured.
3. If in delivery scope of SSI: The authorities' test for relevant components is organized (e.g., fire doors, compressor system, elevators etc.). The pre-conditions for the official tests are checked. The official test is carried out and approval is signed. Potential open issues from test are fixed. The approval documents are transferred to the Technical Writer – Customer Documentation (TW-CD).
4. All defined documents which are included in the standard documentation must be up to date. The documentation of all 3rd party components is available. The standard documentation is delivered to the customer as contractually defined (in service portal or paper).

5. The customer training for SSI components and 3rd party components is done at the latest (if not already done earlier, see [Commissioning Process](#) for details). The purpose of the customer training is to secure the ability of the customer to use the customer installation independently without support of the project team (e.g. must be able to operate the work station -> Customer must be able to carry out the UAT). Skilled personnel are available for executing the training sessions based on the standard documentation. The training is subdivided into safety, technical and operational training. The training is documented by signing the training protocols.

Output: Dashboards for KPIs and reports successfully tested (WAMAS Control Center), System is ready for the On-site Acceptance Tests with the customer (User Acceptance Test (UAT); in case of contractually agreed availability and/or performance also System Performance and System Load Test in advance of UAT). The customer and the RM team basically know how to run the system and how to solve errors.

27 QUALITY GATE 11 – On-site System Tests & Internal Project Acceptance completed

Find the process description in [CWA](#).

Target:

The system and its subsystems as well as the mechanical components of the warehouse together and across the board on-site has been successfully tested SSI internally. All internal project acceptance procedures (functional tests, performance tests) have been successfully completed and documented as specified in the SSI Schäfer internal acceptance standard. Authorities' approvals are signed (if in delivery scope of SSI) and system is now ready for the On-site Acceptance Tests with the customer (User Acceptance Test (UAT); in case of contractually agreed availability and/or performance also System Performance and System Load Test in advance of UAT). The project core team is now sure that everything is well prepared to start the external project acceptance with the customer.

Previous process steps:

Commissioning up to 10

Items – Commissioning & Internal P-Acceptance up to QG 11 “On-site System Tests & Internal Project Acceptance completed”	Resp.
On-site System Test Controls & WAMAS <i>More details find in the according process steps in CWA</i>	
Carry out Functional System Test	
General conditions for Functional System Test checked (process description).	PMSW
Host communication interface tested according to specification.	LDP
Dashboards for KPIs and reports successfully tested. Correctness of KPIs checked.	LLC
All Software test cases and error scenarios successfully executed. Tests are based on in-house test cases but are now executed under real conditions with real data transmitted from Host. All tests defined in Jira (process description).	LLC

Items – Commissioning & Internal P-Acceptance up to QG 11 “On-site System Tests & Internal Project Acceptance completed”	Resp.
All 3 rd party IT functionalities and interfaces successfully tested.	LLC
Server switch successfully tested (Failover Test). * In case of WAMAS Control Center Server only (no Software Realization involved) the responsibility lies with the SIM.	PMSW, (SIM*), SLEC, PES, IT Sys Admin
Execution of Functional System Test checked (technical performance, all defined functionalities and business processes including error scenarios according to specification and QA Plan).	SIM, AIM, PMA
Carry out System Performance and System Load Test	
Conditions for system performance and system load testing created. -> Organization of qualified personnel and test material (e.g., in sufficient numbers and with the correct or relevant dimensions and weights). For details see process description .	SIM
System Performance Test (process description) and System Load Test (process description) executed. IMPORTANT: The detailed responsibilities for single activities in this context are defined in the projects QA Plan.	SIM
System Load tests executed with test orders from Host for entire system successfully done.	LLC
System Load Test supported and analyzed (performance, errors etc.).	SLEC, SIM, AIM, PEC
If simulation study was performed: Feedback to Head of Simulation or Simulation Manager regarding System Load Test results.	PMSW, Head of Simulation/Simulation Manager
Server performance evaluated (high handling times, GUI reaction times, response times to PLC, reaction time of PBL etc.) * In case of WAMAS Control Center Server only (no Software Realization involved) the responsibility lies with the SIM.	PMSW, (SIM*), SLEC, PES, IT Sys Admin
Status of System Test Controls & WAMAS is continuously documented in Jira (test cases in Zephyr) and progress is shown in a Jira Dashboard (e.g. Boohoo). A decision about starting the user acceptance tests is made.	PMSW, LDP, SIM, SLEC
Final test end reports of the test level implementations of test level On-Site System Test Controls & WAMAS created.	PMSW
Customer training	
Customer training completed and training protocols signed. This covers operational trainings for the Software, and training of error handling. Trainings to be aligned with overall training schedule.	PMSW, SIM
CS service contract signed (= desirable event, however, customer cannot be forced to sign a service contract).	CS

Items – Commissioning & Internal P-Acceptance up to QG 11 “On-site System Tests & Internal Project Acceptance completed”	Resp.
Transfer of specific project know-how to CS executed (focus on Software). For A-projects the responsible CS resource to be on site during user acceptance tests and go-live.	CS , RM, PMSW
<i>Preparation for internal acceptance</i>	
Software backups done.	PMSW
Server monitoring activated and verified.	PMSW , CS
All acceptance relevant topics checked and prepared for external acceptance phase (according to acceptance procedure resp. contract).	SIM , PMA,
Power outage test for entire system performed. Ramp-up of system checked.	SIM , SLEC, PEC, PMSW
Network outage tests performed. Automatic re-connection of network devices checked.	SIM , SLEC, PEC, PMSW
Open issue list updated in issue tracking system Jira.	PMA , PCTM
Deployment procedure for WAMAS and PLC modifications aligned with customer and communicated to all involved persons.	PMA , PMSW, SLEC, PEC
<i>Execute Authorities’ approvals</i> (if in delivery scope of SSI)	
Authority approval (e.g., VdS) for all fire protection doors done.	SIM , PMA
Authority approval (e.g., TÜV) for all machines according to appendix 4 of “Machinery Directive” (e.g. for Exyz), elevators, compressor system etc. done.	SIM , PMA
Authority approval handed over to Technical Writer – Customer Documentation (TW-CD) to be integrated in customer documentation.	SIM , PMA, TW-CD
Compliance of defined escape routes checked.	SIM
<i>Deliver Standard documentation</i>	
Standard operating instructions for each sub-system incl. 3 rd party components compiled and stored in Service-Portal. <u>Content of operating instructions:</u> <ul style="list-style-type: none"> - Safety instructions - Sub-system manuals (e.g., for conveyors, SMC, EXYZ, Cuby etc.) - Layouts and electrical drawings - 3rd party component manuals - WAMAS Control Center Documentation 	MHEM, TW-CD
User manual for WAMAS software (might not be final version at this time) stored on Service-Portal.	PMSW , TW-CD
User manuals for all workstations created (e.g., for picking work stations). Covers full process and all operating components such as buttons, scanners, switches etc.	PMSW , TW-CD
Completeness of documentation stored on Service-Portal checked (quantitative check).	SIM

Items – Commissioning & Internal P-Acceptance up to QG 11 “On-site System Tests & Internal Project Acceptance completed”	Resp.
Access for customer to Service-Portal granted and customer informed. In case documentation is delivered in paper the handover of the documentation must be confirmed by the customer.	PMA, SIM
Customer training	
Customer training completed and training protocols signed. This covers safety training, technical trainings for SSI components*, technical trainings for 3 rd party components and operational trainings for Controls (PLC & WAMAS Control Center, done at QG 10). *If RM contract exists no technical training for the customer is executed as this is covered by RM team. If no RM contract exists technical training for SSI components is executed by installation team.	SIM , PMSW, PEC, ISVM, ISVE, PMA, CS, RM
Transfer of specific project know-how to CS executed (focus PLC). For A-projects the responsible CS resource to be on site during user acceptance tests and go-live.	CS , RM, PEC
Incident management defined (customer-procedure for requesting support to solve incidents / issues in case project team is not available – e.g., during night shifts or on weekends). Contacts and response times defined. Test call to hotline done. No official hotline calls before Go-Live.	PMA , CS, RM
Final spare parts package (SSI and 3 rd party spare parts) to be on site and handed over to customer (incl. confirmation of customer that all parts have been received).	CS, RMM

Obligatory Outputs QG 11

(refer to CWA [process](#) and [QG 11](#) for all details)

Documents:

- * On-Site System Test Controls & WAMAS: Test end report “Functional System Test” acc. QA Plan (PDF or Jira issue)

* If the test end report is documented in a Jira issue, the output is a result, not a document.

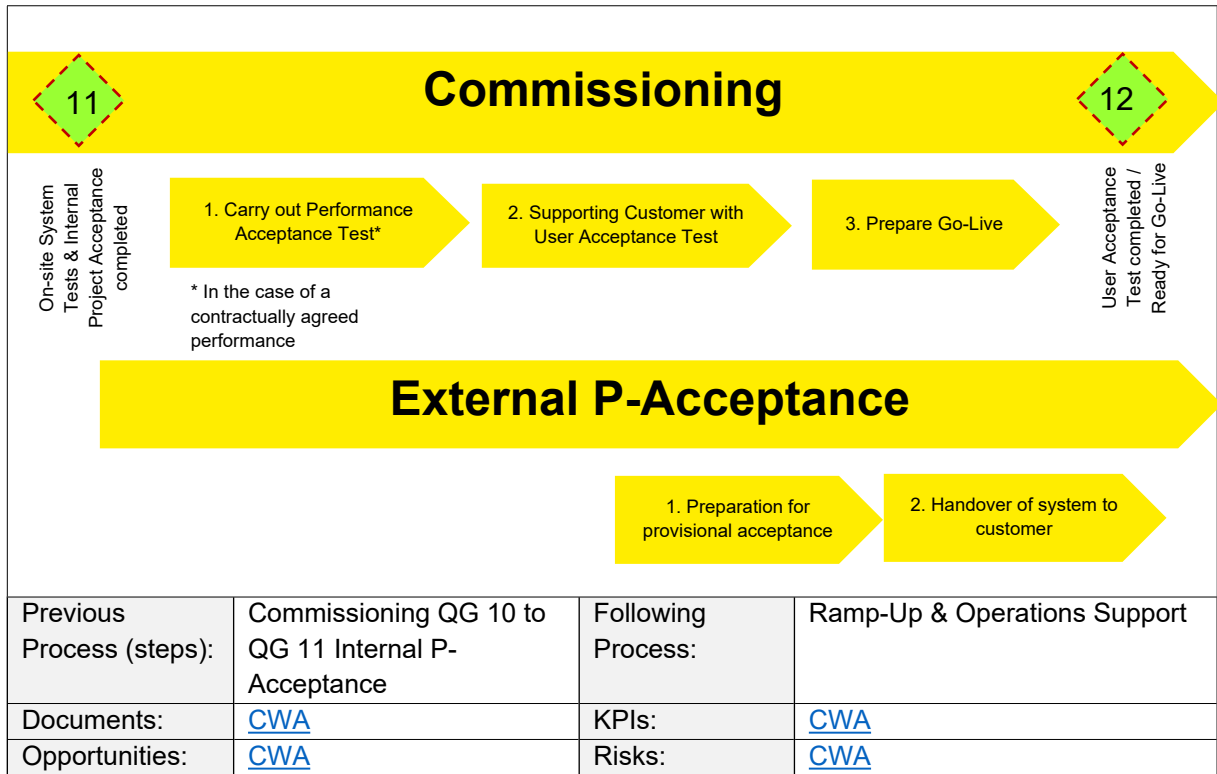
- WAMAS customer training completed, and training protocols signed by customer
- Controls customer training completed and training protocol signed by the customer (if not already done before QG 10)
- Created WAMAS User Manuals
- Signed training protocols (safety training etc.)
- On-Site System Test Controls & WAMAS: System performance test plan including documented test results acc. QA Plan
- On-Site System Test Controls & WAMAS: Test protocol System Load Test including documented test results acc. QA Plan
- If in delivery scope of SSI: Authority approvals

Results:

- Hotline (call hotline number) informed about upcoming go-live
- Final spare parts package on site and confirmed by customer

28 IPM MACRO PROCESS: Commissioning QG 11 to QG 12 (UAT) & External Project Acceptance up to QG 12

Find the process description in [CWA](#).



Input: Successfully completed System Tests, completed customer training

Process steps:

1. In the case of a contractually agreed performance the prerequisites for the performance acceptance tests are created and the performance acceptance test is carried out.
2. The User Acceptance Tests are executed by the customer supported by the Software Realization team. Arising issues related to the MHE components are continuously solved. Error statistics are evaluated and availability tests (if already possible at this point) are carried out. If applicable, noise measurements are carried out. Open issues are prioritized together with the customer and documented. The system is now ready for Go-Live.
3. The system is handed over to the customer. The provisional acceptance certificate ([TL-04338](#)) is signed. The documentation is updated and handed over to the customer and the warranty starts. CE-declaration for system is issued. The system is now operated by the customer.
4. Defined test cases and test scenarios for user acceptance tests are executed. Stress-tests of system are done under live conditions - functionalities, performance and system availability are evaluated. Open issues are prioritized together with the customer and documented. The system is now ready for Go-Live.

Advance Support - Contact Level & First Level Support through Customer Service (CS):

Customer Service is prepared to take over the contact level support and the first level support at the beginning of the Go-Live (Exception: Ramp-Up is sold; then the support is given after the sold ramp-up period (in the case of a sold ramp-up with only one or two shifts, the CS takes over the contact and first level support during the unsold times; this also applies to the weekend)) if the following criteria are met:

- Relevant points from the Handover Protocol to Service (HOPS) are fulfilled (training BU CS, documentation, tools up to date, ...)
- Escalation paths are defined and functioning (= project readiness)
 - The project team must ensure to be reachable even after business hours (2nd Level) in case Customer Service is not able to solve critical issues
 - Escalation path for Management Escalations with regards to CS:
 - Non-Software Issue: PMA -> Head of Operational Project Management (Region/BU - L5) -> Head of Project Management (BU - L4) -> Head of Order Processing (BU)
 - Software Issues: PMSW -> Head of Software Realization (Region/BU - L5) -> Head of Software Realization (BU - L4) -> Head of Order Processing (BU)
- Project must be in a stable status

The responsibility to solve the problem tickets (= unknown causes after an "incident") and to process escalations remains with the project team. The go-live support from BU CS has no impact on the monitoring phase.

Output:

- All test scenarios, test cases and error scenarios are executed successfully
- The installed system meets the sold functionalities & figures
- Test protocols (e.g., via Zephyr Test Cases, Jira Dashboards) and Test end reports of the test level implementations.
- Documentation of the system's performance

All conditions for the start of the Go-Live have been checked and documented.

29 QUALITY GATE 12 – User Acceptance Test completed / Ready for Go-Live

Target:

The user acceptance tests have been successfully completed and the provisional acceptance certificate is signed. The system is prepared for Go-Live and implementation of the Operations and Ramp Up concepts that have been prepared according to the specifications. First live orders can be processed (decision by customer). RM setup according to the RM project plan has been finished and regular RM tasks have been started according to the RM contract.

Previous process (steps):

Commissioning QG 10 to QG 11

Internal P-Acceptance

Items – Commissioning & External P-Acceptance up to QG 12 “User Acceptance Test completed / Ready for Go-Live”	Resp.
<p>If Advance Support was requested for the project: All criteria for advance support are fulfilled and this has been documented in the HOPS.</p> <p>Only if the criteria for Advance Support are met, we get this support from CS!</p>	PMA, SOM
<p>Already created ramp-up plan aligned with customer in detail (e.g., duration of inbound, target of goods-in per day/week to fill up the storage areas; outbound volume planning per day/week etc.). It must be ensured that the key-users of the customer (trained by SSI) have trained the operational staff.</p>	SIM, PMSW, LLC
<p>On-site Acceptance Test Controls & WAMAS <i>More details find in the according process steps in CWA</i></p>	
<p>Preparation & Execution of the Performance Acceptance Test* <small>* In the case of a contractually agreed performance</small></p>	
<p>Preparation: see process step in CWA Execution: see process step in CWA</p>	SIM
<p>Performance Acceptance Test prepared and successfully completed accordingly to defined procedure.</p> <p>IMPORTANT: If possible, always test with the order structures and quantities agreed in the contract (the agreed performance is based on these); <u>not</u> with real order structures/quantities, as these can differ massively from the contractually agreed order structures/quantities.</p> <p><u>Note:</u> In case the order volume of the customer is quite low at this time it makes sense to execute several mini-stress tests in order to prove the performance.</p>	SIM, PMA, PMSW, SLEC, PEC, ISVM, ISVE, IMA, MHEM
<p>Performance Acceptance Test supported, and results analyzed. Error messages evaluated and sorted by frequency in order to prioritize rectifications.</p>	SLEC, SIM, AIM, PMSW
<p>Supporting Customer with the User Acceptance Test</p>	

Items – Commissioning & External P-Acceptance up to QG 12 “User Acceptance Test completed / Ready for Go-Live”	Resp.
General conditions for UAT checked.	PMSW
Software Realization resources to be on-site during the entire UAT-phase to support customer and to solve arising Software issues immediately. If necessary additional Software Realization resources organized to support the on-site Software Realization team remotely.	PMSW
If necessary, Installation and/or Controls resources are on-site during UAT. (must be defined in the QA Plan)	PMA, PCTM
All defined test cases and test scenarios successfully executed and approved by customer. Tests are executed by customer and supported by project team.	PMA, LLC , PMSW
System ready for Go-Live.	PMSW, PMA, LLC
CS resource on site and integrated in the IT team (for A-projects). Project is known within the CS organization, especially within the Hotline team.	PMSW, CS
Internal IT training for Hotline performed.	PMSW, CS
All login details (access details, passwords etc.) for the IT Infrastructure & Software equipment in the scope of SSI is stored in “Passion”.	PMSW, SLEC
All login details (access details, passwords etc.) for the Controls equipment in the scope of SSI is stored in “Passion”. This includes also commissioning computers for Controls. They remain on site, after the commissioning has been completed. Whether the commissioning computers for Controls can remain in the network must be clarified by the customer, as the customer would have to take care of the active patching of the PC. PLC + Commissioning PC -> PEC; WAMAS Control Center -> PES	SLEC, PEC, PES, CS
Arising issues on MHE components solved continuously during UAT.	SIM, MHEM, ISVM, ISVE, PEC, PMA, PMSW
Preparation of Availability Test (Proof of Availability)	
Necessary preparations for availability tests (Proof of availability) done (availability tool up to date, error statistic reports available). This test is planned in collaboration with the customer and carried out by customer personnel. The defined criteria for availability, such as planned operating time, planned downtime and recovery times must be considered. The test staff carries out the defined test scenarios. If already possible the test can be carried out at this point; at latest before QG 13.	PMA, SIM , AIM, PMSW
Final invoice of an IC purchase order/order	

Items – Commissioning & External P-Acceptance up to QG 12 “User Acceptance Test completed / Ready for Go-Live”	Resp.
<p>Internal Acceptance Certificate (TL-04929) signed (= Legal requirement of Finance department for the final invoice of an IC purchase order/order).</p> <p><u>Note:</u> Internal acceptances only to be issued when overall system is in live operation (exception Steelwork – can be done earlier).</p>	PMA, PMSW, SIM, AIM
Hotline	
Internal PLC training for Hotline performed.	PEC, CS
<p>Hotline informed about details of impending Go-Live. Information to be provided to hotline:</p> <ul style="list-style-type: none"> - VPN access and password (passion) - Operating hours of system - Contact details of customer (in charge of operations) - Contact details of project team in charge (PMA, PEC, PMSW) <p><u>Note:</u> SAM contacts customer and explains the service processes.</p>	PMA, PMSW, RM, CS
Hotline (from all parties) is able to connect to system remotely (VPN connection). Latest software packages (e.g., PLC software, parameters etc.) archived and accessible by hotline.	CS, SIM, SLEC, PMSW
Handover of the System to the Customer	
All required documents to issue the CE Declaration prepared and handed over to the CE Manager. Required documents: Link	PMA, QA, CEM
<p>All open points regarding the CE declaration are clarified and closed and CEM is informed.</p> <p>Note: In case of commercial use of parts of the system (phased go-live), it is mandatory to have a CE declaration to QG 12 signed by the CEM.</p>	PMA, CEM
Check of completeness of all required documents for issuing CE declaration done. Verify that CE-relevant Jira Issues are closed. CE declaration sent to Documentation (TW-CD) by email to be stored on Service-Portal.	CEM, PMA, TW-CD
Handover of system to customer done and provisional acceptance certificate (TL-04338-EN / TL-04338-DE) signed (transfer of risk, approval of successful UAT).	PMA
Warranty started.	PMA
<p>Go-Live of system occurred and confirmed.</p> <p><u>Note:</u> Project-resources from all professions to be on site at go-live (Installation, Controls, Software Realization, Project Management).</p>	PMA, SIM, ISVM, ISVE, PEC, PMSW, IMA
Hotline ready to process contact level service in case project team is not available (e.g. outside business hours when project team not on site). Incidents to be communicated immediately from CS to project team. Project team responsible to solve incidents.	CS, RM

Obligatory Outputs QG 12

(refer to CWA [QG 12](#) for details)

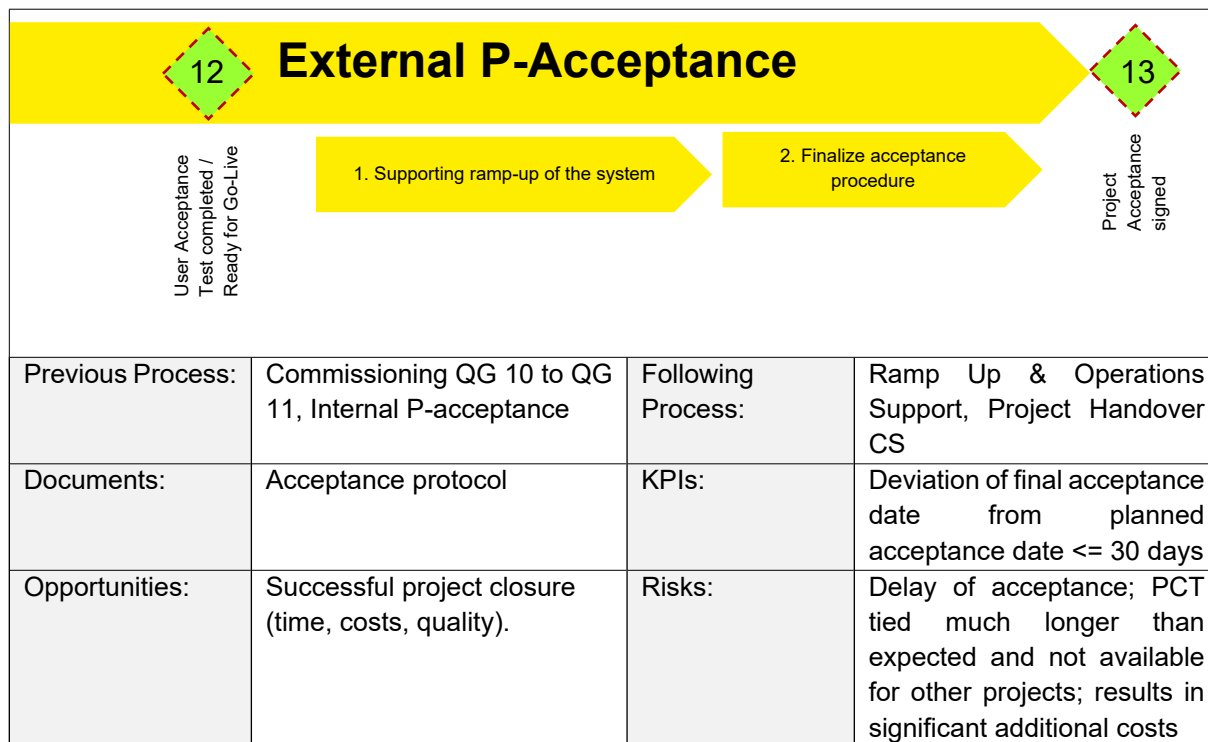
Documents:

- Finalized Ramp-up plan aligned with customer
- Performance Acceptance Test: System Performance Test Plan signed by the customer (in the case of a contractually agreed performance)
- All documents required for the CE declaration prepared and handed over to the CE Manager*
* Completeness of all required documents is managed via the corresponding CE Jira issues (CE Jira Workflow)
- Provisional Acceptance Certificate signed by customer ([TL-04338-EN](#) / [TL-04338-DE](#))
- EC declaration of conformity (= CE declaration) created

Results:

- All criteria for advance support fulfilled (documented in HOPS Online)
- Prerequisites for Go-Live are met
- All login details for entire IT Infrastructure & Software equipment in scope of SSI is stored in "Passion"
- All login details for entire Controls equipment in scope of SSI is stored in "Passion"

30 IPM MACRO PROCESS: External Project Acceptance QG 12 to QG 13



Input: Successfully completed Performance Acceptance Test (only if contractually agreed performance) and UAT, Go-Live prepared, Provisional Acceptance Certificate signed by customer
CE declaration issued for the entire system

Process steps:

- The ramp-up and operational support is given according to ramp-up-planning. Results are daily analyzed, and actions are defined. The performance of the system is increased. Arising issues are analyzed, assigned, and prioritized. Project status is regularly updated and documented together with customer (preparation for formal acceptance).
- All acceptance relevant documents are updated and approved by the customer. There are no major open issues. The final acceptance certificate ([TL-00310](#)) is signed and work instruction [WI-01028](#) considered. The final invoice is released. The correction of remaining open issues is organized. The resource planning is updated. Handover to CS is prepared. For A-projects CS resource is on-site during Ramp-Up phase (within team of Project Manager Software). Project closure is prepared – returning of remaining site equipment and remaining material on site.

Output: System has been formally accepted by the customer. Open issues are clearly described, assigned, scheduled, and prioritized.

31 QUALITY GATE 13 – Project Acceptance signed

Target:

The final acceptance certificate has been signed by the customer. There has been a smooth project acceptance procedure because it has followed the acceptance specifications agreed with the customer and because it has been well prepared.

Previous process:

“External P-Acceptance”

Items – External P-Acceptance up to QG 13 “Project Acceptance signed”	Resp.
<i>Support the Ramp-Up of the System</i>	
Operational processes of customer organization monitored, improvement potentials documented and discussed with customer (documentation with pictures and videos).	SIM , PMSW, LLC, RM
Daily analysis of KPIs and error statistics. <u>Note:</u> PMSW ensures that the defined KPIs are fully available (e.g., in WAMAS Control Center).	SIM , PMSW, LLC, RM
Optimization potentials analyzed and actions scheduled if necessary (e.g., change requests).	SIM , AIM, PMSW, PEC
All major open issues solved, remaining open issues list updated and provided with deadlines.	SIM , PMSW, PEC, RM
Project status documented together with customer – aligned view on remaining tasks, technical and operational issues in order to receive external acceptance.	PMA , SIM, PMSW, PEC
Availability test (Proof of availability) successfully been completed accordingly to defined procedure in QA Plan. During testing, communication and collaboration with the system is monitored to ensure that it is reliably available under the defined conditions. Any problems or downtime that occur are logged to enable comprehensive analysis and optimization. <u>NOTE:</u> The availability test should be done as early as possible. QG 13 is the latest possible date.	SIM , PEC, ISVM, ISVE, RM
Return deliveries of materials done according to the process of the receiving plant.	ISVM , ISVE , MHEM
<i>Finalize acceptance procedure</i>	
System documentation (as-built documentation) handed over to customer and RM team (operating manuals for each sub-system incl. 3 rd party components updated on Service-Portal).	MHEM , TW-CD
Final version of user manuals (WAMAS, work stations etc.) handed over to customer and RM team (updated on Service-Portal).	PMSW , TW-CD
Completeness of updated documentation stored on Service-Portal checked (quantitative check).	SIM

Items – External P-Acceptance up to QG 13 “Project Acceptance signed”	Resp.
All relevant documents for acceptance updated.	PMA
Final acceptance certificate (TL-00310-EN / TL-00310-DE) incl. open issue list with completion dates signed by customer. All open issues from the FAC must be entered in Jira with FixVersion “Open Issues after Final Acceptance” incl. due date for all issues according to the FAC (Jira Dashboard).	PMA
Email sent to mailing list DL-LSOP-FinalAcceptance (LSOP-FinalAcceptance@ssi-schaefer.com) after the final acceptance certificate has been signed by the customer according to WI-01028 . (not valid for BU CS) Note: Additionally, to the email sent by the PMA an automatic workflow ensures that for each project reaching QG 13 a notification is posted in MS Teams channel “Project acceptance signed (QG-13)” in the room “LSOP Project Management”.	PMA
Final invoice sent to customer.	PMA
Actions and resources scheduled to solve remaining open issues.	PMA
Acceptance for SSI scopes and 3 rd party systems given.	PMA
Project marketing activities organized (e.g., case studies).	PMA
All site equipment returned (containers, FLT's etc.).	PMA, MHEM

Obligatory Outputs QG 13:

(refer to CWA [QG 13](#) for details)

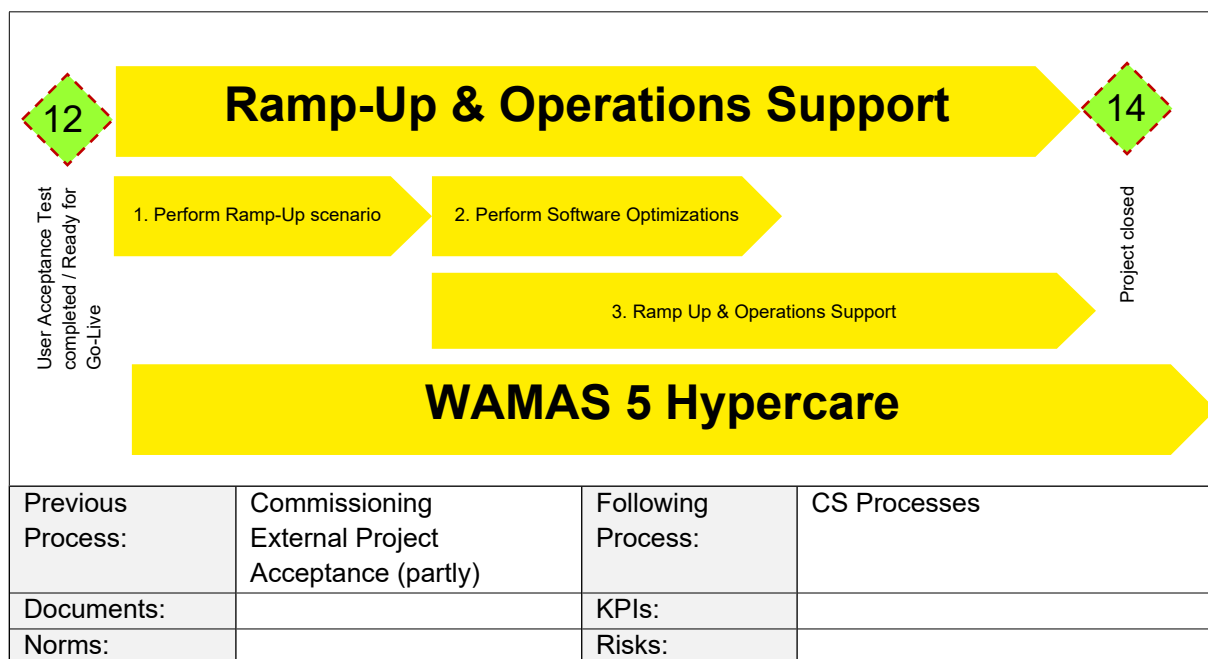
Documents:

- Final acceptance certificate incl. open issue list with completion dates signed by customer ([TL-00310-EN](#) / [TL-00310-DE](#))

Results:

- System documentation handed over to customer and RM team

32 IPM MACRO PROCESS: Ramp-Up & Operations Support



Input:

- Successful user acceptance test
- Signed handover protocol
- Acceptance by authorities
- Successful decision for go live

Goal:

The customer is assisted during this phase to make sure that ramp up will proceed as defined for the installation. At the end of this phase the customer is able to run his business and the installation shows the performance defined in the contract.

Process steps:

1. After a successful go live decision from the customer, the productive operation of the system is started according to the defined ramp up scenario.
2. Deviations to the defined scope of service & supply are analyzed and eliminated. Moreover, optimization potentials are identified and offered to the customer. The customer is supported in this phase as it is necessary. The support can also be ensured with an IT – resident maintenance team.
3. After starting the production operation, the ramp up phase is starting, with the target of running the system autonomous. The duration of this phase depends on the defined scope in the offer. The system is monitored from SSI Schäfer by focusing on different criteria. In order to ensure the proper function of the system, reports are generated on daily and weekly basis. Target values for defined KPIs are at least met. Necessary optimizations must be performed to meet the sold figures. These optimizations are observed by the defined KPIs. Identified bugs are eliminated and scope of service and supply is completed. Occurring errors or change requests are handled by the project team. Moreover, the internal project handover to CS (Service Line Remote Services) is prepared.

Output:

- System meets the sold figures and functionalities
- Errors and deviations are handled via the deviation management process

- The customer is running the installation independently in production operation
- The ramp up phase is documented
- All open issues (according to in final acceptance certificate) are solved
- Handover to CS (Service Line Remote Services) is prepared including Software documentation and quick guides

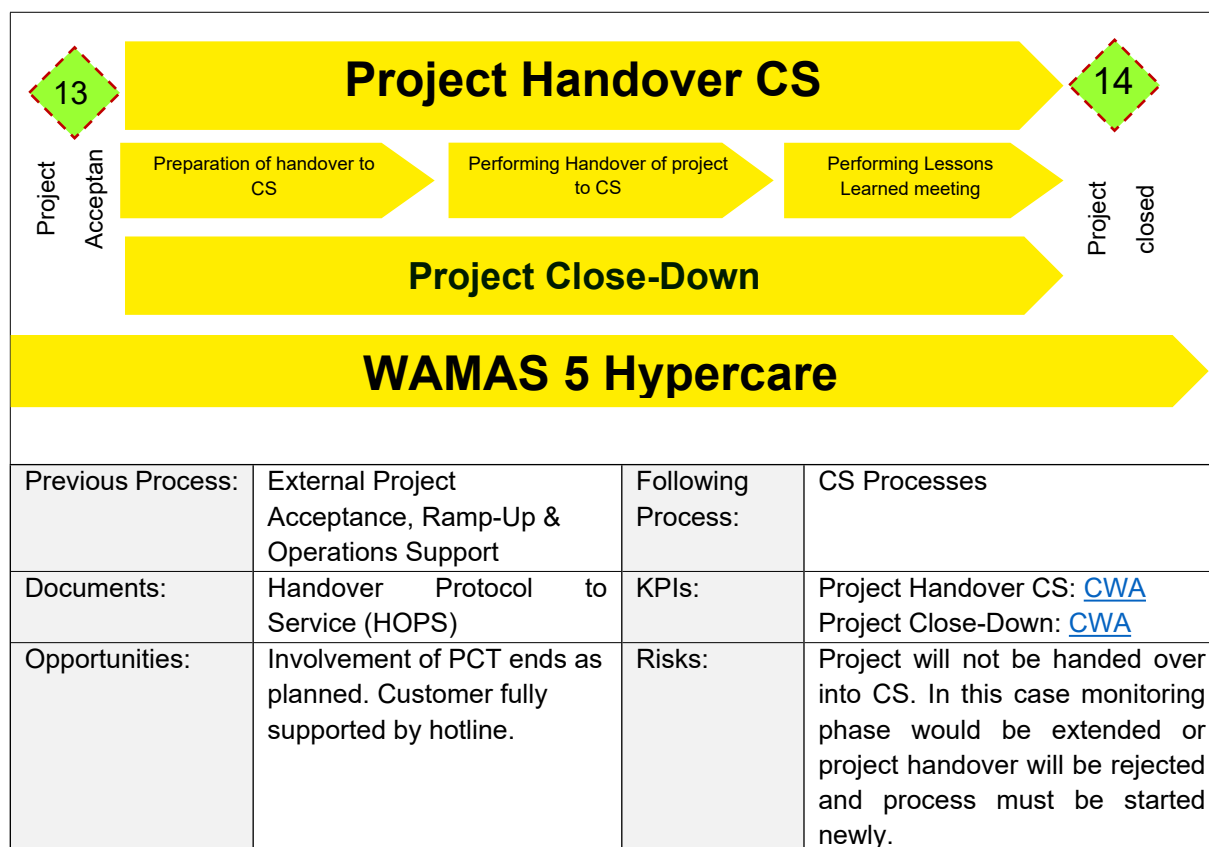
In addition to Ramp-Up & Operations Support, the “WAMAS 5 Hypercare” project phase begins after “QG 12 – User Acceptance Test completed / Ready for Go-Live” (refer to chapter 0).

33 IPM MACRO PROCESS: Project Handover CS* & Project Close-Down

* = Service Line Remote Services

Note:

For Steelwork only projects the handover procedure to CS is omitted. However, tasks in context of Project Close-Down are still valid (lessons learned, project close-down report etc.).



Input: Project ready for Close-out.

Process steps:

1. After receiving the signed in final acceptance certificate from the customer, the relevant information for handing over the project to CS (Service Line Remote Services) is being collected in accordance with the handover protocol to service (HOPS).

2. Ensure that all preconditions are fulfilled to be able to start monitoring phase (i.e., filled out HOPS). The monitoring phase starts when all preconditions according to HOPS are fulfilled. The duration of the monitoring phase is defined in accordance with the project complexity. Within the monitoring phase the amount of service calls and the number of critical incidents is evaluated. If the evaluation during the monitoring phase is positive (= monitoring criteria are fulfilled) the project is officially handed over to CS. Otherwise the monitoring phase will be extended until evaluation is positive.

At the end of the agreed monitoring phase the SOM organizes a handover meeting to get the current state of the internal handover. In the meeting the predefined criteria for internal handover are evaluated. Depending on the open and not fulfilled criteria the monitoring phase will either be closed (project is handed over) or extended (some minor criteria are not fulfilled). Missing information is highlighted, and a completion date is being agreed. Remaining open issues from the project are reported and being decided upon who will take responsibility to solve them. Remaining open orders (i.e., last minute change requests of the customer) are bundled for handover.

The completed Customer Satisfaction Survey is collected and handed over from CS to QA. The project is prepared for financial closing (e.g., financial balancing of list of adds and omits between all parties etc.).

3. The Lessons Learned meeting is being held including the project core team and sales, following the proper procedure of a learning organization, and ensuring sound feedback loops that resolve issues and prevent them from recurring. A project close-out workshop in accordance to IPM guideline is being held with the team and the team is officially disbanded.

Output:

Project handed over to CS (Service Line Remote Services)

34 QUALITY GATE 14 – Project closed

Target:

The Go Live, Ramp Up and Operations Support have been successfully finished and acceptance of the project has been given by the customer (signed in final acceptance certificate). The customer is able to handle the system properly and produces the expected output (according to the contract). The customer satisfaction is therefore high as his expectations have been met. The transfer of all relevant project information to the customer service (CS/RM) organization has been successfully completed. It has been made sure of both, the project organization, and the CS/RM organization, that the information gap during/after the handover is as little as possible. This ensures that the customer finds well informed and competent support which is on the same quality level as the support that he had received from the project organization. The customer feels to be in good hands and project close-down is completed.

Previous process step:

“Project Handover CS”, and “Ramp-Up / Operations Support” and Project Close-Down completed

Items – Project Handover CS up to QG 14 “Project closed”	Resp.
<i>Preparation for monitoring phase</i>	
Second signature of the final acceptance certificate (FAC) acc. QG 13, all open points from the FAC have been resolved and completed (confirmation from customer that open issues are resolved)	PMA
All relevant documents to be handed over to CS* are updated and prepared (according to HOPS = handover protocol to service). *Service Line Remote Services <u>Documents / information to be prepared:</u> <ul style="list-style-type: none"> - Ensure that all preconditions are fulfilled to be able to start monitoring phase (i.e., filled out in HOPS Online) - Confirmation of available VPN site to site connection (connection details to be provided by PMSW) - Signed final acceptance certificate - Actual open issue list (e.g., in Jira, open issue list with customer) - Project documentation to be stored in service portal - Safe passwords entered in Passion 	PMA, PMSW, CS
Defined system- or technical performance officially confirmed (within signed final acceptance certificate) according to the contract.	PMA, CS
<i>Performing Internal Handover of project to CS</i>	
Monitoring phase of CS started after the customer has been informed about the service processes and all criteria according to HOPS are fulfilled. Duration of monitoring phase defined in HOPS.	SOM, PMA
Internal Review Meeting (optional) organized by SOM in order to have an intermediate state of the current internal handover process and everybody is on the same page of the open points for final internal handover and the timeline for further processing is aligned.	SOM, PMA
Incidents during monitoring phase evaluated.	CS
All open Software issues (only issue type “Bug”) resolved prior official hand over to CS.	CS, PMSW, PMA

Items – Project Handover CS up to QG 14 “Project closed”	Resp.
<u>Note:</u> The monitoring phase can be started with Software issues (issue type “Bug”).	
Organize and carry out internal handover meeting (mandatory) at the end of the monitoring phase. The predefined criteria for internal handover in HOPS are evaluated. Project is either handed over or monitoring phase is extended.	SOM, PMA
Project officially handed over to CS* and confirmed / signed in HOPS. Handover date entered in ERP system. <u>Note:</u> <ul style="list-style-type: none"> - Project can be officially handed over to CS* also with remaining open issues from the acceptance protocol (except IT issues with issue type “Bug”). Responsibility for solving these open issues must be clearly aligned with CS. - In case no VPN connection to the customer site is existing the project can still be handed over to CS*. A written statement from the customer is required which confirms that no VPN connection is available. <p>*Service Line Remote Services</p> <p>In case the PMA and SOM cannot agree on the official hand over this will be escalated to the Head of BU CS.</p>	PMA, CS
Survey of customer satisfaction done via Customer Satisfaction Tool.	CS
Financial closing of project done in ERP system. All project costs booked to project (e.g., back charge reports), financial balancing of list of adds and omits done.	PMA
<p align="center">Performing Lessons Learned Meeting More details find in the according process steps in CWA</p>	
Content for lessons learned workshop prepared (e.g., issues from Jira).	PMA, PCTM
<p>Lessons learned workshop incl. contractual/legal lessons learned with all involved parties (e.g., Project Core Team Members, Sales, Group Function (GFC) Legal, Product Owner (PO), etc.) done.</p> <p>Feedback regarding country-specific regulations in addition to CE can be reported directly via DL-DE-GIE1-Country.Specific to be recorded in the country-specific database.</p> <p><u>BU LS:</u> According project governance must also be invited:</p> <ul style="list-style-type: none"> • For A-projects >10 Mio. EUR and B-projects >50 Mio. EUR (project classes A1, A2, B1): CEO, CFO, BU LS Head and BULS-PMO@ssi-schaefer.com • For A-projects <10 Mio EUR and B-projects <=50 Mio. EUR (project classes A3, B2, B3): BU LS Head as "optional"; i.e. when scheduling the Project Lessons Learned Workshop, it is not necessary to take into account the times already planned by the BU LS Head according to his calendar. <p><u>BU CS:</u> For BU CS projects, lessons learned workshop is organized only for B-projects and projects that were selected by the Global Head of Project Management BU CS.</p>	PMA, PCTM, Sales, GFC Legal / Head of Legal BU LS, PO

Items – Project Handover CS up to QG 14 “Project closed”	Resp.
<p>Organization of the workshop is responsibility of PMA and all involving parties shall be invited (e.g., Project Core Team Members, Global Head of Project Management BU CS, Sales, SAM, CS Region Head, etc.). Additionally, PMA and Global Head of Project Management BU CS can invite VP Global Head of Project Services BU CS, Lead PMO BU CS and other participants that can benefit from the workshop.</p> <p>For projects, where Lessons Learned workshop took place, a Close Down report is expected to be filled and signed.</p>	
Derived actions from lessons learned workshop communicated to line organization (process manager, product owner (PO) / product manager).	PMA
Lessons learned regarding 3rd party suppliers done with all relevant parties.	PMA
Project formally closed.	PMA

Obligatory Outputs QG 14

(refer to CWA [QG 14](#) for details)

Documents:

Ramp-Up & Operations Support / Project Handover CS

- Final Acceptance Certificate with signed open issue list (confirmation from customer that open issues are resolved)

Project Close-Down

- Lessons Learned documentation (at least: photo documentation of workshop; e.g. also presentation, new lessons learned issues etc.)
- Signed Project Close Down Report*
* Reuse your project document “Project Charter & Project Close Down Report” ([TL-00182](#))

Results:

Ramp-Up & Operations Support / Project Handover CS

- Handover Protocol to Service ([HOPS Online](#))

Project Close-Down

- All Jira issues in the Jira customer project closed

35 IPM MACRO PROCESS: WAMAS 5 Hypercare

The “WAMAS 5 Hypercare” project phase begins after “QG 12 – User Acceptance Test completed / Ready for Go-Live”.

Software Realization units will remain responsible to provide the following WAMAS 5 related services to our customers:

- 2nd level support in terms of problem analyzing and providing bug fixes to the customers
- On-call duty according to service level agreements
- Value-added services, such like consulting, additional training, configurations and developments beyond project and service contract

This additional phase will last up to two years after final acceptance of the project. Depending on BU CS capabilities, the duration can be – based on a mutual agreement – reduced case-by case.

Commercially, the project contract will be closed with the signed Final Acceptance Certificate (FAC), whereas the service contract is replacing SSI’s contractual basis to the customer. The Project Manager Software (PMSW) will embed the Service Account Manager (SAM) latest with Go-Live to liaise with the customer and enable a trustful handover to the service organization during WAMAS 5 Hypercare.

The underlying internal commercial/business model is driven by two principles:

- Margins will be allocated to the BUs, providing the respective services
- In case of on-call duty losses of BU LS, the deficit will be taken 50:50 by both BUs

After “WAMAS 5 Hypercare” phase, the handover to BU CS will be executed without the known observation period. Know-how transfer from BU LS to CS will be initiated by BU CS as part of WAMAS 5 Hypercare, depending on available WAMAS 5 capabilities. Maximum period of 2 years after FAC has been signed must not be exceeded.

36 Version History

Version	Update	Comment	Editor
1	23.03.2016	Pre-Release	Christoph Wrann
2	31.03.2016	Updates: project order processing and project handover	Christoph Wrann
3	29.04.2016	Updates according to comments of PLC (SSI GRZ)	Christoph Wrann
4	12.05.2016	Revise Quality Gates C-2 (incl. macro processes)	Christoph Wrann
5	24.05.2016	Minor changes according to comments of PM-SP and Installation department. Revise project preparation.	Christoph Wrann
6	13.06.2016	Comments from PCT updated (SSI GIE, SSI FRI)	Christoph Wrann
7	23.06.2016	Macro process "project handover CSS" revised; Installation process and Q-Gate 8 revised	Christoph Wrann
8	23.08.2016	Updates according to comments of Mr. Glos and Mr. Adler-Rindler (safety)	Christoph Wrann
9	12.09.2016	IT processes integrated	Christoph Wrann
10	07.02.2017	Updates according to comments of IT, primarily responsibilities defined	Christoph Wrann
11	15.09.2017	Various updates according the process harmonization workshops	Christoph Wrann
12	07.12.2017	Various updates according the process harmonization workshops	Christoph Wrann
13	19.03.2019	Various updates according the process harmonization workshops	Christoph Wrann
14	14.01.2020	Various updates according the process harmonization workshops	Christoph Wrann
15	23.04.2020	Various updates according the process harmonization workshops; for detailed information please check the revision comparison	Matheus Barcza-Stockler
16	24.09.2020	Various updates according the process harmonization workshops; for detailed information please check the revision comparison Link	Matheus Barcza-Stockler
17	21.12.2020	Various updates according the process harmonization workshops; for detailed information please check the revision comparison, Link	Ernst Wolflehner
18	31.05.2021	<ul style="list-style-type: none"> Replaced wording "CSS" with "CS" Performing Handover of project to CS -> Replaced EVP CSS with Head of BU CS Added „SOM“ to abbreviations for roles Changed description of "Service GC to be defined" to "The PMA informs the Service Operations Manager (SOM) about the new project via som@ssi-schaefer.com" and role to be informed from CS to SOM. 	Domenika Stoiser

Version	Update	Comment	Editor
		<ul style="list-style-type: none"> QUALITY GATE 2 – Preliminary project charter signed / Open issue list completed: Content regarding “Contract Analysis Checklist” removed, since the document is CC Graz specific, so cannot be used globally Added note of importance and link to CL-00619 CE Required Documents (QG 5) Added column “Editor” in this table 	
19	17.09.2021	<ul style="list-style-type: none"> More detailed description and highlighting of System Optimization Workshop and Lessons Learned with Sales in chapters 12 IPM MACRO PROCESS: System Optimization and 13 QUALITY GATE 4 – Customer approval signed (acc. meeting Exec Perf & Sales) Removed wording “IT” from Software processes, renamed to e.g. “Realization (Software)” / “Commissioning (Software)” Added content regarding Advance Support (Contact Level & First Level Support through Customer Service) Changes regarding feedback from Installation (e.g. Removed “IBN checklists”, since GIE checklists cannot be used on the global level) Added row regarding email to DL-LSOP-FinalAcceptance (LSOP-FinalAcceptance@ssi-schaefer.com) in chapter 0 QUALITY GATE 13 – Project Acceptance signed Changes with regard to new CS Process “Carry out Internal Handover” Project Start Workshop: SLEM added 	Domenika Stoiser
20	08.08.2022	<ul style="list-style-type: none"> Added latest time by which advance support must be announced (QG 6) Added latest time at which Advance Support criteria must be fulfilled (QG 12) Updates according to process changes (Sales, Project Initiation) Reviewed and updated visualization system (Lighthouse) topics incl. change of responsibility from Software Realization to Controls Reviewed, updated, and added CE Management topics Replaced role Sales Manager with Bid Manager and role Sales Engineer with Concept Engineer QG 3: Added/Updated utilization time of Site Managers QG 5: Detailed description of the point „Conditions of delivery (customs) clarified“ QG 10: Added point for updating spare parts offer (covering additional components installed due to Change Requests or internal changes) Adaptions acc. to the inputs from reviews of CI Teams Installation, Engineering and Controls; and Project Management 	Domenika Stoiser Christoph Wrann Clemens Höfler Olga Bauder Gernot Luttenberger

Version	Update	Comment	Editor
		<ul style="list-style-type: none"> Added mandatory documents acc. to descriptions in the tables to "Obligatory Documents" 	
21	12.10.2023	<ul style="list-style-type: none"> Project Core Team Meetings mentioned and described Coordination activities of the PCTMs and project subteam communication structure mentioned and described Note regarding rules when changing / substituting a PCTM or project subteam member added Renamed acceptance protocol to final acceptance certificate, introduced provisional acceptance certificate Added CS-specific definitions (acc. Vuk Krivec) Added role "Automation Integration Manager (AIM)" as contributor Renamed "Lighthouse" to "WAMAS Control Center" Added more detailed information for Lessons Learned Added more detailed information for System Optimization Workshop Descriptions regarding CE declaration for QG 8 and QG 12 refined Newsfeed referring to the major changes 	Christoph Wrann Michael Fankhauser Max Wedding Markus Rainer Johannes Wohlfahrt Gernot Luttenberger Clemens Höfler Domenika Stoiser
22	23.04.2024	<ul style="list-style-type: none"> Updated regarding Commissioning / QA Plan NEW (test level + implementation terms etc.) Updated regarding feedback in context of "Streamlining for C/D projects" Added new phase "WAMAS 5 Hypercare" (chapter 0) Updated designation of the QGs (e.g. "completed" instead of "finished", updates regarding Commissioning / QA Plan NEW) Graphics updated (uniform, state-of-the-art coloring of the processes, etc.) Renamed "preliminary Project Charter" to "draft of the Project Charter"; System Optimization Workshop to System Review Workshop Site facility points reviewed and updated (e.g. responsibility), CIPLSOPRP-763 QG 3: CE Manager (CEM) must be invited to Kick-Off meeting; Optional Project Handbook removed QG 4: Added Minimum requirement for C- and D-Projects regarding confirmation of the status of the layout; new procedure for Freight Management QG 5: Added "How- to request logical network planning"; Added "Organization of Parts provided by the customer, shipped directly to Graz" incl. work instruction QG 6: Added note regarding MPIS creation by SWAN in case no Software Realization is involved in the project. QG 7: CS RM Team is planned to be on-site at least starting from QG 8. If no RM Team is planned for the project, the responsible service provider has been nominated to ensure know-how transfer. 	Christoph Wrann, Michael Fankhauser, Peter Diener, Brad Moffatt, Alessandro Miertschink, Armin Kaufmann, Dragan Vujadinovic, Albert Lorente, Antje Pithan, Alfred Emmerstorfer, Clemens Höfler, Johannes Wohlfahrt, Bernhard Anderle, Gernot Luttenberger, Christoph Gaugl, Alexander Orthaber, Arno Pretthenthaler-Buksek, Erich Juraske, Caroline Ühlein Plante, Ernst Wolflehner,

Version	Update	Comment	Editor
		<ul style="list-style-type: none"> QG 12: Installation (ISVE) and Controls (if defined in QA Plan) on-site during UAT, NEW: Internal Acceptance Certificate (TL-04929) (= Legal requirement of Finance department for the final invoice of an IC contract/order) replaces CL-00518 Internal Project Acceptance Protocol – QG11. QG 14: Note: Added note regarding the handover procedure to CS is omitted for Steelwork only projects. Chapter 36 “QG 15 Multi-Project review finished” removed 	Domenika Stoiser
23	06.03.2025	<ul style="list-style-type: none"> Reference to Project Governance Policy added Sales remains responsible for the layout until the system-optimized layout for project realization is approved by the customer. All obligatory Quality Gate Outputs revised and updated Added “SSI Data Acquisition / Predictive Maintenance” (QG 4, QG 5, QG 8.2) QG 3: Internal Kickoff-Meeting: Invite Bid Manager, Carry out Contract Analysis: Invite Project Controller to contract workshop, Project Start Workshop: Best Practice Example available, Regular Project Core Team Meetings: Invite Bid Manager (or a representative) QG 4: Logistics concept and layout checked: Involve Bid Manager, System Review Workshop: Invite Bid Manager / Protocol template available, Layout of transport units created: Barcodes, Detailed analysis of transport units done: Analysis of goods inside transport units, Safety Briefing 1: Invite also SLEE, PEE and SLEC, Revise Steelwork Planning: Steelwork Manager, Lessons Learned Meeting: Invite Technical Director (TD) and Bid Manager / Mandatory for all projects QG 5: Availability model: Start with creation of the availability model (if availability is sold), Safety Briefing 2, System Risk Analysis including different interfaces between subsystems done QG 6: IT Hardware / Server specification and triggering procurement QG 7: Meeting with installation team: Invite also SLEC and PEC, Availability model defined (if availability is sold) QG 8: Reporting accidents on site: Added Project Manager, Reporting accidents on site: Added Project Manager, Handover of PLC Software to Software Realization QG 8.1 – QG 10: Daily Stand-up Meetings must be initiated with start of Controls Commissioning, On-Site Component Test Controls (QG 8.1): Load Test SOC for each control area of a subsystem QG 12: Ramp-up plan aligned with customer, Performance Acceptance Test: Test with order structures and quantities agreed in the contract, Internal Acceptance Certificate QG 13: Final Acceptance Certificate: All open issues to be entered in Jira 	Chr. Wrann M. Fankhauser P. Diener S. Maar A. Pithan C. Höfler, J. Wohlfahrt, B. Anderle, G. Luttenberger, Chr. Gaugl, A. Orthaber, L. Einemann, A. Pretthenthaler- Buksek, E. Juraske, B. Osrecki-Ostojic, S.Kohn, D. Stoiser

Version	Update	Comment	Editor
		<ul style="list-style-type: none">QG 14: Lessons Learned Workshop: Participants and feedback regarding country specific regulations, template for Project Close-Down Report	