

QA Plan LDPE B TA2026

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Covering: LDPE B TA2026

Location: Porvoo PO

Next review:



Keep Discovering

Quality Assurance Plan PorLD B Turnaround 2026

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- 1. Work Planning Quality / TA Engineers
- 2. TA Integration & Coordination Quality / TA Engineer and CM
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- 5. Preparedness Quality Checks
- 6. Execution Quality / Quality Team, work planners and supervisors

PORVOO LDPE B TA2026 Quality Process (extended)



Work Planning quality		
Topic	Action responsible	TA owner
Maintenance works	Work Planner	TA Engineer
Project works	EPCM	TA PM
Screening of works	Work Planner	TA Engineer
Scheduling and planning	Work Planner	TA Engineer
Spareparts reservations	Work Planner	TA Engineer
Needed equipment for work	Work Planner	TA Engineer
Integration and coordination quality		
Topic	Action responsible	TA owner
TA Reviews	TA Manager	TA Manager
Plant integration	Construction Manager	TA Manager
Scheduling	TA Scheduler (TA Engineer)	TA Manager
Reporting	All	TA Manager
TA Trainings	HSE-Coordinator	TA Manager
Construction site plans	Construction Manager	TA Manager
Procurement Quality		
Topic	Action responsible	TA owner
Procurement Strategy	PPL	TA Manager
Purchase requests	Work Planners	Lead Buyer
Procurement scheduling	Lead Buyer	TA Manager
Material & equipment quality	Work Planner	Asset Manager
Service quality (maint)	Work Planner	Asset Manager
Service quality (projects)	EPCM	PM
Material quality check in warehouse	Warehouse Manager	MEE Manager

Resource Quality		
Topic	Action responsible	TA owner
Competence of own personnel	Department managers	TA Manager
Contractor personnel	Work Planner	Asset Manager
Execution quality		
Topic	Action responsible	TA owner
Flange leaking prevention	Quality Team (all)	Quality Captain
Flange tagging system	Operations	Product. Mgr.
Certificates working with flanges	Work Planner	Asset Manager
Leak testings	Operations	Product. Mgr.
Cleanless	Supervisors, QT, oper.	Asset Manager
Rotating equipment	Work Planner & Maint. Engineer	Asset Manager
Static equipment	Work Planner & Maint. Engineer	Asset Manager
Electrical	Work Planner & Maint. Engineer	Asset Manager
Instrumentation	Work Planner & Maint. Engineer	Asset Manager
Piping	Work Planner & Maint. Engineer	Asset Manager
Inspection quality	Work Planner & Insp. Engineer	Insp. Manager
Handover system (Commissioning)	Commissioning Manager	TA Coordinator
Contractor Quality Plan	Work Planner & Maint. Engineer	Asset Manager

Quality targets

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- Executing the turnaround maintenance and project activities in given time schedule and without TRIs. Committed to Zero Harm -approach to be applied.
- Leaking flanges or delaying blinds at start up phase: see KPI's
- Reliability of units after Turnaround : see KPI's
- Duration from off- spec to on spec: see KPI's

1. Work Planning Quality

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- Maintenance Work
 - Task lists
 - Screening of work scope (Screening Procedure)
 - Scheduling and planning of Work Orders
 - Task lists,
 - WO planning guide
 - Ensure enough planning time for part-time planners (beside daily & other activities)
 - WO planning quality check by scope coordinators
- Spare parts reservation and ordering
 - WO planning instructions
- Special Tools, crane and other work equipment reserving & planning
 - Constructions site crane and machine plan
- Project Work
 - Borealis Project Procedures

4.Competence of Personnel

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- Own Personnel
 - Additional Training
 - Turnaround training
 - Quality training
 - Supervisor training
- Contractor Personnel
 - Enough Competent Quantity
 - Employee list with names required from Contractor 2 months prior TA in Sedatus
 - Ensuring Skills and Professionalism
 - Employee certificate spot checks (need to plan in advance)
 - Language and communication competence
 - Supervisors language will be Finnish or English
 - Supervisor need to be able to communicate for own team by language which workers can understand clearly
 - Reliability, certification of Contractor
 - FA contractors
 - "Trusted Vendors"
 - ISO-standards
 - Quality certificates

6.Execution Quality

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- Flange leaking prevention
 - Flange Management Excellence
 - Contractor and Borealis mechanics flange training requirements
 - Leak Tests per production system, follow the LDPE department's leak testing protocol
- Cleanliness & Process inspections
 - Turnaround Quality Support Team
- Rotating equipment work
 - Borealis Rotating Equipment Expertise
- Static equipment work
 - Borealis Static Equipment Expertise
- Electrical work
 - Borealis Electrical Expertise
- Instrumentation work
 - Borealis Instrumentation Expertise
 - DCS ESD Systems, Functional Testing
- Piping / Other Welding work
 - PED Requirements, Borealis Piping expertise
 - Pre-fabrication work checks / inspections
- Inspection quality
 - Borealis Inspection plans
- Hand Over system - De / Re-commissioning
- Expediting (e-motor, safety valves, control valves...)

Quality Plan



Quality Assurance Porvoo LDPE B Turnaround 2026

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Following key elements of quality are defined in following slides

1. Valid procedures
2. Flange leak prevention
3. Process inspections
4. Mechanical Integrity
5. Rotating Scope
6. Inspection and maintenance reports
7. Quality of contractor staff
8. Hand over system
9. Piping work quality

1. Valid procedures

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- All valid maintenance, HSE, engineering and inspection procedures are completely applicable in the Turnaround
- Q-aspects are defined for:
 - Hoisting
 - Inspection procedures about welding, prefabrication
 - Maintenance procedures for specific equipment
 - Blinding and removing blinds (tag procedures)
 - Working at heights (scaffolding inspections)
 - Etc.
- Specific Quality Support Group to be initiated
- Maintenance history reporting of the Turnaround activities and updating the P3M plans

2. Flange leak prevention

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- A specific TA QA procedure is available to avoid flange leaking – with process media – at the start-up. [BOY-2035](#)
- Sealing surface inspections after opening the flange
- Protecting of sealing surfaces during TA execution before box up
- Leak tests for flanges before start-up.
 - Flange box ups will be checked by quality support team
- Certification of flange fitters required according to SFS-EN 1591-4, spot checks before and during Turnaround execution
- Borealis arranged training required for lens ring flanges (high pressure flanges)

3. Process inspections

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- Quality support team is a part of improved methodology how to follow up and report quality during turnarounds. Team follows up quality during shutdown, turnaround execution and start up. Following main tasks are appointed to team:
 - Process observation where equipment condition is observed directly after opening → before cleaning
 - Approval of equipment cleaning quality
 - Box up quality inspection
 - Overall quality observations during TA
 - Documentation of observations, quality inspections and handover
 - In handover strategy quality support is one party before final handover for operations
- Points of interest :
 - Bolts, screws, gaskets, gloves, ... that were left behind
 - Are all necessary internal parts present?

4. Mechanical integrity

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- All maintenance works are handed over via MaTap
- When all operations are finished at a specific system, a formal handover of this production system will be made from maintenance to production. Handover is done utilizing MaTap system except
- In the planning phase typically 2 quality checkpoints are provided as formal handover of a system:
 - Supervisors will sign for each work phase in MaTap after verifying that all activities on this system are performed and all flanges etc. (packing, bolts, ...) are installed correctly.
 - Operation area supervisor/quality team will sign for 'production system in MaTap ready for start-up' after verifying on the spot that the system is complete (caps & drains present and closed, valves lined-up, no venting flexibles or flushing flexibles connected, all blinds removed and the right packing present,)
 - Approval (signing) of these steps is performed on name.

5. Rotating scope

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- Rotating scope included compressors and pumps
 - All the work will be performed by Borealis mechanics in co-operation with contractors
 - OEM supervisor to be used as QA where possible, otherwise Borealis expertise
 - Installation instructions, measurement logbooks, check lists, tool lists, spare part lists and machine drawings in English (Finnish where available)



6. Inspection and maintenance reports

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- For particular scope points, specific inspection reports are made up with the revision of specific plant parts
- Static equipment (equipment integrity including equipment and piping, observations and recommendations for actions during/till next TA, ...): according to the reports of inspection bodies
- First periodical inspections are made for new equipment/systems
- Operational inspections are made within 4 months after SU
- Piping (pressure test, visual, ...): according to the reports of inspection bodies. A specific quality plan is in place.
- Safety valves: according to the reports of vendor and spot checks by discipline responsible
- SIL instrumentation and functional testing
- Control and XCV valves, a maintenance report is received per item
- Instrumentation calibrations are documented in validated Beamex system
- Motor overhaul and other electrical equipment maintenance reports are required
- Maintenance report done for each Rotating Equipment overhaul separately



7. Quality of Contractor staff

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- Each contractor needs to provide a yard logbook for its staff containing a list of all present staff with a list and certification of their qualifications/education. During the Turnaround spot checks will be carried out.
 - Welding: all welding people need to be certified
 - Mechanical staff: certification of flange fitters according to SFS-EN 1591-4
 - Rigging work: training certificate
 - Scaffolding Work: training certificate
 - Education of Fork-lift truck driver
- Each contractor needs to send own HSE- & Q-plan prior to TA

8. Hand over system - a. Maintenance and WB work

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1. In Matap

I. Work supervisor hands work over to operations (for each work order)

- a. After the last A type work activity (prevents start-up preparations such as leak testing) has been finished
- b. Recording of discovered (B/C) punches. (Insulation, heat tracing and scaffolding are not added as punches when they already exist in the system)

II. Operations accepts the work as MC (for each work order)

- a. Recording of punches

Entities (production system, area, ..) are handed over to production manager. Documents signed in this phase and the enclosed punch lists are produced from MaTaP (reads data from Primavera database). These documents also cover project work.

8. Hand over system - b. Small and medium projects

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1. Handovers per equipment

e.g. pipe, EA-, XCV-, ...

a. Contractor hands the work over to project supervisor

- a. Project supervisor completes the work activity in Matap if NO A punches exist
- b. Record (B/)C punches

b. Project supervisor hands the work over to Borealis maintenance

- a. Checklist (activity steps) -> 100%
- b. Record punches

c. Borealis maintenance supervisors acceptance

- a. Sets the activity as 'Completed' if no A punches exist
- b. Record punches

d. Partial handover

Handover per discipline of a main equipment/work package once all work of a discipline have been finished and accepted.
Documents for partial handover were produced from MaTaP.

e. Handover for operations

E.g. Main equipment, work package, ...

I. Approval review

- a. Field check (Quality group, operations, maintenance, project)
- b. No A punches?
- c. Recording of (B/)C punches

II. Operations accepts as mechanically complete

- a. Sets their activity as 'Completed' in Matap



9. Piping work quality

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- Work definition ready
 - All the details described regarding PED requirements and effective execution
- Pipeworks packages
 - Isometrics, notifications, materials
- Contractor Pipework Quality Plan (CPQP)
 - Manufacturing time schedule, welding quality (WPS, WPQR, welder certifications, welding log), safety, material traceability, inspection and test plan (ITP) for prefabrication and on-site works
- Resources
 - Supervisors, NDT inspectors
- Review of Contractor pipeworks quality plan by 3rd party inspector
- Weekly follow up of pre-fabrication is in place
- Execution
 - Active supervision and follow-up of work quality, NDTs, documentation
 - Supervisor to ensure that requirements are fulfilled before handover
- Post-work follow-up (incl. documentation)
 - Two directional evaluation / feedback

Quality support team

– Scope of work



Quality Support Team Function

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1. Quality is a wide term and is present in each step of the work or project. Every person in TA is responsible for quality and safety.
2. **Quality support team** is a part of improved methodology how to follow up and report quality during turnarounds. Team follows up quality during shutdown, turnaround execution and start up. Quality support team may be considered as an extra layer of inspectors ensuring quality during turnaround execution.
3. **Quality team scope before execution:**
 - Perform trainings according to TA training matrix
 - Review process and quality findings of previous TAs.
 - Present scope of quality team at subcontractor seminar. Emphasis is on concrete case examples:
 - Previous quality flaws
 - Cleanliness demands on equipment

Quality Support Team Function 1/2

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1. Quality team main scope during execution:

- Documented process learnings during shutdown and start-up
- Documented process and quality observations for each equipment after opening / before 1st cleaning
 - Fouling situation
 - Open manways, loose trays and other mechanical flaws
 - Process samples
 - Photos *and "process observations"-template are collected per equipment*
- Approval of equipment cleaning quality
 - Main emphasis on nozzles, downcomers and other "hidden locations"
 - Special probe for checking heat exchanger tubes
- Permissions for closing equipment
- Box-up quality inspection before handover
 - Righteous gaskets, bolts
 - No loose bolts
 - No blinds

Quality Support Team Function 2/2

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- Punching of equipment
 - Feedback from punches are given directly to supervisors and contractors. Quality support has the right and power to intervene quality flaws
 - Punches also written to MaTap per equipment for internal follow-up
 - Quality highlights / lowlights are collected and communicated to interest groups
- Quality group signature required to final handover certificate before start-up
 - Summarize findings
 - To be utilized in planning of next TA

Other, supporting tasks:

- Report repeating or severe quality errors to Synergi
- Supervise process isolation and flange tagging procedure
- Check that gasket surfaces and tube ends are covered when valves / caps are taken out of line
- Ensure that pre-fabrications are preserved appropriately at pre-fabrication area and at the field
- Check that safety valves are installed back to correct locations after maintenance
- Overall quality observations during TA (lifting areas, working platforms, housekeeping etc.)



Quality Support Team Basic Tools

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- Schedule and progress follow up – Primavera and MaTap
- Electronic wallpapers
- RAP – work permits (same as inspection department)
- SAP – material management, work orders
- Synergi – Safety and quality deviation reporting
- Quality support team reports
 - Final report

Handover

- Electronical handover in MaTap
 - Includes punch list and responsible persons

Thank you

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