QuantityWare

Bulk Calculations – Petroleum BCP 3.0

Project Assessment and Implementation Guidelines (PAIG)

10.11.2017

Notes

Valid for BCS 3.0 “Technical” Releases:

SAP Release	BCS Release	CSP Level
ECC600+	30A	001
S/4HANA 1610	30B	000
S/4HANA 1709	30B	000
tba	tba	tba

Your release level can be determined via:

“/o/QTYW/COCKPIT” -> “Cockpit” -> “Support Package Level”

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Version History

BCS 3.0 CSP01	31.03.2017	Initial Release.
	15.08.2017	Links corrected.
	10.11.2017	S/4HANA 1709 validity added.

1 Introduction

This document describes the proven QuantityWare project methodology that enables technical consultants to successfully design and configure quantity conversion solutions that run in an SAP Oil & Gas ERP system. This methodology reflects the logical structure of the Petroleum Measurement Cockpit (PMC), whose design in turn was influenced heavily by the methodology.

The PMC is the single access point for measurement specialists and technical consultants to the QuantityWare BCP solution. Here you design, monitor, maintain and enhance complex, measurement standard based quantity conversion implementations that run within the SAP Oil & Gas ERP system. The PMC provides an easy to use user interface (UI), which is structured so that measurement experts and technical consultants can organize their work efficiently.

The methodology is called *Project Assessment and Implementation Guidelines,* or “PAIG” for short. The methodology is intended for medium to very complex requirements and/or large scale implementations (e.g. cross country, complex product portfolio, etc.), but should also be consulted for apparently easy quantity conversion implementations.

You should always apply the methodology as a check list for your SAP Oil & Gas quantity conversion implementations. By combining the PAIG methodology with the BCP 3.0 QuantityWare template configuration you will be able to obtain a maximum return on investment:

Quantity conversion set-up is an important part of any SAP Oil & Gas implementation project (new installation or upgrade/change project). It should be carefully planned and is typically the first project step before business process implementation can start, since all processes are based upon a working and well defined quantity conversion setup and product/material master definition. Rough implementation time estimates are made for individual steps described in this methodology. Quantity conversion requirements may show large variations for different projects (e.g. number of products and standards to be supported, process integration with respect to the configurable QCI user interface, rounding requirements for calculation models and target quantity values etc.).
Thus, *three new installation project complexity cases* are defined in this chapter to help support the different kinds of SAP Oil & Gas implementation projects.

1.1 PAIG Complexity Cases - New Installation Projects

1.1.1 Low Complexity Quantity Conversion Project:

- Make fast decisions on relevant measurement standards
- One country / similar countries with respect to measurement standards
- No legacy quantity conversion solution to be mapped
- Use QuantityWare template conversion groups (copy) with predefined model algorithm
- Use QuantityWare template reading groups (copy) with no changes to entries
- 1 to 3 conversion groups required
- Use QuantityWare range checks with predefined parameters – define and maintain ranges
- Use SAP & QuantityWare UoM template without changes
- Define manual test scenarios (effort then spreads to software life cycle)

1.1.2 Medium Complexity Quantity Conversion Project:

- Spend limited time to make decisions on relevant measurement standards
- One country / similar countries with respect to measurement standards
- No legacy quantity conversion solution to be mapped
- Use QuantityWare template conversion groups (copy) with predefined model algorithm
- Use QuantityWare template reading groups (copy) with changes to entries (e.g. descriptions, remove or add parameters)
- 2 to 5 conversion groups required
- Use QuantityWare range checks with additional parameters – define and maintain ranges
- Use SAP & QuantityWare UoM template and define new UoM
- Define specific UoM rounding
- Define automated test scenarios (effort reduction for software life cycle)

1.1.3 High Complexity Quantity Conversion Project:

- Spend considerable time on decision making for complex measurement standards situations (customer specific requirements, legal requirements)
- Many countries / differences with respect to measurement standards
- legacy quantity conversion solution to be mapped
- Use QuantityWare template conversion groups (copy) but change/enhance predefined model algorithm
- Use QuantityWare template reading groups (copy) with changes to entries (e.g. descriptions, remove or add parameters)
- 3 to >> 5 conversion groups required
- Use QuantityWare range checks with additional parameters – define and maintain ranges
- Use SAP & QuantityWare UoM templates and define new UoM
- Define specific UoM rounding for SAP / QW UoM and possibly own new UoM
- Define automated test scenarios (effort reduction for software life cycle)

1.2 PAIG Complexity Cases - Legacy Integration Projects

- The three project complexity cases described above assume that a new installation project – “greenfield project” – is to be planned.

- If QuantityWare BCP 3.0 shall be installed and integrated into an existing SAP Oil & Gas ERP system with a running legacy solution, additional efforts need to be considered. These additional efforts depend on the detailed legacy migration plan.

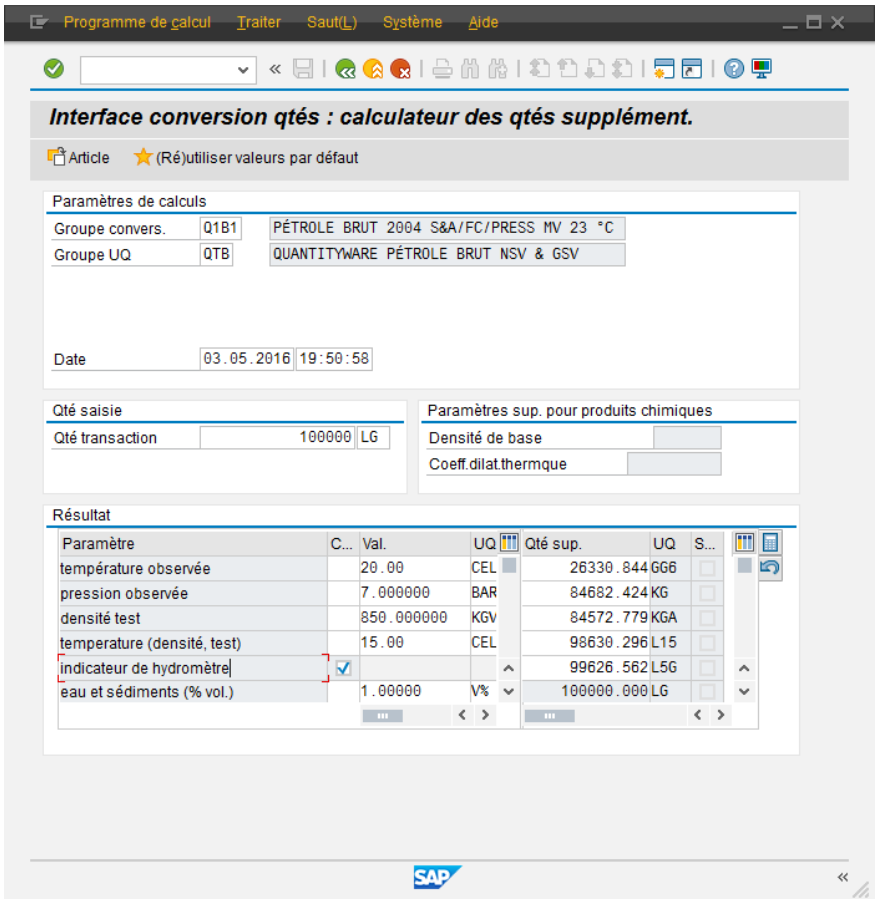
    - It is recommended to start such a project following the CTP PAIG approach.
    - As a second project step the migration of legacy SAP QCI C Code conversions to QuantityWare BCS 3.0 conversions should be executed, following the QuantityWare API C to ABAP methodology.
    - Finally, as a third step, this PAIG document provides the methodology for the implementation of new product quantity conversions or migration from SAP QCI to MQCI conversions.

2 Language Support

With BCP 3.0, QuantityWare ships all language dependent customizing template entries in four languages (listed in alphabetical order):

- English
- French
- Portuguese
- Spanish

Thus, all 400+ UoM definition texts, all 400+ conversion groups, more than 5000 reading group and range group entries (descriptions and parameter texts) are available in these four logon languages. The Petroleum Measurement Cockpit (PMC) UI itself is only available in English. Thus, you should perform the initial configuration work in English and make the final tests in your preferred language.



3 Prerequisites

- You have purchased a license for BCP and the technical implementation of QuantityWare BCP 3.0 has been completed successfully
- BC set /QTYW/BCP_30A/B/* has been applied to client 045 (or equivalent client if client number 045 is already in use for other purposes)
- Composite Role Y_QTYW_CR_ALL must be assigned to your user in order to be able to work with the Petroleum Measurement Cockpit
- You have successfully executed the QuantityWare installation and post installation steps described in the QuantityWare Technical Installation Documentation

Per system, the technical installation should take:

- Study documentation: 2 hours
- Package and CSP download: 15 minutes (one time for all systems)
- Installation via SAINT: 15 minutes
- Template client copy from 000: 30 minutes to 2 hours (system dependent)
- Template BC set distribution: 30 minutes
- QuantityWare installation test: 15 minutes

In total, 3-6 hours per system.

4 Overview

As noted above, these guidelines are aligned around the QuantityWare Petroleum Measurement Cockpit (PMC). The PMC provides all tools necessary to complete the challenging task of setting up sophisticated quantity conversion solutions. The PMC is accessible via transaction /n/QTYW/COCKPIT. More details on the PMC can be found in the BCP 3.0 Documentation Reference Manual.

- Chapter 5 describes the implementation steps that need to be followed to complete the task successfully

- Chapter 6 provides a summary with effort estimates for the three project complexity cases described in Chapter 1

5 The Methodology - PAIG

In this chapter, we provide all relevant project steps of our Project Assessment and Implementation Guidelines (PAIG) in chronological order. If one step is a definite prerequisite before next steps can be tackled, this is noted at the beginning of each step description.
The project steps are based upon our unique and extensive experience gained through our involvement and feedback from certified BCP consultants from many customer implementations.

> ⚠ *The completion time effort estimates are based on times for **highly skilled quantity conversion experts**.*
> *"L" denotes the low complexity case,*
> *"M" the medium complexity case,*
> *"H" the high complexity case.*

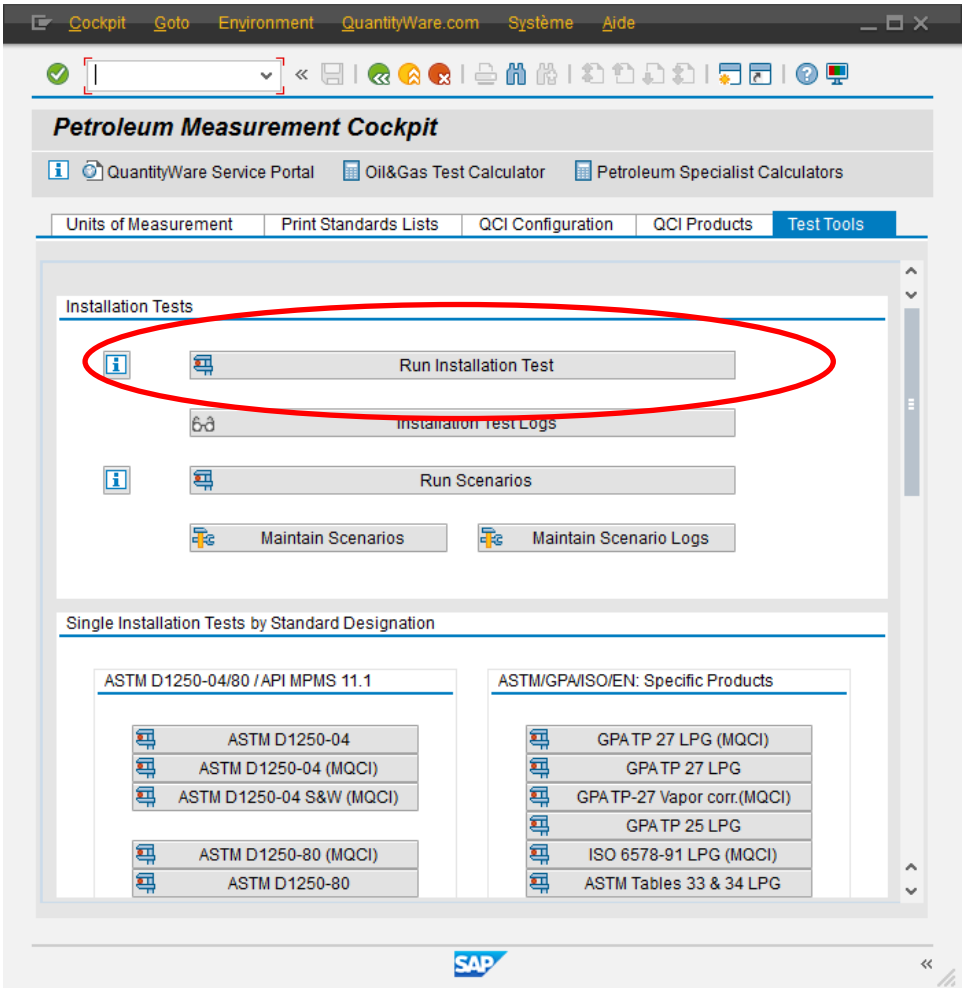
5.1 Run BCP 3.0 Installation Test in Client 045

Implementation step	1
Estimated time to completion	L: 0.1 hours M: 0.2 hours H: 1 hour
Next major step	2
Related project teams	Technical SAP basis experts or certified BCP consultants

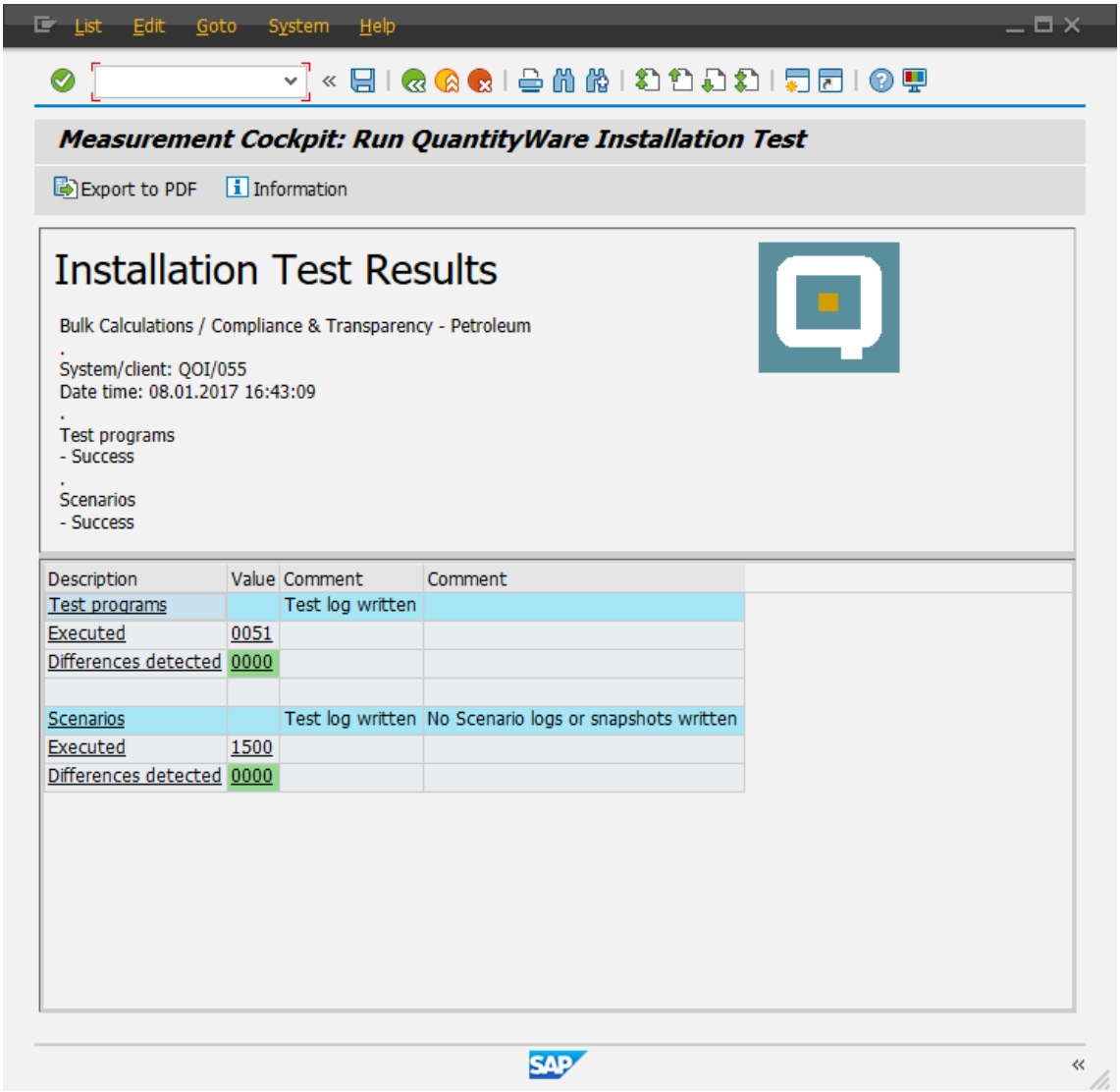
The PMC (Petroleum Measurement Cockpit) is the central access point for all QuantityWare test tools that are delivered with BCP 3.0.

- Log on to **client 045** (or relevant client where the BCP 3.0 BC set template is installed) and start transaction /n/QTYW/COCKPIT - The PMC is launched.
- Navigate to tab strip "Test Tools":

Run the Installation Test by selecting the push button: “Run Installation Test”:



The complete installation test run takes typically less than one minute. You should then see the following result list on your screen:



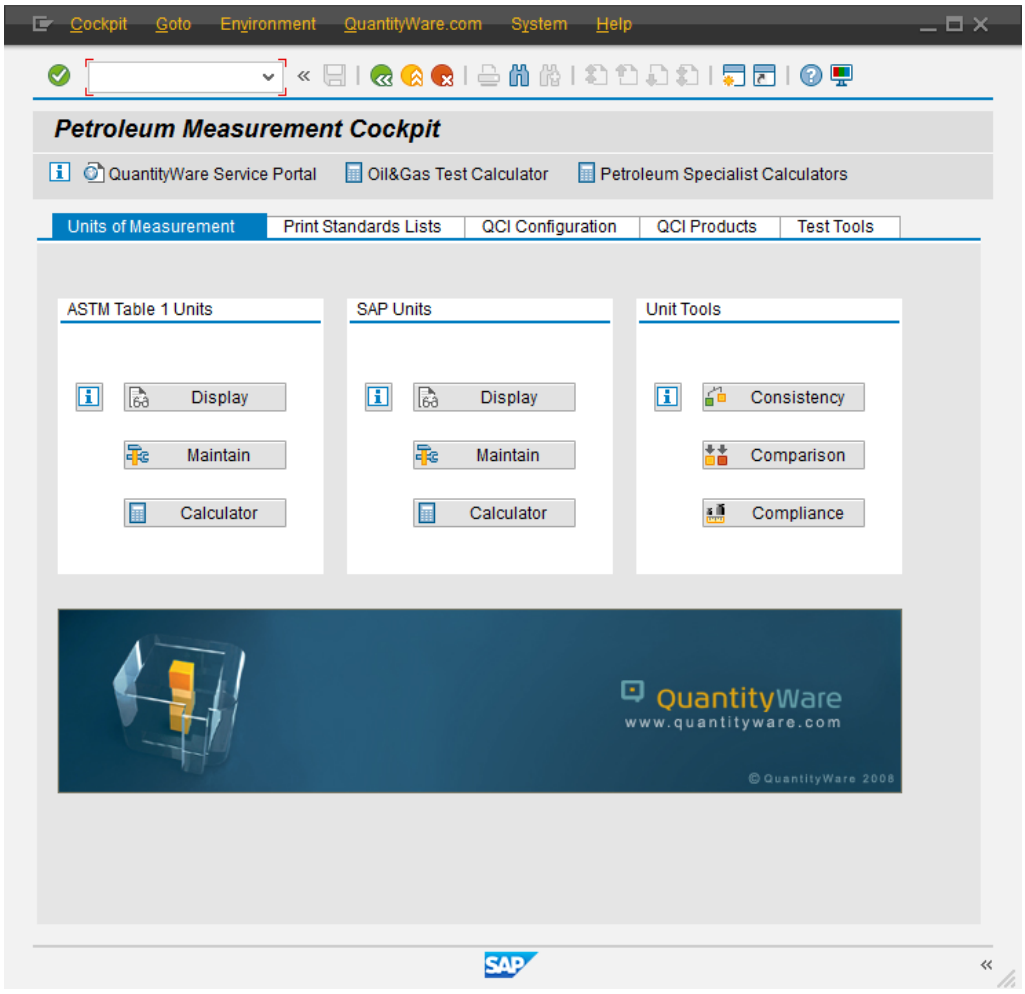
> ⚠ ***Select "Export to PDF" and save the installation test results to a local PDF file which you send to QuantityWare support – QuantityWare Service Portal to confirm that your installation has been validated successfully.***

This completes the installation test. Your system is now ready for project implementation of the BCP 3.0 quantity conversion solution.

> ⚠ *QuantityWare strongly recommends that you develop customer project specific tests scenarios that contain manually calculated results (cross checked by at least two experts), allowing an automated check of system calculations against these expected and validated results. Then a high degree of automation is ensured, as well as system compatibility with your measurement standards during productive usage.*
>
> ⚠ *Alternatively, a manual test procedure with at least four test calculation scenarios for one conversion group must be developed, which serves as a base for manual quality assurance processes.*

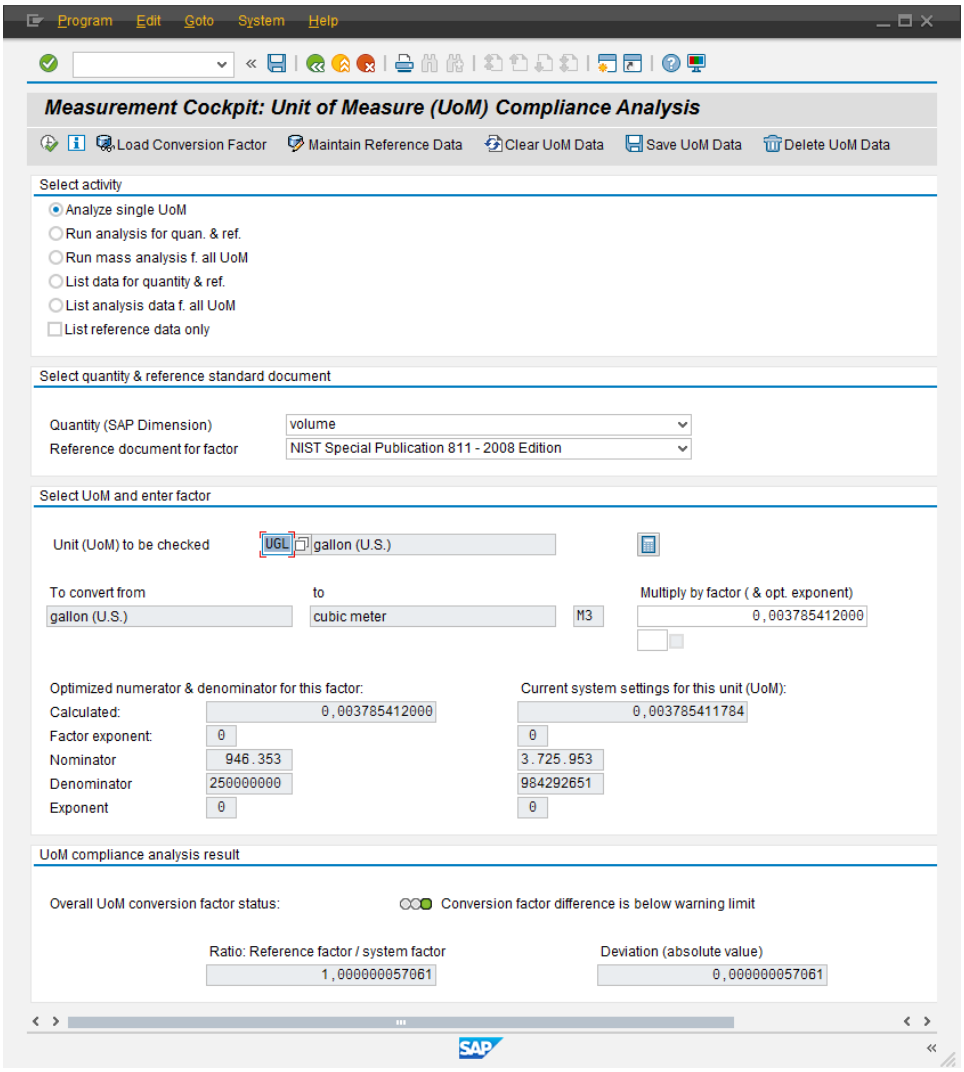
5.2 Define Units of Measurement

Implementation step	2
Estimated time to completion	L: 1.5 days M: 4.5 days H: 12 days
Next major step	3
Related project teams	Measurement specialists - customer and/or certified BCP consultants



- Collect all UoM requirements from all relevant departments
- Define all relevant Units of Measurement (UoM) and settings for quantity conversion calculations in your **project development client XXX**
- Use the Petroleum Measurement Cockpit to select your required UoM from the list of available UoM in your **project development client XXX**
- Document your required UoM

- If UoM are missing in **your project development client XXX,** select missing UoM definitions in the QuantityWare template **client 045** and transport these UoM into **your project development client XXX**
- Define & select UoM Compliance Reference Data in template **client 045** and transport required reference data to your project development client
- Run UoM Compliance Analysis in **your project development client XXX** and resolve issues, if any are found:



5.2.1 Units of Measurement - Usage

Implementation step	2.1.
Estimated time to completion	L: 4 hours M: 12 hours H: 40 hours
Next step	2.2
Related project teams	Measurement specialists - customer and/or certified BCP consultants

Collect all Units of Measurement (UoM) that are relevant for the business processes, i.e. UoM required for:

- Stock keeping (Bulk products are kept in stock with several UoM in parallel)
- Pricing
- Reporting
- Sales
- Financials
- Excise Duty

5.2.2 Units of Measurement - Definitions

Implementation step	2.2.
Estimated time to completion	L: 4 hours M: 16 hours H: 40 hours
Next step	2.3
Related project teams	Measurement specialists - customer and/or certified BCP consultants

Define & check the following parameters for all UoM that you identified in the previous step **in your development client XXX**:

- Rounding (display and calculation)
- Significant digits
- Commercial keys
- Descriptions
- **Conversion factors**

The conversion factors of the QuantityWare Template UoM have been validated via the UoM Compliance Analysis in client 045 and can be used as a reference for your customer specific UoM compliance analysis **in the development client XXX.**

5.2.3 Define Unit of Measurement Groups

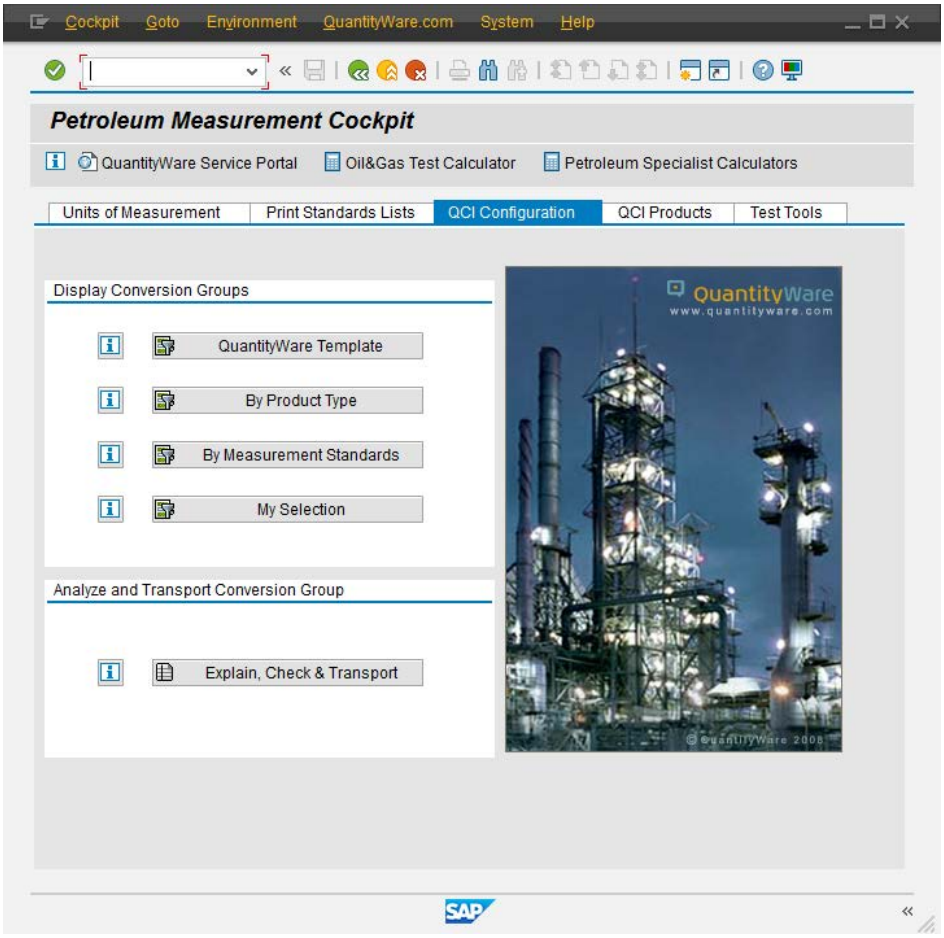
Implementation step	2.3.
Estimated time to completion	L: 4 hours M: 8 hours H: 16 hours
Next step	3
Related project teams	Inventory mangers customer & project experts

For all materials, define a collection of UoM, which is added to a UoM group in **your project development client XXX**. The UoM group is then assigned to the material master. Stock keeping is done in parallel for all UoM that are defined in the UoM group. Typically, you assign at least one weight UoM, one mass UoM, and a standardized volume UoM (e.g. L15, L20, UG6, GG6 ...) to a UoM group.

> ⚠ *Once a UoM group is assigned to a material and stock has been posted, it **CANNOT** be changed in ECC 600. Read SAP note 145824 for details. S/4HANA 1610 onwards supports the addition of a UoM to a UoM group via the utilization of a report which must be run locally in every SID.*

5.3 Define Product Measurement Standards

Implementation step	3
Estimated time to completion	L: 2 days M: 7 days H: 16.5 days
Next major step	4
Related project teams	Master data team – material master



Establish expert team (consultants and company business experts). Align with master data team.

> ⚠ *If you require quantity conversion calculations that map existing legacy system calculations, collect legacy system conversion data – example calculations - and contact QuantityWare for expert consultancy – a solution feasibility analysis is required, which may need additional customer specific developments.*

Conversion group calculations are determined by 4 different measurement standards:

- UoM conversion standards
- Mass–to–weight conversion standards
- CT(P)L standards (“effect of temperature and pressure on liquid”)
- Calculation model standards

Therefore, you need to define all four standards for each of your products.

> ⚠ *Read the BCP 3.0 Supported Standards documentation, which provides important guidance how to map products to CT(P)L standards*

5.3.1 Define Raw Data List

Implementation step	3.1.
Estimated time to completion	L: 4 hours M: 8 hours H: 20 hours
Next step	3.2
Related project teams	Master data team – material master

You should define a raw data list of all bulk materials / products that require dynamic quantity conversions. Classify the products following the classification scheme as defined in the QuantityWare **template client 045**, which contains more than 400 template conversion groups. The classification scheme is available via the Petroleum Measurement Cockpit using tab “QCI Configuration” -> "QuantityWare Template".
Additional information/documentation for all supported standards and products can be found on the QuantityWare website.

5.3.2 Assign & Confirm - Standards for Products

Implementation step	3.2.
Estimated time to completion	L: 4 hours M: 16 hours H: 20 hours
Next step	3.3.
Related project teams	Measurement specialists - customer and/or certified BCP consultants

You need to define the following standards for your products:

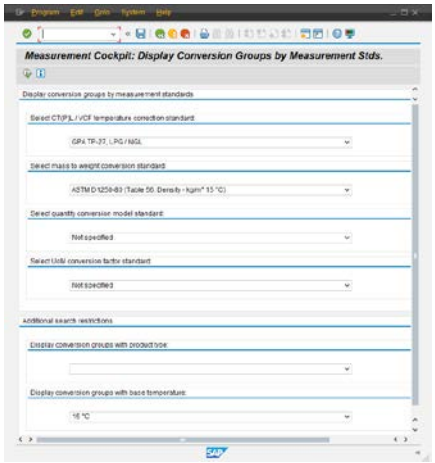
- UoM conversion standards
- Mass–to–weight conversion standards
- CT(P)L standards (“effect of temperature and pressure on liquid”)
- Calculation model standards

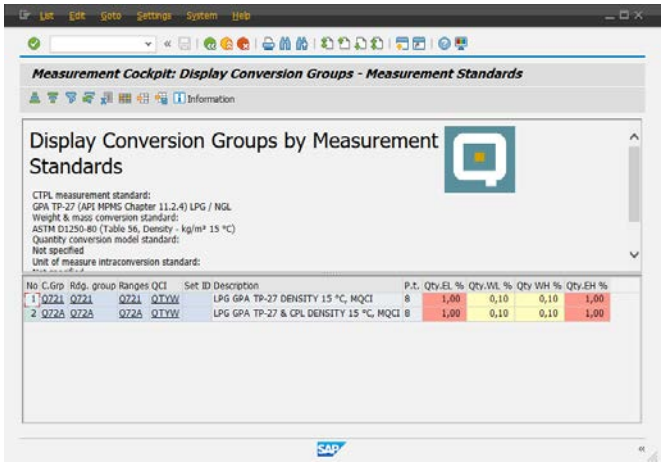
For many products (e.g. crude, diesel, gasoline …), several standards (e.g. national standards versus a global standard) or differing versions of standards are available. Contact the business owners and discuss the list to define which standards and which versions are relevant. Define standard versions for all products. Confirm and document specific national business requirements. Confirm and document specific national legal requirements.

5.3.3 Assign QuantityWare Template Conversion Groups

Implementation step	3.3.
Estimated time to completion	L: 4 hours M: 12 hours H: 32 hours
Next step	3.4.
Related project teams	Measurement specialists - customer and/or certified BCP consultants

Define a list of relevant QuantityWare template conversion groups as a basis for your customer specific conversion groups. In the PMC, the QuantityWare template conversion groups **in client 045** can be displayed and analyzed via tab strip “QCI configuration”: Select button: “QuantityWare Template” and select the relevant product groups or select button: “By Measurement Standards” if you already know which standards are required. For all major product groups, the QuantityWare template contains pre-configured conversion groups both for the SAP QCI and QuantityWare MQCI. Both SAP QCI and MQCI conversion groups are technically linked to the SAP Oil & Gas ERP system via the SAP QCI interface to ERP processes. MQCI conversion groups provide much greater configuration flexibility, which may be required by your business processes.





5.3.4 Copy Template Conversion / Reading / Range Groups

Implementation step	3.4.
Estimated time to completion	L: 4 hours M: 20 hours H: 60 hours
Next step	3.5
Related project teams	Measurement specialists - customer and/or certified BCP consultants

Copy the relevant QuantityWare template conversion groups and reading groups from Q*** to Z*** (customer name space range) **in client 045** and transport your configuration into your **project development client XXX** (e.g. using transaction SCC1) or via SAP TMS (Transport Management System) from the template **client 045**.
Although many QuantityWare template conversion groups can theoretically be used in production with a few adjustments based on your requirements, **we strongly recommend that you perform the copy described above to keep the template intact.** Typically, you need to:

- Change settings in a conversion group for rounding procedures
- Add or remove reading group parameters depending on business requirements
- Change parameter names to customer specific business terminology
- For complex requirements, add specific conversion functions to the MQCI model sequence
- Define ranges for reading group parameters (warning and error messages)

The time required for this step depends heavily on the complexity of your project.

> ⚠ *A reading group is linked to a conversion group and defines which parameters (temperature, density, etc.) are required for the conversion. It also defines which results are displayed to a user (base density in air, VCF, etc.).*

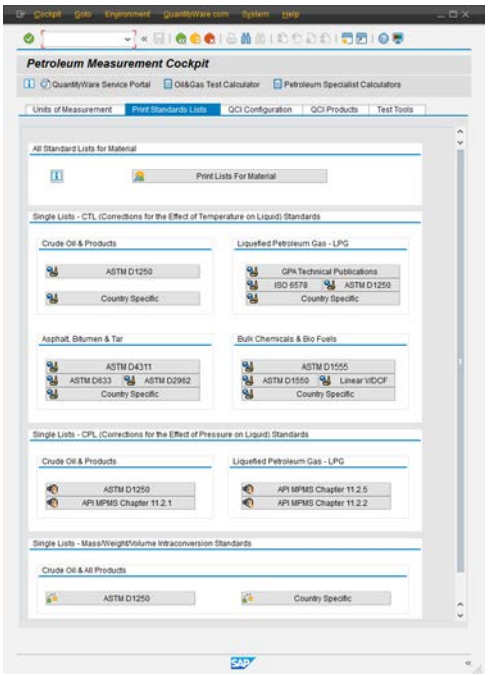
All QuantityWare customizing transactions are accessible via the PMC.

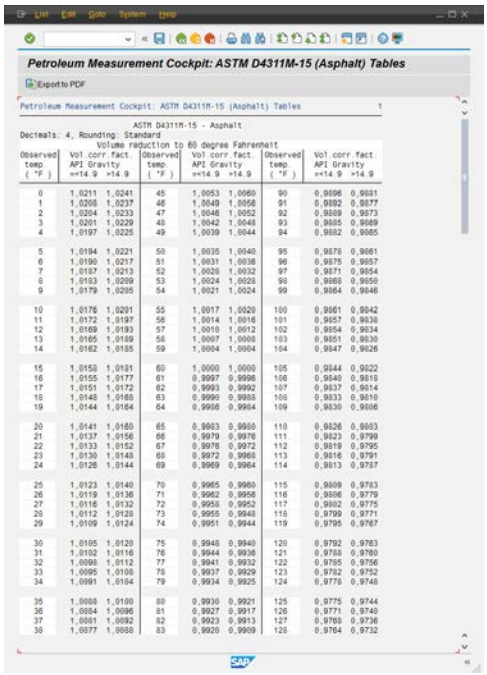
5.3.5 Define Test Calculation Matrix for Conversion Groups

Implementation step	3.5
Estimated time to organize	L: 1 day M: 3 days H: 10 days
Next step	4
Related project teams	Master data team – material master

For each conversion group, define at least four test calculations (e.g. with varying observed temperature values, for all UoM in the UoM group) in your **project development client XXX** and calculate the expected results using e.g. a pocket calculator or PC calculator (64 bit FLTP processor).

> ⚠ *The PMC provides list printouts of all relevant measurement standards. Use these printouts to obtain the VCF (volume correction factors) for your example calculations (QuantityWare standard implementations are validated in the implementation step). QuantityWare also recommends that you obtain your own measurement standard copy from the relevant standard organization as a reference and to allow the validation to be cross-checked.*
> *The list of sources for standards can be found in QuantityWare Note 000008.*

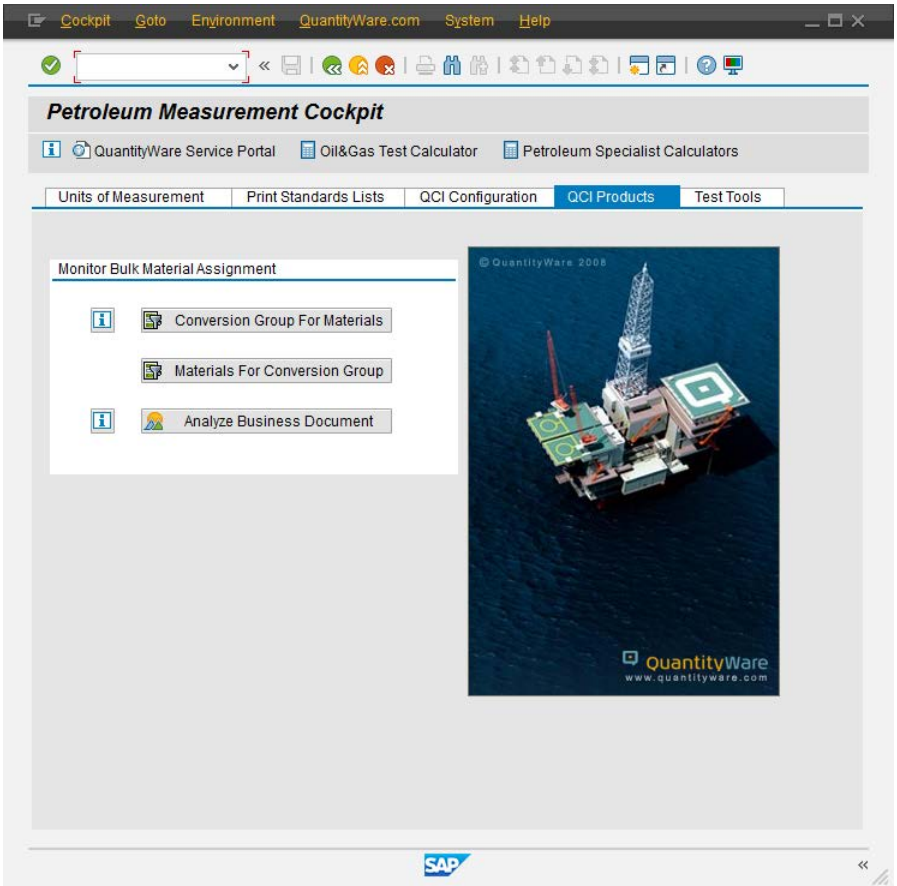




Calculate all expected results and have them cross-checked by a second expert. Document your results.
The next step is to compare the expected results with the results obtained from the Oil & Gas test calculator, which can be accessed from the PMC. Document the degree of similarity. If deviations are found, analyze the conversions (manual and system) to determine the deviation reason.

5.4 Assign Conversion Groups and UoM Groups to Material Master

Implementation step	4
Estimated time to completion	L: 0.5 day M: 2 days H: 4 days
Next step	5
Related project teams	Master data team – material master

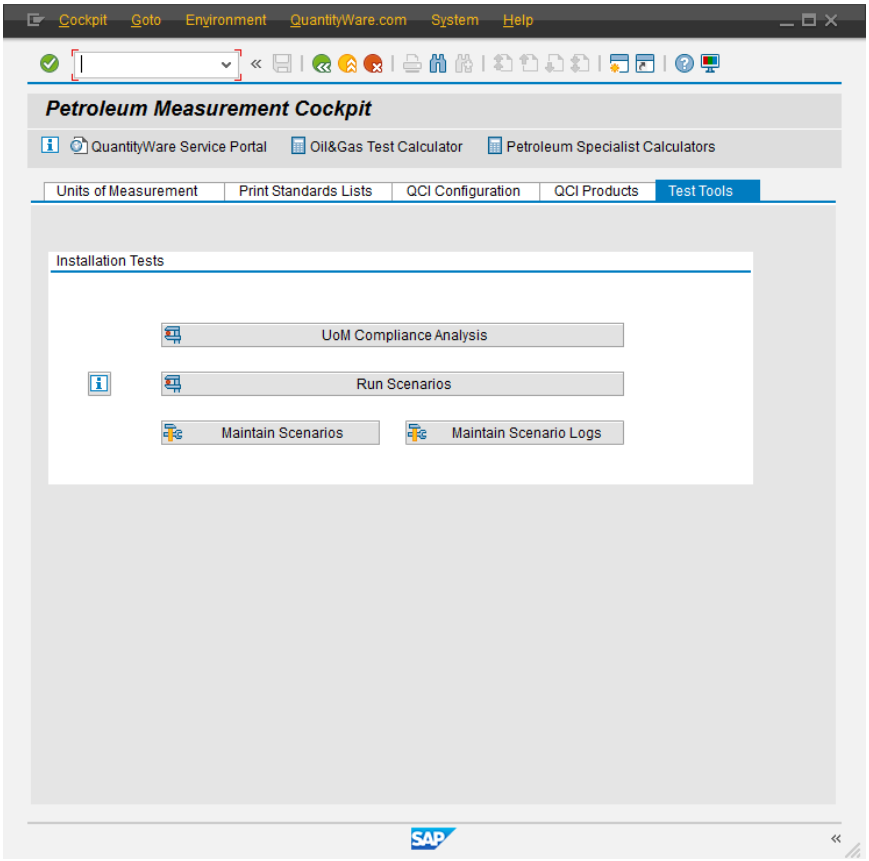


Assign the conversion groups and UoM groups to all materials (at plant level) in your **project development client XXX.** Once you are finished, check the assignment via tab strip “QCI Products”-> "Conversion Group for Materials" in the PMC to ensure that all materials are correctly set up.

Test the quantity conversion results once more using the Oil & Gas test calculator, this time with the material & plant data.

5.5 Define & Implement Test Calculation Quality Procedure

Implementation step	5
Estimated time to completion	L: 2 days M: 7 days H: 17 days
Next step	-
Related project teams	Master data team – material master

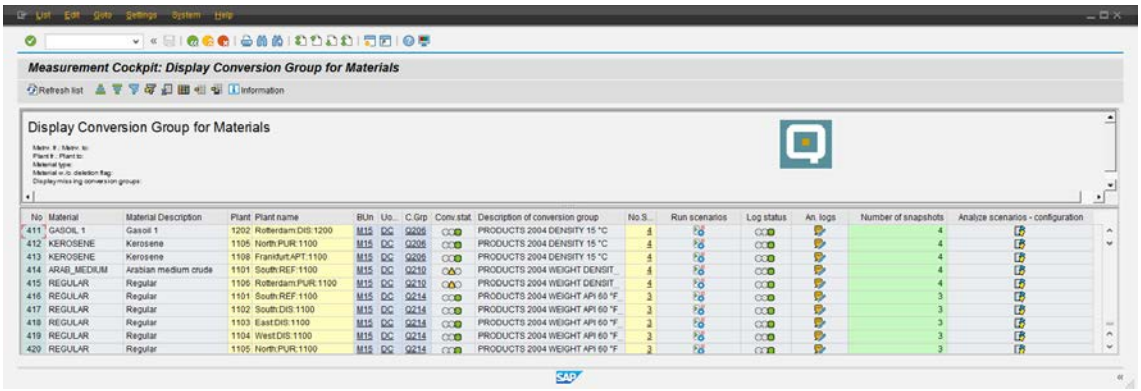


Define the overall quality assurance test procedure for the software life cycle. There are two main options:

- Either define a manual procedure – complex manual tests using the Oil & Gas test calculator after system changes (e.g. SAP Enhancement Package updates)
- Or, in your **project development client XXX:** Develop fully automated test scenarios (e.g. using a spreadsheet for each calculation) and then use the QuantityWare test tool to store your tests in the system, transport the test scenarios to any required system and run them at any desired point in time in your system

> ⚠ *For the development of automated test scenarios based on your test example definitions an experienced measurement consultant requires 2 to 17 days (Low to High complexity case), including definition of the test scenarios in the system, which is included in the previous figures. 90% of this time is required for the manual calculation of the expected results.*

If you decide to develop fully automated test scenarios, you can monitor the status of your QCI calculations via one central list (PMC – QCI Products -> Conversion Groups for Materials):



From this list, you may run scenarios at any point in time, monitor the log status, and if an error is reported, utilize the snapshot tool to easily analyze the root cause of the error.

6 Summary

After you have completed the test calculation procedure based on your test conversion matrix and established functional correctness of your conversion configuration, you can hand over your work to the overall project team. You have now established a state-of-the-art quantity conversion solution for the project, which can be tested, monitored (and extended in the same way as described above) via the PMC.

The time estimates for a Low, Medium and High complexity projects are summarized in the list below (rounded to full working days - new implementation project):

Complexity:	**Low**	**Medium**	**High**
Effort estimate (**days**):	7	24	60

As noted in chapter 1.1.4., added complexity needs to be considered if BCP is implemented “into” an existing productive system landscape. Depending on the customer specific system set up and requirements, **between 5 and 50++ days of effort need to be considered.**

These estimates assume that an experienced quantity conversion consultant leads these tasks and the quantity conversion implementation sub-project is well embedded into the overall implementation project, with established communication and decision channels.

The overheads of geographic separation and differing organization-internal procedures are not considered in the figures.