Note: 000101

Overview

Number	**000101**
Description	**Measurement Standards - Development Planning**
Version	**12 from 06.06.2024**
Status	**Released to Customer**
Language	**EN**
Responsible	**Markus Seng**
Product	**BCS**
Category	**Documentation**

Symptom

QuantityWare develops implementations of petroleum and natural gas measurement standards, that are delivered within the BCS solution. Measurement standard organizations issue and constantly update/revise standard documents via a defined revision and balloting process - typically every 5 to 10 years.

QuantityWare keeps track of existing standards changes and continuously monitors appropriate sources for new standards, thereby extending the portfolio of supported measurement standards for BCS.

In this note, we list all measurement standards inculsions and revisions - starting with BCS 30A CSP03 BCS 30B CSP02 - that are under consideration for addition into the supported standards portfolio, or have been revised and require additional developments.

Read the FAQ New Development for additional information.

Cause

Development planning.

Solution

The following measurement standards ***are planned to be added or updated after revision*** into the BCS supported standards portfolio with the next CSP:

1. Development HPH 2 – High Pressure Hydrogen gas calculations - energies - see note 000106 - point 3 for details

2. Release of AGA Report No. 8 Part 1 and Part 2 (2017) for **industrial gases** - see news item industrial gases for details

   The related additional template conversion groups for industrial gases will be delivered with the next CSP.

3. New version of ISO 6578 "Refrigerated Hydrocarbon Liquids - Static Measurement - Calculation Procedure" expected - see ISO homepage for details

4. tbd

The following measurement standards ***have been added*** into the BCS supported standards portfolio with BCS 30A CSP03 / BCS 30B CSP02:

1. High pressure hydrogen quantity conversions:

   A fundamental solution for 100% high pressure hydrogen gas (up to 700 bar) - considering hydrogen density and compressibility factors as defined **in J. Res. Natl. Inst. Stand. Technol. 113, 341-350 (2008) - Revised Standardized Equation for Hydrogen Gas Densities for Fuel Consumption Applications.**

2. SGERG-mod-H2:
   In order to enable the calculation of compression factors an gas law deviation factors based on the SGERG equation also at higher hydrogen content of hydrogen - natural gas mixtures, the existing algorithm has been modified. This new equation is denoted SGERG-mod-H2 .

3. Anhydrous ammonia (NH_3):
   A national standard document from Measurement Canada, based on experimental data, is available for the liquid phase product – the experimental data is defined in "The Thermodynamic Properties of Ammonia, by L. Haar and S.J. Gallagher, Journal of Physics Chemistry Ref. Data, Volume 7, No. 3, 1978."

4. AGA Report No. 8 - Part 2:
   Thermodynamic Properties of Natural Gas and Related Gases - GERG–2008 Equation of State - April 2017: Provides technical information necessary to compute thermodynamic properties including compressibility factors, densities, speeds of sound, and dew and bubble points for natural gas and related gases. It is based on the research performed at the Ruhr University in Bochum,

Germany, and published in 2006 as the doctoral dissertation of Oliver Kunz under the direction of Prof. Dr.-Ing. Wolfgang Wagner.

5. Brazilian Standard RESOLUÇÃO ANP No 894 - 2022:
   This standard replaces C.N.P. No. 6 – 70, Table I & II [MINISTÉRIO DAS MINAS E ENERGIAS, CONSELHO NACIONAL DO PETRÓLEO, 1521. ª SESSÃO ORDINÁRIA, (25 de junho de 1970) RESOLUÇÃO No 6 – 70, TABELA I,II].

   NOTE: With RESOLUÇÃO ANP No 894 - 2022, RESOLUÇÃO No 6 – 70 has been revoked, and technically been put into force again. No changes to the 1970 Tables 1 and 2 content and description have been made. Thus, from an implementation point of view, the documentation of this new implementation will refer to it as RESOLUÇÃO ANP No 894 - 2022 / RESOLUÇÃO No 6 – 70, whereas the technical implementation continues to utilize RESOLUÇÃO No 6 – 70 / CNP 6 - 70 as technical ID (e.g. ABAP programs).

The following measurement standards *have been revised* and required additional developments, delivered with BCS 30A CSP03 / BCS 30B CSP02:

1. ISO 6976:
   The third edition of the standard "ISO 6976 Natural gas – Calculation of calorific values, density, relative density and Wobbe indices from composition" was issued in 2016. Through technical revision, it cancels and replaces the second edition from 1995. As stated in the third editions' introduction, adoption of the revisions detailed in this standard will not be without cost, as instrumental (and ERP business) software will need updating. QuantityWare has carefully analyzed this third edition. The major technical changes of this standard are:

1.   a. New method to calculate ideal and real molar-based calorific value and thus subsequent calorific values (mass and volume based)
   b. Introduction of net Wobbe index
   c. New component data (n-dodecane, n-tridecane, n-tetradecane, n-pentadecane) (**will be implemented on customer request**)
   d. Completely updated physical property data and auxiliary constants
   e. Harmonization with GPA 2172 and related U.S. customary based standards – Provision of different reference pressures in all formulas of ISO 6976.

2. ABNT NBR 5992:
   This standard has been revised and published in November 2016 as ABNT NBR 5992 (2016). QuantityWare has carefully analyzed this latest version. The basic formulas for calculation of the alcohol densities and mass proportions did not change when compared with the 2008 version; however, the definition of the volume correction factor (VCF) changed between the 2008 and 2016 version. The 2008 version requires the multiplication of the densities related VCF with the expansion coefficient of stainless steel (0.000036 / °C). The 2016 version does not contain this storage device correction any longer. Thus, a new MQCI implementation of ABNT NBR 5992 (2016) has been delivered by QuantityWare as an Advanced Development (AD) in Q2 2022 - see QW Note 000108.

Transport Reference

No SAP-based transport

Validity

SAP Release	From SP	To SP	In SP Shipment
ECC600	ALL	ALL	
S/4 HANA	ALL	ALL	