Addendum API 16F second edition

Item #1

Changed the definition of class 2 bolting from:

3.1.12.1
class 2 bolting
Bolting in the riser’s primary load path not exposed to subsea environment or any pressure-containing bolting not intended for wellbore fluid containment.

NOTE See Table 2.

To by adding the word subsea:

3.1.12.1
class 2 bolting
Bolting in the riser’s primary load path not exposed to subsea environment or any subsea pressure-containing bolting not intended for wellbore fluid containment.

NOTE See Table 2.

Item #2

Change the definition of class 3 bolting from:

3.1.12.2
class 3 bolting
Subsea bolting in the riser’s primary load path or whose failure could result in release of wellbore fluid to the environment.

NOTE Examples include riser coupling bolts, see Table 2.

To by adding the word bolting:

3.1.12.2
class 3 bolting
Subsea bolting in the riser’s primary load path or bolting whose failure could result in release of wellbore fluid to the environment.

NOTE Examples include riser coupling bolts, see Table 2.
Item #3

Change the note in 3.1.12.3 utility bolting from:

NOTE Examples include bolting on lifting eye, wear bushing, nameplate, clamps for tubing, guards, buoyancy supports.

To:

NOTE Examples include bolting on lifting eye, wear bushing, nameplate, clamps for tubing, guards, buoyancy supports, lockdown screws, keeper plate screws, hydraulic cylinders (whose failure would not result in the release of wellbore fluid to the environment).

Item #4

Add new definition to section 3:

Riser primary load path
The path through which riser tensioning loads pass, beginning at the lower flex joint and ending at the tensioner foundation.

Note: All components between these two points through which riser tension loads pass are considered to be in the primary load path. Examples of components in the riser primary load path include riser joints, riser connectors, tension ring, riser tensioner assemblies, both direct connect and wire line type, and idler sheaves.

Item #5

Changed the definition of maximum supply pressure MSP from:

3.1.47
maximum supply pressure MSP

Highest pressure that can be supplied to the tensioners.
To:

3.1.47
maximum supply
pressure MSP

Highest pressure that can be supplied to the tensioners at the stroke corresponding to the rated tension.
Note: See Section 7.3.1.1 for rated tension

Item #6

Change CEM in section 3.2 Abbreviations and Symbols from:

CEM contract equipment manufacturer

To:

OEM original equipment manufacturer

Justification:

CEM has been removed for document Annex F and only OEM is there.

Item #7

Change last sentence in first paragraph in impact testing bullet point in section 5.4.1.2.2 from:

Impact energy requirements may be reduced by a factor of 0.883 and 0.667 for ¾ size and ½ size specimens, respectively.

To:

Impact energy requirements may be reduced by a factor of 0.833 and 0.667 for ¾ size and ½ size specimens, respectively.

Justification:

The 0.883 was a typo. API 16F 1st edition, API 6A table 10 and API 16A table 34 all says requirement
Item #8

Change sentence below in 5.5.3 Bolting for Marine Drilling Riser Equipment from:

For bolting purposes, the tension ring shall be considered subsea equipment. Primary-load-path bolting on the tension ring shall be class 3.

To:

For bolting purposes, the tension ring and attachments to it shall be considered subsea equipment. Primary-load-path bolting on the tension ring and attachments to it shall be class 3.

Item #9

Add the following requirements to section 5.5.3 Bolting for Marine Drilling Riser Equipment after the sentence on the tension ring and before Table 2 – Bolting Requirements.

Bolting in the riser’s primary load path during running/handling operations for Riser Running & Handling Equipment as defined by Section 14 shall be considered Class 2 Bolting.

Bolting for riser tensioner equipment shall meet the requirements of section 7.

Item #10

Add a NOTE 3 to Section 5.5.3. NOTE to be:

NOTE 3 Low alloy steel or carbon steel bolting may be susceptible to hydrogen embrittlement at hardness levels above 34 HRC.

Item #11

Changed section 7.3.1.1 from:
7.3.1.1 Rated Tension

Tensioners shall be rated at the 75 % stroke position for compression-loaded tensioners and 25 % stroke position for tension-loaded tensioners (see Figure 1).

NOTE Ideally during operation, riser tensioners are set at the mid-stroke (50 % stroke) to allow for equal stroking either side of the mid-point as the vessel heaves. In reality, achieving mid-stroke position is difficult due to the following:

| — riser geometry might not position the tension ring exactly where a mid-stroke position can be obtained, |
| — increased tension with increased mud weights results in additional riser stretch, |
| — tidal changes at the well site can change the stroke setting. |

The above factors along with the potential for drift-off make it desirable to miss the mid-stroke setting to the high side should a miss occur. The rated tension shall not exceed MCP at any stroke.

To by deleting last sentence and changing into bullet point:

7.3.1.1 Rated Tension

Tensioners shall be rated at the 75 % stroke position for compression-loaded tensioners and 25 % stroke position for tension-loaded tensioners (see Figure 1).

NOTE Ideally during operation, riser tensioners are set at the mid-stroke (50 % stroke) to allow for equal stroking either side of the mid-point as the vessel heaves. In reality, achieving mid-stroke position is difficult due to the following:

| — riser geometry might not position the tension ring exactly where a mid-stroke position can be obtained, |
| — increased tension with increased mud weights results in additional riser stretch, |
| — tidal changes at the well site can change the stroke setting. |
| — The above factors along with the potential for drift-off make it desirable to miss the mid-stroke setting to the high side should a miss occur. |
Item #12

Change title from, “Pressure Vessels” to “Pressure Vessels (APV’s)”

Add NOTE to section 7.5.1. NOTE to be:

NOTE: Pressure vessels can contain either air or an inert gas as the compressible medium. The minimum corrosion allowance shall apply regardless of the compressible medium used.

Item #13

Changed fist sentence in section 7.5.2 from:

Cylinders shall be designed, fabricated, and tested to meet the strength requirements of ASME BPVC, Section VIII, Division 1 or Division 2, or other nationally or internationally recognized standards.

To by removing the word strength:

Cylinders shall be designed, fabricated, and tested to meet the requirements of ASME BPVC, Section VIII, Division 1 or Division 2, or other nationally or internationally recognized standards.

Item #14

Added new section 7.5.9

7.5.9 Tensioner Bolting

Bolting for riser tensioner cylinders and pressure vessels shall be selected to meet the requirements of ASME BPVC Sec VIII, Division 1 or Division 2, or other nationally or internationally recognized standard,

Bolting for piping shall be in accordance with ASME B31.3 or other nationally or internationally recognized standard.

All other bolting shall be in accordance with 5.5.3 with the following exceptions.

— Low alloy and carbon steel bolting in the riser primary load path used in compression
loaded connections are allowed up to 45 HRC max hardness when conditions for hydrogen stress cracking are not expected by design.

— NOTE: This exception typically applies to 12 point and socket head cap screw designs.

— Utility bolting shall meet industry standard or OEM requirements.

Item #15

Add new section 14.3.2

Riser Running Tool

The riser running tool shall include a method to confirm running tool engagement and provide a positive lock signal output.

Riser running tools that utilize riser bolting are excluded from the lock signal output requirement.

Verification of correct installation shall be accomplished through one of the following; visual indications, measurements, gauge, or other device(s) to confirm running tool engagement.

The output signal shall be electrical, hydraulic, or both. The output signal shall provide positive indication that the riser running tool lock or latch is engaged prior to lifting.

Note: These tools are typically hydraulic riser running tools.

The method of correct installation verification shall be documented within the OEM manuals.

Prototype testing

Prototype testing shall confirm the following results are produced.

1. The method delivers a positive output signal when the tool is properly engaged in and locked to the riser joint.
2. The method does not deliver a positive output signal (false positive) if the device is not properly engaged and is not locked to the riser joint.

Functional testing

Functional testing shall confirm that the method used does give a positive output signal when the tool is properly engaged in a riser joint.
Item #16

Change note in 14.3.2.5 from:

NOTE The use of the method in this section requires local strains to be analyzed for the test load with the addition of a few cycles of the rated load to determine if shakedown occurs, i.e. no progressive distortion or stress ratcheting.

To a requirement statement in section 14.3.2.5:

Elastic-perfectly plastic material properties shall be used for shakedown analysis to justify high local primary and secondary stresses. The design is acceptable if shakedown occurs, if after successive application shall include the effect of proof load/hydrostatic testing as well as operational loading.

Item #17

Add new section 16.5.1.1:

16.5.1.1 Scaling

Scaling may be used to validate the members of a product family in accordance with the requirements and limitations described in this section.

16.5.1.1.1 Product Family

A product family shall meet the following design requirements:

— Configuration: The design principles of physical configuration, material properties and functional operation are the same;
— Design stress levels: The design stress levels in relation to material mechanical properties are based on the same criteria;
— Analyzed stress levels: The analyzed stress levels and SAF/SLR in the scaled product shall not exceed the analyzed stress levels and SAF/SLR in the product that is qualification tested per Section 16.5.

16.5.1.1.2 Design Validation by Rated Load

If scaling is used to validate the same product family, testing shall qualify only products of the same family having one nominal rated load (refer to section 16.2.3) lower than tested size.
Item #18

Change first sentence wording in Annex C.2 from:

For all components except coupling bolts and auxiliary, choke, and kill lines (see Section 9), linearized stresses shall be ......

To:

For all components except coupling bolts and auxiliary / choke / kill rigid piping, linearized stresses shall be ......

Item #19

Remove CEM from Annex F from the Manufacturing Data Book (MDB) Table in the Test Report(s), Pressure Testing, and Final Acceptance Testing (including the following): section. Change lines in that section from:

Dimensions (as defined by OEM/CEM)

All remaining documentation required as defined in API 16F are kept at OEM/CEM facility for required retention period

To:

Dimensions (as defined by OEM)

All remaining documentation required as defined in API 16F are kept at OEM facility for required retention period